

Bridge 606, Highway 409

Greater Toronto Airport Groundside Association (GTAGA) required services for a large steel box girder bridge as part of the highway expansion required for the new Toronto Airport terminal located on Highway 409.

LEA provided services for bridge engineering and construction liaison for a large steel box girder bridge as part of the highway expansion required for the new Toronto Airport terminal. The bridge, located on Highway 409, is 250 metres in length, and has spans of 38-48-62-58-44 metres. The superstructure consists of a variable depth haunched concrete slab supported by two 2.1 metre deep steel box girders. The deck width varies from 12 metres to 19 metres, and the girder spacing also increases with the deck widening. Transverse post-tensioning was required in parts of the deck slab.



View of integral diaphragm detail at Pier 3

Due to tight clearance constraints to adjacent highway ramps below the bridge, the box girders are supported by complex integral steel diaphragms at two of the piers (clearance for pier caps was not available). The girders were fabricated on circular curves. The substructure consists of reinforced concrete HPC elements supported by caissons, or by spread footings founded into the dense underlying glacial till.

The analysis and design work for the bridge was completed initially using OMBAS beam modelling. A full 3-D finite element computer model in SAP 2000 was then set up and bracing forces, box girder stresses, deformations, bearing reactions and deck forces were checked and the design completed.



View of girder erection near Pier

PROJECT SUMMARY

Client:

Greater Toronto Airport Groundside Association (GTAGA)

Location:

City of Toronto, Canada

Services Provided:

Bridge Engineering and Construction Liaison

Cost:

\$ 5.5 Million

Date of Completion:

2000 - 2001



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