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INTRODUCTION

The objective of this project is to analyze and design a ~50m span pedestrian bridge over 16th avenue at 29th street. The bridge will enhance connectivity across a busy road and highly populated areas.

There is a new UxBorough center on the north side from the Calgary Cancer Center. The bridge will also connect pedestrians to the newly planned BRT bus stations.



CONSTRAINTS

- 6m clearance over roadway.
- 3m clearance over walkways.
- 3x3m clear space inside bridge.
- Underground utilities.

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Industry Advisors:

- Abul Rafiquzzaman, Parsons
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ANALYSIS

SAP2000 was used to determine the stresses and internal forces acting on the members. The loads and member sizes were selected from the results of the analysis.

Materials

Applied Loads (CSA S6 - CHBDC)



ABUTMENT DESIGN



16th Avenue Pedestrian Bridge

Schulich School of Engineering, University of Calgary

Steel: CSA G40.21 350AT Concrete: CSA A23-40MPa Rebar: CSA G30.18-400W

Pedestrian Live Load: 3.5 kPa Maintenance Vehicle: 80 kN gross load Wind Load: 2.72 kPa horizontal | 1.36 kPa vertical Temperature Loads: ±30 °C



Figure 1. SAP2000 Deformations

The applied loads on the span are effectively transferred to the abutments at the end of the bridge.







FINAL DESIGN

Different connection types were analyzed in detail to ensure adequate resistance from the applied forces. Welded connections were utilized for most of the truss connections, while anchors were used for the abutment.

We used SAP2000 to perform the structural analysis and verified the design using hand calculations for various components.

Steel: Tension & Compression Members | Bending Members | Bracing | Key Connections



WEBS

Welds: 6mm longitudinal fillet welds (E49XX) • **Capacity:** $V_r = 627 \text{ kN}$

