



BULLETIN #2 (2023-01)

Revision to Concrete Sidewalk Structure

Objective

This bulletin is issued to supersede the current concrete sidewalk structure to provide an improved sidewalk structure. This will provide guidance to The City of Calgary (City) personnel, Contractors, and Consultants who comply with the Standard Specifications for Road Construction (2021) for work in new subdivision development and redevelopment in existing neighbourhoods.

Background

The current City Specifications require a sidewalk structure of 100 mm concrete over compacted subgrade. The City of Calgary has the thinnest sidewalk structure in all major Canadian municipalities and does not specify a granular base layer. This contributes to excessive cracking under standard sidewalk loading conditions.

As follow up to the recommendations of City Council Notice of Motion for Concrete Quality in the Public Realm (TT2017-0345) and during engagement with Building Industry and Land Development – Calgary Region (BILD), a stakeholder group of BILD and City representatives was established. The focus of the stakeholder engagement was to conduct a pilot study to evaluate efficiencies of various concrete sidewalks structures to improve durability and implement best construction practices for concrete construction. To monitor the construction of pilot projects and evaluate the performance measurement of various trial structures (as shown on the last page of this bulletin), the city retained a consultant to complete a performance evaluation after a five-year monitoring period.

Key Findings of 5-year Assessment

- The current specified sidewalk design thickness of 100 mm concrete has a predominantly high risk of cracking under the most common loads experienced on the sidewalks
- The five-year assessment of the pilot project found an average replacement rate of the control structure (2015 specifications) of 53 %
- The consultant's performance assessment report recommends the optimum sidewalk thickness of 125mm fibre concrete placed on 100 mm granular base course

Discussions with BILD

The City and BILD have discussed the outcome of the five-year assessment to determine a cost-effective concrete structure for the sidewalk. Given the constraints on the local economy and supply chain, implementing the pilot study's optimal sidewalk structure of Section B (fibre reinforced concrete over gravel base layer) may be cost-prohibitive at this time. The City is supportive of BILD's recommendation, with a phased approach towards the optimal recommendation by first implementing Section E (125 mm concrete over compacted subgrade) as a reasonable first step towards improving the City's sidewalk lifecycle and sustainability.

Recommendations

Per agreement with the City Director of Mobility and the CEO of BILD, **125 mm concrete with no gravel base or fibre reinforcement (Section E)** will be accepted as an initial first step to improve the City’s concrete assets. Further, the City recommends the use of low carbon concrete in all applications. The City also recommends that the development industry monitor the improved concrete specifications and evaluate whether the consultant’s recommendation of a granular base layer would be a viable addition to improve the overall durability of sidewalks in the future.

Implementation:

This bulletin will supersede the current Standard Specifications for Road Construction (2021) concrete sidewalk structure and other related sections of the sidewalk specifications. The new structure per **Section E**, will be effective starting **January 1, 2023**.

Contact

Any questions regarding this bulletin may be directed to Mobility – Materials and Surface Restoration – Nasir-ul Mulk, Senior Pavement Engineer at Nasir-ul.Mulk@calgary.ca

Recommended:



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Attachment: 5-Year Pilot Study Cross-Sections



5-Year Pilot Study Cross-Sections (Not to Scale):

Section A		100 mm thick concrete No fiber, No gravel
Section B		125 mm thick concrete Fiber, 100 mm of Gravel
Section C		100 mm thick concrete Fiber, 100 mm of Gravel
Section D		100 mm thick concrete No fiber, 100 mm of Gravel
Section E		125 mm thick concrete No fiber, No gravel