

Elgin O'Hare – West Bypass: Willow Creek York Culverts

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Purpose

Flow from the Willow Creek South Tributary (South Unnamed Creek) and the Willow Creek North Tributary (North Unnamed Creek) on the west side of York Road drains easterly towards O'Hare Airport via three trapezoidal structures as described below. The purpose of this Technical Memorandum is to document the preference for leaving these structures in place versus replacing the structures with one single large structure at the northern crossing.

Existing Drainage Conditions

The tributary area of the three trapezoidal structures is approximately bounded by York Road to the east, Thomas Drive to the west, Sivert Court to the south and Pan Am Boulevard to the north.

The Flood Insurance Rate Map of DuPage County dated December 16, 2004 considers the area south of Thorndale Avenue as the South Unnamed Creek watershed and the area in the vicinity of Pan Am Boulevard and Supreme Drive as the North Unnamed Creek watershed. Flow from the South Unnamed Creek and the North Unnamed Creek converges on the west side of York Road and drains easterly towards O'Hare Airport via three trapezoidal structures. There is a 3- 10' (span) x 4' (rise) box culvert carrying Thorndale Avenue over the South Unnamed Creek. Flow on the north side of the triple box culvert turns to the east direction towards the intersection of Thorndale Avenue and York Road. Then, the South Unnamed Creek turns northerly to follow the York Road ditch on the west side for approximately 3,000' where a trapezoidal structure of 40' (top width) x 8.4' (height) x 6' (bottom width) exists. The South Unnamed Creek drains easterly via this structure and another trapezoidal structure of 31' (top width) x 5.2' (height) x 10' (bottom width) approximately 2,500' from the Thorndale Avenue intersection. The North Unnamed Creek mainly uses the trapezoidal structure of 30' (top width) x 6' (height) x 6' (bottom width) to drain easterly, which is located approximately 300' south of Pan Am Boulevard. The North Unnamed Creek will potentially overflow to the middle trapezoidal structure of 40' x 84' x 6' and converge with the South Unnamed Creek at this location. The total opening of the three trapezoidal structures is 407.8 square feet.

The existing low grade elevation of York Road within the Willow Creek floodplain is 660.9'. The headwater elevation of the three trapezoid structures is 656.1' and 656.5' for the 50-year flood frequency and 100-year flood frequency respectively. The hydraulic capacity of the

existing trapezoidal structures is more than adequate because York Road has a freeboard of 4.8' and will not be overtopped by the 100-year storm event.

Feasibility Evaluation:

Based on a review of the proposed geometry by CH2M Hill, Inc. associated with remaining alternates 203 and 402, there is no geometric benefit to combining the existing three trapezoidal drainage structures into one structure at the northern crossing. In addition, since the existing structures provide sufficient hydraulic capacity as-is, there is no reason to consider replacement for hydraulic purposes.

Furthermore, any consideration of removing and relocating the trapezoidal structures would require extensive hydraulic analysis for various combinations to determine a permissible type, size and location of the structure. Given the extensive and approved/permitted OMP hydraulic analysis based on the three trapezoidal structures remaining in place, a very time-consuming effort would be required to come up with a proposed structure that is acceptable to IDOT, OMP, DuPage County and associated Railroad(s). The timeline associated with this analysis and coordination would likely not be compatible with the OMP Willow Creek channel modernization, tentatively targeted to be implemented in 2010.

From the constructability perspective, construction of a new culvert beneath York Road and the Railroad(s) would require temporary causeways if traffic on York Road and the Railroad(s) must be maintained at all times. Either constructing bridges with temporary causeways or installing pipe culverts will be very costly. Constructing two bridges with each waterway opening of approximately 410 square feet is certain to disrupt traffic on York Road and the railroad for a while.

Conclusion:

On the above basis, given the absence of geometrics or hydraulics reasons for replacement, and given the extensive coordination and constructability issues associated with replacement, it is recommended that the three existing trapezoidal drainage structures beneath York Road and the Railroad(s) remain in place.