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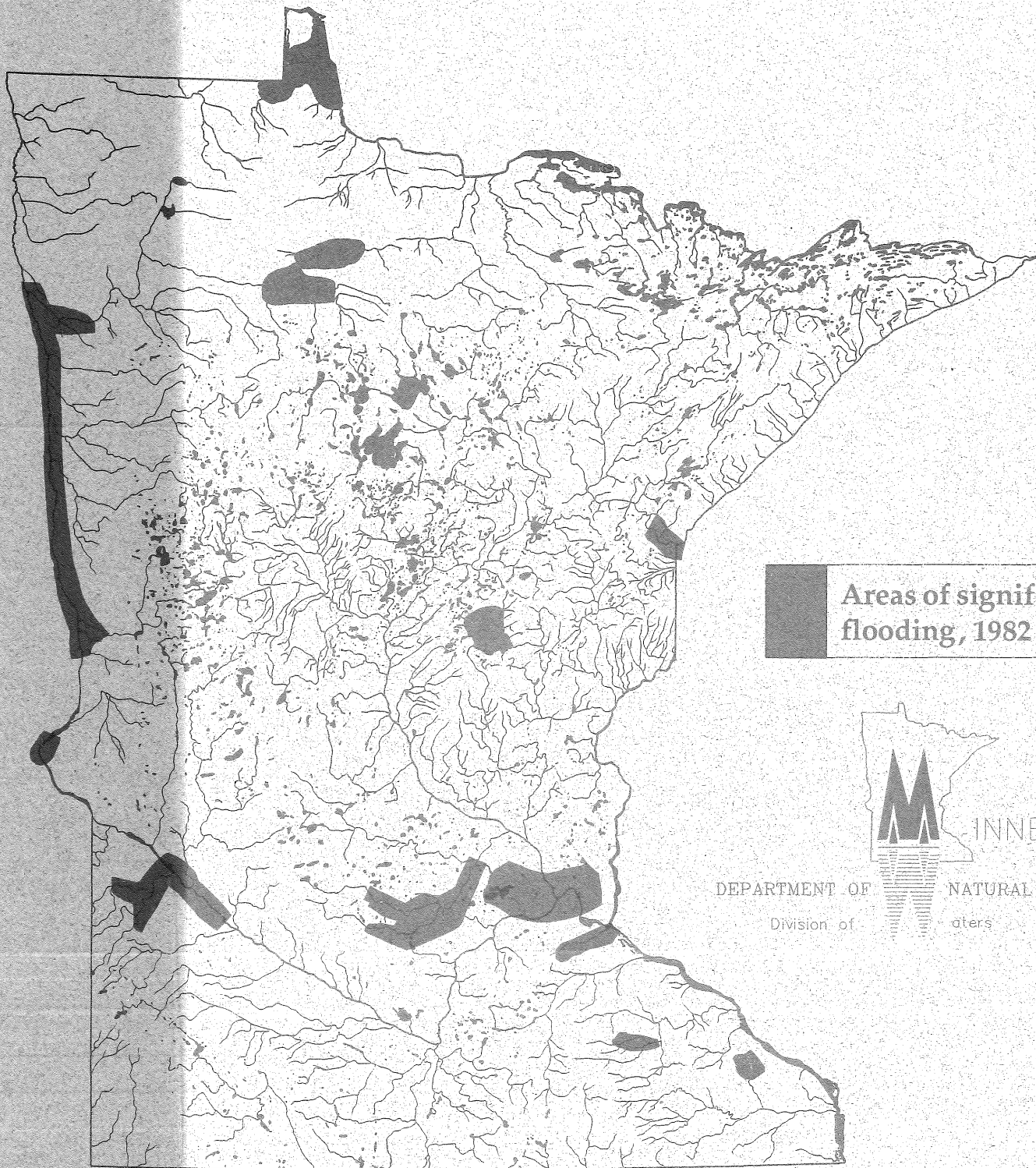
- Floodplain management : a handbook



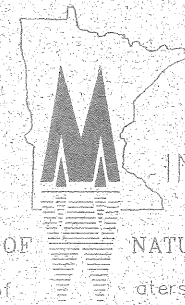
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# FLOODPLAIN MANAGEMENT

A HANDBOOK FOR LOCAL OFFICIALS



Areas of significant  
flooding, 1982 - 1992



MINNESOTA

DEPARTMENT OF

NATURAL RESOURCES

Division of

Waters

**MINNESOTA**  
**DEPARTMENT OF NATURAL RESOURCES**  
**Division of Waters**

**FLOODPLAIN  
MANAGEMENT**

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**A HANDBOOK FOR LOCAL OFFICIALS**

**St. Paul, MN**  
**January 1993**

**Prepared by:**  
**Floodplain Management Staff**

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# FLOODPLAIN MANAGEMENT

## - an OVERVIEW -

**Don't Bet Against a FLOOD**

**FRIDAY PM**

JULY 24, 1987

MINNESOTA'S FIRST NEWSPAPER

ST. PAUL  
**PIONEER PRESS**  
**DISPATCH**

**FLOOD**

# Flooding claims two lives

**Torrential rains pound area; 10 inches at airport**

**Floods close airport, many roads awash**

By Karl J. Kaulson and Katherine Lanpher Staff Writers

Torrential rain and flooding struck throughout the Twin Cities area on Friday.

# Flash flood brings catastrophe to almost everyone in Stockton

By Pat Doyle Staff Writer

Stockton, Minn. As flood waters rushed a foot a minute toward their home, Colin and Bonnie Gilles grabbed their youngest daughter and headed for higher ground. Then Colin returned home to look for his daughter's cat.

Minutes later, the swirling flash flood pounded the side of the house and

# Avenues of aid open to flood-ravaged area

By BOB FREUND Post-Bulletin Staff Writer

State and local officials

**Flooding could threaten wells — Page 3B**

fields of corn flattened and the stock of a commercial trout farm outside of Stockton floated away, she said.

instance, a family of four making less than \$25,600 would be eligible. The program offers a deferred loan,

approve emergency reassessment of property values, which could cut victims' property taxes, Dyrstad said.

# Storm loss severe, Red Cross reports

By Ben Chanco Staff Writer

The storm that struck a 10-county area last week damaged the residences of 1,116 families and destroyed 42 homes, the American Red Cross reported Tuesday.

"The numbers may rise because some of the streams are still rising," Paula Beck, spokeswoman for the Red Cross, said.

repairing city parks could reach \$550,000.

Damage to greens, fairways and tees at the Como Park golf course amounted to more than \$250,000, he said, and a mudslide that covered many of the hike paths and foot trails at Hidden Falls park will cost \$105,000 to clean up.

A storage cave at Watagate

5 miles west of Winona. A thunderstorm dropped an estimated 6 inches of rain in a couple of hours, much of it running down gullies into an already swollen Garvin Brook, which winds around Stockton.

Mayor Lee Henry said it was the town's worst flood since 1951. The last memorable flood was in 1980. He said that the town hopes to obtain federal or state aid to build dikes to channel the Garvin but that such a

Winona County Assessor Loren Benz began surveying 175 homeowners yesterday in preparing to apply for federal disaster relief. Several houses are a total loss and many incurred heavy damage.

"If the town were built now, it wouldn't be here because of the flood plain," Benz said. "You'd have to put most of it on 6-foot stilts or something."

Roger Fritz was driving Sunday night

almost in residential area.

He was just wondering they turn next, they do," Dyrstad wading into mudmounds and listening meeting of town

of certain income tax money to begin repairs of homes. The Minnesota Multi-agency and Redevelopment Authority is coordinating programs. "Our

# Stockton residents ponder wet damage from flash flooding

DON AHERN STAFF WRITER

One minute, Collin Gilles was on the mission of rescuing the family cat from what seemed likely to become a rather damp basement.

The next, he was floating like a flailing bobber in danger of being swept away as the full fury of a flash flood slammed into this southeastern Minnesota town.

Gilles and his wife, Connie, and their daughters, Andrea and Jenna, had seen water beginning to rise over the nearby banks of Garvin Brook about 8 p.m. Sunday and decided it was time to seek higher ground at a neighbor's house.

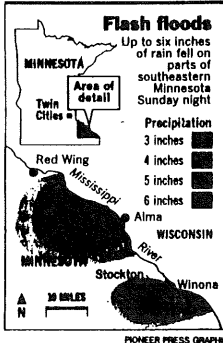
But first Collin Gilles returned to the house for the family pet, and he was in the basement when the flood slammed into the town. It smashed windows in the Gilles house and flooded the basement where he was searching for the cat.

Struggling to escape the rapidly rising water, Gilles forced his way upstairs only to find his yard full of chest-deep, surging water. He grabbed a fence and pulled himself hand-over-hand to the neighbor's house, where Bill and Mary Jo Lanik and their young children were scrambling to the roof to escape the flood.

As they reached out their hands to Gilles to pull him onto the roof, he caught a glimpse of something out of the corner of his eye.

"We're got to get out of here," he yelled at his rescuers. "The Evanses' house is going to crash into us."

But there was no time to flee, nor anywhere to go, Connie Gilles said Monday as she recounted the experience. Collin Gilles and the Lanik family sat on the roof and watched as Steve and Judy Evans' double mobile home bobbed toward them. The floating house stopped for a



moment as it strained against some power lines, then raged forward and slipped under the wires without snapping them, Steve Evans said.

The house was like a rudderless ship as it followed the current and rammed into both the Lanik and Gilles houses. It remained wedged there Monday after the waters had subsided almost as fast as they rose.

Steve Evans said he had fled his house and was up the street on a hill watching as it floated away.

"I was just numb," he said. "I wasn't thinking anything. What could you do? I couldn't run down there and stop it."

# Perpich declares emergency

Storm left 2 dead, widespread floods

By David Shuttler Staff Writer

Gov. Rudy Perpich on Friday declared an emergency in the aftermath of the record-setting rain that killed two people, damaged more than 400 homes and caused widespread flooding and power blackouts in the Twin Cities metropolitan area.

Bringing first to Maple Grove and Brooklyn Park, where a surge destroyed six homes and damaged 180 others, the storm then settled over the Twin Cities for an eight-hour siege Thursday night, drenching the worst-hit areas with 16 to 11 inches of rain.

Flooding and water seepage in low-lying areas destroyed five homes and damaged 300 others, authorities said. Thousands of basements were flooded and countless vehicles were stalled on streets and highways. The Minneapolis-St. Paul International Airport was closed for eight hours.

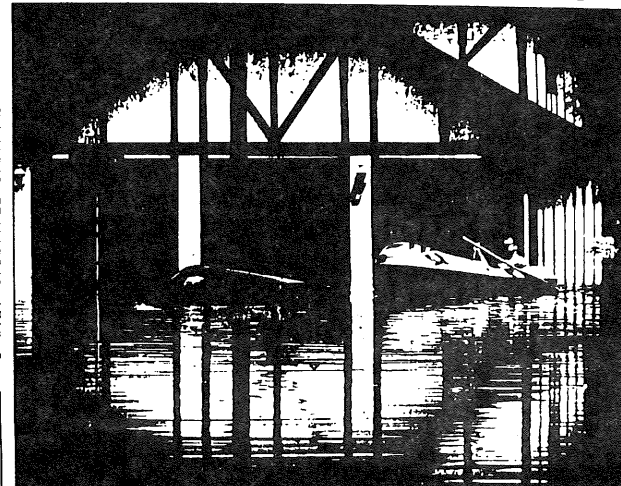
**THE DAY THE RAIN CAME**

It flooded victims fought for years to solve his neighborhood's chronic flooding problem. Page 8A

Maple Grove residents spent Friday cleaning up the damage from Thursday's deluge and torrential rain. Page 8A

A 100,000-gallon sewer line in Glen Prairie is spewing more than 60,000 gallons of raw sewage into the Mississippi River every hour, but officials say the sewage does not pose an immediate threat. Page 8A

A Downpour shattered decade-old record with more than 10 inches of rain recorded at Minneapolis-St. Paul International Airport and more elsewhere. Page 8A



Tomp Weaeter rows his raft past a submerged car Friday at Rich Road and Toledo Curve in Bloomington. Weaeter, who lives nearby, was looking to see whether anyone needed a ride from his homes.

# 'Water warriors' don battle gear in wake of deluge

By Thomas Monahan Staff Writer

Many were the weapons and rubber waders were the armor.

Some water warriors faced worse than others. Sylvia Damsgaard and Irvin DeWitt were the first to be in the basement apartment at 3151 Alving Ave. E. in Minneapolis when

water poured over a 3-foot retaining wall and shattered the windows.

While minutes, the water was to their waists — too high to open the door, Damsgaard searched frantically for her cat and found it floating in a mattress.

"We started yelling, 'Help! Help!' and the neighbors came and broke down the door with a sledgehammer," she said.

On Friday, the couple picked through their apartment, but there was little to be salvaged. Mud and debris covered their floor, furniture and ceiling.

Apartment manager James Hilltop said the basement had never flooded before, and he expects to have the apartment cleaned up to rent again.

"Something like this can't go on happening again," he said. "This

was an act of God. In Apple Valley, several rowing teams' basements flooded with raw sewage after a power failure at a lift station or pump.

"We tried to barricade it with towels and bedspreads, everything please see Water 10A.



# CHAPTER 1

## FLOODPLAIN MANAGEMENT - AN OVERVIEW

Topics to be covered:

1. Introduction
2. Minnesota's Floodplain Management Program
3. National Flood Insurance Program
4. Community Participation in the NFIP
5. Why A Floodplain Manager's Handbook ?

### 1. Introduction

Minnesota is the land of 10,000 lakes and 95,000 miles of streams and rivers. These lakes and watercourses are confined within their banks throughout most years. Periodically, these waterbodies reclaim the low-lying surrounding lands, resulting in flooding. This flooding normally is a result of heavy summer thunderstorms, or a combination of snowmelt and spring rains.

Major flooding has occurred in every river basin in the state: most recently in 1965 and 1969 on the Minnesota and Mississippi Rivers; 1975, 1978, 1979 and 1989 on the Red River of the North; 1978 on the Zumbro River (causing \$50 million in damages in the City of Rochester); and in the Twin Cities in 1987 from the "Super Storm". This flooding has resulted in tremendous social and economic losses to individuals, communities and taxpayers as a whole. Various federal and state agencies and local governments have developed policies and programs to alleviate floods and flood related losses. Nevertheless, flood damages have continued to increase, and lives continue to be lost due to flooding.

The most current figures available for Minnesota indicate an average annual direct flood loss of \$60-70 million. Average annual direct flood loss figures of this type have historically included only: 1) the direct loss to the individual homeowner, business and agricultural interests (e.g., structural and contents

damage, damage to motor vehicles, crop loss, etc.); 2) the damage to community infrastructure (storm sewers, roads, bridges, etc.); and 3) the costs associated with the flood fight and clean up. An increased awareness has developed nationwide that the indirect losses due to flooding are very dramatic, affecting individuals living in and out of the floodplain.

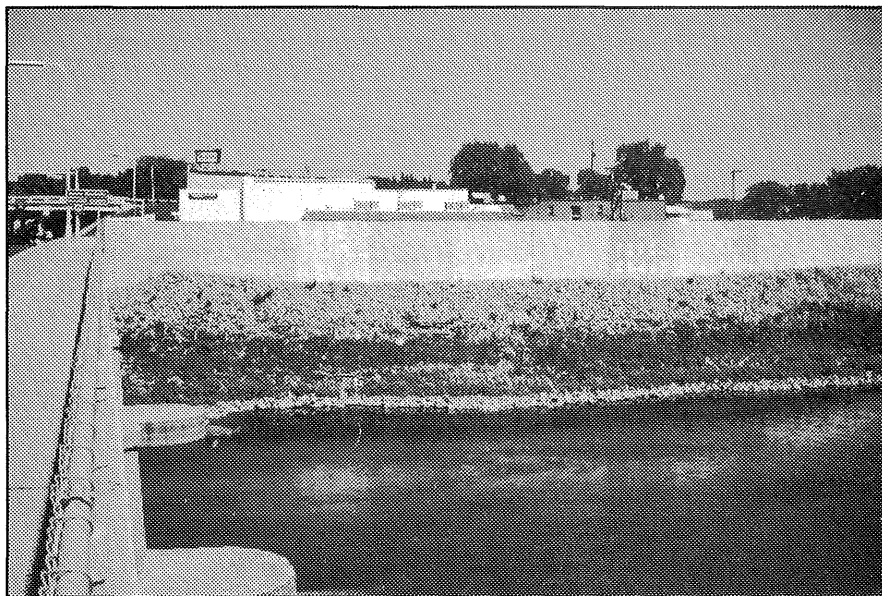
The indirect losses related to flooding include: 1) lost profits to businesses closed during floods; 2) wage losses and unemployment benefits; 3) federally subsidized flood insurance payments via the National Flood Insurance Program (NFIP); 4) income tax deductions for flood losses not covered by insurance; 5) low interest disaster relief loans; and 6) the cost to federal and state agencies and local government in implementing disaster relief programs. The taxpayers are burdened with a significant portion of the cost of responding to unwise flood plain development. These indirect costs may, in fact, equal or exceed the direct costs.

Until the late 1960's, the primary method of reducing flood damage consisted of building structural flood control projects such as dikes, levees, and floodwalls. In spite of these structural projects, average annual flood losses in Minnesota continued to increase because of unwise floodplain development.



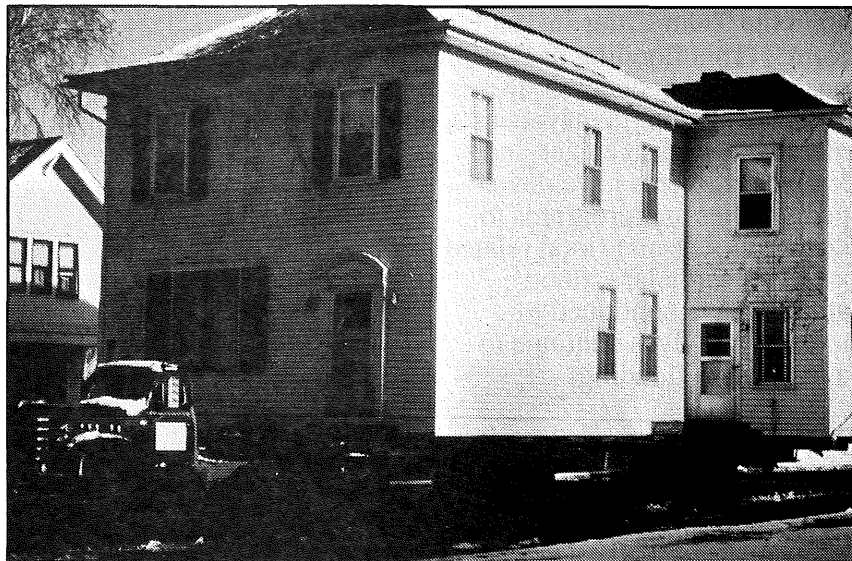
Figure 1.1. July, 1978  
Rochester, MN flood.





**Figure 1.2**  
This concrete floodwall in Mankato is an example of structural flood control measures.

**Figure 1.3**  
Non-structural flood loss reduction techniques include floodproofing, improved flood warning and response, and acquisition/ relocation.

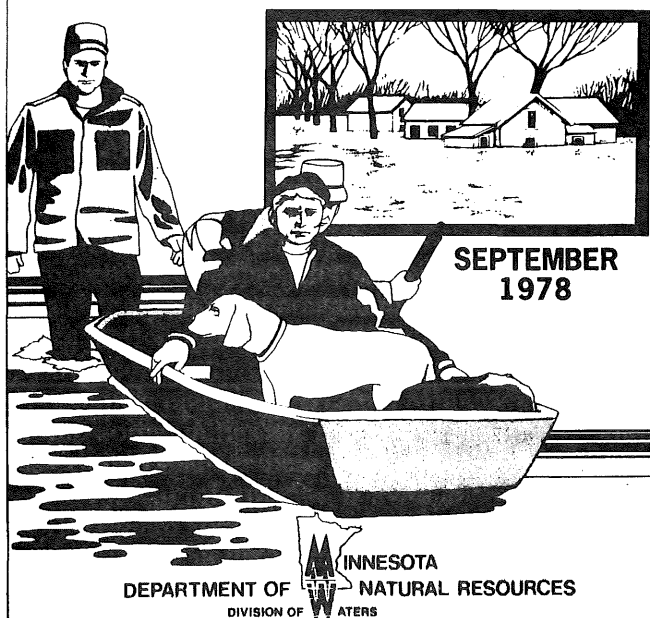


## 2. Minnesota's Floodplain Management Program

In 1969, the Minnesota Legislature enacted the State Flood Plain Management Act (Minnesota Statutes, Chapter 103F). This Act and sound floodplain management principles stress the need for a comprehensive approach to solving flood problems by emphasizing nonstructural measures, such as floodplain zoning regulations, flood insurance, floodproofing, and flood warning and response planning. By law, Minnesota's flood prone communities are required to: 1) adopt floodplain management regulations when adequate technical information is available to identify floodplain areas; and 2) enroll and maintain eligibility in the National Flood Insurance Program (NFIP) so that the people of Minnesota may insure themselves from future losses through the purchase of flood insurance. In 1987 the Flood Plain Management Act was amended to establish a state cost-sharing grant program to help local government units plan for and implement flood hazard mitigation measures. The Department of Natural Resources (DNR) is the state agency with overall responsibility for implementation of the State Flood Plain Management Act.

At the state level, the DNR has promulgated minimum standards for floodplain management entitled "Statewide Standards and Criteria for Management of Flood Plain Areas of Minnesota" (Minn. Rules parts 6120.5000 - 6120.6200). These standards have two direct applications: 1) all local floodplain management regulations adopted after June 30, 1970 must be compliant with these standards; and 2) all state agencies and local units of government must comply with Minnesota Regulations in the construction of structures, roads, bridges or other facilities located within floodplain areas delineated by local ordinance. Local floodplain regulatory programs, administered by county government predominantly for the unincorporated areas of a county, and by municipal government for the incorporated areas of a county, must be compliant with federal and state floodplain management standards. Both federal and state standards identify the 100-year floodplain as the minimum area necessary for regulation at the local level. These regulations are intended to protect new development and modifications to existing development from flood damages when locating in a flood prone area cannot be avoided.

### SAMPLE FLOOD PLAIN ZONING ORDINANCE For LOCAL UNITS Of GOVERNMENT



#### MINNESOTA STATE REGULATIONS

#### Rules and Regulations of THE DEPARTMENT OF NATURAL RESOURCES (Formerly Department of Conservation)

Relating to  
STATEWIDE STANDARDS AND CRITERIA  
FOR MANAGEMENT OF FLOOD PLAIN AREAS  
OF MINNESOTA



Cite the rules and regulations as:  
(for example)  
Minn. Reg. NR 85

1970  
new citation:  
Minn. Reg. 1983  
Parts 6120.5000-6120.6200

Distributed by  
DOCUMENT SECTION, DEPARTMENT OF ADMINISTRATION  
Room 140 Centennial Office Building, St. Paul, Minnesota 55101

### 3. National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a relatively recent federal program. Throughout much of this century, the federal government has been actively involved in flood control, however only since 1968 has there been a strong federal initiative in floodplain management. An excerpt from the 1979 U.S. Water Resource Council report on "A Unified National Program for Flood Plain Management" summarizes the events leading to the NFIP:


Congressional acceptance of limited Federal responsibility for flood control began in 1927 following major floods on the Mississippi River. It subsequently expanded geographically to nationwide scope and functionally to include coastal hurricane flooding. Earlier, in 1890, Congress had accepted Federal responsibility for flood forecasting and warning. Beginning with the Flood Control Act of 1936, the Congress accepted national responsibility, and the Corps of Engineers was assigned responsibility for flood control engineering works and later for flood plain information services. In the early 1930's, Congress created the Tennessee Valley Authority as a regional resource development agency.

Flood control, through the construction of dams and reservoirs, was included among its duties. In the late 1930's, Congress expanded Bureau of Reclamation authority to include building reservoirs for flood control purposes. In the 1940's, the Congress authorized the Department of Agriculture to construct 11 specifically authorized projects for flood control, and in the 1950's the department was authorized to carry out a nationwide program for upstream watershed projects.


Despite these programs and rapidly rising federal expenditures for flood control, flood losses continued to rise rapidly. Federal programs continued to rely predominantly on engineering works for modifying floods, although the Tennessee Valley Authority had initiated a local floodplain management assistance program in the early 1950's and the 1960 Flood Control Act had authorized the U.S. Army Corps of Engineers to provide states and localities with information needed to regulate floodplain lands. Thus it was, that in its review of Federal programs, the Task Force on Federal Flood Control Policy in 1966 urged a policy that emphasized modification of susceptibility to flooding and the impacts of flooding.

In 1968, Congress created the NFIP to make flood insurance available to property owners, at federally subsidized rates, provided the community agrees to adopt local regulations to protect lives and future development from flooding. The NFIP is often characterized as employing a carrot-stick approach in its program implementation. The incentive, or "carrot", is the availability of low-cost flood insurance for residents of a participating community. The stipulation, or "stick", of participation is that communities must agree to regulate/restrict future floodplain development.

FEDERAL EMERGENCY MANAGEMENT AGENCY



Answers to  
Questions About  
The National  
Flood Insurance  
Program



## 4. Community Participation in the NFIP

Community participation in the NFIP is divided into two phases, the emergency phase and the regular program phase. Several steps are required to "join" the emergency phase of the NFIP and then be converted to the regular program.

The Federal Emergency Management Agency (FEMA), which administers the regulatory aspects of the NFIP, formally notifies a community that it has special flood hazard areas (SFHA) by issuing a Flood Hazard Boundary Map (FHBM). The FHBM shows the approximate boundaries of the 100-year floodplain in that community. This map does not contain 100-year flood elevations or floodway/flood fringe delineations.

In Minnesota, most FHBM's were initially published during the early to mid-1970's identifying over 600 flood prone communities in the state. As of 1991, over 465 of these Minnesota communities are participating in the NFIP.

A community must join (participate in) the NFIP before residents can purchase a flood insurance policy. The community must submit an application to FEMA for initial participation. Historically, the application had to include a resolution passed by the city council or county board stating that the community will act in good faith to regulate future flood plain development. Recently, FEMA has been requiring local adoption of a floodplain management ordinance. Community eligibility in Minnesota is generally established by municipal government for incorporated areas and county government for unincorporated areas.

Upon application approval by FEMA, the community enters the emergency phase of the NFIP. "Emergency phase" does not mean the community is in a state of emergency. It means that the community has become eligible for the sale of subsidized flood insurance despite the fact that the community's actual degree of flood hazard has not been determined.

The next step in this process is for FEMA to hire an engineering contractor, either a private consultant or another federal agency, to prepare a flood insurance study (FIS) for a particular

community. Using detailed engineering methods, the study contractor will determine the following for selected stream reaches and lakes:

- 1) Flood profiles which establish the 100-year flood elevations for selected flood hazard areas within the community;
- 2) A floodplain map which delineates the community's flood hazard areas;
- 3) Floodway/flood fringe delineations for selected stream reaches.

A series of review periods follow the release of the data contained in the preliminary draft of the FIS, including publication of the 100-year flood elevations twice in the community's official newspaper. After the end of this review period, the community must, within 6 months, upgrade its floodplain regulations by ordinance to incorporate these additional data and include more stringent land use regulations. The community is then converted to the regular phase of the NFIP and residents become eligible for additional flood insurance at rates reflecting the actual degree of flood hazard determined in the FIS.

FEMA is interested in whether communities which have joined the NFIP are achieving the flood loss reduction objectives of the program. To determine this, they have developed a "Community Assistance Program" (CAP). Through CAP, the respective states contract with FEMA to monitor and/or assist their communities so that floodplain management issues can be resolved before they develop into problems requiring enforcement actions. The State of Minnesota floodplain staff offers assistance via Community Assistance Visits (CAVs), more informal Community Assistance Contacts (CACs), Ordinance Assists (ordinance revisions), training sessions, *Water Talk* (newsletter) articles, as well as day-to-day contact regarding technical and interpretive issues.

The newest innovation in the NFIP is the Community Rating System (CRS). The CRS is a program that provides discounts on flood insurance rates in communities that take a proactive approach to floodplain management. Communities must demonstrate that they have implemented floodplain management activities that exceed the minimum state and Federal requirements in order to receive CRS credit. Communi-

ties that participate are eligible for flood insurance premium reductions of 5% to 45% depending on the number and type of creditable floodplain management activities that they are involved in.

Additional information on the National Flood Insurance Program may be found in the FEMA pamphlet "Questions and Answers on the National Flood Insurance Program" that can be obtained by calling FEMA's toll free number 1-800-638-6620.

## **5. Why a Floodplain Manager's Handbook ?**

Land use regulatory programs are a long-term approach to reducing flood damage by controlling new development and redevelopment within the floodplain. In Minnesota, local governments have been given the primary responsibility to insure that new floodplain development is compliant with local ordinances, which must be compliant with minimum state and federal standards.

The process by which a community adopts or amends a floodplain ordinance is typically accomplished without significant training. Some assistance was provided to the community for the initial ordinance adoption. However, limited training and assistance have been provided since that time to assist the individual communities in the day-to-day administration of their ordinance.

The first comprehensive statewide training program for local officials was conducted by the DNR in the summer of 1981. Many communities have adopted floodplain ordinances since that time and, as would be expected, staff and elected officials turnover has also occurred statewide. Strong support was received from a 1983 survey of community officials by DNR for further state-sponsored training and education. This resulted in the development of the first addition of the handbook in 1984 and a series of training sessions throughout the state in 1985. For these reasons, the DNR is pursuing an ongoing training program.

It was decided that the previous handbook prepared by the DNR for past training workshops was in need of updating and refinement. This new handbook, updated for the current series of training workshops, will hopefully fulfill three major objectives:

**Training Document** - This handbook is intended to be used as a training document during future DNR workshops as well as individually initiated training sessions. New community staff or those not able to attend a workshop will hopefully gain a basic understanding of floodplain management concepts by reviewing this handbook.

**Administrative Guide**- The major portion of this handbook is intended to assist the local community in the day-to-day administration of their floodplain ordinance. Chapters within this handbook will specify responsibilities of various individuals within the community, including the zoning administrator, building official, board of adjustment and planning commission. Step-by-step procedures for a typical floodplain development proposal from the initial request to either approval and construction or permit denial and appeal will be highlighted. Required record keeping will be stressed.

**Resource Guide** - Finally, this handbook is intended to provide guidance on where to look for assistance for virtually any type of floodplain related question or problem. This includes existing publications as well as public and private organizations.

This handbook utilizes a three-ring binder to enable easy updating. Individual pages or entire sections will be added or updated as the need is identified.

Users are strongly encouraged to provide comments on the adequacy of this handbook. Suggested improvements on general readability, accuracy, need for clarification or additional topics will be reviewed for inclusion in future editions.



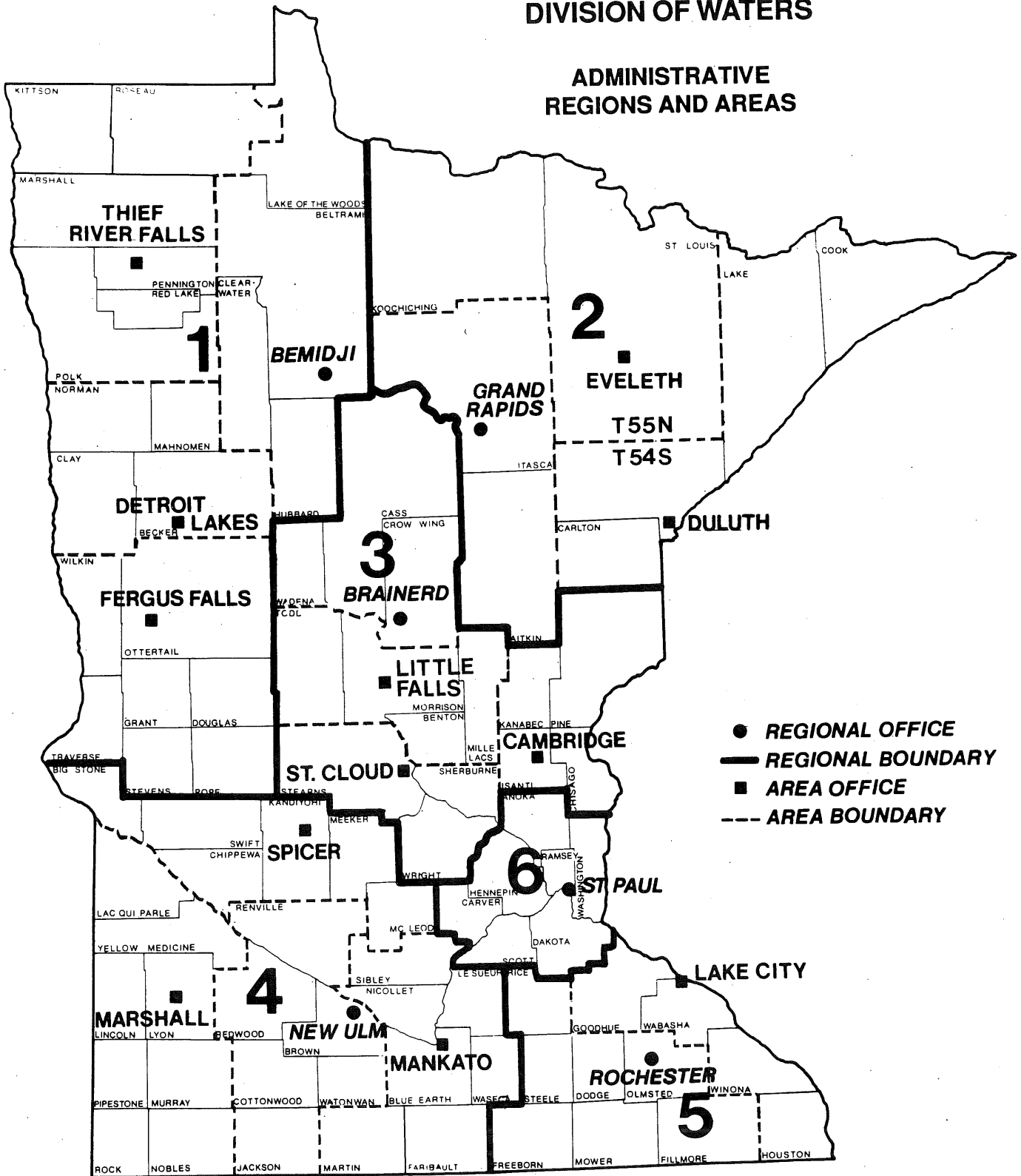




APPENDIX 1A

DIVISION OF WATERS

ADMINISTRATIVE  
REGIONS AND AREAS



revised 12/92

(OVER)

**APPENDIX 1B  
DIVISION OF WATERS**

**ADMINISTRATIVE  
REGIONS AND AREAS**

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**REGION 1 (& Bemidji Area)**

Regional Hydrologist  
DNR-Division of Waters  
2115 Birchmont Beach Road N.E.  
Bemidji, MN 56601  
(218) 755-3973

***Detroit Lakes Area***

Area Hydrologist  
DNR-Division of Waters  
P.O. Box 823  
Detroit Lakes, MN 56501  
(218) 847-1580

***Fergus Falls Area***

Area Hydrologist  
DNR-Division of Waters  
1221 Fir Avenue East  
Fergus Falls, MN 56537  
(218) 739-7576

***Thief River Falls Area***

Area Hydrologist  
DNR-Division of Waters  
123 Main Ave. N.  
Thief River Falls, MN 56701  
(218) 681-7789

**REGION 2 (& Grand Rapids Area)**

Regional Hydrologist  
DNR-Division of Waters  
1201 East Highway 2  
Grand Rapids, MN 55744  
(218) 327-4416

***Duluth Area***

Area Hydrologist  
DNR-Division of Waters  
5351 North Shore Drive  
Duluth, MN 55804  
(218) 723-4786

***Eveleth Area***

Area Hydrologist  
DNR-Division of Waters  
2005 Highway 37  
Eveleth, MN 55734  
(218) 749-9610

**REGION 3 (& Brainerd Area)**

Regional Hydrologist  
DNR-Division of Waters  
1601 Minnesota Drive  
Brainerd, MN 56401  
(218) 828-2605

***Cambridge Area***

Area Hydrologist  
DNR-Division of Waters  
800 Oak Savanna Ln. S.W.  
Cambridge, MN 55008  
(612) 689-2832

***St. Cloud Area***

Area Hydrologist  
DNR-Division of Waters  
3725 12 Street North  
P.O. Box 370  
St. Cloud, MN 56302  
(612) 255-2976

***Little Falls Area***

Area Hydrologist  
DNR-Division of Waters  
Route 4, Box 19 A  
Little Falls, MN 56345  
(612) 632-2430

**REGION 4 (& New Ulm Area)**

Regional Hydrologist  
DNR-Division of Waters  
Box 756, Highway 15 South  
New Ulm, MN 56073  
(507) 359-6053

***Spicer Area***

Area Hydrologist  
DNR-Division of Waters  
P.O. Box 457  
10590 County Rd. 8 NE  
Spicer, MN 56288  
(612) 796-6271 or 6272

***Mankato Area***

Area Hydrologist  
DNR-Division of Waters  
Nichols Office Center  
Suite 180, 410 Jackson St.  
Mankato, MN 56001  
(507) 389-6713

***Marshall Area***

Area Hydrologist  
DNR-Division of Waters  
Box 111, 1400 E. Lyon  
Marshall, MN 56258  
(507) 537-7258

**REGION 5**

Regional Hydrologist  
DNR-Division of Waters  
P.O. Box 6247  
Rochester, MN 55903  
(507) 285-7430

***Lake City Area***

Area Hydrologist  
DNR-Division of Waters  
1801 So. Oak Street  
Lake City, MN 55041  
(612) 345-5601

**REGION 6**

Regional Hydrologist  
DNR-Division of Waters  
1200 Warner Road  
St. Paul, MN 55106  
(612) 772-7910

**CENTRAL OFFICE**

DNR-Division of Waters  
500 Lafayette Road  
St. Paul, MN 55155-4032  
(612) 296-4800







# COMMONLY USED TERMS

A	Q	E	L	O	A	D	E	R	X	G	I	P	G
F	L	U	M	H	U	O	Z	A	J	O	E	T	A
L	J	F	E	W	O	O	F	E	M	A	N	H	R
O	U	L	N	C	Y	L	M	I	F	E	I	W	D
O	D	O	I	H	P	F	U	Q	M	P	V	A	E
D	Y	O	T	X	O	E	K	H	E	U	O	T	N
P	A	D	S	D	I	S	C	H	A	R	G	E	U
R	L	P	I	J	K	A	B	U	K	E	X	R	F
O	R	L	R	O	O	B	D	T	I	B	B	S	A
O	Q	A	H	R	F	P	E	D	N	O	R	H	T
F	N	I	C	P	U	A	S	O	A	M	E	E	P
I	O	N	E	W	A	T	E	R	D	T	T	D	Y
N	E	A	M	B	I	L	L	Q	I	S	U	Z	G
G	Z	S	Q	E	E	N	F	I	P	L	O	M	E

Can you find some of the terms and acronyms from this chapter in the above puzzle ?

(HINT: There are 10, including the one done for you. The answer is on the back of this page).

A	Q	E	L	O	A	D	E	R	X	G	I	P	G
F	L	U	M	H	U	O	Z	A	J	O	E	T	G
L	J	F	W	Y	O	F	F	E	M	A	N	H	R
O	U	L	C	P	L	M	I	F	E	I	W	A	D
O	D	O	H	X	O	E	K	H	E	U	O	T	E
D	Y	O	T	X	O	E	K	H	E	U	O	T	N
P	A	D	S	D	I	S	C	H	A	R	G	E	U
R	R	P	I	J	K	A	B	U	K	E	X	R	F
O	R	L	R	O	O	B	D	T	I	B	B	S	A
O	Q	A	H	B	F	P	E	D	N	O	R	E	H
F	N	I	C	P	U	A	S	O	A	M	E	T	P
I	Q	W	E	W	A	T	E	R	D	T	S	U	Y
N	A	M	B	I	L	L	Q	I	S	U	Z	G	E
G	Z	S	Q	E	E	N	F	I	P	L	O	M	E

## CHAPTER 2

### COMMONLY USED TERMS

#### 1. Definitions

**Base Flood** - The flood having a one-percent chance of being equaled or exceeded in any given year. Base flood is synonymous with the term "regional" or "100-year" flood.

**Basement** - Any area of a building having its floor subgrade (below ground level) on all sides.

**Cross Section** - Horizontal view of a stream channel and overbank areas, taken perpendicular to the channel.

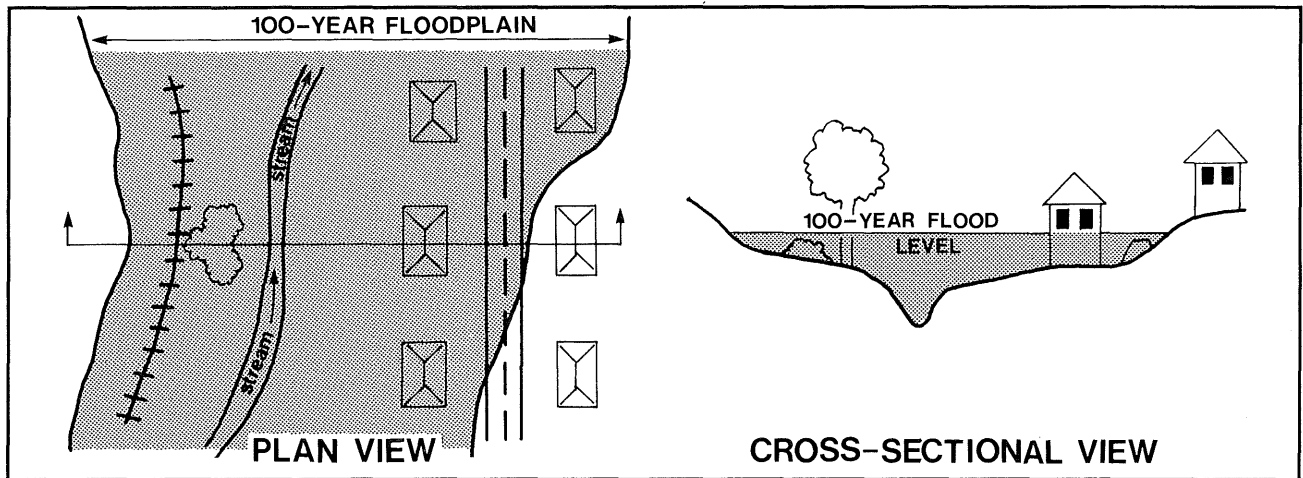


Figure 2.1 Cross Section

**Datum** - An established (or assumed) reference point or elevation - most commonly Mean Sea Level (MSL). All elevations in a flood insurance study refer to a vertical distance above MSL.

**Discharge** - The volume of water moving past a particular stream cross section per unit of time, usually expressed as cubic feet per second.

**Encroachment** - The obstruction of floodplains which result in the restriction of flow areas needed by streams to discharge flood waters during flood conditions. This "encroachment" of the natural stream overflow area results in increased flood levels.

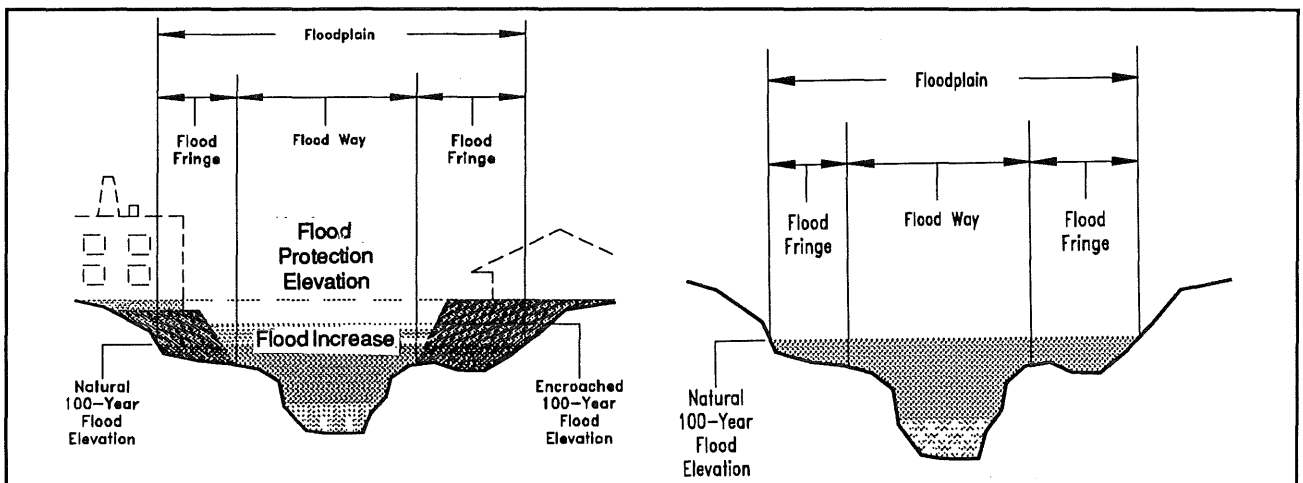


Figure 2.2 The effect of encroachment on flood levels

**Flood Crest** - The maximum level reached by flood waters at a particular location along the stream.

**Flood Frequency** - This term refers to the probability of a flood of a certain magnitude occurring in a given time period. The larger the flood, the less frequent a flood of that magnitude is expected to occur.

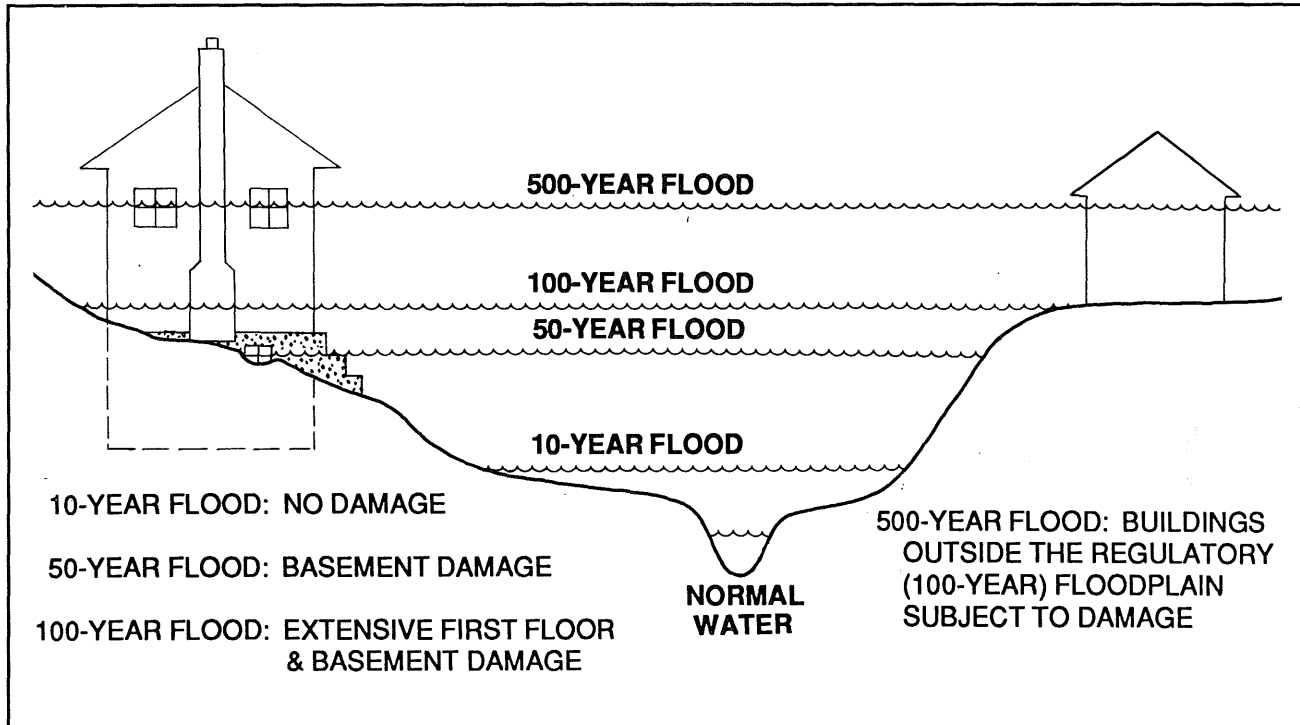


Figure 2.3 Depth of flooding vs. various flood frequencies

Flood frequency can also be referred to in terms of **Probability of Occurrence**, which is the percent chance a flood of a given frequency will be equaled or exceeded in any given year. For example, a 100-year frequency flood is also called the “1%-chance” flood, since it has a 1% chance of occurring or being exceeded during any given year. This terminology avoids the misconception that a 100-year flood can only happen once in 100 years. It is possible for a 100-year flood to occur three years in a row, and then not to occur at all for the next 300 years.

**Flood Profile** - A graphical representation showing the water elevation at various locations along a stream during a specific flood event. The flood insurance study text contains a flood profile for each stream studied in detail for the 10, 50, 100 and 500-year flood events.

**Floodplain** - Floodplains are lowland areas adjoining lakes and rivers which are susceptible to inundation of water during a flood. For land use regulatory purposes, the floodplain is normally the area covered by the 100-year flood and it is usually divided into two zoning districts, the floodway and flood fringe.

**Floodway** - The floodway is the channel of a river or other watercourse and the adjacent land areas which must remain open in order to discharge the base flood(see Figure 2.4).

**Flood Fringe** - That portion of the 100-year flood plain outside of the floodway. Most new floodplain development must be located in the flood fringe, with any structure elevated or floodproofed to the regulatory flood protection elevation (see Figure 2.4).

**Floodproofing** - Any combination of structural provisions, changes or adjustments to properties and structures subject to flooding, primarily for the purpose of reducing or eliminating flood damages. The most common method of floodproofing a structure is to raise it on fill to a height equal to or above the regulatory flood protection elevation (see floodproofing classifications, page 85).

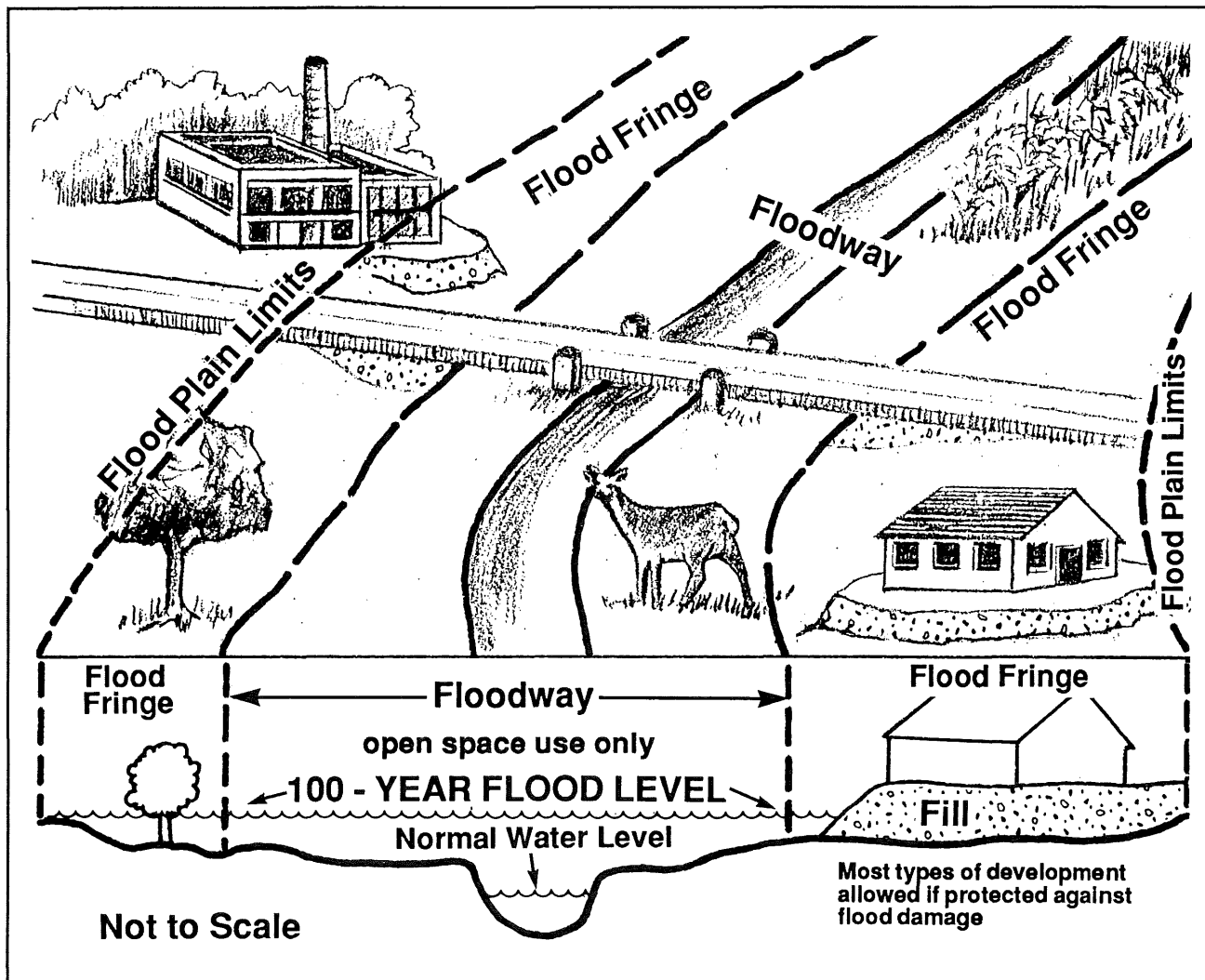


Figure 2.4 The floodway and flood fringe

**Freeboard** - A factor of safety usually expressed in feet above a certain flood level. For example, most communities might require a structure's lowest floor to be placed at 1' above the 100-year flood level. Freeboard compensates for the many unknown factors (e.g., waves, ice, debris, etc.) that may increase flood levels beyond the calculated level. Another example of freeboard is found in Minnesota regulations which require, at a minimum, that properly designed and constructed (permanent) levees have at a minimum three feet of freeboard above the 100-year flood in order to remove the area behind the levee from the floodplain designation.

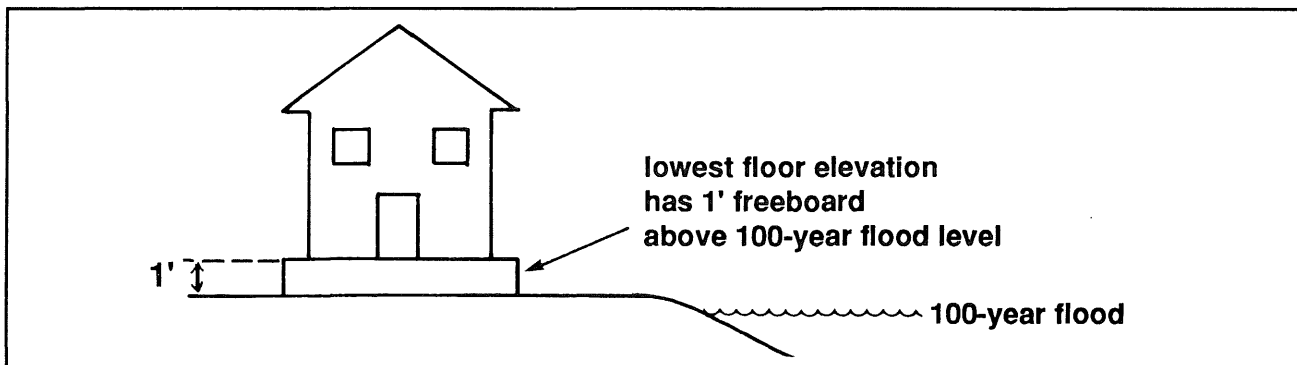


Figure 2.5 Freeboard

**Lowest Floor** - The lowest floor of the lowest enclosed area (including basement).

**Regulatory Flood Protection Elevation (RFPE)** - The minimum elevation established by local ordinance for which all new floodplain development must be protected against flood damage. At a minimum, this is an elevation no lower than the 100-year flood elevation plus any increase in flood levels resulting from the designation of flood fringe areas. The DNR strongly encourages all communities to also include at least 1' of freeboard in their local ordinance.

**Substantial Improvement** - Any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds 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 (FEMA definition).

**Watershed** - The total land area upstream of a given point along or adjacent to a waterbody that contributes drainage of surface water to that point.

## **2. Acronyms**

**BFE** - Base Flood Elevation

**CAC** - Community Assistance Contact

**CAV** - Community Assistance Visit

**CRS** - Community Rating System

**DNR** - Minnesota Department of Natural Resources

**FBFM** - Flood Boundary and Floodway Map

**FDR** - Flood Damage Reduction Program

**FEMA** - Federal Emergency Management Agency

**FHBM** - Flood Hazard Boundary Map

**FIA** - Federal Insurance Administration

**FIRM** - Flood Insurance Rate Map

**LOMA** - Letter of Map Amendment

**LOMR** - Letter of Map Revision

**NFIP** - National Flood Insurance Program

**NOHW** - Natural Ordinary High Water Level

**RFPE** - Regulatory Flood Protection Elevation

**SBC** - State Building Code

**SFHA** - Special Flood Hazard Area











## CHAPTER 3

### USING FLOOD INSURANCE STUDY DATA

Topics to be covered:

1. Introduction
2. Types of Floodplain Delineations
3. Developing Floodplain Maps
4. Floodplain Mapping Format
5. Components of Flood Insurance Studies
  - A. Map Index
  - B. Flood Insurance Rate map (FIRM) - Old Format
  - C. Flood Boundary and Floodway Map (FBFM)
  - D. Flood Insurance Rate Map (FIRM) - New Format
  - E. Floodway Data Table
  - F. Flood Profile
6. Special Considerations
  - A. Lakes
  - B. Approximate Study Areas

The primary items of use to local officials in a typical FIS include:

- 1) Flood Insurance Rate Map (FIRM)
- 2) Flood Boundary Floodway Map (FBFM)
- 3) FIS text
  - Flood profiles
  - Floodway Data Table

This chapter will review the components of an FIS, and important features will be explained and highlighted using actual examples. The chapter will conclude with a discussion of approximate study areas and sources of additional information.

#### 1. Introduction

Achieving the goals and objectives of floodplain management, including the proper administration of a floodplain ordinance, is dependent on community officials and local lending institutions being able to correctly interpret the floodplain maps and supporting documentation in the flood insurance study.

This chapter will cover the technical data which serve as the basis for nearly all floodplain management ordinances in Minnesota. A community is required to adopt a floodplain ordinance following completion of a flood insurance study (FIS) by the Federal Emergency Management Agency (FEMA). The FIS identifies the portion of a community subject to flooding, and provides the necessary data with which to regulate future floodplain development.

In addition, lending institutions that are federally regulated or insured must use the FIS, specifically the Flood Insurance Rate Map (FIRM) to determine if the subject structure is located within the floodplain. If it is, the lending institution must require the party securing the loan to purchase flood insurance as a condition of the loan.

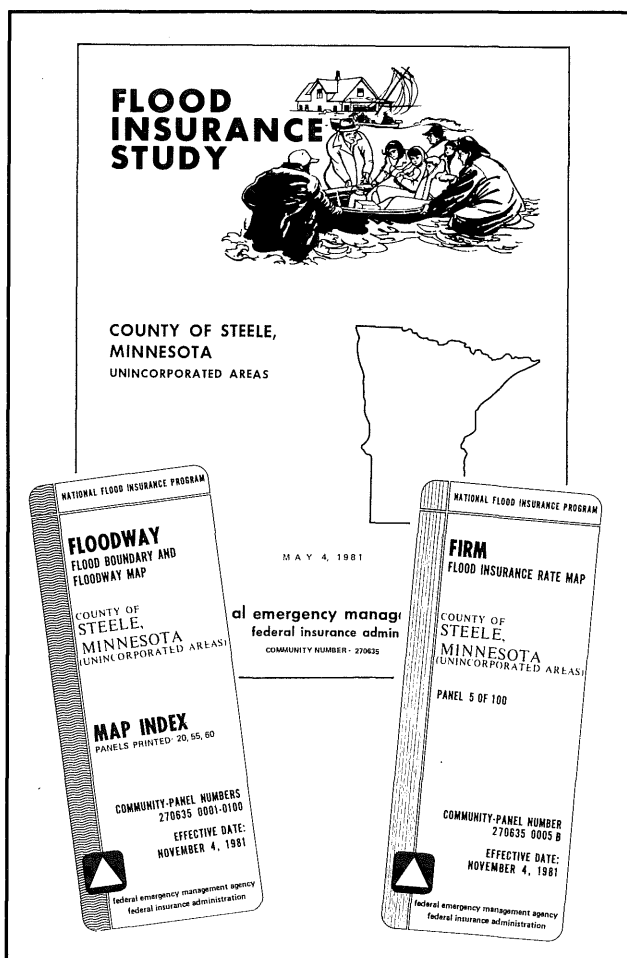


Figure 3.1 A typical flood insurance study and associated maps.

## 2. Types of Floodplain Delineations

Before discussing specific items on floodplain mapping, it is important to understand the types of floodplain delineations. Prior to the start of each FIS, a meeting is held with community officials to discuss existing flooding problems and possible future floodplain development activity. Those streams and lakes with existing or proposed floodplain development would usually be studied by “**detailed**” engineering methods. Those lakes and stream reaches with little or no development potential were studied by less-costly “**approximate**” methods. As a result, an FIS may contain two separate types of floodplain delineations; these being:

- 1) Floodplain delineations based on **detailed** engineering methods. The end result is a floodplain delineation that represents a projected flood height or stage stated in feet above mean sea level datum. The projected flood height or stage is calculated using a detailed hydrologic and hydraulic model of the watercourse or lake in question; and
- 2) Floodplain delineations based on **approximate** study techniques. The approximate floodplain delineation is determined using the best available data, in lieu of performing a detailed engineering study. These data may be from soils mapping, experienced high water profiles, aerial photographs of previous floods, or other appropriate sources. There are no associated 100-year flood elevations with approximate floodplain delineations unlike detailed study areas.

For regulating floodplain development, a map developed through hydrologic and hydraulic analyses is preferable. The advantage of this method is that the analysis will develop flood elevations for various frequency floods. These elevations are then the basis for regulating future floodplain development.

However, where it is too costly to perform hydrologic/hydraulic investigations and where adequate historic flood data are lacking, other types of approximate maps are used. Communities utilizing these approximate maps are required to incorporate ordinance provisions which require that the floodplain data be developed when considering individual permit applications.

Since the National Flood Insurance Program uses hydrologic and hydraulic analyses in preparing flood insurance studies, it may be helpful for those involved in the administration of floodplain management ordinances to have a general understanding of how these maps are developed.

Simply stated, the science of **hydrology** is used to determine the amount of water flowing in a river or stream for a given frequency flood event. This involves calculating the amount of runoff that can be expected to drain from the surrounding watershed. The principles of **hydraulics** are applied to help determine how the river or stream channel will handle the flow and to what extent the excess water will spread over the floodplain when the flood is at its peak. Specialized computer programs are used to perform most hydrologic and hydraulic computations.

## 3. Developing Floodplain Maps

The following subsections give a brief description of the procedures involved in applying these techniques in the preparation of detailed floodplain maps.

### Step 1 - Calculating Flood Flows (Hydrologic Evaluation)

There are various techniques that can be used to estimate flood flows. Preferred techniques use statistical analysis of actual stream gauge data. If stream gauge data are not available, other methods which consider the measurable characteristics of the drainage basin can be applied, depending on the size of the watershed.

### Stream Records

The data collected from rivers and streams that have stream gaging stations can be used to compute flow in the stream for a 100-year flood. This can be done by using the highest peak flow each year in a statistical analysis. Data points are plotted on a special type of graph paper (log-probability) and a line is drawn through these data points. From that graph, the flow for a particular frequency flood can be determined. The flow is usually given in the number of cubic feet of water that passes a given location in one second, abbreviated cfs.

On the accompanying chart, each dot represents the highest peak flow for a given year for a

sample stream. Each dot is placed on the chart based on its recurrence interval, which is basically the number of recorded years divided by the number of times over the recorded period that the particular flow has been equalled or exceeded. A line is drawn through the center axis of the dots and is used to project a given flow. Based on this line, the flow for a 100-year flood would be 2,800 cfs.

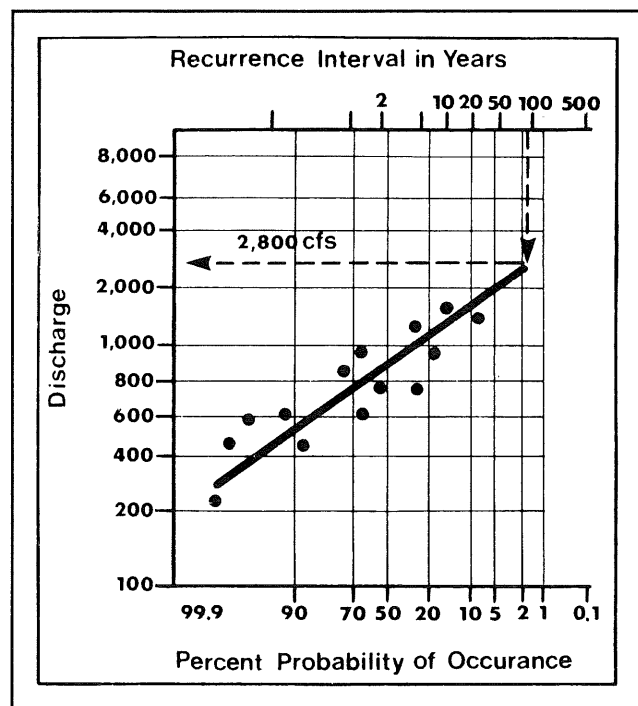


Figure 3.2 Discharge vs. frequency curve.

### Estimating Flow-Ungaged Streams

When stream gage records are not available or are incomplete, flood peaks must be estimated. Numerous equations and basin modeling techniques for estimating the flood peak have been developed. Their applicability varies over a wide range. Thus, it is important for the engineer to choose the procedure that best fits the size and locality of the drainage basin. Techniques for large watersheds are usually based on gage stream data from nearby watersheds that have been correlated to physical characteristics of the drainage basin.

Figure 3.3 Cross section data are usually obtained by field surveys.



### Step 2 - Preparing Field Measurements

Once the flow is known, the particular slope and shape (cross section) of the stream channel and adjoining floodplain are determined at numerous points. A cross section is a graphic picture of a section of the stream and adjoining floodplain cut at right angles to the direction of flow. Cross section elevation data are either obtained through field survey or aerial photogrammetric methods. Measurements of encroachments such as dams, bridges and culverts are also obtained.

### Step 3 - Estimating Resistance to Flow

The resistance to the flow is needed to complete the data required to calculate the height of water. This resistance to flow, or roughness factor, is determined by analyzing the character of the landscape. For example, a wooded floodplain would tend to hold back the water, causing a higher flood level than a grassed floodplain. A smooth, concrete-lined channel will obviously convey water with less resistance than a channel strewn with large rocks and fallen trees. Objects such as buildings, fences, highways and bridges will also have an effect on resistance to the flow.

### Step 4 - Calculating Flood Elevations (Hydraulic Evaluation)

All of the above factors, flood flow, channel and floodplain configurations, constructed and natural obstructions and roughness coefficients are used to compute flood depths at each cross section. These factors are coded for input into a computer program developed by the U.S. Army

Corps of Engineers (HEC-II) which performs the actual computations. The computer model is calibrated using historic highwater and flood flow data, when available.

#### *Step 5 - Preparing the Flood Profile*

The flood elevations for each cross section are then plotted on a profile and the points are connected (see Figure 3.10). A profile is a graphic picture of a section of the stream as if it were cut length wise down the centerline giving a side view. The profile is related to the map by finding the corresponding cross sections used in the computer model on the Floodway Flood Boundary Maps (Figure 3.7) or the new Flood Insurance Rate Maps (Figure 3.8).

#### *Step 6 - Delineating the Floodplain*

The last step is to translate the height of the flood at each cross-section onto a topographic map. In mapping the outer limits of the floodplain, the 100-year flood elevation is compared to the actual ground contour. The flood boundary is located at the point where the flood level intersects the ground surface of the same elevation (see Figure 3.4).

The reliability of the floodplain delineation is dependent on the accuracy of the data used to calculate the flood elevation and the accuracy of the topography and features shown on the floodplain map. For example, if the topographic map has 5-foot contour intervals and the flood elevation was calculated to the nearest one foot, a judgement has to be made where that elevation is located on the map.

#### *Step 7 - Floodway/Flood Fringe Delineation*

The manner in which the floodway and flood fringe districts are delineated on the map is quite different than that for the 100-year floodplain boundary determination. The actual floodway/flood fringe line is not dependent on the ground elevation a given point along the cross section; rather it is a distance from a known reference point, such as the centerline of a road or the stream bank.

The floodplain ordinance will require the floodway district to remain in open spaces uses. Future development can occur in the flood fringe district if properly protected against flood damages. The selection of floodway and flood fringe districts is accomplished in conjunction with the preparation of the FIS. Community officials

have a major voice in the original floodway/flood fringe selection. Usually, community officials request that areas of existing and potential development be placed in the flood fringe district; city parks, nature areas and other open space areas are typically placed in the floodway.

The FIS consultant uses this information on existing or proposed floodplain development to draw a preliminary floodway/flood fringe line. The cross sectional area associated with the flood fringe is assumed to be no longer available to convey the floodwaters downstream. The consultant modifies the "base condition" computer model described above by removing the area designated as flood fringe from each cross section. This determines the incremental increase in water surface elevation above the 100-year flood level necessary to compensate for the cross sectional area designated as flood fringe. State standards generally limit this stage increase to one-half foot.

Minor adjustments may be necessary for the floodway/flood fringe delineation to be compliant with state and federal standards. There is no guarantee that all existing development or potential new development sites will be placed in the flood fringe district.

To again emphasize the differences identified above:

- 1) the 100-year floodplain boundary is based on the elevation of the 100-year flood and the actual ground elevation; and
- 2) the floodway/flood fringe delineation can be thought of as a horizontal distance from the center of the channel; its location is not related to ground elevations.

## **4. Floodplain Mapping Format**

The format of the maps contained in the Flood Insurance Study (FIS) has recently changed. In the old format, the FIS usually contains two separate maps:

- 1) Flood Insurance Rate Map (FIRM), Figure 3.6.
- 2) Flood Boundary and Floodway Map (FBFM), Figure 3.7.

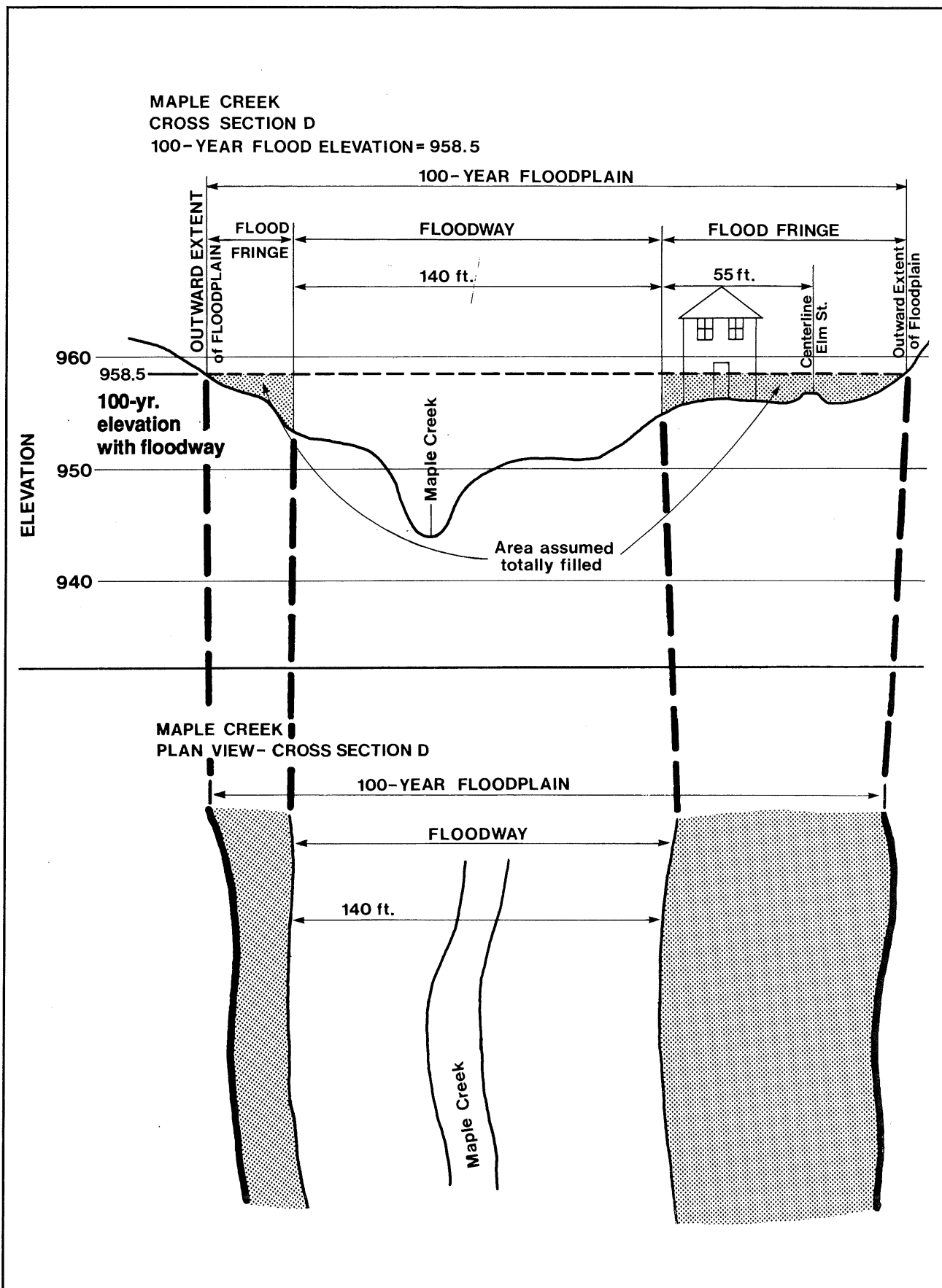


Figure 3. 4 Floodway/flood fringe delineation



In the new FIS format, the maps are combined into the FIRM. Most of the FIS's for Minnesota communities have been done in the older FIS format.

In the old format, all FIS's contain a FIRM, but only those with streams that were studied in detail and where a floodway has been designated will contain a Flood Boundary and Floodway Map (FBFM). The information contained on these two types of maps are summarized in the table below:

<u>Flood Plain Data</u>	<u>FIRM</u>	<u>FBFM</u>
Approximate 100-year floodplain	Yes	Yes
Detailed 100-year floodplain	Yes	Yes
500 year floodplain	Yes	Yes
Base flood elevations	Yes	No
Flood Insurance rate zones	Yes	No
Cross-section locations	No	Yes
Floodway/flood fringe delineations	No	Yes
Elevation reference marks	Yes	Yes

In the old format, the FIRM is primarily intended for use by lenders and insurance agents. The FBFM is primarily used by community officials in administering their floodplain zoning ordinance. However, community officials should maintain a current copy and refer to both types of maps because:

- 1) The FBFM for a particular community may not contain all map panels which have flood hazard delineations. FEMA will publish FBFM panels for only those panels where a floodway has been designated. The FIRM will contain all panels with flood hazard delineations, whether they are approximate or detailed study areas; and
- 2) As conditions change, or new data become available, FEMA will often republish the appropriate FIRM. The FBFM is less frequently updated. It is therefore always a good idea to check the most current FIRM.

## 5. Components of Flood Insurance Studies

### A. Map Index

Many communities, including all Minnesota Counties, are geographically large enough so

that the entire community will not fit on one map panel. These communities are therefore divided into two or more "panels"; each panel is given a unique panel number. Whenever a community requires more than one panel, a "Map Index" for both the FIRM and FBFM is prepared (see Figure 3.5).

The Map Index will show the entire community boundary, highlighting prominent features within the community including major highways, railroads, streams and lakes. The Map Index will show how the community was divided into the various panels.

**1** PANELS PRINTED: FEMA prints only those panels having flood hazard areas; those panel numbers printed are indicated on the title block.

**2** PANELS NOT PRINTED: Those panels having no flood hazard areas are indicated by an asterisk "\*".

**3** MAP INDEX DATE: The date shown on the title block reflects the most recent revision. As changes occur within a community which result in a change in flood elevations or floodplain delineations, FEMA republishes only those map panels affected. The revised panel(s) is given a new map effective date for the date it was officially revised. It is therefore possible that a given community would have two or more effective map panel dates. The map index will show the most recent map effective date.

**4** MAP PANEL NUMBER: Each panel is given a unique number consisting of three parts:

Example: 2706355 0055 B  
   (a)       (b) (c)

- (a) community number
- (b) panel number
- (c) panel suffix (if revised)

As indicated above, individual panels will be revised as needed. With each revision, the panel suffix will be increased.

Area shown is in Figure 3.6

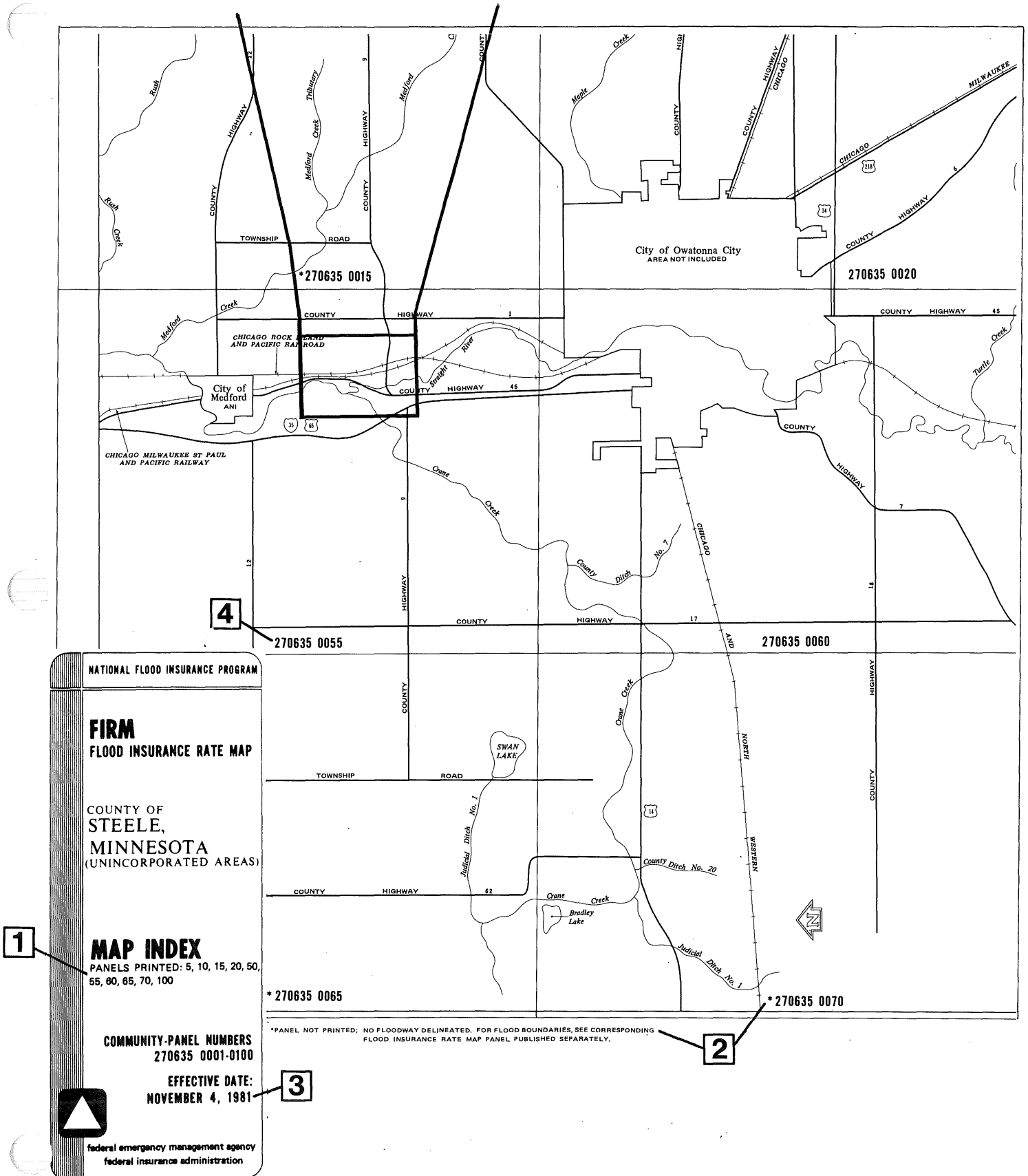


Figure 3.5 Example of a Map Index

## B. Flood Insurance Rate Map (FIRM) - Old Format

**How it is used.** The FIRM (Figure 3.6) is used mainly by lenders, insurance agents, and private citizens to determine:

- Whether a specific property is within the floodplain
- The flood insurance zone that applies to the property
- The Base Flood Elevation (BFE) of the property

The FIRM should also be reviewed by the community zoning official. The FIRM may be particularly useful in determining the BFE for a site that is not immediately adjacent to a source of flooding. Also, the FIRM may delineate floodplain areas where a floodway has not been determined and no FBFM panel is printed.

**1** **TITLE BLOCK:** Includes the community and county name and community identification number and the panel number.

**2** **MAP DATES:** Several dates may be listed, including:

Initial Identification - date of first Flood Hazard Boundary Map

Flood Insurance Rate Map Effective - date the community was converted to the regular program of the NFIP which normally corresponds to the date of initial FIRM.

Flood Insurance Rate Map Revision - date of subsequent revisions to the FIRM. This date refers only to that panel.

**3** **NORTH ARROW:** Directional point of reference. Caution, some maps are not oriented toward the top of the page.

**4** **MAP SCALE:** Two different scales may have been used for a community with more than one map panel.

**5** **100-YEAR FLOODPLAIN:** Designated by the dark shaded areas (insurance zones A, A1-A30, A0, AH)

**6** **500-YEAR FLOODPLAIN:** Designated by the lighter shaded areas (Insurance Zone B).

**7** **BASE FLOOD ELEVATION (BFE):**  
The water surface elevation of the base flood (100-year flood) at that point of the stream.

**8** **FLOOD INSURANCE RATE ZONES:**  
Zone designations which reflect relative flood risks. In the past, these various zones were used for determining flood insurance policy premiums. The only distinction **now** made is between areas either **in** or **outside** the 100-year floodplain.

**9** **ZONE BREAK LINE:** These lines separate different flood insurance rate zones within the 100-year floodplain.

**10** **APPROXIMATE FLOODPLAIN AREAS:** 100-year floodplain areas determined using approximate methodologies. No base flood elevations will be shown in approximate floodplain areas. These areas are classified as (unnumbered) Zone A.

**11** **ELEVATION REFERENCE MARKS:**  
Using these elevation benchmarks, a survey can determine the exact elevation of a particular structure or property. The surveyed elevation, when compared to the actual BFE, will determine whether the property in question is within the 100-year floodplain.

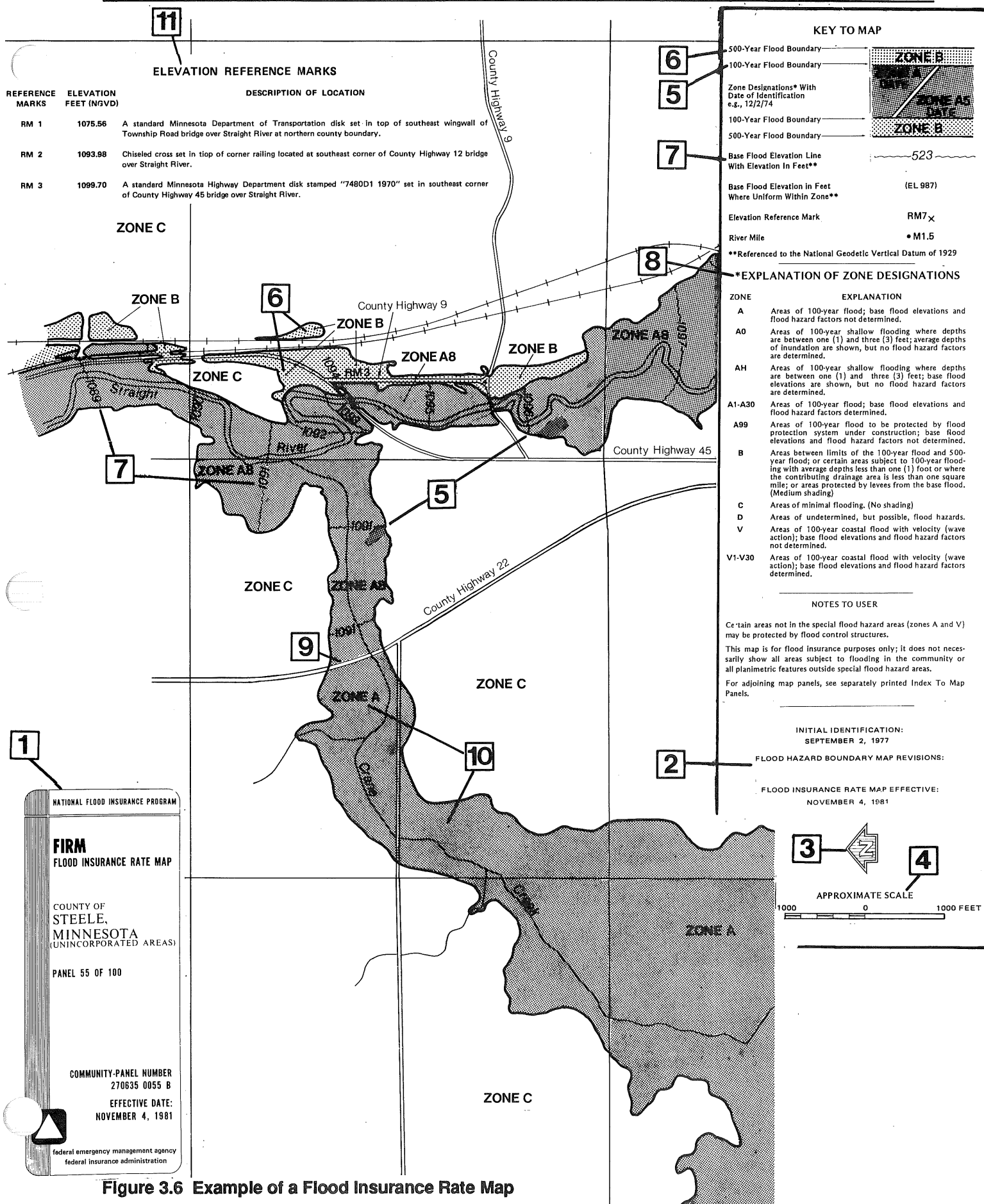


Figure 3.6 Example of a Flood Insurance Rate Map

### C. Flood Boundary and Floodway Map (FBFM)

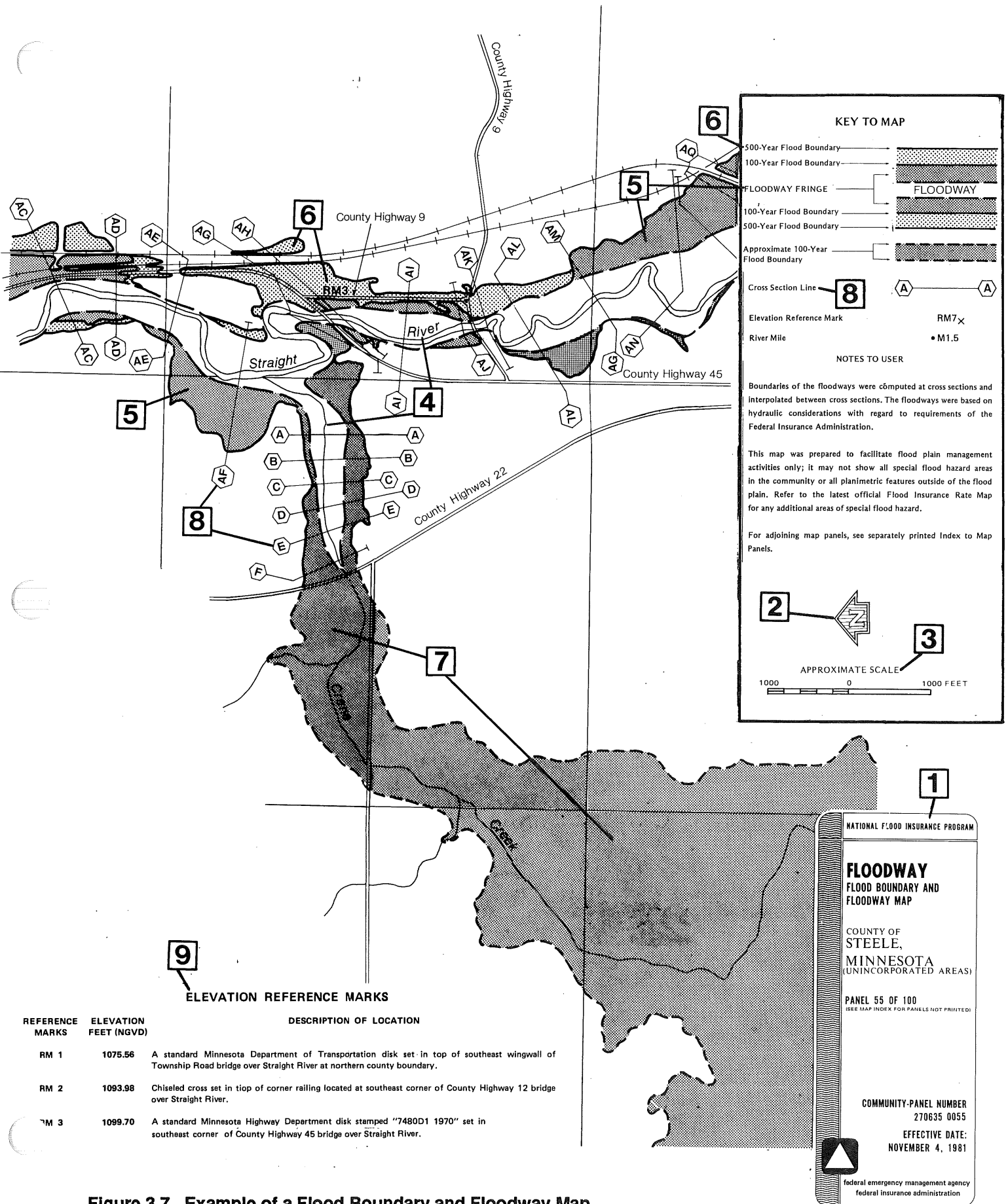
**How it is used.** The FBFM (Figure 3.7) is used by community officials for administration of floodplain zoning ordinances. The FBFM shows how the floodplain is divided into floodway and flood fringe where streams are studied in detail. They also show general floodplain areas where floodplains have been studied by approximate methods. Where a map panel does not include any detailed study areas only a FIRM panel will be printed. The FBFM shows the location of stream cross sections. Cross sections can be used in conjunction with the Floodway Data Table (Figure 3.9) to make a more exact determination of the Regulatory Flood Protection Elevation (RFPE) for a site.

- 1** **TITLE BLOCK:** Includes the community and county name, panel and community number and the map date.
- 2** **NORTH ARROW:** Maps may not be oriented with north toward the top of the page.
- 3** **MAP SCALE:** Caution, the FBFM often has a different scale than the FIRM for that particular community.

The 100-year floodplain (detailed study stream reaches) has been divided into two land use zoning districts - floodway and flood fringe.

- 4** **FLOODWAY:** The non-shaded areas adjacent to a stream or shoreline between the heavy dashed lines. The floodway must remain in open space uses to allow for the unobstructed passage of the 100-year flood waters.
- 5** **FLOOD FRINGE:** Shaded areas landward of the floodway but still within the 100-year floodplain. The flood fringe may be developed in the future provided all new structures are elevated or floodproofed to the RFPE. (The term floodway fringe is synonymous with the term flood fringe used throughout this handbook).

- 6** **500-YEAR FLOODPLAIN:** Lighter shaded areas adjacent to, but outside of the 100-year floodplain.
- 7** **APPROXIMATE FLOODPLAIN AREAS:** 100-year floodplain areas determined using approximate methodologies. The limits of the approximate floodplain on the FBFM are shown as small dashed lines.
- 8** **CROSS SECTION LINE:** These lines represent the surveyed cross sections used in the computer model of the stream for calculating 100-year flood elevations. These cross sections can be used to relate a specific point on the FBFM to the Flood Profile and Floodway Data Table (discussed later in this chapter).
- 9** **ELEVATION REFERENCE MARKS:** Similar to those shown on the FIRM.



**KEY TO MAP**

500-Year Flood Boundary ————

100-Year Flood Boundary ————

FLOODWAY FRINGE ————

100-Year Flood Boundary ————

500-Year Flood Boundary ————

Approximate 100-Year Flood Boundary ————

Cross Section Line **8** ———— A ———— A

Elevation Reference Mark ———— RM7x

River Mile ———— • M1.5

**NOTES TO USER**

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Insurance Administration.

This map was prepared to facilitate flood plain management activities only; it may not show all special flood hazard areas in the community or all planimetric features outside of the flood plain. Refer to the latest official Flood Insurance Rate Map for any additional areas of special flood hazard.

For adjoining map panels, see separately printed Index to Map Panels.

**2** **3**

APPROXIMATE SCALE

1000 0 1000 FEET

**9**

**ELEVATION REFERENCE MARKS**

REFERENCE MARKS	ELEVATION FEET (NGVD)	DESCRIPTION OF LOCATION
RM 1	1075.56	A standard Minnesota Department of Transportation disk set in top of southeast wingwall of Township Road bridge over Straight River at northern county boundary.
RM 2	1093.98	Chiseled cross set in top of corner railing located at southeast corner of County Highway 12 bridge over Straight River.
RM 3	1099.70	A standard Minnesota Highway Department disk stamped "7480D1 1970" set in southeast corner of County Highway 45 bridge over Straight River.

**1**

NATIONAL FLOOD INSURANCE PROGRAM

**FLOODWAY**  
FLOOD BOUNDARY AND  
FLOODWAY MAP

COUNTY OF  
STEELE,  
MINNESOTA  
(UNINCORPORATED AREAS)

PANEL 55 OF 100  
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER  
270635 0055

EFFECTIVE DATE:  
NOVEMBER 4, 1981

federal emergency management agency  
federal insurance administration

**Figure 3.7 Example of a Flood Boundary and Floodway Map**

### D. Flood Insurance Rate Map (FIRM) - New Format

**How it is used.** The new FIRM's (Figure 3.8) contain the data that has been combined from the old format FBFM's and FIRM's. Therefore, the new FIRM's are used by both community officials for floodplain zoning administration, and lenders and insurance agents to determine the need for flood insurance and to rate policy applications.

- 1** **TITLE BLOCK:** Includes the community and county name and community identification number and the panel number.
- 2** **MAP DATES:** Several dates may be listed, including:
  - Initial Identification - date of first Flood Hazard Boundary Map.
  - Flood Insurance Rate Map Effective - date the community was converted to the regular program of the NFIP which normally corresponds to the date of initial FIRM.
  - Flood Insurance Rate Map Revision - date of subsequent revisions to the FIRM. This date refers only to that panel.
- 3** **NORTH ARROW:** Directional point of reference. Caution, some maps are not oriented toward the top of the page.
- 4** **MAP SCALE:** Indicates the scale to which the map is drawn, in this case, 1 inch on the map represents 1000 feet.
- 5** **100-YEAR FLOODPLAIN:** Designated by the dark shaded areas (insurance zones A, AE, A99, A0, AH)
- 6** **FLOODWAY:** The cross-hatched areas adjacent to a stream or shoreline. The floodway must remain in open space uses to allow for the unobstructed passage of the 100-year flood waters.

- 7** **BASE FLOOD ELEVATION (BFE):** The water surface elevation of the base flood (100-year flood) at that point of the stream.
- 8** **FLOOD INSURANCE RATE ZONES:** Zone designations which reflect relative flood risks. The zone designation is required when writing a flood insurance policy and determining the policy premium.
- 9** **ZONE BREAK LINE:** These lines separate different flood insurance rate zones within the 100-year floodplain.
- 10** **APPROXIMATE FLOODPLAIN AREAS:** 100-year floodplain areas determined using approximate methodologies. No base flood elevations will be shown in approximate floodplain areas. These areas are classified as (unnumbered) Zone A.
- 11** **ELEVATION REFERENCE MARKS:** Using these elevation benchmarks, a survey can determine the exact elevation of a particular structure or property. The surveyed elevation, when compared to the actual BFE, will determine whether the property in question is within the 100-year floodplain.
- 12** **CROSS SECTION LINE:** These lines represent the surveyed cross sections used in the computer model of the stream in calculating 100-year flood elevations. These cross sections can be used to relate a specific point on the FIRM to the Flood Profile or Floodway Data Table.
- 13** **500-YEAR FLOODPLAIN:** Designated by light shaded area. In old format, the 500-year floodplain was designated as Zone B. It is now designated as Zone X.

NATIONAL FLOOD INSURANCE PROGRAM


**1**

**FIRM**  
FLOOD INSURANCE RATE MAP

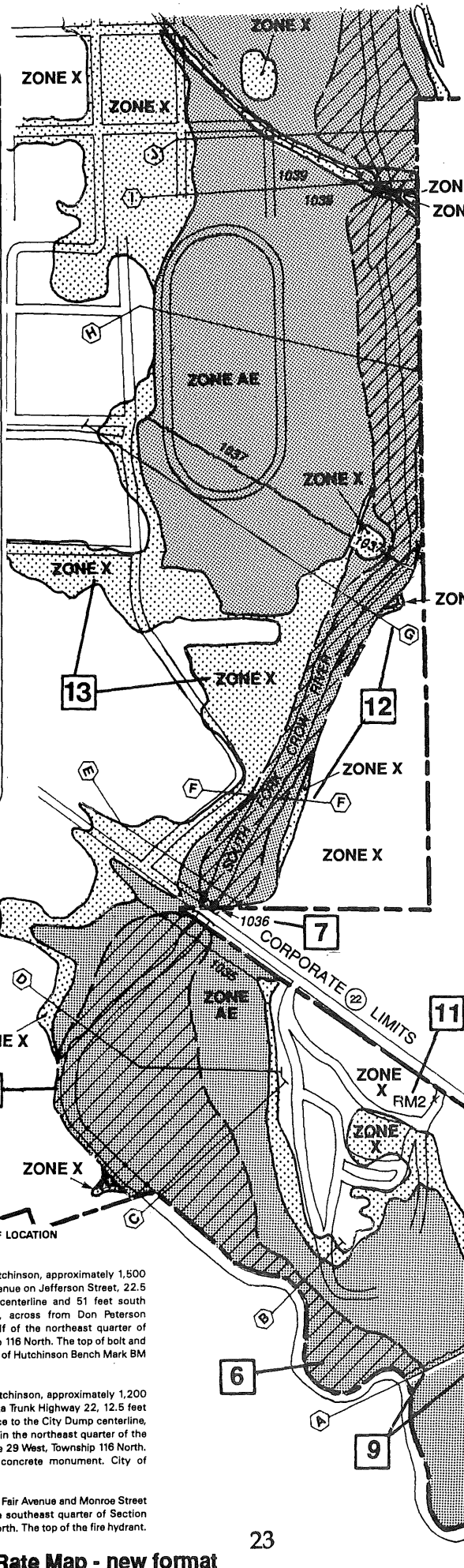
CITY OF HUTCHINSON,  
MINNESOTA  
MCLEOD COUNTY

PANEL 4 OF 4  
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY—PANEL NUMBER:  
270264 0004 D  
MAP REVISED:  
AUGUST 18, 1992



Federal Emergency Management Agency



**LEGEND**

**SPECIAL FLOOD HAZARD AREAS INUNDED BY 100-YEAR FLOOD**

**ZONE A** No base flood elevations determined.  
**ZONE AE** Base flood elevations determined.  
**ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.  
**ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.  
**ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.  
**ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.  
**ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

**FLOODWAY AREAS IN ZONE AE**

**OTHER FLOOD AREAS**

**ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

**OTHER AREAS**

**ZONE X** Areas determined to be outside 500-year flood plain.  
**ZONE D** Areas in which flood hazards are undetermined.

**UNDEVELOPED COASTAL BARRIERS**

Flood Boundary  
Floodway Boundary  
Zone D Boundary  
Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zone.  
567 Base Flood Elevation Line: Elevation in Feet  
A—A Cross Section Line  
(EL 19) Base Flood Elevation in Feet Where Uniform Within Zone\*  
RM5 Elevation Reference Mark  
M3.0 Mile Mark

\*Referenced to the National Geodetic Vertical Datum of 1929

MAP REPOSITORY  
City Engineer's Office, 37 Washington Avenue West, Hutchinson, Minnesota (Maps available for reference only, not for distribution.)

**2** INITIAL IDENTIFICATION:  
MARCH 29, 1974  
FLOOD HAZARD BOUNDARY MAP REVISION:  
JUNE 4, 1976  
MAY 20, 1977  
FLOOD INSURANCE RATE MAP EFFECTIVE:  
NOVEMBER 5, 1980  
FLOOD INSURANCE RATE MAP REVISIONS:  
Map revised August 18, 1992  
to change base flood elevations, special flood hazard areas, zone designations, floodway and corporate limits.  
To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

**3** APPROXIMATE SCALE IN FEET

**4** 400 0 400

**11**

**ELEVATION REFERENCE MARKS**

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
RM1	1069.39	In McLeod County, southeast of Hutchinson, approximately 1,500 feet south southeast of Century Avenue on Jefferson Street, 22.5 feet east of the Jefferson Street centerline and 51 feet south southwest of the telephone pole, across from Don Peterson Construction, and in the south half of the northeast quarter of Section 7, Range 29 West, Township 116 North. The top of bolt and disk set in concrete monument. City of Hutchinson Bench Mark BM 7E.
RM2	1044.09	In McLeod County, southeast of Hutchinson, approximately 1,200 feet south of bridge along Minnesota Trunk Highway 22, 12.5 feet northwest of the southwest entrance to the City Dump centerline, 5 feet northeast of fence post, and in the northeast quarter of the northeast quarter of Section 7, Range 29 West, Township 116 North. The top of bolt and disk set in concrete monument. City of Hutchinson Bench Mark BM 7 NE.
RM3	1045.27	At Hutchinson, at the intersection of Fair Avenue and Monroe Street and in the northwest quarter of the southeast quarter of Section 6, Range 29 North, Township 116 North. The top of the fire hydrant. City of Hutchinson Bench Mark.

**Figure 3.8 Flood Insurance Rate Map - new format**



## E. Floodway Data Table

**How it is used.** The Floodway Data Table (Figure 3.9) found in the FIS text is prepared for stream reaches with a designated floodway. This table includes the computed 100-year flood elevation at each cross section as well as the associated stage increase resulting from the designation of a floodway. Both of these pieces of data are needed to determine the proper building elevation within the 100-year floodplain. The Floodway Data Table also provides the width of the floodway which can be useful for determining floodway boundaries. In addition, it provides a mean velocity for flood flows which can be used for flood-proofing design.

- 1** **COMMUNITY AND STREAM IDENTIFIER:**
- 2** **FLOODING SOURCE:** Each line (row) represents data for a particular cross section. Each cross section in this table is also shown on the Flood Boundary and Floodway Map and the Flood Profile. **STREAM DISTANCE** corresponds to the horizontal scale shown on the Flood Profile.

**FLOODWAY:** These three columns provide specific data on the designated floodway.

- 3** **WIDTH:** Total width of the floodway, which can also be scaled from the FBFM or new format FIRM.
- 4** **AREA:** Cross-sectional area of the floodway.
- 5** **VELOCITY:** The average water velocity throughout the entire cross section which usually is lower than the flow velocity within the channel.

**BASE FLOOD WATER SURFACE ELEVATION:** Tabulation of the actual computed 100-year flood elevation at each cross section.

- 6** **REGULATORY:** Most Floodway Data Tables do not contain this column. If this column is present, it may indicate another waterbody

has the controlling influence on flood elevations for that particular reach. In our example, 100-year flood elevations for the downstream reach of Crane Creek are determined by the Straight River, not Crane Creek. Therefore, when present, the "regulatory" column should be used instead of the "without floodway" column.

- 7** **WITHOUT FLOODWAY:** These elevations correspond to the 100-year flood levels shown on the flood profiles and the FIRM.
- 8** **WITH FLOODWAY:** These elevations represent the 100-year flood elevations assuming the entire flood fringe is filled (i.e., developed) to the 100-year flood level.
- 9** **INCREASE:** This last column represents the rise in the 100-year flood elevation or stage increase resulting from the floodway designation. This value is needed to determine the proper building elevation within the 100-year floodplain at this cross section.

Figure 3.9 Example of a Floodway Data Table

2 FLOODING SOURCE		3 FLOODWAY			6 BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
<b>STRAIGHT RIVER</b>								
AA	21,681	370	2913	5.1	1087.6	1087.6	1088.0	0.4
AB	22,631	541	3855	3.9	1088.5	1088.5	1088.9	0.4
AC	23,581	426	3374	4.4	1089.0	1089.0	1089.3	0.3
AD	24,341	407	2965	5.1	1089.4	1089.4	1089.7	0.3
AE	25,101	387	3277	4.6	1090.1	1090.1	1090.4	0.3
AF	26,431	563	3318	4.5	1091.0	1091.0	1091.3	0.3
AG	28,860	370	2739	4.4	1092.8	1092.8	1092.9	0.1
AH	29,492	425	2843	4.2	1094.4	1094.4	1094.4	0.0
AI	30,301	435	3666	3.3	1095.0	1095.0	1095.1	0.1
AJ	31,053	164	2074	5.8	1095.2	1095.2	1095.2	0.0
AK	31,329	165	2162	5.6	1095.5	1095.5	1095.6	0.1
AL	32,231	650	4585	2.6	1096.5	1096.5	1096.5	0.0
AM	33,331	650	4365	2.7	1096.7	1096.7	1096.9	0.2
AN	34,751	989	6750	1.8	1097.1	1097.1	1097.3	0.2
<b>CRANE CREEK</b>								
A	1180	491	4357	0.6	1091.4	1088.4	1088.7	0.3
B	1480	417	3528	0.5	1091.4	1088.5	1088.8	0.3
C	1780	366	2955	0.4	1091.4	1088.6	1088.9	0.3
D	2080	322	2491	0.4	1091.4	1088.7	1089.0	0.3
E	2380	279	2064	0.3	1091.4	1089.0	1089.3	0.3
F	2750	96	1097	0.2	1091.4	1089.0	1089.3	0.3

<sup>1</sup> FEET ABOVE COUNTY BOUNDARY

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY  
Federal Insurance Administration  
**COUNTY OF STEELE, MN**  
(UNINCORPORATED AREAS)

1

FLOODWAY DATA

STRAIGHT RIVER & CRANE CREEK

## **F. Flood Profile**

**How it is used.** The Flood Profile (Figure 3.10), found at the back of the flood insurance study text for all detailed study stream reaches, is a graphical representation of flood depths along the stream reach. This profile can be thought of as a horizontal view of a section of the stream taken along the middle of the channel. The flood profile can be used to determine the Base Flood Elevation of a site. This is particularly useful for determining BFE's between cross sections.

- 1** COMMUNITY IDENTIFICATION BLOCK:
- 2** STREAM IDENTIFIER:
- 3** LEGEND:
- 4** VERTICAL SCALE: Elevation in feet above mean sea level (MSL).
- 5** HORIZONTAL SCALE: Stream distance in feet or miles, measured along the center of the channel from a known reference point.
- 6** STREAM BED: The lowest surveyed point in the stream channel.
- 7** CROSS SECTION: Location of surveyed cross sections used in the hydraulic analysis. The actual 100-year flood elevation at each cross section is also shown in the Floodway Data Table. Each cross section on the profile is also shown on the FBFM.
- 8** FLOOD PROFILE: Each line represents the flood elevation for a specific flood frequency (i.e., 10-year, 50-year, 100-year and 500-year) at that particular point along the stream.
- 9** IDENTIFIABLE LANDMARKS:
- 10** FLOOD INSURANCE ZONES: These zones correspond to those shown on the applicable Flood Insurance Rate Map (FIRM).

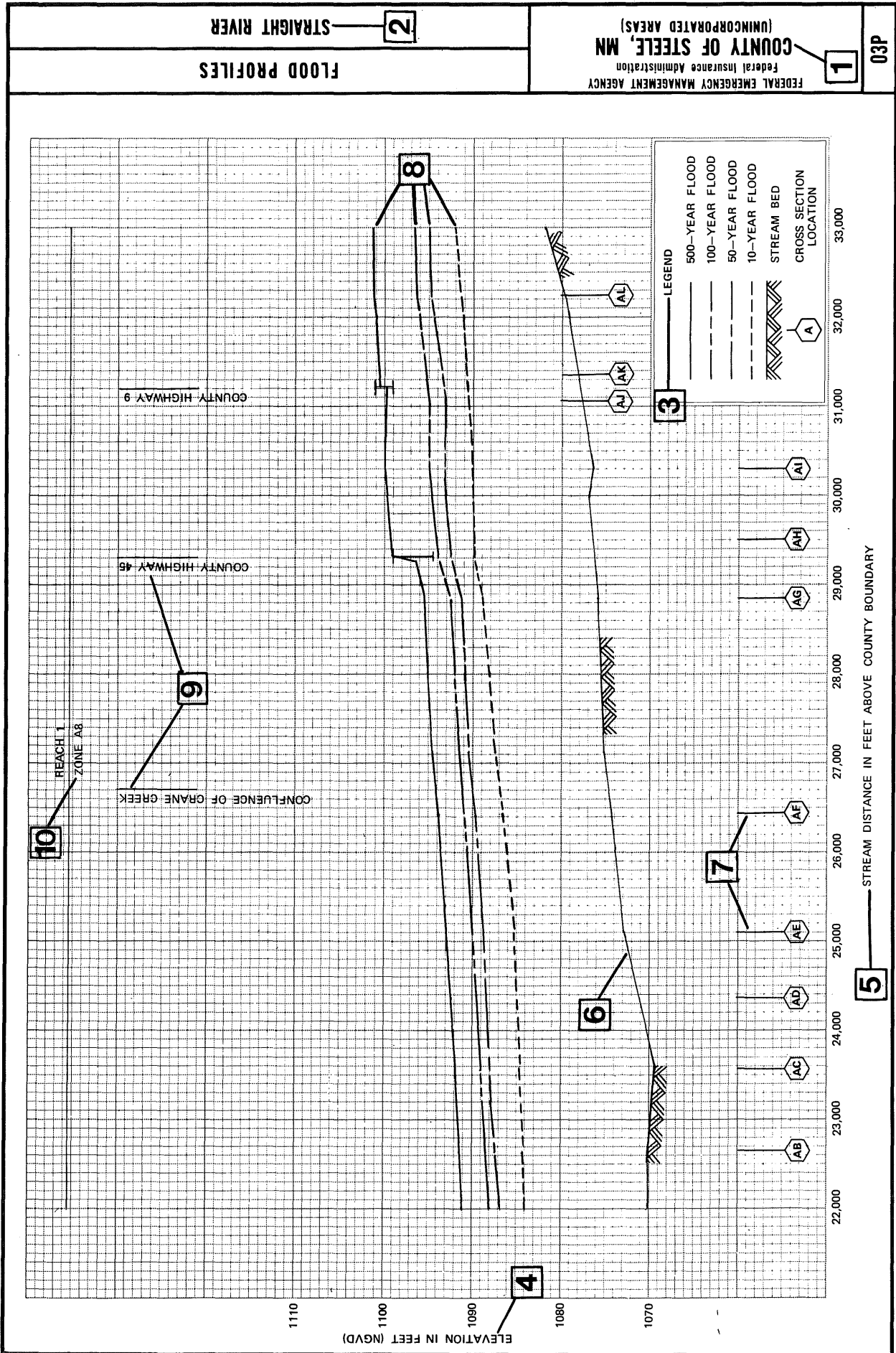


Figure 3.10 Example of a Flood Profile

## 6. Special Considerations

### A. Lakes

Data for lakes studied by detailed methods are displayed differently on the flood maps and in the FIS text than are stream data. First, on the Flood Insurance Rate Map, the 100-year flood elevation for lakes is shown directly below the flood insurance zone designation, rounded to the nearest whole foot. On the Flood Boundary and Floodway Map, the floodplain for a detailed study lake is usually not divided into a floodway/

flood fringe districts. The exception may occur if the lake is actually a wide point in a river; in this situation, the lake may have a designated floodway.

There will not be a flood profile or floodway data table entry for lake data. Instead, a Table of Lake Elevations will be included in the Flood Insurance Study text. This table will contain flood elevation data for various frequency floods for all lakes studied by detailed methods for that community.

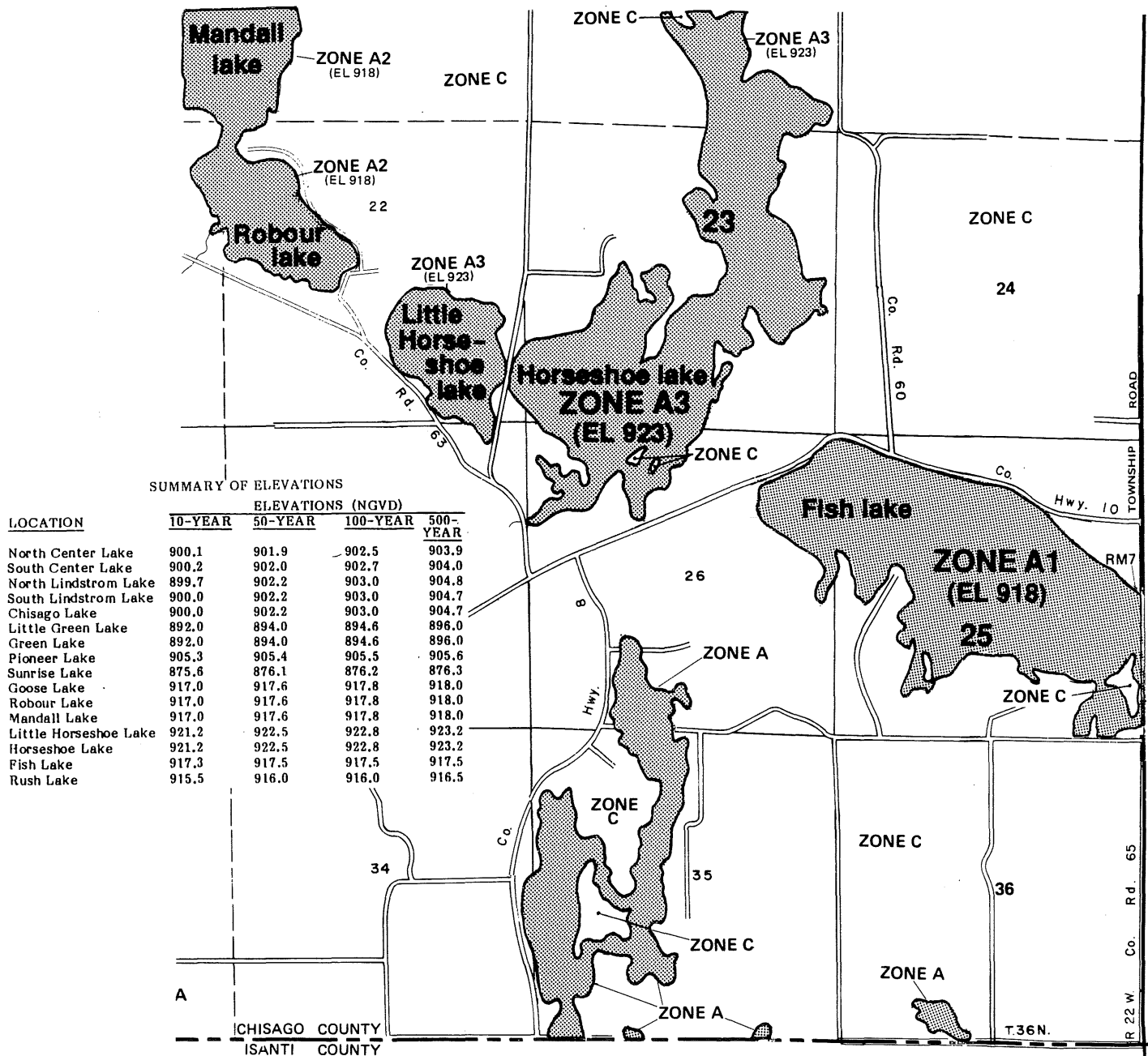


Figure 3.11 Example of detailed lake data in a FIS

### B. Approximate Study Areas

Approximate floodplain areas are those areas not studied by the detailed hydrologic/hydraulic methods during the FIS. These areas are shown as “unnumbered A Zones” on the FIRM and “approximate 100-year flood zones” on the FBFM. The FIS will not contain specific 100-year flood elevations for approximate study areas nor will there be a floodway/flood fringe designation on the FBFM.

The lack of specific flood data in certain areas may cause additional burdens to those wishing to develop approximate floodplain areas. Communities can allow development within an approximate study area through the conditional use permit process. These flood zones are commonly referred to as a “General Floodplain District” in a floodplain ordinance.

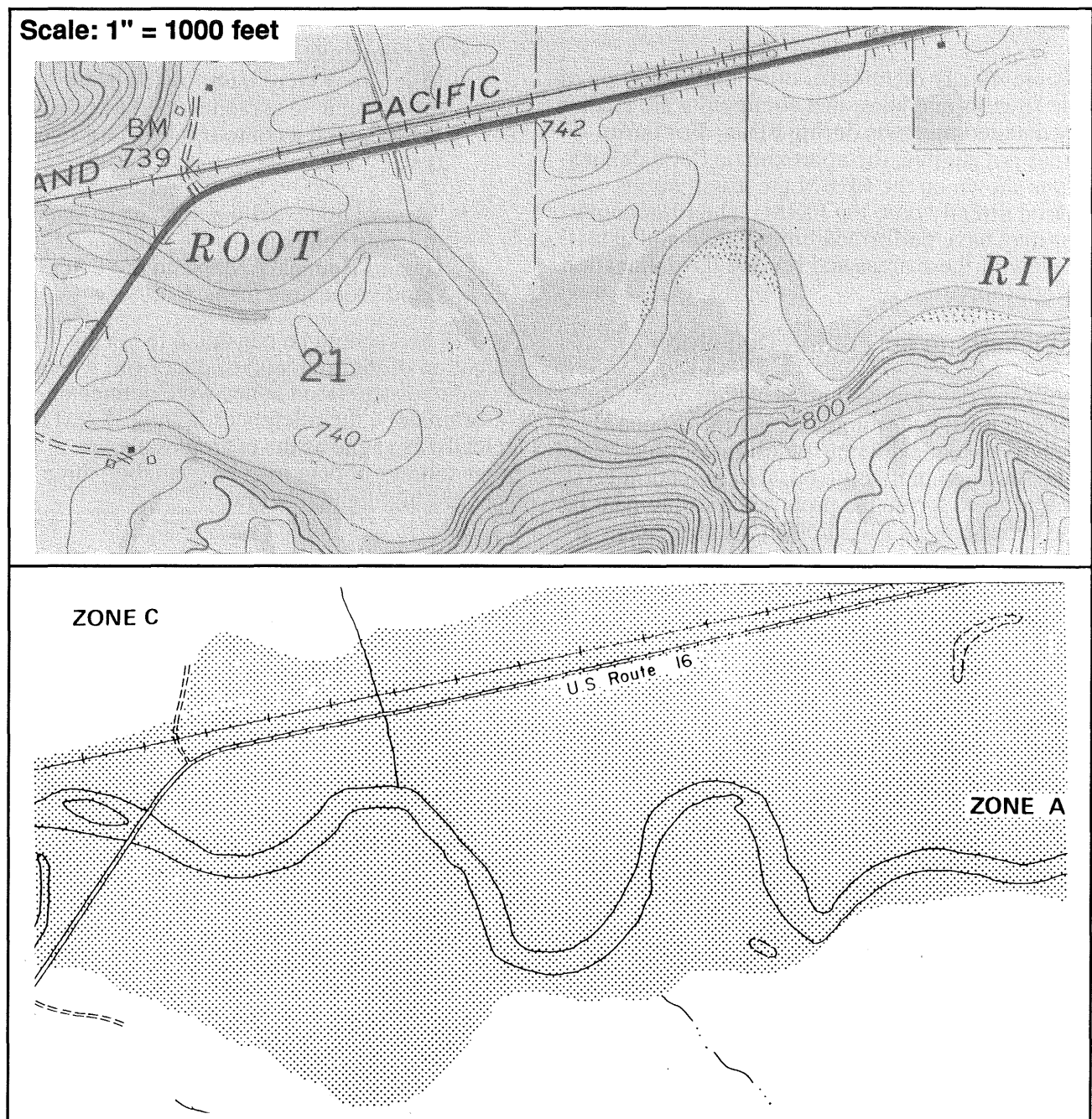


Figure 3.12 Example of an approximate study

## Original Determination

In nearly all situations, the approximate floodplain boundaries shown on the FIRM were originally developed for the Flood Hazard Boundary Map (FHBM). A handful of consulting engineering companies (none from Minnesota) were under contract with FEMA to develop and publish FHBM's nationwide. During the 1970's and early 1980's roughly 20,000 FHBM's have been published. Limited data, often nothing more than USGS quadrangle maps, were used in the preparation of the original FHBM's.

As previously mentioned, often only a portion of the streams and lakes in a community are studied by detailed methods during FIS's. For those areas not studied, the approximate flood delineations shown on the FHBM are usually transferred directly onto the FIRM. The FIS contractor may have performed limited field and data review of these areas and revised the delineation as appropriate.

## Implications for Zoning Decisions

With any development proposal, the local zoning official must determine whether the proposed activity is located within a designated floodplain. The first step in making this determination would be to locate the proposed development on the community's FIRM/official zoning map. If the structure is clearly within an approximate 100-year floodplain, the developer should be instructed to secure a conditional use permit. A community's conditional use permit process is worded such that procedures are spelled out for determining the 100-year flood elevation, the floodway/flood fringe boundary and the regulatory flood protection elevation for the site.

There will no doubt be borderline situations where the development is not clearly in, or out, of the approximate floodplain. There may also be situations where the approximate floodplain boundary does not appear reasonable.

In these situations, the zoning administrator should make a good faith effort in reviewing all available data prior to reaching a decision. Neither the DNR nor FEMA will second guess the local zoning administrator who makes a reasonable approximate floodplain boundary determination based on historic flood data, site inspection, soils mapping or other appropriate data.

## Additional Data Sources

The FIS text will sometimes identify the methodology used for delineating approximate floodplain boundaries. This reference is usually found in Section 4.1 of the FIS text, "Flood Boundaries." Typical examples are:

- "For areas studied by approximate methods, the boundary for the 100-year flood was taken directly from the Flood Hazard Boundary Map for Steele County."
- "Approximate flood boundaries for Nine Mile Creek were interpolated using topographic maps reduced to a scale of 1:4800, with a contour interval of two feet."
- "Approximate delineations were made utilizing soil maps ... the published Flood Hazard Boundary Map and the USGS flood prone area maps."

The FIS text should be consulted to get an indication of the source(s) of data from which the approximate flood zones were delineated. Unfortunately, the references in the FIS text are typically as vague as the examples above. Other sources of data may be available, three types are highlighted below.

### Soils Mapping

In many areas of Minnesota, lands subject to periodic flooding and certain soil type exhibit a close correlation. The Soil Conservation Service has published "Soil Surveys" for approximately half of all Minnesota counties (see Figure 3.13). Several Minnesota counties use soil data for many zoning and building activity related decisions. For example, Anoka County has adopted, as part of their zoning ordinance, specific soil classifications to designate floodplain areas as stated below:

"The areas delineated in the maps specified in Section 3.02 A as an unnumbered A Zone shall be considered a general delineation of the area subject to the "Regional Flood" or "Base Flood" and shall be subject to field evaluation based on the specific soil conditions present. The general floodplain boundary may be expanded or reduced as may be justified by the presence or absence of soils, in or



### Examples of Flood Prone Soils Goodhue County

- Af: Alluvial land; frequently flooded
- AxA: Ankeny sandy loam, 0-3% slopes; subject to flooding
- Bc: Biscay loam; seasonally high water table
- Bm: Bremer silty clay loam, wet; subject to flooding
- Co: Colo silty clay loam; seasonally high water table, subject to flooding
- TeB: Terril sandy loam, 2-6% slopes; subject to slight flooding
- TeD: Terril sandy loam, 12-25% slopes; subject to slight flooding
- Zu: Zumbro loamy sand; subject to slight flooding

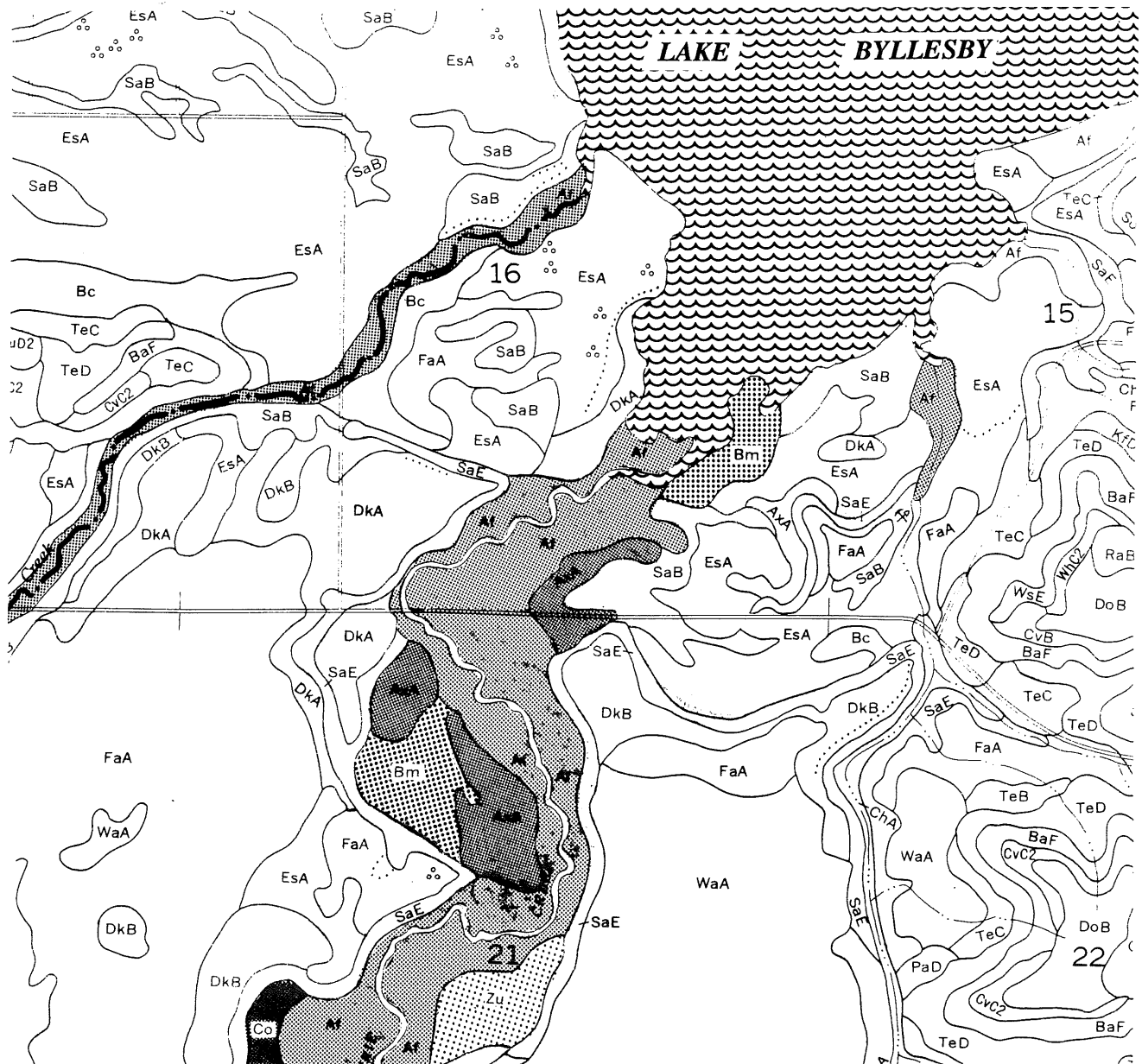


Figure 3.13 Example of a Soils Map



adjacent to the mapped area, that may be subject to flooding. For purposes of this evaluation, those soils delineated by the Soil Conservation Service (USDA), in their report "Soil Survey of Anoka County, Minnesota" (September, 1977) and identified by the following soil mapping unit name and mapping symbol shall be considered as being the lateral extent of the General Floodplain District:

<u>MAPPING UNIT NAME</u>	<u>MAP SYMBOL</u>
Alluvial	Af
Becker	Ba
Cathro	Cb
Duelm	Dp
Glencoe	Gc
(etc.)	

### Historic Highwater Levels

One of the better sources of additional data are historic flood records. Newspaper reports, county engineer's records and "old-timers" recollections, such as the depth of flooding over a particular roadway, can often be used to accurately determine areas inundated by previous floods.

Another good source of historic flood data for larger streams and rivers are the U.S. Army Corps of Engineer's Water Surface Profiles. These profiles graphically show flood elevations for selected river reaches for one or more flood events.

Historic flood data should be used with caution; few flood events equal or exceed a 100-year flood. Just because an area of land has not previously flooded does not necessarily indicate it will not flood in the future.

### Stormwater Management Plans/ Watershed District Studies

Another good source of data is available from hydrologic investigations not related to the NFIP. These reports include stormwater management plans, watershed management plans and flood control reports prepared by private consultants and other regional and federal governmental agencies. In many cases, these reports contain the available flood data for selected streams and rivers and can be used for regulatory purposes.

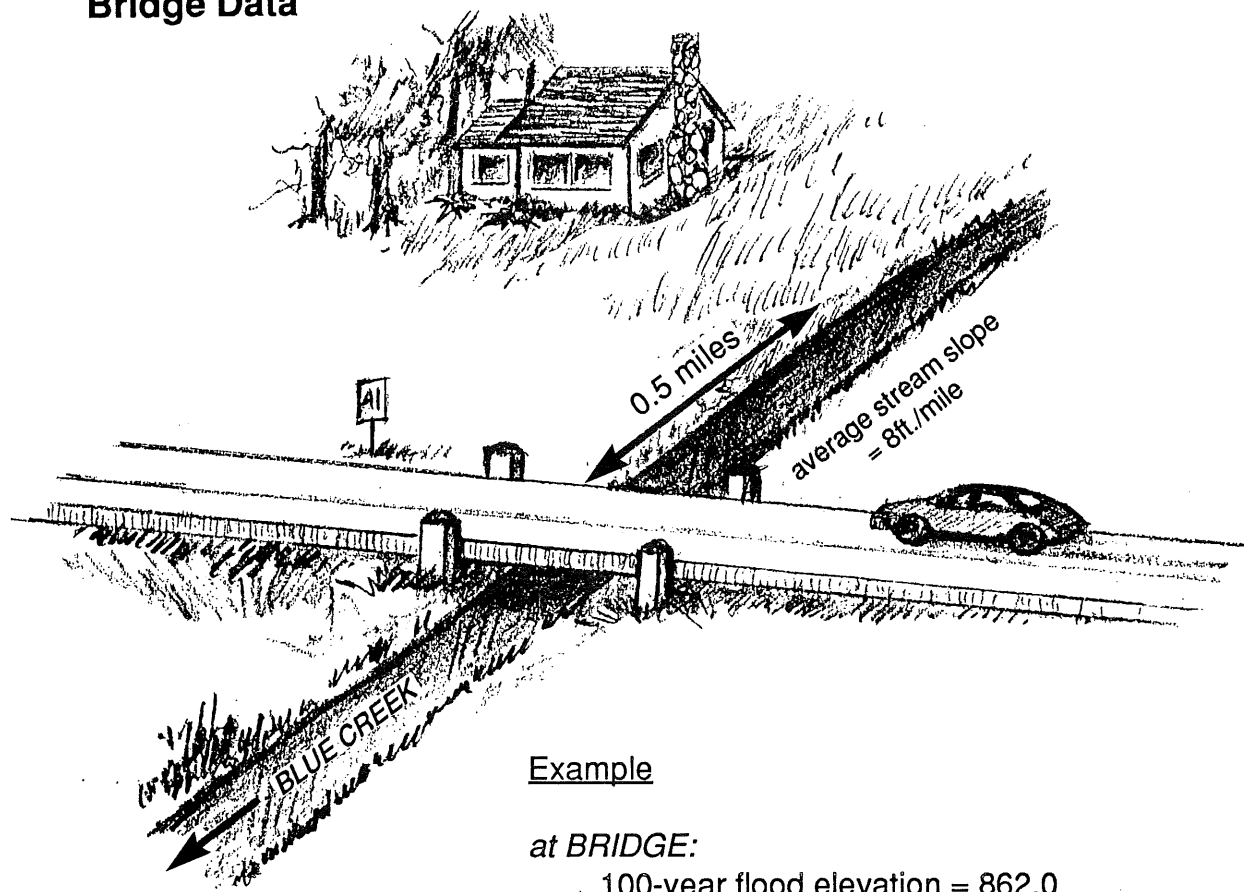
Where a complete flood profile containing 100-year flood elevations is available for approximate floodplain areas, these data could be adopted into the community's floodplain ordinance. Please consult your DNR area hydrologist for more information.

### Bridge Data

A hydrologic/hydraulic investigation is usually performed for new or replacement bridges and culverts. The bridge plans will often include 50- and 100-year flood discharge and elevation data for the area immediately adjacent to the bridge. The DNR and Minnesota Department of Transportation inventory these data for bridges throughout the state.

Bridge hydraulic data can be very useful in rural areas where no other data are available. Flood elevations can, in most instances, be extrapolated a short distance up or downstream using a constant river slope. If a particular development proposal is located in/near an approximate floodplain area in the vicinity of a bridge crossing, these data may be available; please consult the DNR or Department of Transportation.

## Bridge Data



### Example

at BRIDGE:

100-year flood elevation = 862.0

at HOUSE:

Approximate 100-year flood elevation  
 =  $862.0 + 8\text{ft./mi.} \times 0.5\text{ mi.}$   
 = 866.0 ft.

Not to Scale

Figure 3.14 An example of using bridge hydraulic data to determine an approximate 100-year flood elevation











## CHAPTER 4

### ORDINANCE ADOPTION AND AMENDMENT

Topics to be covered:

1. Introduction
2. DNR Adoption Procedure
3. County Adoption Procedure
4. Municipal Adoption Procedure
5. Town Adoption Procedure
6. Town Relations With County
7. DNR Policy Requirements

#### 1. Introduction

Adoption of a floodplain management ordinance by the local unit of government is considered to be the primary method for flood damage reduction in the state. A community that has been formally identified as containing a Special Flood Hazard Area (SFHA) by the Administrator of the National Flood Insurance Program (NFIP) must adopt a floodplain management ordinance approved by both the Department of Natural Resources (DNR) and the Federal Emergency Management Agency (FEMA). Adoption of the ordinance is necessary for the purchase of flood insurance. The purchase of flood insurance within a flood-prone community is necessary as a condition of receiving any form of federal or federally-related loans and assistance for the acquisition or construction of insurable buildings or mobile homes within a SFHA (Flood Disaster Protection Act of 1973). Federal and state disaster assistance in the event of a severe flood event is dependent upon adoption of minimum standards for the management of flood-prone areas (44 Code of Federal Regulations Ch. 1, Sections 59.2 and 60.3, and Minnesota Statutes, Chapter 103F).

The Department of Natural Resources and Federal Emergency Management Agency have developed several versions of a model ordinance which can be adopted by communities in order to meet the requirements for floodplain management. Each version represents a different set of conditions for management of land use in floodplains depending on the type of flood hazard, the detail of mapping available and the degree of restriction of land use that is appropriate for a particular community that has been identified as containing a Special Flood Hazard Area by the Administrator of the National Flood Insurance Program. An annotated version of the most

comprehensive model ordinance is included as Appendix 4A for your information.

#### 2. DNR Adoption Procedure (M.S. § 103F.121, Subd. 2)

- a) Upon determination that sufficient technical information is available for the delineation of floodplains and/or floodways, the Commissioner of Natural Resources shall notify affected local governments that technical information is available. Within six months after receiving this notice, **the local governmental units shall prepare or amend their floodplain management ordinances in conformance with the provisions of Sections 103F.101 to 103F.155 and shall submit the ordinance to the Commissioner for review and approval before adoption.**
- b) The Commissioner shall approve or disapprove the proposed ordinance within 120 days after receiving it.
- c) If the proposed ordinance is disapproved, the Commissioner shall return it to the local governmental unit with a written statement of reasons for disapproval. **Within 90 days after disapproval, the local governmental unit shall resubmit an amended proposed ordinance for further review and approval before adoption. The local governmental unit shall adopt a floodplain management ordinance within 90 days after approval by the Commissioner.**
- d) **A floodplain management ordinance adopted by a local governmental unit is invalid unless it is approved by the Commissioner.**
- e) A local governmental unit may adopt a floodplain management ordinance in the absence of notification by the Commissioner that the required technical data is available, provided that any such ordinance is submitted to the Commissioner prior to its adoption for approval.



- f) A local governmental unit may adopt a floodplain management ordinance that is **more restrictive than required under Sections 103F.101 to 103F.155.**
- g) Floodplain management ordinances may be amended by a local governmental unit upon approval of the Commissioner.

### **3. County Adoption Procedure (M.S. § 375.51, M.S. Chapter 394)**

- a) **A public hearing shall be held before the enactment of any ordinance adopting or amending a comprehensive plan or official control.**
- b) **No county ordinance shall be enacted unless a notice of the intention to enact it has been published in the official newspaper of the county not less than ten days before the meeting or public hearing.** The notice shall state the subject matter and the general purpose of the proposed ordinance. Proof of the publication of the notice shall be attached to and filed with the ordinance, if enacted, in the office of the county auditor.
- c) Every ordinance enacted by a county board shall be published at least once in the official newspaper as part of the proceedings of the meeting at which the ordinance was enacted. A lengthy ordinance or an ordinance which includes charts or maps need not be published in its entirety if the title and a summary of the ordinance conforming to M.S. § 331A.01, Subdivision 10, are included in the publication of the proceedings of the meeting at which it is enacted, with notice that a printed copy of the ordinance is available for inspection by any person during regular office hours at the office of the county auditor.
- d) Prior to adoption at least one copy of the statute, rule, ordinance or code shall be marked as official copies and filed for use and examination by the public in the office of the county auditor.

- e) In addition to the requirements of M.S. § 375.51, subdivision 2, written notice of public hearings on all official controls and amendments shall be sent to the governing bodies of all towns and all municipalities located within the county. Written notice of public hearings regarding the application of official controls to specific properties shall be sent to all property owners of record within 500 feet of the affected property in incorporated areas. In unincorporated areas, the written notice shall be sent to owners of record within one-half mile of the affected property.

Written notice shall also be given to the affected board of town supervisors, and the municipal council of any municipality within two miles of the affected property.

- f) Every county ordinance shall be enacted by a majority vote of all the members of the county board unless a larger number is required by law. It shall be signed by the chair of the board and attested by the clerk of the board. Proof of publication shall be attached to and filed with the ordinance in the office of the county auditor. Every ordinance shall be recorded in an ordinance book in the office of the county auditor within 20 days after its publication. All ordinances shall be suitably entitled and shall be substantially in the style: "The county board of ... County ordains:".
- g) Upon the adoption of any ordinance or other official control included on maps or charts supplemented to or as part thereof, the county auditor shall file a certified copy with the county recorder for record.

#### 4. **Municipal Adoption Procedure** (M.S. § 462.357)

- a) Any time after the adoption of a land use plan for the municipality, the planning agency, for the purpose of carrying out the policies and goals of the land use plan, may prepare a proposed zoning ordinance and submit it to the governing body with its recommendations for adoption. If the comprehensive municipal plan is in conflict with the zoning ordinance, the zoning ordinance supersedes the plan.
- b) **No zoning ordinance or amendment shall be adopted until a public hearing has been held by the planning agency or by the governing body.** A notice of the time, place and purpose of the hearing shall be published in the official newspaper of the municipality at least ten days prior to the hearing.
- c) Statutory cities should also follow provisions of Minn. Stat., Section 412.191, Subd. 4. Cities of the first class should also follow provisions of Minn. Stat., Section 462.357, Subd. 5.
- d) **A certified copy of every ordinance, resolution, map, regulation adopted, or variance granted under the provisions of Sections 462.358 and 462.3595 shall be filed with the county recorder of the county or counties in which the municipality adopting it is located.**
- e) An amendment to a zoning ordinance may be initiated by the governing body, the planning agency, or by petition of affected property owners as defined in the zoning ordinance. An amendment not initiated by the planning agency shall be referred to the planning agency, if there is one, for study and report and may not be acted upon by the governing body until it has received the recommendation of the planning agency on the proposed amendment or until 60 days have elapsed from the date of reference of the amendment without a report by the planning agency.

#### 5. **Town Adoption Procedure** (M.S. § 366.10, M.S. § 368.01)

- a) The board of supervisors of any town may submit to the legal voters of the town at any annual or special town meeting, the question as to whether or not such board shall adopt building and zoning regulations and restrictions in the town. If a majority of the voters voting on such question vote "yes", the town board shall be authorized and empowered to adopt building and zoning regulations and establish zoning districts. All such regulations shall be uniform for each class and kind of buildings and for the use of land throughout each district, but the regulations in one district may differ from those in other districts. (Certain towns have municipal powers and thereby follow M.S. § 462.357).
- b) Before adopting building and zoning regulations or zoning districts, the board shall hold a public hearing on the matter, after giving at least ten days notice of the time and place of the hearing, by at least one publication in a newspaper of general circulation in the county where the town is located.
- c) Every ordinance shall be enacted by a majority vote of all members of the town board unless a larger number is required by law. It shall be signed by the chair of the town board, attested by the clerk and published once in a qualified newspaper having general circulation within the town. The town board may direct that only the title of the ordinance and a summary be published with notice that a printed copy of the ordinance is available for inspection by any person during regular office hours of the town clerk and any other location which the town board designates. A copy of the entire text of the ordinance shall be posted in the community library, if there is one, or if not, in any other public location which the town board designates. Before the publication of the title and summary the town board shall approve the text of the summary and determine that it clearly informs the public of the intent and effect of the ordinance. The publishing of the

title and summary shall be deemed to fulfill all legal publication requirements as completely as if the entire ordinance had been published. Proof of the publication shall be attached to and filed with the ordinance. Every ordinance shall be recorded in the ordinance book within 20 days after publication of the ordinance or its title and summary. All ordinances shall be suitably entitled and shall be substantially in the style: "The Town Board of Supervisors ... ordains."

- d) The board of supervisors of any such town may amend the number, shape, boundary, or area of any district or zone, or any regulation of area within such zone, or any provision of the zoning ordinance. Before finally adopting any such amendment the board of supervisors shall hold a public hearing on it, after giving at least ten days notice of the time and place of the hearing, by at least one publication in a newspaper of general circulation in the county where the town is located. No change may be made in the boundary line of zones or districts unless at least 50 percent of the owners of the lands proposed to be changed file a petition for the change.

## 6. Town Relations With County (M.S. § 394.33)

- a) The governing body of any town including a town with the powers of a statutory city pursuant to law may continue to exercise the authority to plan and zone as provided by law, but after the adoption of official controls for a county or portion thereof by the board of county commissioners **no town shall enact or enforce official controls inconsistent with or less restrictive than the standards prescribed in the official controls adopted by the county board.** Nothing in this section shall limit any town's power to adopt official controls, including shoreland regulations which are more restrictive than provided in the controls adopted by the county.
- b) Upon the adoption or amendment of any official controls the governing body of

the town shall file a certified copy with the county recorder or registrar of titles for record. A certified copy of any official controls of any town which are in effect on August 1, 1974 shall also be filed by the governing body of the town with the county recorder or registrar of titles for record within one year from August 1, 1974.

- c) The board of supervisors of any town which has adopted or desires to adopt building and zoning regulations and restrictions pursuant to law **shall have the authority granted the governing body of any municipality as provided in Section 394.32.**

## 7. DNR Policy Requirements

It is the DNR's policy that townships adopt and enforce **all** of its land use programs (floodplain, shoreland and wild and scenic rivers program if applicable) before it will approve of any one of these programs individually.

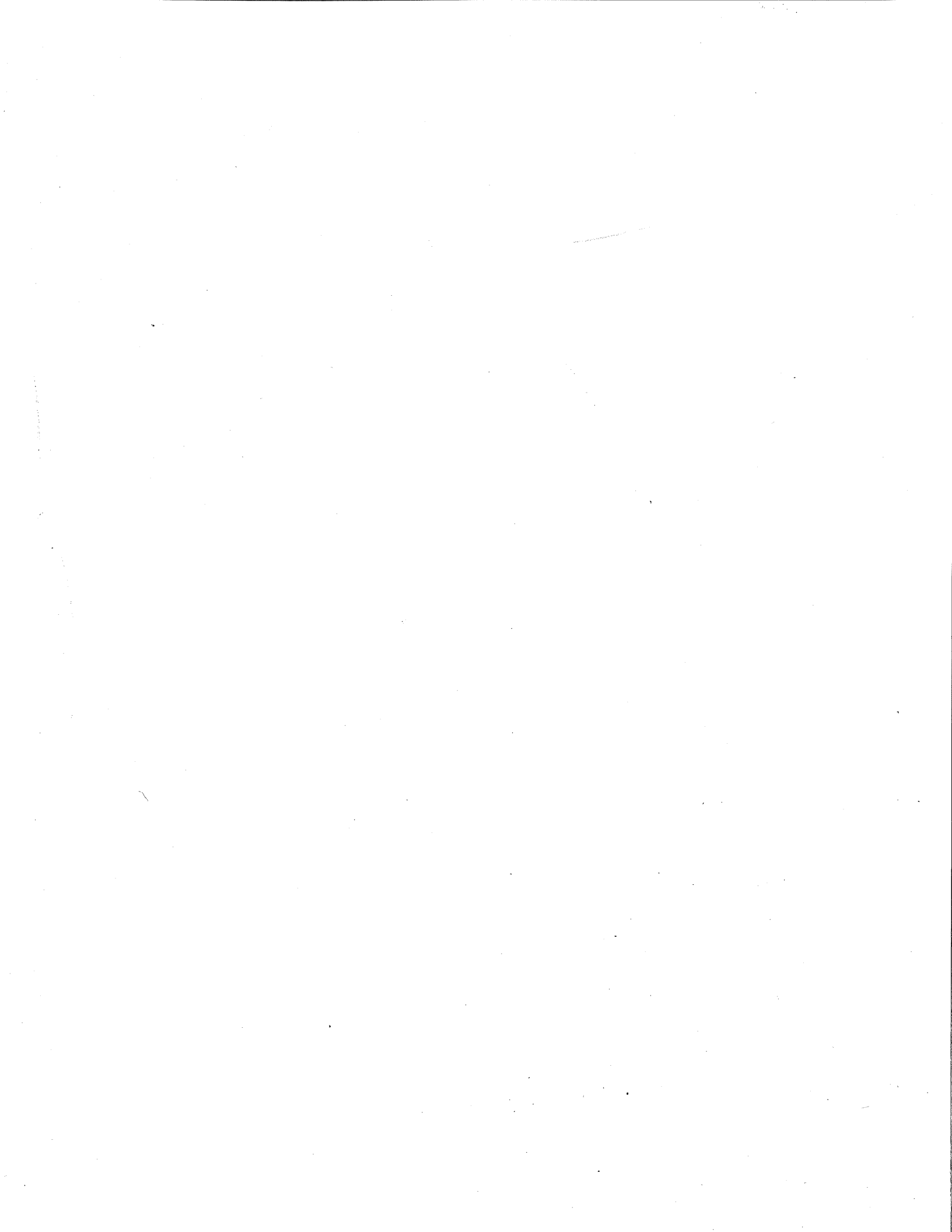
Points to consider before a township elects to administer its **own zoning**, in lieu of the respective county's program, as related to DNR Floodplain, Shoreland and Wild and Scenic Rivers Management Programs:

- a) The township must demonstrate to the county board that their proposed ordinance and administration cover the same full range of land use management controls as the county's controls and are at least as restrictive as the county's prior to final adoption. Townships must provide for administration and enforcement of controls at least as effective as county implementation. The township must have the staff (or contract arrangement with a qualified consultant) necessary to administer the ordinance, have sufficient permit application and certification forms and procedures, and have an enforcement mechanism to monitor and enforce violations. The rule is not intended to limit township zoning, but to ensure a uniform and effective approach to administration of the state's lake and river resources.

- b) The county board should pass a resolution or present other information affirming that the above criteria have been met. Following any corrections proposed by the county board and final adoption by the township, the Department of Natural Resources will take steps to review the township's ordinance for approval and certification.
- c) After DNR certification, the township must make applications to the Federal Emergency Management Agency (FEMA) for admission into the National Flood Insurance Program and FEMA must approve the township's floodplain ordinance. An application package will be sent to the township with the DNR certification letter.
- d) **Until the township ordinance is approved by the DNR and FEMA, the county continues to be responsible for administration and enforcement for shoreland, floodplain and wild and scenic river zoning activities in its unincorporated areas.** The DNR will notify the county when the township receives approval for DNR land use management zoning. Once the township's ordinance is certified, property owners need only obtain necessary permits and approvals through the township ordinance. Thereafter, the township, not the county, has full responsibility for the quality of its ordinance administration.
- e) Whenever the county ordinance is amended in a way that makes it more restrictive, the township must amend its ordinance as applicable to remain as restrictive as the county ordinance.







## APPENDIX 4A

### Sample Three District Floodplain Management Ordinance Two-Map Format

October 17, 1990

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SAMPLE THREE DISTRICT FLOOD PLAIN MANAGEMENT ORDINANCE

TWO-MAP FORMAT\*

SECTION 1.0 STATUTORY AUTHORIZATION, FINDINGS OF FACT AND PURPOSE

1.1 Statutory Authorization: The legislature of the State of Minnesota has, in Minnesota Statutes Chapter 103F and

(Zoning Enabling Statute) delegated the responsibility to local government units to adopt regulations designed to minimize flood losses.

Therefore, the \_\_\_\_\_ of \_\_\_\_\_ (governing body), Minnesota does ordain as follows:  
(local unit)

1.2 Findings of Fact:

103F.105

1.21 The flood hazard areas of \_\_\_\_\_ (local unit) Minnesota, are subject to periodic inundation which results in potential loss of life, loss of property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures or flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.

103F.121  
6120.5600  
44CFR Chap. 1-60.3

1.22 Methods Used to Analyze Flood Hazards. This Ordinance is based upon a reasonable method of analyzing flood hazards which is consistent with the standards established by the Minnesota Department of Natural Resources.

103F.105  
104.01 Subd. 2

1.3 Statement of Purpose: It is the purpose of this Ordinance to promote the public health, safety, and general welfare and to minimize those losses described in Section 1.21 by provisions contained herein.

SECTION 2.0 GENERAL PROVISIONS

44 CFR Chap. 1-60.3  
64.3  
103F.141  
6120.5700 Subp. 2

2.1 Lands to Which Ordinance Applies: This ordinance shall apply to all lands within the jurisdiction of \_\_\_\_\_ shown on the Official Zoning (local unit)

\*A Flood Boundary and Floodway Map and a Flood Insurance Rate Map have been published for the community.

Map and/or the attachments thereto as being located within the boundaries of the Floodway, Flood Fringe, or General Flood Plain Districts.

394.25 Subd.3  
462.353 Subd. 2

2.2 Establishment of Official Zoning Map: The Official Zoning Map together with all materials attached thereto is hereby adopted by reference and declared to be a part of this ordinance. The attached material shall include the Flood Insurance Study for the \_\_\_\_\_ prepared by the \_\_\_\_\_ (local unit) Federal Insurance Administration dated \_\_\_\_\_, and the Flood Boundary and Floodway Map and Flood Insurance Rate Map dated \_\_\_\_\_ therein. The Official Zoning Map shall be on file in the Office of the \_\_\_\_\_ and the \_\_\_\_\_ (City Clerk/County Auditor) \_\_\_\_\_ (Zoning Administrator)

44 CFRCH. 1 60.3C  
103F.141  
6120.5700 Subp. 5  
(in the rule but not  
in the statute)

2.3 Regulatory Flood Protection Elevation: The Regulatory Flood Protection Elevation shall be an elevation no lower than one foot above the elevation of the regional flood plus any increases in flood elevation caused by encroachments on the flood plain that result from designation of a floodway.

#### 2.4 Interpretation:

2.41 In their interpretation and application, the provisions of this Ordinance shall be held to be minimum requirements and shall be liberally construed in favor of the Governing Body and shall not be deemed a limitation or repeal of any other powers granted by State Statutes.

6120.5600  
6120.5700 Subp. 2

2.42 The boundaries of the zoning districts shall be determined by scaling distances on the Official Zoning Map. Where interpretation is needed as to the exact location of the boundaries of the district as shown on the Official Zoning Map, as for example where there appears to be a conflict between a mapped boundary and actual field conditions and there is a formal appeal of the decision of the Zoning Administrator, the Board of Adjustment shall make the necessary interpretation. All decisions will be based on elevations on the regional (100-year) flood profile and other available technical data. Persons contesting the location of the district boundaries shall be given a reasonable opportunity to present their case to the Board and to submit technical evidence.

2.5 Abrogation and Greater Restrictions: It is not intended by this Ordinance to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this Ordinance imposes greater restrictions, the provisions of this Ordinance shall prevail. All other

ordinances inconsistent with this Ordinance are hereby repealed to the extent of the inconsistency only.

2.6 Warning and Disclaimer of Liability: This Ordinance does not imply that areas outside the flood plain districts or land uses permitted within such districts will be free from flooding or flood damages. This Ordinance shall not create liability on the part of \_\_\_\_\_ or \_\_\_\_\_ (name of local unit) or any officer or employee thereof for any flood damages that result from reliance on this Ordinance or any administrative decision lawfully made thereunder.

6120.5300

2.7 Severability: If any section, clause, provision, or portion of this Ordinance is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this Ordinance shall not be affected thereby.

2.8 Definitions: Unless specifically defined below, words or phrases used in this Ordinance shall be interpreted so as to give them the same meaning as they have in common usage and so as to give this Ordinance its most reasonable application.

44 CFR Ch. 1 59.1  
(Appurtenant Structure)

2.811 Accessory Use or Structure - a use or structure on the same lot with, and of a nature customarily incidental and subordinate to, the principal use or structure.

44 CFR Ch. 1 59.1

2.812 Basement - means any area of a structure, including crawl spaces, having its floor or base subgrade (below ground level) on all four sides, regardless of the depth of excavation below ground level.

394.22 Subd. 7

2.813 Conditional Use - means a specific type of structure or land use listed in the official control that may be allowed but only after an in-depth review procedure and with appropriate conditions or restrictions as provided in the official zoning controls or building codes and upon a finding that: (1) certain conditions as detailed in the zoning ordinance exist and (2) the structure and/or land use conform to the comprehensive land use plan if one exists and are compatible with the existing neighborhood.

6120.5000 Subp. 6

2.814 Equal Degree of Encroachment - a method of determining the location of floodway boundaries so that flood plain lands on both sides of a stream are capable of conveying a proportionate share of flood flows.

44 CFR Ch. 1 59.1  
6120.500 Subp.7

2.815 Flood - a temporary increase in the flow or stage of a stream or in the stage of a wetland or lake that results in the inundation of normally dry areas.

- 6120.5000 Subp. 8 2.816 Flood Frequency -- the frequency for which it is expected that a specific flood stage or discharge may be equalled or exceeded.
- 103F.111 Subd.3  
6120.5000 Subp.9 2.817 Flood Fringe - that portion of the flood plain outside of the floodway. Flood fringe is synonymous with the term "floodway fringe" used in the Flood Insurance Study for  

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(local unit)
- 44 CFR Ch.1 59.1  
103F.111 Subd. 4  
6120.5000 Subp.11 2.818 Flood Plain - the beds proper and the areas adjoining a wetland, lake or watercourse which have been or hereafter may be covered by the regional flood.
- 44 CFR Ch.1 59.1  
6120.5000 Subp.15 2.819 Flood-Proofing - a combination of structural provisions, changes, or adjustments to properties and structures subject to flooding, primarily for the reduction or elimination of flood damages.
- 44 CFR Ch.1 59.1  
103 F.111 Subd. 5  
6120.5000 Subp. 17 2.820 Floodway - the bed of a wetland or lake and the channel of a watercourse and those portions of the adjoining flood plain which are reasonably required to carry or store the regional flood discharge.
- 2.821 Obstruction - any dam, wall, wharf, embankment, levee, dike, pile, abutment, projection, excavation, channel modification, culvert, building, wire, fence, stockpile, refuse, fill, structure, or matter in, along, across, or projecting into any channel, watercourse, or regulatory flood plain which may impede, retard, or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water.
- 2.822 Principal Use or Structure - means all uses or structures that are not accessory uses or structures.
- 6120.5000 Subp.19 2.823 Reach - a hydraulic engineering term to describe a longitudinal segment of a stream or river influenced by a natural or man-made obstruction. In an urban area, the segment of a stream or river between two consecutive bridge crossings would most typically constitute a reach.
- 44 CFR Ch.1 59.1 (base flood)  
103 F.111 Subd.10  
6120.5000 Subp.21 2.824 Regional Flood - a flood which is representative of large floods known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100-year recurrence interval. Regional flood is synonymous with the term "base flood" used in the Flood Insurance Study.
- Repetitive, See  
Sec.2.3 2.825 Regulatory Flood Protection Elevation - The Regulatory Flood Protection Elevation shall be an elevation no lower than one foot above the elevation of the regional flood plus any increases in flood elevation caused by encroachments on the flood plain that result from designation of a floodway.

44 CFR Ch.1 59.1

2.826 Structure - anything constructed or erected on the ground or attached to the ground or on-site utilities, including, but not limited to, buildings, factories, sheds, detached garages, cabins, manufactured homes, travel trailers/vehicles not meeting the exemption criteria specified in Section 9.31 of the ordinance and other similar items.

44 CFR Ch.1 59.1  
394.22 Subd.10

2.827 Variance - means a modification of a specific permitted development standard required in an official control including this ordinance to allow an alternative development standard not stated as acceptable in the official control, but only as applied to a particular property for the purpose of alleviating a hardship, practical difficulty or unique circumstance as defined and elaborated upon in a community's respective planning and zoning enabling legislation.

### SECTION 3.0 ESTABLISHMENT OF ZONING DISTRICTS

44 CFR Ch.1 64.3  
103F.121 Subd.1  
6120.5700 Subp.2 & Subp.4

#### 3.1 Districts:

3.11 Floodway District. The Floodway District shall include those areas designated as floodway on the Flood Boundary and Floodway Map adopted in Section 2.2.

3.12 Flood Fringe District. The Flood Fringe District shall include those areas designated as floodway fringe on the Flood Boundary and Floodway Map adopted in Section 2.2.

3.13 General Flood Plain District. The General Flood Plain District shall include those areas designated as unnumbered A Zones on the Flood Insurance Rate Map adopted in Section 2.2.

44 CFR Ch.1 60.3  
103F.141  
6120.5800 Subp.1 & Subp.3

3.2 Compliance: No new structure or land shall hereafter be used and no structure shall be located, extended, converted, or structurally altered without full compliance with the terms of this Ordinance and other applicable regulations which apply to uses within the jurisdiction of this Ordinance. Within the Floodway, Flood Fringe and General Flood Plain Districts, all uses not listed as permitted uses or conditional uses in Sections 4.0, 5.0 and 6.0 that follow, respectively, shall be prohibited. In addition, a caution is provided here that:

Reference

3.21 New manufactured homes, replacement manufactured homes and certain travel trailers and travel vehicles are subject to the general provisions of this Ordinance and specifically Section 9.0;

3.22 Modifications, additions, structural alterations or repair after damage to existing nonconforming structures and

nonconforming uses of structures or land are regulated by the general provisions of this Ordinance and specifically Section 11.0; and

Reference

3.23 As-built elevations for elevated or flood proofed structures must be certified by ground surveys and flood proofing techniques must be designed and certified by a registered professional engineer or architect as specified in the general provisions of this Ordinance and specifically as stated in Section 10.0 of this Ordinance.

SECTION 4.0 FLOODWAY DISTRICT (FW)

44 CFR Ch.1 60.3  
103F.141  
6120.5800 Subp.3

4.1 Permitted Uses:

4.11 General farming, pasture, grazing, outdoor plant nurseries, horticulture, truck farming, forestry, sod farming, and wild crop harvesting.

4.12 Industrial-commercial loading areas, parking areas, and airport landing strips.

4.13 Private and public golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, boat launching ramps, swimming areas, parks, wildlife and nature preserves, game farms, fish hatcheries, shooting preserves, target ranges, trap and skeet ranges, hunting and fishing areas, and single or multiple purpose recreational trails.

Subp.3 3.A.

4.14 Residential lawns, gardens, parking areas, and play areas.

4.2 Standards for Floodway Permitted Uses:

4.21 The use shall have a low flood damage potential.

4.22 The use shall be permissible in the underlying zoning district if one exists.

4.23 The use shall not obstruct flood flows or increase flood elevations and shall not involve structures, fill, obstructions, excavations or storage of materials or equipment.

6120.5800 Subp.3.B

4.3 Conditional Uses:

4.31 Structures accessory to the uses listed in 4.1 above and the uses listed in 4.32-4.38 below.

4.32 Extraction and storage of sand, gravel, and other materials.

4.33 Marinas, boat rentals, docks, piers, wharves, and water control structures.

Subp.3B

4.34 Railroads, streets, bridges, utility transmission lines, and pipelines.

4.35 Storage yards for equipment, machinery, or materials.

4.36 Placement of fill.

Reference

4.37 Travel trailers and travel vehicles either on individual lots of record or in existing or new subdivisions or commercial or condominium type campgrounds, subject to the exemptions and provisions of Section 9.3 of this Ordinance.

Subp.3B

4.38 Structural works for flood control such as levees, dikes and floodwalls constructed to any height where the intent is to protect individual structures and levees or dikes where the intent is to protect agricultural crops for a frequency flood event equal to or less than the 10-year frequency flood event.

4.4 Standards for Floodway Conditional Uses:

4.41 All Uses. No structure (temporary or permanent), fill (including fill for roads and levees), deposit, obstruction, storage of materials or equipment, or other uses may be allowed as a Conditional Use that will cause any increase in the stage of the 100-year or regional flood or cause an increase in flood damages in the reach or reaches affected.

4.42 All floodway Conditional Uses shall be subject to the procedures and standards contained in Section 10.4 of this Ordinance.

4.43 The Conditional Use shall be permissible in the underlying zoning district if one exists.

4.44 Fill:

44 CFR 65.5  
a.6 (1-4)

(a) Fill, dredge spoil and all other similar materials deposited or stored in the flood plain shall be protected from erosion by vegetative cover, mulching, riprap or other acceptable method.

(b) Dredge spoil sites and sand and gravel operations shall not be allowed in the floodway unless a long-term site development plan is submitted which includes an erosion/sedimentation prevention element to the plan.

(c) As an alternative, and consistent with Subsection (b) immediately above, dredge spoil disposal and sand and gravel operations may allow temporary, on-site storage of fill or other materials which would have caused an increase to the stage of the 100-year or regional flood but only after the



Governing Body has received an appropriate plan which assures the removal of the materials from the floodway based upon the flood warning time available. The Conditional Use Permit must be title registered with the property in the Office of the County Recorder.

Subp.3B

4.45 Accessory Structures:

(a) Accessory structures shall not be designed for human habitation.

(b) Accessory structures, if permitted, shall be constructed and placed on the building site so as to offer the minimum obstruction to the flow of flood waters.

(1) Whenever possible, structures shall be constructed with the longitudinal axis parallel to the direction of flood flow, and, (2) So far as practicable, structures shall be placed approximately on the same flood flow lines as those of adjoining structures.

(c) Accessory structures shall be elevated on fill or structurally dry flood proofed in accordance with the FP-1 or FP-2 flood proofing classifications in the State Building Code. As an alternative, an accessory structure may be flood proofed to the FP-3 or FP-4 flood proofing classification in the State Building Code provided the accessory structure constitutes a minimal investment, does not exceed 500 square feet in size, and for a detached garage, the detached garage must be used solely for parking of vehicles and limited storage. All flood proofed accessory structures must meet the following additional standards, as appropriate:

(1) The structure must be adequately anchored to prevent flotation, collapse or lateral movement of the structure and shall be designed to equalize hydrostatic flood forces on exterior walls; and

(2) Any mechanical and utility equipment in a structure must be elevated to or above the Regulatory Flood Protection Elevation or properly flood proofed.

6120.5800 Subp.3

4.46 Storage of Materials and Equipment:

(a) The storage or processing of materials that are, in time of flooding, flammable, explosive, or potentially injurious to human, animal, or plant life is prohibited.

44 CFR 60.22 c(6)  
103F.141  
1335.1200

(b) Storage of other materials or equipment may be allowed if readily removable from the area within the time available after a flood warning and in accordance with a plan approved by the Governing Body.

4.47 Structural works for flood control that will change the course, current or cross section of protected wetlands or public waters shall be subject to the provisions of Minnesota Statute, Chapter 103G. Community-wide structural works for flood control intended to remove areas from the regulatory flood plain shall not be allowed in the floodway.

6120.5700  
Subp.4.8  
6120.5900  
Subp.6.B.2.

4.48 A levee, dike or floodwall constructed in the floodway shall not cause an increase to the 100-year or regional flood and the technical analysis must assume equal conveyance or storage loss on both sides of a stream.

6120.5800 Subp.4

#### SECTION 5.0 FLOOD FRINGE DISTRICT (FF)

5.1 Permitted Uses: Permitted Uses shall be those uses of land or structures listed as Permitted Uses in the underlying zoning use district(s). If no pre-existing, underlying zoning use districts exist, then any residential or non residential structure or use of a structure or land shall be a Permitted Use in the Flood Fringe provided such use does not constitute a public nuisance. All Permitted Uses shall comply with the standards for Flood Fringe "Permitted Uses" listed in Section 5.2 and the "Standards for all Flood Fringe Uses" listed in Section 5.5.

6120.5800 Subp.4

#### 5.2 Standards for Flood Fringe Permitted Uses:

103F.141  
1335.2100  
6120.5800 Subp.4.b

5.21 All structures, including accessory structures, must be elevated on fill so that the lowest floor including basement floor is at or above the Regulatory Flood Protection Elevation. The finished fill elevation for structures shall be no lower than one (1) foot below the Regulatory Flood Protection Elevation and the fill shall extend at such elevation at least fifteen (15) feet beyond the outside limits of the structure erected thereon.

5.22 As an alternative to elevation on fill, accessory structures that constitute a minimal investment and that do not exceed 500 square feet for the outside dimension at ground level may be internally flood proofed in accordance with Section 4.45 (c).

5.23 The cumulative placement of fill where at any one time in excess of one-thousand (1,000) cubic yards of fill is located on the parcel shall be allowable only as a Conditional Use, unless said fill is specifically intended to elevate a structure in accordance with Section 5.21 of this ordinance.

Subp.4.F.

5.24 The storage of any materials or equipment shall be elevated on fill to the Regulatory Flood Protection Elevation.

Reference

5.25 The provisions of Section 5.5 of this Ordinance shall apply.

5.3 Conditional Uses: Any structure that is not elevated on fill or flood proofed in accordance with Section 5.21-5.22 or any use of land that does not comply with the standards in Section 5.23-5.24 shall only be allowable as a Conditional Use. An application for a Conditional Use shall be subject to the standards and criteria and evaluation procedures specified in Sections 5.4-5.5 and 10.4 of this Ordinance.

103F.141

5.4 Standards for Flood Fringe Conditional Uses:

5.41 Alternative elevation methods other than the use of fill may be utilized to elevate a structure's lowest floor above the Regulatory Flood Protection Elevation. These alternative methods may include the use of stilts, pilings, parallel walls, etc., or above-grade, enclosed areas such as crawl spaces or tuck under garages. The base or floor of an enclosed area shall be considered above-grade and not a structure's basement or lowest floor if: 1) the enclosed area is above-grade on at least one side of the structure; 2) it is designed to internally flood and is constructed with flood resistant materials; and 3) it is used solely for parking of vehicles, building access or storage. The aboved-noted alternative elevation methods are subject to the following additional standards:

(a) Design and Certification - The structure's design and as-built condition must be certified by a registered professional engineer or architect as being in compliance with the general design standards of the State Building Code and, specifically, that all electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities must be at or above the Regulatory Flood Protection Elevation or be designed to prevent flood water from entering or accumulating within these components during times of flooding.

(b) Specific Standards for Above-grade, Enclosed Areas - Above-grade, fully enclosed areas such as crawl spaces or tuck under garages must be designed to internally flood and the design plans must stipulate:

44 CFR 60.3 C 5

(1) The minimum area of openings in the walls where internal flooding is to be used as a flood proofing technique. When openings are placed in a structure's walls to provide for entry of flood waters to equalize pressures, the bottom of all openings shall be no higher than one-foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of flood waters.

103F.141  
1335.1900 Sec.402.1

(2) That the enclosed area will be designed of flood resistant materials in accordance with the FP-3 or FP-4 classifications in the State Building Code and shall be used solely for building access, parking of vehicles or storage.

5.42 Basements, as defined by Section 2.812 of this Ordinance, shall be subject to the following:

44 CFR 60.3 C (2)

(a) Residential basement construction shall not be allowed below the Regulatory Flood Protection Elevation.

44 CFR 60.6 C (1)

(b) Non-residential basements may be allowed below the Regulatory Flood Protection Elevation provided the basement is structurally dry flood proofed in accordance with Section 5.43 of this Ordinance.

103F.141  
1335.1900 Sec.402.1

5.43 All areas of non residential structures including basements to be placed below the Regulatory Flood Protection Elevation shall be flood proofed in accordance with the structurally dry flood proofing classifications in the State Building Code. Structurally dry flood proofing must meet the FP-1 or FP-2 flood proofing classification in the State Building Code and this shall require making the structure watertight with the walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of bouyancy. Structures flood proofed to the FP-3 or FP-4 classification shall not be permitted.

5.44 When at any one time more than 1,000 cubic yards of fill or other similar material is located on a parcel for such activities as on-site storage, landscaping, sand and gravel operations, landfills, roads, dredge spoil disposal or construction of flood control works, an erosion/sedimentation control plan must be submitted unless the community is enforcing a state approved shoreland management ordinance. In the absence of a state approved shoreland ordinance, the plan must clearly specify methods to be used to stabilize the fill on site for a flood event at a minimum of the 100-year or regional flood event. The plan must be prepared and certified by a registered professional engineer or other qualified individual acceptable to the Governing Body. The plan may incorporate alternative procedures for removal of the material from the flood plain if adequate flood warning time exists.

5.45 Storage of Materials and Equipment:

6120.5800 Subp.3

(a) The storage or processing of materials that are, in time of flooding, flammable, explosive, or potentially injurious to human, animal, or plant life is prohibited.

44 CFR 60.22 C (6)  
1335.1200

(b) Storage of other materials or equipment may be allowed if readily removable from the area within the time available

after a flood warning and in accordance with a plan approved by the Governing Body.

Reference

5.46 The provisions of Section 5.5 of this Ordinance shall also apply.

5.5 Standards for All Flood Fringe Uses:

5.51 All new principal structures must have vehicular access at or above an elevation not more than two (2) feet below the Regulatory Flood Protection Elevation. If a variance to this requirement is granted, the Board of Adjustment must specify limitations on the period of use or occupancy of the structure for times of flooding and only after determining that adequate flood warning time and local flood emergency response procedures exist.

6120.5800 Subp.4C

5.52 Commercial Uses - accessory land uses, such as yards, railroad tracks, and parking lots may be at elevations lower than the Regulatory Flood Protection Elevation. However, a permit for such facilities to be used by the employees or the general public shall not be granted in the absence of a flood warning system that provides adequate time for evacuation if the area would be inundated to a depth greater than two feet or be subject to flood velocities greater than four feet per second upon occurrence of the regional flood.

6120.5800 Subp.4D

5.53 Manufacturing and Industrial Uses - measures shall be taken to minimize interference with normal plant operations especially along streams having protracted flood durations. Certain accessory land uses such as yards and parking lots may be at lower elevations subject to requirements set out in Section 5.52 above. In considering permit applications, due consideration shall be given to needs of an industry whose business requires that it be located in flood plain areas.

44 CFR 65.5  
a.6. (1-4)

5.54 Fill shall be properly compacted and the slopes shall be properly protected by the use of riprap, vegetative cover or other acceptable method. The Federal Emergency Management Agency (FEMA) has established criteria for removing the special flood hazard area designation for certain structures properly elevated on fill above the 100-year flood elevation - FEMA's requirements incorporate specific fill compaction and side slope protection standards for multi-structure or multi-lot developments. These standards should be investigated prior to the initiation of site preparation if a change of special flood hazard area designation will be requested.

6120.5800 Subp.4A

5.55 Flood plain developments shall not adversely affect the hydraulic capacity of the channel and adjoining flood plain of any tributary watercourse or drainage system where

a floodway or other encroachment limit has not been specified on the Official Zoning Map.

Reference

5.56 Standards for travel trailers and travel vehicles are contained in Section 9.3.

44 CFR 60.3 B 8

5.57 All manufactured homes must be securely anchored to an adequately anchored foundation system that resists flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state or local anchoring requirements for resisting wind forces.

#### SECTION 6.0 GENERAL FLOOD PLAIN DISTRICT

##### 6.1 Permissible Uses:

Reference

6.11 The uses listed in Section 4.1 of this Ordinance shall be permitted uses.

6.12 All other uses shall be subject to the floodway/flood fringe evaluation criteria pursuant to Section 6.2 below. Section 4.0 shall apply if the proposed use is in the Floodway District and Section 5.0 shall apply if the proposed use is in the Flood Fringe District.

Equal Degree of  
Encroachment Def.

6.2 Procedures for Floodway and Flood Fringe Determinations Within the General Flood Plain District.

6120. 5600 Subp.4

6.21 Upon receipt of an application for a Conditional Use Permit for a use within the General Flood Plain District, the applicant shall be required to furnish such of the following information as is deemed necessary by the Zoning Administrator for the determination of the Regulatory Flood Protection Elevation and whether the proposed use is within the Floodway or Flood Fringe District.

(a) A typical valley cross-section showing the channel of the stream, elevation of land areas adjoining each side of the channel, cross-sectional areas to be occupied by the proposed development, and high water information.

(b) Plan (surface view) showing elevations or contours of the ground; pertinent structure, fill, or storage elevations; size, location, and spatial arrangement of all proposed and existing structures on the site; location and elevations of streets; photographs showing existing land uses and vegetation upstream and downstream; and soil type.

(c) Profile showing the slope of the bottom of the channel or flow line of the stream for at least 500 feet in either direction from the proposed development.

6.22 The applicant shall be responsible to submit one copy of the above information to a designated engineer or other expert person or agency for technical assistance in determining whether the proposed use is in the Floodway or Flood Fringe District and to determine the Regulatory Flood Protection Elevation. Procedures consistent with Minnesota Regulations 1983, Parts 6120.5000 - 6120.6200 shall be followed in this expert evaluation. The designated engineer or expert is strongly encouraged to discuss the proposed technical evaluation methodology with the respective Department of Natural Resources' Area Hydrologist prior to commencing the analysis. The designated engineer or expert shall:

(a) Estimate the peak discharge of the regional flood.

(b) Calculate the water surface profile of the regional flood based upon a hydraulic analysis of the stream channel and overbank areas.

(c) Compute the floodway necessary to convey or store the regional flood without increasing flood stages more than 0.5 foot. A lesser stage increase than .5' shall be required if, as a result of the additional stage increase, increased flood damages would result. An equal degree of encroachment on both sides of the stream within the reach shall be assumed in computing floodway boundaries.

6.23 The Zoning Administrator shall present the technical evaluation and findings of the designated engineer or expert to the Governing Body. The Governing Body must formally accept the technical evaluation and the recommended Floodway and/or Flood Fringe District boundary or deny the permit application. The Governing Body, prior to official action, may submit the application and all supporting data and analyses to the Federal Emergency Management Agency, the Department of Natural Resources or the Planning Commission for review and comment. Once the Floodway and Flood Fringe Boundaries have been determined, the Governing Body shall refer the matter back to the Zoning Administrator who shall process the permit application consistent with the applicable provisions of Section 4.0 and 5.0 of this Ordinance.

SECTION 7.0 SUBDIVISIONS<sup>2</sup>

7.1 Review Criteria: No land shall be subdivided which is unsuitable for the reason of flooding, inadequate drainage, water supply or sewage treatment facilities. All lots within the flood plain districts shall contain a building site at or above the Regulatory Flood Protection Elevation. All subdivisions shall have water and sewage treatment facilities that comply with the provisions of this Ordinance and have road access both to the subdivision and to the individual building sites no lower than two feet below the Regulatory Flood Protection Elevation. For all subdivisions in the flood plain, the Floodway and Flood Fringe boundaries, the Regulatory Flood Protection Elevation and the required elevation of all access roads shall be clearly labelled on all required subdivision drawings and platting documents.

Reference

7.2 Floodway/Flood Fringe Determinations in the General Flood Plain District: In the General Flood Plain District, applicants shall provide the information required in Section 6.2 of this Ordinance to determine the 100-year flood elevation, the Floodway and Flood Fringe District boundaries and the Regulatory Flood Protection Elevation for the subdivision site.

94 CFR 65.5.6 & 7

7.3 Removal of Special Flood Hazard Area Designation: The Federal Emergency Management Agency (FEMA) has established criteria for removing the special flood hazard area designation for certain structures properly elevated on fill above the 100-year flood elevation. FEMA's requirements incorporate specific fill compaction and side slope protection standards for multi-structure or multi-lot developments. These standards should be investigated prior to the initiation of site preparation if a change of special flood hazard area designation will be requested.

<sup>2</sup>This Section is not intended as a substitute for a comprehensive city or county subdivision ordinance. It can, however, be used as an interim control until the comprehensive subdivision ordinance can be amended to include necessary flood plain management provisions.



SECTION 8.0 PUBLIC UTILITIES, RAILROADS, ROADS, AND BRIDGES

6120.5800 Subp. 3.85

8.1 Public Utilities. All public utilities and facilities such as gas, electrical, sewer, and water supply systems to be located in the flood plain shall be flood-proofed in accordance with the State Building Code or elevated to above the Regulatory Flood Protection Elevation.

44 CFR.60.22 c (8)

8.2 Public Transportation Facilities. Railroad tracks, roads, and bridges to be located within the flood plain shall comply with Sections 4.0 and 5.0 of this Ordinance. Elevation to the Regulatory Flood Protection Elevation shall be provided where failure or interruption of these transportation facilities would result in danger to the public health or safety or where such facilities are essential to the orderly functioning of the area. Minor or auxiliary roads or railroads may be constructed at a lower elevation where failure or interruption of transportation services would not endanger the public health or safety.

44 CFR 60.3a 5 & 6  
6120.5900 Subp.4

8.3 On-site Sewage Treatment and Water Supply Systems: Where public utilities are not provided: 1) On-site water supply systems must be designed to minimize or eliminate infiltration of flood waters into the systems; and 2) New or replacement on-site sewage treatment systems must be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters and they shall not be subject to impairment or contamination during times of flooding. Any sewage treatment system designed in accordance with the State's current statewide standards for on-site sewage treatment systems shall be determined to be in compliance with this Section.

SECTION 9.0 MANUFACTURED HOMES AND MANUFACTURED HOME PARKS AND PLACEMENT OF TRAVEL TRAILERS AND TRAVEL VEHICLES.

Reference

9.1 New manufactured home parks and expansions to existing manufactured home parks shall be subject to the provisions placed on subdivisions by Section 7.0 of this Ordinance.

Reference

9.2 The placement of new or replacement manufactured homes in existing manufactured home parks or on individual lots of record that are located in flood plain districts will be treated as a new structure and may be placed only if elevated in compliance with Section 5.0 of this Ordinance. If vehicular road access for pre-existing manufactured home parks is not provided in accordance with Section 5.51, then replacement manufactured homes will not be allowed until the property owner(s) develops a flood warning emergency plan acceptable to the Governing Body.

44 CFR 60.3 b (8)

9.21 All manufactured homes must be securely anchored to an adequately anchored foundation system that resists

flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state or local anchoring requirements for resisting wind forces.

9.3 Travel trailers and travel vehicles that do not meet the exemption criteria specified in Section 9.31 below shall be subject to the provisions of this Ordinance and as specifically spelled out in Sections 9.33-9.34 below.

9.31 Exemption - Travel trailers and travel vehicles are exempt from the provisions of this Ordinance if they are placed in any of the areas listed in Section 9.32 below and further they meet the following criteria:

- (a) Have current licenses required for highway use.
- (b) Are highway ready meaning on wheels or the internal jacking system, are attached to the site only by quick disconnect type utilities commonly used in campgrounds and trailer parks and the travel trailer/travel vehicle has no permanent structural type additions attached to it.
- (c) The travel trailer or travel vehicle and associated use must be permissible in any pre-existing, underlying zoning use district.

44 CFR 60.3 c (14)  
new rule

9.32 Areas Exempted For Placement of Travel/Recreational Vehicles:

- (a) Individual lots or parcels of record.
- (b) Existing commercial recreational vehicle parks or campgrounds.
- (c) Existing condominium type associations.

9.33 Travel trailers and travel vehicles exempted in Section 9.31 lose this exemption when development occurs on the parcel exceeding \$500 dollars for a structural addition to the travel trailer/travel vehicle or an accessory structure such as a garage or storage building. The travel trailer/travel vehicle and all additions and accessory structures will then be treated as a new structure and shall be subject to the elevation/flood proofing requirements and the use of land restrictions specified in Sections 4.0 and 5.0 of this Ordinance.

purpose is to bring  
language into line  
with shoreland  
standards

9.34 New commercial travel trailer or travel vehicle parks or campgrounds and new residential type subdivisions and condominium associations and the expansion of any existing similar use exceeding five (5) units or dwelling sites shall be subject to the following:

Reference

- (a) Any new or replacement travel trailer or travel vehicle will be allowed in the Floodway or Flood Fringe Districts provided said trailer or vehicle and its contents are placed

on fill above the Regulatory Flood Protection Elevation and proper elevated road access to the site exists in accordance with Section 5.51 of this Ordinance. No fill placed in the floodway to meet the requirements of this Section shall increase flood stages of the 100-year or regional flood.

44 CFR 60.22 c (6)  
103F.141  
6120.5900 Subp.5 B (3)

(b) All new or replacement travel trailers or travel vehicles not meeting the criteria of (a) above may, as an alternative, be allowed as a Conditional Use if in accordance with the following provisions and the provisions of 10.4 of the Ordinance. The applicant must submit an emergency plan for the safe evacuation of all vehicles and people during the 100 year flood. Said plan shall be prepared by a registered engineer or other qualified individual and shall demonstrate that adequate time and personnel exist to carry out the evacuation. All attendant sewage and water facilities for new or replacement travel trailers or other recreational vehicles must be protected or constructed so as to not be impaired or contaminated during times of flooding in accordance with Section 8.3 of this Ordinance.

103F.141  
394.29  
462.354  
6120.3900 Subp.1

#### SECTION 10.0 ADMINISTRATION

10.1 Zoning Administrator: A Zoning Administrator or other official designated by the Governing Body shall administer and enforce this Ordinance. If the Zoning Administrator finds a violation of the provisions of this Ordinance the Zoning Administrator shall notify the person responsible for such violation in accordance with the procedures stated in Section 12.0 of the Ordinance.

44 CFR 60.3 a (1) & b (1)  
103F.141  
395.30 Subd. 5  
462.357 Subd.1  
6120.3900 Subp.2

#### 10.2 Permit Requirements:

10.21 Permit Required. A Permit issued by the Zoning Administrator in conformity with the provisions of this Ordinance shall be secured prior to the erection, addition, or alteration of any building, structure, or portion thereof; prior to the use or change of use of a building, structure, or land; prior to the change or extension of a nonconforming use; and prior to the placement of fill, excavation of materials, or the storage of materials or equipment within the flood plain.

10.22 Application for Permit. Application for a Permit shall be made in duplicate to the Zoning Administrator on forms furnished by the Zoning Administrator and shall include the following where applicable: plans in duplicate drawn to scale, showing the nature, location, dimensions, and elevations of the lot; existing or proposed structures, fill, or storage of materials; and the location of the foregoing in relation to the stream channel.

10.23 State and Federal Permits. Prior to granting a Permit or processing an application for a Conditional Use Permit or Variance, the Zoning Administrator shall determine that the applicant has obtained all necessary State and Federal Permits.

10.24 Certificate of Zoning Compliance for a New, Altered, or Nonconforming Use. It shall be unlawful to use, occupy, or permit the use or occupancy of any building or premises or part thereof hereafter created, erected, changed, converted, altered, or enlarged in its use or structure until a Certificate of Zoning Compliance shall have been issued by the Zoning Administrator stating that the use of the building or land conforms to the requirements of this Ordinance.

10.25 Construction and Use to be as Provided on Applications, Plans, Permits, Variances and Certificates of Zoning Compliance. Permits, Conditional Use Permits, or Certificates of Zoning Compliance issued on the basis of approved plans and applications authorize only the use, arrangement, and construction set forth in such approved plans and applications, and no other use, arrangement, or construction. Any use, arrangement, or construction at variance with that authorized shall be deemed a violation of this Ordinance, and punishable as provided by Section 12.0 of this Ordinance.

6120.5800 Subp.1

10.26 Certification. The applicant shall be required to submit certification by a registered professional engineer, registered architect, or registered land surveyor that the finished fill and building elevations were accomplished in compliance with the provisions of this ordinance. Flood-proofing measures shall be certified by a registered professional engineer or registered architect.

44 CFR 60.3 b (5) (1-3)  
6120.5800 Subp.1

10.27 Record of First Floor Elevation. The Zoning Administrator shall maintain a record of the elevation of the lowest floor (including basement) of all new structures and alterations or additions to existing structures in the flood plain. The Zoning Administrator shall also maintain a record of the elevation to which structures or alterations and additions to structures are flood-proofed.

MS 394.27  
MS 462.354 Subd.2

10.3 Board of Adjustment:

10.31 Rules. The Board of Adjustment shall adopt rules for the conduct of business and may exercise all of the powers conferred on such Boards by State law.

10.32 Administrative Review. The Board shall hear and decide appeals where it is alleged there is error in any order, requirement, decision, or determination made by an

administrative official in the enforcement or administration of this Ordinance.

44CFR 60.6  
MS.394.462  
462.357 Subd.6  
6120.6100

10.33 Variances. The Board may authorize upon appeal in specific cases such relief or variance from the terms of this Ordinance as will not be contrary to the public interest and only for those circumstances such as hardship, practical difficulties or circumstances unique to the property under consideration, as provided for in the respective enabling legislation for planning and zoning for cities or counties as appropriate. In the granting of such variance, the Board of Adjustment shall clearly identify in writing the specific conditions that existed consistent with the criteria specified in the respective enabling legislation which justified the granting of the variance. No Variance shall have the effect of allowing in any district uses prohibited in that district, permit a lower degree of flood protection than the Regulatory Flood Protection Elevation for the particular area, or permit standards lower than those required by State law.

MS 394.26  
466.357 Subd.3  
6120.6200

10.34 Hearings. Upon filing with the Board of Adjustment of an appeal from a decision of the Zoning Administrator, or an application for a variance, the Board shall fix a reasonable time for a hearing and give due notice to the parties in interest as specified by law. The Board shall submit by mail to the Commissioner of Natural Resources a copy of the application for proposed Variances sufficiently in advance so that the Commissioner will receive at least ten days notice of the hearing.

10.35 Decisions. The Board shall arrive at a decision on such appeal or Variance within \_\_\_\_\_ days. In passing upon an appeal, the Board may, so long as such action is in conformity with the provisions of this Ordinance, reverse or affirm, wholly or in part, or modify the order, requirement, decision or determination of the Zoning Administrator or other public official. It shall make its decision in writing setting forth the findings of fact and the reasons for its decisions. In granting a Variance the Board may prescribe appropriate conditions and safeguards such as those specified in Section 10.46, which are in conformity with the purposes of this Ordinance. Violations of such conditions and safeguards, when made a part of the terms under which the Variance is granted, shall be deemed a violation of this Ordinance punishable under Section 12.0. A copy of all decisions granting Variances shall be forwarded by mail to the Commissioner of Natural Resources within ten (10) days of such action.

MS 394.27 Subd.9  
462.357 Subd.6

10.36 Appeals. Appeals from any decision of the Board may be made, and as specified in this Community's Official Controls and also Minnesota Statutes.

10.37 Flood Insurance Notice and Record Keeping. The Zoning Administrator shall notify the applicant for a variance that: 1) The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage and 2) Such construction below the 100-year or regional flood level increases risks to life and property. Such notification shall be maintained with a record of all variance actions. A community shall maintain a record of all variance actions, including justification for their issuance, and report such variances issued in its annual or biennial report submitted to the Administrator of the National Flood Insurance Program.

MS 462.3595  
394.301

10.4 Conditional Uses. The

\_\_\_\_\_  
(Governing Body/Planning Comm./Bd. of Adjust.  
shall hear and decide applications for Conditional Uses permissible under this Ordinance. Applications shall be submitted to the Zoning Administrator who shall forward the application to \_\_\_\_\_ for consideration.  
(Designated Body)

10.41 Hearings. Upon filing with the \_\_\_\_\_ an application for a  
(Designated Body)

Conditional Use Permit, the \_\_\_\_\_ shall submit  
(Designated Body)  
by mail to the Commissioner of Natural Resources a copy of the application for proposed Conditional Use sufficiently in advance so that the Commissioner will receive at least ten days notice of the hearing.

10.42 Decisions. The \_\_\_\_\_ shall arrive at  
(Designated Body)  
a decision on a Conditional Use within \_\_\_\_\_ days. In granting a Conditional Use Permit the \_\_\_\_\_ shall prescribe appropriate  
(Designated Body)

conditions and safeguards, in addition to those specified in Section 10.46, which are in conformity with the purposes of this Ordinance. Violations of such conditions and safeguards, when made a part of the terms under which the Conditional Use Permit is granted, shall be deemed a violation of this Ordinance punishable under Section 12.0. A copy of all decisions granting Conditional Use Permits shall be forwarded by mail to the Commissioner of Natural Resources within ten (10) days of such action.

10.43 Procedures to be followed by the \_\_\_\_\_  
(Designated Body)  
in Passing on Conditional Use Permit Applications Within all Flood Plain Districts.

(a) Require the applicant to furnish such of the following information and additional information as deemed necessary by the \_\_\_\_\_ for determining the suitability of the particular site for the proposed use:  
(Designated Body)

(1) Plans in triplicate drawn to scale showing the nature, location, dimensions, and elevation of the lot, existing or proposed structures, fill, storage of materials, flood-proofing measures, and the relationship of the above to the location of the stream channel.

(2) Specifications for building construction and materials, flood-proofing, filling, dredging, grading, channel improvement, storage of materials, water supply and sanitary facilities.

(b) Transmit one copy of the information described in subsection (a) to a designated engineer or other expert person or agency for technical assistance, where necessary, in evaluating the proposed project in relation to flood heights and velocities, the seriousness of flood damage to the use, the adequacy of the plans for protection, and other technical matters.

(c) Based upon the technical evaluation of the designated engineer or expert, the \_\_\_\_\_ shall determine the specific flood hazard at the site and evaluate the suitability of the proposed use in relation to the flood hazard.  
(Designated Body)

10.44 Factors Upon Which the Decision of the \_\_\_\_\_ Shall Be Based. In passing  
(Designated Body)  
upon Conditional Use applications, the \_\_\_\_\_

(Designated Body)  
shall consider all relevant factors specified in other sections of this Ordinance, and:

6120.5900 Subp.3 (c)

(a) The danger to life and property due to increased flood heights or velocities caused by encroachments.

(b) The danger that materials may be swept onto other lands or downstream to the injury of others or they may block bridges, culverts or other hydraulic structures.

(c) The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.

(d) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner.

(e) The importance of the services provided by the proposed facility to the community.

- (f) The requirements of the facility for a waterfront location.
- (g) The availability of alternative locations not subject to flooding for the proposed use.
- (h) The compatability of the proposed use with existing development and development anticipated in the foreseeable future.
- (i) The relationship of the proposed use to the comprehensive plan and flood plain management program for the area.
- (j) The saretly of access to the property in times of flood for ordinary and emergency vehicles.
- (k) The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters expected at the site.
- (l) Such other factors which are relevant to the purposes of this Ordinance.

10.45 Time for Acting on Application. The \_\_\_\_\_ shall act on an application in the (Designated Body) manner described above within \_\_\_\_\_ days from receiving the application, except that where additional information is required pursuant to 10.44 of this Ordinance. The \_\_\_\_\_ shall render a written decision within (Designated Body) \_\_\_\_\_ days from the receipt of such additional information.

10.46 Conditions Attached to Conditional Use Permits. Upon consideration of the factors listed above and the purpose of this Ordinance, the \_\_\_\_\_ shall attach such (Designated Body) conditions to the granting of Conditional Use Permits as it deems necessary to fulfill the purposes of this Ordinance. Such conditions may include, but are not limited to, the following:

6120.5900

- (a) Modification of waste treatment and water supply facilities.
- (b) Limitations on period of use, occupancy, and operation.
- (c) Imposition of operational controls, sureties, and deed restrictions.
- (d) Requirements for construction of channel modifications, compensatory storage, dikes, levees, and other protective measures.
- (e) Flood-proofing measures, in accordance with the State Building Code and this Ordinance. The applicant shall submit a plan or document certified by a registered professional engineer or architect that the flood-proofing measures are consistent with the Regulatory Flood Protection Elevation and associated flood factors for the particular area.



SECTION 11.0 NONCONFORMING USES

11.1 A structure or the use of a structure or premises which was lawful before the passage or amendment of this Ordinance but which is not in conformity with the provisions of this Ordinance may be continued subject to the following conditions:

11.11 No such use shall be expanded, changed, enlarged, or altered in a way which increases its nonconformity.

11.12 Any alteration or addition to a nonconforming structure or nonconforming use which would result in increasing the flood damage potential of that structure or use shall be protected to the Regulatory Flood Protection Elevation in accordance with any of the elevation on fill or flood proofing techniques ( i.e. , FP-1 thru FP-4 floodproofing classifications) allowable in the State Building Code, except as further restricted in 11.13 below.

11.13 The cost of any structural alterations or additions to any nonconforming structure over the life of the structure shall not exceed 50 percent of the market value of the structure unless the conditions of this Section are satisfied. The cost of all structural alterations and additions constructed since the adoption of the Community's initial flood plain controls must be calculated into today's current cost which will include all costs such as construction materials and a reasonable cost placed on all manpower or labor. If the current cost of all previous and proposed alterations and additions exceeds 50 percent of the current market value of the structure, then the structure must meet the standards of Section 4.0 or 5.0 of this Ordinance for new structures depending upon whether the structure is in the Floodway or Flood Fringe, respectively.

11.14 If any nonconforming use is discontinued for 12 consecutive months, any future use of the building premises shall conform to this Ordinance. The assessor shall notify the Zoning Administrator in writing of instances of nonconforming uses which have been discontinued for a period of 12 months.

11.15. If any nonconforming use or structure is destroyed by any means, including floods, to an extent of 50 percent or more of its market value at the time of destruction, it shall not be reconstructed except in conformity with the provisions of this Ordinance. The applicable provisions for establishing new uses or new structures in Sections 4.0, 5.0 or 6.0 will apply depending upon whether the use or structure is in the Floodway, Flood Fringe or General Flood Plain District, respectively.

103F.145  
MS 394.37  
462.362  
6120.3900

## SECTION 12.0 PENALTIES FOR VIOLATION

12.1 Violation of the provisions of this Ordinance or failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with grants of Variances or Conditional Uses) shall constitute a misdemeanor and shall be punishable as defined by law.

12.2 Nothing herein contained shall prevent the \_\_\_\_\_ from taking such other lawful action (local unit) as is necessary to prevent or remedy any violation. Such actions may include but are not limited to:

12.21 In responding to a suspected ordinance violation, the Zoning Administrator and Local Government may utilize the full array of enforcement actions available to it including but not limited to prosecution and fines, injunctions, after-the-fact permits, orders for corrective measures or a request to the National Flood Insurance Program for denial of flood insurance availability to the guilty party. The community must act in good faith to enforce these official controls and to correct ordinance violations to the extent possible so as not to jeopardize its eligibility in the National Flood Insurance Program.

12.22 When an ordinance violation is either discovered by or brought to the attention of the Zoning Administrator, the Zoning Administrator shall immediately investigate the situation and document the nature and extent of the violation of the official control. As soon as is reasonably possible, this information will be submitted to the appropriate Department of Natural Resources' and Federal Emergency Management Agency Regional Office along with the Community's plan of action to correct the violation to the degree possible.

12.23 The Zoning Administrator shall notify the suspected party of the requirements of this Ordinance and all other Official Controls and the nature and extent of the suspected violation of these controls. If the structure and/or use is under construction or development, the Zoning Administrator may order the construction or development immediately halted until a proper permit or approval is granted by the Community. If the construction or development is already completed, then the Zoning Administrator may either (1) issue an order identifying the corrective actions that must be made within a specified time period to bring the use or structure into compliance with the official controls, or (2) notify the responsible party to apply for an after-the-fact permit/development approval within a specified period of time not to exceed 30-days.

12.24 If the responsible party does not appropriately respond to the Zoning Administrator within the specified period of time, each additional day that lapses shall constitute an additional violation of this Ordinance and shall be prosecuted accordingly. The Zoning Administrator shall also upon the lapse of the specified response period notify the landowner to restore the land to the condition which existed prior to the violation of this Ordinance.

#### SECTION 13.0 AMENDMENTS

103F.121 Subd. 2  
394.25 Subd.10  
462.355 Subd. 2  
6120.5400

The flood plain designation on the Official Zoning Map shall not be removed from flood plain areas unless it can be shown that the designation is in error or that the area has been filled to or above the elevation of the regional flood and is contiguous to lands outside the flood plain. Special exceptions to this rule may be permitted by the Commissioner of Natural Resources if he determines that, through other measures, lands are adequately protected for the intended use.

All amendments to this Ordinance, including amendments to the Official Zoning Map, must be submitted to and approved by the Commissioner of Natural Resources prior to adoption. Changes in the Official Zoning Map must meet the Federal Emergency Management Agency's (FEMA) Technical Conditions and Criteria and must receive prior FEMA approval before adoption. The Commissioner of Natural Resources must be given 10-days written notice of all hearings to consider an amendment to this Ordinance and said notice shall include a draft of the ordinance amendment or technical study under consideration.

## APPENDIX 4B

### CHAPTER 103F

#### PROTECTION OF WATER RESOURCES

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- 103F.101 Citation.  
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- SOUTHERN MINNESOTA RIVERS BASIN AREA II
- 103F.171 Southern Minnesota rivers basin area II boundaries.  
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- 103F.201 Regulatory purpose of shoreland development.  
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- WILD AND SCENIC RIVERS ACT
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103F.367 Mississippi headwaters board.  
103F.369 Plan implementation.  
103F.371 Responsibilities of other governmental units.  
103F.373 Review and certification of land use actions.  
103F.375 Incorporation and annexation.  
103F.377 Biennial report.
- PROJECT RIVERBEND
- 103F.381 Findings.  
103F.383 Definitions.  
103F.385 Board.  
103F.387 Comprehensive plan.  
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103F.391 Restrictions on land incorporated or annexed.  
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- SOIL EROSION
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**LAKE PRESERVATION  
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103F.801 County lake improvement program.

103F.805 State aid for lake improvements. **MILLE LACS PRESERVATION AND DEVELOPMENT BOARD**

103F.806 Application.

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103F.808 Mille Lacs preservation and development board.

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103F.901 Definitions.

103F.902 Local planning and approval.

103F.903 Wetland establishment and restoration cost-share program.

103F.904 Wetland establishment.

103F.905 Rules.

**103F.001 EFFECT OF CHAPTER 103F ON WATER LAW.**

This chapter and chapters 103A, 103B, 103C, 103D, 103E, and 103G constitute the water law of this state and may be cited as the water law.

*History: 1990 c 391 art 6 s 1*

**FLOODPLAIN MANAGEMENT****103F.101 CITATION.**

Sections 103F.101 to 103F.155 may be cited as the floodplain management law.

*History: 1990 c 391 art 6 s 2*

**103F.105 FLOODPLAIN MANAGEMENT POLICY.**

(a) The legislature finds:

(1) a large portion of the state's land resources is subject to recurrent flooding by overflow of streams and other watercourses causing loss of life and property, disruption of commerce and governmental services, unsanitary conditions, and interruption of transportation and communications, all of which are detrimental to the health, safety, welfare, and property of the occupants of flooded lands and the people of this state; and

(2) the public interest necessitates sound land use development as land is a limited and irreplaceable resource, and the floodplains of this state are a land resource to be developed in a manner which will result in minimum loss of life and threat to health, and reduction of private and public economic loss caused by flooding.

(b) It is the policy of this state to reduce flood damages through floodplain management, stressing nonstructural measures such as floodplain zoning and floodproofing, and flood warning practices.

(c) It is the policy of this state:

(1) not to prohibit but to guide development of the floodplains consistent with legislative findings;

(2) to provide state coordination and assistance to local governmental units in floodplain management;

(3) to encourage local governmental units to adopt, enforce and administer sound floodplain management ordinances; and

(4) to provide the commissioner of natural resources with authority necessary to carry out a floodplain management program for the state and to coordinate federal, state, and local floodplain management activities in this state.

*History: 1990 c 391 art 6 s 3*

**103F.111 DEFINITIONS.**

Subdivision 1. **Applicability.** The definitions in this section apply to sections 103F.111 to 103F.165.

Subd. 2. **Commissioner.** "Commissioner" means the commissioner of natural resources.

Subd. 3. **Flood fringe.** "Flood fringe" means the portion of the floodplain outside of the floodway.

Subd. 4. **Floodplain.** "Floodplain" means the areas adjoining a watercourse or water basin that have been or may be covered by a regional flood.

Subd. 5. **Floodway.** "Floodway" means the channel of the watercourse, the bed of water basins, and those portions of the adjoining floodplains that are reasonably required to carry and discharge floodwater and provide water storage during a regional flood.

Subd. 6. **Local governmental unit.** "Local governmental unit" means a county, statutory or home rule charter city, town, watershed district, or lake improvement district.

Subd. 7. **Mitigation.** "Mitigation" means the act of alleviating the effects of floods and flooding by moderating or reducing the severe damages resulting from floods through structural and nonstructural flood management measures.

Subd. 8. **Mitigation measures.** "Mitigation measures" means structural or non-structural flood management measures, or both.

Subd. 9. **Nonstructural flood management measures.** "Nonstructural flood management measures" means actions in floodplains designed to reduce the damaging effects of floods on existing and potential users of floodplains, without physically altering the flood behavior. Nonstructural flood management measures include:

- (1) public acquisition of floodplain lands;
- (2) relocation of public and private structures and facilities;
- (3) floodproofing of public and private facilities;
- (4) installation and operation of flood warning systems and evacuation procedures;
- (5) adoption and enforcement of land use control ordinances and building codes;
- (6) installation of signs and other notifications in regional flood areas; and
- (7) provision of flood insurance and public education.

Subd. 10. **Regional flood.** "Regional flood" means a flood that is representative of large floods known to have occurred generally in the state and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of a 100-year recurrence interval.

Subd. 11. **Structural flood management measures.** "Structural flood management measures" means physical actions taken to modify the behavior and extent of floods and flooding, including the construction of dams, dikes, levees, flood bypass channels, floodwater storage and retardation structures, and water level control structures, excluding deepening or straightening of existing stream channels.

Subd. 12. **Waterbasin.** "Waterbasin" has the meaning given it by section 103G.005, subdivision 16.

*History: 1990 c 391 art 6 s 4*

#### **103F.115 PRIORITY FOR REDUCTION OF FLOOD DAMAGE.**

Floodplain management ordinances are to be given primary consideration in the reduction of flood damage in the state and alternative methods for reducing flood damage may not be carried out before adoption of floodplain management ordinances by local governmental units. Structural projects which have the purpose of controlling floods are to be considered only as elements of a floodplain management program.

*History: 1990 c 391 art 6 s 5*

#### **103F.121 FLOODPLAIN MANAGEMENT ORDINANCES.**

Subdivision 1. **Adoption.** (a) In accordance with sections 103F.101 to 103F.155, the rules of the commissioner and applicable laws authorizing local governmental units to adopt floodplain management ordinances, local governmental units shall adopt, administer, and enforce floodplain management ordinances, which must include:

- (1) the delineation of floodplains and floodways;
- (2) the preservation of the capacity of the floodplain to carry and discharge regional floods;

- (3) the minimization of flood hazards; and
- (4) the regulation of the use of land in the floodplain.

(b) The ordinances shall be based on adequate technical data and competent engineering advice and shall be consistent with local and regional comprehensive planning.

**Subd. 2. Adoption procedure.** (a) The commissioner, upon determining that sufficient technical information is available for the delineation of floodplains and floodways on a watercourse, shall notify affected local governmental units that technical information is available. Within six months after receiving this notice, the local governmental units shall prepare or amend their floodplain management ordinances in conformance with the provisions of sections 103F.101 to 103F.155 and shall submit the ordinance to the commissioner for review and approval before adoption.

(b) The commissioner shall approve or disapprove the proposed ordinance within 120 days after receiving it.

(c) If the proposed ordinance is disapproved, the commissioner shall return it to the local governmental unit with a written statement of reasons for disapproval. Within 90 days after disapproval, the local governmental unit shall resubmit an amended proposed ordinance for further review and approval before adoption. The local governmental unit shall adopt a floodplain management ordinance within 90 days after approval by the commissioner.

(d) A floodplain management ordinance adopted by a local governmental unit is invalid unless it is approved by the commissioner.

(e) A local governmental unit may adopt a floodplain management ordinance in the absence of notification by the commissioner that the required technical data is available, provided that any such ordinance is submitted to the commissioner prior to its adoption for approval.

(f) A local governmental unit may adopt a floodplain management ordinance that is more restrictive than required under sections 103F.101 to 103F.155.

(g) Floodplain management ordinances may be amended by a local governmental unit upon the approval of the commissioner.

**Subd. 3. Commissioner's adoption of ordinance.** (a) If a local governmental unit fails to adopt a floodplain management ordinance, the commissioner shall adopt an ordinance that meets the minimum standards established under section 103F.141 for the local governmental unit.

(b) The commissioner shall hold at least one public hearing on the proposed ordinance in the manner provided in section 394.26 or 462.357, as applicable, after giving notice as provided in section 394.26 or 462.357.

(c) The ordinance is effective for the local governmental unit on the date and in accordance with rules prescribed by the commissioner.

(d) The ordinance shall be enforced as provided in section 394.37 or 462.362, as applicable. The penalties provided in section 394.37 or 462.362 apply to violations of an ordinance adopted by the commissioner.

**Subd. 4. Cost of commissioner's ordinance.** (a) The cost incurred by the commissioner in adopting a floodplain management ordinance for the local governmental unit shall be paid by the local governmental unit upon submission to the local governmental unit of an itemized statement of these costs by the commissioner.

(b) If the local governmental unit fails to pay the costs within 90 days after the commissioner's statement is received, the commissioner shall file a copy of the statement of the costs for collection by special tax levy with the county auditor of the county where the local governmental unit is located. The county auditor, upon receiving a statement from the commissioner, shall include the amount of the state's claim in the tax levy for general revenue purposes of the local governmental unit. Upon completion of the tax settlement following this levy, the county treasurer shall remit the amount due to the state to the commissioner for deposit in the state treasury.

**Subd. 5. Major alterations and hazardous uses prohibited.** (a) If a floodplain has

been delineated by a floodplain management ordinance under sections 103F.101 to 103F.155, a major alteration to a structure in existence on the effective date of the ordinance or a new fill, structure, deposit, or other floodplain use that is unreasonably hazardous to the public or that unduly restricts the capacity of the floodplain to carry and discharge a regional flood may not be permitted after the effective date of the ordinance delineating the floodplain.

(b) As used in this subdivision, major alterations of existing structures do not include repair or maintenance and do not include repairs, maintenance, or alterations to structures made under the authority of another authorized agency of the state or federal government.

(c) This subdivision does not apply to alterations, repair, or maintenance reasonably done under emergency circumstances to preserve or protect life or property.

(d) This subdivision applies to alterations to existing structures and to new fill, structures, deposits, or other floodplain uses by the state and state agencies.

*History: 1990 c 391 art 6 s 6; 1991 c 199 art 2 s 1*

#### **103F.125 CONSIDERATION OF INDUSTRIAL USES IN FLOODPLAIN.**

The commissioner in promulgating guidelines under section 103F.141 and local governmental units in preparing floodplain management ordinances shall give due consideration to the needs of an industry whose business requires that it be located within a floodplain.

*History: 1990 c 391 art 6 s 7*

#### **103F.131 AMUSEMENT PARK EXEMPTION.**

(a) An amusement park that exists before a floodplain is delineated by a floodplain management ordinance is exempt from the requirements of sections 103F.101 to 103F.155 if the amusement park continues to be used as an amusement park within the amusement park boundaries.

(b) Notwithstanding any other law, the state is not liable for any damage from flooding to an amusement park operating in a floodplain under this subdivision.

*History: 1990 c 391 art 6 s 8*

#### **103F.135 COMMISSIONER'S ASSISTANCE AND INSPECTIONS.**

Subdivision 1. **Commissioner's duties.** The commissioner shall:

(1) collect and distribute information relating to flooding and floodplain management;

(2) coordinate local, state, and federal floodplain management activities to the greatest extent possible, and encourage the United States Army Corps of Engineers and the United States Soil Conservation Service to make their flood control planning data available to local governmental units for planning purposes, to allow adequate local participation in the planning process and in the selection of desirable alternatives;

(3) assist local governmental units in their floodplain management activities in cooperation with the commissioner of trade and economic development; and

(4) do all other things, within lawful authority, that are necessary or desirable to manage the floodplain for beneficial uses compatible with the preservation of the capacity of the floodplain to carry and discharge the regional flood.

Subd. 2. **Inspections.** In cooperation with local governmental units, the commissioner shall conduct, whenever possible, periodic inspections to determine the effectiveness of local floodplain management programs, including an evaluation of the enforcement of and compliance with local floodplain management ordinances.

*History: 1990 c 391 art 6 s 9*



**103F.141 RULES.**

Subdivision 1. **Authority and criteria.** The commissioner shall adopt rules to implement sections 103F.101 to 103F.155, including:

- (1) criteria for determining the floodplain uses that may be permitted without creating an unreasonable public hazard or unduly restricting the capacity of the floodplain to carry and discharge a regional flood;
- (2) variance procedures; and
- (3) the establishment of criteria for alternative or supplemental floodplain management measures such as floodproofing, subdivision rules, building codes, sanitation rules, and flood warning systems.

Subd. 2. **Protection needed only for regional flood level.** Notwithstanding the rules adopted under this section establishing a flood protection level higher than the elevation of the regional flood, a local governmental unit may elect to adopt and enforce a flood protection level at the elevation of the regional flood in its floodplain ordinance.

*History: 1990 c 391 art 6 s 10*

**103F.145 ENFORCEMENT AND PENALTIES.**

Subdivision 1. **Uses in violation of ordinance are public nuisances.** Every structure, fill, deposit, or other floodplain use placed or maintained in the floodplain in violation of a floodplain management ordinance adopted under the provisions of sections 103F.105 to 103F.155 is a public nuisance.

Subd. 2. **Civil remedies.** The creation of a public nuisance under this section may be enjoined and the maintenance of a public nuisance under this section may be abated by an action brought by the commissioner or a local governmental unit.

Subd. 3. **Criminal penalties.** A person who violates a provision of sections 103F.105 to 103F.155 is guilty of a misdemeanor. Each day that the violation exists is a separate offense.

*History: 1990 c 391 art 6 s 11*

**103F.151 FLOOD PRONE AREA INVENTORY AND ASSESSMENT.**

The commissioner shall conduct a statewide inventory and flood damage assessment of flood prone structures and lands.

*History: 1990 c 391 art 6 s 12*

**103F.155 FLOOD PROTECTION PLANS.**

Subdivision 1. **Construction of flood protection measures.** If emergency flood protection measures are undertaken, the affected local governmental unit shall submit to the commissioner a plan outlining their use as a part of a future comprehensive flood emergency program. The plan shall be submitted within 120 days after construction.

Subd. 2. **Commissioner's review.** (a) The commissioner shall review the plan and consult with the state office of civil defense and other appropriate state and federal agencies. Following the review, the commissioner shall accept, require modification, or reject the plan.

(b) If required modifications are not made, or if the plan is rejected, the commissioner shall order the removal of the emergency protection measures.

*History: 1990 c 391 art 6 s 13*

**103F.161 FLOOD HAZARD MITIGATION GRANTS.**

Subdivision 1. **Grants authorized.** The commissioner may make grants to local governments to:

- (1) conduct floodplain damage reduction studies to determine the most feasible, practical, and effective methods and programs for mitigating the damages due to flooding within flood prone rural and urban areas and their watersheds; and

(2) plan and implement flood mitigation measures.

Subd. 2. **Action on grant applications.** (a) A local government may apply to the commissioner for a grant on forms provided by the commissioner. The commissioner shall confer with the local government requesting the grant and may make a grant up to \$75,000 based on the following considerations:

(1) the extent and effectiveness of mitigation measures already implemented by the local government requesting the grant;

(2) the feasibility, practicality, and effectiveness of the proposed mitigation measures and the associated nonflood related benefits and detriments;

(3) the level of grant assistance that should be provided to the local government, based on available facts regarding the nature, extent, and severity of flood problems;

(4) the frequency of occurrence of severe flooding that has resulted in declaration of the area as a flood disaster area by the President of the United States;

(5) the economic, social, and environmental benefits and detriments of the proposed mitigation measures;

(6) whether the floodplain management ordinance or regulation adopted by the local government meets the minimum standards established by the commissioner, the degree of enforcement of the ordinance or regulation, and whether the local government is complying with the ordinance or regulation;

(7) the degree to which the grant request is consistent with local water plans developed under chapters 103B and 103D;

(8) the financial capability of the local government to solve its flood hazard problems without financial assistance; and

(9) the estimated cost and method of financing of the proposed mitigation measures based on local money and federal and state financial assistance.

(b) If the amount of the grant requested is \$75,000 or more, the commissioner shall determine, under the considerations in paragraph (a), whether any part of the grant should be awarded. The commissioner must submit an appropriation request to the governor and the legislature for funding consideration before each odd-numbered year, consisting of requests or parts of grant requests of \$75,000 or more. The commissioner must prioritize the grant requests, under the considerations in paragraph (a), beginning with the projects the commissioner determines most deserving of financing.

(c) A grant may not exceed one-half the total cost of the proposed mitigation measures.

(d) After July 1, 1991, grants made under this section may be made to local governments whose grant requests are part of, or responsive to, a comprehensive local water plan prepared under chapter 103B or 103D.

*History: 1990 c 391 art 6 s 14*

#### **103F.165 FLOOD INSURANCE.**

Subdivision 1. **Policy.** It is the policy of the state that local governmental units subject to recurrent flooding participate in the national flood insurance program, Public Law Number 90-448, and amendatory and supplementary acts, so that the people of the state may have the opportunity to indemnify themselves from future flood losses through the purchase of the insurance.

Subd. 2. **List of recurrent flooding areas.** The commissioner shall prepare a list of local governmental units having areas subject to recurrent flooding and shall notify each local governmental unit included on the list of the findings. If a local governmental unit objects to the commissioner's findings, it shall submit evidence supporting its objections within 45 days after receiving the commissioner's notification. The commissioner shall accept or reject the findings of each local governmental unit submitting evidence, shall prepare an amended list of local governmental units having areas subject to recurrent flooding, and shall notify each local governmental unit of its inclusion on the amended list.

Subd. 3. **Application for flood insurance.** Within 120 days after receiving notice of inclusion on the amended list, each local governmental unit shall apply for participation in the national flood insurance program in the manner prescribed by federal laws and regulations.

*History: 1990 c 391 art 6 s 15*

## SOUTHERN MINNESOTA RIVERS BASIN AREA II

### 103F.171 SOUTHERN MINNESOTA RIVERS BASIN AREA II BOUNDARIES.

For the purposes of sections 103F.171 to 103F.187, the term "southern Minnesota rivers basin area II" means the area within the watersheds of rivers and streams that are tributaries of the Minnesota River from the south between the cities of Ortonville and Mankato. Major rivers included within the watershed are the Yellow Bank, Lac Qui Parle, Yellow Medicine, Redwood, and Cottonwood. All of Lac Qui Parle, Yellow Medicine, and Redwood counties, and parts of Lincoln, Lyon, Pipestone, Murray, Cottonwood, and Brown counties are included within the boundaries of the area.

*History: 1990 c 391 art 6 s 16*

### 103F.173 PROGRAM.

There shall be a state grant-in-aid pilot program of providing financial assistance to units of local government, including counties, soil and water conservation districts, and watershed districts, located in the southern Minnesota river basin area II for project and construction costs for the building of floodwater retarding and retention structures within a general plan for floodplain management.

*History: 1990 c 391 art 6 s 17*

### 103F.175 AID FORMULA.

Grants may be made by the board of water and soil resources to a local governmental unit for the purposes of sections 103F.171 to 103F.187 in an amount not to exceed 75 percent of the total cost of each project, including site acquisition, engineering, and construction. If federal funds are being utilized for a portion of the project costs, the state contribution may not exceed 50 percent of the remaining nonfederal costs. If the structure is located in the state of South Dakota, the two states shall share the nonfederal costs equally. Money granted by the state may not be used for any project of stream channelization.

*History: 1990 c 391 art 6 s 18*

### 103F.177 OPERATION WITHIN AGENCY.

Subdivision 1. **Board of water and soil resources.** The board of water and soil resources shall supervise the grant-in-aid pilot program pursuant to sections 103F.171 to 103F.187.

Subd. 2. **Procedures and forms.** The board shall devise procedures and forms for application for grants by the local units of government, and review of and decision on the applications by the state board.

Subd. 3. **Staff position.** A professional engineer shall be employed by the board to work exclusively on the technical implementation and engineering of the pilot project established pursuant to sections 103F.171 to 103F.187. The engineer shall assist the local units of government and the board to achieve the purposes of the project, and shall have duties including:

- (1) field review and analysis of projects and project sites;
- (2) preparation of permit applications, including evaluation of environmental effects;
- (3) development of recommended pertinent provisions of permits for specific projects;





## CHAPTER 5

### REGULATIONS: DISTRICTS AND USES

Topics to be covered:

1. Introduction
2. Legislative Authority and Mandates
3. Underlying Ordinance
4. Overlay District
5. Properties Regulated by a Floodplain Ordinance
  - Floodway/Flood Fringe Determination
6. Regulatory Flood Protection Elevation
7. Floodplain Uses
  - A. Permitted Uses
    - Floodway/ Flood Fringe/ General Floodplain Districts
  - B. Conditional Uses
    - Floodway/ Flood Fringe/General Floodplain Districts
  - C. Nonconforming Uses
    - Floodway/Flood Fringe Nonconformities
    - Maintenance and Repairs

#### 1. Introduction

Land use regulations are the cornerstone of all floodplain management programs. Regulatory controls provide a long-term approach to flood damage reduction. These controls require new building activity in the floodplain to be constructed in a manner which should eliminate future flood-related damages, and protect the public health and safety.

This chapter will review the **minimum** state and federal land use regulatory standards applicable in floodplain areas. It must be remembered that each community has the option to adopt and enforce regulations more restrictive than these minimum standards, of which many Minnesota cities and counties have elected to do. Therefore when reviewing this chapter, it may be helpful to refer to the actual language of your community's floodplain ordinance.

Looking ahead, Chapter 6 will address subdivision of land and the use of manufactured homes in the floodplain, as well as the relationship of flood insurance to regulations. Chapter 7 will

discuss the day-to-day administration of a typical floodplain ordinance. The duties and responsibilities of various individuals within the community will be highlighted. Suggestions, helpful forms and procedures which may be utilized by local administrators have also been included.

#### 2. Legislative Authority and Mandates

Existing state enabling legislation has long given local governmental units the discretionary authority to plan and regulate a broad category of land use development activities. This authority has included local adoption of comprehensive land use plans, official maps, zoning and subdivision ordinances and building codes.

The State Floodplain Management Act (M.S. Chapter 103F) **mandates** the local adoption of floodplain regulations when adequate technical data are available to identify the 100-year floodplain. The state Floodplain Management Act, coupled with the minimum state standards found in Minnesota Rules, parts 6120.5000 to 6120.6200 - Floodplain Management Rules (see Appendix 5A), identify the specific allowable land uses and development standards applicable (only) to floodplain areas. Many communities will have previously adopted zoning and subdivision ordinances and building codes; the community's adoption of specific floodplain management regulations at a later date only amends and builds upon these existing codes and ordinances. When adopting floodplain regulations, a community must follow the prescribed procedures in the respective enabling legislation for adoption and enforcement of these controls.

(Note: This chapter will not discuss the authorities of certain classes of towns to plan and zone. Because of the way community eligibility is established and maintained for the NFIP, county government must insure floodplain regulations are adopted and enforced properly for the unincorporated areas of the county -

except for Hennepin and Ramsey Counties. Municipalities must adopt floodplain regulations for incorporated areas. The DNR is very cautious in having towns adopt floodplain regulations. Further questions regarding township zoning should be referred to your DNR area hydrologist for further consultation.)

### 3. Underlying Ordinance

Zoning regulations may control a broad category of activities, such as the use of land or buildings within respective (zoning) districts of a community. Figure 5.1 below shows where a hypothetical community has been divided into two districts (R-1 and C-1) before the community adopted its floodplain zoning ordinance. The associated zoning ordinance text will specify what uses of land or structures are permissible in each district and may regulate the size, bulk, setback and density of structures in these respective districts.

It is fair to say many initial ordinances were adopted to provide for the safe and orderly development and functioning of the community, but little specific attention was given to flooding conditions or floodplain management principles. Therefore the goal of the state mandated floodplain ordinance adoption is to: 1) shore-up the

gaps in local regulatory programs where they exist; and 2) use existing enabling legislation for ordinance adoption and enforcement procedures.

It must be kept in mind that minimum state and federal floodplain standards only require revised or new local regulatory programs to insure: 1) all new floodplain development is properly protected against flood damage; 2) the health and safety of floodplain occupants is insured; and 3) floodway areas are devoted to essentially open space uses so that floodplain encroachments do not increase flood levels above acceptable limits to the detriment of others. These concepts will be discussed in greater detail later in this chapter.

### 4. Overlay District

Figure 5.2 on the following page, shows our hypothetical community's zoning district boundaries after it has adopted its regulatory floodplain district boundary as an overlay district. In this case, the community has taken its 100-year floodplain and divided it into floodway and flood fringe districts. The floodway and flood fringe districts are super-imposed over the existing (underlying) zoning use districts and the existing zoning ordinance text must be revised to incorporate the appropriate land use and flood protection standards mentioned above.

Communities which do not have existing underlying zoning regulations in effect at the time they adopt floodplain controls are only required to meet state and federal minimum standards for floodplain management (following the same procedures for ordinance adoption and enforcement procedures specified in the respective enabling legislation). At the time of adoption, a community would have to decide whether it wishes to proceed to adopt regulations addressing only floodplain development issues or adopt broader community-wide regulations addressing such issues as density, use of land, setbacks, and height and bulk limitations.

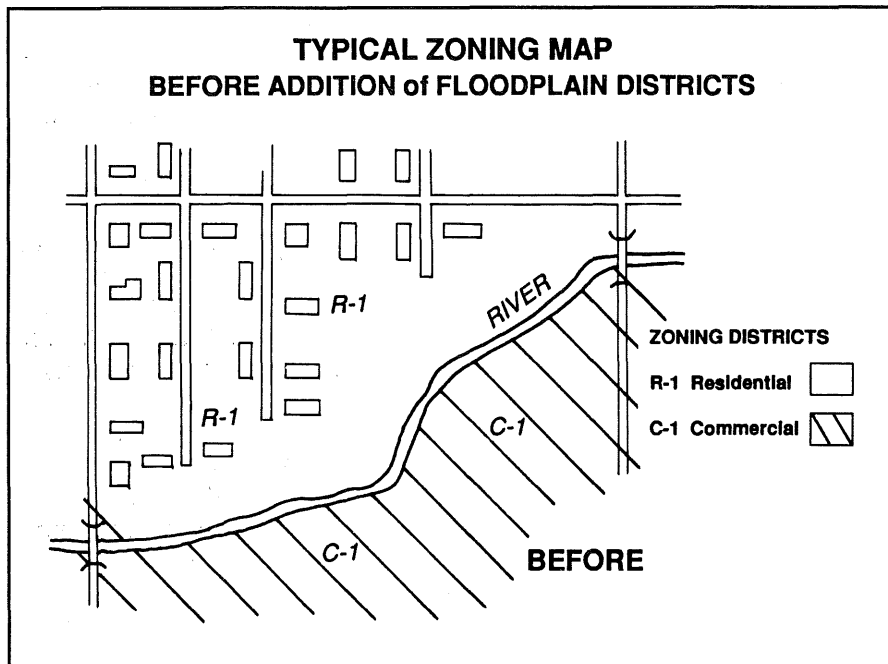
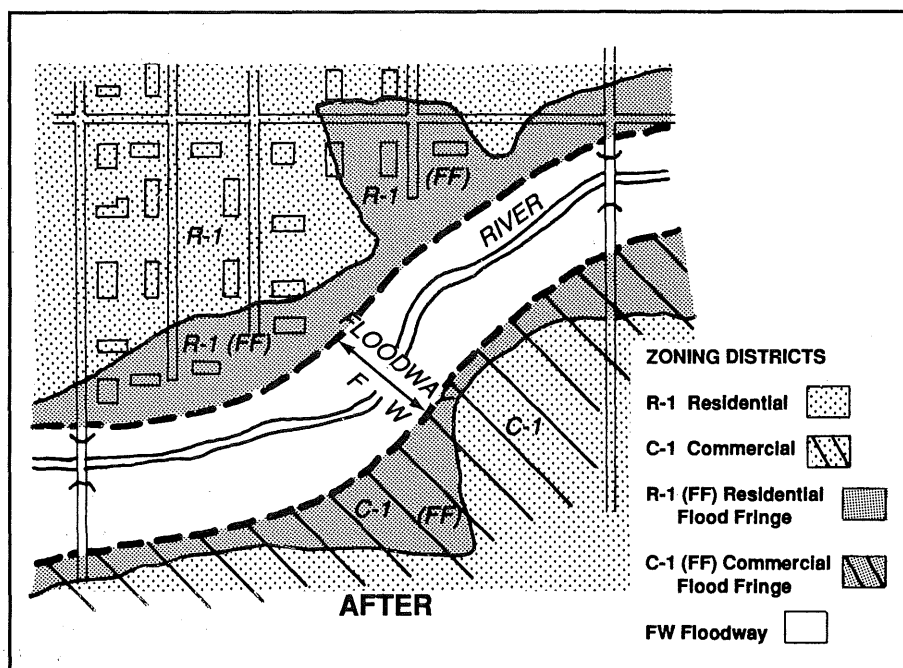


Figure 5.1 Community officials should carefully review all floodplain development proposals to insure compliance with their ordinance.



**Figure 5.2 Typical zoning map with floodplain district overlay**

The DNR takes an active role in assisting communities to adopt floodplain regulations compliant with minimum state and federal standards. DNR coordinates its review of floodplain ordinances with the Federal Emergency Management Agency to insure all federal standards are also met. The Floodplain Management Act does require that the Commissioner of Natural Resources to give prior approval of all locally adopted or amended floodplain regulations after June 30, 1970.

## 5. Properties Regulated by a Floodplain Ordinance

The first step in regulating floodplain development is to establish a regulatory jurisdiction and determine when a proposed activity is within the jurisdiction of the ordinance. All communities in Minnesota have identified their regulatory floodplain to encompass the area inundated by the 100-year flood. A community must adopt the flood insurance study and maps by reference and declare them to be a part of the official zoning map of the community. A community may choose to transfer its floodplain boundaries directly onto the official zoning map, however the FIS/maps should be consulted to confirm floodway and flood fringe delineations (and base flood/100-year flood elevations).

It is not always an easy matter to determine whether a particular structure or property is located in the floodplain. The property may be situated very close to the outer limits of the floodplain and the flood outline map may be of insufficient scale or detail to provide for an accurate determination. In such cases, it is the responsibility of the local official reviewing permit applications to determine whether or not the property is located in the floodplain. If the proposed activity is located in the floodplain,

then provisions of the ordinance, such as building (lowest floor) elevation and use requirements, would apply.

When a dispute arises over the exact floodplain boundary, the actual elevation of the property must be compared to the 100-year flood elevation shown on the flood profile or FIRM adopted by local ordinance. Minnesota floodplain management standards state, "Where a conflict exists between the floodplain limits on the official map and actual field conditions, the flood elevations shall be the governing factor in locating the regulatory floodplain limits". For those areas where a detailed engineering study has been performed, the actual ground elevation and lowest floor elevation may have to be surveyed and compared to the 100-year flood elevation shown on the FIRM.

For those areas where 100-year flood elevations have not been provided to the community (approximate study areas), the location of the property would have to be compared against the delineated floodplain boundaries and the best available information. The local zoning official can require the developer or building permit applicant to follow a technical study process to determine a 100-year flood elevation in approximate study areas. Approximate study areas are commonly referred to as a "General Floodplain District" in the local ordinance and development proposals are subject to a conditional use permit review process. As time permits, the DNR will assist a community in this technical review



process if supplied with the supporting data, e.g., surveyed cross sections. Once a 100-year flood elevation is established, it is again a matter of comparing that elevation with the actual ground elevation for the property in question. A detailed discussion of approximate study areas is contained in Chapter 3.

**Floodway/Flood Fringe Determination**

When a development proposal is determined to be located in the regulatory floodplain, it will then be necessary to determine whether the property is located in the floodway or flood fringe district. This is extremely important because floodplain controls normally distinguish between allowable uses in floodway and flood fringe districts.

For areas that have been studied in detail, the Flood Boundary and Floodway Map (FBFM) or the FIRM, with the new map format, should normally be used in making a floodway/flood fringe boundary determination. The actual location of the floodway can be measured in the field by using a distance scaled off the zoning map or FBFM/FIRM from a known point of

reference, such as a street or top of river bank. Where the exact location of the floodway is desired, the original hydraulic model developed for the flood insurance study should be consulted. This information is available from the DNR. In approximate study areas, the floodway/flood fringe boundaries are determined on a case-by-case basis via the conditional use permit process. More detail is available in Chapter 3.

**6. Regulatory Flood Protection Elevation**

All floodplain ordinances in Minnesota will include the term Regulatory Flood Protection Elevation (RFPE). The RFPE represents the elevation to which new floodplain development must be elevated or floodproofed. For example, all new residential structures must be elevated on fill such that the lowest floor, including basement, is no lower than the RFPE. Since the RFPE represents an elevation at a specific location along a stream, the RFPE must be determined for each and every floodplain development proposal.

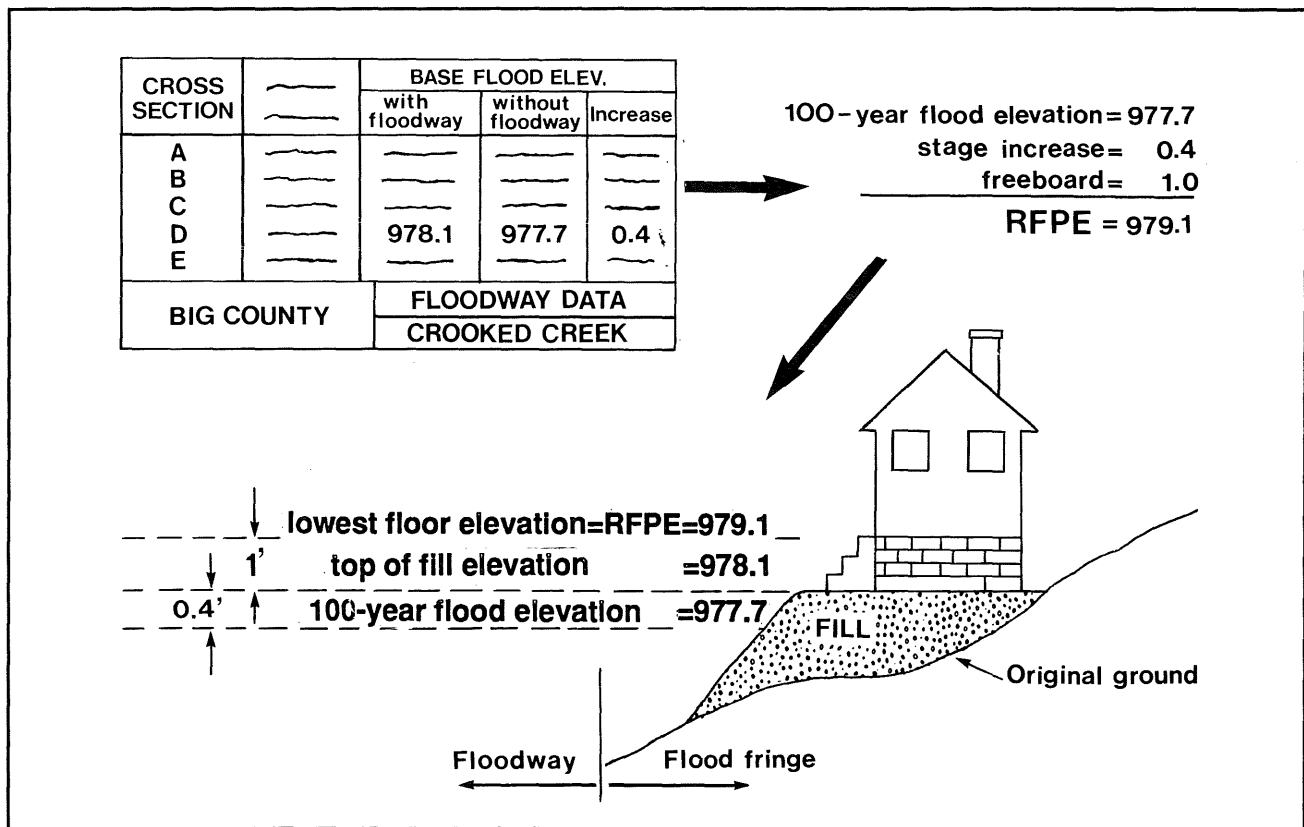


Figure 5.3 This figure illustrates the use of the RFPE in the construction of a single family home within the flood fringe. By using the above formula, and entering the data from cross section D on Crooked Creek, the RFPE can be determined for the new residential structure.

The RFPE is determined as follows:

$$\begin{aligned} \text{RFPE} = & \text{100-year flood elevation} \\ & + \text{stage increase to the} \\ & \quad \text{100-year flood level due} \\ & \quad \text{to potential filling} \\ & \quad \text{in designated flood fringe} \\ & \quad \text{areas} \\ & + \text{1 foot of freeboard*} \end{aligned}$$

\*Optional, but strongly recommended; check the specific language in your ordinance.

## 7. Floodplain Uses

Certain land uses and construction methods are deemed perfectly acceptable on their face for floodplain areas. Therefore, a floodplain zoning ordinance may use the standard zoning convention of identifying these uses as **permitted uses** within the floodplain. Obviously, floodway and flood fringe areas must be treated differently and will have different sets of permitted uses. **For all floodplain permitted uses, the community must require a building/use permit prior to:** the erection, addition or alteration of any building, structure, or portion thereof; the use or change of use of a structure, building or land; the extension or change of a nonconforming structure or use of land; and the placement of fill or excavation of land.

Certain uses and construction methods for the floodplain are not accepted on face value as appropriate, but also on face value cannot be positively ruled as inappropriate. A special review process could demonstrate adequate precautions can be taken, subject to specified standards and criteria in local ordinance, to insure compliance according to the intent of the ordinance. The conditional/special use permit is the standard convention found in many zoning ordinances. The following activities in the respective floodplain districts are traditionally treated as **conditional uses**:

- Floodway - fill, storage of materials and equipment and structures accessible to certain specified open space uses;
- Flood Fringe - where floodproofing a structure is proposed in lieu of elevating a building on fill to the RFPE, and

- General Floodplain District (approximate study areas) - any activity which requires fill, obstructions, structures or storage of materials and equipment.

For regulatory purposes, the 100-year floodplain is divided into two districts, the **floodway** and **flood fringe**. For some communities, these districts were originally determined along with the 100-year flood elevations during the flood insurance study process. These districts should be shown on either the community's official zoning map or the Flood Boundary and Floodway Map found in the FIS.

As previously discussed in Chapter 3, floodway/flood fringe districts were designated only for detailed study stream reaches. For regulatory purposes, approximate study areas (shown as "unnumbered" A Zones on the Flood Insurance Rate Map) are generally classified as **general floodplain districts**. While all counties will have designated general floodplain districts, many cities will not, because their floodplain areas were studied in detail.

### A. Permitted Uses

#### Floodway District

The floodway district is a high hazard area adjacent to the stream channel and is considered the minimum area necessary to convey floodwater downstream. The floodway is generally subject to faster flowing water and greater flood depths.

From a "use" standpoint, floodway use restrictions often change or restrict uses previously allowed in the underlying zoning district. Only open space type activities are allowed. This is necessary to insure that encroachment from new development (e.g., roads, parking areas, loading areas, structures and storage of materials and equipment) do not further obstruct flood flows. Those open space activities specified in the underlying ordinance consistent with this standard can be allowed in the floodway.

The following uses can be permitted uses in the floodway provided they are not prohibited by the underlying ordinance use district classifications and provided they do not include structures, fill, or storage of materials or equipment.



**Figure 5.4** A community park is an appropriate open space use in a floodway district.

- 1) Agricultural - general farming, pasture, horticulture, and sod farming;
- 2) Industrial/Commercial - loading areas, parking areas, and airport landing strips;
- 3) Recreation - tennis courts, parks, picnic ground, ball fields, nature preserves, target ranges and recreational trails (a golf course, while an open space use, can suffer significant flood related damages and is therefore not necessarily an appropriate use within the floodplain); and
- 4) Residential - lawns, gardens, parking and play areas.

### Flood Fringe District

The flood fringe district is a lower hazard area within the 100-year floodplain but outside of the floodway zone. The flood fringe generally consists of floodwater storage and “backwater” areas and is often characterized by lower water depths and velocities than the floodway district.

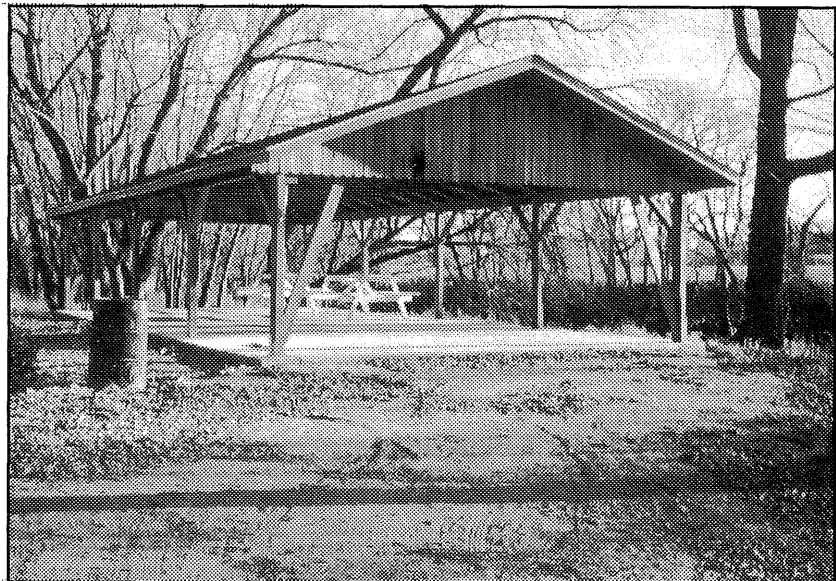
The flood fringe regulations need not change the allowable uses specified by the underlying ordinance. The goal of flood fringe regulations is to insure that a use in the flood fringe district is protected to the RFPE and the health and safety of the occupants are insured.

Communities may allow new, or additions to, residential, commercial and industrial buildings within the flood fringe district. The new development must be elevated on fill, or otherwise protected against flood damage, to the RFPE. Fill may also be permitted for elevating access

roads and accessory uses, such as parking lots and storage areas.

The following uses are permitted uses within the flood fringe district provided they are not prohibited by the underlying ordinance:

- 1) Any permitted use in the floodway;
- 2) Accessory structures constructed in conformance with the standards for the floodway, i.e., elevated or floodproofed to the RFPE; and
- 3) Residences and other principal structures constructed on fill so that the lowest floor including basement, is at or above the RFPE.



**Figure 5.5** This park shelter, located in a floodway district, was constructed in a manner which minimizes potential flood damage and obstruction of flood flows.

The finished fill elevation must be no lower than 1 foot below the RFPE\* and must extend at that elevation for at least 15 feet beyond all sides of the building. Residential structures must have road access to the structure no lower than 2' below the RFPE\*, unless a variance is granted by the community (see later discussion on variances).

### General Floodplain District

The general floodplain district corresponds to the approximate study areas discussed in Chapter 3. Areas are designated as general floodplain district primarily because sufficient data are not available to divide the floodplain into floodway and flood fringe districts.

Permitted uses listed for the general floodplain district are those generally listed for the floodway district. All other uses are conditional uses.

\*For the very few communities which do not include the foot of freeboard in their RFPE definition, then the fill must be no lower than the RFPE and road access must be no lower than 1 foot below the RFPE.

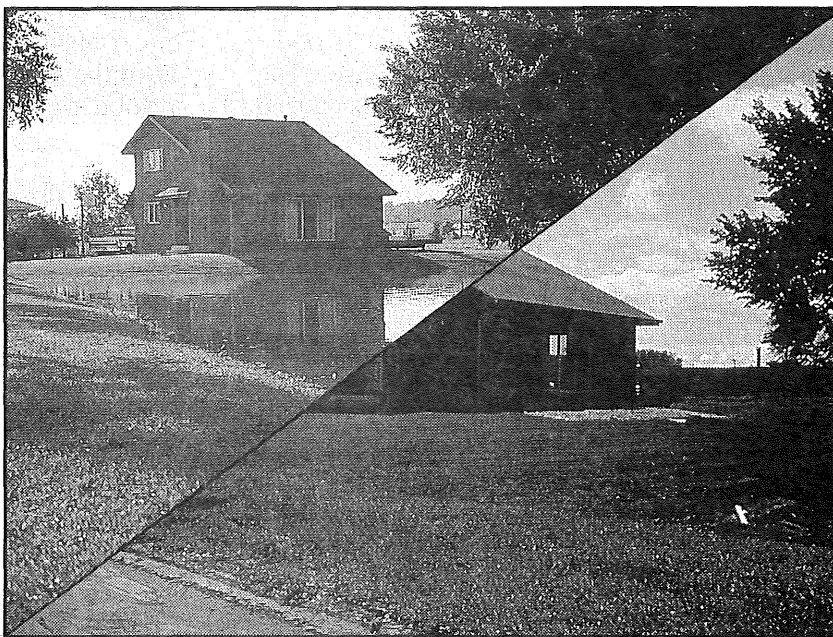


Figure 5.6 Residential homes can be considered permitted uses in a flood fringe district if elevated on fill to the RFPE.

### B. Conditional Uses

#### Floodway District

Conditional uses involving fill, structures or storage of materials in the floodway must receive special attention, prior to approval, to prevent the obstruction of the floodway. In addition, these uses are generally more susceptible to flood damage than the permitted uses listed earlier. As a result, a determination should be made as to the appropriateness of the proposed use and its need to be located in the floodway. Examples of potential conditional uses in the floodway include:

- 1) Structures accessory to open space uses ;
- 2) Placement of fill;
- 3) Sand and gravel operations;
- 4) Marinas, docks, piers and other water control structures;
- 5) Railroads, streets, and pipelines; and
- 6) Storage yards for materials or equipment.

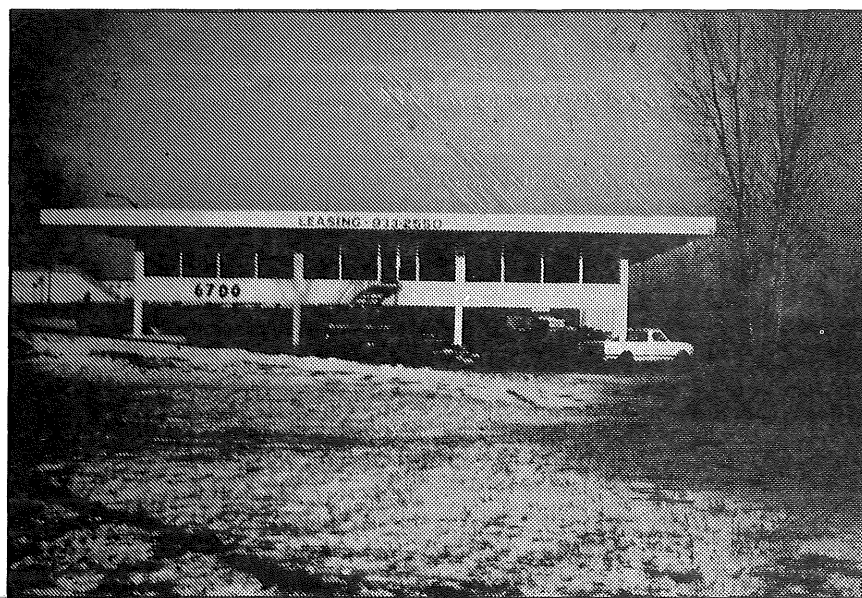


Figure 5.7 Commercial structures located in the flood fringe district, which are floodproofed to the RFPE in lieu of elevating on fill, are classified as conditional uses.



The critical determination for floodway conditional uses is whether the use obstructs flood flows such that flood elevations increase. The amount of the increase in flood heights caused by a proposed use in the floodway is not based just on the effect of the single use acting alone. The ordinance must assume that other land owners within the stream reach have the same right to develop within the floodway. An accessory structure or small amount of fill may not cause a measurable increase, but the cumulative effect of many landowners taking similar actions may be substantial.

Structures designed for human habitation are not permitted because of the high velocities and depths of inundation generally occurring within the floodway district. Structures permitted as conditional uses must be accessory to an open space use (not commercial, manufacturing, residential, etc.) and have a low damage potential; must be situated so as to minimize obstruction to flood flows; and must be floodproofed in accordance with the State Building Code or, in its absence, the floodproofing standards stated in the local ordinance. Communities with relatively narrow floodways are encouraged to prohibit structures entirely within the floodway district since adequate alternative building sites should be available elsewhere in the community.

The placement of fill must be minimized to preserve the flow capacity of the floodway. Fill may be used for the purposes of landscaping or to fill localized depressions to create level terrain for a listed conditional use. It is not intended, however, that fill measurably obstruct the flow of flood waters.

Storage of materials that are buoyant, flammable, or otherwise injurious if transported by flood waters is prohibited for health and safety reasons. Storage of materials and equipment not

having these characteristics is permissible if the materials and equipment are readily removable from the area within the time available following a flood warning.

### Flood Fringe District

Conditional uses in the flood fringe involve alternate flood damage prevention methods. Different standards apply as to the type of structure.

**Residential Structures** - For residential structures, other methods of **elevating** the first floor (including basements) above the RFPE may be authorized where existing streets, utilities or small lot sizes preclude the use of fill. This



**Figure 5.8** Damage to belongings, in addition to the residential structure, can occur when buildings at an elevation below the RFPE are permitted in the flood fringe.

primarily involves use of piling or concrete support columns to elevate the residence. This type of building activity must be done in accordance with the State Building Code or, in its absence, the floodproofing standards adopted by local ordinance (see the following discussion on road access requirements).

Residential basements **below** the RFPE are not allowed unless a community has been granted a "basement exception" from the Federal Emergency Management Agency (FEMA). This topic is discussed in depth later in Chapter 6.

Non-residential Structures - Commercial, manufacturing and industrial buildings are usually elevated on fill so that their lowest floor is at or above the RFPE. These type of structures may also be dry flood proofed to the RFPE (FP-1 or FP-2 classification - see Chapter 8) as a conditional use. Accessory land uses, such as storage yards and parking lots may be at an elevation lower than the RFPE provided adequate warning time is available to safely remove materials.

The community will have many issues to resolve during the conditional use process when reviewing a floodproofing proposal. First, and foremost, is whether the floodproofing design specifications are adequate. Once a design is agreed upon, a certification procedure must establish that the building is constructed as designed. A floodproofing design plan may require lead time to put in place contingency measures (closure of openings, relocations of damageable items, etc.); and community officials must assess the adequacy of existing flood forecasting and warning capabilities. Provisions may have to be placed on the permit to limit certain activities below the RFPE. Periodic inspections may be necessary to insure that all the floodproofing provisions are adequately maintained. (Chapter 8 of this handbook is devoted exclusively to floodproofing.)

### General Floodplain District

Conditional uses in the general floodplain district are those uses that involve structures, fill, or storage of materials or equipment. An engineering analysis must be performed to determine if the proposed use lies within the floodway or flood fringe district of the previously unstudied general floodplain district. The appropriate floodway or flood fringe district standards can then be referenced. This analysis will also provide the RFPE which is needed to determine the proper building elevation.

### C. Nonconforming Uses

Existing structures or uses of land or structures that do not meet all of the standards of an ordinance are called "nonconformities". Most zoning regulations recognize the right of landowners to continue to use and occupy structures and land that existed prior to the adoption of the ordinance. The commonly used term is that a nonconformity is "Grandfathered In" when the

regulations are adopted. This right extends only to the structure and land as they exist when an ordinance is adopted and does not give the landowner the absolute right to extend or enlarge the structure or intensify the use. One of the long term aims of zoning is to eliminate nonconformities either by making a structure conforming or by having a nonconforming use of land or a structure replaced by a conforming use.

The zoning enabling legislation for municipalities (M.S. Chapter 462) does not mention the subject of nonconformities. Municipalities may regulate nonconformities if they so choose. This would fall under the umbrella of a local unit of government's "implied powers" to protect the public health, safety, and general welfare (often called the "police powers" of local units of government).

The enabling legislation for county planning and zoning activities (M.S. Chapter 394) does contain specific language pertaining to the regulation of nonconformities.

State and federal floodplain standards build upon existing regulatory programs, and do require that communities, both cities and counties, regulate floodplain nonconformities. These standards allow legally established floodplain nonconformities to be "grandfathered" at the time of ordinance adoption. However, state and federal standards mandate that the expansion, intensification of use and reconstruction after damage of nonconformities be done in a manner to prevent future flood damages and obstruction to flood flows.

The long term goal of regulating existing floodplain nonconformities is to: 1) preserve and re-establish the open space characteristics of the floodway by discouraging the longevity of existing "use" nonconformities; and 2) eliminate or upgrade "structure" nonconformities that are not properly elevated on fill or floodproofed to the RFPE.

### Floodway/Flood Fringe Nonconformities

Different regulatory provisions apply depending on whether the nonconformity is located in the floodway or flood fringe district. Within the floodway district, the use (i.e., the use of a principal or accessory structure for residential, commercial or industrial purposes) or accessory structure for residential, commercial or industrial purposes is prohibited. Therefore, greater

restrictions are placed on nonconformities in the floodway than in the flood fringe district. The following actions are **prohibited** in the floodway:

- 1) Any **addition** to a structure in the floodway district, unless the addition is to an accessory structure of an open space use.
- 2) **Reconstruction** of a residential, commercial or industrial structure damaged to greater than 50% of its value at the time of loss unless the structure is relocated **outside** of the floodway.
- 3) An intensification of use that increases the flood damage potential, potential for loss of life or increases the stage of the 100-year flood.

Greater flexibility normally exists for nonconformities within the flood fringe district. In the **flood fringe**, the existing **use** is normally permissible, but the **structure** itself is not in compliance with the ordinance. Therefore, any type of addition, alteration, reconstruction or intensification of use is generally allowed provided the proposed activity does **not** increase the flood damage potential of the structure or the potential for loss of life. Specifically, within the flood fringe district:

- 1) Any addition to a nonconforming structure must be elevated on fill or floodproofed to the RFPE in accordance with the provisions of the local unit of government's floodplain management ordinance;
- 2) Local government floodplain controls require the **entire** structure to be permanently changed to a conforming structure when the cumulative improvements, since it became a

nonconforming structure, exceed 50% of its current market value;\*

- 3) An intensification of use must not increase the flood damage potential of the original use; and
- 4) Any structure destroyed to greater than 50% of its market value at the time of loss may be reconstructed provided the entire structure and/or use of land complies with the standards of the ordinance.\*

It should also be remembered that a structure may be nonconforming with other zoning provisions in the regulations underlying the floodplain ordinance (e.g., height, area, setback, use, etc.). Communities may require some or all of these underlying provisions to be met when a floodplain nonconformity is expanded, reconstructed, intensified, etc. Additionally, a community's underlying nonconformity regulations may be more restrictive than that generally permissible for floodplain areas. For example, a community may choose to not allow an alteration, reconstruction or intensification of use of **any** nonconformity, be it floodplain or non-floodplain. The approach for nonconformities is similar to the entire structuring of the floodplain ordinance - that is, only revise underlying regulations to the degree necessary to incorporate minimum state and federal standards. Where the underlying ordinance is more restrictive, it remains in effect.

\*In a cumulative system, structures do not necessarily have to be substantially damaged to be considered a "substantial improvement" (defined by FEMA as "any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds 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 damaged occurred"). For example if, prior to a disaster, a structure had already used 25% of its allotted 50% for improvements, that structure would only have to incur 25% damage during the disaster to become a substantial improvement possibility.

## Maintenance and Repairs

Minimum state and federal floodplain standards for nonconformities do not apply to normal maintenance and repairs, or repairs or alterations required by an appropriate regulatory official to keep a structure in a safe and habitable condition. In this case, the following activities are permissible below the RFPE.\*

### Normal Repairs and Maintenance:

- Re-siding
- Repairs to plumbing, electrical systems, etc.
- Reroofing
- Installation of storm windows
- Insulation
- Installation of replacement heating or air conditioning unit
- Painting

Repairs and alterations necessary to keep a structure in a safe and habitable condition:

- Installation of indoor plumbing
- Rewiring/updating to comply with electrical codes
- Installation of central air conditioning
- Structural alterations necessary for the safety of the building or that prevent flood damages
- Alterations, repair, or maintenance **reasonably** done under emergency conditions to preserve or protect life or property

Local officials are encouraged to stress to their constituents floodproofing techniques may be available to prevent future damage. For example, heating and air conditioning units may be elevated on platforms or bracings above the RFPE. Non water-damageable materials should be used in spaces below the RFPE, e.g., clay tile instead of carpeting.

An example for determining cumulative improvements on non-conforming uses is included in Chapter 7.

\*Note: These repair and maintenance activities are permitted individually to improve conditions as they deteriorate. In the case of an improvement or substantial damage occurring, these items must be added to the cumulative costs UNLESS 1) an appropriate building inspector, code enforcement officer, fire marshal or health officer was informed about and knew the extent of the code-related deficiencies and 2) the deficiency was in existence prior to the damage event or improvement and is not triggered solely by the fact that the structure is being improved or repaired.









## APPENDIX 5A

### FLOODPLAIN MANAGEMENT

#### 6120.5000 DEFINITIONS.

Subpart 1. **Scope of terms.** For the purposes of these rules, certain terms or words used herein shall be interpreted as follows.

Subp. 2. **Building code.** "Building code" means a collection of regulations adopted by a local governing body setting forth standards for the construction, addition, modification, and repair of buildings and other structures for the purpose of protecting the public health, safety, and general welfare.

Subp. 3. **Channel.** "Channel" means a natural or artificial depression of perceptible extent, with definite bed and banks to confine and conduct flowing water either continuously or periodically.

Subp. 4. **Commissioner.** "Commissioner" means the commissioner of natural resources.

Subp. 5. **Encroachment lines.** "Encroachment lines" means the lateral limits or lines drawn along each side and generally parallel to a stream or another body of water, which delineates the floodway and within which the flood-carrying capacity of the stream or other body of water is to be preserved. Their location, if along a stream, should be such that the floodway between them will effectively carry and discharge a flood not less than the regional flood.

Subp. 6. **Equal degree of encroachment.** "Equal degree of encroachment" means a method of determining the location of encroachment lines so that floodplain lands on both sides of a stream are capable of conveying a proportionate share of flood flows. This is determined by considering the effect of encroachment on the hydraulic efficiency of the floodplain along both sides of a stream for a significant reach.

Subp. 7. **Flood.** "Flood" means a temporary rise in stream flow or stage which results in inundation of the areas adjacent to the channel.

Subp. 8. **Flood frequency.** "Flood frequency" means the average frequency, statistically determined, for which it is expected that a specific flood stage or discharge may be equalled or exceeded. By strict definition, such estimates are designated "exceedence frequency," but in practice the term "frequency" is used. The frequency of a particular stage or discharge is usually expressed as having a probability of occurring once within a specified number of years. See also recurrence interval in subpart 20.

Subp. 9. **Flood fringe.** "Flood fringe" means that portion of the floodplain outside of the floodway.

Subp. 10. **Flood peak.** "Flood peak" means the highest value of stage or discharge attained during a flood event; thus peak stage or peak discharge.

Subp. 11. **Floodplain.** "Floodplain" means the areas adjoining a watercourse which has been or hereafter may be covered by the regional flood.

Subp. 12. **Floodplain management.** "Floodplain management" means the full range of public policy and action for ensuring wise use of the floodplains. It includes everything from collection and dissemination of flood control information to actual acquisition of floodplain lands, construction of flood control measures, and enactment and administration of codes, ordinances, and statutes regarding floodplain land use.

Subp. 13. **Floodplain regulations.** "Floodplain regulations" means the full range of codes, ordinances, and other regulations relating to the use of land and construction within floodplain limits. The term encompasses zoning ordinances, subdivision regulations, and sanitary and building codes.

Subp. 14. **Flood profile.** "Flood profile" means a graph or a longitudinal plot of water surface elevations of a flood event along a reach of a stream or river.

Subp. 15. **Floodproofing.** "Floodproofing" means a combination of structural provisions, changes or adjustments to properties and structures subject to flooding primarily for the reduction or elimination of flood damages to properties, water and sanitary facilities, structures, and contents of buildings in a flood hazard area.

Subp. 16. **Flood stage.** "Flood stage" means, as commonly used by the U.S. Weather Bureau and others, that stage, at a particular river gauge, where overflow of the natural banks of the stream results in significant flood damage in any portion of the reach for which the gauge is a representative index.

Subp. 17. **Floodway.** "Floodway" means the channel of the watercourse and those portions of the adjoining floodplains which are reasonably required to carry and discharge the regional flood.

Subp. 18. **Local governmental unit.** "Local governmental unit" means a county, city, village, or borough.

Subp. 19. **Reach.** "Reach" means the hydraulic engineering term used to describe longitudinal segments of a stream or river influenced by a natural or man made obstruction. In an urban area, the segment of a stream or river between two consecutive bridge crossings would typically constitute a reach.

Subp. 20. **Recurrence interval.** "Recurrence interval" means the average interval of time, based on a statistical analysis of actual or representative stream flow records, which can be expected to elapse between floods equal to or greater than a specified stage or discharge. The recurrence interval is generally expressed in years. See also flood frequency in subpart 8.

Subp. 21. **Regional flood.** "Regional flood" means a flood which is representative of large floods known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100-year recurrence interval.

Subp. 22. **Rural areas.** "Rural areas" means all areas not included under urban areas, such as agricultural, forest, and undeveloped areas.

Subp. 23. **Standard project flood.** "Standard project flood" means the flood that may be expected from the most severe combination of meteorological and hydrological conditions that is considered reasonably characteristic of the geographical area in which the drainage basin is located, excluding extremely rare combinations. Such floods are intended as practicable expressions of the degree of protection that should be sought in the design of flood control works, the failure of which might be disastrous.

Subp. 24. **Subdivision regulations.** "Subdivision regulations" means regulations and standards established by a local unit of government with authority granted under a state enabling law, for the subdivision of land in order to secure coordinated land development.

Subp. 25. **Urban areas.** "Urban areas" means the area within the present corporate limits plus the adjoining areas that are or could be under the statutory extraterritorial zoning jurisdiction of any city, village, or borough.

Subp. 26. **Watercourse.** "Watercourse" means a channel in which a flow of water occurs either continuously or intermittently in a definite direction. The term applies to either natural or artificially constructed channels.

Subp. 27. **Zoning ordinance.** "Zoning ordinance" means an ordinance adopted by a local unit of government, with authority from state enabling legislation, which under the police power divides local governmental areas into districts and, within each district, regulates the use of land.

**Statutory Authority:** *MS s 104.05*

**6120.5100 POLICY.**

The following standards and criteria establishing minimum floodplain management standards are promulgated in accordance with the authority granted in Minnesota Statutes 1969, section 104.05 and apply to land adjacent to all watercourses of the state except as herein provided.

**Statutory Authority:** *MS s 104.05*

**6120.5200 SCOPE.**

These standards and criteria for the management of flood-prone areas and private and governmental uses located therein pertain to all watercourses, both intrastate and interstate, where the drainage area of the watercourse is over two square miles and where the commissioner finds a watercourse having a drainage area under two square miles has significant flood hazard.

**Statutory Authority:** *MS s 104.05*

**6120.5300 SEVERABILITY.**

The provisions of these rules shall be severable and the invalidity of any lettered paragraph, subparagraph, or subdivision thereof shall not invalidate any other lettered paragraph or subparagraph, subdivision, or any other part.

**Statutory Authority:** *MS s 104.05*

**6120.5400 LOCAL DUTIES.**

In accordance with Minnesota Statutes 1969, chapter 104, local governmental units shall:

A. submit to the commissioner for his review a list of available flood data, floodplain maps, and degree of flood damage potential for each watercourse having flood hazards;

B. adopt or amend a floodplain management ordinance which meets these minimum standards and criteria for floodplain management, upon the determination of the commissioner that sufficient technical information is available for the delineation of floodplains and floodways on a watercourse;

C. submit proposed floodplain management ordinances to the commissioner for his review and approval before adoption;

D. administer and enforce floodplain management ordinances upon adoption; and

E. submit to the commissioner for approval any amendments to floodplain management ordinances before adoption.

**Statutory Authority:** *MS s 104.05*

**6120.5500 COMMISSIONER'S DUTIES.**

The commissioner shall:

A. Establish statewide standards for management of floodplain areas which apply to private and governmental uses located therein.

B. Determine the availability of sufficient technical information for the delineation of floodplains and floodways on a watercourse.

C. Upon request, assist the local governmental unit in the drafting of a floodplain management ordinance which meets the provisions of Minnesota Statutes 1969, chapter 104 and the minimum standards set forth herein. This assistance may include, but not be limited to, creation of specific guidelines to be used locally in the formulation of reasonable regulations and other floodplain management practices based on sound technical data and consistent with state standards and community land use needs.

D. Review and approve floodplain management ordinances prior to adoption by the local governmental unit.

E. Where sufficient information is not available, cooperate to the fullest practical extent with appropriate federal agencies and local governmental units in securing adequate technical information which can be used for the delineation of floodplains and floodways along the state's watercourses.

F. Periodically review and upgrade floodplain management criteria based on new hydrologic, hydraulic, and other technical methodologies.

G. Disseminate to local governmental units, whenever available, technical information including information of federal programs involving floodplain areas, educational materials, and other material useful in carrying out a floodplain management program.

H. Survey the enforcement of floodplain management ordinances.

I. Coordinate federal, state, and local floodplain management activities in the state.

**Statutory Authority:** *MS s 104.05*

#### **6120.5600 TECHNICAL STANDARDS AND REQUIREMENTS FOR FLOODPLAIN EVALUATION.**

Subpart 1. **Scope.** Except as otherwise provided herein, or as new hydrologic and hydraulic techniques of nationwide scope and acceptance are developed and deemed acceptable by the commissioner, any federal, state, or local agency, any of their consultants, or any private consultants involved in the establishment and/or implementation of floodplain management studies or programs in Minnesota shall comply with technical standards prescribed in all applicable sections of these standards and criteria.

Subp. 2. **Flood frequency techniques for delineation of floodplain.** The regional flood shall serve as the basis for delineation of the floodplain and floodway for regulatory purposes.

The basic method of flood frequency analysis in the determination of regional flood flows shall be the log, Pearson Type III distribution (with log, normal as a special case) as described in the Federal Water Resources Council Bulletin 15, A Uniform Technique for Determining Flood Flow Frequencies, December 1967.

In those instances where inadequate stream flow data exists to allow use of the method outlined in the preceding paragraph, the commissioner may use or authorize use of other acceptable hydrologic methods or techniques.

Subp. 3. **Determination of extreme flooding events.** Whenever the commissioner finds that sufficient technical information is available to estimate the magnitude of floods larger than the regional flood (such as the standard project flood) this information shall be made available by the commissioner to the local unit of government for use by the public as general information.

Subp. 4. **Standards for technical hydrologic and hydraulic techniques in flood hazard evaluation.** In order to provide uniformity in the analysis of flood hazards and the effects of various artificial and natural obstructions to flood flows within floodplain areas the commissioner will adopt and require use of a uniform system for the analysis of technical factors including:

A. minimum required survey data needed to provide adequate vertical and horizontal ground control elevations and distances for the channel of a stream or river and the adjoining floodplain area;

B. referencing of bench marks used for vertical control data; and

C. procedures for computation of water surface profiles and analysis of backwater effects in floodplain areas.

**Statutory Authority:** *MS s 104.05*

## **6120.5700 MINIMUM FLOODPLAIN MANAGEMENT STANDARDS FOR LOCAL ZONING ORDINANCES.**

Subpart 1. **In general.** The standards contained in this part apply to the amendment or creation of local floodplain zoning ordinances.

To provide for comprehensive floodplain management, supplemental measures as contained in part 6120.5900 shall be enacted consistent with these standards.

These standards and criteria are considered to provide only a minimum degree of flood protection for floodplain developments. Local governmental units may enact local floodplain regulations which exceed these standards.

Subp. 2. **Minimum mapping standard.** All mapping used to delineate floodplain zoning districts shall include the following properly identified regulatory districts: floodplains, floodways, and flood fringe areas. Where adequate information is available the limits of the area subject to inundation by floods larger than the regional flood, as provided in part 6120.5600, subpart 3, shall be designated for public information purposes.

Local ordinances may superimpose the floodplain zoning districts on the prior official zoning map or the ordinance may adopt, by reference, a supplemental official map providing the supplemental map is approved by the commissioner.

The floodplain limits on the zoning map shall correspond to the actual area subject to inundation, not street or property lines, unless use of the latter would include all areas subject to inundation.

Subp. 3. **Delineation of the floodplain.** Delineation:

A. The delineation of the floodplain shall be based on the flood protection elevation as set forth in subpart 5.

B. Procedures for floodplain determination shall conform to technical standards established in part 6120.5600, subparts 2 and 4. Each local floodplain zoning ordinance must include a floodplain map conforming to the standards established in subpart 2.

C. In special instances and upon approval of the commissioner, the use of other techniques such as maps indicating limits of past flooding, detailed soil maps, and/or aerial photographic interpretation may initially serve as a basis for the delineation of floodplains for regulatory purposes provided that:

(1) the affected floodplains are generally undeveloped;

(2) the associated text of the zoning ordinance provides for a special permit use procedure to determine the effects of proposed construction upon flood stages and flood flows and to establish the flood protection elevation; and

(3) the local unit of government has initiated a program to ultimately obtain regional flood data.

D. Where a conflict exists between the floodplain limits illustrated on the official zoning map and actual field conditions, the flood elevations shall be the governing factor in locating the regulatory floodplain limits.

Subp. 4. **Delineation of the floodway.** Local government floodplain zoning ordinances shall designate a floodway. Exceptions may be allowed by the commissioner for those conditions listed in subpart 3, item C. A portion of the floodplain, outside of the immediate channel of a watercourse, shall be selected and designated as the floodway by a local governmental unit upon approval of the commissioner. The selection must be based on an evaluation of the flood hazard for the area which may be involved or affected by such designation and must conform to the following standards:

A. The limits of the floodway shall be designated so that permissible encroachments on the floodplain will not cause an increase in stage of the regional flood of more than 0.5 feet in any one reach or for the cumulative effect



of several reaches of a watercourse. If the increase in flood stage will materially increase the flood damage potential, the commissioner may require that such increases be less than 0.5 feet. The commissioner may authorize increases greater than 0.5 feet where studies show that further increases in flood stages will not materially increase the flood damage potential.

B. The limits of the floodway shall be based on a uniform degree of encroachment for a significant reach on both sides of a watercourse. Variances from this part may be authorized by the commissioner when topography, existing development patterns, and comprehensive land use plans justify a modified approach.

C. The floodway shall be determined consistent with minimum standards for technical hydrologic and hydraulic techniques and mapping standards contained in parts 6120.5600, subpart 4 and 6120.5700, subpart 2.

Subp. 5. **Flood protection elevations.** The flood protection elevations shall correspond to a point not less than one foot above the water surface profile associated with the regional flood plus any increases in flood stages attributable to encroachments on the floodplain established under subpart 4, item A. The flood protection elevations shall be clearly lettered at identifiable positions on the official zoning district map consistent with the water surface profile of the regional flood, or the profile shall be attached to and made part of the official zoning district map.

**Statutory Authority:** *MS s 104.05*

#### **6120.5800 ZONING: LAND USES PERMITTED IN FLOODWAY AND FLOOD FRINGE AREAS.**

Subpart 1. **Certification of compliance.** No vacant flood plain land shall be occupied or used and no building hereafter erected, altered, or moved shall be occupied until the applicant submits to the appropriate local official a certification by a registered professional engineer, land surveyor, or other qualified person designated by the local governing body that the finished fill and building floor elevations or other flood protection measures are in compliance with appropriate flood plain zoning provisions and other flood plain regulations.

Subp. 2. **Removal of lands from a flood plain district.** The floodplain designation on official zoning maps shall not be removed from floodplain areas adjacent to and outside of floodways unless it can be shown that the areas are filled to an elevation at or above the flood protection level and are contiguous to other lands lying outside the floodplain district or unless flood control measures which meet the standards of part 6120.5900, subpart 6, items B, subitem (1) and D are constructed and operative.

Subp. 3. **Permitted uses within the floodway or between levees.** Local zoning ordinances may designate specified uses as permitted or special permit uses provided such uses have a low flood damage potential and will not materially obstruct flood flows or increase velocities or stages of the regional flood. However, uses that are likely to cause pollution of waters, as defined in Minnesota Statutes 1969, section 115.01, are prohibited unless adequate safeguards approved by the state water pollution control agency are provided. All other uses are prohibited including storage of any potentially hazardous materials which if subject to flooding may become buoyant, flammable, explosive, or may be injurious to human, animal, or plant life. Permitted uses must not be detrimental to the uses permitted in adjoining districts. The following uses may be permitted within the floodway or between levees:

A. Uses having a low flood damage potential including agricultural uses, recreational uses, parking lots, loading areas, storage yards, airport landing strips, certain sand and gravel operations, water control structures, navigation facilities, and other open space uses.

B. Structures accessory to the above uses and commercial excavation and stockpiling of materials may be permitted if:

- (1) structures are not intended for human habitation;
- (2) structures will have a low flood damage potential;
- (3) structures or stockpiles of materials, if permitted, will be constructed and placed so as to offer a minimal obstruction to the flow of flood waters;
- (4) structures will be firmly anchored to prevent flotation; and
- (5) service facilities within these structures, such as electrical and heating equipment, will be at or above the flood protection elevation for the site as described in part 6120.5700, subpart 5, or adequately floodproofed as provided in part 6120.5900, subpart 3, item D.

C. Channel and harbor connections to public waters, constructed under authority of Minnesota Statutes 1969, chapter 105, which can be shown will not cause material increases in flood stages within the floodplain and which will not increase the flood hazard to properties adjacent to the floodplain.

D. Public utility facilities and water oriented industries which must be adjacent to watercourses provided that the development is located in such a manner that it will not significantly alter flood flows, heights, or velocities of the regional flood. Whenever necessary, compensating measures shall be required to be undertaken to offset any adverse effects of allowing the use within the floodway and to keep increases in stages of the regional flood within the limits specified in part 6120.5700, subpart 4, item A.

**Subp. 4. Development of flood fringe areas adjacent to and outside of floodways. Development:**

A. General provisions. All floodplain developments within designated flood fringe areas shall be compatible with local comprehensive plans.

Floodplain developments shall not adversely affect the efficiency or unduly restrict the capacity of the channels or floodways of any tributaries to the main stream, drainage ditches, or any other drainage facilities or systems.

B. Residential areas. The finished surface of the first floor or basement floor of any residential building or structure to be erected, constructed, reconstructed, altered, or moved on the floodplain shall ordinarily be placed on fill at or above the flood protection elevation. The fill shall be at or above the elevation associated with the regional flood plus any increase in the water surface elevation due to floodplain encroachment as described in part 6120.5700, subpart 4, item A. The fill shall extend at such elevation at least 15 feet beyond the limits of any structure or building erected thereon. Where existing streets or utilities are at elevations which make strict compliance with this provision impractical, the commissioner may authorize use of floodproofing or other measures or methods to provide protection to the flood protection elevation. Floodproofing or other protective measures may be allowed only upon issuance of a special use permit by the local governmental unit.

C. Commercial areas. Commercial buildings or structures generally are to be constructed on fill with no first floor or basement floor below the flood protection elevation. Accessory land uses such as yards, railroad tracks, and parking lots may be at lower elevations. However, in the absence of an adequate local flood warning system, no area shall be designed for use by the public which would be inundated to a depth greater than two feet or subjected to flood velocities greater than four feet per second upon the occurrence of the regional flood.

D. Manufacturing and industrial areas. Manufacturing and industrial buildings, structures, and appurtenant works shall be protected to the flood protection elevation. Measures shall be taken to minimize interference with normal plant operations especially for streams having protracted flood durations.

Certain accessory land uses such as yards, railroad tracks, and parking lots may be at lower elevations subject to requirements of item C. Local ordinances shall give due consideration to needs of industries whose businesses require that they be located in a floodplain area.

E. Public utilities, roads, and bridges. Public utility facilities, roads, railroad tracks, and bridges within the floodplain should be designed to minimize increases in flood elevations and should be compatible with existing local comprehensive floodplain development plans. When failure or interruption of these public facilities would result in danger to the public health or safety or where such facilities are essential to the orderly functioning of the area, protection to the flood protection elevation shall be provided. Where failure or interruption of service would not endanger life or health, a lesser degree of protection may be provided for minor or auxiliary roads, railroad tracks, or utilities.

F. Storage of materials. Materials that, in time of flooding, are buoyant, flammable, explosive, or could be injurious to human, animal, or plant life shall be stored at or above the flood protection elevation, floodproofed, or protected by structural measures consistent with the standards set forth herein. Furthermore, storage of materials likely to cause pollution of the waters, as defined in Minnesota Statutes 1969, section 115.01, if subject to flooding are prohibited unless adequate safeguards approved by the state water pollution control agency are provided.

Subp. 5. **Nonconforming uses of the floodplain.** Local floodplain management ordinances may, where appropriate, provide for the gradual elimination of nonconforming uses within the floodway. Any addition or modification to a lawful nonconforming use shall be in conformance with the provisions of these standards and criteria and shall not increase the flood damage potential or increase the degree of obstruction to flood flows.

Nonconforming uses within the flood fringe may be continued provided that such uses will not have an unduly adverse effect on flood flows, velocities, or stages associated with the regional flood. Any addition or modification to a lawful nonconforming use within the flood fringe shall be in conformance with the provisions of these standards and criteria. Where applicable, provisions shall be made to allow the proposed modifications and additions to be protected to the flood protection elevation by an approved use of supplemental floodplain management measures as outlined in part 6120.5900.

**Statutory Authority:** *MS s 104.05*

#### **6120.5900 SUPPLEMENTAL STANDARDS AND CRITERIA FOR FLOODPLAIN MANAGEMENT.**

Subpart 1. **In general.** Supplemental measures for floodplain management should be included in local governmental comprehensive floodplain management programs and adopted or provided in addition to local zoning ordinances when sufficient technical data and resources are available for their effectuation. All local governmental units shall provide for control of the development and use of floodplains in flood hazard areas by adopting the following specific regulations and measures where practical to supplement and complement floodplain zoning ordinances and provide comprehensive floodplain management.

Subp. 2. **Subdivision regulations.** Local government floodplain subdivision regulations shall regulate floodplain land subdivision in order to promote the public health, safety, and general welfare; promote wise use of floodplain lands; assure that floodplain lands are suitable for building sites and public improvements; provide for adequate drainage of the subdivided area; provide for ingress and egress to all lands involved; promote proper surveying, legal description, and monumenting of subdivided land; and establish procedures for vacating, correcting, and revising plats. The subdivision regulations shall

establish standards for protection of roads, sewers, water supply, and other facilities from floods. In addition the regulations shall provide that:

A. the floodplain, floodway, and flood fringe areas as determined by standards set forth in part 6120.5600, subpart 4, be clearly labeled on the plat;

B. subdivision of lands within floodplain areas may not be approved if the cost of providing governmental services would impose an unreasonable economic burden on the local government unit; and

C. restrictive deed covenants shall be filed with the final plat and shall provide that the floodplain area be left essentially in the state shown on the plat, establish finished elevations of buildings, structures, and private streets and roads, and require that additions or modifications to these facilities will not violate any provisions of the floodplain zoning ordinances or supplemental regulations.

Subp. 3. **Building codes.** Building codes shall provide for the control of the design, construction, addition, and modification of buildings or structures placed in floodplain areas under authorized floodplain management ordinances. Floodplain building codes shall provide for necessary construction measures to protect health, safety, and welfare and to reduce the damaging effects and hazards of floods subject to the following standards:

A. The degree of flood protection required for building construction by building codes shall be based on the flood protection elevation described in part 6120.5700, subpart 5, and on flood velocities and duration of the regional flood for the particular area.

B. Whenever feasible and compatible with floodplain zoning ordinances and other regulations, all new buildings or structures located, constructed, or reconstructed in the floodplain shall conform to the following provisions:

(1) The first floors or basement floors of the buildings or structures shall be at or above the flood protection elevation in accordance with parts 6120.5700, subpart 5 and 6120.5800.

(2) Those portions of buildings, structures, and appurtenances located below the flood protection elevation shall be adequately floodproofed as provided in item D.

C. Alterations or additions to existing buildings or structures may be permitted if such will:

(1) decrease the flood damage potential of the building or structure;

(2) not increase the degree of obstruction to flood flows;

(3) provide for adequate protection of the building or structure to the flood protection elevations where applicable, in accordance with the provisions of part 6120.5700, subpart 5; and

(4) not endanger human life.

D. Where floodproofing is incorporated into new buildings or structures, and into alterations or additions to existing nonconforming structures, floodproofing measures shall be provided to the flood protection elevations described in part 6120.5700, subpart 5, and designed to withstand flood velocities, depths, durations, forces, and any other factors associated with the regional flood. A plan or document certified by a registered professional engineer or architect that the floodproofing measures are adequately designed to withstand regional flood conditions shall be submitted to the local government unit for approval before authorization is granted for the proposed work. Where this is not practical because of the particular circumstances, the commissioner may authorize other methods to determine the adequacy of floodproofing measures. Authorized floodproofing measures may include such provisions as anchorage of structures to prevent flotation, installation of watertight barriers over openings, reinforcement of walls to resist water pressures, use of materials

to reduce wall seepage, construction or modification of water supply and waste disposal systems to prevent entry of flood waters, placement of essential utilities above the flood protection elevation, and installation of pumping facilities for internal and subsurface drainage.

Subp. 4. **Sanitary regulations.** In addition to all applicable state rules, regulations, requirements and laws, and local laws, local sanitary regulations shall:

A. Require the floodproofing of proposed water supply systems in floodplain areas to prevent entry of flood waters by means of floodproofing techniques consistent with subpart 3, item D.

B. Control the location, construction, or modification of private and public liquid or solid waste treatment and disposal facilities in floodplain areas so that:

(1) No new construction, addition, or modification to existing sewage, industrial waste, or other waste disposal systems shall be permitted within the floodplain unless emergency plans and procedures for action to be taken in the event of flooding are prepared, filed with, and approved by the state water pollution control agency.

(2) Emergency plans and procedures established consistent with item B, subitem (1) must provide for measures to prevent introduction of any pollutant or toxic material into the flood waters.

(3) Public or municipal collection and treatment facilities are used where available and where feasible.

(4) There shall be no disposal of garbage or solid waste materials within any floodplain areas, except at those disposal sites approved by the state water pollution control agency provided there will be no further encroachment on the floodway.

Subp. 5. **Warning signs and public information regulations.** Local governmental regulations shall provide for adequate floodplain warning and public informational services as follows:

A. In urban areas the limits of the areas which have been or would be inundated by the regional flood or by experienced floods of greater magnitude shall be delineated in the field at reasonable intervals by means of firmly placed markers of a sufficient size to be easily read from a distance of 20 feet.

The markers shall record the maximum known depth of flooding or height to the flood protection elevation, whichever is greater, as well as the zoned land use classification of the area involved.

The local government unit may prescribe the shape, size, lettering, and installation instructions for floodplain markers.

The cost of preparing and installing floodplain markers in future subdivided areas should be borne by the subdivider and the markers shall be installed prior to the sale of lots and construction of any buildings or structures.

Provisions should be made to monument bench marks for vertical control data as provided in part 6120.5600, subpart 4.

B. To fulfill the intent of Minnesota Statutes 1969, section 104.03, every local governmental unit with flood hazard areas and a floodplain management program shall submit to the commissioner by March 30 an annual report outlining and summarizing the previous year's activity and progress in floodplain management activities on a form to be provided by the commissioner. The report shall include information as to:

(1) progress in the acquisition of technical floodplain information, including a summary of any flood crest elevations, cross sectional data and maps or illustrative material prepared by or for the local governmental unit;

(2) progress in floodplain management program administration, including a summary of zoning permits issued, subdivision plats approved, building permits issued, variances granted, enforcement action, etc.; and

(3) flood warning and information sources, including a summary of flood warning systems established or implemented, emergency plans prepared, and public informational reports and studies concerning various aspects of local floodplain management.

Subp. 6. **Measures for flood control.** When local floodplain management plans provide for structural works for flood control, such as levees, floodwalls, channel improvements, and reservoirs, all structural works or land treatment practices shall be consistent with the following statewide standards and criteria for floodplain management practices:

A. Any proposed work in the beds of public waters, as defined in Minnesota Statutes 1969, chapter 105, which will change the course, current, or cross-section of public waters of the state shall be subject to the provisions of Minnesota Statutes 1969, chapter 105, and other applicable statutes.

B. The minimum height and structural design of any dikes, levees, floodwalls, or similar structural works in place, or proposed to be placed in the floodplain shall be based on the flood profile of the regional flood confined between the structures subject to the following:

(1) For urban areas the minimum authorized height and design of proposed structural works shall be at least three feet above the elevation of the regional flood, as confined by the structures, or shall be at the elevation of the standard project flood, whichever provides the greater protection from flooding.

(2) Increases in upstream flood stages which would result from construction of dikes, levees, floodwalls, or similar structures for protection of urban areas and for agricultural uses in rural areas shall not increase the stage of the regional flood in excess of amounts listed in part 6120.5700, subpart 4, item A, and shall be reflected in the flood protection elevations for the upstream reach.

(3) Modifications and additions to existing structural works shall be regulated to assure that the proposed work will provide a means of decreasing the flood damage potential in the area and will provide the most reasonable protection of properties in heavily populated floodplain areas consistent with these standards and criteria. Any existing structural work which potentially threatens public health or safety shall be modified or reconstructed in order to meet the standards contained herein within a reasonable period of time based on agreement between the local government unit and the commissioner.

C. Flood protection elevations and floodway limits which reflect proposed measures for flood control shall not be effective until such measures are constructed and operative unless the proposed measures will increase flood heights in a given reach.

D. Floodplain development landward of any levee or floodwall shall provide for interior drainage including designation of ponding areas to protect against flooding from interior drainage.

**Statutory Authority:** *MS s 104.05*

#### **6120.6000 REGULATION OF PUBLIC USES.**

In accordance with Minnesota Statutes 1969, sections 104.03 and 104.05, all state agencies and local units of government, in the construction of buildings, structures, roads, bridges, or other facilities located within floodplain areas delineated by local ordinances shall comply with the standards set out in these administrative rules.

**Statutory Authority:** *MS s 104.05*

**6120.6100 VARIANCE FROM STANDARDS.**

Local governmental units may permit variances to the provisions of their floodplain management ordinances where it appears that by reason of exceptional circumstances the strict enforcement of the local ordinance would cause undue hardship and strict conformity with the standards would be unreasonable, impractical, and not feasible under the circumstances. Variances granted by local governmental units must be consistent with the general purpose of these standards and the intent of applicable state and national laws and programs. Although variances may be used to modify permissible methods of flood protection, no variance shall provide for a lesser degree of flood protection than stated in these standards.

**Statutory Authority:** *MS s 104.05*

**6120.6200 GENERAL ADMINISTRATION OF FLOODPLAIN MANAGEMENT ORDINANCES.**

Subpart 1. **Procedures.** Local governmental units shall provide for the administration and enforcement of their floodplain management ordinances. To aid the commissioner in evaluating the effectiveness of local administration and enforcement, as provided in Minnesota Statutes 1969, section 104.03, the zoning administrator or other officer designated by the local governing body shall submit to the commissioner a copy of any application for a variance or special permit use where a hearing is to be held to consider such application. The commissioner shall receive at least ten days' notice of the hearing. Such notice shall specify the time, place, and subject matter of the hearing and shall be accompanied by such supporting information as is necessary to indicate the nature and effect of the proposed use. A copy of all decisions granting a variance or special permit to the provisions of the local floodplain management ordinance shall be forwarded to the commissioner within ten days of such action.

Subp. 2. **Technical assistance.** The local governmental unit may request technical assistance from the commissioner in evaluating requests for variances or special permits to the local floodplain management ordinance. Such assistance shall be provided by the commissioner within the limits of available appropriations and personnel.

**Statutory Authority:** *MS s 104.05*







## CHAPTER 6

### REGULATIONS: SPECIAL CASES

Topics to be covered:

1. Subdivision of Land in the Floodplain
  - A. Floodplain Subdivision Criteria
  - B. Development Standards within Subdivisions
  - C. Platting Standards
2. Public Utilities, Railroads, Roads and Bridges
3. Manufactured Homes
  - A. Mobile Homes on Individual Lots of Record
  - B. New Mobile Home Parks & Expansions to Existing Parks
  - C. Existing Mobile Home Parks
  - D. Repairs to Existing Mobile Home Parks
  - E. Mobile Home Tie-Down Requirements
4. Basement Exceptions

#### ***1. Subdivision of Land in the Floodplain***

Land subdivision is the process of dividing a lot, tract, or parcel of land into two or more lots, tracts or parcels for the purpose of sale or development. Local units of government in Minnesota have been given the authority by the State Legislature to control the subdivision of land through the adoption of local subdivision regulations. The purpose of subdivision regulations is to promote public health, safety, and general welfare, and to provide for the orderly, economic, and safe development of land within a community. Subdivision regulations may address the size, location, grading and improvement of lots, structures, public areas, streets, roads, trails, walkways, curbs and gutters, water supply, storm drainage, lighting, sewers, electricity, gas, and other utilities; the planning and design of sites; access to solar energy; and the protection and conservation of floodplains, shorelands, soils, water, vegetation, energy, air quality, and geologic and ecologic features.

The State of Minnesota enabling legislation allowing local units of government to adopt subdivision regulations does not mandate the adoption of subdivision controls by local units of government. This enabling legislation is contained in Minnesota Statute, Chapters 462 for municipalities and 394 for counties. While Chapter 394 does not give specific guidance to counties, Chapter 462 does require minimum administrative and regulatory language when a municipality decides to voluntarily adopt subdivision regulations. This minimum language includes the formal platting of certain subdivisions and provisions regarding the content of applications for proposed subdivisions, the preliminary and final review and approval or disapproval of applications, and the coordination of such reviews with affected political subdivisions and state agencies.

Generally, when a local unit of government decides to adopt subdivision regulations, they have considerable latitude as to the standards to be adopted, and the administrative procedures which the local unit of government will follow in review and approval of subdivision proposals. A local unit of government's platting criteria, for the preparation of the map or drawing of the subdivision or resubdivision of land, must be in accordance with the platting requirements of Minnesota Statute, Chapter 505.

Subdivision controls provide the community an opportunity to insure that new residential, commercial, and other development will be consistent with the community's comprehensive plan, zoning ordinance, and official map. A very important additional benefit of the subdivision review and approval process is that it should insure that each lot within the subdivision is capable of having a buildable site compliant with all associated zoning and building code regulations of the community. The fact that a tract of land has been divided by a metes-and-bounds description, unapproved registered land survey or unapproved plat does not mean that a local unit of government is obligated to issue a building/use permit for development of individual lots within that tract of land.

State and federal floodplain management standards require local government to regulate the subdivision of land in the 100-year floodplain. When a community adopts floodplain regulations it must either adopt legally enforceable subdivision regulations, or amend existing regulations to meet minimum state and federal standards. The minimum jurisdiction of these regulations must be for the following subdivisions (unless the community's existing subdivision ordinance is more inclusive):

**“Subdivision” means land that is divided for the purpose of sale, rent, or lease, including planned unit development.**

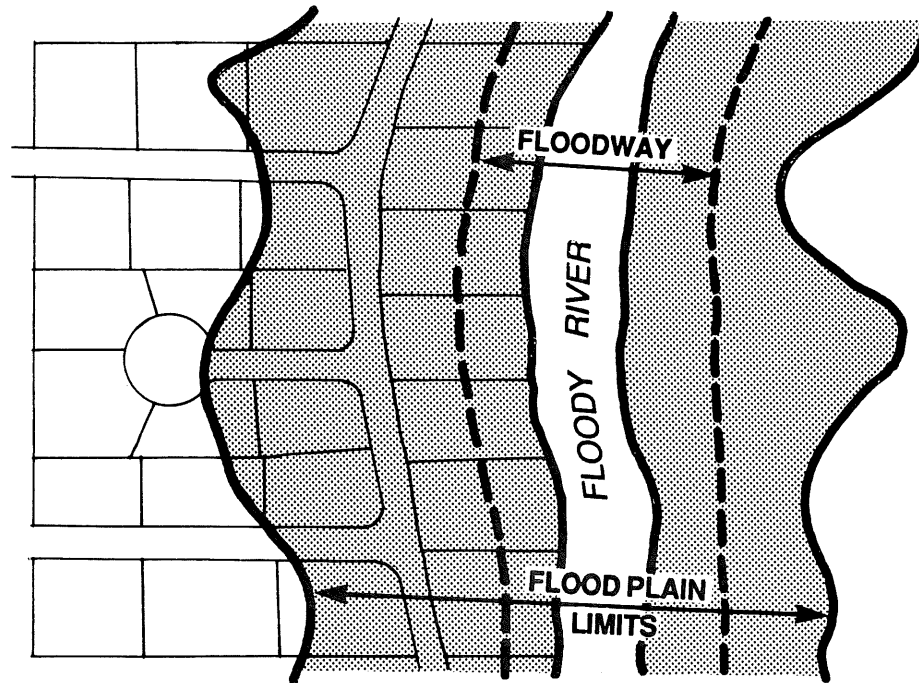
#### **A. Floodplain Subdivision Criteria**

Lots in an approved subdivision, including subdivisions adjacent to, or partially within a designed floodplain, should require no further improvements to be buildable. For floodplain management purposes, the following items require special attention during the subdivision review process:

- 1) Each lot must include a buildable site outside of the floodway district containing either natural high ground or an area filled to the RFPE where sufficient high ground is not available (See figure 6.1 and please note development standards below).
- 2) Streets and driveways must be elevated to no lower than two feet below the RFPE\* to insure that homes remain accessible during times of flooding. Fill for streets and driveways must be located outside of the floodway;
- 3) Water supply and sewage disposal facilities must be protected to insure continued service during times of flooding. Fill used to elevate an onsite sewage treatment system must be located outside of the floodway district. At a minimum, the sewage treatment system must be constructed in compliance with the Minnesota Pollution Control Agency's minimum standards for on-site sewage treatment systems (Minnesota Rules, part 7080);
- 4) Areas subject to fast moving floodwaters should be adequately protected against erosion;
- 5) Site drainage must be maintained. A flood insurance study will often only show flood boundaries for a major waterway crossing the property under consideration. Structures, roadways, sewage treatment systems, and fill must be located and designed to take into consideration waterways and small ditches not identified as floodplain areas; and
- 6) In approximate study areas (general floodplain district), the community must determine the RFPE and floodway/flood fringe district boundaries prior to giving preliminary plat approval. The community can require the subdivider to provide the necessary hydrologic/hydraulic data or the community may decide to assume this responsibility. This must be done to insure that each lot is capable of having an adequate building site outside of the floodway above the RFPE and adequate vehicular access will be provided.

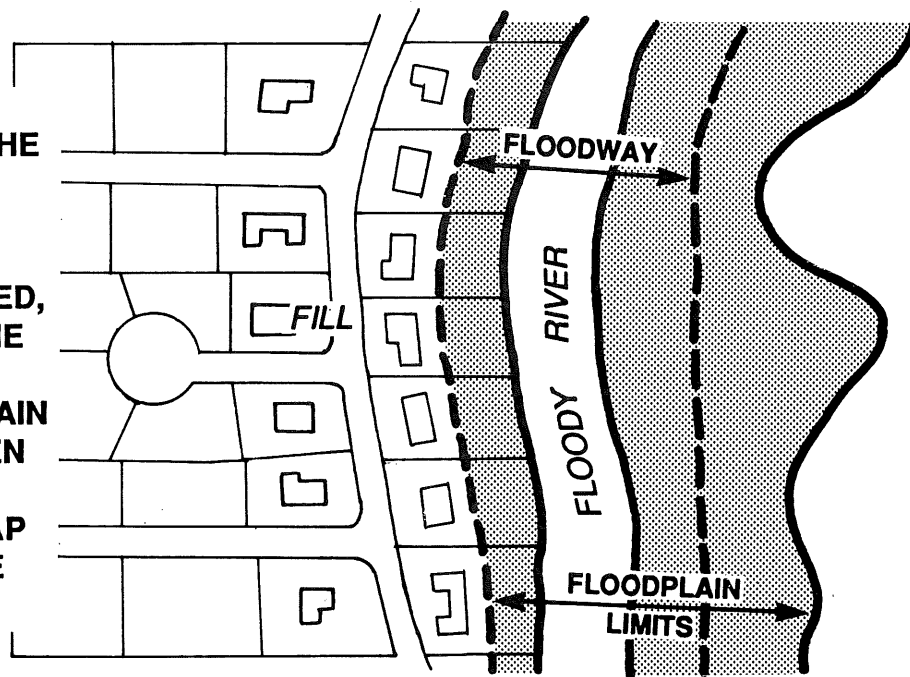
\* For the very few communities which did not include the foot of freeboard in their RFPE definition, the road access must be no lower than 1' below the RFPE.

**TYPICAL FLOOD PLAIN SUBDIVISION  
BEFORE SITE PREPARATION**



**BEFORE**

**ALL LOTS  
(EXCLUDING THE  
FLOODWAY),  
STREETS &  
HOMES HAVE  
BEEN ELEVATED,  
BY FILL, TO THE  
RFPE.  
THE FLOODPLAIN  
LIMIT HAS BEEN  
REVISED BY  
LETTER OF MAP  
REVISION (SEE  
CHAPTER 10).**



**AFTER**

**Figure 6.1 Floodplain subdivision before and after elevation on fill**

## **B. Development Standards within Subdivisions**

The following discussion identifies additional specific standards which will apply to all subdivisions and should be addressed during the subdivision review process:

- 1) Even though a subdivided area may be filled to the RFPE prior to final subdivision approval, restrictions remain:
  - No portion of a residential structure may be located below the RFPE, unless the community has been granted a "basement exception" by FEMA. For those communities with a basement exception, the basement area below the RFPE must be flood proofed FP-1 (watertight - without human intervention) and the first (habitable) floor must be at or above the RFPE.
  - Non-residential buildings must have their lowest floor, including basement floor, elevated to or above the RFPE. As an alternative, these buildings may be flood proofed to the FP-1 or FP-2 classification. (FP-2 is watertight - with human intervention).
  - A community cannot waive these requirements when individual building/use permits are applied for after subdivision approval has been given and the subdivision has been officially recorded.
- 2) The floodway area must remain free of obstructions that would impede the flow of floodwaters. Therefore, activities such as accessory structures (i.e., garages, storage buildings, etc.) and fill (other than filling depressional areas) for lawns, patios, tennis courts, etc., must be located outside of the floodway; and
- 3) A community may opt to approve a subdivision proposal where the individual building sites have not been filled to the RFPE prior to final plat approval and recording (this is not the recommended approach).

Note: The streets in the subdivision must be in place to the specified flood protection elevation prior to final subdivision approval or the community must have received a sufficient (monetary) guarantee to insure their construction prior to issuance of any individual building permits. With this approach, the subdivision may be recorded and the individual lots sold. The builder would be required to comply with the requirements of the floodplain ordinance for lowest floor elevation, onsite sewage treatment systems, fill around the building (15'), access, etc.

Therefore, it seems prudent for a community to require, prior to final approval, that sufficient recorded statements be placed on the deeds specifying that certain floodplain management standards must be met prior to the issuance of future building permits. This may still be appropriate even though local officials have thoroughly reviewed the subdivision proposal and have determined all of the development/floodplain standards can be reasonably met. There may be sufficient area on all lots to place a small amount of fill to elevate a slab on grade home to the RFPE, but potential buyers may not know they cannot have a basement or they cannot place fill on the floodway portion of their lot for some accessory activity they had envisioned. Local officials may deem it appropriate to have restrictions recorded on each deed specifically stating which future activities are prohibited.

## **C. Platting Standards**

To aid in the review of a proposed subdivision and to aid potential purchasers of the individual lots, certain information should be placed on the preliminary and final plats. This should include:

- 1) Regulatory Flood Protection Elevations clearly labelled on the plat (in Mean Sea Level Datum).

Flood Insurance Studies provide flood elevations in National Geodetic Vertical Datum, 1929 Adjustment (NGVD 1929); a vertical adjustment factor may be required if an alternative datum is used for the plat;\*

\*Effective October 1, 1992, all new or revised federal floodplain maps will be in North American Vertical Datum of 1988.

- 2) A statement providing that the lowest floor including basement of all residential structures must be elevated on fill to the RFPE.

For communities with a basement exception from FEMA, the statement should specify that only FP-1 flood-proofing is allowed;

- 3) The floodway and flood fringe boundaries clearly identified on the plat.

The outer limit of the floodplain, as identified by the contour line representing the 100-year flood elevation, must be based on a vertical elevation survey where: 1) it is obvious any of the proposed building sites lie within the 100-year floodplain; or 2) community officials cannot make this determination without a vertical elevation survey. Where it is obvious that all building sites lie sufficiently outside of the 100-year floodplain, the outer limit of floodplain boundaries can be derived from best available topographic mapping such as a United States Geological Survey topographic map;

- 4) Centerline elevations of roads in the floodplain at distances not exceeding 100' apart, as well as elevations of low spots in the roads; and
- 5) Specifications for on-site water supply and sewage treatment systems, such as the minimum elevations for the bottom of drainfield trenches, holding tanks, mound systems or (watertight) well casings.

## **2. Public Utilities, Railroads, Roads and Bridges**

These subjects are covered briefly, but adequately, in the model ordinance located in Appendix 6A. The general requirement is to use common sense in either floodproofing or elevat-

ing these facilities. Where failure or interruption of the utility, railroad, road, water supply or sewage treatment system would endanger public health or safety, careful design is required. Construction of public utilities in the floodway must not increase flood elevations.

## **3. Manufactured Homes**

Manufactured homes are a special category of structure which can be located either on an individual lot of record or in a "mobile home" park. Special restrictions will apply to certain categories of manufactured homes. In order to maintain consistency with the terminology contained within FEMA guidelines, this section will be primarily concerned with what is commonly referred to as mobile homes.

Certain travel trailers and travel vehicles are exempted from these requirements. Please refer to section 9.3 of the model ordinance in Appendix 6A.

### **A. Manufactured Homes on Individual Lots of Record**

Manufactured homes are treated like any other structure when placed on individual lots of record within the floodplain. The structure must be located outside of the floodway district and properly elevated on fill to the RFPE. Road access, no lower than two feet below the RFPE\*, must be provided.

A community must utilize the conditional use permit process to evaluate a proposal to use a method other than fill, such as "stilts" or masonry walls, to elevate a manufactured home to the RFPE. At a minimum, the community must insure that the proposal is compliant with the Floodproofing Regulation of the State Building Code (SBC). The "Floodproofing Regulations" of the SBC (sec. 612.2.3) specify standards for the spacing, orientation, bracing and foundations of support columns and walls.

\*For the very few communities which did not include the foot of freeboard in their RFPE definition, the road access must be no lower than 1' below the RFPE.

## **B. New Manufactured Home Parks and Expansions to Existing Manufactured Home Parks**

New manufactured home parks and expansions to existing manufactured home parks in the floodplain are subject to many of the same review criteria as new subdivisions. The community must require a development/use permit for a new manufactured home park or park expansion, and prior to issuing such approval must insure that all of the following standards are met:

- 1) All individual manufactured home sites (pads) must be of sufficient size, vertical elevation and configuration to insure the structure will be capable of being placed at the RFPE, outside of the floodway;
- 2) Road access to the park/park expansion and the individual pads must be no lower than two feet below the RFPE\*;
- 3) All utilities must be protected against possible flood related damages; and
- 4) Proper site drainage must be provided.

Quite obviously, the ideal approach is to require the manufactured home park/park subdivision to be elevated on fill to the RFPE during site development. The community would be assured proper road access is provided and each manufactured home will be placed above the RFPE. If proper road access is not provided during site development, the developer would be required to secure a variance from the community (communities should use extreme caution in granting such a variance). **If the pads are not elevated on fill to the RFPE, the community will be required to develop a review procedure to insure each manufactured home placement/replacement is properly elevated.** As the pad decreases in elevation below the RFPE, the review procedure will be more complex to insure the standards stated previously in this section for elevation on stilts, masonry walls, etc. are met.

## **C. Existing Manufactured Home Parks**

Upon adoption of a floodplain ordinance, that portion of an existing manufactured home park located in the floodplain below the RFPE, which does not meet the standards previously stated for new manufactured home parks, is a "nonconformity". The manufactured home park use is "grandfathered" at such time as the floodplain ordinance is adopted, subject to certain restrictions.

Replacement manufactured homes, manufactured homes placed on vacated or previously unoccupied pads, or manufactured homes destroyed to over 50% of their market value (from fire, flood, wind, etc.) are not allowable unless the floor elevation is at or above the RFPE and the mobile home is located outside of the floodway. Where existing pads are below the RFPE, the community must develop a (permit) review process to insure the manufactured home is placed outside of the floodway at the proper elevation.

In addition to the above-stated elevation and location requirements, manufactured home park owners are required to develop a flood emergency plan before allowing replacement manufactured homes in the floodplain. The plan should account for the severity of flooding and realistically assess the minimum flood warning time available. The plan must also address the availability of evacuation routes and the time required to safely evacuate all occupants. Replacement manufactured homes are allowed only if sufficient flood warning time and evacuation routes are available.

The park owner is required to notify manufactured home owners that their individual pad is located in the 100-year floodplain. It should be explained that their manufactured home will not be insurable for flood insurance unless the manufactured home is anchored with tie-downs acceptable to FEMA.

The placement of manufactured homes should meet the same standards as those applied to more permanent structures. Flood damage to manufactured homes can be more severe than flood damage to more permanent structures.

\*For the very few communities which did not include the foot of freeboard in their RFPE definition, the road access must be no lower than 1' below the RFPE.



Figure 6.2 By adhering to floodplain guidelines for the placement of manufactured homes, owners can avoid expensive flood damage.

#### ***D. Repairs to Existing Manufactured Home Parks***

Repair, reconstruction or improvement of the streets, utilities and pads of a manufactured home park, exceeding 50% of the park's market value, constitute a substantial improvement to that mobile home park. If the proposed activity is determined to constitute a substantial improvement, the entire park must be upgraded to a conforming use following the repair, reconstruction or improvements. Standards for substantial improvements are similar to those for new parks and expansions to existing manufactured home parks.

For existing manufactured home parks, where the repair, reconstruction or improvement of the streets, pads and utilities equals or exceeds 50% of the market value before the repair, reconstruction or improvement has commenced, FEMA requires that:

- 1) Stands or lots are elevated on compacted fill or on pilings so that the lowest floor of the manufactured home will be at or above the RFPE;
- 2) Adequate surface drainage and access for a hauler are provided; and

- 3) In the instance of elevation on pilings, lots are large enough to permit steps and piling foundations to be placed no more than ten feet apart in stable soil, and reinforcement is provided for pilings more than six feet above the ground level.

#### ***E. Manufactured Home Tie-Down Requirements***

As stated earlier, manufactured homes in a designated floodplain are not insurable under the NFIP unless tie-downs are constructed compliant with FEMA standards. These standards have been imposed due to the buoyancy of manufactured homes.

Manufactured homes, if dislodged from their foundation during a flood, may damage structures with which they collide or may block a bridge or culvert opening.

Current FEMA tie-down standards require that:

- 1) Over-the-top ties be provided at each of the four corners of the manufactured home, with two additional ties per side at intermediate locations, except that on manufactured homes less than 50 feet in length one tie per side is required;
- 2) Frame ties be provided at each corner of the home with five additional ties per side at intermediate points except that, on manufactured homes less than 50 feet in length, four ties per side are required;
- 3) All components of the anchoring system be capable of carrying a force of 4,800 pounds; and
- 4) All additions to a manufactured home be similarly anchored.



## 4. Basement Exceptions

FEMA recognizes that, because of extraordinary circumstances, local conditions may create a situation of severe hardship or “gross” inequity should the floodplain management standards be imposed without exception. Therefore, in very rare cases, FEMA may grant a community a “basement exception,” where floodproofed (FP1) residential basements would be allowed below the RFPE (see Chapter 8 - Floodproofing - Residential Basement Construction).

A community applying for a basement exception shall explain, in writing to FEMA, the nature and extent of and the reasons for the exception request. This explanation shall include sufficient supporting economic, environmental, topographic, hydrologic and other scientific and technical data, to detail the impact on public safety and the environment.

FEMA may approve the proposal provided that:

1) The community has demonstrated that areas of special flood hazard in which basements will be permitted are subject to shallow and low velocity flooding and that there is adequate flood warning time to ensure that all residents are notified of impending floods.

2) The community has adopted floodplain management measures that require that new construction and substantial improvements of residential structures with basements in zones A1-30, AH, AO, and AE shall:

- Be dry floodproofed to a pre-determined design level;
- Have the top of the floor of any basement area no lower than five feet below the elevation of the base flood;
- Have the area surrounding the structure on all sides filled (fill compacted and revegetated) to or above the elevation of the base flood;
- Have a registered professional engineer or architect develop (or review) and certify the basement design; and
- Have the as-built structure verified by the building inspector or other authorized representative of the community.

The only Minnesota communities which have basement exceptions at the time this handbook went to print are:

Warren  
East Grand Forks  
Dilworth  
Stephan  
Clay County  
Moorhead  
Alvarado  
Roseau





## APPENDIX 6A

### Sample Three District Floodplain Management Ordinance Two-Map Format

October 17, 1990

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SAMPLE THREE DISTRICT FLOOD PLAIN MANAGEMENT ORDINANCE

TWO-MAP FORMAT\*

SECTION 1.0 STATUTORY AUTHORIZATION, FINDINGS OF FACT AND PURPOSE

1.1 Statutory Authorization: The legislature of the State of Minnesota has, in Minnesota Statutes Chapter 103F and

\_\_\_\_\_ (Zoning Enabling Statute) delegated the responsibility to local government units to adopt regulations designed to minimize flood losses.

Therefore, the \_\_\_\_\_ of

(governing body)

\_\_\_\_\_, Minnesota does ordain as follows:

(local unit)

1.2 Findings of Fact:

1.21 The flood hazard areas of \_\_\_\_\_, (local unit)

Minnesota, are subject to periodic inundation which results in potential loss of life, loss of property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures or flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.

1.22 Methods Used to Analyze Flood Hazards. This Ordinance is based upon a reasonable method of analyzing flood hazards which is consistent with the standards established by the Minnesota Department of Natural Resources.

1.3 Statement of Purpose: It is the purpose of this Ordinance to promote the public health, safety, and general welfare and to minimize those losses described in Section 1.21 by provisions contained herein.

SECTION 2.0 GENERAL PROVISIONS

2.1 Lands to Which Ordinance Applies: This ordinance shall apply to all lands within the jurisdiction of

\_\_\_\_\_ shown on the Official Zoning

(local unit)

\*A Flood Boundary and Floodway Map and a Flood Insurance Rate Map have been published for the community.

Map and/or the attachments thereto as being located within the boundaries of the Floodway, Flood Fringe, or General Flood Plain Districts.

2.2 Establishment of Official Zoning Map: The Official Zoning Map together with all materials attached thereto is hereby adopted by reference and declared to be a part of this ordinance. The attached material shall include the Flood Insurance Study for the \_\_\_\_\_ prepared by the \_\_\_\_\_ (local unit) Federal Insurance Administration dated \_\_\_\_\_, and the Flood Boundary and Floodway Map and Flood Insurance Rate Map dated \_\_\_\_\_ therein. The Official Zoning Map shall be on file in the Office of the \_\_\_\_\_ and the \_\_\_\_\_ (City Clerk/County Auditor) \_\_\_\_\_ (Zoning Administrator).

2.3 Regulatory Flood Protection Elevation: The Regulatory Flood Protection Elevation shall be an elevation no lower than one foot above the elevation of the regional flood plus any increases in flood elevation caused by encroachments on the flood plain that result from designation of a floodway.

#### 2.4 Interpretation:

2.41 In their interpretation and application, the provisions of this Ordinance shall be held to be minimum requirements and shall be liberally construed in favor of the Governing Body and shall not be deemed a limitation or repeal of any other powers granted by State Statutes.

2.42 The boundaries of the zoning districts shall be determined by scaling distances on the Official Zoning Map. Where interpretation is needed as to the exact location of the boundaries of the district as shown on the Official Zoning Map, as for example where there appears to be a conflict between a mapped boundary and actual field conditions and there is a formal appeal of the decision of the Zoning Administrator, the Board of Adjustment shall make the necessary interpretation. All decisions will be based on elevations on the regional (100-year) flood profile and other available technical data. Persons contesting the location of the district boundaries shall be given a reasonable opportunity to present their case to the Board and to submit technical evidence.

2.5 Abrogation and Greater Restrictions: It is not intended by this Ordinance to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this Ordinance imposes greater restrictions, the provisions of this Ordinance shall prevail. All other

ordinances inconsistent with this Ordinance are hereby repealed to the extent of the inconsistency only.

2.6 Warning and Disclaimer of Liability: This Ordinance does not imply that areas outside the flood plain districts or land uses permitted within such districts will be free from flooding or flood damages. This Ordinance shall not create liability on the part of \_\_\_\_\_ or (name of local unit) any officer or employee thereof for any flood damages that result from reliance on this Ordinance or any administrative decision lawfully made thereunder.

2.7 Severability: If any section, clause, provision, or portion of this Ordinance is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this Ordinance shall not be affected thereby.

2.8 Definitions: Unless specifically defined below, words or phrases used in this Ordinance shall be interpreted so as to give them the same meaning as they have in common usage and so as to give this Ordinance its most reasonable application.

2.811 Accessory Use or Structure - a use or structure on the same lot with, and of a nature customarily incidental and subordinate to, the principal use or structure.

2.812 Basement - means any area of a structure, including crawl spaces, having its floor or base subgrade (below ground level) on all four sides, regardless of the depth of excavation below ground level.

2.813 Conditional Use - means a specific type of structure or land use listed in the official control that may be allowed but only after an in-depth review procedure and with appropriate conditions or restrictions as provided in the official zoning controls or building codes and upon a finding that: (1) certain conditions as detailed in the zoning ordinance exist and (2) the structure and/or land use conform to the comprehensive land use plan if one exists and are compatible with the existing neighborhood.

2.814 Equal Degree of Encroachment - a method of determining the location of floodway boundaries so that flood plain lands on both sides of a stream are capable of conveying a proportionate share of flood flows.

2.815 Flood - a temporary increase in the flow or stage of a stream or in the stage of a wetland or lake that results in the inundation of normally dry areas.



2.816 Flood Frequency - the frequency for which it is expected that a specific flood stage or discharge may be equalled or exceeded.

2.817 Flood Fringe - that portion of the flood plain outside of the floodway. Flood fringe is synonymous with the term "floodway fringe" used in the Flood Insurance Study for

(local unit)

2.818 Flood Plain - the beds proper and the areas adjoining a wetland, lake or watercourse which have been or hereafter may be covered by the regional flood.

2.819 Flood-Proofing - a combination of structural provisions, changes, or adjustments to properties and structures subject to flooding, primarily for the reduction or elimination of flood damages.

2.820 Floodway - the bed of a wetland or lake and the channel of a watercourse and those portions of the adjoining flood plain which are reasonably required to carry or store the regional flood discharge.

2.821 Obstruction - any dam, wall, wharf, embankment, levee, dike, pile, abutment, projection, excavation, channel modification, culvert, building, wire, fence, stockpile, refuse, fill, structure, or matter in, along, across, or projecting into any channel, watercourse, or regulatory flood plain which may impede, retard, or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water.

2.822 Principal Use or Structure - means all uses or structures that are not accessory uses or structures.

2.823 Reach - a hydraulic engineering term to describe a longitudinal segment of a stream or river influenced by a natural or man-made obstruction. In an urban area, the segment of a stream or river between two consecutive bridge crossings would most typically constitute a reach.

2.824 Regional Flood - a flood which is representative of large floods known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100-year recurrence interval. Regional flood is synonymous with the term "base flood" used in the Flood Insurance Study.

2.825 Regulatory Flood Protection Elevation - The Regulatory Flood Protection Elevation shall be an elevation no lower than one foot above the elevation of the regional flood plus any increases in flood elevation caused by encroachments on the flood plain that result from designation of a floodway.

2.826 Structure - anything constructed or erected on the ground or attached to the ground or on-site utilities, including, but not limited to, buildings, factories, sheds, detached garages, cabins, manufactured homes, travel trailers/vehicles not meeting the exemption criteria specified in Section 9.31 of the ordinance and other similar items.

2.827 Variance - means a modification of a specific permitted development standard required in an official control including this ordinance to allow an alternative development standard not stated as acceptable in the official control, but only as applied to a particular property for the purpose of alleviating a hardship, practical difficulty or unique circumstance as defined and elaborated upon in a community's respective planning and zoning enabling legislation.

### SECTION 3.0 ESTABLISHMENT OF ZONING DISTRICTS

#### 3.1 Districts:

3.11 Floodway District. The Floodway District shall include those areas designated as floodway on the Flood Boundary and Floodway Map adopted in Section 2.2.

3.12 Flood Fringe District. The Flood Fringe District shall include those areas designated as floodway fringe on the Flood Boundary and Floodway Map adopted in Section 2.2.

3.13 General Flood Plain District. The General Flood Plain District shall include those areas designated as unnumbered A Zones on the Flood Insurance Rate Map adopted in Section 2.2.

3.2 Compliance: No new structure or land shall hereafter be used and no structure shall be located, extended, converted, or structurally altered without full compliance with the terms of this Ordinance and other applicable regulations which apply to uses within the jurisdiction of this Ordinance. Within the Floodway, Flood Fringe and General Flood Plain Districts, all uses not listed as permitted uses or conditional uses in Sections 4.0, 5.0 and 6.0 that follow, respectively, shall be prohibited. In addition, a caution is provided here that:

3.21 New manufactured homes, replacement manufactured homes and certain travel trailers and travel vehicles are subject to the general provisions of this Ordinance and specifically Section 9.0;

3.22 Modifications, additions, structural alterations or repair after damage to existing nonconforming structures and

nonconforming uses of structures or land are regulated by the general provisions of this Ordinance and specifically Section 11.0; and

3.23 As-built elevations for elevated or flood proofed structures must be certified by ground surveys and flood proofing techniques must be designed and certified by a registered professional engineer or architect as specified in the general provisions of this Ordinance and specifically as stated in Section 10.0 of this Ordinance.

#### SECTION 4.0 FLOODWAY DISTRICT (FW)

##### 4.1 Permitted Uses:

4.11 General farming, pasture, grazing, outdoor plant nurseries, horticulture, truck farming, forestry, sod farming, and wild crop harvesting.

4.12 Industrial-commercial loading areas, parking areas, and airport landing strips.

4.13 Private and public golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, boat launching ramps, swimming areas, parks, wildlife and nature preserves, game farms, fish hatcheries, shooting preserves, target ranges, trap and skeet ranges, hunting and fishing areas, and single or multiple purpose recreational trails.

4.14 Residential lawns, gardens, parking areas, and play areas.

##### 4.2 Standards for Floodway Permitted Uses:

4.21 The use shall have a low flood damage potential.

4.22 The use shall be permissible in the underlying zoning district if one exists.

4.23 The use shall not obstruct flood flows or increase flood elevations and shall not involve structures, fill, obstructions, excavations or storage of materials or equipment.

##### 4.3 Conditional Uses:

4.31 Structures accessory to the uses listed in 4.1 above and the uses listed in 4.32-4.38 below.

4.32 Extraction and storage of sand, gravel, and other materials.

4.33 Marinas, boat rentals, docks, piers, wharves, and water control structures.

4.34 Railroads, streets, bridges, utility transmission lines, and pipelines.

4.35 Storage yards for equipment, machinery, or materials.

4.36 Placement of fill.

4.37 Travel trailers and travel vehicles either on individual lots of record or in existing or new subdivisions or commercial or condominium type campgrounds, subject to the exemptions and provisions of Section 9.3 of this Ordinance.

4.38 Structural works for flood control such as levees, dikes and floodwalls constructed to any height where the intent is to protect individual structures and levees or dikes where the intent is to protect agricultural crops for a frequency flood event equal to or less than the 10-year frequency flood event.

#### 4.4 Standards for Floodway Conditional Uses:

4.41 All Uses. No structure (temporary or permanent), fill (including fill for roads and levees), deposit, obstruction, storage of materials or equipment, or other uses may be allowed as a Conditional Use that will cause any increase in the stage of the 100-year or regional flood or cause an increase in flood damages in the reach or reaches affected.

4.42 All floodway Conditional Uses shall be subject to the procedures and standards contained in Section 10.4 of this Ordinance.

4.43 The Conditional Use shall be permissible in the underlying zoning district if one exists.

#### 4.44 Fill:

(a) Fill, dredge spoil and all other similar materials deposited or stored in the flood plain shall be protected from erosion by vegetative cover, mulching, riprap or other acceptable method.

(b) Dredge spoil sites and sand and gravel operations shall not be allowed in the floodway unless a long-term site development plan is submitted which includes an erosion/sedimentation prevention element to the plan.

(c) As an alternative, and consistent with Subsection (b) immediately above, dredge spoil disposal and sand and gravel operations may allow temporary, on-site storage of fill or other materials which would have caused an increase to the stage of the 100-year or regional flood but only after the

Governing Body has received an appropriate plan which assures the removal of the materials from the floodway based upon the flood warning time available. The Conditional Use Permit must be title registered with the property in the Office of the County Recorder.

#### 4.45 Accessory Structures:

(a) Accessory structures shall not be designed for human habitation.

(b) Accessory structures, if permitted, shall be constructed and placed on the building site so as to offer the minimum obstruction to the flow of flood waters.

(1) Whenever possible, structures shall be constructed with the longitudinal axis parallel to the direction of flood flow, and, (2) So far as practicable, structures shall be placed approximately on the same flood flow lines as those of adjoining structures.

(c) Accessory structures shall be elevated on fill or structurally dry flood proofed in accordance with the FP-1 or FP-2 flood proofing classifications in the State Building Code. As an alternative, an accessory structure may be flood proofed to the FP-3 or FP-4 flood proofing classification in the State Building Code provided the accessory structure constitutes a minimal investment, does not exceed 500 square feet in size, and for a detached garage, the detached garage must be used solely for parking of vehicles and limited storage. All flood proofed accessory structures must meet the following additional standards, as appropriate:

(1) The structure must be adequately anchored to prevent flotation, collapse or lateral movement of the structure and shall be designed to equalize hydrostatic flood forces on exterior walls; and

(2) Any mechanical and utility equipment in a structure must be elevated to or above the Regulatory Flood Protection Elevation or properly flood proofed.

#### 4.46 Storage of Materials and Equipment:

(a) The storage or processing of materials that are, in time of flooding, flammable, explosive, or potentially injurious to human, animal, or plant life is prohibited.

(b) Storage of other materials or equipment may be allowed if readily removable from the area within the time available after a flood warning and in accordance with a plan approved by the Governing Body.

4.47 Structural works for flood control that will change the course, current or cross section of protected wetlands or public waters shall be subject to the provisions of Minnesota Statute, Chapter 103G. Community-wide structural works for flood control intended to remove areas from the regulatory flood plain shall not be allowed in the floodway.

4.48 A levee, dike or floodwall constructed in the floodway shall not cause an increase to the 100-year or regional flood and the technical analysis must assume equal conveyance or storage loss on both sides of a stream.

#### SECTION 5.0 FLOOD FRINGE DISTRICT (FF)

5.1 Permitted Uses: Permitted Uses shall be those uses of land or structures listed as Permitted Uses in the underlying zoning use district(s). If no pre-existing, underlying zoning use districts exist, then any residential or non residential structure or use of a structure or land shall be a Permitted Use in the Flood Fringe provided such use does not constitute a public nuisance. All Permitted Uses shall comply with the standards for Flood Fringe "Permitted Uses" listed in Section 5.2 and the "Standards for all Flood Fringe Uses" listed in Section 5.5.

#### 5.2 Standards for Flood Fringe Permitted Uses:

5.21 All structures, including accessory structures, must be elevated on fill so that the lowest floor including basement floor is at or above the Regulatory Flood Protection Elevation. The finished fill elevation for structures shall be no lower than one (1) foot below the Regulatory Flood Protection Elevation and the fill shall extend at such elevation at least fifteen (15) feet beyond the outside limits of the structure erected thereon.

5.22 As an alternative to elevation on fill, accessory structures that constitute a minimal investment and that do not exceed 500 square feet for the outside dimension at ground level may be internally flood proofed in accordance with Section 4.45 (c).

5.23 The cumulative placement of fill where at any one time in excess of one-thousand (1,000) cubic yards of fill is located on the parcel shall be allowable only as a Conditional Use, unless said fill is specifically intended to elevate a structure in accordance with Section 5.21 of this ordinance.

5.24 The storage of any materials or equipment shall be elevated on fill to the Regulatory Flood Protection Elevation.

5.25 The provisions of Section 5.5 of this Ordinance shall apply.

5.3 Conditional Uses: Any structure that is not elevated on fill or flood proofed in accordance with Section 5.21-5.22 or any use of land that does not comply with the standards in Section 5.23-5.24 shall only be allowable as a Conditional Use. An application for a Conditional Use shall be subject to the standards and criteria and evaluation procedures specified in Sections 5.4-5.5 and 10.4 of this Ordinance.

5.4 Standards for Flood Fringe Conditional Uses:

5.41 Alternative elevation methods other than the use of fill may be utilized to elevate a structure's lowest floor above the Regulatory Flood Protection Elevation. These alternative methods may include the use of stilts, pilings, parallel walls, etc., or above-grade, enclosed areas such as crawl spaces or tuck under garages. The base or floor of an enclosed area shall be considered above-grade and not a structure's basement or lowest floor if: 1) the enclosed area is above-grade on at least one side of the structure; 2) it is designed to internally flood and is constructed with flood resistant materials; and 3) it is used solely for parking of vehicles, building access or storage. The aboved-noted alternative elevation methods are subject to the following additional standards:

(a) Design and Certification - The structure's design and as-built condition must be certified by a registered professional engineer or architect as being in compliance with the general design standards of the State Building Code and, specifically, that all electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities must be at or above the Regulatory Flood Protection Elevation or be designed to prevent flood water from entering or accumulating within these components during times of flooding.

(b) Specific Standards for Above-grade, Enclosed Areas - Above-grade, fully enclosed areas such as crawl spaces or tuck under garages must be designed to internally flood and the design plans must stipulate:

(1) The minimum area of openings in the walls where internal flooding is to be used as a flood proofing technique. When openings are placed in a structure's walls to provide for entry of flood waters to equalize pressures, the bottom of all openings shall be no higher than one-foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of flood waters.

(2) That the enclosed area will be designed of flood resistant materials in accordance with the FP-3 or FP-4 classifications in the State Building Code and shall be used solely for building access, parking of vehicles or storage.

5.42 Basements, as defined by Section 2.812 of this Ordinance, shall be subject to the following:

(a) Residential basement construction shall not be allowed below the Regulatory Flood Protection Elevation.

(b) Non-residential basements may be allowed below the Regulatory Flood Protection Elevation provided the basement is structurally dry flood proofed in accordance with Section 5.43 of this Ordinance.

5.43 All areas of non residential structures including basements to be placed below the Regulatory Flood Protection Elevation shall be flood proofed in accordance with the structurally dry flood proofing classifications in the State Building Code. Structurally dry flood proofing must meet the FP-1 or FP-2 flood proofing classification in the State Building Code and this shall require making the structure watertight with the walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of bouyancy. Structures flood proofed to the FP-3 or FP-4 classification shall not be permitted.

5.44 When at any one time more than 1,000 cubic yards of fill or other similar material is located on a parcel for such activities as on-site storage, landscaping, sand and gravel operations, landfills, roads, dredge spoil disposal or construction of flood control works, an erosion/sedimentation control plan must be submitted unless the community is enforcing a state approved shoreland management ordinance. In the absence of a state approved shoreland ordinance, the plan must clearly specify methods to be used to stabilize the fill on site for a flood event at a minimum of the 100-year or regional flood event. The plan must be prepared and certified by a registered professional engineer or other qualified individual acceptable to the Governing Body. The plan may incorporate alternative procedures for removal of the material from the flood plain if adequate flood warning time exists.

5.45 Storage of Materials and Equipment:

(a) The storage or processing of materials that are, in time of flooding, flammable, explosive, or potentially injurious to human, animal, or plant life is prohibited.

(b) Storage of other materials or equipment may be allowed if readily removable from the area within the time available



after a flood warning and in accordance with a plan approved by the Governing Body.

5.46 The provisions of Section 5.5 of this Ordinance shall also apply.

5.5 Standards for All Flood Fringe Uses:

5.51 All new principal structures must have vehicular access at or above an elevation not more than two (2) feet below the Regulatory Flood Protection Elevation. If a variance to this requirement is granted, the Board of Adjustment must specify limitations on the period of use or occupancy of the structure for times of flooding and only after determining that adequate flood warning time and local flood emergency response procedures exist.

5.52 Commercial Uses - accessory land uses, such as yards, railroad tracks, and parking lots may be at elevations lower than the Regulatory Flood Protection Elevation. However, a permit for such facilities to be used by the employees or the general public shall not be granted in the absence of a flood warning system that provides adequate time for evacuation if the area would be inundated to a depth greater than two feet or be subject to flood velocities greater than four feet per second upon occurrence of the regional flood.

5.53 Manufacturing and Industrial Uses - measures shall be taken to minimize interference with normal plant operations especially along streams having protracted flood durations. Certain accessory land uses such as yards and parking lots may be at lower elevations subject to requirements set out in Section 5.52 above. In considering permit applications, due consideration shall be given to needs of an industry whose business requires that it be located in flood plain areas.

5.54 Fill shall be properly compacted and the slopes shall be properly protected by the use of riprap, vegetative cover or other acceptable method. The Federal Emergency Management Agency (FEMA) has established criteria for removing the special flood hazard area designation for certain structures properly elevated on fill above the 100-year flood elevation - FEMA's requirements incorporate specific fill compaction and side slope protection standards for multi-structure or multi-lot developments. These standards should be investigated prior to the initiation of site preparation if a change of special flood hazard area designation will be requested.

5.55 Flood plain developments shall not adversely affect the hydraulic capacity of the channel and adjoining flood plain of any tributary watercourse or drainage system where

a floodway or other encroachment limit has not been specified on the Official Zoning Map.

5.56 Standards for travel trailers and travel vehicles are contained in Section 9.3.

5.57 All manufactured homes must be securely anchored to an adequately anchored foundation system that resists flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state or local anchoring requirements for resisting wind forces.

## SECTION 6.0 GENERAL FLOOD PLAIN DISTRICT

### 6.1 Permissible Uses:

6.11 The uses listed in Section 4.1 of this Ordinance shall be permitted uses.

6.12 All other uses shall be subject to the floodway/flood fringe evaluation criteria pursuant to Section 6.2 below. Section 4.0 shall apply if the proposed use is in the Floodway District and Section 5.0 shall apply if the proposed use is in the Flood Fringe District.

### 6.2 Procedures for Floodway and Flood Fringe Determinations Within the General Flood Plain District.

6.21 Upon receipt of an application for a Conditional Use Permit for a use within the General Flood Plain District, the applicant shall be required to furnish such of the following information as is deemed necessary by the Zoning Administrator for the determination of the Regulatory Flood Protection Elevation and whether the proposed use is within the Floodway or Flood Fringe District.

(a) A typical valley cross-section showing the channel of the stream, elevation of land areas adjoining each side of the channel, cross-sectional areas to be occupied by the proposed development, and high water information.

(b) Plan (surface view) showing elevations or contours of the ground; pertinent structure, fill, or storage elevations; size, location, and spatial arrangement of all proposed and existing structures on the site; location and elevations of streets; photographs showing existing land uses and vegetation upstream and downstream; and soil type.

(c) Profile showing the slope of the bottom of the channel or flow line of the stream for at least 500 feet in either direction from the proposed development.

6.22 The applicant shall be responsible to submit one copy of the above information to a designated engineer or other expert person or agency for technical assistance in determining whether the proposed use is in the Floodway or Flood Fringe District and to determine the Regulatory Flood Protection Elevation. Procedures consistent with Minnesota Regulations 1983, Parts 6120.5000 - 6120.6200 shall be followed in this expert evaluation. The designated engineer or expert is strongly encouraged to discuss the proposed technical evaluation methodology with the respective Department of Natural Resources' Area Hydrologist prior to commencing the analysis. The designated engineer or expert shall:

(a) Estimate the peak discharge of the regional flood.

(b) Calculate the water surface profile of the regional flood based upon a hydraulic analysis of the stream channel and overbank areas.

(c) Compute the floodway necessary to convey or store the regional flood without increasing flood stages more than 0.5 foot. A lesser stage increase than .5' shall be required if, as a result of the additional stage increase, increased flood damages would result. An equal degree of encroachment on both sides of the stream within the reach shall be assumed in computing floodway boundaries.

6.23 The Zoning Administrator shall present the technical evaluation and findings of the designated engineer or expert to the Governing Body. The Governing Body must formally accept the technical evaluation and the recommended Floodway and/or Flood Fringe District boundary or deny the permit application. The Governing Body, prior to official action, may submit the application and all supporting data and analyses to the Federal Emergency Management Agency, the Department of Natural Resources or the Planning Commission for review and comment. Once the Floodway and Flood Fringe Boundaries have been determined, the Governing Body shall refer the matter back to the Zoning Administrator who shall process the permit application consistent with the applicable provisions of Section 4.0 and 5.0 of this Ordinance.

## SECTION 7.0 SUBDIVISIONS<sup>2</sup>

7.1 Review Criteria: No land shall be subdivided which is unsuitable for the reason of flooding, inadequate drainage, water supply or sewage treatment facilities. All lots within the flood plain districts shall contain a building site at or above the Regulatory Flood Protection Elevation. All subdivisions shall have water and sewage treatment facilities that comply with the provisions of this Ordinance and have road access both to the subdivision and to the individual building sites no lower than two feet below the Regulatory Flood Protection Elevation. For all subdivisions in the flood plain, the Floodway and Flood Fringe boundaries, the Regulatory Flood Protection Elevation and the required elevation of all access roads shall be clearly labelled on all required subdivision drawings and platting documents.

7.2 Floodway/Flood Fringe Determinations in the General Flood Plain District: In the General Flood Plain District, applicants shall provide the information required in Section 6.2 of this Ordinance to determine the 100-year flood elevation, the Floodway and Flood Fringe District boundaries and the Regulatory Flood Protection Elevation for the subdivision site.

7.3 Removal of Special Flood Hazard Area Designation: The Federal Emergency Management Agency (FEMA) has established criteria for removing the special flood hazard area designation for certain structures properly elevated on fill above the 100-year flood elevation. FEMA's requirements incorporate specific fill compaction and side slope protection standards for multi-structure or multi-lot developments. These standards should be investigated prior to the initiation of site preparation if a change of special flood hazard area designation will be requested.

<sup>2</sup>This Section is not intended as a substitute for a comprehensive city or county subdivision ordinance. It can, however, be used as an interim control until the comprehensive subdivision ordinance can be amended to include necessary flood plain management provisions.

## SECTION 8.0 PUBLIC UTILITIES, RAILROADS, ROADS, AND BRIDGES

8.1 Public Utilities. All public utilities and facilities such as gas, electrical, sewer, and water supply systems to be located in the flood plain shall be flood-proofed in accordance with the State Building Code or elevated to above the Regulatory Flood Protection Elevation.

8.2 Public Transportation Facilities. Railroad tracks, roads, and bridges to be located within the flood plain shall comply with Sections 4.0 and 5.0 of this Ordinance. Elevation to the Regulatory Flood Protection Elevation shall be provided where failure or interruption of these transportation facilities would result in danger to the public health or safety or where such facilities are essential to the orderly functioning of the area. Minor or auxiliary roads or railroads may be constructed at a lower elevation where failure or interruption of transportation services would not endanger the public health or safety.

8.3 On-site Sewage Treatment and Water Supply Systems: Where public utilities are not provided: 1) On-site water supply systems must be designed to minimize or eliminate infiltration of flood waters into the systems; and 2) New or replacement on-site sewage treatment systems must be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters and they shall not be subject to impairment or contamination during times of flooding. Any sewage treatment system designed in accordance with the State's current statewide standards for on-site sewage treatment systems shall be determined to be in compliance with this Section.

## SECTION 9.0 MANUFACTURED HOMES AND MANUFACTURED HOME PARKS AND PLACEMENT OF TRAVEL TRAILERS AND TRAVEL VEHICLES.

9.1 New manufactured home parks and expansions to existing manufactured home parks shall be subject to the provisions placed on subdivisions by Section 7.0 of this Ordinance.

9.2 The placement of new or replacement manufactured homes in existing manufactured home parks or on individual lots of record that are located in flood plain districts will be treated as a new structure and may be placed only if elevated in compliance with Section 5.0 of this Ordinance. If vehicular road access for pre-existing manufactured home parks is not provided in accordance with Section 5.51, then replacement manufactured homes will not be allowed until the property owner(s) develops a flood warning emergency plan acceptable to the Governing Body.

9.21 All manufactured homes must be securely anchored to an adequately anchored foundation system that resists

flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state or local anchoring requirements for resisting wind forces.

9.3 Travel trailers and travel vehicles that do not meet the exemption criteria specified in Section 9.31 below shall be subject to the provisions of this Ordinance and as specifically spelled out in Sections 9.33-9.34 below.

9.31 Exemption - Travel trailers and travel vehicles are exempt from the provisions of this Ordinance if they are placed in any of the areas listed in Section 9.32 below and further they meet the following criteria:

- (a) Have current licenses required for highway use.
- (b) Are highway ready meaning on wheels or the internal jacking system, are attached to the site only by quick disconnect type utilities commonly used in campgrounds and trailer parks and the travel trailer/travel vehicle has no permanent structural type additions attached to it.
- (c) The travel trailer or travel vehicle and associated use must be permissible in any pre-existing, underlying zoning use district.

9.32 Areas Exempted For Placement of Travel/Recreational Vehicles:

- (a) Individual lots or parcels of record.
- (b) Existing commercial recreational vehicle parks or campgrounds.
- (c) Existing condominium type associations.

9.33 Travel trailers and travel vehicles exempted in Section 9.31 lose this exemption when development occurs on the parcel exceeding \$500 dollars for a structural addition to the travel trailer/travel vehicle or an accessory structure such as a garage or storage building. The travel trailer/travel vehicle and all additions and accessory structures will then be treated as a new structure and shall be subject to the elevation/flood proofing requirements and the use of land restrictions specified in Sections 4.0 and 5.0 of this Ordinance.

9.34 New commercial travel trailer or travel vehicle parks or campgrounds and new residential type subdivisions and condominium associations and the expansion of any existing similar use exceeding five (5) units or dwelling sites shall be subject to the following:

- (a) Any new or replacement travel trailer or travel vehicle will be allowed in the Floodway or Flood Fringe Districts provided said trailer or vehicle and its contents are placed

on fill above the Regulatory Flood Protection Elevation and proper elevated road access to the site exists in accordance with Section 5.51 of this Ordinance. No fill placed in the floodway to meet the requirements of this Section shall increase flood stages of the 100-year or regional flood.

(b) All new or replacement travel trailers or travel vehicles not meeting the criteria of (a) above may, as an alternative, be allowed as a Conditional Use if in accordance with the following provisions and the provisions of 10.4 of the Ordinance. The applicant must submit an emergency plan for the safe evacuation of all vehicles and people during the 100 year flood. Said plan shall be prepared by a registered engineer or other qualified individual and shall demonstrate that adequate time and personnel exist to carry out the evacuation. All attendant sewage and water facilities for new or replacement travel trailers or other recreational vehicles must be protected or constructed so as to not be impaired or contaminated during times of flooding in accordance with Section 8.3 of this Ordinance.

#### SECTION 10.0 ADMINISTRATION

10.1 Zoning Administrator: A Zoning Administrator or other official designated by the Governing Body shall administer and enforce this Ordinance. If the Zoning Administrator finds a violation of the provisions of this Ordinance the Zoning Administrator shall notify the person responsible for such violation in accordance with the procedures stated in Section 12.0 of the Ordinance.

#### 10.2 Permit Requirements:

10.21 Permit Required. A Permit issued by the Zoning Administrator in conformity with the provisions of this Ordinance shall be secured prior to the erection, addition, or alteration of any building, structure, or portion thereof; prior to the use or change of use of a building, structure, or land; prior to the change or extension of a nonconforming use; and prior to the placement of fill, excavation of materials, or the storage of materials or equipment within the flood plain.

10.22 Application for Permit. Application for a Permit shall be made in duplicate to the Zoning Administrator on forms furnished by the Zoning Administrator and shall include the following where applicable: plans in duplicate drawn to scale, showing the nature, location, dimensions, and elevations of the lot; existing or proposed structures, fill, or storage of materials; and the location of the foregoing in relation to the stream channel.

10.23 State and Federal Permits. Prior to granting a Permit or processing an application for a Conditional Use Permit or Variance, the Zoning Administrator shall determine that the applicant has obtained all necessary State and Federal Permits.

10.24 Certificate of Zoning Compliance for a New, Altered, or Nonconforming Use. It shall be unlawful to use, occupy, or permit the use or occupancy of any building or premises or part thereof hereafter created, erected, changed, converted, altered, or enlarged in its use or structure until a Certificate of Zoning Compliance shall have been issued by the Zoning Administrator stating that the use of the building or land conforms to the requirements of this Ordinance.

10.25 Construction and Use to be as Provided on Applications, Plans, Permits, Variances and Certificates of Zoning Compliance. Permits, Conditional Use Permits, or Certificates of Zoning Compliance issued on the basis of approved plans and applications authorize only the use, arrangement, and construction set forth in such approved plans and applications, and no other use, arrangement, or construction. Any use, arrangement, or construction at variance with that authorized shall be deemed a violation of this Ordinance, and punishable as provided by Section 12.0 of this Ordinance.

10.26 Certification. The applicant shall be required to submit certification by a registered professional engineer, registered architect, or registered land surveyor that the finished fill and building elevations were accomplished in compliance with the provisions of this ordinance. Flood-proofing measures shall be certified by a registered professional engineer or registered architect.

10.27 Record of First Floor Elevation. The Zoning Administrator shall maintain a record of the elevation of the lowest floor (including basement) of all new structures and alterations or additions to existing structures in the flood plain. The Zoning Administrator shall also maintain a record of the elevation to which structures or alterations and additions to structures are flood-proofed.

### 10.3 Board of Adjustment:

10.31 Rules. The Board of Adjustment shall adopt rules for the conduct of business and may exercise all of the powers conferred on such Boards by State law.

10.32 Administrative Review. The Board shall hear and decide appeals where it is alleged there is error in any order, requirement, decision, or determination made by an



administrative official in the enforcement or administration of this Ordinance.

10.33 Variances. The Board may authorize upon appeal in specific cases such relief or variance from the terms of this Ordinance as will not be contrary to the public interest and only for those circumstances such as hardship, practical difficulties or circumstances unique to the property under consideration, as provided for in the respective enabling legislation for planning and zoning for cities or counties as appropriate. In the granting of such variance, the Board of Adjustment shall clearly identify in writing the specific conditions that existed consistent with the criteria specified in the respective enabling legislation which justified the granting of the variance. No Variance shall have the effect of allowing in any district uses prohibited in that district, permit a lower degree of flood protection than the Regulatory Flood Protection Elevation for the particular area, or permit standards lower than those required by State law.

10.34 Hearings. Upon filing with the Board of Adjustment of an appeal from a decision of the Zoning Administrator, or an application for a variance, the Board shall fix a reasonable time for a hearing and give due notice to the parties in interest as specified by law. The Board shall submit by mail to the Commissioner of Natural Resources a copy of the application for proposed Variances sufficiently in advance so that the Commissioner will receive at least ten days notice of the hearing.

10.35 Decisions. The Board shall arrive at a decision on such appeal or Variance within \_\_\_\_\_ days. In passing upon an appeal, the Board may, so long as such action is in conformity with the provisions of this Ordinance, reverse or affirm, wholly or in part, or modify the order, requirement, decision or determination of the Zoning Administrator or other public official. It shall make its decision in writing setting forth the findings of fact and the reasons for its decisions. In granting a Variance the Board may prescribe appropriate conditions and safeguards such as those specified in Section 10.46, which are in conformity with the purposes of this Ordinance. Violations of such conditions and safeguards, when made a part of the terms under which the Variance is granted, shall be deemed a violation of this Ordinance punishable under Section 12.0. A copy of all decisions granting Variances shall be forwarded by mail to the Commissioner of Natural Resources within ten (10) days of such action.

10.36 Appeals. Appeals from any decision of the Board may be made, and as specified in this Community's Official Controls and also Minnesota Statutes.

10.37 Flood Insurance Notice and Record Keeping. The Zoning Administrator shall notify the applicant for a variance that: 1) The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage and 2) Such construction below the 100-year or regional flood level increases risks to life and property. Such notification shall be maintained with a record of all variance actions. A community shall maintain a record of all variance actions, including justification for their issuance, and report such variances issued in its annual or biennial report submitted to the Administrator of the National Flood Insurance Program.

10.4 Conditional Uses. The

\_\_\_\_\_  
(Governing Body/Planning Comm./Bd. of Adjust.  
shall hear and decide applications for Conditional Uses permissible under this Ordinance. Applications shall be submitted to the Zoning Administrator who shall forward the application to \_\_\_\_\_ for consideration.  
(Designated Body)

10.41 Hearings. Upon filing with the \_\_\_\_\_ an application for a  
(Designated Body)

Conditional Use Permit, the \_\_\_\_\_ shall submit  
(Designated Body)  
by mail to the Commissioner of Natural Resources a copy of the application for proposed Conditional Use sufficiently in advance so that the Commissioner will receive at least ten days notice of the hearing.

10.42 Decisions. The \_\_\_\_\_ shall arrive at  
(Designated Body)

a decision on a Conditional Use within \_\_\_\_\_ days. In granting a Conditional Use Permit the \_\_\_\_\_ shall prescribe appropriate  
(Designated Body)

conditions and safeguards, in addition to those specified in Section 10.46, which are in conformity with the purposes of this Ordinance. Violations of such conditions and safeguards, when made a part of the terms under which the Conditional Use Permit is granted, shall be deemed a violation of this Ordinance punishable under Section 12.0. A copy of all decisions granting Conditional Use Permits shall be forwarded by mail to the Commissioner of Natural Resources within ten (10) days of such action.

10.43 Procedures to be followed by the \_\_\_\_\_  
(Designated Body)

in Passing on Conditional Use Permit Applications Within all Flood Plain Districts.

(a) Require the applicant to furnish such of the following information and additional information as deemed necessary by the \_\_\_\_\_ for determining the suitability of (Designated Body) the particular site for the proposed use:

(1) Plans in triplicate drawn to scale showing the nature, location, dimensions, and elevation of the lot, existing or proposed structures, fill, storage of materials, flood-proofing measures, and the relationship of the above to the location of the stream channel.

(2) Specifications for building construction and materials, flood-proofing, filling, dredging, grading, channel improvement, storage of materials, water supply and sanitary facilities.

(b) Transmit one copy of the information described in subsection (a) to a designated engineer or other expert person or agency for technical assistance, where necessary, in evaluating the proposed project in relation to flood heights and velocities, the seriousness of flood damage to the use, the adequacy of the plans for protection, and other technical matters.

(c) Based upon the technical evaluation of the designated engineer or expert, the \_\_\_\_\_ shall determine the (Designated Body) specific flood hazard at the site and evaluate the suitability of the proposed use in relation to the flood hazard.

10.44 Factors Upon Which the Decision of the \_\_\_\_\_ Shall Be Based. In passing (Designated Body) upon Conditional Use applications, the \_\_\_\_\_ (Designated Body) shall consider all relevant factors specified in other sections of this Ordinance, and:

(a) The danger to life and property due to increased flood heights or velocities caused by encroachments.

(b) The danger that materials may be swept onto other lands or downstream to the injury of others or they may block bridges, culverts or other hydraulic structures.

(c) The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.

(d) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner.

(e) The importance of the services provided by the proposed facility to the community.

- (f) The requirements of the facility for a waterfront location.
- (g) The availability of alternative locations not subject to flooding for the proposed use.
- (h) The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.
- (i) The relationship of the proposed use to the comprehensive plan and flood plain management program for the area.
- (j) The safety of access to the property in times of flood for ordinary and emergency vehicles.
- (k) The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters expected at the site.
- (l) Such other factors which are relevant to the purposes of this Ordinance.

10.45 Time for Acting on Application. The \_\_\_\_\_ shall act on an application in the (Designated Body) manner described above within \_\_\_\_\_ days from receiving the application, except that where additional information is required pursuant to 10.44 of this Ordinance. The \_\_\_\_\_ shall render a written decision within (Designated Body) \_\_\_\_\_ days from the receipt of such additional information.

10.46 Conditions Attached to Conditional Use Permits. Upon consideration of the factors listed above and the purpose of this Ordinance, the \_\_\_\_\_ shall attach such (Designated Body) conditions to the granting of Conditional Use Permits as it deems necessary to fulfill the purposes of this Ordinance. Such conditions may include, but are not limited to, the following:

- (a) Modification of waste treatment and water supply facilities.
- (b) Limitations on period of use, occupancy, and operation.
- (c) Imposition of operational controls, sureties, and deed restrictions.
- (d) Requirements for construction of channel modifications, compensatory storage, dikes, levees, and other protective measures.
- (e) Flood-proofing measures, in accordance with the State Building Code and this Ordinance. The applicant shall submit a plan or document certified by a registered professional engineer or architect that the flood-proofing measures are consistent with the Regulatory Flood Protection Elevation and associated flood factors for the particular area.

SECTION 11.0 NONCONFORMING USES

11.1 A structure or the use of a structure or premises which was lawful before the passage or amendment of this Ordinance but which is not in conformity with the provisions of this Ordinance may be continued subject to the following conditions:

11.11 No such use shall be expanded, changed, enlarged, or altered in a way which increases its nonconformity.

11.12 Any alteration or addition to a nonconforming structure or nonconforming use which would result in increasing the flood damage potential of that structure or use shall be protected to the Regulatory Flood Protection Elevation in accordance with any of the elevation on fill or flood proofing techniques ( i.e. , FP-1 thru FP-4 floodproofing classifications) allowable in the State Building Code, except as further restricted in 11.13 below.

11.13 The cost of any structural alterations or additions to any nonconforming structure over the life of the structure shall not exceed 50 percent of the market value of the structure unless the conditions of this Section are satisfied. The cost of all structural alterations and additions constructed since the adoption of the Community's initial flood plain controls must be calculated into today's current cost which will include all costs such as construction materials and a reasonable cost placed on all manpower or labor. If the current cost of all previous and proposed alterations and additions exceeds 50 percent of the current market value of the structure, then the structure must meet the standards of Section 4.0 or 5.0 of this Ordinance for new structures depending upon whether the structure is in the Floodway or Flood Fringe, respectively.

11.14 If any nonconforming use is discontinued for 12 consecutive months, any future use of the building premises shall conform to this Ordinance. The assessor shall notify the Zoning Administrator in writing of instances of nonconforming uses which have been discontinued for a period of 12 months.

11.15. If any nonconforming use or structure is destroyed by any means, including floods, to an extent of 50 percent or more of its market value at the time of destruction, it shall not be reconstructed except in conformity with the provisions of this Ordinance. The applicable provisions for establishing new uses or new structures in Sections 4.0, 5.0 or 6.0 will apply depending upon whether the use or structure is in the Floodway, Flood Fringe or General Flood Plain District, respectively.

## SECTION 12.0 PENALTIES FOR VIOLATION

12.1 Violation of the provisions of this Ordinance or failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with grants of Variances or Conditional Uses) shall constitute a misdemeanor and shall be punishable as defined by law.

12.2 Nothing herein contained shall prevent the \_\_\_\_\_ from taking such other lawful action (local unit) as is necessary to prevent or remedy any violation. Such actions may include but are not limited to:

12.21 In responding to a suspected ordinance violation, the Zoning Administrator and Local Government may utilize the full array of enforcement actions available to it including but not limited to prosecution and fines, injunctions, after-the-fact permits, orders for corrective measures or a request to the National Flood Insurance Program for denial of flood insurance availability to the guilty party. The community must act in good faith to enforce these official controls and to correct ordinance violations to the extent possible so as not to jeopardize its eligibility in the National Flood Insurance Program.

12.22 When an ordinance violation is either discovered by or brought to the attention of the Zoning Administrator, the Zoning Administrator shall immediately investigate the situation and document the nature and extent of the violation of the official control. As soon as is reasonably possible, this information will be submitted to the appropriate Department of Natural Resources' and Federal Emergency Management Agency Regional Office along with the Community's plan of action to correct the violation to the degree possible.

12.23 The Zoning Administrator shall notify the suspected party of the requirements of this Ordinance and all other Official Controls and the nature and extent of the suspected violation of these controls. If the structure and/or use is under construction or development, the Zoning Administrator may order the construction or development immediately halted until a proper permit or approval is granted by the Community. If the construction or development is already completed, then the Zoning Administrator may either (1) issue an order identifying the corrective actions that must be made within a specified time period to bring the use or structure into compliance with the official controls, or (2) notify the responsible party to apply for an after-the-fact permit/development approval within a specified period of time not to exceed 30-days.

12.24 If the responsible party does not appropriately respond to the Zoning Administrator within the specified period of time, each additional day that lapses shall constitute an additional violation of this Ordinance and shall be prosecuted accordingly. The Zoning Administrator shall also upon the lapse of the specified response period notify the landowner to restore the land to the condition which existed prior to the violation of this Ordinance.

#### SECTION 13.0 AMENDMENTS

The flood plain designation on the Official Zoning Map shall not be removed from flood plain areas unless it can be shown that the designation is in error or that the area has been filled to or above the elevation of the regional flood and is contiguous to lands outside the flood plain. Special exceptions to this rule may be permitted by the Commissioner of Natural Resources if he determines that, through other measures, lands are adequately protected for the intended use.

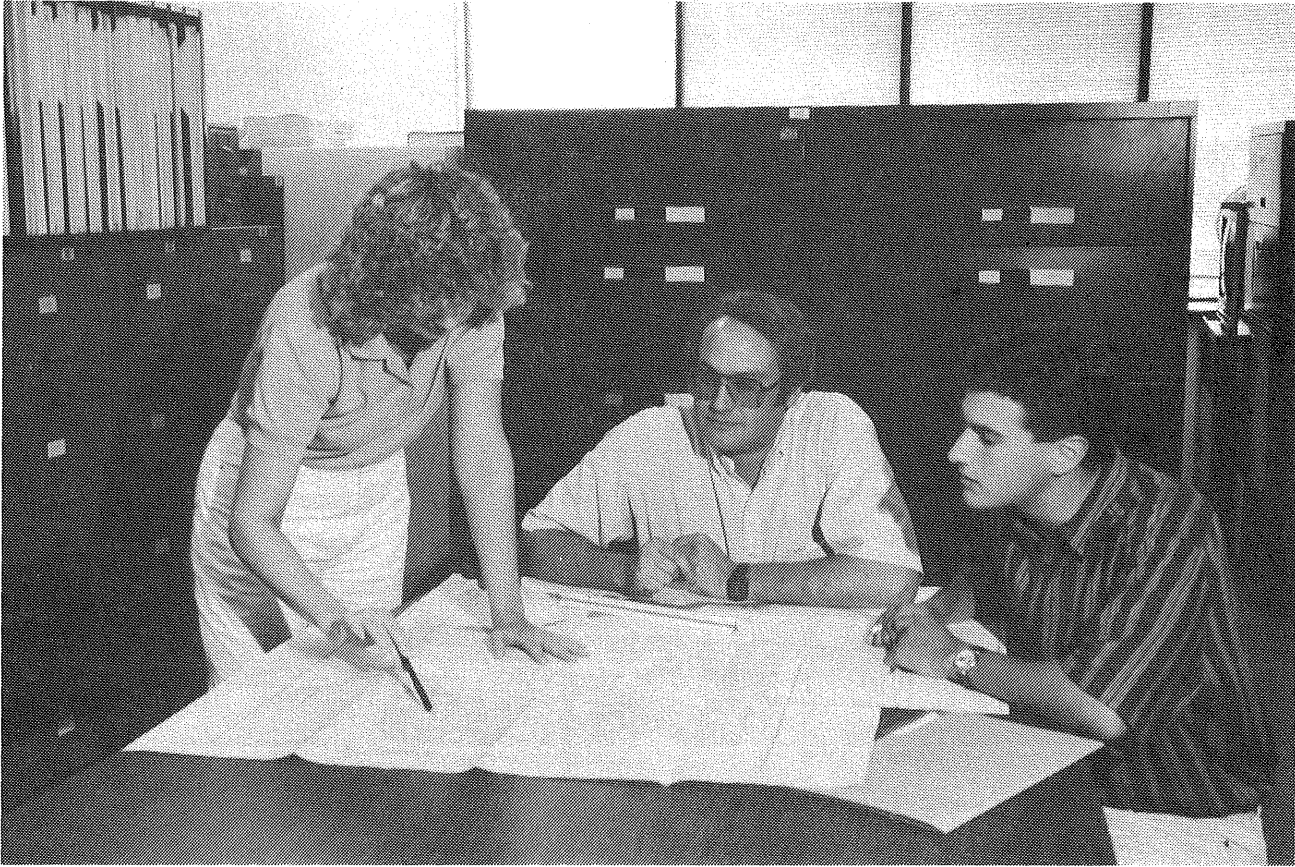
All amendments to this Ordinance, including amendments to the Official Zoning Map, must be submitted to and approved by the Commissioner of Natural Resources prior to adoption. Changes in the Official Zoning Map must meet the Federal Emergency Management Agency's (FEMA) Technical Conditions and Criteria and must receive prior FEMA approval before adoption. The Commissioner of Natural Resources must be given 10-days written notice of all hearings to consider an amendment to this Ordinance and said notice shall include a draft of the ordinance amendment or technical study under consideration.







# ORDINANCE ADMINISTRATION





# CHAPTER 7

## ORDINANCE ADMINISTRATION

Topics to be covered:

1. Introduction
2. The Role of the Zoning Administrator
3. Permit Process
  - A. Permit Application
  - B. Permit Review Checklist
  - C. Acting on a Permit Application
4. Conditional Uses
  - A. Definition/Enabling Legislation
  - B. Justification of Procedure
  - C. Activities Requiring a Conditional Use Permit
  - D. The Review Process
5. Nonconforming Uses
  - A. Methods for Determining Cumulative Improvements
6. Appeals and Variances
  - A. Appeals
  - B. Variances
7. Record Keeping
  - A. Elevation Certificate
  - B. FEMA Biennial Report
  - C. ZBase©
8. Enforcement
  - A. Inspections
  - B. Certificates
  - C. Violations
  - D. Sanctions
9. Ordinance Administration - the Relationship with the NFIP

For floodplain management, the local community has the primary responsibility to insure that new floodplain development is properly elevated or floodproofed. While the DNR and FEMA have oversight responsibilities, these two agencies have limited involvement in the day-to-day decision-making process at the local level.

To accomplish the goals of the floodplain management ordinance, the local community must establish a mechanism to administer the adopted ordinance. For those communities with previously established zoning and subdivision ordinances, these mechanisms should already be in place.

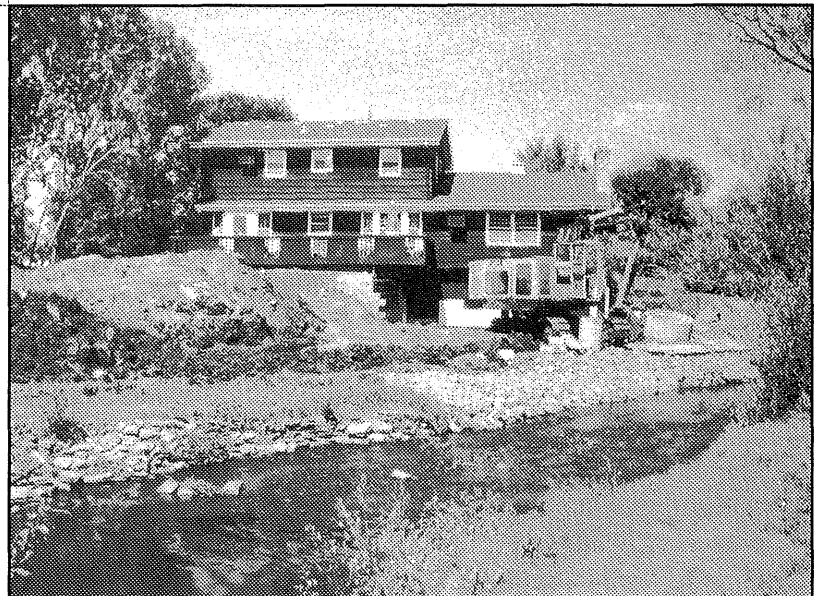
### ***2. The Role of the Zoning Administrator***

The zoning administrator is the community employee responsible for administering the local zoning ordinance. Counties and larger cities with sufficient ongoing development activities will often have one or more full-time zoning administrators. In smaller cities, the building inspector, city administrator, city clerk or other community employee often must wear several hats, including that of zoning administrator.

### ***1. Introduction***

This chapter will discuss the day-to-day administration of the floodplain ordinance. Responsibilities of various community staff and elected officials will be highlighted. Helpful suggestions, sample forms and procedures are also included.

**Figure 7.1 Community officials should carefully review all floodplain development proposals to insure compliance with their ordinance and avoid expensive retrofitting.**



Approval for certain activities not explicitly allowed as a permitted use by the ordinance (land subdivision, conditional uses, variances and disputes arising from decisions made by the zoning administrator) must come from the Board of Adjustment, Planning Commission or other locally established board—**NOT the zoning administrator.**

General administrative responsibilities of the zoning administrator (or designee) include:

- Reviewing and evaluating permit applications and plans;
- Issuing building/use permits to applicants demonstrating full compliance with the provisions of the ordinance;
- Inspecting construction activity for permit compliance (can be done by building inspector);
- Receiving requests for appeals, variances and conditional use permits to be heard by the appropriate governing body;
- Issuing certificates of zoning compliance and elevation certificates where it is demonstrated that a development is constructed in compliance with all applicable provisions of the ordinance; and
- Keeping records of all applications, plans, notices of hearings, certificates of compliance and occupancy and other important documents.

Specific development review responsibilities of the zoning administrator in regard to the floodplain ordinance include:

- Determining whether the proposed development is located in the 100-year floodplain; if so,
- Determining whether the proposed development is located in the floodway or flood fringe district;

- Determining the appropriate regulatory flood protection elevation (RFPE); and
- Insuring the development is designed in accordance with the access, elevation, floodproofing, occupancy or other requirements of the adopted community ordinance.

### **3. Permit Process**

The only means of administering the floodplain ordinance is through a permit system. A primary requirement is to have a building permit system for structures or activities located in floodplain areas.

#### **A. Permit Application**

Anyone planning to develop in a floodplain area must first apply for a **building/use permit**. The ordinance usually specifies the types of data which the applicant must provide to the zoning administrator. The applicant should be required to complete a permit application form (sample form is presented in Appendix 7D).

A standard application has two basic parts. The first part is an administrative form which serves as an official record of pertinent facts, including:

- 1) Name and address of the applicant, engineer, architect and developer;
- 2) Brief description of the proposed development, including proposed use, cost of improvement and value of structure;
- 3) Location of the development;
- 4) Final permit action; and
- 5) Inspection record.

The second part of the application should be a map or diagram clearly illustrating the location of the project and all other pertinent features, including:

- 1) Property lines;
- 2) All proposed principal structures, parking and storage areas and accessory structures;

3) Building setback lines;

(For floodplain management considerations, the following should also be included on the map or diagram):

- 4) Location of the stream channel and/or lake bed;
- 5) 100-year floodplain boundary;
- 6) Designated floodway;
- 7) 100-year flood elevation and RFPE;
- 8) Proposed building and grade elevations for all structures;
- 9) The elevation of all existing or proposed access roads;

10) A description of any floodproofing measures to be included in building design, and a specific statement identifying how floodproofed spaces are to be used and/or occupied; and

11) A description of any accessory uses of land (e.g., storage, parking, etc.) located below the RFPE.

An important function of the zoning administrator is to assist the applicant with their permit application so that all forms are as complete and accurate as possible. This helps avoid processing delays while saving the applicant, and taxpayers, time and money.



**Figure 7.2 Proper ordinance administration can save lives and prevent property damage.**

**B. Permit Application Review Checklist**

- 1) Is the application complete?
- 2) Is the project located in the floodplain?
  - a. If not obvious, has site been field inspected/surveyed?  
Lowest natural ground elevation @ structure locations(s) \_\_\_\_\_  
100-year flood elevation (base flood elevation) \_\_\_\_\_  
RFPE (to be used in #5 below) \_\_\_\_\_
  - b. Is zoning map incorrect?  
(If yes, file map revision request through DNR & FEMA.)
  - c. Is it a borderline call?  
(Map revision not necessarily required.)
- 3) If in the floodplain, is the property in the  
Flood Fringe District \_\_\_\_\_?  
Floodway District \_\_\_\_\_?  
General Floodplain District (conditional use) \_\_\_\_\_?  
If in the General Floodplain District, determine whether in the Flood Fringe or Floodway via conditional use procedure.
- 4) Is proposed development  
Permitted \_\_\_\_\_?  
Conditional \_\_\_\_\_?  
Prohibited \_\_\_\_\_?
- 5) Are adequate measures being taken to safeguard against future flood damages?  
  
Residential structures - elevated to or above RFPE?  
Commercial /Industrial - elevated to RFPE or dry floodproofed?  
Both - is access adequate? Are accessory structures/land uses appropriate?
- 6) Have all required permits been obtained?

## Notes on Checklist

**1) Is the application complete?** - The zoning administrator cannot properly review an application which does not include a thorough description of the proposed development or provide enough data to determine if the project will comply with all ordinance provisions. Additional data should be requested from the applicant as soon as possible.

**2) Is the project located in the floodplain?** - The provisions of the floodplain ordinance only apply to those buildings, obstructions, and uses of land located in the designated floodplain. If this determination is not obvious when using the available zoning and floodplain maps, an on-site inspection or survey will be necessary. As indicated in Chapter 3 of this handbook, the natural elevation of the property in question compared to the 100-year flood elevation is the determining factor. The community may perform the required site survey, or may require the applicant to obtain the services of a registered land surveyor to make this determination.

As a result of an on-site inspection or survey, the zoning administrator may find the zoning map inaccurately includes a property in the floodplain. If this is the case, the zoning administrator should file a map amendment request to the city council or planning commission before proceeding with the assumption the property is not in the floodplain (see Chapter 10).

In borderline situations, where the map scale and the closeness of the proposed development to the flood boundary prevent an easy determination, the zoning administrator may determine, based on site inspection or field survey, that the development is or is not located in the floodplain. If it is, the floodplain ordinance applies to this development proposal. In either case, a map revision is not necessarily required. The ordinance administrator has the authority to make the determination in borderline cases. A developer or landowner can always appeal the decision to the board of adjustment and appeals.

**3) If the project is located in the floodplain, is it located in the flood fringe or floodway districts?** - As discussed in Chapter 3, if the development is located in a detailed study reach for the community's flood insurance study, the floodway/flood fringe district should be shown

on the community's official zoning map or the FEMA Flood Boundary and Floodway Map. If the development proposal is located in an approximate study area (general floodplain district), this determination must be made as specified in the conditional use section of the community's ordinance. The applicant is usually responsible for providing the information necessary for the planning commission/governing body to make this determination. (See next section on Conditional Uses.)

**4) Is the proposed development a permitted, conditional or prohibited use?** - The community's ordinance should specify various permitted and conditional uses within the floodway, flood fringe and general floodplain districts. The zoning administrator must determine from the permit application whether the proposed development is a permitted, conditional or prohibited use and act accordingly.

**5) Are adequate measures being taken to safeguard occupants and the structure from future flooding?** - For residential structures, the community's ordinance will require the lowest floor, including basement, to be elevated on fill to, or above, the RFPE. Commercial and industrial development must be elevated on fill or "dry" floodproofed to the RFPE. Other considerations include access, setback requirements, and the location of accessory land uses such as storage of materials or equipment, loading and parking areas, etc.

**6) Have all other applicable permits been obtained?** - Quite often, more than one permit is required to complete a certain project. It is the applicant's responsibility to insure that all applicable local, state and federal permits for the proposed project are acquired. The zoning administrator should issue the community's land use permit only after making a "good faith" effort to determine that the applicant has secured all additional required permits.



### C. Acting on a Permit Application

Following a complete review of the permit application for the permitted use or conditional/special use permit, the zoning administrator has four basic options:

- 1) Approve the permit;
- 2) Approve the permit on the condition certain modifications are made to comply with the ordinance;
- 3) Forward the permit application to the appropriate governing body to evaluate the request for a conditional use permit, variance, etc; or
- 4) Deny the permit.

If the permit request is approved, a land use permit is issued to the property owner. If denied, the zoning administrator should explain the reasons for denial to the applicant. When denied a permit, the property owner has the right to appeal the decision to the Board of Adjustments and Appeals (appeals will be discussed later in this chapter).

## 4. Conditional Uses

### A. Definition/Enabling Legislation

Some uses are generally not appropriate for the zoning district in which they are located. The special/conditional use review procedure may demonstrate that the development proposal is compatible (often with specific conditions attached to the permit approval) with existing adjacent development and the community's comprehensive plan and local ordinance.

The county "Planning Development, Zoning" statute in M.S. § 394.22 defines a conditional use as:

Subd. 7. "Conditional use" means a land use or development as defined by ordinance that would not be appropriate generally but may be allowed with appropriate restrictions as provided by official controls upon a finding that (1) certain conditions as detailed in the zoning ordinance exist, and (2) the use or development conforms to the comprehen-

sive land use plan of the county and (3) is compatible with the existing neighborhood.

While the "Municipal Planning Act" in M.S. Chapter 462 and the Flood Plain Management Act in M.S. Chapter 103F do not define the term "conditional use", the above definition is also applicable to the discussion of conditional uses in municipalities. Both Chapters 394 and 462 allow the governing body discretionary authority to designate certain types of development conditional uses by ordinance. However, the State floodplain management program requires that certain categories of activities in the floodplain be allowed only after the granting of a conditional use permit.

The respective enabling laws for cities and counties require that certain ordinance language be adopted and specific review procedures be followed for conditional uses:

- Those activities permissible as a conditional use must be listed in the local ordinance;
- The standards and criteria for granting a conditional use must be clearly stated in the local ordinance;
- The governing body may be the review and granting authority or the governing body may delegate this authority;
- A public hearing must be held prior to the approval of a conditional use;
- Prior to approval, the applicant must show that the standards and criteria stated in the ordinance are satisfied; and
- The approval authority must, when ordering the issuance of a conditional use permit, impose restrictions or conditions necessary to protect the public interest and insure that the intent of the ordinance is met.

## **B. Justification of Procedure**

The conditional use permit procedure is appropriate because of the potential for these uses to obstruct flood flows or increase flood damage potential (to the development itself or neighboring properties) if proper flood protection techniques are not followed. Advantages of the conditional use process are the following:

- It provides a mechanism to obtain additional data needed to thoroughly evaluate the development proposal;
- It allows for a thorough review of a development proposal against the standards and criteria stated in the local ordinance. A "judgement" that a development is compliant with a set of standards and criteria is often subject to interpretation, especially where complex hydrologic/hydraulic data may be under consideration. This decision is best made by the governing body or quasi-judicial body (such as the planning commission) instead of the permit official;
- It allows for the input of adjoining property owners who could be impacted by improper floodplain development; and
- It allows the community to specify conditions to its approval, such as limitation of the use or occupancy of the structure and adjoining lands, modifications to original building design, etc.

## **C. Activities Requiring a Conditional Use Permit**

As was stated in Chapter 5, the following activities in the floodplain require the issuance of a conditional use permit:

- Floodway District - fill, storage of materials and equipment and structures accessory to certain specified open space uses;
- Flood Fringe District - floodproofing a structure in lieu of elevating a building on fill to the RFPE; and

- General Floodplain District - any activity which requires fill, obstructions, structures or storage of materials and equipment.

It must be remembered that most communities treat a floodplain zoning district as an overlay zoning district. Therefore, an activity which was a permitted use prior to floodplain ordinance adoption may have to be a conditional use after adoption of floodplain controls (e.g., a commercial building in a commercially-zoned district that is being floodproofed to the RFPE in lieu of elevation on fill). Conversely, there are activities which would have been permissible as a permitted use in the floodplain (e.g., a church properly elevated on fill to the RFPE where the pre-existing underlying zoning district has specified this activity as a conditional use in a residential district). If the underlying zoning is more restrictive than the floodplain ordinance provisions, the former takes precedence.

## **D. The Review Process**

The review process for a floodplain conditional use involves up to three basic steps: 1) data gathering; 2) weighing the accumulated data/information and the development proposal itself against the standards and criteria specified in the local ordinance; and 3) determining whether to grant without conditions, grant with conditions or deny the application.

### **Data Gathering - General Floodplain District**

As stated above, virtually any development proposal within a General Floodplain District (or unnumbered A Zone) should go through the conditional use process. The process should determine: 1) the regulatory flood protection elevation (RFPE); and 2) the floodway/flood fringe districts at the site. Once this determination is made, the zoning administrator can refer to the main body of the ordinance to identify appropriate standards and permissible uses in the floodway and flood fringe districts.

The local reviewing authority is not expected to have technical expertise in the fields of hydrology and hydraulics. It is assumed that prior to approval, comments will be solicited from the community's technical staff (if available), the DNR and FEMA and adjacent landowners who may be very knowledgeable about local flooding conditions. (See discussion on Approximate Study Areas, Chapter 3.)

Most communities have specified during the adoption of their floodplain ordinance that the developer is responsible for generating the data for the conditional use review process for general floodplain districts. The following field data are generally needed to make the site evaluation:

- **Typical valley cross sections** showing the channel of the stream, elevation of land areas adjoining **each side** of the channel, cross-sectional areas to be occupied by the proposed development, and known high water information;
- **Plan (surface) view** showing elevations or contours of the ground; pertinent structure, fill, or storage elevations; size, location, and spatial arrangement of all proposed and existing structures on the site; location and elevations of streets; photographs showing existing land uses and vegetation upstream and downstream; and soil type; and
- **Profile** showing the slope of the bottom of the channel or flow line of the stream for at least 500 feet in both directions from the proposed development.

The above data are used to determine the RFPE and floodway/flood fringe district. The floodway/flood fringe analysis must allow for an “equal degree of encroachment” on both sides of a stream channel. The resultant stage increase in the 100-year flood level should not exceed 0.5 feet or result in an increase in flood damage potential in adjacent, upstream or downstream areas.

The community’s approval authority must decide to accept or deny the above noted hydrologic/hydraulic analyses which are normally submitted by the developer’s technical consultant; this decision will be aided by the comments provided by the community’s technical support staff, local citizens and outside agencies.

## Data Gathering - Floodway and Flood Fringe Districts

Conditional uses involving fill, storage of materials or equipment, accessory structures to open space uses in the **floodway district** or the floodproofing of buildings in the **flood fringe district** may require additional data for proper review. The review authority has the discretion to request the following types of information from the developer prior to taking action on the proposal:

- 1) Hydrologic/hydraulic data including:
  - effect of fill or other obstructions in the floodway on increasing the 100-year flood profile;
  - flood flow velocities;
  - rate of rise and fall of a “typical” flood event; or
  - duration of flooding at the site;
- 2) Specifications for the floodproofing design of a structure, including water supply and sanitary facilities, to be certified by a registered professional engineer or architect;
- 3) A contingency plan prepared by a registered professional engineer or architect identifying those floodproofing measures requiring human intervention. The plan must specify when floodproofing measures must be put in place, who will be responsible for their implementation and a periodic maintenance and practice exercise schedule; and/or
- 4) A signed statement by the property owner indicating the intended future use of the proposed structure and land. This statement should include whether any space below the RFPE is intended to be used for human habitation or for storage or processing of materials that would—in time of flooding—be flammable, explosive, or potentially injurious to human, animal or plant life.

Depending upon the complexity of the development proposal, the review authority may accept as sufficient the supporting hydrologic/hydraulic data and supporting information received from the applicant or may request additional information. Prior to accepting this information, a community may solicit the advice of its own technical staff or advice from state and federal agencies.

As will be noted in the following subsection on "DNR Notification", the DNR must receive notification of a hearing to consider an application for a conditional use. A community may solicit DNR assistance in advance in determining whether floodway/flood fringe boundaries have been properly identified or whether sufficient supporting information has been submitted for final review of the development proposal. A "Conditional Use Evaluation" sheet has been included in Appendix 7A as an aid in determining data/information needs for review of conditional use permit applications.

#### Compliance with State Standards and Criteria

Once the reviewing authority has received, reviewed and accepted all required technical data and supporting information supplied by the applicant, a decision must be made to grant approval, grant approval with conditions, or deny the application. The community's floodplain ordinance must specify those standards and criteria which must be adhered to when determining whether a proposed development is suitable for the intended site. (Note: as discussed earlier, the underlying zoning use district may have stipulated additional standards and criteria applicable to that underlying use district.)

Specific standards and criteria for various uses in the floodway and flood fringe district are highlighted in Chapter 5. These standards and criteria relate to protecting the public's health and safety and guarantee that there will be no increase in flood damage potential in the community. The record of the public meeting must clearly demonstrate that the technical data, supporting information and conditions attached to the permit approval are consistent with the standards and criteria for the respective development. A "Project Evaluation Factors Worksheet" is included in the Appendix 7B as an aid in determining compliance with stated standards and criteria.

#### Conditions Which May Be Placed on Conditional Use Approval

As was stated earlier, a community must place sufficient conditions on the granting of a conditional use application to protect the public interest and insure ordinance compliance. The type and extent of these conditions will vary depending on the complexity of the development proposal and the potential harm if the flood protection measure failed or the permittee violated the conditions placed in the community's approval.

The following is a list of conditions which may be appropriate:

- Limitations on the use or the period of use, occupancy or operation of a structure and its adjoining lands. This is necessary to guarantee that, at a minimum, spaces below the RFPE will be devoted to the storage of non-hazardous and non-damageable materials or equipment and not be used for human habitation;
- Regularly scheduled inspections (annually, semi-annually, etc.) or other assurances to guarantee the conditions placed on the community's approval have not been violated by the permittee. This will substantiate compliance with any limitations on the use of the property identified above and also whether required contingency floodproofing devices remain accessible and in working order;
- Require sufficient practice exercises to insure all floodproofing contingency measures and evacuation plans are capable of being installed or implemented;
- Require sufficient recorded statements notifying potential purchasers or tenants of the property of the degree of flood protection provided and the floodproofing contingency measures and evacuation actions necessary should flooding occur; and
- Upon completion of the project, require the applicant to submit a

document and/or plan certified by a registered professional engineer or architect that the as-built condition of the development is compliant with the design plans and specifications approved by the community. This document and/or plan must demonstrate how contingency flood protection measures will be implemented and that all limitations on the use of the structure and/or land have been met.

All conditions specified by the local approving authority must be clearly identified in written form and be included in the conditional use permit. This should insure that the permittee is fully cognizant of the restrictions and conditions placed on the community's approval. This documentation should be used in future inspections of the project and used to resolve any disputes.

#### DNR Notification

Notification requirements and record keeping for conditional use permits are similar to those for variances (see section 6 of this chapter). State floodplain management standards require the local unit of government to submit a notice of hearing for all conditional uses to the Commissioner of Natural Resources at least 10 days before the scheduled hearing. If the DNR is being specifically asked to review the technical adequacy of the conditional use application, additional time should normally be provided. The notice should include the time, date, purpose and location of the public hearing, along with a copy of the supporting information available to the community (e.g., floodway/flood fringe or encroachment analyses, development plans, proposed floodproofing design, etc.). All materials should be submitted directly to the appropriate DNR area office for review and comment.

The local unit of government must submit to the DNR area hydrologist a notice of decision within 10 days of the granting of a conditional use permit. This notice should include a copy of all conditions placed on the permit by the local review authority.

The community must keep a record of the conditional use application, including all pertinent supporting documents and findings of the approval authority. It is important that the record clearly demonstrates the facts and findings of the

approval authority. As with variances, any future appeal of the community's decision will likely center on the supporting documentation, testimony and findings generated during the review process.

## 5. Nonconforming Uses

### A. Methods for Determining Cumulative Improvements

Although nonconforming uses were addressed thoroughly in Chapter 5, an example of the actual calculation of the cumulative value of improvements on a structure would help to clarify the process:

1975 - Mr. Walter Water receives a permit to build a new home in Floodville. It is constructed unknowingly in the flood hazard area of Canyon Creek.

1977 - The City of Floodville joins the NFIP and a detailed flood insurance study is performed on Canyon Creek. The City does an inventory of homes in the flood hazard area and finds that Mr. Water's home is in the flood fringe and was constructed below the 100-year flood elevation and is therefore nonconforming.

- RFPE at Mr. Water's site = 891.5.
- Lowest floor (basement) of Mr. Water's home is surveyed at 885.
- Estimated market value of Mr. Water's house in 1977 is \$40,000.

1980 - Mr. Water applies for a permit to construct a 3-season porch.

- Estimated market value of house (1980) = \$50,000.
- Estimated cost of constructing porch (1980) = \$10,000.

City requires porch to be elevated to RFPE. No changes are required of the pre-existing structure because the cost of improvements is less than 50% of the market value ( $10,000/50,000 = 20\%$ ).

1983 - Mr. Water applies for a major (\$30,000) addition (elevated to the RFPE) to his home. Note: 1983 values must be used in this calculation.

- 1983 estimated market value of house = \$65,000.
- cumulative value of additions = \$10,000\* + \$30,000 = \$40,000.
- cumulative value of additions is greater than 50% of market value ( $40,000/65,000 = 61.5\%$ ).

Options:

- Fill in basement of main structure and elevate addition.
- Elevate entire structure (including basement).
- Reduce cost of addition so that cumulative costs of all improvements are less than 50% (or  $65,000/2 - 10,000* = \$22,500$  cost of 1983 addition).
- Deny permit.

## 6. Appeals and Variances

If prepared correctly, an ordinance will be specific enough to guide a zoning administrator in making determinations of conformity. An ordinance which lacks such detail and clarity may leave the interpretation of the provisions up to the discretion of the permit officer. This could lead to inconsistencies. However, no matter how well an ordinance is written, situations will arise where an applicant may wish to appeal a decision of a permit officer or request a variance from the strict application of certain provisions of the ordinance. **Both municipal and county zoning enabling legislation in Minnesota require, as a prerequisite to adoption of land use controls, that a board of adjustment be established to resolve these issues.** It is important for permit officers to understand the differences between these two types of situations and the role they should play in seeing that these matters are properly handled.

\* This figure should reflect inflation but, for simplification, was left the same.

### A. Appeals

Land use ordinances must include a provision allowing citizens the right to appeal a decision of a zoning administrator to a higher authority. An appeal usually occurs when an applicant, who is denied a building permit, feels that the permit officer either made an error in applying the requirements of the ordinance (e.g., the property is not within the floodplain), or misinterpreted certain aspects of the ordinance.

Appeals are handled by the board of adjustment which is specifically established to deal with these matters. It is the responsibility of this body to review the facts of the case and to take official action.

For communities with pre-existing land use controls, a board of adjustment would have already been established in accordance with the procedures in the respective enabling legislation. **If a community has just a floodplain ordinance, a board of adjustment must be established at the time the floodplain ordinance is adopted.**

The zoning administrator should be in a position to inform the person filing the appeal about the appeals procedure. The applicant should submit, in writing, his or her explanation of the situation in as clear and concise a manner as possible. The zoning administrator should make sure the appeal letter gets to the chairperson of the board of adjustment promptly. In addition, the zoning administrator should appear at the hearing to present testimony on the facts and to answer any questions the board members may have. After a decision is reached, the permit officer is responsible for seeing that it is carried out.

### B. Variances

Zoning and other land use control ordinances contain a variance procedure which, under special circumstances, can provide relief from the strict application of the ordinance. Regulations must be applied uniformly and consistently in every situation. In other words, the permit officer has absolutely no discretion in modifying the provisions of the ordinance. Like appeals, variances are handled by the board of adjustment.



A request for a variance usually arises when an application for a zoning or building permit is rejected by the permit officer because the proposed activity does not meet all the requirements of the ordinance. However, a request for a variance can also come about by a direct request from a prospective applicant when it is clear, in advance, that the requirements of the ordinance are going to pose a hardship in his or her particular instance. The applicant then makes application to the board for a variance.

The zoning administrator should attend the hearing and offer whatever assistance is needed. If a variance is granted, the zoning administrator must insure that the variance is carried out under the conditions decided upon by the board.

The respective enabling legislation for municipalities (MS Chapter 462) and counties (MS Chapter 394) specify the minimum criteria in which a board of adjustment may grant a variance. These respective statutory provisions, plus any additional provisions a community may have adopted by ordinance or charter for the granting of variances, must be met prior to issuance of a variance in a floodplain area. In addition to the above, Minnesota Rule, part 6120.6100 states "although variances may be used to modify permissible methods of flood protection, **no variance shall provide for a lesser degree of flood protection than stated in these standards.**"

Because of the wording of Minnesota Rule, part 6120.6100 and the wording of the enabling legislation preventing "use" variances, very few activities qualify for variances to the floodplain management provisions of the local ordinance. A variance can be granted **only** to those actions which modify the type of flood protection measure employed and **not** the flood protection standard itself. Therefore, certain variance requests on their face are automatically excluded: 1) a request to not elevate and/or flood-proof a regulated activity to the RFPE, 2) a request to allow a use not allowable as a permitted or conditional use in the floodplain - a "use" variance; 3) **any** use in the floodway which would result in measurable increase in the stage of the 100-year flood; and 4) the reconstruction of any structure damaged in excess of 50% of the market value of the structure without bringing the structure into compliance with the floodplain ordinance.

The most common legitimate requests for a variance include:

- 1) *A platted, undeveloped lot of record where the depth of flooding over an existing road grade makes it impracticable to provide elevated road access to the site.* The development proposal in all other aspects would be compliant with the flood protection standards of the floodplain ordinance. The intent of the floodplain ordinance is to insure the public health and safety of the occupants of the proposed use. This includes providing (elevated) road access to the site to insure proper egress to the area. This is necessary for residents to evacuate the area if required and for the community to provide public services, such as police, fire, and other emergency vehicles. These objectives cannot be ignored with the granting of a variance.



**Figure 7.3 Lack of proper access during times of flooding can severely limit the ability of a community to provide essential services. Variance requests for a lesser vehicular access road standard must be closely scrutinized.**

The board of adjustment may determine these public health and safety

objectives can be met with an access road elevation lower than that required by local ordinance, or that alternate, non-road type access is available. This decision must be based on the depth of flooding over the access route, flow velocity and the duration of flooding. In flash flood areas, the decision often is dependent on the flood forecasting capability of the community and its ability to provide timely warnings and monitor evacuation of the area.

With the granting of this type of variance, the community must clearly spell out and deed register those conditions required of the occupants to insure their safety. This could include actions such as: a) when an occupant must evacuate, b) when the structure can be reoccupied, and c) the condition of the building when it is evacuated (e.g. gas/electric service shut-off, building security, etc.). The hearing record should also clearly describe how the community will provide emergency services and who is responsible for these actions.

- 2) *The use of a flood protection technique not permissible in the floodplain ordinance.* For example, federal standards do not allow "wet" floodproofing of non-residential spaces. In addition, some communities have adopted ordinance language more stringent than state and federal standards and do not allow any floodproofing in the community. As a result, an applicant may request to floodproof a building to the RFPE with a technique not permitted by local ordinance. The community must determine prior to granting this type of variance that the building and its contents will not be subject to flood damage during the 100-year flood and the building occupants are safe. In all cases, the building must be designed and certified by a registered professional engineer or architect. In addition, the following conditions must be met:

- Proper road access is provided as described above;
- Proper flood warning time exists to implement any required floodproofing measures involving human

intervention (e.g., intentionally flooding wet floodproofed spaces, removal of damageable contents, placement of bulkheads/closures, etc.);

- Assurance is given that the floodproofing measures will be implemented in a timely fashion. This could include annual inspections/exercises or limitations on the use and occupancy of spaces; and
- The use and occupancy of a space below the RFPE must be limited so that a use is not allowed inconsistent with the type of floodproofing being employed.

It should be noted that variances may be requested to the underlying, non-floodplain type provisions of local ordinance(s). Variance requests to dimensional standards such as setbacks, height limitations, bulk and area requirements must meet the statutory tests for variance approval but are not normally germane to state and federal floodplain management standards. Notice of hearings or decisions for these non-floodplain type provisions need not be submitted to the area hydrologist as discussed in the following paragraphs.

#### DNR Notification

*Hearings* - State floodplain management standards require the local unit of government to submit a notice of hearing for all applications for variances to the Commissioner of Natural Resources at least 10 days before the hearing by the board of adjustment. The notice materials submitted should be of sufficient detail to locate the subject property and structures involved on the community's flood insurance study maps. In addition, the application materials must clearly specify the variance requested in relation to the requirements of the ordinance and the applicant's justification for the variance. These materials should be submitted directly to the respective DNR area office. The area hydrologist will provide the appropriate DNR response. If a DNR response is provided, these comments should be formally entered into the hearing record.

*Notice of Decision* - A local unit of government must submit to the area hydrologist a notice of the decision within 10 days of the approval of a



variance request. This notice of approval should include a copy of the minutes of the meeting of the board of adjustment. These minutes should summarize the findings of the board of adjustment, including the justification for granting the variance. The minutes should also state any conditions attached to the granting of the variance.

Community officials are cautioned about the need for preparing an adequate hearing record. The hearing record documents the findings and actions of the board of adjustment and is of extreme importance should an interested party appeal the decision. The

DNR has no approval authority over the issuance of floodplain ordinance variances. **The DNR does have standing to appeal local variances and, if the DNR would question the variance approved, a copy of the hearing record would be requested.**

### Record Keeping for Variances

FEMA requires that a community: 1) maintain a record of all variance actions to the floodplain management standards, including a justification for their issuance; and 2) provide the number of variances issued to the floodplain management ordinance on the FEMA "biennial report" (see page 74). FEMA also requires that "a community shall notify the applicant in writing over the signature of a community official that: 1) the issuance of a variance to construct a structure below the 100-year flood level will result in increased premium rates for flood insurance coverage up to amounts as high as \$25 for \$100 of insurance coverage; and 2) such construction below the 100-year flood level increases risks to life and property." Such notification shall be maintained with a record of all applicable variance actions to the floodplain management standards of local ordinances. A consistent pattern of issuing variances to the local floodplain ordinance could result in probation or suspension proceedings being pursued by DNR or FEMA. This could result in the elimination of the availability of flood insurance and federal disaster assistance.

## 7. Record Keeping

Record keeping is an extremely important part of the zoning administrator's responsibility in administering the community's land use

**programs.** All official actions must be completely documented so that the planning and zoning commission, board of adjustment and appeals and possibly even the courts, can make well-informed decisions. Aside from the fact that **good records of permit applications and decisions should be kept for the community's own purposes, it is a requirement for continued eligibility in the NFIP.**

Specifically, the following documents must be kept on file and open for public inspection:

- 1) A complete copy of all ordinances and maps, including all ordinance and map amendments;
- 2) A complete copy of the most recent flood insurance study, including the FIRM and FBFM;
- 3) A project file for each development permit application.

This file should contain:

- The permit application;
  - The permit review checklist;
  - Copies of all pertinent correspondence relating to the project;
  - Any appeal, conditional use permit or variance proceedings, including: notice of the hearing, hearing minutes, and the written decision and conditions attached thereto;
  - Documentation of inspections;
  - Subdivision data (if necessary); and
  - A copy of the certificate of compliance.
- 4) A record of the fill and floor elevations (including basement) for all new or substantially improved structures in a designated floodplain area.
    - For floodproofed structures, the elevation to which the structure has been floodproofed must be obtained and recorded.



Whether or not local building officials decide to complete the FEMA Elevation Certificate for their constituents is at the discretion of the community. (DNR zoning forms are available as well — see Appendix 7D.) *Some* kind of certification is required, however. It is likely that flood insurance applicants will contact community officials because: 1) the community's current FIRM/FHBM should be on file in the community; and 2) the majority of the information requested on the Elevation Certificate is shown on the FIRM/FHBM or should be on file with the building permit forms or certificates of occupancy/compliance. Community officials must make sure a current copy of the FIRM/FHBM is on file in the community and that building permit/certificate of compliance forms contain all information required by the local floodplain regulations.

### B. FEMA Biennial Report

Much of the previously discussed record-keeping data is required for one additional report required by the NFIP—the Biennial Report. When a community receives a biennial report from FEMA, it must be filled out and returned promptly. Information requested on the form includes:

- 1) Descriptions of physical changes, including community boundary changes;
- 2) Copies of any amendments to the floodplain management ordinance enacted during the previous year;
- 3) A report of the number of building permits and variances requested and approved, both for the entire community and for structures located in the identified 100-year floodplain; and
- 4) Estimates of population and structures in flood hazard areas as a proportion of the community totals.

### C. ZBase ©

The DNR Division of Waters has recently (1989) developed a zoning software package entitled ZBase. ZBase is a database management program designed to efficiently handle many administrative functions related to the administration of local zoning ordinances.

The DNR was specifically interested in a program that would help communities better address shoreland and floodplain management issues. ZBase has community-wide zoning and building

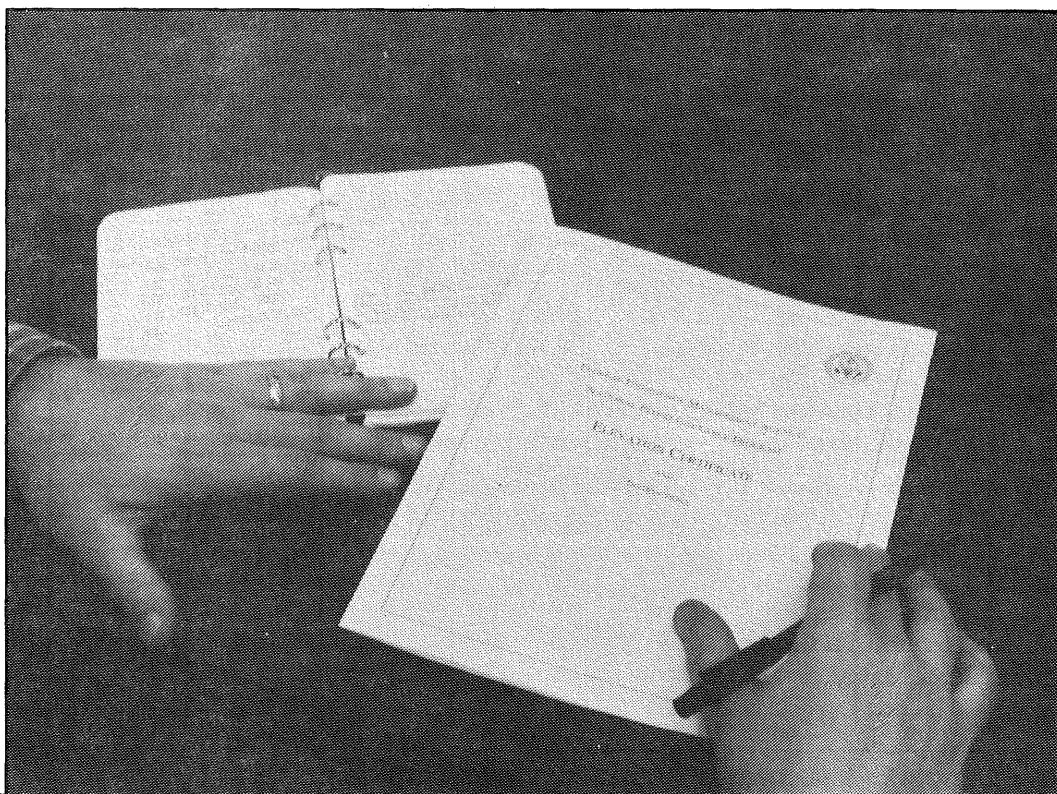


Figure 7.5 Completing the Elevation Certificate

permit applications. ZBase will print permits or authorizations for building permits, landscape alteration permits, sewage system permits, variances, conditional use permits and generic authorizations. A set of general conditions can be established and up to five lines of special conditions can be added to each permit. ZBase will generate fee reports, type of action reports, floodplain and shoreland activity reports, a Uniform Building Code Fee Table and an Ad Hoc Fee Table. ZBase is designed to meet the zoning needs of small to medium communities. It requires at least an IBM XT computer with hard disk drive or other compatible personal computer.

ZBase is available at no charge since its use will enhance the management of local floodplain and shoreland ordinances. Once the system is up and functioning in a community, it will greatly simplify the record keeping and reporting requirements of both the floodplain and shoreland programs. ZBase can be obtained by calling the Division of Waters at (612) 296-4800.

## 8. Enforcement

Even though an individual obtains all applicable land use and building permits, it does not necessarily guarantee that the development will be constructed in conformance with all provisions of the approved permit. The local community must insure that the construction activity is in compliance through periodic inspections and the ultimate issuance of a certificate of compliance and occupancy. As mentioned in the section on

permit application review, the sooner a code violation is identified, the easier and less costly it will be to modify the construction activity.

The actual inspection function may vary considerably from community to community or due to the complexity of the development. In smaller communities without a full-time building inspector, the zoning administrator will probably assume the responsibility for construction compliance. In other communities with both a zoning administrator and building inspector, the building inspector usually assumes all inspection responsibilities. However, in this situation, the building department and the planning and zoning department must maintain open communication. The inspection person(s) must not only insure compliance with construction standards (e.g., flood-proofing, site grading, plumbing, heating and electrical codes), but he/she must also check for the proper zoning type standards, such as setback, elevation, limitations of use and occupancy, etc., as specified on the use permit. An alternative is to require that the applicant hire an engineer, architect or surveyor to certify that various zoning requirements have been met.

### A. Inspections

Inspections should be scheduled for key stages of construction and should be done in a timely manner to avoid construction delays. The size, scope and complexity of a development project will dictate the number and extent of inspections required. An addition to a residential structure would require fewer inspections than would a major new sub-division or commercial development. To monitor floodplain construction activities, up to four separate inspections may be required:

- 1. Before issuing a land use permit** - If the zoning administrator is not familiar with the development site, an inspection prior to issuing a permit can prevent future problems. If a question exists as to whether the property is located in the floodplain, a visual inspection of the site may be sufficient to make this determination. Additionally, an inspection prior to permit

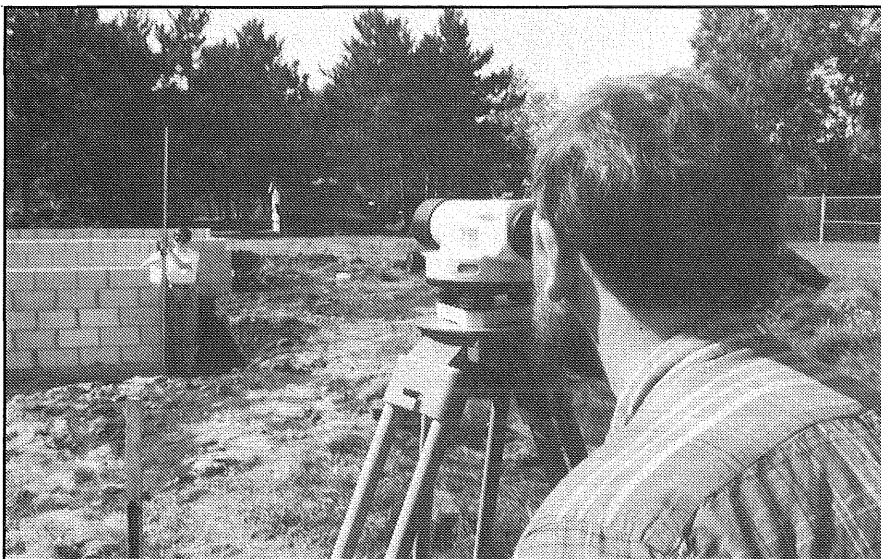


Figure 7.6 Confirm building elevations during construction.

issuance should help resolve any questions relating to the intent of the developer and possible conflicts with the zoning ordinance.

**2. Following development layout, just before construction is scheduled to commence** - This inspection should detect any errors in location. Errors detected at this stage should be easier to correct. For example, an accessory structure, which had been “staked out” in the floodway district could possibly be interchanged with a proposed parking area located outside the floodway. These types of modifications are much easier to implement before construction begins than after the building is erected.

**3. When the footings have been set in place, but not covered** - This is a critical inspection for all floodplain development. The footings should be surveyed to insure that the finished elevation of the lowest floor is at or above the regulatory flood protection elevation. The developer should give the zoning administrator or building inspector adequate notice when construction reaches this stage so an inspection can be scheduled. A verified elevation of the footings can be used later in making the additional inspections required prior to issuance of the certificate of occupancy.

Footings or a slab on-grade placed too low and not detected until the project is completed has serious consequences for both the community and the owner. The building will be not only a violation but also a non-conformity which, as discussed in Chapter 5, results in restrictions being imposed on future additions and modifications to the structure. Additionally, flood insurance premiums are significantly higher for buildings not properly elevated.

**4. Project completion** - The final inspection is the basis for the certificate of compliance. This inspection should insure that all permit conditions and building codes have been met. This is often the last opportunity for the building official to correct any deficiencies.

### **B. Certificate of Zoning Compliance**

New buildings or additions are not to be occupied until a “Certificate of Zoning Compliance” is issued to the landowner. This certificate declares that the particular building or project was completed in full compliance with the city

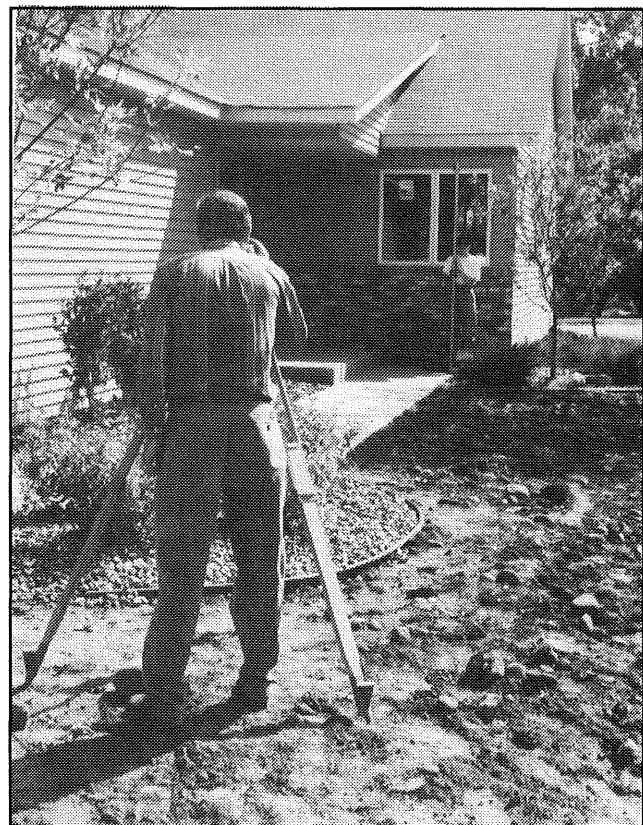
or county zoning ordinance and other applicable laws and regulations.

Before the certificate can be issued, all errors in construction or installation of equipment must be corrected. In floodplain areas, the applicant must submit a certification by a registered professional engineer, architect or surveyor that the finished construction conforms to the fill and lowest floor elevation requirement as well as appropriate floodproofing standards. Normally the applicant is responsible to obtain the required survey data, however, as a service to its residents, the city or county engineer or surveyor may survey the finished fill and lowest floor elevation.

Any uncorrected error, is a violation and the zoning administrator must act accordingly.

### **C. Violations**

Violations of floodplain regulations require the same action by local officials as violations of other established zoning and building code provisions. Any violation should be resolved as quickly as possible; minor deficiencies, often easily corrected at the start of construction, may be very costly to correct once the project is



**Figure 7.7 Final inspection.**



completed. Community officials must realize that a community's eligibility in the NFIP is dependent upon the community making a good faith effort to enforce the floodplain ordinance.

The local community may be held liable for issuing a permit not compliant with the local ordinance or for not following prudent inspection/certification and enforcement procedures. For instance, even though a new residential structure built in the floodplain with a basement below the RFPE may be compliant with the issued building permit, it would not be compliant with the local floodplain zoning ordinance, unless the community has a basement exception from FEMA. This violation of the local floodplain regulations may not be detected until the next flood event when the basement area is subject to substantial damage.

Hopefully most violations involve only minor deviations from the approved plans or specifications. **The contractor or owner should be informed immediately and given an opportunity to make the necessary corrections. Documentation of the nature and extent of the violation should be submitted to the appropriate DNR and FEMA offices along with a plan of action to correct the violation.** If the matter is not corrected within a reasonable period of time, a written notice of noncompliance should be given to the permit holder, with each additional day that lapses constituting an additional violation of the ordinance. If this does not bring compliance, the zoning administrator or building official should issue a stop work order and/or take action to impose a penalty for code violation.

#### **D. Sanctions**

If a community fails to enforce its local ordinance, it may be placed on probation until all program deficiencies have been corrected and violations remedied to the maximum extent possible. In addition, when FEMA places a community on formal probation, a \$50.00 surcharge will be placed on all flood insurance policies in the community for at least one year. If the community fails to take the remedial measures mentioned above, it may be suspended from the National Flood Insurance Program, the effects being as indicated in Appendix 7C.

## **9. Ordinance Administration - the Relationship with the NFIP**

It must be recognized that the NFIP has set the 100-year flood level as the standard for protection of new buildings and substantial improvements. When new buildings are constructed in accordance with design standards and substantial improvements acceptable to FEMA, continued flood insurance availability and generally affordable insurance premiums are assured.

A key element in determining flood insurance premiums for post-FIRM construction in regular program communities is to compare the lowest floor, including basement, to the 100-year flood level. The greater a building's lowest floor is below the 100-year flood level (unless an acceptable method of floodproofing is employed), the higher insurance premiums become, to the point of being prohibitive. This is a strong financial inducement for property owners and community officials to closely follow the standards of the community's floodplain ordinance.

A community's floodplain ordinance is reviewed by state and federal officials prior to adoption to insure that only permissible flood protection standards are stated, from both a "regulatory" and "insurance" standpoint:

- For new structures and substantial improvements, the lowest floor, including basement, must be elevated on fill to the RFPE;
- Non-residential structures and substantial improvements can, as an alternative to being placed on fill to the RFPE, be floodproofed to the FP-1 or FP-2 classification; and
- Residential basements below the RFPE can only be permitted in communities with a formal basement exception from FEMA, and provided at a minimum, the basement is flood proofed watertight (FP-1).

The only way floodplain building standards can be legally varied is if the community grants a variance to its floodplain ordinance. If a community was to grant such a variance, two ramifications occur:

**First**, the variance approval does not affect how the NFIP will rate the flood insurance policy. Remember, the premium is largely dependent on the building's lowest floor (for insurance purposes) and the 100-year flood level. For example, a community grants a variance to allow a "wet" flood proofed commercial building (FP-3 or FP-4). The basement floor is 7' below the 100-year flood level and the basement is properly designed against flood damage and is used to store movable items. The floor immediately above is higher than the RFPE and is used for business purposes. Because wet floodproofing is not an acceptable flood protection method to the NFIP, the lowest floor "for insurance purposes" is the basement floor, 7' below the 100-year flood level.

Another example, a community **without** a formal basement exception grants a variance for a residential basement. The basement is floodproofed FP-1 to the RFPE, and is not used for human habitation. Regardless of the variance being granted, the lowest floor for insurance purposes is the basement floor.

This hypothetical community may have legitimately granted these variances, but they will not be credited for insurance purposes. It is important for community officials to inform potential developers of this ramification prior to permit approval.

**Second**, the granting of numerous variances could jeopardize a community's eligibility in the NFIP. While all communities are expected to enforce regulations as written, both the state and FEMA realize certain circumstances require granting the developer relief from the provisions of the ordinance. (See variance discussion, Section 6.B. of this chapter). FEMA and the state will closely monitor all variances granted by a community. If it is determined the variance procedure is being misused, the **community's** eligibility in the NFIP could be suspended (see list of sanctions, Appendix 7C). Because of this potential ramification, local officials are encouraged to submit all variance applications to FEMA and DNR for comment sufficiently in advance of final action.







APPENDIX 7A

Conditional Use Evaluation

Applicant \_\_\_\_\_

Project Name \_\_\_\_\_

Address \_\_\_\_\_

Location \_\_\_\_\_

Application Number \_\_\_\_\_

A. Description of Project:

Site Plan Attached

\_\_\_ Yes \_\_\_ No

B. Project is located in the:

General Flood Plain District \_\_\_\_\_;  
Floodway \_\_\_\_\_

Flood Fringe \_\_\_\_\_;

C. General Flood Plain District Attachments

-Site Plan	___ Yes	___ No
-Cross-Section(s)	___ Yes	___ No
-Stream Water Surface Profile	___ Yes	___ No
-Stream Photos	___ Yes	___ No
-Overbank Photos	___ Yes	___ No

D. Hydrology

Available \_\_\_\_\_  
Not Available \_\_\_\_\_

Source \_\_\_\_\_

To be developed by:\*

Applicant \_\_\_\_\_  
DNR \_\_\_\_\_  
Other \_\_\_\_\_

Hydrology approved by DNR \_\_\_\_\_

Date \_\_\_\_\_

-10-year Discharge	_____	cfs
-50-year Discharge	_____	cfs
-100-year Discharge	_____	cfs
-10-year Water Surface elevation	_____	cfs
-50-year Water Surface elevation	_____	cfs
-100-year Water Surface elevation	_____	cfs

Project is in the Flood Plain? \_\_\_ Yes \_\_\_ No

\* A hydrology report outlining the methodology assumptions should be included.

E. Hydraulics

Available \_\_\_\_\_  
Not Available \_\_\_\_\_

Source \_\_\_\_\_

To be developed by:\*\*

Applicant \_\_\_\_\_  
DNR \_\_\_\_\_  
Other \_\_\_\_\_

Floodway Alignments (shown on Map)

- Natural (0.0' increase)
- 0.5' Stage increase
- Project \_\_\_\_\_ ft. increase

Water Depth/Velocity from Floodway Analyses

	Natural	.05'	Project
-100-year			
Water Surface Elevation	_____ ft.	_____ ft.	_____ ft.
Velocity			
-Left over bank	_____ fps	_____ fps	_____ fps
-Right over bank	_____ fps	_____ fps	_____ fps
-Channel	_____ fps	_____ fps	_____ fps
-10-year			
Water Depth	_____ ft.	_____ ft.	_____ ft.
Velocity			
-Left over bank	_____ fps	_____ fps	_____ fps
-Right over bank	_____ fps	_____ fps	_____ fps
-Channel	_____ fps	_____ fps	_____ fps

F. Storage Loss Analyses

Available \_\_\_\_\_  
Not Available \_\_\_\_\_

Source \_\_\_\_\_

To be developed by:\*\*\*

Applicant \_\_\_\_\_  
DNR \_\_\_\_\_  
Other \_\_\_\_\_

Not Applicable \_\_\_\_\_ (Explain)

G. Flood Proofing

- \_\_\_\_\_ Designed to USCE Flood Proofing Standards
- \_\_\_\_\_ Designed to State Building Code Standards
- \_\_\_\_\_ Flood Proofing design certified by a Registered Professional Engineer

\*\* A report discussing methodology and assumptions should be included.

\*\*\* Storage analyses report should be requested and include the following:

- Routing methodology
- Assumptions used
- Present and project hydrographs
- Elevations and discharges downstream for present and project conditions

## APPENDIX 7B

### Project Evaluation Factors

Check appropriate impact box and justify answer in space provided, S=significant, I=insignificant, and U=unknown.

1. Potential for loss of life \_\_S \_\_I \_\_U
  
2. Potential for damage or increase in damage to existing upstream or downstream properties or adjoining property \_\_S \_\_I \_\_U
  
3. Impact of public or private services rendered by the proposed development \_\_S \_\_I \_\_U
  
4. Susceptibility of proposed development facilities to damage from flooding \_\_S \_\_I \_\_U
  
5. Impact of road access, particularly emergency access during flooding and potential implications for the proposed development \_\_S \_\_I \_\_U
  
6. Impact of flood depths and velocities on the proposed development in the immediate area \_\_S \_\_I \_\_U
  
7. Impact of duration of flood and the rate of rise of flood at the proposed site \_\_S \_\_I \_\_U
  
8. The potential for ice jams, debris jams, and wave action in the area and the implications \_\_S \_\_I \_\_U
  
9. Impact of the availability and adequacy of a flood warning plan for proposed project areas \_\_S \_\_I \_\_U
  
10. Potential of auxiliary uses (e.g. parking and storage areas) to float or be swept away by flood waters \_\_S \_\_I \_\_U

11. S I U
- 
12. S I U
13. S I U
14. S I U
15. Suitability of site to accommodate water supply and sewage disposal facilities without interruption or hazard to related public or other private facilities or resources. (Explain)
16. Compatibility of development with the comprehensive plan, present zoning, adjacent development, and other local codes, rules or ordinances. (Explain)
17. Comparison of the present replacement value of any existing structure with the estimated value (materials and labor) of the addition, modification or improvement. (Explain)
18. Necessity for facility to be located on a waterfront. (Explain)
19. Availability of alternative sites for development. (Explain)
- 20.
- 21.
- 22.

## APPENDIX 7C

### ***Effects of Non-Compliance In The National Flood Insurance Program***

(This insert is adapted from a handout of the Illinois Department of Transportation, Division of Water Resources.)

#### **Effects on a Community:**

1. If a community fails to enforce its local ordinance, it may be placed on probation until all program deficiencies have been corrected and violations remedied to the maximum extent possible. In addition, a \$25.00 surcharge will be placed on all flood insurance policies in the community for at least one year.
2. If a community fails to take the remedial measures mentioned above, it may be suspended from the National Flood Insurance Program. Suspension has the following effects on the community:
  - a. Flood insurance is not available on buildings located within non-participating or suspended communities. No owner of a residence, business or public building will be able to purchase a flood insurance policy.
  - b. No Federal grants or loans for buildings may be made in identified flood hazard areas if flood insurance is a condition of the grant or loan. Includes all Federal agencies such as HUD, EPA, SBA, HHS, EDA, DOT, DOE, etc.
  - c. No Federal disaster assistance may be provided in identified flood hazard areas if flood insurance is a condition of the assistance. (i.e. Disaster recovery loans and grants.)
  - d. No Federal mortgage insurance may be provided in identified flood hazard areas. This includes FHA, VA, Farmers Home Administration, etc.
  - e. Legislative changes to FDPA (Flood Damage Protection Act) Restriction on conventional loans in non-participating communities replaced by requirement that lenders:
    - (1) must notify buyer or lessee that property is in flood area, and
    - (2) must notify buyer or lessee that property in flood hazard area is not eligible for Federal disaster relief in a declared disaster.
  - f. Actuarial rates go into effect regardless of whether or not a community participates in the program. Unprotected construction today may be prohibitively expensive to insure should the community later re-enter the program.
  - g. Local governing body may be susceptible to some form of liability by not participating because their action: (1) denies the ability of its citizens to purchase flood insurance, and (2) does not take positive steps to reduce the exposure of life and property in the face of authoritative scientific and technical data.
3. If flood damages have occurred, claims have been paid, and all or part of the damage can be attributed to acts or omissions of the community, the Federal Emergency Management Agency's (FEMA) General Counsel Office may proceed with subrogation actions against the community.
4. If it appears that a community is ignoring violations or granting unwarranted variances, FEMA may request that the Federal Insurance Administration field verify all or part of the structures within a community. If the structures were improperly rated earlier, this could lead to increased costs to individuals for flood insurance (see flood insurance example).

(over)

## B. Effects on Individual Structures:

1. If an individual structure is found to be in violation of Federal, state or local floodplain management regulations, flood insurance coverage may be denied. This would have the same effect on an individual structure as the effects listed in A.2. above.
2. If an individual structure is found not to be in compliance with the local ordinance, it may be rerated, using the actual elevation for the lowest floor (including basement).
3. If a structure is misrated due to fraudulent or willful concealment or misrepresentation of facts by the policyholder or his agent, claims may be denied and back premiums may be collected during claims adjustment.
4. If claims have been paid and damage can be attributed to acts or omissions of the individual, subrogation actions may be brought by the FEMA Office of General Counsel.

### Example

Flood Insurance Rates for \$80,000 structural coverages on a single family dwelling with no basement and \$30,000 contents coverage based on elevation of the lowest floor above or below the Base Flood Elevation.

+2 ft. \$80.00 structure + \$42.00 contents + \$45.00 constant = \$167.00

+1 ft. \$100.00 structure + \$61.50 contents + \$45.00 constant = \$206.50

0 ft. \$144.00 structure + \$106.50 contents + \$45.00 constant = \$295.50

-1 ft. \$512.00 structure + \$375.00 contents + \$45.00 constant = \$932.00

-2 ft. any policy at an elevation of 2' or greater below the base flood elevation must be submitted to Washington to be rated at actuarial rates however actual rates for -2' are \$640.00 structure + \$427.50 contents + \$45.00 constant = \$1,112.50

APPENDIX 7D

**FLOODPLAIN AND SHORELAND  
ZONING ADMINISTRATION FORMS**

**By: Bruce Sandstrom**

**Division of Waters  
Minnesota Department of Natural Resources  
500 Lafayette Road  
St. Paul, MN 55155-4032  
(612) 297-3886**

**JUNE, 1987**

**Includes:**

**Zoning Application Summary Form \_\_\_\_\_ FORM A**  
**Supplemental Data for Building Permit \_\_\_\_\_ FORM B**  
**Supplemental Data for Sewage System Permit \_\_\_\_\_ FORM C**  
**Supplemental Data for Well Permit \_\_\_\_\_ FORM D**  
**Supplemental Data for Land Alteration Permit \_\_\_\_\_ FORM E**  
**Supplemental Data for Conditional Use Permit \_\_\_\_\_ FORM F**  
**Supplemental Data for Variance \_\_\_\_\_ FORM G**  
**Sketch Plan \_\_\_\_\_ FORM H**  
**Certificate of Occupancy or Zoning Compliance For**  
**Authorized Floodplain Developments \_\_\_\_\_ FORM I**  
**Certificate of Occupancy \_\_\_\_\_ FORM J**  
**Project Review Worksheet for**  
**Water Resource Projects \_\_\_\_\_ FORM K**

**Rev. 12/8/88**

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## INTRODUCTION

The following text is a brief explanation of various types of zoning administration forms which were developed by the Division of Waters, Department of Natural Resources. The purpose of this project is to promote the sound administration of local floodplain and shoreland management programs. The forms are not fastened to this text so that they can be detached and easily copied in whatever numbers the user desires. If you have a copy of "Floodplain Management - A Handbook For Local Officials," this text should be inserted as Appendix X, Section E. The goals of this project are three-fold:

1. To provide local units of government with forms which would promote more uniform and consistent review of floodplain and shoreland developments on a state-wide basis;
2. To provide forms which address common oversights in floodplain / shoreland management decisions which could have been averted if the applicant or the zoning officer had been posed the proper question;
3. To provide forms with a format and numbering system which is compatible with either a computerized data management system or a "hard copy" file type of system.

As simple as these goals seem, the task was complicated by the fact that there is a large array of communities involved with floodplain and shoreland zoning. Some larger cities and counties have six or more professional zoning staff who handle several hundred zoning requests each year. At the other end of the spectrum are a number of small cities and townships where the City Clerk wears many "hats", with zoning decisions involving floodplain or shoreland issues only once a year. Some communities have comprehensive zoning with shoreland / floodplain "overlay" districts. Others have only state and federally mandated floodplain and or shoreland zoning. Therefore, except for some communities which only have floodplain / shoreland regulations, very few communities are utilizing zoning administrative forms which promote sound floodplain and shoreland management.

As most zoning officials know, the DNR, Division of Waters (DOW) is charged with the role of monitoring local shoreland and floodplain management programs and providing technical assistance to communities involved with these programs. As a result of this experience with local zoning programs, the DOW has concluded that many errors and oversights at the local level are simply due to the fact that administrative forms have not been available which promote thorough project review. In many cases, important questions affecting floodplain issues simply were not being asked.

For these reasons, the Department of Natural Resources encourages each community to closely review the enclosed forms and make an effort to utilize these forms wholly or in part in carrying out their floodplain and shoreland management programs. While the use of these forms is not nor will not be made mandatory, we are confident that their use will help make the duties of the zoning officer easier.

The first draft of this project was sent to 64 counties and municipalities for comment and review. About one-third (1/3) of them returned questionnaires and about half of this group volunteered to review the second draft. DOW field and central office staff also critiqued both drafts.

The forms herein are designed to be used as a "system." They will work best if a community elects to adopt the entire set as their official zoning forms. Several of them could be used by themselves to augment existing forms in use, however. Due to their generic nature, the forms should be able to be used even in communities which do not have floodplain or shoreland zoning.

You will note that all of the forms have questions relating to water resource issues. If your community elects not to adopt these forms, we strongly recommend that your existing forms should be modified to address water resource issues. When dealing with floodplain and shoreland zoning issues, it is important that your forms should include questions relating to 100-year flood elevation, highest known water level, lowest floor elevation, sewer/well elevation, ordinary high water level (both elevation and location), etc.

When you review the forms, you will note that Form A is meant to be used to administratively summarize aspects common to all types of zoning projects. The remaining forms are individualized to provide supplemental information for each type of zoning request you may receive. Generally, the administrative approval is provided for on the lower portion of the page. General and Special Conditions are provided for on the reverse side.

## ADOPTION OF THE FORMS

If your community elects to adopt and use these forms, we want to hear from you! No doubt there will be a need to revise them at a future date. This can only be done effectively if feedback and critique are received from the people who may use them on a day-to-day basis. If we don't know who is using them, the update / revision process will not be as effective. A call, postcard or letter to the author would be appreciated advising us whether you are adopting or testing the use of these forms.

In their present format, you will have to either use carbon paper or a photo copier to make additional copies of the applicant's original for administrative use. If there is widespread use and acceptance of the forms, the Division of Waters may decide to produce the forms in a "press through carbon" format. They could then be made available at low cost to users. Again, this is why your feedback is needed.

The following pages contain a brief discussion of each form.

**FORM A  
ZONING APPLICATION SUMMARY FORM**

All communities should consider utilizing this form or a variation of it in order to provide a basis for a file system to record all zoning related actions. Many communities are using forms which are long on construction data (materials, cost, etc.) but are light on zoning district criteria. The Application Summary Form attempts to bridge this gap. The form provides a means to administratively keep track of the status of any type of pending zoning request. This is accomplished by providing for the entry of a unique application number as well as a tax parcel number in order to conduct file searches of past actions for parcels which have changed hands.

We encourage the use of a six (6) digit zoning application number when the community is using or contemplating establishing a computer data base for its zoning records. The recent advent of the personal computer and the multitude of data base software which has become available makes it possible for even a small community to establish a computer data base for their zoning records.

Small communities which do not have access to a computer would benefit by using a seven (7) digit, alphanumeric number which can be assigned to each application. This would enable the establishment of a "hard copy" file system which would make tracking of past actions an easier task.

Presuming all your zoning permit files are kept in one location, a quick check of the tabs will allow you to easily locate specific types of files. This would be useful for formulating reports, determining status of past or pending actions as well as accomplishing other administrative tasks. This would not be necessary if the records are computerized, since most data base software available have "search and sort" routines.

For example, by entering the number 85-0123B on the tab of a standard file folder the following information can be easily obtained by scanning the file tabs:

**Calendar or Fiscal Year - 1985**

**123rd Zoning Application received during 1985**

**B - signifies a request for a building permit.**

Other types of applications could be signified by other letters for example; (S = sewage system permit, W = well permit; C = conditional use permit; V = variance; F = filling permit; D = subdivision). This alphanumeric coding could be easily expanded to include another letter to signify which zoning district the project. This eighth digit will allow further identification the specific action. For example, the number 85-0123BF would indicate the same information as above, but would further indicate that the building permit was in a floodplain zoning district. (Other letters could indicate: S = shoreland district, R = residential district, C = commercial district, A = agricultural district, and so on).

You will note that Section F of FORM A provides for the entry of key administrative data. This allows for a quick review of the project from an administrative standpoint. By having this on the same form as the general project information, it provides for the easy transfer of the data to a computer data base. It also provides for easy permit progress tracking and report development for those communities not yet using a computer data base. Most data base programs available have the ability to quickly generate a report to what ever specifications you tell it to from the generalized data on this form.

FORM A ZONING APPLICATION SUMMARY FORM						Application Number
						Tax Parcel Number
<b>A. GENERAL INFORMATION</b>						
1. Applicant's Name (Last, First, M.I.)			2. Authorized Agent (if applicable)			
3. Mailing Address (Street, RFD, Box Number, City, State, Zip Code)						
4. Day Phone		5. Evening Phone		6. File Number of Project Location		
<b>B. PROPERTY DESCRIPTION</b>						
1. Lot(s), Block, Subdivision Name		2. Section	3. Township	4. Range	5. Tr./Qtr.	6. Gov. Lot No.
7. Note: If the property is a metes and bounds description, check here <input type="checkbox"/> and attach a copy of the exact legal description.						
<b>C. - APPLICABLE ZONING DISTRICTS</b>			<b>D. - TYPE OF ZONING REQUEST</b>		<b>E. - SHORELAND MANAGEMENT DATA</b>	
(check all that apply) 1. <input type="checkbox"/> Residential 2. <input type="checkbox"/> Business 3. <input type="checkbox"/> Commercial 4. <input type="checkbox"/> Industrial 5. <input type="checkbox"/> Agricultural 6. <input type="checkbox"/> Shoreland (*) 7. <input type="checkbox"/> Well & Spring River 8. <input type="checkbox"/> Flood Fringe 9. <input type="checkbox"/> Floodway 10. <input type="checkbox"/> General Flood Plain 11. <input type="checkbox"/> Other (specify below)			Project Type 1. <input type="checkbox"/> Building Permit Form B and H 2. <input type="checkbox"/> Sewage System Permit Form C and H 3. <input type="checkbox"/> Well Permit Form D and H 4. <input type="checkbox"/> Land Alteration Permit Form E and H 5. <input type="checkbox"/> Conditional Use Permit Form F 6. <input type="checkbox"/> Variance Form G 7. <input type="checkbox"/> Zoning District Change 8. <input type="checkbox"/> Subdivision Approval 9. <input type="checkbox"/> Ordinance Amendment 10. <input type="checkbox"/> Other (specify below)		Necessary Supplemental Form 1. Lake / Stream Name 2. Lake / Stream I.D. Number 3. Classification: <input type="checkbox"/> HE; <input type="checkbox"/> RD; <input type="checkbox"/> GD; <input type="checkbox"/> Other (specify below)	
* Fill in Section E. also.					-IMPORTANT NOTICE- Most projects require the submission of one or more additional forms as shown in SECTION D. and sometimes plans specific to the project. Please refer to the application form for a complete list of forms. Form A primarily provides summary information for record keeping.	
I hereby certify with my signature that all data contained herein is true and correct to the best of my knowledge.						
						Signature _____ Date _____
<b>F. - ADMINISTRATIVE DATA SUMMARY (For Office Use Only)</b>						
1. <input type="checkbox"/> Proper attention to application has been submitted. 2. <input type="checkbox"/> Detailed plans have been submitted which were prepared by: _____ Dated: _____ 3. <input type="checkbox"/> Written project description has been submitted which was prepared by: _____ Dated: _____ 4. <input type="checkbox"/> Approved <input type="checkbox"/> with <input type="checkbox"/> without modification on: _____ 5. <input type="checkbox"/> Denied on: _____ 6. Itemization of Fees: General Application _____ State Surcharge _____ _____ _____ 7. Total Fees = _____ 8. Fee paid on (date): _____ 9. Administrative Summary for Building Permits, Sewage System Permits, Well Permits, and Shoreland Alteration Permits. a. Date of Inspection(s): _____ b. Certificate of Occupancy (Zoning Compliance) issued on: _____						
10. Administrative Summary for Applications for Subdivision Approval, Variance, Conditional Use Permits, Ordinance Amendments and Zoning District Changes: a. Referred to Township on: _____ b. Referred to Planning Commission on: _____ c. Referred to Board of Adjustment on: _____ d. Referred to County/City Engineer on: _____ e. Referred to County/City Attorney on: _____ f. Referred to Soil and Water Cons. Dist. on: _____ g. Referred to Watershed District on: _____ h. Date of Hearing Notice: _____ i. Date of Public Hearing: _____ j. Is ten (10) day notice to the DNR necessary? <input type="checkbox"/> yes, <input type="checkbox"/> no If yes, enter date sent to DNR here: _____ k. Is ten (10) day final notice to the DNR necessary? <input type="checkbox"/> yes, <input type="checkbox"/> no If yes, enter date sent to DNR here: _____ l. Final Action: <input type="checkbox"/> APPROVED <input type="checkbox"/> with <input type="checkbox"/> without modification <input type="checkbox"/> DENIED By: <input type="checkbox"/> County Board; <input type="checkbox"/> City Council; <input type="checkbox"/> Board of Adjustment Date of Action: _____ MDR - MAY, 1987						



### FORM C SUPPLEMENTAL DATA FOR SEWAGE SYSTEM PERMIT

Most counties and many rural municipalities regulate the installation of drainfields, septic tanks, holding tanks and the like. All communities who have floodplain and shoreland districts are required by state law to regulate such facilities.

This form provides the administrator the ability to gain specific important design data relative to proper sewage treatment. Since the advent of the Shoreland Management Act, there have been significant advances in on-site sewage treatment.

You will note that very specific data is asked for relating to soil conditions, system configuration and high water level conditions. These all relate back to specific code requirements and concerns addressed in Minnesota Rule 7080 of the Minnesota Pollution Control Agency.

Again, permit sign-off is provided for at the bottom of the page with cross reference to general and special provisions on the reverse. The general provisions provide for the ability to control typical problems related to the enforcement of a sewage system installation. The special provisions provide the opportunity to modify minor design criteria without having to require submission of a revised plan in all cases.

### FORM D SUPPLEMENTAL DATA FOR WELL PERMIT

Not many communities regulate the installation of wells. For those communities which do, however, this form has been provided for such use. The format is the same as the other forms presented herein.

Specific questions are asked which relate to specific well construction criteria deemed most important to water quality maintenance within the Water Well Construction Code of the Minnesota Department of Health.

Again, sign off for approval and denial is at the bottom of the front side with general and special provision sections provided on the reverse.

FORM C SUPPLEMENTAL DATA FOR SEWAGE SYSTEM PERMIT			Application Number
			Tax Parcel Number
A. GENERAL INFORMATION			
1. Applicant's Name (Last, First, M.I.)		2. Day Phone	3. Evening Phone
4. Sewer Installer		5. Soil Tester	6. Earthwork Contractor
B. SEWAGE SYSTEM DATA		C. SITE DATA	
1. Work Category a. <input type="checkbox"/> New System b. <input type="checkbox"/> Repair	2. Type of System a. <input type="checkbox"/> Septic Tank Only b. <input type="checkbox"/> Drainfield Only c. <input type="checkbox"/> Septic Tank & Drainfield d. <input type="checkbox"/> Holding Tank e. <input type="checkbox"/> Alternative System (specify) _____	1. Soils Data a. Soil Type: _____ b. Percolation Rate (minutes per inch): _____ c. Depth to Water Table: _____ d. Depth to Mottled Soil: _____ e. Date of Soil Testing: _____	2. Supporting Data/Attachments <input type="checkbox"/> Sketch Plan** <input type="checkbox"/> Percolation Data Sheets <input type="checkbox"/> Soil Borings <input type="checkbox"/> Tank/Drainfield Design Calculations  ** This is normally a mandatory requirement. It is recommended that the applicant submit sketch plan on FORM H.
3. Anticipated Use a. <input type="checkbox"/> Single Family b. <input type="checkbox"/> Multiple Family c. <input type="checkbox"/> Commercial d. <input type="checkbox"/> Agricultural e. <input type="checkbox"/> Other (specify) _____	4. Type of Drainfield a. <input type="checkbox"/> Standard System b. <input type="checkbox"/> Mound (pressure distribution) e. <input type="checkbox"/> Mound (gravity distribution)	3. Water Level Data Worksheet a. Highest Known Water Level: _____ b. 100-Year Flood Elevation: _____ c. 10-Year Flood Elevation: _____ d. Design of Tank and/or Drainfield is Based on: <input type="checkbox"/> 100-Year Flood Elevation <input type="checkbox"/> 10-Year Flood Elevation <input type="checkbox"/> Highest Known Water Level <input type="checkbox"/> Highest Known Ground Water Level <input type="checkbox"/> Soil Mottling or Impervious Soil Layer  Note: The proper design of sewage systems is contingent upon these limiting factors. The most conservative resulting design prevails.	
8. System Design Data			
		Tank      Drainfield	
a. Distance to Well:	_____	_____	
b. Distance to Building:	_____	_____	
c. Distance to Property Line:	_____	_____	
d. Distance to Suction Line:	_____	_____	
e. Distance to Pressure Line:	_____	_____	
f. Tank Capacity (gal.) and Area of Drainfield (R <sub>2</sub> ):	_____	_____	
g. Distance to Lake or Stream (from Ordinary High Water Level):	_____	_____	
h. Drainfield Separation from Highest Known Ground Water Level, Impervious Layer or Soil Heading:	_____	_____	
I hereby certify with my signature that all data on my application forms, plans and specifications are true and correct to the best of my knowledge: _____ Signature of Applicant      Date			
<b>SEWAGE SYSTEM PERMIT</b>			
[ ] APPLICATION IS HEREBY DENIED			
[ ] PERMISSION IS HEREBY GRANTED TO _____ all in accordance with the application, addendum forms, plans, specifications and all other supporting data, unless specified hereinafter in the GENERAL and/or SPECIAL PROVISIONS.			
BY ORDER OF: _____ Title _____ Date _____ Signature of Permitting Authority			
NOTE: THIS PERMIT TERMINATES ON: _____ except as provided for by local ordinance and/or Minnesota Law.			
- SEE REVERSE FOR GENERAL AND SPECIAL PROVISIONS -			
MNR-MAY, 1987			

FORM D SUPPLEMENTAL DATA FOR WELL PERMIT			Application Number
			Tax Parcel Number
A. GENERAL INFORMATION			
1. Applicant's Name (Last, First, M.I.)		2. Day Phone No.	3. Evening Phone
4. Well Driller		5. Plumber	
B. PROJECT INFORMATION			
1. Type of Action a. <input type="checkbox"/> Install New Well b. <input type="checkbox"/> Repair Well c. <input type="checkbox"/> Abandon Well	3. Well Data a. Depth: _____ b. Diameter: _____ c. Screen Length: _____ d. Static Level: _____ e. Pumping Level: _____ f. Pumping Rate: _____ (gpm)	4. Well Design Standards a. Setback from Drainfield: _____ proposed _____ required _____ b. Setback from Septic Tank: _____ c. Setback from Lake: _____ d. Setback from Structure: _____ e. Setback from Pollution Sources: _____	
2. Type of Well a. <input type="checkbox"/> Drilled b. <input type="checkbox"/> Sand Point c. <input type="checkbox"/> Augered	5. Type of Pump a. <input type="checkbox"/> Jet Pump (shallow) b. <input type="checkbox"/> Jet Pump (deep) c. <input type="checkbox"/> Submersible d. <input type="checkbox"/> Reciprocating	6. Well Site Considerations a. Is site subject to surface runoff? <input type="checkbox"/> yes <input type="checkbox"/> no b. Is site located in a flood-prone area? <input type="checkbox"/> <input type="checkbox"/> c. Is site within the footings or foundation of a building? <input type="checkbox"/> <input type="checkbox"/>  NOTE: A 'yes' answer to any of these questions may indicate a problem may exist. Applicant should review the current well code of the Minnesota Department of Health.	
I hereby certify with my signature that all data on my application forms, plans and specifications are true and correct to the best of my knowledge: _____ Signature of Applicant      Date			
<b>WELL PERMIT</b>			
[ ] APPLICATION IS HEREBY DENIED			
[ ] PERMISSION IS HEREBY GRANTED TO _____ all in accordance with the application, addendum forms, plans, specifications and all other supporting data, unless specified hereinafter in the GENERAL and/or SPECIAL PROVISIONS.			
BY ORDER OF: _____ Title _____ Date _____ Signature of Permitting Authority			
NOTE: THIS PERMIT TERMINATES ON: _____ except as provided for by local ordinance and/or Minnesota Law.			
- SEE REVERSE FOR GENERAL AND SPECIAL PROVISIONS -			
MNR-MAY, 1987			

## FORM E SUPPLEMENTAL DATA FOR LAND ALTERATION PERMIT

This form was originally designed for the sole purpose of regulating grading and filling. It was renamed and slightly revised so that vegetation alteration projects (ie. clear cutting) could be regulated using this form.

All communities who are administering floodplain and shoreland controls must do some degree of regulation of grading and filling. The need is obvious! Fill placed in floodplains can increase flood levels under many circumstances. Fill placed adjacent to lakes can cause serious erosion problems and degrade water quality.

FORM E provides opportunity to collect answers to specific water resource questions common to most grading and filling projects. The answers to the questions will help guide the applicant in his planning process. They will also help the administrator in his review of important considerations with respect to these types of projects.

The General Provisions on the reverse side provide the administrator with some conditions which will provide him/her with the ability to enforce the intent of the permit during and shortly after the construction phase.

## FORM F SUPPLEMENTAL DATA FOR CONDITIONAL USE PERMIT

This form is fairly self explanatory. As will all the forms herein, this form is not complete unless it is accompanied by FORM A. Because of the complexity and variety of conditional use permit requests, it is difficult at best to develop a form to address all of the potential issues. It is therefore essential that detailed supporting data, narrative and plans are submitted with each request for a conditional use permit. Item B.4. provides a means of documenting this necessary supplemental information.

The reverse provides general provisions as well as space for the approving body to clearly spell out any special conditions they deem necessary to keep the project within the intent of the underlying ordinance. Minnesota Law requires that a certified copy of all conditional use permits be filed with the county recorder (M.S. 394.301, Subd. 4 and 462.3595, Subd. 4). Consequently, it is important to insure that FORM A is attached to and filed with FORM F. FORM A either contains the legal description or has a separate sheet attached thereto which has the correct legal description.

FORM E SUPPLEMENTAL DATA FOR LAND ALTERATION PERMIT			Application Number
			Tax Parcel Number
<b>A. GENERAL INFORMATION</b>			
1. Applicant's Name (Last, First, M.I.)		2. Day Phone No.	3. Evening Phone No.
4. Grading Contractor		5. Fill Header	
<b>B. PROJECT INFORMATION</b>			
<b>1. Project Type</b> a. <input type="checkbox"/> Vegetation Removal b. <input type="checkbox"/> Fill Only c. <input type="checkbox"/> Grading Only d. <input type="checkbox"/> Both Grading and Filling	<b>2. Water Resource Data</b> a. Project is adjacent to: <input type="checkbox"/> Lake <input type="checkbox"/> Stream <input type="checkbox"/> Marsh Name: _____ L.O. No.: _____ b. Present water level: _____ c. Ordinary High Water Level: _____ d. Highest Known Water Level: _____ e. 100-Year Flood Level: _____ f. Datum of elevation: <input type="checkbox"/> Sea Level, <input type="checkbox"/> Assumed Note: Any fill below the ordinary high water level may require a DMR permit.	<b>3. Flood Plain Data</b> a. Is site in the flood plain? <input type="checkbox"/> yes <input type="checkbox"/> no Note: If answer is "YES", fill in the remainder of this section. b. Is site in the FLOODWAY? <input type="checkbox"/> yes <input type="checkbox"/> no c. Is site in General Flood Plain District? <input type="checkbox"/> yes, <input type="checkbox"/> no Note: A "YES" answer to either b. or c. indicates that a problem may exist. A conditional use permit as well as an engineering study will be required in order to determine the impacts on flood elevations and velocities.	
<b>4. Project Purpose</b> a. <input type="checkbox"/> Clear Land b. <input type="checkbox"/> Road or Driveway c. <input type="checkbox"/> Fill in Wetland d. <input type="checkbox"/> Elevate Building Site e. <input type="checkbox"/> Improve Lawn f. <input type="checkbox"/> Improve Commercial/Industrial Site g. <input type="checkbox"/> Other (specify below)	<b>5. Project Scope</b> a. Area of Disturbed Ground in [ ] sq. [ ] acres: in sq. yards: _____ b. Volume of Fill _____ c. Closest Distance to Ordinary High Water Level (ft.): _____ d. Project Start Date: _____ e. Project Completion Date: _____ Note: This application is not complete until plans or blueprints are submitted which adequately describe the proposed project.	<b>6. Site Characterization</b> a. Project Site Soil Type: <input type="checkbox"/> sand, <input type="checkbox"/> gravel, <input type="checkbox"/> silt, <input type="checkbox"/> loam b. Fill Type: <input type="checkbox"/> sand, <input type="checkbox"/> gravel, <input type="checkbox"/> silt, <input type="checkbox"/> loam, <input type="checkbox"/> black dirt, <input type="checkbox"/> demolition material, <input type="checkbox"/> other (specify) _____ c. Average Slope of Work Area: _____ feet of rise for each 100 (1%) feet of horizontal distance. d. Type of Erosion Control Proposed: <input type="checkbox"/> seed, <input type="checkbox"/> stake-and-seed, <input type="checkbox"/> seed only, <input type="checkbox"/> seed & mulch, <input type="checkbox"/> mulch only, <input type="checkbox"/> no control, <input type="checkbox"/> other (specify): _____	
I hereby certify with my signature that all data on my application forms, plans and specifications are true and correct to the best of my knowledge. <div style="text-align: right;">Signature of Applicant _____ Date _____</div>			
<b>LAND ALTERATION PERMIT</b>			
<input type="checkbox"/> APPLICATION IS HEREBY DENIED <input type="checkbox"/> PERMISSION IS HEREBY GRANTED TO _____ all in accordance with the application, addendum form, plans, specifications and all other supporting data, unless specified hereinafter in the GENERAL and/or SPECIAL PROVISIONS.			
BY ORDER OF: _____ Signature of Permitting Authority Title Date			
NOTE: THIS PERMIT TERMINATES ON: _____ except as provided for by local ordinance and/or Minnesota Law.			
- SEE REVERSE FOR GENERAL AND SPECIAL PROVISIONS -			
MDNR - MAY, 1987			

FORM F SUPPLEMENTAL DATA FOR CONDITIONAL USE PERMIT			Application No.
			Tax Parcel No.
<b>A. GENERAL DATA</b>			
NAME OF APPLICANT:			
The above named individual, firm or corporation hereby respectfully submits the following supplemental data in support of the preliminary information provided on the accompanying Zoning Application Summary Form (FORM A) dated _____ for the purpose of securing a conditional use permit.			
Contact Person Last Name,	First	M.I.	Day Phone No. Evening Phone No.
<b>B. PROJECT INFORMATION</b>			
1. Specify the section of the ordinance which applies to this project: _____			
2. Brief narrative description of this request: _____			
3. Written justification for request including discussion of how any potential conflicts with existing nearby land uses will be minimized: _____			
4. Check all additional supporting documents and data which are being submitted to help explain this project proposal: <input type="checkbox"/> sketch plan, <input type="checkbox"/> topographic map, <input type="checkbox"/> detailed narrative, <input type="checkbox"/> operation plans, <input type="checkbox"/> engineering plans, <input type="checkbox"/> flood plain hydraulic analysis, <input type="checkbox"/> flood proofing plans & specifications, <input type="checkbox"/> other (specify) _____			
I hereby certify with my signature that all data on my application forms, plans and specifications are true and correct to the best of my knowledge. <div style="text-align: right;">Signature of Applicant _____ Date _____</div>			
<b>CONDITIONAL USE PERMIT</b>			
In accordance with _____ of _____ the _____ (Section of Ordinance) (Ordinance Name or No.) _____ hereby <input type="checkbox"/> approves, <input type="checkbox"/> denies the foregoing Application for Conditional Use Permit. If approved, said approval is subject to the following General and Special Provisions.			
By _____ (Authorized Signature) _____ (Title) _____ (Date)			
- SEE REVERSE FOR GENERAL AND SPECIAL PROVISIONS -			
MDNR - MAY, 1987			

**FORM G  
SUPPLEMENTAL DATA FOR VARIANCE**

This form is similar to variance forms in use in most communities. The main difference is that a Findings Section has been added to the reverse side (page 2) to help facilitate formulation of written justification for granting or denying a variance. This is an important legal criteria that a few Boards of Adjustment have neglected to follow in the past. Many decisions on variances have been overturned by courts just on technicalities such as this.

You will note that General Provision #1 requires that a certified copy of the document be recorded with the Office of the County Recorder. This is a provision of Minnesota Statutes 394.27, Subd. 8 and 462.36, Subd. 1. Care must be taken to ensure that FORM A is recorded along with FORM G since this is where the legal description resides or is attached.

**FORM H  
SKETCH PLAN**

Many communities do not require submission of a sketch plan for various types of projects. Most communities who do require a sketch plan have found them extremely useful. A sketch plan provides the applicant with a means to explain the various relationships of his proposal. This is especially important if professionally drawn plans and specifications are not available.

By listing specific important criteria directly on this form, the applicant is given guidance on what he needs to show. This leads to a more complete diagram with less questions being raised later during the review process.

<b>FORM G</b>	<b>SUPPLEMENTAL DATA FOR VARIANCE</b>	Application No. Tax Parcel No.
<b>A. GENERAL DATA</b>		
NAME OF APPLICANT : _____		
The above named individual, firm or corporation hereby respectfully submits the following supplemental data in support of the preliminary information provided on the accompanying Zoning Application Summary Form (FORM A) dated _____ for the purpose of securing a variance from existing land use zoning controls.		
Contact Person Last Name, First	M.I.	Day Phone No. Evening Phone No.
<b>B. PROJECT INFORMATION</b>		
1. Specify the section of the ordinance from which variance is sought : _____		
2. Explain how you wish to vary from the applicable provisions of the ordinance _____		
3. Explain the hardship or practical difficulty imposed if strict application of the ordinance is imposed _____		
4. Check all additional supporting documents and data which are being submitted to help explain this project proposal : <input type="checkbox"/> sketch plan, <input type="checkbox"/> topographic map, <input type="checkbox"/> detailed narrative, <input type="checkbox"/> operation plans, <input type="checkbox"/> engineering plans, <input type="checkbox"/> flood plain hydraulic analysis, <input type="checkbox"/> flood proofing plans & specifications, <input type="checkbox"/> other (specify) _____		
I hereby certify with my signature that all data on my application forms, plans and specifications are true and correct to the best of my knowledge.		
Signature of Applicant	Date	
<b>ORDER GRANTING OR DENYING VARIANCE</b>		
In accordance with the findings stated on the reverse side of this document, the Board of Adjustment of _____ hereby <input type="checkbox"/> approves, <input type="checkbox"/> denies the foregoing Application for Variance. If approved, said approval is subject to the General and Special Provisions following the Findings section on page 2.		
By: _____	(Authorized Signature)	(Title) (Date)
SEE REVERSE FOR FINDINGS AND GENERAL AND SPECIAL PROVISIONS		
MDNR - MAY, 1987		

<b>FORM H</b>	<b>SKETCH PLAN</b>	Application Number Tax Parcel Number
Please be as complete as possible. Include all of the items listed below where applicable.		
<b>GENERAL CHECKLIST</b>	<b>WATER RESOURCE CHECKLIST</b>	Scale of Diagram : 1 inch = _____ feet
<input type="checkbox"/> -easle <input type="checkbox"/> -width arrow <input type="checkbox"/> -lot dimensions <input type="checkbox"/> -structure location <input type="checkbox"/> -side lot setback <input type="checkbox"/> -road setback <input type="checkbox"/> -septic tank location <input type="checkbox"/> -drainfield location <input type="checkbox"/> -location of all walls within 100' of drainfield <input type="checkbox"/> -fill & grading limits <input type="checkbox"/> -vegetation alteration limits	<input type="checkbox"/> -location of boundary <input type="checkbox"/> -location of flood fringe <input type="checkbox"/> -location of ordinary high water level (OHWL) <input type="checkbox"/> -location of present water line <input type="checkbox"/> -location from OHWL <input type="checkbox"/> -location of highest known water level <input type="checkbox"/> -existing land drainage <input type="checkbox"/> -location of wetland areas	Drawing By : _____ Date of Drawing : _____
MDNR - MAY, 1987		

<b>PAGE 2 FORM G - VARIANCE FINDINGS</b>
1. This matter was heard at a public hearing before the Board of Adjustment on: _____
2. Strict application of the provisions of the Zoning Ordinance <input type="checkbox"/> would, <input type="checkbox"/> would not cause undue hardship to the owner of the property in question because of the following facts which were presented at the hearing held on this case : _____
3. The hardship found to exist in Finding 1, above <input type="checkbox"/> is, <input type="checkbox"/> is not unique to the property in question, and <input type="checkbox"/> is, <input type="checkbox"/> is not shared by properties in the immediate vicinity of this property and in the same use district because of the following facts: _____
4. The granting of the variance requested <input type="checkbox"/> would, <input type="checkbox"/> would not alter the essential character of the neighborhood because of the following facts : _____
<b>GENERAL PROVISIONS</b>
1. This variance is not valid until the recipient has recorded it at the Office of the County Recorder and submitted a certified copy thereof to the Office of the Zoning Administrator.
2. This variance does not constitute a building permit, sewage system permit, grading / filling permit, well permit or the like. Separate permits may have to be applied for and obtained in order to accomplish all of the goals of your project.
3. The issuance of this variance does not negate the need to secure other permits from other local units of government, state agencies or federal agencies who may also have jurisdiction over portions of your project.
<b>SPECIAL PROVISIONS</b>
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

**FORM I  
CERTIFICATE OF OCCUPANCY FOR  
AUTHORIZED FLOODPLAIN DEVELOPMENTS**

Both federal and state floodplain laws and regulations require that the local floodplain zoning authority certify the as-built elevations of structures and fill which they authorize. Due to recent monitoring of local floodplain administration procedures, the DNR, DOW has concluded that many of the communities enrolled in the National Flood Insurance Program (NFIP) are negligent in this respect. Failure to certify as-built elevations will lead to lost opportunities for identifying ordinance violations and could also be the cause for suspension of the community from the NFIP. This is especially true if the community has received a warning from the Federal Emergency Management Agency (FEMA) that they are in violation of this requirement.

This form provides for the entry of specific Flood Insurance Rate Map (FIRM) data, as-built elevation data and certification of flood proofing criteria by a registered engineer or architect. This information is transferable to FEMA's "Elevation Certificate", provided that a certified copy of FORM I is attached thereto. Furthermore, the form provides a good basis for maintaining a record of first floor elevations, another requirement for maintaining eligibility in the NFIP.

<b>FORM I</b>		<b>CERTIFICATE OF COMPLIANCE FOR AUTHORIZED FLOOD PLAIN DEVELOPMENTS</b>			<small>APPLICATION NUMBER</small>
					<small>TAX PARCEL NUMBER</small>
<b>A. GENERAL INFORMATION</b>					
1. Permittee's Name (Last, First, M.I.)			2. Authorized Agent (if applicable)		
3. Mailing Address (Street, RFD, Box Number, City, State, Zip Code)					
4. Work Phone		5. Home Phone		6. Fire Number	
<b>B. LEGAL DESCRIPTION</b>					
1. Lot(s), Block, Subdivision Name		2. Section	3. Township	4. Range	5. Qtr./Qtr.
6. Note: If property is malle and bounds description, check here <input type="checkbox"/> and attach a copy of the exact legal description.					
<b>C. TYPE OF ZONING OR PERMIT REQUEST</b>			<b>D. FLOOD INSURANCE RATE MAP (FIRM) DATA</b>		
1. <input type="checkbox"/> building permit for: a. <input type="checkbox"/> new construction; b. <input type="checkbox"/> addition; c. <input type="checkbox"/> remodeling d. <input type="checkbox"/> relocation of structure; 2. <input type="checkbox"/> fill permit in: a. <input type="checkbox"/> flood fringe; b. <input type="checkbox"/> floodway; c. <input type="checkbox"/> general flood plain district 3. <input type="checkbox"/> conditional use permit for: Specify: _____			1. Community No.: _____ 2. Panel No.: _____ 3. Suffix: _____ 4. Date of FIRM _____ 5. FIRM Zone _____ 6. Date of Constr.: _____ 7. Base Flood (100-yr) Elev (10-40 Year use exempt) 8. Building is: a. <input type="checkbox"/> New/Emergency Program b. <input type="checkbox"/> Pre-FIRM Reg. Program c. <input type="checkbox"/> Post-FIRM Reg. Program		
(Page 1 of 2)					
SEE REVERSE (PAGE 2) FOR ACTUAL CERTIFICATION					
<small>MDNR-MAY, 1987</small>					

<b>E. - ELEVATION CERTIFICATION (AS BUILT)</b>		
1. Benchmark/Reference Mark Information: the elevations cited herein are based on the following described benchmark (BM): _____		
BM elevation is in: <input type="checkbox"/> See Level Datum; <input type="checkbox"/> assumed datum with BM equal to elevation		
	<small>Required By Ordinance</small>	<small>Actual As-Built</small>
2. Structure:	a. Elevation of first floor:	_____
	b. Basement elevation:	_____
	b. Lowest adjacent grade:	_____
	c. Highest adjacent grade:	_____
3. Sewer:	a. Top of septic or holding tank:	_____
	b. Bottom of drainfield trench or bed:	_____
4. Low point of access/road:		_____
5. Compacted fill elevation around building:		_____
6. Top of well casing:		_____
7. Elevation to which structure is flood proofed:		_____
<b>- CERTIFICATION -</b>		
I, _____ (print or type name) hereby certify that, to the best of my knowledge, information and belief, the subject structure is constructed in accordance with the elevations stated immediately above items 2 through 7.		
Signature: _____	Date: _____	
Registration No. (*): _____	<small>*Only necessary if local ordinance requires certification by registered professional engineer or registered surveyor</small>	
<b>F. - FLOOD PROOFING CERTIFICATION</b>		
I, _____ (print or type name) hereby certify that I am a registered <input type="checkbox"/> engineer, <input type="checkbox"/> architect and that, to the best of my knowledge, information and belief, the subject structure is constructed in accordance with the approved plans and specifications which I have prepared, and that the subject structure meets the criteria and standards for <input type="checkbox"/> FP1, <input type="checkbox"/> FP2, <input type="checkbox"/> FP3, <input type="checkbox"/> FP4 flood proofing as well as all local ordinances, and the State Building Code where applicable		
Signature _____	Date: _____	
Registration No. _____		
(Page 2 of 2)		

**FORM J  
CERTIFICATE OF OCCUPANCY OR  
ZONING COMPLIANCE**

This form is provided for consideration for those communities whose ordinance requires issuance of a certification of occupancy or zoning compliance but do not have such forms available.

<b>FORM J</b>		<b>CERTIFICATE OF OCCUPANCY OR ZONING COMPLIANCE</b>		Permit Number
				Tax Parcel Number
<b>A. - TYPE OF ZONING OR PERMIT REQUEST</b>		<b>B. LEGAL DESCRIPTION OF PROJECT LOCATION</b>		
<input type="checkbox"/> general use permit <input type="checkbox"/> building permit <input type="checkbox"/> sewage system permit <input type="checkbox"/> conditional use permit <input type="checkbox"/> grading or filling permit <input type="checkbox"/> other (specify below) _____		1 Section	2 Township	3 Range
		4 County	5 Ctr. Ctr. Sec	6 Gov. Lot No.
		7 Lot, Block, Subdivision Name		
Note: If property is a metes and bounds description, check here <input type="checkbox"/> and attach true and correct copy of complete legal description				
<b>C. - CERTIFICATION</b>				
I, _____, acting in behalf of City/County/Township of _____ (name of community) in the capacity of _____ (title) hereby CERTIFY that the above described premises and project has been inspected by myself or my assigns on _____ (date of inspection) and that the permit or use as authorized in the above referenced Zoning Application has been completed in compliance with all applicable codes and ordinances and is not in variance with said application and supporting data as of the date of said inspection.				
Note: If the project involves the construction of a building in a designated Flood Plain District, either attach a copy of a fully executed Elevation Certificate as provided by the Federal Emergency Management Agency or attach a copy of a fully executed MDNR FORM I. Certification of certain elevations relating to developments located in flood plain areas is a mandatory requirement of state and federal laws and regulations.				
This Certification was issued to: Name of Applicant: _____ Mailing Address: _____ City, State, & Zip: _____ On: _____ (date of issuance)				
MDNR-MAY, 1987				

**FORM K  
PROJECT REVIEW WORKSHEET FOR  
FLOODPLAIN / SHORELAND DEVELOPMENTS**

This form is intended for use by communities who are satisfied with the forms they are currently using. The goal of this form is to provide a uniform set of questions to help facilitate a thorough review of some of the more important aspects of floodplain and shoreland zoning.

The form is designed to remind the reviewer of some of the more important aspects of a typical floodplain/shoreland zoning ordinance. Generally, a "no" answer should raise a flag and cause the reviewer to refer back to the specific language of their ordinance. Use of this form should not be necessary (except for subdivision reviews) if FORMS A through J are adopted by the community, however.

<b>FORM K</b>		<b>PROJECT REVIEW WORKSHEET FOR WATER RESOURCE PROJECTS</b>		Application Number
				Tax Parcel Number
<b>A. FLOOD PLAN REVIEW</b>		<b>B. SHORELAND DEVELOPMENT CONCERNS / ISSUES</b>		
1. Is project in a mapped flood plain? <input type="checkbox"/> Yes, <input type="checkbox"/> No * If answer is "no", proceed to Section B. * 2. Regulatory Flood Protection Elevation (R.F.P.E.) determination. Base Flood (100 yr) Elevation: _____ Freeboard required by Ordinance: _____ Slope increase due to flooding: _____ R.F.P.E.: _____ 3. Public Safety Concerns (A "no" answer will indicate that project must be revised or possibly a variance must be applied for.) a. Is road access available which no lower than two (2) feet below the R.F.P.E.? <input type="checkbox"/> yes, <input type="checkbox"/> no b. Will the general public have use of the project site? <input type="checkbox"/> yes, <input type="checkbox"/> no c. For structures built on fill, do plans specify that the fill stands at least 15 feet beyond the base of the structure at an elevation not lower than (1) foot below the R.F.P.E.? <input type="checkbox"/> yes, <input type="checkbox"/> no 4. FLOODPROOFING ISSUES (Reminder: no community should allow any type of flood-proofing of residential buildings unless the community has received a "BASEMENT EXCEPTION" from the Federal Emergency Management Agency.) a. Type of flood proofing proposed: <input type="checkbox"/> FF-1, <input type="checkbox"/> FF-2, <input type="checkbox"/> FF-3, <input type="checkbox"/> FF-4 b. Name and registration number of engineer or architect who designed and will certify the floodproofing measures. Name: _____ Reg. No. _____ c. Does the proposed floodproofing provide protection to the R.F.P.E.? <input type="checkbox"/> yes, <input type="checkbox"/> no *NOTE: If answer is "no", project is likely in violation of local, state and federal regulations.		7. Proposed structure setback from OHWL _____ 8. Bathroom concerns. a. Will any of the structure be used for habitation? <input type="checkbox"/> yes, <input type="checkbox"/> no b. Are decks, heating, plumbing, or similar amenities proposed? <input type="checkbox"/> yes, <input type="checkbox"/> no c. Will the bathroom obstruct the view of adjoining property owners? <input type="checkbox"/> yes, <input type="checkbox"/> no 9. Sewage Treatment Concerns a. Soil type: <input type="checkbox"/> clay, <input type="checkbox"/> loam, <input type="checkbox"/> sand, <input type="checkbox"/> gravel b. Depth to mottled soil, bedrock or impermeable soil type: _____ c. Depth to highest known ground water level in feet: _____ d. Percolation rate (min. per inch): _____ e. Drainfield setback from OHWL: _____ f. Tank setback from OHWL: _____ g. Is site subject to flooding? <input type="checkbox"/> yes, <input type="checkbox"/> no		
1. Name of public water: _____ 2. Lake Classification: <input type="checkbox"/> GD, <input type="checkbox"/> RD, <input type="checkbox"/> NE, <input type="checkbox"/> W&S & Scenic <input type="checkbox"/> Other: _____ 3. Ordinary High Water Level: _____ which is in <input type="checkbox"/> Assumed Datum, <input type="checkbox"/> Sea Level This elevation was determined: _____ <input type="checkbox"/> at a public hearing, <input type="checkbox"/> by court order, <input type="checkbox"/> preliminary determination by DNR, <input type="checkbox"/> by Order of the Commissioner of Natural Resources 4. Highest Known water level: _____ 5. Required setback from OHWL in feet: _____ 6. Proposed lowest floor elevation: _____		<b>C. SUBDIVISION REVIEW ISSUES</b> NOTE: Any "NO" answer to the following questions may indicate a problem relative to approving the subject plat as it is currently proposed! Consultation with your DNR Area Hydrologist is recommended in such cases. 1. Flood Plain District Concerns a. Check which districts apply: <input type="checkbox"/> Flood Fringe <input type="checkbox"/> Floodway, <input type="checkbox"/> General Flood Plain * b. Are these districts shown on preliminary plat? <input type="checkbox"/> yes, <input type="checkbox"/> no * NOTE: If plat is affected by a General Flood Plain District, a hydraulic analysis may have to be conducted in order to delineate the Flood Fringe and Floodway and to determine the Base Flood Elevation and the R.F.P.E. c. Does preliminary plat specify the elevation of the Base Flood (100 year Flood)? <input type="checkbox"/> yes, <input type="checkbox"/> no d. Does each lot have sufficient "buildable lot area which is not subject to flooding"? <input type="checkbox"/> yes, <input type="checkbox"/> no e. Does each lot have a site suitable for the installation of a sewage treatment system not subject to flooding? <input type="checkbox"/> yes, <input type="checkbox"/> no f. Does each lot have access which meets the requirements of your ordinance? <input type="checkbox"/> yes, <input type="checkbox"/> no 2. Shoreland District Concerns a. Is the location of the Ordinary High Water Level (OHWL) shown on the preliminary plat? <input type="checkbox"/> yes, <input type="checkbox"/> no b. Is the highest known water level listed on the plat? <input type="checkbox"/> yes, <input type="checkbox"/> no c. Are lot sizes based on land area above the OHWL? <input type="checkbox"/> yes, <input type="checkbox"/> no d. Do all lots have adequate lot area, width, depth, height so that intended development can be conducted without the need to secure a variance? <input type="checkbox"/> yes, <input type="checkbox"/> no		
MDNR - 364 - 1 - 87				





**FORM A**

**ZONING APPLICATION  
SUMMARY FORM**

Application Number
Tax Parcel Number

**A. GENERAL INFORMATION**

1. Applicant's Name (Last, First, M.I.)		2. Authorized Agent (If applicable)	
3. Mailing Address (Street, RFD, Box Number, City, State, Zip Code)			
4. Day Phone	5. Evening Phone	6. Fire Number of Project Location	

**B. - PROPERTY DESCRIPTION**

1. Lot(s), Block, Subdivision Name	2. Section	3. Township	4. Range	5. Qtr./Qtr.	6. Gov. Lot No.
------------------------------------	------------	-------------	----------	--------------	-----------------

7. Note: If the property is a metes and bounds description, check here  and attach a copy of the exact legal description.

**C. - APPLICABLE ZONING DISTRICTS**

(check all that apply)

1.  Residential
2.  Business
3.  Commercial
4.  Industrial
5.  Agricultural
6.  Shoreland (\*)
7.  Wild & Scenic River
8.  Flood Fringe
9.  Floodway
10.  General Flood Plain
11.  Other (specify below)

\_\_\_\_\_

\* Fill in Section E. also.

**D. - TYPE OF ZONING REQUEST**

Project Type	Necessary Supplemental Form
1. <input type="checkbox"/> Building Permit	Form B and H
2. <input type="checkbox"/> Sewage System Permit	Form C and H
3. <input type="checkbox"/> Well Permit	Form D and H
4. <input type="checkbox"/> Land Alteration Permit	Form E and H
5. <input type="checkbox"/> Conditional Use Permit	Form F
6. <input type="checkbox"/> Variance	Form G
7. <input type="checkbox"/> Zoning District Change	
8. <input type="checkbox"/> Subdivision Approval	
9. <input type="checkbox"/> Ordinance Amendment	
10. <input type="checkbox"/> Other (specify below)	

\_\_\_\_\_

**E. - SHORELAND MANAGEMENT DATA**

1. Lake / Stream Name \_\_\_\_\_
2. Lake / Stream I.D. Number \_\_\_\_\_
3. Classification:  NE;  RD;  GD;  
 Other (specify below)

\_\_\_\_\_

**- IMPORTANT NOTICE -**  
Most projects require the submission of one or more additional forms as shown in SECTION D. and sometimes plans, specifications and a written project description before your application is considered to be complete. Form A primarily provides summary information for record keeping.

I hereby certify with my signature that all data contained herein as well as all supporting data are true and correct to the best of my knowledge: \_\_\_\_\_  
Signature Date

**F. - ADMINISTRATIVE DATA SUMMARY  
(For Office Use Only)**

<ol style="list-style-type: none"> <li>1. <input type="checkbox"/> Proper addendum to application has been submitted.</li> <li>2. <input type="checkbox"/> Detailed plans have been submitted which were prepared by: _____ Dated: _____</li> <li>3. <input type="checkbox"/> Written project description has been submitted which was prepared by: _____ Dated: _____</li> <li>4. <input type="checkbox"/> Approved <input type="checkbox"/> with, <input type="checkbox"/> without modification on: _____</li> <li>5. <input type="checkbox"/> Denied on: _____</li> <li>6. Itemization of Fees:                     <table border="0"> <tr> <td>General Application</td> <td>_____</td> </tr> <tr> <td>State Surcharge</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table> </li> <li>7. Total Fees = _____</li> <li>8. Fee paid on (date): _____</li> <li>9. Administrative Summary for Building Permits, Sewage System Permits, Well Permits, and Shoreland Alteration Permits.                     <ol style="list-style-type: none"> <li>a. Dates of inspection(s): _____</li> <li>_____</li> <li>_____</li> <li>b. Certificate of Occupancy (Zoning Compliance) issued on: _____</li> </ol> </li> </ol>	General Application	_____	State Surcharge	_____	_____	_____	_____	_____	_____	_____	_____	_____	<ol style="list-style-type: none"> <li>10. Administrative Summary for Applications for Subdivision Approval, Variances, Conditional Use Permits, Ordinance Amendments and Zoning District Changes :                     <ol style="list-style-type: none"> <li>a. Referred to Township on: _____</li> <li>b. Referred to Planning Commission on: _____</li> <li>c. Referred to Board of Adjustment on: _____</li> <li>d. Referred to County/City Engineer on: _____</li> <li>e. Referred to County/City Attorney on: _____</li> <li>f. Referred to Soil and Water Cons. Dist. on: _____</li> <li>g. Referred to Watershed District on: _____</li> <li>h. Date of Hearing Notice: _____</li> <li>i. Date of Public Hearing: _____</li> <li>j. Is ten (10) day notice to the DNR necessary? <input type="checkbox"/> yes, <input type="checkbox"/> no If yes, enter date sent to DNR here: _____</li> <li>k. Is ten (10) day final notice to the DNR necessary? <input type="checkbox"/> yes, <input type="checkbox"/> no If yes, enter date sent to DNR here: _____</li> <li>l. Final Action: <input type="checkbox"/> APPROVED <input type="checkbox"/> with, <input type="checkbox"/> without modification <input type="checkbox"/> DENIED</li> </ol> </li> </ol> <p>By: <input type="checkbox"/> County Board; <input type="checkbox"/> City Council; <input type="checkbox"/> Board of Adjustment Date of Action: _____</p>
General Application	_____												
State Surcharge	_____												
_____	_____												
_____	_____												
_____	_____												
_____	_____												





**PAGE 2**  
**FORM B - BUILDING PERMIT**

**GENERAL PROVISIONS**

1. This permit [ ] is ; [ ] is not subject to the State Building Code.
2. No changes in plans or specifications can be made to the work authorized herein unless such change is first approved in writing by the permitting authority.
3. Permittee shall grant access to the site at all reasonable times so that the permitting authority or his/her agents may conduct inspections to ascertain compliance with the terms and conditions of this permit.
4. The construction site shall be kept reasonably free of debris at all times so as to not create a public nuisance.
5. Permittee shall install permanent and temporary erosion control measures in order to prevent erosion of disturbed soils from the project site onto adjacent parcels of land, public waters, public roads, ditches, sewer facilities and the like. Permittee shall cease all related authorized construction activities until such time as any such problem is corrected as agreed to by the permitting authority.
6. No certificate of occupancy or zoning compliance may be issued until all the provisions and conditions of this permit are complied with in full.
7. A copy of this permit or an official notice or placard thereof must be posted in a conspicuous place protected from the effects of weather no more than 12 feet above grade on the premises which the work is to be done and shall be maintained there until completion of said work.
8. The granting of this permit does not exempt the permittee from having to secure other permits from other state, federal or local units of government which may have jurisdiction over portions of the authorized project.

**SPECIAL PROVISIONS**

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
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4. \_\_\_\_\_  
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7. \_\_\_\_\_  
\_\_\_\_\_
8. \_\_\_\_\_  
\_\_\_\_\_

**FORM C**

**SUPPLEMENTAL DATA  
FOR SEWAGE SYSTEM PERMIT**

Application Number
Tax Parcel Number

**A - GENERAL INFORMATION**

1. Applicant's Name (Last, First, M.I.)	2. Day Phone	3. Evening Phone
4. Sewer Installer	5. Soil Tester	6. Earthwork Contractor

**B. SEWAGE SYSTEM DATA**

**C. SITE DATA**

<p><b>1. Work Category</b></p> <p>a. <input type="checkbox"/> New System</p> <p>b. <input type="checkbox"/> Repair</p>	<p><b>2. Type of System</b></p> <p>a. <input type="checkbox"/> Septic Tank Only</p> <p>b. <input type="checkbox"/> Drainfield Only</p> <p>c. <input type="checkbox"/> Septic Tank &amp; Drainfield</p> <p>d. <input type="checkbox"/> Holding Tank</p> <p>e. <input type="checkbox"/> Alternative System (specify) _____</p>	<p><b>1. Soils Data</b></p> <p>a. Soil Type: = _____</p> <p>b. Percolation Rate (minutes per inch): = _____</p> <p>c. Depth to Water Table: = _____</p> <p>d. Depth to Mottled Soil: = _____</p> <p>e. Date of Soil Testing: = _____</p>	<p><b>2. Supporting Data/Attachments</b></p> <p><input type="checkbox"/> Sketch Plan**</p> <p><input type="checkbox"/> Percolation Data Sheets</p> <p><input type="checkbox"/> Soil Borings</p> <p><input type="checkbox"/> Tank/Drainfield Design Calculations</p> <p>** This is normally a mandatory requirement. It is recommended that the applicant submit sketch plan on FORM H.</p>																											
<p><b>3. Anticipated Use</b></p> <p>a. <input type="checkbox"/> Single Family</p> <p>b. <input type="checkbox"/> Multiple Family</p> <p>c. <input type="checkbox"/> Commercial</p> <p>d. <input type="checkbox"/> Agricultural</p> <p>e. <input type="checkbox"/> Other (specify) _____</p>	<p><b>4. Type of Drainfield</b></p> <p>a. <input type="checkbox"/> Standard System</p> <p>b. <input type="checkbox"/> Mound (pressure distribution)</p> <p>c. <input type="checkbox"/> Mound (gravity distribution)</p>	<p><b>3. Water Level Data Worksheet</b></p> <p>a. Highest Known Water Level: = _____</p> <p>b. 100-Year Flood Elevation: = _____</p> <p>c. 10-Year Flood Elevation: = _____</p> <p>d. Design of Tank and/or Drainfield is Based on:</p> <p><input type="checkbox"/> 100-Year Flood Elevation</p> <p><input type="checkbox"/> 10-Year Flood Elevation</p> <p><input type="checkbox"/> Highest Known Water Level</p> <p><input type="checkbox"/> Highest Known Ground Water Level</p> <p><input type="checkbox"/> Soil Mottling or Impervious Soil Layer</p> <p>Note: The proper design of sewage systems is contingent upon these limiting factors. The most conservative resulting design prevails.</p>																												
<p><b>5. System Design Data</b></p> <table border="1"> <thead> <tr> <th></th> <th>Tank</th> <th>Drainfield</th> </tr> </thead> <tbody> <tr> <td>a. Distance to Well:</td> <td>= _____ - _____</td> <td>_____ - _____</td> </tr> <tr> <td>b. Distance to Building:</td> <td>= _____ - _____</td> <td>_____ - _____</td> </tr> <tr> <td>c. Distance to Property Line:</td> <td>= _____ - _____</td> <td>_____ - _____</td> </tr> <tr> <td>d. Distance to Suction Line:</td> <td>= _____ - _____</td> <td>_____ - _____</td> </tr> <tr> <td>e. Distance to Pressure Line:</td> <td>= _____ - _____</td> <td>_____ - _____</td> </tr> <tr> <td>f. Tank Capacity (gal.) and Area of Drainfield (ft.2):</td> <td>= _____ - _____</td> <td>_____ - _____</td> </tr> <tr> <td>g. Distance to Lake or Stream (from Ordinary High Water Level):</td> <td>= _____ - _____</td> <td>_____ - _____</td> </tr> <tr> <td>h. Drainfield Separation from Highest Known Ground Water Level, Impervious Lens or Soil Mottling:</td> <td>= _____ - _____</td> <td>_____ - _____</td> </tr> </tbody> </table>					Tank	Drainfield	a. Distance to Well:	= _____ - _____	_____ - _____	b. Distance to Building:	= _____ - _____	_____ - _____	c. Distance to Property Line:	= _____ - _____	_____ - _____	d. Distance to Suction Line:	= _____ - _____	_____ - _____	e. Distance to Pressure Line:	= _____ - _____	_____ - _____	f. Tank Capacity (gal.) and Area of Drainfield (ft.2):	= _____ - _____	_____ - _____	g. Distance to Lake or Stream (from Ordinary High Water Level):	= _____ - _____	_____ - _____	h. Drainfield Separation from Highest Known Ground Water Level, Impervious Lens or Soil Mottling:	= _____ - _____	_____ - _____
	Tank	Drainfield																												
a. Distance to Well:	= _____ - _____	_____ - _____																												
b. Distance to Building:	= _____ - _____	_____ - _____																												
c. Distance to Property Line:	= _____ - _____	_____ - _____																												
d. Distance to Suction Line:	= _____ - _____	_____ - _____																												
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g. Distance to Lake or Stream (from Ordinary High Water Level):	= _____ - _____	_____ - _____																												
h. Drainfield Separation from Highest Known Ground Water Level, Impervious Lens or Soil Mottling:	= _____ - _____	_____ - _____																												

I hereby certify with my signature that all data on my application forms, plans and specifications are true and correct to the best of my knowledge: \_\_\_\_\_  
Signature of Applicant Date

**SEWAGE SYSTEM PERMIT**

APPLICATION IS HEREBY DENIED

PERMISSION IS HEREBY GRANTED TO \_\_\_\_\_; all in accordance with the application, addendum form, plans, specifications and all other supporting date, unless specified hereinafter in the GENERAL and/or SPECIAL PROVISIONS.

BY ORDER OF: \_\_\_\_\_  
Signature of Permitting Authority Title Date

NOTE: THIS PERMIT TERMINATES ON: \_\_\_\_\_ except as provided for by local ordinance and/or Minnesota Law.

- SEE REVERSE FOR GENERAL AND SPECIAL PROVISIONS -

**PAGE 2**  
**FORM C - SEWAGE SYSTEM PERMIT**  
**GENERAL PROVISIONS**

1. Permittee shall not cover the system authorized herein until such system has been inspected and determined to be compliant by the permitting authority. This provision can be waived only at the discretion of the permitting authority.
2. Where clay soils are predominant, no drainfield excavation can proceed if more than one (1) inch of total rainfall has been received at the nearest official rain gage within one (1) week prior to construction. This provision can only be waived at the discretion of the permitting authority.
3. No changes in plans or specification can be made to the work authorized herein unless such change is first approved in writing by the permitting authority.
4. Permittee shall grant access to the site at all reasonable times so that the permitting authority or his/her agents may conduct inspections to ascertain compliance with the terms and conditions of this permit.
5. The construction site shall be kept reasonably free of debris at all times so as to not create a public nuisance.
6. Permittee shall install permanent and temporary erosion control measures in order to prevent erosion of disturbed soils from the project site onto adjacent parcels of land, public waters, public roads, ditches, sewer facilities and the like. Permittee shall cease all related authorized construction activities until such time as any such problem is corrected as agreed to by the permitting authority.
7. No certificate of occupancy or zoning compliance may be issued until all the provisions and conditions of this permit are complied with in full.
8. A copy of this permit or an official notice or placard thereof must be posted in a conspicuous place protected from the effects of weather no more than 12 feet above grade on the premises which the work is to be done and shall be maintained there until completion of said work.
9. The granting of this permit does not exempt the permittee from having to secure other permits from other state, federal or local units of government which may have jurisdiction over portions of the authorized project.
10. This permit does not allow the destruction or removal of any trees or vegetation which exists more than ten (10) feet beyond the foundation of the authorized structure or more than five (5) feet beyond the edge of a driveway or parking lot unless authorized in a Special Provision below.

**SPECIAL PROVISIONS**

1. \_\_\_\_\_  
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2. \_\_\_\_\_  
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3. \_\_\_\_\_  
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6. \_\_\_\_\_  
\_\_\_\_\_





**PAGE 2**  
**FORM D - WELL PERMIT**  
**GENERAL PROVISIONS**

1. The well authorized herein shall be constructed by a licensed well driller or shall be installed and located in accordance with the current well construction code/regulation of the Minnesota Department of Health.
2. No water shall be consumed from the well authorized herein until the permittee has had the water tested and found safe for human consumption. Permittee shall submit a copy of the test results within fifteen (15) days of receipt of said test.
3. A copy of this permit shall be at the well site and in the possession of the person or firm constructing the well authorized herein during construction.
4. No changes in plans or specifications can be made to the work authorized herein unless such change is first approved in writing by the permitting authority.
5. Permittee shall grant access to the site at all reasonable times so that the permitting authority or his/her agents may conduct inspections to ascertain compliance with the terms and conditions of this permit.
6. The construction site shall be kept reasonably free of debris at all times so as to not create a public nuisance. No well drilling fluid shall be allowed to enter a public water or a watercourse leading thereto.
7. No certificate of occupancy or zoning compliance may be issued until all the provisions and conditions of this permit are complied with in full.
8. The granting of this permit does not exempt the permittee from having to secure other permits from other state, federal or local units of government which may have jurisdiction over portions of the authorized project.

**SPECIAL PROVISIONS**

1. \_\_\_\_\_  
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3. \_\_\_\_\_  
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7. \_\_\_\_\_  
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**FORM E**

**SUPPLEMENTAL DATA  
FOR LAND ALTERATION PERMIT**

Application Number
Tax Parcel Number

**A. GENERAL INFORMATION**

1. Applicant's Name (Last, First, M.I.)	2. Day Phone No.	3. Evening Phone No.
4. Grading Contractor	5. Fill Hauler	

**B. PROJECT INFORMATION**

<p><b>1. Project Type</b></p> <p>a. <input type="checkbox"/> Vegetation Removal          b. <input type="checkbox"/> Fill Only          c. <input type="checkbox"/> Grading Only          d. <input type="checkbox"/> Both Grading and Filling</p>	<p><b>2. Water Resource Data</b></p> <p>a. Project is adjacent to: <input type="checkbox"/> lake  <input type="checkbox"/> stream  <input type="checkbox"/> ditch</p> <p>Name: _____</p> <p>I.D. No. : _____</p> <p>b. Present water level: _____</p> <p>c. Ordinary High Water Level: _____</p> <p>d. Highest Known Water Level: _____</p> <p>e. 100-Year Flood Level _____</p> <p>f. Datum of elevation: <input type="checkbox"/> Sea Level, <input type="checkbox"/> Assumed</p> <p>Note: Any fill below the ordinary high water level may require a DNR permit.</p>	<p><b>3. Flood Plain Data</b></p> <p>a. Is site in the flood plain? <input type="checkbox"/> yes <input type="checkbox"/> no</p> <p>Note: If answer is "YES", fill in the remainder of this section.</p> <p>b. Is site in the FLOODWAY? <input type="checkbox"/> yes <input type="checkbox"/> no</p> <p>c. Is site in General Flood Plain District? <input type="checkbox"/> yes, <input type="checkbox"/> no</p> <p>Note: A "YES" answer to either b. or c. indicates that a problem may exist. A conditional use permit as well as an engineering study will be required in order to determine the impacts on flood elevations and velocities.</p>
<p><b>4. Project Purpose</b></p> <p>a. <input type="checkbox"/> Clear Land          b. <input type="checkbox"/> Road or Driveway          c. <input type="checkbox"/> Fill in Wetland          d. <input type="checkbox"/> Elevate Building Site          e. <input type="checkbox"/> Improve Lawn          f. <input type="checkbox"/> Improve Commercial/Industrial Site          g. <input type="checkbox"/> Other (specify below)</p> <p>_____</p>	<p><b>5. Project Scope</b></p> <p>a. Area of Disturbed Ground in [ ]ft<sup>2</sup>, [ ] acres: = _____</p> <p>b. Volume of Fill in cu. yards: = _____</p> <p>c. Closest Distance to Ordinary High Water Level (ft.): = _____</p> <p>d. Project Start Date: = _____</p> <p>e. Project Completion Date: = _____</p> <p>Notice: This application is not complete until plans or sketches are submitted which adequately describe the proposed project.</p>	<p><b>6. Site Characteristics</b></p> <p>a. Project Site Soil Type: <input type="checkbox"/> sand, <input type="checkbox"/> gravel, <input type="checkbox"/> clay, <input type="checkbox"/> loam</p> <p>b. Fill Type: <input type="checkbox"/> sand, <input type="checkbox"/> gravel, <input type="checkbox"/> clay, <input type="checkbox"/> loam, <input type="checkbox"/> black dirt, <input type="checkbox"/> demolition material, <input type="checkbox"/> other (specify)</p> <p>_____</p> <p>c. Average Slope of Work Area: _____ feet of rise for each ten (10) feet of horizontal distance.</p> <p>d. Type of Erosion Control Proposed: <input type="checkbox"/> sod, <input type="checkbox"/> stake-sod, <input type="checkbox"/> seed only, <input type="checkbox"/> seed &amp; mulch, <input type="checkbox"/> mulch only, <input type="checkbox"/> no control, <input type="checkbox"/> other (specify): _____</p>
<p>I hereby certify with my signature that all data on my application forms, plans and specifications are true and correct to the best of my knowledge: _____</p> <p style="text-align: right;">Signature of Applicant <span style="margin-left: 150px;">Date</span></p>		

**LAND ALTERATION PERMIT**

APPLICATION IS HEREBY DENIED

PERMISSION IS HEREBY GRANTED TO \_\_\_\_\_ all in accordance with the application, addendum form, plans, specifications and all other supporting data, unless specified hereinafter in the GENERAL and/or SPECIAL PROVISIONS.

BY ORDER OF: \_\_\_\_\_

Signature of Permitting Authority Title Date

NOTE: THIS PERMIT TERMINATES ON: \_\_\_\_\_ except as provided for by local ordinance and/or Minnesota Law.

- SEE REVERSE FOR GENERAL AND SPECIAL PROVISIONS -

**PAGE 2**  
**FORM E - LAND ALTERATION PERMIT**

**GENERAL PROVISIONS**

1. Permittee shall maintain temporary erosion controls at all times during construction in order to prevent erosion into any adjacent water body or watercourse. Temporary erosion controls comprise strawbales, straw mulch, pollution curtains, filter cloth and the like.
2. Permittee shall install permanent erosion control measures in order to prevent erosion of disturbed soils from the project site onto adjacent parcels of land, public waters, public roads, ditches, sewer facilities and the like. Permittee shall cease all related authorized construction activities until such time as any such problem is corrected as agreed to by the permitting authority. All permanent erosion control measures shall be installed within seven (7) days of completion of final grading or the termination date of this permit, whichever comes first.
3. No changes in plans or specifications can be made to the work authorized herein unless such changes are first approved in writing by the permitting authority.
4. Permittee shall grant access to the site at all reasonable times so that the permitting authority or his/her agents may conduct inspections to ascertain compliance with the terms and conditions of this permit.
5. The construction site shall be kept reasonably free of debris at all times so as to not create a public nuisance.
7. No certificate of occupancy or zoning compliance may be issued until all the provisions and conditions of this permit are complied with in full.
8. A copy of this permit or an official notice or placard thereof must be posted in a conspicuous place protected from the effects of weather no more than 12 feet above grade on the premises which the work is to be done and shall be maintained there until completion of said work.
9. The granting of this permit does not exempt the permittee from having to secure other permits from other state, federal or local units of government which may have jurisdiction over portions of the authorized project.

**SPECIAL PROVISIONS**

1. \_\_\_\_\_  
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2. \_\_\_\_\_  
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3. \_\_\_\_\_  
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6. \_\_\_\_\_  
\_\_\_\_\_
7. \_\_\_\_\_  
\_\_\_\_\_

FORM F

SUPPLEMENTAL DATA FOR CONDITIONAL USE PERMIT

Application No.
Tax Parcel No.

A. GENERAL DATA

**NAME OF APPLICANT :** \_\_\_\_\_

The above named individual, firm or corporation hereby respectfully submits the following supplemental data in support of the preliminary information provided on the accompanying Zoning Application Summary Form (FORM A) dated \_\_\_\_\_ for the purpose of securing a conditional use permit.

Contact Person Last Name,      First      M.I.      Day Phone No.      Evening Phone No.

B. PROJECT INFORMATION

1. Specify the section of the ordinance which applies to this project : \_\_\_\_\_

2. Brief narrative description of this request : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

3. Written justification for request including discussion of how any potential conflicts with existing nearby land uses will be minimized : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

4 Check all additional supporting documents and data which are being submitted to help explain this project proposal :  sketch plan,  topographic map,  detailed narrative,  operation plans,  engineering plans,  flood plain hydraulic analysis,  flood proofing plans & specifications,  other (specify) \_\_\_\_\_

I hereby certify with my signature that all data on my application forms, plans and specifications are true and correct to the best of my knowledge: \_\_\_\_\_  
 Signature of Applicant      Date

CONDITIONAL USE PERMIT

In accordance with \_\_\_\_\_ of \_\_\_\_\_, the  
 (Section of Ordinance)      (Ordinance Name or No.)

\_\_\_\_\_ hereby  approves,  denies the foregoing Application  
 (Name of Governing Body)

for Conditional Use Permit. If approved, said approval is subject to the following General and Special Provisions :

By: \_\_\_\_\_  
 (Authorized Signature)      (Title)      (Date)

- SEE REVERSE FOR GENERAL AND SPECIAL PROVISIONS -

**PAGE 2**  
**FORM F - CONDITIONAL USE PERMIT**

**GENERAL PROVISIONS**

1. This permit is not valid until it has been recorded at the Office of the County Recorder. A true and correct copy of the full legal description of the affected property must be attached to this document.
2. This permit does not constitute a building permit, sewage system permit, grading permit, land alteration permit, well permit or the like. Separate permits may have to be applied for and obtained in order to accomplish all the goals of the project authorized herein.
3. The issuance of this permit does not negate the need to secure other permits from other local units of government, state agencies or federal agencies who may also have jurisdiction over portions of your project.

**SPECIAL PROVISIONS**

1. \_\_\_\_\_  
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2. \_\_\_\_\_  
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\_\_\_\_\_
9. \_\_\_\_\_  
\_\_\_\_\_

**FORM G**

**SUPPLEMENTAL DATA  
FOR VARIANCE**

Application No.
Tax Parcel No.

**A. GENERAL DATA**

<b>NAME OF APPLICANT :</b> _____				
The above named individual, firm or corporation hereby respectfully submits the following supplemental data in support of the preliminary information provided on the accompanying <b>Zoning Application Summary Form (FORM A)</b> dated _____ for the purpose of securing a variance from existing land use zoning controls.				
Contact Person Last Name,	First	M.I.	Day Phone No.	Evening Phone No.

**B. PROJECT INFORMATION**

1. Specify the section of the ordinance from which variance is sought : _____
2. Explain how you wish to vary from the applicable provisions of the ordinance: _____ _____ _____
3. Explain the hardship or practical difficulty imposed if strict application of the ordinance is imposed: _____ _____
4. Check all additional supporting documents and data which are being submitted to help explain this project proposal : <input type="checkbox"/> sketch plan, <input type="checkbox"/> topographic map, <input type="checkbox"/> detailed narrative, <input type="checkbox"/> operation plans, <input type="checkbox"/> engineering plans, <input type="checkbox"/> flood plain hydraulic analysis, <input type="checkbox"/> flood proofing plans & specifications, <input type="checkbox"/> other (specify) _____
I hereby certify with my signature that all data on my application forms, plans and specifications are true and correct to the best of my knowledge: _____ Signature of Applicant _____ Date _____

**ORDER GRANTING OR DENYING VARIANCE**

In accordance with the findings stated on the reverse side of this document, the Board of Adjustment of \_\_\_\_\_ hereby  approves,  denies the foregoing Application (Name of Community) for Variance. If approved, said approval is subject to the General and Special Provisions following the Findings section on page 2.

By: \_\_\_\_\_ (Authorized Signature) \_\_\_\_\_ (Title) \_\_\_\_\_ (Date)

**SEE REVERSE FOR FINDINGS  
AND  
GENERAL AND SPECIAL PROVISIONS**

**PAGE 2  
FORM G - VARIANCE  
FINDINGS**

1. This matter was heard at a public hearing before the Board of Adjustment on: \_\_\_\_\_

2. Strict application of the provisions of the Zoning Ordinance [ ] would, [ ] would not cause undue hardship to the owner of the property in question because of the following facts which were presented at the hearing held on this case :

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. The hardship found to exist in Finding 1. above [ ] is, [ ] is not unique to the property in question, and [ ] is, [ ] is not shared by properties in the immediate vicinity of this property and in the the same use district because of the following facts:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. The granting of the variance requested [ ] would, [ ] would not alter the essential character of the neighborhood because of the following facts :

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**GENERAL PROVISIONS**

1. This variance is not valid until the recipient has recorded it at the Office of the County Recorder and submitted a certified copy thereof to the Office of the Zoning Administrator.
2. This variance does not constitute a building permit, sewage system permit, grading / filling permit, well permit or the like. Separate permits may have to be applied for and obtained in order to accomplish all of the goals of your project.
3. The issuance of this variance does not negate the need to secure other permits from other local units of government, state agencies or federal agencies who may also have jurisdiction over portions of your project.

**SPECIAL PROVISIONS**

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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6. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# FORM H

# SKETCH PLAN

Application Number
Tax Parcel Number

Please be as complete as possible. Include all of the items listed below where applicable.

### GENERAL CHECKLIST

- scale
- north arrow
- lot dimensions
- structure location
- side lot setback
- road setback
- septic tank location
- drainfield location
- location of all wells within 100' of drainfield
- fill & grading limits
- vegetation alteration limits

### WATER RESOURCE CHECKLIST

- location of floodway
- location of flood fringe
- location of ordinary high water level (OHWL)
- location of present water line
- setback from OHWL
- location of highest known water level
- existing local drainage
- location of wetland areas

Scale of Diagram : 1 inch = \_\_\_\_\_ feet

Drawing By : \_\_\_\_\_

Date of Drawing : \_\_\_\_\_





FORM I

**CERTIFICATE OF COMPLIANCE  
FOR  
AUTHORIZED FLOOD PLAIN DEVELOPMENTS**

APPLICATION NUMBER

TAX PARCEL NUMBER

**A. GENERAL INFORMATION**

1. Permittee's Name (Last, First, M.I.)		2. Authorized Agent (if applicable)	
3. Mailing Address (Street, RFD, Box Number, City, State, Zip Code)			
4. Work Phone	5. Home Phone	6. Fire Number	

**B. LEGAL DESCRIPTION**

1. Lot(s), Block, Subdivision Name	2. Section	3. Township	4. Range	5. Qtr./Qtr.
6. Note: If property is metes and bounds description, check here <input type="checkbox"/> and attach a copy of the exact legal description.				

**C. TYPE OF ZONING OR PERMIT REQUEST**

1.  building permit for:  
a.  new construction;  
b.  addition;  
c.  remodeling  
d.  relocation of structure;

2.  fill permit in:  
a.  flood fringe;  
b.  floodway;  
c.  general flood plain district

3.  conditional use permit for:  
(specify): \_\_\_\_\_

**D. FLOOD INSURANCE RATE MAP (FIRM) DATA**

1. Community No.:	
2. Panel No.:	3. Suffix:
4. Date of FIRM	5. FIRM Zone
6. Date of Constr.:	7. Base Flood (100-yr) Elev. (In AO Zone, use depth)
8. Building is: a. <input type="checkbox"/> New/Emergency Program b. <input type="checkbox"/> Pre-FIRM Reg. Program c. <input type="checkbox"/> Post-FIRM Reg. Program	

(Page 1 of 2)

**SEE REVERSE (PAGE 2) FOR ACTUAL CERTIFICATION**

**E. - ELEVATION CERTIFICATION (AS BUILT)**

1. Benchmark/Reference Mark Information; the elevations cited herein are based on the following described benchmark (BM): \_\_\_\_\_

BM elevation is in:  Sea Level Datum;  assumed datum with BM equal to elevation \_\_\_\_\_

		Required By Ordinance	Actual As-Built
2. Structure:	a. Elevation of first floor:	= _____	- _____
	b. Basement elevation):	= _____	- _____
	b. Lowest adjacent grade:	= _____	- _____
	c. Highest adjacent grade:	= _____	- _____
3. Sewer:	a. Top of septic or holding tank:	= _____	- _____
	b. Bottom of drainfield trench or bed:	= _____	- _____
4. Low point of access/road:		= _____	- _____
5. Compacted fill elevation around building:		= _____	- _____
6. Top of well casing:		= _____	- _____
7. Elevation to which structure is flood proofed:		= _____	- _____

**- CERTIFICATION -**

I, \_\_\_\_\_ (print or type name) hereby certify that, to the best of my knowledge, information and belief, the subject structure is constructed in accordance with the elevations stated immediately above items 2 through 7).

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Registration No. (\*): \_\_\_\_\_

\*(Only necessary if local ordinance requires certification by registered professional engineer or registered surveyor)

**F. - FLOOD PROOFING CERTIFICATION**

I, \_\_\_\_\_ (print or type name), hereby certify that I am a registered  engineer,  architect and that, to the best of my knowledge, information and belief, the subject structure is constructed in accordance with the approved plans and specifications which accompanied the above referenced Zoning Application and or Zoning Permit and the subject structure meets the criteria and standards for  FP1,  FP2,  FP3,  FP4 flood proofing as well as all local ordinances, and the State Building Code where applicable.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Registration No.: \_\_\_\_\_

FORM J

CERTIFICATE OF OCCUPANCY  
OR  
ZONING COMPLIANCE

Permit Number
Tax Parcel Number

A. - TYPE OF ZONING OR PERMIT REQUEST

1. <input type="checkbox"/> general use permit
2. <input type="checkbox"/> building permit
3. <input type="checkbox"/> sewage system permit
4. <input type="checkbox"/> conditional use permit
5. <input type="checkbox"/> grading or filling permit
6. <input type="checkbox"/> other (specify below)
_____

B. LEGAL DESCRIPTION OF PROJECT LOCATION

1. Section	2. Township	3. Range
4. County	5. Qtr./Qtr. Sec.	6. Gov. Lot No.
7. Lot, Block, Subdivision Name		
Note: If property is a metes and bounds description, check here <input type="checkbox"/> and attach true and correct copy of complete legal description.		

C. - CERTIFICATION

I, \_\_\_\_\_, acting in behalf of City/County/Township of \_\_\_\_\_  
(print or type name) (name of community)  
in the capacity of \_\_\_\_\_ hereby CERTIFY that the above described premises and project  
(Title)  
has been inspected by myself or my assigns on \_\_\_\_\_, and that the permit or use as authorized in the  
(date of inspection)  
above referenced Zoning Application has been completed in compliance with all applicable codes and  
ordinances and is not in variance with said application and supporting data as of the date of said inspection.

**Note:** If the project involves the construction of a building in a designated Flood Plain District, either attach a copy of a fully executed Elevation Certificate as provided by the Federal Emergency Management Agency or attach a copy of a fully executed MDNR FORM I. Certification of certain elevations relating to developments located in flood plain areas is a mandatory requirement of state and federal laws and regulations.

This Certification was issued to:  
Name of Applicant: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
City, State, & Zip: \_\_\_\_\_  
On: \_\_\_\_\_  
(date of issuance)



**FORM K**

**PROJECT REVIEW WORKSHEET  
FOR WATER RESOURCE PROJECTS**

Application Number
Tax Parcel Number

**A. FLOOD PLAIN REVIEW**

1. Is project in a mapped flood plain?  Yes,  No  
 \* If answer is "no", proceed to Section B. \*

2. Regulatory Flood Protection Elevation (R.F.P.E.) determination.  
 Base Flood (100 yr) Elevation: = \_\_\_\_\_  
 Freeboard required by Ordinance: = \_\_\_\_\_  
 Stage increase due to Floodway: = \_\_\_\_\_  
 R.F.P.E. : = \_\_\_\_\_

3. Public Safety Concerns  
 (A "no" answer will indicate that project must be revised or possibly a variance must be applied for.)  
 a. Is road access available which no lower than two (2) feet below the R.F.P.E.?  yes,  no  
 b. Will the general public have use of the project site?  yes,  no  
 c. For structures built on fill, do plans specify that the fill extend at least 15 feet beyond the base of the structure at an elevation not lower than (1) foot below the RFPE?  yes,  no

4. FLOODPROOFING ISSUES  
 (Reminder, no community should allow any type of flood-proofing of residential basements unless the community has received a "BASEMENT EXCEPTION" from the Federal Emergency Management Agency.)  
 a. Type of flood proofing proposed:  FP-1,  FP-2,  FP-3,  FP-4  
 b. Name and registration number of engineer or architect who designed and will certify the floodproofing measures.  
 Name: \_\_\_\_\_  
 Reg. No. \_\_\_\_\_  
 c. Does the proposed floodproofing provide protection to the RFPE?  yes,  no \*

\*NOTE: If answer is "no", project is likely in violation of local, state and federal regulations.

7. Proposed structure setback from OHWL: \_\_\_\_\_  
 8. Boathouse concerns:  
 a. Will any of the structure be used for habitation?  yes,  no  
 b. Are decks, heating, plumbing, or similar amenities proposed?  yes,  no  
 c. Will the boathouse obstruct the view of adjoining property owners?  yes,  no

9. Sewage Treatment Concerns  
 a. Soil types:  clay,  loam,  sand,  gravel  
 b. Depth to mottled soil, bedrock or impermeable soil type: \_\_\_\_\_  
 c. Depth to highest known ground water level in feet: \_\_\_\_\_  
 d. Percolation rate (min. per inch): \_\_\_\_\_  
 e. Drainfield setback from OHWL: \_\_\_\_\_  
 f. Tank setback from OHWL: \_\_\_\_\_  
 g. Is site subject to flooding?  yes,  no

**B. SHORELAND DEVELOPMENT CONCERNS / ISSUES**

1. Name of public water: \_\_\_\_\_  
 2. Lake Classification:  GD,  RD,  NE,  Wild & Scenic  
 Other: \_\_\_\_\_  
 3. Ordinary High Water Level: \_\_\_\_\_  
 which is in  Assumed Datum,  Sea Level  
 This elevation was determined:  
 at a public hearing,  by court order,  
 preliminary determination by DNR  
 by Order of the Commissioner of Natural Resources  
 4. Highest Known water level: \_\_\_\_\_  
 5. Required setback from OHWL in feet: \_\_\_\_\_  
 6. Proposed lowest floor elevation: \_\_\_\_\_

**C. SUBDIVISION REVIEW ISSUES**

**NOTE: Any "NO" answer to the following questions may indicate a problem relative to approving the subject plat as it is currently proposed! Consultation with your DNR Area Hydrologist is recommended in such cases.**

1. Flood Plain District Concerns  
 a. Check which districts apply:  Flood Fringe  Floodway,  General Flood Plain \*  
 b. Are these districts shown on preliminary plat?  yes,  no

\* NOTE: If plat is affected by a General Flood Plain District, a hydraulic analysis may have to be conducted in order to delineate the Flood Fringe and Floodway and to determine the Base Flood Elevation and the RFPE.

c. Does preliminary plat specify the elevation of the Base (100 year) Flood?  yes,  no  
 d. Does each lot have sufficient \*buildable lot area which is not subject to flooding?  yes,  no  
 e. Does each lot have a site suitable for the installation of a sewage treatment system not subject to flooding?  yes,  no  
 f. Does each lot have access which meets the requirements of your ordinance?  yes,  no

2. Shoreland District Concerns  
 a. Is the location of the Ordinary High Water Level (OHWL) shown on the preliminary plat?  yes,  no  
 b. Is the highest known water level listed on the plat?  yes,  no  
 c. Are lot sizes based on land area above the OHWL?  yes,  no  
 d. Do all lots have adequate lot area, width, depth, height, so that intended development can be conducted without the need to secure a variance?  yes,  no



**APPENDIX 7E**

**THE NEED FOR LOCAL WATER LEVEL MONITORING**

**WITH**

**APPLICATION TO FLOODPLAIN AND SHORELAND MANAGEMENT**

**By: Bruce Sandstrom**

**Division of Waters  
Department of Natural Resources  
500 Lafayette Road  
St. Paul, MN 55155-4032  
(612) 297-3886**

**June, 1987**

This document was prepared with funding provided by the Federal Emergency Management Agency under the State Support Services Element of the Community Assistance Program. The purpose of the document is to provide guidance in the collection of high water data by municipal and county governments in order to enhance local floodplain and shoreland management planning and administration. The author and the Department of Natural Resources are solely responsible for the accuracy of the statements and interpretations contained in this publication.



## **The Need For Local Water Data Collection**

The primary purpose of this publication is to promote the systematic collection of high water level data by local government for floodplain management purposes. Even though floodplain management is emphasized, the water level data collected in accordance with the program described herein can be used for a variety of reasons, including but not limited to: shoreland management, sewer and water installations, local water planning, bridge design and resolution of local water use conflicts and issues.

Most communities who administer floodplain zoning do so in order to maintain their eligibility in the National Flood Insurance Program (NFIP). Unfortunately, many communities, especially counties, have large areas designated as flood prone but were never provided with detailed flood profiles to help administer their zoning ordinances. Most of such areas are designated as "Un-numbered A-Zones" and are typically zoned as "General Floodplain District" in local ordinances.

Because there are no 100-year flood elevations or other high water data available in these areas, such situations have frustrated both zoning officials and home builders alike. This is because the typical floodplain ordinance essentially requires the builder to conduct a hydraulic and hydrologic analysis to establish a proper building elevation for the site. This can be expensive and time consuming. The task is much less difficult if good documentation of previous floods is already available. Profiles of past flood events are extremely helpful in deriving reliable estimates of the 100-year flood when evaluated by people experienced in this type of analysis.

High water level records are also extremely important in the administration of shoreland management ordinances. In fact, countless homes and cabins around Minnesota lakes and streams have been spared flood damage simply because their lowest floors were required to be elevated 3 feet above the highest known water level. Unfortunately, this has not always been the case because on many lakes and streams little or no high water information is available!

High water records are useful not only to the zoning office. The county highway department, the soil & water conservation district, the civil defense director and the county surveyor all have occasion to use high water level data. Private surveyors, contractors, developers and engineers as well as state and federal agencies also regularly solicit zoning offices for high water level data.

A data collection form is provided at the end of this publication to help facilitate collection of high water data. A short discussion is provided to explain the relevance of certain data entries on the form. The form is primarily designed for gathering data at bridge crossings since this is the most practical location for collection of high water data in most situations.

## **The County's Role**

Many will ask, "why should local government be involved or even concerned with the collection of high

water data? The U.S. Geological Survey (USGS), the Corps of Engineers, the DNR and the Minnesota Department of Transportation (MnDOT) are already doing this!"

The answer is two-fold. First, these agencies all collect the data pursuant to the goals of specific programs. For example at the state level, MnDOT primarily collects high water data along the state highway network to aid in bridge design and maintenance programs. DNR primarily collects water levels on lakes for lake management purposes. Unfortunately, the DNR is only able to maintain gage sites on only about 160 out of the more than 12,000 lake basins in the state. And at many of the gage sites only sporadic water level recordings are able to be documented. Most lakes are totally lacking in documented high water levels!

At the federal level, the USGS collects streamflow data primarily at established single-location sites on selected streams mainly for water supply and technological purposes. Where USGS gages exist, valuable information is available for the gage site. Usually little information is available for flood levels upstream and downstream of the gage site, however. The Army Corps of Engineers collects data on primarily the larger rivers for a variety of programs and purposes. Consequently, because these data gathering efforts are selective in scope, little flood profile data is available on numerous small streams and tributaries. To aggravate the situation, these streams are typically the ones that are classed as "Un-numbered A-Zones" on flood insurance rate maps and thus are zoned as General Floodplain Districts.

Second, there is now strong interest (and legislative authority) for counties to develop "local water plans". As the local water planning process evolves, its going to be quite apparent in some counties that the water resource data they can obtain from state and federal agencies contains many "information gaps". In most cases these "information gaps" will go unfilled unless counties or other local units of government make an effort to gather the data themselves.

## **The Role of the Zoning Administrator**

The next question many zoning administrators will pose is "Why should the zoning office be involved? We are already under-staffed and new duties are being assigned to us each year."

This is a very real problem! Most zoning offices in Minnesota are operating on a small budget and seem to be the first to be cut back when the budget tightens.

Regardless of the local budget situation, the zoning office has a primary vested interest in maintaining a good record of high water levels within its jurisdiction. The zoning office has daily contact with the public and is usually at the forefront of all development proposals. In most communities, the zoning office is the repository for the community's flood insurance study. It follows then that the zoning office should also be a key player in any local program to collect and disseminate other high water level data. The zoning office usually has first hand knowledge of where data is lacking, local development patterns and the local comprehensive

zoning plan. Consequently, the zoning office is in the best position to establish data collection priorities.

### **Forming A Partnership at the County Level**

The actual data gathering at the local level would best be accomplished through a "partnership" between the various local agencies or departments which already exist. No one department will usually have the time or staff to do the job by itself.

An ideal "partnership" at the county level would involve the zoning office, the county highway department, the soil and water conservation district, the county surveyor and any watershed or lake improvement district which is in the county. The suggested duties would be as follows:

#### **Zoning Office:**

- 1) Serve as the primary coordinator of a local water level monitoring program.
- 2) Identify which lakes and streams have little or no high water data and establish priorities based on development potential.
- 3) Serve as the primary records keeper.
- 4) Disseminate available high water information to the public relative to their development goals in accordance with local ordinance requirements.

#### **County Highway Department:**

- 1) Provide bridge and road elevation data relative to hydraulic design of bridges.
- 2) Provide benchmark information near bridge and other data collection sites.
- 3) Provide staff to collect high water data during an actual flood event
- 4) Provide staff where possible to stake, or otherwise locate high water marks shortly after a flood.
- 5) Solicit existing bridge and high water data from MnDOT, municipalities and townships for bridges the county has no data available.

#### **Soil and Water Conservation District:**

- 1) Assist highway department in monitoring water levels during a flood and help stake actual high water marks shortly after a flood.
- 2) As time allows (such as during slack periods in winter) tie in high water marks to sea level datum.
- 3) Draft profiles of flood events for the zoning office.
- 4) Assist in the establishment of measuring points and gages at monitoring locations.

#### **County Surveyor:**

- 1) Provide benchmark information.

- 2) Establish Mean Sea Level Datum (M.S.L.D.) at bridge sites where it is lacking.

### **Watershed and Lake Improvement Districts:**

- 1) Provide the zoning office with all usable water level data which they have available.
- 2) Take a lead role in the gathering of water level data within their jurisdictional boundaries.

### **Forming a Partnership at the Municipal Level**

At the municipal level, the partnership will vary considerably due to the considerable variation in departmental structure. The idea is the same however, ... use whatever staff or organizational structure which is already available! In many cases county level departments may be available to offer staff or other assistance to a municipal program to collect high water level data, or vice versa.

Local water planning will never work unless there is a good working relationship between counties and municipalities. A water level monitoring program which involves the cooperation of counties and municipalities will further the goals of any local water planning efforts.

Fortunately, most cities have detailed floodplain data available. Therefore in most cases municipalities will not have a driving need to establish a water data collection program. The exception would be for cities which have known storm water management or other flood problems which are not delineated as flood prone areas on flood insurance rate maps. The record flooding which occurred on July 23 and 24, 1987 in the St. Paul / Minneapolis metropolitan area is a case in point. **The majority of the damage occurred outside of designated floodplains!** Many of the hardest hit areas had a history of flooding.

The federal government, through the National Flood Insurance Program, does not map urban stormwater flooding problems due to the cost and uncertainty of the task. Accordingly, these areas will be subject to a continued flood threat unless the drainage systems are improved or the localities attempt to map the flood prone areas themselves, develop flood elevations and adopt special ordinances to guide development. The point to be stressed here is that unmapped flooding problems exist all over the state.

As you read this, some will scoff, "This won't work in my community. So and so has never cooperated with my office in the past." You may be right! This concept of a partnership will not work in all situations. Department rivalries, staff/budget cut-backs, priority projects all are realities which will adversely affect a local water data collection effort. If you can't get around such obstacles, the program promoted by this document probably will not work.

This type of problem can be overcome in some situations when a department head can demonstrate to the local governing body that there is a need for such a program and can justify how it can be done at minimal cost by using existing staff wisely. Programs which are mandated by elected officials have a way of promoting

inter-departmental cooperation! When trying to gain support from elected officials it should also be stressed that there are also future economic benefits to local government when a local water level monitoring program is established. These savings are in the form of: 1) reduced potential for liability because there will a better basis for establishing proper building permit elevations, 2) less need to reduce property taxes for flooded property, 3) less damage to public roads due to better bridge design and 4) less outlays for emergency services (provided flood level data is incorporated into local water management and emergency plans).

### **The DNR's Role**

The DNR, Division of Waters is committed to assisting local units of government in establishing their own water level monitoring program. Our Area Hydrologists provide individual assistance relative to water level data issues on an almost daily basis. The division's central office regularly provides water level information and technical assistance to the public, engineering firms and public agencies. We are also usually aware of any cost-share or grant programs which are available from time to time to help promote local water management functions. Since the DNR is responsible for the proper implementation of shoreland and floodplain ordinances on a statewide basis, these services will continue to be available.

A current goal of the Division of Waters is to develop an enhanced lake and stream gaging program on a statewide basis. The envisioned program will utilize volunteer observers much like the current cooperative rain gage network the division oversees. If this project succeeds, the Division will have even greater capabilities to assist a local unit of government with the analysis of and compilation of any water level data they would collect. In summation, the DNR, Division of Waters is dedicated to providing assistance to any local water level monitoring program within its capabilities and funding levels, whether or not the expanded program succeeds.

### **The Goal Is To Collect Useful Data**

Scattered records of past high water levels are usually available for many bridge sites in a county. Unless there was a systematic approach to collecting the data, the value of such data can be limited.

The main goal of the program promoted by this publication is to collect enough data to be able to develop a **continuous profile of the peak flood level for each significant flood event which occurs.**

For instance, when you only have the high water level of the 1953 and 1965 flood at one bridge and documentation of the 1969 and 1978 flood at the next bridge downstream, the data may be of limited value for flood plain management purposes. What is desired is to document peak flood levels from the same flood event at as many locations as is possible and practical. Analysis of the resulting profile by a hydrologist, engineer or other qualified individual can lead to many reasonable conclusions for determining a safe building elevation for a site in compliance with the local flood

plain and/or shoreland zoning ordinance.

The following are some of the more important uses which can be made of data collected:

1. The slope of the water surface profile during a flood event can be reasonably approximated. This will help in calculating the peak discharge of the subject flood and can aid in extrapolating known, 100-year flood levels to upstream and downstream building sites.
2. If rainfall data and antecedent soil moisture conditions are known, an estimate of the frequency of recurrence can be made for a particular flood event.
3. More reliable estimates of the 100-year flood level for single site analyses can be achieved.
4. If the stream is ever studied by detailed study methods, the model can be calibrated (fine tuned) with respect to an actual flood profile. This will result in much more reliable estimates of the 100-year flood profile.

### **Case History - Prairie River, Itasca County**

During the spring of 1985, the Prairie River near Grand Rapids experienced significant flooding. The majority of the flood damage occurred to cabins on three lakes on the Prairie River flowage. The Flood Insurance Rate Map had the affected area designated as "Unnumbered A-Zone". In other words, no 100-year flood elevations were available to regulate future development. Concerned about this fact, Itasca County asked the DNR for assistance in developing flood elevations and high water data to help guide future development.

The most desirable option was to conduct a detailed study complete with extensive mapping, surveying and a computer model of the river. This was out of the question due to lack of funding. Since 25 miles of remote river was involved, the cost would have been in the neighborhood of \$50,000 to \$100,000 to do the job right.

The next best thing was to work together in an attempt to develop a profile of the 1985 flood and use existing data as best as possible. An interim partnership was formed between the DNR and Itasca County.

The zoning office coordinated the effort at the county level. County highway department staff collected the 1985 high water marks at all bridge locations. The County Surveyor conducted level surveys to establish benchmarks in Mean Sea Level Datum at bridge sites where only assumed datum had existed.

DNR, Division of Waters provided a survey crew to collect data on the three lakes involved. The DOW survey crew also established permanent gages on the three lakes involved in order to facilitate future data collection on the lakes. The DOW central office conducted file research to document any existing hydrology data available. Plotting, treatment and analysis of the data was done at this level. For one

stream reach of particular concern a computer simulated hydraulic model was created to estimate the 100-year flood levels at several locations. At three other locations, other means were used to estimate the 100-year flood levels.

The effort resulted in a good profile of the 1985 flood and a reasonable approximation of the 100-year profile. Granted, there probably are improvements which could be made if funding were available to refine the data. But it represents "best available data" and its reasonable to assume that any error is conservative and will result in new structures with much less flood damage potential than if this data were not available. The cost was minimal with respect to the value of the data generated and was absorbed easily by the participating agencies..

Figure 1 shows the resulting profile for a portion of the stream which was evaluated. The data will be used for zoning and planning purposes by the Itasca County Zoning Office until such time as better data may become available.

### Data Collection Form

The last page of this document is a form which can be used for collecting high water data. The front page of the form is designed to be used by people who are familiar with determining elevations by standard survey methods. Most staff of the highway department, surveyors office, and the soil and water conservation district have this capability. The data contained in the section entitled "Bridge and Culvert Structural Data", should be available from existing bridge plans or other information on file in the County Engineer's office. Figure 2 on page F-6 provides a schematic of a typical bridge showing the locations of key features affecting flow of water which are provided for on the "Water Level Data Collection Form".

Once the front page of the data form is filled out to completion and it is decided whether the water level measurements will be made from a measuring point (MP) or a gage, then most anybody with minimal training can collect and record future water level data on the reverse side of the form.

FIGURE 1

This profile showing the 1985 flood for a portion of the Prairie River in Itasca County was made possible due to the cooperative efforts of the DNR, Division of Waters, the Itasca County Zoning Office, the Itasca County Highway Department and the Itasca County Surveyor. Since the profile of floods of different magnitude generally exhibit similar slope with respect to their water surface profiles, it is reasonable to extrapolate the 100-year flood elevation from point locations on the basis of the slope of the observed flood event. By applying this assumption and knowing the 100-year flood elevation at several locations, a reasonable approximation of the 100-year profile was possible. Care must be taken to ensure that large differences in headwater to tailwater elevation at bridges do not exist. In the case of the Prairie River, this was not a great concern and was due in part from the gentle slope of its drainage basin.

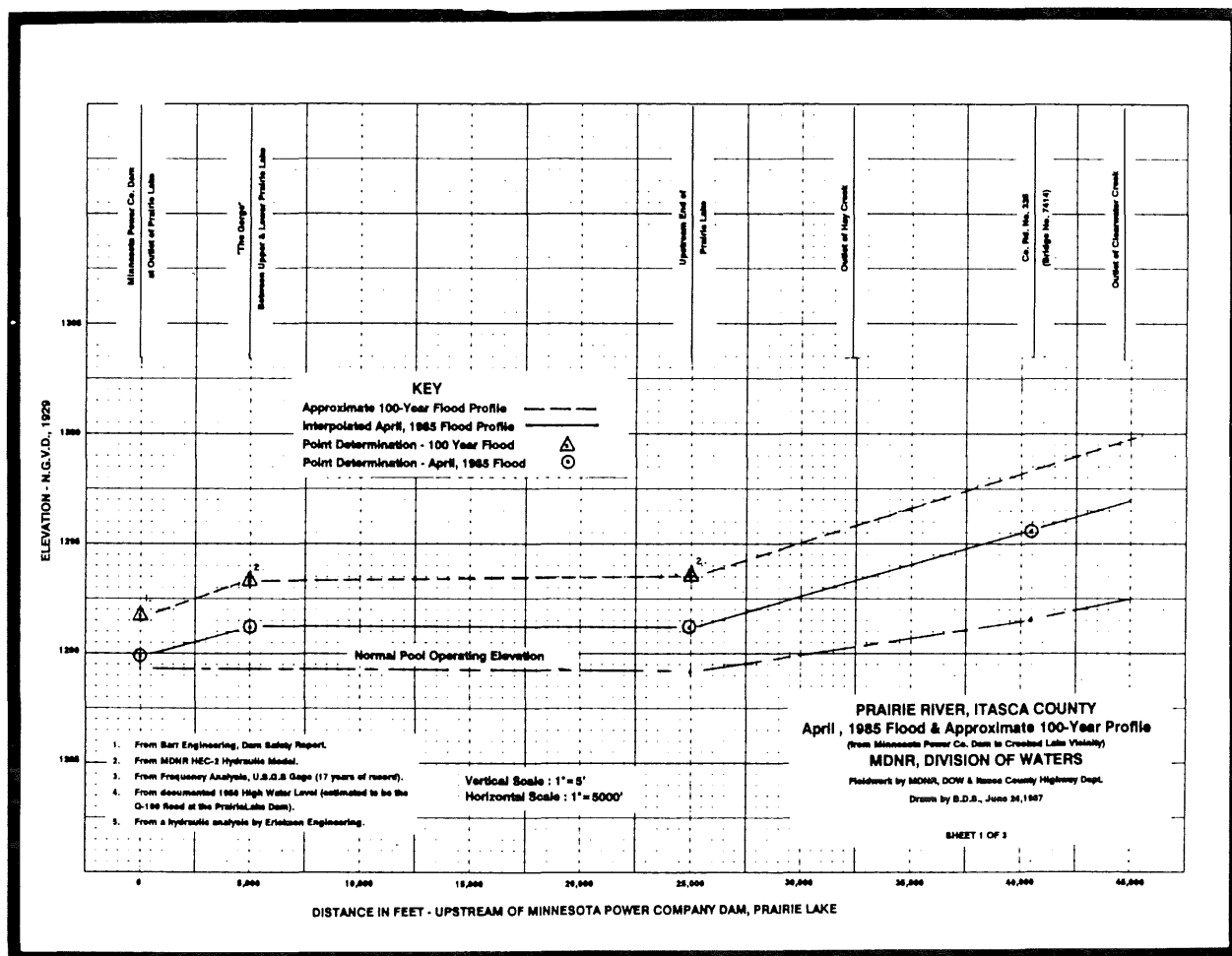


FIGURE 2

The following schematic depicts a cross section of a typical, single-span bridge crossing. Because people tend to use different terms to describe the same bridge features, the 'Key to Terms', below, provides terminology consistent with that which is requested on the enclosed 'Water Level Data Collection Form.' The features identified here are important to document to aid in any future floodplain analysis that might be conducted with respect to data collected at a bridge site.

Key To Terms

1. Road Sag / Overflow Elevation
2. Bridge Rail Top Elevation
3. Bridge Curb Elevation
4. Elevation of Top of River Bank
5. Normal Pool Elevation
6. Flowline Elevation
7. Low Steel (member) Elevation
8. Bridge Deck Elevation

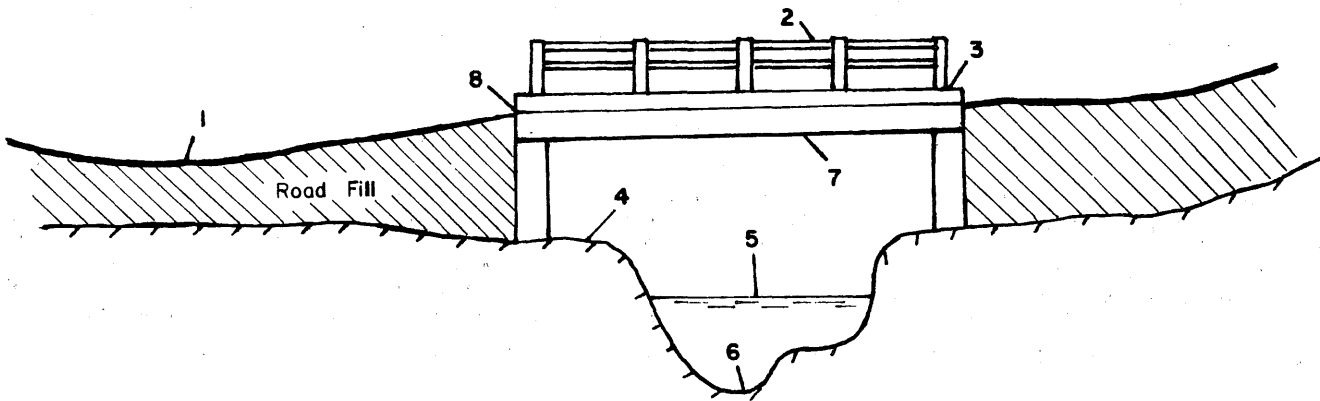
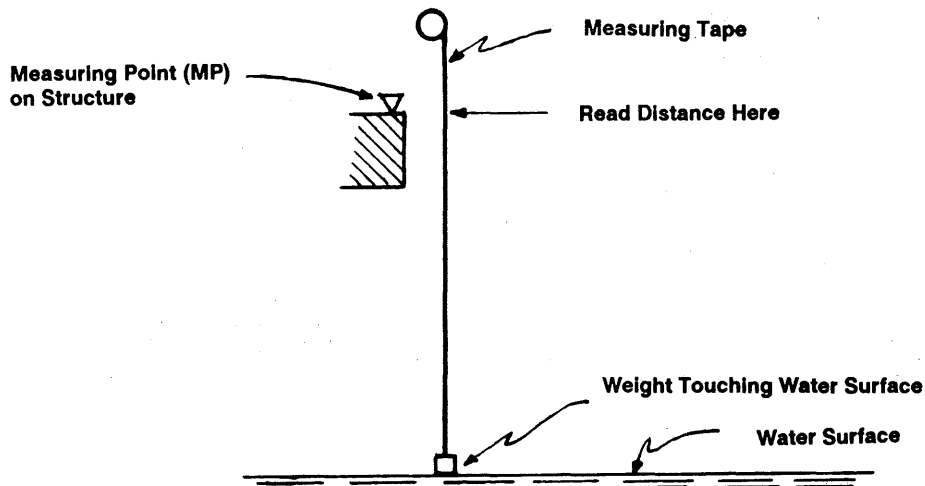


FIGURE 3  
Diagram of a Typical Measuring Point<sup>1</sup>



## Notes on Water Level Data Collection

Below are some notes to keep in mind before any water level data collection program is initiated.

### 1. Planning Effort:

Long before flooding takes place, meet with the various local government departments and agencies who you think should be involved. Decide if a program like this is workable or necessary in your county. Once this is done, decide who would be most suited to act as the coordinator of the program. Invite your DNR Area Hydrologist if possible. At this meeting, ask for general commitments for staff to accomplish the necessary tasks before, during and after a flood event. If your community is involved in local water planning, be sure individuals involved in that effort are invited.

### 2. Collect All Existing Data:

Contact all state and federal government agencies who may have water level data available for streams and lakes in your community. The Department of Natural Resources should have water level records for many lakes in your community. The U.S. Army Corps of Engineers may have unpublished flood level data available. If they do, they also may have benchmark and reference marks at bridge sites which are already tied to Mean Sea Level Datum. The U.S. Geological Survey has records on both existing and discontinued stream gage locations which may be useful. Be sure that all local departments and agencies provide all useful data that they may have. This includes watershed districts, lake improvement districts, soil and water conservation districts as well as the county highway department and municipal public works departments.

### 3. Establish Sea Level Datum:

If a benchmark in sea level datum is not available near existing bridge sites where high water data is going to be collected, ask the county surveyor or county engineer if this could be done during the off season or in conjunction with other survey work being done in the vicinity. If a profile of a flood is to be developed, it is essential that data can be readily converted to sea level datum.

### 4. Use of Measuring Points:

In most cases, the simplest means to collect data is from a measuring point (MP) established on or near all existing bridges, culverts or dams. It is a relatively simple process to establish a network of measuring points (MP's) directly on all existing bridges or dams along targeted watercourses. The MP should be established at a location where the distance to the water surface can be measured directly from the MP with a survey rod or preferably a weighted tape measure. The MP should be located at the upstream side of a bridge or dam. If it is at all possible a MP should also be established on the downstream side to measure tailwater. This is especially important at dam sites. If possible, the MP should be located so that low water measurements can also be measured directly from the

MP. If measuring points are marked with spray paint, always use the same color of paint and describe its location accurately on the water data collection form. A chiseled "X" on a concrete curb or abutment or a large spike set in a bridge timber provides an excellent MP with some permanence. As each MP is established, accurately describe the MP on the data collection form in the space provided in such manner that even a novice can understand the description. Figure 3 on page F-6 depicts a typical MP and how a measurement is made.

There are two main potential disadvantages in using measuring points.

First, water flow is constricted near bridges and dams so consequently the water velocity accelerates and the water surface is usually depressed below the actual static headwater elevation. The actual effect on the profile can be measured and compensated for by using survey equipment to determine the static water level in a non-flow area adjacent to the upstream and downstream sides of a bridge, culvert or dam. This relationship should be established for at least one flood level measurement made from the measuring point. This type of documentation is especially useful when the data is analyzed at a later date by a hydrologist or hydraulic engineer to determine flow rates and estimate the levels of floods of greater magnitude. Except where velocities are exceedingly high, this phenomenon will have little negative impact on the value of data collected from a MP.

The other main potential disadvantage is that access to the measuring point may not be possible if extreme flooding occurs.

### 5. Use of Gages:

Staff gages provide a relatively inexpensive means for direct measurement of high water elevations. Those in use by the DNR consist of enameled plate sections 3.33 feet long and numbered continuously from 0 feet to as high as 100 feet. Several of the sections can be combined by attaching them to a plank or other object thereby creating a continuous gage. Staff gages of this type are not expensive yet they are rugged, will last a long time, and permit the observer to readily read the high water elevation. A limited number of these staff gages are available occasionally from the DNR, DOW to local units of government. Also, DNR, Division of Waters regional offices have templates available which can be used to spray paint gages directly onto bridge piers, bridge abutments or wooden planks which are intended for use as gage plates.

There are some disadvantages to using a staff gage. Number one is that they are easily tampered with except when they are painted or bolted directly onto a permanent structure. If they are affixed to a post in the ground, ice, floating debris and vandalism can damage them thereby necessitating a level survey to reset the gage zero. Also, if the floodplain is wide and the range of anticipated water elevations is large, two gages may be needed to be installed at some sites to insure the water level can be documented at all flood stages. In such cases it is appropriate to have the gages set so that the same reading is achieved where the gage sections overlap. (See Figure 4 on page F-9)

## **6. The Main Goal is to Document the Peak Profile:**

The main goal of gathering water level data on a flood event is to document the peak level at as many locations as is possible. This is difficult to do especially on small streams which are subject to flash flooding when peak flooding occurs during the night. This is also a problem in instances where the gage or measuring point is inundated by the flood.

In these cases it may only be feasible to resurrect the peak flood level by determining the elevation of debris lines or silt stains on the road, trees, vegetation or other permanent objects. This type of evidence is quickly destroyed due to rainfall and vegetation growth. Therefore it is imperative that efforts to document such evidence is done shortly after the flood.

In most cases where the gage or measuring point is inaccessible due to extreme high water levels, observers should set stakes at the water's edge to mark the location of the peak level on the landscape. At a later date this level can then be tied into sea level or other datum.

## **7. Use of Local Observers:**

In many cases it will be advantageous to attempt to enlist the services of a local resident to take water level readings. Some of the best water level data which the DNR obtains from its lake gage program is through volunteer observers who live nearby. Many times local residents have a vested interest or concern about flooding and are more than willing to donate their time to take measurements.

Volunteer observers should be provided with whatever equipment is needed to measure and record the levels. They should be given an overview of the purposes of the program and the importance of any readings they take. Personalized instruction should be given as to where the MP or gage is located and how to measure and record the levels on the forms provided. Whenever rainfall is received which could result in flooding, the observer should be contacted by phone to insure he/she is available to take measurements. If he/she is not available, arrangements should be made for local agency staff to collect measurements.

Local residents can also provide valuable information on historic high water levels which occurred in the past. When such levels can be documented, be sure to document whether or not bridges and road grades have been changed which could alter the reliability and usefulness of this information for floodplain or shoreland management purposes.

## **8. Importance of Safety:**

All people who will be taking water level measurements should be instructed that safety comes first. Observers should never drive over flooded roads, use boats or otherwise enter the water to attempt to document a flood level. Consideration should be given to require observers to wear life jackets while measuring water levels from bridge or dam sites. No water level record is worth even the slightest amount of risk to observers.

When measuring levels from measuring points, use a weighted tape measure whenever possible to avoid the potential of a survey rod or other measuring device from coming in contact with overhead wires.

## **9. Frequency of Measurement:**

If a program such as the one described herein is implemented, consider yourself lucky if you are able to document the exact peak level at each location you intended to document. Generally, the more observations which can be made at each site, the more accurate will be the resulting peak elevation. At least two locations on a stream should be designated for an attempt to record levels at regularly scheduled times throughout each day. On smaller, flashy streams, an observation made every 15 minutes would be ideal. The larger the stream, the less frequent the recordings need to be. For example, on a stream which is 25 to 50 miles in length, a reading every 4 to 6 hours may be ideal.

The data generated from a continuous series of timed observations can be helpful in documenting the warning time available from the time of heavy rain or quick snow melt. This type of information is useful for planning evacuations, setting up flood warning systems and making decisions on variances and conditional use permits.

## **10. Expansion of A High Water Data Program:**

If a community is successful in setting up a program for gathering high water data, it would be easy to convert the program to an "all purpose" or "all season" water level monitoring program. A monitoring program to document all ranges of flows can be especially useful for those communities who are involved in local water planning. Such data is useful in the decision making process on a variety of issues, including; ditch and drainage controversies, irrigation, lake management, dam operation, boating and fish and wildlife management. Many watershed districts, lake improvement districts as well as some county zoning offices are already benefitting from such programs and are effectively using the data in management decisions.

The frequency of monitoring will vary according to the goals of such a project and existing data availability.

### **Primary Agencies to Contact For Existing Water Level Data**

If your community is considering the development of an organized program to collect water level data, attempt to contact all agencies which may have data available. Your Division of Waters Area Hydrologist should be one of your initial contacts. He/she will be able to provide any data that he/she may have personally collected, give advice on which individuals to contact and provide insight on the availability of any grants or cost share assistance which may be available through the DNR.

The following is a list of addresses and phone numbers of the DOW regional offices as well as the main office of various state and federal agencies who

are involved in water data collection in Minnesota. Besides water level data, these agencies may also have additional publications available which treat the topic in greater depth than this document does. Many of these agencies have field offices near your community and it is recommended that you first attempt to contact their local field staff if at all possible.

DNR, Division of Waters,  
Surface Water & Hydrographics Section  
500 Lafayette Road  
St. Paul, MN 55155-4032  
(612) 296-4800

Minnesota Department of Transportation  
Technical Services Division  
Design Services Section - Hydraulics  
Transportation Building  
St. Paul, MN 55155  
(612) 296-0824

U. S. Geological Survey  
2280 Woodale Dr.  
Mounds View, MN 55113  
(612) 783-3100

U.S. Army Corps of Engineers  
ED-GH Branch  
180 E. Kellogg Blvd., Room 421  
St. Paul, MN 55101  
(612) 220-0200

Soil Conservation Service  
375 North Robert Street, Suite 600  
St. Paul, MN 55101  
(612) 290-3675

National Weather Service  
River Forecast Center  
6301 34th Street  
Mpls., MN 55450  
(612) 725-3090

**DNR, Division of Waters Regional Offices :**

**Region 1**  
2115 Birchmont Road NE  
Bemidji, MN 56601  
(218) 755-3973

**Region 2**  
1201 East Highway 2  
Grand Rapids, MN 55744  
(218) 327-4416

**Region 3**  
1601 Minnesota Drive  
Brainerd, MN 56401  
(218) 828-2605

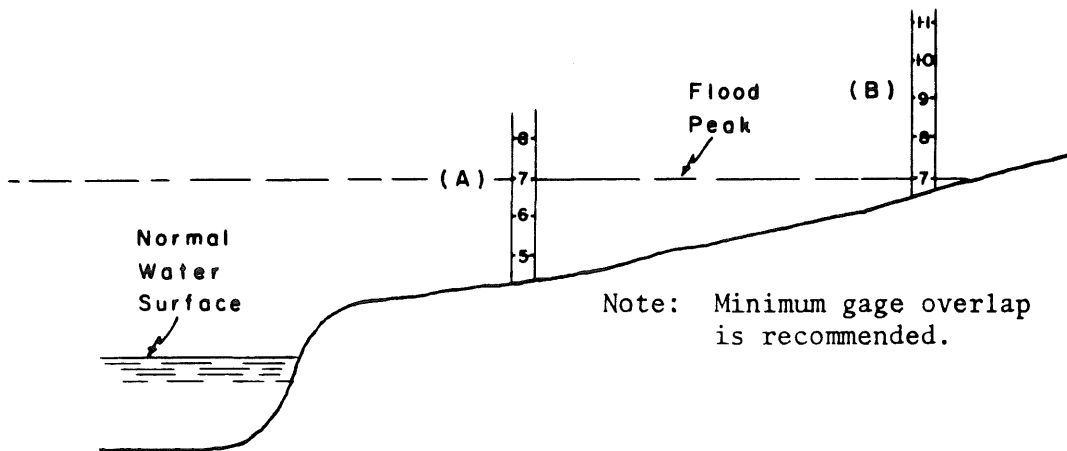
**Region 4**  
Box 756  
Highway 15 South  
New Ulm, MN 56073  
(507) 359-6053

**Region 5**  
P.O. Box 6247  
Rochester, MN 55903  
(507) 285-7430

**Region 6**  
1200 Warner Road  
St. Paul, MN 55106  
(612) 772-7910

**FIGURE 4**

A two-section gage may have to be placed in wide, gently sloping floodplains to assure accessibility during high flood stages. The section nearest the stream (A) would be used to measure intermediate flood stages. The other section, (B), is used to measure higher stages. In a two-section gage, common graduations should be set at the same elevation whenever possible to avoid different gage readings at the flood peak. It is preferred that each gage section be tied together by leveling to a common datum. (From Technical Report 3, MDNR, Division of Waters, March, 1971)







# WATER LEVEL DATA COLLECTION FORM

## SECTION A - LOCATION OF DATA SITE

1. Lake / Stream Name: \_\_\_\_\_  
Lake / Stream I.D. # : \_\_\_\_\_
2. Legal Description: Sec. \_\_\_\_\_, Twp. \_\_\_\_\_, Rge. \_\_\_\_\_,  
Qtr./Qtr. or Gov. Lot \_\_\_\_\_, County of \_\_\_\_\_
3.  County Rd;  C.S.A.H.;  Twp Rd;  State Hwy  
Road No. \_\_\_\_\_ Bridge No. \_\_\_\_\_
4.  Private Road (\*):  
Fire No. / Address \_\_\_\_\_
5.  Other Location (\*):  
Fire No. / Address: \_\_\_\_\_

## SECTION B - SKETCH PLAN OF DATA SITE

(draw sketch of data collection site and show the location of measuring point(s), gage(s), bridge configuration, direction of flow, north arrow, etc.)

\* NOTE: At locations other than public roads, describe the location in further detail in the following space provided. Indicate the name of the landowner, phone number, mailing address and the distance upstream or downstream from a nearby bridge site.

\_\_\_\_\_

\_\_\_\_\_

## SECTION C - BENCHMARK / ELEVATION CONTROL INFORMATION

1. On-Site Benchmark: All elevations contained herein are based on the following described on-site benchmark. This on-site benchmark is in the following datum:  M.S.L.D., 1929;  M.S.L.D., 1912;  assumed datum;  Other Datum (specify): \_\_\_\_\_  
On-site BM description: \_\_\_\_\_  
\_\_\_\_\_ . BM = elevation \_\_\_\_\_
2. This on-site BM is considered to be  temporary;  permanent and was established by \_\_\_\_\_  
(Name of person or agency who set BM)
3. The control for this benchmark is based on the following published benchmark (insert BM I.D. # and elev.): \_\_\_\_\_
4. All water level recordings contained on the reverse of this form have been made from a  measuring point (MP);  staff gage which is described as follows: (describe the location of the MP or gage below and specify elevation in section 5. If more than one MP or gage is established at this site, describe others in the "NOTES" section on the reverse side of this form.)
5.  MP;  Gage is described as: \_\_\_\_\_  
\_\_\_\_\_ ; MP elevation = \_\_\_\_\_ Gage 0.<sup>00</sup> = \_\_\_\_\_

## SECTION D - WATER LEVEL & HYDRAULIC DATA

- |  | Elevation | Date  |
|--|-----------|-------|
| 1. Normal Pool/ Flow Elevation:  | _____ -   | _____ |
| 2. Lowest Water Level:   | _____ -   | _____ |
| 3. Highest Observed Level:   | _____ -   | _____ |
| 4. Other High Water Levels   | _____ -   | _____ |
|  | _____ -   | _____ |
|  | _____ -   | _____ |
| 5. Flowline (streambed) Elevation:   | _____ -   | _____ |
| 6. Design (Q-50) Elevation:  | _____ -   | _____ |
| 7. Q-100 Elevation:  | _____ -   | _____ |
| 8. Elevation of River Bank:  | _____ -   | _____ |
| 9. Does site have history of blocking by debris? <input type="checkbox"/> yes; <input type="checkbox"/> no |           |       |

## SECTION E - BRIDGE AND CULVERT DATA

1. Waterway Opening (ft<sup>2</sup>): \_\_\_\_\_
2. Number of Spans: \_\_\_\_\_
3. Low Steel (member) Elevation: \_\_\_\_\_
4. Bridge Deck Elevation: \_\_\_\_\_
5. Bridge Curb Elevation: \_\_\_\_\_
6. Bridge Rail Top Elevation: \_\_\_\_\_
7. Road Sag / Overflow Elevation: \_\_\_\_\_
8. Year Built : \_\_\_\_\_
9. Culvert Descriptions (type, number, sizes):  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

USE REVERSE SIDE FOR NOTES AND WATER LEVEL MEASUREMENTS

MDNR,DOW - AUGUST,1987



APPENDIX 7F



FEDERAL EMERGENCY MANAGEMENT AGENCY

NATIONAL FLOOD INSURANCE PROGRAM

ELEVATION CERTIFICATE

AND

INSTRUCTIONS

## **PAPERWORK BURDEN DISCLOSURE NOTICE**

**GENERAL** - This information is provided pursuant to Public Law 96-511, (The Paperwork Reduction Act of 1980, as amended), dated December 11, 1980, to allow the public to participate more fully and meaningfully in the Federal paperwork review process.

**AUTHORITY** - Public Law 96-511, amended; 44 U.S.C. 3507; and 5 CFR 1320

**DISCLOSURE OF BURDEN** - Public reporting burden for the collection of information entitled "Post-Construction Elevation Certificate/Floodproofing Certificate" (FEMA Form 81-31 and 81-65) is estimated to average 12 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the forms. Send comments regarding the burden estimate or any aspect of the collection, including suggestions for reducing the burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W. 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0077), Washington, D.C. 20503.



**SECTION E CERTIFICATION**

This certification is to be signed by a land surveyor, engineer, or architect who is authorized by state or local law to certify elevation information when the elevation information for Zones A1–A30, AE, AH, A (with BFE), V1–V30, VE, and V (with BFE) is required. Community officials who are authorized by local law or ordinance to provide floodplain management information, may also sign the certification. In the case of Zones AO and A (without a FEMA or community issued BFE), a building official, a property owner, or an owner’s representative may also sign the certification.

Reference level diagrams 6, 7 and 8 - Distinguishing Features–If the certifier is unable to certify to breakaway/non-breakaway wall, enclosure size, location of servicing equipment, area use, wall openings, or unfinished area Feature(s), then list the Feature(s) not included in the certification under Comments below. The diagram number, Section C, Item 1, must still be entered.

*I certify that the information in Sections B and C on this certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.*

CERTIFIER'S NAME	LICENSE NUMBER (or Affix Seal)		
TITLE	COMPANY NAME		
ADDRESS	CITY	STATE	ZIP
SIGNATURE	DATE	PHONE	

**Copies should be made of this Certificate for: 1) community official, 2) insurance agent/company, and 3) building owner.**

**COMMENTS:** \_\_\_\_\_

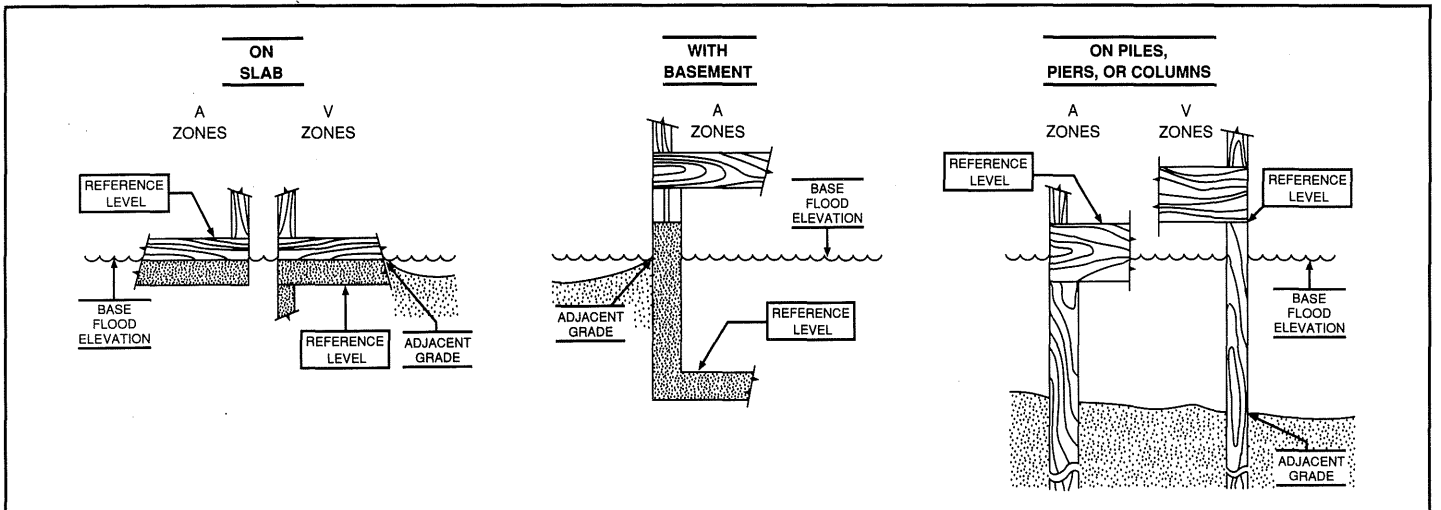
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



The diagrams above illustrate the points at which the elevations should be measured in A Zones and V Zones. Elevations for all A Zones should be measured at the top of the reference level floor. Elevations for all V Zones should be measured at the bottom of the lowest horizontal structural member.

# THE NATIONAL FLOOD INSURANCE PROGRAM ELEVATION CERTIFICATE

## PURPOSE OF THE ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP).

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt a floodplain management ordinance containing certain minimum requirements intended to reduce future flood losses. One such requirement is that the community "obtain the elevation of the lowest floor (including basement) of all new and substantially improved structures, and maintain a record of all such information." The Elevation Certificate is one way for a community to comply with this requirement.

The Elevation Certificate is also required to properly rate post-FIRM structures, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), for flood insurance in FIRM Zones A1-A30, AE, AO, AH, A (with Base Flood Elevations [BFE's]), V1-V30, VE, and V (with BFE's). In addition, the Elevation Certificate is also needed for pre-FIRM structures being rated under post-FIRM flood insurance rules.

Use of this certificate does not in any way alter the flood insurance purchase requirement. The Elevation Certificate is only used to provide information necessary to ensure compliance with applicable community floodplain management ordinances, to determine the proper flood insurance premium rate, and/or to support a request for a Letter of Map Amendment or Revision (LOMA or LOMR). Only a LOMA or LOMR from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal requirement for a lending institution to require the purchase of flood insurance. Note that the lending institution may still require flood insurance.

This certificate is only used to certify the elevation of the reference level of a building. If a non-residential building is being floodproofed, then a Floodproofing Certificate must be completed in addition to certifying the building's elevation. Floodproofing of a residential building does not alter a community's floodplain management elevation requirements or affect the insurance rating unless the community has been issued an exception by FEMA to allow floodproofed residential basements.

## INSTRUCTIONS FOR COMPLETING THE ELEVATION CERTIFICATE

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by state or local law to certify elevation information when the elevation information for Zones A1-A30, AE, AH, A (with BFE's), V1-V30, VE, and V (with BFE's) is required. Community officials who are authorized by local law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE's), a building official, a property owner, or an owner's representative may also provide the information on this certification.

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### SECTION A Property Information

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The Elevation Certificate identifies the building, its owner and its location. Provide the building owner's name(s), the building's complete street address, and lot and block number. If the property address is a rural route or PO box number, provide a legal description or an abbreviated location description based on distance from a reference point.

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### SECTION B Flood Insurance Rate Map Information

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In order to properly complete the Elevation Certificate, it is necessary to locate the building on the appropriate FIRM, and record the appropriate information. To obtain a FIRM, contact the community or call 1-800-333-1363.

The Elevation Certificate may be completed based on either the FIRM in effect at the time of the certification or the FIRM in effect when construction of the building was started.

**Items 1 - 6.** Using the FIRM Index and the appropriate FIRM panel for the community, record the community number, panel (or page) number, suffix, and Index date. From the appropriate FIRM panel, locate the property and record the zone and the BFE (or flood depth number) at the building site. BFE's are shown on a FIRM for Zones A1-A30, AE, AH, V1-V30, and VE; flood depth numbers are shown for Zone AO.

**Item 7.** Record the vertical datum system to which the elevations on the applicable FIRM are referenced. The datum is specified in the upper right corner of the title block of the FIRM.

**Item 8.** In A or V Zones where BFE's are not provided on the FIRM, the community may have established BFE's based on data from other sources. For subdivisions and other development greater than 50 lots or 5 acres, establishment of BFE's is required by community floodplain management ordinance. When this is the case, complete this item.



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## SECTION C Building Elevation Information

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**Item 1.** The Elevation Certificate uses a building's reference level as the point for measuring its elevation. Pages 5 and 6 of this Elevation Certificate package contain a series of eight diagrams of various building types that are to be used to help determine the reference level. Choose the diagram that best represents this building, record the diagram number, and use the indicated reference level to measure the elevation as requested in Items 2a-d.

**Item 2.** Depending on the property location's FIRM Zone, complete Item 2a, 2b, 2c, or 2d. Use the reference level shown in the appropriate building diagram as the point of measurement. As shown in the diagram on the back of the Certificate, for all A Zones, the elevation should be measured at the top of the reference level floor. For all V Zones, the elevation should be measured at the bottom of the lowest horizontal structural member of the reference level floor. Reporting of elevations in Items 2a and 2b should be to the nearest tenth of a foot, or alternatively, unless prohibited by state or local ordinance, the reference level elevation may be "rounded down" to the nearest whole foot ("**rounding up**" is prohibited).

**Item 2(a).** For structures located in FIRM Zones A1-A30, AE, AH, and A (with BFE's), record the elevation (to the nearest tenth of a foot) of the top of the floor identified as the reference level in the applicable diagram.

**Item 2(b).** For structures located in FIRM Zones V1-V30, VE, and V (with BFE's), record the elevation (to the nearest tenth of a foot) of the bottom of the lowest horizontal structural member of the floor identified as the reference level in the applicable diagram.

**Item 2(c).** For structures located in FIRM Zone A (without BFE's), record the height (to the nearest tenth of a foot) of the top of the floor indicated as the reference level (from the applicable diagram) above or below the highest adjacent grade immediately next to the building.

**Item 2(d).** For structures located in FIRM Zone AO, the FIRM will show the base flood depth. For locations in FIRM Zone AO record the height (to the nearest tenth of a foot) of the top of the floor identified as the reference level (from the applicable diagram) above or below the highest adjacent grade immediately next to the building. For post-FIRM buildings, the community's floodplain management ordinance requires that this value equal or exceed the base flood depth provided on the FIRM. For those few communities where this base flood depth is not available, the community will need to determine if the lowest floor is elevated in accordance with their floodplain management ordinance.

**Item 3.** Record the vertical datum system used in identifying the reference level elevations for all buildings. If the datum used in measuring the elevations is different than that used on the FIRM, then convert the elevations in Items 2a-d to the datum used on the FIRM, and show the conversion equation under the Comments section on Page 2.

**Item 4.** Indicate if the elevation reference mark used appears on the FIRM. Reference marks other than those shown on the FIRM may be used for elevation determinations. In areas experiencing ground subsidence, the most recently adjusted reference mark elevations must be used for reference level elevation determinations.

**Item 5.** Indicate if the reference level used in making the elevation measurement is based on actual construction or construction drawings. Construction drawings should only be used if the building does not yet have the reference level floor in place, in which case the Elevation Certificate will only be valid for the building during the course of construction. A post-construction Elevation Certificate will be needed once construction is complete.

**Item 6.** Record the elevation measurement of the lowest grade adjacent to the building (to the nearest tenth of a foot). Adjacent grade is defined as the elevation of the ground, sidewalk, patio, deck support, or basement entryway immediately next to the structure. This measurement should be to the nearest tenth of a foot if this Certificate is being used to support a request for a LOMA/LOMR.

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## SECTION D Community Information

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Completion of this section may be required by the community in order to meet the minimum floodplain management requirements of the NFIP. Otherwise, completion of this section is not required.

**Item 1.** The community's floodplain management ordinance requires elevation of the building's "lowest floor" above the BFE. For the vast majority of building types, the reference level and the lowest floor will be the same. If the community determines that there is a discrepancy, record the elevation of the lowest floor.

**Item 2.** Enter date. These terms are defined by local ordinance.

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## SECTION E Certification

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Complete as indicated. The Elevation Certificate may only be signed by a land surveyor, engineer, or architect who is authorized by state or local law to certify elevation information when the elevation information for Zones A1-A30, AE, AH, A (with BFE's), V1-V30, VE, and V (with BFE's) is required. Community officials who are authorized by local law or ordinance to provide floodplain management information may also sign this certification. In the case of Zones AO and A (without BFE's), a building official, a property owner, or an owner's representative may sign this certification.

Certification is normally to the information provided in Sections B and C. If the certifier is unable to certify to the selection of reference level diagram 6, 7 or 8 (Section C, Item 1), e.g., because of difficulty in obtaining construction or building use information needed to determine the Distinguishing Feature(s), the certifier must list the Feature(s) excluded from the certification under Comments on Page 2. The diagram number used for the Reference level must still be entered in Section C, Item 1.

# INSTRUCTIONS

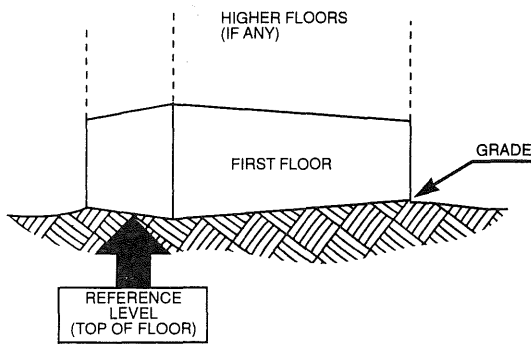
The following 8 diagrams contain descriptions of various types of buildings. Compare the features of your building with those shown in the diagrams and select the diagram most applicable. Indicate the diagram number on the Elevation Certificate (Section C, Item 1) and complete the Certificate. The reference level floor is that level of the building used for underwriting purposes.

**NOTE:** In all A Zones, the reference level is the top of the lowest floor; in V Zones the reference level is the bottom of the lowest horizontal structural member (see diagram on page 2). Agents should refer to the Flood Insurance Manual for instruction on lowest floor definition.

## DIAGRAM NUMBER 1

**ALL SINGLE AND MULTIPLE FLOOR BUILDINGS (OTHER THAN SPLIT LEVEL), INCLUDING MANUFACTURED (MOBILE) HOUSING AND HIGH RISE BUILDINGS, EITHER DETACHED OR ROW TYPE (E.G., TOWNHOUSE, ETC.); WITH OR WITHOUT ATTACHED GARAGE.**

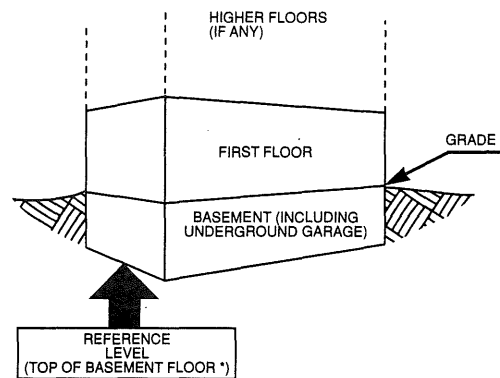
**Distinguishing Feature** - The first floor is *not* below ground level (grade) on *all* sides\*. This includes "walkout" basements, where at least one side is at or above grade. (Not illustrated)



## DIAGRAM NUMBER 2

**ALL SINGLE AND MULTIPLE FLOOR BUILDINGS (OTHER THAN SPLIT LEVEL), INCLUDING MANUFACTURED (MOBILE) HOUSING AND HIGH RISE BUILDINGS, EITHER DETACHED OR ROW TYPE (E.G., TOWNHOUSES, ETC.); WITH OR WITHOUT ATTACHED GARAGE.**

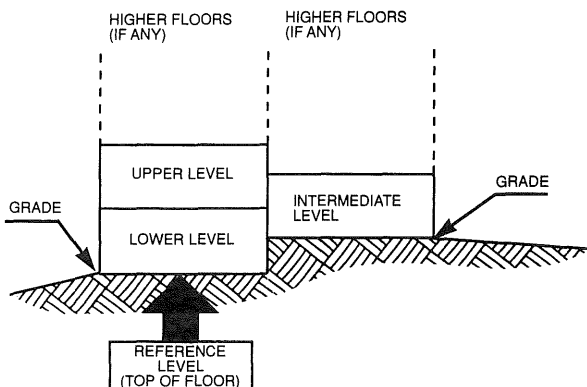
**Distinguishing Feature** - The first floor *or* basement (including an underground garage\*) is below ground level (grade) on *all* sides\*.



## DIAGRAM NUMBER 3

**ALL SPLIT LEVEL BUILDINGS, EITHER DETACHED OR ROW TYPE (E.G., TOWNHOUSES, ETC.); WITH OR WITHOUT ATTACHED GARAGE.**

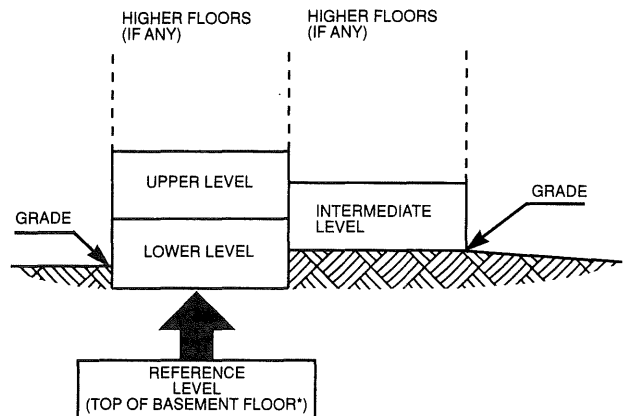
**Distinguishing Feature** - The lower level is *not* below ground level (grade) on *all* sides\*. This includes "walkout" basements, where at least one side is at or above grade.



## DIAGRAM NUMBER 4

**ALL SPLIT LEVEL BUILDINGS, EITHER DETACHED OR ROW TYPE (E.G., TOWNHOUSES, ETC.); WITH OR WITHOUT ATTACHED GARAGE.**

**Distinguishing Feature** - The lower level (*or* intermediate level) is below ground level (grade) on *all* sides\*.



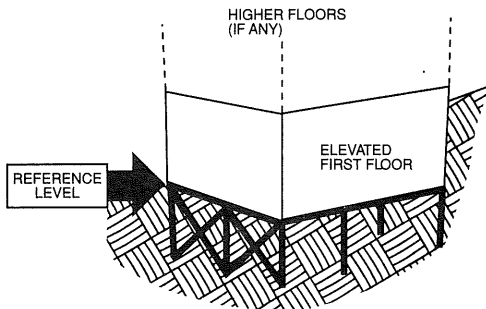
\* Under the National Flood Insurance Program's risk classification and insurance coverage, a floor that is below ground level (grade) on all sides is considered a basement even though the floor is used for living purposes, or as an office, garage, workshop, etc.

Note: In all A Zones, the reference level is the top of the lowest floor; in V Zones the reference level is the bottom of the lowest horizontal structural member (see diagram on page 2). Agents should refer to the Flood Insurance Manual for instruction on lowest floor definition.

**DIAGRAM NUMBER 5**

**ALL BUILDINGS, INCLUDING MANUFACTURED (MOBILE) HOMES ELEVATED ON PIERS, POSTS, COLUMNS, SHEAR WALLS, WITH OR WITHOUT PARKING AREA BELOW ELEVATED FLOOR.**

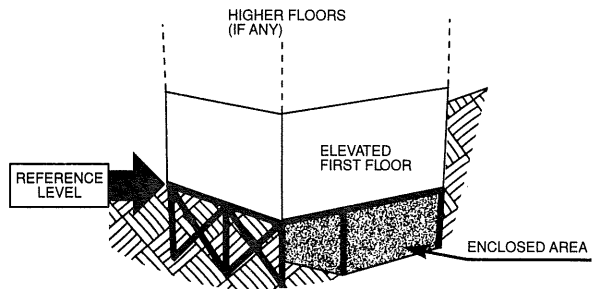
**Distinguishing Feature** - For all zones, the area below the elevated floor is open, with no obstruction to the flow of flood waters (open wood lattice work or readily removable insect screening is permissible).



**DIAGRAM NUMBER 6**

**ALL BUILDINGS, INCLUDING MANUFACTURED (MOBILE) HOMES ELEVATED ON PIERS, POSTS, COLUMNS, SHEAR WALLS, WITH OR WITHOUT PARKING AREA BELOW ELEVATED FLOOR.**

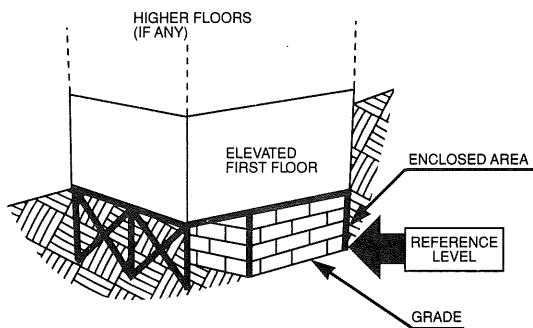
**Distinguishing Feature** - For V Zones only, the area below the elevated floor is enclosed, either partially or fully, by solid breakaway walls.\*\* When enclosed area is greater than 300 square feet or contains equipment servicing the building, use Diagram Number 7; this will result in a higher insurance rate. The enclosed area can be used for parking, building access or limited storage.



**DIAGRAM NUMBER 7**

**ALL BUILDINGS, INCLUDING MANUFACTURED (MOBILE) HOMES ELEVATED ON PIERS, POSTS, COLUMNS, SHEAR WALLS, SOLID NON-BREAKAWAY WALLS, WITH OR WITHOUT PARKING AREA BELOW ELEVATED FLOOR.**

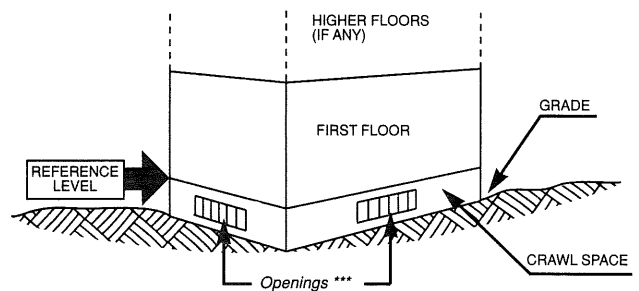
**Distinguishing Feature** - For all zones, the area below the elevated floor is enclosed, either partially or fully, by solid non-breakaway walls, or contains equipment servicing the building. For V Zones only, the area is enclosed, either partially or fully, by solid breakaway walls\*\* having an enclosed area greater than 300 square feet. For A Zones only, with an area enclosed by solid walls having proper openings,\*\*\* and used only for parking, building access, or limited storage, use Diagram Number 8 to determine the reference level.



**DIAGRAM NUMBER 8**

**ALL BUILDINGS CONSTRUCTED ABOVE AN UNFINISHED SPACE, INCLUDING CRAWL SPACE.**

**Distinguishing Feature** - For A Zones only, the area below the first floor is enclosed by solid or partial perimeter walls, is unfinished, and contains no equipment servicing the structure. The area can be used for parking, building access, or limited storage.



\* Under the National Flood Insurance Program's risk classification and insurance coverage, a floor that is below ground level (grade) on all sides is considered a basement even though the floor is used for living purposes, or as an office, garage, workshop, etc.

\*\* Solid breakaway walls are walls that are not an integral part of the structural support of a building and are intended through their design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation. An area so enclosed is not secure against forceable entry.

\*\*\* If the area below the lowest floor is fully enclosed, then a minimum of two openings are required with a total net area of at least one square inch for every square foot of area enclosed with the bottom of the openings no more than one foot above grade. Alternatively, certification may be provided by a registered professional engineer or architect that the design will allow equalization of hydrostatic flood forces on exterior walls. If neither of these criteria are met, then the reference level is the lowest grade adjacent to the structure.





# CHAPTER 8

## FLOODPROOFING

Topics to be covered:

1. Introduction
2. Concept of Floodproofing
3. Classification of Floodproofing
4. Dry vs. Wet Floodproofing
  - A. Dry Floodproofing
  - B. Wet Floodproofing
5. Classification of Floodproofed Structures
6. Limitations
7. State Building Code
8. Minimum State and Federal Floodplain Management Standards
  - A. Residential Structures
  - B. Residential Basement Construction
  - C. Commercial and Industrial Buildings
  - D. Accessory Structures
9. Data Needs
  - A. Flooding Characteristics
  - B. Building Site
10. Certification

### 1. Introduction

The purpose of this chapter is to provide guidance on administering floodproofing regulations at the local level. The effective floodproofing of new and existing buildings can play an integral part in a community's overall effort at flood damage reduction.

Floodproofed structures should not be considered as safe as structures elevated on fill since they may be subject to damage due to improper design, impact from floating debris, or from floods of a greater magnitude than the 100-year flood. In addition, these structures often have access problems during floods. For these reasons, floodproofed structures should be permitted only after a careful evaluation of the site and the proposed use of the structure.

Each community's ordinance will specify those structures which can be floodproofed, as a conditional use, and the appropriate floodproofing classification. For example, many communities allow, as an alternative to elevating on fill, new commercial and industrial buildings to be floodproofed to the FP1/FP2 classification (this classification scheme will be discussed later in this chapter).

Many Minnesota cities and counties have adopted floodproofing standards more restrictive than minimum state and federal standards. The local ordinance should be reviewed before any permit is issued authorizing floodproofing as an alternate approach to elevating a building on fill.

### ***CHECK THE SPECIFIC LANGUAGE OF YOUR ORDINANCE!***

The review of the adequacy of a floodproofing proposal must be based on a set of use and building standards. The U.S. Army Corps of Engineers' (COE) **Floodproofing Regulations** has been adopted by reference into the State Building Code (SBC). All Minnesota cities and counties administering the SBC, by default, are also administering the Corps' Floodproofing Regulations. Communities not administering the SBC must adopt, by reference, the U.S. Army Corps of Engineers' Floodproofing Regulations or similar standards in order to allow floodproofing as a conditional use.

The intent of this chapter is not to turn zoning administrators and other local officials into floodproofing experts; rather, the objective is to assist community officials in understanding the basic concepts of floodproofing so they can better administer their ordinance provisions relating to floodproofing activities.

### 2. Concept of Floodproofing

Floodproofing is a composite body of techniques and approaches for preventing flood damage to the structure and contents of buildings in flood hazard areas. Examples of floodproofing include the placement of watertight closures for windows, doors and other openings; wall reinforcement to resist lateral pressure and debris flow; elevation of a building on pilings or fill; use of membranes, paint or other substances to reduce water seepage into buildings; and the installation of check valves at sewer and utility locations to prevent entrance of flood waters.

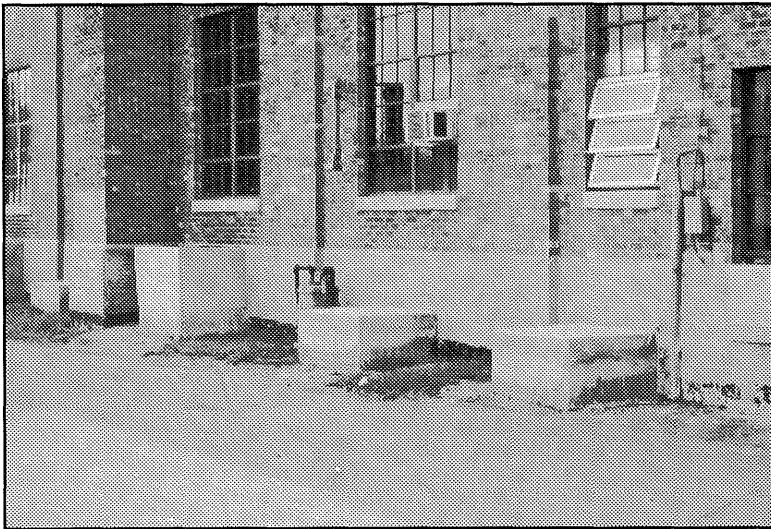


Figure 8.1 Permanent floodproofing

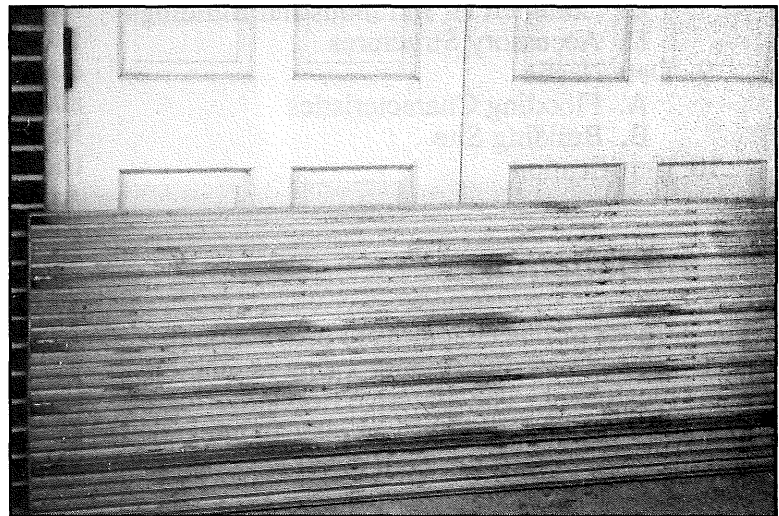


Figure 8.2 Contingent floodproofing



Figure 8.3 Emergency floodproofing

Floodproofing is the technique of building new structures in the floodplain (or modifying existing structures) in such a way that the structures are, by their design and composition, protected against floodwater and floating debris. Thus, floodproofing enables development in low-hazard areas of the floodplain normally where:

- There is only moderate flooding with low flood stages against the building, with low velocity and short duration;
- A structural flood control project is not feasible;
- Structures essential to activities dependent on riverine locations need some degree of protection; or
- A higher degree of protection than that provided by a flood control project is desired.

A decision to use a particular floodproofing method to reduce flood damages must be based on the characteristics and use of the individual structure. It is important to understand that these techniques are not a guaranteed solution, but rather their success depends on how they relate to the structural condition of a building, local soil characteristics, and the type of flooding that will occur. It should be noted that dikes or levees to protect individual or small groups of structures are not allowed as a floodproofing technique by FEMA. Flood insurance premiums for these structures could be prohibitive.

### 3. Classification of Floodproofing

The various floodproofing techniques commonly used can be categorized by two classification schemes. The first scheme identifies the amount of human action required to implement the floodproofing measures prior to a flood event. The second classification pertains to whether the interior building spaces are kept free of floodwater or whether the building is intentionally flooded to equalize water pressure.

### Human Intervention

Specific floodproofing measures are classified as permanent, contingent, or emergency. **Permanent** measures are typically incorporated into the design of new structures and do not require any advance flood warning or human intervention. Permanent floodproofing, such as elevation on pilings or columns, is always in place and reduces the element of human error. **Contingent** or partial floodproofing measures, such as prefitted window and door closures, require some type of human action to make the floodproofing measures operational at the time a flood warning is announced. Contingent measures require someone to be at the site during the flood warning and that an adequate flood warning plan exists for the community. **Emergency** floodproofing measures, such as sandbagging, are made operational during an actual flood event. Emergency measures are temporary and should be carried out according to a pre-arranged plan. Table 8.1 gives a summary of the classification of specific floodproofing measures.

## 4. Dry vs. Wet Floodproofing

Floodproofing measures are also categorized as employing either dry floodproofing or wet floodproofing techniques. **Dry** floodproofing can employ a number of techniques to prevent water from entering a building during a flood. **Wet** floodproofing techniques provide for the intentional flooding of interior spaces to offset water pressure against the walls and foundation of a building during a flood. These two methods are not applicable in all building situations; their strengths and weaknesses will be highlighted below.

### A. Dry Floodproofing

Five factors need to be accounted for when dry floodproofing is proposed for an existing or new structure:

- 1) All outside walls must be capable to resist the lateral pressures exerted by the floodwaters;
- 2) The floor must be capable to resist the upward pressure exerted by the floodwaters and saturated soil conditions;



- 3) The building must have enough mass (weight) to prevent flotation;
- 4) The walls and floors must be watertight and all openings below the flood level (if any) must be closed and made watertight; and
- 5) The building must be able to withstand the impact of floating debris.

Dry floodproofing measures must be designed by an experienced structural engineer or architect who can prepare the best design to take into account the expected flood levels, velocities, soil conditions and the particular building design. If the dry floodproofing is done incorrectly, the walls or floor may collapse during a flood, causing more damage than if the building were allowed to flood.

Dry floodproofing is generally most feasible when incorporated into the design for a new building. Certain measures can be incorporated during construction, including use of reinforced walls and floor, subsurface drainage, impermeable membrane or sealant for all surfaces below the expected flood levels and sewer backup valves. These measures are more difficult to install in existing buildings.

It can be extremely difficult to dry floodproof an existing building where the depth of flooding is greater than two feet above the lowest floor, including basement. The difficulty arises when trying to offset uplift and lateral water pressures. Reinforcing outside walls and/or use of subsurface drainage can be used with extreme care to offset the additional pressure. Elevating a building on fill or pilings is an alternate dry floodproofing technique for an existing building.

### B. Wet Floodproofing

Most of the expense and dangers involved in dry floodproofing result from the tremendous pressure exerted against a building by the unequal water levels inside and out. For an existing building, wet floodproofing is usually the easiest and cheapest method to protect against a major structural failure. Damage potential could still exist for the buildings contents and utilities.

Wet floodproofing provides for the equalization of water pressure by allowing water on the inside of the building to reach the same level as the floodwaters on the outside of the building. Obviously, the internally flooded areas should be capable of being flooded without serious damage. Items difficult to evacuate should be permanently moved to higher levels. A water-proofed floodwall should be constructed around items which are not relocated, such as a furnace or water heater. All utilities would also have to be raised above the anticipated flood levels.

Wet floodproofing severely limits the use of the interior spaces because they will be intentionally flooded. This limits the use of these areas to the storage of materials that can be easily removed during floods.

Wet floodproofing is rarely utilized in new construction. In addition to restrictions on the use of internally flooded spaces, current FEMA standards (the minimum state and federal floodproofing standards will be discussed later in this chapter) would allow wet floodproofing only through

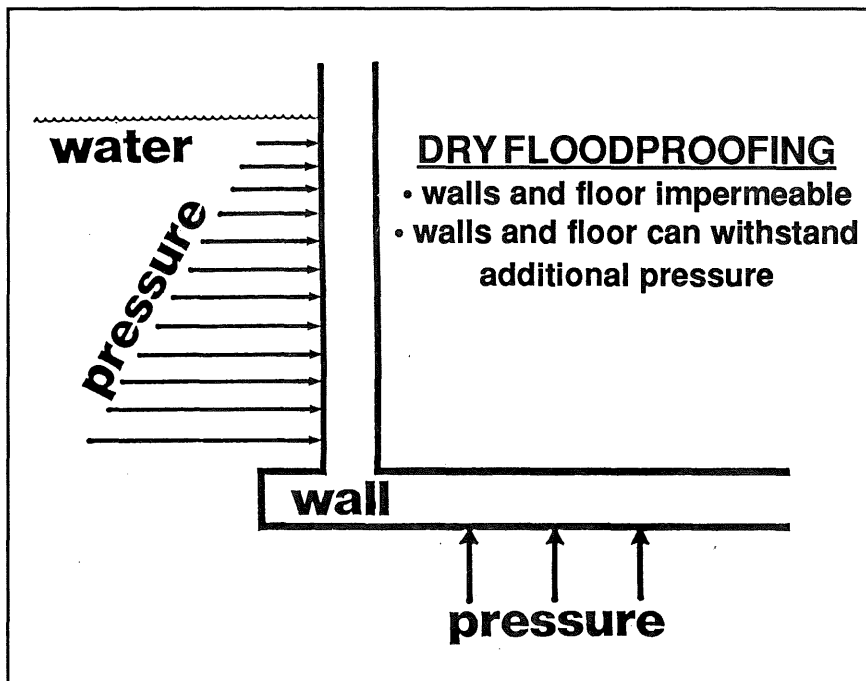


Figure 8.4 Dry floodproofing

the variance procedure. Several other more suitable flood loss reduction techniques are usually available for new construction. While wet floodproofing should rarely be permitted for new construction, it is often the only viable flood damage reduction technique for existing floodplain development.

**5. Classification of Floodproofed Structures**

In classifying floodproofed structures, the classification is based on the level of protection against the 1% chance flood (100-year) and the method of floodproofing. Figure 8.6 lists the floodproofing classification found in the State Building Code (SBC).

Briefly, the local floodplain ordinance will specify which of these floodproofing options (FP1-FP4) are allowed for various building types and uses. For example, new residential construction is normally a permitted use if elevated on fill above RFPE; floodproofing of residential structures, other than elevation on columns, pilings, etc., is usually not permitted. **Only those communities with a formal "Basement Exception" from FEMA may allow residential basements below the Regulatory Flood Protection Elevation and they must be floodproofed to the FP1 classification.** Federal standards require new or substantially improved

commercial or industrial construction to be floodproofed to the FP1 or FP2 classification.

The owner of an existing building in the floodplain may wish to alter or modify the structure to generally implement various floodproofing measures to reduce future damages. These activities are permissible and wet or dry floodproofing techniques may be implemented as appropriate for the building design and use. Caution should be exercised in those situations when the floodproofing measures, in combination with all other modifications or alterations (for example in a complete building rehabilitation) exceed 50% of the market value of the structure. These substantial improvements must meet the dry floodproofing standards for new construction identified above.

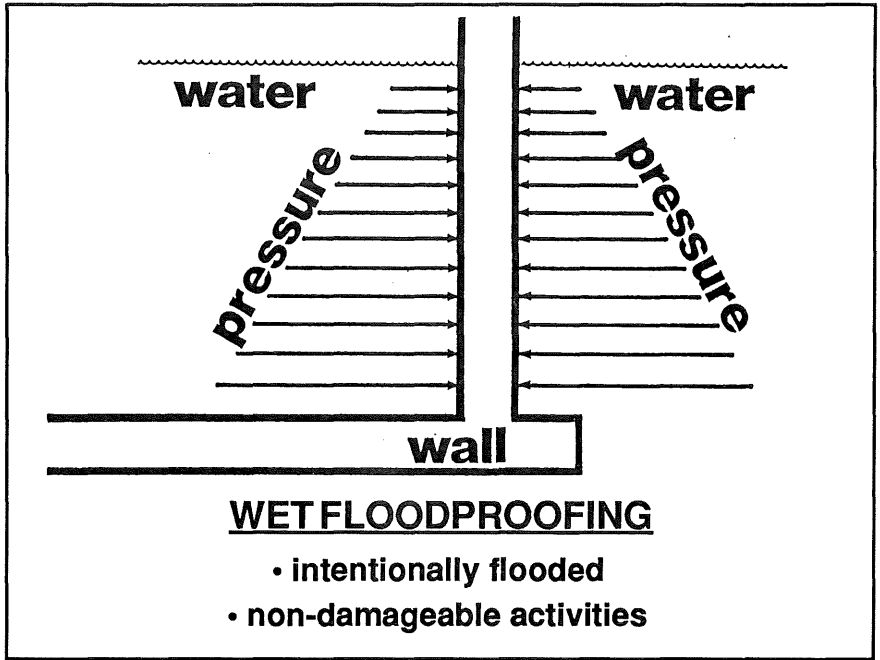


Figure 8.5 Wet floodproofing

<b>Classification of Floodproofed Structures</b>		
<u>Floodproofing Category</u>	<u>Human Intervention</u>	<u>Wet or Dry Floodproofing</u>
FP1	No	Dry
FP2	Yes	Dry
FP3	No	Wet
FP4	Yes	Wet

Figure 8.6 Floodproofing Classifications

## Example

Two basement walls of a single family residence are destroyed during a flood. The first floor of this hypothetical house is one foot below the RFPE. As part of the reconstruction, the owner decides to dry floodproof the basement by reinforcing all walls and the floor and permanently block all low openings. This action does not constitute a substantial improvement.

A building permit is required for this work. The building code official should require that the specific construction details of the floodproofing be accomplished in accordance with the Floodproofing Regulations. In addition, the building permit, in accordance with the SBC, should prohibit the use of the basement area for human habitation, such as a bedroom.

The basement should more properly be used to house the furnace, hot water heater, freezer, etc. and to store non-hazardous materials.

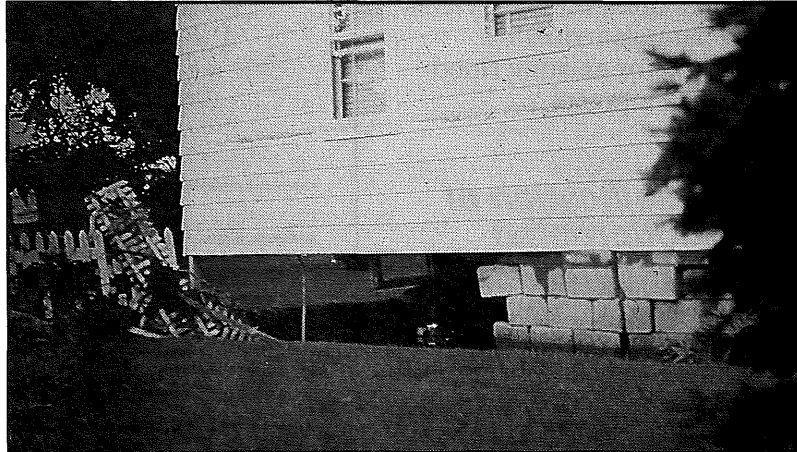


Figure 8.7 Flood-damaged basement

Even though this individual has substantially reduced the flood damage potential for his/her residence, the house remains a nonconforming structure. The first floor remains below the RFPE and the community's ordinance does not allow floodproofed residential basements as a permitted or conditional use unless the community has received a basement exception.

## 6. Limitations

Any floodplain development entails a certain element of risk. The most failsafe approach would not allow any floodplain development. This may not be a practical alternative in many, if not most, communities. The best method of protecting floodplain development is by elevating the lowest floor of the building to above the RFPE on fill material. Even this method is subject to risk due to the possibility of flood events occurring greater than a 100-year flood or flood flows increasing over time as a result of urbanization of the watershed. Floodproofing, as a means of building protection, has additional limitations which limit its effectiveness in many situations.

The engineering and construction aspects of various floodproofing techniques can become complex. For example, the consequences of

failure can be significantly higher when floodproofing an existing building than if the building were allowed to flood. Floods in excess of the design flood, inadequately reinforced walls and floors, human error and lack of sufficient warning time to implement contingency measures are examples of potential causes of structural failure.

Many floodproofing applications require some form of human intervention to implement the floodproofing methods. Someone must therefore always be available during times of potential flooding. This is especially true in rapid-rise or flash flood situations. Knowledge and experience in implementing required contingency floodproofing measures may be lost with a change of building ownership or staff turnover.

Many floodproofing measures require periodic maintenance, such as sewer backup valves, closures and sump pumps. The infrequent use of these items may suggest a low priority for

maintenance. For example, experience in portions of Minnesota where manual sewer backup valves have been installed indicate these devices require periodic use to maintain their effectiveness. Unfortunately, many were found to be rusted in the open position and could not be closed prior to an actual flood event and therefore provided no flood protection.

Floodproofed buildings should not be occupied during times of flooding due to the safety factor involved with possible failure. Additionally it is often difficult to provide emergency access to floodproofed buildings not adjacent to high ground.

Finally, it is more difficult to administer and monitor floodproofed building activity than a building which is simply elevated on fill. **The additional conditions placed on the use/building permit requires periodic inspection during construction and in the years following construction.** For example, the SBC does not allow "habitable" living areas below the RFPE. Even though a community with a basement exception may allow a residential floodproofed basement on the condition it is used for utilities and storage only, the local community has a responsibility to insure this space is not converted to an extra bedroom or recreation area. This monitoring of use restrictions of floodproofed areas is difficult, if not impossible to accomplish.

## **7. State Building Code**

The State Building Code (Minnesota Regulations Chapter 1335) by virtue of adopting the U.S. Army Corps of Engineers' "Floodproofing Regulations" requires that all new structures and their mechanical systems (electrical, plumbing, heating, ventilation, air conditioning, and fire protection) in the area subject to the code meet minimum building standards. These standards are intended to safeguard life, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, and the location and maintenance of structures and equipment. The Building Code Division of the Department of Administration develops and promulgates the State Building Code (SBC) and amendments thereto and assists the municipal building code officials in code administration. If a community does not administer the SBC, then the U.S. Army Corps

of Engineers' Floodproofing Regulations or similar standards must be adopted in the floodplain zoning ordinance if floodproofed structures are going to be allowed.

The SBC is a freestanding document from a community's floodplain zoning ordinance. Standing by itself it would allow either wet or dry floodproofing, provided the floodproofing classification (FP1-FP4) is consistent with the proposed use of the structure. Those communities enforcing the SBC that adopt floodplain regulations which allow for floodproofing of structures must meet the floodproofing standards in the SBC. We have seen that FEMA's regulations do not allow wet floodproofing of new or substantially improved non-residential structures and allow only the FP1 floodproofing of residential basements where a basement exception has been received by the community. Therefore, the zoning ordinance text must stipulate that certain wet floodproofing options allowable in the SBC are not permissible in the community. The protection of a structure or small number of structures by levees or floodwalls is also not allowed by FEMA.

## **8. Minimum State and Federal Floodplain Management Standards**

State and federal regulations have established minimum standards for permitted floodproofing activities in the designated floodplain. As earlier stated, many Minnesota cities and counties have adopted ordinances more restrictive than the minimum standards.

The discussion of minimum state and federal standards is complicated by the conflicting standards found in the state and federal regulations. Further complications have resulted from the changing policy and interpretation of these rules through the years. Finally, even though a community may legally grant a variance from these standards, the flood insurance implications may severely limit the practicality of this approach.

If after reading this section (and chapter) on floodproofing, questions still remain in regard to your particular situation, please do not hesitate to contact DNR or FEMA.

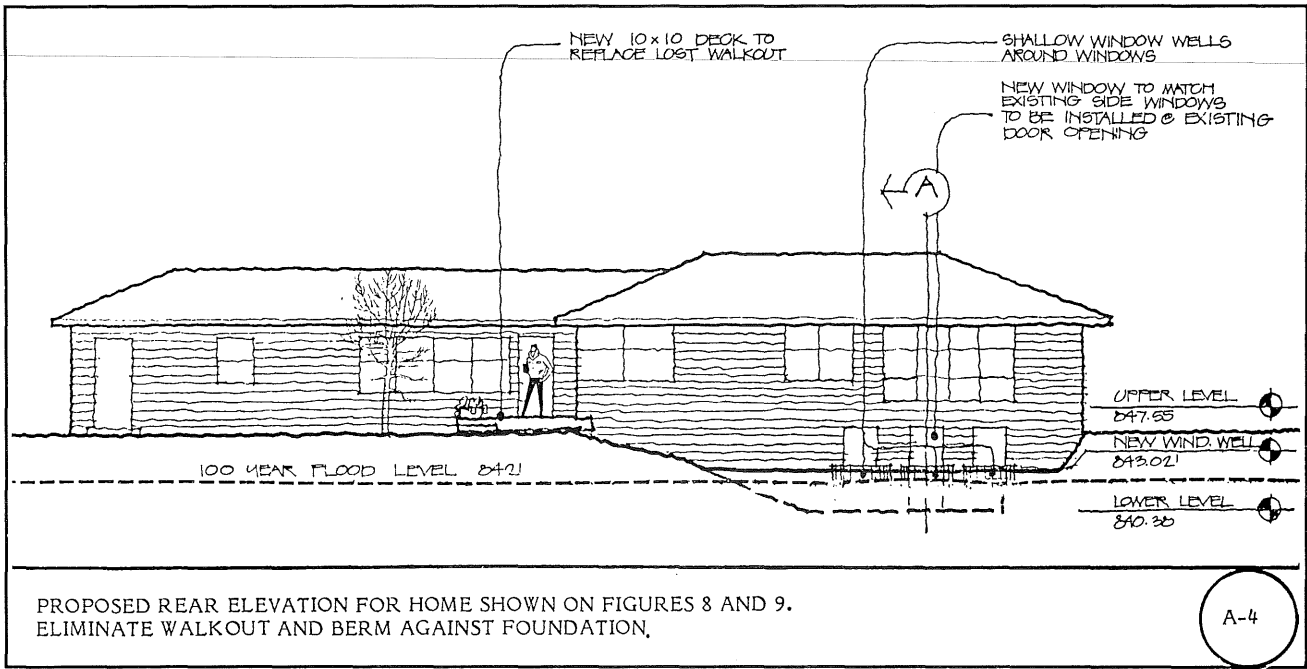


Figure 8.8 Floodproofing measures designed by a competent engineer or architect can significantly reduce the flood damage potential.

## **A. Residential Structures**

As previously stated, new residential structures elevated with their lowest floor, including basement, above the RFPE in the flood fringe district are permitted uses. Alternate methods of elevating a residence, such as pilings, parallel walls, or above grade enclosed areas which are intentionally flooded, are allowed as a conditional use.

## **B. Residential Basement Construction**

The specific wording of the current National Flood Insurance Program (NFIP) rules and regulations dated October 1, 1990 does not allow a community to permit the construction of residential floodproofed basements below the 100-year flood level. The NFIP has established a "basement exception" process where, if a community is successful in getting a basement exception, floodproofed basements are permissible and floodproofing is credited for flood insurance premium rating purposes (see Chapter 6, Regulations: Special Cases - Basement Exceptions). In the absence of a formal community basement exception, the NFIP rules require a community to grant a variance to its floodplain ordinance prior to granting a permit for a floodproofed basement.

Many Minnesota communities during the 1978-1983 period were allowed to adopt floodplain regulations which permitted "dry" floodproofed basements (FP1/FP2) in the absence of a formal basement exception via the conditional use permit review process. FEMA no longer allows residential basement construction below the RFPE in most communities. Communities that adopted floodplain ordinances which allow for residential basement construction as a conditional use are required to amend these ordinances at the earliest possible date and delete this provision until a basement exception is received.

As of 1992, only eight communities in Minnesota have been granted basement exceptions by FEMA. This allows residents of these communities to construct dry floodproofed basements FP1 below the RFPE. These basements' design and as-built condition must be certified by a registered professional engineer or architect. Properly flood-proofed basements in these communities can not be used for living space.

## **C. Commercial and Industrial Buildings**

State and federal regulations are more lenient in regard to floodproofing commercial and industrial buildings. These structures may be floodproofed to the FP-1/FP-2 classification as a conditional use. The floodproofing methods must be designed and certified by a registered professional engineer or architect.

## **D. Accessory Structures**

Accessory structures constructed in the floodplain also require flood protection. Due to the generally lower degree of flood risk, more latitude in building design and construction is generally afforded accessory structures.

There is no specific language in the Minnesota Floodplain Management Regulations restricting the use of any of the wet or dry floodproofing classifications in the SBC for accessory structures. As specified in the Sample Floodplain Ordinance developed by the DNR, accessory structures are permitted in the flood fringe district provided they are compliant with the SBC. Accessory structures to open space uses are permitted in the floodway district provided they do not adversely affect flood elevations.

General design standards for accessory structure are similar to standards for principal structures:

- Structure does not exceed 500 square feet;
- Only damage resistant materials can be used below the RFPE;
- All structures must be anchored to resist flotation;
- Storage of buoyant, flammable or other hazardous materials are normally prohibited;
- Storage of non-hazardous material and equipment is permissible if readily removable from the floodplain in the time allowed after a flood forecast;
- Human habitation is not allowed; and
- Gas, electrical and other services must be elevated or floodproofed.

**It is important to remember that copies of applications for conditional uses and variances must be provided to the DNR Area Hydrologist so that the DNR will have at least 10 days notice of the hearing on the conditional use or variance.**



## Example

A detached garage is a frequent example of an accessory structure built in the floodplain. The preferred construction technique is elevating the garage on fill to the RFPE. However, in many situations this approach is not practicable, especially in previously developed residential areas. Most local floodplain ordinances permit garage construction in the floodplain if floodproofed in accordance with the SBC.

As stated earlier, the Floodproofing Regulations grant local building code officials certain latitude in applying the regulations to actual building design and construction. This has resulted in various communities applying different design specifications for floodproofed structures. One southeast Minnesota city does not permit any portion of

a floodproofed garage below the RFPE to be constructed using wood. Instead, concrete blocks are used, as illustrated above.



Figure 8.9 Floodproofed garage

A northwestern Minnesota community allows the use of treated lumber in the construction of a floodproofed garage. In this second community, it is reasoned that treated lumber will not be damaged if submerged for short periods of time. Other provisions of the SBC, such as the secure anchoring of the building to the foundation, are enforced similarly between the two communities.

One approach is not necessarily better than the other. It is recommended that a community interpret and enforce the Floodproofing Regulations, consistently and reasonably, in a manner in which they are most comfortable.

## 9. Data Needs

By their very nature, a conditional use or variance requires special attention by the community before a permit can be issued. In order to evaluate the particular floodproofing proposal, the local governing board, i.e., board of adjustment or planning commission, will need additional information not normally required for other types of building activity. This additional information primarily includes the characteristics of the likely flood event affecting the property and the specific characteristics of the building site.

### A. Flooding Characteristics

The characteristics of the likely flood event will greatly influence which alternate floodproofing measures are appropriate, if any. The flooding characteristics which should be considered include:

- The rate of rise and fall of floodwaters;
- Amount of warning time realistically available;
- Duration of flooding;
- Occurrence of floating debris or ice; and
- Depth and velocity of floodwaters.

Along a stream which rises quickly following a heavy rainstorm and where little or no warning of impending floods is available, a floodproofing technique which requires human intervention is **not** feasible. This would be especially true for facilities which do not have personnel on-site 24 hours per day or on standby to implement the floodproofing measures.

Any floodproofing proposal requiring human intervention should have a **written** plan of action. This plan of action should include specific details concerning:

- Who is responsible for implementing the floodproofing measures;
- When the plan is put into effect;
- The amount of warning time required to fully implement the floodproofing plan;
- The specific steps to be taken, and by whom; and
- A regularly-scheduled practice drill.

Most floodproofed buildings should not be occupied during times of flooding. Depending on the effect of this "down-time" to the community, a floodproofing technique other than elevation on fill with "dry" access, may not be an appropriate proposal.

Any building **not** elevated on fill in the floodplain may be subject to damage by floating debris or ice. The distance from the building to the stream channel and the depth and velocity of floodwaters at the building site are factors involved in estimating the degree of risk. Any building with exposed walls or building supports below the 100-year flood level would have to be designed to withstand the potential impact loadings.

### **B. Building Site**

In addition to the flooding characteristics, the local community should closely evaluate the particular building site when reviewing a request for a floodproofed building. Specific items of concern include:

- Soil characteristics;
- Groundwater table, both normal and during times of flooding;
- Depth of flooding; and
- Access road

Soil characteristics are important factors in building design to account for erosion, sedimen-

tation, infiltration and seepage. One of the most important soil characteristics is permeability, a measure of the ability of water to flow through a particular soil. Permeability, to a large degree, controls the amount and rate of surface water infiltration and the zone of saturation.

Groundwater and seepage are major concerns when floodproofing is being considered. The occurrence of a high groundwater table can be a significant component of the hydrostatic forces that develop during flooding and must be considered in the structural design of footings, foundations and basement walls. Structures below the ground level must also prevent seepage into the building unless wet floodproofing is being accomplished.

The depth of flooding as compared to the proposed lowest floor elevation is also important when designing a dry floodproofed building. As the flood depths increase, so must the strength of the walls and foundation be increased. Additionally, provisions for closing any openings below the anticipated flood levels must be included in the building design.

Finally, available/proposed access to the building must be evaluated prior to the granting of a permit. Of particular concern is the ability to

## **10. Certification**

The most important consideration in reviewing a building proposal that includes floodproofing is certification of building plans. State and federal standards require that floodproofing techniques be designed by a registered architect or professional engineer. Before a building permit is issued for a floodproofed building, a registered architect or professional engineer must certify that the building plans meet the standards for the classification of floodproofing required by the ordinance. Similar certification that as-built conditions meet floodproofing standards is required before a floodproofed building can be occupied.













## CHAPTER 9

### RELATED DNR PROGRAMS

Topics to be covered:

1. Introduction
2. Shoreland Management Program
3. Wild and Scenic Rivers and Associated Programs
4. Protected Waters Permits Program
5. Interrelationships
  - A. Area of Jurisdiction
  - B. Mapping of District Boundaries
6. Shoreland/Floodplain Management
  - A. Lakes
  - B. Rivers
7. Protected Waters Permits/Floodplain Management
8. Federal Hazard Mitigation Grant Program (HMGP)
9. State Flood Damage Reduction Program (FDR)
10. Dam Safety Program

#### **1. Introduction**

The Minnesota floodplain management program is one of four significant water resource programs impacting land and water development activities administered by the DNR. It is important to understand the interrelationship of these programs to effectively administer the provisions of the floodplain management program. This chapter will review the legislative authority, goals and objectives, general provisions and interrelationships of these programs.

#### **2. Shoreland Management Program**

The Minnesota Legislature passed the Shoreland Management Act in 1969 to provide guidance for the wise development of shorelands of protected waters. This Act strives to preserve and enhance the quality of surface waters, preserve the economic and natural environmental values of shorelands and provide for the wise utilization of water and related land resources of the state. To further this purpose, the Commissioner of Natural Resources established State-wide Standards for Shoreland Management. Last revised in 1989, these standards: a) designate the minimum acceptable lot size and length of water frontage suitable for a building site;

b) regulate the placement of structures in relation to shorelines and roads; c) designate types of land uses; d) require proper construction and placement of sewage treatment systems; e) preserve natural shorelands and bluffs through the restriction of land uses; f) establish procedures for variances from the minimum standards and criteria; and h) encourage the use of Best Management Practices in controlling pollution. The Statewide Standards for Shoreland Management are found in Minn. Rules, parts 6120.2500 through 6120.3900. They represent the minimum standards that local units of government are required to adopt into their zoning ordinances for the protection of shorelands.

The definition of shoreland for purposes of these standards is as follows:

Shoreland means land located within the following distances from the ordinary high water level of protected waters:

- 1) land within 1000 feet from the ordinary high water level of a lake, pond or flowage; and
- 2) land within 300 feet of a river or stream or the landward extent of a floodplain delineated by ordinance on such a river or stream, whichever is greater.

The legislation required counties to adopt shoreland management ordinances incorporating the above-noted minimum state standards or more restrictive standards by July 1, 1972. Currently 85 counties administer shoreland ordinances; Hennepin and Ramsey Counties were excluded from the adoption requirement since both counties are virtually 100% incorporated. Municipalities were not covered in the original legislation.

In 1973, the legislature amended the Shoreland Management Act to include municipalities. In March of 1976, the Commissioner of Natural Resources promulgated Rules and Regulations relating to "Standards and Criteria for the Management of Municipal Shoreland Areas of Minnesota" (new citation: Minn. Rule 1983, parts 6120.2500 - 6120.3900). On July 3, 1989,

the rules were again revised. Cities and counties have been prioritized. Upon notification, they have two years to adopt the revised rules into their zoning ordinances. Shoreland grants are available to assist with the adoption and administration of the new rules.

### **3. Wild and Scenic Rivers and Associated Programs**

The Wild & Scenic Rivers Program and related river programs in Minnesota are an outgrowth of both legislative and congressional action (Figure 9.1).

The Lower St. Croix River National Scenic Riverway (Taylors Falls to the Mississippi River) was designated by the 92nd Congress through the Lower St. Croix River Act of 1972 (Public Law 92-560). This act resulted in a comprehensive management plan, developed cooperatively by the U.S. Department of Interior and the States of Wisconsin and Minnesota. In 1973, the Minnesota Legislature formally recognized the federal designation by stating, "The preservation of this unique scenic and recreational asset is in the public interest and will benefit the citizens of Minnesota." This legislative action directed the Commissioner of Natural Resources to promulgate rules that address permitted and nonpermitted uses of land within the riverway corridor. These rules specify minimum acreage, frontage and setback requirements on development in order to protect riverway lands (see Table 2, located in Appendix 9A). Performance criteria were also included in the rule to manage all activities in the riverway, consistent with the intent of the Act. The rules for the Lower St. Croix Riverway Minn. Rules, parts 6105.0300 - 6105.0550) were promulgated in 1976, and are currently being revised. All cities and counties within the designated riverway district were required to adopt and administer land use controls consistent with the minimum standards. The DNR must approve local ordinances, amendments, and variance decisions.

In 1973, the Legislature established the Minnesota Wild and Scenic Rivers Act in Minn. Stat. §103F.301. This act declares that certain Minnesota rivers and their shorelands possess outstanding scenic, recreational, natural, historical, and scientific values and it is in the interest of present and future generations that the state

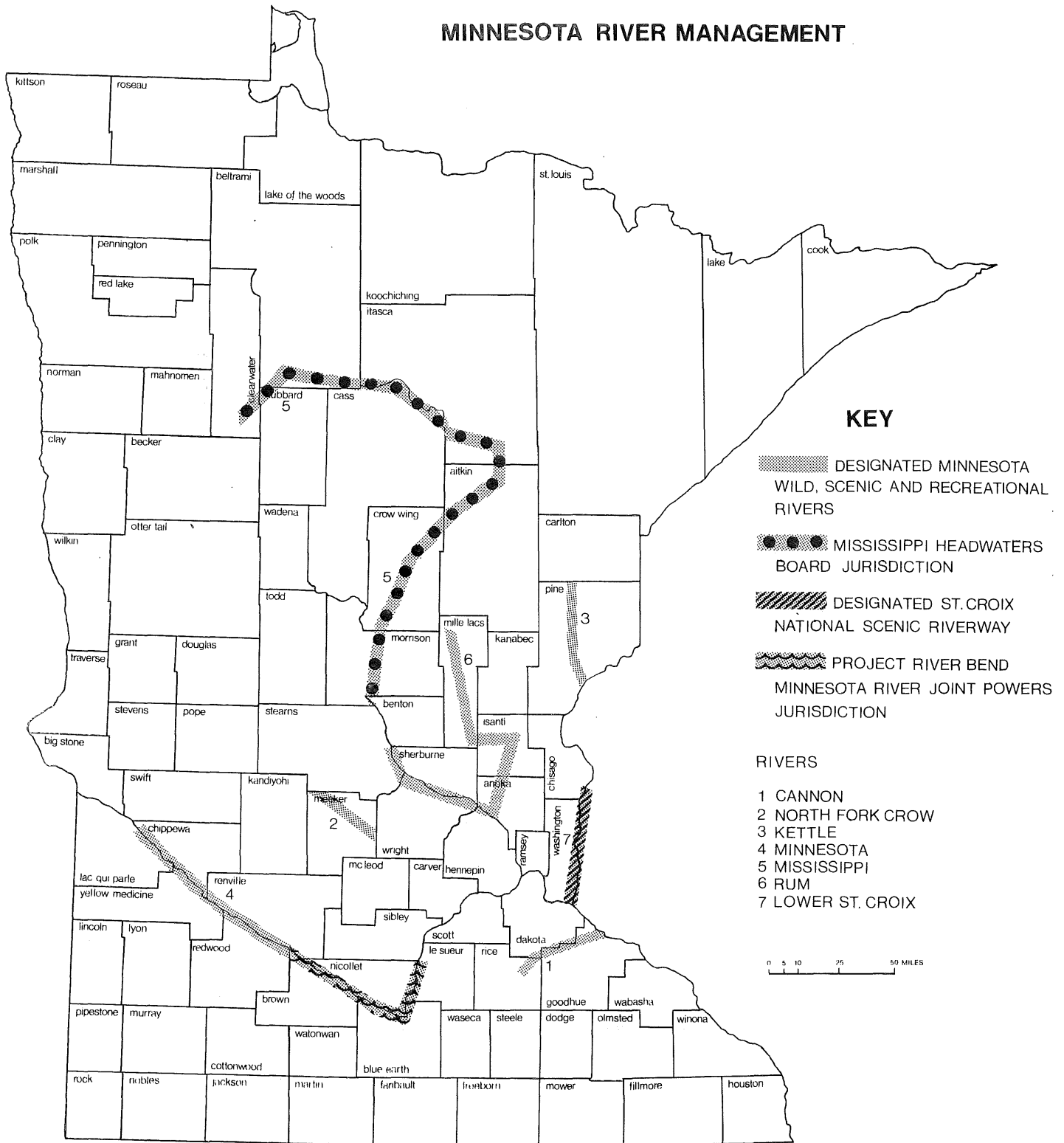
preserve and protect these rivers. To further this policy, the Commissioner of Natural Resources was authorized to promulgate rules relating to the designation and management of these rivers. Portions of a designated river may be managed under one of three classifications: wild, scenic, or recreational. These rules also specify allowable land uses, minimum dimensional standards (see Table 1, located in Appendix 9A); and standards for alterations of the natural landscape. The rules were promulgated in 1974 (Minn. Rules, parts 6105.0010 - 6105.0250). All of the Rum River, the majority of the Kettle and Cannon Rivers, portions of the North Fork of the Crow, and the Minnesota and Mississippi Rivers have been designated. Specific management plans for each designation have been prepared. Local communities within the designated river districts must adopt and administer state approved land use controls. The DNR must approve local ordinances, amendments, and variance decisions.

Similar management plans have evolved for the Mississippi River Headwaters Area, the Mississippi Critical Area in the metropolitan area, and the middle Minnesota River. These three plans have similar goals to the Wild and Scenic Rivers Act. The Critical Areas Act was passed in 1973 and the Mississippi Headwaters Board and Management Plan was formally authorized in Minn. Stat. Section 103F.361 - 103F.377 in 1981. The River Bend Management Plan was adopted by a joint powers agreement for six counties along the Minnesota River in 1982 (Minn. Stat. Section 103F.381 - 103F.393).

### **4. Protected Waters Permits Program**

M.S. § 103G.245 authorizes the Commissioner of the Department of Natural Resources to regulate activities which change the course, current or cross-section of protected waters. The earliest state effort in protected waters regulation dates back to 1937. The current rules provide for the orderly and consistent review of permit applications by the DNR in order to conserve and utilize the water resources of the state in the best interests of its people. Decisions on permit applications are also guided by the goals and objectives of programs such as shoreland, floodplain, wild and scenic rivers and water surface use management, boat and water safety, protected species management, etc.

# MINNESOTA RIVER MANAGEMENT



## KEY

-  DESIGNATED MINNESOTA WILD, SCENIC AND RECREATIONAL RIVERS
-  MISSISSIPPI HEADWATERS BOARD JURISDICTION
-  DESIGNATED ST. CROIX NATIONAL SCENIC RIVERWAY
-  PROJECT RIVER BEND MINNESOTA RIVER JOINT POWERS JURISDICTION

## RIVERS

- 1 CANNON
- 2 NORTH FORK CROW
- 3 KETTLE
- 4 MINNESOTA
- 5 MISSISSIPPI
- 6 RUM
- 7 LOWER ST. CROIX

Figure 9.1 Map of Minnesota River Management



A protected waters inventory has been completed by the DNR which maps the waters of the state which are subject to this program. Each county has a map showing protected waters and wetlands where a DNR permit must be secured prior to the alteration of the water resource. The protected waters permit program is administered primarily through the DNR Division of Waters' regional and area hydrologists.

## **5. Interrelationships**

Each of the programs described above was designed to function independently of the other programs. This is necessary to maintain the individual integrity of each program. There are, however, relationships among the programs that need to be recognized when a specific development proposal is being considered.

The floodplain, shoreland and/or scenic river ordinances adopted by local government generally contain a statement regarding compliance with more restrictive provisions of other sections of the ordinance, separate ordinances or codes. These statements insure continuity of local controls. Floodplain and shoreland ordinances can co-exist as separate ordinances or as combined provisions of a single ordinance. The same is true where Wild & Scenic Rivers management plan provisions have been adopted by ordinance.

As in most any setting where one or more set of regulations are involved, the most restrictive provisions are applicable when inconsistencies exist among the various regulations. This is true whether the discrepancy involves an allowable use, district boundaries, setback requirements or other building standards.

### **A. Area of Jurisdiction**

The greatest confusion with these programs is often in regard to the area of jurisdiction along rivers and streams and around lakes. The shoreland district boundary extends 300' back from the top of both banks of a stream or river. If a regulatory floodplain district has been established by local ordinance, the shoreland district extends to the limit of the floodplain district in those areas where the floodplain extends greater than 300 feet on either side of the channel. The shoreland district also extends 1000 feet from the shoreline of a lake. However, the shoreland district around a lake does not

extend to the limit of the floodplain where the floodplain extends greater than 1000' from a lake.

The Wild and Scenic Rivers Program designates regulatory districts up to 1320 feet back from the banks of a designated river. This designation attempts to include those areas possessing outstanding scenic recreational, natural historic or scientific values but may not exceed the 1320' distance. Unlike the shoreland district, a wild and scenic river regulatory district is not expanded when the limit of the designated floodplain is beyond that of the wild and scenic river district.

### **B. Mapping of District Boundaries**

Floodplain, shoreland and scenic rivers management ordinances are most often adopted as overlay districts to an underlying ordinance. The ordinance will adopt by reference one or more maps or other supporting documentation which establish the various overlay district(s) boundaries. However, many shoreland ordinances do not reference a map, instead, they establish the boundary district in the text of the ordinance.

It is easy to see how it may be difficult to effectively administer both a shoreland and floodplain management ordinance as well as the underlying ordinance. For any development proposal near a stream or lake, the local zoning administrator may have to review the zoning district map, the floodplain (flood insurance study) maps, the map or ordinance text designating the shoreland district and possible mapping for other regulatory programs. To further complicate matters, the various map sets will often use different bases at varying scales.

It is strongly recommended that those communities administering more than one land use regulatory program develop a single zoning map showing **all** district boundaries. The base map should ideally be of sufficient scale and detail such that district boundary determinations can be easily made.

Two mapping techniques could be used to accomplish this objective. The first involves delineating all district boundaries on a single base map. Each set of district boundaries would have to be carefully transferred from its present map to the new map. The boundaries should be adjusted to reflect the more restrictive standards of another program. For example, the shoreland

management district boundaries should be drawn to the outward extent of floodplain in those areas where the floodplain extends beyond 300' on either side of a stream or river channel.

The second mapping technique utilizes overlays to a single base map. Each overlay would contain the district boundaries for one land use program: floodplain, shoreland, underlying zoning as well as any other appropriate district boundaries or setback requirements. The review of any development proposal using a base map and overlays involves: 1) locating the site on the base map; and 2) reviewing each overlay in succession to determine applicable regulatory programs.

## 6. Shoreland/Floodplain Management

Although the overall goals of the Shoreland and Floodplain Management Programs are different, the jurisdiction and specific objectives of these programs often overlap. The relationship between these programs varies somewhat whether they are implemented on lakes or rivers.

### A. Lakes

Development proposals which are compliant with the standard provisions of a shoreland management ordinance for lakeshore properties will usually also satisfy the principle floodplain management considerations. The shoreland ordinance will require:

- 1) a building setback (50 to 200 ft.) from the ordinary highwater level; and
- 2) the lowest floor (including basement floor) of any building to be elevated to the regulatory flood protection elevation where local floodplain management controls exist; or, in absence of floodplain controls, at least three feet above the highest known water level; or, in the absence of a highest known water level, three feet above the ordinary high water elevation.

Since the areal extent of the floodplain around lakes in Minnesota is usually not extensive nor do most lakes exhibit a considerable "bounce" due to a heavy rainfall, the above provisions should, in many cases, be sufficient to insure adequate flood protection.

In addition to number 2, above, the RFPE elevation **must** be used where it exceeds the lowest floor elevation requirement of a shoreland ordinance. Unfortunately, 100-year flood elevations and, thus RFPEs, are available for very few lakes. Therefore, the floodplain management ordinance will classify low-lying land around lakes as a general floodplain district. As such, the conditional use process must be used to determine an appropriate lowest floor elevation at or above the 100-year flood level for any development proposal in a general floodplain district. At a minimum, the conditional use process should **reasonably** demonstrate that the requirements of the shoreland ordinance equal or exceed the 100-year flood level, even though the 100-year flood level may not be calculated. Historic water level measurements or "old-timers" recollections can serve as the basis for this determination (see Chapters 3 and 7 for more discussion on areas with no detailed flood information).

One concern not germane to lakes that is applicable to rivers is the designation of floodway and flood fringe districts. The conveyance of floodwaters is not a concern for lakes (except at the outlet). For floodplain management purposes, all areas landward of the OHW on lakes can usually be considered flood fringe, while all areas below the shoreline (OHW) are considered undevelopable.

One note of caution. The above discussion applies to "typical" lakes which have sufficient outlet capacity to minimize lake level fluctuations. Landlocked lakes and lakes influenced by "backwater" affects of a river can experience significant water level fluctuations. A more detailed study may be required to determine an appropriate RFPE than relying solely on the building/lowest floor requirements of a shoreland ordinance.

### B. Rivers

The consequences of flooding along rivers can be more severe than flooding around lakes. In addition, the unwise development and construction activity in the floodplain of rivers can have significant adverse impact on other property owners. For these reasons, floodplain management provisions are critical for areas along streams and rivers.

For any development proposal in a designated riverine floodplain, both an RFPE and floodway/

flood fringe districts will have to be determined. These data are available for stream reaches studied in detail in a published flood insurance study; otherwise these data must be determined through the conditional use permit process.

In many instances, especially for the larger streams and rivers, the floodway delineation will exceed the shoreland setback requirement. Conversely, the shoreland setback must be used for building setbacks where it extends landward of the floodway boundary. It must also be remembered that the shoreland district may even extend beyond the limit of the 100-year floodplain.

The shoreland and floodplain management districts are usually treated as overlay districts to the underlying ordinance. Restrictions are placed on allowable uses only in the floodway district since the floodplain ordinance would prohibit non-open space uses in the floodway even though the shoreland ordinance would not expressly prohibit residential or commercial development.

## **7. Protected Waters Permits/ Floodplain Management**

In many instances, permit applications for altering the course, current, or cross-section of rivers and lakes are an outgrowth of a proposed land use activity located primarily above the OHW of the waterbody. For this reason, applications to the Division of Waters are also sent to the local unit of government, hopefully ending up in the zoning office for review and comment as appropriate. Since the review of any permit application by the Division of Waters includes consideration of consistencies with local floodplain, shoreland and scenic rivers ordinances, input from local planning and zoning officials regarding the status of local ordinance approvals, denials and concerns is relevant. Advising developers and shoreland residents of mutual authorities and coordination among local government planning and zoning staff and DNR area hydrologists can reduce confusion by the public and increase efficiencies in managing the water and related land resources.

Certain activities require review under both the community's floodplain ordinance and the state protected waters permit program. Before a floodplain management concern is realized, the

proposed activity must be located in a designated floodplain. Certain activities requiring a DNR protected waters permit involving small wetlands or drainage ditches, and which are not mapped as floodplain, do not require review under the floodplain ordinance.

Activities requiring both a DNR protected waters permit and review under the local community's floodplain management ordinance include:

- 1) Most stream crossings, including bridges and culverts which either replace an existing crossing or constitute a new crossing. The effect of the new bridge or culvert must be analyzed to assess the impact on flood stages. If an existing crossing is replaced with a bridge or culvert having a larger or smaller waterway opening, the 100-year flood profile will usually be different. If the bridge is located in a detail studied stream reach, the flood insurance study and associated maps must be updated to reflect the revised profiles (see Chapter 10 for floodway revisions). Where a new or replacement bridge or culvert increases flood levels, the potential for increased flood damages must be assessed;
- 2) Stream channel modification, including placement of riprap or fill in the stream channel, requires approval from the DNR's permit program and from the community's floodplain management ordinance. Fill, development or other activities in or near a stream channel may adversely affect flood elevations. Fill in lakebeds or changes to the natural shoreline of lakes below the 100-year flood level do not usually impact the flooding potential but, nevertheless do require review under the community's floodplain management program unless the community has adopted shoreline regulations which address this issue; and
- 3) The construction of marinas, docks, piers, boat rental facilities and other water-front facilities require that a DNR permit be issued prior to construction. Where these facilities could result in the blockage of flowing water in rivers or at lake inlets and outlets, the community must review the proposal for compliance with their floodplain ordinance. The community must insure that any building is adequately floodproofed or elevated above the RFPE

and that obstructions do not increase flood levels.

Most other activities requiring a DNR protected waters permit do not have direct floodplain management concerns.

## **8. Federal Hazard Mitigation Grant Program (HMGP)**

Section 404 of the Stafford Act established a HMGP to fund state and local post-disaster mitigation measures.

Hazard mitigation is the identification and implementation of cost effective measures that reduce vulnerability to hazards and lessen the severity of future disasters.

The Hazard Mitigation Grant Program provides a source of funding for hazard mitigation projects that are cost effective and compliment existing post-disaster mitigation programs and activities by providing funding for beneficial mitigation measures that are not funded through other programs.

Funding is on a 50/50 federal/non-federal cost share basis. The total amount of federal funding available is 10% of the estimate of the federal share of permanent restorative work under the Public Assistance Program. The non-federal share can consist of any combination of state, local, or private funds.

## **9. State Flood Damage Reduction Program (FDR)**

### **What is the program?**

During the 1987 Legislative Session, Laws of Minnesota Chapter 306, Sections 3-5, established within the Department of Natural Resources a flood hazard mitigation program to provide state technical and financial assistance to local government units for conducting flood damage reduction studies and for planning and implementing structural and non-structural flood damage reduction measures.

### **What flood hazard mitigation measures are eligible for funding assistance?**

Financial assistance may be available for conducting flood damage reduction studies and for planning and implementing structural and non-structural measures including: dams, dikes, levees, flood bypass channels, flood storage and retardation structures, water level control structures, acquisition of floodplain lands, relocations, floodproofing, development of flood warning systems and evacuation procedures, development of flood mitigation plans, flood prone structure inventories, emergency levee evaluations, signs and other notifications of 100-year flood areas, provision of flood insurance information and public education activities.

### **What measures are not eligible for funding assistance?**

Certain measures are excluded from this program including deepening or straightening existing stream channels, cleaning out public ditches and clearing and snagging natural water-courses.

### **Who may apply for funding assistance?**

Applications for financial assistance must be made by a local government unit including a county, statutory or home rule charter city, town, watershed district or lake improvement district. Financial assistance is not available directly to individuals, companies or corporations. Communities where studies and projects are located must be in good standing with the Federal Emergency Management Agency's National Flood Insurance Program and must be meeting the State of Minnesota's minimum floodplain zoning requirements. Grants can only be made to local governments whose grant requests are part of or responsive to a comprehensive local water plan prepared under Minn. Stat. Chapters 103B or 103D.

### **How much financial assistance is available?**

The Department of Natural Resources may award grants up to \$75,000. Grants for more than \$75,000 must be submitted for consideration by the governor and the legislature before each even numbered year. Grants awarded under this program must be matched equally by the local government unit sponsors. If a proposed project requires more than \$75,000 in state

cost-sharing assistance please contact your DNR area hydrologist.

**When will the flood hazard mitigation grant funds be distributed?**

Applications for grants will generally be accepted until September 30, of odd numbered years by DNR area hydrologists. One half of the available funds will be distributed by December 31, of the odd numbered year. The other one half of the funds will be distributed by September 15, of the next even numbered year. The same applications will be used for both of these funding cycles.

**What is the contracting and billing process for a grant?**

Successful applicants will be notified and will be asked to enter into a contract with the Department of Natural Resources to complete the project described in the grant application. Billings will be accomplished by submitting paid invoices to the respective area hydrologist for approval. Once the billing is approved, the local government unit will be reimbursed for one-half of the invoice amount. If special financing arrangements are needed, contact your area hydrologist.

**How do I get more information or get assistance in making an application for a flood damage reduction grant?**

Contact the local DNR area hydrologist. The area hydrologist will be able to help evaluate flooding problems and may have ideas about how to best solve the flooding problems. The area hydrologist may also be able to suggest improvements to the application before it is submitted for the formal review process. A list of regional hydrologists, area hydrologists and their locations is located in Appendix 1B.

## **10. Dam Safety Program**

Dams can create a false sense of security for floodplain residents. Unlike levees, they do not need a condition of flooding to break. They can breach with little warning and send a wall of water downstream. The combination of high velocity, great depth, and short notice has proven particularly deadly and destructive. The best way to minimize this hazard is for dam owners to construct, operate and maintain dams safely and in accordance with the state dam safety standards.

The design, construction and operation of dams in Minnesota is regulated by state rules which became effective in 1980. The dam safety program is carried out by the Division of Waters (DOW) for the purpose of causing dams to be designed, constructed, operated and maintained in a manner which enhances public safety and welfare. Plans for construction or repair of dams are reviewed as part of the DOW permit process. Program activities also include field inspections and grants to local units of government.

Information and/or assistance regarding dam safety can be obtained from the DOW dam safety staff by calling (612) 296-4800.





**APPENDIX 9A**  
**WILD, SCENIC & RECREATIONAL RIVERS**  
**MINIMUM STANDARDS**

	Wild	Scenic	Recreational
Lot Size (acres)	6	4	2
Lot Width at Water Line and Building Line (feet)	300	250	200
Structure Setback From: (feet)			
• Ordinary High Water Level (OHWL)	200	150	100
• Designated Tributary	100	100	100
• Bluffline	40	30	20
Sewage Treatment System Setback From: (feet)			
• OHWL	150	100	75
• Designated Tributary	75	75	75

**Table 1.**

**LOWER ST. CROIX NATIONAL SCENIC RIVERWAY**  
**MINIMUM STANDARDS**

	Districts		
	Rural	Urban	
		Unsewered	Sewered
Lot Size (acres)	2 1/2	1	20,000 sq.ft.
Lot Width at Water Line and Building Line (feet)	200	150	100
Structure Setback From: (feet)			
• Ordinary High Water Level (OHWL)	200	100	100
• Bluffline	100	40	40
Sewage Treatment System Setback From: (feet)			
• OHWL	200	100	NA
• Bluffline	40	40	NA

**Table 2.**









## CHAPTER 10

### FLOODPLAIN MAP AMENDMENTS AND REVISIONS

Topics to be covered:

1. Introduction
2. Type of Map Changes
3. Data Requirements
  - A. Map Amendments
  - B. Map Revisions
  - C. Conditional Map Revisions
  - D. Floodway Revisions
4. Getting More Information

#### **1. Introduction**

Flooding conditions in a given community or watershed can change. A community's development priorities may change, new roads and bridges will be constructed, and the urbanization of rural areas will occur. New data that better defines the flood threat to a community may become available. A recently completed flood control project may significantly alter the extent of the regulatory floodplain. Finally, the original flood maps and profiles may be in error. For these and other reasons, it is expected that flood plain maps and profiles may periodically need revision or amendment.

#### **2. Type of Map Changes**

There are three basic types of floodplain map changes; map amendments, map revisions, and conditional map revisions.

A **map amendment** will exclude an individual structure and/or a legally described parcel of land that was inadvertently included in the Special Flood Hazard Area (SFHA) shown on floodplain maps. If FEMA determines that a structure or parcel has been inadvertently included in the SFHA, they will issue a Letter of Map Amendment (LOMA). A LOMA can not be issued for fill or other floodplain changes that have taken place after the initial effective date of the community's Flood Insurance Rate Map.

A **map revision** will change an effective floodplain map. A map revision may be warranted due to some physical change such as filling, or the availability of better technical data. Map revisions may change base flood elevations, floodways, and other flood risk information

contained on flood plain maps or in Flood Insurance Studies (FIS). When a map revision is warranted, FEMA will either republish the affected panel and FIS report, issue an annotated map and FIS report, or issue a Letter of Map Revision (LOMR).

If a **conditional map revision** is requested, FEMA will determine whether a proposed project, such as filling a parcel or constructing a levee, channel enlargement, or bridge, will warrant a revision to the effective floodplain map. FEMA's conditional determinations are issued in a letter, referred to as a Conditional Letter of Map Revision (CLOMR). CLOMR's describe the effect of a proposed project on effective floodplain map and FIS reports. A CLOMR does not revise a floodplain map.

Keep in mind that, in Minnesota, a map revision does not change the zoning requirements for the subject property until the community's flood plain zoning ordinance is amended to adopt the revised map. On the other hand, a **map amendment** simply clarifies that a property is "naturally" out of the floodplain, and the floodplain regulations do not apply. Map amendments and revisions can be used to waive the requirements for flood insurance.

#### **3. Data Requirements**

When requesting changes to floodplain maps and reports, community officials and property owners must submit adequate technical data to support the request. The data that is required differs with the type of change requested and the circumstances that warrant map changes. The following sections will describe the data requirements in greater detail.

##### **A. Map Amendments**

The accuracy of the floodplain boundaries shown on the NFIP maps depends on the scale at which the maps are drawn and the accuracy of available topographic information. A structure or parcel of land may inadvertently be included in the Special Flood Hazard Area (SFHA). Also, due to the map scale, map users may find it

difficult to determine if a particular structure or parcel of land is in the SFHA.

FEMA has developed the map amendment process by which property owners may request that FEMA determine whether specific structures or legally described parcels of land are in the SFHA and, if necessary, issue a LOMA.

The map amendment process is applicable only to requests for determinations based on conditions that existed on the effective date of the first NFIP map that showed the property to be within the SFHA. All other requests for determinations will be processed as requests for map revisions.

Any owner or lessee of property can request a LOMA from FEMA. Because such requests do involve property inadvertently included in the SFHA, and do not involve recent filling or result in changes to the flooding information contained in the FIS report, LOMA requests can be submitted directly to FEMA and are not subject to the review and approval of the community or the state. However, a LOMA may not be issued to remove a structure or a parcel from the floodway portion of the SFHA. Property can be removed from the floodway only with community concurrence and state approval through a map revision process.

### Required Supporting Data

A person requesting a LOMA must provide sufficient data to allow FEMA to verify the location of the structure or parcel of land, and verify that the structure or parcel of land is not subject to flooding during the base flood. For LOMA requests involving structures, the required data includes:

- A copy of the recorded deed indicating the legal description of the property and the deed book volume and page number, bearing the seal of the Recorder of Deeds;
- A copy of the recorded plat for the property. If the property is not recorded on a plat map, copies of a tax map or other suitable maps are required to aid FEMA in accurately locating the property;
- A topographic map, certified as-built by a registered professional engineer or registered land surveyor, showing the

location of the structure, ground elevations, and the lowest finished grade adjacent to the structure. If the request involves an undeveloped parcel of land, the submitted data must include the elevation of the lowest point of ground within the parcel. These will be considered as CLOMRs until as-built elevations of the lowest adjacent grade and lowest floor are submitted; and

- Data to substantiate the base flood elevation. These data may be obtained from the community's FIS report, or other authoritative sources, such as the U.S. Army Corps of Engineers, the U. S. Geological Survey, the Soil Conservation Service, or other federal, state or local water resource agencies, or a registered professional engineer.

### B. Map Revisions

Flood hazards for a community can change over time. In order to keep floodplain maps and FIS reports up-to-date, FEMA has developed the map revision process. Through this process, communities may request that effective FIRM's and FBFM's be revised to incorporate new or corrected flooding data.

NFIP maps may be revised by a "physical" map revision or by a LOMR. A physical map revision involves republishing the individual map panels affected by the requested changes. When NFIP maps are revised by a LOMR, the changes made to the map are described in the letter and revised maps are not reprinted. When revisions cannot be adequately described in writing, an annotated photocopy of the affected map may be issued with the LOMR.

Physical map changes are usually used when large floodplain areas are being revised, or when maps are being revised to show increased flood risk. Typically, revisions such as enlarging SFHA's or floodways, shifting SFHA's or floodways to areas previously not designated, or raising BFE's require the issuance of a physical map revision.

A physical map revision will be submitted to the community for a 30-day review period. For FIRM revisions that raise BFE's, the 30-day review period will be followed by a 90-day appeal period.

Structures and legally described parcels of land that have been elevated on fill can be issued a LOMR to remove them from the Special Flood Hazard Area. Similarly, individual structures and parcels of land that were inadvertently included in the floodway can be issued LOMRs if they were either naturally on high ground or were elevated on fill above the BFE before the first effective date of the NFIP map for that area.

A private party or a community may request a map revision. However, because a community is responsible for floodplain management within its jurisdiction, any private party that wishes to have a map revised, must submit the request to the Chief Executive Officer or designated official of the community for approval. The community official should review the map revision request and forward it to the Department of Natural Resources with a statement of whether or not the community supports the request. A request may be submitted to the community, the DNR and FEMA simultaneously. However, FEMA will not review map revision requests submitted directly to FEMA until evidence of community and state concurrence is provided.

### Required Supporting Data

The type and amount of supporting data required depends on the reason for the requested revision and the data to be changed.

Map revisions are usually requested to reflect some physical change in the floodplain such as construction of a new bridge, levee or channel improvement, or the placement of fill in the flood fringe for development. Occasionally, revisions will be requested because the analysis used by FEMA to develop the NFIP map is found to contain errors, or because better data becomes available.

To support a request for a map revision based on physical changes to the floodplain or because better data or methodologies are available, the requestor must submit the analysis that is required by FEMA to revise the NFIP map. FEMA will not perform the analysis required to support the proposed map revision.

All analyses and data submitted to support a map revision request must be certified by a registered professional engineer or registered land surveyor, as appropriate.

Some of the general supporting data that will be required is listed below. Additional data may be required based on the type of revision requested.

- General description of the physical changes to the floodplain or new data that is the basis for the proposed map revision;
- Construction plans for as-built conditions, if applicable;
- New hydraulic and/or hydrologic analysis of the flood plain changes or new data;
- Revised delineations of flood plain and floodway boundaries;
- New topographic information (e.g., spot elevations, grading plans, or contour maps) for map revisions based on filling; and
- Annotated copies of FIRM's, FBFM's, Flood Profiles and FIS data tables, as appropriate, that show the requested revisions.

For proposed map revisions to exclude a structure or legally described parcel of land from the SFHA based on filling, there are some additional requirements. The additional data is similar to the data required for a LOMA. The requestor must provide data that verifies the location of the structure or parcel, and shows that the structure or parcel is not subject to flooding during the occurrence of the base flood.

- When the map revision requested involves more than one structure or a single parcel of land, the requestor must provide evidence that the fill will not settle below the BFE, and is protected against erosion;
- When the revision request involves the exclusion of one or more structures placed on fill, the requestor must submit a certified survey which shows that the lowest floor of each structure is above the BFE (local ordinances require lowest floors to be above the Regulatory Flood Protection Elevation - RFPE), and that the lowest adjacent grade to each structure is at or above the BFE; and

- When the request involves the exclusion from the SFHA of a parcel of land, the requestor must show that the entire legally described parcel is at or above the BFE.

### **C. Conditional Map Revisions**

Conditional map revisions are intended to give the requestor some assurance from FEMA that the proposed impact of modification in the flood plain will be approved by FEMA and allow a change in the appropriate FIRM. Communities, government agencies, developers, or individual property owners who propose floodplain modification such as construction of a flood control levee or a new bridge, may wish to know if FEMA concurs with the requestor's assessment of the impact of the modification on flood risk data shown on the FIRM or contained in FIS reports.

A person or agency requesting a conditional map revision submits design plans and engineering data of the proposed modification to FEMA for review. FEMA's response to such a request is to provide comments describing the changes that may eventually be made to effective NFIP maps if the modification is constructed as planned. This response is called a Conditional Letter of Map Revision (CLOMR).

**Note:** Before permitting an encroachment into a regulatory floodway that would cause any rise in flood elevations over in-place conditions, a community **must** obtain a CLOMR.

Either a community or a private party may request a CLOMR. However, the community must support the proposed map revision for FEMA to consider it. Therefore, a CLOMR request from a private party should be submitted to the community for review. As in the LOMR process, the designated community official should review the request and forward it to the DNR with a statement of whether or not the community supports the request. Again, a private party may wish to send a CLOMR request to the community, the DNR and FEMA simultaneously and have the community and DNR submit comments to FEMA after their review.

FEMA charges a fee for reviewing CLOMR requests. The fee varies depending on the nature

of the proposed floodplain modification. The fee schedule is shown in Appendix 10A. Federal, state, and local governments are not charged a fee if the proposed floodplain modification is intended to reduce flood damages to existing development.

### **Required Supporting Data**

The types and amounts of technical data that must be submitted in support of a Conditional Letter of Map Revision are essentially the same as those required for a Letter of Map Revision described previously. The basic difference between data required for a map revision and data required for a conditional map revision is that any plans, maps or drawings submitted with a conditional map revision are proposed and cannot be certified "as-built." Once the project is constructed, certified as-built plans are submitted for the actual map revision.

### **D. Floodway Revisions**

As discussed in previous chapters, where a detailed flood plain study is conducted, a floodway is designated so that the 100-year flood may pass through the floodplain without raising flood levels by more than 0.5 feet. Zoning provisions in some communities are more restrictive and may have not allowed any stage increase when the floodway was designated.

Once a floodway has been adopted by a community, any encroachment within the floodway that would increase 100-year flood levels is prohibited. However, in certain cases, a community may find it necessary or desirable to revise the floodway delineation. A typical case involving a floodway revision would be the construction of a new bridge. If the proposed bridge would encroach on a community designated floodway and raise flood levels, and there is no increased flood damage potential from the increased flood levels, a community may wish to revise the floodway.

Because the community selects and adopts the floodway, all requests for floodway revisions must be initiated or approved by the community. As with any NFIP map revision, a private party requesting a floodway revision must submit the request and supporting data to the community official. The community official should review the proposed floodway revision and forward it to

the DNR with a statement as to whether or not the community supports the floodway revision. Again, a private party requesting a floodway revision may submit the request to the community, the DNR, and FEMA simultaneously and have the community and the DNR submit comments to FEMA after their review.

Communities may not feel that they have the technical expertise to review the analysis submitted to support a floodway revision. In this case, communities can conditionally support the revision with the stipulation that the review by the DNR and FEMA finds that the technical data accurately reflects the impact of the proposed floodway change.

### **Required Supporting Data**

The following engineering analysis and documentation must be submitted with a floodway revision request:

- Copy of a public notice stating the community's intent to revise the floodway and a statement that the community has notified any affected landowners or adjacent jurisdictions;
- Copy of a letter notifying the state of the floodway revision;
- Copy of state approval of floodway revision;

- Hydraulic analysis of the impact of the proposed floodway. This should include the original floodway model as well as the model of the proposed floodway. Hard copies of both input and output will be required by FEMA. The DNR will also require computerized files for their review; and
- Delineation of the revised floodway on a topographic map or on a copy of the effective FBFM.

All analysis submitted in support of a floodway revision must be certified by a registered professional engineer. All supporting survey data must be certified by a registered land surveyor.

## **4. Getting More Information**

Much of this chapter was excerpted from FEMA's document called; "Appeals, Revisions, and Amendments to Flood Insurance Maps. A Guide For Community Officials" (FEMA, January 1990). This guide is quite complete and easy to use. It can be obtained by calling your Regional DNR Office, or the DNR Central Office at (612) 296-4800. You can also get more information from your area hydrologist or the Floodplain Program staff in St. Paul.









**APPENDIX 10A  
FEES SCHEDULE FOR CLOMAS AND CLOMRS**

**Initial fee for CLOMR\*:**

● Review of new hydrology	\$245
● New bridge or culvert (no channelization)	\$490
● Channel modifications only	\$560
● Channel modification and new bridge or culvert	\$735
● Levees, berms, or other structural measures	\$945
● Structural measures on alluvial fans	\$2,800

**Initial fee for CLOMR (Based on Fill) or CLOMA\*:**

● Single-lot	\$175
● Multiple-lot/subdivision	\$245

**Hourly review rate:** **\$35**

**Authorization Limits:**

● CLOMA	\$500
● CLOMR (Based on Fill)	\$500
● CLOMR	\$1,500
● CLOMR for review of levees, dams, or other structural measures	\$2,500
● CLOMR for review of structural measures on alluvial fans	\$5,000

**\*Based on fees effective October 1, 1990. Fees are subject to change.**

**§72.3 Initial fee schedule.**

(a) For conditional Letters of Map Amendment, the initial fee shall be paid by the requestor in the following amounts:

- (1) Single-lot..... \$175
- (2) Multi-lot/subdivision..... \$245

(b) For conditional Letters of Map Revision, the initial fee shall be paid by the requestor in the following amounts:

- (1) Review of new hydrology..... \$245
- (2) New bridge or culvert (no channelization)..... \$490
- (3) Channel modifications only..... \$560
- (4) Channel modification and new bridge or culvert..... \$735
- (5) Levees, berms, or other structural measures..... \$945
- (6) Structural measures on alluvial fans..... \$2,800

(c) For projects involving combinations of the above actions which are not separately identified, the initial fee shall be that charged for the most expensive of the actions comprising the combination.

**§72.4 Submittal/payment procedures and FEMA response.**

(a) Initial fees shall be submitted with the request for FEMA review and processing of conditional LOMAs and conditional LOMRs.

(b) Initial fees must be received by FEMA before the review can be initiated for any conditional LOMA or conditional LOMR request.

(c) Following completion of FEMA review for any conditional LOMA or conditional LOMR, the requestor will be billed at the prevailing private sector labor rate for any actual costs exceeding the initial fee incurred during the review. The rate (currently \$35.00 per hour) will be revised on a fiscal year basis using the most current fiscal data available and the revised hourly rate will be published as a notice in the Federal Register for each fiscal year if the rate increases or decreases.

(1) Requestors of conditional LOMAs will be notified of the anticipated total cost if the total cost of processing their request will exceed \$500.

(2) Requestors of conditional LOMRs for the review of new hydrology, bridges or culverts, channel modifications, or combination bridge/culvert and channel modification will be notified of the anticipated total cost if the total cost of processing their request will exceed \$1,500.

(3) Requestors of conditional LOMRs for the review of levees, dams or other structural measures will be notified of the anticipated total cost if the total cost of processing their request will exceed \$2,500.

(4) Requestors of conditional LOMRs for the review of structures on alluvial fans will be

notified of the anticipated total cost if the total cost of processing their request will exceed \$5,000.

(5) In the event that processing costs exceed the limits defined in paragraphs (c)(1) through (c)(4) of this section, processing of the request will be suspended pending FEMA receipt of written approval from the requestor to proceed.

(d) The entity that applies to FEMA through the local community for review will be billed for the cost of the review. The local community incurs no financial obligation under the reimbursement procedure set forth in this part as a result of transmitting the submittal to FEMA.

(e) Payment of both the initial fee and final cost shall be by check or money order payable to the National Flood Insurance Program and must be received by FEMA before the conditional LOMA or conditional LOMR will be issued.

(f) For conditional LOMA requests, FEMA shall:

(1) Notify the requestor within 30 days as to the adequacy of the submittal, and

(2) Within 30 days of receipt of adequate information, provide comment to the requestor on the proposed project.

(g) For conditional LOMR requests, FEMA shall:

(1) Notify the requestor within 60 days as to the adequacy of the submittal, and

(2) Within 90 days of receipt of adequate information, provide comment to the requestor on the proposed project.

## **§72.5 Exemptions.**

Federal, State, and local governments and their agencies shall be exempt from fees for projects they sponsor if the Administrator determines or the requestor certifies that the particular project is for public benefit and primarily intended for flood loss reduction to existing development in identified flood hazard areas, as opposed to planned flood plain development.

[50 FR 36028, Sept. 4, 1985, as amended at 53 FR 16280, May 6, 1988]

**§72.6 Unfavorable response.**

A conditional LOMA or conditional LOMR may be denied or may contain specific comments, concerns, or conditions regarding a proposed project or design and its impacts on flood hazards in a community. A requestor is not entitled to any refund if the letter contains such comments, concerns, or conditions, or if the letter is denied. A requestor is not entitled to any refund if the requestor is unable to obtain required authorizations, permits, financing, etc., for which the letter was sought.



**§72.7 Resubmittals.**

Any resubmittal of a request more than 90 days after FEMA notification that a request has been denied or after a review has been terminated due to insufficient information or other reasons will be treated as an original submission and subject to all submittal/payment procedures as described in §72.4, including the initial fee. The procedure of §72.4 including the initial fee, will also apply if the project has been significantly altered in design or scope other than that necessary to respond to previously issued comments, concerns, or conditions by FEMA.

## APPENDIX 10B

### FLOOD PLAIN MANAGEMENT REQUIREMENTS FOR BRIDGE REPLACEMENTS AND CONSTRUCTION

The following points should be considered when constructing or replacing bridges and culverts in designated flood plain areas.

1. The hydraulic capacity of the structure must be established.
2. In areas where the community has not designated a flood plain, increases up to 0.5 feet in the elevation of the 100 year flood may be permitted if they do not materially increase flood damage potential. Additional increases in flood elevations may be permitted if it is shown that the increased flood elevation does not increase flood damage potential.
3. Where a community has adopted a general (approximate detail) flood plain, conditions in item 2 above apply. In addition, if the extent of the flood plain would change based on the information provided, the flood plain boundary should be amended.
4. In an area where a community has adopted a detailed flood insurance study, new bridges and replacement bridges must not increase the elevation of the 100 year flood (with floodway), unless; it can be shown that the increase does not increase flood damage potential, the proposed flood elevations receive DNR and FEMA approval, and the community adopts the proposed flood elevations. Furthermore, when a DNR permit is required, and an in-place structure causes a headwater elevation more than 0.5 feet higher than the tailwater for the 100-year flood, permit rules allow stage increases up to the existing stage increase only if there is no significant flood damage potential upstream of the crossing.

When a change to flood elevations is proposed, the following information may be required for DNR and FEMA approval:

- A. HEC-2 models for in-place and proposed conditions for the 100 year flood and floodway models .
- B. Certified plots of any new or modified cross-sections.
- C. New flood plain maps if the boundaries of the flood plain have changed. Topographical mapping may also be required.
- D. A new floodway data table.

E. HEC-2 models of the 10, 50, and 500 year floods, and new flood profiles graphs, may be required if it is found that natural flood profiles are higher than shown in the community's FIS.

Another concern for bridge proposals that raise flood elevations is the effect on adjoining property rights. Although it may be shown that a proposed increase in flood elevations does not increase flood damage potential for existing development, it may affect future development. If flood elevations are raised significantly, or a significant area is added to a flood plain area, then easements or some form of permission should be obtained from the impacted landowners.

