

# Development Application Guideline

## Terms of Reference – Floodplain Analysis

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### **Description**

A Floodplain Analysis is used for determining the risks associated with development that is proposed in a location that may be subject to flooding hazards. The intent of the analysis is to determine the potential for a development to impact surrounding water resources, and how surrounding water resources could impact the development. The analysis should include recommendations to mitigate potential conflict with the natural functions of the floodplain. This Terms of Reference document is intended to be applied in conjunction with all other applicable guidelines, such as the City of Kingston's Site Plan Control Guideline and the City of Kingston's Subdivision Development Guideline and Technical Standards.

### **Rationale**

A Floodplain Analysis is required in order to provide City staff with the necessary information to evaluate the potential of development to impact, and be impacted by, local water resources. The floodplain analysis may also be required to determine the applicability of Ontario Regulation 148/06: Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses on a particular site. The purpose of the floodplain analysis is to confirm the extent of flooding that would be associated with the 1:100 year event. Depending on the location and circumstance, this information would then be used by the City and the Cataraqui Region Conservation Authority (CRCA) to direct proposed development and/or site alteration away from areas identified as hazardous lands which are impacted by flooding hazards, to ensure that the development would be located in an area of least and acceptable risk, to determine floodproofing standards and access standards, and/or to determine off-site impacts.

### **When Required**

A Floodplain Analysis may be required, in consultation with the CRCA, when development or site alteration is proposed within 30 metres of a waterbody for which the elevation of the regulatory floodplain is unknown. A Floodplain Analysis may be required for any of the following applications:

- Official Plan Amendment
- Zoning By-law Amendment
- Plan of Subdivision/Condominium

- Site Plan Control
- Consent and/or Minor Variance applications
- Any other development application deemed appropriate by Council or delegate

### **Applicable Legislation**

The Planning Act, Section 2 directs municipalities to have regard for the conservation and management of natural resources and for the protection of public health and safety.

The Planning Act also gives Council the authority to request other information or material that it deems necessary in order to evaluate and make a decision on a proposed planning application.

Section 9.12.3 of the City's Official Plan contains a list of additional information (such as a Floodplain Analysis) which may be required upon request.

### **Qualified Persons**

A floodplain analysis must be prepared by a qualified engineer who has experience in hydrology, and any other relevant fields of study.

### **Required Contents**

The floodplain analysis should contain the property description, name of owners, legal description, street address/geographical location, including a location map depicting the property location and any other regionally significant information used in the report. Where applicable a detailed site plan showing the location of the proposed development and site alteration relative to the property boundaries and waterbody will be included.

The required contents shall also include the following information:

Required Contents Include:

1. A topographic and geomorphological description of the site and a statement as to the type and location of natural hazards that may affect the site.
2. A reference to any previous geotechnical studies or floodplain analyses that have been completed on the site and surrounding area or scientifically relevant sites elsewhere.
3. An assessment of the nature, extent, magnitude, frequency (probability) and potential effect of all flood and debris flow hazards that may affect the property, including a description of the scientific methodology used to define the parameters. The methodology should be described in sufficient detail as to facilitate a professional review of the study, by or on behalf of, the City of Kingston or Cataraqui Region Conservation Authority.

4. Recommendations and assessments stating what mitigated works, construction and maintenance are required in terms of the works' ability to reduce the potential impact of the hazard.
5. Where mitigation works and/or actions are proposed, an assessment of the effects that the proposed works and/or actions may have on other properties including public infrastructure must be included in the report. Where mitigated works and/or actions designed to reduce hazards are contemplated, prior to completing the report and expending time and money on detailed design, the proponent should confirm that the works and/or actions proposed will be accepted by the City of Kingston, and that they would meet regulatory requirements.
6. Additional information should be included on any other matters that, in the Engineer's opinion, should be known to the City or Conservation Authority, or brought to the attention of the Building Inspection and/or Planning Departments.
7. Any recommendations that the Engineer believes appropriate.
8. The report submitted must include the signature and seal of a Registered Professional Engineer, with experience in water resource engineering, verifying that the land may be used safely for the use intended.

#### Hazard Specific Requirements:

1. For Lakes, Ponds, Marsh Areas and Reservoirs:
  - a. Where an existing flood construction level (FCL) is deemed inappropriate provide details of the calculation and confirmation that Provincial guidelines were considered in the process.
  - b. Where applicable provide shoreline profile(s) starting from below low water level to a point some distance above the safe building area(s), depicting the FCL, maximum wave run-up, existing and/or proposed mitigation works, natural boundary, safe lines (if any) and any other relevant shoreline features.
2. For Watercourses:
  - a. Where an existing FCL shown on a floodplain map is deemed inappropriate provide details of the calculation and confirmation that Provincial guidelines were considered in the process.
  - b. For property adjacent to, or within a meandering and/or braided river floodplain, use air photographs, maps and other information to describe and assess relevant ongoing river processes (including ice and/or debris jamming) that may pose a hazard to the property.
3. For Alluvial Fans and/or Areas Subject to Debris Flows:
  - a. Suitably scaled topographic map depicting the following where appropriate: watershed area, fan boundaries, existing and abandoned

channels, hydraulic structures, existing and proposed mitigation works, potential avulsion and overland flow paths (thinking in terms of a 1:200 year flood event), features on the fan that would serve to give direction to and/or impede overland and/or channel avulsion flow paths and the property boundaries.

- b. Where applicable, channel cross-sections and stream profile(s).
  - c. Where applicable, depths of flow and velocities used in analysis.
  - d. Where applicable, centerline profile(s) from debris flow start zone(s) to toe of run out zone(s).
  - e. Assessment of the sensitivity of the watershed area, with respect to hydrology and sediment and debris loading.
  - f. Assessment of long term channel bed load and debris maintenance requirements in relation to any recommended flood hazard mitigation measures.
  - g. Where existing channel capacity and topographic features on the fan are identified as features contributing to the safe use of the property, provide an assessment of the effects (if any) of any future changes to the channel or fan. This information is required to identify land use and/or in-stream work measures that may be required for the land use decision maker to put in place to ensure the longevity of the features contributing to the safe use of the property. Examples of such measures include the maintenance of the channel discharge capacity and the operation and maintenance of protective structures.
  - h. Plans, cross-sections, and design specifications for proposed building foundation treatments and other site-specific mitigation measures.
4. Areas Protected by Standard Dikes:
- a. Map(s) depicting; existing and proposed dikes, dike right-of-ways, dike access routes and easements, areas protected by the dikes, and property boundaries. A summary of all comments and concerns raised through consultation with the proper authorities, complete with statements on how each comment or concern is addressed in the report.

Additional Elements to Be Given Consideration:

1. Regional and/or a site map and/or air photograph overlay depicting: the existing property boundaries; all water courses, alluvial fans and areas exposed to debris flow hazards; hydraulic structures, existing and proposed flood protection works; proposed safe building sites; and any other relevant regional or site specific information.

2. Review of all relevant restrictive covenants registered on title for the subject property and any relevant nearby properties (copies of covenants should be attached to the report).
3. Review of all relevant local government land use policies, guidelines and regulations including; floodplain and other relevant bylaws, Official Plan or Rural Land Use Bylaws, development permit area requirements and policy statements.
4. Description of site visits complete with documentation of observations.
5. Review of current and historical air photographs.
6. Review of historical flood information including; Water Survey of Canada hydrometric data (discharges, flow depths and velocities), Environment Canada climate data, local government and Provincial reports, local newspaper archives, Lidar Mapping and interviews with local residents.
7. Location of all proposed safe building sites by specifying building setback distance(s) from the natural boundary of watercourse(s) and/or map notation. Areas depicted on maps must be delineated with sufficient accuracy and detail as to allow the preparation of legal reference plan(s) for attachment to a restrictive covenant.
8. Where applicable; Flood Construction Levels by prescribing an elevation above the natural boundary of a watercourse or natural ground elevation at the building site, or by specifying a geodetic elevation, or by a combination of the above. Geodetic elevations should be referenced to Geodetic Survey of Canada datum or some other datum acceptable to the decision maker.

**Additional Required Contents Include:**

For more information on the required contents of a floodplain analysis, please refer to Ontario Ministry of Natural Resources and Forestry's Technical Guide – River and Stream Systems: Flooding Hazard Limit (2002). The Technical Guide specifies the methodology and reporting requirements for a floodplain analysis.

**Submission Requirements**

All development applications and accompanying studies and reports should be submitted through the City of Kingston's **DASH Development and Services Hub** which can be accessed online at: [City of Kingston DASH](#)

**Additional Information**

For additional information, please contact the City of Kingston Planning, Building and Licensing Services Department at:

1211 John Counter Boulevard, Kingston

613-546-4291 ext. 3180

[planning@cityofkingston.ca](mailto:planning@cityofkingston.ca)

The Cataraqui Region Conservation Authority can also be contacted at:

P.O. Box 160, 1641 Perth Road, Glenburnie, ON K0H 1S0

613-546-4228

[info@crca.ca](mailto:info@crca.ca)

[Cataraqui Region Conservation Authority](#)