

# 1984 - 515524\_CityofFairfax\_CFPF-1

## Application Details

Funding Opportunity:	1448-Virginia Community Flood Preparedness Fund - Study Grants - CY23 Round 4
Funding Opportunity Due Date:	Nov 12, 2023 11:59 PM
Program Area:	Virginia Community Flood Preparedness Fund
Status:	Under Review
Stage:	Final Application
Initial Submit Date:	Nov 10, 2023 1:08 PM
Initially Submitted By:	Jonathan D'Alessandro
Last Submit Date:	
Last Submitted By:	

## Contact Information

### Primary Contact Information

Active User*:	Yes
Type:	External User
Name*:	Mr. Jonathan J D'Alessandro <small>Salutation First Name Middle Name Last Name</small>
Title:	Senior Project Manager
Email*:	<a href="mailto:jon.dalessandro@kimley-horn.com">jon.dalessandro@kimley-horn.com</a>
Address*:	11400 Commerce Park Drive, Suite 400  Reston Virginia 20191 <small>City State/Province Postal Code/Zip</small>
Phone*:	703-752-0589 Ext. <small>Phone</small> ###-###-####
Fax:	###-###-####
Comments:	

### Organization Information

Status*:	Approved
Name*:	Kimley-Horn
Organization Type*:	
Tax ID*:	56-0885615
Unique Entity Identifier (UEI)*:	V8PKGG6NLKV6

Organization Website:

Address\*: 421 Fayetteville Street Suite 600

Raleigh North Carolina 27601-  
City State/Province Postal Code/Zip

Phone\*: 919-677-2000 Ext.  
### ### #####

Fax: ### ### #####

Benefactor:

Vendor ID:

Comments:

## VCFPF Applicant Information

### Project Description

Name of Local Government\*: City of Fairfax

Your locality's CID number can be found at the following link: [Community Status Book Report](#)

NFIP/DCR Community Identification  
Number (CID)\*: 515524

If a state or federally recognized Indian tribe,

Name of Tribe:

Authorized Individual\*: Robert Stalzer  
First Name Last Name

Mailing Address\*: 10455 Armstrong Street  
Address Line 1  
Room 316  
Address Line 2  
Fairfax Virginia 22030  
City State Zip Code

Telephone Number\*: 703-385-7850

Cell Phone Number\*: 703-385-7850

Email\*: [Rob.Stalzer@fairfaxva.gov](mailto:Rob.Stalzer@fairfaxva.gov)

Is the contact person different than the authorized individual?

Contact Person\*: Yes

Contact: Satoshi Eto  
First Name Last Name  
10455 Armstrong Street  
Address Line 1  
Room 200  
Address Line 2  
Fairfax Virginia 22030  
City State Zip Code

Telephone Number: 703-273-6073

Cell Phone Number: 571-641-0839

Email Address: [satoshi.eto@fairfaxva.gov](mailto:satoshi.eto@fairfaxva.gov)

Enter a description of the project for which you are applying to this funding opportunity

### Project Description\*:

To evaluate the existing hydrologic and hydraulic features of the of Dwight Avenue and Virginia Street Drainage Corridors in the City of Fairfax and develop conceptual solutions to help abate localized drainage issues due to lack of stormwater infrastructure and existing drainage patters. The Study Limits receive large volumes of concentrated flow during high intensity storm events and several properties at the southwest corner of Dwight Avenue and Virginia Street are impacted.

Low-income geographic area means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

Is the proposal in this application intended to benefit a low-income geographic area as defined above?

**Benefit a low-income geographic area\*:** No

Information regarding your census block(s) can be found at [census.gov](https://census.gov)

**Census Block(s) Where Project will Occur\*:** 2001, 2000, 1009, 3010, 1008, 3011, 2004, 2005, 2007, 2006, 1007

**Is Project Located in an NFIP Participating Community?\*** Yes

**Is Project Located in a Special Flood Hazard Area?\*** No

**Flood Zone(s)  
(if applicable):** X

**Flood Insurance Rate Map Number(s)  
(if applicable):** 5155240005D

## Eligibility - Round 4

### Eligibility

Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these)?

**Local Government\*:** Yes  
Yes - Eligible for consideration  
No - Not eligible for consideration

If the applicant is not a town, city, or county, are letters of support from all affected local governments included in this application?

**Letters of Support\*:** N/A  
Yes - Eligible for consideration  
No - Not eligible for consideration

Has this or any portion of this project been included in any application or program previously funded by the Department?

**Previously Funded\*:** No  
Yes - Not eligible for consideration  
No - Eligible for consideration

Has the applicant provided evidence of an ability to provide the required matching funds?

**Evidence of Match Funds\*:** Yes  
Yes - Eligible for consideration  
No - Not eligible for consideration  
N/A - Match not required

## Scope of Work - Studies - Round 4

### Scope of Work

#### Upload your Scope of Work

Please refer to Part IV, Section B. of the grant manual for guidance on how to create your scope of work

**Scope of Work\*:** [CID515524C\\_CityofFairfax\\_CFPF\\_ScopeOfWork.pdf](#)

**Comments:**

Attached is the Consultants scope of work to perform the Dwight Avenue and Virginia Street Drainage Study. A full Scope of Work Narrative is outlined in the Combined Grant Application Package attached to this submission.

**Budget Narrative****Budget Narrative Attachment\*:**[CID515524C\\_CityofFairfax\\_CFPF\\_SectionB-BudgetNarrative.pdf](#)**Comments:**

Attached is Section B of the of Attached Compiled Grant Application Package which contains the project budget narrative, budget narrative template, and funding request authorization for this study.

## Scoring Criteria for Studies - Round 4

**Scoring**

Revising floodplain ordinances to maintain compliance with the NFIP or to incorporate higher standards that may reduce the risk of flood damage. This must include establishing processes for implementing the ordinance, including but not limited to, permitting, record retention, violations, and variances. This may include revising a floodplain ordinance when the community is getting new Flood Insurance Rate Maps (FIRMs), updating a floodplain ordinance to include floodplain setbacks or freeboard, or correcting issues identified in a Corrective Action Plan.

**Revising Floodplain Ordinances\*:**

No  
Select

Creating tools or applications to identify, aggregate, or display information on flood risk or creating a crowd-sourced mapping platform that gathers data points about real-time flooding. This could include a locally or regionally based web-based mapping product that allows local residents to better understand their flood risk.

**Mapping Platform\*:**

No  
Select

Conducting hydrologic and hydraulic studies of floodplains. Applicants who create new maps must apply for a Letter of Map Revision or a Physical Map Revision through the Federal Emergency Management Agency (FEMA).

**Hydrologic and Hydraulic Studies\*:**

No  
Select

Studies and Data Collection of Statewide and Regional Significance. Funding of studies of statewide and regional significance and proposals will be considered for the following types of studies:

Updating precipitation data and IDF information (rain intensity, duration, frequency estimates) including such data at a sub-state or regional scale on a periodic basis.

**Updating Precipitation Data and IDF Information\*:**

No  
Select

Regional relative sea level rise projections for use in determining future impacts.

**Projections\*:**

No  
Select

Vulnerability analysis either statewide or regionally to state transportation, water supply, water treatment, impounding structures, or other significant and vital infrastructure from flooding.

**Vulnerability Analysis\*:**

No  
Select

Flash flood studies and modeling in riverine regions of the state.

**Flash Flood Studies\*:**

Yes  
Select

Statewide or regional stream gauge monitoring to include expansion of existing gauge networks.

**Stream Gauge Monitoring\*:**

No  
Select

New or updated delineations of areas of recurrent flooding, stormwater flooding, and storm surge vulnerability in coastal areas that include projections for future conditions based on sea level rise, more intense rainfall events, or other relevant flood risk factors.

**Delineations of Areas of Recurrent Flooding\*:**

No  
Select

Regional flood studies in riverine communities that may include watershed-scale evaluation, updated estimates of rainfall intensity, or other information.

<b>Regional Flood Studies*:</b>	Yes Select
Regional Hydrologic and Hydraulic Studies of Floodplains	
<b>Regional Hydrologic and Hydraulic Studies of Floodplains*:</b>	No Select
Studies of potential land use strategies that could be implemented by a local government to reduce or mitigate damage from coastal or riverine flooding.	
<b>Potential Land Use Strategies*:</b>	No Select
Other proposals that will significantly improve protection from flooding on a statewide or regional basis.	
<b>Other Proposals*:</b>	No Select
Is the project area socially vulnerable? (based on <a href="#">ADAPT Virginia's Social Vulnerability Index Score</a> )	
<b>Social Vulnerability Scoring:</b>	
Very High Social Vulnerability (More than 1.5)	
High Social Vulnerability (1.0 to 1.5)	
Moderate Social Vulnerability (0.0 to 1.0)	
Low Social Vulnerability (-1.0 to 0.0)	
Very Low Social Vulnerability (Less than -1.0)	
<b>Socially Vulnerable*:</b>	Very Low Social Vulnerability (Less than -1.0)
Is the proposed project part of an effort to join or remedy the community's probation or suspension from the NFIP?	
<b>NFIP*:</b>	No
Is the proposed project in a low-income geographic area as defined below?	
"Low-income geographic area" means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.	
<b>Low-Income Geographic Area*:</b>	No
Projects eligible for funding may also reduce nutrient and sediment pollution to local waters and the Chesapeake Bay and assist the Commonwealth in achieving local and/or Chesapeake Bay TMDLs.	
Does the proposed project include implementation of one or more best management practices with a nitrogen, phosphorus, or sediment reduction efficiency established by the Virginia Department of Environmental Quality or the Chesapeake Bay Program Partnership in support of the Chesapeake Bay TMDL Phase III Watershed Implementation Plan?	
<b>Reduction of Nutrient and Sediment Pollution*:</b>	No
<b>Comments:</b>	

## Scope of Work Supporting Information - Studies

**Scope of Work Supporting Information**

Is the proposed study a new study or updates on a prior study?

**New or Updated Study\*:** New Study

Describe the relationship of the study to the local government's needs for flood prevention and protection, equity, community improvement, identification of nature-based solutions or other priorities contained in this manual

**Relationship of Study to Priorities Contained in this Manual\*:**

This project has been outlined in the City's DRAFT-Resilience Plan (still in development) and is outlined in the City's CIP and tied to the City's neighborhood drainage improvements program that focuses on aging infrastructure and localized drainage problems throughout the community.

Describe the qualifications of the individuals or organizations charged with conducting the study or the elements of any request for proposal that define those qualifications

**Qualifications of Individuals Conducting Study\*:**

Please See Section A of the Attached Compiled Grant Application Package for the Qualifications and Resumes of the team that will be in charge of conducting the study.

Describe the expected use of the study results in the context of the local resilience plan or, in the case of regional plans, how the study improves any regional approach

**Expected use of Study Results\*:**

This project has been outlined in the City's DRAFT-Resilience Plan (still in development) and is outlined in the City's CIP and tied to the City's neighborhood drainage improvements program that focuses on aging infrastructure and localized drainage problems throughout the community.

If applicable, describe how the study may improve Virginia's flood protection and prevention abilities in a statewide context (type N/A if not applicable)

**Statewide Improvements\*:**

N/A

Provide a list of repetitive and/or severe repetitive loss properties. Do not provide the addresses for the properties, but include an exact number of repetitive and/or severe repetitive loss structures within the project area

**Repetitive Loss and/or Severe Repetitive Loss Properties\*:** [CID515524C\\_CityofFairfax\\_CFPF\\_RepetitiveLossStatement.docx](#)

Describe the residential and commercial structures impacted by this project, including how they contribute to the community such as historic, economic, or social value. Provide an exact number of these structures in the project area

**Residential and/or Commercial Structures\*:**

The proposed study limits receive large volumes of concentrated flow during high intensity storm events and several properties at the southwest corner of Dwight Avenue and Virginia Street are impacted by these flows. Residents have also reported that runoff from the western half of Virginia Street south of Dwight will spill out of the roadside ditch and onto their properties. Section C of the Combined Grant Application package (attached to this submission) contains documentation of resident complaints of drainage issues within the study limits.

If there are critical facilities/infrastructure within the project area, describe each facility

**Critical Facilities/Infrastructure\*:**

N/A

## Budget

**Budget Summary**

<b>Grant Matching Requirement*:</b>	Flood Prevention and Protection Studies - Fund 50%/Match 50%
<b>Total Project Amount*:</b>	\$123,112.32
<b>REQUIRED Match Percentage Amount:</b>	\$61,556.16

## BUDGET TOTALS

**Before submitting your application be sure that you meet the match requirements for your project type.**

<b>Match Percentage:</b>	50.00%
	Verify that your match percentage matches your required match percentage amount above.
<b>Total Requested Fund Amount:</b>	\$61,556.16
<b>Total Match Amount:</b>	\$61,556.16
<b>TOTAL:</b>	\$123,112.32

**Personnel**

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

**Fringe Benefits**

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

Travel

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

Equipment

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

Supplies

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

Construction

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

Contracts

Description	Requested Fund Amount	Match Amount	Match Source
Consutant Fee Form Performing Survey and Study	\$61,556.16	\$61,556.16	City 2024 CIP Line Item for Neighborhood Drainage Projects
	\$61,556.16	\$61,556.16	

Pre-Award and Startup Costs

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

Other Direct Costs

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

Supporting Documentation

Supporting Documentation

Named Attachment	Required	Description	File Name	Type	Size	Upload Date
Detailed map of the project area(s) (Projects/Studies)		Detailed Map of Project Areas	<a href="#">CID515524C_CityofFairfax_CFPF_DetailedMapofProjectArea.pdf</a>	pdf	1 MB	11/10/2023 12:52 PM
FIRMette of the project area(s) (Projects/Studies)		Firmette of Project Area	<a href="#">CID515524C_CityofFairfax_CFPF_FIRMetteofProjectArea.pdf</a>	pdf	784 KB	11/10/2023 12:54 PM
Historic flood damage data and/or images (Projects/Studies)		Historic Flood Damage Data	<a href="#">CID515524C_CityofFairfax_CFPF_HistoricFloodDamageData.pdf</a>	pdf	580 KB	11/10/2023 12:55 PM
A link to or a copy of the current floodplain ordinance		City of Fairfax FP Ordinance	<a href="#">CID515524C_CityofFairfax_CFPF_FloodplainOrdinance.pdf</a>	pdf	298 KB	11/10/2023 12:55 PM
Maintenance and management plan for project						
A link to or a copy of the current hazard mitigation plan						
A link to or a copy of the current comprehensive plan		Link to Comprehensive Plan	<a href="#">CID515524C_CityofFairfax_CFPF_LinktoComprehensivePlan.pdf</a>	pdf	354 KB	11/10/2023 12:56 PM
Social vulnerability index score(s) for the project area		SVI Map	<a href="#">CID515524C_CityofFairfax_CFPF_SVIMap.pdf</a>	pdf	776 KB	11/10/2023 12:56 PM
Authorization to request funding from the Fund from governing body or chief executive of the local government		Funding Authorization request from City Manager	<a href="#">CID515524C_CityofFairfax_CFPF_FundingAuthorizationRequest.pdf</a>	pdf	79 KB	11/10/2023 12:56 PM
Signed pledge agreement from each contributing organization						
Maintenance Plan						
<i>Benefit-cost analysis must be submitted with project applications over \$2,000,000. in lieu of using the FEMA benefit-cost analysis tool, applicants may submit a narrative to describe in detail the cost benefits and value. The narrative must explicitly indicate the risk reduction benefits of a flood mitigation project and compares those benefits to its cost-effectiveness.</i>						
Benefit Cost Analysis						
Other Relevant Attachments		Compiled CFPF Grant Application for the Dwight Avenue and Virginia Street Drainage Improvements Study	<a href="#">CID515524_CityofFairfax_CFPF_CompiledApplicationPackage.pdf</a>	pdf	8 MB	11/10/2023 01:02 PM

### Letters of Support

Description	File Name	Type	Size	Upload Date
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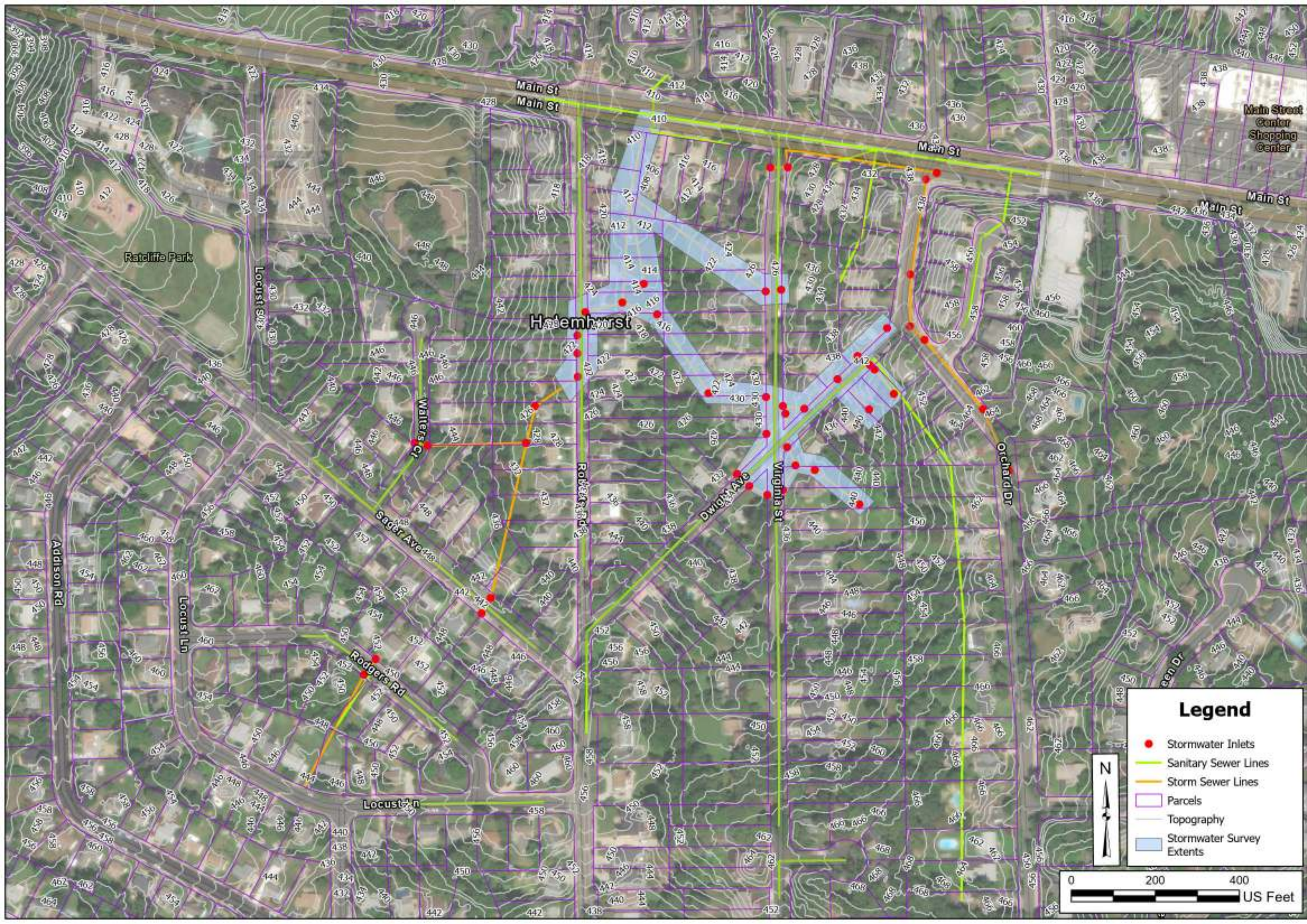
No files attached.



## Detailed Map of Project Area







DATE

11/7/2023

DRAWN BY

MNP

CHECKED BY

JJD

DWIGHT AVENUE DRAINAGE STUDY

PREPARED FOR CITY OF FAIRFAX  
FAIRFAX, VIRGINIA

**Legend**

- Stormwater Inlets
- Sanitary Sewer Lines
- Storm Sewer Lines
- ▭ Parcels
- Topography
- ▭ Stormwater Survey Extents



0 200 400  
US Feet

SCALE

1" = 200'

PROJECT NUMBER

N/A

SHEET NUMBER

EXHIBIT



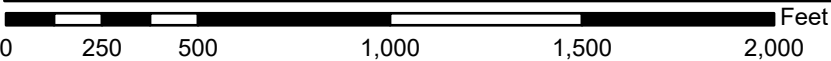
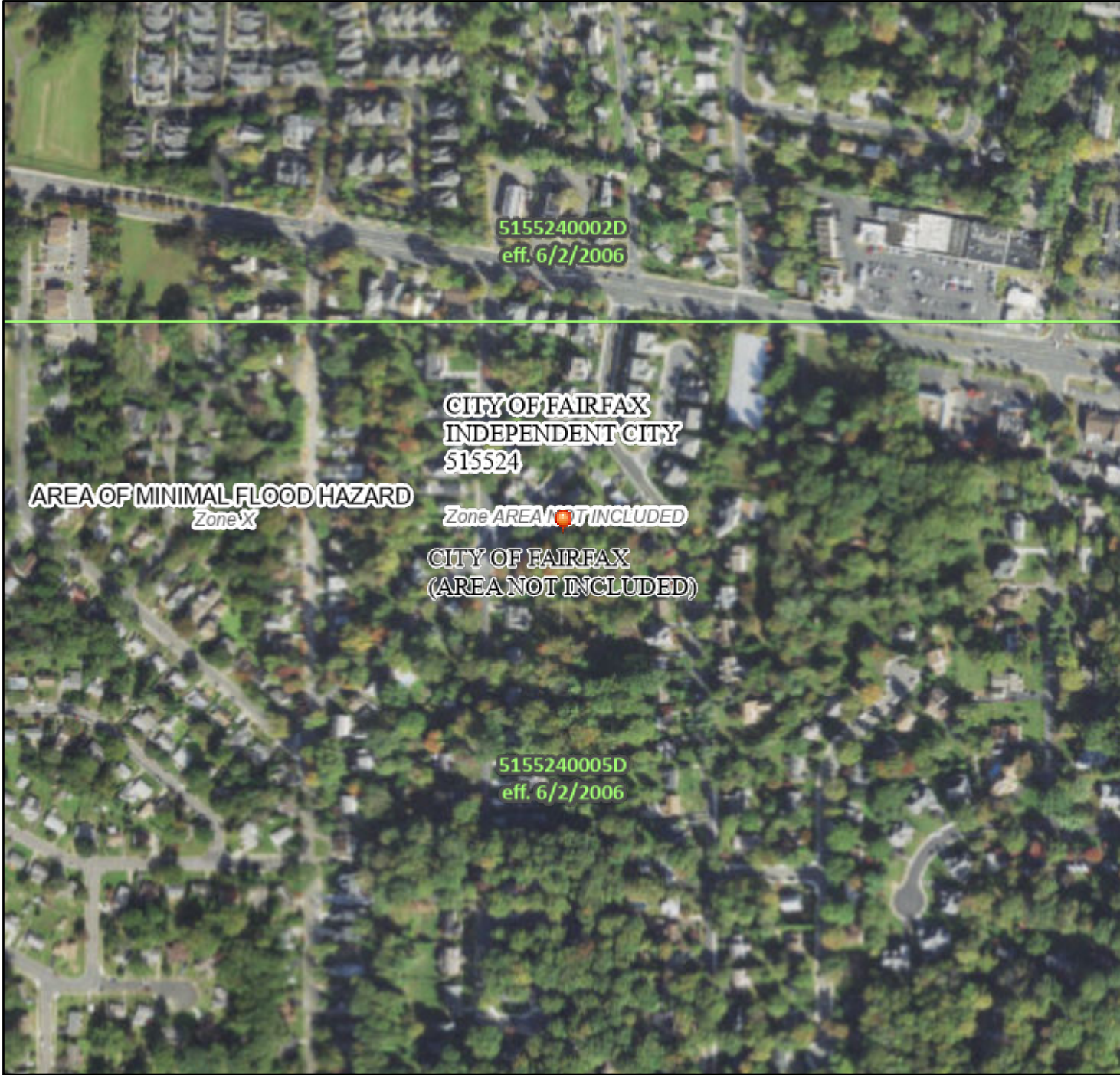
## **FIRMette of the Project Area**



# National Flood Hazard Layer FIRMette



77°17'59"W 38°50'46"N



1:6,000

77°17'21"W 38°50'18"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/31/2023 at 2:03 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

# Historic Flood Damage Documentation



# DOCUMENTATION ITEM 1

[REDACTED]

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From: [REDACTED]  
Sent: Monday, April 5, 2021 8:52 AM  
To: Eto, Satoshi  
Cc: Summers, David; [REDACTED]  
Subject: Re: Storm Water Issues [REDACTED]

**CAUTION: External Email**

Good morning Mr. Eto,

Thank you for the prompt response. This Wednesday at 9am works well. It's great to hear that our street is part of the upcoming construction plans but you are correct FY26 is a bit out. Let's meet here at our house, so we can show you some of the problems we're facing. Thank you again and we look forward to meeting you.

Thanks,  
[REDACTED]

On Apr 5, 2021, at 8:01 AM, Eto, Satoshi <Satoshi.Eto@fairfaxva.gov> wrote:

Good morning Erika,

Thank you for reaching out to us. Would you be available to meet this Wednesday at 9AM?

The City has a Neighborhood Drainage Projects program in the capital budget and a drainage project for Virginia & Dwight was added during this budget cycle after we met with residents to discuss their drainage concerns. This project is currently proposed for design in FY24 and construction in FY26. I can tell you more about this program and how you can support it during the budget process.

FY26 is a ways off, so I would like to get an understanding of the drainage impacts to your property and then meet with our maintenance staff to discuss any additional interim measures we can implement to help you.

Sincerely,

<image001.png>

Satoshi Eto  
Acting City Engineer  
Stormwater Resource Engineer  
Public Works

---

From: [REDACTED]  
Sent: Saturday, April 03, 2021 1:10 PM  
To: Summers, David <David.Summers@fairfaxva.gov>; Eto, Satoshi <Satoshi.Eto@fairfaxva.gov>; [REDACTED]

[REDACTED]  
Subject: Storm Water Issues [REDACTED]

**CAUTION: External Email**

Good afternoon,

Hope this email finds you well. My family and I recently moved to Fairfax City, residing in [REDACTED]. In the last few months we have experienced a significant amount of Storm Water coming directly into our property from the street directly behind us (Virginia St.) and surrounding properties. The storm water sits in our property for days at a time, which is causing a significant amount of damage including soil erosion to potential foundation issues.

Mr. Summers, my understanding is that this issue was reported to your department last year by the previous owner ([REDACTED]) and although some measures were taken to address this issue, this continues to be a problem. We need to find a way to divert the water from Virginia St. and because of this I am kindly requesting a meeting with you and Mr. Eto in order to address this issue before it becomes more significant and damaging. We want to get ahead of this problem prior to the rainy season. I'm including my husband [REDACTED] and our personal cell phone numbers. If possible I would like to meet with you no later than next Friday March 9th, because there is rain forecasted for the upcoming weeks and we would like to care of this sooner rather than later. Thank you in advance for your attention to this matter.

[REDACTED]  
Regards,  
[REDACTED]

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**FOIA Disclaimer**

You are hereby advised that, pursuant to the Virginia Freedom of Information Act, written correspondence (including, but not limited to, letters, e-mails and faxes) from and to the City of Fairfax and its officials and employees, and others acting on its behalf, may be subject to disclosure as being a public record. This includes the e-mail address(es) and other contact and identifying information for parties involved in the correspondence.



# DOCUMENTATION ITEM 2



## City of Fairfax, Virginia

10455 Armstrong Street • Fairfax, VA 22030-3630  
703-385-7810 • [www.fairfaxva.gov](http://www.fairfaxva.gov)

Satoshi Eto  
Public Works Program Manager  
(703) 273-6073  
[Satoshi.Eto@fairfaxva.gov](mailto:Satoshi.Eto@fairfaxva.gov)

Wednesday, October 11, 2023

RE: Dwight Avenue Drainage Concerns

I received a letter yesterday through our Transportation Division which you had sent on July 18, 2023, stating support for construction of sidewalks on Dwight Ave and relaying of concerns related to drainage at your property and timeframe of the sidewalk project.

Public Works has a project in the Capital Improvements Plan called the Neighborhood Drainage Projects to address drainage and flooding concerns received from property owners. Virginia & Dwight was added to the Neighborhood Drainage Projects list in 2020, when we received concerns about runoff impacting properties at this intersection during a heavy storm event.

Since then, City Council adopted the Stormwater Utility Ordinance which has provided the stormwater program with sufficient funding to design and construct several needed drainage improvements on this list. I do have good news to share –the Dwight Ave & Virginia St is up for design and funding is available in the current fiscal year. Our intention is to apply for the Department of Conservation & Recreation's Community Flood Preparedness Fund (CFPF grant) in November to conduct a flood study of this area. If approved, the grant would fund 50% of the costs of this study, which would include conducting survey to develop topographic data, asking for first-hand information from residents in the area, modeling drainage patterns and impacts, and developing options to address flooding in the area.

We expect to begin work on the flood study in spring 2024. Construction funding for drainage improvements at Virginia & Dwight is included in the proposed FY25 capital budget in the Neighborhood Drainage Projects. The FY25 budget development process is in its early stages and there will be opportunities to provide input to City Council, including public hearings, and I encourage you to participate.

I would like to add your phone number to the list of resident contacts for this project, and if possible, your email as well. Please feel free to email me at [satoshi.eto@fairfaxva.gov](mailto:satoshi.eto@fairfaxva.gov) to have your address added to the contact list.

Sincerely,

A handwritten signature in blue ink, appearing to be "Satoshi Eto", enclosed in a circular blue ink scribble.



# **Copy of the City of Fairfax Floodplain Ordinance**



## **§4.15. FLOODPLAIN REGULATIONS**

### **§4.15.1. Authority**

These regulations are adopted pursuant to the authority granted to localities by Code of Virginia, §15.2 - 2280.

### **§4.15.2. Purpose**

The purpose of these regulations is to prevent: the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base by:

- A. Regulating uses, activities, and development which, alone or in combination with other existing or future uses, activities, and development, will cause unacceptable increases in flood heights, velocities, and frequencies;
- B. Restricting or prohibiting certain uses, activities, and development from locating within districts subject to flooding;
- C. Requiring all those uses, activities, and developments that do occur in flood-prone districts to be protected and/or floodproofed against flooding and flood damage; and
- D. Protecting individuals from buying land and structures that are unsuited for intended purposes because of flood hazards.

### **§4.15.3. General Provisions**

#### **A. Applicability**

These regulations shall apply to all privately and publicly owned lands within the city and identified as areas of special flood hazard identified by the city of Fairfax or shown on the flood insurance rate map (FIRM) or Flood Insurance Study (FIS) that is provided to the city of Fairfax by the Federal Emergency Management Agency (FEMA).

#### **B. Compliance and liability**

- 1. No land shall hereafter be developed and no structure shall be located, relocated, constructed, reconstructed, enlarged, or structurally altered except in full compliance with the terms and provisions of these regulations and any other applicable ordinances and regulations, which apply to uses within the city.
- 2. The degree of flood protection sought by the provisions of these regulations is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study, but does not imply total flood protection. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. These regulations do not imply that districts outside the floodplain district or land uses permitted within such district will be free from flooding or flood damages.
- 3. These regulations shall not create liability on the part of the city or any officer or employee thereof for any flood damages that result from reliance on these regulations or any administrative decision lawfully made thereunder.

**C. Records**

Records of actions associated with administering these regulations shall be kept on file and maintained by or under the direction of the floodplain administrator in perpetuity.

**D. Abrogation and greater restrictions**

These regulations supersede any regulations currently in effect in flood-prone districts. Any existing regulation, however, shall remain in full force and effect to the extent that its provisions are more restrictive than the provisions of these regulations.

These regulations are not intended to repeal or abrogate any existing ordinances including the subdivision ordinance, zoning ordinance, or building codes. In the event of a conflict between these regulations, the more restrictive shall govern.

**E. Severability**

See provisions of §1.1.9 for severability clause.

**F. Penalty for violations**

See Article 8 of the zoning ordinance for enforcement and penalties for violations.

**§4.15.4. Administration****A. Duties and responsibilities of the floodplain administrator**

The duties and responsibilities of the floodplain administrator designated in §5.9 shall include but are not limited to:

1. Do the work themselves. In the absence of the designated floodplain administrator, the duties are conducted by the City Manager.
2. Delegate duties and responsibilities set forth in these regulations to qualified technical personnel, plan examiners, inspectors, and other employees.
3. Enter into a written agreement or written contract with another community or private sector entity to administer specific provisions of these regulations. Administration of any part of these regulations by another entity shall not relieve the city of its responsibilities pursuant to the participation requirements of the National Flood Insurance Program (NFIP) as set forth in the Code of Federal Regulations at 44 CFR 59.22.
4. Review applications for floodplain permits to determine whether proposed activities will be located in the special flood hazard area (SFHA).
5. Interpret floodplain boundaries and provide available base flood elevation and flood hazard information.
6. Review applications to determine whether proposed activities will be reasonably safe from flooding and require new construction and substantial improvements to meet the requirements of these regulations.
7. Review applications to determine whether all necessary permits have been obtained from the federal, state or local agencies from which prior or concurrent approval is required; in particular, permits from state agencies for any construction, reconstruction, repair, or alteration of a dam, reservoir, or waterway obstruction (including bridges, culverts, structures), any alteration of a watercourse, or any change

of the course, current, or cross section of a stream or body of water, including any change to the 1-percent annual chance floodplain of free-flowing nontidal waters of the state.

8. Verify that applicants proposing an alteration of a watercourse have notified adjacent communities, the Virginia Department of Conservation and Recreation (DCR) Division of Dam Safety and Floodplain Management, and other appropriate agencies (Virginia Department of Environmental Quality [VADEQ], United States Army Corps of Engineers [USACE]) and have submitted copies of such notifications to FEMA.
9. Approve applications and issue floodplain permits to develop in flood hazard areas if the provisions of these regulations have been met, or disapprove applications if the provisions of these regulations have not been met.
10. Inspect or cause to be inspected, buildings, structures, and other development for which permits have been issued to determine compliance with these regulations or to determine if non-compliance has occurred or violations have been committed.
11. Review elevation certificates and require incomplete or deficient certificates to be corrected.
12. Submit to FEMA via a LOMR, or require applicants to submit to FEMA, data and information necessary to maintain FIRMs, including hydrologic and hydraulic engineering analyses prepared by or for the city of Fairfax, within six months after such data and information becomes available if the analyses indicate changes in base flood elevations.
13. Maintain and permanently keep records that are necessary for the administration of these regulations, including:
  - (a) Flood insurance studies, FIRMs (including historic studies and maps and current effective studies and maps) and letters of map change; and
  - (b) Documentation supporting issuance and denial of permits, elevation certificates, documentation of the elevation (in relation to the datum on the FIRM) to which structures have been floodproofed, inspection records, other required design certifications, special exceptions, and records of enforcement actions taken to correct violations of these regulations.
14. Enforce the provisions of these regulations, investigate violations, issue notices of violations or stop work orders, and require permit holders to take corrective action.
15. Advise the board of zoning appeals, or the city council, as appropriate, regarding the intent of these regulations and, for each application for special exceptions, prepare a staff report and recommendation.
16. Administer the requirements related to proposed work on existing buildings:
  - (a) Make determinations as to whether buildings and structures that are located in flood hazard areas and that are damaged by any cause have been substantially damaged.
  - (b) Make reasonable efforts to notify owners of substantially damaged structures of the need to obtain a permit to repair, rehabilitate, or reconstruct. Prohibit the non-compliant repair of substantially damaged buildings except for temporary

emergency protective measures necessary to secure a property or stabilize a building or structure to prevent additional damage.

17. Undertake, as determined appropriate by the floodplain administrator due to the circumstances, other actions which may include but are not limited to: issuing press releases, public service announcements, and other public information materials related to permit requests and repair of damaged structures; coordinating with other Federal, State, and local agencies to assist with substantial damage determinations; providing owners of damaged structures information related to the proper repair of damaged structures in special flood hazard areas; and assisting property owners with documentation necessary to file claims for Increased Cost of Compliance coverage under NFIP flood insurance policies.
18. Notify FEMA when the corporate boundaries of the city have been modified and:
  - (a) Provide a map that clearly delineates the new corporate boundaries or the new area for which the authority to regulate pursuant to these regulations has either been assumed or relinquished through annexation; and
  - (b) If the FIRM for any annexed area includes special flood hazard areas that have flood zones that have regulatory requirements that are not set forth in these regulations, prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the city council for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended regulations shall be provided to DCR Division of Dam Safety and Floodplain Management and FEMA.
19. Upon the request of FEMA, complete and submit a report concerning participation in the NFIP which may request information regarding the number of buildings in the special flood hazard area, number of permits issued for development in the special flood hazard area, and number of special exceptions issued for development in the special flood hazard area.
20. Take into account flood, mudslide and flood-related erosion hazards, to the extent that they are known, in all official actions relating to land management and use throughout the entire jurisdictional area of the city, whether or not those hazards have been specifically delineated geographically (e.g. via mapping or surveying).

#### **B. Use and interpretation of FIRMs**

The floodplain administrator shall make interpretations, where needed, as to the exact location of special flood hazard areas, floodplain boundaries, and floodway boundaries. The following shall apply to the use and interpretation of FIRMs and data:

1. Where field surveyed topography indicates that adjacent ground elevations:
  - (a) Are below the base flood elevation in riverine SFHAs, even in areas not delineated as a special flood hazard area on a FIRM, the area shall be considered as special flood hazard area and subject to the requirements of these regulations.
  - (b) Are above the base flood elevation and the area is labeled as a SFHA on the FIRM, the area shall be regulated as special flood hazard area unless the applicant obtains a letter of map change that removes the area from the special flood hazard area.

## §4.15.4 Administration

2. In FEMA-identified special flood hazard areas where base flood elevation and floodway data have not been identified and in areas where FEMA has not identified special flood hazard areas, any other flood hazard data available from a federal, state, or other source shall be reviewed and reasonably used.
3. Base flood elevations and designated floodway boundaries on FIRMs and in flood insurance studies shall take precedence over base flood elevations and floodway boundaries by any other sources if such sources show reduced floodway widths and/or lower base flood elevations.
4. Other sources of data shall be reasonably used if such sources show increased base flood elevations and/or larger floodways than are shown on FIRMs and in flood insurance studies.
5. If a Preliminary FIRM and/or a Preliminary Flood Insurance Study has been provided by FEMA:
  - (a) Upon the issuance of a letter of final determination by FEMA, the preliminary flood hazard data shall be used and shall replace the flood hazard data previously provided from FEMA for the purposes of administering these regulations.
  - (b) Prior to the issuance of a letter of final determination by FEMA, the use of preliminary flood hazard data shall be deemed the best available data pursuant to §4.15.5.A.3 regarding A Zones, and used where no base flood elevations and/or floodways are provided on the effective FIRM.
  - (c) Prior to issuance of a letter of final determination by FEMA, the use of preliminary flood hazard data is permitted where the preliminary base flood elevations or floodways exceed the base flood elevations and/or designated floodway widths in existing flood hazard data provided by FEMA. Such preliminary data may be subject to change and/or appeal to FEMA.

**C. Jurisdictional boundary changes**

1. The city floodplain regulations then in effect on the date of annexation or agreed upon boundary line adjustment shall remain in effect and shall be enforced by the city for all annexed areas until the city adopts and enforces an ordinance which meets the requirements for participation in the NFIP. It is a requirement that municipalities with existing floodplain ordinances shall pass a resolution acknowledging and accepting responsibility for enforcing floodplain ordinance standards prior to annexation of any area containing identified flood hazards. If the FIRM for any annexed area includes special flood hazard areas that have flood zones that have regulatory requirements that are not set forth in these regulations, the city shall prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the city council for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended regulations shall be provided to the DCR Division of Dam Safety and Floodplain Management and FEMA.
2. In accordance with the Code of Federal Regulations, Title 44 Subpart (B) Section 59.22 (a) (9) (v) all NFIP participating communities must notify the Federal Emergency Management Agency and optionally the State Coordinating Office (Virginia Department of Conservation and Recreation – Division of Dam Safety and Floodplain Management)

in writing whenever the boundaries of the community have been modified by annexation or the community has otherwise assumed or no longer has authority to adopt and enforce floodplain management regulations for a particular area.

3. In order that all FIRMs accurately represent the city's boundaries, a copy of a map of the city suitable for reproduction, clearly delineating the new corporate limits or new area for which the community has assumed or relinquished floodplain management regulatory authority must be included with the notification.

**D. District boundary changes**

The delineation of any of the Floodplain Districts may be revised by the city where natural or man-made changes have occurred and/or where more detailed studies have been conducted or undertaken by the U.S. Army Corps of Engineers or other qualified agency, or an individual documents the need for such change. However, prior to any such change, approval must be obtained from FEMA. A completed LOMR is a record of this approval.

**E. Interpretation of district boundaries**

The floodplain administrator shall be responsible for initial interpretations of the boundaries of the floodplain districts. Should a dispute arise concerning the boundaries of any of the districts, the aggrieved party may appeal the determination to the board of zoning appeals pursuant to §6.22. The party questioning or contesting the location of the district boundary shall be given a reasonable opportunity to present their case to the board and to submit their own technical evidence if they so desire.

**F. Submitting model backed technical data**

The city's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, the city shall notify FEMA of the changes by submitting technical or scientific data. The community may submit data via a LOMR. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data.

**G. Letters of map revision**

When development in the floodplain will cause or causes a change in the base flood elevation, the applicant, including state agencies, must notify FEMA by applying for a Conditional Letter of Map Revision (CLOMR) prior to construction, and a Letter of Map Revision (LOMR) after construction. Example cases:

1. Any development that causes a rise in the base flood elevations within the floodway.
2. Any development outlined in §4.15.6.B.1 occurring in Zone AE without a designated floodway that will cause a cumulative rise of one (1) foot or more in the base flood elevation on the property or on an offsite property.
3. Any development not defined in §4.15.6.B.1 occurring in Zone AE without a designated floodway, which will cause a rise in the base flood elevation either on the property or on an offsite property.
4. Alteration or relocation of a stream, including but not limited to installing culverts and bridges. [44 CFR 65.3 and 65.6(a)(12)]

## §4.15.5 Establishment of special flood hazard districts

**§4.15.5. Establishment of special flood hazard districts****A. Description of special flood hazard districts**

The various special flood hazard districts shall include the special flood hazard areas. The basis for the delineation of these districts shall be the flood insurance study and the FIRM for the city prepared by FEMA, dated June 2, 2006, and any subsequent revisions or amendments thereto upon Letter of Final Determination issuance.

The city may identify and regulate local flood hazard or ponding areas that are not delineated on the FIRM. These areas may be delineated on a local flood hazard map using best available topographic data and locally derived information such as flood of record, historic high water marks or approximate study methodologies. The boundaries of the SFHA Districts are established as shown on the FIRM which is declared to be a part of these regulations and which shall be kept on file at the city offices.

The mapped floodplain includes all of the below regions and also the regions designated as having a 0.2 percent annual chance of flooding on any flood map or flood insurance study. In this area, emergency service, medical service, or governmental records storage shall be built above or protected to a 1-foot above the 0.2 percent annual chance water surface elevation.

1. The Floodway District is in an AE Zone and is delineated, for purposes of these regulations, using the criterion that certain areas within the floodplain must be capable of carrying the waters of the one percent annual chance flood without increasing the water surface elevation of that flood more than one (1) foot at any point. The areas included in this District are specifically defined in Table 23 of the above-referenced FIS and shown on the accompanying FIRM.

The following provisions shall apply within the floodway district of an AE Zone [44 CFR 60.3(d)]:

- (a) Within any floodway, no encroachments, including fill, new construction, substantial improvements, or other development shall be permitted unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that the proposed encroachment will not result in any increase in flood elevations within the community during the occurrence of the base flood discharge. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently-accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the floodplain administrator.
  - (b) Development activities which increase the water surface elevation of the base flood may be allowed, provided that the applicant first applies – with the city's endorsement – for a conditional letter of map revision (CLOMR), and receives the approval of FEMA.
  - (c) If §4.15.5.A.1(a) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of §4.15.6, §4.15.7, and §4.15.8.
2. The AE or AH Zones on the FIRM accompanying the Flood Insurance Study shall be those areas for which one-percent annual chance flood elevations have been provided



and the floodway has not been delineated. The following provisions shall apply within an AE or AH Zone [44 CFR 60.3(c)] where FEMA has provided base flood elevations and no floodway:

- (a) Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the areas of special flood hazard, designated as Zones AE or AH on the FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the city.
  - (b) Development activities in Zones AE or AH, on the city of Fairfax FIRM which increase the water surface elevation of the base flood by more than one foot may be allowed, provided that the applicant first applies – with the city’s endorsement – for a Conditional Letter of Map Revision, and receives the approval of FEMA.
- 3. The A Zone on the FIRM accompanying the Flood Insurance Study shall be those areas for which no detailed flood profiles or elevations are provided, but the one percent annual chance floodplain boundary has been approximated. For these areas, the following provisions shall apply [44 CFR 60.3(b)]:
  - (a) The approximated floodplain district shall be that floodplain area for which no detailed flood profiles or elevations are provided, but where a 1-percent annual chance floodplain boundary has been approximated. Such areas are shown as Zone A on the maps accompanying the Flood Insurance Study. For these areas, the base flood elevations and floodway information from federal, state, and other acceptable sources shall be used, when available. For development proposed in the approximate floodplain the applicant must use technical methods that correctly reflect currently accepted non-detailed technical concepts, such as point on boundary, high water marks, or detailed methodologies hydrologic and hydraulic analyses. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the floodplain administrator.
  - (b) The floodplain administrator reserves the right to require a hydrologic and hydraulic analysis for any development. When such base flood elevation data is utilized, the lowest floor shall be elevated at least two (2) feet above the base flood elevation.
  - (c) During the permitting process, the floodplain administrator shall obtain:
    - (1) The elevation of the lowest floor (in relation to mean sea level), including the basement, of all new and substantially improved structures; and,
    - (2) If the structure has been floodproofed in accordance with the requirements of this article, the elevation (in relation to mean sea level) to which the structure has been floodproofed.

Base flood elevation data shall be obtained from other sources or developed using detailed methodologies comparable to those contained in a FIS for subdivision proposals and other proposed development proposals (including manufactured home parks and subdivisions) that exceed fifty lots or five acres, whichever is the lesser.

## §4.15.6 Development standards

4. The AO Zone on the FIRM accompanying the Flood Insurance Study shall be those areas of shallow flooding identified as AO on the FIRM. For these areas, the following provisions shall apply [44 CFR 60.3(c)].
  - (a) All new construction and substantial improvements of residential structures shall have the lowest floor, including basement, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the FIRM plus two (2) feet. If no flood depth number is specified, the lowest floor, including basement, shall be elevated no less than four (4) feet above the highest adjacent grade.
  - (b) All new construction and substantial improvements of nonresidential structures shall:
    - (1) Have the lowest horizontal structural member, including basement, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the FIRM plus two (2) feet. If no flood depth number is specified, the underside of the lowest floor, including basement, shall be elevated at least four (4) feet above the highest adjacent grade; or,
    - (2) Together with attendant utility and sanitary facilities be completely floodproofed to the specified flood elevation so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.
  - (c) Adequate drainage paths around structures on slopes shall be provided to guide floodwaters around and away from proposed structures.
5. Overlay concept

The Floodplain Districts described above shall be overlays to the existing underlying districts as shown on the city's zoning map, and as such, the provisions for the Floodplain Districts shall serve as a supplement to the underlying district provisions.

  - (a) If there is any conflict between the provisions or requirements of the Floodplain Districts and those of any underlying district, the more restrictive provisions and/or those pertaining to the floodplain districts shall apply.
  - (b) In the event any provision concerning a Floodplain District is declared inapplicable as a result of any legislative or administrative actions or judicial decision, the basic underlying provisions shall remain applicable.

**§4.15.6. Development standards****A. General standards**

The following standards shall apply to all permits:

1. New construction and substantial improvements shall be built according to these regulations and the Virginia USBC, and anchored to prevent flotation, collapse or lateral movement of the structure.
2. New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

3. New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.
4. Electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities, including duct work, shall be elevated to or above the base flood elevation plus 2 feet or be designed so as to prevent water from entering or accumulating within the components during conditions of flooding.
5. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
6. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters.
7. On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.
8. In addition to the provisions 1-7 above, in all special flood hazard areas, these additional provisions shall apply:
  - (a) Prior to any proposed alteration or relocation of any channels or of any watercourse, stream, etc., within this jurisdiction a permit shall be obtained from the U.S. Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resources Commission (a joint permit application is available from any of these organizations). Furthermore, in riverine areas, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management), other required agencies, and the Federal Emergency Management Agency.
  - (b) The flood carrying capacity within an altered or relocated portion of any watercourse shall be maintained.
9. Any activities that cause an offsite rise in the BFE require notification by the responsible party to the affected property owner(s) and the written authorization that the affected property owner(s) accept the potential for a rise in the BFE on their property.

**B. Site development standards**

The following development shall be permitted within the floodplain, provided, that such activity is permitted in the underlying zoning district within which they are located, and a floodplain permit is obtained as specified in §6.11.

1. Utilities and public facilities and improvements such as streets, trails, channel improvements, bridges, utility pipes, utility transmission lines and stormwater management facilities and any improvements required for public safety or welfare shall be permitted subject to §4.15.4.G.
2. All development not included in §4.15.6.B.1 within the floodplain shall be permitted subject to §4.15.4.G, provided that the development or use is otherwise permitted in this chapter and that the area of impervious surface shall not exceed 2,500 square feet and such uses or improvements shall not contain areas of fill in excess of 12 inches in depth.

## §4.15.7 Elevation and construction standards

3. Applications for a variance will be subject to the criteria contained in §6.18.7.

**§4.15.7. Elevation and construction standards**

In all identified flood hazard areas where base flood elevations have been provided in the Flood Insurance Study or generated by a certified professional in accordance with §4.15.5.A.3, the following provisions shall apply:

**A. Residential construction**

New construction or substantial improvement of any residential structure in Zones AE, AH and A with detailed base flood elevations shall have the lowest floor, including basement, elevated at least two (2) feet above the base flood elevation.

**B. Non-Residential construction**

1. New construction or substantial improvement of any commercial, industrial, or nonresidential building shall have the lowest floor, including basement, elevated at least two (2) feet above the base flood elevation.
2. New construction or substantial improvement of any building designated as Flood Design Class 4 in the Virginia USBC shall have the lowest floor, including basement, elevated at least two (2) feet above the base flood elevation, or the 0.2 percent annual chance flood elevation, whichever is higher.
3. Buildings located in all AE and AH Zones may be floodproofed in lieu of being elevated provided that all areas of the building components below the elevation corresponding to the base flood elevation plus two (2) feet are watertight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the standards of this §4.15.7 are satisfied. Such certification, including the specific elevation (in relation to mean sea level) to which such structures are floodproofed, shall be maintained by the floodplain administrator. For buildings designated as Flood Design Class 4 in the Virginia USBC the elevation of floodproofing shall be at least two (2) feet above the base flood elevation, or the 0.2 percent annual chance flood elevation, whichever is higher.

**C. Space below the lowest floor**

In Zones A, AE, AH, and AO, fully enclosed areas, of new construction or substantially improved structures, which are below the base flood elevation plus two (2) feet shall:

1. Not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator).
2. Be constructed entirely of flood damage-resistant materials below the base flood elevation plus two (2) feet.
3. Include measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, flood openings shall meet the following minimum design criteria:

- (a) There shall be a minimum of two flood openings on different sides of each enclosed area; if a building has more than one enclosure below the lowest floor, each such enclosure shall have flood openings on exterior walls.
- (b) The total net area of all flood openings shall be at least one (1) square inch for each square foot of enclosed area (non-engineered flood openings), or the flood openings shall be engineered flood openings that are designed and certified by a licensed professional engineer to automatically allow entry and exit of floodwaters; the certification requirement may be satisfied by an individual certification or an Evaluation Report issued by the ICC Evaluation Service, Inc..
- (c) The bottom of each flood opening shall be one (1) foot or less above the higher of the interior floor or grade, or the exterior grade, immediately below the opening.
- (d) Any louvers, screens or other covers for the flood openings shall allow the automatic flow of floodwaters into and out of the enclosed area.
- (e) Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and, therefore, do not require openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires openings as outlined above.

#### **D. Accessory structures**

1. All accessory structures in the SFHA shall comply with the elevation requirements and other requirements of §3.5.5 and §6.11.5 or, if not elevated or floodproofed, shall:
  - (a) Be at or above grade on at least one side.
  - (b) Not be used for human habitation.
  - (c) Be limited to no more than one story in height and 600 square feet in total floor area.
  - (d) Be useable only for parking of vehicles or limited storage.
  - (e) Be constructed with flood damage-resistant materials below the base flood elevation plus two (2) feet.
  - (f) Be constructed and placed to offer the minimum resistance to the flow of floodwaters.
  - (g) Be anchored to prevent flotation, collapse, and lateral movement.
  - (h) Have electrical service and utility and mechanical equipment elevated to or above the base flood elevation plus two (2) feet.
2. Shall be provided with flood openings which shall meet the requirements of §4.15.7.C.3.
3. A signed Declaration of Land Restriction (Non-Conversion Agreement) shall be recorded on the property deed.

#### **E. Manufactured homes**

All manufactured homes shall be prohibited within the city of Fairfax. No special exceptions or variances will be granted.

**§4.15.8 Existing structures in floodplain areas****F. Recreational vehicles**

All recreational vehicles shall be prohibited within any special flood hazard area. No special exceptions or variances will be granted.

**G. Subdivisions**

For Subdivision standards, see Chapter 86, Subdivision Ordinance.

**§4.15.8. Existing structures in floodplain areas**

A structure, including accessory structures, or use of a structure or premises which lawfully existed before the enactment of these provisions, but which is not in conformity with these provisions, may be continued subject to the following conditions:

- A.** Existing structures in the floodway shall not be expanded or enlarged unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practices that the proposed expansion would not result in any increase in the base flood elevation.
- B.** Any modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use located in any floodplain areas to an extent or amount of less than 49 percent of its market value shall conform to the Virginia USBC and the appropriate provisions of these regulations.
- C.** The modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use, regardless of its location in a floodplain area to an extent or amount of 49 percent or more of its market value shall be undertaken only in full compliance with these regulations and shall require the entire structure to conform to the Virginia USBC.

**§4.15.9. Variances**

See provisions of §6.18 for variances.

**§4.16. STORM DRAINAGE FACILITIES****§4.16.1. Purpose**

- A.** The purpose of §4.16 to define those storm drainage facilities which must be provided by landowners to control rainfall runoff from and across their property in a manner not detrimental to other inhabitants of the city and to preserve, where possible, presently existing natural creek channels. It is the further purpose of §4.16 to minimize the adverse effects of stormwater runoff on downstream drainageways within the city.
- B.** Article 2.3 (§62.1-44.15:27) of Chapter 3.1 of Title 62.1 of the Code of Virginia establishes the requirement for localities to establish a stormwater management program. §4.16 is adopted pursuant to Chapter 3.1 of Title 62.1 of the Code of Virginia (§62.1-44.15:25 and §62.1-44.15:28 et seq.).

**§4.16.2. Performance standards for facilities**

Stormwater BMPs, on-site detention facilities, and on-site drainage facilities shall be designed and maintained in such a manner as to minimize economic and environmental costs to the city and its inhabitants in accordance with §4.16.7.

# City of Fairfax Comprehensive Plan





## Link to the City of Fairfax 2019 Comprehensive Plan

<https://www.fairfaxva.gov/government/community-development-planning/planning/comprehensive-plan>





## **Social Vulnerability Score(s) for the Project Area**







Social Vulnerability Index	
ID	Social Vulnerability Score
1	0.86
2	-1.47
3	-1.665

N

0200400

US Feet

Project Survey Extents

Social Vulnerability

Moderate Social Vulnerability

Very Low Social Vulnerability

Kimley»Horn

Expect More. Experience Better.

DATE

11/7/2023

DRAWN BY

MNP

CHECKED BY

JJD

DWIGHT AVENUE

SOCIAL VULNERABILITY INDEX

SOURCE VRFIS SVI LAYER

PREPARED FOR CITY OF FAIRFAX

FAIRFAX, VIRGINIA

SCALE

1" = 200'

PROJECT NUMBER

N/A

SHEET NUMBER

EXHIBIT



# Funding Request Authorization





City of Fairfax – Dwight Avenue Drainage Improvements Study  
Community Flood Preparedness Fund (CFPF)  
Grant Application Package

I, Robert Stalzer, City of Fairfax – City Manager, authorize the City of Fairfax Department of Public Works to request funding from the 2023 Funding Round of the Virginia Community Flood Preparedness Fund for the development of a Dwight Avenue Drainage Improvements Study.

Signed: Robert Stalzer

Date: 11-7-23

# CITY OF FAIRFAX

## DWIGHT AVENUE AND VIRGINIA STREET DRAINAGE IMPROVEMENT STUDY CFPF GRANT APPLICATION PACKAGE

November 10, 2023

Prepared for:



Prepared by: **Kimley»Horn**

## Community Flood Preparedness Fund Grant Application

The City of Fairfax (the City) is pleased to submit this application for a Community Flood Preparedness Fund (CFPF) Study Grant that has been developed to meet the applicable scoring criteria outlined in Appendix D of the CFPF Grant Manual. A large drainage area south of Dwight Avenue creates large volumes of concentrated flow during intense storm events, with homes and residents along Dwight Avenue and Virginia Street being impacted by these flows. The impacts to City residents and their properties, as documented in **Section C**, has necessitated this study grant. If awarded, this grant would be used to bridge the gap between project costs and available funding in the City's Adopted Capital Improvement Program, which has been included in **Section B**. The Scope of Services included in **Section B** includes additional information about the proposed work that will be covered under this study grant and **Section A** includes the qualifications of the individuals conducting the study.

## Table of Contents

### Section A – Organizational Data

- Scope of Work Narrative and Qualifications of Project Team
- Application Form for Grant and Loan Requests for All Categories

### Section B – Budget Data

- Project Budget Narrative and Scope of Services
- Budget Narrative Template
- Funding Request Authorization

### Section C – Checklist Requirements

- Completed 2023 CFPF Funding Manual Checklist
- Detailed Map(s) of the Project Area
- FIRMette of the Project Area
- Historic Flood Damage Documentation
- Copy of the City of Fairfax Floodplain Ordinance
- City of Fairfax Comprehensive Plan
- Social Vulnerability Scores for the Project Area



# **SECTION A – ORGANIZATIONAL DATA**

Scope of Work Narrative and Project Team Qualifications

Application Form for Grant and Loan Requests for All  
Categories



# Scope of Work Narrative and Project Team Qualifications





## Scope of Work Narrative

This section includes a summary of the project's background, goals, scope of work, and impact on the community, the qualifications of the individuals on the study project team, and the application form for grant and loan requests for all categories of the CFPF grant.

A large drainage area south of Dwight Avenue creates large volumes of concentrated flow during intense storm events, with homes and residents along Dwight Avenue and Virginia Street being impacted by these flows. The impacts to City residents and their properties, as documented in **Section C**, has necessitated this study grant. If awarded, this grant would be used to bridge the gap between project costs and available funding in the City's Adopted Capital Improvement Program, which has been included in **Section B**.

Within the City, there are ninety-six (96) active flood insurance policies through the National Flood Insurance Program (NFIP) with an average premium of approximately \$1,380. There have been forty-nine (49) recorded insurance claims, with an average claim value of approximately \$18,210. There are four (4) repetitive loss properties within the City, with total paid claims of \$590,686. This project has been outlined in the City's draft resilience plan as well as in its City's Adopted Capital Improvement Program and will help better understand the flooding not only in the Dwight Avenue and Virginia Street corridor but in the City as a whole as well.

The goal of this project is to mitigate flooding impacts to the residents in the vicinity of the Dwight Avenue and Virginia Street corridor by evaluating local flooding conditions and developing conceptual solutions. A detailed Scope of Services for the Dwight Avenue and Virginia Street Drainage Improvement Study that elaborates on each task, project assumptions and exclusions, and schedule is included in **Section B** and the qualifications of the individuals executing this project's scope of services are included in this section. An outline of the Kimley-Horn scope of services for this project is as follows:

1. Project Corridor Survey Services
2. Site Base Mapping, Project Due Diligence, and Site Visit
3. Hydrologic Analysis of the Dwight Avenue and Virginia Street Corridor Drainage Areas.
4. Development of a Dwight Avenue and Virginia Street Corridor Watershed Model
5. Development of a Dwight Avenue and Virginia Street Corridor Drainage Improvements Concept Plan
6. Development of a Dwight Avenue and Virginia Street Corridor Drainage Improvements Report
7. Meetings & Coordination

The following items are anticipated deliverables for this project's scope of services:

- All developed Hydrologic and Hydraulic Model(s)
- Dwight Avenue and Virginia Street Corridor Drainage Improvements 24 x 36 AutoCAD Derived Conceptual Plan
- Dwight Avenue and Virginia Street Corridor Drainage Improvements Report
- All maps, models, analyses, spreadsheets, and base data utilized for the design (if requested).



CITY OF FAIRFAX CFPF GRANT APPLICATION  
DWIGHT AVENUE & VIRGINIA STREET DRAINAGE  
IMPROVEMENT STUDY

This project is estimated to be completed by September 30<sup>th</sup>, 2024, assuming that all survey data outlined in the Scope of Services is provided to Kimley-Horn prior to March 31<sup>st</sup>, 2024. The City of Fairfax Public Works Department is responsible for managing this project and project progress and budget will be tracked monthly and reported to the City with a monthly project progress report containing documentation of services provided. Because the proposed project is a study, no operation or maintenance will be required on behalf of the City or Kimley-Horn. Potential project partners for this project include the private property owners within the vicinity of the project area.

Although it will likely not impact the state's resilience to flooding, completing a drainage improvement study utilizing the tasks and procedures in Kimley-Horn's scope of services will help strengthen the City's resilience to flooding on a local and basin-wide scale.





## Key Individuals

**Kimley-Horn** brings you a carefully selected team of seasoned professionals who are genuinely committed to the City of Fairfax's success. Our team serving the City prides ourselves on maintaining our strong project delivery, reputation for dependability, proactive thinking, and solid, consistent results. We are committed to delivering projects successfully and improving Fairfax's resilience to flooding. Brief introductions to our team can be found below and resumes for each team member can be found on subsequent pages.



**Jon D'Alessandro, P.E.**

*Project Manager*

Jon has more than 14 years of experience in water resources engineering. He is experienced in the design and implementation of stormwater management projects with core expertise in hydrologic and hydraulic (H&H) modeling, Best Management Practice (BMP) design, BMP retrofit analysis and design, floodplain analysis, dam failure analysis, stream restoration design, and stormwater master planning. He has extensive experience using AutoCAD Civil 3D and Arc-GIS, as well as various H&H modeling software including, but not limited to, HEC-HMS, HEC-RAS, PondPack, Flowmaster, SWMM, WMS, and L-THIA. Additionally, he has supported local government municipal separate storm sewer systems (MS4) permit compliance programs through TMDL Action Plan Development, Program Plan and Annual Reporting Development, and inspection of stormwater infrastructure. His municipal relationships in Virginia include the City of Fairfax, Loudoun County, City of Winchester, Fairfax County, Stafford County, City of Fredericksburg, and support to the Loudoun County Soil and Water Conservation District.



**Jared Hodes, P.E.**

Jared has more than 7 years of experience in technical H&H modeling with a focus on hydrologic extremes, floodplain management, and municipal flooding issues. Jared has used a variety of H&H software including HEC-RAS, HEC-HMS, XPSWMM, HY-8, FlowMaster, and PondPack to model watersheds, culverts, bridges, dams, stormwater infrastructure, and stormwater BMPs for the purposes of design, retrofitting, municipality permitting, FEMA floodplain permitting, resiliency assessment, and flooding hot spot identification. He has extensive experience using ArcGIS for spatial data analysis, map product creation,

online dashboard creation, and compiling and editing ESRI geodatabases for asset management. He has performed field work for stream, stormwater, precipitation, and geophysical measurements and for pollutant sampling projects.



**Juan Campos, P.E.**

Juan has more than 6 years of water resources experience primarily focused on support of municipal projects needed to meet local and Chesapeake Bay TMDL POC reduction requirements. Juan's core expertise lies in his knowledge of the approved design protocols required for restoration and retrofit projects in the Commonwealth and the implementation of different strategies and funding mechanisms to assist localities with improving their stormwater resiliency efforts. He has executed successful projects in the City of Fairfax, Loudoun County, City of Fredericksburg, City of Winchester, Prince William County, Fauquier County, and as part of the Virginia State Community College System.



**Joe Arizzi, P.E.**

Joe is an experienced urban stormwater management designer in the State of Virginia. His skills include technical use of ArcGIS for land cover analyses and BMP desktop siting studies, and HEC-RAS and HEC-HMS for hydrology and hydraulic analyses of stream channel characteristics. He is experienced in urban drainage assessments including conveyance system modeling, flood studies, and green infrastructure design.



**Michelle Manfrey, EIT**

Michelle has 2 years of water resources engineering experience. Michelle's experience is primarily focused on supporting municipal projects needed to meet local and Chesapeake TMDL POC reduction requirements as well as spearheading field campaign efforts. Michelle is well-versed in AutoCAD Civil 3D and ArcGIS and has had exposure to numerous H&H modeling software, including, but not limited to, HEC-HMS, HEC-RAS, and PondPack. Michelle has municipal relationships in the City of Fairfax, Loudoun County, City of Winchester, and Fairfax County.



**Jon D'Alessandro, P.E.**  
Project Manager

## Relevant Experience

**Lake Drive Dam and Roadway Preliminary Engineering Design, Loudoun County, VA** — Senior Project Manager and Senior Engineer. Jon is leading an effort to develop a preliminary design that will improve Lake Drive from Thomas Avenue to the terminus of Lake Drive with the design goal of future road acceptance into the Virginia Department of Transportation (VDOT) Secondary System of Roadways. Jon also is leading a team that is performing an evaluation of rehabilitation, repair, and retrofit options for the pond, dam, and downstream receiving channels at the 30 percent design level. The dam and roadway overtop multiple times annually, and the dam is experiencing significant downstream erosion at the toe of the dam and dam abutments. The dam impoundment area also is exhibiting enhanced sediment loading and erosion along the two main inflow channels.

**Willow Lake Dam and Spillway Rehabilitation Plan/Pond Dredging and Retrofit, Loudoun County, VA** — Senior Project Manager and Senior Engineer. Jon is the project manager and senior engineer responsible for leading a team in the development of a dam and spillway rehabilitation plan to repair the Willow Lake Dam and accompanying principal and emergency spillway channels. As part of this project, Jon and his team are also providing storm sewer system realignment design services to modify the discharge location of a 48-inch storm sewer pipe away from the toe of the dam to help with embankment erosion.

During the dam and spillway repair design, Jon worked with the County to identify if the corresponding Willow Pond needed maintenance and potential enhancement. From the joint analysis with County, Jon is managing a team that is preparing an accompanying Willow Lake Dredging and Pond Retrofit Design Plan that will be paired with the dam and spillway rehabilitation plan. It is anticipated that once fully designed and constructed, the conversion, enhancement, and retrofit of Willow Lake will provide Phosphorous, Nitrogen, and Total Suspended Solid (TSS) removal capabilities that will assist the County in meeting the pollutant load reduction requirements set forth in their municipal separate storm sewer system (MS4) permit and Chesapeake Bay TMDL Action Plan. Furthermore, the proposed dredging of the pond will return the pond to its original design volume and will help with pond maintenance and the aesthetics of the community.

**Ashby Pond Conservancy - Pond Retrofit Final Design Services, Fairfax, VA** — Senior Project Manager and Senior Engineer. Jon is leading an effort to finalize design plans for the Ashby Pond Conservancy – Pond Retrofit project. When completed the project will restore, enhance, and retrofit Ashby Pond in the City of Fairfax. This project also includes restoration and stabilization of both inflow channels that drain to the pond. The pond was designed in 2010, constructed in 2011, and does not meet Technical II.B criteria design standards for Wet Ponds outlined in BMP Clearinghouse Specification No. 14.

The project is intended to provide Phosphorous, Nitrogen, and Sediment reductions within the Accotink Creek, Potomac River, and Chesapeake Bay Watershed. The project has duplicative benefits towards assisting the City in meeting their MS4 Permit requirements for Chesapeake Bay TMDL Pollutant of Concern Reductions, as well as assists the City in implementing one of the Means and Methods outlined in their Local TMDL Action Plan for the Benthic/Sediment

## Special Qualifications

- More than 14 years of experience in water resources engineering.

## Professional Credentials

- Professional Engineer in Virginia
- Bachelor of Science, Biological Systems Engineering, Virginia Polytechnic Institute and State University, 2008
- Bachelor of Science, Biology, Virginia Polytechnic Institute and State University, 2008
- Applied Fluvial Geomorphology (Rosgen Level 1)
- River Morphology and Applications (Rosgen Level 2)
- VDEQ - Stormwater Management Program Administrator
- VDEQ - Stormwater Management Inspector



TMDL for Accotink Creek. Furthermore, this project is a community centerpiece with a trail that encompasses the pond. Once the pond is retrofitted, the trail around the pond will be paired with signage which will provide Public Education and Outreach opportunities for the City which will help address Minimum Control Measure 1 (MCM-1) requirements of the MS-4 Permit.

**Staff Augmentation Services for Review of Floodplain Use Determination Request Package Submittals, Fairfax County, VA** — Program Manager. Jon is the program manager for a team that provides staff augmentation services related to the review of County Floodplain Use Determination Request Package submissions and re-submissions received by the County.

**\*Riverbend Stream Restoration Design, Loudoun County, VA** — Senior Project Manager and Senior Engineer. Jon was the project manager and senior engineer responsible for engineering design and analysis for a comprehensive stream and outfall restoration project totaling 3,125 linear feet of stream and five outfall channels totaling at 800 linear feet. The design and corresponding engineering analyses utilized natural channel design (NCD) restoration techniques to repair extreme channel erosion and aimed to minimize grading impacts to the floodplain fringe to preserve existing riparian areas. The outfall restorations were credited and designed in accordance with Protocol 5 *“Recommendations for Crediting Outfall and Gully Stabilization Projects in the Chesapeake Bay Watershed.”*

**\*Moorefield Station East Pond - Dam Safety Compliance Services, Loudoun County, VA** — Senior Project Manager and Senior Engineer. Jon assisted Loudoun County with Dam Safety Compliance Services for the Moorefield Station – East Pond Dam. The dam that impounds the East Pond is a State Regulated, High Hazard Dam classified through the Virginia Department of Conservation and Recreation (DCR) dam safety program. Jon provided engineering and consulting services to assist the County in transferring ownership from the Claude Moore Charitable Foundation to the County. As part of this project Jon recreated existing inundation zone mapping, performed an update of the existing Moorefield Station East Pond – Emergency Action Plan (EAP), researched and provided recommendation(s) for installation of pond and dam gauging equipment, and provided support services for transfer of dam ownership.

**\*Lake Carroll - Dam Failure Analysis, Dam Inundation Zone Mapping, and Design Alternatives Analysis, Stafford County, VA** — Assistant Project Manager and Lead Engineer. Jon was the lead engineer and assistant project manager for the Lake Carroll Dam Failure Analysis and Dam Design Alternatives Project. Jon was responsible for development of hydrologic, hydraulic, and dam breach modeling input parameters to determine different breach scenarios, derive breach hydrographs, and perform HEC-RAS unsteady state routing of the breach hydrographs to develop respective breach inundation boundaries. Jon was also tasked to develop conceptual design alternatives that could modify the dam to meet Virginia Dam Safety requirements for High Hazard Dams.

**\*2nd Phase Chesapeake Bay TMDL Action Plan Development, Fairfax, VA** — Senior Project Manager. Jon was responsible for the development of an update of the city’s Chesapeake Bay TMDL Action Plan in accordance with Part II.A.11 of the MS4 General Permit. Jon managed a team and provided technical expertise to develop the city’s estimated 2nd permit cycle Chesapeake Bay TMDL Pollutant of Concern (POC) Reduction requirements. Jon also was responsible for outlining and developing means and methods to help address the city’s 2nd Phase POC reduction goals.

**\*Smith Run – Pond D Dam Failure Analysis, Dam Inundation Zone Mapping, and Design Alternatives Analysis, City of Fredericksburg, VA** — Senior Project Manager and Engineer of Record for the Dam. Jon prepared a dam failure analysis for the Smith Run – Pond D Dam in accordance with current VA DCR Dam Safety Regulation requirements. As part of this project, Jon managed a team that developed design alternatives analysis to evaluate repair/renovation alternatives needed to meet spillway design requirements in accordance with State Regulations. Also, Jon provided Virginia Dam Safety services to assist the city with the Virginia DCR regulatory requirements related to the Smith Run – Pond D Dam.

**\*Indicates project completed prior to joining Kimley-Horn**





**Jared Hodes, P.E.**  
Project Engineer

## Relevant Experience

### **Stafford Drive Stream Restoration CLOMR, City of Fairfax, VA —**

Project Manager. Jared is responsible for managing a team that is providing hydrologic and hydraulic modeling services for approximately 2,400 linear feet of stream restoration along the North Fork Accotink Creek. As part of the permitting process, a CLOMR submittal package was prepared for FEMA approval. The tasks associated with the CLOMR package include HEC-RAS model development to reflect existing and proposed grading reflective of the restoration, evaluation of land cover changes, and utilization of model results to prepare a FEMA MT-2 application.

### **The Lakes Dam Inundation Study and Emergency Action Plan**

**Development, City of Fayetteville, NC —** Project Manager. Jared performed a dam breach analysis and subsequently provided inundation mapping for The Lakes Dam, which is classified as a high hazard dam. As part of this project, Jared updated the existing Emergency Action Plan based on the results of the inundation study. 1/3 Probable Maximum Precipitation and Sunny Day breaches were modeled using HEC-RAS 1-D unsteady methodology. The project resulted in successful approval through North Carolina Dam Safety.

### **Fairfax County Floodplain Use Determination (FPUD) Reviews and Other Services, Fairfax County, VA —**

Project Manager. Jared is leading a team contracted to provide engineering augmentation services for county reviews of FPUD requests. This includes utilizing GIS-based tools and detailed Zoning Ordinance understanding to assess if the proposed work is approvable under Zoning Ordinance statutes. This work also includes cost estimation in accordance with FEMA NFIP Substantial Improvement guidelines.

### **East Durham Water Sewer and Belt Street Stormwater,**

**Durham, NC —** Lead Engineer. Kimley-Horn evaluated approximately 68,500 linear feet of waterlines, 56,000 linear feet of sanitary sewer lines, and 9,000 linear feet of stormwater pipes via in-field and CCTV footage assessments. Designed approximately 2,100 linear feet of 15- through 66-inch stormwater infrastructure. A combined 1-D/2-D XPSWMM model was developed for a larger and more complex portion of the stormwater network with known flooding issues to better assess the existing system's performance. The model was field verified in an intense storm event and was then used to help design the proposed system. Civil 3D was utilized for iterative pipe network design and plan set development and hydraulic performance was confirmed in the XPSWMM model.

**Lakeside Trail Phases, Henrico County, VA —** Lead Engineer. Kimley-Horn is designing 4 phases of the overall Lakeside Trail project in Henrico County. Jared has led the floodplain permitting and modeling effort to provide Henrico County with analyses of the floodplains associated with North Run and Upham Brook in relation to the multi-phase trail design. Jared guided iterative trail design updates to achieve a No-Rise for the County. The County has also asked Kimley-Horn to incorporate an additional adjacent project into Phase 1 of the analysis, since they have been so pleased with the coordination, quality of deliverables, and responsiveness of the team. This project involves coordination with Henrico County and City of Richmond Floodplain Administrators, and VDOT. There are multiple funding sources for this work including County funds, bonds, VDOT, and ARPA funding, which necessitates hitting schedule milestones to bid the work for construction in accordance with the various funding sources.

## Special Qualifications

- Experienced water resources engineer
- Applied Fluvial Geomorphology (Rosgen Level1)

## Professional Credentials

- Master of Science, Civil and Environmental Engineering, Duke University, 2016
- Bachelor of Science, Atmospheric, Oceanic, and Environmental Sciences, University of California, Los Angeles, 2014
- Professional Engineer in Virginia and North Carolina



**Holly Springs Road Widening Phase 2 CLOMR, Holly Springs, NC** — Lead Engineer. Jared provided engineering services to the Town of Holly Springs to evaluate the effects of a proposed road widening on the floodplain. One of the main project objectives was to address the recurring flooding at the crossing of Middle Creek. Kimley-Horn designed the conversion of a triple barrel box culvert to a 150 linear foot, 3-span bridge to elevate the roadway profile to avoid roadway overtopping in the 100-year flood event. This work included HEC-RAS model development and modification using best available public data, survey data, proposed grading, land use changes, and FEMA MT-2 application preparation. Effective and Preliminary Floodway remapping was required.

**Loudoun Soil and Water Conservation District (LSWCD) Floodplain Services, Loudoun County, VA** — Project Manager. Jared is responsible for leading a team that provides floodplain analyses using GIS-based tools and available FEMA models, performing site visits to characterize potential impacts on the floodplain, and coordinating with the county's floodplain administrator to facilitate permit approvals through No-Rise designations. The County has a cost sharing program to help partially fund riparian tree plantings or livestock control fence installations that will lead to improved floodplain management. These projects had previously been on hold due to impasses encountered during floodplain permitting. Kimley-Horn was hired to assist LSWCD navigate the permitting process for these projects without making them cost prohibitive. Kimley-Horn has helped LSWCD successfully navigate the permitting process in a cost-effective manner for all projects worked on thus far.

**Junction and Ferrell Industrial & Beth Page Apartments No-Rise Studies, Durham, NC** — Project Manager. Jared managed a team that provided engineering services on two sites (for Scannell Properties LLC and Buckingham Companies respectively) with three new roadway crossings in the floodplain. This work required HEC-RAS analyses to design the culvert crossings such that a No-Rise could be achieved for the non-encroachment areas, effective floodplain, and future conditions floodplain along Panther Creek Trib. 1 and Unnamed Trib. to Stirrup Iron Creek Tributary D, per Durham County standards.



**Juan Campos, P.E.**  
Project Engineer

## Relevant Experience

### **Stafford Drive Stream Restoration Construction Plans, Fairfax, VA —**

Project Manager. Juan managed the design and development of the construction documents for approximately 2,400 linear feet of stream restoration and two outfall restorations along the North Fork of Accotink Creek. As part of the project the following services were performed: threatened & endangered species study, FEMA Conditional Letter of Map Revision (CLOMR) submission, development of a Stormwater Construction General Permit Registration Statement (VAR10), development of a Stormwater Pollutant Prevention Plan (SWPPP), development of a USACE Nationwide Permit 27, and three community outreach presentations to obtain constituents and public official's support.

### **2022 Virginia Community Flood Preparedness Fund – Resiliency Plan and Mosby Woods Study, Fairfax, VA —**

Project Manager. Juan managed, prepared, and assembled two grant applications packages for the 2022 Virginia Community Flood Preparedness Fund – Round 3. The first grant application was submitted for the development of a Resilience Plan to assist the City of Fairfax in the development and implementation of a strategy to reduce localized flooding. Once approved, the Resilience Plan will also be used as part of the FEMA Community Rating System (CRS) program under Activity 510 – Floodplain Management Planning. The second grant application was submitted in the Studies category for the evaluation of the effects of the North Fork of Accotink Creek floodplain on the Mosby Woods Condominiums. Both grants were selected and awarded funding as part of Round 3.

### **Outfall and Gully Stabilization Project (OGSP) 100% Construction Plans, Fairfax, VA —**

Project Manager. Juan managed the design and development of construction plan sets for three outfall restoration projects on separate sites. The design was done in accordance with the Unified Guide for Crediting Stream and Floodplain Restoration Projects in the Chesapeake Bay Watershed. The projects were conducted to assist the City of Fairfax in meeting their Chesapeake Bay Phase II TMDL Pollutant of Concern (POC) reduction requirements as well as satisfy the City's Benthic (Sediment) Local TMDL Reduction Requirements for Accotink Creek.

### **Stormwater and Flooding Resilience Plan Development, City of Winchester, VA —**

Project Manager. Juan managed the preparation and submittal of a Virginia Community Flood Preparedness Fund (CFPF) grant for the development of a Resiliency Plan. The grant application was successful and the City received a 90%/10% match from DCR. The Resilience Plan is now being developed to assist the City in project prioritization and implementation to reduce their localized flooding. The Resilience Plan will serve as the base document for future CFPF grant applications and allow the City to apply for project related grants to offset infrastructure improvements costs.

### **Tye River Stream Restoration Guidance Document, Nelson County, VA —**

Project Manager. Juan managed the design and development of guidance documents for approximately 4,350 linear feet of stream restoration. The stream restoration was a critical component of a large private stream mitigation credit bank. Minimal grading practices along with structural solutions were implemented to help minimize the impact to the private property.

## Special Qualifications

- 6+ years of water resources engineering experience with a focus in stream & outfall restoration, pond enhancement and retrofit, hydrology & hydraulics, design implementation and construction administration, flood resiliency planning and improvements, and grant funding assistance.
- Applied Fluvial Geomorphology (Rosgen Level 1)

## Professional Credentials

- Master of Science, Civil Engineering, Virginia Polytechnic Institute and State University, 2016
- Bachelor of Science, Civil Engineering, Virginia Polytechnic Institute and State University, 2015
- Professional Engineer in Virginia





**Joe Arizzi, P.E.**  
Project Engineer

## Relevant Experience

**Loudoun County Department of General Services (DGS) On-Call MS4 Support, Loudoun County, VA** — Project Engineer. Joe actively assists Loudoun County's DGS department in providing municipal separate storm sewer system (MS4) program support. This work has consisted of various tasks orders including watershed planning for quality and quantity control which includes identifying projects for stream and outfall restorations, BMP retrofits, and infrastructure improvements. Project evaluation for this client has included assessing projects for both phosphorus, nitrogen and TSS reductions associated with the Chesapeake Bay TMDL and TSS reductions for Loudoun County's local TMDL. The assessments include use of GIS to identify project locations based on hydrologic, environmental and developmental restrictions, ease of implementation, and constructibility.

**Greening of Lincoln, City of Falls Church, Falls Church, VA** — Project Manager. Joe is actively leading a PCSWMM analysis for a 250-acre watershed with known flooding issues in the City of Falls Church. This project is a hybrid stormwater – roadway capital improvement project which also is evaluating traffic calming measures and roadway features along an existing corridor within this watershed. As part of Phase 2 of this project, recommendations and solutions will be presented which incorporate GI along the corridor to act as both community assets and stormwater treatment practices.

**Zumot Data Center, Manassas, VA** — Task Manager. Joe is the task manager for a data center development in the City of Manassas that included the relocation of an existing stream around the proposed data center, along with the design of several bioretention facilities, dry ponds, and underground detention facilities to meet VSMP requirements for the development. Joe oversaw the design, modeling, and permitting of this task for the approximately 18-acre site in the city.

**GMU MS4 and Annual Standards and Specifications Program Mock Audit, Fairfax, VA** — Project Engineer. Joe completed a comprehensive review of George Mason's MS4 Program to ensure compliance with regulatory requirements in anticipation of a DEQ audit. This review consisted of the entire program, evaluating each individual MCM and the Annual Standards and Specifications, and determining any outstanding information that should be incorporated to comply with their MS4 permit.

**\*Fairfax County MSMD Facility Inspections and Reporting, Fairfax, VA** — Task Manager. Joe oversaw a team of 15 stormwater management inspectors responsible for the inspection of privately and publicly owned stormwater management facilities as part of the Maintenance and Stormwater Management Division's inspection program within Fairfax County. Joe managed inspection assignments and tracked progress through ArcCollector. Joe was responsible for the quality control of completed inspection reports, including the review of identified maintenance issues and recommendations for remediation in support of Fairfax County's MS4 Requirements.

**\*Indicates project completed prior to joining Kimley-Horn.**

## Special Qualifications

- Joe is an accomplished water resources engineer providing MS4 Support Services in Virginia for nearly a decade

## Professional Credentials

- Bachelor of Science, Environmental Engineering, Rensselaer Polytechnic Institute, 2014
- Professional Engineer in Virginia
- Rosgen II Certified
- VDEQ Stormwater Management Inspector and Plan Reviewer



**Michelle Manfrey, EIT**  
Project Engineer

## Relevant Experience

**Lake Drive Dam and Roadway Preliminary Engineering Design, Loudoun County, VA** — Project Engineer. Michelle is assisting in evaluating rehabilitation, repair, and retrofit options for the Lake Drive pond, dam, and downstream receiving channels. The dam and roadway overtop multiple times annually and the dam is experiencing significant downstream erosion at the toe of the dam and dam abutments. The impoundment area is exhibiting enhanced sediment loading and erosion along the two main inflow channels. This project has required a considerable amount of coordination due to the risk involved as well as the project crossing County lines, HOA-owned property, and privately owned property. In addition to alternatives development, Michelle has been at the forefront of that coordination.

**Ashby Pond Wet Pond Enhancement Plans (90% Design), City of Fairfax, VA** — Project Engineer. The goal of this project is to restore, enhance, and retrofit Ashby Pond to return the pond to its original design volume and achieve current design standards, as well as restore and stabilize both inflow channels that drain to the pond. Michelle has provided direct engineering support for this project in the form of developing engineering plans, performing hydrologic analyses, and utilizing Quality Assurance and Quality Control protocols throughout the design process. Michelle has also provided auxiliary support by preparing SLAF Grant materials, performing field reconnaissance to provide site status updates, and provided field mapping services for ancillary service.

**Accotink Creek Stream Stability Assessment and Prioritization Plan, Fairfax, VA** — Project Engineer. The goal of this project is to update the 2008 Accotink Creek Stream Stability Assessment and Prioritization Plan with current stream assessment information. Michelle collaborated with the City to develop a GIS-based platform that allows multiple types of data to be collected simultaneously for rapid assessment of stream geometry and attribute data to automatically prioritize reaches of Accotink Creek in terms of their restoration potential. In addition to her role in its development, Michelle has been instrumental in the field implementation of the data collection platform. Michelle leads and manages data collection efforts, interfaces with the City to communicate progress, and continues to work with the City to refine the platform and create a user-friendly interface and dashboard.

**Fairfax County Floodplain Use Determination (FPUD) Reviews and Other Services, Fairfax County, VA** — Project Engineer. Kimley-Horn has been contracted to provide engineering augmentation services for county reviews of FPUD requests. Michelle intakes and reviews these cases, which includes utilizing GIS-based tools, detailed Zoning Ordinance understanding, and cost estimation in accordance with FEMA NFIP Substantial Improvement guidelines, to assess if the proposed work is approvable under Zoning Ordinance statutes.

## Special Qualifications

- Applied Fluvial Geomorphology (Rosgen Level 1)

## Professional Credentials

- Bachelor of Science, Environmental Engineering, University of Florida, 2021
- Engineer-in-Training, 1100025639, FL

# **Application Form for Grant and Loan Requests for All Categories**



Applicants must have prior approval from the Department to submit applications, forms, and supporting documents by mail in lieu of the WebGrants portal.

## Appendix A: Application Form for Grant and Loan Requests for All Categories

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Virginia Department of Conservation and Recreation  
Virginia Community Flood Preparedness Fund Grant Program

Name of Local Government: City of Fairfax

Category Being Applied for (check one):

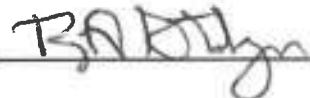
☐ Capacity Building/Planning

☐ Project

☒ Study

NFIP/DCR Community Identification Number (CID) 515524

Name of Authorized Official and Title: Robert A. Stalzer - City Manager

Signature of Authorized Official: 

Mailing Address (1): 10455 Armstrong St, Room 316

Mailing Address (2): \_\_\_\_\_

City: Fairfax State: VA Zip: 22030

Telephone Number: (703) 385-7850 Cell Phone Number: (    ) \_\_\_\_\_

Email Address: Rob.Stalzer@fairfaxva.gov

Contact and Title (If different from authorized official): Satoshi Eto

Public Works Program Manager  
Application Form CFPPF| 1

Mailing Address (1): 10455 Armstrong St, Room 200

Mailing Address (2): \_\_\_\_\_

City: Fairfax State: VA Zip: 22030

Telephone Number: (703) 273-6073 Cell Phone Number: (571) 641-0839

Email Address: satoshi.eto@fairfaxva.gov

Is the proposal in this application intended to benefit a low-income geographic area as defined in the Part 1 Definitions? Yes \_\_\_\_\_ No X

**Categories (select applicable activities that will be included in the project and used for scoring criterion):**

**Capacity Building and Planning Grants**

☐ Floodplain Staff Capacity.

☐ Resilience Plan Development

☐ Revisions to existing resilience plans and modifications to existing comprehensive and hazard mitigation plans.

☐ Resource assessments, planning, strategies, and development.

☐ Policy management and/or development.

☐ Stakeholder engagement and strategies.

☐ Other: \_\_\_\_\_

**Study Grants (Check All that Apply)**

☐ Studies to aid in updating floodplain ordinances to maintain compliance with the NFIP, or to incorporate higher standards that may reduce the risk of flood damage. This must include establishing processes for implementing the ordinance, including but not limited to, permitting, record retention, violations, and variances. This may include revising a floodplain ordinance when the community is getting new Flood Insurance Rate Maps (FIRMs), updating a floodplain ordinance to include floodplain setbacks, freeboard, or other

higher standards, RiskMAP public noticing requirements, or correcting issues identified in a Corrective Action Plan.

- ☐ Revising other land use ordinances to incorporate flood protection and mitigation goals, standards, and practices.
- ☐ Conducting hydrologic and hydraulic (H&H) studies of floodplains. *Changes to the base flood, as demonstrated by the H&H must be submitted to FEMA within 6 months of the data becoming available.*
- ☐ Studies and Data Collection of Statewide and Regional Significance.
- ☐ Revisions to existing resilience plans and modifications to existing comprehensive and hazard.
- ☒ Other relevant flood prevention and protection project or study.

**Project Grants and Loans (Check All that Apply – Hybrid Solutions will include items from both the “Nature-Based” and “Other” categories)**

**Nature-based solutions**

- ☐ Acquisition of property (or interests therein) and/or structures for purposes of allowing floodwater inundation, strategic retreat of existing land uses from areas vulnerable to flooding; the conservation or enhancement of natural flood resilience resources; or acquisition of structures, provided the acquired property will be protected in perpetuity from further development, and where the flood mitigation benefits will be achieved as a part of the same project as the property acquisition.
- ☐ Wetland restoration.
- ☐ Floodplain restoration.
- ☐ Construction of swales and settling ponds.
- ☐ Living shorelines and vegetated buffers.
- ☐ Permanent conservation of undeveloped lands identified as having flood resilience value by *ConserveVirginia* Floodplain and Flooding Resilience layer or a similar data driven analytic tool, or the acquisition of developed land for future conservation.
- ☐ Dam removal.
- ☐ Stream bank restoration or stabilization.
- ☐ Restoration of floodplains to natural and beneficial function.

**Other Projects**

- ☐ Structural floodwalls, levees, berms, flood gates, structural conveyances.
- ☐ Storm water system upgrades.
- ☐ Medium and large-scale Low Impact Development (LID) in urban areas.

- ☐ Developing flood warning and response systems, which may include gauge installation, to notify residents of potential emergency flooding events.
- ☐ Dam restoration.
- ☐ Beneficial reuse of dredge materials for flood mitigation purposes
- ☐ Removal or relocation of structures from flood-prone areas where the land will not be returned to open space.
- ☐ Acquisition of property (or interests therein) and/or structures for purposes of allowing floodwater inundation, strategic retreat of existing land uses from areas vulnerable to flooding; the conservation or enhancement of natural flood resilience resources; or acquisition of structures, provided the acquired property will be protected in perpetuity from further development, and where the flood mitigation benefits will **not be** achieved as a part of the same project as the property acquisition.
- ☐ Other project identified in a DCR-approved Resilience Plan.

Location of Project or Activity (Include Maps): See Appendix C

NFIP Community Identification Number (CID#) : 515524

Is Project Located in an NFIP Participating Community? ☒ Yes ☐ No

Is Project Located in a Special Flood Hazard Area? ☐ Yes ☒ No

Flood Zone(s) (If Applicable): Zone X

Flood Insurance Rate Map Number(s) (If Applicable): 5155240005D

Total Cost of Project: \$123,112.32

Total Amount Requested \$61,556.16

Amount Requested as Grant \$61,556.16

Amount Requested as Project Loan (not including short-term loans for up-front costs)  
Not Applicable

Amount Requested as Short-Term loan for Up-Front Costs (not to exceed 20% of amount requested as Grant) Not Applicable

For projects, planning, capacity building, and studies in low-income geographic areas: Are you requesting that match be waived? ☐ Yes ☒ No (**Not Applicable**)

**Additional Information for Loan Requests**

Requested Loan Security: Not Applicable

(General Obligation, Lease, Revenue, Special Fund Revenue, and/or Moral obligation from other government entity)

Desired loan term: Not Applicable

Since the date of your latest financial statements, did the applicant issue any new debt? Not Applicable  
(If yes, provide details)

Is there any pending or potential litigation by or against the applicant? Not Applicable

Attach five years of current audited financial statements (FY18-22) or refer to website if posted  
(Not necessary for existing VRA borrowers)

**Not Applicable - No loans are requested as part of this application.**

Attach FY2024 adopted budget or refer to website

**Not Applicable - No loans are requested as part of this application.**

Attach current Capital Improvement Plan

**Not Applicable - No loans are requested as part of this application.**

Attach adopted Financial Policies

**Not Applicable - No loans are requested as part of this application.**

Attach a list of the ten largest employers in the Applicant's jurisdiction.

**Not Applicable - No loans are requested as part of this application.**

Attach a list of the ten largest taxpayers in the Applicant's jurisdiction

**Not Applicable - No loans are requested as part of this application.**



# **SECTION B – BUDGET DATA**

Project Budget Narrative and Scope of Services

Budget Narrative Template

Funding Request Authorization



# **Project Budget Narrative and Scope of Services**



## **Project Budget Narrative and Scope of Services**

A detailed budget narrative is included below and contains the required information outlined in the 2023 Funding Manual for the Virginia Community Flood Preparedness Fund. This section also includes the Kimley-Horn Scope of Services to complete the Dwight Avenue and Virginia Street Drainage Improvement Study.

### **Estimated Total Project Cost**

The total identified project cost to complete the Dwight Avenue and Virginia Street Drainage Improvement Study is \$123,112.32.

### **Amount of Funds Requested from the Fund**

The total amount of grant assistance sought from the Fund is \$61,556.16.

### **Amount of Funds Available**

The amount of funds available through this project's funding source is greater than the total estimated project cost of \$123,112.32. The following documentation has been included in this section:

- City of Fairfax, Virginia – Adopted Capital Improvement Program FY2024 to 2028 – FY2024 Adopted Budget
- City of Fairfax, Virginia – Adopted Capital Improvement Program FY2024 to 2028 – Environment – Stormwater Capital Projects – Neighborhood Drainage Projects
- City of Fairfax, Virginia – Adopted Capital Improvement Program FY2024 to 2028 – Neighborhood Drainage Project Information

### **Authorization to Request Funding**

A signed statement from the City of Fairfax City Manager authorizing the request for funding for this project has been included in this section.



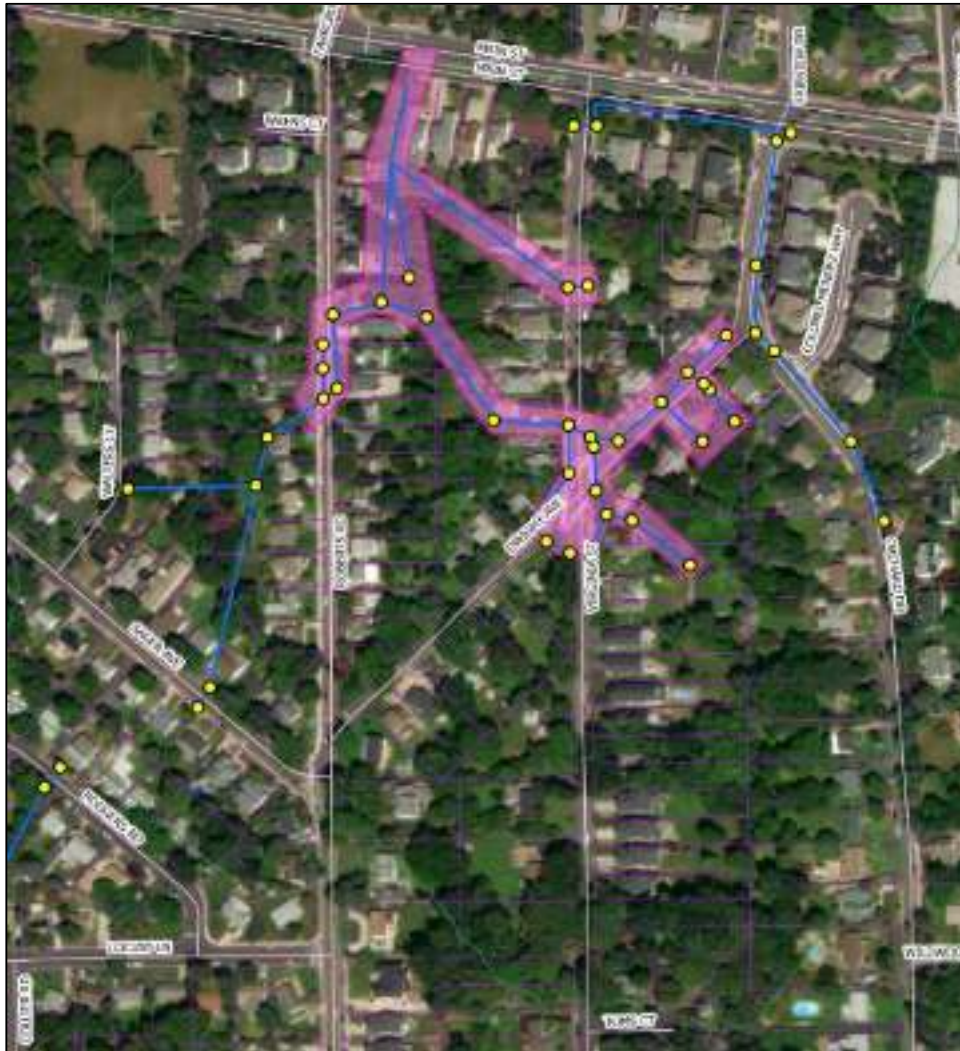
November 9, 2023

Satoshi Eto  
City of Fairfax, Department of Public Works  
10455 Armstrong Street, Room 200  
Fairfax, Virginia 22030

**RE: DWIGHT AVENUE AND VIRGINIA STREET DRAINAGE IMPROVEMENTS STUDY**

Dear Mr. Eto:

Kimley-Horn and Associates, Inc. (Kimley-Horn) is pleased to submit this task order proposal to the City of Fairfax (City) to provide professional consulting services related to the development of a Drainage Improvement Study for the Dwight Avenue and Virginia Street Corridor shown in Figure (Study Limits).



**Figure 1. Dwight Avenue and Virginia Street Corridor (Study Limits)**

The language outlined below identifies our project understanding, scope of requested services, and accompanying fees related to the overall project.

## **PROJECT UNDERSTANDING**

This proposal summarizes the phases and tasks necessary to evaluate the existing hydrologic and hydraulic features of the of Dwight Avenue and Virginia Street Drainage Corridors (Study Limits), in the City of Fairfax, and develop conceptual solutions to help abate localized drainage issues due to lack of stormwater infrastructure and existing drainage patters. The Study Limits receive large volumes of concentrated flow during high intensity storm events and several properties at the southwest corner of Dwight Avenue and Virginia Street are impacted by these flows. Residents have also reported that runoff from the western half of Virginia Street south of Dwight will spill out of the roadside ditch and onto their properties. As part of this project, Kimley-Horn will utilize dynamic SWMM modeling to identify the inadequacies in the existing stormwater management system, and then model proposed solutions that will assist in developing strategies to prevent and mitigate damages from the localized flooding within the Study Limits.

## **SCOPE OF SERVICES**

This proposal has been divided into seven (7) tasks. Each task is outlined below with a summary defining the Scope of Services for each task. A time and materials cost to perform this work is provided (Attachment 2) and includes Kimley-Horn project management and coordination time.

1. Project Corridor Survey Services
2. Site Base Mapping, Project Due Diligence, and Site Visit
3. Hydrologic Analysis of the Dwight Avenue and Virginia Street Corridor Drainage Areas.
4. Development of a Dwight Avenue and Virginia Street Corridor Watershed Model
5. Development of a Dwight Avenue and Virginia Street Corridor Drainage Improvements Concept Plan
6. Development of a Dwight Avenue and Virginia Street Corridor Drainage Improvements Report
7. Meetings & Coordination

### **TASK 100 – PROJECT CORRIDOR SURVEY SERVICES (PROVIDED BY JMT)**

See Attachment 1 for Detailed Survey Scope and Fee Breakdown

### **TASK 200 - SITE BASE MAPPING, PROJECT DUE DILIGENCE, AND SITE VISIT**

Kimley-Horn will develop both an AutoCAD and Geographic Information Systems (GIS) base-map illustrating the Study Limits. The Survey information derived in Task 100 will be the basis for all base mapping and conceptual exhibits referenced in this Scope of Services. As part of the base map development, the Survey will be supplemented with all pertinent available City of Fairfax and Virginia Flood Risk Information System (VFRIS) data to depict existing site conditions and display the impacts of the existing flood limits on Study Limit infrastructure (if applicable). The base mapping will be used by Kimley-Horn to assist in site reconnaissance efforts and to supplement all meetings, efforts, modeling and study deliverables outlined in this Scope of Services.



As part of this task, Kimley-Horn will perform project due diligence for the Study Limits by compiling pertinent information from the following reports and data sets:

- Survey Information Developed in Task 100 of this Scope of Services
- Any relevant studies or approved development plans within the project study areas (to be provided by the City)
- Available VDOT and City of Fairfax Roadway/Drainage Infrastructure Plans for the project Study Areas
- Best available VFRIS, State, and City GIS Shapefile Data and Aerial Imagery
- Available as-builts/electronic records of existing stormwater infrastructure.

Kimley-Horn will utilize the survey data and base mapping in this task to assist in a site visit to photo-document current conditions along the Study Limits. Kimley-Horn will take georeferenced photos along the study limits and include them in a photo location map that identifies potential Study Limits opportunities and constraints.

### **TASK 300 – HYDROLOGIC ANALYSIS OF THE DWIGHT AVENUE AND VIRGINIA STREET CORRIDOR DRAINAGE AREAS**

Kimley-Horn will determine existing study area hydrologic parameters such as drainage areas, Runoff Curve Numbers (RCNs), Times of Concentrations (Tc), Basin Slopes, as well as all required existing catchment area data needed to effectively model the study area existing hydrologic conditions. The hydrologic parameters will be derived from a compilation of the most readily available aerial landcover data, survey data, GIS Shapefile data, and soils data. The derived basin hydrologic conditions will be utilized as model input parameters in Task 300 to determine each study area's flow characteristics for the 1-yr, 2-yr, 10-yr, and 100-yr storm events. All information derived in this task will be documented within the Dwight Avenue and Virginia Street Corridor Drainage Improvements Report (Task 600).

### **TASK 400 – DEVELOPMENT OF A DWIGHT AVENUE AND VIRGINIA STREET CORRIDOR WATERSHED MODEL**

#### **Task 400A – Existing Conditions Watershed Modeling**

Kimley-Horn will build an existing conditions model of the Study Limits watershed using a dynamic SWMM modeling package that will be based on Survey Data, City GIS information, lidar topography, and will be supplemented with all relevant plan and as-built data ascertained in Task 200. Kimley-Horn will develop basin flow networks that are indicative of the Study Area stormwater and roadway infrastructure, topography, and building footprint and structural features. The existing model will be validated using publicly available rainfall gage data for recent storm events, and a comparison will be performed between the existing modeled inundation to historical observed inundation in the study areas.

The modeled results and data generated in this task will be used to determine limits and depths of localized and basin wide drainage issues along study area corridors. Existing inundation depths, velocities, flow spread, and flood limits will be derived as part of this analysis. Kimley-Horn will develop and document both graphical and tabular results for the existing conditions modeling. These values will provide a baseline.

comparison to assess proposed conceptual design implementation scenarios. All information derived in this subtask will be documented within the Dwight Avenue and Virginia Street Corridor Drainage Improvements Report (Task 600).

#### **Task 400B – Proposed Improvements Watershed Modeling**

Kimley-Horn will modify the Existing Conditions Watershed Model to evaluate proposed infrastructure and grading changes that could help abate flooding throughout the study area(s). The modeling will focus on implementation of new drainage infrastructure in areas without it, upgrades of existing drainage infrastructure, grading techniques, and pairing of multiple practices within the study areas (if necessary). Drainage basin wide implementation and evaluation of conceptual solutions will be prioritized as to provide wholistic approaches to flooding issues, and to not potentially transfer flooding issues to other locations.

Kimley-Horn will model up to (5) conceptual solutions. After assessing the viability and potential success of the conceptual infrastructure changes within the study corridor, Kimley-Horn will run revised model scenarios for the 1, 2, 10, and 100-yr storm events to compare to the existing conditions modeling as to quantify the effect of the proposed improvements on the localized flooding limits within the Study Areas. The graphical and tabular information generated from this task will be included in the Dwight Avenue and Virginia Street Corridor Drainage Improvements Report (Task 600).

#### **TASK 500 - DEVELOPMENT OF A DWIGHT AVENUE AND VIRGINIA STREET CORRIDOR DRAINAGE IMPROVEMENTS CONCEPT PLAN**

Based on the results determined through the SWMM Modeling Task (Task 400), Kimley-Horn and the City will agree upon the best three (3) conceptual solutions to evaluate further. From this, Kimley-Horn will develop three (3) - 24x36 AutoCAD conceptual exhibits that will graphically depict locations of potential drainage improvements within the Study Area. Proposed conceptual improvements will include, but are not limited to the following:

- Infrastructure based improvements
  - Additional pipe locations, inlet placement, junction boxes, etc.
- Natural based solutions
  - Green Infrastructure Approaches

Due to the conceptual nature of this plan, all proposed storm and structural improvements, preliminary grading enhancements, and proposed future project implementation locations will have limited engineering design and will focus on project layout, location, and feasibility.

#### **TASK 600 – DEVELOPMENT OF A DWIGHT AVENUE AND VIRGINIA STREET CORRIDOR DRAINAGE IMPROVEMENTS REPORT**

Kimley-Horn will develop a Dwight Avenue and Virginia Street Corridor Drainage Improvements Report outlining the information derived in tasks 100 - 500. Study graphics, tabular summaries, numerical analysis, and conceptual level designs created in all previous tasks will be included in the final report. Recommendations on future drainage basin stormwater management improvements, future storm sewer designs, as well as comprehensive drainage improvement implementation scenarios for the Study Area will be included with the report.

## **TASK 700 – MEETINGS & COORDINATION**

Kimley-Horn staff will be available for up to two (2) project coordination meetings to discuss the project. In addition, Kimley-Horn staff will participate in calls to discuss the project with City staff. If additional meetings and coordination activities are requested, Kimley-Horn will prepare a separate Scope of Services and cost estimate for client approval prior to proceeding with the additional work.

## **DELIVERABLES**

The following items are anticipated as project deliverables for this Scope of Services.

- All developed Hydrologic and Hydraulic Model(s)
- Dwight Avenue and Virginia Street Corridor Drainage Improvements 24 x 36 AutoCAD Derived Conceptual Plan
- Dwight Avenue and Virginia Street Corridor Drainage Improvements Report
- All maps, models, analyses, spreadsheets, and base data utilized for the design (if requested).

## **OVERALL PROJECT ASSUMPTIONS**

For the purposes of developing this proposed Scope of Services and the accompanying cost estimate, we have made the following assumptions:

- It is assumed that all Survey data outlined in Attachment 1 will be provided to Kimley-Horn prior to March 31<sup>st</sup>, 2024 to facilitate completion of this study by September 30<sup>th</sup>, 2024.
- Accuracy and precision of survey data provided by others is solely on the firm that derived the studies. Kimley-Horn will review all survey data referenced in this Scope of Services for completeness but assumes no responsibility for information developed by others.
- All previous project information developed by others will be provided by the City to Kimley-Horn in a timely manner to accommodate anticipated project schedule.
- The drainage studies and analyses proposed in this Scope of Services are intended as a planning level. As such this information and data will not be stamped and sealed by a Virginia Professional Engineer (PE).
- The Conceptual Design Exhibits referenced in this Scope of Services will be limited in terms of engineering design and analysis. As such, they will be not stamped by a licensed Virginia Professional Engineer and labeled as “Not for Construction Purposes”.
- The City will provide site access coordination and permission to Kimley-Horn for conducting all necessary fieldwork related tasks in a timely manner to facilitate the project schedule.
- Readily available City GIS shapefile and geodatabase information will be used to supplement this study, as needed.
- The City will provide all coordination with Inter-City departments with regards to this project.
- This proposal and the accompanying cost estimate are valid for a period of 90 days and will expire if not accepted within that timeframe.

## **OVERALL PROJECT EXCLUSIONS**

Services that are not currently anticipated as part of this project and are therefore outside the scope of this task order proposal include the following:

- Environmental Site Assessments
- Perennial Stream Assessments and/or Flow Determinations
- Project Renderings
- Floodplain Studies and Submittals
- FEMA Applications
- Engineering Design Plan Submittals / Construction Document Development
- Utility Design
- VDOT Design, Coordination, Permitting
- Right of Way Permitting or Dedication associated with planned or future development.
- Development/Delivery of Presentations, Board of Supervisors, Committees, or the Public
- Notifications to impacted Property Owners
- All other services not explicitly stated in this Scope of Services

## **SCHEDULE**

The tasks referenced in this scope will be coordinated with City Staff. Meetings, action items, and deliverables will be tracked monthly and reported to the County with a monthly progress report for documentation of services provided. Assuming Kimley-Horn receives a notice to proceed by January 31st, 2024, Kimley-Horn anticipates completion of the Scope of Services outlined above by September 30, 2024. A detailed schedule will be developed for the City outlining project workflow and deliverables after contract execution.

## **FEE AND BILLING**

Kimley-Horn will provide the following scope of services under our term contract #23050-A. The following tasks will be provided on a time and materials basis not to exceed a total project cost of **\$123,112.32**. A detailed breakdown (by task) of Kimley-Horn's fee estimate is provided in Attachment 1 and utilizes the rate schedule as provided for in the City of Fairfax Task Order Contract #23050-A, Year 1. Please note that hourly fees will be invoiced monthly based upon hours expended for services performed and payment will be due within 25 days of receipt of invoices related to this project.

**CLOSURE**

The work described with this proposal will be completed in accordance with the terms and conditions of Contract #23050-A between the City of Fairfax and Kimley-Horn. We appreciate the opportunity to provide these services to you. Please contact me if you have any questions.

Very truly yours,  
KIMLEY-HORN AND ASSOCIATES, INC.



Jon D' Alessandro, P.E.  
Senior Project Manager



## **ATTACHMENT 1 – JMT SURVEY LIMITS AND SCOPE OF SERVICES**



November 9, 2023

Jon D'Alessandro, PE  
Senior Project Manager  
Kimley-Horn  
11400 Commerce Park Drive, Suite 400  
Reston, Virginia 20191

RE: Task Order 003 – Dwight Avenue Drainage Area Survey  
JMT Contract 23-02627-003

Dear Mr. D'Alessandro:

We are submitting, herewith, our man-hour estimate of the anticipated hours and estimated fee required to provide topographic surveys for Dwight Avenue Drainage Area Study in the City of Fairfax, Virginia. The site is the approximate drainage area for Dwight Avenue, containing approximately 82.5 +/- acres of land. See the attachment at the end of the proposal.

The Scope of Services for this task will consist of the following:

Property Owner Entry Letters.

It is our understanding that the city will handle property owner notifications. JMT will follow the requirements of Article 33.2-1011 of the Code of Virginia, and personnel will not enter private property until 30 calendar days after the mailing of the certified letters.

Survey Datums

The final deliverables will be in AutoCAD format, at a scale of 1" = 25', and on Virginia State Plane North NAD83(NSRS2011, US Feet) horizontal and **NGVD 29 vertical**.

Drone Imagery

JMT will establish seventeen (17) photo-identifiable features for use as ground control points (GCPs) spread evenly within the project area, according to the attached exhibit. Each point will be observed using GNSS RTK observations with reference ties to the primary site control.

A Microdrones MD4-1000 unmanned aerial system (UAS) with a mdLiDAR1000LR LiDAR and photogrammetric payload will be operated to capture UAS-based LiDAR with a target ground density of 200 points per square meter. All UAS flights will be performed with an FAA Certified Part 107 Remote Pilot and the assistance of a visual observer (VO) per FAA-recommended guidelines. Flights will be in conformance with FAA Part 107 regulations and other applicable State and local regulations.

The site is within the Flight-Restricted Zone (FRZ) airspace surrounding Washington D.C. and centered at Ronald Reagan Washington National Airport. JMT will apply for the FAA waiver to conduct flights within the FRZ. The waiver process typically requires one month from the time of application to get permission to fly.

Once the flight is complete, JMT will register all LiDAR and photogrammetric data to the established GCPs. JMT will confirm the LiDAR and photogrammetric solutions by establishing at least eight (8) validation points valued by averaging three GNSS RTK observations on each validation point and spread evenly throughout the project area.

JMT will provide a 2D planimetric of major ground features (roads, sidewalks, driveways, buildings) to accompany the surface and contours. Deliverables will also include a digital elevation model (DEM) from the resulting point cloud, an XML of the DEM surface, and 0.50-foot contours in AutoCAD format from said surface.

#### Storm Water Structures

Storm drain structures are to be located with elevations on the tops of manholes or drop inlets and their pipe invert elevations. The location of the next structure (manhole, etc.) outside of survey limits shall be included with elevations. Also, the open ends of pipes will have their locations with invert elevations. Existing pipe sizes will be labeled. Structures will be located in the highlighted area only, according to the attached exhibit. This is approximately 34 structures.

For this task, JMT will attempt to use GPS to locate the stormwater structures (including pipe inverts), minimizing the need for setting survey control. If there is an area where GPS proves inaccurate enough for this task, survey control will need to be established. A minimum of three (3) control points are to be set on site. Control will be tied to the Virginia State Plane Coordinate System (North Zone), North American Datum of 1983 / NSRS 2011 adjustment horizontally, and **National Geodetic Vertical Datum of 1929 (NGVD 29) vertically**. Real-time Kinematic (RTK) Global Positioning System (GPS) will be utilized whenever it is practical to do so. All control points will be set using rebar and cap labeled with our firm's unique identification number. Control will be observed using RTK GPS technology and post-processed.

The following are our assumptions related to out-of-scope items and access. It is our understanding that JMT will not be responsible for delivering the services listed below as part of this task assignment, and they have been excluded:

- This level of effort does not include boundary surveys as defined by the Virginia Minimum Standards.
- JMT assumes unrestricted access to all areas of the project area, receipt of all digital and bond copies of plat, maps, ALTA Surveys or plans relating to the project.
- JMT assumes one revision to the final submission. Additional revisions are considered out of scope.
- JMT assumes any and all permits, rights of entry or property owner notifications, if any are required, will be the responsibility of the client with the exception of the permit to use drone imagery inside the flight restriction zone.
- JMT assumes no special badging or clearances are required for this task.
- JMT assumes no dewatering of structures or confined space entry under this contract.
- JMT assumes no subsurface utility designation activities will be covered under this contract.
- JMT assumes any activity related to litigation or the preparation thereof is considered out of scope and will be charged at hourly rates.

- JMT will make every attempt to meet the schedule stated herein unless field work is hampered by inclement weather.

The proposed fee to complete this assignment is broken down with the approximate hours and rates shown in the man hour table attached and can be performed for the lump sum price of \$55,484.00

All surveys will be on the Virginia State Plane North NAD83(NSRS2011) horizontal datum, and **NGVD 29 vertical datum**, unless otherwise specified by the KHA. If additional work is required outside of the normal Scope of Services listed above, JMT will contact KHA before initiating any additional work.

We understand that we will receive a written Notice-to-Proceed once you have reviewed and approved the enclosed estimates. JMT anticipates a start date within 10 days of Notice to Proceed, and delivery of completed files approximately twelve (12) weeks from NTP.

If you should have any questions or require any additional information, please do not hesitate to contact this office. We look forward to working together on this task.

Very truly yours,

JOHNSON, MIRMIRAN & THOMPSON, INC.

A handwritten signature in blue ink, appearing to read 'D. Stickles', with a stylized flourish at the end.

David Stickles, L.S.  
Vice President



Survey Requests:  
-All survey in NGVD29 and NAD83 State Plane North.  
-0.5 foot contours throughout all areas calling for topographic survey.  
-All storm pipes and structures denoted on exhibit and inclusion of all sizes, invert, lengths, type, ect.  
-Parcel Boundaries/Easements only within core project limits.  
-City GIS data is shown for informational purposes only.

**Kimley»Horn**

Expect More. Experience Better.

DATE

10/31/2023

DRAWN BY

MNP

CHECKED BY

JJD

CITY OF FAIRFAX DEPARTMENT OF PUBLIC WORKS  
DWIGHT AVENUE DRAINAGE AREA SURVEY EXHIBIT

PREPARED FOR CITY OF FAIRFAX  
FAIRFAX, VIRGINIA

SCALE

1" = 200'

PROJECT NUMBER

N/A

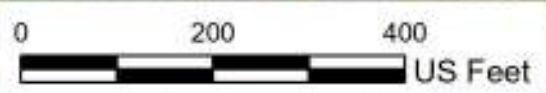
SHEET NUMBER

EXHIBIT

**Legend**

- Stormwater Inlets
- Storm Sewer Lines
- Drainage Area
- Streets
- Topography Survey Limits
- Parcels
- Stormwater Sewer Survey Limits

Topographic  
survey area  
~82.5 Acres





## FY 2024 Adopted Budget - City of Fairfax, Virginia


Stormwater Utility Fund Expense Detail							
Account	Account Title	FY 2022 Actual	FY 2023 Budget	FY 2023 Estimate	FY 2024 Adopted	Variance to Budget \$	Variance to Budget %
<b>SWU Operations &amp; Maintenance (438120)</b>							
511105	Salaries - Full Time	-	540,921	540,921	547,049	6,128	1.13%
511115	Salaries - Overtime	-	68,125	68,125	80,000	11,875	17.43%
511125	Temporary Help	-	6,000	6,000	6,000	-	0.00%
511130	On Call Pay	-	8,500	8,500	8,500	-	0.00%
512110	Fringe Benefits	-	265,168	265,168	306,030	40,862	15.41%
530113	Contract Services	-	262,746	262,746	239,231	(23,515)	-8.95%
540102	Motor Pool Charges	-	154,216	-	-	(154,216)	-100.00%
550430	Equipment Rental	-	1,000	1,000	1,500	500	50.00%
550501	Travel & Training	-	6,000	6,000	12,000	6,000	100.00%
550806	Other Services	-	60,000	60,000	60,000	-	0.00%
560110	Office Supplies	-	6,000	6,000	6,000	-	0.00%
560120	Small Equipment	-	10,500	10,500	10,500	-	0.00%
560416	Uniforms	-	4,389	4,389	6,550	2,161	49.24%
560420	Operating Supplies	-	38,900	38,900	40,150	1,250	3.21%
560421	Pipe & Accessories	-	10,000	10,000	21,000	11,000	110.00%
560422	Construction Materials	-	20,000	20,000	27,500	7,500	37.50%
560424	Concrete	-	7,000	7,000	10,000	3,000	42.86%
560430	Operating Materials	-	101,585	101,585	101,585	-	0.00%
560435	Soil & Mulch	-	7,000	7,000	7,000	-	0.00%
580214	Capital Outlay	-	5,000	5,000	5,000	-	0.00%
	<b>Subtotal</b>	-	<b>1,583,050</b>	<b>1,428,834</b>	<b>1,495,596</b>	<b>(87,454)</b>	<b>-5.52%</b>
<b>SWU Admin &amp; Engineering (438130)</b>							
511105	Salaries - Full Time	-	342,643	342,643	405,510	62,867	18.35%
512110	Fringe Benefits	-	167,969	167,969	221,491	53,522	31.86%
530113	Contract Services	-	151,500	151,500	147,500	(4,000)	-2.64%
540060	Management Fee	-	335,650	-	-	(335,650)	-100.00%
550820	Dues & Subscriptions	-	-	-	7,000	7,000	0.00%
560110	Office Supplies	-	20,526	20,526	6,000	(14,526)	-70.77%
560120	Small Equipment	-	-	-	400	400	0.00%
580411	Stormwater Utility Credit Program	-	-	-	3,800	3,800	0.00%
580501	Ashby Pond Dredging	-	984,927	1,575,000	-	(984,927)	-100.00%
580523	Flood Mitigation Planning & Resilie	-	76,750	225,000	-	(76,750)	-100.00%
580503	Mosby Road Drainage Improvemen	-	45,000	45,000	500,000	455,000	1011.11%
580504	Municipal Separate Storm Sewer S	-	155,000	155,000	180,000	25,000	16.13%
580505	Neighborhood Drainage Projects	-	-	520,000	500,000	500,000	0.00%
580506	Northfax Linear Park	-	80,000	80,000	-	(80,000)	-100.00%
580522	Plantation Parkway Culvert Repairs	-	-	500,000	-	-	0.00%
580507	Private BMP/SWM Inspection	-	130,000	130,000	145,000	15,000	11.54%
580508	Public BMP/SWM Inspection & Ma	-	130,000	130,000	135,000	5,000	3.85%
580509	Reline Bridge Culvert Storm Struct	-	85,000	85,000	98,000	13,000	15.29%
580510	Replacement of Failing Galvanized	-	120,000	120,000	135,000	15,000	12.50%
580514	Storm Drainage Repair for Paving S	-	110,000	110,000	127,000	17,000	15.45%
580516	Storm Pipe Lining Rehabilitation	-	120,000	120,000	138,000	18,000	15.00%
580517	Storm Sewer Evaluation & Update	-	100,000	250,000	300,000	200,000	200.00%
580518	Stormwater & Wastewater Plan Re	-	-	-	60,000	60,000	0.00%
580519	Stream Evaluation and Restoration	-	200,000	200,000	225,000	25,000	12.50%
580520	TMDL Action Plans	-	477,580	500,000	500,000	22,420	4.69%
580521	University Drive Storm Sewer Outfa	-	-	-	300,000	300,000	0.00%
580525	Roberts Road East Side Drainage	-	-	-	1,000,000	1,000,000	0.00%
580526	GIS and CMMS Technical Support	-	-	-	65,000	65,000	0.00%
580527	Community Rating System	-	-	-	200,000	200,000	0.00%
590102	Reserve	-	143,850	-	-	(143,850)	-100.00%
	<b>Subtotal</b>	-	<b>3,976,395</b>	<b>5,427,638</b>	<b>5,399,701</b>	<b>1,423,306</b>	<b>35.79%</b>
<b>Total Stormwater Utility Fund</b>		<b>\$ -</b>	<b>\$ 5,559,445</b>	<b>\$ 6,856,472</b>	<b>\$ 6,895,297</b>	<b>\$ 1,335,851</b>	<b>24.03%</b>

**City of Fairfax, Virginia - Adopted Capital Improvement Program FY 2024 to 2028**

**Environment - Stormwater Capital Projects**

Project Name	Ref Num	Funding Source	FY 2023 Adopted	FY 2024 Adopted	FY 2025 Proposed	FY 2026 Proposed	FY 2027 Proposed	FY 2028 Proposed	FY 24 to 28 Total
<b>Annual Maintenance</b>									
Replacement of Failing Galvanized Storm Drainage Systems	63	General,Storm	120,000	135,000	135,000	145,000	160,000	175,000	750,000
Storm Drainage Repair for Paving Schedule	64	General,Storm	110,000	127,000	127,000	133,000	146,000	161,000	694,000
Storm Pipe Lining Rehabilitation	65	General,Storm	120,000	138,000	138,000	145,000	160,000	176,000	757,000
<b>Drainage</b>									
Mosby Road Drainage Improvements	66	General,Storm	45,000	500,000	-	-	-	-	500,000
Neighborhood Drainage Projects	67	ARPA,Storm	520,000	500,000	700,000	650,000	300,000	570,000	2,720,000
Reline Bridge Culvert Storm Structures	68	Storm	85,000	98,000	98,000	103,000	113,000	125,000	537,000
Roberts Road East Side Drainage and Roadway Improvements	69	ARPA,Storm	485,000	1,000,000	-	-	-	-	1,000,000
Sager Ave Culvert Replacement	-	RevShr,Storm	-	-	1,300,000	-	-	-	1,300,000
<b>Infrastructure Replacement and Improvements</b>									
Ashby Pond Dredging & Retrofit	-	Grant,Storm	1,575,000	-	-	-	-	-	-
GIS and CMMS Technical Support for Public Works	70	Storm,Waste	-	65,000	65,000	65,000	65,000	65,000	325,000
Plantation Parkway Culvert Repairs	-	Storm	500,000	-	-	-	-	-	-
Storm Improvement, Oak Street and Second	-	Storm	-	-	-	300,000	-	-	300,000
Storm Sewer Evaluation & Update Program	71	Storm	250,000	300,000	320,000	320,000	330,000	330,000	1,600,000
University Drive Storm Sewer Outfall Relocation	72	ARPA	-	300,000	-	-	-	-	300,000
<b>Planning</b>									
Community Rating System	73	General	-	200,000	-	-	-	-	200,000
Flood Mitigation Planning & Resiliency	-	State,Storm	225,000	-	-	-	-	-	-
Northfax Linear Park Design	-	Storm	80,000	-	-	-	-	-	-
Stormwater & Wastewater Plan Review	74	Storm,Waste	40,000	60,000	65,000	65,000	70,000	70,000	330,000
<b>State/Federal Mandated</b>									
Municipal Separate Storm Sewer System (MS4)	75	Storm	155,000	180,000	185,000	190,000	190,000	195,000	940,000
Private BMP/SWM Inspection	76	Storm	130,000	145,000	145,000	145,000	150,000	150,000	735,000
Public BMP/SWM Inspection and Maintenance	77	General,Storm	130,000	135,000	135,000	140,000	140,000	145,000	695,000
Stream Evaluation and Restoration	78	Grant,Storm	200,000	225,000	2,700,000	1,500,000	200,000	3,000,000	7,625,000
TMDL Action Plans	79	Grant,Storm	500,000	500,000	550,000	550,000	600,000	600,000	2,800,000
<b>Subtotal Stormwater</b>			<b>5,270,000</b>	<b>4,608,000</b>	<b>6,663,000</b>	<b>4,451,000</b>	<b>2,624,000</b>	<b>5,762,000</b>	<b>24,108,000</b>
American Rescue Plan Act			-	1,800,000	-	-	-	-	1,800,000
General Fund			-	1,200,000	-	-	-	-	1,200,000
Grant			1,065,811	150,000	1,415,000	915,000	180,000	1,680,000	4,340,000
State - Other			148,250	-	-	-	-	-	-
State—Revenue Sharing			-	-	650,000	-	-	-	650,000
Stormwater Utility Fund			4,015,939	1,400,500	4,535,500	3,473,500	2,381,500	4,019,500	15,810,500
Wastewater Fund			40,000	57,500	62,500	62,500	62,500	62,500	307,500
<b>Total Stormwater</b>			<b>5,270,000</b>	<b>4,608,000</b>	<b>6,663,000</b>	<b>4,451,000</b>	<b>2,624,000</b>	<b>5,762,000</b>	<b>24,108,000</b>

Bolded items represent new CIP projects identified in FY 2024

PROJECT INFORMATION								
<b>Name:</b> Neighborhood Drainage Projects					<b>Project #</b> 555-438130-580505			
<b>2035 Comprehensive Plan Reference:</b> IU1.3.1 p. 144		<b>2035 Comprehensive Plan Timeframe:</b>		<b>Ongoing</b>				
Comprehensive Plan Element								
✓	Land Use		✓	Environment and Sustainability				
	Multimodal Transportation			Economic Vitality				
✓	Community Services		✓	Other City Plan/Policy				
<b>Statement of Need:</b> These projects provide for stormwater improvements in residential neighborhoods to alleviate existing drainage problems. The projects have been requested by residents and represent the projects recommended for design and construction by staff.  FY24 - Virginia St. & Dwight Ave., Design Orchard Dr. & Evergreen Dr., Construction  FY25 - Orchard St. & Howerton Ave., Design Virginia St. & Dwight Ave., Construction  FY26 - Norman Ave & Cobb Dr, Design Orchard St. & Howerton Ave., Construction . FY27 - Parklane Rd, Design Norman Ave & Cobb Dr, Construction . FY28 - Evergreen Dr cul-de-sac, Design Parklane Rd Construction				<b>Picture:</b> 				
Funding Allocation		FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Totals
Feasibility/Planning/Design/Engineering		100,000	100,000	100,000	50,000	100,000	70,000	420,000
Construction		420,000	400,000	600,000	600,000	200,000	500,000	2,300,000
<b>Total Costs</b>		<b>\$ 520,000</b>	<b>\$ 500,000</b>	<b>\$ 700,000</b>	<b>\$ 650,000</b>	<b>\$ 300,000</b>	<b>\$ 570,000</b>	<b>\$ 2,720,000</b>
Funding Sources		FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Totals
American Rescue Plan Act		-	500,000	-	-	-	-	500,000
Stormwater Utility Fund		520,000	-	700,000	650,000	300,000	570,000	2,220,000
<b>Total Funding</b>		<b>\$ 520,000</b>	<b>\$ 500,000</b>	<b>\$ 700,000</b>	<b>\$ 650,000</b>	<b>\$ 300,000</b>	<b>\$ 570,000</b>	<b>\$ 2,720,000</b>
Estimated Project Timeline		New Project			Responsible Department(s):			
Project Origination Date					Cable TV		Police	
Project Design Start Date					CD&P		PW Admin	
Construction Start Date					City Manager		PW Fleet	
Project Completion Date		Ongoing			Finance		PW Operations	
					Fire		PW Signs/Signal	
					Historic		PW Stormwater	
					Human Svc		PW Streets	
					IT		PW Transport	
					Parks & Rec		PW Wastewater	
					Personnel		Schools	
Financial Impacts								
Annual Revenue Generated:		\$ -						
Annual Cost Savings:		\$ -						
Annual Increase in Operating Costs:		\$ -						
Projected Future Savings:		\$ -						

# Budget Narrative Template



## Appendix B: Budget Narrative Template

<p align="center"> <b>Applicant Name: City of Fairfax - Public Works Department</b>  <b>Community Flood Preparedness Fund &amp;</b>  <b>Resilient Virginia Revolving Loan Fund</b>  <b>Detailed Budget Narrative</b>  <b>Period of Performance: <u>January 31, 2024</u> through <u>September 30, 2024</u></b>  <b>Submission Date: <u>November 10, 2023</u></b> </p>									
Grand Total State Funding Request									\$61,556.16
Grand Total Local Share of Project									\$61,556.16
Federal Funding (if applicable)									\$
Project Grand Total									\$123,112.32
Locality Cost Match									%50
Breakout By Cost Type	Personnel	Fringe	Travel	Equipment	Supplies	Contracts	Indirect Costs	Other Costs	Total
Federal Share (if applicable)									
Local Share						\$61,556.16			\$61,556.16
State Share						\$61,556.16			\$61,556.16
Pre-Award/Startup									
Maintenance									
Total	\$	\$	\$	\$	\$	\$123,112.32	\$	\$	\$123,112.32



# Funding Request Authorization





City of Fairfax – Dwight Avenue Drainage Improvements Study  
Community Flood Preparedness Fund (CFPF)  
Grant Application Package

I, Robert Stalzer, City of Fairfax – City Manager, authorize the City of Fairfax Department of Public Works to request funding from the 2023 Funding Round of the Virginia Community Flood Preparedness Fund for the development of a Dwight Avenue Drainage Improvements Study.

Signed: Robert Stalzer

Date: 11-7-23

# **SECTION C – CHECKLIST REQUIREMENTS**

Completed 2023 CFPF Funding Manual Checklist

Detailed Map(s) of the Project Area

FIRMette of the Project Area(s)

Historic Flood Damage Documentation

Copy of the City of Fairfax Floodplain Ordinance

City of Fairfax Comprehensive Plan

Social Vulnerability Index Score(s) for the Project Area



# Completed 2023 CFPF Funding Manual Checklist



## Appendix C: Checklist All Categories

(Benefit-cost analysis must be included if the proposed Project is over \$2 million.)

Virginia Department of Conservation and Recreation

Community Flood Preparedness Fund Grant Program

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☒ Detailed map of the project area(s) (Projects/Studies)

*Included in Section C Appendix*

☒ FIRMette of the project area(s) (Projects/Studies)

*Included in Section C Appendix*

☒ Historic flood damage data and/or images (Projects/Studies)

*Included in Section C Appendix*

☒ A link to or a copy of the current floodplain ordinance

*Included in Section C Appendix*

☒ Non-Fund financed maintenance and management plan for project extending a minimum of 10 years from project close

*Not Applicable for this Project*

☒ A link to or a copy of the current comprehensive plan

*Included in Section C Appendix*

☒ Social vulnerability index score(s) for the project area from VFRIS SVI Layer

*Included in Section C Appendix*

☒ If applicant is not a town, city, or county, letters of support from affected localities

*Not Applicable for this Project*

☒ Letter of support from impacted stakeholders

*Not Applicable for this Project*

☒ Budget Narrative

*Included in Section B Appendix*

☒ Supporting Documentation, including the Benefit-Cost Analysis tool/narrative (for projects over \$2 million)

*Not Applicable for this Project*

☒ Authorization to request funding from the Fund from governing body or chief executive of the local government

*Included in Section B Appendix*



☒ Signed pledge agreement from each contributing organization

*Not Applicable for this Project*

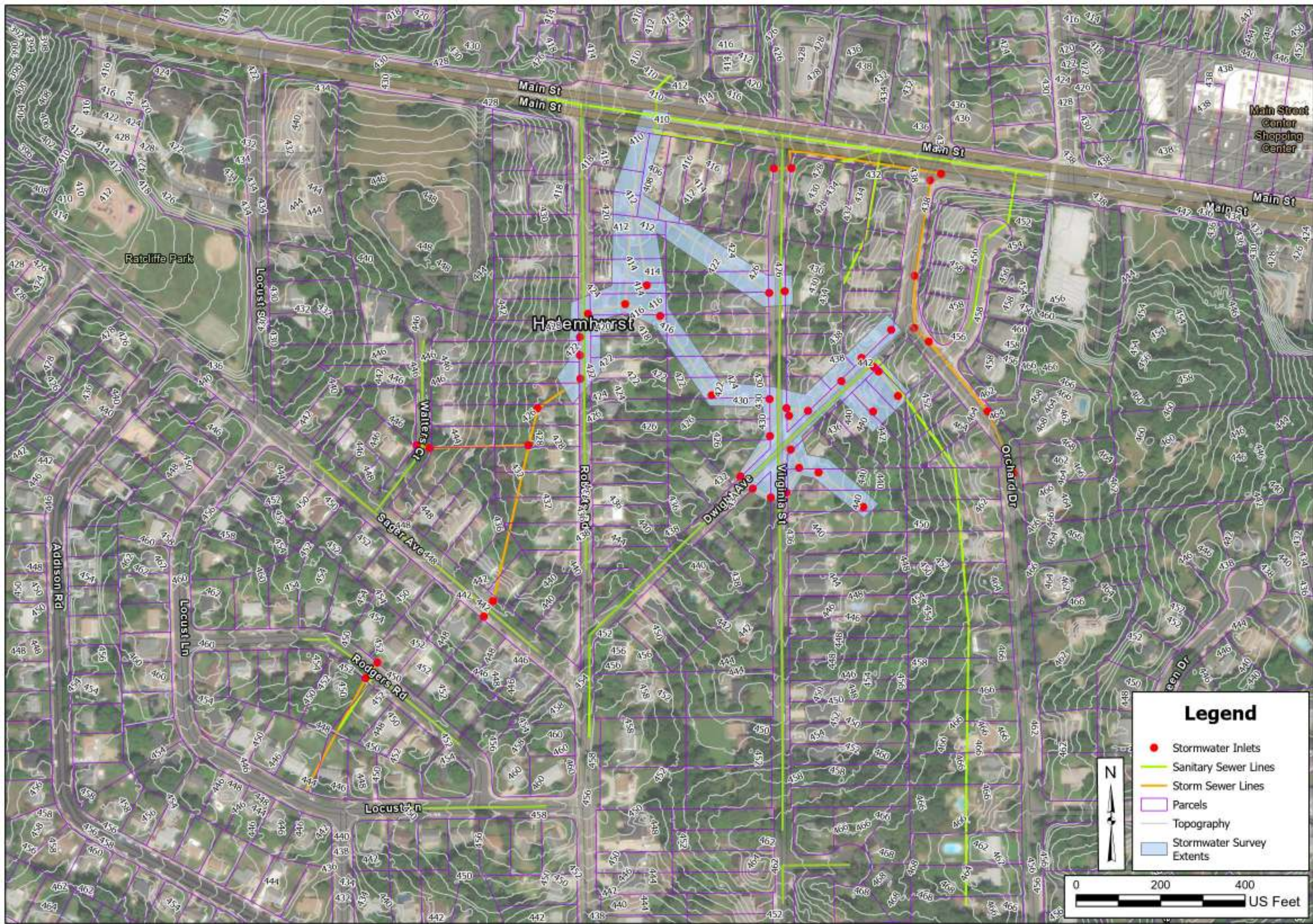
☒ Detailed budget and narrative for all costs

*Included in Section B Appendix*

## Detailed Map of Project Area







DATE
11/7/2023
DRAWN BY
MNP
CHECKED BY
JJD

DWIGHT AVENUE DRAINAGE STUDY

PREPARED FOR CITY OF FAIRFAX  
FAIRFAX, VIRGINIA

SCALE
1" = 200'
PROJECT NUMBER
N/A
SHEET NUMBER
EXHIBIT

**Legend**

- Stormwater Inlets
- Sanitary Sewer Lines
- Storm Sewer Lines
- Parcels
- Topography
- Stormwater Survey Extents



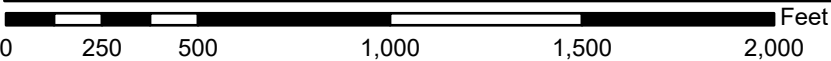
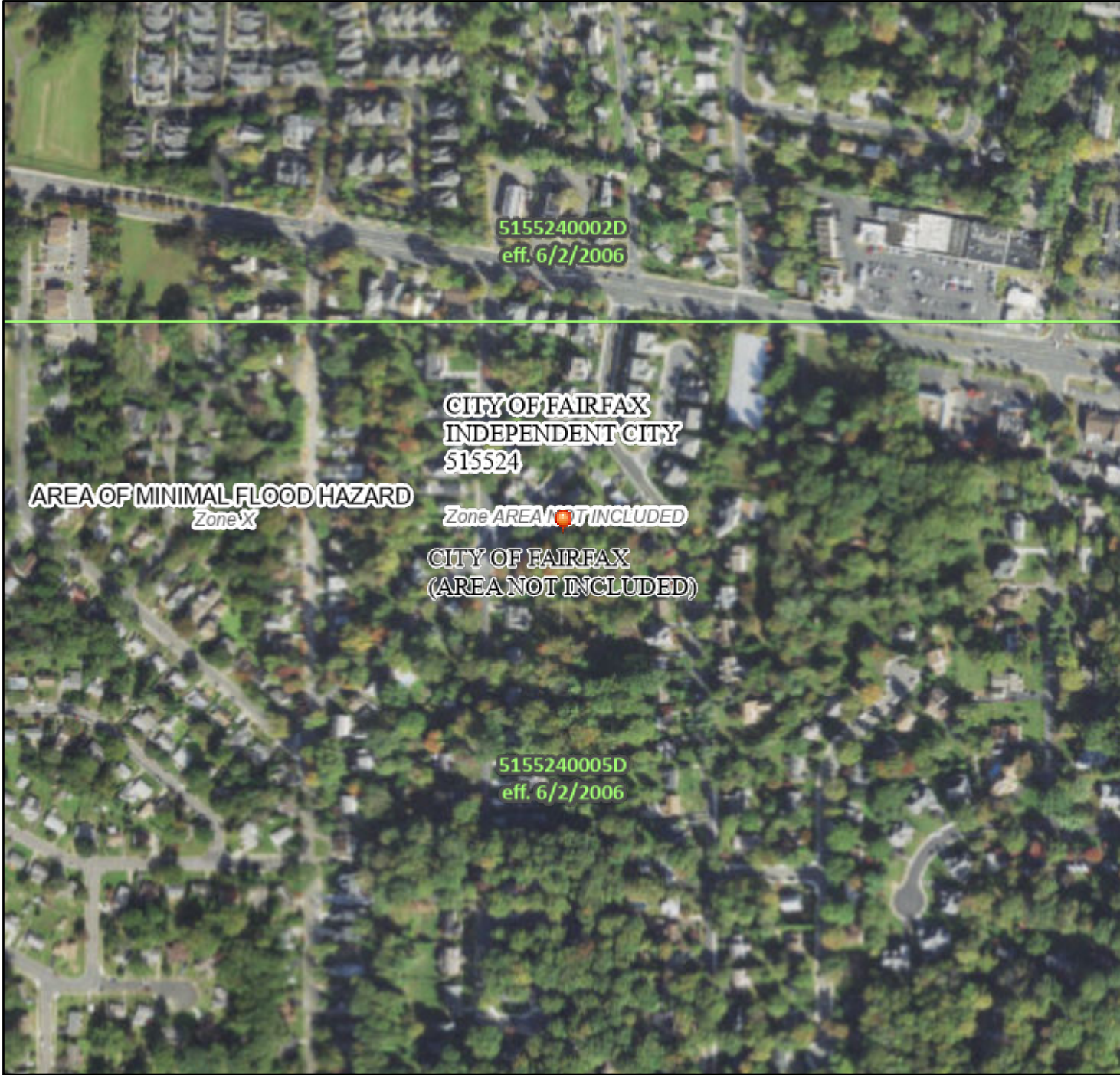
## **FIRMette of the Project Area**



# National Flood Hazard Layer FIRMette



77°17'59"W 38°50'46"N



1:6,000

77°17'21"W 38°50'18"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/31/2023 at 2:03 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



# Historic Flood Damage Documentation



# DOCUMENTATION ITEM 1

[REDACTED]

---

From: [REDACTED]  
Sent: Monday, April 5, 2021 8:52 AM  
To: Eto, Satoshi  
Cc: Summers, David; [REDACTED]  
Subject: Re: Storm Water Issues [REDACTED]

**CAUTION: External Email**

Good morning Mr. Eto,

Thank you for the prompt response. This Wednesday at 9am works well. It's great to hear that our street is part of the upcoming construction plans but you are correct FY26 is a bit out. Let's meet here at our house, so we can show you some of the problems we're facing. Thank you again and we look forward to meeting you.

Thanks,  
[REDACTED]

On Apr 5, 2021, at 8:01 AM, Eto, Satoshi <Satoshi.Eto@fairfaxva.gov> wrote:

Good morning Erika,

Thank you for reaching out to us. Would you be available to meet this Wednesday at 9AM?

The City has a Neighborhood Drainage Projects program in the capital budget and a drainage project for Virginia & Dwight was added during this budget cycle after we met with residents to discuss their drainage concerns. This project is currently proposed for design in FY24 and construction in FY26. I can tell you more about this program and how you can support it during the budget process.

FY26 is a ways off, so I would like to get an understanding of the drainage impacts to your property and then meet with our maintenance staff to discuss any additional interim measures we can implement to help you.

Sincerely,

<image001.png>

Satoshi Eto  
Acting City Engineer  
Stormwater Resource Engineer  
Public Works

---

From: [REDACTED]  
Sent: Saturday, April 03, 2021 1:10 PM  
To: Summers, David <David.Summers@fairfaxva.gov>; Eto, Satoshi <Satoshi.Eto@fairfaxva.gov>; [REDACTED]

[REDACTED]  
Subject: Storm Water Issues [REDACTED]

**CAUTION: External Email**

Good afternoon,

Hope this email finds you well. My family and I recently moved to Fairfax City, residing in [REDACTED]. In the last few months we have experienced a significant amount of Storm Water coming directly into our property from the street directly behind us (Virginia St.) and surrounding properties. The storm water sits in our property for days at a time, which is causing a significant amount of damage including soil erosion to potential foundation issues.

Mr. Summers, my understanding is that this issue was reported to your department last year by the previous owner ([REDACTED]) and although some measures were taken to address this issue, this continues to be a problem. We need to find a way to divert the water from Virginia St. and because of this I am kindly requesting a meeting with you and Mr. Eto in order to address this issue before it becomes more significant and damaging. We want to get ahead of this problem prior to the rainy season. I'm including my husband [REDACTED] and our personal cell phone numbers. If possible I would like to meet with you no later than next Friday March 9th, because there is rain forecasted for the upcoming weeks and we would like to care of this sooner rather than later. Thank you in advance for your attention to this matter.

[REDACTED]  
Regards,  
[REDACTED]

---

**FOIA Disclaimer**

You are hereby advised that, pursuant to the Virginia Freedom of Information Act, written correspondence (including, but not limited to, letters, e-mails and faxes) from and to the City of Fairfax and its officials and employees, and others acting on its behalf, may be subject to disclosure as being a public record. This includes the e-mail address(es) and other contact and identifying information for parties involved in the correspondence.

# DOCUMENTATION ITEM 2



## City of Fairfax, Virginia

10455 Armstrong Street • Fairfax, VA 22030-3630  
703-385-7810 • [www.fairfaxva.gov](http://www.fairfaxva.gov)

Satoshi Eto  
Public Works Program Manager  
(703) 273-6073  
[Satoshi.Eto@fairfaxva.gov](mailto:Satoshi.Eto@fairfaxva.gov)

Wednesday, October 11, 2023

RE: Dwight Avenue Drainage Concerns

I received a letter yesterday through our Transportation Division which you had sent on July 18, 2023, stating support for construction of sidewalks on Dwight Ave and relaying of concerns related to drainage at your property and timeframe of the sidewalk project.

Public Works has a project in the Capital Improvements Plan called the Neighborhood Drainage Projects to address drainage and flooding concerns received from property owners. Virginia & Dwight was added to the Neighborhood Drainage Projects list in 2020, when we received concerns about runoff impacting properties at this intersection during a heavy storm event.

Since then, City Council adopted the Stormwater Utility Ordinance which has provided the stormwater program with sufficient funding to design and construct several needed drainage improvements on this list. I do have good news to share –the Dwight Ave & Virginia St is up for design and funding is available in the current fiscal year. Our intention is to apply for the Department of Conservation & Recreation's Community Flood Preparedness Fund (CFPF grant) in November to conduct a flood study of this area. If approved, the grant would fund 50% of the costs of this study, which would include conducting survey to develop topographic data, asking for first-hand information from residents in the area, modeling drainage patterns and impacts, and developing options to address flooding in the area.

We expect to begin work on the flood study in spring 2024. Construction funding for drainage improvements at Virginia & Dwight is included in the proposed FY25 capital budget in the Neighborhood Drainage Projects. The FY25 budget development process is in its early stages and there will be opportunities to provide input to City Council, including public hearings, and I encourage you to participate.

I would like to add your phone number to the list of resident contacts for this project, and if possible, your email as well. Please feel free to email me at [satoshi.eto@fairfaxva.gov](mailto:satoshi.eto@fairfaxva.gov) to have your address added to the contact list.

Sincerely,

A handwritten signature in blue ink, appearing to be "Satoshi Eto", is written over a circular blue stamp or seal.

# **Copy of the City of Fairfax Floodplain Ordinance**



## **§4.15. FLOODPLAIN REGULATIONS**

### **§4.15.1. Authority**

These regulations are adopted pursuant to the authority granted to localities by Code of Virginia, §15.2 - 2280.

### **§4.15.2. Purpose**

The purpose of these regulations is to prevent: the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base by:

- A. Regulating uses, activities, and development which, alone or in combination with other existing or future uses, activities, and development, will cause unacceptable increases in flood heights, velocities, and frequencies;
- B. Restricting or prohibiting certain uses, activities, and development from locating within districts subject to flooding;
- C. Requiring all those uses, activities, and developments that do occur in flood-prone districts to be protected and/or floodproofed against flooding and flood damage; and
- D. Protecting individuals from buying land and structures that are unsuited for intended purposes because of flood hazards.

### **§4.15.3. General Provisions**

#### **A. Applicability**

These regulations shall apply to all privately and publicly owned lands within the city and identified as areas of special flood hazard identified by the city of Fairfax or shown on the flood insurance rate map (FIRM) or Flood Insurance Study (FIS) that is provided to the city of Fairfax by the Federal Emergency Management Agency (FEMA).

#### **B. Compliance and liability**

- 1. No land shall hereafter be developed and no structure shall be located, relocated, constructed, reconstructed, enlarged, or structurally altered except in full compliance with the terms and provisions of these regulations and any other applicable ordinances and regulations, which apply to uses within the city.
- 2. The degree of flood protection sought by the provisions of these regulations is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study, but does not imply total flood protection. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. These regulations do not imply that districts outside the floodplain district or land uses permitted within such district will be free from flooding or flood damages.
- 3. These regulations shall not create liability on the part of the city or any officer or employee thereof for any flood damages that result from reliance on these regulations or any administrative decision lawfully made thereunder.



**C. Records**

Records of actions associated with administering these regulations shall be kept on file and maintained by or under the direction of the floodplain administrator in perpetuity.

**D. Abrogation and greater restrictions**

These regulations supersede any regulations currently in effect in flood-prone districts. Any existing regulation, however, shall remain in full force and effect to the extent that its provisions are more restrictive than the provisions of these regulations.

These regulations are not intended to repeal or abrogate any existing ordinances including the subdivision ordinance, zoning ordinance, or building codes. In the event of a conflict between these regulations, the more restrictive shall govern.

**E. Severability**

See provisions of §1.1.9 for severability clause.

**F. Penalty for violations**

See Article 8 of the zoning ordinance for enforcement and penalties for violations.

**§4.15.4. Administration****A. Duties and responsibilities of the floodplain administrator**

The duties and responsibilities of the floodplain administrator designated in §5.9 shall include but are not limited to:

1. Do the work themselves. In the absence of the designated floodplain administrator, the duties are conducted by the City Manager.
2. Delegate duties and responsibilities set forth in these regulations to qualified technical personnel, plan examiners, inspectors, and other employees.
3. Enter into a written agreement or written contract with another community or private sector entity to administer specific provisions of these regulations. Administration of any part of these regulations by another entity shall not relieve the city of its responsibilities pursuant to the participation requirements of the National Flood Insurance Program (NFIP) as set forth in the Code of Federal Regulations at 44 CFR 59.22.
4. Review applications for floodplain permits to determine whether proposed activities will be located in the special flood hazard area (SFHA).
5. Interpret floodplain boundaries and provide available base flood elevation and flood hazard information.
6. Review applications to determine whether proposed activities will be reasonably safe from flooding and require new construction and substantial improvements to meet the requirements of these regulations.
7. Review applications to determine whether all necessary permits have been obtained from the federal, state or local agencies from which prior or concurrent approval is required; in particular, permits from state agencies for any construction, reconstruction, repair, or alteration of a dam, reservoir, or waterway obstruction (including bridges, culverts, structures), any alteration of a watercourse, or any change

of the course, current, or cross section of a stream or body of water, including any change to the 1-percent annual chance floodplain of free-flowing nontidal waters of the state.

8. Verify that applicants proposing an alteration of a watercourse have notified adjacent communities, the Virginia Department of Conservation and Recreation (DCR) Division of Dam Safety and Floodplain Management, and other appropriate agencies (Virginia Department of Environmental Quality [VADEQ], United States Army Corps of Engineers [USACE]) and have submitted copies of such notifications to FEMA.
9. Approve applications and issue floodplain permits to develop in flood hazard areas if the provisions of these regulations have been met, or disapprove applications if the provisions of these regulations have not been met.
10. Inspect or cause to be inspected, buildings, structures, and other development for which permits have been issued to determine compliance with these regulations or to determine if non-compliance has occurred or violations have been committed.
11. Review elevation certificates and require incomplete or deficient certificates to be corrected.
12. Submit to FEMA via a LOMR, or require applicants to submit to FEMA, data and information necessary to maintain FIRMs, including hydrologic and hydraulic engineering analyses prepared by or for the city of Fairfax, within six months after such data and information becomes available if the analyses indicate changes in base flood elevations.
13. Maintain and permanently keep records that are necessary for the administration of these regulations, including:
  - (a) Flood insurance studies, FIRMs (including historic studies and maps and current effective studies and maps) and letters of map change; and
  - (b) Documentation supporting issuance and denial of permits, elevation certificates, documentation of the elevation (in relation to the datum on the FIRM) to which structures have been floodproofed, inspection records, other required design certifications, special exceptions, and records of enforcement actions taken to correct violations of these regulations.
14. Enforce the provisions of these regulations, investigate violations, issue notices of violations or stop work orders, and require permit holders to take corrective action.
15. Advise the board of zoning appeals, or the city council, as appropriate, regarding the intent of these regulations and, for each application for special exceptions, prepare a staff report and recommendation.
16. Administer the requirements related to proposed work on existing buildings:
  - (a) Make determinations as to whether buildings and structures that are located in flood hazard areas and that are damaged by any cause have been substantially damaged.
  - (b) Make reasonable efforts to notify owners of substantially damaged structures of the need to obtain a permit to repair, rehabilitate, or reconstruct. Prohibit the non-compliant repair of substantially damaged buildings except for temporary

emergency protective measures necessary to secure a property or stabilize a building or structure to prevent additional damage.

17. Undertake, as determined appropriate by the floodplain administrator due to the circumstances, other actions which may include but are not limited to: issuing press releases, public service announcements, and other public information materials related to permit requests and repair of damaged structures; coordinating with other Federal, State, and local agencies to assist with substantial damage determinations; providing owners of damaged structures information related to the proper repair of damaged structures in special flood hazard areas; and assisting property owners with documentation necessary to file claims for Increased Cost of Compliance coverage under NFIP flood insurance policies.
18. Notify FEMA when the corporate boundaries of the city have been modified and:
  - (a) Provide a map that clearly delineates the new corporate boundaries or the new area for which the authority to regulate pursuant to these regulations has either been assumed or relinquished through annexation; and
  - (b) If the FIRM for any annexed area includes special flood hazard areas that have flood zones that have regulatory requirements that are not set forth in these regulations, prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the city council for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended regulations shall be provided to DCR Division of Dam Safety and Floodplain Management and FEMA.
19. Upon the request of FEMA, complete and submit a report concerning participation in the NFIP which may request information regarding the number of buildings in the special flood hazard area, number of permits issued for development in the special flood hazard area, and number of special exceptions issued for development in the special flood hazard area.
20. Take into account flood, mudslide and flood-related erosion hazards, to the extent that they are known, in all official actions relating to land management and use throughout the entire jurisdictional area of the city, whether or not those hazards have been specifically delineated geographically (e.g. via mapping or surveying).

#### **B. Use and interpretation of FIRMs**

The floodplain administrator shall make interpretations, where needed, as to the exact location of special flood hazard areas, floodplain boundaries, and floodway boundaries. The following shall apply to the use and interpretation of FIRMs and data:

1. Where field surveyed topography indicates that adjacent ground elevations:
  - (a) Are below the base flood elevation in riverine SFHAs, even in areas not delineated as a special flood hazard area on a FIRM, the area shall be considered as special flood hazard area and subject to the requirements of these regulations.
  - (b) Are above the base flood elevation and the area is labeled as a SFHA on the FIRM, the area shall be regulated as special flood hazard area unless the applicant obtains a letter of map change that removes the area from the special flood hazard area.

## §4.15.4 Administration

2. In FEMA-identified special flood hazard areas where base flood elevation and floodway data have not been identified and in areas where FEMA has not identified special flood hazard areas, any other flood hazard data available from a federal, state, or other source shall be reviewed and reasonably used.
3. Base flood elevations and designated floodway boundaries on FIRMs and in flood insurance studies shall take precedence over base flood elevations and floodway boundaries by any other sources if such sources show reduced floodway widths and/or lower base flood elevations.
4. Other sources of data shall be reasonably used if such sources show increased base flood elevations and/or larger floodways than are shown on FIRMs and in flood insurance studies.
5. If a Preliminary FIRM and/or a Preliminary Flood Insurance Study has been provided by FEMA:
  - (a) Upon the issuance of a letter of final determination by FEMA, the preliminary flood hazard data shall be used and shall replace the flood hazard data previously provided from FEMA for the purposes of administering these regulations.
  - (b) Prior to the issuance of a letter of final determination by FEMA, the use of preliminary flood hazard data shall be deemed the best available data pursuant to §4.15.5.A.3 regarding A Zones, and used where no base flood elevations and/or floodways are provided on the effective FIRM.
  - (c) Prior to issuance of a letter of final determination by FEMA, the use of preliminary flood hazard data is permitted where the preliminary base flood elevations or floodways exceed the base flood elevations and/or designated floodway widths in existing flood hazard data provided by FEMA. Such preliminary data may be subject to change and/or appeal to FEMA.

**C. Jurisdictional boundary changes**

1. The city floodplain regulations then in effect on the date of annexation or agreed upon boundary line adjustment shall remain in effect and shall be enforced by the city for all annexed areas until the city adopts and enforces an ordinance which meets the requirements for participation in the NFIP. It is a requirement that municipalities with existing floodplain ordinances shall pass a resolution acknowledging and accepting responsibility for enforcing floodplain ordinance standards prior to annexation of any area containing identified flood hazards. If the FIRM for any annexed area includes special flood hazard areas that have flood zones that have regulatory requirements that are not set forth in these regulations, the city shall prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the city council for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended regulations shall be provided to the DCR Division of Dam Safety and Floodplain Management and FEMA.
2. In accordance with the Code of Federal Regulations, Title 44 Subpart (B) Section 59.22 (a) (9) (v) all NFIP participating communities must notify the Federal Emergency Management Agency and optionally the State Coordinating Office (Virginia Department of Conservation and Recreation – Division of Dam Safety and Floodplain Management)

in writing whenever the boundaries of the community have been modified by annexation or the community has otherwise assumed or no longer has authority to adopt and enforce floodplain management regulations for a particular area.

3. In order that all FIRMs accurately represent the city's boundaries, a copy of a map of the city suitable for reproduction, clearly delineating the new corporate limits or new area for which the community has assumed or relinquished floodplain management regulatory authority must be included with the notification.

**D. District boundary changes**

The delineation of any of the Floodplain Districts may be revised by the city where natural or man-made changes have occurred and/or where more detailed studies have been conducted or undertaken by the U.S. Army Corps of Engineers or other qualified agency, or an individual documents the need for such change. However, prior to any such change, approval must be obtained from FEMA. A completed LOMR is a record of this approval.

**E. Interpretation of district boundaries**

The floodplain administrator shall be responsible for initial interpretations of the boundaries of the floodplain districts. Should a dispute arise concerning the boundaries of any of the districts, the aggrieved party may appeal the determination to the board of zoning appeals pursuant to §6.22. The party questioning or contesting the location of the district boundary shall be given a reasonable opportunity to present their case to the board and to submit their own technical evidence if they so desire.

**F. Submitting model backed technical data**

The city's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, the city shall notify FEMA of the changes by submitting technical or scientific data. The community may submit data via a LOMR. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data.

**G. Letters of map revision**

When development in the floodplain will cause or causes a change in the base flood elevation, the applicant, including state agencies, must notify FEMA by applying for a Conditional Letter of Map Revision (CLOMR) prior to construction, and a Letter of Map Revision (LOMR) after construction. Example cases:

1. Any development that causes a rise in the base flood elevations within the floodway.
2. Any development outlined in §4.15.6.B.1 occurring in Zone AE without a designated floodway that will cause a cumulative rise of one (1) foot or more in the base flood elevation on the property or on an offsite property.
3. Any development not defined in §4.15.6.B.1 occurring in Zone AE without a designated floodway, which will cause a rise in the base flood elevation either on the property or on an offsite property.
4. Alteration or relocation of a stream, including but not limited to installing culverts and bridges. [44 CFR 65.3 and 65.6(a)(12)]

### §4.15.5. Establishment of special flood hazard districts

#### A. Description of special flood hazard districts

The various special flood hazard districts shall include the special flood hazard areas. The basis for the delineation of these districts shall be the flood insurance study and the FIRM for the city prepared by FEMA, dated June 2, 2006, and any subsequent revisions or amendments thereto upon Letter of Final Determination issuance.

The city may identify and regulate local flood hazard or ponding areas that are not delineated on the FIRM. These areas may be delineated on a local flood hazard map using best available topographic data and locally derived information such as flood of record, historic high water marks or approximate study methodologies. The boundaries of the SFHA Districts are established as shown on the FIRM which is declared to be a part of these regulations and which shall be kept on file at the city offices.

The mapped floodplain includes all of the below regions and also the regions designated as having a 0.2 percent annual chance of flooding on any flood map or flood insurance study. In this area, emergency service, medical service, or governmental records storage shall be built above or protected to a 1-foot above the 0.2 percent annual chance water surface elevation.

1. The Floodway District is in an AE Zone and is delineated, for purposes of these regulations, using the criterion that certain areas within the floodplain must be capable of carrying the waters of the one percent annual chance flood without increasing the water surface elevation of that flood more than one (1) foot at any point. The areas included in this District are specifically defined in Table 23 of the above-referenced FIS and shown on the accompanying FIRM.

The following provisions shall apply within the floodway district of an AE Zone [44 CFR 60.3(d)]:

- (a) Within any floodway, no encroachments, including fill, new construction, substantial improvements, or other development shall be permitted unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that the proposed encroachment will not result in any increase in flood elevations within the community during the occurrence of the base flood discharge. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently-accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the floodplain administrator.
  - (b) Development activities which increase the water surface elevation of the base flood may be allowed, provided that the applicant first applies – with the city's endorsement – for a conditional letter of map revision (CLOMR), and receives the approval of FEMA.
  - (c) If §4.15.5.A.1(a) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of §4.15.6, §4.15.7, and §4.15.8.
2. The AE or AH Zones on the FIRM accompanying the Flood Insurance Study shall be those areas for which one-percent annual chance flood elevations have been provided



and the floodway has not been delineated. The following provisions shall apply within an AE or AH Zone [44 CFR 60.3(c)] where FEMA has provided base flood elevations and no floodway:

- (a) Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the areas of special flood hazard, designated as Zones AE or AH on the FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the city.
  - (b) Development activities in Zones AE or AH, on the city of Fairfax FIRM which increase the water surface elevation of the base flood by more than one foot may be allowed, provided that the applicant first applies – with the city’s endorsement – for a Conditional Letter of Map Revision, and receives the approval of FEMA.
- 3. The A Zone on the FIRM accompanying the Flood Insurance Study shall be those areas for which no detailed flood profiles or elevations are provided, but the one percent annual chance floodplain boundary has been approximated. For these areas, the following provisions shall apply [44 CFR 60.3(b)]:
  - (a) The approximated floodplain district shall be that floodplain area for which no detailed flood profiles or elevations are provided, but where a 1-percent annual chance floodplain boundary has been approximated. Such areas are shown as Zone A on the maps accompanying the Flood Insurance Study. For these areas, the base flood elevations and floodway information from federal, state, and other acceptable sources shall be used, when available. For development proposed in the approximate floodplain the applicant must use technical methods that correctly reflect currently accepted non-detailed technical concepts, such as point on boundary, high water marks, or detailed methodologies hydrologic and hydraulic analyses. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the floodplain administrator.
  - (b) The floodplain administrator reserves the right to require a hydrologic and hydraulic analysis for any development. When such base flood elevation data is utilized, the lowest floor shall be elevated at least two (2) feet above the base flood elevation.
  - (c) During the permitting process, the floodplain administrator shall obtain:
    - (1) The elevation of the lowest floor (in relation to mean sea level), including the basement, of all new and substantially improved structures; and,
    - (2) If the structure has been floodproofed in accordance with the requirements of this article, the elevation (in relation to mean sea level) to which the structure has been floodproofed.

Base flood elevation data shall be obtained from other sources or developed using detailed methodologies comparable to those contained in a FIS for subdivision proposals and other proposed development proposals (including manufactured home parks and subdivisions) that exceed fifty lots or five acres, whichever is the lesser.

## §4.15.6 Development standards

4. The AO Zone on the FIRM accompanying the Flood Insurance Study shall be those areas of shallow flooding identified as AO on the FIRM. For these areas, the following provisions shall apply [44 CFR 60.3(c)].
  - (a) All new construction and substantial improvements of residential structures shall have the lowest floor, including basement, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the FIRM plus two (2) feet. If no flood depth number is specified, the lowest floor, including basement, shall be elevated no less than four (4) feet above the highest adjacent grade.
  - (b) All new construction and substantial improvements of nonresidential structures shall:
    - (1) Have the lowest horizontal structural member, including basement, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the FIRM plus two (2) feet. If no flood depth number is specified, the underside of the lowest floor, including basement, shall be elevated at least four (4) feet above the highest adjacent grade; or,
    - (2) Together with attendant utility and sanitary facilities be completely floodproofed to the specified flood elevation so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.
  - (c) Adequate drainage paths around structures on slopes shall be provided to guide floodwaters around and away from proposed structures.
5. Overlay concept

The Floodplain Districts described above shall be overlays to the existing underlying districts as shown on the city's zoning map, and as such, the provisions for the Floodplain Districts shall serve as a supplement to the underlying district provisions.

  - (a) If there is any conflict between the provisions or requirements of the Floodplain Districts and those of any underlying district, the more restrictive provisions and/or those pertaining to the floodplain districts shall apply.
  - (b) In the event any provision concerning a Floodplain District is declared inapplicable as a result of any legislative or administrative actions or judicial decision, the basic underlying provisions shall remain applicable.

**§4.15.6. Development standards****A. General standards**

The following standards shall apply to all permits:

1. New construction and substantial improvements shall be built according to these regulations and the Virginia USBC, and anchored to prevent flotation, collapse or lateral movement of the structure.
2. New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

3. New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.
4. Electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities, including duct work, shall be elevated to or above the base flood elevation plus 2 feet or be designed so as to prevent water from entering or accumulating within the components during conditions of flooding.
5. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
6. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters.
7. On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.
8. In addition to the provisions 1-7 above, in all special flood hazard areas, these additional provisions shall apply:
  - (a) Prior to any proposed alteration or relocation of any channels or of any watercourse, stream, etc., within this jurisdiction a permit shall be obtained from the U.S. Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resources Commission (a joint permit application is available from any of these organizations). Furthermore, in riverine areas, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management), other required agencies, and the Federal Emergency Management Agency.
  - (b) The flood carrying capacity within an altered or relocated portion of any watercourse shall be maintained.
9. Any activities that cause an offsite rise in the BFE require notification by the responsible party to the affected property owner(s) and the written authorization that the affected property owner(s) accept the potential for a rise in the BFE on their property.

**B. Site development standards**

The following development shall be permitted within the floodplain, provided, that such activity is permitted in the underlying zoning district within which they are located, and a floodplain permit is obtained as specified in §6.11.

1. Utilities and public facilities and improvements such as streets, trails, channel improvements, bridges, utility pipes, utility transmission lines and stormwater management facilities and any improvements required for public safety or welfare shall be permitted subject to §4.15.4.G.
2. All development not included in §4.15.6.B.1 within the floodplain shall be permitted subject to §4.15.4.G, provided that the development or use is otherwise permitted in this chapter and that the area of impervious surface shall not exceed 2,500 square feet and such uses or improvements shall not contain areas of fill in excess of 12 inches in depth.

## §4.15.7 Elevation and construction standards

3. Applications for a variance will be subject to the criteria contained in §6.18.7.

**§4.15.7. Elevation and construction standards**

In all identified flood hazard areas where base flood elevations have been provided in the Flood Insurance Study or generated by a certified professional in accordance with §4.15.5.A.3, the following provisions shall apply:

**A. Residential construction**

New construction or substantial improvement of any residential structure in Zones AE, AH and A with detailed base flood elevations shall have the lowest floor, including basement, elevated at least two (2) feet above the base flood elevation.

**B. Non-Residential construction**

1. New construction or substantial improvement of any commercial, industrial, or nonresidential building shall have the lowest floor, including basement, elevated at least two (2) feet above the base flood elevation.
2. New construction or substantial improvement of any building designated as Flood Design Class 4 in the Virginia USBC shall have the lowest floor, including basement, elevated at least two (2) feet above the base flood elevation, or the 0.2 percent annual chance flood elevation, whichever is higher.
3. Buildings located in all AE and AH Zones may be floodproofed in lieu of being elevated provided that all areas of the building components below the elevation corresponding to the base flood elevation plus two (2) feet are watertight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the standards of this §4.15.7 are satisfied. Such certification, including the specific elevation (in relation to mean sea level) to which such structures are floodproofed, shall be maintained by the floodplain administrator. For buildings designated as Flood Design Class 4 in the Virginia USBC the elevation of floodproofing shall be at least two (2) feet above the base flood elevation, or the 0.2 percent annual chance flood elevation, whichever is higher.

**C. Space below the lowest floor**

In Zones A, AE, AH, and AO, fully enclosed areas, of new construction or substantially improved structures, which are below the base flood elevation plus two (2) feet shall:

1. Not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator).
2. Be constructed entirely of flood damage-resistant materials below the base flood elevation plus two (2) feet.
3. Include measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, flood openings shall meet the following minimum design criteria:

- (a) There shall be a minimum of two flood openings on different sides of each enclosed area; if a building has more than one enclosure below the lowest floor, each such enclosure shall have flood openings on exterior walls.
- (b) The total net area of all flood openings shall be at least one (1) square inch for each square foot of enclosed area (non-engineered flood openings), or the flood openings shall be engineered flood openings that are designed and certified by a licensed professional engineer to automatically allow entry and exit of floodwaters; the certification requirement may be satisfied by an individual certification or an Evaluation Report issued by the ICC Evaluation Service, Inc..
- (c) The bottom of each flood opening shall be one (1) foot or less above the higher of the interior floor or grade, or the exterior grade, immediately below the opening.
- (d) Any louvers, screens or other covers for the flood openings shall allow the automatic flow of floodwaters into and out of the enclosed area.
- (e) Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and, therefore, do not require openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires openings as outlined above.

#### **D. Accessory structures**

1. All accessory structures in the SFHA shall comply with the elevation requirements and other requirements of §3.5.5 and §6.11.5 or, if not elevated or floodproofed, shall:
  - (a) Be at or above grade on at least one side.
  - (b) Not be used for human habitation.
  - (c) Be limited to no more than one story in height and 600 square feet in total floor area.
  - (d) Be useable only for parking of vehicles or limited storage.
  - (e) Be constructed with flood damage-resistant materials below the base flood elevation plus two (2) feet.
  - (f) Be constructed and placed to offer the minimum resistance to the flow of floodwaters.
  - (g) Be anchored to prevent flotation, collapse, and lateral movement.
  - (h) Have electrical service and utility and mechanical equipment elevated to or above the base flood elevation plus two (2) feet.
2. Shall be provided with flood openings which shall meet the requirements of §4.15.7.C.3.
3. A signed Declaration of Land Restriction (Non-Conversion Agreement) shall be recorded on the property deed.

#### **E. Manufactured homes**

All manufactured homes shall be prohibited within the city of Fairfax. No special exceptions or variances will be granted.



**§4.15.8 Existing structures in floodplain areas****F. Recreational vehicles**

All recreational vehicles shall be prohibited within any special flood hazard area. No special exceptions or variances will be granted.

**G. Subdivisions**

For Subdivision standards, see Chapter 86, Subdivision Ordinance.

**§4.15.8. Existing structures in floodplain areas**

A structure, including accessory structures, or use of a structure or premises which lawfully existed before the enactment of these provisions, but which is not in conformity with these provisions, may be continued subject to the following conditions:

- A.** Existing structures in the floodway shall not be expanded or enlarged unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practices that the proposed expansion would not result in any increase in the base flood elevation.
- B.** Any modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use located in any floodplain areas to an extent or amount of less than 49 percent of its market value shall conform to the Virginia USBC and the appropriate provisions of these regulations.
- C.** The modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use, regardless of its location in a floodplain area to an extent or amount of 49 percent or more of its market value shall be undertaken only in full compliance with these regulations and shall require the entire structure to conform to the Virginia USBC.

**§4.15.9. Variances**

See provisions of §6.18 for variances.

**§4.16. STORM DRAINAGE FACILITIES****§4.16.1. Purpose**

- A.** The purpose of §4.16 to define those storm drainage facilities which must be provided by landowners to control rainfall runoff from and across their property in a manner not detrimental to other inhabitants of the city and to preserve, where possible, presently existing natural creek channels. It is the further purpose of §4.16 to minimize the adverse effects of stormwater runoff on downstream drainageways within the city.
- B.** Article 2.3 (§62.1-44.15:27) of Chapter 3.1 of Title 62.1 of the Code of Virginia establishes the requirement for localities to establish a stormwater management program. §4.16 is adopted pursuant to Chapter 3.1 of Title 62.1 of the Code of Virginia (§62.1-44.15:25 and §62.1-44.15:28 et seq.).

**§4.16.2. Performance standards for facilities**

Stormwater BMPs, on-site detention facilities, and on-site drainage facilities shall be designed and maintained in such a manner as to minimize economic and environmental costs to the city and its inhabitants in accordance with §4.16.7.

# City of Fairfax Comprehensive Plan



## Link to the City of Fairfax 2019 Comprehensive Plan

<https://www.fairfaxva.gov/government/community-development-planning/planning/comprehensive-plan>



## **Social Vulnerability Score(s) for the Project Area**







Social Vulnerability Index	
ID	Social Vulnerability Score
1	0.86
2	-1.47
3	-1.665

N

0

200

400

US Feet

Project Survey Extents

Social Vulnerability

Moderate Social Vulnerability

Very Low Social Vulnerability

Kimley»Horn

Expect More. Experience Better.

DATE

11/7/2023

DRAWN BY

MNP

CHECKED BY

JJD

DWIGHT AVENUE

SOCIAL VULNERABILITY INDEX

SOURCE VRFIS SVI LAYER

PREPARED FOR CITY OF FAIRFAX

FAIRFAX, VIRGINIA

SCALE

1" = 200'

PROJECT NUMBER

N/A

SHEET NUMBER

EXHIBIT



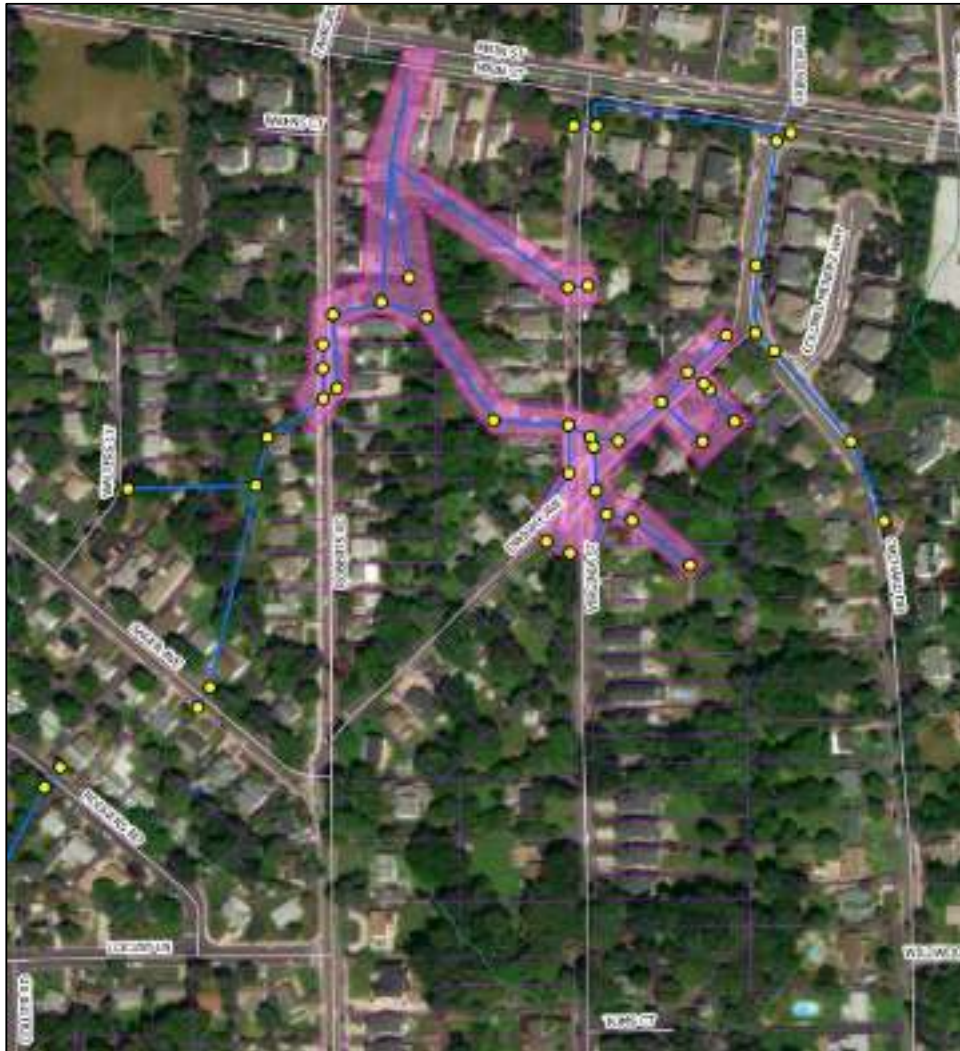
November 9, 2023

Satoshi Eto  
City of Fairfax, Department of Public Works  
10455 Armstrong Street, Room 200  
Fairfax, Virginia 22030

**RE: DWIGHT AVENUE AND VIRGINIA STREET DRAINAGE IMPROVEMENTS STUDY**

Dear Mr. Eto:

Kimley-Horn and Associates, Inc. (Kimley-Horn) is pleased to submit this task order proposal to the City of Fairfax (City) to provide professional consulting services related to the development of a Drainage Improvement Study for the Dwight Avenue and Virginia Street Corridor shown in Figure (Study Limits).



**Figure 1. Dwight Avenue and Virginia Street Corridor (Study Limits)**

The language outlined below identifies our project understanding, scope of requested services, and accompanying fees related to the overall project.

## **PROJECT UNDERSTANDING**

This proposal summarizes the phases and tasks necessary to evaluate the existing hydrologic and hydraulic features of the of Dwight Avenue and Virginia Street Drainage Corridors (Study Limits), in the City of Fairfax, and develop conceptual solutions to help abate localized drainage issues due to lack of stormwater infrastructure and existing drainage patters. The Study Limits receive large volumes of concentrated flow during high intensity storm events and several properties at the southwest corner of Dwight Avenue and Virginia Street are impacted by these flows. Residents have also reported that runoff from the western half of Virginia Street south of Dwight will spill out of the roadside ditch and onto their properties. As part of this project, Kimley-Horn will utilize dynamic SWMM modeling to identify the inadequacies in the existing stormwater management system, and then model proposed solutions that will assist in developing strategies to prevent and mitigate damages from the localized flooding within the Study Limits.

## **SCOPE OF SERVICES**

This proposal has been divided into seven (7) tasks. Each task is outlined below with a summary defining the Scope of Services for each task. A time and materials cost to perform this work is provided (Attachment 2) and includes Kimley-Horn project management and coordination time.

1. Project Corridor Survey Services
2. Site Base Mapping, Project Due Diligence, and Site Visit
3. Hydrologic Analysis of the Dwight Avenue and Virginia Street Corridor Drainage Areas.
4. Development of a Dwight Avenue and Virginia Street Corridor Watershed Model
5. Development of a Dwight Avenue and Virginia Street Corridor Drainage Improvements Concept Plan
6. Development of a Dwight Avenue and Virginia Street Corridor Drainage Improvements Report
7. Meetings & Coordination

### **TASK 100 – PROJECT CORRIDOR SURVEY SERVICES (PROVIDED BY JMT)**

See Attachment 1 for Detailed Survey Scope and Fee Breakdown

### **TASK 200 - SITE BASE MAPPING, PROJECT DUE DILIGENCE, AND SITE VISIT**

Kimley-Horn will develop both an AutoCAD and Geographic Information Systems (GIS) base-map illustrating the Study Limits. The Survey information derived in Task 100 will be the basis for all base mapping and conceptual exhibits referenced in this Scope of Services. As part of the base map development, the Survey will be supplemented with all pertinent available City of Fairfax and Virginia Flood Risk Information System (VFRIS) data to depict existing site conditions and display the impacts of the existing flood limits on Study Limit infrastructure (if applicable). The base mapping will be used by Kimley-Horn to assist in site reconnaissance efforts and to supplement all meetings, efforts, modeling and study deliverables outlined in this Scope of Services.

As part of this task, Kimley-Horn will perform project due diligence for the Study Limits by compiling pertinent information from the following reports and data sets:

- Survey Information Developed in Task 100 of this Scope of Services
- Any relevant studies or approved development plans within the project study areas (to be provided by the City)
- Available VDOT and City of Fairfax Roadway/Drainage Infrastructure Plans for the project Study Areas
- Best available VFRIS, State, and City GIS Shapefile Data and Aerial Imagery
- Available as-builts/electronic records of existing stormwater infrastructure.

Kimley-Horn will utilize the survey data and base mapping in this task to assist in a site visit to photo-document current conditions along the Study Limits. Kimley-Horn will take georeferenced photos along the study limits and include them in a photo location map that identifies potential Study Limits opportunities and constraints.

### **TASK 300 – HYDROLOGIC ANALYSIS OF THE DWIGHT AVENUE AND VIRGINIA STREET CORRIDOR DRAINAGE AREAS**

Kimley-Horn will determine existing study area hydrologic parameters such as drainage areas, Runoff Curve Numbers (RCNs), Times of Concentrations (Tc), Basin Slopes, as well as all required existing catchment area data needed to effectively model the study area existing hydrologic conditions. The hydrologic parameters will be derived from a compilation of the most readily available aerial landcover data, survey data, GIS Shapefile data, and soils data. The derived basin hydrologic conditions will be utilized as model input parameters in Task 300 to determine each study area's flow characteristics for the 1-yr, 2-yr, 10-yr, and 100-yr storm events. All information derived in this task will be documented within the Dwight Avenue and Virginia Street Corridor Drainage Improvements Report (Task 600).

### **TASK 400 – DEVELOPMENT OF A DWIGHT AVENUE AND VIRGINIA STREET CORRIDOR WATERSHED MODEL**

#### **Task 400A – Existing Conditions Watershed Modeling**

Kimley-Horn will build an existing conditions model of the Study Limits watershed using a dynamic SWMM modeling package that will be based on Survey Data, City GIS information, lidar topography, and will be supplemented with all relevant plan and as-built data ascertained in Task 200. Kimley-Horn will develop basin flow networks that are indicative of the Study Area stormwater and roadway infrastructure, topography, and building footprint and structural features. The existing model will be validated using publicly available rainfall gage data for recent storm events, and a comparison will be performed between the existing modeled inundation to historical observed inundation in the study areas.

The modeled results and data generated in this task will be used to determine limits and depths of localized and basin wide drainage issues along study area corridors. Existing inundation depths, velocities, flow spread, and flood limits will be derived as part of this analysis. Kimley-Horn will develop and document both graphical and tabular results for the existing conditions modeling. These values will provide a baseline.

comparison to assess proposed conceptual design implementation scenarios. All information derived in this subtask will be documented within the Dwight Avenue and Virginia Street Corridor Drainage Improvements Report (Task 600).

#### **Task 400B – Proposed Improvements Watershed Modeling**

Kimley-Horn will modify the Existing Conditions Watershed Model to evaluate proposed infrastructure and grading changes that could help abate flooding throughout the study area(s). The modeling will focus on implementation of new drainage infrastructure in areas without it, upgrades of existing drainage infrastructure, grading techniques, and pairing of multiple practices within the study areas (if necessary). Drainage basin wide implementation and evaluation of conceptual solutions will be prioritized as to provide wholistic approaches to flooding issues, and to not potentially transfer flooding issues to other locations.

Kimley-Horn will model up to (5) conceptual solutions. After assessing the viability and potential success of the conceptual infrastructure changes within the study corridor, Kimley-Horn will run revised model scenarios for the 1, 2, 10, and 100-yr storm events to compare to the existing conditions modeling as to quantify the effect of the proposed improvements on the localized flooding limits within the Study Areas. The graphical and tabular information generated from this task will be included in the Dwight Avenue and Virginia Street Corridor Drainage Improvements Report (Task 600).

#### **TASK 500 - DEVELOPMENT OF A DWIGHT AVENUE AND VIRGINIA STREET CORRIDOR DRAINAGE IMPROVEMENTS CONCEPT PLAN**

Based on the results determined through the SWMM Modeling Task (Task 400), Kimley-Horn and the City will agree upon the best three (3) conceptual solutions to evaluate further. From this, Kimley-Horn will develop three (3) - 24x36 AutoCAD conceptual exhibits that will graphically depict locations of potential drainage improvements within the Study Area. Proposed conceptual improvements will include, but are not limited to the following:

- Infrastructure based improvements
  - Additional pipe locations, inlet placement, junction boxes, etc.
- Natural based solutions
  - Green Infrastructure Approaches

Due to the conceptual nature of this plan, all proposed storm and structural improvements, preliminary grading enhancements, and proposed future project implementation locations will have limited engineering design and will focus on project layout, location, and feasibility.

#### **TASK 600 – DEVELOPMENT OF A DWIGHT AVENUE AND VIRGINIA STREET CORRIDOR DRAINAGE IMPROVEMENTS REPORT**

Kimley-Horn will develop a Dwight Avenue and Virginia Street Corridor Drainage Improvements Report outlining the information derived in tasks 100 - 500. Study graphics, tabular summaries, numerical analysis, and conceptual level designs created in all previous tasks will be included in the final report. Recommendations on future drainage basin stormwater management improvements, future storm sewer designs, as well as comprehensive drainage improvement implementation scenarios for the Study Area will be included with the report.

## **TASK 700 – MEETINGS & COORDINATION**

Kimley-Horn staff will be available for up to two (2) project coordination meetings to discuss the project. In addition, Kimley-Horn staff will participate in calls to discuss the project with City staff. If additional meetings and coordination activities are requested, Kimley-Horn will prepare a separate Scope of Services and cost estimate for client approval prior to proceeding with the additional work.

## **DELIVERABLES**

The following items are anticipated as project deliverables for this Scope of Services.

- All developed Hydrologic and Hydraulic Model(s)
- Dwight Avenue and Virginia Street Corridor Drainage Improvements 24 x 36 AutoCAD Derived Conceptual Plan
- Dwight Avenue and Virginia Street Corridor Drainage Improvements Report
- All maps, models, analyses, spreadsheets, and base data utilized for the design (if requested).

## **OVERALL PROJECT ASSUMPTIONS**

For the purposes of developing this proposed Scope of Services and the accompanying cost estimate, we have made the following assumptions:

- It is assumed that all Survey data outlined in Attachment 1 will be provided to Kimley-Horn prior to March 31<sup>st</sup>, 2024 to facilitate completion of this study by September 30<sup>th</sup>, 2024.
- Accuracy and precision of survey data provided by others is solely on the firm that derived the studies. Kimley-Horn will review all survey data referenced in this Scope of Services for completeness but assumes no responsibility for information developed by others.
- All previous project information developed by others will be provided by the City to Kimley-Horn in a timely manner to accommodate anticipated project schedule.
- The drainage studies and analyses proposed in this Scope of Services are intended as a planning level. As such this information and data will not be stamped and sealed by a Virginia Professional Engineer (PE).
- The Conceptual Design Exhibits referenced in this Scope of Services will be limited in terms of engineering design and analysis. As such, they will be not stamped by a licensed Virginia Professional Engineer and labeled as “Not for Construction Purposes”.
- The City will provide site access coordination and permission to Kimley-Horn for conducting all necessary fieldwork related tasks in a timely manner to facilitate the project schedule.
- Readily available City GIS shapefile and geodatabase information will be used to supplement this study, as needed.
- The City will provide all coordination with Inter-City departments with regards to this project.
- This proposal and the accompanying cost estimate are valid for a period of 90 days and will expire if not accepted within that timeframe.



## **OVERALL PROJECT EXCLUSIONS**

Services that are not currently anticipated as part of this project and are therefore outside the scope of this task order proposal include the following:

- Environmental Site Assessments
- Perennial Stream Assessments and/or Flow Determinations
- Project Renderings
- Floodplain Studies and Submittals
- FEMA Applications
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- Development/Delivery of Presentations, Board of Supervisors, Committees, or the Public
- Notifications to impacted Property Owners
- All other services not explicitly stated in this Scope of Services

## **SCHEDULE**

The tasks referenced in this scope will be coordinated with City Staff. Meetings, action items, and deliverables will be tracked monthly and reported to the County with a monthly progress report for documentation of services provided. Assuming Kimley-Horn receives a notice to proceed by January 31st, 2024, Kimley-Horn anticipates completion of the Scope of Services outlined above by September 30, 2024. A detailed schedule will be developed for the City outlining project workflow and deliverables after contract execution.

## **FEE AND BILLING**

Kimley-Horn will provide the following scope of services under our term contract #23050-A. The following tasks will be provided on a time and materials basis not to exceed a total project cost of **\$123,112.32**. A detailed breakdown (by task) of Kimley-Horn's fee estimate is provided in Attachment 1 and utilizes the rate schedule as provided for in the City of Fairfax Task Order Contract #23050-A, Year 1. Please note that hourly fees will be invoiced monthly based upon hours expended for services performed and payment will be due within 25 days of receipt of invoices related to this project.

**CLOSURE**

The work described with this proposal will be completed in accordance with the terms and conditions of Contract #23050-A between the City of Fairfax and Kimley-Horn. We appreciate the opportunity to provide these services to you. Please contact me if you have any questions.

Very truly yours,  
KIMLEY-HORN AND ASSOCIATES, INC.



Jon D' Alessandro, P.E.  
Senior Project Manager

## **ATTACHMENT 1 – JMT SURVEY LIMITS AND SCOPE OF SERVICES**



November 9, 2023

Jon D'Alessandro, PE  
Senior Project Manager  
Kimley-Horn  
11400 Commerce Park Drive, Suite 400  
Reston, Virginia 20191

RE: Task Order 003 – Dwight Avenue Drainage Area Survey  
JMT Contract 23-02627-003

Dear Mr. D'Alessandro:

We are submitting, herewith, our man-hour estimate of the anticipated hours and estimated fee required to provide topographic surveys for Dwight Avenue Drainage Area Study in the City of Fairfax, Virginia. The site is the approximate drainage area for Dwight Avenue, containing approximately 82.5 +/- acres of land. See the attachment at the end of the proposal.

The Scope of Services for this task will consist of the following:

Property Owner Entry Letters.

It is our understanding that the city will handle property owner notifications. JMT will follow the requirements of Article 33.2-1011 of the Code of Virginia, and personnel will not enter private property until 30 calendar days after the mailing of the certified letters.

Survey Datums

The final deliverables will be in AutoCAD format, at a scale of 1" = 25', and on Virginia State Plane North NAD83(NSRS2011, US Feet) horizontal and **NGVD 29 vertical**.

Drone Imagery

JMT will establish seventeen (17) photo-identifiable features for use as ground control points (GCPs) spread evenly within the project area, according to the attached exhibit. Each point will be observed using GNSS RTK observations with reference ties to the primary site control.

A Microdrones MD4-1000 unmanned aerial system (UAS) with a mdLiDAR1000LR LiDAR and photogrammetric payload will be operated to capture UAS-based LiDAR with a target ground density of 200 points per square meter. All UAS flights will be performed with an FAA Certified Part 107 Remote Pilot and the assistance of a visual observer (VO) per FAA-recommended guidelines. Flights will be in conformance with FAA Part 107 regulations and other applicable State and local regulations.

The site is within the Flight-Restricted Zone (FRZ) airspace surrounding Washington D.C. and centered at Ronald Reagan Washington National Airport. JMT will apply for the FAA waiver to conduct flights within the FRZ. The waiver process typically requires one month from the time of application to get permission to fly.

Once the flight is complete, JMT will register all LiDAR and photogrammetric data to the established GCPs. JMT will confirm the LiDAR and photogrammetric solutions by establishing at least eight (8) validation points valued by averaging three GNSS RTK observations on each validation point and spread evenly throughout the project area.

JMT will provide a 2D planimetric of major ground features (roads, sidewalks, driveways, buildings) to accompany the surface and contours. Deliverables will also include a digital elevation model (DEM) from the resulting point cloud, an XML of the DEM surface, and 0.50-foot contours in AutoCAD format from said surface.

#### Storm Water Structures

Storm drain structures are to be located with elevations on the tops of manholes or drop inlets and their pipe invert elevations. The location of the next structure (manhole, etc.) outside of survey limits shall be included with elevations. Also, the open ends of pipes will have their locations with invert elevations. Existing pipe sizes will be labeled. Structures will be located in the highlighted area only, according to the attached exhibit. This is approximately 34 structures.

For this task, JMT will attempt to use GPS to locate the stormwater structures (including pipe inverts), minimizing the need for setting survey control. If there is an area where GPS proves inaccurate enough for this task, survey control will need to be established. A minimum of three (3) control points are to be set on site. Control will be tied to the Virginia State Plane Coordinate System (North Zone), North American Datum of 1983 / NSRS 2011 adjustment horizontally, and **National Geodetic Vertical Datum of 1929 (NGVD 29) vertically**. Real-time Kinematic (RTK) Global Positioning System (GPS) will be utilized whenever it is practical to do so. All control points will be set using rebar and cap labeled with our firm's unique identification number. Control will be observed using RTK GPS technology and post-processed.

The following are our assumptions related to out-of-scope items and access. It is our understanding that JMT will not be responsible for delivering the services listed below as part of this task assignment, and they have been excluded:

- This level of effort does not include boundary surveys as defined by the Virginia Minimum Standards.
- JMT assumes unrestricted access to all areas of the project area, receipt of all digital and bond copies of plat, maps, ALTA Surveys or plans relating to the project.
- JMT assumes one revision to the final submission. Additional revisions are considered out of scope.
- JMT assumes any and all permits, rights of entry or property owner notifications, if any are required, will be the responsibility of the client with the exception of the permit to use drone imagery inside the flight restriction zone.
- JMT assumes no special badging or clearances are required for this task.
- JMT assumes no dewatering of structures or confined space entry under this contract.
- JMT assumes no subsurface utility designation activities will be covered under this contract.
- JMT assumes any activity related to litigation or the preparation thereof is considered out of scope and will be charged at hourly rates.



- JMT will make every attempt to meet the schedule stated herein unless field work is hampered by inclement weather.

The proposed fee to complete this assignment is broken down with the approximate hours and rates shown in the man hour table attached and can be performed for the lump sum price of \$55,484.00

All surveys will be on the Virginia State Plane North NAD83(NSRS2011) horizontal datum, and **NGVD 29 vertical datum**, unless otherwise specified by the KHA. If additional work is required outside of the normal Scope of Services listed above, JMT will contact KHA before initiating any additional work.

We understand that we will receive a written Notice-to-Proceed once you have reviewed and approved the enclosed estimates. JMT anticipates a start date within 10 days of Notice to Proceed, and delivery of completed files approximately twelve (12) weeks from NTP.

If you should have any questions or require any additional information, please do not hesitate to contact this office. We look forward to working together on this task.

Very truly yours,

JOHNSON, MIRMIRAN & THOMPSON, INC.

A handwritten signature in blue ink, appearing to read 'D. Stickles', with a stylized flourish at the end.

David Stickles, L.S.  
Vice President



Survey Requests:  
-All survey in NGVD29 and NAD83 State Plane North.  
-0.5 foot contours throughout all areas calling for topographic survey.  
-All storm pipes and structures denoted on exhibit and inclusion of all sizes, invert, lengths, type, ect.  
-Parcel Boundaries/Easements only within core project limits.  
-City GIS data is shown for informational purposes only.

**Kimley»Horn**

Expect More. Experience Better.

DATE

10/31/2023

DRAWN BY

MNP

CHECKED BY

JJD

CITY OF FAIRFAX DEPARTMENT OF PUBLIC WORKS  
DWIGHT AVENUE DRAINAGE AREA SURVEY EXHIBIT

PREPARED FOR CITY OF FAIRFAX  
FAIRFAX, VIRGINIA

SCALE

1" = 200'

PROJECT NUMBER

N/A

SHEET NUMBER

EXHIBIT

**Legend**

- Stormwater Inlets
- Storm Sewer Lines
- Drainage Area
- Streets
- Topography Survey Limits
- Parcels
- Stormwater Sewer Survey Limits

Topographic  
survey area  
~82.5 Acres



0 200 400 US Feet



# **SECTION B – BUDGET DATA**

Project Budget Narrative and Scope of Services

Budget Narrative Template

Funding Request Authorization



# **Project Budget Narrative and Scope of Services**



## **Project Budget Narrative and Scope of Services**

A detailed budget narrative is included below and contains the required information outlined in the 2023 Funding Manual for the Virginia Community Flood Preparedness Fund. This section also includes the Kimley-Horn Scope of Services to complete the Dwight Avenue and Virginia Street Drainage Improvement Study.

### **Estimated Total Project Cost**

The total identified project cost to complete the Dwight Avenue and Virginia Street Drainage Improvement Study is \$123,112.32.

### **Amount of Funds Requested from the Fund**

The total amount of grant assistance sought from the Fund is \$61,556.16.

### **Amount of Funds Available**

The amount of funds available through this project's funding source is greater than the total estimated project cost of \$123,112.32. The following documentation has been included in this section:

- City of Fairfax, Virginia – Adopted Capital Improvement Program FY2024 to 2028 – FY2024 Adopted Budget
- City of Fairfax, Virginia – Adopted Capital Improvement Program FY2024 to 2028 – Environment – Stormwater Capital Projects – Neighborhood Drainage Projects
- City of Fairfax, Virginia – Adopted Capital Improvement Program FY2024 to 2028 – Neighborhood Drainage Project Information

### **Authorization to Request Funding**

A signed statement from the City of Fairfax City Manager authorizing the request for funding for this project has been included in this section.





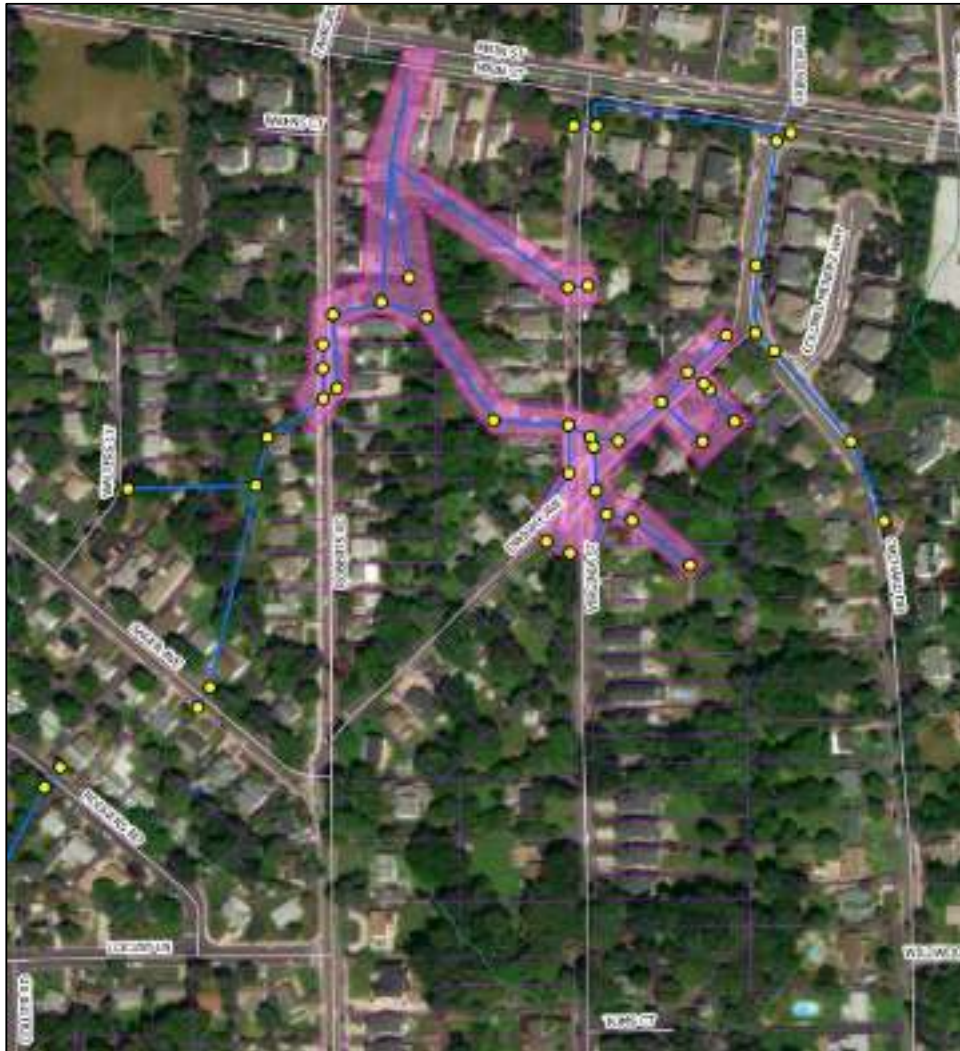
November 9, 2023

Satoshi Eto  
City of Fairfax, Department of Public Works  
10455 Armstrong Street, Room 200  
Fairfax, Virginia 22030

**RE: DWIGHT AVENUE AND VIRGINIA STREET DRAINAGE IMPROVEMENTS STUDY**

Dear Mr. Eto:

Kimley-Horn and Associates, Inc. (Kimley-Horn) is pleased to submit this task order proposal to the City of Fairfax (City) to provide professional consulting services related to the development of a Drainage Improvement Study for the Dwight Avenue and Virginia Street Corridor shown in Figure (Study Limits).



**Figure 1. Dwight Avenue and Virginia Street Corridor (Study Limits)**

The language outlined below identifies our project understanding, scope of requested services, and accompanying fees related to the overall project.

## **PROJECT UNDERSTANDING**

This proposal summarizes the phases and tasks necessary to evaluate the existing hydrologic and hydraulic features of the of Dwight Avenue and Virginia Street Drainage Corridors (Study Limits), in the City of Fairfax, and develop conceptual solutions to help abate localized drainage issues due to lack of stormwater infrastructure and existing drainage patters. The Study Limits receive large volumes of concentrated flow during high intensity storm events and several properties at the southwest corner of Dwight Avenue and Virginia Street are impacted by these flows. Residents have also reported that runoff from the western half of Virginia Street south of Dwight will spill out of the roadside ditch and onto their properties. As part of this project, Kimley-Horn will utilize dynamic SWMM modeling to identify the inadequacies in the existing stormwater management system, and then model proposed solutions that will assist in developing strategies to prevent and mitigate damages from the localized flooding within the Study Limits.

## **SCOPE OF SERVICES**

This proposal has been divided into seven (7) tasks. Each task is outlined below with a summary defining the Scope of Services for each task. A time and materials cost to perform this work is provided (Attachment 2) and includes Kimley-Horn project management and coordination time.

1. Project Corridor Survey Services
2. Site Base Mapping, Project Due Diligence, and Site Visit
3. Hydrologic Analysis of the Dwight Avenue and Virginia Street Corridor Drainage Areas.
4. Development of a Dwight Avenue and Virginia Street Corridor Watershed Model
5. Development of a Dwight Avenue and Virginia Street Corridor Drainage Improvements Concept Plan
6. Development of a Dwight Avenue and Virginia Street Corridor Drainage Improvements Report
7. Meetings & Coordination

### **TASK 100 – PROJECT CORRIDOR SURVEY SERVICES (PROVIDED BY JMT)**

See Attachment 1 for Detailed Survey Scope and Fee Breakdown

### **TASK 200 - SITE BASE MAPPING, PROJECT DUE DILIGENCE, AND SITE VISIT**

Kimley-Horn will develop both an AutoCAD and Geographic Information Systems (GIS) base-map illustrating the Study Limits. The Survey information derived in Task 100 will be the basis for all base mapping and conceptual exhibits referenced in this Scope of Services. As part of the base map development, the Survey will be supplemented with all pertinent available City of Fairfax and Virginia Flood Risk Information System (VFRIS) data to depict existing site conditions and display the impacts of the existing flood limits on Study Limit infrastructure (if applicable). The base mapping will be used by Kimley-Horn to assist in site reconnaissance efforts and to supplement all meetings, efforts, modeling and study deliverables outlined in this Scope of Services.

As part of this task, Kimley-Horn will perform project due diligence for the Study Limits by compiling pertinent information from the following reports and data sets:

- Survey Information Developed in Task 100 of this Scope of Services
- Any relevant studies or approved development plans within the project study areas (to be provided by the City)
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Kimley-Horn will utilize the survey data and base mapping in this task to assist in a site visit to photo-document current conditions along the Study Limits. Kimley-Horn will take georeferenced photos along the study limits and include them in a photo location map that identifies potential Study Limits opportunities and constraints.

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Kimley-Horn will build an existing conditions model of the Study Limits watershed using a dynamic SWMM modeling package that will be based on Survey Data, City GIS information, lidar topography, and will be supplemented with all relevant plan and as-built data ascertained in Task 200. Kimley-Horn will develop basin flow networks that are indicative of the Study Area stormwater and roadway infrastructure, topography, and building footprint and structural features. The existing model will be validated using publicly available rainfall gage data for recent storm events, and a comparison will be performed between the existing modeled inundation to historical observed inundation in the study areas.

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Based on the results determined through the SWMM Modeling Task (Task 400), Kimley-Horn and the City will agree upon the best three (3) conceptual solutions to evaluate further. From this, Kimley-Horn will develop three (3) - 24x36 AutoCAD conceptual exhibits that will graphically depict locations of potential drainage improvements within the Study Area. Proposed conceptual improvements will include, but are not limited to the following:

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#### **TASK 600 – DEVELOPMENT OF A DWIGHT AVENUE AND VIRGINIA STREET CORRIDOR DRAINAGE IMPROVEMENTS REPORT**

Kimley-Horn will develop a Dwight Avenue and Virginia Street Corridor Drainage Improvements Report outlining the information derived in tasks 100 - 500. Study graphics, tabular summaries, numerical analysis, and conceptual level designs created in all previous tasks will be included in the final report. Recommendations on future drainage basin stormwater management improvements, future storm sewer designs, as well as comprehensive drainage improvement implementation scenarios for the Study Area will be included with the report.

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## **DELIVERABLES**

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## **FEE AND BILLING**

Kimley-Horn will provide the following scope of services under our term contract #23050-A. The following tasks will be provided on a time and materials basis not to exceed a total project cost of **\$123,112.32**. A detailed breakdown (by task) of Kimley-Horn's fee estimate is provided in Attachment 1 and utilizes the rate schedule as provided for in the City of Fairfax Task Order Contract #23050-A, Year 1. Please note that hourly fees will be invoiced monthly based upon hours expended for services performed and payment will be due within 25 days of receipt of invoices related to this project.

**CLOSURE**

The work described with this proposal will be completed in accordance with the terms and conditions of Contract #23050-A between the City of Fairfax and Kimley-Horn. We appreciate the opportunity to provide these services to you. Please contact me if you have any questions.

Very truly yours,  
KIMLEY-HORN AND ASSOCIATES, INC.



Jon D' Alessandro, P.E.  
Senior Project Manager

## **ATTACHMENT 1 – JMT SURVEY LIMITS AND SCOPE OF SERVICES**



November 9, 2023

Jon D'Alessandro, PE  
Senior Project Manager  
Kimley-Horn  
11400 Commerce Park Drive, Suite 400  
Reston, Virginia 20191

RE: Task Order 003 – Dwight Avenue Drainage Area Survey  
JMT Contract 23-02627-003

Dear Mr. D'Alessandro:

We are submitting, herewith, our man-hour estimate of the anticipated hours and estimated fee required to provide topographic surveys for Dwight Avenue Drainage Area Study in the City of Fairfax, Virginia. The site is the approximate drainage area for Dwight Avenue, containing approximately 82.5 +/- acres of land. See the attachment at the end of the proposal.

The Scope of Services for this task will consist of the following:

Property Owner Entry Letters.

It is our understanding that the city will handle property owner notifications. JMT will follow the requirements of Article 33.2-1011 of the Code of Virginia, and personnel will not enter private property until 30 calendar days after the mailing of the certified letters.

Survey Datums

The final deliverables will be in AutoCAD format, at a scale of 1" = 25', and on Virginia State Plane North NAD83(NSRS2011, US Feet) horizontal and **NGVD 29 vertical**.

Drone Imagery

JMT will establish seventeen (17) photo-identifiable features for use as ground control points (GCPs) spread evenly within the project area, according to the attached exhibit. Each point will be observed using GNSS RTK observations with reference ties to the primary site control.

A Microdrones MD4-1000 unmanned aerial system (UAS) with a mdLiDAR1000LR LiDAR and photogrammetric payload will be operated to capture UAS-based LiDAR with a target ground density of 200 points per square meter. All UAS flights will be performed with an FAA Certified Part 107 Remote Pilot and the assistance of a visual observer (VO) per FAA-recommended guidelines. Flights will be in conformance with FAA Part 107 regulations and other applicable State and local regulations.

The site is within the Flight-Restricted Zone (FRZ) airspace surrounding Washington D.C. and centered at Ronald Reagan Washington National Airport. JMT will apply for the FAA waiver to conduct flights within the FRZ. The waiver process typically requires one month from the time of application to get permission to fly.

Once the flight is complete, JMT will register all LiDAR and photogrammetric data to the established GCPs. JMT will confirm the LiDAR and photogrammetric solutions by establishing at least eight (8) validation points valued by averaging three GNSS RTK observations on each validation point and spread evenly throughout the project area.

JMT will provide a 2D planimetric of major ground features (roads, sidewalks, driveways, buildings) to accompany the surface and contours. Deliverables will also include a digital elevation model (DEM) from the resulting point cloud, an XML of the DEM surface, and 0.50-foot contours in AutoCAD format from said surface.

#### Storm Water Structures

Storm drain structures are to be located with elevations on the tops of manholes or drop inlets and their pipe invert elevations. The location of the next structure (manhole, etc.) outside of survey limits shall be included with elevations. Also, the open ends of pipes will have their locations with invert elevations. Existing pipe sizes will be labeled. Structures will be located in the highlighted area only, according to the attached exhibit. This is approximately 34 structures.

For this task, JMT will attempt to use GPS to locate the stormwater structures (including pipe inverts), minimizing the need for setting survey control. If there is an area where GPS proves inaccurate enough for this task, survey control will need to be established. A minimum of three (3) control points are to be set on site. Control will be tied to the Virginia State Plane Coordinate System (North Zone), North American Datum of 1983 / NSRS 2011 adjustment horizontally, and **National Geodetic Vertical Datum of 1929 (NGVD 29) vertically**. Real-time Kinematic (RTK) Global Positioning System (GPS) will be utilized whenever it is practical to do so. All control points will be set using rebar and cap labeled with our firm's unique identification number. Control will be observed using RTK GPS technology and post-processed.

The following are our assumptions related to out-of-scope items and access. It is our understanding that JMT will not be responsible for delivering the services listed below as part of this task assignment, and they have been excluded:

- This level of effort does not include boundary surveys as defined by the Virginia Minimum Standards.
- JMT assumes unrestricted access to all areas of the project area, receipt of all digital and bond copies of plat, maps, ALTA Surveys or plans relating to the project.
- JMT assumes one revision to the final submission. Additional revisions are considered out of scope.
- JMT assumes any and all permits, rights of entry or property owner notifications, if any are required, will be the responsibility of the client with the exception of the permit to use drone imagery inside the flight restriction zone.
- JMT assumes no special badging or clearances are required for this task.
- JMT assumes no dewatering of structures or confined space entry under this contract.
- JMT assumes no subsurface utility designation activities will be covered under this contract.
- JMT assumes any activity related to litigation or the preparation thereof is considered out of scope and will be charged at hourly rates.



- JMT will make every attempt to meet the schedule stated herein unless field work is hampered by inclement weather.

The proposed fee to complete this assignment is broken down with the approximate hours and rates shown in the man hour table attached and can be performed for the lump sum price of \$55,484.00

All surveys will be on the Virginia State Plane North NAD83(NSRS2011) horizontal datum, and **NGVD 29 vertical datum**, unless otherwise specified by the KHA. If additional work is required outside of the normal Scope of Services listed above, JMT will contact KHA before initiating any additional work.

We understand that we will receive a written Notice-to-Proceed once you have reviewed and approved the enclosed estimates. JMT anticipates a start date within 10 days of Notice to Proceed, and delivery of completed files approximately twelve (12) weeks from NTP.

If you should have any questions or require any additional information, please do not hesitate to contact this office. We look forward to working together on this task.

Very truly yours,

JOHNSON, MIRMIRAN & THOMPSON, INC.

A handwritten signature in blue ink, appearing to read 'D. Stickles', with a stylized flourish at the end.

David Stickles, L.S.  
Vice President



Survey Requests:  
-All survey in NGVD29 and NAD83 State Plane North.  
-0.5 foot contours throughout all areas calling for topographic survey.  
-All storm pipes and structures denoted on exhibit and inclusion of all sizes, invert, lengths, type, ect.  
-Parcel Boundaries/Easements only within core project limits.  
-City GIS data is shown for informational purposes only.

**Kimley»Horn**

Expect More. Experience Better.

DATE

10/31/2023

DRAWN BY

MNP

CHECKED BY

JJD

CITY OF FAIRFAX DEPARTMENT OF PUBLIC WORKS  
DWIGHT AVENUE DRAINAGE AREA SURVEY EXHIBIT

PREPARED FOR CITY OF FAIRFAX  
FAIRFAX, VIRGINIA

SCALE

1" = 200'

PROJECT NUMBER

N/A

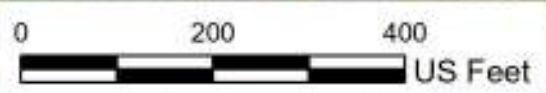
SHEET NUMBER

EXHIBIT

**Legend**

- Stormwater Inlets
- Storm Sewer Lines
- Drainage Area
- Streets
- Topography Survey Limits
- Parcels
- Stormwater Sewer Survey Limits

Topographic  
survey area  
~82.5 Acres





## FY 2024 Adopted Budget - City of Fairfax, Virginia


Stormwater Utility Fund Expense Detail							
Account	Account Title	FY 2022 Actual	FY 2023 Budget	FY 2023 Estimate	FY 2024 Adopted	Variance to Budget \$	Variance to Budget %
<b>SWU Operations &amp; Maintenance (438120)</b>							
511105	Salaries - Full Time	-	540,921	540,921	547,049	6,128	1.13%
511115	Salaries - Overtime	-	68,125	68,125	80,000	11,875	17.43%
511125	Temporary Help	-	6,000	6,000	6,000	-	0.00%
511130	On Call Pay	-	8,500	8,500	8,500	-	0.00%
512110	Fringe Benefits	-	265,168	265,168	306,030	40,862	15.41%
530113	Contract Services	-	262,746	262,746	239,231	(23,515)	-8.95%
540102	Motor Pool Charges	-	154,216	-	-	(154,216)	-100.00%
550430	Equipment Rental	-	1,000	1,000	1,500	500	50.00%
550501	Travel & Training	-	6,000	6,000	12,000	6,000	100.00%
550806	Other Services	-	60,000	60,000	60,000	-	0.00%
560110	Office Supplies	-	6,000	6,000	6,000	-	0.00%
560120	Small Equipment	-	10,500	10,500	10,500	-	0.00%
560416	Uniforms	-	4,389	4,389	6,550	2,161	49.24%
560420	Operating Supplies	-	38,900	38,900	40,150	1,250	3.21%
560421	Pipe & Accessories	-	10,000	10,000	21,000	11,000	110.00%
560422	Construction Materials	-	20,000	20,000	27,500	7,500	37.50%
560424	Concrete	-	7,000	7,000	10,000	3,000	42.86%
560430	Operating Materials	-	101,585	101,585	101,585	-	0.00%
560435	Soil & Mulch	-	7,000	7,000	7,000	-	0.00%
580214	Capital Outlay	-	5,000	5,000	5,000	-	0.00%
	<b>Subtotal</b>	-	<b>1,583,050</b>	<b>1,428,834</b>	<b>1,495,596</b>	<b>(87,454)</b>	<b>-5.52%</b>
<b>SWU Admin &amp; Engineering (438130)</b>							
511105	Salaries - Full Time	-	342,643	342,643	405,510	62,867	18.35%
512110	Fringe Benefits	-	167,969	167,969	221,491	53,522	31.86%
530113	Contract Services	-	151,500	151,500	147,500	(4,000)	-2.64%
540060	Management Fee	-	335,650	-	-	(335,650)	-100.00%
550820	Dues & Subscriptions	-	-	-	7,000	7,000	0.00%
560110	Office Supplies	-	20,526	20,526	6,000	(14,526)	-70.77%
560120	Small Equipment	-	-	-	400	400	0.00%
580411	Stormwater Utility Credit Program	-	-	-	3,800	3,800	0.00%
580501	Ashby Pond Dredging	-	984,927	1,575,000	-	(984,927)	-100.00%
580523	Flood Mitigation Planning & Resilie	-	76,750	225,000	-	(76,750)	-100.00%
580503	Mosby Road Drainage Improvemen	-	45,000	45,000	500,000	455,000	1011.11%
580504	Municipal Separate Storm Sewer S	-	155,000	155,000	180,000	25,000	16.13%
580505	Neighborhood Drainage Projects	-	-	520,000	500,000	500,000	0.00%
580506	Northfax Linear Park	-	80,000	80,000	-	(80,000)	-100.00%
580522	Plantation Parkway Culvert Repairs	-	-	500,000	-	-	0.00%
580507	Private BMP/SWM Inspection	-	130,000	130,000	145,000	15,000	11.54%
580508	Public BMP/SWM Inspection & Ma	-	130,000	130,000	135,000	5,000	3.85%
580509	Reline Bridge Culvert Storm Struct	-	85,000	85,000	98,000	13,000	15.29%
580510	Replacement of Failing Galvanized	-	120,000	120,000	135,000	15,000	12.50%
580514	Storm Drainage Repair for Paving S	-	110,000	110,000	127,000	17,000	15.45%
580516	Storm Pipe Lining Rehabilitation	-	120,000	120,000	138,000	18,000	15.00%
580517	Storm Sewer Evaluation & Update	-	100,000	250,000	300,000	200,000	200.00%
580518	Stormwater & Wastewater Plan Re	-	-	-	60,000	60,000	0.00%
580519	Stream Evaluation and Restoration	-	200,000	200,000	225,000	25,000	12.50%
580520	TMDL Action Plans	-	477,580	500,000	500,000	22,420	4.69%
580521	University Drive Storm Sewer Outfa	-	-	-	300,000	300,000	0.00%
580525	Roberts Road East Side Drainage	-	-	-	1,000,000	1,000,000	0.00%
580526	GIS and CMMS Technical Support	-	-	-	65,000	65,000	0.00%
580527	Community Rating System	-	-	-	200,000	200,000	0.00%
590102	Reserve	-	143,850	-	-	(143,850)	-100.00%
	<b>Subtotal</b>	-	<b>3,976,395</b>	<b>5,427,638</b>	<b>5,399,701</b>	<b>1,423,306</b>	<b>35.79%</b>
<b>Total Stormwater Utility Fund</b>		<b>\$ -</b>	<b>\$ 5,559,445</b>	<b>\$ 6,856,472</b>	<b>\$ 6,895,297</b>	<b>\$ 1,335,851</b>	<b>24.03%</b>

**City of Fairfax, Virginia - Adopted Capital Improvement Program FY 2024 to 2028**

**Environment - Stormwater Capital Projects**

Project Name	Ref Num	Funding Source	FY 2023 Adopted	FY 2024 Adopted	FY 2025 Proposed	FY 2026 Proposed	FY 2027 Proposed	FY 2028 Proposed	FY 24 to 28 Total
<b>Annual Maintenance</b>									
Replacement of Failing Galvanized Storm Drainage Systems	63	General,Storm	120,000	135,000	135,000	145,000	160,000	175,000	750,000
Storm Drainage Repair for Paving Schedule	64	General,Storm	110,000	127,000	127,000	133,000	146,000	161,000	694,000
Storm Pipe Lining Rehabilitation	65	General,Storm	120,000	138,000	138,000	145,000	160,000	176,000	757,000
<b>Drainage</b>									
Mosby Road Drainage Improvements	66	General,Storm	45,000	500,000	-	-	-	-	500,000
Neighborhood Drainage Projects	67	ARPA,Storm	520,000	500,000	700,000	650,000	300,000	570,000	2,720,000
Reline Bridge Culvert Storm Structures	68	Storm	85,000	98,000	98,000	103,000	113,000	125,000	537,000
Roberts Road East Side Drainage and Roadway Improvements	69	ARPA,Storm	485,000	1,000,000	-	-	-	-	1,000,000
Sager Ave Culvert Replacement	-	RevShr,Storm	-	-	1,300,000	-	-	-	1,300,000
<b>Infrastructure Replacement and Improvements</b>									
Ashby Pond Dredging & Retrofit	-	Grant,Storm	1,575,000	-	-	-	-	-	-
GIS and CMMS Technical Support for Public Works	70	Storm,Waste	-	65,000	65,000	65,000	65,000	65,000	325,000
Plantation Parkway Culvert Repairs	-	Storm	500,000	-	-	-	-	-	-
Storm Improvement, Oak Street and Second	-	Storm	-	-	-	300,000	-	-	300,000
Storm Sewer Evaluation & Update Program	71	Storm	250,000	300,000	320,000	320,000	330,000	330,000	1,600,000
University Drive Storm Sewer Outfall Relocation	72	ARPA	-	300,000	-	-	-	-	300,000
<b>Planning</b>									
Community Rating System	73	General	-	200,000	-	-	-	-	200,000
Flood Mitigation Planning & Resiliency	-	State,Storm	225,000	-	-	-	-	-	-
Northfax Linear Park Design	-	Storm	80,000	-	-	-	-	-	-
Stormwater & Wastewater Plan Review	74	Storm,Waste	40,000	60,000	65,000	65,000	70,000	70,000	330,000
<b>State/Federal Mandated</b>									
Municipal Separate Storm Sewer System (MS4)	75	Storm	155,000	180,000	185,000	190,000	190,000	195,000	940,000
Private BMP/SWM Inspection	76	Storm	130,000	145,000	145,000	145,000	150,000	150,000	735,000
Public BMP/SWM Inspection and Maintenance	77	General,Storm	130,000	135,000	135,000	140,000	140,000	145,000	695,000
Stream Evaluation and Restoration	78	Grant,Storm	200,000	225,000	2,700,000	1,500,000	200,000	3,000,000	7,625,000
TMDL Action Plans	79	Grant,Storm	500,000	500,000	550,000	550,000	600,000	600,000	2,800,000
<b>Subtotal Stormwater</b>			<b>5,270,000</b>	<b>4,608,000</b>	<b>6,663,000</b>	<b>4,451,000</b>	<b>2,624,000</b>	<b>5,762,000</b>	<b>24,108,000</b>
American Rescue Plan Act			-	1,800,000	-	-	-	-	1,800,000
General Fund			-	1,200,000	-	-	-	-	1,200,000
Grant			1,065,811	150,000	1,415,000	915,000	180,000	1,680,000	4,340,000
State - Other			148,250	-	-	-	-	-	-
State—Revenue Sharing			-	-	650,000	-	-	-	650,000
Stormwater Utility Fund			4,015,939	1,400,500	4,535,500	3,473,500	2,381,500	4,019,500	15,810,500
Wastewater Fund			40,000	57,500	62,500	62,500	62,500	62,500	307,500
<b>Total Stormwater</b>			<b>5,270,000</b>	<b>4,608,000</b>	<b>6,663,000</b>	<b>4,451,000</b>	<b>2,624,000</b>	<b>5,762,000</b>	<b>24,108,000</b>

Bolded items represent new CIP projects identified in FY 2024

PROJECT INFORMATION								
Name: <b>Neighborhood Drainage Projects</b>					Project # <b>555-438130-580505</b>			
2035 Comprehensive Plan Reference: <b>IU1.3.1 p. 144</b>		2035 Comprehensive Plan Timeframe: <b>Ongoing</b>						
Comprehensive Plan Element								
✓	Land Use		✓	Environment and Sustainability				
	Multimodal Transportation			Economic Vitality				
✓	Community Services		✓	Other City Plan/Policy				
<b>Statement of Need:</b> These projects provide for stormwater improvements in residential neighborhoods to alleviate existing drainage problems. The projects have been requested by residents and represent the projects recommended for design and construction by staff.  FY24 - Virginia St. & Dwight Ave., Design Orchard Dr. & Evergreen Dr., Construction  FY25 - Orchard St. & Howerton Ave., Design Virginia St. & Dwight Ave., Construction  FY26 - Norman Ave & Cobb Dr, Design Orchard St. & Howerton Ave., Construction  FY27 - Parklane Rd, Design Norman Ave & Cobb Dr, Construction  FY28 - Evergreen Dr cul-de-sac, Design Parklane Rd Construction				<b>Picture:</b> 				
Funding Allocation		FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Totals
Feasibility/Planning/Design/Engineering		100,000	100,000	100,000	50,000	100,000	70,000	420,000
Construction		420,000	400,000	600,000	600,000	200,000	500,000	2,300,000
<b>Total Costs</b>		<b>\$ 520,000</b>	<b>\$ 500,000</b>	<b>\$ 700,000</b>	<b>\$ 650,000</b>	<b>\$ 300,000</b>	<b>\$ 570,000</b>	<b>\$ 2,720,000</b>
Funding Sources		FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Totals
American Rescue Plan Act		-	500,000	-	-	-	-	500,000
Stormwater Utility Fund		520,000	-	700,000	650,000	300,000	570,000	2,220,000
<b>Total Funding</b>		<b>\$ 520,000</b>	<b>\$ 500,000</b>	<b>\$ 700,000</b>	<b>\$ 650,000</b>	<b>\$ 300,000</b>	<b>\$ 570,000</b>	<b>\$ 2,720,000</b>
Estimated Project Timeline		New Project			Responsible Department(s):			
Project Origination Date					Cable TV		Police	
Project Design Start Date					CD&P		PW Admin	
Construction Start Date					City Manager		PW Fleet	
Project Completion Date		Ongoing			Finance		PW Operations	
					Fire		PW Signs/Signal	
					Historic		PW Stormwater	
					Human Svc		PW Streets	
					IT		PW Transport	
					Parks & Rec		PW Wastewater	
					Personnel		Schools	
Financial Impacts								
Annual Revenue Generated:		\$ -						
Annual Cost Savings:		\$ -						
Annual Increase in Operating Costs:		\$ -						
Projected Future Savings:		\$ -						



# Budget Narrative Template



## Appendix B: Budget Narrative Template

Applicant Name: **City of Fairfax - Public Works Department**  
 Community Flood Preparedness Fund &  
 Resilient Virginia Revolving Loan Fund

Detailed Budget Narrative

Period of Performance: **January 31, 2024** through **September 30, 2024**

Submission Date: **November 10, 2023**

Grand Total State Funding Request									<b>\$61,556.16</b>
Grand Total Local Share of Project									<b>\$61,556.16</b>
Federal Funding (if applicable)									\$
Project Grand Total									<b>\$ 123,112.32</b>
Locality Cost Match									<b>%50</b>
Breakout By Cost Type	Personnel	Fringe	Travel	Equipment	Supplies	Contracts	Indirect Costs	Other Costs	Total
Federal Share (if applicable)									
Local Share						<b>\$61,556.16</b>			<b>\$61,556.16</b>
State Share						<b>\$61,556.16</b>			<b>\$61,556.16</b>
Pre-Award/Startup									
Maintenance									
Total	\$	\$	\$	\$	\$	<b>\$123,112.32</b>	\$	\$	<b>\$123,112.32</b>

# Funding Request Authorization





City of Fairfax – Dwight Avenue Drainage Improvements Study  
Community Flood Preparedness Fund (CFPF)  
Grant Application Package

I, Robert Stalzer, City of Fairfax – City Manager, authorize the City of Fairfax Department of Public Works to request funding from the 2023 Funding Round of the Virginia Community Flood Preparedness Fund for the development of a Dwight Avenue Drainage Improvements Study.

Signed: Robert Stalzer

Date: 11-7-23