

4.4 Floodplains

The floodplain encroachment evaluation was conducted in accordance with EO 11988 “Floodplain Management,” “Assessment and Documentation of Floodplain Encroachment” as contained in the IDOT *Bureau of Design and Environment Manual*, “Floodplain Encroachments” in the *Drainage Manual*, and Illinois Administrative Code 3708 “Floodway Construction in Northeastern Illinois.” Guidance from the DuPage County Countywide Stormwater and Floodplain Ordinance was applied in determining compensatory storage requirements, because the County ordinance is more restrictive than IDOT requirements.

Potential floodplain encroachments were identified by overlaying proposed roadway locations onto FIRMs published by the FEMA. Proposed roadways were separated by county – Cook or DuPage – and compensatory storage requirements due to fill in floodplains were analyzed in accordance with the respective local stormwater management ordinance since they are more strenuous or demanding. Because of the absence of a proposed roadway profile, all floodplains were assumed to be affected to the 100-year flood elevation. The width of encroachment area was based on proposed roadway width (roadway footprint) from proposed typical cross sections. Affected floodplain and floodway areas were calculated using GIS software and overlaying proposed roadways onto the FIRMs.

Floodplain encroachments and mitigation measures are discussed below. Tables 4-18, 4-19, and 4-20 include itemized descriptions of encroachment type, encroachment area, compensatory storage volume required to mitigate encroachment, and assessment category for each floodplain. Exhibits 4-1A through 4-1E and Exhibit 4-5 depict floodplain impacts. Transverse (crossing) and longitudinal (edge) floodplain encroachments are differentiated. Longitudinal encroachments often result in significant floodplain impacts and greater reduction in conveyance.

TABLE 4-18
Summary of Floodplain/Floodway Encroachment by Build Alternative and South Bypass Connection Option in Cook County

| Encroachment | Alternative 203 | Alternative 402 | Option A | Option D |
|---|-----------------|-----------------|----------|----------|
| Potential Transverse Encroachments | 2 | 2 | 1 | 1 |
| Potential Longitudinal Encroachments | 2 | 3 | 1 | 1 |
| Floodway Encroachment (acre) | 1.5 | 1.1 | 0.3 | 0.3 |
| Floodplain Encroachment (acre) | 2.1 | 4.6 | 0.6 | 0.6 |
| Estimated Compensatory Storage for Filling Floodway (acre)/(acre-foot) ^a | 3.0/14.8 | 1.6/8.2 | 1.6/7.8 | 1.6/7.8 |

Note: Shoulder-to-shoulder roadway widths were used to determine the amount of fill in the floodplain or floodway. Methodology will be redefined during Tier Two environmental studies, when proposed profiles are available.

^a Compensatory storage locations are assumed to have a five-foot depth. Compensatory storage is provided at a ratio of 1:1 for encroached floodways in Cook County. Mitigation ratios refer to acre-foot values.

TABLE 4-19
Summary of Floodplain/Floodway Encroachment by Build Alternative and South Bypass Connection Option in DuPage County

| Encroachment | Alternative 203 | Alternative 402 | Option A | Option D |
|---|-----------------|-----------------|----------|----------|
| Potential Transverse Encroachments | 5 | 7 | 0 | 0 |
| Potential Longitudinal Encroachments | 0 | 1 | 0 | 0 |
| Floodway Encroachment (acre) | 1.6 | 1.6 | 0 | 0 |
| Floodplain Encroachment (acre) | 22.0 | 22.0 | 0 | 0 |
| Estimated Compensatory Storage for Filling Floodplain (acre)/(acre-foot) ^a | 29.7/148.6 | 29.7/148.6 | 0/0 | 0/0 |

Note: Shoulder-to-shoulder roadway widths were used to determine the amount of fill in the floodplain or floodway. Methodology will be redefined during Tier Two environmental studies, when proposed profiles are available.

^a Compensatory storage locations are assumed to have a five-foot depth. Compensatory storage is provided at a ratio of 1.5:1 for encroached floodplains in DuPage County. Mitigation ratios refer to acre-foot values.

Design alternatives to avoid or minimize significant impacts would need to be investigated in subsequent detailed design, Tier Two. It is expected that all Category 6 (i.e., significant) encroachments (see Table 4-20) would be avoided or mitigated during the future phase of work. Category 6 encroachments are either transverse or longitudinal, and are predicted to result in a significant adverse impact on natural and beneficial floodplain values, a significant increase in flood risk, or a significant increase in potential for interruption or termination of emergency service or emergency evacuation routes. In subsequent phases of design, notices published in the news media would indicate that such floodplain encroachments are being considered. All potential floodplain encroachments would be identified during the presentation hearings or meetings.

TABLE 4-20
Summary of Floodplain Encroachment by Waterway and Assessment Category

| Floodplain | Transverse | Longitudinal | Assessment Category ^{a,b,c} |
|------------------------------|------------|--------------|--------------------------------------|
| Meacham Creek | X | | 3 |
| Salt Creek | X | | 4 |
| Higgins Creek | X | | 3, 6 |
| Higgins Creek Tributary A | X | X | 4, 6 |
| Higgins Creek Tributary B | | X | 6 |
| Willow Creek | X | | 4 |
| Willow Creek North Tributary | X | X | 4, 6 |
| Willow Creek South Tributary | X | X | 4, 6 |
| Bensenville Ditch | X | | 4 |
| Addison Creek | X | | 3 |

^a Assessment categories are from IDOT's *BDE Manual, 2002*: Chapter 26, Section 26-7, *Floodplain Finding* and *IDOT Drainage Manual*: Chapter 3, Section 3-005 Categories. Assessment categories range from 1 to 6.

Category 1 represents projects that will not involve any work below the 100-year flood elevation. Category 6 represents significant floodplain encroachment.

^b Category 3 represents projects involving modification to existing drainage structures.

^c Category 4 represents projects involving replacement of existing drainage structures on existing alignment.

Alternative 203 may encroach upon seven base floodplains – Meacham Creek, Salt Creek, Willow Creek, Willow Creek South Tributary, Higgins Creek, Higgins Creek Tributary A, and Bensenville Ditch – both transversely and longitudinally (see Tables 4-18, 4-19, and 4-20). The area of floodplain encroachment is roughly 24.1 acres. The total potential floodway encroachment is 3.1 acres. As a result, Alternative 203 would require a compensatory storage area of 32.7 acres to comply with the local stormwater management requirements. The compensatory storage would be provided at an area hydraulically connecting to the floodplain (see Tables 4-18 and 4-19).

The encroachments at the Higgins Creek floodplain and the Higgins Creek Tributary A floodplain would be longitudinal along I-90. Retaining walls would be used to eliminate potential longitudinal impacts and possible creek relocation or realignment.

Alternative 402 may encroach on nine base floodplains – Meacham Creek, Salt Creek, Higgins Creek, Higgins Creek Tributary A, Higgins Creek Tributary B, Willow Creek, Willow Creek North Tributary, Willow Creek South Tributary, and Bensenville Ditch – both transversely and longitudinally (see Tables 4-18, 4-19, and 4-20). The areas of floodplain encroachment are 26.6 acres of floodplain and 2.7 acres of floodway. The compensatory storage area is estimated to be 31.3 acres to comply with the local stormwater management requirements. Compensatory storage would be provided at an area hydraulically connecting to the floodplain (see Tables 4-18 and 4-19).

York Road is supported by a dry-land bridge over the Willow Creek floodplain. The dry-land bridge extends 1,200 feet northward from a location 2,400 feet north of the intersection of York and Thorndale Roads. Under this dry-land bridge, there are three irregular trapezoidal structures: 30 feet (top width) by six feet (height) by six feet (bottom width); 40 feet (top width) by 8.4 feet (height) by six feet (bottom width); and 31 feet (top width) by 5.2 feet (height) by 10 feet (bottom width). This condition would be maintained to avoid affecting the effective waterway opening. Retaining walls would be used at Higgins Creek, Higgins Creek Tributary A, and Higgins Creek Tributary B to eliminate longitudinal floodplain encroachment.

Options A and D would have the same floodplain impact: a longitudinal encroachment on the Addison Creek floodplain, on the west side of I-294 near Grand Avenue. The Addison Creek 100-year floodplain impact is located in Cook County, and either connection option could encroach on 0.6 acre of the floodplain and 0.3 acre of the floodway. Roughly 1.6 acres of compensatory storage would be required (see Table 4-18 and Table 4-20).