Industry Bulletin
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Update to Scour and Abrasion Protection Requirements for Stormwater Manholes

The City of Calgary is amending the December 2013 Industry Bulletin 'WATER RESOURCES/WATER SERVICES AMENDMENTS TO THE 2011 STORMWATER MANAGEMENT & DESIGN MANUAL'.

Effective immediately, steel or plastic protection plates are no longer required in drop manholes. Instead, sacrificial concrete benching shall be provided for drops exceeding 1.0 m and design flows greater than 500 L/s. Drop manholes meeting these criteria must have a minimum benching thickness of 150 mm above and independent of the manhole base. Manholes requiring sacrificial benching must be identified in the Stormwater Management Report and on the Construction Drawings. As per the 2013 Bulletin, drop heights shall not exceed 2.0 m and design velocities exceeding 4.5 m/s shall be avoided.

The hydraulics of steeply sloping pipes, single drop manholes, and drop manholes in series require specialized designs to appropriately manage energy, air entrainment, and provide adequate system capacity. The City is currently investigating potential updates to the hydraulic design requirements, including additional explicit guidance for drop manholes and steeply sloping pipes.

For those interested, some examples with detailed guidance on specialized hydraulic design are available in the following textbooks and papers:

- Wastewater Hydraulics Theory and Practice Second Edition by Willi H. Hager (2010)
- Hydraulic Structures by C.D. Smith (1995)
- HEC-14 Energy Dissipators, Federal Highways Administration (2006)
- Hydraulics of Circular Drop Manholes, Granata et al. (2011)
- Energy Dissipation in Circular Drop Manholes, Ma et al. (2017)
- Design Considerations for High Speed Flow, Qian et al. (2023)

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