VILLAGE OF
LINCOLNSHIRE

EMERGENCY FLOOD RESPONSE PLAN

Adopted February 12, 2007
(last revised May 19, 2017)

Table of Contents

1. Introduction 5

2. Important Numbers 6-7

3. Important Email Addresses 8-9

4. Objective 10

5. Manpower 11
- (1) Incident Commander - Village Manager 11
- (2) Site Manager - Public Works Director 11
- (3) Operations Chief - Utilities Superintendent 11
- (4) Planning Chief - Assistant Public Works Director/Village Engineer 11
- (5) Liaison Officer- Chief of Police 11
- (6) Law Enforcement Branch - Police 11
- (7) Information Officer - Mayor/Village Manager 12
- (8) Volunteer Coordinator - Streets/Stormwater Foreman 12
- (9) Public Works Branch - Forestry/Parks Foreman 12
- (10) Other Village Employees 12
- (11) Volunteers 12

5. Flood Response Equipment and Tools Checklist 13
- a. Personal Items and Gear 13
- b. Flood Response Tools and Equipment 13
- c. Additional Response and Recovery Items 14
- d. Other Miscellaneous Items 14

6. Des Plaines River Flood Alert Stages 15
- a. Observation Stage 15
- e. Action Stage 15
- b. Minor Flood Stage 15
- c. Moderate Flood Stage 15
- d. Major Flood Stage 15
- e. Evacuation Stage 15
- e. 100-Year Flood Stage 15

7. Stream Gauge Flood Elevation Conversion Chart 16

8. Flood Forecasting 17
- a. Real Time Flood Information 17
- b. Stream Gauge 17
- c. Hydrograph 18

9. Pre-Flood Communication Plan 19
a. Pre-Flood Notification 19
b. Flood Event Notification 19
c. Blackboard Connect 20
d. Automated Telephone Dialing System 20

10. Village Flood Response Procedures 21
a. Incident Command 22
b. Mobilization 22
d. Materials 23
i. Sandbags 23
ii. Sand 23
iii. Polyethylene 23
e. Equipment 23
i. Front-End Loader 23
ii. JCB Load All 23
iii. Emergency Response Trailer 24
iv. Sandbag Machine 24
iv. Pumps 25

11. Work Smart: Flood Response Personal Safety Tips 26
a. Take Care of Yourself 26
b. Stay Healthy and Maintain Safety 26
c. Typical Flood Response Injuries 26
d. Realities of Flood Response 26
e. Weather Conditions 27
f. Mental Preparation and Fatigue 27

12. Additional Flood Response Acitivities 27
a. Sandbagging 27
b. Pumping 27
c. Evacuation 27

13. Des Plaines River Earth Berm 28
a. History 28
b. Inspections 28

14. Base Station Set-Up 29
a. Base Locations 29
i. Spring Lake Park 29
ii. Village Hall 30
iii. Public Works Facility 30

15. Health Issues 31
a. Food 31
b. Water 31
c. Shelter 31
d. Rest 31
e. Flood Water Contamination 31

16. Sand Bag Information 32
a. Sandbagging Procedures 33
b. Managing Volunteers 33
c. Sandbag Materials 34
d. Site Selection 34
e. Sandbag Estimates 34
f. Dimensions of Dike Wall 35-36
g. Filling Sandbags 37
h. Stacking Sandbags 38
i. Sealing the Dike Wall 39
j. Controlling Seapage 39
k. Disposing of Used Sand 39

17. Do-It-Yourself Sandbag Tubes 40
a. Parts and Tools 41
b. Fabrication Steps 41
c. Dimensions 42
d. Assembly 42

18. Post Flood Response 43
a. Utilities 44
b. Damage Assessment 44
c. Post Flood Assistance 44

19. Post Flood Debriefing 45

20. Types of Floods That Occur in Lincolnshire 45
a. Riverine 45
b. Flash 45
c. Urban 45

21. History of Flooding in Lincolnshire 46

22. Village of Lincolnshire Floodplains 47
a. Des Plaines River 47
i. Description 47
ii. Location 47
iii. Flood Hazard Description 47

iv. Flood Elevation 47
b. Indian Creek....48
i. Description....48
ii. Location....48
iii. Flood Hazard....48
iv. Flood Elevations....48
v. Flood Response for Indian Creek....49
(1) Response to 10/100 Year Frequency Flood....49
c. West Fork of North Branch of Chicago River....49
i. Description....49
ii. Location....50
iii. Flood Elevations....50
iv. Flood Response for Chicago River....50
(1) Response to 10/100Year Frequency Flood....51
d. Lincolnshire Creek....51
i. Description....51
ii. Location....51
iii. Flood Hazard....52
iv. Flood Elevations....52
v. Flood Response for Lincolnshire Creek....52
(1) Response to 10/100 Year Frequency Flood....53

23. Notification to Residents....54
a. Tetnus Shots....54

24. Automated Telephone Dialing System (Example Messages)....55
a. Minor Flood Stage....55
b. Major Flood Stage....55
c. Evacuation Flood Stage....55

25. Situation Report....56

26. Volunteer Management Sign-Up Sheet....57

27. Waiver of Liability Release Form....58

28. Definitions and Acronyms....59-64

Introduction & Background

May 19, 2017

This manual is a guidebook or F.O.G. (Field Operating Guide) for flood response operations within the Village of Lincolnshire.

Based on lessons learned from past operations, we have compiled a variety of informational and response steps that could help ease the burden of our residents and response personnel.

No flooding event is identical. Watershed impacts vary due to current weather, location, duration, and amount of precipitation and snow melt.

This document is prepared to provide current and future Village staff and residents with a guide to fighting floods in our community. Additionally, this manual was created to detail a procedure to be followed in the event of a threat or occurrence of a flood.

Sincerely,

Bradford H. Woodbury,
Public Works Director
847-883-8600 x2381
bwoodbury@lincolnshireil.gov

Important Phone Numbers

Village of Lincolnshire	847-883-8600
Lincolnshire Police	847-913-2350
Lincolnshire-Riverwoods Fire Protection	847-634-2512
Lake County Sheriff	847-549-5200
Lake County Health Department	847-377-8020
Lake County Storm Water Mgt.	847-377-7700
Lake Forest Hospital	847-234-5600
FEMA	800-621-3362
IDNR	847-608-3100
IEMA	800-782-7860
IEPA	847-294-4000
IPWMAN (Mutual Aid Network)	217-819-3155
North Shore Gas	866-556-6005
ComEd	800-334-7661
Comcast	866-594-1234
AT&T	800-244-4444
J.U.L.I.E.	800-892-0213
American Red Cross	800-733-2767
Solid Waste Agency of Lake County	847-336-9340

U.S. Army Corp of Engineers	847-205-4540
Great Lakes Naval Base (volunteers)	847-688-3500
Traffic Control and Protection (barricades)	630-293-0026
School District #103 (buses)	847-295-4030
Ernie's Wrecker Service (fuel)	847-634-3737
Metropolitan Emergency Support (food)	800-438-6377
Meyer Material (sand)	815-385-4920
Lester's Materials Inc. (sandbags)	847-223-7000
Winthrop Harbor P.D. (helicopter)	847-872-2131
Best Sanitation (toilets)	847-364-7345
Davey Tree Expert Co. (tree removal)	847-537-4340
Waste Management	800-796-9696
Courtyard by Marriott	800-230-4134
Marriott Resort	847-634-0100
Springhill Suites	847-793-7500
Staybridge Suites	847-821-0002
Hampton Inn	847-478-1400
Homewood Suites	847-945-9300
Buffalo Grove Public Works	847-459-2500
Highland Park Public Works	847-432-0807
Libertyville Public Works	847-362-2430

Important E-Mail Addresses

Village Manager – Brad Burke	bburke@lincolnshireil.gov
Mayor – Elizabeth J. Brandt	MayorBrandt@lincolnshireil.gov
Police Chief – Joe Leonas	jleonas@lincolnshireil.gov
LRFPD Chief – Tom Krueger	tkrueger@lrfpd.org
PW Director – Brad Woodbury	bwoodbury@lincolnshireil.gov
Village Engineer - Wally Dittrich	wdittrich@lincolnshireil.gov
Utilities Superintendent – Max Geib	mgeib@lincolnshireil.gov
Finance Director – Michael Peterson	mpeterson@lincolnshireil.gov
Village Trustee – Julie Harms Muth	TrusteeHarmsmuth@lincolnshireil.gov
Village Trustee – Robert Mitchell	TrusteeMitchell@lincolnshireil.gov
Village Trustee – Mara Grujanac	TrusteeGrujanac@lincolnshireil.gov
Village Trusteee – Veronica Pantelis	TrusteePantelis@lincolnshireil.gov
Village Trustee – Jill Raizin	TrusteeRaizin@lincolnshireil.gov
Village Trustee – Sandra Wright	TrustreeWright@lincolnshireil.gov
Lake Co. Emer. Mgt. - Kent McKenzie	kmckenzie@lakecountyil.gov
Lake County – Engineer Kurt Woolford	kwoolford@lakecountyil.gov
Lake Co. Sheriff's Office – Chris Covelli	ccovelli@lakecountyil.gov
IPWMAN – (Emergency Assistance)	IPWMAN@seecom911.org
Vernon Dispatch	comm@vhills.org
ComEd – Darren Boundy	darren.boundy@ComEd.com

AT&T – Tricia Conway	tf2748@att.com
SWALCO – Walter Willis	wwillis@swalco.org
Paula Eaves (Sandbags)	paula@thesandbagger.com
MGP Owner – Tom Thomey (GIS)	tthomey@mgpinc.com
MGP Liaison – Seth Tribby	stribby@mgpinc.com
Buffalo Grove – Mike Skibbe	mskibbe@vbg.com
Hawthorne Woods – Erika Frable	EFrable@vhw.org
Lake Zurich PW – Mike Brown	Mike.Brown@LakeZurich.org
Lake Forest – Mike Thomas	thomasm@cityoflakeforest.com
Libertyville PW – Paul Kendzior	pkendzior@libertyville.com
Boy Scouts – Todd Spohnholtz	toddnanita1@gmail.com
Waste Management – Mike Brink	mbrink@wm.com
SD 103 Superintendent-Scott Warren	swarren@d103.org
SD 103 Communications Margaret Van Duch	mvanduch@d103.org
SD 103 Buses – Anthony Mendoza	amendoza@d103.org
Stevenson Busing – Barb Anderson	barbara.anderson@firstgroup.com
Marriott Manager – Brad LaJoie	blajoie@chicagomarriottlincolnshire.com
Sedgebrook Director – DeAnn Daniel	ddaniel@sedgebrook.net
Spectrum Office Center – Sue Nelsen	suenelsen@bethcoproration.com
Vernon Township – Todd Gedville	todd@vernontownship.com

Objective

The objective of the Village of Lincolnshire **Flood Response Manual** is to provide information for early flood recognition and warning dissemination, establish response and emergency response actions, establish post-flood recovery actions, and develop community awareness.

Through the implementation of this manual, the Village of Lincolnshire's main goal is to assist with minimizing public and private property losses, while protecting the public safety in an efficient and cost-effective manner.

It is the long-standing policy of the Village of Lincolnshire not to actively protect private property.

The purpose of the Village's Flood Response is to protect public infrastructure including streets, water and sanitary systems, and public utilities. Village officials will provide advisory assistance to residents desiring to protect their own private property.

When deemed necessary, the Village may order evacuation of structures. The Village assumes residents will make arrangements for temporary lodging with relatives, friends, or hotels. Please refer to the list of important phones at the front of this document for additional lodging information.

Finally, the Village of Lincolnshire does not prevent flood disasters, but enables public response actions to be timely and workable.

Manpower

Village Officials:

1. Incident Commander - Village Manager

Job Description: to remain at the Emergency Operations Center (typically the Village Hall) as the overall command in flood operations. He/she is also responsible for the decision to evacuate.

2. Site Manager – Public Works Director

Job Description: to oversee his/her assigned site (either Spring Lake Park or the bagging operation near the river). He/she will not participate in any sand bagging activities. He/she will make sure all operations are running smoothly as well as direct food, water, and shelter providers. He/she is the go to person at his/her specified site where questions are concerned. The Public Works Director will communicate with other base stations set up around the village to be fully informed of the entire procedure.

3. Operations Chief – Utilities Superintendent

Job Description: to make sure the Village's water supply is not contaminated, clear debris from the streets, as well as oversees the Public Works personnel.

4. Planning Chief – Village Engineer

Job Description: to decide where sand bags should be placed. He/she should be on site by the river and in constant communication with the other base stations.

5. Liaison Officer - Chief of Police

Job Description: to serve as the Emergency Services Coordinator and as such is responsible to direct all Village departments and to keep the Mayor and Village Manager apprised of the current disaster or emergency status.

6. Law Enforcement Branch- Police

Job Description: to serve as the main source of security for residents as well as maintain the security of the Village.

7. Information Officer – Mayor/Village Manager

Job Description: to relay information as it comes to the media as well as work with the media to inform all Village residents of precautions needed as well as requests for volunteers, food, water, or shelter. This job may be completed by the mayor or a Village trustee as designated.

8. Volunteer Coordinator – Streets/Stormwater Foreman

Job Description: to organize the volunteer force so as to use all manpower in the most efficient way. Considerations should be given to parking, sign-in, food/water/shelter for volunteers, and distribution of information packets on how to sand bag. Additionally, background checks may be required of volunteers if requested.

9. Public Works Branch – Forestry/Parks Foreman

Job Description: to report to the Public Works Director and assist and/or contribute in any ways requested. Acts as a shadow liaison to help evaluate processes and identify improvements as needed.

10. Other Village Employees

Job Description: to complete the job assigned to their designated department as well as contribute in any other ways requested.

11. Volunteers

Job Description: Volunteers must be 16 years or older and will report to a base station and await further instruction. Volunteers younger than 16 should be discouraged from assisting directly in flood operations such as sandbagging.

Flood Response Equipment, Gear and Tools Checklist:

Personal Items & Gear:

- Rubber boots, sturdy shoes, and waterproof gloves, Safety Glasses
- Proper clothing for weather and conditions & extra rain gear
- First aid kit
- Drinking water
- Hand sanitizers, insect repellent, suntan lotion
- Extra Gloves
- Floatation devices for working near water
- Flashlight and extra batteries
- Fire extinguisher
- Multi-Purpose “Leatherman type” tool

Flood Response Tools & Equipment:

- Shovels, wheel barrels
- Polyethylene: Commonly called “Poly.” or Visqene. Poly provides a water barrier for sandbag barriers. Use the heaviest and longest polyethylene sheeting available. I.e.. 20'x100' 6mil
  Have extra/more than you think you need.
- Lumber and planking: Lumber may be needed for field construction projects. Planking is valuable to make paths over muddy ground. Caution: Can be slippery!
- Sump, trash, or skimmer pumps to remove water that permeates through the dike. Extra hoses and fittings, etc.
- Road Closed Signs
- Generators
- Type I and Type II Barricades
- Duct tape, various hand tools, Utility knives
- Fuel
- Chairs

Additional Response and Recovery Items:

Item	Quantity	Notes
Barricades - Type 1, 2 with lights.	20	In stock
Cones	20	In stock
Caution Tape:	10 Rolls	In stock
Port-A-John's	1-2	Order as needed
Water (bottled)	10 cases	Order as needed
Food (employees/volunteers)	TBD	Order as needed
Sand	4 tons	Order as needed
Sandbags	10,000	In stock
Plastic (polysheeting) 6 mils	5 rolls	Order as needed
Light towers (balloon light)	1-2	In stock
Dumpsters	3-4	Order as needed
Clean Up Kits	TBD	Coordinate w/Red Cross

Other Misc. Items:

- Row boat or canoe for sandbag placement or evacuations
- Pop-Up Canopy, 10'x10' for rain/sun shelter
- Ropes, Bungee Cords, Zip Ties, etc.
- Additional lighting, in case there is a need to work at night
- Tarps
- Buckets
- Paper, Pens and Pencils
- Additional Cell Phone Chargers
- Flip Charts

DES PLAINES RIVER - FLOOD ALERT STAGES

10.5 feet - Observation Stage (640.48)
The observation stage is when Village Staff begins monitoring weather forecasts and the river gauge on a daily basis. Staff will begin assessing equipment and inventory needs at this time.

11.5 feet - Action Stage (641.48)
The Action Stage is a "heads-up" stage at which the National Weather Service begins to issue river flood advisories and river forecasts. Village will begin servicing pumps and generators. Staff will order skids and sandbags as needed. Staff will also check all intake and discharge hoses are functional and order additional hose as needed.

12.5 feet - Minor Flood Stage (642.48)
Water begins to overflow onto Londonderry Lane. If the river is forecasted to increase above 13.0, the Village will monitor Londonderry Lane to determine if closure of the road is warranted. Village officials will decide whether or not to close Londonderry Lane. Village will order 2-3 semi-loads of sand to be deployed at Spring Lake Park. Public Works Staff will begin making sandbags and placing them onto skids to be placed in designated locations.

14.0 feet - Moderate Flood Stage (643.98)
Water begins to pond on Lincolnshire Drive at Wiltshire Lane. Londonderry Lane is closed between Lincolnshire Drive and 45 Londonderry Lane. At this point, the Village may deploy pumps along Lincolnshire Drive to assist in the removal of water from the pavement. Village Officials will close Londonderry Lane and close the flood control valves along Lincolnshire Drive. Pumping will begin at Wiltshire Drive and Londonderry Lane. Village will need to begin gathering volunteer information. At this stage the EOC (Emergency Operations Center) is now activated and in full effect out of Village Hall.

15.5 feet - Major Flood Stage (645.48)
Water approaches the top of the river bank on the east side of the Des Plaines River. The Village may initiate sand bag operations to protect Village facilities. Public Works will need to make a decision on whether or not to sandbag. The decision to sand bag or not sand bag will be based upon many factors, including but not limited to: forecasted crest elevation, forecasted time to crest, available resources, weather conditions, and safety of workers and volunteers.

16.5 feet – Evacuation Stage (646.48)
At this stage the Village would require a mandatory evacuation of the residents on Lincolnshire Drive from Oxford Drive to Londonderry Lane. All residents would be advised to shut off any power sources.

17.5 feet – 100 Year Flood Stage (647.48)
Lincolnshire Drive is closed from Cambridge Lane to Oxford Drive; Wiltshire Drive closed from Lincolnshire Drive to Cumberland; Cumberland Drive impacted; Oxford Drive between Half Day Rd and Essex Lane impacted; Stonegate Circle impacted; Half Day Rd between Village Hall and Oxford Drive (including Route 22 bridge over Des Plaines River) potentially impacted

Stream Gauge – Flood Elevation Conversion Chart

FASL – (Feet Above Sea Level)

0 feet = 629.98 (FASL)

1 foot = 630.98 (FASL)

2 feet = 631.98 (FASL)

3 feet = 632.98 (FASL)

4 feet = 633.98 (FASL)

5 feet = 634.98 (FASL)

6 feet = 635.98 (FASL)

7 feet = 636.98 (FASL)

8 feet = 637.98 (FASL)

9 feet = 638.98 (FASL)

10 feet = 639.98 (FASL)

11 feet = 640.98 (FASL)

12 feet = 641.98 (FASL)

13 feet = 642.98 (FASL)

14 feet = 643.98 (FASL)

15 feet = 644.98 (FASL)

16 feet = 645.98 (FASL)

17 feet = 646.98 (FASL)

Flood Forecasting

Forecasting a flood is the first step in developing event specific objectives for fighting flooding. Data must be obtained from weather reports and forecasts, stream gauges, field observations, maps and studies, outside agencies, and other sources. In general, the Public Works Department will monitor flood forecasts and warnings.

Real-Time Flood Stage Information

The National Weather Service provides predictions as to how high the water will go based upon antecedent ground conditions, forecasted precipitation, and river hydraulics and hydrology.

Real-time information is now available for the Des Plaines River to help determine actions to take in the event of a flood along the Des Plaines River.

The Village, in partnership with the Lake County Stormwater Management Commission, U.S. Geological Survey, United States Department of the Interior, and NOAA National Weather Service Chicago, maintains a river gauge to measure the height of the water along the Des Plaines River.

Information on this website is the same information the Village uses to assess its response to flooding along the Des Plaines River.

The real-time data may be found on the National Weather Service website located at:http://www.crh.noaa.gov/lot/

Stream Gauge

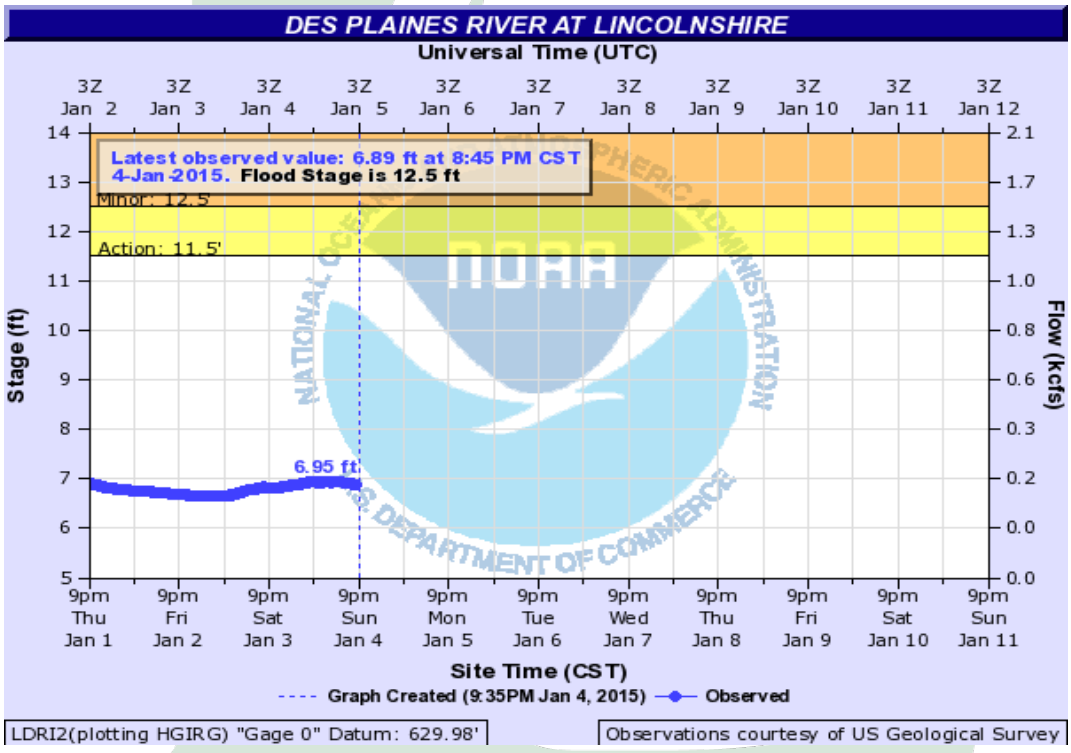
Figure 1. Des Plaines River
Stream Gage @ Route 22

Hydrograph

In 2004, the Department of the Interior, United States Geological Survey, Water Resources Discipline installed Gage Model 85CC on the south face of the Half Day Road/Route 22 Bridge. This gauge measures the water depth of the Des Plaines River. These gauges provide information to determine the type of flood at each point along the river. By measuring the flood elevation at points upstream from Lincolnshire and monitoring upstream rainfall events, we may be able to predict the type of flood expected in Lincolnshire. These gauges will also assist in predicting the time flooding may occur in Lincolnshire.

The main source of information during a flood event is a website with real-time data for USGS 05528000 Des Plaines River near Gurnee, IL which can be found at the Village of Lincolnshire River Gauge Site:

http://water.weather.gov/ahps2/hydrograph.php?wfo=lot&gage=LDRI2



Based upon previous floods and response times, the Village has identified what will likely be observed at various stages. Responses are triggered when the National Weather Service predicts a certain stage will be reached.

Pre-Flood Communication Plan

As the potential impact to health, safety, and welfare is significant during a flood, public notification is a very important component of the Village's flood response. The public notification campaign to Lincolnshire residents must begin well before the start of a flood event and continues well beyond the recession of the water.

1. Pre-Flood Notification

The Village conducts yearly outreach activities to alert residents to the existence of flood hazards. The importance of flood insurance is stressed. Direct mailings are sent to real estate agents and lenders advising them of the Village's flood program. The details of these outreach activities are not detailed in this manual.

2. Flood Event Notification

As soon as it is evident a significant flood will occur, a concerted effort must be made to alert the public about the potential for the flood and advise them of the actions they should take to protect themselves and their property. It is assumed major television and radio stations will report flood watches and warnings.

Messages to the public should be clear, concise, and consistent. The messages must be coordinated between the Mayor and the Village Manager.

The Village has established a series of pre-formatted messages for various media types including:

1. Signs
2. Cable-TV
3. Village website
4. Door-to-Door communications
5. Front Desk Information
6. Message Board
7. Social Media
8. Blackboard Connect
9. E-News

Blackboard Connect

In order to provide residents with the quickest and most effective and up-to-date information regarding flooding, Village staff shall direct residents to sign up for the Village's Blackboard Connect notification service located at:

http://www.lincolnshireil.gov/news-updates/connect-cty

Automated Telephone Dialing System

The Village of Lincolnshire maintains access to an automated telephone dialing system. During significant storm events, this system will be used to phone residents and businesses within the floodplain and provide recorded messages containing important information. The message to be played will depend upon the flood threat to the area. Please refer to page 54. of the Lincolnshire Flood Response manual for detailed examples of the automated messages.

Village Flood Response Procedures

Upon receipt of a flash flood watch or flood watch, the Public Works Director shall execute the following:

A. Immediately notify the Chief of Police.
B. Assign personnel to monitor the affected area every thirty minutes until the threat of flooding has ceased.
C. The Village Manager should be made aware of flooding conditions throughout the Village and its effect on the property and residents of the Village.
D. If appropriate make all necessary notifications to all remaining Village personnel and Village officials.
E. Begin execution of the Village's Flood Response Plan or any portion of the plan which applies if appropriate.
F. Stay abreast of all weather forecasts
G. Continually assess the situation including determination of potential flood hazards and estimate rise of water based on flood warning notifications.
H. Change work schedules to fit needs.
I. Secure emergency or temporary housing for evacuees if needed.
J. Set up patrols of evacuated areas for protection of property and prevention of fires.
K. Contact all public utilities to schedule electrical, gas and water inspections as necessary to prevent accidents.
L. Request local, state and county authorities to assist as needed.

During all flood events, the following priorities are established for the Department:

1. Ensure that an adequate supply of potable water to the affected area is maintained, and that the water system is not contaminated.
2. Ensure safe access to the affected area is maintained by removing any debris from the streets.
3. Place barricades and provide manual traffic control as necessary to isolate the affected area.
4. Determine the locations for placing sandbags.
5. Provide equipment and manpower to assist in sandbagging operations as requested.
6. Provide updates to the Village Manager as requested.
7. Provide equipment and manpower to assist in sandbagging operations as requested
8. Identify and locate emergency shelter for evacuated residents as necessary.

Additionally, in the event of a flood event, the Village will take the following actions:

- The Village Emergency Preparedness Plan will be implemented
- Residents will be notified of the pre-flood state of alert
    - Information will be broadcast on Cable Channel 10
    - Residents in a hazard area will be notified by phone or in person.
- The Village will begin to place sandbags as necessary to protect public infrastructure.

Property owners are responsible for protective measures for individual homes and property, including sandbagging, pumping, turning electricity off, etc. Action taken by Village staff, such as sandbagging, is intended to protect public property and benefit the entire area.

Incident Command

The Village follows the National Incident Management Systems (NIMS). The Department and its personnel are NIMS certified at various levels. Flood response follows the NIMS model as it is likely the response will need to be coordinated not only among departments within the Village but also with state, federal and other local officials.

Mobilization

Once river levels are anticipated to reach the observation stage (10.5 feet), the Public Works Department will begin to monitor the Des Plaines River gage at Route 22. These readings will be utilized to predict when to initiate an emergency response.

Based upon the initial assessment of the potential for flooding, the Village Manager will prepare incident objectives for the first 12 hours of the flood response. In preparation of commencing sandbagging operations, the Public Works Administrative Assistant should be directed to order sand and additional sandbags.

Materials

In general, the flood mitigation will consist of installing sand bags at strategic locations to protect public infrastructure. A brief discussion of the materials, their source, and procedures for obtaining the materials is described below:

1. Sandbags

Before a rain event with flooding potential reaches the Village, the Public Works Director shall decide if and when sandbags will be provided to Village residents and business owners. Sand bags shall be provided at the Village's distribution point, located at Spring Lake Park (49 Oxford Drive). The Village shall advise residents and business owners of the availability of sand bags through the outreach channels. Sandbags shall be burlap or plastic bags. The Village maintains a supply of approximately 10,000 bags. When it is clear that the Village will need additional bags, the Public Works Director shall obtain the required number of bags.

2. Sand

Material for sand bags shall consist of fine sand. ***Sand from the Spring Lake Park beach shall not be used for sand bags.*** In anticipation of a flood, the Public Works Director or his designee shall order sand from one of the suppliers listed in Appendix B. The sand shall be delivered to the parking lot located at Spring Lake Park for incorporation into the bags.

3. Polyethylene

A layer of polyethylene should be placed beneath the sand bags. The Village does not maintain a supply of polyethylene. Sources for this material are listed in Appendix B. The polyethylene is to be delivered to the staging area.

4. Equipment

All Public Works equipment is available to fight floods. Below is a brief description of the main pieces utilized for fighting floods. Not all pieces are described herein. For a complete listing of public works equipment, see Appendix C.

Front End Loader: John Deere 544-K II. It is located at the Public Works Facility. It can be used in water up to about 4 feet.

JCB Loadall: JCB 520. It is located at 45 Londonderry Lane in the storage garage. It is mainly used to load sand and transport sandbags.

Emergency Response Trailer: The Village owns a 2015 Wells Cargo Emergency Response Trailer which simplifies transporting essential tools and materials during Emergency Flood Operations. The trailer contains the following materials to assist with Emergency Flood Operations:

Barricades	Caution Tape
Road Closed/Open Signs	Extension Cords
Fire Extinguisher	Road Flare Kit
Street Brooms	LED Traffic Batons
Oil Dry	Tool Kit
Traffic Cones	First Aid Kit
Operations Table	Portable Tent
Incident Report Forms	Chainsaws
Rubber Hip Waders	Sandbags
Temporary Lighting	Traffic Paddles (Stop/Slow)
Life Preserver Jacket	Quick Connect Hoses
Water Containers	Pitchforks
Shovels	Rakes
Loppers	Flashlights

Figure 2. Emergency Response Trailer

Sandbag Machine: The Village owns a Kanzler sandbag machine capable of filling up to 4 sand bags at a time. The machine has the capacity to fill 700 bags per hour. The machine is stored at the Public Works Facility and can be delivered anywhere in the Village on a flatbed trailer and can be seen below in figure 5.

Figure 3. Kanzler Sandbag Machine

Pumps: The Village has the following pumps available for flood mitigation:

Table 6. Pumps

Pump Description	Capacity	Storage Location
1 each - 4" Godwin Dri-Prime pump mounted on a trailer with quick disconnect suction and discharge hoses - Diesel powered - 30 gal tank.	500 gal/min. or 30,000 gal./hr.	Public Works Facility
1 each - 6" Godwin Dri-Prime-pump mounted on a trailer with quick disconnect suction and discharge hoses - Diesel powered – 60 gal tank.	600 gal/min. or 36,000 gal./hr.	Public Works Facility

Work Smart - Flood Response Personal Safety Tips:

Please use the following safety tips in order to keep yourself and other co-workers safe while participating in the Village flood response procedures:

Take Care of Yourself:

- Drink plenty of fluids and eat regularly. Avoid Caffeine & Alcohol
- Pace yourself. Take Frequent Rest Breaks. Dress appropriately.
- Know your personal limitations and never engage in any response activity that feels uncomfortable

Stay Healthy & Maintain Personal Safety:

- Wash your hands before eating, and follow basic sanitary procedures.
- Always lift with your legs, not your back.
- Properly care for all wounds and injuries, no matter how minor.
- Stop immediately if you feel dizzy, have chest pain, shortness of breath, or pain down your left arm. Seek immediate medical attention if you experience any of these symptoms!
- Use the buddy system

Typical Flood Response Injuries Include:

- Heat and cold-related injuries, Infections from open wounds from the water.
- Sprains, Strains, Cuts & Lacerations, Blisters

Realities of Flood Response:

- Be aware that flood response is a mentally and physically demanding process.
- Speak up if you are uncomfortable working in any situation.
- You know your limitations better than anyone
- Maintain a safe working environment throughout operations.
- Be aware of potential lift, trip, fall, pinch, electrical, puncture, chemical and environmental hazards associated with operations
- Be aware of potential waterborne, foodborne, and other hazards associated with flooding and potential environmental conditions
- When working near waterways, rivers, and/or levees/dams will wear assigned personal flotation devices (PFD) during operations.
- Do not walk through moving water. Six inches of moving water can make you fall. If you have to walk in water, walk where the water is not moving. Use a stick to check the firmness of the ground in front of you.

Your Personal safety is always the top priority!

Weather Conditions:

- Weather conditions, such as rain and wind, can affect the flood response by making the tasks associated with constructing a sandbag barrier more difficult and increasing the likelihood of injury.
- It is important to **dress appropriately** for the weather and to wear layers.

Mental Preparation & Fatigue:

- Responding to a flood is a long, arduous process. The work involved, including filling sandbags, is often repetitive, and there are few immediate signs that progress is being made. This can result in a frustrating experience for responders who aren't mentally prepared.
- The mental stress, as well as the physical stress, is another reason that taking breaks is important during flood response to stay alert.
- Participating in a flood response is physically demanding. It is important to listen to your body and take breaks as needed, especially when working extended hours under stressful circumstances.

Additional Flood Response Activities

Sand Bagging : Sand bags will be placed at the locations directed by the Operations Chief based upon input from the Planning Chief. The procedures for placing sand bags are outlined in Appendix D.

Pumping : Pumps will be utilized along Lincolnshire Drive to minimize water on the pavement. Typically, pumps will be placed near Wiltshire Drive and near Londonderry Lane. Pumps may be placed at other locations as directed by the Operations Chief.

Evacuation : In the event that structures are evacuated, the Village should attempt to obtain contact information for those people who are leaving the area. This contact information is to be maintained so that Village officials can notify the residents and/or family members of significant changes in the status of their structures. The list is also to be utilized to ensure that all persons are accounted for during the flood.

Des Plaines River Earth Berm

History

Overbank flooding is partially mitigated along Lincolnshire Drive between Londonderry Lane and Spring Lake Park by the existence of a non-engineered earthen embankment. According to minutes of the September 9, 1963 Village Board meeting, a contractor constructing a sewer line was "directed to dump the dirt on the bank" to create a "berm on the river." The intent of this work was to establish a "reasonably effective dike on the Des Plaines river in case of future flooding." Minutes of the November 26, 1963, meeting of the Village Board of Trustees indicates that the placement of dirt was complete that the Village would hire a contractor to "shape the dyke and prepare for flood control."

- *It shall be noted this earth berm is not a true levee and may weaken over time.*

Inspections

It is advised that residents along the West side of Lincolnshire Drive between Londonderry Lane and Spring Lake Park shall conduct bi-annual inspections of the berm that borders their individual property. These inspections should be conducted in early Spring and late Fall. During these inspections, residents are advised to evaluate the berm, identify weak point areas to focus on and address those areas as needed. **The Village of Lincolnshire does not maintain and/or perform work on any areas of the berm as this is considered private property.**

Figure 4. Des Plaines River Earth Berm

Additional information on flood berm maintenance and care can be found on the FEMA website located at: http://www.fema.gov/media-library-data/20130726-1608-20490-6445/fema551_ch_05.pdf

Base Station Set-Up

Base Locations

1. Spring Lake Park : When the anticipated flood event is less than a 100-year event, Spring Lake Park may be utilized as a base station. In events greater than or equal to a 100-year event, Spring Lake Park will be inundated and its use as a base station will be compromised. The base station should be set up as shown in "Spring Lake Park Base Station Diagram" Figure 3. The following key components must be considered when setting up the base station.

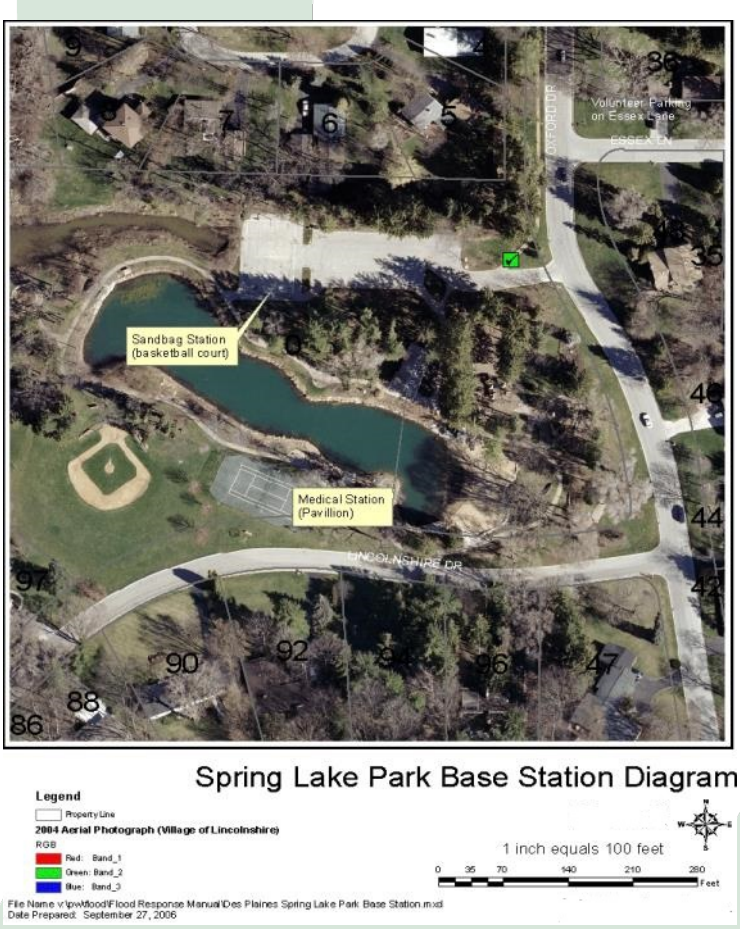


Figure 5. Spring Lake Park Base Station

A. Restricted access to the station is to be provided at the park entrance. The Police Department should supply a sentry, most likely an Explorer, to ensure that only Village authorized vehicles enter the driveway. All other vehicles are prohibited from utilizing the driveway, including residents picking up sandbags, unless otherwise authorized by the Public Works Director.

B. The base station may also include a baby-sitting tent for children less than 16 years of age who cannot volunteer with their parents. The tent shall be run by of age volunteers who are physically incapable of filling sandbags and may be manned with older children 12 to 15. In extreme weather conditions, this station may be moved to the Public Works Facility.

C. Food and Water stations may also be added at the direction of the Village Manager.

2. Village Hall: The Village Hall is the primary location of the Emergency Operations Center. For more information on setting up the Village Hall as the Emergency Operations Center, see the Village of Lincolnshire Preparedness Plan Annex A "Emergency Operations Center Annex."

3. Public Works Facility: In the event that Spring Lake Park is not available for use as a Base Station, operations should be moved to the Public Works Facility. The Public Works facility is the site where equipment is stored and maintained. In the event that the Village Hall is unavailable, the Public Works Facility may also become the site of the Emergency Operations Center.

Figure 6. Public Works Facility Base Station

Health Issues

Food: Food may be obtained from a variety of sources including local grocery stores and restaurants. Often these businesses will donate food for responders. The Chamber of Commerce or other groups may assist in obtaining these supplies.

Water: During the flood event, one of the primary goals of the flood response is to secure the potable water system. Workers will need approximately one (1) gallon per day per person to remain properly hydrated. A water station is to be set up at the main staging facility. Cups or bottled water are to be provided by the Public Works Director.

Shelter: For extended flood response, tents should be set up near the river site to store food, water, and blankets and to provide an escape from the weather. The Spring Lake Park Pavilion may be used, as well as Village Hall and the Public Works Facility. Cots are available at the Public Works Facility.

Rest: During a flood response, flood fighters will spend long hours in the field. Each worker must take a minimum of 6 hours off after working a maximum of 18 consecutive hours. Adequate provision must be made to provide food, water, and shelter to the workers.

Flood Water Contamination**:** The contamination is a result of flood waters coming in contact with chemicals from sewage treatment plants, chemical storage facilities, and other areas.

The Public Works Director should inform all persons entering the flood area that they should wash the hands before touching food or beverages. They should wash their hands upon leaving the flood area.

The Village should make available tetanus shots to all employees who come into contact with flood water and who have not been vaccinated within the prescribed time as determined by medical practitioners. The Village may arrange for a nurse from the Occupational Health services to provide the shots at a location convenient to employees such as the Spring Lake Park Pavilion, Village Hall, or the Public Works Facility.

The Village should recommend that all volunteers contact their physician to determine whether they should receive tetanus shots.

Sand Bag Information

Sandbagging can be used to create a temporary protective barrier at unprotected low points or to protect isolated critical facilities. Sandbagging also can add a few feet to the height of existing berms for additional temporary protection.

Sandbagging takes a lot of time and manpower, and high sandbag berms are not stable. Therefore, sandbagging should only be used to protect against flood depths of up to three feet.

Sandbags, sand, and plastic sheeting must be purchased. Burlap sandbags are considered more durable and reliable than plastic sandbags when temperatures are below freezing.

Sandbags can be obtained from the U.S. Army Corps of Engineers by calling 847.688.4431 which now charges about $0.35 per bag. If the flood is declared a major disaster and your community is eligible for disaster assistance, the Village can reclaim 75% of the cost for sandbags provided they were purchased from a private (non-governmental) supplier.

Sand is usually purchased from suppliers because it is easier to deliver and use than getting fill by digging up the ground. Figure one ton of sand for every 60 bags needed.

Below is a chart to estimate the number of sandbags and tons of sand needed for a 100 foot wall. The length of the plastic sheeting is based on the length of the wall, allowing for overlapping between sheets.

Table 7. Sandbag Wall Materials Quantities vs. Height

Height	Number of sandbags	Tons of sand	Width of plastic sheeting
1'	800	13	4'
2'	2,000	33	5'
3'	3,400	57	6'
4'*	5,300	88	7'
5'*	7,600	127	8'

*Sandbag walls over three feet high are not recommended

Sandbagging is more than simply filling bags with sand and throwing them on top of each other. Considerable time is required to construct a sandbag wall. Plan on hours rather than minutes.

You may want to experiment with labor saving devices to fill sandbags (trenching machines and salt spreaders can work). Some communities have built frames to put on the tailgate of a dump truck and fill sandbags in an assembly-line fashion..

Sandbag or other emergency barriers should be located as far back from the river as possible to take advantage of higher ground and provide more area for flood flows. Sharp bends in the wall should be avoided. Keep trees and brush between the levee and the river to protect against current and debris.

Other barriers can be built if you can afford them. Temporary levees can be put up quickly if you have the equipment. The ground should be stripped, the first (preferably clay) should be compacted, and the levee protected from scour by plastic sheeting. The sides should have a 3:1 slope. Because these quickly built levees can be very unstable, the Corps of Engineers should be consulted for technical advice before the flood.

Sandbagging Procedures

1. Strip the ground of sod. When the grass gets wet it is slippery, and your wall could be pushed back by the force of the flood waters.
2. Dig a trench about 1 foot wide by 6 inches deep. This is called a bonding trench and helps keep the wall in place.
3. Lay a plastic sheet in the bonding trench and on the ground toward the flood.
4. Fill bags about 1/2 to 3/4 full with sand or gravelly material. Don't overfill bags.
5. Starting in the bonding trench, lay the bags down with each bag placed on top of the previous one's flap. Stomp and/or tamp the bags tightly in place.
6. Each layer should have the bags laid at right angles to the previous one.
7. When your protection height is reached, pull the plastic sheet up in front of the wall and hold it down on the top with more bags.
8. If current and debris are expected, you may want to place the plastic sheet behind the outside layer of sandbags to protect it from being snagged or ripped.

A sandbag dike must be built properly to prevent or reduce flood damage.

■ Managing Volunteers

Since a dike will fail if not built correctly, training people on proper procedures for placing sandbags is very important. In the rush, volunteers will do something, but the result frequently is a dike that performs poorly or fails. Put a high priority on planning and organization. Identifying a supervisor for the project is recommended.

■ Sandbag Materials

Bags are made from various materials, but the most common is woven polypropylene. They usually measure about 14 inches wide and 24 to 26 inches long. Other sizes of bags also are available, but bags are easier to handle if their weight with filling in them is limited to 35 to 40 pounds. Sand is the easiest material for filling and shaping sandbags. Silt and clay in bags will form a good dike, but working with those materials is more difficult. Fill sandbags slightly more than one-half full. Contact your county emergency management office for information on where to obtain sandbags.

■ Site Selection

When selecting the location for the dike, take advantage of natural land features that keep the dike as short and low as possible. Avoid obstructions that would weaken the dike. Do not build the dike against a building wall due to the forces the dike may place on the building. Leave at least 8 feet to maneuver between the dike and buildings for observation, pumping seepage water and other activities.

Since friction holds a dike from sliding, create a good bond between the ground and the dike. Remove ice and snow since it will melt permitting water to flow under the dike. Remove anything else that is “slippery.” If the dike is to be more than about 3 feet high, dig a bonding trench where the dike will be placed if possible. The trench should be about 4 to 6 inches deep and 18 to 24 inches wide.

■ Estimate Sandbags Needed

Build the dike at least 1 foot higher than the projected crest level to allow for fluctuations in the water level. Local experience will assist in determining the amount of freeboard to provide.

The U.S. Army Corps of Engineers recommends building a dike with a width at the base that is three times the dike height. For example, a 4-foot-high dike would have a base width of 12 feet. The corps indicates that each foot of finished dike length requires one bag, each foot of height requires three bags, and each 2.5 feet of width requires three bags. This results in each bag having placed dimensions of about 4 inches high by 10 inches wide by 14 inches long.

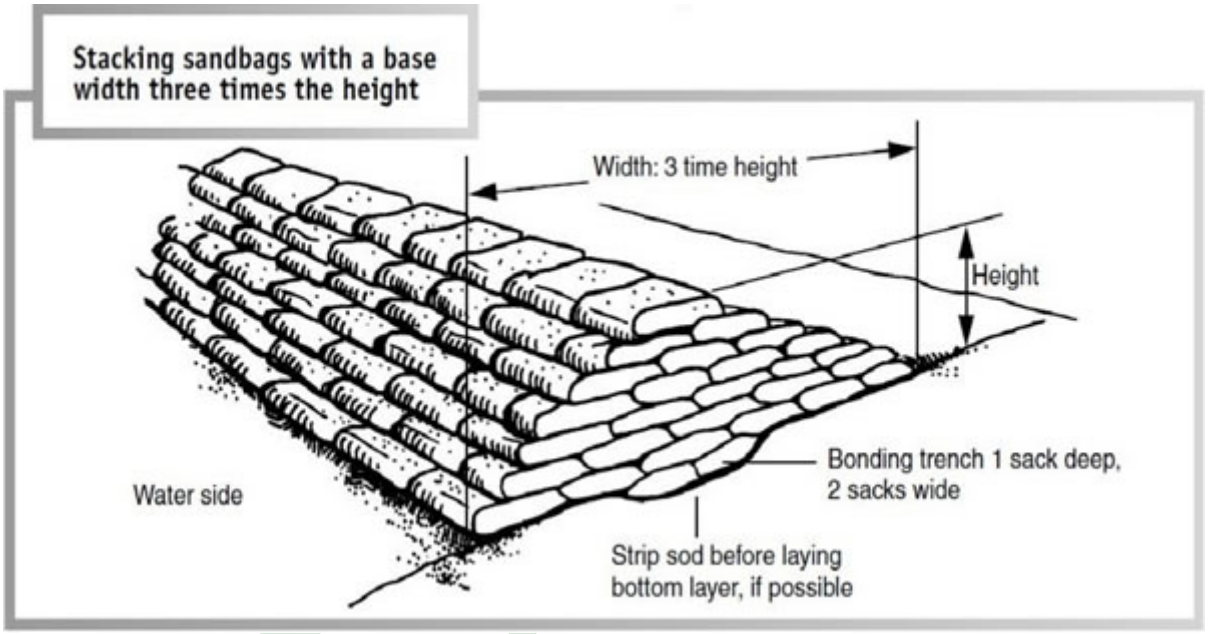


Figure 7. Stacking Sandbags Diagram

Use the following equation to estimate the number of bags required per linear foot of dike for a dike with a **base width that is three times the height.**

N = (3 x H) + (9 x H x H) / 2

N – Number of bags required per linear foot of dike

H – Dike height (feet)

Example: Estimate the number of bags required per linear foot for a dike 3 feet tall.

N = (3 x 3) + (9 x 3 x 3) / 2 = 45 bags

The estimated number of bags needed for 100 linear feet of dike is:

1-foot-high dike: 600

2-foot-high dike: 2,100

3-foot-high dike: 4,500

4-foot-high dike: 7,800

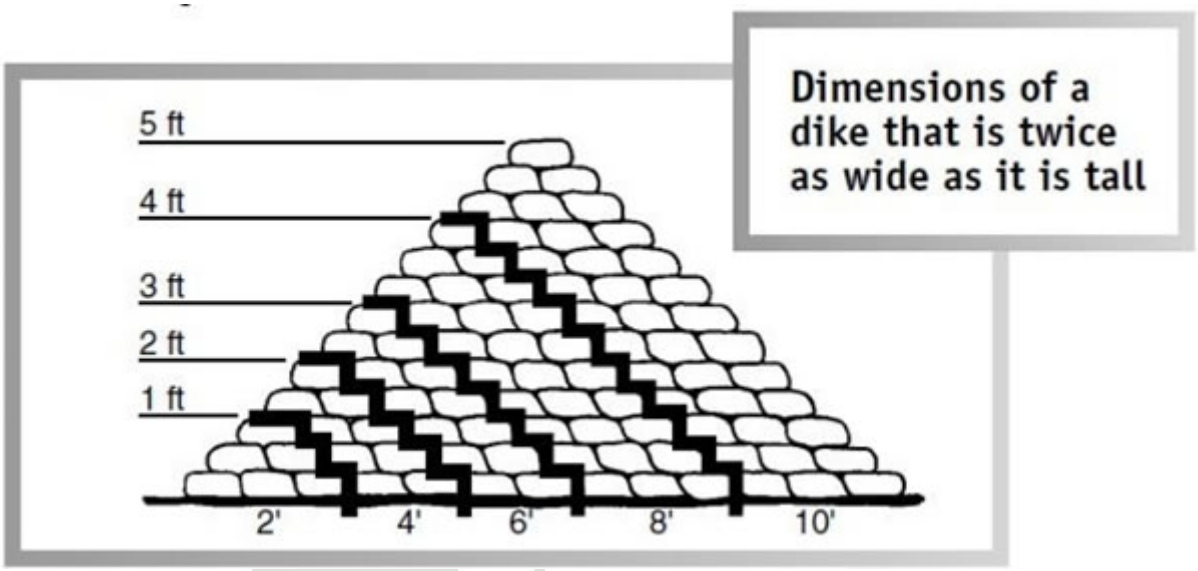


Figure 8. Dike Dimensions Diagram

A common recommendation is to make the dike twice as wide as its height. This is a minimum width-to-height ratio that should be used. The estimated number of bags needed for this ratio is in the following table. This is based on each bag having placed dimensions of about 4 to 5 inches high by 9 to 10 inches wide by 14 inches long.

The **estimated** number of bags needed for 100 linear feet of dike that it **twice as wide as its height is**:

1-foot-high dike: 600

2-foot-high dike: 1,700

3-foot-high dike: 3,000

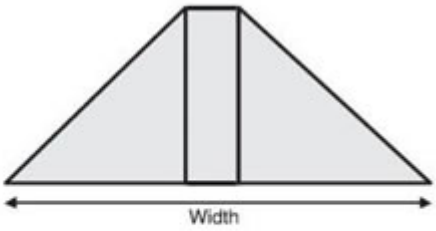
4-foot-high dike: 5,500

5-foot-high dike: 9,000

A cubic yard will fill about 100 30-pound sandbags or about 75 40-pound bags, assuming the sand weighs 110 pounds per cubic foot. Sand weighs 100 to 130 pounds per cubic foot, depending on moisture content and packing. A cubic yard is 27 cubic feet. Each 14-inch by 24-inch bag will hold about 0.4 cubic feet if filled about one-half full. Based on volume, each yard will fill about 67 bags one-half full.

Estimated cubic yards of sand needed per 100 feet of dike length for various dike heights and ratios of height to width. An additional 2 cubic yards will be needed for bags to hold the plastic.

		Dike Height (ft.)								
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Cubic Yards of Sand	Width 3 x H	7	15	25	38	54	73	95	119	145
	Width 2 x H	6	11	18	27	38	50	65	82	100



This volume is calculated based on a center section that is 9 inches wide and the remainder is in a triangular shape.

Figure 9. Dike Height Diagram

■ Filling Sandbags

Fill the bags about one-half full and tie the bag near the top, if it is tied, which permits the sand to move easily in the bag to create a good dike. Overfilled bags and bags tied too low leave gaps in the dike, which allows water to seep through. Sandbags do not need to be tied unless they are transported. Filling sandbags usually is a two person operation. One member of the team holds the bag on the ground slightly in front of his or her spread feet and the second shovels the sand into the bag. Use gloves to protect the bag holder's hands. The use of safety goggles is desirable, especially during dry and windy days. For large-scale operations, filling sandbags can be expedited by using bag-holding racks, funnels on the back of dump trucks used for sanding operations and various power loading equipment. However, the special equipment required is not always available during an emergency.

Figure 10. Filling Sandbags Diagram

■ Stacking Sandbags

Lift bags using your legs and limit twisting of your back. Gently hand the sandbag to the next person in a sandbag brigade or line. A triangular or pyramid shape for the dike is not necessary if the height will be 1 foot or less. Support the wall of sandbags with “clusters” of bags every 5 feet to stabilize the sandbag wall so it does not tip over from the force exerted by the floodwater.

Place the first layer of bags lengthwise on the dike (parallel to the flow), lapping the bags so the filled portion of one bag lies on the unfilled portion of the next, with the tied or open end of the bag facing downstream. Offset adjacent rows or layers by one-half bag length to eliminate continuous joints, similar to what is done laying bricks. Compact and shape each bag by walking on it to develop dike strength and create a tight seal.

Continue to walk on the bags as succeeding layers are placed. The base of the dike should be about two to three times as wide as the dike is high to provide adequate strength and friction surface area. Water exerts a tremendous force against the dike. Estimate the pressure on the dike base by multiplying the water depth by 62 pounds. For example, the pressure that 5 feet of water exerts on the base of a dike is about 310 pounds per square foot. The force of 5 feet of water on a vertical wall is about 775 pounds per linear foot of wall. Flowing water striking the dike exerts even more force on the dike. A triangular shaped dike permits the weight of the water to push down on the dike to help hold it in place.

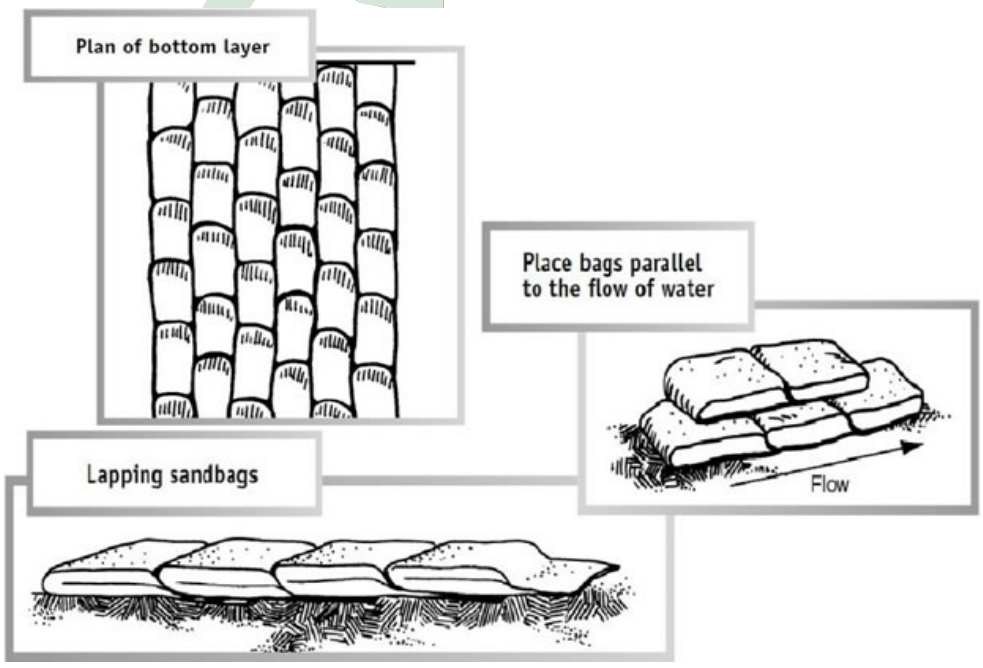


Figure 11. Stacking Sandbags Diagram

■ Sealing the Dike Wall

The finished dike should be sealed with a sheet of plastic to improve water tightness. Spread a layer of soil or sand 1 inch deep and about 1 foot wide along the bottom of the dike on the water side. Lay polyethylene plastic sheeting so the bottom extends 1 foot beyond the bottom edge of the dike over the loose soil or sand. The upper edge should extend over the top of the dike. Polysheeting at least 6 mils thick is preferred. It generally is available in 100-foot rolls from construction supply firms, lumberyards and farm stores. Do not put plastic sheeting under the bags since that will increase the potential for the dike to slide. If more than one sheet of plastic is used, the poly sheeting should be placed from downstream to upstream and the next sheet upstream overlapped by at least 3 feet. Overlapping in this direction prevents the current from flowing under the overlap and tearing the poly loose.

Lay the plastic sheeting down very loosely. The pressure of the water will make the plastic conform easily to the sandbag surface. If the plastic is stretched too tightly, the water force could puncture it. Place a row of sandbags on the bottom edge of the plastic to form a watertight seal along the water side. Place sandbags to hold down the top edge of the plastic. Avoid puncturing the plastic with sharp objects or by walking on it.

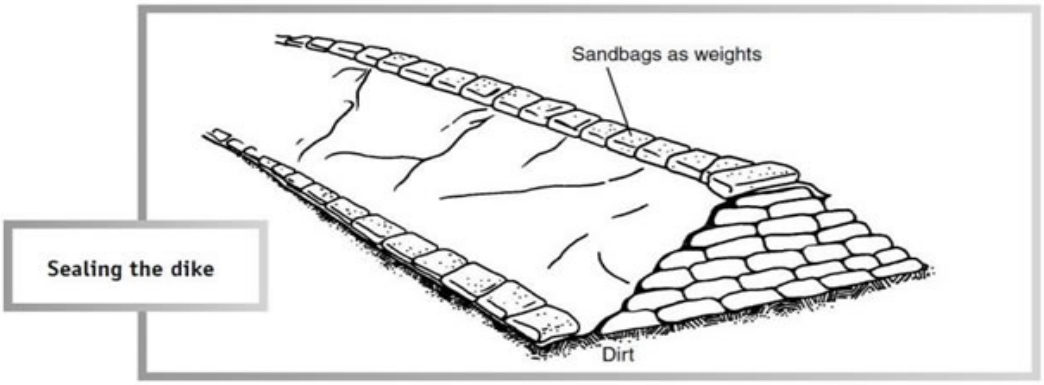


Figure 12. Sealing the Dike Diagram

■ Controlling Seepage

Use a sump or skimmer pump to remove water that permeates through the dike. Use ground fault circuit interrupters on circuits or extension cords to reduce the risk of electrocution.

■ **Disposing of Used Sand**

Floodwater is generally considered polluted, so sand from bags exposed to flood water should not be used for children's sand boxes. It can be used for typical construction application

DIY Sandbag Tubes: The Easy Way to fill Sandbags

Figure 13. Sandbag Tubes Picture

Sandbags are still the best way to put up a quick dike in times of need. They are useful for many things, but the main focus of this is for those fighting floods. It's easy to get a lot of sand delivered quickly, sandbags themselves are cheap, and with a little labor, anyone can protect their home.

Filling the sandbags is the bulk of the work; holding the bags while someone shovels is time consuming, back breaking and tedious. There are many inventions that can help with the process, but most of the ones that work well are expensive.

The Sandbag Tubes are a cheap, simple to make, tool that will reduce the amount of effort required to fill bags and speed up the process. Anyone can use them and they can be used over and over. Because they are so cheap and easy, many sets can be made and used simultaneously.

Figure 14. Sandbag Tubes Overhead View

Figure 15. Sandbag Tubes Bag Use

Figure 16. Sandbag Tubes Pre-Fill

Advantages include- No one stuck bent over holding bags - All participants can shovel - Does not require lifting the shovel any higher than necessary - All bags filled correctly and consistently (no heavy/light bags). - Faster than many machines

Younger Volunteers can become more effective when utilizing Sandbag Tubes

Parts needed: - One 6" x 10' thin walled sewer pipe - Two 8 foot 2x4s - 1-5/8" construction screws (for attaching tubes) - 3" construction screws or nails (for frame assembly) - 2' 5" x 1'5" 1/4" or thicker plywood (optional but recommended)

Tools Needed: - Saw to cut the tubing and 2x4 - Drill bit to pre-drill the holes for screws (right angle drill is easier) - Powered screwdriver - handheld jigsaw or router for cutting plywood (for optional top)

Fabrication Steps:

First, get out the saw
-Cut the sewer pipe into 6 sections (each 19-7/8" long)
-Cut the lumber into the following sections
(3) 2' 2"
(2) 1' 5-1/16"
(4) 6- 5/16"

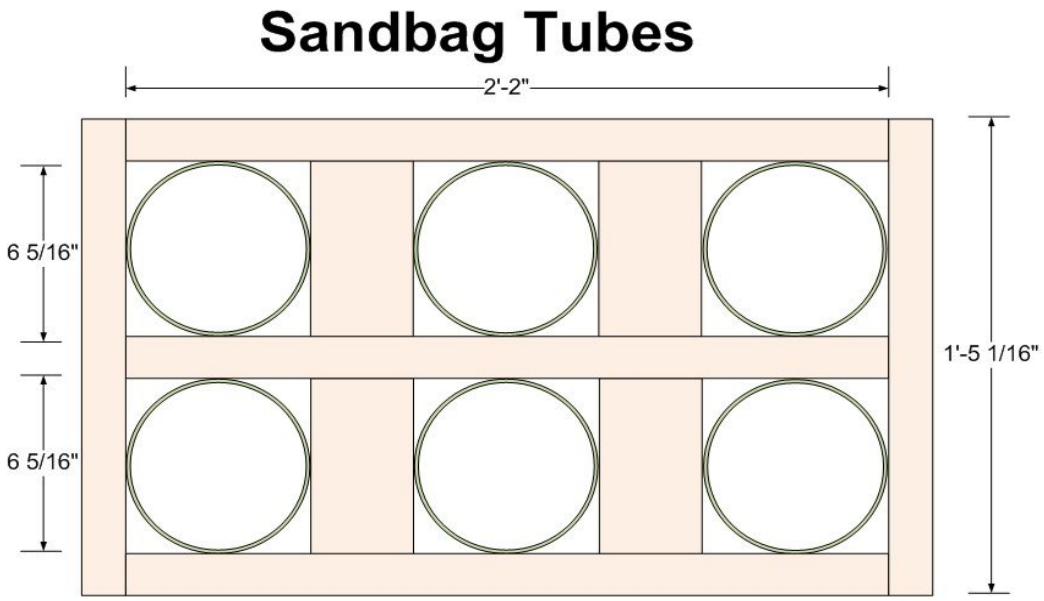


Figure 17. Sandbag Tube Dimensions

Assembly:

Now, assemble the wood as shown in the diagram below, using the 3" screws (or nails) to hold the boards together. Once you have your frame, you can see how you will slide the tubes into each hole. You will need to put the 1-5/8 screws through the tube and into the sides where it touches the boards on all four sides. There should be two screws at each spot. First, take your drill and pre-drill the 8 holes on each tube; one at 1" from the top and one at 2.5" from the top every 90 degrees. Now put the tube in the frame and put screws in each hole. The easiest way is with a right angle drill.

When all 6 tubes are screwed on, the tubes are usable. At this point, you can put on the optional top. The advantage of putting on the top is that it will prevent sand from falling down next to the tubes and pushing the bags down. If you are going to put the top on, cut the top to fit over the frame. Screw the top onto the frame boards. Now drill a hole and then using either a router or a hand jigsaw, cut the holes out for each tube.

To use the tubes, you just need to flip it over and slide a bag on each tube. Roll it back upright and start shoveling to fill the bags. By design it will fill each bag to about 35lbs. Once you have filled all 6 tubes, pick it straight up and the sand will slide out of the tubes into the bags. Then you will have 6 perfectly filled sandbags.

Post-Flood Response

Post-Flood Recovery Operations involve:

1. The Community and Economic Development Department conducting inspections and estimates of damages to structures.
2. Public Works providing equipment and manpower to remove portions of damaged buildings that are a clear and present danger to the public safety and to clear public roadways of debris.
3. Public Works removing sandbags and clean up flood debris.
4. Public Works removing barricades and signs.
5. Finance and Administration assisting residents with miscellaneous issues.

Debris and sandbags touched by flood waters must be considered to be contaminated. Therefore, debris may need to be treated as special waste and delivered to a landfill. Although sand may be buried at local construction sites, it may not be used at playgrounds or other areas where it can come into contact with humans. Once the sand is removed, the bags may be disposed of in the regular garbage. Unless a suitable site is found, sandbags must also be disposed of at the landfill.

Contaminated sand may not be placed at Spring Lake Park. Spring Lake Park should not be used as a staging area for debris removal.

The Village is responsible for removing debris from the right-of-way and from Village-owned properties. Public Works manpower and vehicles will be utilized for this work. In the event of a significant flood, the Public Works Department may utilize the mutual aid system, volunteers, and private contractors to supplement its staff.

Debris removal from the right-of-way may occur in stages, depending upon the amount of debris. The first priority is to open the roads for emergency vehicles. The secondary priority is to open the roads to the general public. The final priority is to remove debris from the right-of-way.

It is anticipated that the Public Works Department will be asked to assist residents in removing debris from their homes. The role of the PWD will be to facilitate pick-ups from the Village's waste hauler. The Public Works Department may contract for the positioning of roll-off style dumpsters at the 45 Londonderry Lane site.

In general Village Staff will not remove debris from private homes or yards. However, at the discretion of the Mayor and Board of Trustees, or the Village Manager, the Department may haul away any items placed at the curb side that were damaged as a result of the flood. The Village will dispose of sandbags brought to staging yards by residents. Residents are responsible for disposing of their own sandbags. Upon removal of sandbags, particularly along the Lincolnshire Drive berm, the Public Works Department shall inspect the areas. Damage shall be noted and appropriate restoration measures scheduled.

A. Utilities: The Village will notify the public utilities in the event that their lines are down or compromised. Commonwealth Edison may need to pull the residential electric meters and North Shore Gas Company may need to close and seal the gas valves to the home. The restoration time for utilities will depend upon the height of the water and the pervasiveness of the flood event. The Village will coordinate response with the public utility companies. At all times, safety of people is the number one priority.

B. Damage Assessment

The Department of Community and Economic Development prepares damage assessments for structures affected by flood events. The general outline of how the Village will conduct damage assessments is contained in the *Village of Lincolnshire Disaster Preparedness Plan* - Annex J "Damage Assessment Annex" and "Damage Assessment Guide".

Procedures for Dealing with Substantial Damaged Structures are included in the "Flood Emergency and Residential Repair Handbook" found in the Vernon Area Public Library reference section.

C. Post-Flood Assistance

1. Disaster Declaration: Records must be kept of all hours worked by Village employees and volunteers as well as equipment used. If the numbers are high enough and a disaster is declared, the Village may receive reimbursement for its expenses.

2. Financial Assistance: If a flood event is declared a State or Federal Disaster, financial assistance may be available to residents. Information regarding federal financial assistance can be found online at http://www.fema.gov/about/process/index.shtm#guide

Post Flood Debriefing

Within 30 days of the completion of a flood event, the Village Manager, Chief of Police, Public Works Director, Mayor, and Village Trustees shall meet to discuss the efficiency and effectiveness of the flood response. This Flood Response Manual shall also be reviewed and updated, as necessary, based upon experiences with each event. Items to be discussed shall include what methods worked and what methods need to be revised to better suit the needs of each specific emergency. Problems will be addressed and noted for the next flood emergency to run more efficiently. Clean-up methods shall be discussed as well as total damage.

If requested, Village officials should meet with outside agencies to review the flood response. Such agencies may include the Lake County Office of Emergency Services, the State of Illinois Emergency Management Agency (IEMA), and the Federal Emergency Management Agency (FEMA).

Types of Floods that Occur in Lincolnshire

a. **Riverine** – periodic overbank flow of rivers and streams
b. **Flash** - a flood that reaches its peak flow in a short period of time after the storm or other event. This type of flood is often characterized by high velocity water flows. These floods rise quickly in small streams after heavy rain or rapid snow melt
c. **Urban** - temporary inundation of normally dry land areas from the overflow of inland waters and/or from the unusual or rapid accumulation or runoff of surface waters from any source such as the overflow of storm sewer systems, poor drainage systems, or following heavy rain or rapid snow melt

The Flood Response Manual primarily deals with riverine flooding. The assumption is that flash flooding will occur so rapidly Public Works personnel will not be able to respond quickly enough to protect property. Response to urban flooding will typically involve removal of obstructions in the drainage system and long-term improvements such as grading or installation of storm structures to improve drainage.

History of Flooding in Lincolnshire

The Village of Lincolnshire cannot prevent flooding, however does take several steps to reduce its impact. The Village of Lincolnshire was established along the banks of the Des Plaines River. The Village incorporated in 1957. Historical records indicate that the Des Plaines River has flooded approximately every 10 years. Table 2 shows the recurrence intervals and river elevations at feet above sea level (FASL) for various time periods.

Table 1. Des Plaines River Historical Floods

Date	Recurrence Interval	River Elevation at Half Day Road
August 1987	Not available	Not available
May 17, 1996	Not available	643.56 (FASL)
May 21, 1996	8 year	645.15 (FASL)
June 17, 2000	Not available	644.41 (FASL)
May 24, 2004	15 year	646.17 (FASL)
April 19, 2013	10 year	646.34 (FASL)

Sources: 1987-1996 floods: Federal Emergency Management Agency, "Flood Insurance Study," (September 7, 2000): 22.
1996-Present floods: Village of Lincolnshire Files

Village of Lincolnshire Floodplains

A. Des Plaines River

1. Description
   The Des Plaines River is the main riverine source of flooding in Lincolnshire. The Des Plaines River begins near Kenosha, WI, and ends at its confluence with the Kankakee River where it becomes the Illinois River. The Des Plaines River bisects the Village separating the Village's residential area from its commercial area and townhomes/ Sedgebrook.

2. Location
   The river enters the Village at Stream Mile 80.96 at the north Village limits near Route 22 and exits the Village at Stream Mile 76.26 at the south Village limits at the south end of the Sedgebrook campus.

3. Flood Hazard Description
   The flood hazard along the Des Plaines River is primarily from overbank flooding due to a significant rain event in the Des Plaines River watershed to the north of Lincolnshire. However, flash flooding may occur along the Des Plaines if a significant rainfall occurs in the Indian Creek watershed. Rain events which occur in the Indian Creek watershed after the Des Plaines watershed pose the greatest potential threat due to backwaters from Indian Creek and its potential impact on the existing Des Plaines River main stem.

4. Flood Elevation
   The Army Corps of Engineers, acting under contract to the Federal Emergency Management Agency, has established flood elevation profiles for the Des Plaines River. The elevations are defined as the number of feet above sea level (FASL) at selected points along the river are shown in Table 2.

Table 2. Des Plaines River Elevations by Recurrence Frequency

	10-year Frequency	100-Year Frequency
IL Route 22	645.5 (FASL)	647.8 (FASL)
Lincolnshire Dr/Londonderry	644.3 (FASL)	646.6 (FASL)
45 Londonderry Lane	644.1 (FASL)	646.5 (FASL)

B. Indian Creek

1. Description
   Indian Creek runs from the Northwest corner of the Village and feeds into the Des Plaines River at the Marriott Golf Course. Indian Creek Along with the West Fork of the North Branch of the Chicago River and the Des Plaines River, Indian Creek is one of the main flood hazards in the Village.

2. Location
   Indian Creek enters the Village east of Indian Creek Road near Port Clinton Road. It crosses Milwaukee Avenue 0.31 miles north of Route 22 and continues through the Village's downtown. It crosses Half Day Road (IL 22) 0.45 miles north of the Creek's confluence with the Des Plaines River. Between Half Day Road and the confluence, Indian Creek and meanders through Marriott's Lincolnshire Resort golf course. The confluence is located on the Des Plaines River at River Mile 80.72 which is 0.23 river miles south of the existing river gauge at Route 22.

3. Flood Hazard
   The flood hazard along Indian Creek is related to overbank flooding. The flow in Indian Creek is flashy and will typically peak prior to the Des Plaines River. Flooding along Indian Creek may affect the condominiums in the Lincolnshire downtown. Overbank flooding may also require the closure of Lincolnshire Marriott's golf course. The following public infrastructure may be affected by Indian Creek flooding: streets, storm sewer system, sanitary system, IDOT's Milwaukee Avenue (US 45/IL 21) and Half Day Road (IL 22) bridges, the structure at One Olde Half Day Road (Village Hall), and the sanitary lift station in the Lincolnshire Downtown. Public utility systems such as electric, gas, cable-tv may also be affected, particularly near any risers.

4. Flood Elevations
   The hydrographic and hydrologic study of Indian Creek to establish the Base Flood Elevation of Indian Creek was conducted in the 1970's. A substantial amount of development has occurred in the watershed since then. In addition, construction of the Route 22 by-pass in 1982 and the construction of embankment and a bridge are not accounted for in the Flood Insurance Rate Map. Therefore, the regulatory Base Flood Elevation is suspect and should be used with caution.

Table 3. Indian Creek Elevations by Recurrence Frequency		
	10-year Frequency	100-Year Frequency
Village Limits (Port Clinton Road Bridge)	656.0 (FASL)	657.8 (FASL)
Upstream at Milwaukee Avenue Bridge (US 45/IL 21)	651.4 (FASL)	654.2 (FASL)
Upstream at Milwaukee Avenue Bridge (US 45/IL 21)	651.3 (FASL)	653.2 (FASL)
@ Half Day Road Bridge (IL 22)	648.5 (FASL)	649.8 (FASL)
~ 900' upstream of confluence of Des Plaines River	646.6 (FASL)	648.9 (FASL)

5. Flood Response for Indian Creek: North of Milwaukee Avenue (U.S. 45/IL 21), Indian Creek is located adjacent to two residential properties (Indian Creek Road) and one commercial property (220 Olde Half Day Road.) Between Milwaukee Avenue and Route 22, Indian Creek passes several commercial building and residential condominium buildings. South of Route 22, Indian Creek passes through open space. Therefore, no response is anticipated other than to monitor the Creek.

Response to 10-Year Frequency Flood: A 10 year frequency flood on this river is anticipated to have minimal to no effect on areas in the Village and therefore is not considered in this study.

Response to 100-Year Frequency Flood: Development occurring since 1992 has had to comply with the Watershed Development Ordinance. Although the development accounted for the Base Flood Elevations along Indian Creek, significant development occurred within the drainage basin which may have increased the BFE. Therefore, the Village will need to monitor the river elevations and adjust its response plan accordingly.

C. West Fork of North Branch of Chicago River

1. Description
   The headwaters of the Chicago River are located just north of Everett Road near North Park in the northeast corner of the Village. North of Half Day Road, the Chicago River flows through restored woodlands. A portion of the river was relocated in the 1950's to make way for the construction of the Illinois Tollway. South of Half Day Road, developer's constructed on-stream detention to form lakes for the Tri-State International office complex. These lakes have significant distance between the normal water

level and the commercial buildings which in turn reduce the potential for flooding. Upon leaving the Tri-State ponds, the river returns to a narrow, deep cut channel which has significant bank erosion. The river is maintained by the Union Drainage district south of the Tri-State lakes.

2. Location
   The West Fork of the North Branch of the Chicago River is located at the east side of the Village, west of Interstate 94. The river enters the Village at the northern border at North Park and meanders southward while passing through North Park, Florsheim Park, and the Medline office campus located at the northwest corner of I-94 and Route 22. It then passes beneath Half Day Road (IL 22) in a box culvert between Hewitt Drive/Westminster Way and the Tollway. The river then passes beneath Westminster Way in a box culvert. South of the box culvert, the river separates the Tri-State International campus from the Sutton Place residential subdivision.

Table 4. West Branch of the North Fork of the Chicago River Elevations by Recurrence Frequency

	10-year Frequency Flood	100-Year Frequency Flood
Village Limits (Everett Road Bridge)	670.1 (FASL)	671.5 (FASL)
~ 3,350' downstream of Everett Road	669.3 (FASL)	670.5 (FASL)
@ Half Day Road (IL 22) Bridge - Upstream of Bridge	664.3 (FASL)	666.2 (FASL)
@ Half Day Road (IL 22) Bridge - Downstream of Bridge	665.5 (FASL)	667.3 (FASL)
@ Duffy Lane	663.4 (FASL)	665.5 (FASL)

3. Flood Response for Chicago River: Since the Village is located at the headwaters of the West Branch of the North Fork of the Chicago River; the anticipated response under any frequency event is to monitor the elevation of the water and upstream rainfall to aid in determining the maximum water level anticipated.

Response to 10-Year Frequency Flood
A 10 year frequency flood on this river is anticipated to have minimal to no effect on areas in the Village and therefore is not considered in this study.

Response to 100-Year Frequency Flood
The developer of the Tri-State Office Park on Westminster Way constructed on-stream detention along the West Fork of the North Branch of the Chicago River. As a result, the river has significant capacity to store flood water in the two lakes of the development. The area around the river is generally built at or above the 100-year Base Flood Elevation. Record drawings for various improvements indicate the following:

The first floor of the town homes on lots 8 through 15 of the Sutton Place subdivision are at least one foot above the referenced flood elevation. However, these units have basements below the 100 year flood elevation and may become filled with water during such an event. Sump pump failure may occur due to backwater pressure and groundwater inflow into those homes in the area with basements. Most of Westminster Way is constructed within one foot of the Base Flood Elevation. Therefore, the road may have a minimal amount of surface waters to pond on it to a depth of not more than one foot. Windsor Drive between Kent Ct. and Whitby Ct. may receive approximately one foot of backwater from the river.

D. Lincolnshire Creek

1. Description
   Lincolnshire Creek is a local stream that drains areas of the Villages of Lincolnshire and Riverwoods. The total drainage areas is approximately 180 acres at the entrance to the culvert east of 10 Coventry Lane.[1] The creek is primarily subject to flash flooding related to locally intense storms. Near the Des Plaines River, the creek is also subject to backwater flooding.

2. Location
   Lincolnshire Creek enters the Village at Riverwoods Road south of Londonderry Lane and north of Victoria Lane. It passes south of 1970 Riverwoods Road (Community Christian Church) and then makes a 90 degree bend east of the 10/11 Coventry Lane. The creek continues north for approximately 300 feet before making a 90 degree turn to the west. The creek crosses Londonderry Lane between 14/16 Londonderry Lane and then again between 23/25 Londonderry Lane. The creek continues westward into Rivershire Park where it joins the Des Plaines River.

[1] STS Consultants, Ltd., *"Lincolnshire Creek Phase II Flood Control Evaluation and Preliminary Engineering"* (February 21, 2004): 2.

3. Flood Hazard
   The flood hazard near the Des Plaines River is primarily attributable to backwater flooding from the Des Plaines River. However, the further away from the Des Plaines, the greater the impact of local flash flooding is on the creek. In 2004, the Village of Lincolnshire conducted a study of Lincolnshire Creek to determine the condition of the creek. The study revealed that the culvert in the rear yards of 11/13 Coventry Lane is undersized. The study mapped a potential floodplain in the area.

4. Flood Elevations
   The 2004 STS study determined the following floodplain elevations for Lincolnshire Creek:

Table 5. Lincolnshire Creek Flood Elevations (FASL)

Cross-Section		**Flood Elevation (feet)**	
Designation	**Location***	**10-year**	**100-year**
2634	55' downstream of Londonderry Lane	651.59	653.56
2736	20' upstream of Londonderry Lane	651.63	655.27
2919	Downstream face of 584' culvert	653.59	655.47
3319	Coventry Lane cul-de-sac	659.17	659.79
3529	Upstream face of584' culvert	661.78	661.71
3571	55' upstream of 584' culvert	661.78	661.71
3598	Downstream face of small 42" culvert road crossing (80' upstream of 584' culvert)	661.78	661.71
3663	Uppermost cross-section (150' upstream of 584' culvert)	661.78	661.69

5. Flood Response for Lincolnshire Creek: Flows along Lincolnshire Creek tend to be flashy. As a result, unless there is a prolonged rainfall, there is little the Department can do to protect infrastructure. The 584' culvert east of 10-11 Coventry Lane is on the Department's critical inspection list. When significant rainfall is expected, Public Works personnel inspect the structures to ensure they are not obstructed.

Response to 10-Year Frequency Flood

The 584' culvert east of 10-11 Coventry Lane has the capacity to convey less than a 2-year flood event.[2] The STS Study states: "Flooding during a 10-year flood event would cause flooding that would inundate several residential properties, and would extend to Coventry Lane. This event would have the potential to cause basement flooding at several residences."[3]

Response to 100-Year Frequency Flood

During the 100-year frequency event, Lincolnshire Creek will rise above its banks. Flow will occur between 10 and 11 Coventry Lane, and will continue west along the Coventry Lane pavement. The flow will then turn north between 2 and 4 Coventry Lane and between 4 and 6 Coventry Lane where it will rejoin the Creek.

The STS Study states: "It appears that first floor flooding (not including basements) during a 100-year flood is only a remote possibility because water diverts through side yards to Coventry Lane before this degree of flooding occurs. Flood water does appear to have direct access to building foundation walls and basements at several locations."[4]

The Public Works Department response will consist of inspecting and clearing of debris from all inlets along Coventry Lane as well as the 584' culvert.

Flooding along the Des Plaines River has significant potential to impact numerous residential properties. Overbank flooding may also require the closure of Lincolnshire Marriott's golf course. The following public infrastructure may be effected by Des Plaines River flooding: streets, storm sewer system, IDOT's Route 22 bridge, the Village's pedestrian bridge at Route 22, the structures at One Olde Half Day Road (Village Hall) and 45 Londonderry (Rivershire Nature Center), chlorination facility and sanitary lift stations at 45 Londonderry Lane and the sanitary lift station in the Lincolnshire Downtown. Utility systems such as electric, gas, cable-tv may also be affected, particularly near any risers.

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[2] STS Consultants, Ltd., *"Lincolnshire Creek Phase II Flood Control Evaluation and Preliminary Engineering"* (February 21, 2004): 5.

NOTICE TO RESIDENTS/VOLUNTEERS

Tetanus/Diphtheria Immunization

Any persons who have come in contact with flood waters should be immunized against tetanus and diphtheria. Flood waters are typically contaminated in some areas, and could cause illness and infection of even the smallest wound of those not properly immunized. If you or any member of your family who had ANY contact with recent flood water has not been immunized within the last five (5) years, you should contact your family doctor for immunization information.

It is also important to watch any minor injury, including cuts, scratches, and skin irritation, for possible infection. Please seek medical attention immediately for any injury that is not healing properly or for any signs of illness.

If you were helping with the sand-bagging in Lincolnshire, and were exposed to river water, it is highly recommended to call the Lake County Health Department to schedule a tetanus vaccination.

Tetanus shots are normally good for ten years, but if it has been longer than five years since you had one, and you have a cut, it is recommended that you get one.

To schedule a Tetanus shot, please call the Lake County Health Department at 847-377-8470.

Automated Telephone Dialing System – (Example Messages)

The Village of Lincolnshire maintains access to an automated telephone dialing system. This system will be utilized during significant storm events used to phone residents/businesses within the floodplain and provide recorded messages containing important information. Shown below are examples of the automated messages the Village sends out during these types of events:

MINOR FLOOD STAGE:
This is the Village of Lincolnshire with a recorded message regarding water levels along the Des Plaines River, Chicago River, Lincolnshire Creek and Indian Creek. Village staff is in alert phase that means staff is continuously monitoring water levels and weather conditions. Check cable channel 10 or the Village's website at www.lincolnshireil.gov for important storm information. If conditions worsen, a warning phone message will be attempted. To hear this message again, press _1_.

MAJOR FLOOD STAGE:
This is the Village of Lincolnshire with a recorded message regarding flood water levels along the Des Plaines River, Chicago River, Lincolnshire Creek and Indian Creek. Conditions are now in the warning phase as there may be a possibility of flooding in your area. Take necessary precautions to secure your property and personal safety. Check cable channel 10 or the Village's website at www.lincolnshireil.gov for important storm information. If conditions worsen, an evacuation message will be attempted. To hear this message again, press _1_.

EVACUATION FLOOD STAGE:
This if the Village of Lincolnshire with a recorded message regarding flood water levels along the Des Plaines River, Chicago River, Lincolnshire Creek and Indian Creek. Conditions are now in the critical phase as flooding appears imminent in your area. You should evacuate your home immediately. This may be your only evacuation warning. To hear this message again, press _1 _.

Village of Lincolnshire, Lincolnshire IL
Situation Report (SITREP)
Prepared By: Bradford H. Woodbury – PWD

Date/Time: _____	SITREP#: _____	Incident #: ___
Incident: Flood	IEMA Region: 4	County: Lake

CURRENT SITUATION / FLOOD STAGE/CURRENT FLOOD FORECAST:

INJURIES/FATALITIES/EVACUEES:

ROAD STATUS/CLOSURES:

CURRENT OPERATIONAL STATUS: SANDBAGS USED, AMOUNT REQUESTED:

OF RESIDENTS / VOLUNTEERS:

WEATHER CONDITIONS/FORECAST:

STATUS OF UTILITIES:

DISASTER DECLARATIONS:

WORK COMPLETED (LAST 12 HOURS)

WORK TO BE COMPLETED (NEXT 12 HOURS)

_____ _____

Signature **Date**

Lincolnshire Volunteer Management Sign-Up Sheet

Date: _____ Time:_____ Location:_____

Tasks Performed:_____ Prepared By:_____
Signature

Please record your name and contact information so that we can get back to you with more information.

	PRINT NAME	ADDRESS	PHONE #	TIME IN	TIME OUT
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Volunteer Release Form - Waiver of Liability

I UNDERSTAND AND CONFIRM THAT BY SIGNING THIS WAIVER AND RELEASE I HAVE GIVEN UP CONSIDERABLE FUTURE LEGAL RIGHTS. I HAVE SIGNED THIS WAIVER FREELY, VOLUNTARILY, UNDER NO DURESS OR THREAT OF DURESS, WITHOUR INDUCEMENT, PROMISE OR GUARANTEEE BEING COMMUNICATED TO ME. MY SIGNATURE IS PROOF OF MY INTENTION TO EXCECUTE A COMPLETE AND UNCONDITIONAL WAIVER OF RELEASE OF ALL LIABILITY TO THE FULL EXTENT OF THE LAW. I AM 18 YEARS OF AGE OR OLDER AND MENTALLY COMPETENT TO ENTER GRANT THIS WAIVER.

I declare that the foregoing is true and correct. Signed on this ____ day of _____, _____, in the County of Lake, State of Illinois.

_____

Signature

Definitions an Acronyms

AREA OF SPECIAL FLOOD HAZARD	The land which is subject to a one percent (1%) chance of flooding annually. This area may also be identified as that which is subject to the 100- year flood. The area is designated as Zone A, A1-99, AH,or AO on the maps provided by the Federal Insurance Administration.
BASE FLOOD	The flood having a one percent (1%) chance of being equaled or exceeded in any given year. The base flood is also known as the 100-year flood. If the 100-year flood information is not available, the base flood shall be the flood of record.
BASE FLOOD AREA	The land area subject to inundation by waters of the base flood.
BASE FLOOD ELEVATION	The highest water surface elevation of the base flood.
COMPENSATORY STORAGE	An artificially excavated volume of storage within the base flood area used to balance the loss of natural flood storage capacity when artificial fill or structures are placed within the floodplain. The uncompensated loss of natural floodplain storage can increase offsite floodwater elevations and flows.
DEVELOPMENT	Any manmade change to improved or unimproved real estate, including but not limited to construction of or substantial improvements to buildings or other structures, the placement of mobile homes, mining, dredging, filling, grading, paving, excavation or drilling operations.
FLASH FLOOD WARNING	Flash flooding is actually occurring or imminent in the warning area. It can be issued as a result of torrential rains, a dam failure, or ice jam.
FLASH FLOOD WATCH	Flash flooding is possible in or close to the watch area. Flash flood watches are generally issued for flooding that is expected to occur within 6 hours after heavy rains have ended.
FLOOD WARNING	Indicates flooding conditions are actually occurring or are imminent in the warning area.
FLOOD WATCH	Indicates high flow or overflow of water from a river is possible in the given time period. It can also apply to heavy runoff or drainage of water into low-lying areas. These watches are generally issued for flooding that is expected to occur at least 6 hours after heavy rains have ended.
FLOOD	The condition existing when the waters of any watercourse, pond, or depression temporarily rise to a height above their normal levels and overflow the boundaries within which they are ordinarily contained. It also includes the unusual rapid accumulation or runoff of surface waters.

FLOOD FREQUENCY	A period of years, based on a statistical analysis, during which a flood of a stated magnitude may be expected to be equaled or exceeded.
FLOOD FRINGE	The higher portion of the floodplain, immediately adjacent to and on either side of the floodway, occupied by quiescent or slow-moving waters during floods.
FLOOD HAZARD BOUNDARY MAP (FHBM)	An official map of the Village, issued or approved by the Administrator of the Federal Insurance Administration, on which the areas having special flood hazards have been drawn and designated as Zone A.
FLOOD INSURANCE STUDY (FIS)	An examination and evaluation of hydro-logic and hydraulic data sponsored by the Federal Insurance Administration to determine base flood flows, elevations, areas and floodways. The FIS also determines flows, elevations and areas of floods having lesser and greater frequencies of occurrence.
FLOOD OF RECORD	An actual historical flood event for which sufficient records are available to establish its extent. No uniform probability of occurrence is associated with floods of record. However, the probability of occurrence may be determined for the event at specific locations.
FLOOD PROFILE	Graphical representations of the elevations of the water surface of the 100-year flood along the watercourses of the Village.
FLOOD PROTECTION ELEVATION	The elevation to which uses regulated by this Chapter are required to be elevated or flood proofed.
FLOOD RETURN PERIOD	Same as Flood Frequency.
FLOODPLAIN	The special flood hazard lands adjoining a water course, whose surface elevation is lower than the base flood elevation, that are subject to periodic inundation during floods.
FLOODPROOFING	Modifications to structures made to reduce flood damages. These changes may be made to existing structures or incorporated in the design of new structures. In all instances, flood-proofing must be watertight and must be adequate without the need for human intervention.
FLOODWAY	The channel of a watercourse and those portions of the adjoining floodplains which are required to carry and discharge the 100-year flood with no significant increase in the base flood elevation.
FLOODWAY ENCROACHMENT LINES	The lateral boundaries of the floodway which separate it from the flood fringes.

FREEB0ARD	An increment of elevation added to the base flood elevation to provide a factor of safety for uncertainties in calculations, unknown localized conditions, wave actions and unpredictable effects such as may be caused by ice or debris jams.
HYDROSTATIC PRESSURE	The upward pressure exerted on flood slabs or an entire structure by standing water or groundwater, which tends to float a structure or crack the floor. It is based on the difference in elevation between the surface level of the water. Hydrostatic pressure may also be horizontal, imposing forces on walls causing them to crack or fail.
MAJOR FLOODING	Indicates extensive inundation and property damage, usually characterized by the evacuation of people and livestock, and the closure of both primary and secondary roads as determined by the National Weather Service.
MINOR FLOODING	Indicates minimal or no property damage, but some public inconvenience is possible as determined by the National Weather Service.
MODERATE FLOODING	Indicates the inundation of secondary roads as determined by the National Weather Service. Transfer to higher elevation may be necessary to save property. Some evacuation may be required.
NWS	National Weather Service – Romeoville (Chicago Office)
ONE HUNDRED YEAR FLOOD	A flood magnitude with a one percent (1%) statistical of being equaled or exceeded during any year. A flood this large would be reached once during a 100-year period, on the average. However, the occurrence of such an event does not diminish the chance of its recurring again at any time.
RISK PREMIUM RATE ZONE	Flood hazard areas designated according to the degree of flooding they would experience during the base flood. The symbols used to designate these zones are as follows: A Area of special flood hazard without water surface elevations determined. Al-99 Area of special flood hazard with water surface elevations deter-mined. AH Area of special flood hazards having a level water surface (ponding) with water depths between 1 and 3 feet. AO Area of special flood hazards having a sloping water surface (sheet runoff) with water depths between 1 and 3 feet. VO Area of special flood hazards having shallow water depths and/or unpredictable flow paths between 1 and 3 feet and with velocity. B Area of moderate flood hazards. C Area of minimal hazards.

RIVERINE	Relating to, formed by, or resembling a river (including tributaries), stream, creek or brook.
SEVERE THUNDERSTORM WATCH	Conditions are conducive to the development of severe thunderstorms in and close to the watch area.
SEVERE THUNDERSTORM WARNING	A severe thunderstorm has actually been observed by spotters or indicated on radar, and is occurring or imminent in the warning area.
STRUCTURE	A walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a mobile home.
SUBSTANTIAL IMPROVEMENT	Any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds fifty percent (50%) of the market value of the structure either before the improvement or repair is started, or if the structure has been damaged, and is being restored, before the damage occurred. The term does not, however, include either: A. Any project for improvement of a structure to comply with existing State or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions, or B. Any alteration of a structure or site documented as deserving preservation by the Illinois Department of Conservation or listed on the National Register of Historic Places.
WATERCOURSE	Any river, stream, creek, brook, branch or other drainage way in or into which stormwater runoff and floodwaters flow either regularly or intermittently.

Sources: *Village Code (January 2007)* and *SMC Flood Response Manual April 2006*

ACRONYMS: Not of all these terms are used in this Annex however they are terms typically used in an event response mode.

ARC	American Red Cross
CRS	Community Rating System
DHS	Department of Homeland Security
DRC	Disaster Recovery Center
EAS	Emergency Alert System
EMAC	Emergency Management Assistance Compact
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
ESF	Emergency Support Function
FASL	Feet Above Sea Level
FEMA	Federal Emergency Management Agency
FWA	Fox Waterway Agency
HAZMAT	Hazardous Material
HMPG	Hazard Mitigation Grant Program
IA	Individual Assistance
IC	Incident Commander
ICC	Increased Cost of Compliance
ICP	Incident Command Post
ICS	Incident Command System
IEMA	Illinois Emergency Management Agency
JIC	Joint Information Center
JFO	Joint Field Office
LEPC	Local Emergency Planning Committee
IDNR-OWR	Illinois Department of Natural Resources – Office of Water Resources
IDOT	Illinois Department of Transportation
LAN	Local Area Network
LCEMA	Lake County Emergency Management Agency
LCHD	Lake County Health Department
LCPW	Lake County Department of Public Works
LCSMC	Lake County Stormwater Management Agency
MCI	Mass Casualty Incident
MOA	Memorandum of Agreement
MWRD	Metropolitan Water Reclamation District of Great Chicago
NGO	Nongovernmental Organizations (volunteer organizations)
NIMS	National Incident Management System
NOAA	National Oceanographic & Atmospheric Association
NWS	National Weather Service
PA	Public Assistance
PB&D	Lake County Department of Planning, Building & Development
PDA	Preliminary Damage Assessment
PIO	Public Information Officer
PFO	Principal Federal Officer
PW	Public Works
SBA	Small Business Administration

RACES	Radio Amateur Civil Emergency Service
SEOC	State Emergency Operations Center
SEWRPC	Southeastern Wisconsin Regional Planning Commission
SMC	Stormwater Management Commission
SOP	Standard Operating Procedure
Sub Dam	FEMA's Substantial Damage Requirement
USACE	U.S. Army Corps of Engineers, also called the Corps
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
US&R	Urban Search and Rescue
UC	Unified Command
WAN	Wide Area Network