



FLOODPROOF CONSTRUCTION REQUIREMENTS

*For lots touched by the Special Flood Hazard Area (100-yr floodplain) or
lots with an approved FEMA Letter of Map Revision*

**ENGINEERING DEPARTMENT
(218)299-5390**

Pre-Construction

- Section 1: Floodproof Construction Requirements Checklist
- Section 2: Floodplain Development Application
- Section 3: Standard Floodproof Construction Details
- Section 4: Floodplain Development Permit

Construction

- Section 5: Floodproofing Inspection Record

Post-Construction

- Section 6: Property Survey (11" x 17")
- Section 7: Elevation Certificate (FEMA Form)
- Section 8: Residential Basement Floodproofing Certificate (FEMA Form)



Section 1

Floodproof Construction Requirements Checklist FEMA Special Flood Hazard Areas (100-year Floodplain)

Step 1: Check the City of Moorhead website for lot information to determine if floodproof construction requirements are applicable.

For new construction, if the lot is in or touched by the 100-year floodplain proceed to Step 2. If the lot in the 100-year floodplain, a Conditional Use Permit (CUP) may be required. Contact the City Planning & Zoning Director for assistance.

For existing built lots, the mapping tools at the website below can be used to determine if the lot is in the 100-year floodplain. City Engineering staff is available to assist in determining the applicable requirements.

- | | |
|--------------------------|--------------------------|
| Permitted Use | <input type="checkbox"/> |
| Provisional Use (LOMR-F) | <input type="checkbox"/> |
| Conditional Use | <input type="checkbox"/> |

All construction in the 100-year floodplain requires a Floodplain Development Permit.

Step 2: Floodproof construction requirements package and required elevation forms are attached to this document.

- | | |
|------------------------------------|--------------------------|
| Floodplain Development Application | <input type="checkbox"/> |
| City Permit (completed by City) | <input type="checkbox"/> |
| Floodproof construction details | <input type="checkbox"/> |

Step 3: Plans

If construction will vary from the detail sheets within this packed then the plans must be developed and signed by a professional engineer or architect licensed in the State of Minnesota.

Construction plans for basements in the floodplain must not show sleeping rooms or a kitchen. Basements can be designed for bathrooms, closets, halls, storage rooms, laundry or utility space.

When submitting the plans to the City for issuance of a Floodplain Development Permit, verify the following:

- | | |
|---|--------------------------|
| Floodproof construction details are clearly shown | <input type="checkbox"/> |
|---|--------------------------|

- Critical elevations are clearly shown
- Floodplain Development Application is completed
- Plans signed by an engineer or architect (for the floodproofing portions of the plans that vary from the standard detail sheets)

Step 4: Submit plans to the City.

- 1 set of plans submitted to the Engineering Department
- 1 set of plans submitted to Building Codes

Step 5: The City will issue a Floodplain Development Permit (Engineering Department), Provisional Use Permit for LOMR-F lots (Planning and Zoning Department), and a Building Permit (Building Codes).

Step 6: Proceed to construction. Inspections listed below must be performed. *All floodproofing inspections in the Engineer/Architect column must be completed by the builder's engineer or architect and certified on a signed inspection report. Failure to certify these inspections will void the floodproof certification.*

	Building Codes	Engineer/ Architect
Place Base Flood Elevation (BFE) stake		<input type="checkbox"/>
Elevation check on footings before concrete is placed		<input type="checkbox"/>
Footings	<input type="checkbox"/>	<input type="checkbox"/>
Foundation/rebar		<input type="checkbox"/>
Waterproofing		<input type="checkbox"/>
Drain tile		<input type="checkbox"/>
Concrete floor/poly		<input type="checkbox"/>
Sanitary sewer valve	<input type="checkbox"/>	
Sanitary sewer line	<input type="checkbox"/>	
Joist blocking	<input type="checkbox"/>	
Finish grading (LAG)		<input type="checkbox"/>

Step 7: Complete the following documents for a post-construction submittal to the City.

- Signed inspection report (completed by engineer or architect)
- Property Flood Survey
- FEMA Elevation Certificate
- FEMA Residential Basement Floodproofing Certificate

Step 8: Upon submission and verification of the documents in Step 7, Building Codes will issue a Certificate of Occupancy.



Section 2

Floodplain Development Permit Application

This permit application is required when any type of development is proposed within the floodplain. Development must comply with the specific standards outlined in City Code. *Please reference the City's Floodproof Construction Requirements Packet, as appropriate, when completing this application ([City of Moorhead : Floodplain Permits](#)).*

- **Development** - any manmade change to improved or unimproved real estate, including buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.
- **Regulatory Flood Protection Elevation (RFPE)** - an elevation not less than one foot above the base flood elevation (BFE) plus any increases in the water surface elevation caused by encroachments on the floodplain that result from designation of a floodway (i.e. stage increase).
- **Floodproofing Design Level (FDL)** – an elevation not less than two feet above the BFE.

Description of Work

Applicant Information

Property Owner:	Contractor/Agent:
Mailing Address:	Mailing Address:
Phone:	Phone:
Email:	Email:

Site Information

Site Address:
Parcel #:

Brief Description of Project

Submittal Requirements

- Location and detail of grading, fill, compaction, and methods to stabilize soil including existing and proposed elevations
- If this application is for fill only, with a future permit application anticipated for buildings and/or other development activities, include a proposed site plan of the property detailing all existing and proposed buildings, structures, service facilities, roads, waterbodies, and other pertinent design features. If specific locations for development activity are not known, identify all potential locations that may be used or reserved for development. Include a description of anticipated future development requiring a future permit in the Brief Description of Project above.
- Copies of any other required state or federal permits or approvals (if applicable)

For buildings, please include:

- Site plan of the property detailing all existing and proposed buildings, structures, service facilities, roads, waterbodies, and other pertinent design features including elevations. Where applicable, plans shall detail:
 - Anchoring (if needed)
 - Proposed elevations of lowest floor (including basement or crawlspace)
 - Detail of the materials used and flood protection for all facilities servicing the building
 - Engineer/Architect prepared plans and certifications (for floodproofed structures)
 - Details of repairs and improvements, including cost estimate (for existing nonconforming structures)

For Buildings (check all that apply)**Activity:**

- New Structure
- Existing Structure:
 - Demolition and Replacement
 - Demolition
 - Relocation/Elevation
 - Alteration/Addition/Improvement
 - Repair after Damage

Building Type:

- Residential
- Non-residential
- Multi-use development
- Manufactured Home
- Recreational Vehicle
- Accessory Building (square footage: _____)
- Other: _____

Elevation and Floodproofing:

- Slab-on-grade
 - Ground elevation at or above the RFPE at the structure
 - Lowest floor at or above the RFPE
 - Fill to a point 15 feet beyond the structure footprint at or above the BFE
- Basement or crawlspace
 - Ground elevation at or above the FDL
 - Lowest floor at or above the FDL
 - Fill to a point 15 feet beyond the structure footprint at or above the BFE
- Building or addition's lowest floor will be elevated above the RFPE via method alternative to fill (requires CUP)
 - Development utilizes fill, but fill does not meet the standards noted above
 - Elevated on a filled stem wall
 - Elevated above an enclosed area designed to be internally flooded
 - Elevated with blocks, pilings, or stilts
- Nonresidential building will be designed to be watertight below the RFPE (requires CUP)
- Buildings less than 576 square feet can be wet floodproofed per City Code
- Building or addition's lowest floor won't be elevated, but will be designed to be internally flooded (accessory structures and garages only, requires CUP if in floodway – when allowed)

For Other Structural Development (check all that apply)

- Deck/Patio/Gazebo
- Fence
- Gas or liquid storage tank
- Utilities, well, ISTS, or other service facilities

For Other Development Activities (check all that apply)

- Earth moving, excavation, grading, or fill
- Mining
- Road or trail construction
- Shoreline stabilization or restoration
- Bridge or culvert construction or alteration
- Subdivision

Application will be evaluated based on compliance with the standards outlined in City Code. No work of any kind may start until an application is approved and a permit is issued. The permit may be revoked if any false statements are made in this application. If revoked, all work must cease until a permit is re-issued. Applicant gives consent to the Zoning Administrator and/or Floodplain Administrator to carry out inspections required to verify compliance. When applicable the applicant must hire a Professional Engineer or Architect to complete inspections and FEMA paperwork.

Fill placed in the floodway and/or floodplain must be inspected and supervised by a Professional Engineer.

All floodproof construction inspections must be completed by a Professional Engineer or Architect. At the conclusion of construction, a Property Flood Survey (as-built), inspection certification form, FEMA elevation certificate, and FEMA Floodproof Basement Certification form must be completed and submitted to the City before a Certificate of Occupancy can be issued.

Applicant signature: _____ Date: _____

Engineer and/or Architect certification: I hereby certify that I was hired by the applicant to perform floodproof requirements, site inspections and submit post-construction documents to the City of Moorhead.

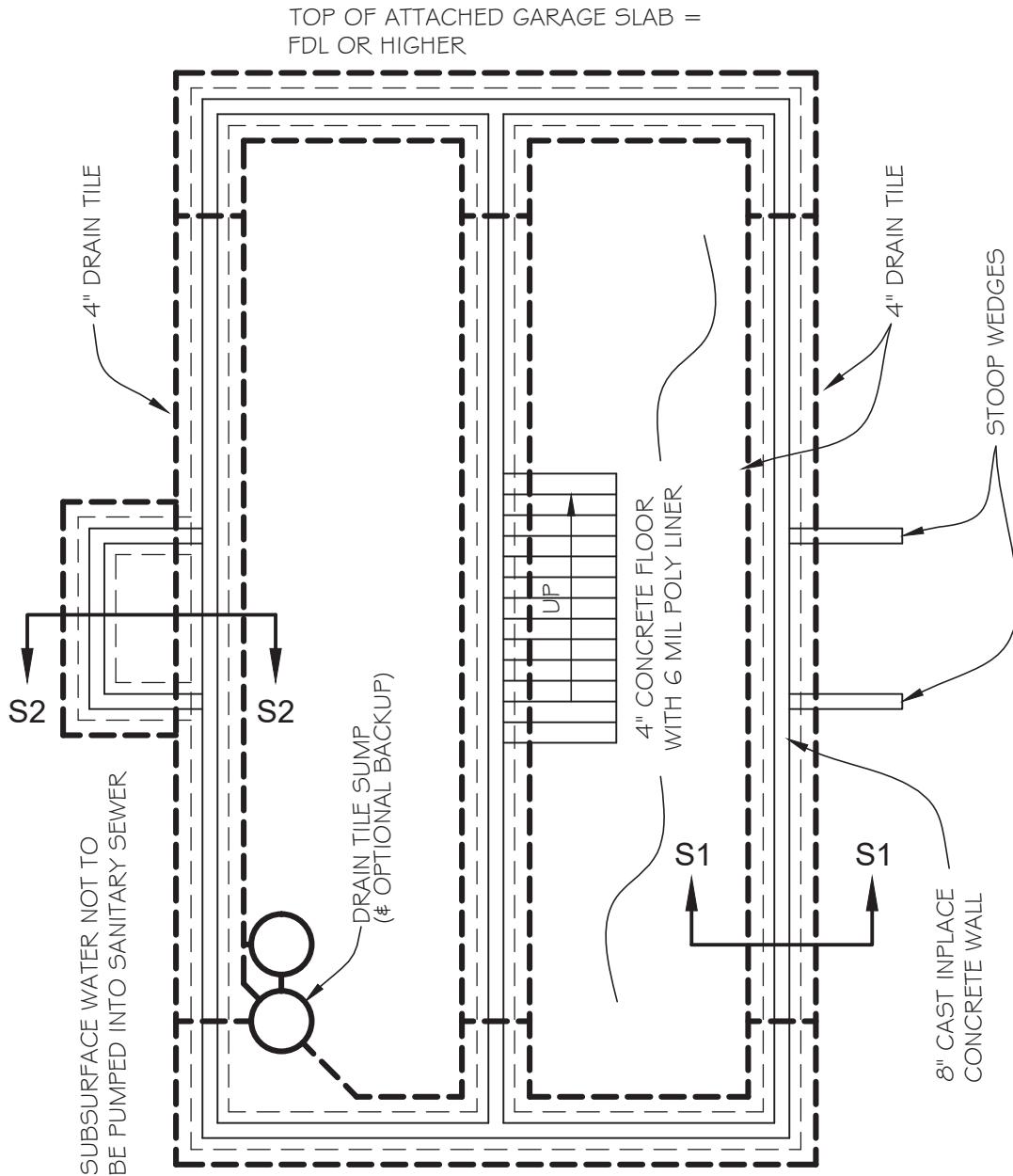
Engineering Firm: _____

Engineering Firm Address: _____

Engineers Printed Name: _____

Engineers signature: _____ Date: _____

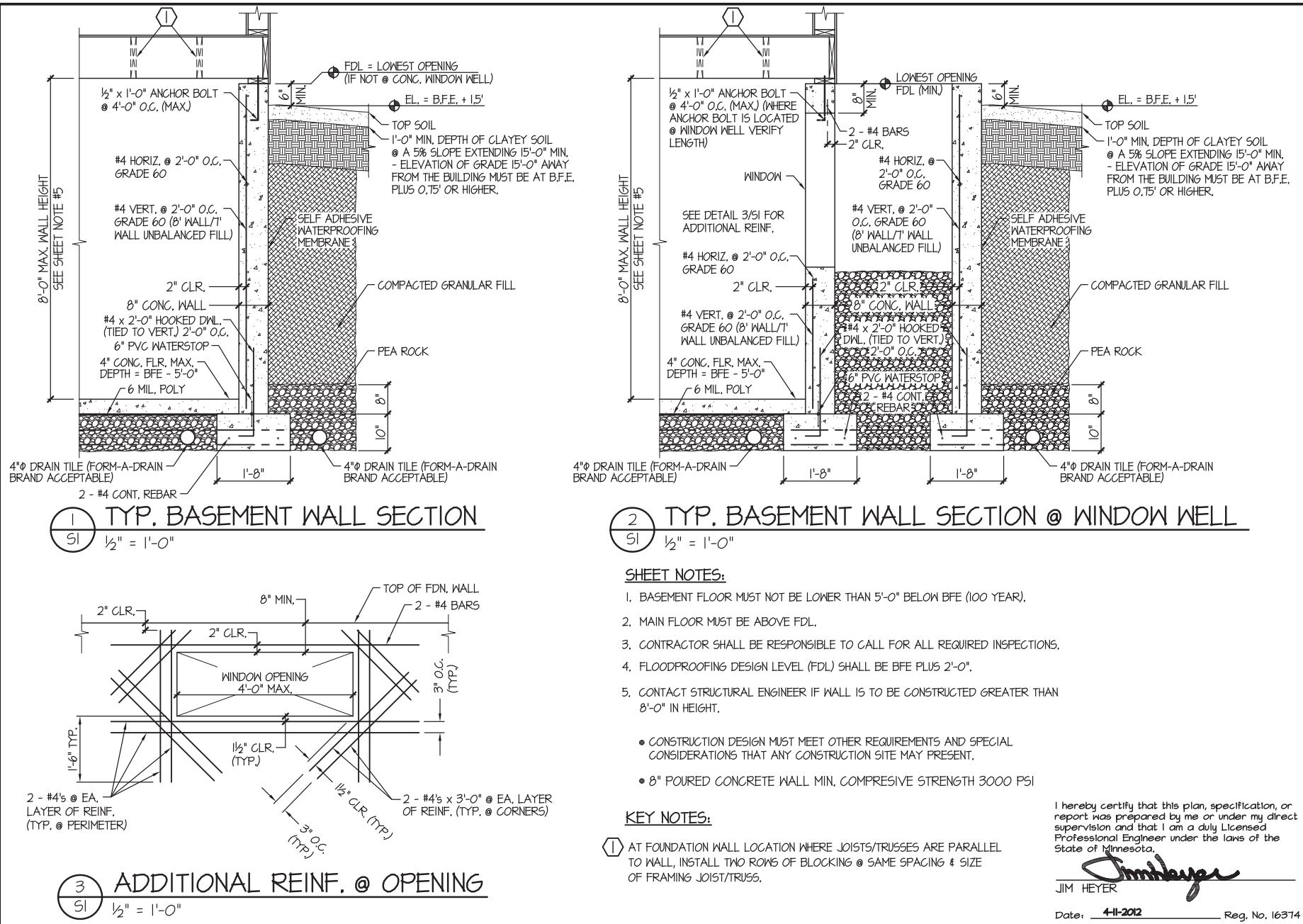
Section 3



CONTRACTOR SHALL BE RESPONSIBLE TO CALL FOR
ALL REQUIRED INSPECTIONS.

FOOTING & FOUNDATION WALL PLAN

SCALE: $\frac{1}{8}$ " = 1'-0"





Section 4

Permit No. _____

FLOODPLAIN DEVELOPMENT PERMIT

SECTION 1: DESCRIPTION OF WORK:

PROJECT ADDRESS: _____ PARCEL NO. _____

LEGAL DESCRIPTION: _____

BRIEF DESCRIPTION OF WORK: _____

A. STRUCTURAL DEVELOPMENT

ACTIVITY

- New Structure
- Addition
- Alteration
- Repair/Maintenance
- Relocation
- Demolition
- Replacement
- Flood Mitigation

STRUCTURE TYPE

- Residential (1-4 family or more than 4 family)
- Non-residential, commercial, office, etc. (Floodproofed? Yes)
- Warehouse
- Mixed Use (Residential & Commercial)
- Manufactured (Mobile) Home (In mobile home park? Yes)
- Shed/Storage
- Deck
- Porch/3-Season Porch
- Garage
- Fence
- Other: _____

B. OTHER DEVELOPMENT ACTIVITIES

- Clearing Grading Fill Drilling
- Excavation (other than structural development checked above)
- Subdivision (new or expansion)
- Drainage Improvements (including culvert work)
- Road, Street or Bridge Construction
- Private Well or Septic/Drain Field
- Watercourse Alteration (including dredging & channeling modifications)
- Other (please specify) _____

C. Estimated Project Cost: \$ _____

SECTION 2: FLOODPLAIN DETERMINATION

Floodplain District

- Floodway
- Flood Fringe

Zoning Determination

- Permitted Use
- Provisional Use Permit (PUP)
- Conditional Use Permit (CUP)
- Variance
- DNR Notified
- Planning Department Review
- Hearing

SECTION 3: FLOOD FRINGE DEVELOPMENT

Source for BFE & Stage Increase:

- FIRM Map & FIS (for detailed Study Areas)
 Other: _____

Effective Flood Insurance Study:

FIS Effective Date: _____

Community /Panel #: _____

FIS Cross-section: _____

Flooding Source: _____

Flood Zone: _____

NOT located in the SFHA.

In the SFHA as shown on the effective FIRM, but has been removed by a:

- Letter of Map Revision Based on Fill (LOMR-F) FEMA Case No. _____
 Letter of Map Amendment (LOMA) FEMA Case No. _____

In the SFHA as shown on the effective FIRM, and must be removed by a Letter of Map Revision Based on Fill (LOMR-F)

Partially located in the SFHA, but the building/development is not within the SFHA.

In the SFHA

In the floodway (See Floodway Section 4 of permit)

See section 5 for additional information required for permit issuance.

Floodproofing Design Level (FDL): Basements and crawlspaces

A. Base Flood Elevation (BFE): _____ ft.

B. Freeboard required by ordinance: 2.0 ft.

C. FDL (A+B) = _____ ft.

Datum: NGVD 1929 NAVD1988

Regulatory Flood Protection Elevation (RFPE): Slab-on-grade

A. Base Flood Elevation (BFE): _____ ft.

B. Freeboard (1.0 ft.) plus river stage: _____ ft.

C. RFPE (A+B) = _____ ft.

Datum: NGVD 1929 NAVD1988

Structure Elevation Requirements	Proposed	Required FDL	Required RFPE
a. Top of bottom flooring (slab-on-grade, basement or crawl space)		>BFE - 5 ft. =	> RFPE =
b. Top of next higher floor		> FDL =	> RFPE =
c. Attached garage (top of slab)		> FDL =	> RFPE =
d. Lowest elevation of machinery or equipment servicing the building (describe equipment _____)		> BFE - 5 ft. =	> RFPE =
e. Lowest adjacent (finished) grade (LAG)		BFE + 1.5 =	BFE + _____ = (B-.5") =
f. Lowest compacted fill elevation at 15 ft. from building		> BFE + 0.75 =	> BFE =

All proposed elevations are at or above required elevations

Yes n/a For structures with enclosed areas below the RFPE, the plans detail required floodproofing standards and certifications

Evaluating Improvements

Project Cost Factors for additions, improvements or repairs/maintenance (for nonconforming structures)	
a. Cost of improvements/repairs/maintenance (including cost of labor and all supplies)	\$
b. Cost of previous improvements/ repairs/maintenance	\$
c. Total cost of improvements/repairs/maintenance (a + b)	\$
d. Estimated market value of existing structure (not including land value) without any improvements	\$
e. Percentage cost of improvements/repairs/maintenance (c ÷ d)*100, (must be < 50% for approval).	%

Substantial Damages and Repetitive Loss

Project Cost Factors for Repairs – Rolling 10yr Period	
Date of Damage	\$
a. Cost of repairs (including cost of labor and all supplies)	\$
b. Cost of previous repairs	\$
c. Total cost of repairs (a+b)	\$
d. Pre-damage Market Value (structure only, land excluded)	\$
e. Percentage cost of repairs (c ÷ d)*100, (must be < 25% for approval).	%

SECTION 4: FLOODWAY DEVELOPMENT

No fill or construction may be placed in the floodway without a conditional use permit and a “No-Rise” certificate.

- It has been determined that development will not cause an increase in water surface elevations, obstruct flood flows, or increase velocities during the one-percent annual chance flood.
 - Analysis performed by a professional engineer. Attach analysis and [No-Rise Certification](#).
 - Verified through other accepted standard engineering practices (such as when a riprap project is proposing to restore the site to its previous cross-sectional area). Attach analysis.
 - Conditional Letter of Map Revision
- Conditional Use Permit (CUP). The development meets the standards in the ordinance.
- DNR Public Waters Work Permit or utility crossing license included with application (if below the ordinary high-water level in the bed of a public water).

SECTION 5: SUBMITTED INFORMATION

- Subdivision or other development plans (including future development master plan).
- A site plan showing the location of all existing structures, water bodies, adjacent roads, lot dimensions, easements, proposed grading/fill, and proposed development/buildings to the extent known.
- Building plans (drawn to scale) (2 sets required if floodproofed) and specifications, including where applicable:
 - floodproofing details per City floodproof construction requirements or as designed by a Professional Engineer or Architect.
 - proposed elevations outlined in Section 3 above.
 - types of water-resistant materials used below the first floor
 - details for floodproofing of utilities located below the first floor
 - details of enclosures below the first floor, if applicable
 - details for anchoring structures, if applicable
- Plans showing the extent of watercourse relocation and/or landform alterations, if applicable.
- Other: _____

SECTION 6: SPECIAL CONDITIONS

SECTION 7: REQUIRED DOCUMENTATION (TO BE SUBMITTED BY PERMITTEE)

- Signed inspection reports (completed by professional engineer or architect)
- Property Flood Survey
- FEMA Elevation Certificate
- FEMA Floodproof Basement Certificate
- FEMA LOMR-F and Community Acknowledgement Form

DEFINITIONS

- **Development** - any manmade change to improved or unimproved real estate, including buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.
- **Regulatory Flood Protection Elevation (RFPE)** - an elevation not less than one foot above the base flood elevation (BFE) plus any increases in the water surface elevation caused by encroachments on the floodplain that result from designation of a floodway (i.e. stage increase).
- **Floodproofing Design Level (FDL)** – an elevation not less than two feet above the BFE.
- **Repetitive Loss** - Flood related damages sustained by a structure on two (2) separate occasions during a ten (10) year period for which the cost of repairs at the time of each such flood event on the average equals or exceeds twenty five percent (25%) of the market value of the structure before the damage occurred.
- **Substantial Damage** - Any damage of any origin sustained by a structure where the cumulative cost of restoring the structure to its before damaged condition would equal or exceed fifty percent (50%) of the market value of the structure before the initial damage occurred. The cost of restoration must include all costs such as construction materials and a reasonable cost placed on all manpower or labor regardless of the actual repair work performed.
- **Substantial Improvement** - Within any consecutive three hundred sixty five (365) day period, any reconstruction, rehabilitation (including normal maintenance and repair), repair after damage, addition, or other improvement of a structure, the cumulative cost of which equals or exceeds fifty percent (50%) of the market value of the structure before the "start of construction" of the initial improvement. This term includes structures which have incurred "substantial damage", regardless of the actual repair work performed.

Permit Approval or Denial

- Approve Permit**
- Deny Permit**

Floodplain Administrator signature: _____ **Date:** _____



Section 5

Floodplain Dev. Permit #

ENGINEERING DEPARTMENT
500 CENTER AVENUE
MOORHEAD, MN 56560
(218) 299-5390

BUILDING CODES
500 CENTER AVENUE
MOORHEAD, MN 56560
(218) 299-5424

FLOODPROOFING INSPECTION REPORT

Permit Applicant: _____ Phone Number: _____

Property Address: _____ Parcel Number: _____

INSPECTIONS

Inspection Type	Inspection Date	Inspected By	Photo	Comments
BFE Stake				BFE Benchmark:
Elev. Check				Elevation of footings must be checked before concrete is placed.
Footing				
Foundation & rebar				
Waterproofing				
Drain Tile				
Concrete Floor & Poly				
Finish Grading (LAG)				

Note: Photographs must be submitted with Floodproof inspection report.

Engineer and/or Architect must complete all inspections listed above.

Building Codes must complete inspections of footings, sewer line, sewer valve, and joist blocking in addition to other routine construction inspections.

CERTIFICATION

I certify that the above-referenced inspections have been completed by me or under my direct supervision and the construction activities were verified to meet federal, state and local requirements.

Print Name

Signature

MN License #
(Engineer/Architect)

Date

Section 6

Property Flood Survey Form (as-built)

Parcel-ID: _____

Property Address: _____

Subdivision\Legal Description: _____

Longitude: _____ Latitude: _____

Is this property in or touched by the Special Flood Hazard Area (SFHA) as shown on the Flood Insurance Rate Map (FIRM) Yes No

Community/Panel Number: _____ Effective Date: _____ FIS Cross-section: _____

Flood Zone(S): _____

LOMA/LOMR Submitted: Yes No Date Submitted: _____

LOMA/LOMR Received: Yes No Date Received: _____ Approved Denied FEMA Case Number: _____

Year Constructed: _____

Type of Structure: _____ FEMA Elevation Certificate Building Diagram Number: _____

Benchmark Used (NAVD88): _____

Base Flood Elevation (BFE): _____.____ ft.

Floodproofing Design Level (FDL): _____.____ ft. or Regulatory Flood Protection Elevation (RFPE): _____.____ ft.

Basement Information:

Floodproof Basement: Yes No

Walk-out Basement: Yes No Elevation: _____.____ ft.

Basement Floor or Crawlspace Elevation: _____.____ ft. Square Feet: _____

Basement Equipment: _____

Main Floor Elevation: _____.____ ft. Square Feet: _____

Garage Floor Elevation: _____.____ ft. Square Feet: _____ Attached Garage: Yes No

Lowest Opening: _____.____ ft.

Lowest Ground on Lot: _____.____ ft.

Lowest Adjacent Grade: _____.____ ft. Highest Adjacent Grade: _____.____ ft. Ground 15' from Building: _____.____ ft.

Deck Stairs Elevation: _____.____ ft. Attached to House Yes No

Top of Private Dike: _____.____ ft.

Survey Date: _____

Survey

Section 7

FEMA Elevation Certificate

Visit FEMA website for most current FEMA Elevation Certificate

U.S. DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

OMB No. 1660-0008
Expiration Date: November 30, 2018

ELEVATION CERTIFICATE

Important: Follow the instructions on pages 1-9.

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

SECTION A – PROPERTY INFORMATION		FOR INSURANCE COMPANY USE
A1. Building Owner's Name		Policy Number: _____
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.		Company NAIC Number: _____
City	State	ZIP Code
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)		
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)		
A5. Latitude/Longitude: Lat. _____ Long. _____		Horizontal Datum: <input type="checkbox"/> NAD 1927 <input type="checkbox"/> NAD 1983
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.		
A7. Building Diagram Number _____		
A8. For a building with a crawlspace or enclosure(s): a) Square footage of crawlspace or enclosure(s) _____ sq ft		

Section 8

FEMA Floodproof Basement Certificate

Visit FEMA for the most up to date certificate

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
National Flood Insurance Program

RESIDENTIAL BASEMENT FLOODPROOFING CERTIFICATE

OMB No. 1660-0033
Expiration Date: November 30, 2016

For use ONLY in communities that have been granted an exception by FEMA to allow the construction of floodproofed residential basements in Special Flood Hazard Areas.

BUILDING OWNER'S NAME	FOR INSURANCE COMPANY USE	
STREET ADDRESS (Including Apt., Unit Number)	POLICY NUMBER	
OTHER DESCRIPTION (Lot and Block Numbers, etc.)	COMPANY NAIC NUMBER	
CITY	STATE	ZIP CODE

SECTION I – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Provide the following from the FIRM and flood profile (from Flood Insurance Study)

COMMUNITY NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM	ZONE	BASE FLOOD ELEVATION (In AO Zones, Use Depth)	NAME OF FLOODING SOURCE(S) AFFECTING BUILDING
_____	_____	_____	_____	_____	_____	_____

Indicate elevation datum used for Base Flood Elevation shown above: NGVD 1929 NAVD 1988 Other/Source: _____