

# Floodplain - Final Application Checklist



Project Name: \_\_\_\_\_

Developer Name: \_\_\_\_\_

Engineer Name: \_\_\_\_\_

## General

Study Type (One Checklist needed for each type / drainage-way study)

- Intermittent or Perennial Streams (as shown on USGS Quadrangle): \_\_\_\_\_
- Wetland / Closed Depression (e.g. Madison Flats)
- FEMA Letter of Map Revision (LOMR), Stream Name: \_\_\_\_\_

Upstream Limit of Study (Street crossing or PLSS to 1/4-1/4 section): \_\_\_\_\_

Downstream Limit of Study (Street crossing or PLSS to 1/4-1/4 section): \_\_\_\_\_

Reason for study (check all that apply)

- Establishing 100-Year Flood Elevations
- Evaluating impacts on upstream or downstream property owners
- Re-routing stream channel
- Road crossing
- Filling and/or grading adjacent to an intermittent or perennial stream

## Hydrology

What method was used to determine peak flood discharges?

- SWMM (Version, e.g. XP, Info, EPA, etc.: \_\_\_\_\_)
- HEC-HMS / HEC-1
- HydroCAD (if selected, Dynamic method required)
- USGS Gage / Gage Comparisor
- USGS Rural Regression Equations
- Existing Study (Study Name, Author, Date: \_\_\_\_\_)
- Other: \_\_\_\_\_

If storage is used in the hydrologic / hydraulic model, where is the storage located? (check all that apply)

- FEMA Flood Zone
- Local Flood Zone
- Public Outlot or Easement
- Public Right-of-Way
- None of the above
- Not applicable

## Hydraulics

What method was used to determine peak flood elevations?

- HEC-RAS (steady-state)
- HEC-RAS (unsteady-state)
- SWMM (Version, e.g. XP, Info, EPA, etc.: \_\_\_\_\_)
- Existing Study (Study Name, Author, Date: \_\_\_\_\_)
- Other: \_\_\_\_\_

What is the datum for peak flood elevations?

- NAVD88
- NGVD29
- Other, list conversion to NAVD88/NGVD29: \_\_\_\_\_

What is the topographic source for determining flood extents? (check all that apply)

- Site Survey
- LIDAR or photogrammetric
- Other, list type: \_\_\_\_\_

<b>1.0 Design Requirements</b>		
1.1 Will the proposed development impact property not owned by the Developer? Impacts, for the purposes of this application only, are defined as increases in 100-year flood elevations allowable by FEMA or greater than 0.1 feet (whichever is less) on lands not owned by the Developer, including City-owned property and ROW.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1.2 If in a FEMA floodplain, analysis and design shall be consistent with FEMA and NFIP requirements.	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A
1.3 Minimum building elevations shall be consistent with the provisions of Ch. XIV-Flood Damage ordinance of the Watford City Code of Ord. Future land use shall be as defined by the most current Watford City growth plan.	<input type="checkbox"/> Yes	

Not  
Included Applicable

<b>2.0 Drawing / Map Contents</b>		
2.1 Information outlined in Erosion Control Drawing Contents Checklist, Items 2.1 through 2.13, as applicable.		
2.2 Map(s) showing topography, subwatersheds with unique identifiers, soils, land use / vegetative cover		
2.3 Map(s) showing cross section/manhole locations, culvert / bridge locations, 100-year flood extents, parcels		
2.4 Outlot locations, easements, and 100-year peak water surface elevations in surface drainage features.		
2.5 Minimum building elevations		

<b>3.0 Report Contents</b>		
3.1 Narrative describing the proposed project		
3.2 Purpose of the study and description of the study area		
3.3 Known past flooding events (If yes, list source, date, and any information available)		
3.4 Past studies (If yes, list source, date, and any information available)		
3.5 Data used and gathered for this study		
3.6 Supporting calculations for hydrologic analysis (such as CN and Tc)		
3.7 Summary table showing existing (and future, if applicable) land use subwatershed hydrologic parameters (such as Area, CN, % Impervious, Tc)		
3.8 Summary output showing existing (and future, if applicable) land use 100-year peak runoff rates and volumes from each subwatershed		
3.9 Description of basis and applicability of selected hydrologic analysis method.		
3.10 Description of any key assumptions such as storage, land use, soils, etc.		
3.11 Description of storage used in the hydrologic and/or hydraulic model.		
3.12 Description of changes in flow due to Developer's proposed development work		
3.13 Description of future land use changes in study area, as outlined in the most current Watford City growth plan, and how those changes might affect flows in the study area.		
3.14 Summary of source data used to generate cross sections (e.g. LIDAR for overbanks, survey for channel, proposed grading)		
3.15 Photographs of channel / overbanks and modeled bridges / culverts		
3.16 Summary table showing cross section and/or manhole locations and peak 100-year flood elevations		
3.17 Summary table comparing existing and proposed peak 100-year flood elevations for existing (and future, if applicable) land use		
3.18 Description of any key assumptions such as Manning's roughness, tailwater condition		
3.19 Description of 100-year flood elevation impacts from Developer's proposed development work		
3.20 Hydrologic and hydraulic model files have been provided to the City (CD)		

<b>4.0 Certification</b>		
4.1 Floodplain study shall be certified by a duly licensed Professional Engineer in the State of North Dakota that the analysis (and design as applicable) was completed by or under the direct supervision of the Engineer and that the analysis and design complies with these guidelines.		
4.2 If impacts are created by the project (as defined in 1.1 of this checklist), Developer shall submit supporting documentation that impacted landowners, including the City, are aware and approve of the impacts.		
4.3 If the project includes grading and/or filling within the floodplain, Engineer responsible for the design shall submit an as-built survey of site grading activities following site stabilization. Engineer shall certify that the as-built project is consistent with the analysis (and design as applicable). (Submitted after project completion.)		