

CHAPTER 16
STORMWATER AND FLOODPLAIN MANAGEMENT

ARTICLE 1 - GENERAL AND ADMINISTRATIVE PROCEDURES.....	3
16.1.01. Purpose.....	3
16.1.02. Organization.....	4
16.1.03. Definitions.....	4
16.1.04. Permit Procedures	16
16.1.05. Permit Materials.....	20
16.1.06. Variances.....	24
16.1.07. Disclaimer of Liability	25
16.1.08. Penalty.....	26
16.1.09. Abrogation and Greater Restrictions	27
16.1.10. Severability.	27
ARTICLE 2 - SITE DEVELOPMENT REQUIREMENTS.....	28
16.2.01. General Requirements.....	28
16.2.02. Stormwater Storage.....	30
16.2.03. Stormwater Conveyance	37
16.2.04. Erosion and Sediment Control	39
16.2.05. Stream and Wetland Protection	44
ARTICLE 3 - FLOODPLAIN DEVELOPMENT REQUIREMENTS	48
16.3.01. How to Use This Ordinance.....	48
16.3.02. Duties of the Building Commissioner.....	48
16.3.03. Base Flood Elevation	52
16.3.04. Occupation and Use of Flood Fringe Areas.....	53
16.3.05. Occupation and Use of Designated Floodways	58
16.3.06. Occupation and Use of SFHA Areas Where Floodways Are Not Identified.	76
16.3.07. Permitting Requirements Applicable to All Floodplain Areas and Protection of Buildings.	82
16.3.08. Other Development Requirements.....	89

ARTICLE 1 - GENERAL AND ADMINISTRATIVE PROCEDURES

16.1.01. PURPOSE

This Ordinance is enacted pursuant to the police powers granted to this City by 65 ILCS 5/1-2-1, 5/11-12-12, 5/11-30-2, 5/11-30-8, and 5/11-31-2. The purpose of this Ordinance is to maintain this City's eligibility in the National Flood Insurance Program; to minimize potential losses due to periodic flooding including loss of life, loss of property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare; and to preserve and enhance the quality of surface waters, conserve economic and natural values and provide for the wise utilization of water and related land resources. This Ordinance is adopted in order to accomplish the following specific purposes:

- A. To meet the requirements of 615 ILCS 5/18(g) Rivers, Lakes and Streams Act;
- B. To assure that new development does not increase the flood or drainage hazards to others, or creating unstable conditions susceptible to erosion;
- C. To protect new buildings and major improvements to buildings from flood damage;
- D. To protect human life and health from the hazards of flooding;
- E. To lessen the burden on the taxpayer for flood control projects, repairs to flood-damaged public facilities and utilities, and flood rescue and relief operations; and
- F. To make federally subsidized flood insurance available for property in the City by fulfilling the requirements of the National Flood Insurance Program;
- G. To comply with the rules and regulations of the National Flood Insurance Program codified as 44 CFR 59-79, as amended.
- H. To protect, conserve, and promote the orderly development of land and water resources; and
- I. To preserve the natural characteristics and functions of watercourses and floodplains in order to moderate flood and stormwater impacts, improve water quality, reduce soil erosion, protect aquatic and riparian habitat, provide recreational opportunities, provide aesthetic benefits and enhance community and economic development.

16.1.02.

ORGANIZATION

To protect people and property from flooding, development of land must be managed both in the watershed (where the water comes from) and in the floodplain (where it accumulates). Therefore this ordinance has three parts.

- A. General and Administrative Procedures. Article 1 of this ordinance includes the definitions, permit procedures and similar administrative matters that apply to all development projects.
- B. Site Development Requirements. Article 2 of this ordinance contains the land development requirements that manage the runoff of stormwater that leaves the development site. It includes criteria for the amount of water that can leave a site as well as the measures that must be taken to improve the quality of water.
- C. Floodplain Development Requirements. Article 3 of this ordinance contains requirements for developments that will be located in the floodplain. It includes criteria to protect the new development to minimize the impact of the development on flooding to other properties, and to protect the flood conveyance channel.
- D. Overlapping Requirements
 - a. Floodplains are part of the watershed. All floodplain developments must also meet the site development requirements of Article 2, where applicable.
 - b. The definitions in Article 1, Section 3 and the administrative procedures in Article 1, Sections 4 and 5 apply to both Articles 2 and 3.

16.1.03.

DEFINITIONS

For the purposes of this Ordinance, the following definitions are adopted:

- A. ACCESSORY STRUCTURE: A non-habitable structure which is on the same parcel of property as the principal structure to be insured and the use of which is incidental to the use of the principal structure.
- B. ACT: An act in relation to the regulation of the rivers, lakes and streams of the State of Illinois", 615 ILCS 5/5 et seq.
- C. APPLICANT: Any person, firm, corporation or agency which submits an application.
- D. APPROPRIATE USE: Only uses of the designated floodway that are permissible and will be considered for permit issuance. The only uses that will be allowed are as specified in Article 3, Section 5.2.

- E. BASE FLOOD: The flood having a one-percent chance of being equaled or exceeded in any given year. The base flood is also known as the 100-year frequency flood event. Application of the base flood elevation at any location is as defined in Article 3, Section 3.0 of this Ordinance.
- F. BASE FLOOD ELEVATION (BFE): The elevation in relation to mean sea level of the crest of the base flood.
- G. BASEMENT: That portion of the building having its floor subgrade (below ground level) on all sides.
- H. BEST MANAGEMENT PRACTICE (BMP): A measure used to control the adverse impacts of a stormwater discharge on water quality downstream. BMPs include structural devices (e.g. grassed swales, filter strips and detention basins) designed to remove pollutants and reduce runoff volumes and non-structural measures such as public information on proper disposal and use of pesticides and herbicides.
- I. BUFFER: An area of natural vegetation adjacent to channels, wetlands, lakes, ponds or other surface waters to be left open for the purpose of eliminating or minimizing adverse impacts to such areas.
- J. BUILDING: A walled and roofed structure, including gas or liquid storage tank, that is principally above ground, including manufactured homes, prefabricated buildings, and gas or liquid storage tanks. The term also includes recreational vehicles and travel trailers installed on a site for more than 180 days per year.
- K. BY-PASS FLOW: An approach that routes tributary drainage area runoff around and not through a stormwater control structure.
- L. CHANNEL: Any river, stream, creek, brook, branch, natural or artificial depression, ponded area, flowage, slough, ditch, conduit, culvert, gully, ravine, wash, or natural or man-made drainageway, which has a definite bed and banks or shoreline, in or into which surface or groundwater flows, either perennially or intermittently.
- M. CHANNEL MODIFICATION: Alteration of a channel by changing the physical dimensions or materials of its bed or banks. Channel modification includes damming, rip-rapping (or other armoring), widening, deepening, straightening, relocating, lining and significant removal of native vegetation from the bottom or banks. Channel modification does not include the clearing of dead or dying vegetation, debris, or trash from the channel. Channelization is a severe form of channel modification involving a significant change in the channel cross-section and typically involving relocation of the existing channel (e.g. straightening).

- N. COMPENSATORY STORAGE: An artificially excavated, hydraulically equivalent volume of storage within the SFHA used to balance the loss of natural flood storage capacity when artificial fill or structures are placed within the floodplain. The uncompensated loss of natural floodplain storage can increase off-site floodwater elevations and flows.
- O. CONDITIONAL APPROVAL OF A DESIGNATED FLOODWAY MAP CHANGE: Preconstruction approval by IDNR/OWR and FEMA of a proposed change to the floodway map. This preconstruction approval, pursuant to this Part, gives assurances to the property owner that once an Appropriate Use is constructed according to permitted plans, the floodway map can be changed, as previously agreed, upon review and acceptance of as-built plans.
- P. CONDITIONAL LETTER OF MAP REVISION (CLOMR): A letter which indicates that FEMA will revise base flood elevations, flood insurance rate zones, flood boundaries or floodway as shown on an effective Flood Hazard Boundary Map or Flood Insurance Rate Map, once the as-built plans are submitted and approved.
- Q. CONTROL STRUCTURE: A structure designed to control the rate of flow that passes through the structure, given a specific upstream and downstream water surface elevation.
- R. CRITICAL FACILITY: Any facility which is critical to the health and welfare of the population and, if flooded, would create an added dimension to the disaster. Damage to these critical facilities can impact the delivery of vital services, can cause greater damage to other sectors of the community, or can put special populations at risk. Examples of critical facilities where flood protection should be required include: emergency services facilities (such as fire and police stations), schools, hospitals, retirement homes and senior care facilities, major roads and bridges, critical utility sites (telephone switching stations or electrical transformers), and hazardous material storage facilities (chemicals, petrochemicals, hazardous or toxic substances). Examples of critical facilities where flood protection is recommended include: sewage treatment plants, water treatment plants, and pumping stations.
- S. DAM: All obstructions, wall embankments or barriers, together with their abutments and appurtenant works, if any, constructed for the purpose of storing or diverting water or creating a pool. Dams may also include weirs, restrictive culverts or impoundment structures. Underground water storage tanks are not included.
- T. DESIGNATED FLOODWAY: The channel, including on-stream lakes, and that portion of the floodplain adjacent to a stream or watercourse,

generally depicted on the FEMA FIRM map, which is needed to store and convey the existing 100-year frequency flood discharge with no more than a 0.1 foot increase in stage due to the loss of flood conveyance or storage, and no more than a 10 percent increase in velocities.

- 1) The floodways are designated for on the countywide Flood Insurance Rate Map of Cook County prepared by FEMA and dated August 19, 2008. When two floodway maps exist for a waterway, the more restrictive floodway limit shall prevail.
- 2) The floodways for those parts of unincorporated Cook County that are within the extraterritorial jurisdiction of the City that may be annexed into the City are designated for southwest branch of the Calumet Union Drainage Ditch and tributaries north and south on the countywide Flood Insurance Rate Map prepared by FEMA and dated August 19, 2008 .
- 3) To locate the designated floodway boundary on any site, the designated floodway boundary should be scaled off the designated floodway map and located on a site plan, using reference marks common to both maps. Where interpretation is needed to determine the exact location of the designated floodway boundary, IDNR/OWR should be contacted for the interpretation.

U. DETENTION BASIN: A man-made structure for the temporary storage of stormwater runoff with controlled release during and immediately following a storm.

V. DEVELOPMENT: Any man-made change to real estate, including:

- 1) Construction, reconstruction, repair, or placement of a building or any addition to a building.
- 2) Installing a manufactured home on a site, preparing a site for a manufactured home, or installing a travel trailer or recreational vehicle on a site for more than 180 days. If the travel trailer or recreational vehicle is on site for more than 180 days, it must be fully licensed and ready for highway use.
- 3) Drilling, mining, installing utilities, construction of roads, bridges, or similar projects.
- 4) Demolition of a structure or redevelopment of a site.
- 5) Clearing of land as an adjunct of construction
- 6) Construction or erection of levees, walls, fences, dams, or culverts;

channel modification; filling, dredging, grading, excavating, paving, or other non-agricultural alterations of the ground surface; storage of materials; deposit of solid or liquid waste;

- 7) Any other activity of man that might change the direction, height, or velocity of flood or surface water, including extensive vegetation removal;
- 8) Substantial improvement of an existing building.

Development does not include routine maintenance of existing buildings and facilities such as re-roofing or re-surfacing of roads when there is no increase in elevation, or gardening, plowing, and similar agricultural practices that do not involve filling, grading, or construction of levees.

- W. ELEVATION CERTIFICATES: A form published by fema that is used to certify the elevation to which a building has been elevated.
- X. EMERGENCY OVERFLOW: The structure in a detention or retention basin designed to protect the basin in the event of a malfunction of the primary outlet or a storm event greater than the basin design storm.
- Y. EROSION: The general process whereby soils are moved by flowing water or wave action.
- Z. EXCAVATION: Any act by which organic matter, earth, sand, gravel, rock or any similar material is cut into, dug, quarried, uncovered, removed, displaced, relocated or bulldozed. The term shall include the conditions resulting therefrom.
- AA. EXCEPTIONAL FUNCTIONAL VALUE WETLAND: Any wetland that either (1) meets the Illinois Natural Area Inventory's definition for determining exceptional functional value or (2) is located in an Illinois Natural Area inventory site.
- BB. EXEMPT ORGANIZATIONS: Organizations which are exempt from this Ordinance per Illinois Compiled Statutes (ILCS) including state, federal or local units of government.
- CC. EXISTING GRADE: The vertical location of the existing ground surface prior to excavation or filling.
- DD. EXISTING MANUFACTURED HOME PARK OR SUBDIVISION: A manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the

construction of streets, and either final site grading or the pouring of concrete pads) has been completed before April 1, 1990.

- EE. EXPANSION TO AN EXISTING MANUFACTURED HOME PARK OR SUBDIVISION: The preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).
- FF. FEMA: Federal Emergency Management Agency and its regulations at 44 CFR 59-79, as amended.
- GG. FLOOD: A general and temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waves, or the unusual and rapid accumulation or runoff of surface waters from any source.
- HH. FLOOD FREQUENCY: A period of years, based on a statistical analysis, during which a flood of a stated magnitude may be expected to be equaled or exceeded.
- II. FLOOD FRINGE: That portion of the floodplain outside of the designated floodway. See commentary on “designated floodway”.
- JJ. FLOOD INSURANCE RATE MAPS (FIRM): A map prepared by FEMA that depicts the Special Flood Hazard Area (SFHA) within a community. This map includes insurance rate zones and floodplains and may or may not depict floodways.
- KK. FLOOD INSURANCE STUDY: An examination, evaluation and determination of flood hazards and if appropriate, corresponding water surface elevations.
- LL. FLOODPLAIN: That land typically adjacent to a body of water with ground surface elevations at or below the base flood or the 100-year frequency flood elevation. Floodplains may also include detached Special Flood Hazard Areas, ponding areas, etc. The floodplain is also known as the Special Flood Hazard Area (SFHA).
 - 1) The floodplains are those lands within the jurisdiction of the City that are subject to inundation by the base flood or 100-year frequency flood. The SFHAs of the City are generally identified as such on panel number(s) 17031C0707J, 17031C0709J, 17031C0717J, 17031C0719J, 17031C0738J, and 17031C0739J of the countywide Flood Insurance Rate Map of the City prepared by

the Federal Emergency Management Agency and dated August 19, 2008.

- 2) The SFHAs of those parts of unincorporated Cook County that are within the extraterritorial jurisdiction of the City or that may be annexed into the City are generally identified as such on panel numbers(s) 17031C0707J, 17031C0709J, 17031C0717J, 17031C0719J, 17031C0738J, and 17031C0739J of the countywide Flood Insurance Rate Map prepared for Cook County by the Federal Emergency Management Agency) and dated August 19, 2008.

MM. FLOODPROOFING: Any combination of structural and non-structural additions, changes or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

NN. FLOODPROOFING CERTIFICATE: A form published by FEMA that is used to certify that a building has been designed and constructed to be structurally dry floodproofed to the flood protection elevation.

OO. FLOOD PROTECTION ELEVATION (FPE): The elevation of the base flood or 100-year frequency floods plus one foot of freeboard at any given location in the SFHA.

PP. FLOODWAY: See 3.20 Designated Floodway.

QQ. HISTORIC STRUCTURE: Any structure that is:

- 1) Listed individually in the National Register of Historic Places or preliminary determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- 2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historic district or a district preliminary determined by the Secretary to qualify as a registered historic district;
- 3) Individually listed on the State inventory of historic places by the Illinois Historic Preservation Agency;
- 4) Individually listed on a local inventory of historic places that has been certified by the Illinois Historic Preservation Agency.

RR. HYDROLOGIC AND HYDRAULIC CALCULATIONS: Engineering analysis which determine expected flood flows and flood elevations based on land characteristics and rainfall events.

- SS. IDNR/OWR: Illinois Department of Natural Resources, Office of Water Resources.
- TT. LETTER OF MAP AMENDMENT (LOMA): Official determination by FEMA that a specific structure is not in a 100-year floodplain; amends the FIRM.
- UU. LETTER OF MAP REVISION (LOMR): Letter that revises base flood or 100-year frequency flood elevations, floodplains or floodways as shown on an effective FIRM.
- VV. LEVEL 1 DEVELOPMENT: A development project that meets any of the following criteria:
- 1) Is a single family residential development on 10 acres or more,
 - 2) Is a multi-family or non-residential development on 3 acres or more, or
 - 3) Disturbs more than 20,000 square feet of land area.
- WW. LEVEL 2 DEVELOPMENT: A development project which does not qualify as a Level 1 development but meets any of the following criteria:
- 1) Has one or more new dwelling units,
 - 2) Has more than one existing dwelling unit,
 - 3) Has more than one platted lot,
 - 4) Will be used for development other than residential, commercial, public purpose, or
 - 5) Disturbs more than 10,000 square feet of land area or adds an additional 1,000 square feet of new impervious area.
- XX. LEVEL 3 DEVELOPMENT: A development project that does not meet the criteria for the definition of Level 2 development.
- YY. LOWEST FLOOR: The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure usable solely for parking of vehicles, building access or storage, in an area other than a basement area is not considered a buildings lowest floor; provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this ordinance.
- ZZ. MAJOR DRAINAGE SYSTEM: That portion of a drainage system

needed to store and convey flows beyond the capacity of the minor drainage system.

- AAA. MANUFACTURED HOME: A structure, transportable in one or more sections, which is built on a permanent chassis and is designated for use with or without a permanent foundation when attached to the required utilities. The term “manufactured home” also includes park trailers, travel trailers and other similar vehicles placed on site for more than 180 consecutive days. The term “manufactured home” does not include a “recreational vehicle”.
- BBB. MANUFACTURED HOME PARK OR SUBDIVISION: A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.
- CCC. MINOR DRAINAGE SYSTEM: That portion of a drainage system designed to safely convey the 10-year runoff event or less. It includes street gutters, storm sewers, small open channels and swales.
- DDD. MITIGATION: Mitigation includes those measures necessary to minimize the negative effects which floodplain development activities might have on the public health, safety and welfare. Examples of mitigation include: excavation of compensatory storage, soil erosion and sedimentation control, and channel restoration. Mitigation may also include those activities taken to reduce a structure’s susceptibility to flooding.
- EEE. NEW CONSTRUCTION: New construction means structures for which the start of construction commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.
- FFF. NEW MANUFACTURED HOME PARK OR SUBDIVISION: Manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) has been completed on or after April 1, 1990.
- GGG. NAVD 88: National American Vertical Datum of 1988. NAVD 88 supersedes the National Geodetic Vertical Datum of 1929 (NGVD).
- HHH. NATURAL: When used in reference to channels means those channels formed by the existing surface topography of the earth prior to changes made by man. A natural stream tends to follow a meandering path; its floodplain is not constrained by levees; the area near the bank has not been cleared, mowed or cultivated; the stream flows over soil and geologic

materials typical of the area with no substantial alteration of the course or cross-section of the stream caused by filling or excavating. A modified channel may regain some natural characteristics over time as the channel meanders and vegetation is re-established. Similarly, a modified channel may be restored to more natural conditions by man through regarding and revegetation.

- III. ORDINARY HIGH WATER MARK (OHWM): The point on the bank or shore up to which the presence and action of surface water is so continuous so as to leave a distinctive mark such as by erosion, destruction or prevention of terrestrial vegetation, predominance of aquatic vegetation or other easily recognized characteristics.
- JJJ. OVERLAND FLOW PATH: An area of land which conveys stormwater for all events up to and including the base flood event. The overland flow path can be determined using topographic information and shall take into account all on-site and off-site tributary areas.
- KKK. PUBLIC FLOOD CONTROL PROJECT: A flood control project which will be operated and maintained by a public agency to reduce flood damages to existing buildings and structures, including a hydrologic and hydraulic study of the existing and proposed conditions of the watershed. Nothing in this definition shall preclude the design, engineering, construction or financing, in whole or in part, of a flood control project by persons or parties who are not public agencies.
- LLL. PUBLIC BODIES OF WATERS: All open public streams and lakes capable of being navigated by watercraft, in whole or in part, for commercial uses and purposes, and all lakes, rivers, and streams which in their natural condition were capable of being improved and made navigable, or that are connected with or discharge their waters into navigable lakes or rivers within, or upon the borders of the State of Illinois, together with all bayous, sloughs, backwaters, and submerged lands that are open to the main channel or body of water directly accessible thereto.
- MMM. RECREATIONAL VEHICLE OR TRAVEL TRAILER: A vehicle which is:
- 1) Built on a single chassis;
 - 2) 400 square feet or less when measured at the largest horizontal projection;
 - 3) Designed to be self-propelled or permanently towable by a light duty truck; and

- 4) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

- NNN. REGIONAL PERMITS: Regional permits are offered for pre-approved projects which are considered minor projects that are permissible per IDNR/OWR Part 3708 rules for Northeastern Illinois regulatory floodways. A complete listing of the terms and conditions for specific project types can be obtained from the IDNR/OWR website.
- OOO. REGISTERED LAND SURVEYOR: A land surveyor registered in the State of Illinois, under The Illinois Land Surveyors Act. (225 ILCS 330/1, et seq.)
- PPP. REGISTERED OR LICENSED PROFESSIONAL ENGINEER: An engineer registered in the State of Illinois, under The Illinois Professional Engineering Practice Act. (225 ILCS 325/1 et seq.)
- QQQ. REPAIR, REMODELING OR MAINTENANCE: Development activities which do not result in any increases in the outside dimensions of a building or any changes to the dimensions of a structure.
- RRR. REPETITIVE LOSS: Flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25 percent of the market value of the structure before the damaged occurred.
- SSS. RETENTION/DETENTION FACILITY: A retention facility stores stormwater runoff without a gravity release. A detention facility provides for storage of stormwater runoff and controlled release of this runoff during and after a flood or storm.
- TTT. RIVERINE: Related to a river, creek, intermittent stream, ditch, or any other identified channel. This term does not include areas subject to flooding from lakes, ponding areas, or areas of sheet flow.
- UUU. RIVERINE SFHA: Any SFHA subject to flooding from a river, creek, intermittent stream, ditch, on-stream lake system or any other identified channel. This term does not include areas subject to flooding from lakes, ponding areas, areas of sheet flow, or other areas not subject to overbank flooding.
- VVV. RUNOFF: The water derived from melting snow or rain falling on the land surface, flowing over the surface of the ground or collected in channels or conduits.

WWW. SEDIMENTATION: The processes that deposit soils, debris, and other materials either on other ground surfaces or in bodies of water or watercourses.

XXX. SPECIAL FLOOD HAZARD AREA (SFHA): See 3.38 "Floodplain".

YYY. START OF CONSTRUCTION: Includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or placement of a manufactured home on a foundation.

ZZZ. STATEWIDE PERMITS: Statewide permits are offered for pre-approved projects that are considered minor projects which are permissible per the IDNR/OWR Part 3700 rules. A complete listing of the statewide permits and permit requirements can be obtained from the IDNR/OWR website.

AAAA. STRUCTURE: See 3.10 "Building".

BBBB. SUBSTANTIAL DAMAGE: Damage of any origin sustained by a structure whereby the cumulative percentage of damage equals or exceeds 50 percent of the market value of the structure before the damage occurred regardless of actual repair work performed. Volunteer labor and materials must be included in this determination. The term includes Repetitive Loss Buildings See 3.70 "Repetitive Loss".

CCCC. SUBSTANTIAL IMPROVEMENT: Any reconstruction, rehabilitation, addition, or improvement of a structure taking place in which the cumulative percentage of improvements equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started.

- 1) "Substantial Improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the building. This term includes structures which have incurred repetitive loss or substantial damage, regardless of the actual work done.
- 2) The term does not, however, include either:
 - a. any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code

specifications which are solely necessary to assure safe living conditions, or

- b. any alteration of a “historic structure” listed on the National Register of Historic Places or the Illinois Register of Historic Places, provided that the alteration will not preclude the structure’s continued designation as a historic structure.

DDDD. TRANSITION SECTION: Reaches of the stream or floodway where water flows from a narrow cross-section to a wide cross-section or vice versa.

EEEE. VIOLATION: The failure of a structure or other development to be fully compliant with the community’s floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance is presumed to be in violation until such time as that documentation is provided.

FFFF. WATERSHED: The land area above a give point on a channel that contributes stormwater to that point.

GGGG. WATERS OF THE UNITED STATES: Those waters under the authority of the Corps of Engineers under the Clean Water Act and defined in 33 CFR Part 328, as amended. This includes most lakes, rivers, streams, ponds and wetlands.

HHHH. WETLAND: A subset of the Waters of the United States. A wetland is land that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, under normal conditions, a prevalence of vegetation adapted for life in saturated soil conditions (known as hydrophytic vegetation). A wetland is identified based upon three attributes: 1) hydrology, 2) soils and 3) vegetation as mandated by the Federal wetland determination methodology.

IIII. WETLAND IMPACT: Any development activity within the boundary of a delineated wetland. Final determination of wetland impact is performed by the U.S. Environmental Protection Agency and the U.S. Corps of Engineers based on 33 CFR Part 230 – Section 404(b)(1) and 33 CFR Parts 320 through 330, as amended.

16.1.04.

PERMIT PROCEDURES

A. Site Development Permit Required.

- 1) No person, firm, corporation or governmental agency shall commence any development regulated by this Ordinance on any

lot or parcel of land without first obtaining a Site Development Permit from the Building Commissioner.

- 2) A permit shall be issued if the proposed development meets the requirements of this Ordinance.
- 3) No development site shall be occupied, no certificate of occupancy shall be issued, and no subdivision or other development shall be accepted by the City Council unless and until all provisions of this Ordinance are met, including the issuance of a final Letter of Map Revision, where appropriate.

B. Grandfathering

- 1) Development projects that have been approved or permitted prior to the effective date of this ordinance are exempt from this ordinance providing the stormwater management facilities and flood protection measures are installed, functioning and in compliance with all applicable stormwater and floodplain regulations in effect at the time of approval or permit.
- 2) If a previously developed site is redeveloped or modified so that the amount of impervious surface or the amount of stormwater runoff will increase, then the redevelopment or modification project shall comply with the provisions of this ordinance.
- 3) Improvements, modifications, additions and repairs to an existing building in the Special Flood Hazard Area shall meet the requirements of this Ordinance.

C. Contiguous Property

- 1) In order to preclude inappropriate phasing of developments to circumvent the intent of this Ordinance, when a proposed development activity will occur on a lot or parcel of land that has continuous lots or parcels of lands owned by the same property owner, then the criteria as defined in this section will be applied to the total land area compiled from aggregate ownership parcels.
- 2) The determination of Level 1, 2 or 3 development will be based on the total area of all of the contiguous parcels under the same ownership.

D. Other Permits

- 1) The permit applicant shall be responsible for:

- a. Obtaining all other federal, state, and local permits, approvals or permit-not-required letters that may be required for this type of activity, and
 - b. Providing copies of the permits, approvals and letters to the Building Commissioner.
- 2) The Building Commissioner shall not issue a Site Development Permit unless all other federal, state, and local permits have been obtained.
 - 3) The Building Commissioner is responsible for obtaining and maintaining copies of all other required federal, state, and local permits.

E. Conditional Approval

- 1) The Building Commissioner may issue a letter of conditional approval of
 - a. the regulatory floodplain and regulatory floodway delineation, overland flow path, wetland delineation, runoff volume reduction hierarchy, and/or detention and bypass computations for a development and/or
 - b. parts of the development project that comply with local requirements. A letter of conditional approval shall not be issued for those parts of the project that are awaiting state or federal approval.
- 2) A conditional approval to alter the floodway delineation shall not be granted until a CLOMR has been issued by FEMA.
- 3) A conditional approval will be based on conformance with the performance standards, and the submittal of the appropriate application requirements.
- 4) The letter of conditional approval will state the conditions placed on the permit applicant. Variation from these conditions is considered a violation of the provisions of this ordinance.
- 5) Before the issuance of a letter of conditional approval, the permit applicant shall sign a statement that he or she understands that:
 - a. the project has not been granted a final site development permit,

- b. the final site development permit may require changes to the plans, and
- c. the applicant proceeds at his or her own risk pending issuance of the final permit.

F. Timing of Work

- 1) Stormwater management facilities shall be functional before building permits are issued.
- 2) Foundation only permits may be issued for non-residential developments prior to completion of the stormwater systems.
- 3) Soil erosion and sediment control measures shall be functional before general construction begins.
- 4) Where development of a site is to proceed in phases, the timing requirements shall apply to each phase.

G. Application Review

- 1) The Building Commissioner shall approve, deny, or identify what needs to be changed in an application within 60 days.
- 2) If an application is incomplete or otherwise needs to be revised, the amended permit applications shall be reviewed within 60 days of receipt.

H. Permit Termination.

A permit shall be terminated for any of the following causes:

- 1) Noncompliance with any condition of the permit;
- 2) The permittee's failure to disclose fully all relevant facts in the application process or the permittee's misrepresentation of any relevant facts at any time; or
- 3) If the authorized work is not commenced within 180 days after issuance of the permit or, if the authorized works is suspended or abandoned, for a period of 180 days after the time of commencing the work, unless an extension has been granted in writing by the Building Commissioner. The extension should be requested of the Building Commissioner, in writing no sooner than 90 days prior to the termination of the permit.

16.1.05.

PERMIT MATERIALS

A. All Development. Application for a development permit shall be made on a form provided by the Building Commissioner. All applications for a Site Development Permit shall include the following:

- 1) Name and address of applicant;
- 2) Address and legal description of the property
- 3) Site location of the property, drawn to scale, showing
 - a. If the project is in the SFHA and
 - b. If the project is in an incorporated or unincorporated area;
- 4) Description of the proposed activity;
- 5) Statement of purpose of the proposed activity;
- 6) Anticipated dates of initiation and completion of activity;
- 7) Name and mailing address of the owner of the subject property if different from the applicant;
- 8) Plans of the proposed activity, drawn to scale, showing:
 - a. Graphic or numerical scale;
 - b. North arrow;
 - c. Property lines and dimensions;
 - d. Location and dimensions of easements;
 - e. Location and names of roads in the vicinity;
 - f. Location and names of waterways in the vicinity; and
 - g. Location and dimensions of all buildings.
- 9) Acknowledgement by the applicant that representatives of any federal, state or local unit of government with regulatory authority over the project are authorized to enter upon the property to inspect the development.
- 10) Signature of the applicant or the applicant's agent;
 - a. If the applicant is a corporation, the president or other

authorized officer shall sign the application form;

- b. If the applicant is a partnership, each partner shall sign the application form; and
- c. If the applicant is a land trust, the trust officer shall sign the name of the trustee by him (her) as trust officer. A disclosure affidavit shall be filed with the application, identifying each beneficiary of the trust by name and address and defining the respective interests therein.

B. Level 2 Development Application Materials. In addition to the materials required under Section 5.1, an application for a Level 2 development project shall also include:

- 1) A topographic survey of the property at one foot contour intervals keyed to the National Geodetic Vertical Datum 1929, adjusted. The survey shall show:
 - a. Existing terrain;
 - b. Proposed conditions; and
 - c. Adjacent areas necessary to determine off-site impacts to the proposed drainage plan.
 - d. If the development project does not involve regrading the site, then the elevations of the top of foundation, the corners of the lot and representation spots on the lot lines and within the lot may be submitted in lieu of a topographic survey.
- 2) A narrative describing the existing and proposed stormwater management system, including all discharge points, collection, conveyance and stormwater storage facilities.
- 3) A drainage system map including, but not limited to the following:
 - a. Sub-watershed boundaries and the property's location within the larger watershed.
 - b. Location of all existing drainage features, such as streams, lakes, wetlands and field tiles;
 - c. Proposed drainage system including but not limited to storm sewers, overland flow paths, detention facilities and roads;

- d. Proposed post-development terrain at one foot contour intervals;
 - e. Soil classifications; and
 - f. Proposed buffer areas.
- 4) Copy of all stormwater calculations, sealed by a Licensed Professional Engineer, including but not limited to, detention basin sizing, storm sewer sizing and overland flow path design.
 - 5) Copy of the proposed plat or deed restrictions for all stormwater management features.
 - 6) Copy of the draft operation and maintenance procedures for all stormwater management features.
 - 7) Copy of any wetland submittal to the US Army Corps of Engineers, at letter from the Corps stating a permit is not required, or a letter from a qualified person stating no Corps of Engineers permits are required.
 - 8) Subdivisions, annexation agreements, plats, re-plats, manufactured home parks and PUDs shall include a signed statement by a Licensed Professional Engineer that accounts for changes in the drainage of surface waters in accordance with the Plat Act (765 ILCS 205/2)
 - 9) Copy of the erosion and sediment control plan.
- C. Level 1 Development Application Materials. In addition to the materials required under Section 5.1 and 5.2 for Level 2 development applications, an application for a Level 1 development project shall also include:
- 1) Calculations and a plan defining the flood levels and flow areas through the development for the runoff from the 100-year storm;
 - 2) Cross-section data for open channel flow paths and designated overland flow paths;
 - 3) Flow rates and velocities at representative points in the drainage system;
 - 4) A statement by the design engineer of the drainage system's provisions for handling events greater than the 100-year runoff.
- D. Level 3 Development Application Materials. An application for a Level 3

development project shall include a plan of the parcel showing pre-development and post-development surface drainage flows.

E. Floodplain Development Application Materials. In addition to the site development application materials of Article 1, Sections 5.1 – 5.3, a permit application for a development project in the SFHA shall include:

- 1) A copy of the designated floodway map, showing:
 - a. The location of the project and property lines in relation to the floodplain and floodway boundaries;
 - b. Any proposed change in the designated floodway location.
- 2) For all proposed buildings, the elevation of the lowest flood (including basement) and lowest adjacent grade shall be shown on the submitted plans.
- 3) Additional base flood elevation and floodway calculations and data that may be needed as identified in other sections of this Ordinance.

F. Plats. Plats or plans for new subdivisions, mobile home parks and Planned United Developments (PUDs) shall include:

- 1) A signed statement by a Licensed Professional Engineer that the plat or plans account for changes in the drainage of surface waters in accordance with 765 ILCS 205/2.
- 2) The delineation of all SFHAs which appear on the plat, signed and sealed by an Illinois Registered Land Surveyor as per the requirements of Public Act 85-267.

G. Records

- 1) The building commissioner shall maintain all permit and inspection records, including copies of elevation and floodproofing certificates. Such records shall be made readily available for a period of up to three years after the project is completed.
- 2) All stormwater management facilities shall be located and described within a deed or a plat restriction.
- 3) All stormwater management facilities shall be located within easements or rights-of-way that explicitly provide for public access for maintenance of such facilities.

- 4) Perpetual operation and maintenance responsibility and emergency access shall be designated on the plat or deed. Stormwater management facilities that service a single parcel (or two parcels) of property may be excused from this requirement upon approval of the Building Commissioner.

16.1.06.

VARIANCES

- A. No variances shall be granted to any development located in a designated floodway as defined in Article 1, Section 3.20.
 - 1) Whenever the standards of this Ordinance place undue hardship on a specific development proposal, the applicant may apply to the Zoning Board of Appeals for a variance.
 - 2) The Zoning Board of Appeals shall review the applicant's request for a variance and shall submit its recommendation to the City Council. The City may attach such conditions to granting of a variance as it deems necessary to further the flood protection intent of this ordinance.
- B. No variance shall be granted unless the applicant demonstrates that all of the following conditions are met:
 - 1) The development activity cannot be located outside the SFHA; and
 - 2) An exceptional hardship would result if the variance were not granted; and
 - 3) The relief requested is the minimum necessary; and
 - 4) There will be no additional threat to public health, safety, beneficial stream uses and functions, especially aquatic habitat, or creation of a nuisance; and
 - 5) There will be no additional public expense for flood protection, lost environmental stream uses and functions, rescue or relief operations, policing, or repairs to streambeds and banks, roads, utilities, or other public facilities; and
 - 6) The provisions of Article 3, Sections 4.2 and 6.2 of this Ordinance shall still be met; and
 - 7) The activity is not in a designated floodway; and
 - 8) The applicant's circumstances are unique and do not establish a pattern inconsistent with the intent of the NFIP; and

- 9) The granting of the variance will not alter the essential character of the area involved including existing stream uses; and
 - 10) All other required state and federal permits or waivers have been obtained
- C. The Zoning Board of Appeals shall notify an applicant in writing that a variance from the requirements of Article 3, Section 7.0 that would lessen the degree of protection to a building will:
- 1) Result in increased premium rates for flood insurance up to amounts as high as \$25 per \$100 of insurance coverage; and
 - 2) Increase the risks to life and property; and
 - 3) Require that the applicant proceed with knowledge of these risks and that the applicant will acknowledge in writing the assumption of the risk and liability.
- D. Variances requested in connection with restoration of a historic site or historic structure as defined in Article 1, Section 3.43 “Historic Structures”, may be granted using criteria more permissive than the requirements of Article 3, Sections 6.2 and 6.3, subject to the conditions that:
- 1) The repair or rehabilitation is the minimum necessary to preserve the historic character and design of the structure; and
 - 2) The repair or rehabilitation will not result in the structure being removed as a certified historic structure.

16.1.07. DISCLAIMER OF LIABILITY

- A. The degree of flood protection required by this Ordinance is considered reasonable for regulatory purposes and is based on available information derived from engineering and scientific methods of study.
- B. Larger floods may occur or flood heights may be increased by man-made or natural causes.
- C. This Ordinance does not imply that development, either inside or outside of the SFHA, will be free from flooding or damage.
- D. This Ordinance does not create liability on the part of the City or any officer or employee thereof for any flood damage that results from reliance on this Ordinance or any administrative decision made lawfully thereunder.

16.1.08.

PENALTY

Failure to comply with the requirements of a permit or conditions of a variance resolution shall be deemed to be a violation of this ordinance. Upon due investigation, the Building Commissioner may determine that a violation of the minimum standards of this Ordinance exists. The Building Commissioner shall notify the owner in writing of such violation.

- A. If such owner fails after ten days notice to correct the violation:
- 1) The City may make application to the Circuit Court for an injunction requiring conformance with this Ordinance or make such other order as the Court.
 - 2) Any person who violates this Ordinance shall, upon conviction thereof, be fined not less than fifty dollars (\$50.00) or more than one-thousand dollars (\$1,000.00) for each offense.
 - 3) A separate offense shall be deemed committed upon each day during or on which a violation occurs or continues.
 - 4) The City shall record a notice of violation on the title to the property.
- B. The Building Commissioner shall inform the owner that any such violation is considered a willful act to increase flood damages and, therefore, may cause coverage by a Standard Flood Insurance Policy to be suspended.
- 1) The Building Commissioner is authorized to issue an order requiring the suspension of the subject development. The stop-work order shall be in writing, shall indicate the reason for the issuance, and shall order the action, if necessary, to resolve the circumstances requiring the stop-work order. The stop-work order constitutes a suspension of the permit.
 - 2) No site development permit shall be permanently suspended or revoked until a hearing is held by the Zoning Board of Appeals. Written notice of such hearing shall be served on the permittee and shall state: (1) the grounds for complaint or reasons for suspension or revocation; and (2) the time and place of the hearing. At such hearing, the permittee shall be given an opportunity to present evidence on his/her behalf. At the conclusion of the hearing, the Zoning Board of Appeals shall determine whether the permit shall be suspended or revoked.
- C. Nothing herein shall prevent the City from taking such other lawful action

to prevent or remedy any violations. All costs connected therewith shall accrue to the person or persons responsible.

16.1.09. ABROGATION AND GREATER RESTRICTIONS

- A. This Ordinance is not intended to repeal, abrogate or impair any existing easements, covenants, or deed restrictions.

- B. Where this Ordinance and other ordinance, easements, covenants, or deed restrictions conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

- C. This Ordinance is intended to repeal the original ordinance or resolution which was adopted to meet the National Flood Insurance Program regulations, but is not intended to repeal the resolution which the City passed in order to establish initial eligibility for the program

16.1.10. SEVERABILITY

The provisions and sections of this Ordinance shall be deemed separable and the invalidity of any portion of this Ordinance shall not affect the validity of the remainder.

ARTICLE 2 - SITE DEVELOPMENT REQUIREMENTS

16.2.01.

GENERAL REQUIREMENTS

- A. **General Requirement.** No development shall adversely affect the flow of surface waters to or from neighboring properties.
- B. **Existing Systems.**
- 1) Stormwater systems shall properly incorporate and be compatible with existing subsurface and surface drainage systems including agricultural systems;
 - 2) All existing drain tiles shall be incorporated into the new storm sewer system.
- C. **Drainage Easements.**
- 1) No obstructions shall be placed in any drainage easement that may block or divert the flow of surface drainage;
 - 2) All fences built in or across a drainage easement shall be either:
 - a. Open to allow the flow of surface water; or
 - b. Have the bottom of the fence at least 6 inches above grade to allow the unobstructed flow of surface water.
- D. **Stormwater Depths.**
- 1) The maximum depth of stormwater or floodwaters on new streets, parking lots, and other paved areas shall be eight inches measured at the gutter.
 - 2) The maximum depth of stormwater in other areas that are not designated drainageways or water bodies, shall be one foot.
- E. **Diversions.** Transfers of waters between watersheds shall be prohibited except when such transfers will not violate the provisions of this Ordinance.
- F. **Best Management Practices.** Developments shall incorporate all best management practices as may be required pursuant to the United States Clean Water Act, as amended.
- G. **Runoff Volume Reduction Hierarchy.**
- 1) An applicant shall choose a strategy to meet the release rate

requirements that minimizes the increase in runoff volumes and rates from the development and improves water quality.

- 2) The applicant shall use appropriate best management practices and the following hierarchy in preparing a drainage plan:
 - a. Preservation of natural resource features of the development site (e.g. floodplains, wetlands, prairies and woodlands);
 - b. Preservation of the existing natural streams, channels and drainage ways;
 - c. Minimizing impervious surfaces created at the site (e.g., narrowing road width, minimizing driveway length and width, clustering homes and shared driveways;
 - d. Design of open vegetated channels to convey stormwater runoff;
 - e. Preservation of the natural infiltration and storage characteristics of the site (e.g., interspersing grass filter strips in areas with impervious cover and installing on-lot bioretention facilities);
 - f. Implementation of structural measures that provide water quality and quantity control, such as constructing wet-bottom versus dry-bottom basins;
 - g. Implementation of structural measures that provide only quantity control and conveyance.

H. Design Rainfall.

- 1) Unless a continuous simulation approach to drainage system hydrology is used, all design rainfall events shall be based on Illinois State Water Survey's Bulletin 70.
- 2) The first quartile point rainfall events shall be used for the design and analysis of conveyance systems with a duration of less than twelve hours.
- 3) The third quartile point rainfall distributions shall be used for the design and analysis of detention basins and conveyance systems with a duration greater than 12 and less than or equal to 24 hours.
- 4) The fourth quartile distribution shall be used in the design and

analysis of systems with durations greater than 24 hours.

- 5) The SCS Type II distribution may be used as an alternative.

I. Design Methods.

- 1) Major conveyance systems for tributary areas up to ten (10) acres may be designed using the rational method. All minor conveyance systems may be designed using the rational method.
- 2) Event hydrograph methods shall be used to calculate design runoff volumes for stormwater storage basins and major conveyance systems with greater than 10 acres of drainage area.
- 3) The following hydrologic design procedures are considered acceptable for generation of hydrographs: Corps of Engineers HEC-1, TR-20, TR-55 subject to rainfall distribution modifications, and continuous simulation models.
- 4) Event methods must use antecedent moisture condition 2.
- 5) The hydrologic model used shall assume that the watershed is either fully urbanized or fully developed according to current zoning Ordinances that have jurisdiction over the area. The model may assume that detention will be construction for new development as required by current Ordinances that have jurisdiction over the area.
- 6) Payment of the fee does not relieve the development from meeting all pertinent floodplain development requirements of Part 3 of this Ordinance.

16.2.02. STORMWATER STORAGE

A. Release Rates.

- 1) No level 1 or 2 development shall allow the stormwater runoff to leave the development site at a rate greater than the peak runoff from the site under the conditions that exist when the permit is applied for.
- 2) The drainage system for a property shall be designed to control the peak rate of discharge from the property for the two-year, 24-hour and 100-year, 24-hour events.
- 3) The peak discharge for events less than or equal to the two-year event shall not be greater than 0.04 cfs per acre of property drained. The peak 100-year discharge shall not be greater than 0.15

cfs per acre of property drained.

- 4) Upon approval of the Building Commissioner, storage volume calculations for Level 2 developments may be based on the development's percentage of impervious area, using the calculations in Detention Volume versus Impervious Area, (South Suburban Mayors and Managers Association, May, 2000).

B. Emergency Overflow.

- 1) All stormwater infiltration, retention and detention facilities shall be provided with an emergency overflow structure capable of passing the 100-year peak flow inflow rate with out damage to buildings or property.
- 2) The overflow shall be established at the 100-year highwater elevation.
- 3) The remainder of the basin shall have at least one foot of freeboard.

C. Outlet Design.

- 1) Single pipe outlets shall have a minimum inside diameter on 12 inches.
- 2) If design release rates call for a smaller outlet, a design that minimizes the possibility of clogging, such as a perforated riser, shall be used.
- 3) The minimum outlet restrictor size shall be four (4) inches in diameter provided there is adequate downstream capacity.
- 4) All outlets shall be "gravity only" unless otherwise approved by the Building Commissioner.
- 5) Backwater on the outlet structure from the downstream drainage system shall be evaluated when designing the outlet.

D. Dam Construction. If the construction of a storage basin involves the construction, modification or removal of a dam or in-stream impoundment structure, as defined in 17 IL Adm. Code 3702 (Rules for Construction of Dams), the applicant shall obtain an Illinois Division of Water Resources Dam Safety Permit or letter stating no permit is required prior to the start of work.

E. Off-site Flow. Stotmwater infiltration, retention and detention facilities

required to meet a development's discharge requirements shall be designed to by-pass off-site tributary flow from streams and channels unless approved by the Building Commissioner.

F. Depressional Storage.

- 1) The function of existing on-site depressional storage shall be preserved independently of required detention.
- 2) When depressional storage is removed it must be compensated for by an on-site runoff storage facility at a 1 to 1 ratio. This requirement is in addition to the site runoff storage requirements of this Ordinance.

G. Storage Basins. Detention and retention basins shall be designed with the following guidelines:

- 1) Provisions for all basins:
 - a. The facility shall incorporate either open water or wetland features to improve water quality;
 - b. The facility shall be designed to remove stormwater pollutants;
 - c. To the extent feasible, the distance between detention inlets and outlets shall be maximized. Where possible, they should be at opposite ends of the basin;
 - d. The dry portions of the facility may be made available for recreational use.
- 2) Provisions for areas with open water:
 - a. The water shall be at least three feet deep, excluding nearshore banks and safety ledges. If fish habitat is to be provided, at least twenty-five percent of the bottom area shall be ten feet deep to prevent winter freeze-out;
 - b. The side slopes shall be no steeper than 5 to 1 (horizontal to vertical);
 - c. The permanent pool volume at normal depth shall be equal to the runoff volume from its watershed for the 2-year storm. If this can not be achieved, the bottom shall be underdrained or wetland plantings shall be used;

- d. Shoreline protection shall be provided to prevent erosion. Native vegetation is the preferred landscaping material;
- e. Facilities shall be available, if possible, to allow the pond level to be lowered by gravity flow for cleaning purposes and shoreline maintenance;
- f. Aeration facilities may be required to prevent pond stagnation. Agreements for the perpetual operation and maintenance of aeration facilities shall be prepared to the satisfaction of the Building Commissioner.

3) Provisions where wetland features are used:

- a. The design criteria, vegetation selection, performance criteria, and maintenance and monitoring guidelines in Naturalized Stormwater Management Facilities (South Suburban Mayors and Managers Association, May, 2000) shall be followed;
- b. Sediment basins should be provided at all major inlets to the facility. The volume of the basins should be at least 500 cubic feet per acre of impervious surface in the drainage area. Side slopes below one foot of depth should be no steeper than 3 to 1 (horizontal to vertical) and basin depth should be at least 3 feet and designed to allow access for sediment removal equipment;
- c. There should be no low flow bypass between the inlet and outlet. Paved low flow channels shall not be used.

4) Provisions for shoreline zones:

- a. The “shoreline zone” is that area between one foot above normal pool stage and one foot below normal pool stage;
- b. The side slope in the shoreline zone shall not be steeper than 10 to 1 (horizontal to vertical);
- c. Appropriate soil conditions shall be provided in the shoreline zone:
 - i. Compaction of both subsoil and topsoil shall be minimized (i.e., to less than 275 psi).
 - ii. Where subsoil compaction cannot be avoided, it should be disked to a depth of 6 - 8 inches with a

chisel plow before spreading topsoil.

- iii. A suitable uncompacted topsoil, at a minimum thickness of one foot, shall be spread to provide a suitable growing medium for aquatic plants. Coarse soils with minimal clay content and a high organic content are recommended.
- d. Water tolerant, preferably native, vegetation shall be used to landscape the shoreline zone:
 - i. The selected plants and planting methods shall conform to the soils, hydrology, and water quality conditions present in such facilities, with plants being tolerant of highly variable hydrologic conditions and degraded water quality (e.g., high turbidity and salinity content).
 - ii. Plant selection should conform to the guidance in the *Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois* (MRCS et al, 1998).
- 5) Provisions for areas (other than shoreline zones) that are intended to remain dry:
 - a. The minimum bottom slope for turf shall be two percent (2%). If this can not be achieved, the bottom shall be underdrained or wetland plantings shall be used;
 - b. The side slopes shall be no steeper than 4 to 1 (horizontal to vertical) for all turf areas.

H. Streets, Parking and Underground Storage.

- 1) No storage basin shall be constructed within a distance of 10 feet plus one and half times the depth of any basin to the right-of-way of any public roadway without written permission from Building Commissioner.
- 2) The owner of a parcel being developed adjacent to a state or county road right-of-way shall notify the proper highway authority in writing of the proposed development. The owner shall request that the proper highway authority provide, at the cost of the highway authority or as otherwise provided by law, the amount of additional capacity in any stormwater detention facility to be

constructed in the development for the future availability of the highway authority for meeting stormwater detention requirements of any future public construction on the highway.

- 3) The maximum depth of stormwater storage for paved areas designated for public parking is eight inches.
- 4) Underground storage of stormwater shall be avoided. If used, adequate storm sewer inlets must be provided to pass the 100-year flow into the underground storage.

I. Storage in Floodplains.

- 1) Stormwater retention and detention facilities shall not be constructed in the SFHA unless approved by Building Commissioner.
- 2) If a storage facility is constructed in the SFHA, the volume of detention storage required to meet the standards of this Section shall be in addition to the floodplain compensatory storage required for the development.

J. On-Stream Detention.

- 1) On-Stream detention means an in-stream impoundment or other detention basin that includes construction of a dam or other barrier in an existing channel.
- 2) All on-stream detention shall provide a Detention Volume Safety Factor equal to one plus 0.05 times the ratio of off-site tributary drainage area to on-site tributary drainage area. The maximum Detention Volume Safety Factor shall be 1.5.
- 3) The applicant for a permit to construct an on-stream detention facility shall provide the Building Commissioner with either an IDNR dam safety permit or a letter from IDNR stating that a dam safety permit is not required.
- 4) On-stream detention shall not be allowed if:
 - a. The off-site to on-site tributary drainage area ratio is greater than 10:1, except for developments providing a watershed benefit; or
 - b. The tributary drainage area is greater than 640 acres, except for detention that provides a watershed benefit.

- 5) The release rate shall be the total of the following:
 - a. 0.04 cubic feet per second per acre of the total tributary drainage area (on-site and off-site) at the elevation created by impoundment of the on-site 2-year storm volume plus the Detention Volume Safety Factor;
 - b. 0.15 cubic feet per second per acre of the total tributary drainage area (on-site and off-site) at the elevation created by impoundment of the on-site 100-year storm volume plus the Detention Volume Safety Factor;
 - c. The required compensatory storage;
 - d. The release rate and on-site detention volume shall be calculated using the 24-hour storm event. This release rate calculation shall be used unless other site conditions warrant further analysis and modification from this standard or unless watershed-specific release rates have been adopted.
- 6) On-stream detention shall provide water quality treatment. One of the following two methods shall be used:
 - a. A wet detention facility shall be constructed with a minimum permanent pool volume equal to the calculated sediment volume accumulated over a one-year period for the entire up stream watershed and an average normal water depth of at least four feet. The facility shall also have a live storage volume that meets the standard storage requirements of this Section;
 - b. A separate off-line sediment basin shall be used with a volume appropriate for the tributary drainage area to the sediment basin;
- 7) Impoundment of the stream as part of on-stream detention shall not prevent the migration of indigenous fish species, which require access to upstream areas as part of their life cycle, and shall not cause or contribute to the degradation of water quality or stream aquatic habitat. These fish species may be present or potentially present.
- 8) Compensatory storage requirements shall be satisfied and shall be in addition to detention volume requirements.

- 9) No on-stream detention shall be allowed in areas designated as an exceptional functional value wetland.

16.2.03. STORMWATER CONVEYANCE

A. Capacity.

- 1) Minor Stormwater conveyance systems shall be sized to convey the 10-year runoff.
- 1) Major conveyance systems shall be sized to carry the 100-year runoff.

B. Storm Sewers and Swales.

- 1) The 10-year design storm shall be used as a minimum for storm sewers and minor swales.
 - a. Storm sewers shall contain the 10-year storm within the pipes and manholes.
 - b. Roadside ditches and Swales shall contain the 10-year storm without water encroaching on the pavement.
- 2) Storm sewer design shall be based on full flow conditions; otherwise, hydraulic grade calculations shall be performed that show that the rims are not inundated at the design storm.
- 3) Storm sewers and swales shall not connect to sanitary sewers.

C. Existing Systems.

- 1) Field tile systems disturbed during construction must be reconnected by those responsible for their disturbance unless an approved drainage plan includes provisions for the disturbed system. All abandoned field tiles shall be removed in their entirety.
- 2) Storm sewers and swales may connect to existing drain tiles or storm sewers only if the applicant submits a maintenance agreement, recorded easements and a report that indicates the existing system has adequate hydraulic capacity and structural integrity. The recorded easement and maintenance agreement must extend from the connection to the discharge point in an open channel.

D. Easements.

- 1) All storm sewers and swales shall be located in a public road right-

of-way or maintenance easement.

- 2) The following easement widths shall be used to provide sufficient maintenance access:

Pipe diameter (inches)	Easement width (feet)
Less than 11	10
18 to 36	12
36 to 60	15
Greater than 60	10 feet plus the diameter of the pipe

- 3) The Building Commissioner shall require additional easement widths if the storm sewer depth is greater than average.
- 4) All drainage easements shall be accessible to vehicular equipment; however, vehicles do not have to be able to drive down the entire length of the easement.

E. Erosion Protection.

- 1) All stormwater conveyance systems shall be designed and constructed to withstand the expected velocity of flow from all events up to the base flood without erosion.
- 2) Stabilization adequate to prevent erosion shall be provided at the inlets and outlets for all pipe and channel transitions.

F. Sewer Design.

- 1) The minimum storm sewer shall be 10-inches for the first pipe and 12-inches for subsequent reaches unless approved by the Building Commissioner.
- 2) The minimum design velocity for a storm sewer shall be 2.5 fps. The maximum design velocity for a storm sewer shall be 8.0 fps.
- 3) All flared end sections for 12-inch or larger storm sewers shall have grates to stop people, animals or large debris from entering. The grates shall have openings no larger than 3-inches horizontal to 8-inches vertical.

- G. Streams and Channels. Where an existing stream or channel is proposed as part of the conveyance system for the development's increased runoff, the following requirements shall apply:

- 1) The project shall meet all requirements in Sections 10, 11 and 14 on channel and bank protection.
- 2) Clearing of channel vegetation shall be limited to that which is necessary. A revegetation plan is required using the *Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois*, MRCS, et al. as a minimum standard.
- 3) A minimum maintenance easement of 12 feet from the top of bank is required along one side of all channels draining 20 or more acres.

H. Overland Flow Paths.

- 1) The development must have an overland flow path that will pass the 100-year flood flow without damage to buildings or property.
- 2) If the upstream drainage area is less than 20 acres, the storm sewer pipe and inlet systems sized for the base flood can be constructed in lieu of providing an overland flow path.
- 3) The critical duration 100-year flood flow shall be used to design the overland flow path limits and it shall include all on-site and off-site tributary areas.
- 4) Overland flow paths shall be protected from fencing, landscaping or storage shed placement, which could impair its function. This protection shall be established through an easement, deed or plat restriction as required in 16.1.05 (G).
- 5) All principal buildings on parcels containing or adjoining an overland flow path or other high water level designation shall have a lowest adjacent grade elevation:
 - a. 0.5 feet above the overflow elevation for tributary areas of 20 acres or less.
 - b. 1 foot above the overflow elevation for tributary areas greater than 20 acres.

16.2.04.

EROSION AND SEDIMENT CONTROL

A. General Principles.

- 1) The requirements of this Section shall only affect Level 1 and 2 developments.
- 2) Development should be related to the topography and soils of the

site so as to create the least potential for erosion. Areas of steep slopes, where high cut and fills may be required, should be avoided and natural contours should be followed as closely as possible.

- 3) Natural vegetation should be retained and protected. Clearing of natural ground cover and/or trees within a buffer area as defined in Section 11 should be left undisturbed wherever possible.
- 4) The smallest practical area of land should be exposed at any one time.
- 5) Prior to site clearing and grading, sediment basins or traps, filter barriers, diversions and other appropriate control measures shall be installed.
- 6) Permanent vegetation and structures should be installed and functional as soon as practical during development. Native vegetation is preferred for developments near, or adjacent to high quality natural areas, wetlands and streams.
- 7) Those areas being converted from agricultural purposes to other land uses shall be vegetated with an appropriate protective cover prior to development.
- 8) All waste generated as a result of site development shall be properly disposed of and shall be prevented from being carried off the site by either wind or water.

B. On-site Control Measures. The on-site control measures shall be designed based on the size of the disturbed areas as follows:

- 1) For disturbed areas draining less than one (1) acre, filter barriers (including filter fences, straw bales, or equivalent control measures) shall be constructed to control all off-site runoff as specified in referenced handbooks. Vegetated filter strips, with a minimum width of twenty-five (25) feet may be used as an alternative where runoff in sheet flow is expected;
- 2) For disturbed areas draining more than one (1) acre but less than five (5) acres, a sediment trap or equivalent control measure shall be constructed at the downslope point of the disturbed area in conjunction with other filter barriers;
- 3) For disturbed areas draining more than five (5) acres, a sediment basin or equivalent control measure shall be constructed at the downslope point of the disturbed area in conjunction with other

filter barriers;

- 4) Sediment basin and trap design shall provide for both detention storage and sediment storage. The detention storage shall be for equal volumes of “wet” detention storage and “dry” detention storage. Each shall be sized for the 2-year, 24-hour runoff from the site. The release rate shall be that rate required to achieve a minimum detention time of ten (10) hours. The outlet structure shall be placed such that it only drains the dry detention storage;
- 5) The sediment storage shall be sized to store the estimated sediment load generated from the site over the duration of the construction period with a minimum storage equivalent to the volume of sediment generated in one year. A sediment removal schedule is required for construction periods exceeding one year.

C. Stormwater Conveyance Channels. Stormwater conveyance channels, ditches, swales, and diversions, shall convey a 10-year frequency storm without erosion. All channels shall be stabilized within 48 hours, consistent with the following standards:

- 1) For grades up to 4 percent, seeding in combination with mulch or erosion blankets shall be placed along the channel sides with sod or erosion blanket applied to the bottom;
- 2) For grades of 4 to 8 percent, sod shall be used;
- 3) For grades greater than 8 percent, use rock or rip-rap, or reduce the grade using drop structures.

D. Channel Protection.

- 1) A vegetated buffer strip of at least 25 feet in width shall be preserved and/or re-established, where possible, along existing channels.
- 2) Land disturbance activities in stream channels and construction vehicle use of channels shall be minimized.
- 3) Temporary stream crossings shall be constructed, where necessary, to minimize erosion. Temporary crossings shall be constructed of non-erosive materials such as rip-rap or gravel.
- 4) The temporary stream crossing shall be completely removed and the stream restored to its pre-construction condition within 48 hours after completion of construction, incorporating appropriate

native vegetation. Also see Article 3 Section 16.3.03 Requirements in Floodways.

E. Additional Requirements.

- 1) Storm sewer inlets and culverts shall be protected by sediment traps or filter barriers meeting accepted design standards and specifications.
- 2) If dewatering devices are used, discharge locations shall be protected from erosion. All pumped discharges shall be routed through appropriately designed sediment traps or basins, or equivalent.
- 3) Each site shall have graveled entrance roads, access drives and parking areas of sufficient length and width to prevent sediment from being tracked onto public roadways. Any sediment reaching a public or private road shall be removed by shoveling or street cleaning (not flushing) before the end of each workday and transported to a controlled sediment disposal area.

F. References Adopted.

- 1) Specifications for erosion control measures shall be in accordance with the “Illinois Urban Manual” (1995) or latest edition.
- 2) Sediment and erosion control planning shall be in accordance with “Procedures and Standards for Urban Soil Erosion and Sedimentation Control in Illinois” (revised July, 1988) by the Urban Committee of the Association of Illinois Soil and Water Conservation Districts (the “Green Book”) Chapters 1-5.
- 3) Where the requirements of Sections 10.2 - 10.5 of this Ordinance, the Illinois Urban Manual or the “Green Book” conflict, the more restrictive requirement shall prevail.

G. Plan Requirements. An erosion and sediment control plan shall include the following:

- 1) Proposed sequencing schedule, including dates, for:
 - a. Stripping;
 - b. Installation of temporary on-site control measures and perimeter controls;
 - c. Clearing and grading;

- d. Construction;
 - e. Installation of storm drainage and paving; and
 - f. Final grading, removal of temporary measures and landscaping.
- 2) Location, standard details and design specifics of sediment basins and traps. The design specifics should include outlet details and the drainage area to each measure.
 - 3) Location and description of all control measures, including seeding mixtures and rates, types of sod, method of seedbed preparation, expected seeding dates, kind and quantity of mulching for both temporary and permanent vegetative control measures and types of non-vegetative stabilization measures.
 - 4) Description of dust and traffic control measures and location and specifications for construction entrances.
 - 5) Locations of stockpiles and description of stabilization measures.
 - 6) Volumes, locations and methods of stabilization for off-site fill or borrow.
 - 7) Provisions for maintenance of control measures, including a maintenance schedule.
 - 8) Description of permanent stabilization measures.
 - 9) Identification (name, address and telephone) of the person(s) or entity responsible for maintenance during and after construction.
- H. Extended Construction Shutdown Period. Disturbed areas shall be stabilized with temporary or permanent measures within seven (7) calendar days following the end of active disturbance or redisturbance. The condition of the construction site for the winter shut down period shall address proper sediment and erosion control early in the fall growing season. Stabilization measures include seeding, mulching, sodding or erosion control blankets.
- I. Final Site Stabilization. All temporary control measures shall be disposed of within thirty days after permanent soil stabilization measures have been installed. Trapped sediment and other disturbed soils resulting from the temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.

16.2.05.

STREAM AND WETLAND PROTECTION

A. Buffer Areas Required. Buffer areas shall be required along all streams, lakes, waterways, channels and wetlands, except for the following:

- 1) Roadside ditches,
- 2) Existing excavated stormwater storage facilities,
- 3) Borrow pits and quarries,
- 4) Leveed waterways, and
- 5) Improvements to existing public roads and utilities.

B. Buffer Area Dimensions.

- 1) Linear Buffers. Linear buffers shall be designated along both sides of all streams and natural channels. A minimum buffer of thirty feet on each side of the channel shall be provided.
- 2) Water Body Buffers. Water body buffers shall encompass all lakes, wetlands and other non-linear bodies of water. A minimum buffer of thirty feet on each side of the channel shall be provided.
- 3) Exceptional functional value wetlands shall have a minimum buffer of one hundred (100) feet.
- 4) In areas having state or federal threatened and endangered species present or for Illinois Natural Area Inventory Sites, buffer widths may be modified to meet the terms and conditions specified during consultation with the Illinois Department of Natural Resources or United States Fish and Wildlife Service, pursuant to state and federal laws and regulations.
- 5) The buffer area for all Waters of the United States shall extend from the ordinary highwater mark. The buffer area for wetlands shall extend from the edge of the delineated wetland. A property may contain a buffer area that originates from the Waters of the United States on another property.
- 6) Buffer averaging may be allowed by the Building Commissioner, provided the buffer width is at least half of the buffer width required by this Ordinance or the minimum width required by a Corps of Engineers permit, whichever is wider.

C. Buffer Requirements.

- 1) Features of the stormwater management system may be within the buffer area of a development.
- 2) Access through buffer areas shall be provided, when necessary, for maintenance purposes.
- 3) Preservation of buffer areas shall be provided by deed or plat restriction.

D. Allowed Uses in Buffer Areas.

- 1) All buffer areas shall be maintained free from development except for the following uses:
 - a. Passive recreation, including pedestrian, bicycle or equestrian trails.
 - b. Construction and maintenance of utilities and stormwater facilities.
- 2) Structures and impervious surfaces related to recreational facilities, such as trails and paths, may occupy a maximum of twenty (20) percent of the buffer surface area, provided the runoff from such facilities is diverted away from the Waters of the United States or such runoff is directed to enter the buffer area as unconcentrated flow. Boat docks, boathouses and piers shall be allowed and count as a structure when calculating percent of impervious area.
- 3) Buffer areas hydrologically disturbed by allowing construction or as part of a revegetation plan shall be revegetated using the *Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois*, (NRCS, et al.) as a minimum standard.

E. Channel Protection.

- 1) If the proposed activity involves a channel modification. the permit applicant shall demonstrate that:
 - a. There are no practicable alternatives to the activity, which would accomplish its purpose with less impact to the natural conditions of the body of water affected. Channel modification is acceptable if the purpose is to restore natural conditions and improve water quality and fish and wildlife habitat;
 - b. Water quality, habitat, and other natural functions would be significantly improved by the modification and no

significant habitat area may be destroyed, or the impacts are offset by the replacement of an equivalent degree of natural resource values.

- 2) A channel modification shall be designed and constructed in a way which will minimize its adverse impacts on the natural conditions of the body of water affected. consistent with the following criteria:
 - a. The physical characteristics of the modified channel shall match as closely as possible those of the existing channel in length, cross-section, slope and sinuosity. If the existing channel has been previously modified, restoration of more natural physical conditions should be incorporated into channel modification design;
 - b. Hydraulically effective transitions shall be provided at both the upstream and down stream ends of the project, designed such that they will prevent erosion;
 - c. One-sided construction of a channel shall be used when feasible. Removal of stream side (riparian) vegetation should be limited to one side of the channel, where possible, to preserve the shading and stabilization effects of the vegetation;
 - d. Clearing of stabilizing vegetation shall be limited to that which is essential for construction of the channel;
 - e. Channel banks shall be constructed with a side slope no steeper than 3:1 horizontal to vertical, wherever practicable. Native vegetation and gradual side slopes are the preferred methods for bank stabilization. Where high velocities or sharp bends necessitate the use of alternative stabilization measures, soil bioengineering techniques, natural rock or rip-rap are preferred approaches. Artificial materials such as concrete, gabions, or construction rubble should be avoided unless there are no practicable alternatives;
 - f. All disturbed areas associated with the modification shall be seeded or otherwise stabilized as soon as possible upon completion of construction. Erosion blanket or an equivalent material shall be required to stabilize disturbed channel banks prior to establishment of the vegetative cover;

- g. If the existing channel contains considerable bottom diversity such as deep pools, riffles, and other similar features, such features shall be provided in the new channel. Spawning and nesting areas and flow characteristics compatible with fish habitat shall also be established, where appropriate;
- h. A sediment basin shall be installed at the downstream end of the modification to reduce sedimentation and degradation of downstream water quality;
- i. New or relocated channels should be built in the dry and all items of construction, including vegetation, should be completed prior to diversion of water into the new channel;
- j. There shall be no increases in stage or velocity as the channel enters or leaves the project site for any frequency flood unless necessitated by a public flood control project or unless such an increase is justified as part of a habitat improvement or erosion control project;
- k. Unless the modification is for a public flood control project, there shall be no reduction in the volume of floodwater storage outside the floodway as a result of the modification.
- l. The provisions of Sections 10.4 and 14.5 shall also be met.

F. Dumping.

- 1) No person, firm, corporation or governmental agency shall dispose of or dump grass clippings, brush, fill, trash, debris, or other material that may obstruct the flow or storage of water in any channel, swale, culvert, storm sewer, wetland, storage basin or other natural or man-made watercourse or water body.
- 2) No person, firm, corporation or governmental agency shall dispose of or dump any petroleum products, chemicals, noxious liquids, animal waste or other materials that will pollute the water in any channel, swale, culvert, storm sewer, wetland, storage basin or other natural or man-made watercourse or water body.

ARTICLE 3 - FLOODPLAIN DEVELOPMENT REQUIREMENTS

16.3.01. HOW TO USE THIS ORDINANCE

- A. The Building Commissioner shall be responsible for fulfilling all of the duties listed in Article 3, Section 2.
- B. To fulfill those duties, the Building Commissioner should first use the criteria listed in Article 3, Section 3, Base Flood Elevations, to determine whether the development site is located within a floodplain.
- C. Once it has been determined that a site is located within a floodplain, the Building Commissioner must determine whether the development site is within a flood fringe, a designated floodway, or within a SFHA or floodplain for which no floodway has been identified.
 - 1) If the site is within a flood fringe, the Building Commissioner shall require that the minimum requirements of Article 3, Section 4.0 be met.
 - 2) If the site is within a floodway, the Building Commissioner shall require that the minimum requirements of Article 3, Section 5.0 be met.
 - 3) If the site is located within a SFHA or floodplain for which no detailed study has been completed and approved, the Building Commissioner shall require that the minimum requirements of Article 3, Section 6.0 be met.
- D. In addition, the general requirements of Article 3, Section 7.0 shall be met for all developments meeting the requirements of Article 3, Section 3.0, 4.0, or 5.0.
- E. The Building Commissioner shall assure that all subdivision proposals shall meet the requirements of Article 3, Section 8.0.
- F. If a variance is to be granted for a proposal, the Building Commissioner shall review the requirements of Article 1, Section 6 to make sure they are met. In addition, the Building Commissioner shall complete all notification requirements.
- G. In order to assure that property owners obtain permits as required in this Ordinance, the Building Commissioner may take any and all actions as outlined in Article 1, Section 8.

16.3.02. DUTIES OF THE BUILDING COMMISSIONER

- A. Determining the Floodplain Designation.

- 1) Check all new development sites to determine whether they are in a Special Flood Hazard Area (SFHA).
- 2) If they are in a SFHA, determine whether they are in a floodway, flood fringe or in a floodplain for which a detailed study has not been conducted and which drains more than one (1) square mile.
- 3) Check whether the development is potentially within an extended SFHA (with a drainage area less than one square mile), indicating that the development would have adverse impacts regarding storage, conveyance, or inundation which would be the basis for the applicant being required to delineate the floodplain and floodway and be subject to the remaining Sections of this Ordinance.

B. Professional Engineer Review.

- 1) If the development site is within a floodway or in a floodplain for which a detailed study has not been conducted and which drains more than one square mile, the permit shall be referred to a licensed professional engineer under the employ or contract of the City for review to ensure that the development meets Article 3, Sections 5.0 or 6.0.
- 2) In the case of an Appropriate Use, the P.E. shall state in writing that the development meets the requirements of Article 3, Section 5.0.

C. Dam Safety Requirements.

- 1) Dams are classified as to their size and their hazard/damage potential in the event of failure.
- 2) The construction or major modification of all Class I (high hazard) and Class II (moderate hazard) dams require an IDNR/OWR dam safety permit.
- 3) Some Class III (low hazard) dams require an IDNR/OWR dam safety permit, depending on the drainage area to the dam, the height of the dam and the impounding capacity behind the dam. Most off-channel detention basins that have an embankment are non-jurisdictional Class III dam. It is not required that IDNR/OWR “sign off” on all non-jurisdictional Class III dams.
- 4) A consulting engineer with dam safety knowledge can estimate a hazard classification and determine if an IDNR/OWR dam safety

permit is required.

- 5) A permit application submittal must be made to IDNR/OWR for the construction or major modification of jurisdictional dams.
- 6) Regulated dams may include weirs, restrictive culverts or impoundment structures.

D. Other permit requirements.

- 1) Ensure any and all required federal, state and local permits are received prior to the issuance of a floodplain development permit.

E. Plan Review and Permit Issuance.

- 1) Ensure that all development activities within the SFHAs of the jurisdiction of the City meet the requirements of this Ordinance, and;
- 2) Issue a floodplain development permit in accordance with the provisions of this Ordinance and other regulations of this community when the development meets the conditions of this Ordinance.

F. Inspection Review.

- 1) Inspect all development projects before, during and after construction to assure proper elevation of the structure and to ensure compliance with the provisions of this Ordinance; and
- 2) Schedule on an annual basis an inspection of the floodplain and document the results of the inspection.

G. Damage Determinations.

- 1) Make damage determinations of all damaged buildings in the SFHA after a flood to determine substantially damaged structures which must comply with Article 3, Section 7.4.3.

H. Elevation and Floodproofing Certificates.

Maintain permit files including:

- 1) An Elevation Certificate certifying the elevation of the lowest floor (including basement) of a residential or non-residential building subject to Article 3, Section 7.0 of this Ordinance, and/or;

- 2) The elevation to which a non-residential building has been floodproofed, using a Floodproofing Certificate, for all buildings subject to Article 3, Section 7.0 of this Ordinance.

I. Records for Public Inspection.

- 1) Maintain for public inspection and furnish upon request base flood data, SFHA and designated floodway maps, copies of federal or state permit documents, variance documentation, Conditional Letter of Map Revision, Letter of Map Revision, Letter of Map Amendment and "as-built" elevation and floodproofing and/or elevation certificates for all buildings constructed subject to this Ordinance.

J. State Permits.

Ensure that construction authorization has been granted by IDNR/OWR, for all development projects subject to Article 3, Sections 5.0 and 6.0 of this Ordinance, unless enforcement responsibility has been delegated to the City. However, the following review approvals are not delegated to the City and shall require review or permits from IDNR/OWR:

- 1) Organizations which are exempt from this Ordinance, as per the Illinois Compiled Statutes;
- 2) IDNR/OWR projects, dams or impoundment structures as defined in Article 1, Section 3.19 and all other state, federal or local unit of government projects, including projects of the City and County, except for those projects meeting the requirements of Article 3, Section 5.2.1;
- 3) An engineer's determination that an existing bridge or culvert crossing is not a source of flood damage and the analysis indicating the proposed flood profile, per Article 3, Section 5.2.3 (e);
- 4) An engineer's analysis of the flood profile due to Article 3, Section 5.2.3 (d);
- 5) Alternative transition sections and hydraulically equivalent compensatory storage as indicated in Article 3, Section 5.2.3 (a), (b), and (h);
- 6) Permit issuance of structures within, under, or over publicly navigable rivers, lakes and streams;
- 7) Any changes in the mapped floodway or published flood profiles.

K. Cooperation with Other Agencies

- 1) Cooperate with state and federal floodplain management agencies to improve base flood or 100-year frequency flood and floodway data and to improve the administration of this Ordinance;
- 2) Submit data to IDNR/OWR and FEMA for proposed revisions of a regulatory map within 6 months whenever a modification of the floodplain may change the base flood elevation or result in a change to the floodplain map;
- 3) Submit reports as required for the National Flood Insurance Program; and
- 4) Notify FEMA of any proposed amendments to this Ordinance.

L. Promulgate Regulations.

- 1) Promulgate rules and regulations as necessary to administer and enforce the provisions of this Ordinance, subject however to the review and approval of IDNR/OWR and FEMA for any Ordinance changes.

16.3.03.

BASE FLOOD ELEVATION

This Ordinance's protection standard is based on the Flood Insurance Study for the City.

- (1) If a base flood elevation or 100-year frequency flood elevation is not available for a particular site, then the protection standard shall be according to the best existing data available from federal, state or other sources.
 - (2) When a party disagrees with the best available data, they shall submit a detailed engineering study needed to replace existing data with better data and submit it to IDNR/OWR and FEMA for review and consideration prior to any development of the site.
- A. The base flood or 100-year frequency flood elevation for the SFHAs of the southwest branch of the Calumet Union Drainage Ditch and tributaries north and south shall be as delineated on the 100-year flood profiles in the Flood Insurance Study of (Cook County prepared by FEMA dated August 19, 2008 and such amendments to such study and maps as may be prepared from time to time.
 - B. The base flood or 100-year frequency flood elevation for the SFHAs of those parts of unincorporated Cook County that are within the extraterritorial jurisdiction of the City or that may be annexed into the City

shall be as delineated on the 100-year flood profiles in the Flood Insurance Study of Cook County prepared by FEMA and dated August 19, 2008 and such amendments or revisions to such study and maps as may be prepared from time to time.

- C. The base flood or 100-year frequency flood elevation for each SFHA delineated as an "AH Zone" or "AO Zone" shall be that elevation (or depth) delineated on the countywide Flood Insurance Rate Map of Cook County.
- D. The base flood or 100-year frequency flood elevation for each of the remaining SFHAs delineated as an "A Zone" on the countywide Flood Insurance Rate Map of Cook County shall be according to the best existing data available from federal, state or other sources. Should no other data exist, an engineering study must be financed by the applicant to determine base flood elevations.
 - 1) When no base flood or 100-year frequency flood elevation exists, the base flood or 100-year frequency flood elevation for a riverine SFHA shall be determined from a backwater model, such as HEC-II, HEC-RAS, or a dynamic model such as HIP.
 - 2) The flood flows used in the hydraulic models shall be obtained from a hydrologic model, such as HEC-HMS, HEC-1, TR-20, or HIP, or by techniques presented in various publications prepared by the United States Geological Survey for estimating peak flood discharges.
 - 3) For a non-riverine SFHA, the Base Flood Elevation shall be the historic Flood of Record plus three feet (3), unless calculated by a detailed engineering study.
- E. For an unmapped extended SFHA (with a drainage area less than one square mile) which has been identified by the Building Commissioner pursuant to Article 3, Section 2.1.3, the base flood elevation shall be determined by the applicant utilizing a method as approved in Article 3, Section 3.0.

16.3.04. OCCUPATION AND USE OF FLOOD FRINGE AREAS

Development in and/or filling of the flood fringe will be permitted if protection is provided against the base flood or 100-year frequency flood by proper elevation, and compensatory storage, and other applicable provisions of this Ordinance. No use will be permitted which adversely affects the capacity of drainage facilities or systems. Developments located within the flood fringe shall meet the requirements of this Section, along with the requirements of Article 3, Section 7.0.

A. Development Permit.

- 1) No person, firm, corporation, or governmental body not exempted by law shall commence any development in the SFHA without first obtaining a development permit from the Building Commissioner.
- 2) Application for a development permit shall be made on a form provided by the Building Commissioner.
 - a. The application shall be accompanied by drawings of the site, drawn to scale, showing property line dimensions and legal description for the property and sealed by a licensed engineer, architect or land surveyor; existing grade elevations, using the North American Vertical Datum of 1988, and all changes in grade resulting from excavation or filling; the location and dimensions of all buildings and additions to buildings.
 - b. For all proposed buildings, the elevation of the lowest floor (including basement) and lowest adjacent grade shall be shown on the submitted plans and the development will be subject to the requirements of Article 3, Section 7.0 of this Ordinance.
- 3) Upon receipt of a development permit application, the Building Commissioner shall compare the elevation of the site to the base flood or 100-year frequency flood elevation.
 - a. Any development located on land that can be shown to be higher than the base flood elevation of the current Flood Insurance Rate Map and which has not been filled after the date of the site's first Flood Insurance Rate Map without a permit as required by this ordinance is not in the SFHA and, therefore, not subject to the requirements of this Ordinance. Conversely, any development located on land shown to be below the base flood elevation and hydraulically connected, but shown on the current Flood Insurance Rate Map is subject to the provisions of this ordinance.
 - b. The Building Commissioner shall maintain documentation of the existing ground elevation at the development site and certification that this ground elevation existed prior to the date of the site's first Flood Insurance Rate Map identification.

- 4) A soil erosion and sediment control plan for disturbed areas shall be submitted. This plan shall include a description of the sequence of grading activities and the temporary sediment and erosion control measures to be implemented to mitigate their effects. This plan shall also include a description of final stabilization and revegetation measures, and the identification of a responsible party to ensure post-construction maintenance.
- 5) The Building Commissioner shall be responsible for obtaining from the applicant copies of all other federal, state, and local permits, approvals or waivers that may be required for this type of activity. The Building Commissioner shall not issue a permit unless all other federal, state, and local permits have been obtained.

B. Preventing Increased Damages.

No development in the flood fringe shall create a threat to public health and safety.

- 1) If fill is being used to elevate the site above the base flood or 100-year frequency flood elevation, the applicant shall submit sufficient data and obtain a letter of map revision (LOMR) from FEMA for the purpose of removing the site from the floodplain.
- 2) Compensatory Storage.
 - a. Whenever any portion of a floodplain is authorized for use, the volume of space which will be occupied by the authorized fill or structure below the base flood or 100-year frequency flood elevation shall be compensated for and balanced by a hydraulically equivalent volume of excavation taken from below the base flood or 100-year frequency flood elevation.
 - b. The excavation volume shall be at least equal to 1.25 times the volume of storage lost due to the fill or structure
 - c. In the case of streams and watercourses, such excavation shall be made opposite or adjacent to the areas so filled or occupied.
 - d. All floodplain storage lost below the existing 10-year flood elevation shall be replaced below the proposed 10-year flood elevation at at least a 1:1 ratio. All floodplain storage lost above the existing 10-year flood elevation shall be

replaced above the proposed 10-year flood elevation at at least a 1:1 ratio.

- e. All such excavations shall be constructed to drain freely and openly to the watercourse.

C. Construction of the Lowest Floor Below The Base Flood Elevation (BFE).

A person who has obtained a Letter of Map Revision Based on Fill that removes a site in the flood fringe from the floodplain due to the use of fill to elevate the site above the BFE, may apply for a permit from the City to construct the lowest floor of a residential building below the BFE in the flood fringe. The Building Commissioner shall not issue such a permit unless the applicant has complied with all the criteria set forth in the following subsection.

- 1) Compensatory storage shall be provided per Article 3, Section 4.2.2.
- 2) The elevation of the lowest opening in the basement wall (i.e., window wells, access ways) shall be at or above the Flood Protection Elevation (FPE).
- 3) The lowest adjacent grade to the foundation shall be at or above the FPE, for a minimum distance of ten (10) feet beyond the outside face of the structure. However, if site conditions are such that this requirement cannot be met, the Building Commissioner may waive the ten (10) foot minimum setback if an Illinois Licensed Professional Engineer certifies that an alternative method to protect the building from damage due to hydrostatic pressures has been met. The certifications shall be in the form of a detailed soils and structural design analysis, which shall be submitted to the Building Commissioner for review. The Building Commissioner may require such additional documentation as necessary to prove that the proposed shorter setback distance will keep the structure reasonably safe. In no case shall the setback distance be less than four (4) feet.
- 4) The grade around the perimeter of the structure, measured at a distance of twenty (20) feet from the structure, shall be above the BFE. However, if site conditions are such that this requirement cannot be obtained, the Building Commissioner may waive the twenty (20) foot minimum setback distance if an Illinois Licensed Professional Engineer certifies that an alternative method to protect the building from damages due to hydrostatic pressures have been met. A detailed soils analysis and structural design proving that a

shorter setback distance will keep the structure reasonably safe from flooding, shall be submitted to the City for review. In no case shall the setback distance be less than four (4) feet.

- 5) The ground around the building shall be compacted fill that meets all requirements of this subsection and is at least five (5) feet thick under the basement floor slab. Nothing in this subsection shall be interpreted to require the removal or replacement of fill that was placed as part of a LOMR-F, if such fill consists of material, including soils of similar classification and degree permeability, such as those classified as CH, CL, SC or ML according to ASTM standard D-2487, Classification of Soils for Engineering Purposes.
- 6) The fill material must be homogeneous and isotropic; that is, the soil must be all of one material, and the engineering priorities must be in the same direction.
- 7) All fill material and compaction shall be designed, certified and inspected by an Illinois Licensed Professional Engineer, as warranted by the site conditions.
- 8) The basement floor shall be at an elevation that is no more than five (5) below the BFE.
- 9) There shall be a granular drainage layer beneath the floor slab, and minimum of one quarter ($\frac{1}{4}$) horsepower sump pump with a backup power supply shall be provided to remove seepage flow. The pump shall be rated at four (4) times the estimated seepage rate and shall discharge above the BFE and away from the building in order to prevent flooding of the basement or uplift of the floor under the effect of the seepage pressure.
- 10) The drainage system shall be equipped with a positive means of preventing backflow.
- 11) All foundation elements shall be designed to withstand hydrostatic pressure in accordance with accepted engineering practices.
- 12) If the applicant is unable to meet all of the requirements set forth in the preceding paragraphs of this subsection, the Building Commissioner may allow the construction of a basement below the BFE only if the applicant demonstrates that the proposed fill and structure meet the guidelines and requirements set forth in FEMA Technical Bulletin 10-01 and are reasonably safe from flooding. In order to demonstrate that the proposed structure is reasonably safe from flooding, the applicant shall submit a detailed engineering

analysis of the proposed fill and foundation wall. The engineered basement study shall be completed in accordance with the latest edition of FEMA Technical Bulletin 10-01, with the analysis of the fill being prepared by an Illinois Licensed Professional Engineer.

- 13) In order to provide the required compensatory storage on site, in no case shall the depth of excavation in the front and side yards of the lot exceed eighteen (18) inches, as measured from the previously existing natural grade. The rear yard shall be permitted to have a greater depth of excavation, if necessary. All such excavation shall be constructed to drain freely and openly to the watercourse or storm sewer system. The use of mechanical means to drain the compensatory storage area will not be permitted.

16.3.05.

OCCUPATION AND USE OF DESIGNATED FLOODWAYS

This section applies to proposed development, redevelopment, site modification or building modification within a designated floodway. The designated floodway for the Calumet Union Drainage Ditch and tributaries north and south shall be as delineated on the countywide Flood Insurance Rate Map of Cook County and referenced in Article 1, Section 3.20. Only those uses and structures will be permitted which meet the criteria in this section. All floodway modifications shall be the minimum necessary to accomplish the purpose of the project. The development shall also meet the requirements of Article 3, Section 7.0.

A. Development Permit.

No person, firm, corporation or governmental body not exempted by state law shall commence any development in a floodway without first obtaining a development permit from the Building Commissioner and IDNR/OWR.

- 1) Application for a development permit shall be made on a form provided by the Building Commissioner. The application shall include the following information:
 - a. Name and address of applicant
 - b. Site location (including legal description) of the property, drawn to scale, on the designated floodway map, indicating whether it is proposed to be in an incorporated or unincorporated area;
 - c. Name of stream or body of water affected;
 - d. Description of proposed activity;

- e. Statement of purpose of proposed activity;
- f. Anticipated dates of initiation and completion of activity;
- g. Name and mailing address of the owner of the subject property if different from the applicant;
- h. Signature of the applicant or the applicant's agent;
- i. If the applicant is a corporation, the president or other authorized officer shall sign the application form;
- j. If the applicant is a partnership, each partner shall sign the application form; and
- k. If the applicant is a land trust, the trust officer shall sign the name of the trustee by him (her) as trust officer. A disclosure affidavit shall be filed with the application, identifying each beneficiary of the trust by name and address and defining the respective interests therein.
- l. Plans of the proposed activity shall be provided which include as a minimum:
 - i. A vicinity map showing the site of the activity, name of the waterway, boundary lines, names of roads in the vicinity of the site, graphic or numerical scale, and north arrow;
 - ii. A plan view of the project and engineering study reach showing existing and proposed conditions including principal dimensions of the structure or work, elevations, using the North American Vertical Datum of 1988, adjacent property lines and ownership, drainage and flood control easements, location of any channels and any existing or future access roads, distance between proposed activity and navigation channel (when the proposed construction is near a commercially navigable body of water), designated floodway limit, floodplain limit, specifications and dimensions of any proposed channel modifications, location and orientation of cross-sections, north arrow, and a graphic or numerical scale;
 - iii. Cross-section views of the project and engineering

study reach showing existing and proposed conditions including principal dimensions of the work as shown in plan view, existing and proposed elevations, normal water elevation, 10-year frequency flood elevation, 100-year frequency flood elevation, and graphic or numerical scales (horizontal and vertical);

- iv. A soil erosion and sediment control plan for disturbed areas. This plan shall include a description of the sequence of grading activities and the temporary sediment and erosion control measures to be implemented to mitigate their effects. This plan shall also include a description of final stabilization and revegetation measures, and the identification of a responsible party to ensure post-construction maintenance.
- v. A copy of the designated floodway map, marked to reflect any proposed change in the designated floodway location.
- m. Any and all other federal, state, and local permits or approval letters that may be required for this type of development.
- n. Engineering calculations and supporting data shall be submitted showing that the proposed work will meet the permit criteria of Article 3, Section 5.2.
- o. If the designated floodway delineation, base flood or 100-year frequency flood elevation will change due to the proposed project, the application will not be considered complete until IDNR/OWR has indicated conditional approval of the designated floodway map change. No structures may be built until a Letter of Map Revision has been approved by FEMA.
- p. The application for a structure shall be accompanied by drawings of the site, drawn to scale showing property line dimensions and existing ground elevations and all changes in grade resulting from any proposed excavation or filling, and floodplain and floodway limits; sealed by a licensed professional engineer, licensed architect or licensed land surveyor; the location and dimensions of all buildings and additions to buildings; and the elevation of the lowest floor

(including basement) of all proposed buildings subject to the requirements of Article 3, Section 5.0 of this Ordinance.

- q. If the proposed project involves a channel modification, the applicant shall submit the following information:
- i. A discussion of the purpose of and need for the proposed work;
 - ii. A discussion of the feasibility of using alternative locations or methods (see Article 3, Section 5.2.3 (i)) to accomplish the purpose of the proposed work;
 - iii. An analysis of the extent and permanence of the impacts each feasible alternative identified in Article 3, Section 5.2.3 (i) of this Section would have on the physical and biological conditions of the body of water affected; and
 - iv. An analysis of the impacts of the proposed project, considering cumulative effects on the physical and biological conditions of the body of water affected.

- 2) The Building Commissioner shall be responsible for obtaining from the applicant copies of all other federal, state, and local permits and approvals that may be required for this type of activity.
- a. The Building Commissioner shall not issue the development permit unless all required federal and state permits have been obtained.
 - b. A Licensed Professional Engineer, under the employ or contract of the City shall review and approve applications reviewed under this Section.

B. Preventing Increased Damages and a List of Appropriate Uses.

- 1) The only development in a floodway which will be allowed are Appropriate Uses, which will not cause a rise in the base flood elevation, and which will not create a damaging or potentially damaging increase in flood heights or velocity or be a threat to public health and safety and welfare or impair the natural hydrologic and hydraulic functions of the floodway or channel, or permanently impair existing water quality or aquatic habitat. Construction impacts shall be minimized by appropriate mitigation methods as called for in this Ordinance. Only those Appropriate

Uses listed in 17 Ill. Adm. Code Part 3708 will be allowed. The approved Appropriate Uses are as follows:

- a. Flood control structures, dikes, dams and other public works or private improvements relating to the control of drainage, flooding, erosion, or water quality or habitat for fish and wildlife.
- b. Structures or facilities relating to the use of, or requiring access to, the water or shoreline, such as pumping and treatment facilities, and facilities and improvements related to recreational boating, commercial shipping and other functionally water dependent uses;
- c. Storm and sanitary sewer relief outfalls;
- d. Underground and overhead utilities;
- e. Recreational facilities such as playing fields and trail systems, including any related fencing (at least 50 percent open when viewed from any one direction) built parallel to the direction of flood flows, and including open air pavilions and toilet facilities (4 stall maximum) that will not block flood flows nor reduce floodway storage.
- f. Detached garages, storage sheds, or other non-habitable accessory structures that will not block flood flows nor reduce floodway storage;
- g. Bridges, culverts, roadways, sidewalks, railways, runways and taxiways and any modification thereto;
- h. Parking lots built at or below existing grade where the depth of flooding at the 100-year frequency flood event will not exceed nine inches;
- i. Designated floodway regarding, without fill, to create a positive non-erosive slope toward a watercourse. Regrading or other modifications of the floodway for the convenience of site design for a private development is not considered an appropriate use.
- j. Floodproofing activities to protect previously existing lawful structures including the construction of water tight window wells, elevating structures, or construction of floodwalls around residential, commercial or industrial

principal structures where the outside toe of the floodwall shall be no more than ten (10) feet away from the exterior wall of the existing structure, and, which are not considered substantial improvements to the structure.

- k. The replacement, reconstruction, or repair of a damaged building, provided that the outside dimensions are not increased, and if the building was damaged to fifty (50%) percent or more of the market value before the damage occurred, the building will be protected from flooding to the flood protection elevation.
 - l. Modifications to an existing building that would not increase the enclosed floor area of the building below the 100-year frequency flood elevation, and which will not block flood flows including but not limited to, fireplaces, bay windows, decks, patios, and second story additions. If the building is improved to fifty (50%) percent or more of the market value before the modification occurred (i.e., a substantial improvement), the building will be protected from flooding to the flood protection elevation.
- 2) Appropriate uses do not include the construction or placement of any new structures, fill, building additions, buildings on stilts, critical facilities or wastewater treatment plants, excavation or channel modifications done to accommodate otherwise non-appropriate uses in the floodway, fencing (including landscaping or planting designed to act as a fence) and storage of materials except as specifically defined above as an Appropriate Use.
- 3) Within the designated floodway, the construction of an Appropriate Use, will be considered permissible provided that the proposed project meets the following engineering and mitigation criteria and is so stated in writing with supporting plans, calculations and data by a licensed professional engineer and provided that any structure meets the protection requirements of Article 3, Section 7.0 of this Ordinance:
- a. Preservation of Flood Conveyance, so as Not to Increase Flood Stages Upstream. For appropriate uses other than bridge or culvert crossings, on-stream structures or dams, all effective designated floodway conveyance lost due to the project will be replaced for all flood events up to and including the 100-year frequency flood. In calculating effective designated floodway conveyance, the following factors shall be taken into consideration:

- i. Designated floodway conveyance, "K" = $(1.486/n)(AR^{2/3})$ where "n" is Manning's roughness factor, "A" is the effective flow area of the cross-section, and "R" is the ratio of the area to the wetted perimeter. (See Ven Te Chow, *Open Channel Hydraulics*, McGraw-Hill, New York 1959).
- ii. The same Manning's "n" value shall be used for both existing and proposed conditions unless a recorded maintenance agreement with a federal, state, or local unit of government can assure the proposed conditions will be maintained or the land cover is changing from a vegetative to a non-vegetative land cover.
- iii. Transition sections shall be provided and used in calculations of effective designated floodway conveyance. The following expansion and contraction ratios shall be used unless an applicant's engineer can prove to IDNR/OWR through engineering calculations or model tests that more abrupt transitions may be used with the same efficiency:
 - (a.) When water is flowing from a narrow section to a wider section, the water should be assumed to expand no faster than at a rate of one foot horizontal for every four feet of the flooded stream's length.
 - (b.) When water is flowing from a wide section to a narrow section, the water should be assumed to contract no faster than at a rate of one foot horizontal for every one foot of the flooded stream's length.
 - (c.) When expanding or contracting flows in a vertical direction, a minimum of one foot vertical transition for every ten feet of stream length shall be used.
 - (d.) Transition sections shall be provided between cross-sections with rapid expansions and contractions and when meeting the designated floodway delineation on adjacent properties.
 - (e.) All cross-sections used in the calculations shall be located perpendicular to flood flows.
- b. Preservation of Floodway Storage so as Not to Increase

Downstream Flooding.

- i. Compensatory storage shall be provided for any designated floodway storage lost due to the proposed work from the volume of fill or structures placed and the impact of any related flood control projects.
 - ii. Compensatory storage for fill or structures shall be equal to at least 1.25 times the volume of floodplain storage lost.
 - iii. Artificially created storage lost due to a reduction in head loss behind a bridge shall not be required to be replaced.
 - iv. The compensatory designated floodway storage shall be placed between the proposed normal water elevation and the proposed 100-year flood elevation. All designated floodway storage lost below the existing 10-year flood elevation shall be replaced below the proposed 10-year flood elevation at at least a 1:1 ratio. All designated floodway storage lost above the existing 10-year flood elevation shall be replaced above the proposed 10-year flood elevation at at least a 1:1 ratio. All such excavations shall be constructed to drain freely and openly to the watercourse.
 - v. If the compensatory storage will not be placed at the location of the proposed construction, the applicant's engineer shall demonstrate through a determination of flood discharges and water surface elevations that the compensatory storage is hydraulically equivalent.
 - vi. There shall be no reduction in floodway surface area as a result of a floodway modification, unless such modification is necessary to reduce flooding at existing structure.
- c. Preservation of Floodway Velocities so as Not to Increase Stream Erosion or Flood Heights.
- i. For all Appropriate Uses, except bridges or culverts or on-stream structures, the proposed work will not result in an increase in the average channel or

designated floodway velocities or stage for all flood events up to and including the 100-year frequency event.

- ii. In the case of bridges or culverts or on-stream structures built for the purpose of backing up water in the stream during normal or flood flows, velocities may be increased at the structure site if scour, erosion and sedimentation will be avoided by the use of rip-rap or other design measures.
- d. Construction of New Bridges or Culvert Crossings and Roadway Approaches.
- i. The proposed structure shall not result in an increase of upstream flood stages greater than 0.1 foot when compared to the existing conditions for all flood events up to and including the 100-year frequency event; or the upstream flood stage increases will be contained within the channel banks (or within existing vertical extensions of the channel banks) such as within the design protection grade of existing levees or flood walls or within recorded flood easements.
 - ii. If the proposed construction will increase upstream flood stages greater than 0.1 feet, the developer must contact IDNR/OWR to obtain a permit for a dam or waiver.
 - (a.) The engineering analysis of upstream flood stages must be calculated using the flood study flows, and corresponding flood elevations for tailwater conditions for the flood study specified in Article 3, Section 3.0 of this Ordinance. Bridges and Culverts must be analyzed using any commonly accepted FEMA approved hydraulic models.
 - (b.) Lost floodway storage must be compensated for per Article 3, Section 5.2.3 (b).
 - (c.) Velocity increases must be mitigated per Article 3, Section 5.2.3 (c).
 - (d.) If the crossing is proposed over a public water that is used for recreational or commercial navigation, an IDNR/OWR permit must be received.

- (e.) The hydraulic analysis for the backwater caused by the bridge showing the existing condition and proposed regulatory profile must be submitted to IDNR/OWR for concurrence that a CLOMR is not required by Article 3, Section 5.2.
 - (f.) All excavations for the construction of the crossing shall be designed per Article 3, Section 5.2.3 (h).
 - e. Reconstruction or Modification of Existing Bridges, Culverts, and Approach Roads.
 - i. The bridge or culvert and roadway approach reconstruction or modification shall be constructed with no more than 0.1 foot increase in backwater over the existing flood profile for all flood frequencies up to and including the 100-year event, if the existing structure is not a source of flood damage.
 - ii. If the existing bridge or culvert and roadway approach is a source of flood damage to buildings or structures in the upstream floodplain, the applicant's engineer shall evaluate the feasibility of redesigning the structure to reduce the existing backwater, taking into consideration the effects on flood stages on upstream and downstream properties.
 - iii. The determination as to whether or not the existing crossing is a source of flood damage and should be redesigned must be prepared in accordance with 17 Ill. Adm. Code Part 3708 (Floodway Construction in Northeastern Illinois) and submitted to IDNR/OWR for review and concurrence before a permit is issued.
 - f. On-Stream Structures Built for the Purpose of Backing Up Water.
 - i. Any increase in upstream flood stages greater than 0.0 foot when compared to the existing conditions, for all flood events up to and including the 100-year frequency event shall be contained within the channel banks (or within existing vertical extensions of the channel banks) such as within the design protection grade of existing levees or flood walls or within recorded flood easements.

- ii. A permit or letter indicating a permit is not required must be obtained from IDNR/OWR for any structure built for the purpose of backing up water in the stream during normal or flood flow.
- iii. All dams and impoundment structures as defined in Section 300.16 shall meet the permitting requirements of 17 Ill. Adm. Code Part 3702 (Construction and Maintenance of Dams). If the proposed activity involves a modification of the channel or floodway to accommodate an impoundment, it shall be demonstrated that:
 - (a.) The impoundment is determined to be in the public interest by providing flood control, public recreation, or regional stormwater detention;
 - (b.) The impoundment will not prevent the migration of indigenous fish species, which require access to upstream areas as part of their life cycle, such as for spawning;
 - (c.) The impoundment will not cause or contribute to degraded water quality or habitat conditions. Impoundment design should include gradual bank slopes, appropriate bank stabilization measures and a pre-sedimentation basin.
 - (d.) A non-point source control plan has been implemented in the upstream watershed to control the effects of sediment runoff as well as minimize the input of nutrients, oil and grease, metals, and other pollutants. If there is more than one municipality in the upstream watershed, the municipality in which the impoundment is constructed should coordinate with upstream municipalities to ensure comprehensive watershed control;
 - (e.) The project otherwise complies with the requirements of Article 3, Section 5.0.
- g. Flood Proofing of Existing Habitable, Residential and Commercial Structures.
 - i. If construction is required beyond the outside dimensions of the existing building, the outside perimeter of the floodproofing construction shall be placed no further than 10 feet from the outside of the

building.

- ii. Compensation of lost storage and conveyance will not be required for floodproofing activities.

h. Excavation in the Floodway.

- i. When excavation is proposed in the design of bridges and culvert openings, including the modifications to and replacement of existing bridge and culvert structures, or to compensate for lost conveyance or other Appropriate Uses, transition sections shall be provided for the excavation.

- ii. The following expansion and contraction ratios shall be used unless an applicant's engineer can prove to IDNR/OWR through engineering calculations or model tests that more abrupt transitions may be used with the same efficiency:

- (a.) When water is flowing from a narrow section to a wider section, the water should be assumed to expand no faster than at a rate of one foot horizontal for every four feet of the flooded stream's length; and

- (b.) When water is flowing from a wide section to a narrow section, the water should be assumed to contract no faster than at a rate of one foot horizontal for every one foot of the flooded stream's length; and

- (c.) When expanding or contracting flows in a vertical direction, a minimum of one foot vertical transition for every ten feet of stream length shall be used; and

- (d.) Erosion/scour protection shall be provided inland upstream and downstream of the transition sections.

- i. If the proposed activity involves a channel modification, it shall be demonstrated that:

- i. There are no practicable alternatives to the activity which would accomplish its purpose with less impact to the natural conditions of the body of water affected. Possible alternatives include levees, bank stabilization, flood proofing of existing structures, removal of structures from the floodplain, clearing

the channel, high flow channel, or the establishment of a stream side buffer strip or green belt. Channel modification is acceptable if the purpose is to restore natural conditions and improve water quality and fish and wildlife habitat;

- ii. Water quality, habitat, and other natural functions would be significantly improved by the modification and no significant habitat area may be destroyed, or the impacts are offset by the replacement of an equivalent degree of natural resource values;
- iii. The activity has been planned and designed and will be constructed in a way which will minimize its adverse impacts on the natural conditions of the body of water affected, consistent with the following criteria:
 - (a.) The physical characteristics of the modified channel shall match as closely as possible those of the existing channel in length, cross-section, slope and sinuosity. If the existing channel has been previously modified, restoration of more natural physical conditions should be incorporated into channel modification design, where practical.
 - (b.) Hydraulically effective transitions shall be provided at both the upstream and downstream ends of the project, designed such that they will prevent erosion.
 - (c.) One-sided construction of a channel shall be used when feasible. Removal of streamside (riparian) vegetation should be limited to one side of the channel, where possible, to preserve the shading and stabilization effects of the vegetation.
 - (d.) Clearing of stabilizing vegetation shall be limited to that which is essential for construction of the channel.
 - (e.) Channel banks shall be constructed with a side slope no steeper than 3:1 horizontal to vertical, wherever practicable. Native vegetation and gradual side slopes are the preferred methods for bank stabilization. Where high velocities or sharp bends necessitate the use of alternative

stabilization measures, soil bioengineering techniques, natural rock or rip-rap are preferred approaches. Artificial materials such as concrete, gabions, or construction rubble should be avoided unless there are no practicable alternatives.

- (f.) All disturbed areas associated with the modification shall be seeded or otherwise stabilized as soon as possible upon completion of construction. Erosion blanket or an equivalent material shall be required to stabilize disturbed channel banks prior to establishment of the vegetative cover.
 - (g.) If the existing channel contains considerable bottom diversity such as deep pools, riffles, and other similar features, such features shall be provided in the new channel. Spawning and nesting areas and flow characteristics compatible with fish habitat shall also be established, where appropriate.
 - (h.) A sediment basin shall be installed at the downstream end of the modification to reduce sedimentation and degradation of downstream water quality.
 - (i.) New or relocated channels should be built in the dry and all items of construction, including vegetation, should be completed prior to diversion of water into the new channel.
 - (j.) There shall be no increases in stage or velocity as the channel enters or leaves the project site for any frequency flood unless necessitated by a public flood control project or unless such an increase is justified as part of a habitat improvement or erosion control project.
 - (k.) Unless the modification is for a public flood control project, there shall be no reduction in the volume of floodwater storage outside the floodway as a result of the modification; and
- iv. The project otherwise complies with the requirements of Article 3, Section 5.0.

j. Seeding and Stabilization Plan.

For all activities located in a floodway, a seeding and stabilization plan shall be submitted by the applicant.

k. Soil Erosion and Sedimentation Measures

For all activities in the floodway, including grading, filling, and excavation, in which there is potential for erosion of exposed soil, soil erosion and sedimentation control measures shall be employed consistent with the following criteria:

- i. The construction area shall be minimized to preserve the maximum vegetation possible. Construction shall be scheduled to minimize the time soil is exposed and unprotected. In no case shall the existing natural vegetation be destroyed, removed, or disturbed more than 15 days prior to the initiation of improvements.
- ii. Temporary and/or permanent soil stabilization shall be applied to denuded areas as soon as possible. As a minimum, soil stabilization shall be provided within 15 days after final grade is reached on any portion of the site, and within 15 days to denuded areas which may not be at final grade but will remain undisturbed for longer than 60 days.
- iii. Sedimentation control measures shall be installed before any significant grading or filling is initiated on the site to prevent the movement of eroded sediments off site or into the channel. Potential sediment control devices include filter fences, straw bale fences, check dams, diversion ditches, and sediment traps and basins.
- iv. A vegetated buffer strip of at least 25 feet in width shall be preserved and/or re-established, where possible, along existing channels (See Article 3, Section 5.2.3 (p)). Construction vehicle use of channels shall be minimized. Temporary stream crossings shall be constructed, where necessary, to minimize erosion. Necessary construction in or along channels shall be restabilized immediately.
- v. Soil erosion and sedimentation control measures shall be designed and implemented consistent with "Procedures and Standards for Urban Soil Erosion and Sedimentation Control in Illinois" (1988) also known as the "Green Book" and "The Illinois Urban Manual" (NRCS, 2002 or most recent edition).

1. Public Flood Control Projects. For public flood control projects, the permitting requirements of this section will be considered met if the applicant can demonstrate to IDNR/OWR through hydraulic and hydrologic calculations that the proposed project will not singularly or cumulatively result in increased flood heights outside the project right-of-way or easements for all flood events up to and including the 100-year frequency event.

- m. General Criteria for Analysis of Flood Elevations.
 - i. The flood profiles, flows and floodway data in the designated floodway study, referenced in Article 3, Section 3.0, must be used for analysis of the base conditions. If the study data appears to be in error or conditions have changed, IDNR/OWR shall be contacted for approval and concurrence on the appropriate base conditions data to use.
 - ii. If the 100-year designated floodway elevation at the site of the proposed construction is affected by backwater from a downstream receiving stream with a larger drainage area, the proposed construction shall be shown to meet:
 - (a.) The requirements of this section for the 100-year frequency flood elevations of the designated floodway conditions; and
 - (b.) Conditions with the receiving stream at normal water elevations.
 - iii. If the applicant learns from IDNR/OWR, local governments, or a private owner that a downstream restrictive bridge or culvert is scheduled to be removed, reconstructed, modified, or a regional flood control project is scheduled to be built, removed, constructed or modified within the next five years, the proposed construction shall be analyzed and shown to meet the requirements of this section for both the existing conditions and the expected flood profile conditions when the bridge, culvert or flood control project is built.

- n. Conditional Letter of Map Revision.
 - i. If the Appropriate Use would result in a change in the designated floodway location or the 100-year

frequency flood elevation, the applicant shall submit to IDNR/OWR and FEMA all information, calculations and documents necessary to be issued a conditional designated floodway map revision and receive from IDNR/OWR a conditional concurrence of the designated floodway change before a permit is issued.

- ii. The final designated floodway map will not be changed by FEMA until as-built plans or record drawings of initial filling, grading, dredging, or excavating activities are submitted and accepted by FEMA and IDNR/OWR.
 - iii. In the case of non-government projects, the municipality in incorporated areas and the county in unincorporated areas shall concur with the proposed conditional designated floodway map revision before IDNR/OWR approval can be given.
 - iv. No filling, grading, dredging or excavating shall take place until a conditional approval is issued.
 - v. After initial filling, grading, dredging or excavating, no activities shall take place until a final Letter of Map Revision (LOMR) is issued by FEMA with concurrence from IDNR/OWR.
- o. Professional Engineer's Supervision.
- i. All engineering analyses shall be performed by or under the supervision of a licensed professional engineer.
- p. For all activities in the floodway involving construction within 25 feet of the channel, the following criteria shall be met:
- i. A natural vegetation buffer strip shall be preserved within at least 25 feet of the ordinary high water mark of the channel.
 - ii. Where it is impossible to protect this buffer strip during the construction of an Appropriate Use, a vegetated buffer strip shall be established upon completion of construction.

- q. After receipt of conditional approval of the designated floodway change and issuance of a permit and a Conditional Letter of Map Revision, construction as necessary to change the floodway designation may proceed but no buildings or structures or other construction that is not an Appropriate Use may be placed in that area until the designated floodway map is changed and a final Letter of Map Revision is received. The designated floodway map will be revised upon acceptance and concurrence by IDNR/OWR and FEMA of the "as-built" plans.

4) Development Activities In Delegated Communities Requiring State Review.

For those projects listed below located in a designated floodway, the following criteria shall be submitted to IDNR/OWR for their review and concurrence and/or permit prior to the issuance of a permit by a community or county delegated state permitting authority in the floodway.

- a. An engineer's analysis of the flood profile due to a proposed bridge pursuant to Article 3, Section 5.2.3 (d).
- b. An engineer's determination that an existing bridge or culvert crossing is not a source of flood damage and the analysis indicating the proposed flood profile, pursuant to Article 3, Section 5.2.3 (e).
- c. Alternative transition sections and hydraulically equivalent storage pursuant to Article 3, Section 5.2.3(a), (b), and (h).
- d. The construction of any IDNR/OWR projects, dams (as defined in Article 1, Section 3.19) and all other federal, state, or local units of government projects, including projects of the municipality or county.
- e. An engineer's determination that a proposed bridge affected by backwater from a downstream receiving stream may be built with a smaller opening.
- f. Projects which revise or establish the floodway and/or flood profiles.
- g. Projects in public bodies of water.

5) Other Permits.

- a. In addition to the other requirements of this Ordinance, a development permit for a site located in a floodway shall not be issued unless the applicant first obtains a permit or written documentation that a permit is not required from IDNR/OWR, issued pursuant to 615 ILCS 5/5 et seq.
- b. No correspondence from IDNR/OWR shall be required if the project meets the requirements of Regional Permit 3.
- c. No permit from IDNR/OWR shall be required if IDNR/OWR has delegated this responsibility to the City.

6) Permits for Dams.

- a. Any work involving the construction, modification or removal of a dam as defined in Article 1, Section 3.19 per 17 Ill. Adm. Code Part 3702 (Rules for Construction of Dams) shall obtain an IDNR/OWR permit prior to the start of construction of a dam.
- b. If the Building Commissioner finds a dam that does not have an IDNR/OWR permit, the Building Commissioner shall immediately notify the IDNR/OWR Bartlett office.
- c. If the Building Commissioner the finds a dam which is believed to be in unsafe condition, the Building Commissioner shall immediately notify the owner of the dam, the IDNR/OWR Bartlett office, and the Illinois Emergency Management Agency (IEMA).

7) Activities That Do Not Require a Licensed Professional Engineer's Review.

The following activities may be permitted without a licensed professional engineer's review. Such activities shall still meet the other requirements of this Ordinance, including the mitigation requirements.

- a. Regional Permit 3 which authorizes, for example, underground and overhead utilities, storm and sanitary sewer outfalls, sidewalks, patios, athletic fields, playground equipment and streambank protection activities.

16.3.06. OCCUPATION AND USE OF SFHA AREAS WHERE FLOODWAYS ARE NOT IDENTIFIED.

In SFHA or floodplains, (including AE, AH, AO and Unnumbered A Zones)

where no floodways have been identified and no base flood or 100-year frequency flood elevations have been established by FEMA, and draining more than a square mile, no development shall be permitted unless the cumulative effect of the proposals, when combined with all other existing and anticipated uses and structures, shall not significantly impede or increase the flow and passage of the floodwaters nor significantly increase the base flood or 100-year frequency flood elevation.

A. Development Permit.

- 1) No person, firm, corporation, or governmental body, not exempted by state law, shall commence any development in a SFHA or floodplain without first obtaining a development permit from the Building Commissioner.
- 2) Application for a development permit shall be made on a form provided by the Building Commissioner.
 - a. The application shall be accompanied by drawings of the site, drawn to scale showing property line dimensions; and existing grade elevations and all changes in grade resulting from excavation or filling, sealed by a licensed engineer, architect or surveyor; the location and dimensions of all buildings and additions to buildings; and the elevations of the lowest floor (including basement) of all proposed buildings subject to the requirements of Article 3, Section 7.0 of this Ordinance.
 - b. The application for a development permit shall also include the following information:
 - i. A detailed description of the proposed activity, its purpose, and intended use;
 - ii. Site location (including legal description) of the property, drawn to scale, on the designated floodway maps, indicating whether it is proposed to be in an incorporated or unincorporated area;
 - iii. Anticipated dates of initiation and completion of activity;
 - iv. Plans of the proposed activity shall be provided which include as a minimum:

- (a.) A vicinity map showing the site of the activity, name of the waterway, boundary lines, names of roads in the vicinity of the site, graphic or numerical scale, and north arrow;
 - (b.) A plan view of the project and engineering study reach showing existing and proposed conditions including principal dimensions of the structure or work, elevations, using the North American Vertical Datum of 1988, adjacent property lines and ownership, drainage and flood control easements, distance between proposed activity and navigation channel (when the proposed construction is in or near a commercially navigable body of water), floodplain limit, location and orientation of cross-sections, north arrow, and a graphical or numerical scale;
 - (c.) Cross-section views of the project perpendicular to the flow of floodwater and engineering study reach showing existing and proposed conditions including principal dimensions of the work as shown in plan view, existing and proposed elevations, normal water elevation, 10-year frequency flood elevation, 100-year frequency flood elevation, and graphical or numerical scales (horizontal and vertical); and
 - (d.) A soil erosion and sedimentation control plan for disturbed areas. This plan shall include a description of the sequence of grading activities and the temporary sediment and erosion control measures to be implemented to mitigate their effects. This plan shall also include a description of final stabilization and revegetation measures, and the identification of a responsible party to ensure post-construction maintenance.
- c. Engineering calculations and supporting data shall be submitted showing that the proposed work will meet the criteria of Article 3, Section 6.2.
 - d. Any and all other federal, state, and local permits or approvals that may be required for this type of development.

- 3) Based on the best available existing data according to federal, state or other sources, the Building Commissioner shall compare the elevation of the site to the base flood or 100-year frequency flood elevation.
 - a. Should no elevation information exist for the site, the developer's engineer shall calculate the elevation according to Article 3, Section 3.4.
 - b. Any development located on land that can be shown to have been higher than the base flood elevation of the current Flood Insurance Rate Map Identification is not in the SFHA and, therefore, not subject to the requirements of this Ordinance.
 - c. The Building Commissioner shall maintain documentation of the existing ground elevation at the development site and certification that this ground elevation existed prior to the date of the site's first Flood Insurance Rate Map identification.
 - d. The Building Commissioner shall be responsible for obtaining from the applicant copies of all other federal, state, and local permits, approvals or waivers that may be required for this type of activity. The Building Commissioner shall not issue the development permit unless all required federal, state, and local permits have been obtained.

B. Preventing Increased Damages.

- 1) No development in the SFHA where a floodway has not been determined shall create a damaging or potentially damaging increase in flood heights or velocity or threat to public health, safety and welfare or impair the natural hydrologic and hydraulic functions of the floodway or channel, or impair existing water quality or aquatic habitat. Construction impacts shall be minimized by appropriate mitigation methods as called for in this Ordinance.
- 2) Within all riverine SFHAs where the floodway has not been determined, the following standards shall apply:
 - a. The developer shall have a Licensed Professional Engineer state in writing and show through supporting plans, calculations, and data that the project meets the engineering

requirements of Article 3, Section 5.2.3 (a) through 5.2.3 (i) for the entire floodplain as calculated under the provisions of Article 3, Section 3.4 of this Ordinance.

- i. As an alternative, the developer should have an engineering study performed to determine a floodway and submit that engineering study to IDNR/OWR and FEMA for acceptance as a designated floodway.
 - ii. Upon acceptance of the floodway by IDNR/OWR and FEMA, the developer shall then demonstrate that the project meets the requirements of Article 3, Section 5.0 for the designated floodway. The floodway shall be defined according to the definition in Article 3, Section 3.20 of this Ordinance.
 - b. A development permit shall not be issued unless the applicant first obtains a IDNR/OWR permit or a determination has been made that an IDNR/OWR permit is not required.
 - c. Permits for Dams
 - i. Any work involving the construction, modification or removal of a dam as defined in Article 1, Section 3.20 per 17 Ill. Adm. Code Part 3702 (Rules for Construction of Dams) shall obtain an IDNR/OWR permit prior to the start of construction of a dam.
 - ii. If the Building Commissioner finds a dam that does not have an IDNR/OWR permit, the Building Commissioner shall immediately notify the IDNR/OWR Bartlett office.
 - iii. If the Building Commissioner finds a dam which is believed to be in unsafe condition, the Building Commissioner shall immediately notify the owner of the dam, the IDNR/OWR Bartlett office, and the Illinois Emergency Management Agency (IEMA).
- 3) The following activities may be permitted without a Licensed Professional Engineer's review or calculation of base flood elevation and designated floodway. Such activities shall still meet the other requirements of this Ordinance.

- a. Bridge and culvert crossings of streams in rural areas meeting conditions of IDNR/OWR Statewide Permit number 2;
- b. Barge fleeting facilities meeting conditions of IDNR/OWR Statewide Permit No. 3;
- c. Aerial utility crossings meeting conditions of IDNR/OWR Statewide Permit No. 4
- d. Minor boat docks meeting conditions of IDNR/OWR Statewide Permit No. 5;
- e. Minor, non-obstructive activities meeting conditions of IDNR/OWR Statewide Permit No. 6; activities (not involving fill or positive change in grade) are covered by this permit:
- f. Outfall structures and drainage ditch outlets meeting conditions of IDNR/OWR Statewide Permit No. 7;
- g. Underground pipeline and utility crossings meeting the conditions of IDNR/OWR Statewide Permit No. 8;
- h. Bank stabilization projects meeting the conditions of IDNR/OWR Statewide Permit No. 9;
- i. Accessory structures and additions to existing residential buildings meeting the conditions of IDNR/OWR Statewide Permit No. 10;
- j. Minor maintenance dredging activities meeting conditions of DNR/OWR Statewide Permit No. 11;
- k. Bridge and culvert replacement structures and bridge widenings meeting conditions of IDNR/OWR Statewide Permit No. 12;
- l. Temporary construction activities meeting conditions of IDNR/OWR Statewide Permit No. 13;
- m. Special Uses of Public Waters meeting conditions of IDNR/OWR Statewide Permit No. 14; and
- n. Any development determined by IDNR/OWR to be located entirely within a flood fringe area shall be exempt from

State Floodway permit requirements.

- 4) The flood carrying capacity of any altered or relocated watercourse shall be maintained.
- 5) Compensatory Storage.
 - a. Whenever any portion of a floodplain is authorized for use, the volume of space which will be occupied by the authorized fill or structure below the base flood or 100-year frequency flood elevation shall be compensated for and balanced by a hydraulically equivalent volume of excavation taken from below the base flood or 100-year frequency flood elevation.
 - b. The excavation volume shall be at least equal to 1.25 times the volume of storage lost due to the fill or structure.
 - c. In the case of streams and watercourses, such excavation shall be made opposite or adjacent to the areas so filled or occupied.
 - d. All floodplain storage lost below the existing 10-year flood elevation shall be replaced below the proposed 10-year flood elevation at at least a 1:1 ratio. All floodplain storage lost above the existing 10-year flood elevation shall be replaced above the proposed 10-year flood elevation at at least a 1:1 ratio. All such excavations shall be constructed to drain freely and openly to the watercourse.

16.3.07. PERMITTING REQUIREMENTS APPLICABLE TO ALL FLOODPLAIN AREAS AND PROTECTION OF BUILDINGS.

In addition to the requirements found in Article 3, Sections 4.0, 5.0 and 6.0 for development in flood fringes, designated floodways, and SFHA or floodplains where no floodways have been identified, the following requirements shall be met.

A. Public Health Standards

- 1) No developments in the SFHA shall include locating or storing chemicals, explosives, buoyant materials, animal wastes, fertilizers, flammable liquids, pollutants, or other hazardous or toxic materials below the flood protection elevation (FPE) unless such materials are stored in a floodproofed and anchored storage tank and certified by a professional engineer or floodproofed building constructed according to the requirements of Article 3,

Section 7.3 of this ordinance.

- 2) Public utilities and facilities such as sewer, gas and electric shall be located and constructed to minimize or eliminate flood damage.
- 3) Public sanitary sewer systems and water supply systems shall be located and constructed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters.
- 4) New and replacement water supply systems, wells, and sanitary sewer lines may be permitted providing all manholes or other above ground openings located below the FPE are watertight.
- 5) Septic systems and other on-site waste disposal systems are prohibited in the SFHA.
- 6) All other activities defined as development shall be designed so as not to alter flood flows or increase potential flood damages.

B. Filling and Grading. Whenever a development project proposed to fill or grade vacant land in order to remove a portion of it from the SFHA or to change the floodway boundary,

- 1) The top of the resulting filled or graded area shall be at or above the FPE, and
- 2) The Building Commissioner shall not issue a development permit until the applicant has received a Conditional Letter of Map Revision from FEMA.
- 3) The Building Commissioner shall not issue a certificate of occupancy until the applicant has received a Letter of Map Revision from FEMA and a properly completed, signed and sealed as-built FEMA Elevation or Floodproofing Certificate.

C. Carrying Capacity and Notification

- 1) For all projects involving channel modification, fill, or stream maintenance (including levees), the flood carrying capacity of the watercourse shall be maintained.
- 2) In addition, the City shall notify adjacent communities in writing 30 days prior to the issuance of a permit for the alteration or relocation of the watercourse.

D. Protecting Buildings.

- 1) All buildings located within a 100-year floodplain, also known as a SFHA, shall be protected from flood damage below the flood protection elevation. This building protection criteria applies to the following situations:
 - a. Construction or placement of a new building or alteration or addition to an existing building valued at more than one thousand dollars (\$1,000) or seventy (70) square feet.
 - b. Substantial improvements or structural alterations made to an existing building that increase the floor area by more than twenty percent (20%) or equal or exceed the market value by fifty percent (50%). Alteration shall be figured cumulatively. If substantially improved, the existing structure and the addition must meet the flood protection standards of this section.
 - c. Repairs made to a substantially damaged building. These repairs shall be figured cumulatively. If substantially damaged the entire structure must meet the flood protection standards of this section.
 - d. Installing a manufactured home on a new site or a new manufactured home on an existing site (the building protection requirements do not apply to returning a manufactured home to the same site it lawfully occupied before it was removed to avoid flood damage).
 - e. Installing a travel trailer or recreational vehicle on a site for more than 180 days per year;
 - f. Repetitive loss to an existing building as defined in Article 1, Section 3.70 This building protection requirement may be met by one of the following methods; and
 - g. Construction of new buildings and substantial improvements in the 500-year floodplain.

- 2) A residential or non-residential building, when allowed, may be constructed on permanent land fill in accordance with the following:
 - a. The lowest floor (including basement) shall be at or above the flood protection elevation; and
 - b. Fill Requirements:

- i. The fill shall be placed in layers no greater than six (6) inches deep before compaction and should extend at least ten (10) feet beyond the foundation of the building before sloping below the flood protection elevation; and
 - ii. The top of the fill shall be above the flood protection elevation. However, the ten (10) foot minimum may be waived if a structural engineer certifies an alternative method to protect the building from damages due to hydrostatic pressures; and
 - iii. The fill shall be protected against erosion and scour during flooding by vegetative cover, riprap or other structural measure; and
 - iv. The fill shall be composed of rock or soil and not incorporate debris or refuse materials; and
 - v. The fill shall not adversely affect the flow or surface drainage from or onto neighboring properties, and when necessary, stormwater management techniques such as swales or basins shall be incorporated.
- 3) A residential or non-residential building may be elevated in accordance with the following:
- a. The building or improvements shall be elevated on crawl space, stilts, piles, walls, or other foundation that is permanently open to flood waters and not subject to damage by hydrostatic pressures of the base flood or 100-year frequency flood. Designs must either be certified by a licensed professional engineer or architect or the permanent openings, one on each wall, shall be no more than one foot above existing grade, and consists of a minimum of two openings. The openings must have a total net area of not less than one square inch for every one square foot of enclosed area subject to flooding below the Base Flood Elevation; and
 - b. The foundation and supporting members shall be anchored and aligned in relation to flood flows and adjoining structures so as to minimize exposure to known hydrodynamic forces such as current, waves, ice and floating debris; and

- c. All areas below the flood protection elevation shall be constructed of materials resistant to flood damage; and
 - i. The lowest floor (including basement) and all electrical, heating, ventilating, plumbing, and air conditioning equipment and utility meters shall be located at or above the flood protection elevation; and
 - ii. Water and sewer pipes, electrical and telephone lines, submersible pumps, and other waterproofed service facilities may be located below the flood protection elevation provided they are waterproofed; and
- d. The areas below the flood protection elevation may only be used for the parking of vehicles, building access or storage in an area other than a basement and not later modified or occupied as habitable space. The applicant shall be advised that equipment, machinery and fixtures not required for support of the building and contents located below the lowest floor are not covered by a flood insurance policy.
- e. In lieu of the above criteria, the design methods to comply with these requirements may be certified by licensed professional engineer or architect.
- f. Manufactured homes, and travel trailers to be installed on a site for more than 180 days, shall be elevated to or above the flood protection elevation; and, shall be anchored to resist flotation, collapse, or lateral movement by being tied down in accordance with the Rules and Regulations for the Illinois Mobile Home Tie-Down Act issued pursuant to 77 Ill. Adm. Code Part 870. In addition, all manufactured homes shall meet the following elevation requirements:
 - i. In the case of manufactured homes placed or substantially improved (1) outside of a manufactured home park or subdivision, (2) in a new manufactured home park or subdivision, (3) in an expansion to an existing manufactured home park or subdivision, or (4) in an existing manufactured home park or subdivision on which a manufactured home has incurred substantial damage from a flood, the top of the lowest floor shall be elevated to or above the flood protection elevation.

- ii. In the case of manufactured homes placed or substantially improved in an existing manufactured home park or subdivision, the manufactured home shall be elevated so that either the top of the lowest floor is above the base flood elevation or the chassis is at least 36 inches in height above grade and supported by reinforced piers or other foundations of equivalent strength, whichever is less.
 - g. Recreational vehicles or travel trailers shall be required to meet the elevation and anchoring requirements of Article 3, Subsection 7.4.3(f) above unless:
 - i. They are on site for fewer than 180 consecutive days; and,
 - ii. They are fully licensed, ready for highway use, and used only for recreation, camping, travel or seasonal use rather than as a permanent dwelling. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utility and service devices, and has no permanently attached additions.
- 4) Only a non-residential building may be structurally dry floodproofed (in lieu of elevation) provided that:
 - a. A licensed professional engineer or architect shall certify that the building has been structurally dry floodproofed below the flood protection elevation, the structure and attendant utility facilities are watertight and capable of resisting the effects of the base flood or 100-year frequency flood.
 - b. The building design shall take into account flood velocities, duration, rate of rise, hydrostatic and hydrodynamic forces, the effects of buoyancy, and impacts from debris or ice.
 - c. Floodproofing measures shall be operable without human intervention and without an outside source of electricity (levees, berms, floodwalls and similar works are not considered floodproofing for the purpose of this subsection).
- 5) A building may be constructed with a crawlspace located below the flood protection elevation provided that the following

conditions are met:

- a. The building must be designed and adequately anchored to resist flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy; and
 - b. Any enclosed area below the flood protection elevation shall have openings that equalize hydrostatic pressures by allowing for the automatic entry and exit of floodwaters. A minimum of one opening on each wall having a total net area of not less than one square inch per one square foot of enclosed area. The openings shall be no more than one (1) foot above grade; and
 - c. The floor of the crawlspace shall not be lower than the lowest grade adjacent to the building's exterior; and
 - d. The interior height of the crawlspace measured from the interior grade of the crawl to the top of the foundation wall must not exceed 4 feet at any point; and
 - e. An adequate drainage system must be installed to remove floodwaters from the interior area of the crawlspace within a reasonable period of time after a flood event; and
 - f. Portions of the building below the flood protection elevation must be constructed with materials resistant to flood damage; and
 - g. Utility systems within the crawlspace must be elevated above the flood protection elevation.
- 6) Construction of new or substantially improved critical facilities shall be located outside the limits of the floodplain.
 - 7) Tool sheds, detached garages, and other minor accessory structures on an existing single-family platted lot, may be constructed with the lowest floor below the flood protection elevation in accordance with the following:
 - a. The building is not used for human habitation; and
 - b. All areas below the base flood or 100-year frequency flood elevation shall be constructed with waterproof material. Structures located in a designated floodway shall be constructed and placed on a building site so as not to block

the flow of flood waters and shall also meet the Appropriate Use criteria of Article 3, Section 5.0. In addition, all other requirements of Article 3, Section 4.0, 5.0 and 6.0 must be met; and

- c. The structure shall be anchored to prevent flotation; and
 - d. Service facilities such as electrical and heating equipment shall be elevated or floodproofed to the flood protection elevation; and
 - e. The building shall be valued at less than \$10,000 and be less than 500 square feet in floor size; and
 - f. The building shall be used only for the storage of vehicles or tools and may not contain other rooms, workshops, greenhouses or similar uses and cannot be modified later into another use ; and
 - g. The building shall meet the permanent opening criteria of Article 3, Section 7.4.3 (a).
 - h. All flammable or toxic materials (gasoline, paint, insecticides, fertilizers ,etc.) shall be stored above the flood protection elevation; and
 - i. The lowest floor elevation should be documented and the owner advised of the flood insurance implications.
- 8) Existing buildings located within a designated floodway shall also meet the more restrictive Appropriate Use standards included in Article 3, Section 5.0. Non-conforming structures located in a designated floodway may remain in use and may only be enlarged, replaced or structurally altered in accordance with Article 3, Section 5.2. A non-conforming structure damaged by flood, fire, wind or other natural or man-made disaster may be restored unless the damage exceeds fifty percent (50%) of its market value before it was damaged, in which case it shall conform to this Ordinance.

16.3.08.

OTHER DEVELOPMENT REQUIREMENTS

The City Council shall take into account flood hazards, to the extent that they are known in all official actions related to land management, use and development.

- A. New subdivisions, manufactured home parks, annexation agreements, and Planned Unit Developments (PUDs) within the SFHA shall be reviewed to assure that the proposed developments are consistent with Article 3,

Sections 4.0, 5.0, 6.0 and 7.0 of this Ordinance and the need to minimize flood damage. Plats or plans for new subdivisions, mobile home parks and Planned Unit Developments (PUDs) shall include a signed statement by a Licensed Professional Engineer that the plat or plans account for changes in the drainage of surface waters in accordance with the Plat Act (765 ILCS 205/2).

- B. Proposals for new subdivisions, manufactured home parks, travel trailer parks, planned unit developments (PUDs) and additions to manufactured home parks and additions to subdivisions shall include base flood or 100-year frequency flood elevation data and floodway delineations.
 - 1) Where this information is not available from an existing adopted study, the applicant's engineer shall be responsible for calculating the base flood or 100-year frequency flood elevation per Article 3, Section 3.4 and the floodway delineation per the definition in Article 1, Section 3.20.
- C. Streets, blocks, lots, parks and other public grounds shall be located and laid out in such a manner as to preserve and utilize natural streams and channels. Wherever possible, the floodplains shall be included within parks or other public grounds.
- D. The surface of all new arterial streets shall be at or above the base flood elevation. The surface of all new collector streets shall be at or above eight inches below the base flood elevation.
- E. The City Council shall not approve any Planned Unit Development (PUD) or plat of subdivision located outside the corporate limits unless such agreement or plat is in accordance with the provisions of this Ordinance.
- F. All other activities defined as development shall be designed so as not to alter flood flows or increase potential flood damages.