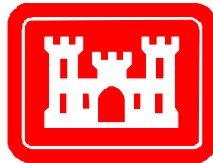


**Westchester County Streams,
Byram River Basin
Flood Risk Management
Fairfield County, Connecticut and
Westchester County, New York**

**Draft Integrated Feasibility Report &
Environmental Impact Statement**



Appendix B3 – Nonstructural

This Appendix documents the activities performed in support of the nonstructural plan development for the initial array of alternatives and final array of alternatives. Four alternatives were evaluated, No Action, nonstructural measures in the 10-percent and 1-percent floodplains, updates to the 1977 Recommendation, and a smaller levee and floodwall plan that also included bridge modifications and channel widening. The evaluation of the initial array suggested nonstructural measures in the 10-percent floodplain may be a viable alternative. The final array of alternatives included nonstructural measures (in the 10-percent, 4-percent, 2-percent, and 1-percent floodplains) as well as the removal and replacement of the Route 1 bridges by itself and in conjunction with nonstructural treatments (in the resulting 10-percent, 4-percent, 2-percent, and 1-percent floodplains). The Nonstructural Plan was initially developed using estimated main floor and low opening elevations based on GIS data. The purpose of the Conceptual Design is to optimize the Nonstructural Plan using more detailed information. The following summarizes the results of the nonstructural evaluation.

1. Project Area

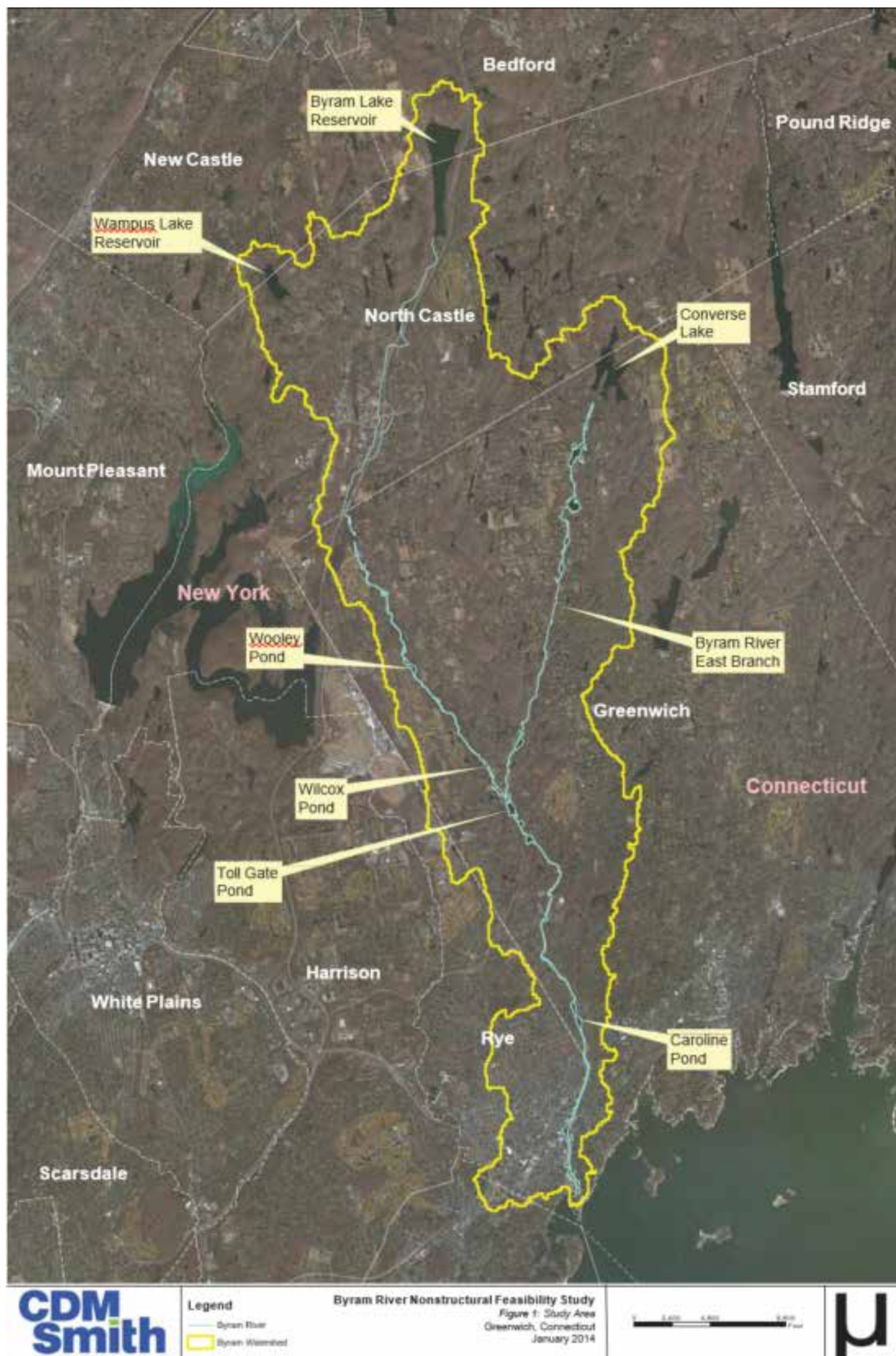
The Byram River basin is almost entirely within the extents of the Town of Greenwich (the Town) in Fairfield County Connecticut with headwaters north across the border in Westchester County, New York (**Figure 1**). The Byram River, with a length of 13.5 miles, flows south and empties into Long Island Sound. The lower portion of the river for a length of 1.3 miles is tidal. At the mouth of the river, the Byram River is the state boundary between Connecticut and New York. The total contributing area at the river mouth is 30 square miles. The riparian zone of the lower three miles of the Byram River is populated with suburban housing and commercial buildings. In the upper reach, generally upstream of the bridge at Bailiwick Road the area is less densely developed.

The Byram River project area includes area west and east of the river, extending between just north of Bailiwick Road to South of West Putnam Avenue (**Figure 2**). Structures within the project area were evaluated for nonstructural flood protection using a structure inventory provided by the Town, topographic mapping, and floodplain delineations.

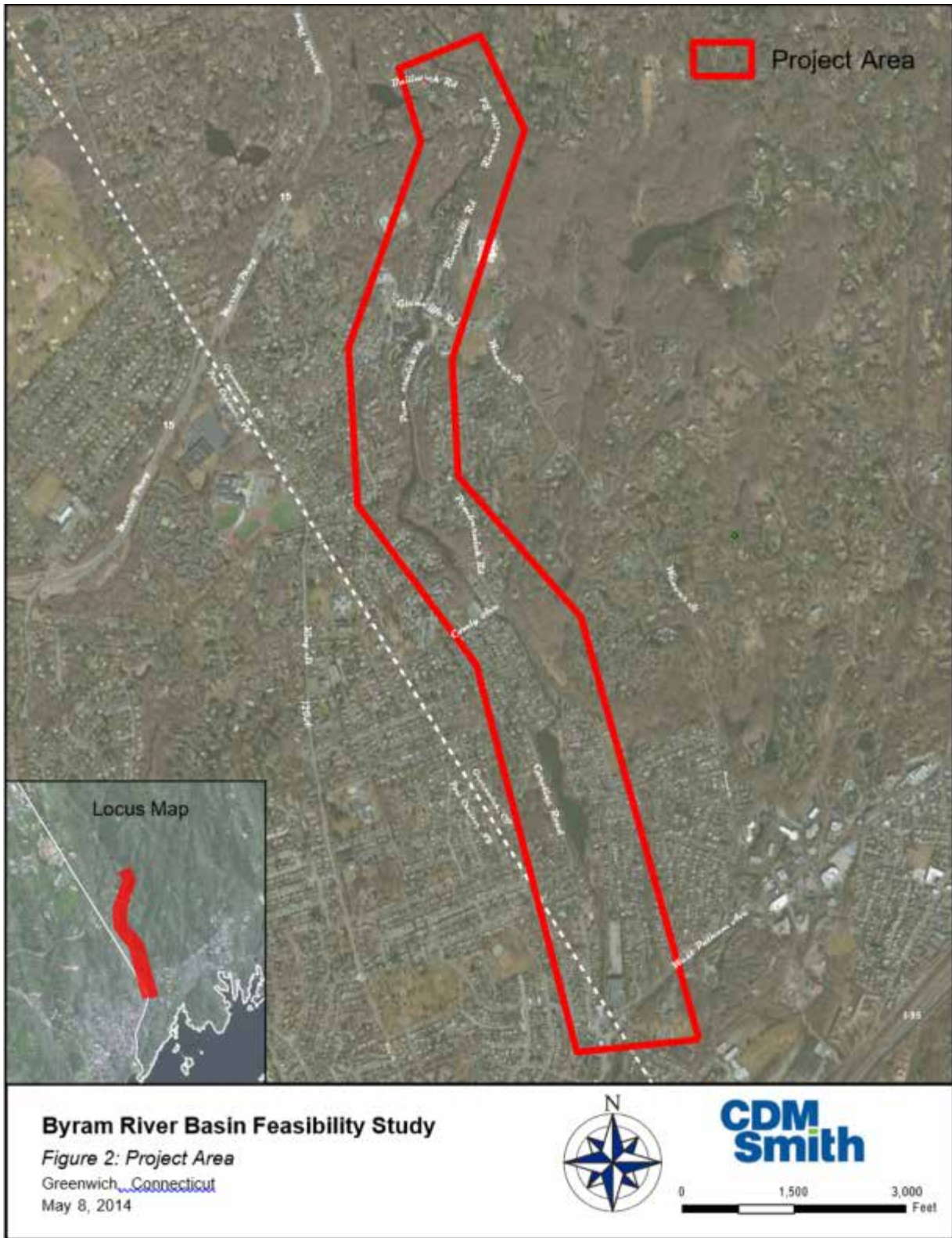
2. Structure Inventory

A structure inventory was developed by the Town of Greenwich to provide information on each structure to be used in the evaluation process (Attachment A). Information provided in the inventory included the type of structure, land use, construction, garage, foundation, structure condition, ground elevation, low opening elevation, and main floor elevation. All information was collected from the Town's Tax Assessor's property information, field visits, Google Earth, and the Town's GIS. Main floor elevations were surveyed by Milone and MacBroom Inc. (MMI) and low opening elevations were field verified by the Town. While collecting main floor and low opening elevations for 18 Halock Drive and a low opening elevation for 11 Hollow Wood Lane the properties were under construction and therefore the respective data could not be collected. For these properties the estimated elevations used in the nonstructural assessment were used in this evaluation.

Land use types within the project area included residential and commercial. Residential structure types included slab-on-grade foundations, subgrade basements, elevated, bi-levels, raised ranches, split levels, and large residential. Nonresidential structure types included slab-on-grade foundations, subgrade basements, and raised foundations. The following provides a brief description and example of each structure type.



Appendix B3-2



Slab-on-Grade Foundation

A slab-on-grade foundation structure includes structures constructed on a slab foundation at grade.

**Example of Slab-on-Grade Structure Type
499 Den Lane, Greenwich, CT (Pump Station)**

Subgrade Basement

Subgrade basement structures contain a basement with all sides subgrade. Basements were considered to be one floor equivalent of space located below the main floor on a slab.



**Example of Subgrade Basement Structure Type
98 Monica Road, Greenwich, CT**

Elevated

Elevated structures include structures raised on posts, piles, piers, or extended walls.



**Example of Elevated Structure Type
18 Hollow Wood Lane, Greenwich, CT**

Bi-Level

Bi-level structures consist of two stories, with the first story (typically a living space or garage) partially below grade. The second story (the main floor) is typically above the first story, with the main entrance located between the two stories.



Example of Bi-Level Structure Type
39 Angelus Drive, Greenwich, CT

Raised Ranch

Ranch ranches consist of two stories, with the first story (typically a living space or garage) built slab-on-grade and the second story (the main floor) directly above the first story.



Example of Raised Ranch Structure Type
9 Lucy Street, Greenwich, CT

Raised Foundation

Raised foundation structures contain a space below the main floor not big enough for a basement (typically a crawlspace).



Example of Raised Foundation Structure Type
9 Fletcher Avenue, Greenwich, CT

Split Level

Split levels consist of at least three levels, with the lower and upper level stacked, and the main floor level adjacent between the two. Each level is at a different elevation and connected by short stairways. The lower level is typically on a slab foundation and is living space and/or a garage. The main floor is typically on a raised foundation and is where the main entrance is located.



**Example of Split Level Structure Type
19 Halock Drive, Greenwich, CT**

Large Residential

Large residential structures include apartments, townhouses, and multi-family units. Foundation types typical of large residential structures include slab-on-grade, raised foundation, and subgrade basement.

**Example of Large Residential Structure Type
2 Homestead Lane, Greenwich, CT**

3. Nonstructural Flood Protection Measures

Nonstructural flood proofing measures involve adaption to the natural floodplain without changing flood characteristics. Nonstructural flood protection measures considered in this study include dry flood proofing, wet flood proofing, ringwalls, elevation, and acquisition. The following provides a brief description of each type of protection.

Dry Flood Proofing

Dry flood proofing prevents water from entering structures through sealants and closures. It includes the addition of waterproofing compounds, impermeable sheeting or other flood-damage resistant materials to the structure's walls (sealants) and attachment of watertight closures to all openings, such as doorways and windows, below the flood elevation (closures). Dry flood proofing is most effective for structures without basements and at flood depths less than 2-feet, which includes 1-foot of freeboard. For structures with basements dry flood proofing should be implemented in conjunction with wet flood proofing. The main floor should be protected through dry flood proofing methods and the basement should be filled or wet flood proofed.

Wet Flood Proofing

Wet flood proofing involves decreasing flood damage to the structure's foundation by allowing flood waters to enter low, nonliving areas of the structure through vents and other openings. Allowing floodwaters to

enter the structure reduces the effects of hydrostatic pressure and in turn decreases flood related damage to the structure's foundation. Wet flood proofing should be implemented in conjunction with protection of all utilities and any other important equipment below the flood depth. This is typically achieved through elevation. Wet flood proofing is suitable for all flood depths.

Ringwall

Ringwalls (also known as floodwalls) prevent floodwater from reaching the structure through construction of a barrier. Other types of flood barriers include levees and berms, but due to the medium to high density of the project area only ringwalls were considered.

Elevation

Elevation involves raising the lowest finished floor of the structure to a height at least one foot above the 1-percent flood elevation. Structures can be elevated on fill, piers, posts, columns, or through extension of foundation walls.

Acquisition

Acquisition (buyout) involves acquiring the land and structure to demolish, sell and remove, or to be used by the municipality. In cases where elevation is required but not suitable, typically due to the condition of the structure, acquisition is recommended.

4. Recommendations

The structure inventory showed structures within the project area to be primarily residential, with several commercial and one utility (Attachment A). All structures with both residential and commercial land use were assessed as residential structures. Each residential structure was evaluated based on depth of inundation, structure type, square footage and condition. Nonresidential structures were assessed based on depth of inundation, construction type, structure type and structure condition.

Using the criteria listed above, an algorithm was developed to determine the appropriate recommendation for each parcel (Attachment B). Structures included in the structure inventory outside of the flood limits were considered "No Action" structures. These structures were determined through identifying any structure with ground elevations greater than the flood elevation. They were also determined visually in GIS using flood inundation mapping. All structures within the flood limits were assessed based on a foot of freeboard to serve as a factor of safety. Each structure was assessed for the 10-, 4-, 2-, and 1-percent storm events.

Based on the USACE requirements, structures within the 10-, 4-, and 2-percent floodplain were improved to the 1-percent level of protection for flood proofing recommendations. Where dry or wet flood proofing was recommended, ringwalls were also considered. A final recommendation was made based on the structure and its surrounding site characteristics. General assumptions made in the assessment process were:

- n Flood velocity is negligible.
- n Debris impacts are negligible.
- n Flooding is gradual (no flash flooding).
- n Structures elevated will be raised (finished floor elevation) to the 1-percent flood elevation plus an additional foot.

A total of 493 structures were evaluated for nonstructural flood protection within the project area, of which 202 required flood proofing for the 1-percent storm event (Attachment C). These 202 structures with one

additional new property were evaluated using the updated main floor and low opening elevations. **Table 1** provides a summary of the recommendations for the 10-, 4-, 2-, and 1-percent storm events respectively. Recommendations are also presented in the structure inventory (**Attachment A**) and shown in **Figures 3a,b,c** (10-percent storm event), **Figures 4a,b,c** (4-percent storm event), **Figures 5a,b,c** (2-percent storm event), and **Figures 6a,b,c** (1-percent storm event).

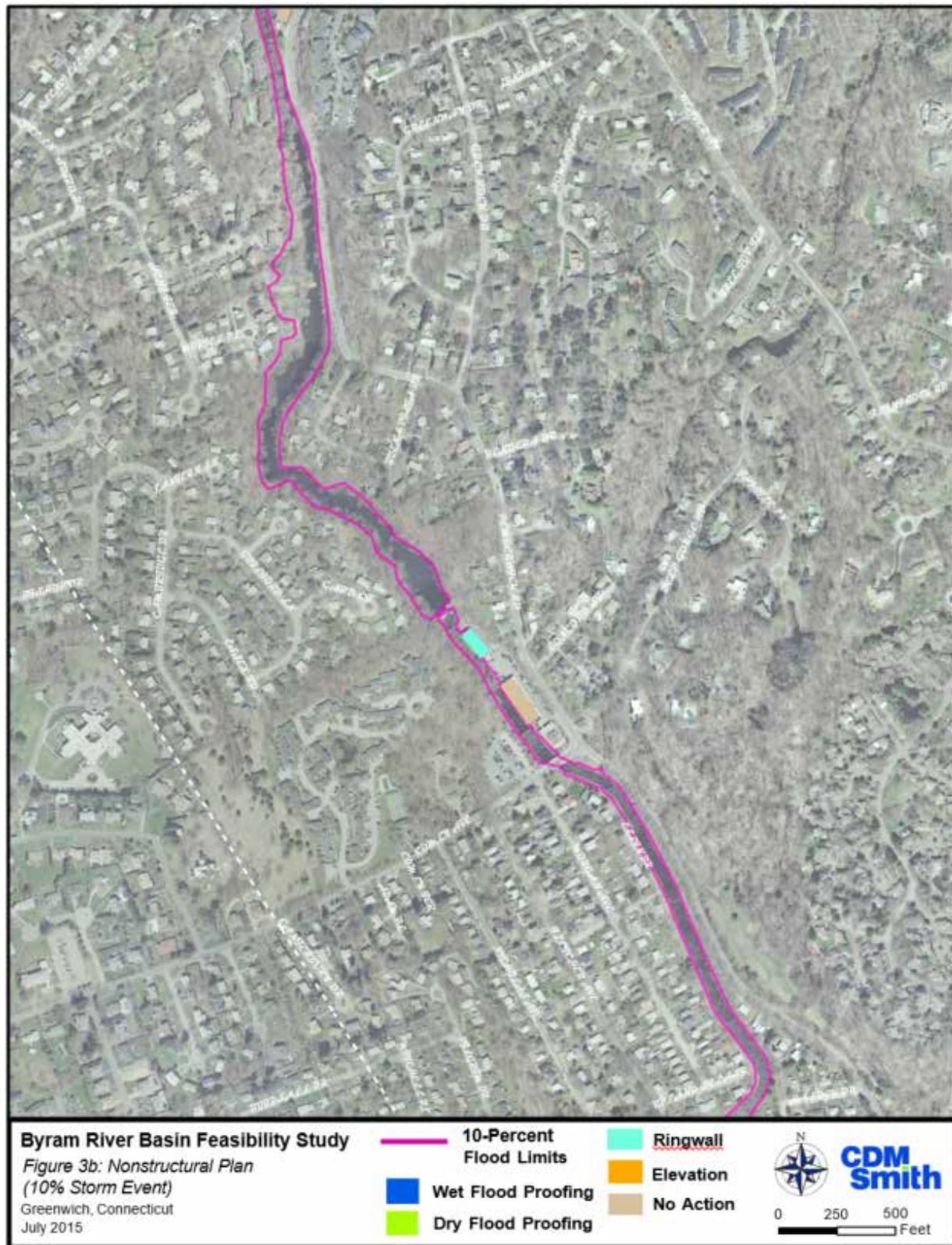
Table 1 Nonstructural Flood Proofing Summary

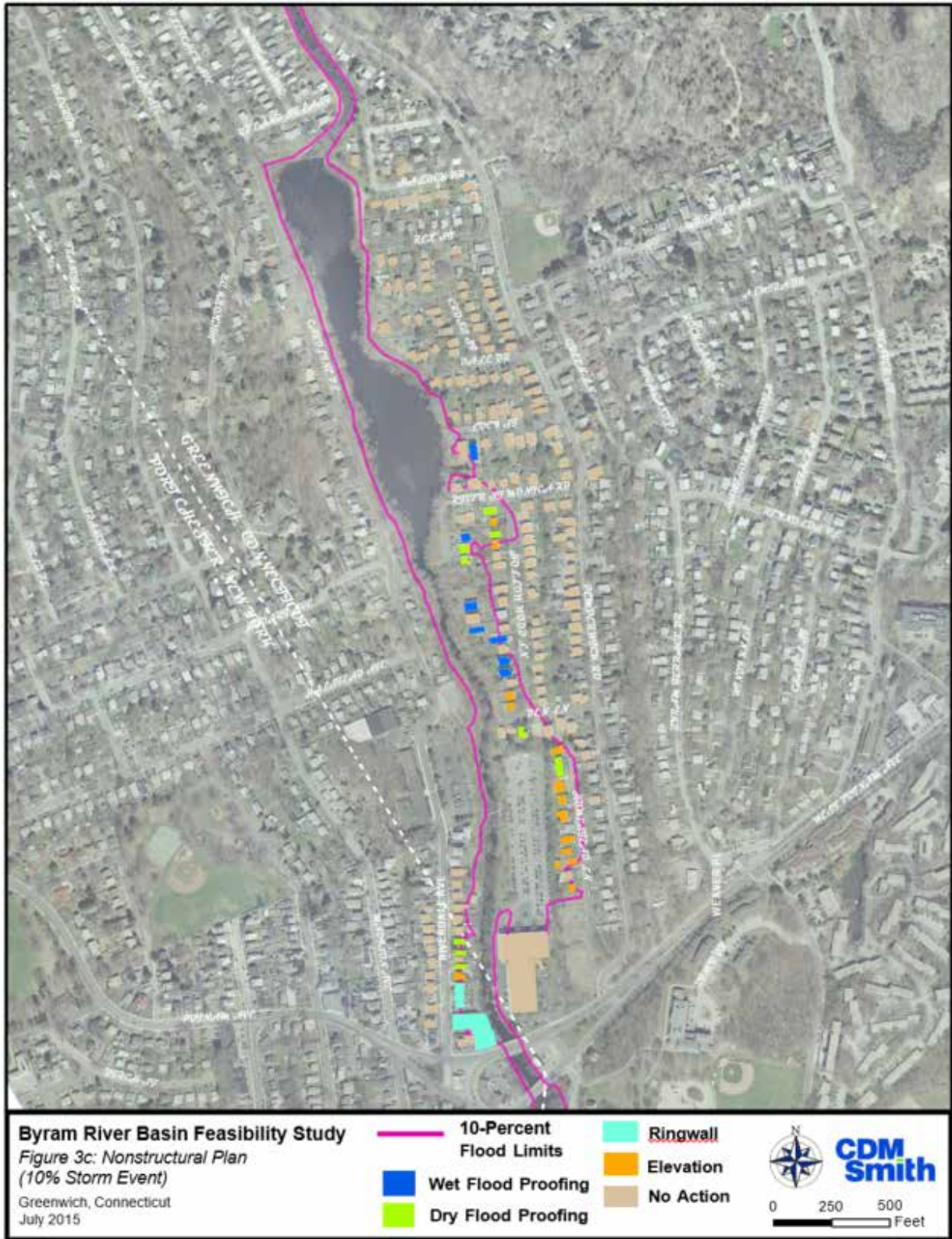
Flood Protection	Number of Structures Requiring Protection for each Storm Event			
	10%	4%	2%	1%
<i>Dry Flood Proofing</i>	9	35	47	59
<i>Wet Flood Proofing</i>	8	29	60	90
<i>Ringwall</i>	9	11	12	12
<i>Elevation</i>	15	22	22	22
Total	41	97	141	183

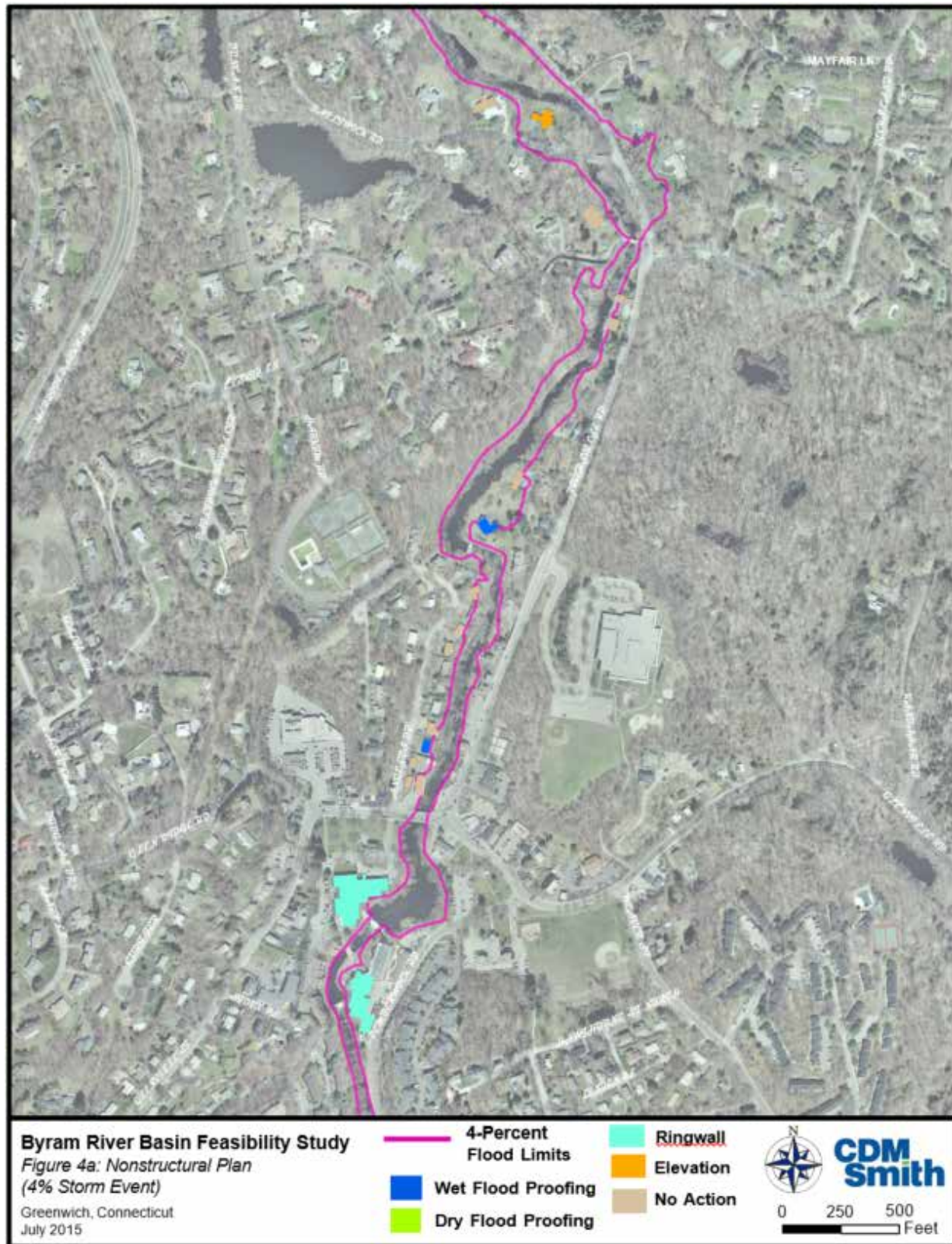
For all storm events it was determined that flood proofing is not required for a majority of the structures in the upstream region of the project area and mostly required for structures in the downstream region on the east side of the Byram River between Halock Drive and West Putnam Avenue. It was also determined that acquisition was not required for any of the structures.

For example, only seven structures require flood proofing in the upstream region for the 1-percent storm event include elevation for several structures near Bailiwick Road, and mostly wet flood proofing and dry flood proofing for several houses located on Angelus Drive, Riversville Road, Glenville Street, and Pemberwick Road (**Figure 6a**). Between Sioux Place and Upland Street East no structures were found to need flood protection for the 1-percent storm event other than 200 Pemberwick Road where a ringwall is recommended (**Figure 6b**). A majority of the structures requiring flood protection for the 1-percent storm event are located in the downstream region of the project area on the east side of the Byram River. In the downstream region several structures on the west side of the Byram River located on Riverdale Avenue require flood protection for the 1-percent storm event as well. All nonstructural flood proofing measures presented in this report are recommended in the downstream region other than acquisition (**Figure 6c**). A majority of the structures require either dry or wet flood proofing for the 1-percent storm event.

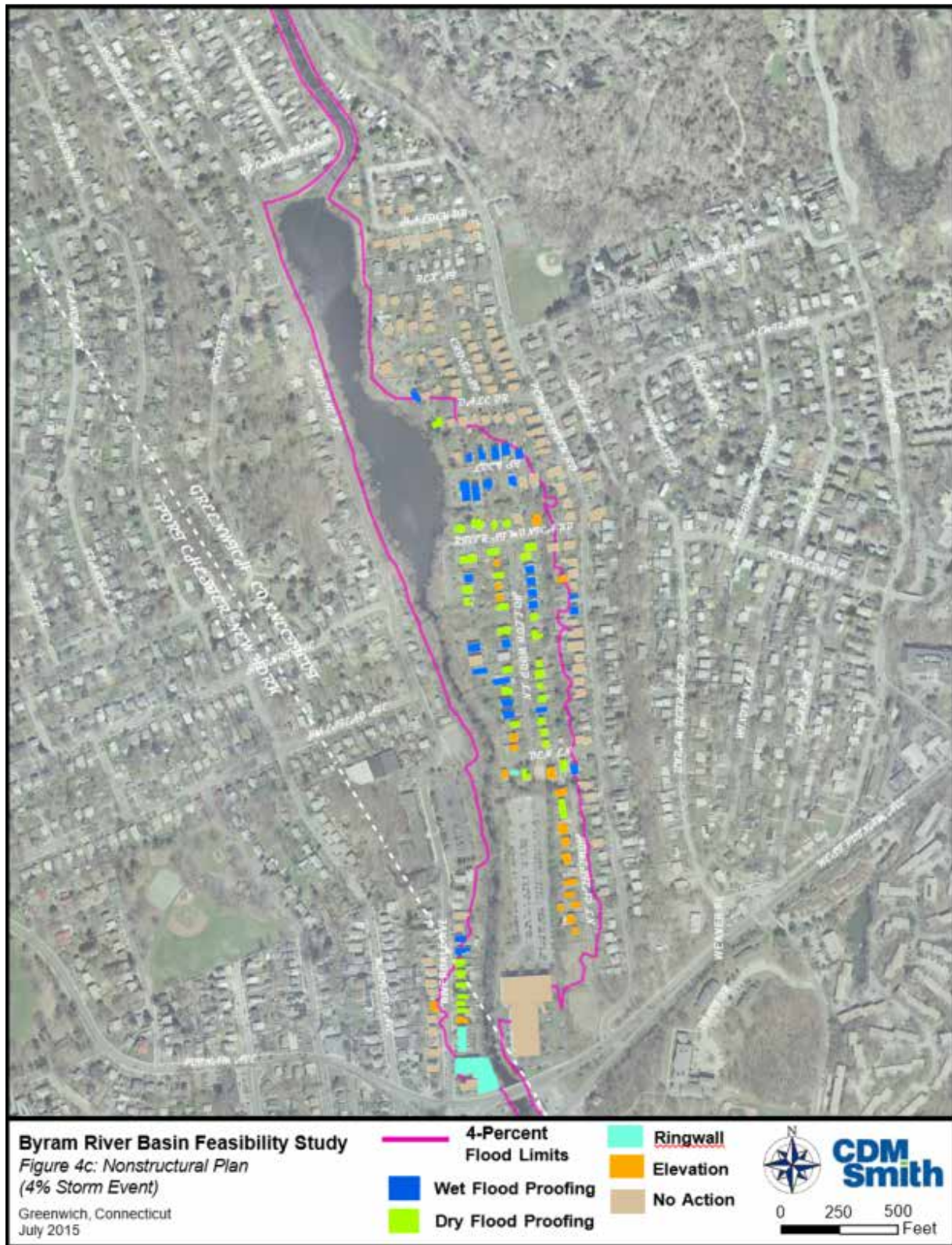


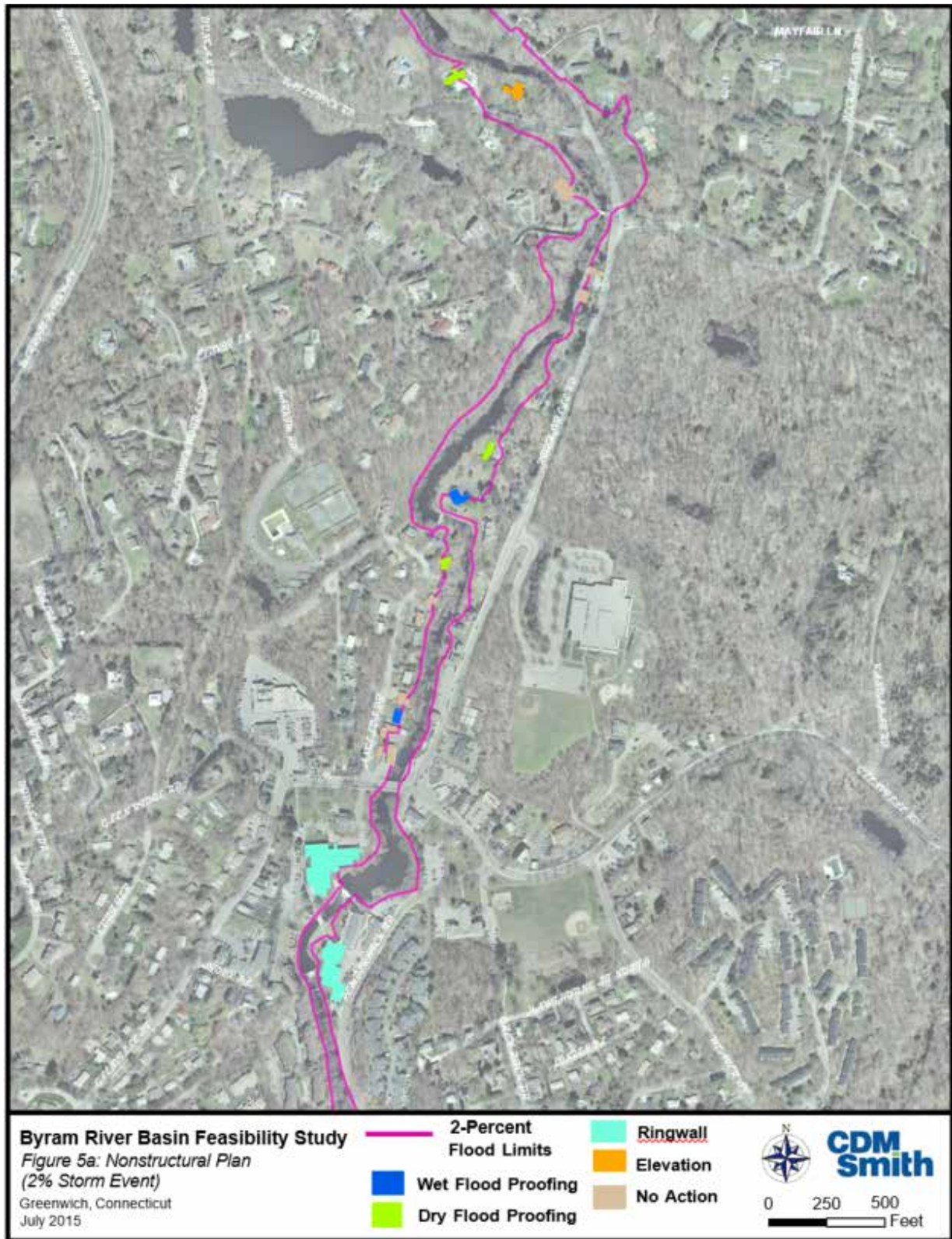


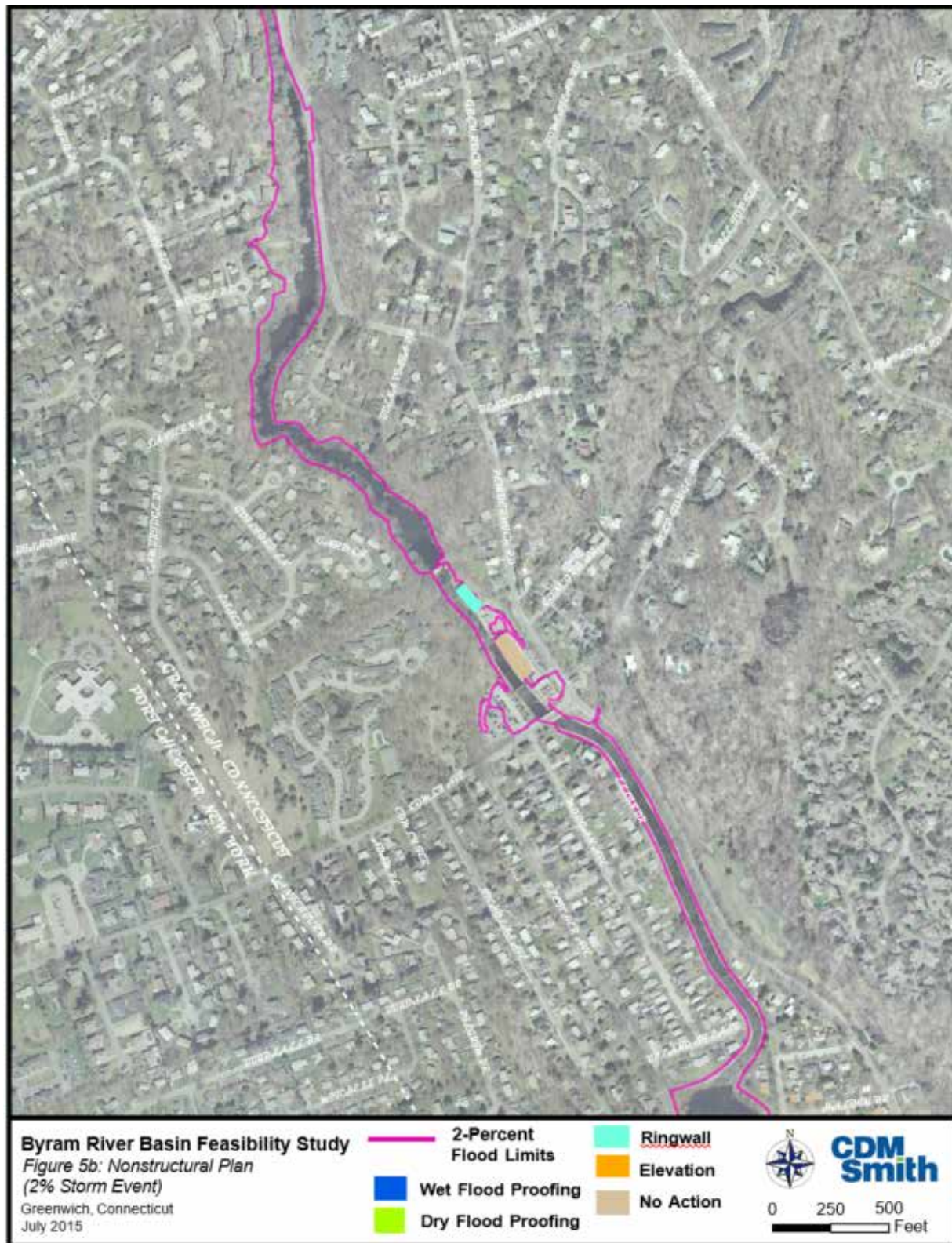


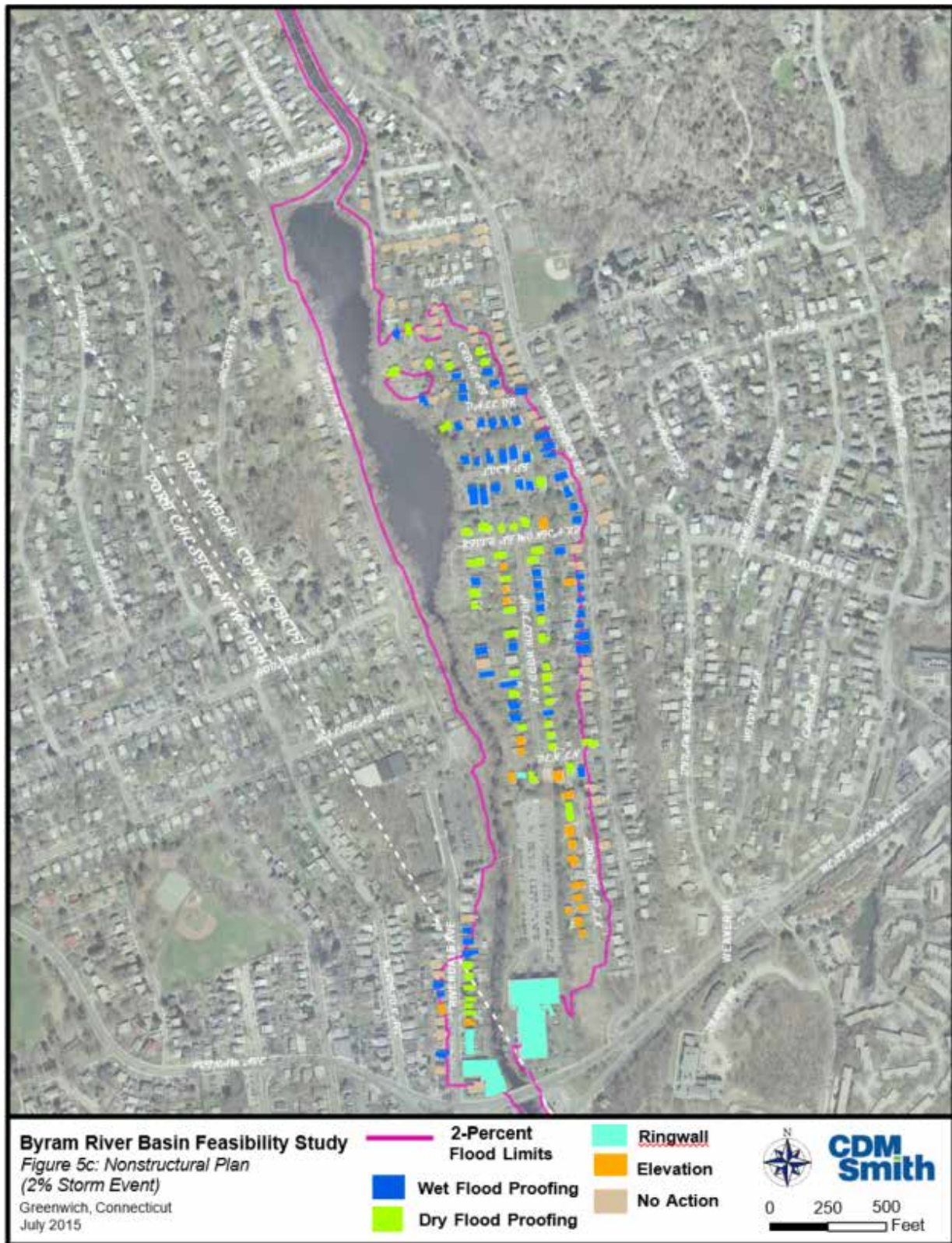


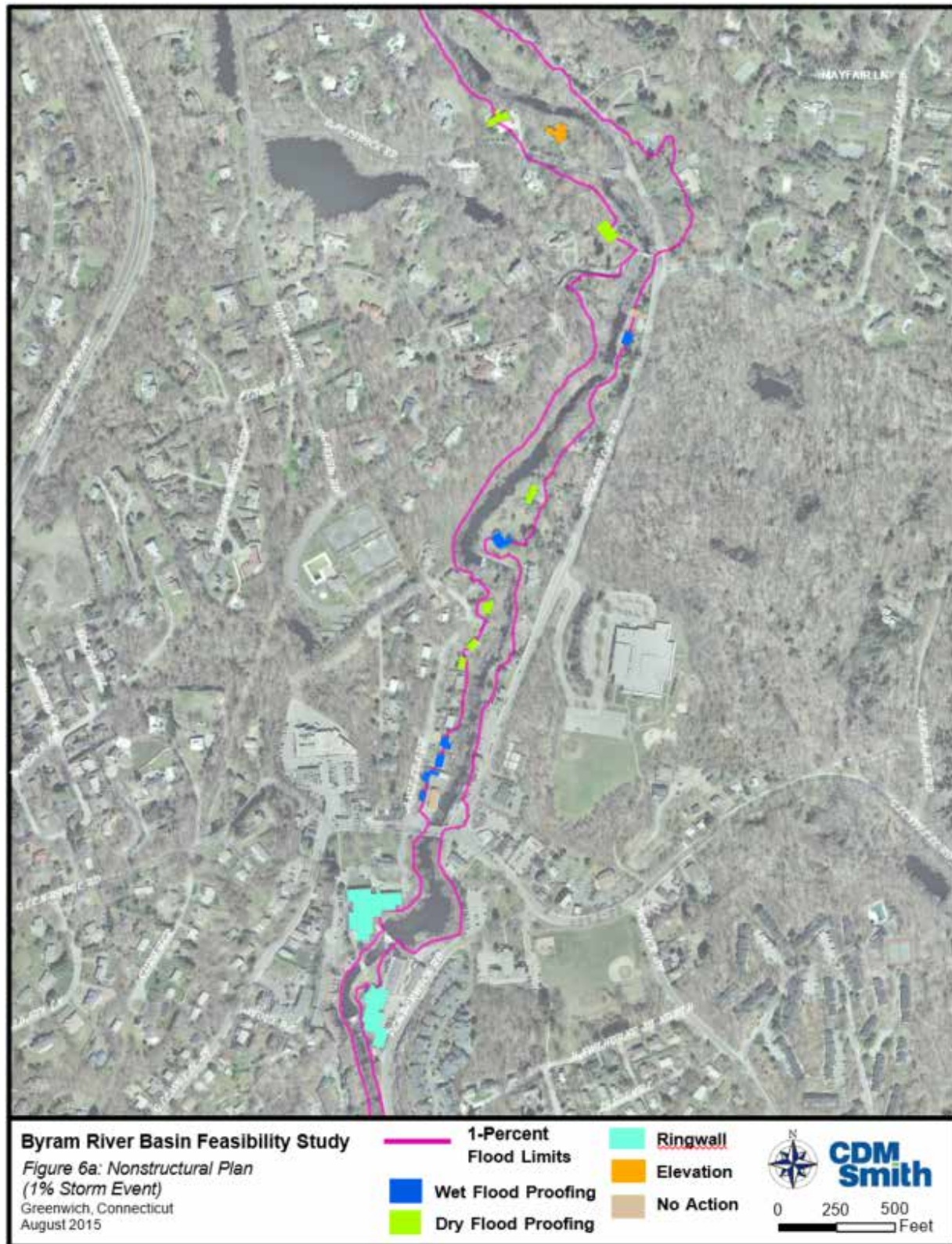


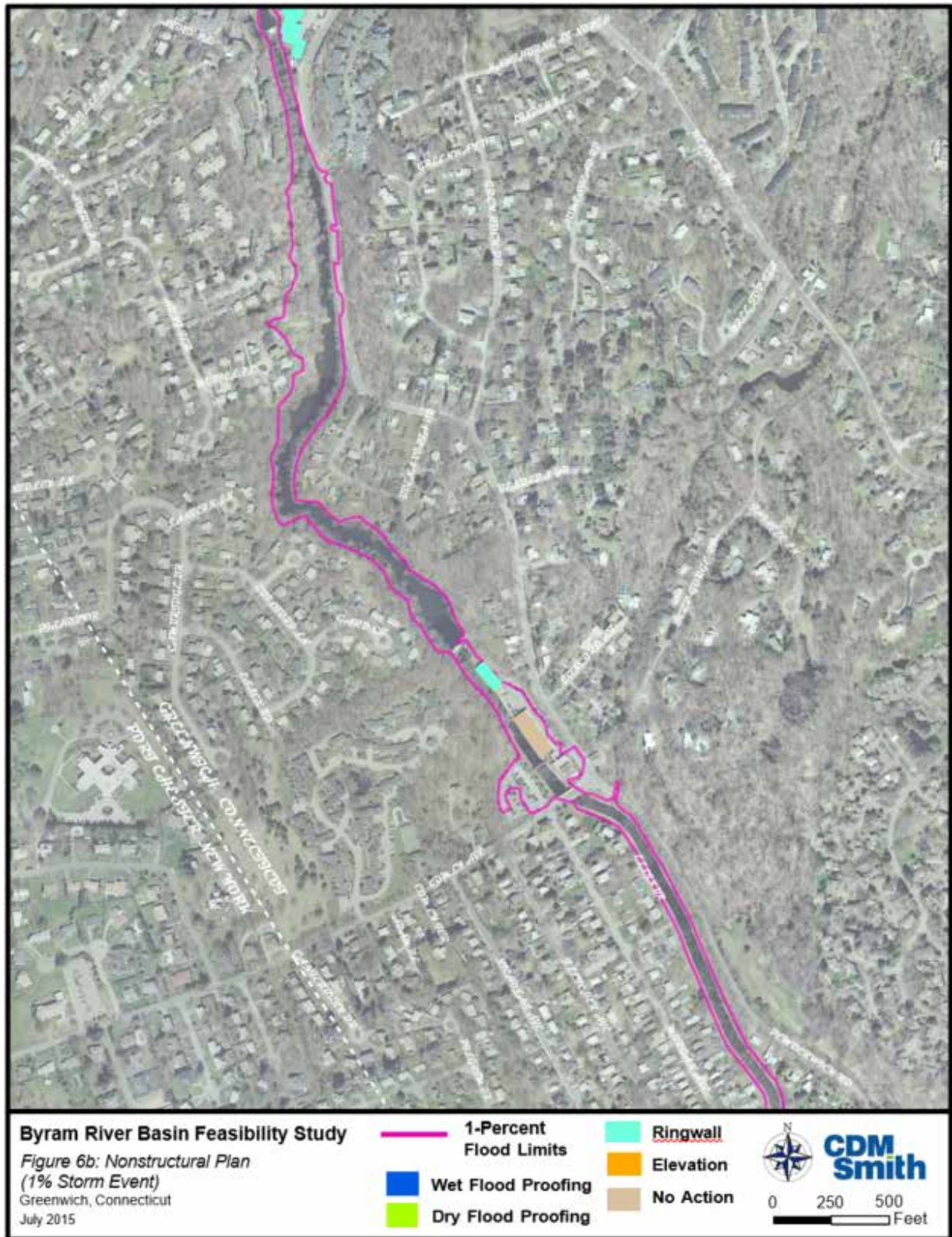


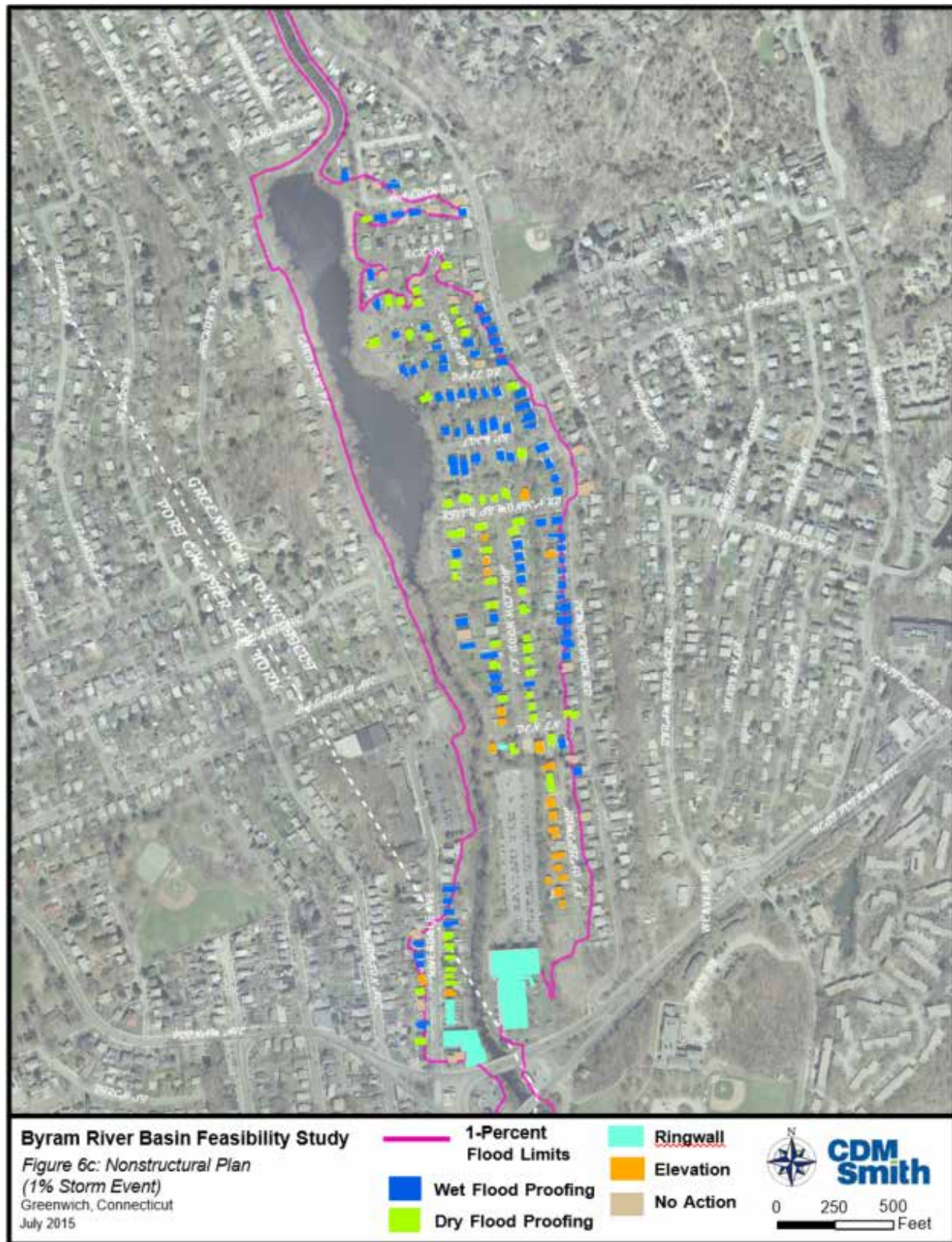












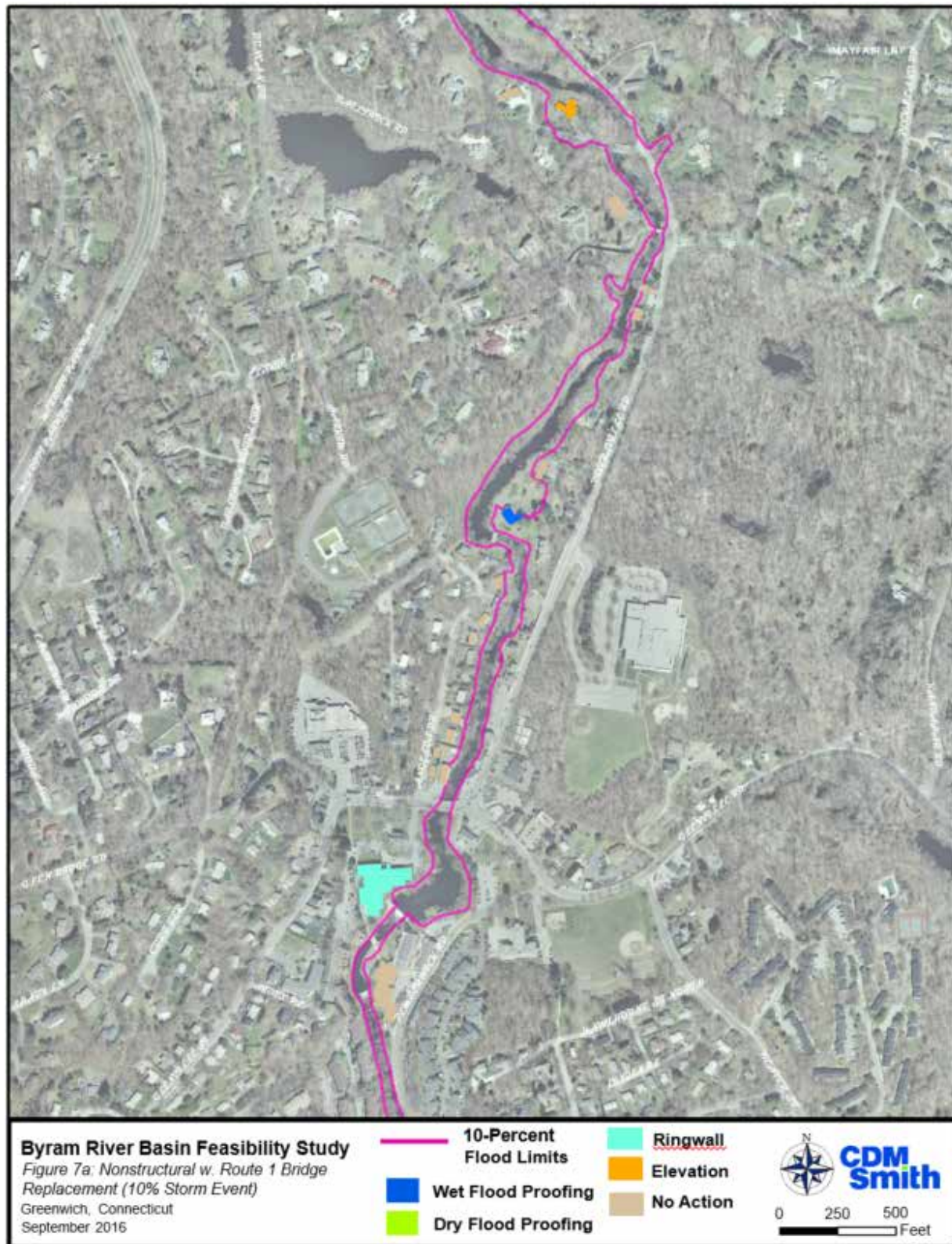
5. Route 1 Bridge Replacement

The Route 1 Bridge Replacement and Nonstructural Flood Proofing alternative was reevaluated using the updated main floor and low opening elevations. Water surface elevations associated with the Route 1 bridge alternative were determined using the recommended bridge replacement, including a raised roadway with prestressed concrete box beams. The superstructure consists of a bridge depth of 4.5-ft and an approximate roadway elevation of 17.7-ft for the Route 1 southbound bridge and 17.0-ft for the Route 1 northbound bridge. The advantages of this bridge type includes the ability to accommodate critical vertical clearance requirements, ease of construction over a waterway and the reduction of trapped debris during high flow events. Replacement of the Route 1 bridges also reduces the severity and number of structures impacted due to flooding. Structures that were shown to remain impacted were evaluated for nonstructural flood risk management measures. **Table 2** presents a comparison summary of the nonstructural recommendations with and without the Route 1 bridge replacement for the 10-, 4-, 2-, and 1-percent storm event. Individual structure recommendations for the nonstructural evaluation with the bridge replacement are presented in Attachment D and shown in **Figures 7a,b,c** (10-percent storm event), **Figures 8a,b,c** (4-percent storm event), **Figures 9a,b,c** (2-percent storm event), and **Figures 10a,b,c** (1-percent storm event).

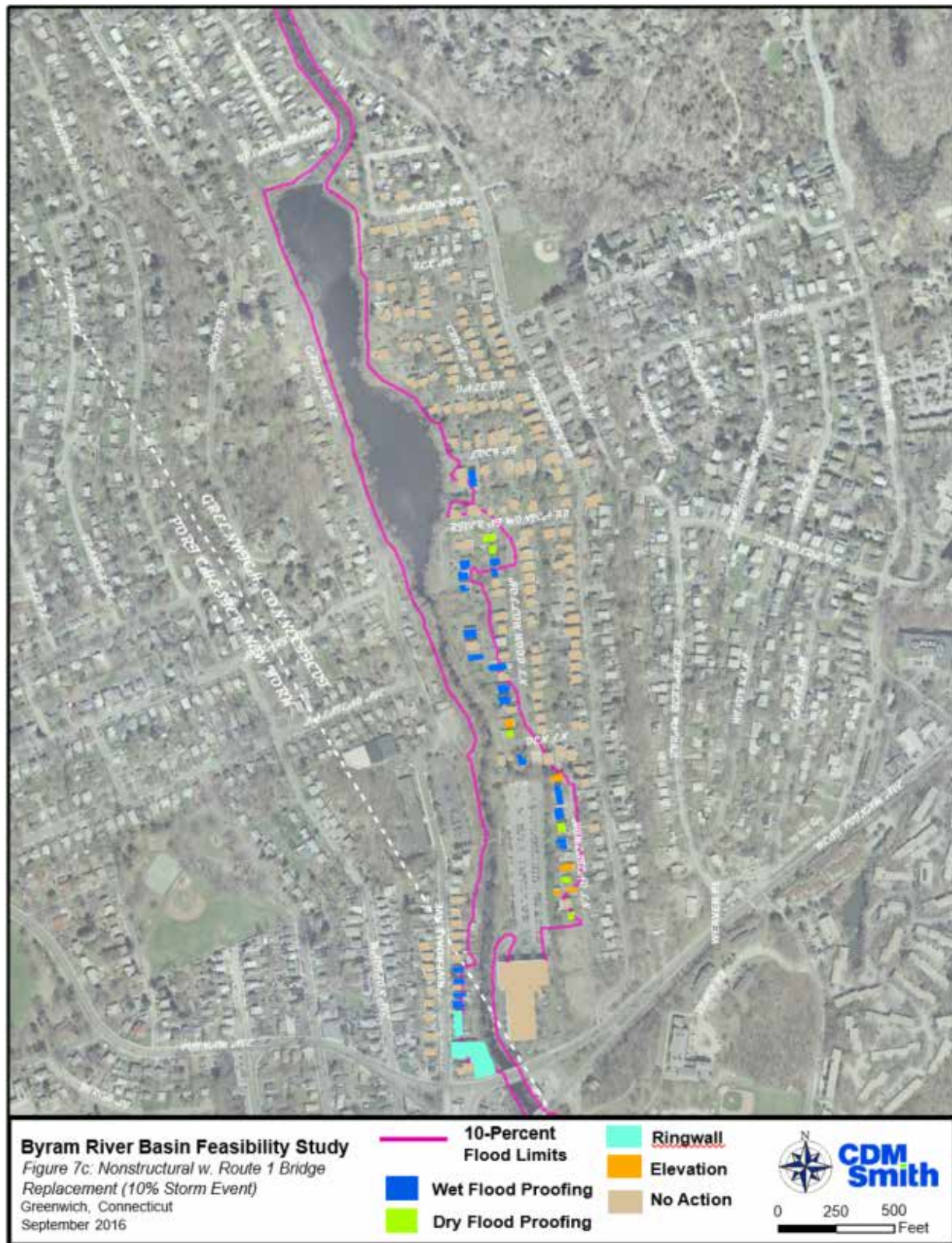
Table 2 Comparison of Nonstructural Recommendations with and without the Route 1 Bridge Replacement

Flood Protection	Nonstructural Comparison							
	10% Flood		4% Flood		2% Flood		1% Flood	
	<i>Nonstructural</i>	<i>Nonstructural w. Bridge Replacement</i>	<i>Nonstructural</i>	<i>Nonstructural w. Bridge Replacement</i>	<i>Nonstructural</i>	<i>Nonstructural w. Bridge Replacement</i>	<i>Nonstructural</i>	<i>Nonstructural w. Bridge Replacement</i>
<i>Dry Flood Proofing</i>	9	6	35	11	47	20	59	24
<i>Wet Flood Proofing</i>	8	20	29	40	60	56	90	85
<i>Ringwall</i>	9	9	11	10	12	11	12	11
<i>Elevation</i>	15	6	22	6	22	8	22	8
Total	41	41	97	67	141	95	183	128
Difference	0		30		46		55	

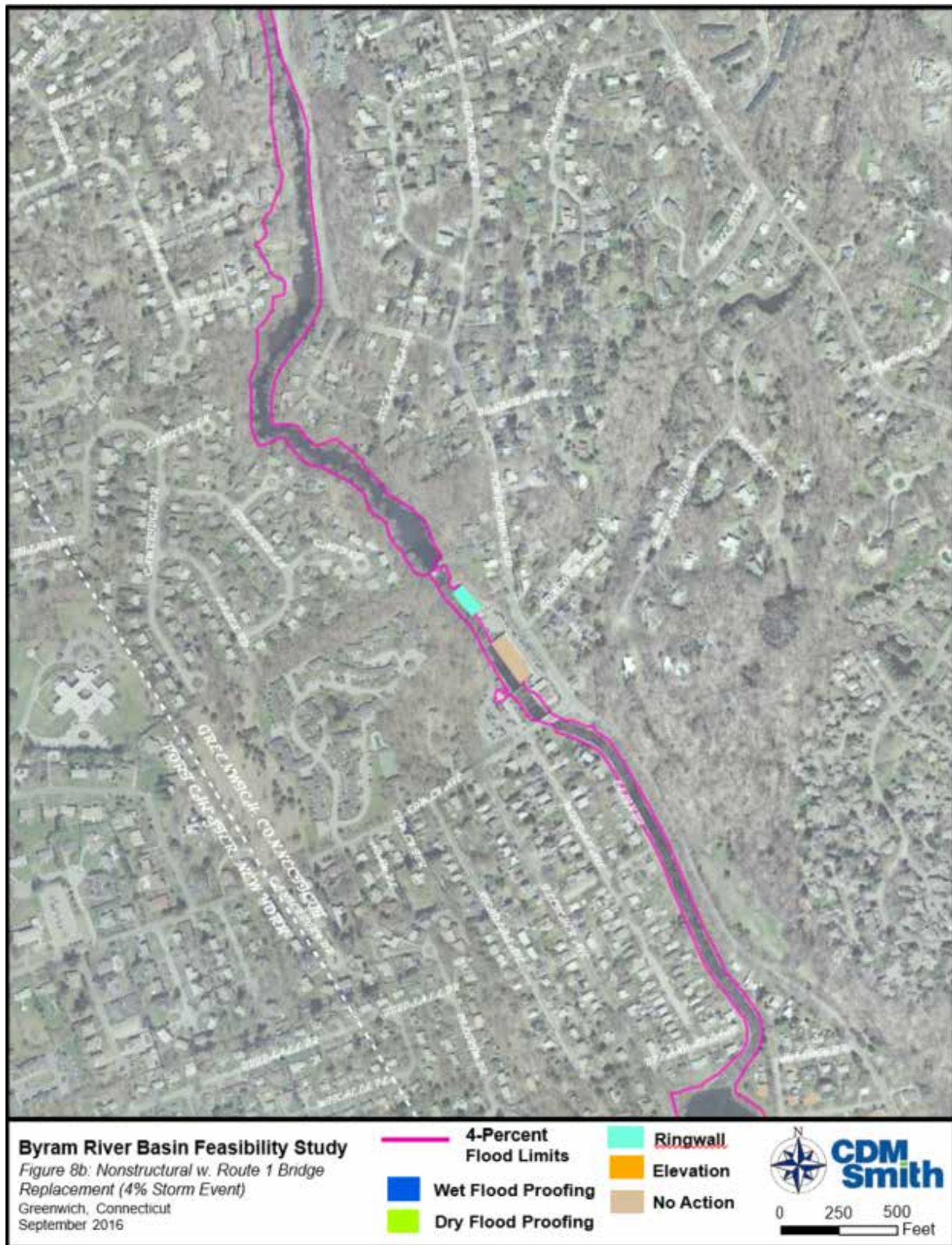
For the nonstructural plan with the Route 1 bridge replacement, the number of structures requiring nonstructural flood proofing was not impacted for the 10-percent storm event, was slightly impacted for the 4-percent storm event, and was significantly impacted for the 2- and 1-percent storm events. For all storm events however, the number of properties requiring elevation decreased significantly with the Route 1 bridge replacement.

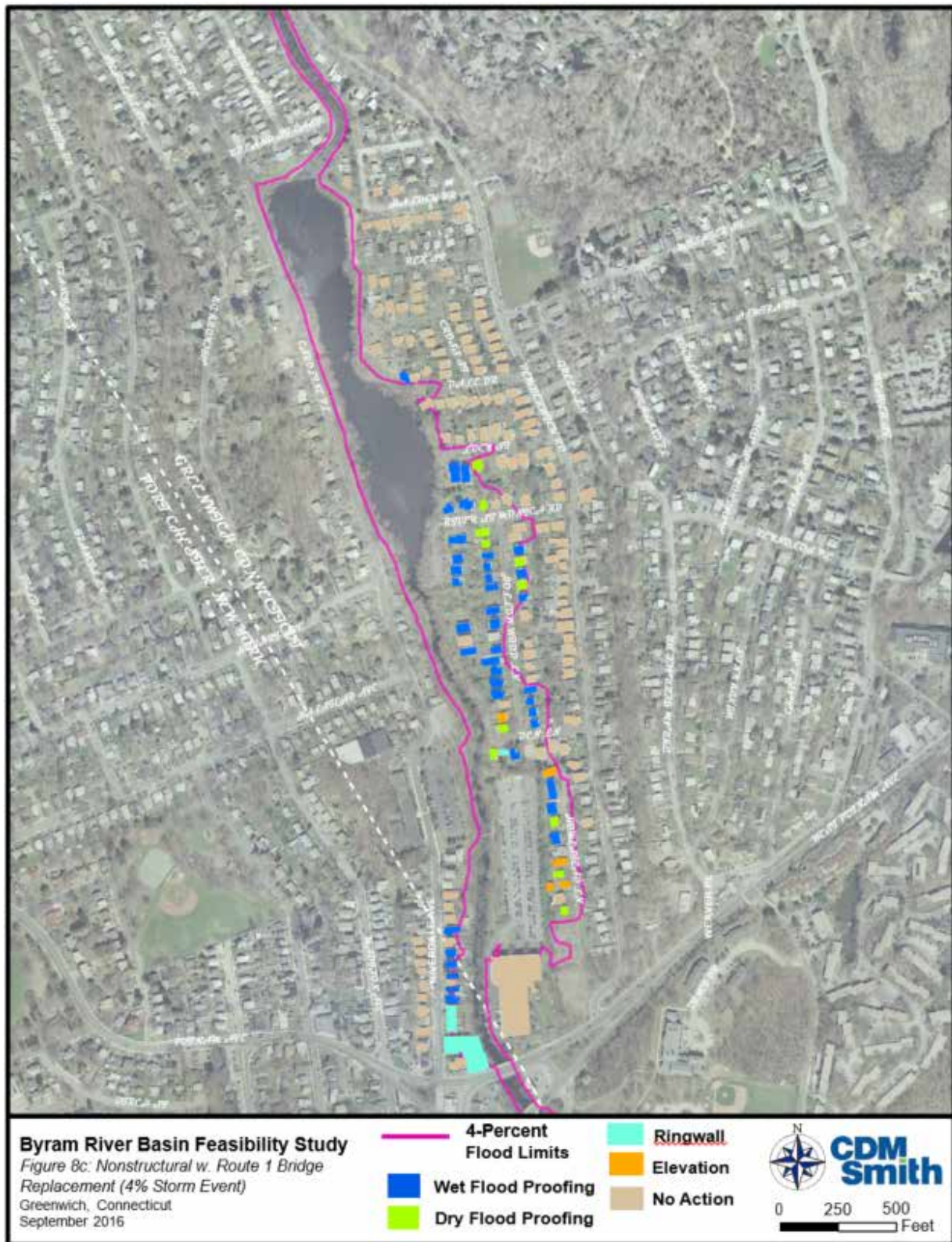


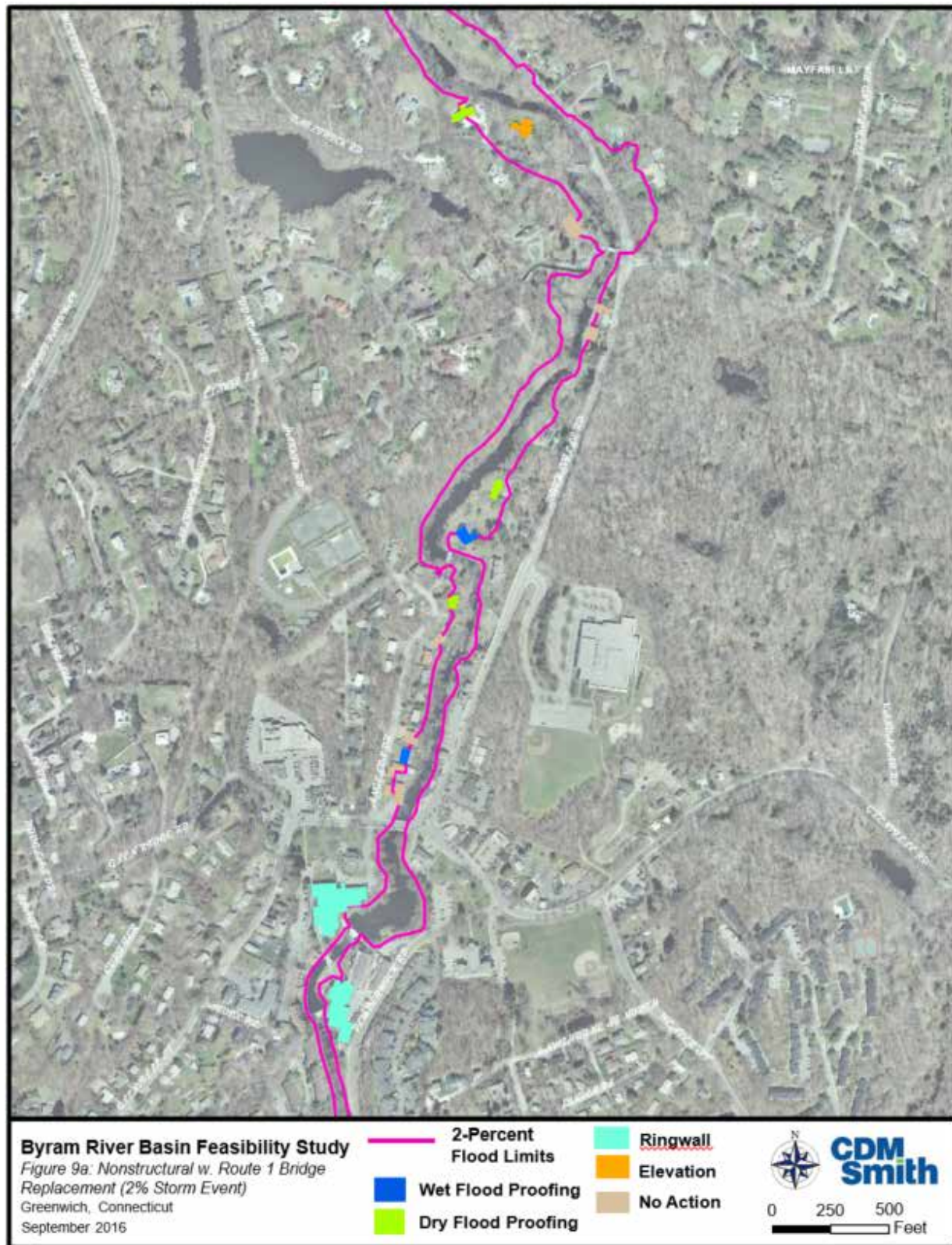




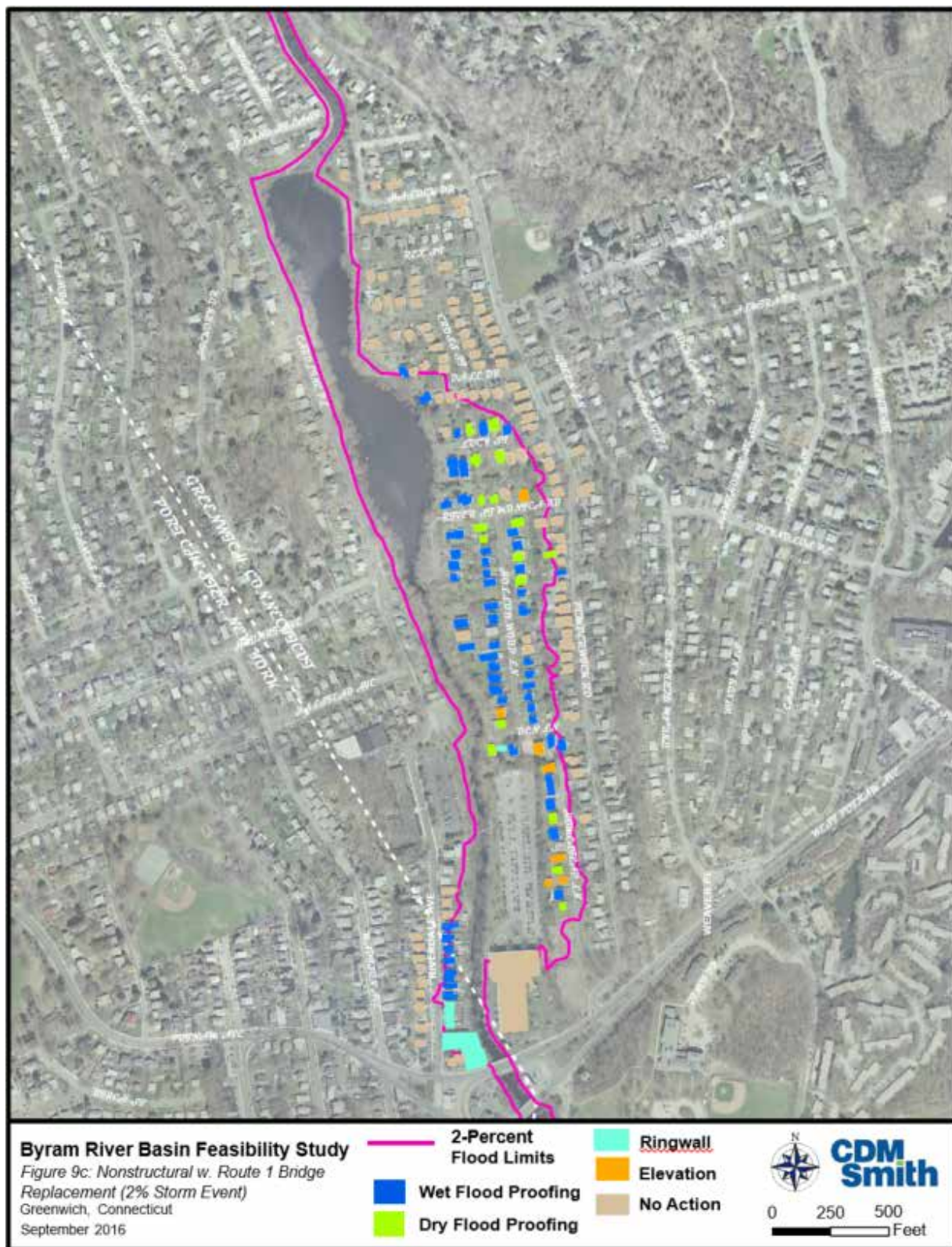


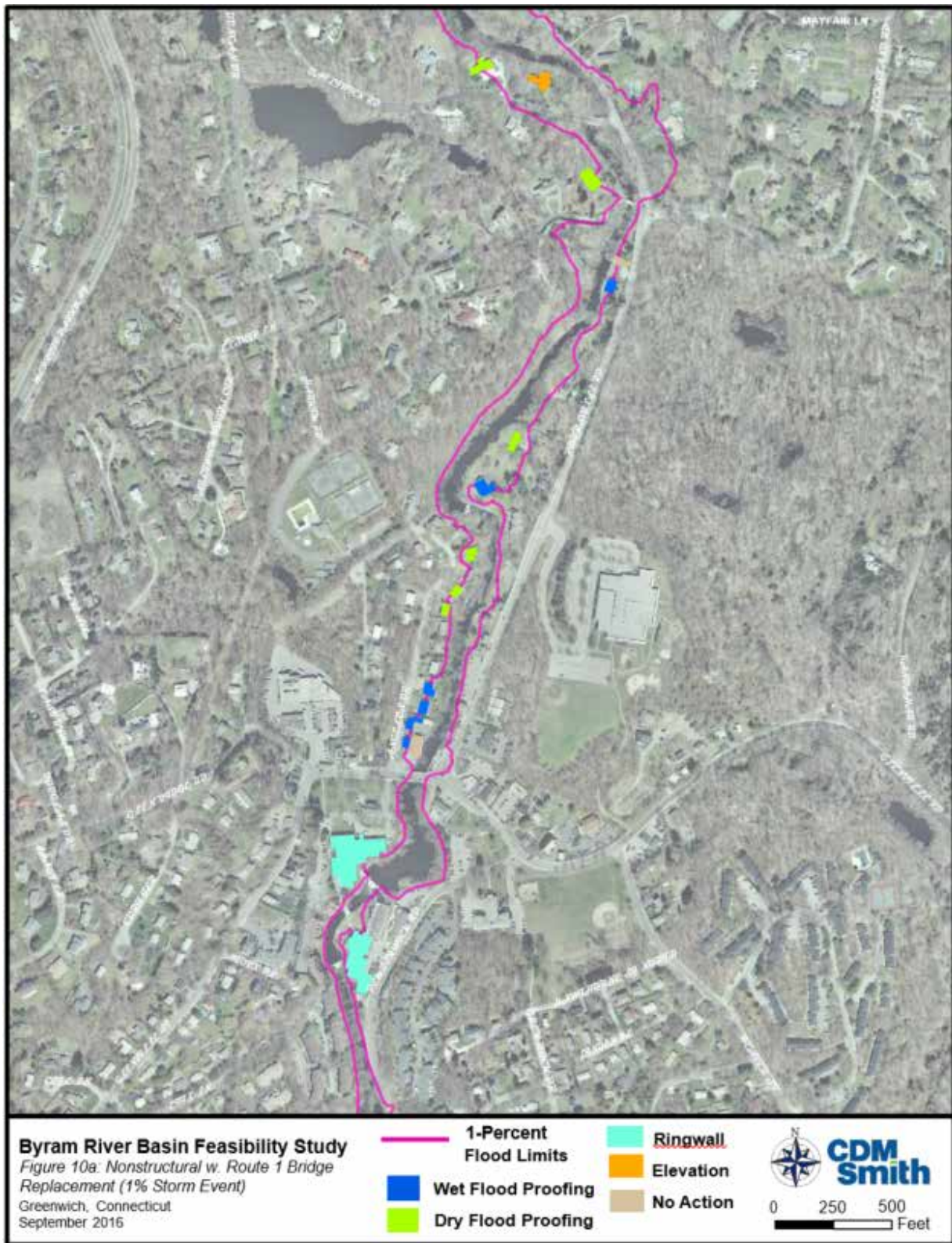


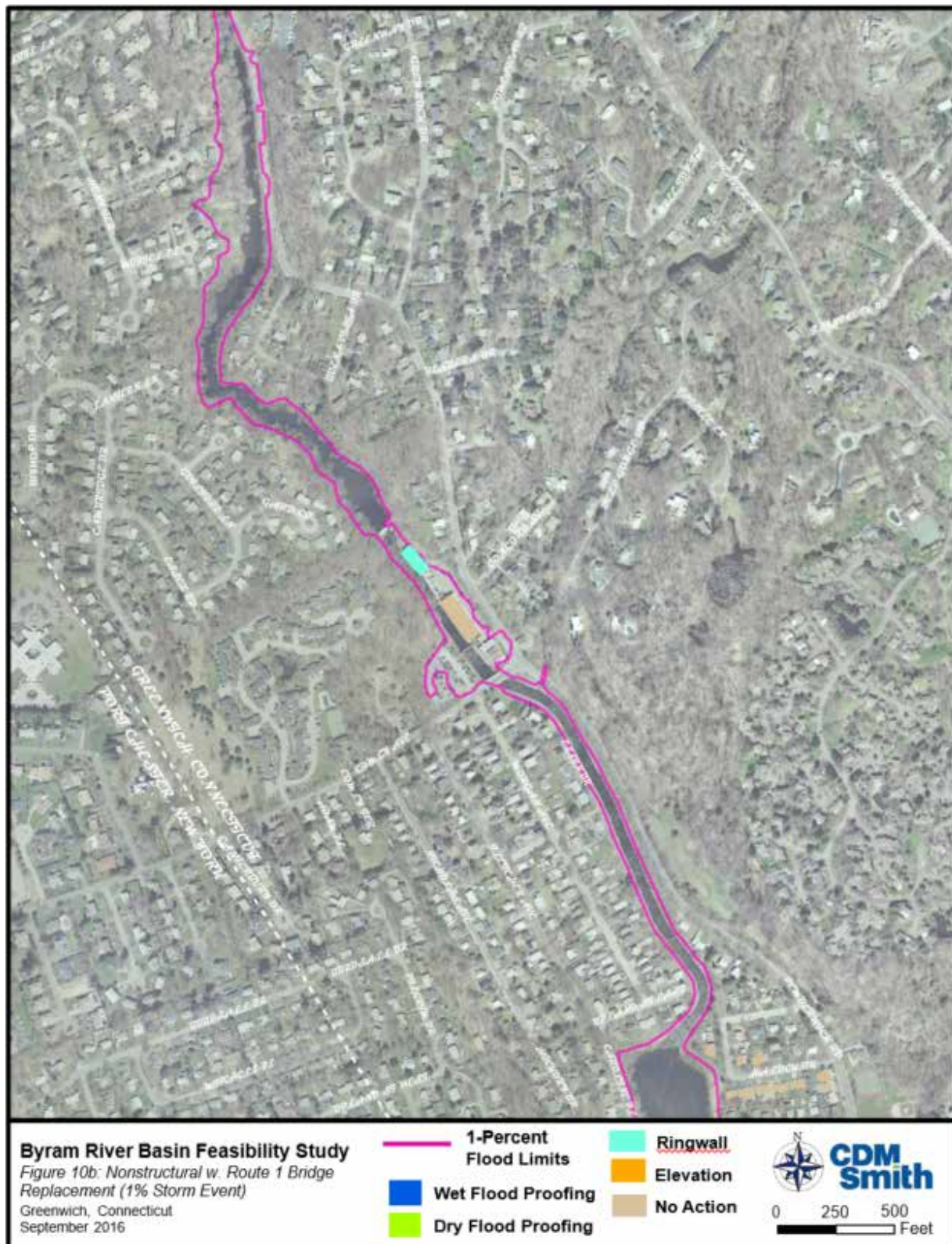


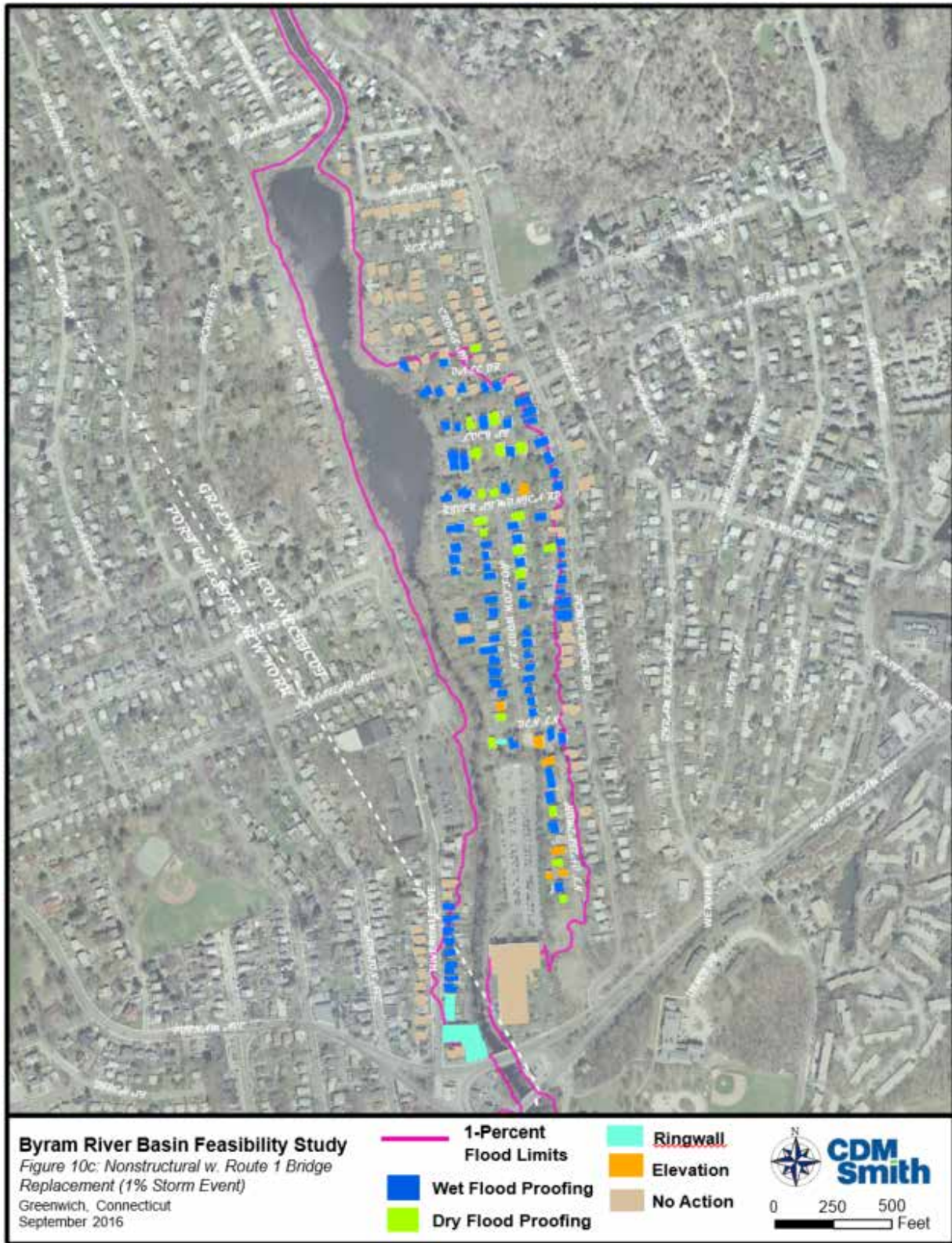












Attachment A

Byram River Basin Feasibility Study

Structure Inventory Key

Ground Elevation (GE)

Ground Elevations were determined using the Town of Greenwich's contours in GIS.

Main Floor Elevation (ME)

Main Floor Elevations are based on the number of steps to the front door of the structure. Each step was assumed to have a height of 7-inches ($ME = \# \text{ of Steps} \times 7 \text{ inches} \div 12 \text{ inches per foot}$).

Low Opening Elevation (LE)

Low Opening Elevations are based on the lowest opening visible from the street. Measurements were taken in the field and from Google Earth.

Flood Elevation (FE)

Flood Elevations are the water elevations during a storm event.

Flood Depth (FD)

$$FD = [ME] \text{ or } [LE] - FE$$

*Negative flood depth values indicate flooding

Structure Type

Structure Type was assumed based on the structure's property information from the Town of Greenwich's Tax Assessor, Google Earth and typical structure type characteristics.

A	Apartment
BL	Bi-Level
E	Elevated
M	Multifamily
RF	Raised Foundation
RR	Raised Ranch
S	Slab-on-Grade
SB	Subgrade Basement
SL	Split Level

The following structure characteristics were populated using the Town of Greenwich's Tax Assessor's property information. Any discrepancies between the Tax Assessor's information and what was seen in the field was assessed and updated.

Land Use Type

C	Commercial
R	Residential
U	Utilities

Construction Type

Wood, Stucco, Composition, Alum/Vinyl, Brick

Garage Type

A	Attached
BI	Built In
D	Detached
N	None

Foundation Type

Basement, Slab, Crawlspace, Unknown

Condition

Structure Condition was assessed from field visits and from Google Earth.

P	Poor
F	Fair
G	Good
E	Excellent

Recommendation

Flood Proofing Recommendations were based on a combination of structure type, land use type, construction type, and condition and flood depth using an algorithm (Attachment B).

WET	Wet Flood Proofing
DRY	Dry Flood Proofing
RW	Ringwall
E	Elevation
BO	Buyout

BYRAM RIVER BASIN FEASIBILITY STUDY
NONSTRUCTURAL PLAN - RECOMMENDATIONS

	Flood Depth equals 0, Recommendation based on 1-foot of freeboard
	Flood Depth between 0 and 2 feet
	Flood Depth greater than 2-feet

User Input
Calculated

NOTE:	DRY/WET entails wet floor proofing of areas below the main floor elevation, including protection/raising of utilities where necessary, and dry flood proofing for the area above the main floor elevation.
-------	--

	StreetNAME	BYRAM RIVER STATION	GE	ME	LE	FD								STRUCTURE										CONDITION	RECOMMENDATION			
			GROUND ELEVATION AT BUILDING	SURVEYED MAIN FLOOR ELEVATION	SURVEYED LOW OPENING ELEVATION	DEPTH OF 10% FLOODING VS. FIRST FLOOR	DEPTH OF 10% FLOODING VS. LOW OPENING	DEPTH OF 4% FLOODING VS. FIRST FLOOR	DEPTH OF 4% FLOODING VS. LOW OPENING	DEPTH OF 2% FLOODING VS. FIRST FLOOR	DEPTH OF 2% FLOODING VS. LOW OPENING	DEPTH OF 1% FLOODING VS. FIRST FLOOR	DEPTH OF 1% FLOODING VS. LOW OPENING	STRUCTURE TYPE	LAND USE TYPE	# OF FLOORS	TOTAL SQ. FT.	CONSTRUCTION TYPE	BASEMENT	GARAGE TYPE	FOUNDATION TYPE	10-PERCENT FLOOD	4-PERCENT FLOOD		2-PERCENT FLOOD	1-PERCENT FLOOD		
	Hillside Avenue	9512	16.0	18.3	18.3	-8	-8	-3	-3	-2	-2	-1	-1	S	C	1.5	1,959	Brick	None	N	Unknown	G	--	--	--	--		
	Riverdale Avenue	9591	8.0	14.6	8.8	-4	2	0	6	2	7	3	9	S	C	2	34,584	Brick	None	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9612	15.0	25.7	16.9	-15	-6	-11	-2	-10	-1	-8	1	RR	R	2	4,056	Wood	Bsmt	2BI	Unknown	G	--	--	--	DRY/WET		
	Riverdale Avenue	9668	10.5	16.8	8.7	-6	2	-2	6	-1	8	1	9	SB - M	R	2	1,568	Wood	Bsmt	N	Unknown	G	RW	RW	RW	RW		
	Riverdale Avenue	9668	13.0	27.4	15.2	-17	-4	-12	0	-11	1	-9	3	SB	R	2.5	2,786	Wood	Bsmt	2D	Unknown	P	--	--	WET	WET		
	Riverdale Avenue	9680	10.5	16.8	8.7	-6	2	-2	6	-1	8	1	9	SB - M	R	2	1,352	Wood	Bsmt	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9686	10.5	16.7	8.6	-6	2	-2	6	0	8	1	9	SB - M	R	2	1,516	Composition	Bsmt	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9698	10.5	16.9	8.8	-6	2	-2	6	-1	7	1	9	SB - M	R	2	1,506	Wood	Bsmt	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9718	10.5	16.7	8.6	-6	2	-2	6	0	8	1	9	SB - M	R	2	1,516	Wood	Bsmt	N	Unknown	G	RW	RW	RW	RW		
	Riverdale Avenue	9727	11.0	16.8	8.7	-6	2	-2	6	-1	8	1	9	SB - M	R	2	1,498	Wood	Bsmt	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9727	13.0	27.2	19.2	-16	-8	-12	-4	-11	-3	-9	-1	RR	R	2	4,250	Wood	Bsmt	1BI	Unknown	G	--	--	--	--		
	Riverdale Avenue	9761	11.0	15.3	9.2	-4	2	0	6	1	7	3	9	RF	R	2	2,349	Stucco	Bsmt	1D	Unknown	F	E	E	E	E		
	Riverdale Avenue	9761	14.0	26.4	18.3	-16	-7	-11	-3	-10	-2	-8	0	RR	R	2	2,076	Wood	Bsmt	1BI	Unknown	G	--	--	--	DRY/WET		
	West Putnam Avenue Lot 48A	9771	18.0	19.6	16.7	-9	-6	-5	-2	-3	0	-2	1	S	C	3	140,445	Reinforced Concrete	None	N	Slab	G	--	--	--	RW		
	Riverdale Avenue	9786	12.0	16.2	9.1	-5	2	-1	6	0	7	2	9	SB	R	2	1,294	Wood - Alum/Vinyl	Bsmt	1D	Unknown	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Riverdale Avenue	9798	14.0	14.8	14.7	-4	-4	0	0	1	2	3	3	RR	R	2	2,588	Wood	Bsmt	1BI	Unknown	G	--	E	E	E		
	Riverdale Avenue	9811	12.0	15.9	12.6	-5	-2	-1	3	0	4	2	6	SB	R	2	1,620	Alum/Vinyl	Bsmt	N	Unknown	F	--	DRY/WET	DRY/WET	DRY/WET		
	Riverdale Avenue	9835	12.0	15.9	8.4	-5	3	-1	7	1	8	2	10	SB	R	2	2,300	Wood	Bsmt	N	Unknown	F	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Riverdale Avenue	9860	14.5	19.1	16.0	-8	-5	-4	-1	-3	0	-1	2	SB	R	2.5	1,616	Wood	Bsmt	1D	Unknown	F	--	--	WET	WET		
	Riverdale Avenue	9873	13.0	17.0	8.9	-6	2	-2	6	-1	7	1	9	SB	R	2	2,008	Wood	Bsmt	N	Unknown	P	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Riverdale Avenue	9885	15.0	19.3	16.8	-8	-6	-4	-2	-3	0	-1	1	SB	R	2.5	2,756	Wood	Bsmt	2D	Unknown	G	--	--	WET	WET		
	Riverdale Avenue	9910	13.0	17.0	12.0	-6	-1	-2	3	-1	4	1	6	RF	R	2	2,342	Alum/Vinyl	Bsmt	N	Slab	G	--	DRY/WET	DRY/WET	DRY/WET		
	Riverdale Avenue	9922	15.0	20.1	17.5	-9	-6	-5	-2	-4	-1	-2	1	SB	R	2	2,356	Wood	Bsmt	3D	Unknown	G	--	--	--	WET		
	Riverdale Avenue	9947	15.0	18.7	12.9	-8	-2	-3	2	-2	4	0	5	SB	R	2	1,834	Stucco	Bsmt	1D	Unknown	G	--	DRY/WET	DRY/WET	DRY/WET		
	Riverdale Avenue	9960	17.0	22.5	20.3	-11	-9	-7	-5	-6	-4	-4	-2	SB	R	2.5	3,140	Wood	Bsmt	N	Unknown	G	--	--	--	--		
	Riverdale Avenue	9972	17.0	19.1	11.9	-8	-1	-4	3	-3	5	-1	6	SB	R	2		Wood	Bsmt	2D	Unknown	G	--	WET	WET	WET		
	Riverdale Avenue	10022	19.0	21.0	14.2	-10	-3	-6	1	-4	2	-3	4	SB	R	2		Wood	Bsmt	3D	Unknown	F	--	WET	WET	WET		
	Riverdale Avenue	10066	22.0	23.2	16.8	-12	-6	-8	-1	-7	0	-5	2	SB	R	2		Wood	Bsmt	N	Unknown	F	--	--	WET	WET		
	Riverdale Avenue	10111	24.0	26.3	18.8	-15	-7	-11	-3	-10	-2	-8	0	SB	R	2		Wood	Bsmt	N	Unknown	G	--	--	--	WET		
	Homestead Lane	10129	12.0	14.1	10.8	-3	0	1	5	3	6	4	8	SB	R	1	810	Wood	Full Bsmt	N	Basement	G	E	E	E	E		
	Homestead Lane	10155	12.0	15.7	13.6	-4	-2	0	2	1	3	3	5	SB	R	2	2,502	Wood frame, vinyl exterior	Full Bsmt	N	Basement	G	--	E	E	E		
	Homestead Lane	10172	10.0	11.5	10.7	0	1	4	5	5	6	7	8	S	R	2	1,486	Wood	None	1BI	Slab	G	E	E	E	E		
	Homestead Lane	10182	10.0	11.5	10.5	0	1	4	5	5	6	7	8	RF	R	1	1,011	Wood	Full Crawl	N	Crawl Space	G	E	E	E	E		
	Homestead Lane	10203	10.0	14.3	10.1	-3	1	1	5	2	7	4	8	SB	R	2	2,222	Wood frame, aluminum ext	1/2 Bsmt	N	Basement	G	E	E	E	E		
	Homestead Lane	10227	10.0	10.9	7.9	1	4	5	8	6	9	8	11	SB	R	1	1,520	Wood frame, vinyl exterior	3/4 Bsmt, 1/4 Crawl	1D	Basement	F	E	E	E	E		
	Homestead Lane	10327	10.0	18.2	9.3	-7	2	-3	6	-1	7	0	9	RR	R	2	3,434	Wood frame, vinyl exterior	1/4 Bsmt, Lower level	1BI	Basement	G	E	E	E	E		
	Pemberwick Road	10459	28.0	32.1	27.2	-20	-16	-17	-12	-15	-10	-14	-9	SB	R	2	2,876	Wood frame, vinyl exterior	1/2 Bsmt	N	Basement	G	--	--	--	--		
	Homestead Lane	10500	10.0	14.7	11.4	-3	0	1	4	2	5	4	7	SB	R	2	2,424	Wood	Full Bsmt	N	Basement	G	E	E	E	E		
	Homestead Lane Lot 485, 486	10569	12.0	17.8	11.3	-6	1	-2	4	-1	6	1	7	RR	R	2		Wood	Full Bsmt	2BI	Basement	-	E	E	E	E		
	Homestead Lane Lot 487, 488	10660	12.0	16.2	9.7	-4	2	-1	6	1	7	2	9	SB	R	2	3,646	Wood	Full Bsmt	2BI	Basement	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Pemberwick Road	10694	30.0	32.3	18.3	-20	-6	-17	-3	-15	-1	-14	0	SB	R	2	2,860	Wood frame, vinyl exterior	Full Bsmt	2BI	Basement	G	--	--	--	WET		
	Den Lane	10699	11.0	13.5	13.5	-1	-1	2	2	3	3	5																

BYRAM RIVER BASIN FEASIBILITY STUDY
NONSTRUCTURAL PLAN - RECOMMENDATIONS

	Flood Depth equals 0, Recommendation based on 1-foot of freeboard
	Flood Depth between 0 and 2 feet
	Flood Depth greater than 2-feet

User Input
Calculated

NOTE:	DRY/WET entails wet floor proofing of areas below the main floor elevation, including protection/raising of utilities where necessary, and dry flood proofing for the area above the main floor elevation.
-------	--

	StreetNAME	BYRAM RIVER STATION	GE	ME	LE	FD								STRUCTURE										CONDITION	RECOMMENDATION			
			GROUND ELEVATION AT BUILDING	SURVEYED MAIN FLOOR ELEVATION	SURVEYED LOW OPENING ELEVATION	DEPTH OF 10% FLOODING VS. FIRST FLOOR	DEPTH OF 10% FLOODING VS. LOW OPENING	DEPTH OF 4% FLOODING VS. FIRST FLOOR	DEPTH OF 4% FLOODING VS. LOW OPENING	DEPTH OF 2% FLOODING VS. FIRST FLOOR	DEPTH OF 2% FLOODING VS. LOW OPENING	DEPTH OF 1% FLOODING VS. FIRST FLOOR	DEPTH OF 1% FLOODING VS. LOW OPENING	STRUCTURE TYPE	LAND USE TYPE	# OF FLOORS	TOTAL SQ. FT.	CONSTRUCTION TYPE	BASEMENT	GARAGE TYPE	FOUNDATION TYPE	10-PERCENT FLOOD	4-PERCENT FLOOD		2-PERCENT FLOOD	1-PERCENT FLOOD		
	Hollow Wood Lane	11606	15.0	23.0	14.7	-9	-1	-7	2	-5	3	-4	4	RR	R	2	2,852	Wood	Full Bsmt		2BI	Basement	F	--	WET	WET	WET	
	Hollow Wood Lane	11606	14.0	19.3	11.6	-5	2	-3	5	-2	6	0	8	RR	R	2	1,838	Wood	Full Bsmt	N	Basement	G	E	E	E	E		
	River Street	11606	13.0	17.8	13.5	-4	0	-1	3	0	4	1	6	SB	R	2	2,952	Brick/wood	Full Bsmt	N	Basement	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Pemberwick RoadBuilding 1	11662	22.0	23.4	17.7	-9	-4	-7	-1	-6	0	-4	2	SB	R	2	2,658	Wood frame, stucco exterior	Full Bsmt	N	Basement	F	--	--	WET	WET		
	Pemberwick RoadBuilding 2	11703	17.0	16.8	16.8	-3	-3	0	0	1	1	3	3	SB	R	2	2,246	Wood	Full Bsmt	N	Basement	F	--	E	E	E		
	Hollow Wood Lane	11751	15.0	23.1	14.9	-9	-1	-6	2	-5	3	-4	5	RR	R	2	2,878	Wood	Full Bsmt	2BI	Basement	G	--	WET	WET	WET		
	Pemberwick Road	11767	22.0	23.8	18.6	-9	-4	-7	-2	-6	-1	-4	1	SB	R	2	3,608	Wood frame, vinyl exterior	Full Bsmt	N	Basement	G	--	--	--	WET		
	Hollow Wood Lane	11779	14.0	19.2	14.7	-5	0	-3	2	-1	3	0	5	SB	R	2	1,838	Wood frame, aluminum ext	Full Bsmt	2D	Basement	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	River Street	11779	12.5	20.9	13.0	-7	1	-4	4	-3	5	-1	6	RR	R	2	2,998	Brick/wood	Full Bsmt	2BI	Basement	F	WET	WET	WET	WET		
	Hollow Wood Lane	11841	14.0	16.1	14.1	-2	0	1	3	2	4	3	5	SB	R	2	1,884	Wood	Full Bsmt	1D	Basement	G	E	E	E	E		
	Monica Road	11847	18.0	21.9	18.5	-7	-4	-5	-2	-4	-1	-2	1	SB	R	2	3,324	Wood frame, stucco exterior	Full Bsmt	N	Basement	G	--	--	--	WET		
	Hollow Wood Lane	11848	15.0	19.1	16.5	-5	-2	-2	0	-1	1	0	3	SB	R	2	2,512	Wood frame, stucco exterior	Full Bsmt	2D	Basement	F	--	DRY/WET	DRY/WET	DRY/WET		
	Monica Road	11868	14.0	19.2	16.1	-5	-2	-2	1	-1	2	0	3	SB	R	1	2,314	Wood frame, aluminum ext	Full Bsmt	1A	Basement	G	--	DRY/WET	DRY/WET	DRY/WET		
	Monica Road	11868	16.5	21.6	18.3	-7	-4	-5	-1	-4	0	-2	1	SB	R	2	3,326	Wood frame, stucco exterior	Full Bsmt	N	Basement	G	--	--	WET	WET		
	Monica Road	11878	16.0	22.1	17.2	-8	-3	-5	0	-4	1	-3	2	BL	R	2	3,482	Wood	1/4 Bsmt	2BI	Basement	G	--	DRY/WET	DRY/WET	DRY/WET		
	Hollow Wood Lane	11880	14.0	18.0	14.1	-3	0	-1	3	0	4	2	5	SB	R	1	1,549	Wood	Full Bsmt	N	Basement	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Pemberwick Road	11908	18.0	20.8	17.1	-6	-3	-4	0	-3	1	-1	2	SB	R	2	2,842	Wood frame, stucco exterior	Full Bsmt	N	Basement	G	--	--	WET	WET		
	Pemberwick Road	11910	20.0	20.4	20.4	-6	-6	-4	-4	-2	-2	-1	-1	S	R/C	2	6,642	Wood/Masonry	None	N	Slab	F	--	--	--	--		
	Pemberwick Road	11933	18.5	23.7	16.7	-9	-2	-7	0	-6	1	-4	3	SB	R	1.5	1,947	Wood frame, stone/stucco ext	Full Bsmt	N	Basement	G	--	--	WET	WET		
	Monica Road	11961	16.5	16.4	8.4	-2	6	0	8	2	10	3	11	RR	R	2	3,716	Brick/Stone	None	N	Slab	G	--	E	E	E		
	Pemberwick Road	11962	18.0	20.8	15.9	-6	-1	-4	1	-3	2	-1	4	SL	R	1.5	3,107	Wood frame, brick/vinyl ext	1/2 Bsmt, 1/4 Crawl, Lower level	1BI	Basement/Crawl	G	--	--	WET	WET		
	Monica Road	11966	14.5	17.8	15.4	-3	-1	-1	1	0	3	2	4	SB	R	2	2,034	Wood frame, vinyl exterior	3/4 Bsmt, 1/4 Crawl	1D	Basement	G	--	DRY/WET	DRY/WET	DRY/WET		
	Monica Road	11969	14.0	18.4	15.7	-4	-1	-2	1	0	2	1	4	SB	R	2	2,778	Brick/wood	Full Bsmt	1A	Basement	G	--	DRY/WET	DRY/WET	DRY/WET		
	Monica Road	11969	15.0	17.9	16.5	-3	-2	-1	0	0	1	2	3	SB	R	1	1,026	Wood frame, vinyl exterior	Full Bsmt	1D	Basement	G	--	DRY/WET	DRY/WET	DRY/WET		
	Monica Road	11976	14.0	19.5	15.1	-5	-1	-3	2	-1	3	0	4	SB	R	1	1,684	Wood frame, vinyl exterior	Full Bsmt	1A	Basement	G	--	DRY/WET	DRY/WET	DRY/WET		
	Monica Road	11976	16.0	19.5	17.6	-5	-3	-3	-1	-2	0	0	2	SB	R	1	1,569	Wood frame, vinyl/brick	3/4 Bsmt, 1/4 Crawl	N	Basement/Crawl	G	--	--	DRY/WET	DRY/WET		
	Lucy Street	11990	16.0	20.8	11.9	-6	3	-4	5	-3	6	-1	8	RR	R	2	4,392	Wood frame, vinyl exterior	None	2BI	Slab	E	WET	WET	WET	WET		
	Pemberwick Road	11990	19.5	27.5	20.0	-13	-5	-11	-3	-10	-2	-8	-1	RR	R	2.5	4,398	Wood frame, aluminum ext	Full Bsmt, Lower level	N	Basement	G	--	--	--	--		
	Pemberwick Road	12000	18.0	22.4	17.4	-8	-3	-6	-1	-4	1	-3	2	SB	R	2	4,162	Wood frame, Brick exterior	Full Bsmt	N	Basement	G	--	--	WET	WET		
	Lucy Street	12097	16.0	20.4	17.9	-6	-3	-4	-1	-2	0	-1	2	SB	R	1	1,446	Wood frame, Brick exterior	Full Bsmt	N	Basement	G	--	--	WET	WET		
	Lucy Street	12100	17.0	18.1	18.1	-4	-4	-1	-1	0	0	1	1	SB	R	2	3,474	Wood frame, vinyl exterior	Full Bsmt	1D	Basement	G	--	--	DRY/WET	DRY/WET		
	Lucy Street	12100	14.5	20.8	15.8	-6	-1	-4	1	-3	2	-1	4	SL	R	2	6,250	Wood frame, stucco exterior	1/2 Bsmt, Lower level	2BI	Basement	G	--	WET	WET	WET		
	Lucy Street	12102	16.0	24.5	16.8	-10	-2	-8	0	-7	1	-5	3	RR	R	2	3,198	Brick	Full Bsmt	2BI	Basement	G	--	WET	WET	WET		
	Lucy Street	12107	16.0	23.7	15.7	-9	-1	-7	1	-6	2	-4	4	RR	R	2	3,282	Brick	Full Bsmt	N	Basement	F	--	WET	WET	WET		
	Lucy Street	12174	18.0	22.9	18.0	-8	-4	-6	-1	-5	0	-3	1	SB	R	1	849	Wood frame, vinyl exterior	Full Bsmt	N	Basement	G	--	--	WET	WET		
	Lucy Street	12183	16.0	24.0	15.8	-9	-1	-7	1	-6	2	-4	4	RR	R	2	3,748	Wood frame, Brick exterior	1/4 Bsmt, Lower level	1BI	Basement	G	--	WET	WET	WET		
	Lucy Street	12183	16.0	23.4	15.7	-9	-1	-7	1	-5	2	-4	4	SB	R	2	3,682	Wood frame, Brick exterior	Full Bsmt	2BI	Basement	G	--	WET	WET	WET		
	Lucy Street	12222	16.0	23.2	17.2	-9	-3	-6	0	-5	1	-4	2	SB	R	1	1,389	Wood frame, vinyl exterior	Full Bsmt	1D	Basement	G	--	WET	WET	WET		
	Pemberwick Road	12224	19.0	23.5	17.6	-9	-3	-7	-1	-5	0	-4	2	SB	R	2	3,416	Wood frame, brick/wood ext	Full Bsmt	1A	Basement	G	--	--	WET	WET		
	Lucy Street	12248	16.0	22.2	16.5	-8	-2	-5	0	-4	2	-3	3	RR	R	2	2,612	Wood	3/4 Bsmt, 1/4 Crawl	1BI	Basement	G</						

BYRAM RIVER BASIN FEASIBILITY STUDY
NONSTRUCTURAL PLAN - RECOMMENDATIONS

	Flood Depth equals 0, Recommendation based on 1-foot of freeboard
	Flood Depth between 0 and 2 feet
	Flood Depth greater than 2-feet

	User Input
	Calculated

NOTE:	DRY/WET entails wet floor proofing of areas below the main floor elevation, including protection/raising of utilities where necessary, and dry flood proofing for the area above the main floor elevation.
-------	--

	StreetNAME	BYRAM RIVER STATION	GE	ME	LE	FD								STRUCTURE								CONDITION	RECOMMENDATION			
			GROUND ELEVATION AT BUILDING	SURVEYED MAIN FLOOR ELEVATION	SURVEYED LOW OPENING ELEVATION	DEPTH OF 10% FLOODING VS. FIRST FLOOR	DEPTH OF 10% FLOODING VS. LOW OPENING	DEPTH OF 4% FLOODING VS. FIRST FLOOR	DEPTH OF 4% FLOODING VS. LOW OPENING	DEPTH OF 2% FLOODING VS. FIRST FLOOR	DEPTH OF 2% FLOODING VS. LOW OPENING	DEPTH OF 1% FLOODING VS. FIRST FLOOR	DEPTH OF 1% FLOODING VS. LOW OPENING	STRUCTURE TYPE	LAND USE TYPE	# OF FLOORS	TOTAL SQ. FT.	CONSTRUCTION TYPE	BASEMENT	GARAGE TYPE	FOUNDATION TYPE		10-PERCENT FLOOD	4-PERCENT FLOOD	2-PERCENT FLOOD	1-PERCENT FLOOD
	Halock Drive	13263	19.5	21.9	20.1	-7	-6	-5	-3	-4	-2	-2	-1	SB	R	1.5	2,703	Wood	Full Bsmt	2BI	Basement	F	--	--	--	--
	Halock Drive	13292	19.0	21.4	19.6	-7	-5	-5	-3	-3	-2	-2	0	SB	R	2	2,984	Wood frame, vinyl exterior	3/4 Bsmt, 1/4 Crawl	2BI	Basement	G	--	--	--	WET
	Halock Drive	13334	19.0	21.4	19.0	-7	-4	-5	-2	-3	-1	-2	1	SL	R	1.5	2,229	Wood frame, vinyl exterior	1/2 Bsmt, Lower level	2A	Basement	G	--	--	--	WET
	Halock Drive	13350	18.5	20.8	18.6	-6	-4	-4	-2	-3	-1	-1	1	SL	R	1.5	3,230	Wood frame, vinyl exterior	1/4 Bsmt, 1/4 Crawl, Lower level	1A	Basement	F	--	--	--	WET
	Halock Drive	13376	18.0	19.8	18.0	-5	-4	-3	-1	-2	0	0	1	SB	R	1.5	1,757	Wood	1/2 Bsmt, Lower level	1A	Basement	P	--	--	--	DRY/WET
	Halock Drive	13531	19.0	21.7	19.3	-8	-5	-5	-3	-4	-2	-3	0	SL	R	1.5	2,568	Wood frame, vinyl exterior	1/4 Bsmt, 1/4 Crawl, Lower level	2A	Basement	G	--	--	--	WET
	Halock Drive	13564	19.0	21.3	20.2	-7	-6	-5	-4	-4	-3	-2	-1	SL	R	1.5	1,680	Wood frame, vinyl exterior	3/4 Bsmt, 1/4 Crawl	1A	Basement	G	--	--	--	--
	Halock Drive	13723	19.0	20.8	18.4	-5	-2	-3	-1	-3	0	-1	1	SL	R	1.5	2,199	Wood frame, composition ext	1/2 Bsmt, 1/4 Crawl, Lower level	1A	Basement	G	--	--	--	WET
	Pemberwick RoadBuilding 2	15675	40.0	40.6	40.6	-4	-4	-2	-2	-1	-1	-1	-1	S	C	2	40,852	Brick	None	N	Unknown	G	--	--	--	--
	Pemberwick RoadBuilding 3	15998	40.0	42.3	42.3	0	0	1	1	3	3	4	4	S	C	2	40,852	Brick	None	N	Unknown	G	RW	RW	RW	RW
	Pemberwick Road	19390	119.0	120.4	88.8	-34	-2	-32	0	-31	1	-30	2	SB	C	3	54,720	Brick	Full Bsmt	N	Basement	G	--	RW	RW	RW
	Glenville Street	19780	128.0	110.8	101.3	3	13	4	14	5	14	5	15	SB	C	2	58,992	Brick	Full Bsmt	N	Basement	G	RW	RW	RW	RW
	Glenville Street	20352	118.0	120.3	120.3	-5	-5	-4	-4	-3	-3	-1	-1	S	R	1	2,848	Wood	None	2A	Slab	G	--	--	--	--
	Angelus Drive	20408	125.0	126.5	118.3	-11	-2	-10	-2	-9	-1	-6	2	SB	R	1	1,876	Wood	3/4 Bsmt, Lower level	N	Basement	G	--	--	--	WET
	Glenville StreetBldg 1	20440	122.0	124.0	119.2	-8	-3	-7	-2	-6	-2	-4	1	SB	R	2	2,072	Wood frame, vinyl exterior	3/4 Bsmt	1D	Basement	G	--	--	--	WET
	Glenville StreetBldg 2	20440	124.0	126.0	118.2	-10	-2	-9	-1	-9	-1	-6	2	SB	R	1	836	Wood frame, wood exterior	Full Bsmt	3BI	Basement	G	--	--	--	WET
	Angelus Drive	20475	125.0	126.8	117.3	-11	-1	-10	0	-9	0	-6	3	RR	R	1	1,902	Wood	1/4 Bsmt, Lower Level	1BI	Basement	G	--	WET	WET	WET
	Angelus Drive	21094	126.0	130.0	121.2	-13	-4	-12	-3	-11	-2	-9	0	RR	R	1	1,287	Wood	1/4 Bsmt, Lower level	1BI	Basement	G	--	--	--	DRY/WET
	Angelus Drive	21105	126.0	128.5	120.2	-12	-3	-10	-2	-9	-1	-7	1	RR	R	2	2,874	Wood	1/2 Bsmt, Lower level	1BI	Basement	G	--	--	--	DRY/WET
	Angelus Drive	21331	122.0	123.9	119.7	-6	-2	-5	-1	-4	0	-2	2	BL	R	1	1,627	Wood	1/2 Bsmt, Lower level	1BI	Basement	G	--	--	DRY/WET	DRY/WET
	Riversville Road	21635	124.5	128.3	123.8	-5	0	-4	0	-4	1	-3	1	SB	R	1.5	5,331	Wood	Full Bsmt	N	Basement	G	WET	WET	WET	WET
	Riversville Road	22041	127.0	127.2	127.2	-1	-1	-1	-1	0	0	0	0	SB	R	1	2,446	Brick frame, brick/wood ext	Bsmt	1BI	Basement	G	--	--	DRY/WET	DRY/WET
	Riversville RoadBuilding 1	22869	132.0	139.0	130.6	-11	-3	-10	-2	-9	-1	-8	0	RF	R	1	2,019	Wood	None	1D	Slab	G	--	--	--	WET
	Riversville RoadBuilding 2	22987	132.0	141.3	134.5	-13	-6	-12	-5	-11	-4	-10	-3	RF	R	1	1,485	Wood	None	N	Slab	G	--	--	--	--
	Riversville Road	23571	134.0	138.7	136.8	-7	-6	-5	-3	-3	-1	0	2	SB	R	2	11,612	Wood	Full Bsmt	N	Basement	G	--	--	--	DRY/WET
	Bailiwick Road	24130	133.0	134.3	134.3	0	0	1	1	2	2	5	5	SB	R	2	7,862	Wood frame, stucco exterior	Full Crawl	1A	Crawl Space	G	E	E	E	E
	Bailiwick Road	24300	136.0	138.8	136.3	-4	-2	-3	0	-2	1	0	3	S	R	1.5	4,907	Wood frame, wood exterior	None	2A	Slab	G	--	--	DRY/WET	DRY/WET

Attachment B

Byram River Basin Feasibility Study

Algorithm by Structure Type

Structure Type	Slab-on-Grade Foundation
Description	Structures that are constructed on a slab foundation at grade.
Assumptions	Structures will not be dry flood proofed for main floor flood depths greater than 2-feet.

Algorithm

Residential

- I. If $FE < GE$ then No Flood Proofing Required
- II. If $FE+1 < ME$ then No Flood Proofing Required
- III. If $FE+1 > ME$ then
 - a. If $FE+1 > ME+3$ then
 - i. If Poor Condition then Buyout
 - ii. Otherwise Elevation
 - b. If $FE+1 < ME+3$ then
 - i. If $FE+1 < GE+6$ then Dry Flood Proofing or Ringwall
 - ii. If $FE+1 > GE+6$ then Dry Flood Proofing

Nonresidential

- I. If $FE < GE$ then No Flood Proofing Required
- II. If Wood or Metal Construction Type then
 - a. If $FE+1 < ME$ then No Flood Proofing Required
 - b. If $FE+1 > ME$ then
 - i. If $FE+1 > ME+3$ then
 - 1. If Poor Condition then Buyout
 - 2. Otherwise Elevation
 - ii. If $FE+1 < ME+3$ then Dry Flood Proofing or Ringwall
- III. If Masonry Construction Type then
 - a. If $FE + 1 < ME$ then No Flood Proofing Required
 - b. If $FE + 1 > ME$ then
 - i. If $FE+1 > GE+3$ then Ringwall
 - ii. If $FE+1 < GE+3$ then Dry Flood Proofing or Ringwall

Structure Type Subgrade Basement

Description Subgrade Basement Structures contain a basement with all sides subgrade. Basements were considered to be one floor equivalent of space located below the main floor on a slab.

Assumptions

- All basements were considered unfinished and containing major utilities.
- All basement foundation types are unreinforced, 8" concrete masonry units (CMUs).
- Any dry flood proofing will be implemented in conjunction with wet flood proofing of the basement area.

Algorithm

Residential

- I. If $FE < GE$ then No Flood Proofing Required
- II. If $FE+1 > ME +3$ then
 - a. If Poor Condition then Buyout
 - b. Otherwise Elevation
- III. If $FE+1 < ME +3$ then
 - a. If $FE+1 > ME$ then
 - i. If $FE+1 < GE+6$ then Dry Flood Proofing or Ringwall
 - ii. If $FE+1 > GE+6$ then Dry Flood Proofing
 - b. If $FE+1 < ME$ then
 - i. If $FE+1 < GE+6$ then Wet Flood Proofing or Ringwall
 - ii. If $FE+1 > GE+6$ then Wet Flood Proofing

Nonresidential

- I. If $FE < GE$ then No Flood Proofing Required
- II. If Wood or Metal Construction Type then
 - a. If $FE +1 > ME +3$ then
 - i. If Poor Condition then Buyout
 - ii. Otherwise Elevation
 - b. If $FE+1 < ME +3$ then
 - i. If $FE+1 > ME$ then
 - 1. If $FE+1 < GE+6$ then Dry Flood Proofing or Ringwall
 - 2. If $FE+1 > GE+6$ then Dry Flood Proofing
 - ii. If $FE+1 < ME$ then
 - 1. If $FE+1 < GE+6$ then Wet Flood Proofing or Ringwall
 - 2. If $FE+1 > GE+6$ then Wet Flood Proofing
- III. If Masonry Construction Type then Ringwall

Structure Type	Elevated
Description	Structures elevated on posts, piles, piers, or extended walls.
Assumptions	No major utilities located below the main floor elevation.

Algorithm

Residential

- I. If $FE < GE$ then No Flood Proofing Required
- II. If $FE+1 > ME$ then
 - a. If $FE+1 > ME+3$ then
 - i. If Poor Condition then Buyout
 - ii. Otherwise Elevation
 - b. If $FE+1 < ME+3$ then
 - i. If $FE+1 < GE+6$ then Dry Flood Proofing or Ringwall
 - ii. If $FE+1 > GE+6$ then Dry Flood Proofing
- III. If $FE+1 < ME$ then No Flood Proofing Required

Nonresidential

Not Applicable

Structure Type Bi-Levels/Raised Ranches

Description Bi-Level structures consist of two stories, with the first story (typically a living space or garage) partially below grade. The second story (the main floor) is typically above the first story, with the main entrance located between the two stories.

Ranch Ranches consist of two stories, with the first story (typically a living space or garage) built slab-on-grade and the second story (the main floor) directly above the first story.

Assumptions -The first floor (lower portion) walls are masonry.
-The foundation is slab-on-grade.
-The main floor can be raised separately from the lower level.

Algorithm

Residential

- I. If $FE < GE$ then No Flood Proofing Required
- II. If $FE+1 > ME$ then
 - a. If Poor Condition then Buyout
 - b. Otherwise Elevation
- III. If $FE+1 < ME$ then
 - a. If $FE+1 < GE+3$ then Dry Flood Proofing or Ringwall
 - b. If $FE+1 > GE+3$ then
 - i. If $FE+1 < GE+6$ then Wet Flood Proofing or Ringwall
 - ii. If $FE+1 > GE+6$ then Wet Flood Proofing

Nonresidential

Not Applicable

Structure Type	Raised Foundations/Split Levels
Description	<p>Raised Foundation Structures contain a space below the main floor not big enough for a basement (typically a crawlspace).</p> <p>Split Levels consist of at least three levels, with the lower and upper level stacked, and the main floor level adjacent between the two. Each level is at a different elevation and connected by short stairways. The lower level is typically on a slab foundation and is living space and/or a garage. The main floor is typically on a raised foundation and is where the main entrance is located.</p>
Assumptions	<ul style="list-style-type: none"> -No major utilities are located in the crawl space. -In cases of dry flood proofing the crawl space will be flooded, and wet flood proofing should be implemented in the area. -The lower level is slab-on-grade. -The low level (lower portion) walls are masonry. -The main floor can be raised separately from the lower level. -Nonresidential flood proofing applies to raised foundation structure types only.

Algorithm

Residential

- I. If $FE < GE$ then No Flood Proofing Required
- II. If $FE+1 > ME+3$ then
 - a. If Poor Condition then Buyout
 - b. Otherwise Elevation
- III. If $FE+1 < ME+3$ then
 - a. If $FE+1 > ME$ then
 - i. If $FE+1 < GE+6$ then Dry Flood Proofing or Ringwall
 - ii. If $FE+1 > GE+6$ then Dry Flood Proofing
 - b. If $FE+1 < ME$ then
 - i. If $FE+1 < GE+6$ then Wet Flood Proofing or Ringwall
 - ii. If $FE+1 > GE+6$ then Wet Flood Proofing

Raised Foundation/Split Level Algorithm Continued...

Nonresidential

- I. If $FE < GE$ then No Flood Proofing Required
- II. If Wood or Metal Construction Type then
 - a. If $FE+1 > ME+3$ then
 - i. If Poor Condition then Buyout
 - ii. Otherwise Elevation
 - b. If $FE+1 < ME+3$ then
 - i. If $FE+1 > ME$ then
 - 1. If $FE+1 < GE+6$ then Dry Flood Proofing or Ringwall
 - 2. If $FE+1 > GE+6$ then Dry Flood Proofing
 - ii. If $FE+1 < ME$ then
 - 1. If $FE+1 < GE+6$ then Wet Flood Proofing or Ringwall
 - 2. If $FE+1 > GE+6$ then Wet Flood Proofing
- III. If Masonry Construction Type then
 - a. If $FE+1 > ME+3$ then Ringwall
 - b. If $FE+1 < ME+3$ then
 - i. If $FE+1 > ME$ then
 - 1. If $FE+1 < GE+6$ then Dry Flood Proofing or Ringwall
 - 2. If $FE+1 > GE+6$ then Dry Flood Proofing
 - ii. If $FE+1 < ME$ then
 - 1. If $FE+1 < GE+6$ then Wet Flood Proofing or Ringwall
 - 2. If $FE+1 > GE+6$ then Wet Flood Proofing

Structure Type	Large Residential
Description	Large Residential structures include apartments, townhouses, and multi-family units. Foundation types typical of large residential structures include slab-on-grade, raised foundation, and subgrade basement.
Assumptions	All assumptions made for slab-on-grade, raised foundation, and subgrade basements apply to large residential structures.

Algorithm

Residential

- I. If $FE < GE$ then No Flood Proofing Required
- II. If Subgrade Basement then
 - a. If $FE+1 > ME$ then
 - i. If Multi-Family Structure with Footprint > 2000 sf, Apartment or Townhouse then Ringwall
 - ii. If Multi-Family Structure with Footprint < 2000 sf then
 1. If Poor Condition then Buyout
 2. Otherwise Elevation
 - b. If $FE+1 < ME$ then
 - i. If $FE+1 < GE+6$ then Wet Flood Proofing or Ringwall
 - ii. If $FE+1 > GE+6$ then Wet Flood Proofing
- III. If Slab-On-Grade or Raised Foundation then
 - a. If $FE+1 > ME$ then
 - i. If Apartment or Townhouse then Ringwall
 - ii. If Multi-Family Structure then
 1. If $FE+1 < GE+3$ then Dry Flood Proofing or Ringwall
 2. If $FE+1 > GE+3$ then
 - a. If Footprint of Structure is > 2000 sf then Ringwall
 - b. If Footprint of Structure is < 2000 sf then
 - i. If Poor Condition then Buyout
 - ii. Otherwise Elevation
 - b. If $FE+1 < ME$ then No Flood Proofing Required

Nonresidential

Not Applicable

Attachment C

Byram River Basin Feasibility Study
Nonstructural Evaluation – Task 2.2.g Recommendation Summaries

Table C.1 Summary of Recommendations (10-Percent Storm Event)

Structure Type	Flood Proofing Measure				
	Dry	Wet	Ringwall	Elevation	Acquisition
Slab-on-Grade	-	-	4	1	-
Subgrade Basement*	4	-	1	18	1
Elevated	-	-	-	-	-
Bi-Levels*	-	-	-	1	-
Raised Ranch	-	1	-	7	-
Raised Foundation*	-	-	-	1	-
Split Level*	1	-	-	1	-
Large Residential	-	-	6	-	-
Flood Proofing Measures Total	5	1	11	29	1

* Dry Flood Proofing entails wet flood proofing of areas below the main floor elevation and dry flood proofing of areas impacted above the main floor elevation.

Table C.2 Summary of Recommendations (1-Percent Storm Event)

Structure Type	Flood Proofing Measure				
	Dry	Wet	Ringwall	Elevation	Acquisition
Slab-on-Grade	4	-	4	2	-
Subgrade Basement*	34	55	1	28	1
Elevated	1	-	-	-	-
Bi-Levels*	1	1	-	1	-
Raised Ranch*	6	28	-	15	-
Raised Foundation	-	2	-	3	-
Split Level*	1	7	-	1	-
Large Residential	-	-	6	-	-
Flood Proofing Measures Total	47	93	11	50	1

* Dry Flood Proofing entails wet flood proofing of areas below the main floor elevation and dry flood proofing of areas impacted above the main floor elevation.

Table C.3 Summary of Recommendations (0.2-Percent Storm Event)

Structure Type	Flood Proofing Measure				
	Dry	Wet	Ringwall	Elevation	Acquisition
Slab-on-Grade	5	-	6	4	-
Subgrade Basement*	48	85	1	62	2
Elevated	2	-	-	1	-
Bi-Levels*	1	-	-	3	-
Raised Ranch	2	19	-	40	-
Raised Foundation*	5	8	-	4	-
Split Level*	12	4	-	2	-
Large Residential	-	-	6	-	-
Flood Proofing Measures Total	75	116	13	116	2

** Dry Flood Proofing entails wet flood proofing of areas below the main floor elevation and dry flood proofing of areas impacted above the main floor elevation.*

Attachment D

BYRAM RIVER BASIN FEASIBILITY STUDY
NONSTRUCTURAL PLAN WITH ROUTE 1 BRIDGE REPLACEMENT - RECOMMENDATIONS

Flood Depth equals 0, Recommendation based on 1-foot of freeboard
Flood Depth between 0 and 2 feet
Flood Depth greater than 2-feet

User Input
Calculated

NOTE:	DRY/WET entails wet floor proofing of areas below the main floor elevation, including protection/raising of utilities where necessary, and dry flood proofing for the area above the main floor elevation.
-------	--

	STREET NAME	BYRAM RIVER STATION	GE	ME	LE	FD								STRUCTURE										CONDITION	RECOMMENDATION			
			GROUND ELEVATION AT BUILDING	SURVEYED MAIN FLOOR ELEVATION	SURVEYED LOW OPENING ELEVATION	DEPTH OF 10% FLOODING VS. FIRST FLOOR	DEPTH OF 10% FLOODING VS. LOW OPENING	DEPTH OF 4% FLOODING VS. FIRST FLOOR	DEPTH OF 4% FLOODING VS. LOW OPENING	DEPTH OF 2% FLOODING VS. FIRST FLOOR	DEPTH OF 2% FLOODING VS. LOW OPENING	DEPTH OF 1% FLOODING VS. FIRST FLOOR	DEPTH OF 1% FLOODING VS. LOW OPENING	STRUCTURE TYPE	LAND USE TYPE	# OF FLOORS	TOTAL SQ. FT.	CONSTRUCTION TYPE	BASEMENT	GARAGE TYPE	FOUNDATION TYPE	10-PERCENT FLOOD	4-PERCENT FLOOD		2-PERCENT FLOOD	1-PERCENT FLOOD		
	Hillside Avenue	9512	16.0	18.3	18.3	-8	-8	-7	-7	-6	-6	-5	-5	S	C	1.5	1,959	Brick	None	N	Unknown	G	--	--	--	--		
	Riverdale Avenue	9591	8.0	14.6	8.8	-5	1	-3	3	-2	4	-1	5	S	C	2	34,584	Brick	None	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9612	15.0	25.7	16.9	-16	-7	-14	-5	-13	-4	-12	-3	RR	R	2	4,056	Wood	Bsmt	2Bl	Unknown	G	--	--	--	--		
	Riverdale Avenue	9668	10.5	16.8	8.7	-7	2	-5	3	-4	4	-3	5	SB - M	R	2	1,568	Wood	Bsmt	N	Unknown	G	RW	RW	RW	RW		
	Riverdale Avenue	9668	13.0	27.4	15.2	-17	-5	-16	-3	-15	-2	-14	-1	SB	R	2.5	2,786	Wood	Bsmt	2D	Unknown	P	--	--	--	--		
	Riverdale Avenue	9680	10.5	16.8	8.7	-7	2	-5	3	-4	4	-3	5	SB - M	R	2	1,352	Wood	Bsmt	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9686	10.5	16.7	8.6	-7	2	-5	3	-4	4	-3	5	SB - M	R	2	1,516	Composition	Bsmt	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9698	10.5	16.9	8.8	-7	1	-5	3	-4	4	-3	5	SB - M	R	2	1,506	Wood	Bsmt	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9718	10.5	16.7	8.6	-6	2	-5	3	-4	4	-3	5	SB - M	R	2	1,516	Wood	Bsmt	N	Unknown	G	RW	RW	RW	RW		
	Riverdale Avenue	9727	11.0	16.8	8.7	-7	2	-5	3	-4	4	-3	5	SB - M	R	2	1,498	Wood	Bsmt	N	Unknown	F	RW	RW	RW	RW		
	Riverdale Avenue	9727	13.0	27.2	19.2	-17	-9	-16	-8	-14	-6	-13	-5	RR	R	2	4,250	Wood	Bsmt	1Bl	Unknown	G	--	--	--	--		
	Riverdale Avenue	9761	11.0	15.3	9.2	-5	1	-4	3	-2	4	-1	5	RF	R	2	2,349	Stucco	Bsmt	1D	Unknown	F	WET	WET	WET	WET		
	Riverdale Avenue	9761	14.0	26.4	18.3	-16	-8	-15	-7	-14	-5	-13	-4	RR	R	2	2,076	Wood	Bsmt	1Bl	Unknown	G	--	--	--	--		
	West Putnam Avenue Lot 48A	9771	18.0	19.6	16.7	-9	-6	-8	-5	-7	-4	-6	-3	S	C	3	140,445	Reinforced Concrete	None	N	Slab	G	--	--	--	--		
	Riverdale Avenue	9786	12.0	16.2	9.1	-6	1	-4	3	-3	4	-2	5	SB	R	2	1,294	Wood - Alum/Vinyl	Bsmt	1D	Unknown	G	WET	WET	WET	WET		
	Riverdale Avenue	9798	14.0	14.8	14.7	-5	-4	-3	-3	-2	-2	-1	-1	RR	R	2	2,588	Wood	Bsmt	1Bl	Unknown	G	--	--	--	--		
	Riverdale Avenue	9811	12.0	15.9	12.6	-6	-2	-4	-1	-3	0	-2	1	SB	R	2	1,620	Alum/Vinyl	Bsmt	N	Unknown	F	--	--	WET	WET		
	Riverdale Avenue	9835	12.0	15.9	8.4	-5	2	-4	4	-3	5	-2	6	SB	R	2	2,300	Wood	Bsmt	N	Unknown	F	WET	WET	WET	WET		
	Riverdale Avenue	9860	14.5	19.1	16.0	-9	-6	-7	-4	-6	-3	-5	-2	SB	R	2.5	1,616	Wood	Bsmt	1D	Unknown	F	--	--	--	--		
	Riverdale Avenue	9873	13.0	17.0	8.9	-7	1	-5	3	-4	4	-3	5	SB	R	2	2,008	Wood	Bsmt	N	Unknown	P	WET	WET	WET	WET		
	Riverdale Avenue	9885	15.0	19.3	16.8	-9	-6	-7	-5	-6	-4	-5	-3	SB	R	2.5	2,756	Wood	Bsmt	2D	Unknown	G	--	--	--	--		
	Riverdale Avenue	9910	13.0	17.0	12.0	-6	-1	-5	0	-4	1	-3	2	RF	R	2	2,342	Alum/Vinyl	Bsmt	N	Slab	G	--	WET	WET	WET		
	Riverdale Avenue	9922	15.0	20.1	17.5	-10	-7	-8	-5	-7	-4	-6	-3	SB	R	2	2,356	Wood	Bsmt	3D	Unknown	G	--	--	--	--		
	Riverdale Avenue	9947	15.0	18.7	12.9	-8	-2	-7	-1	-5	0	-4	1	SB	R	2	1,834	Stucco	Bsmt	1D	Unknown	G	--	--	WET	WET		
	Riverdale Avenue	9960	17.0	22.5	20.3	-12	-10	-10	-8	-9	-7	-8	-6	SB	R	2.5	3,140	Wood	Bsmt	N	Unknown	G	--	--	--	--		
	Riverdale Avenue	9972	17.0	19.1	11.9	-9	-1	-7	0	-6	1	-5	3	SB	R	2		Wood	Bsmt	2D	Unknown	G	--	WET	WET	WET		
	Riverdale Avenue	10022	19.0	21.0	14.2	-10	-4	-9	-2	-7	-1	-6	0	SB	R	2		Wood	Bsmt	3D	Unknown	F	--	--	--	WET		
	Riverdale Avenue	10066	22.0	23.2	16.8	-12	-6	-11	-4	-10	-3	-8	-2	SB	R	2		Wood	Bsmt	N	Unknown	F	--	--	--	--		
	Riverdale Avenue	10111	24.0	26.3	18.8	-15	-8	-14	-6	-13	-5	-11	-4	SB	R	2		Wood	Bsmt	N	Unknown	G	--	--	--	--		
	Homestead Lane	10129	12.0	14.1	10.8	-3	0	-2	2	0	3	1	4	SB	R	1	810	Wood	Full Bsmt	N	Basement	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Homestead Lane	10155	12.0	15.7	13.6	-5	-3	-3	-1	-2	0	-1	1	SB	R	2	2,502	Wood frame, vinyl exterior	Full Bsmt	N	Basement	G	--	--	WET	WET		
	Homestead Lane	10172	10.0	11.5	10.7	-1	0	1	2	2	3	3	4	S	R	2	1,486	Wood	None	1Bl	Slab	G	E	E	E	E		
	Homestead Lane	10182	10.0	11.5	10.5	-1	0	1	2	2	3	3	4	RF	R	1	1,011	Wood	Full Crawl	N	Crawl Space	G	E	E	E	E		
	Homestead Lane	10203	10.0	14.3	10.1	-3	1	-2	2	0	4	1	5	SB	R	2	2,222	Wood frame, aluminum ext	1/2 Bsmt	N	Basement	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Homestead Lane	10227	10.0	10.9	7.9	0	3	2	5	3	6	4	7	SB	R	1	1,520	Wood frame, vinyl exterior	3/4 Bsmt, 1/4 Crawl	1D	Basement	F	E	E	E	E		
	Homestead Lane	10327	10.0	18.2	9.3	-7	2	-5	3	-4	5	-3	6	RR	R	2	3,434	Wood frame, vinyl exterior	1/4 Bsmt, Lower level	1Bl	Basement	G	WET	WET	WET	WET		
	Pemberwick Road	10459	28.0	32.1	27.2	-21	-16	-19	-14	-18	-13	-17	-12	SB	R	2	2,876	Wood frame, vinyl exterior	1/2 Bsmt	N	Basement	G	--	--	--	--		
	Homestead Lane	10500	10.0	14.7	11.4	-3	0	-2	2	-1	3	0	4	SB	R	2	2,424	Wood	Full Bsmt	N	Basement	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Homestead Lane Lot 485, 486	10569	12.0	17.8	11.3	-6	0	-5	2	-4	3	-3	4	RR	R	2		Wood	Full Bsmt	2Bl	Basement	-	WET	WET	WET	WET		
	Homestead Lane Lot 487, 488	10660	12.0	16.2	9.7	-4	2	-3	3	-2	5	-1	6	SB	R	2	3,646	Wood	Full Bsmt	2Bl	Basement	G	WET	WET	WET	WET		
	Pemberwick Road	10694	30.0	32.3	18.3	-20	-6	-19	-5	-18	-4	-17	-3	SB	R	2	2,860	Wood frame, vinyl exterior	Full Bsmt	2Bl	Basement	G	--	--	--	--		
	Den Lane	10699	11.0	13.5	13.5	-1	-1	0	0	1	1	2	2	S	U	1	146	Brick	None	N	Slab	G	--	RW	RW	RW		
	P																											

BYRAM RIVER BASIN FEASIBILITY STUDY
NONSTRUCTURAL PLAN WITH ROUTE 1 BRIDGE REPLACEMENT - RECOMMENDATIONS

Flood Depth equals 0, Recommendation based on 1-foot of freeboard
Flood Depth between 0 and 2 feet
Flood Depth greater than 2-feet

User Input
Calculated

NOTE:	DRY/WET entails wet floor proofing of areas below the main floor elevation, including protection/raising of utilities where necessary, and dry flood proofing for the area above the main floor elevation.
-------	--

HOUSE #	STREET NAME	BYRAM RIVER STATION	GE	ME	LE	FD								STRUCTURE										CONDITION	RECOMMENDATION			
			GROUND ELEVATION AT BUILDING	SURVEYED MAIN FLOOR ELEVATION	SURVEYED LOW OPENING ELEVATION	DEPTH OF 10% FLOODING VS. FIRST FLOOR	DEPTH OF 10% FLOODING VS. LOW OPENING	DEPTH OF 4% FLOODING VS. FIRST FLOOR	DEPTH OF 4% FLOODING VS. LOW OPENING	DEPTH OF 2% FLOODING VS. FIRST FLOOR	DEPTH OF 2% FLOODING VS. LOW OPENING	DEPTH OF 1% FLOODING VS. FIRST FLOOR	DEPTH OF 1% FLOODING VS. LOW OPENING	STRUCTURE TYPE	LAND USE TYPE	# OF FLOORS	TOTAL SQ. FT.	CONSTRUCTION TYPE	BASEMENT	GARAGE TYPE	FOUNDATION TYPE	10-PERCENT FLOOD	4-PERCENT FLOOD		2-PERCENT FLOOD	1-PERCENT FLOOD		
	Hollow Wood Lane Unit 1/2	11562	14.0	22.9	14.6	-9	-1	-8	1	-7	2	-6	3	RR	R	2	2,200	Wood frame, composition ext	Full Bsmt	2BI	Basement	G	--	WET	WET	WET		
	Hollow Wood Lane	11606	15.0	23.0	14.7	-9	-1	-8	0	-7	2	-6	2	RR	R	2	2,852	Wood	Full Bsmt	2BI	Basement	F	--	DRY/WET	DRY/WET	DRY/WET		
	Hollow Wood Lane	11606	14.0	19.3	11.6	-5	2	-4	4	-3	5	-2	6	RR	R	2	1,838	Wood	Full Bsmt	N	Basement	G	WET	WET	WET	WET		
	River Street	11606	13.0	17.8	13.5	-4	0	-3	2	-2	3	-1	4	SB	R	2	2,952	Brick/wood	Full Bsmt	N	Basement	G	WET	WET	WET	WET		
	Pemberwick Road Building 1	11662	22.0	23.4	17.7	-9	-4	-8	-2	-7	-1	-6	0	SB	R	2	2,658	Wood frame, stucco exterior	Full Bsmt	N	Basement	F	--	--	--	WET		
	Pemberwick Road Building 2	11703	17.0	16.8	16.8	-3	-3	-1	-1	0	0	1	1	SB	R	2	2,246	Wood	Full Bsmt	N	Basement	F	--	--	DRY/WET	DRY/WET		
	Hollow Wood Lane	11751	15.0	23.1	14.9	-9	-1	-8	1	-7	2	-6	3	RR	R	2	2,878	Wood	Full Bsmt	2BI	Basement	G	--	WET	WET	WET		
	Pemberwick Road	11767	22.0	23.8	18.6	-9	-4	-8	-3	-7	-2	-6	-1	SB	R	2	3,608	Wood frame, vinyl exterior	Full Bsmt	N	Basement	G	--	--	--	--		
	Hollow Wood Lane	11779	14.0	19.2	14.7	-5	0	-4	1	-3	2	-2	3	SB	R	2	1,838	Wood frame, aluminum ext	Full Bsmt	2D	Basement	G	WET	WET	WET	WET		
	River Street	11779	12.5	20.9	13.0	-7	1	-5	3	-4	4	-3	5	RR	R	2	2,998	Brick/wood	Full Bsmt	2BI	Basement	F	WET	WET	WET	WET		
	Hollow Wood Lane	11841	14.0	16.1	14.1	-2	0	0	2	1	3	2	4	SB	R	2	1,884	Wood	Full Bsmt	1D	Basement	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Pemberwick Road	11847	18.0	21.9	18.5	-7	-4	-6	-3	-5	-2	-4	-1	SB	R	2	3,324	Wood frame, stucco exterior	Full Bsmt	N	Basement	G	--	--	--	--		
	Hollow Wood Lane	11848	15.0	19.1	16.5	-5	-2	-3	-1	-2	0	-1	1	SB	R	2	2,512	Wood frame, stucco exterior	Full Bsmt	2D	Basement	F	--	--	WET	WET		
	Monica Road	11868	14.0	19.2	16.1	-5	-2	-3	0	-2	1	-1	2	SB	R	1	2,314	Wood frame, aluminum ext	Full Bsmt	1A	Basement	G	--	WET	WET	WET		
	Monica Road	11868	16.5	21.6	18.3	-7	-4	-6	-2	-5	-1	-4	0	SB	R	2	3,326	Wood frame, stucco exterior	Full Bsmt	N	Basement	G	--	--	--	WET		
	Hollow Wood Lane Unit B	11878	16.0	22.1	17.2	-8	-3	-6	-1	-5	0	-4	1	BL	R	2	3,482	Wood	1/4 Bsmt	2BI	Basement	G	--	--	DRY/WET	DRY/WET		
	Hollow Wood Lane	11880	14.0	18.0	14.1	-3	0	-2	2	-1	3	0	4	SB	R	1	1,549	Wood	Full Bsmt	N	Basement	G	DRY/WET	DRY/WET	DRY/WET	DRY/WET		
	Pemberwick Road	11908	18.0	20.8	17.1	-6	-3	-5	-1	-4	0	-3	1	SB	R	2	2,842	Wood frame, stucco exterior	Full Bsmt	N	Basement	G	--	--	--	WET		
	Pemberwick Road	11910	20.0	20.4	20.4	-6	-6	-5	-5	-4	-4	-3	-3	S	R/C	2	6,642	Wood/Masonry	None	N	Slab	F	--	--	--	--		
	Pemberwick Road	11933	18.5	23.7	16.7	-9	-2	-8	-1	-7	0	-6	1	SB	R	1.5	1,947	Wood frame, stone/stucco ex	Full Bsmt	N	Basement	G	--	--	--	WET		
	Monica Road	11961	16.5	16.4	8.4	-2	6	-1	7	0	8	1	9	RR	R	2	3,716	Brick/Stone	None	N	Slab	G	--	--	E	E		
	Pemberwick Road	11962	18.0	20.8	15.9	-6	-1	-5	0	-4	1	-3	2	SL	R	1.5	3,107	Wood frame, brick/vinyl ext	1/2 Bsmt, 1/4 Crawl, Lower level	1BI	Basement/Crawl	G	--	--	--	WET		
	Monica Road	11966	14.5	17.8	15.4	-3	-1	-2	0	-1	1	0	2	SB	R	2	2,034	Wood frame, vinyl exterior	3/4 Bsmt, 1/4 Crawl	1D	Basement	G	--	DRY/WET	DRY/WET	DRY/WET		
	Monica Road	11969	14.0	18.4	15.7	-4	-1	-3	0	-2	1	-1	2	SB	R	2	2,778	Brick/wood	Full Bsmt	1A	Basement	G	--	WET	WET	WET		
	Monica Road	11969	15.0	17.9	16.5	-3	-2	-2	-1	-1	0	0	1	SB	R	1	1,026	Wood frame, vinyl exterior	Full Bsmt	1D	Basement	G	--	--	DRY/WET	DRY/WET		
	Monica Road	11976	14.0	19.5	15.1	-5	-1	-4	1	-3	2	-2	3	SB	R	1	1,684	Wood frame, vinyl exterior	Full Bsmt	1A	Basement	G	--	WET	WET	WET		
	Monica Road	11976	16.0	19.5	17.6	-5	-3	-4	-2	-3	-1	-2	0	SB	R	1	1,569	Wood frame, vinyl/brick	3/4 Bsmt, 1/4 Crawl	N	Basement/Crawl	G	--	--	--	WET		
	Lucy Street	11990	16.0	20.8	11.9	-6	3	-5	4	-4	5	-3	6	RR	R	2	4,392	Wood frame, vinyl exterior	None	2BI	Slab	E	WET	WET	WET	WET		
	Pemberwick Road	11990	19.5	27.5	20.0	-13	-6	-12	-4	-11	-3	-10	-2	RR	R	2.5	4,398	Wood frame, aluminum ext	Full Bsmt, Lower level	N	Basement	G	--	--	--	--		
	Pemberwick Road	12000	18.0	22.4	17.4	-8	-3	-7	-2	-6	-1	-5	0	SB	R	2	4,162	Wood frame, Brick exterior	Full Bsmt	N	Basement	G	--	--	--	WET		
	Lucy Street	12097	16.0	20.4	17.9	-6	-3	-5	-2	-3	-1	-3	0	SB	R	1	1,446	Wood frame, Brick exterior	Full Bsmt	N	Basement	G	--	--	--	WET		
	Lucy Street	12100	17.0	18.1	18.1	-4	-4	-2	-2	-1	0	0	0	SB	R	2	3,474	Wood frame, vinyl exterior	Full Bsmt	1D	Basement	G	--	--	--	DRY/WET		
	Lucy Street	12100	14.5	20.8	15.8	-6	-1	-5	0	-4	1	-3	2	SL	R	2	6,250	Wood frame, stucco exterior	1/2 Bsmt, Lower level	2BI	Basement	G	--	WET	WET	WET		
	Lucy Street	12102	16.0	24.5	16.8	-10	-2	-9	-1	-8	0	-7	1	RR	R	2	3,198	Brick	Full Bsmt	2BI	Basement	G	--	--	DRY/WET	DRY/WET		
	Lucy Street	12107	16.0	23.7	15.7	-9	-1	-8	0	-7	1	-6	2	RR	R	2	3,282	Brick	Full Bsmt	N	Basement	F	--	DRY/WET	DRY/WET	DRY/WET		
	Lucy Street	12174	18.0	22.9	18.0	-8	-4	-7	-2	-6	-1	-5	0	SB	R	1	849	Wood frame, vinyl exterior	Full Bsmt	N	Basement	G	--	--	--	WET		
	Lucy Street	12183	16.0	24.0	15.8	-9	-1	-8	0	-7	1	-6	2	RR	R	2	3,748	Wood frame, Brick exterior	1/4 Bsmt, Lower level	1BI	Basement	G	--	--	DRY/WET	DRY/WET		
	Lucy Street	12183	16.0	23.4	15.7	-9	-1	-8	0	-7	1	-6	2	SB	R	2	3,682	Wood frame, Brick exterior	Full Bsmt	2BI	Basement	G	--	--	WET	WET		
	Lucy Street	12222	16.0	23.2	17.2	-9	-3	-7	-1	-6	0	-5	1	SB	R	1	1,389	Wood frame, vinyl exterior	Full Bsmt	1D	Basement	G	--	--	WET	WET		
	Pemberwick Road	12224	19.0	23.5	17.6	-9	-3	-8	-2	-7	-1	-6	0	SB	R	2	3,416	Wood frame, brick/wood ext	Full Bsmt	1A	Basement	G	--	--	--	WET		
	Lucy Street	12248	16.0	22.2	16.5	-8	-2	-6	-1	-5	0	-4	1	RR	R	2	2,61											

BYRAM RIVER BASIN FEASIBILITY STUDY
NONSTRUCTURAL PLAN WITH ROUTE 1 BRIDGE REPLACEMENT - RECOMMENDATIONS

Flood Depth equals 0, Recommendation based on 1-foot of freeboard
Flood Depth between 0 and 2 feet
Flood Depth greater than 2-feet

User Input
Calculated

NOTE:	DRY/WET entails wet floor proofing of areas below the main floor elevation, including protection/raising of utilities where necessary, and dry flood proofing for the area above the main floor elevation.
-------	--

	STREET NAME	BYRAM RIVER STATION	GE	ME	LE	FD								STRUCTURE								CONDITION	RECOMMENDATION			
			GROUND ELEVATION AT BUILDING	SURVEYED MAIN FLOOR ELEVATION	SURVEYED LOW OPENING ELEVATION	DEPTH OF 10% FLOODING VS. FIRST FLOOR	DEPTH OF 10% FLOODING VS. LOW OPENING	DEPTH OF 4% FLOODING VS. FIRST FLOOR	DEPTH OF 4% FLOODING VS. LOW OPENING	DEPTH OF 2% FLOODING VS. FIRST FLOOR	DEPTH OF 2% FLOODING VS. LOW OPENING	DEPTH OF 1% FLOODING VS. FIRST FLOOR	DEPTH OF 1% FLOODING VS. LOW OPENING	STRUCTURE TYPE	LAND USE TYPE	# OF FLOORS	TOTAL SQ. FT.	CONSTRUCTION TYPE	BASEMENT	GARAGE TYPE	FOUNDATION TYPE		10-PERCENT FLOOD	4-PERCENT FLOOD	2-PERCENT FLOOD	1-PERCENT FLOOD
	Rex Street	12962	19.5	23.1	19.2	-8	-5	-7	-3	-6	-2	-5	-1	SB	R	1.5	1,976	Wood frame, vinyl exterior	Full Bsmt	1D	Basement	G	--	--	--	--
	Pemberwick Road	13125	26.0	28.6	19.7	-14	-5	-13	-4	-12	-3	-11	-2	SB	R	2	2,162	Brick frame, brick/vinyl ext	1/2 Bsmt, Lower level	N	Basement	G	--	--	--	--
	Pemberwick Road	13223	26.5	28.0	21.2	-13	-7	-12	-5	-11	-4	-10	-3	SB	R	2	3,922	Wood frame, Brick exterior	1/2 Bsmt, Lower level	N	Basement	G	--	--	--	--
	Halock Drive	13263	19.5	21.9	20.1	-7	-6	-6	-4	-5	-3	-4	-2	SB	R	1.5	2,703	Wood	Full Bsmt	2Bl	Basement	F	--	--	--	--
	Halock Drive	13292	19.0	21.4	19.6	-7	-5	-6	-4	-4	-3	-3	-2	SB	R	2	2,984	Wood frame, vinyl exterior	3/4 Bsmt, 1/4 Crawl	2Bl	Basement	G	--	--	--	--
	Halock Drive	13334	19.0	21.4	19.0	-7	-5	-6	-3	-5	-2	-4	-1	SL	R	1.5	2,229	Wood frame, vinyl exterior	1/2 Bsmt, Lower level	2A	Basement	G	--	--	--	--
	Halock Drive	13350	18.5	20.8	18.6	-6	-4	-5	-3	-4	-2	-3	-1	SL	R	1.5	3,230	Wood frame, vinyl exterior	1/4 Bsmt, 1/4 Crawl, Lower level	1A	Basement	F	--	--	--	--
	Halock Drive	13376	18.0	19.8	18.0	-5	-4	-4	-2	-3	-1	-2	0	SB	R	1.5	1,757	Wood	1/2 Bsmt, Lower level	1A	Basement	P	--	--	--	--
	Halock Drive	13531	19.0	21.7	19.3	-8	-5	-6	-4	-5	-3	-5	-2	SL	R	1.5	2,568	Wood frame, vinyl exterior	1/4 Bsmt, 1/4 Crawl, Lower level	2A	Basement	G	--	--	--	--
	Halock Drive	13564	19.0	21.3	20.2	-7	-6	-6	-5	-5	-4	-4	-3	SL	R	1.5	1,680	Wood frame, vinyl exterior	3/4 Bsmt, 1/4 Crawl	1A	Basement	G	--	--	--	--
	Halock Drive	13723	19.0	20.8	18.4	-5	-2	-4	-1	-3	-1	-2	0	SL	R	1.5	2,199	Wood frame, composition ext	1/2 Bsmt, 1/4 Crawl, Lower level	1A	Basement	G	--	--	--	--
	Pemberwick Road Building 2	15675	40.0	40.6	40.6	-4	-4	-2	-2	-1	-1	-1	-1	S	C	2	40,852	Brick	None	N	Unknown	G	--	--	--	--
	Pemberwick Road Building 3	15998	40.0	42.3	42.3	0	0	1	1	3	3	4	4	S	C	2	40,852	Brick	None	N	Unknown	G	RW	RW	RW	RW
	Pemberwick Road	19390	119.0	120.4	88.8	-34	-2	-32	0	-31	1	-30	2	SB	C	3	54,720	Brick	Full Bsmt	N	Basement	G	--	--	RW	RW
	Glenville Street	19780	128.0	110.8	101.3	3	13	4	14	5	14	5	15	SB	C	2	58,992	Brick	Full Bsmt	N	Basement	G	RW	RW	RW	RW
	Glenville Street	20352	118.0	120.3	120.3	-5	-5	-4	-4	-3	-3	-1	-1	S	R	1	2,848	Wood	None	2A	Slab	G	--	--	--	--
	Angelus Drive	20408	125.0	126.5	118.3	-11	-2	-10	-2	-9	-1	-6	2	SB	R	1	1,876	Wood	3/4 Bsmt, Lower level	N	Basement	G	--	--	--	WET
	Glenville Street Bldg 1	20440	122.0	124.0	119.2	-8	-3	-7	-2	-6	-2	-4	1	SB	R	2	2,072	Wood frame, vinyl exterior	3/4 Bsmt	1D	Basement	G	--	--	--	WET
	Glenville Street Bldg 2	20440	124.0	126.0	118.2	-10	-2	-9	-1	-9	-1	-6	2	SB	R	1	836	Wood frame, wood exterior	Full Bsmt	3Bl	Basement	G	--	--	--	WET
	Angelus Drive	20475	125.0	126.8	117.3	-11	-1	-10	0	-9	0	-6	3	RR	R	1	1,902	Wood	1/4 Bsmt, Lower Level	1Bl	Basement	G	--	--	WET	WET
	Angelus Drive	21094	126.0	130.0	121.2	-13	-4	-12	-3	-11	-2	-9	0	RR	R	1	1,287	Wood	1/4 Bsmt, Lower level	1Bl	Basement	G	--	--	--	DRY/WET
	Angelus Drive	21105	126.0	128.5	120.2	-12	-3	-10	-2	-9	-1	-7	1	RR	R	2	2,874	Wood	1/2 Bsmt, Lower level	1Bl	Basement	G	--	--	--	DRY/WET
	Angelus Drive	21331	122.0	123.9	119.7	-6	-2	-5	-1	-4	0	-2	2	BL	R	1	1,627	Wood	1/2 Bsmt, Lower level	1Bl	Basement	G	--	--	DRY/WET	DRY/WET
	Riversville Road	21635	124.5	128.3	123.8	-5	0	-4	0	-4	1	-3	1	SB	R	1.5	5,331	Wood	Full Bsmt	N	Basement	G	WET	WET	WET	WET
	Riversville Road	22041	127.0	127.2	127.2	-1	-1	-1	-1	0	0	0	0	SB	R	1	2,446	Brick frame, brick/wood ext	Bsmt	1Bl	Basement	G	--	--	DRY/WET	DRY/WET
	Riversville Road Building 1	22869	132.0	139.0	130.6	-11	-3	-10	-2	-9	-1	-8	0	RF	R	1	2,019	Wood	None	1D	Slab	G	--	--	--	WET
	Riversville Road Building 2	22987	132.0	141.3	134.5	-13	-6	-12	-5	-11	-4	-10	-3	RF	R	1	1,485	Wood	None	N	Slab	G	--	--	--	--
	Riversville Road	23571	134.0	138.7	136.8	-8	-6	-5	-3	-3	-1	-3	-1	SB	R	2	11,612	Wood	Full Bsmt	N	Basement	G	--	--	--	--
	Balliwick Road	24130	133.0	134.3	134.3	0	0	1	1	2	2	3	3	SB	R	2	7,862	Wood frame, stucco exterior	Full Crawl	1A	Crawl Space	G	E	E	E	E
	Balliwick Road	24300	136.0	138.8	136.3	-4	-2	-3	-1	-2	0	-2	1	S	R	1.5	4,907	Wood frame, wood exterior	None	2A	Slab	G	--	--	DRY/WET	DRY/WET