Village of Winnetka, Illinois

Repetitive Loss Area Analysis – Area #2

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Village of Winnetka, Illinois
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TABLE OF CONTENTS

Section — Page No.

EXECUTIVE SUMMARY

1. BACKGROUND

1.1 Problem Statement 6
1.2 National Flood Insurance Program 6
1.3 Community Rating System 7
1.4 Repetitive Loss Area 7

2. REPETITIVE LOSS AREA ANALYSIS

2.1 Step 1 – Advise the Residents 10
2.2 Step 2 – Collect Data 10
2.2.1 Previous Studies and Plans 10
2.2.2 Flood Insurance and Flood Event Data 11
2.2.3 Flooding Experiences of Property Owners 11
2.3 Step 3 – Inspect Buildings 11
2.4 Step 4 – Review Alternatives 12
2.4.1 Preventative 13
2.4.2 Property Protection 13
2.4.3 Natural Resource Protection 19
2.4.4 Emergency Services 19
2.4.5 Structural Projects 20
2.4.6 Public Information 20
2.5 Step 5- Document the Findings 20

3. NEXT STEPS

3.1 Recommendations 21
3.2 Funding Assistance 22
3.3 Continuation 23

4. WORKS CITED

LIST OF FIGURES

Figure		Page No.
1	Repetitive Loss Areas in Winnetka	8
2	Repetitive Loss Area #2	9
3	Categories of Floodplain Management Activities (FEMA FIA-15, 2013)	12
4	Wet Floodproofing Example (FEMA P-312, December 2009)	14
5	Dry Floodproofing (FEMA P-312, December 2009)	15
6	New Brick Veneer Over Waterproof Coating FEMA P-312, December 2009	15
7	Driveway Berm	16
8	Raised Concrete Window Well	16
9	Glass Block Basement Windows	17
10	Elevated House	18
11	Common Flood Hazards and Typical Suggested Solutions	21
12	Eligible Activities by Hazard Mitigation Assistance Program (FEMA Hazard Mitigation Assistance Unified Guidance, July 2013)	23

LIST OF APPENDICES

Appendix	Page No.
Appendix A: Resident Survey	25
Appendix B: Letters to the Residents	27
Appendix C: Data Collection Correspondence	31
Appendix D: Summary of Inspection Results	33
Appendix E: Floodproofing Methods	34

ATTACHMENT

ATTACHMENT 1: Site Inspection Data 35

LIST OF DEFINITIONS

100-Year Flood (1% Annual Chance Flood)

A storm event that has a 1% chance of being equaled or exceeded in any given year.

100-Year Flood Elevation

The high water elevation produced by the 100-year flood.

100-Year Floodplain

The area that would be inundated by the 100-year flood.

500-Year Flood (0.2% Annual Chance Flood)

A storm event that has a 0.2% chance of being equaled or exceeded in any given year.

500-Year Floodplain

The area that would be inundated by the 500-year flood.

CRS (Community Rating System)

A voluntary program designed to reward a community for doing more than meeting the NFIP minimum requirements to reduce flood damages.

FEMA (Federal Emergency Management Agency)

The Federal agency responsible for implementing the NFIP.

FIRM (Flood Insurance Rate Map)

A series of maps provided by FEMA that designate areas of a community according to various levels of flood risk.

MWRDGC (Metropolitan Water Reclamation District of Greater Chicago)

An independent government and taxing body that manages water supply, wastewater, and stormwater in Cook County, Illinois.

NFIP (National Flood Insurance Program)

The program enabling property owners in participating communities to purchase insurance protection from the Federal government against losses from flooding.

Repetitive Loss Property

A property for which two or more flood insurance claims of more than $1,000 have been paid within any 10-year period since 1978.

RLA (Repetitive Loss Area)

The properties on the repetitive loss list prepared by FEMA and all nearby properties with the same or similar flooding conditions.

RLAA (Repetitive Loss Area Analysis)

A detailed, site-specific plan to reduce flood losses in repetitively flooded areas.

EXECUTIVE SUMMARY

The purpose of this Report is to help home owners reduce their flood risk by providing a broader understanding of the problems and identifying potential solutions. It is one component of the Village's overall floodplain management program. Due to the number of properties in the Village that meet the National Flood Insurance Program's (NFIP's) definition of Repetitive Loss properties, a Repetitive Loss Area Analysis (RLAA) is required for the Village to participate in the Community Rating System (CRS) program. This Report focuses on Repetitive Loss Area #2, one of the four designated Repetitive Loss Areas (RLAs) within the Village of Winnetka. RLA #2 is comprised of the yellow shaded areas shown in Figure 2.

This Repetitive Loss Area Analysis (RLAA) followed a five step process.

- Step 1 – Advise all the properties in each RLA that the analysis will be conducted and request their input on the hazard and recommended actions.
- Step 2 – Collect data from agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding.
- Step 3 – Inspect each building in the RLA and collect basic data.
- Step 4 – Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible. The review must consider the full range of property protection measures for the types of buildings affected, including: preventative activities, property protection activities, natural resource protection activities, emergency services measures, structural projects, and public information activities.
- Step 5 – Document the findings in a report.

Section 3 of this Report describes the next steps, which include: implementing recommended flood hazard mitigation measures, obtaining funding assistance for these measures, and annually updating this Report.

1. BACKGROUND

1.1 Problem Statement

Flooding is a reoccurring problem for communities across the nation, including Winnetka. Neighborhood flooding events disrupt transportation, commerce, and lives. Property damage due to flooding is much more than an inconvenience; it carries a high price of both time and money.

Simply put, a flood is a damaging overflow of water into a building or onto land that is dry most of the time. One type of flooding occurs when streams or rivers overflow into a floodplain, but flooding also occurs outside of floodplains when the rate of stormwater runoff exceeds the capacity of the drainage system. Flooding in Winnetka is typically due to the capacity of the drainage system and not due to overflowing rivers or streams.

The purpose of this Report is to help home owners reduce their flood risk by providing a broader understanding of the problems and identifying potential solutions. It is one component of the Village's overall floodplain management program. Due to the number of properties in the Village that meet the National Flood Insurance Program's (NFIP's) definition of Repetitive Loss properties, this Repetitive Loss Area Analysis (RLAA) is required for the Village to participate in the Community Rating System (CRS) program. The Village joined the NFIP in 1973 and recently applied for entry into the CRS program. Additional information about the NFIP, the CRS program, and a RLAA is provided below.

1.2 National Flood Insurance Program

The NFIP is based on a cooperative agreement between the Federal Emergency Management Agency (FEMA) and local units of government. FEMA agrees to underwrite flood insurance policies within a community and the community agrees to regulate development in the floodplain. Participation in the NFIP is voluntary, but communities have incentive to join because Federally-backed flood insurance is not available in non-participating communities and a non-participating community will not receive Federal aid for damage to insurable buildings in the floodplain.

The three basic components of the NFIP are floodplain mapping, flood insurance, and floodplain management regulations. Floodplain mapping is provided by FEMA on a series of maps called Flood Insurance Rate Maps (FIRM), which designate areas of a community according to various levels of flood risk. Regardless of its risk level, any building in an NFIP participating community can be covered by a flood insurance policy, even buildings not located in a mapped floodplain. A flood insurance policy is only mandated for Federally-backed mortgages on buildings in the floodplain. Any new buildings constructed in a floodplain, and any improvements or repair of existing buildings in a floodplain, is subject to the Flood Hazard Protection Regulations (Chapter 15.68) of the Village Code.

1.3 Community Rating System

The CRS is a voluntary program designed to reward a community for doing more than meeting the NFIP minimum requirements to reduce flood damages. Communities can be rewarded for activities such as: reducing flood damage to existing buildings, managing development in in areas not shown in the floodplain on the FIRMs, protecting new buildings from floods greater than the 100-year flood, helping insurance agents obtain flood data, and helping people obtain flood insurance. The reward for these activities comes in the form of reduced premiums for flood insurance policy holders.

Once a community has been accepted into the CRS, the community's floodplain management activities are rated according to the scoring system described in the CRS Coordinator's Manual. CRS communities are rated on a scale of 1-10. A Class 10 community receives no reduction in flood insurance premiums, but every class above 10 receives an additional 5% premium reduction. Class 1 requires the most credit points and provides a 45% premium reduction.

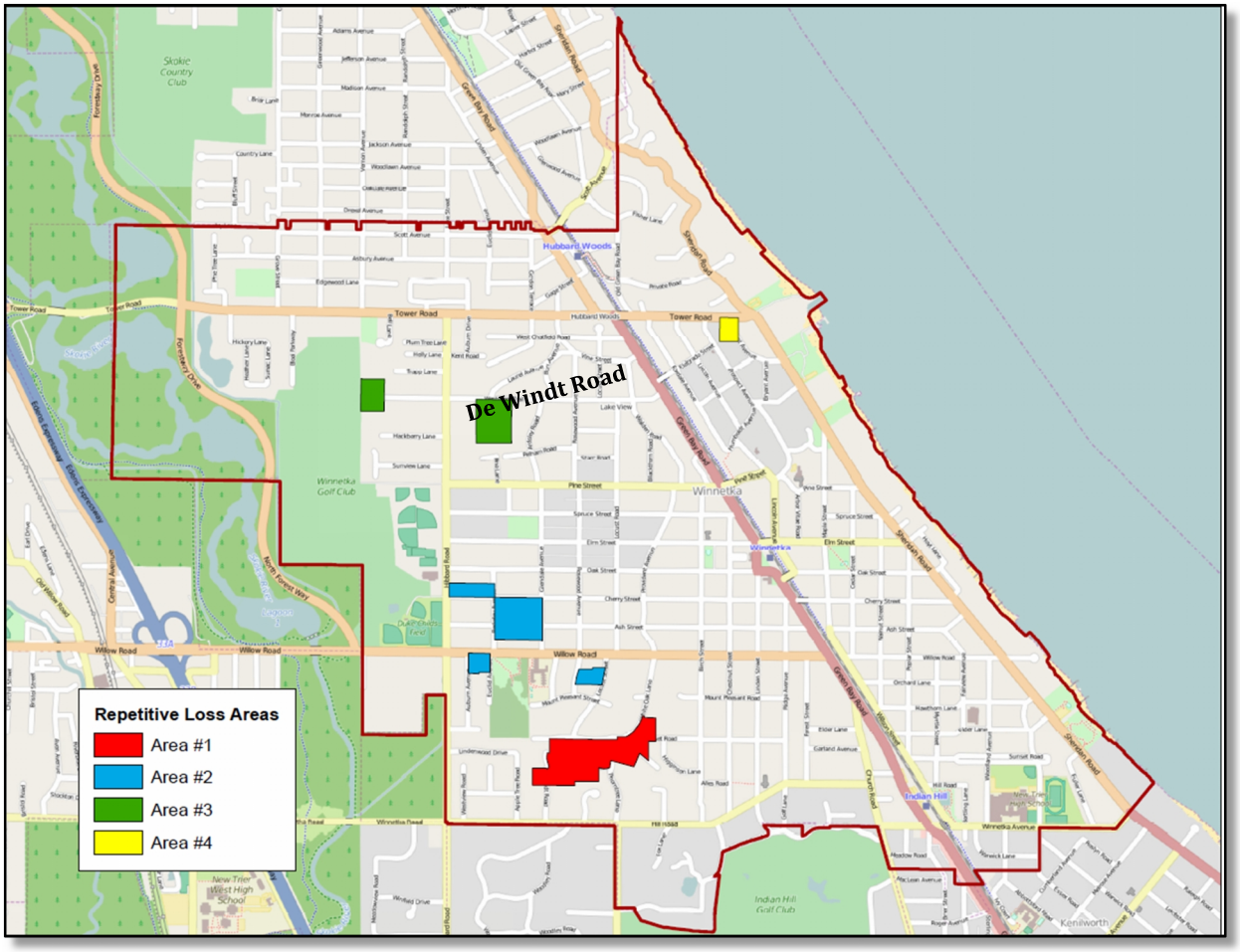
1.4 Repetitive Loss Area

The NFIP considers a property a Repetitive Loss Property if two or more flood insurance claims of more than $1,000 have been paid within any 10-year period since 1978. According to FEMA's records, there are 18 Repetitive Loss Properties within the Village. Many more properties in Winnetka may have reached the damage threshold for Repetitive Loss Properties, but not all properties are covered by flood insurance and flood insurance claims are not submitted for all flood damage sustained.

In order for a community with 10 or more Repetitive Loss Properties to participate in the CRS program, special conditions have to be met. One condition requires the Village to adopt either a Floodplain Management Plan or a Repetitive Loss Area Analysis (RLAA) prior to its entry into the CRS program. A Repetitive Loss Area (RLA) consists of Repetitive Loss properties and the surrounding properties that experience the same or similar flooding conditions, whether or not the buildings on those surrounding properties have been damaged by flooding. Figure 1 shows the 4 RLAs in Winnetka.

FIGURE 1

Repetitive Loss Areas in Winnetka



The process of developing a RLAA consists of five steps:

- Step 1 – Advise all the properties in each Repetitive Loss Area (RLA) that the analysis will be conducted and request their input on the hazard and recommended actions.

- Step 2 – Collect data from agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding.

- Step 3 – Inspect each building in the RLA and collect basic data. Building entry is not necessary for this step since adequate information can be collected by observing the building from the street.

- Step 4 – Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible. The review must consider the full range of property protection measures for the types of buildings affected, including: preventative activities, property protection activities, natural resource protection activities, emergency services measures, structural projects, and public information activities.

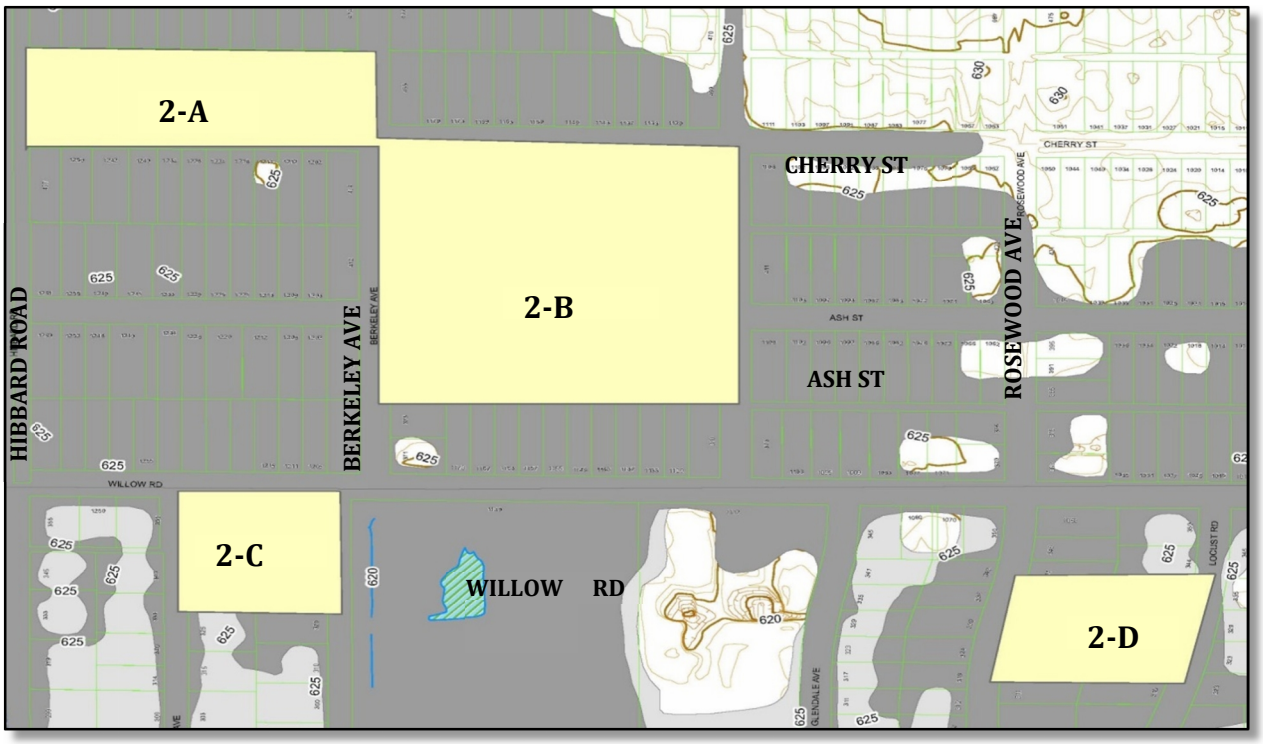
- Step 5 – Document the findings in a report. The report should include: a summary of the process that was followed and how property owners were involved in the process; a problem statement with a map of the affected area; a list or table showing basic information for each building in the affected area; the alternative approaches that were reviewed; and a list of action items identifying the responsible party, when the action should be completed, and how it will be funded.

This Report focuses on RLA #2, one of the four designated RLAs within the Village of Winnetka. RLA #2 is comprised of the four yellow shaded sub-areas shown in Figure 2. The dark grey shaded areas are the 100-year floodplain. The light grey shaded areas are the 500-year floodplain.

These four sub-areas were grouped together as a single RLA because of their proximity and because of their similar building and flooding characteristics. They were included in the RLA, while adjacent areas were not, because of two factors that compound the likelihood of flooding: the sub-areas are at the upstream end of an undersized storm sewer system; and the buildings within the sub-areas have adjacent ground elevations that are relatively low.

FIGURE 2

Repetitive Loss Area #2



2. REPETITIVE LOSS AREA ANALYSIS

2.1 Step 1 – Advise the Residents

Flooding has been an ongoing problem in Winnetka for many years. The most extreme storm event in recent history took place on July 22 and 23, 2011. Following that event, the Village sent a survey to all residents inquiring about flooding they may have experienced during the July 2011 storm event. This survey and a summary of the survey results are included in Appendix A.

On April 15, 2014, as part of the Village's annual outreach letter mailed to residents in RLAs, the Village notified residents of the ongoing RLAA and requested their input. Upon completion of a draft of this Report, another letter was sent out to residents in the RLA informing them of this Report, where and how they would be able to review it, and where and how they might submit comments regarding it. Both letters are included in Appendix B.

2.2 Step 2 – Collect Data

Plans and studies from several sources were utilized in this analysis. The sources listed below provided data related to the causes and impacts of flooding in the RLA.

- FEMA
- Metropolitan Water Reclamation District of Greater Chicago (MWRDGC)
- Village of Winnetka

A request for information was also sent to the Illinois State Water Survey (ISWS), but no additional information was available. Correspondence with MWRDGC and ISWS can be found in Appendix C.

2.2.1 Previous Studies and Plans

Flood Insurance Study – Cook County, Illinois and Incorporated Areas (FEMA 17031CV001G, 2008)

Within the RLA, the Cook County Flood Insurance Study (FIS) determined the 100-year flood elevation to be 625.3 (based on the North American Vertical Datum of 1988). The Village's topographic maps indicate the ground elevations within the RLA generally range between 621 and 625.

Detailed Watershed Plan - North Branch of the Chicago River and Lake Michigan Watershed: Volume 1 (HDR, January 2011)

Within the RLA, MWRDGC's Detailed Watershed Plan determined the 100-year flood elevation to be 625.5 (based on the North American Vertical Datum of 1988).

2.2.2 Flood Insurance and Flood Event Data

According to both the FIRM and the Cook County Flood Inundation Map, every property within the RLA is at least partially, if not fully, within the 100-year floodplain. This data correlates well with flood data reported by residents and Village staff.

2.2.3 Flooding Experiences of Property Owners

A flooding survey was sent to all residents in the Village of Winnetka in August of 2011. Of the approximately 4,425 properties in the Village, 1,061 survey responses were received. This 24% response rate is a very good response for surveys of this type. Of 72 properties within RLA #2, 21 residents responded (29%).

- 43% of the respondents reported overland flooding.
- 86% reported sewer backups.

A full summary of the survey results is included in Appendix A.

2.3 Step 3 – Inspect Buildings

On-site inspections of buildings in the RLA were performed in April of 2014. This inspection was performed from the public right-of-way by a licensed professional engineer. As such, the engineer did not survey building elevations in relation to the 100-year flood elevation. Therefore, the flood protection assessments in this Report are based upon visual observation of relative elevations. Each property within the RLA was visited and the following attributes were documented:

- Foundation type and condition;
- Relative low-opening elevations;
- Relative elevation of first floor;
- Basement window types and elevation;
- Window well types and elevation;
- Subsurface or at-grade doors;
- Garage location and relative elevation;
- Property grading;
- Downspout discharge location; and
- Neighborhood topography and flow routes.

The summary of the collected data for RLA #2 is as follows:

- 38% of the buildings have a low-opening elevation (basement windows, window wells, doorways, etc.) that appears to be below the 100-year flood elevation;
- 19% of the properties have ground adjacent to the building that is flat or sloped toward the building; and
- 31% of the properties have downspouts discharging adjacent to the building foundation.

A full summary of the results is included in Appendix E, and the data collected is included as Attachment 1.

2.4 Step 4 – Review Alternatives

Many types of flood hazard mitigation exist, and there is not one mitigation measure that fits every case. Nor is there even one application that fits most cases. Successful mitigation often requires multiple strategies. The CRS Coordinator's Manual breaks the primary types of mitigation down as displayed in Figure 3.

FIGURE 3

Categories of Floodplain Management Activities (FEMA FIA-15, 2013)

1. **Preventive** activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.
2. **Property Protection** activities are usually undertaken by property owners on a building-by-building or parcel basis.
3. **Natural Resource Protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
4. **Emergency Services** measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.
5. **Structural Projects** keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
6. **Public Information** activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.

2.4.1 Preventative

The Village regulates residential and commercial development through its building code, planning and zoning requirements, stormwater management regulations and floodplain regulations. Any project located in a floodplain, regardless of its size, requires a permit from the Village, unless the project can be characterized as routine maintenance. Depending on the size and scope of the project, a development within the Village may also fall under the jurisdiction of the MWRDGC, the Cook County Department of Transportation and Highways, the Illinois Environmental Protection Agency, the Illinois Department of Natural Resources, the Illinois Department of Transportation, and/or the U.S. Army Corps of Engineers.

Responsibility: Village of Winnetka, along with Federal, State, and other local regulatory agencies
Timeline: Ongoing
Funding: Municipal revenues

2.4.2 Property Protection

These measures are generally performed by the property owners or their agents. FEMA has published numerous manuals that help a property owner determine which property protection measures are appropriate for particular situations, several of which are listed below. The manuals listed below are available for review at Public Works, Village Hall, and the Winnetka Public Library.

- FEMA 259, *Engineering Principles and Practices of Retrofitting Floodprone Residential Structures*
- FEMA 312, *Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding*
- FEMA 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures*
- FEMA 348, *Protecting Building Utilities from Flood Damage*
- FEMA 511, *Reducing Damage from Localized Flooding*
- FEMA 102, *Floodproofing Non-Residential Structures*
- FEMA 55, *Coastal Construction Manual (Volume 1 and 2)*
- FEMA 84, *Answers to Questions about the NFIP*
- FEMA 54, *Elevated Residential Structures Book*
- FEMA 268, *Protecting Floodplain Resources: A Guidebook for Communities*
- FEMA 347, *Above the Flood: Elevating Your Floodprone House*
- FEMA 257, *Mitigation of Flood and Erosion Damage to Residential Buildings in Coastal Areas*
- FEMA 85, *Protecting Manufactured Homes from Floods and Other Hazards*

The primary methods of property protection are: sewer improvements, wet floodproofing, dry floodproofing, elevation, relocation, and demolition. Each of these methods are described below. A table of floodproofing types versus relative cost can be found in Appendix E.

Sewer Improvements

Heavy rains can saturate the soil and infiltrate the sanitary sewer system through leaky joints or cracks in the pipes. The inflow of stormwater floods the sanitary sewer system causing water to back-up into the home through lower level plumbing fixtures. This occurrence can be prevented by installing a sewer backflow preventer, an overhead sewer system, floor drain plugs and/or stand

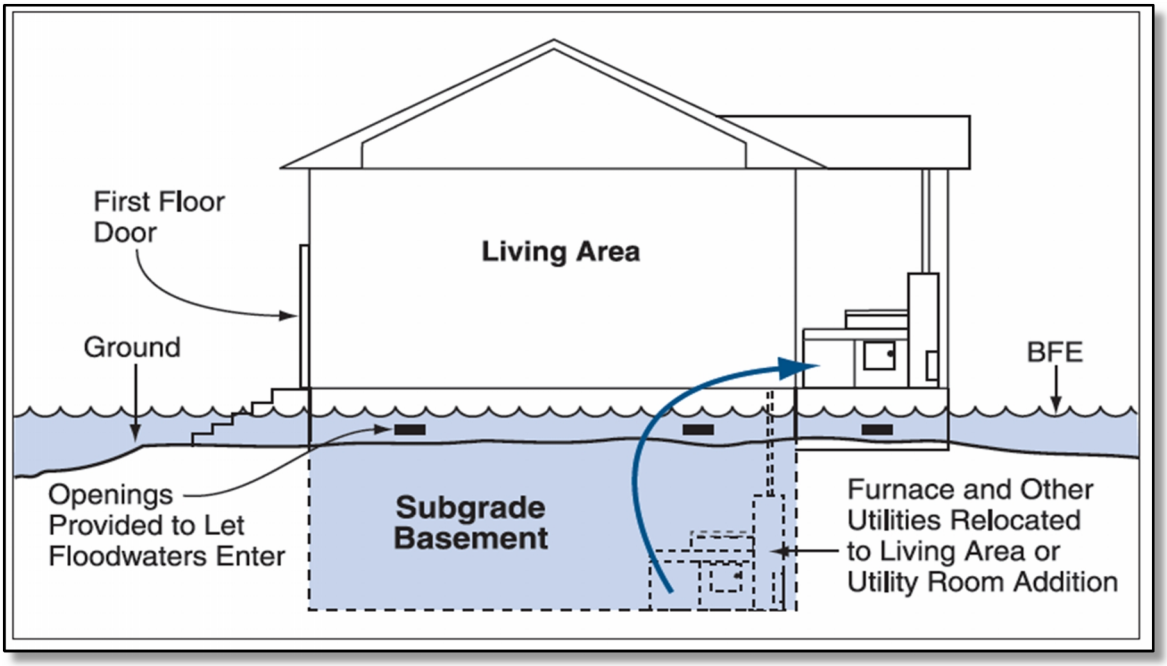
pipes. A backflow preventer will allow the sanitary sewer water to flow freely from the home to the sewer, but restrict the reverse flow. Backflow preventers do require maintenance and can fail if debris in the sewer prevents the valve seating properly. An overhead sewer system pumps wastewater from basement level plumbing fixtures up to an elevation near the ground level, where it can drain by gravity into the sewer service line. This higher sewer makes it unlikely that water will back-up into the building. Floor drain plugs and stand pipes are are much simpler ways to stop a sewer back-up. Some floor drain plugs stop water from flowing in either direction and are typically installed manually before a storm event. Other floor drain plugs utilize a float that will not interfere with the normal operation of the drain, but can fail if debris in the sewer prevents the valve from seating properly. Stand pipes involve fitting a length of pipe (generally three feet or less) in the floor drain so that the sewer back-up is contained within the stand pipe.

Wet Floodproofing

Wet floodproofing consists of modifying uninhabited portions of a home, such as a crawl space, garage, or unfinished basement with flood-damage resistant materials, to allow floodwaters to enter the structure without causing damage (see Figure 4). Wet floodproofing requires portions of the building need to be cleared of valuable items and mechanical utilities. A key component of wet floodproofing is providing openings large enough for the water to flow through the structure such that the elevation of the water in the structure is equal to the elevation of the water outside of the structure. This equilibrium of floodwater prevents hydrostatic pressure from damaging structural walls.

FIGURE 4

Wet Floodproofing Example (FEMA P-312, December 2009)



Dry floodproofing consists of completely sealing around the exterior of the building so that water cannot enter the building (see Figure 5). Dry floodproofing is not a good option for areas where floodwater is deep or flows quickly. The hydrostatic pressure and/or hydrodynamic force can structurally damage the building by causing the walls to collapse or causing the entire structure to float. However, in areas that have minimal velocity and low depth, dry floodproofing can be a good option.

FIGURE 5

Dry Floodproofing (FEMA P-312, December 2009)

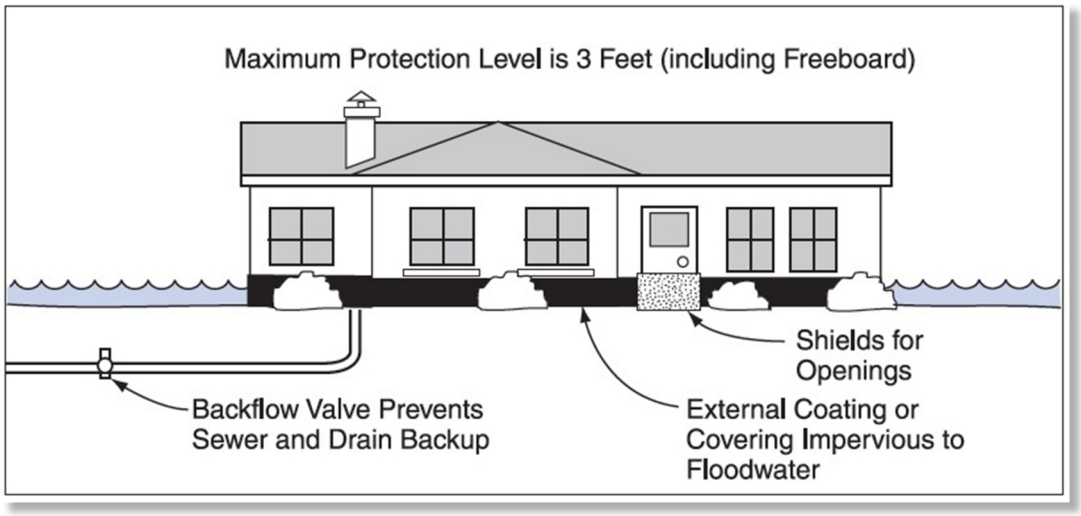


FIGURE 6

New Brick Veneer Over Waterproof Coating FEMA P-312, December 2009

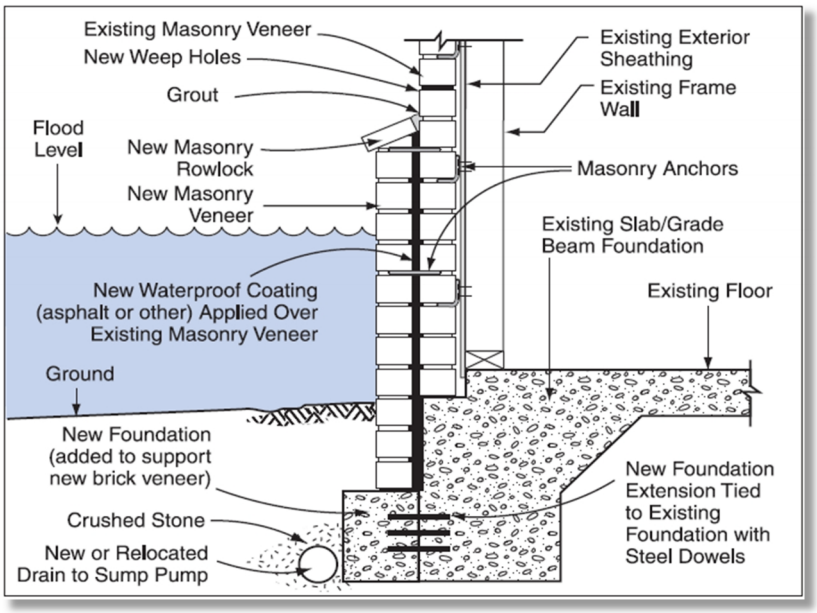


FIGURE 7

Driveway Berm

FIGURE 8

Raised Concrete Window Well

FIGURE 9

Glass Block Basement Windows

Figures 6, 7, 8, and 9 display various methods of dry floodproofing. The schematic detail in Figure 6 portrays an asphalt coating spread on the exterior of a structure covered by a decorative brick veneer. Figure 7 is an example of a driveway reconstructed to prevent surface water in the street from flooding a below-grade garage. Figure 8 is a raised concrete window well that is sealed to the side of the structure to prevent floodwaters from entering through the basement window. Figure 9 is an alternate to the window well; the glass pane window is removed and replaced with glass blocks that can withstand the pressure of ponding floodwaters.

Many flood hazards can be mitigated with various forms of dry flood proofing. Properties that do not have adequate protection of their low opening (window or basement door) can effectively raise the low opening height with a window well or a flood gate. The ultimate height of the low opening depends on several factors, such as: the level of flood protection desired, the appearance, and cost. The flood protection elevation could be set 1-foot higher than the existing low opening elevation, or it could be set to match the elevation of the lowest opening into a home that cannot be raised. This might be the elevation of the threshold of a door, for example.

Properties that do not have adequate grading can re-grade their lawns. The ground adjacent to a building should slope away from the building so stormwater runoff does not accumulate against the foundation wall, where it can seep into the building. If possible, a minimum ground slope of 1% is desirable. Furthermore, downspouts should extend at least 6 feet away from a building foundation. In cases where the ground adjacent to the building is flat or slopes toward the building, the downspouts should extend far enough to ensure stormwater does not drain back toward the foundation.

The NFIP only allows dry floodproofing for residential retrofits that are not classified as a substantial improvement. A substantial improvement is any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the "start of construction" of the improvement.

FIGURE 10

Elevated House

Elevation

Sometimes dry or wet floodproofing are not enough and greater measures must be taken. For example, if the floodwaters are too high for dry floodproofing and the inhabited area is too low for wet floodproofing, it may be necessary to raise the structure. While this can be a much costlier endeavor, it may be the only solution to protect a home from floodwaters. The structure in Figure 10 is an example of a home that is elevated above the 100-year flood elevation. The Cook County Watershed Management Ordinance requires all substantially improved residential buildings have their lowest floor elevated 2 feet above the 100-year flood elevation. This may preclude a basement in the elevated building.

Demolition

The only way to ensure a structure will not accumulate additional losses from future flood events is to demolish the structure completely. There are two options demolishing a structure.

1. A government agency can purchase the property, demolish the structure, and convert the property to a park or other open space.

2. The property owner may retain ownership, demolish the structure, and build a new structure in a manner that meets all local building and flood protection code requirements.

The primary methods of property protection are: sewer improvements, wet floodproofing, dry floodproofing, elevation, relocation, and demolition. These are the most common methods of property protection, although other methods exist ranging a very broad span of cost and effort.

Responsibility: Property Owners
Timeline: As Soon As Possible
Funding: Private Funding or Grant Funding

2.4.3 Natural Resource Protection

Care should be taken to maintain the streams, wetlands and other natural resources within a floodplain. Removing debris from streams and channels prevents obstructions. Preserving and restoring natural areas provides flood protection, preserves water quality and provides natural habitat. Most of the natural resources within the Village are in open spaces owned and maintained by either the Winnetka Park District or the Cook County Forest Preserve District.

Responsibility: Winnetka Park District, Cook County Forest Preserve
Timeline: Ongoing
Funding: Government taxing bodies

2.4.4 Emergency Services

Advance identification of an impending storm is only the first part of an effective Flood Warning and Response Plan. To truly realize the benefit of an early flood warning system, the warning must be disseminated quickly to floodplain occupants and critical facilities. Appropriate response activities must then be implemented, such as: road closures, directing evacuations, sandbagging, and moving building contents above flood levels. Finally, a community should take measures to protect public health and safety and facilitate recovery. These measures may include: cleaning up debris and garbage, clearing streets, and ensuring that that citizens have shelter, food, and safe drinking water.

Responsibility: Village of Winnetka
Timeline: Ongoing
Funding: Municipal revenues

2.4.5 Structural Projects

In response to the flood damage resulting from severe storm events in September 2008 and July 2011, the Village initiated several Flood Risk Reduction Assessments to determine what structural improvements could be made to mitigate flood damage from future storm events in the areas that have proven to be the most susceptible to flooding.

Construction of the Winnetka Avenue Pump Station Improvements was completed in the summer of 2014. These improvements, which include the replacement of four pumps at the station to increase capacity from 40,000 gallons/minute to 60,000 gallons/minute, will directly benefit residents in RLA #2 by improving flow in storm sewers in south and west Winnetka and increasing the discharge capacity of the Forest Preserve ditch.

Final engineering began in 2014 for the Willow Road Tunnel Improvements, which will also directly benefit residents in RLA #2. The planned improvements consist of a large trunk sewer under Willow Road and Glendale Avenue with branches along Ash Street and Cherry Street that extend into RLA #2. Construction is anticipated to begin in 2016.

Responsibility: Village of Winnetka
Timeline: 2014-2018
Funding: Stormwater Utility

2.4.6 Public Information

One of the most important, and often overlooked, aspects of mitigation is public awareness. Awareness starts with recognition of the flood risk. FIRM panels, which designate areas of a community according to various levels of flood risk, can be viewed at www.FEMA.gov. Also, real estate transactions require disclosure of known flood hazards.

The next level of awareness is related to hazard mitigation measures. Often homeowners can greatly reduce their risks with mitigation efforts; they just do not know it. For that reason, as part of this analysis, every resident in the RLA has been contacted and informed of the opportunity to review this Report. In addition, the Village sends out an annual outreach letter to every resident in each RLA.

Responsibility: Village of Winnetka, FEMA, real estate agents
Timeline: Ongoing
Funding: Flood insurance premiums, real estate transaction fees, and municipal revenues

2.5 Step 5- Document the Findings

This Report documents the findings of the required RLAA. As required, the Report includes: a summary of the process that was followed and how property owners were involved in the process; a problem statement with a map of the affected area; a list or table showing basic information for each building in the affected area; the alternative approaches that were reviewed; and a list of action items identifying the responsible party, when the action should be completed, and how it will be funded.

3. NEXT STEPS

3.1 Recommendations

First and foremost, the Village should continue its ongoing flood hazard mitigation initiatives. These initiatives include: enforcing development regulations and keeping them up-to-date; planning and constructing capital improvement projects; informing the public about flood hazards and mitigation options; and providing critical emergency services. Other government agencies, such as FEMA, MWRDGC, the Cook County Forest Preserve District, and the Winnetka Park District, should continue doing their part, as well. Finally, homeowners and residents should take steps to protect their property and reduce the likelihood of future flood losses.

Since every property in RLA #2 is within the 100-year floodplain, every property owner should carry flood insurance. In most cases, a sewer back-up or basement flood rider should be added to the insurance policy so that the building contents are covered.

Figure 11 lists common flood hazards that are known to exist in RLA #2 based on information received from residents and observations made during the on-site building inspections. Many of the flood hazards are related to openings that appear to be at or below the 100-year flood elevation. It should be noted that the 100-year flood elevation is not the highest possible elevation that flood waters may reach; greater flood elevations can and do occur. Common practice when installing flood protection measures is to protect the building to 2 feet above the 100-year flood elevation in order to account for uncertainties in the calculated flood elevation, wave action, and unpredictable effects such as those caused by ice or debris jams.

FIGURE 11

Common Flood Hazards and Typical Suggested Solutions

Common Flood Hazard	Typical Suggested Solution
Home within the 100-year floodplain	Carry flood insurance and elevate all mechanical facilities and valuable property above the 100-year flood elevation
Sanitary sewer back-up	Install an overhead sewer system or other backflow prevention
Unprotected window below the 100-year flood elevation	Replace a glass pane window with a glass block window or increase the height and seal around the edges of the window well
Unprotected door below the 100-year flood elevation	Install a flood barrier, such as a driveway berm, a permanent concrete flood wall, or a removable flood gate
Detached garages below the 100-year flood elevation	Raise the garage above the 100-year flood elevation or wet floodproof the garage
Downspouts splash on grade near the foundation	Install downspout extensions that discharge away from the foundation and ensure there is positive drainage from the foundation
Unprotected finished floor below the 100-yr flood elevation	Dry floodproof or elevate the building above the 100-year flood elevation

The common flood hazards and typical suggested solutions in this Report are broad-based recommendations for the entire RLA. They are not applicable to all properties in the RLA, but appear to be applicable to many of the properties. Property owners should consider obtaining an elevation certificate to determine the exact elevation of their house in relation to the 100-year flood elevation and should consult with an engineer, plumber, or other contractor regarding mitigation measures for a specific property.

Due to the height of the 100-year flood elevation above the ground throughout most of RLA #2, high intensity storm events are likely to cause some flooding, even on properties that have a well-graded yard that slopes away from the building foundation and a private yard drain system; however, many of the properties in RLA #2 have very low rear yards that are likely to collect and retain water after small amounts of rainfall. Installing private yard drain systems connected to the Village storm sewer system should reduce the duration of standing water in these locations; however, it should be noted that the depth of flooding may not be reduced for high intensity storm events when the Village's storm sewer system is at capacity.

3.2 Funding Assistance

In certain cases, a flood insurance policy holder will be eligible for up to $30,000 of coverage over and above the structural flood insurance coverage. This coverage is called Increased Cost of Compliance (ICC). It applies in cases where local floodplain management regulations require a substantially damaged building to be elevated or retrofitted. This coverage is not dependent upon a community receiving a disaster declaration, but it is only available if the building damage was caused by a flood and if there was a flood insurance policy on the building before the flood.

Several other sources of hazard mitigation assistance will become available once the Cook County All Hazards Mitigation Plan is complete and has been adopted by both the County and the Village. The Plan is currently being developed and may be completed in 2014. The most common hazard mitigation assistance programs are: the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA). Each program has its own eligibility and funding criteria, but each can be used to fund property protection measures as shown in Figure 12 below, provided that the Benefit Cost Ratio exceeds 1.0. In general, these programs are funded when FEMA approves an application prepared jointly by a local government, such as the Village, and the Illinois Emergency Management Agency (IEMA). In most cases, FEMA pays 75% of eligible expenses, but the federal share can reach 90% for Repetitive Loss Properties and 100% for Severe Repetitive Loss (SRL) properties.

FIGURE 12

Eligible Activities by Hazard Mitigation Assistance Program (FEMA Hazard Mitigation Assistance Unified Guidance, July 2013)

Eligible Activities	HMGP	PDM	FMA
Property Acquisition and Structure Demolition	√	√	√
Property Acquisition and Structure Relocation	√	√	√
Structure Elevation	√	√	√
Mitigation Reconstruction			√
Dry Floodproofing of Historic Residential Structures	√	√	√
Dry Floodproofing of Non-residential Structures	√	√	√
Minor Localized Flood Reduction Projects	√	√	√
Structural Retrofitting of Existing Buildings	√	√	
Non-structural Retrofitting of Existing Buildings and Facilities	√	√	√
Safe Room Construction	√	√	
Wind Retrofit for One- and Two-Family Residences	√	√	
Infrastructure Retrofit	√	√	√
Soil Stabilization	√	√	√
Wildfire Mitigation	√	√	
Post-Disaster Code Enforcement	√		
Generators	√	√	
5 Percent Initiative Projects	√		
Advance Assistance	√		

3.3 Continuation

The CRS program requires an annual update to this RLAA. The annual update must review each recommended action, discuss the actions that were implemented and those that were not, and recommend any changes to the recommended actions. The report must be made available to the public, including the media and property owners and residents of the RLA. This process must continue every year for the Village to maintain its standing in the CRS program. Also, this update must preface each CRS cycle verification visit. Refer to Section 510 of the CRS Coordinator's Manual for more information (FEMA FIA-15, 2013).

4. WORKS CITED

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FEMA 17031CV001G. (2008). *Flood Insurance Study - Cook County, Illinois and Incorporated Areas.*

FEMA 551. (March 2007). *Selecting Appropriate Mitigation Measures for Floodprone Structures.*

FEMA FIA-15. (2013). *Comnunity Rating System Coordinator's Manual.* National Flood Insurance Program, Community Rating System.

FEMA P-312. (December 2009). *Homeowner's Guide to Retrofitting - Six Ways to Protect Your Home From Flooding* (Second Eddition ed.).

HDR. (January 2011). *North Branch of the Chicago River and Lake Michigan Watershed: Volume 1.* Metropolitan Water Reclamation District of Greater Chicago.

Appendix A: Resident Survey

Dear Winnetka Resident:

In light of the recent rain storm on Friday, July 22 and Saturday, July 23, 2011, the Village is conducting a Village-wide survey to get an accurate account of basement flood occurrences, and in particular, **sanitary** sewer backups. This information will be used to evaluate the existing sanitary sewer systems, as well as to plan for possible future sanitary sewer improvements.

Please take a few moments to fill out the attached survey and return it by Friday, September 23. The survey may also be returned via fax at 847-716-3599 or by email to sanitarysewersurvey@winnetka.org Residents may also access the survey on the Village website at www.villageofwinnetka.org. We thank you in advance for your help in this endeavor. If you have any questions, please contact the Public Works Department at 847-716-3568.

Steven M. Saunders, P.E.
Director of Public Works/Village Engineer

1. Address_____, Winnetka, Illinois

2. How long have you lived at this address?_____ years

3. Was your home built before 1970? □ NO □ YES □ DON'T KNOW

4. Did you experience flooding in your house or basement or attached garage during the July 22-23, 2011 storm? □ NO □ YES

5. If yes, please indicate the location(s) that water entered the building:
   □ Floor drain, laundry tub, shower or toilet □ Wall or floor seepage
   □ Window well or doorway □ Sump pump failure
   □ Other_____ □ Not sure

6. If water entered via floor drain, laundry tub, shower, or toilet, approximately what time did flooding commence? _____.
   What time did flooding subside? _____

7. How much water did you get? (feet-inches)_____

8. If water entered via floor drain, laundry tub, shower, or toilet, approximately how many times in the last five years has this occurred?_____. Do you recall the approximate month/year of the occurrence(s)? _____

9. Does your building have any protection from **sanitary** sewer back-ups? □ NO
   □ YES □ Not sure

10. If yes, indicate what type of protection and approximate date of installation:
    _____

2011 Flooding Survey Results		
Total Properties	72	
Total Respondents	21	
	29%	response rate
Did you experience flooding in your house, basement, or attached garage during the July 22-23 storm?	95%	Yes
	5%	No
Type of Flooding	86%	Floor drain, laundry, tub, shower, or toilet
	38%	Window well or doorway
	14%	Wall or floor seepage
	14%	Sump pump failure
	5%	Other
What time did flooding commence?	57%	12am-6am
	0%	6am-12pm
	0%	12pm-6pm
	0%	6pm-12am
What time did flooding subside?	5%	12am-6am
	19%	6am-12pm
	14%	12pm-6pm
	10%	6pm-12am
How much water did you get?	38%	0-1 foot
	38%	1-3 feet
	10%	3-6 feet
	0%	>6 feet
How many occurrences in the last five years?	38%	0
	24%	1
	10%	2
	5%	3
	0%	4
	5%	5
In what years did it flood?	5%	2007
	5%	2008
	0%	2009
	10%	2011
Does you building have protection for sanitary backups?	19%	Yes
	62%	No
	14%	Not sure
If yes, what type?	5%	Sump pump
	0%	Backflow preventor
	5%	Ejector pit
	5%	Elevated drain pipe

Appendix B: Letters to the Residents

VILLAGE·OF·WINNETKA

Incorporated in 1869

April 15, 2014

Resident

Winnetka, IL 60093

Re: Village of Winnetka
Analysis of Flood Prone Areas and
Repetitive Loss Areas

Dear Resident:

The Village has applied for entry into the Community Rating System (CRS), which is a voluntary program designed to reward a community for its flood mitigation efforts. The reward comes in the form of reduced premiums for flood insurance policy holders within the community. One of the prerequisites for entry into the CRS is an analysis of the areas within the Village that have repeatedly suffered from flood damages. You have received this letter because your property has either been subject to flooding on more than one occasion for which claims have been made and received on your flood insurance policy of more than $1,000 from the National Flood Insurance Program within any rolling 10-year period for your home, or because your property is located in an area where adjacent properties have experienced flood damage on several occasions for which flood insurance claims have been made. **Your input in this analysis will be valuable whether your house has been damaged by flooding or not.**

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) produces a list of repetitive loss properties within each National Flood Insurance Program (NFIP) community, which the Village of Winnetka is an active member in good standing, that has one or more repetitive loss properties. Repetitive loss properties are those properties for which two or more claims of more than $1,000 have been paid by the NFIP within any 10-year period since 1978. Although these properties represent only 1% of all the NFIP's insurance policies, they account for nearly one-third of the claim payments. In order for the Village of Winnetka to participate in the CRS program with repetitive loss properties, an outreach program must be implemented in an attempt to try to mitigate the cause of the flood damage, either on your property or in your neighborhood. All specific repetitive loss property information is for the Village's internal use only, and is protected by the Privacy Act of 1974.

If your property is a repetitive loss property, or if you have any information to share regarding the recurrence and severity of past flooding in the area, the Village of Winnetka is kindly requesting that you provide information regarding the exact nature of the flood damage so that we may better provide you with the appropriate property protection measures for the flood situation. Please forward the information regarding the flood damage that resulted in the flood insurance claims to the Village of Winnetka, attention Susan Chen, 1390 Willow Road, Winnetka, IL 60093; by phone at (847)716-3532; or by e-mail to schen@winnetka.org. Please note that if you responded to the Village's flood survey in August 2011, the Village can incorporate the information you provided at that time into this analysis. You will be notified again once a draft of the analysis report is available for review and comment. We hope you can participate in this analysis and we look forward to your input.

As many of you are aware, the Village of Winnetka is in the process of pursuing several possible large scale storm water management mitigation projects which can be viewed on the Village of Winnetka's website www.villageofwinnetka.org. Unfortunately, some of the repetitive loss areas are situated on private streets with private storm sewers. While the Village of Winnetka is unable to undertake specific public improvements in these areas, certain aspects of the proposed storm water mitigation plans will help to mitigate the flooding in these areas. Meanwhile, here are some things that you can do:

1390 WILLOW ROAD, WINNETKA IL 60093
Administration and Finance (847) 501-6000 Fire (847) 501-6029 Police (847) 501-6034
Public Works (847) 716-3568 Water and Electric (847) 716-3558

VILLAGE·OF·WINNETKA

Incorporated in 1869

1. Contact the Village of Winnetka Public Works Department at (847) 716-3568 to speak with one of the Engineering Staff about possible mitigation measures for your flooding issues;

2. Prepare for flooding by doing the following:
   - Know how to shut off the electricity and gas to your house when a flood comes;
   - Make a list of emergency numbers and identify a safe place to go;
   - Make a household inventory, especially of basement contents;
   - Put insurance policies, valuable papers, medicine, etc… in a safe, dry place;
   - Collect and put cleaning supplies, camera, waterproof boots, etc… in a convenient location;
   - Develop a disaster response plan – See the Red Cross' website: www.redcross.org/images/pdfs/code/family_disaster_plan.pdf for a copy of the brochure ***"Your Family Disaster Plan"***
   - Get a copy of ***Repairing Your Flooded Home*** at www.redcross.org/www-files/Documents/pdf/Preparedness/file_cont333_lang0_150.pdf. Also visit FEMA's web site at www.fema.gov/hazards/floods/

3. Consider some permanent flood protection measures.
   - Mark your fuse or breaker box to show the circuits to the floodable areas. Turning off the power to the basement can reduce property damage and save lives, except the storm sump pump and sanitary ejector pump should be placed on a separate circuit with battery back-up which can remain operable during a storm event;
   - Consider elevating your house to the Flood Protection Elevation, which is two feet above the Base Flood Elevation;
   - Check your home for water entry points. These can be basement windows, the basement stairwell, doors, and dryer vents. These can be protected with low walls or temporary shields;
   - Install floor drain plugs, standpipe, overhead sanitary sewer or a sanitary sewer backflow prevention device to prevent sewer backup flooding;
   - More information can be found in ***Homeowner's Guide to Retrofitting: Six Ways to Protect your House from Flooding***. This publication can be found at www.fema.gov/library/file?type=publishedFile&file=fema_p312_a.pdf&fileid=7f8c0a20-fa08-11de-8441-001cc456982e or at the public library.
   - There is also a link on the Village's website, www.villageofwinnetka.org the Guide to Flood Protection in Northeastern Illinois, published by the Illinois Association for Flood plain and Storm Water Management.
   - Note that some flood protection measures may need a building permit and others may not be safe for your type of building, so be sure to talk with the Community Development Department for code and permit requirements.

1390 WILLOW ROAD, WINNETKA IL 60093
Administration and Finance (847) 501-6000 Fire (847) 501-6029 Police (847) 501-6034
Public Works (847) 716-3568 Water and Electric (847) 716-3558

VILLAGE·OF·WINNETKA

Incorporated in 1869

4. Obtain information on financial assistance programs.
   - FEMA offers four grant programs to fund pre- and post-disaster mitigation activities, including: Hazard Mitigation Grant Program (HMGP); Pre-Disaster Mitigation (PDM); Flood Mitigation Assistance (FMA); and Repetitive Flood Claims (RFC). Detailed information on these programs and other related programs is available at www.fema.gov/about/divisions/mitigation/mitigation.shtm#6.

5. Obtain flood insurance.
   - A flood insurance policy will help pay for repairs after a flood and, in some cases, it will help pay the costs of elevating a substantially damaged building.
   - Homeowner's insurance policies do not cover damage from floods. However, because the Village of Winnetka participates in the National Flood Insurance Program, you can purchase a separate flood insurance policy. This insurance is backed by the Federal Government and is available to everyone, even properties that have been flooded or are out of the flood plain. Most flood insurance policies include Increased Cost of Compliance coverage. The coverage provides for the payment of claims up to $30,000 toward the costs to comply with State or Community flood plain management laws or ordinances after a flood event in which the structure has been declared substantially damaged in accordance with the locally enforceable regulation.
   - If your property is located in an area that is not mapped as a Special Flood Hazard Area (Zone A or AE), you may qualify for a lower-cost Preferred Risk Policy.
   - Some people purchased flood insurance because it was required by the bank with they got a mortgage or home improvement loan. Usually, these policies just cover the building's structure and not the contents. During the kind of flooding that happens in your area, there is usually more damage to the furniture and contents than there is to the structure. Ensure that you have contents coverage.
   - Don't wait for the next flood to buy insurance protection. In most cases, there is a 30-day waiting period before the National Flood Insurance Program coverage takes effect.
   - Contact your insurance agent for more information on rates and coverage.

If you have questions regarding Repetitive Loss Areas or other general flood plain requirements, please provide the Village with the street address of the property in question. Inquiries can be directed to the Engineering Department of the Village of Winnetka, and can be made in person, by telephone, or by e-mail. The Engineering Department is located at the Village Yards, 1390 Willow Road, Winnetka. While any of our Engineering Staff can answer your questions, our Flood Plain Manager is Susan Chen, Assistant Village Engineer, who can be reached at (847) 716-3532 or schen@winnetka.org.

For general questions or concerns regarding local flooding, drainage issues or sewer back-ups, contact 847-716-3568, and your call can be directed to the appropriate Public Works staff.

Sincerely,

Steven M. Saunders, P.E.
Director of Public Works/Village Engineer

1390 WILLOW ROAD, WINNETKA IL 60093
Administration and Finance (847) 501-6000 Fire (847) 501-6029 Police (847) 501-6034
Public Works (847) 716-3568 Water and Electric (847) 716-3558

Month X, 2014

Name
Address
Winnetka, Illinois 60093

Subject: Village Analysis of Flood Prone Areas

Dear Name:

The Village has applied for entry into the Community Rating System (CRS), which is a voluntary program designed to reward a community for its flood mitigation efforts. The reward comes in the form of reduced premiums for flood insurance policy holders within the community. One of the prerequisites for entry into the CRS is an analysis of the areas within the Village that have repeatedly suffered from flood damages. Your property is located within an area identified as Repetitive Loss Area #X. A draft report on the Repetitive Loss Area Analysis for Area #X can be reviewed at www.villageofwinnetka.org or at the Village of Winnetka Public Works Facility (1390 Willow Road). Your input on the draft report is welcome and comments will be accepted until Month X, 2014.

Sincerely,

Steven M. Saunders, P.E.
Director of Public Works/Village Engineer

I:\Chicago\WINNE\131058-WINNE - Repetitive Loss\90-General Municipal Services\Work\Resident Invitation Letter.docx

This letter will be finalized and sent on Village letterhead as soon as the Village is satisfied with the draft Reports.

Appendix C: Data Collection Correspondence

Correspondence with MWRDGC

To: Mark G. Phipps
Cc: Steve Saunders (SSaunders@winnetka.org); Fitzpatrick, Kevin (Eng)
Subject: RE: Winnetka - Repetitve Loss Area Analysis

Mark,

As discussed over the phone, the District completed the North Branch of the Chicago River (NBCR) Detailed Watershed Plan (DWP) in 2011. During DWP, we collected problems identified by the communities, updated the H&H model, and developed projects. Below is a link to the DWP and inundation maps.

http://www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/protecting_the_environment/Stormwater_Management/htm/North_Branch_Chicago_River_Watershed/North_Branch_Chicago_River_DWP.htm

http://gispub.mwrd.org/swima/

The TARP system does not impact the Winnetka storm sewer system. If you have additional questions on TARP, feel free to contact Kevin Fitzpatrick at 1-312-751-3163.

Michael "Mick" Cosme, P.E., CFM
Senior Civil Engineer
Metropolitan Water Reclamation District of Greater Chicago
111 E. Erie
Chicago, IL 60611
p 312.751.3092
f 312.751.5710

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Correspondence with ISWS

From: Heistand, Glenn [mailto:heistand@illinois.edu]
Sent: Tuesday, April 08, 2014 2:37 PM
To: Mark G. Phipps
Cc: Steve Saunders (SSaunders@winnetka.org)
Subject: RE: Winnetka - Repetitive Loss Area Analysis

Mark,

ISWS does not have any flooding studies in Winnetka, besides possibly some dusty paper copies of FEMA effective models.
The Village is probably already in coordination with Brian Eber at IDNR-OWR for their pre-CRS Community Assistance Visit, but if not, I recommend contacting him for additional information (brian.eber@illinois.gov). Let me know if I can be of further assistance.

Glenn

Glenn N Heistand, PE, CFM
Illinois State Water Survey
Prairie Research Institute
University of Illinois
2204 Griffith Drive
Champaign, IL 61820-7495
(217) 244-8856
heistand@illinois.edu

Appendix D: Summary of Inspection Results

Total Properties	72	
Foundation	93%	Concrete
	1%	Other
Yard	79%	Sloped away
	18%	Flat
Rear Yard	32%	Low
Downspout	21%	Splash on Grade
	35%	Underground
	22%	Extended
	10%	Underground/Splash on Grade
	6%	Underground/Extended
Approximated steps up to 1st floor	8%	1
	32%	2
	14%	3
	14%	4
	17%	5
	11%	>6
	0%	Low
	0%	Raised
Window Height	19%	Low
	1%	Grade
	24%	Raised
Window Type	50%	Glass
	7%	Glass block
Window Well Height	18%	Low
	1%	Grade
	17%	Raised
Window Well Type	13%	Metal
	29%	Concrete
Garage	51%	Detached
	44%	Attached
Garage Elevation	36%	Low
	28%	Grade
	32%	Raised

Appendix E: Floodproofing Methods

Table 3-16. Relative Costs of Various Retrofit Measures

Construction Type	Existing Foundation	Measure	Retrofit	Relative Cost
Frame, Masonry Veneer, or Masonry	Crawlspace or Basement	Wet Floodproofing	Wet floodproof crawlspace to a height of 4 feet above LAG or wet floodproof unfinished basement to a height of 8 feet above basement floor	Lowest
Masonry Veneer or Masonry	Slab-on-Grade or Crawlspace	Dry Floodproofing	Dry floodproof to a maximum height of 3 feet above LAG	
Frame, Masonry Veneer, or Masonry	Basement, Crawlspace, or Open Foundation	Levees and Floodwalls	Levee constructed to 6 feet above grade or floodwall constructed to 4 feet above grade	
Frame, Masonry Veneer, or Masonry	Basement, Crawlspace, or Open Foundation	Elevation	Elevate on continuous foundation walls or open foundation	
Frame, Masonry Veneer, or Masonry	Basement, Crawlspace, or Open Foundation	Relocation	Elevate on continuous foundation walls or open foundation	
Frame, Masonry Veneer, or Masonry	Slab-on-Grade	Elevation	Elevate on continuous foundation walls or open foundation	
Frame, Masonry Veneer, or Masonry	Slab-on-Grade	Relocation	Elevate on continuous foundation walls or open foundation	Highest
Frame, Masonry Veneer. or Masonry	Slab-on-Grade, Crawlspace, Basement, or Open Foundation	Demolition	Demolish existing building and buying or building a home elsewhere	Varies

HOMEOWNER'S GUIDE TO RETROFITTING SIX WAYS TO PROTECT YOUR HOME FROM FLOODING 3-41

(FEMA P-312, December 2009)

ATTACHMENT 1: Site Inspection Data