



Road Construction In Environmentally Significant Area

Project:

Construction of Doctor Kay Drive

Owners:

Regional Municipality of York
Township of King

Consulting Engineer:

Ainley & Associates Limited

Contractor:

Corm Construction Sewer & Watermain Ltd.

Suppliers:

Centennial Concrete Pipe & Products Inc.

Contract Value:

\$980,000



Challenging site conditions for construction of Doctor Kay Drive

Construction of Doctor Kay Drive took place along an existing abandoned rail right-of-way that bisects the Dufferin Marsh. The new road was needed to provide direct access into the core of Schomberg from Highway 27, and to improve safety and ease of access to external commercial services on Highway 27. In addition, the road would link the two major commercial cores of the Town, relieve traffic congestion, and improve traffic circulation from new housing developments. A traffic impact study prepared for the Region of York recommended that at least one lane on Highway 27 remain open at all times through the traffic staging plan.

The project followed Schedule C of the Class Environmental Assessment (EA) Process, requiring an Environmental Study Report (ESR). This report provided information on the existing natural features at the site, the habitat functions and linkages, and the potential impacts associated with the proposed alternatives to the road extension. The report provided the basis for road design criteria, after

input from the public, Township of King, Region of York, Ministry of the Environment, and Lake Simcoe Region Conservation Authority.

The ESR also determined that timing was a critical factor for construction activities so that the impact on the fishery would not be significant. In addition, there was a need to ensure that herpetiles (amphibians and reptiles) would have access to both areas of the marsh separated by the road. Consequently, five (300 mm diameter) corrugated metal culverts were installed along the length of the road, at ditch inlet grade, to accommodate the movement of amphibians. Pre-design considerations of a precast concrete culvert were modified to include 6-inch to 8-inch river stone. Any submerged features adjacent to the road required river stone and not rip rap. This change provided better substrata for the development of aquatic habitat and less injury to herpetiles.

The submerged twin-cell (0.9 m high x 1.8 m wide x 17.5

m long) precast reinforced concrete box culvert was designed with a transition slab.

The road grade had to be lowered to accommodate complex stormwater management plans for the marsh and downtown core. The culvert had to maintain constant flow from both sides of the marsh, and at the same time provide relief to the core area in the event of a flood. The road and culvert were designed to allow floodwaters to flow in a sheet over the road to prevent a backup and flooding in the town. Because of this, the backfill cover over the culvert was minimal, requiring a slab to strengthen the installation. The contractor was able to dewater the site for the box units, and set them on a granular base. This was not possible for alternative culvert designs and material due to special footing requirements and minimal backfill over the culvert.

For reasons of public safety, a lighting system for the roadway and sidewalk was incorporated into the roadway design. To reduce unnecessary lighting of the marsh, shields were placed on the lights on the north side of the road.

Significant trees with a mature canopy were saved, along with existing vegetation on the north side of the right-of-way, by using the old railway ditch for drainage.

After the contract had been awarded, and just before start of the tight construction schedule, unexpected concerns were raised about the nesting of migratory birds. The consulting engineer retained the services of a wildlife specialist who ensured that construction activities would comply with the Migratory Birds Convention Act, 1994. The construction date was altered to allow the nesting birds to fledge.

Once construction had commenced, there were no complaints from any of the participants in the EA Process. Construction was undertaken in partnership with development activity south of the new road to accommodate future services and road linkages. At the intersection with Highway 27, the contractor was able to keep traffic moving most of the time in an acceleration lane, a deceleration lane, and a detour lane, while the intersection and a significant grade separation were being constructed. During the peak tourist season of July and August, at least two lanes were kept open at all times.

The construction of Doctor Kay Drive was just as challenging at the intersection with Highway 27. High rainfall during the spring and early summer had saturated the soils of the construction site, making construction activities more difficult. An abandoned sanitary sewer, sanitary forcemain, and an abandoned and unknown 1½-inch water line had been installed in deleterious material along the right-of-way. Native material had never been stripped, only backfilled. Deleterious material included construction debris, tires, stumps, trees, mass concrete and broken concrete sidewalk, and old train tracks. Consequently, as the new road was being constructed, the contractor received information on how much material to be excavated, and the required quantities of select sub-grade material (SSM) to be imported to stabilize the road base. When the precast concrete box units arrived for installation, access to the installation site was not possible. The contractor moved another larger excavator of its own to the site, offloaded the culvert box units, and placed them successfully into position.



Precast concrete culvert with transition slab



Completion of Doctor Kay Drive road base