Urban Drainage and Flood Control District

Guidelines for Model Approval for Use of the
High Line Canal for Stormwater Purposes
September, 2018

Introduction

The High Line Canal has been in existence in the Denver metropolitan area for nearly 135 years. Owned and operated by Denver Water, the canal has historically transported water for irrigation and recreational activities for local residents. Over time, land use in the region has transitioned from agricultural use to commercial and residential uses, so the number of consumers along the canal and the need for supply has decreased substantially. The canal currently still functions to deliver water to about 80 customers up to the Fairmount Cemetery but is primarily used as a recreational corridor. Denver Water intends to decommission the canal as a delivery system in the near future.

The High Line Canal is one of the premier recreational corridors in the Denver metropolitan area, with a multi-use trail running adjacent to the canal for its entire length that provides local users a dense canopy of cottonwood trees. In an effort to protect this recreational experience for the community, the High Line Canal Working Group was formed in 2010. Once the canal is decommissioned there will not be a water source available to maintain the existing vegetation along the corridor. For this reason, the High Line Canal Working Group and Denver Water reached out to the Urban Drainage and Flood Control District (UDFCD) to explore opportunities for utilizing the existing canal to serve a need of water quality treatment in both fully developed and developing areas in order to maintain a water source for vegetation.

UDFCD, in cooperation with local governments surrounding the canal, including City of Aurora, City of Cherry Hills Village, City of Greenwood Village, City and County of Denver, City of Littleton, City of Centennial, Arapahoe County and Douglas County, prepared a High Line Canal Stormwater and Operations Master Plan (Master Plan) which analyzed utilizing the canal for stormwater purposes. The objectives of the master plan were to quantify the stormwater runoff currently entering the canal and to model the movement of the inflows along the full length of the canal and to develop an operational SWMM model (Model) that includes development and evaluation of nearly thirty years of continuous historic precipitation data. This model is necessary given the interconnected nature the canal has to multiple jurisdictions along its length, the lengthy travel times of flow within the canal, the multiple existing and potential future inflow points, and the limited constructed overflow locations where water may exit the canal. The master plan develops potential improvements to the existing canal infrastructure in order to limit flood risk, improve water supply to existing vegetation, and provide water quality measures to stormwater runoff before returning treated flows to a stream.

Proposed Use of the Canal

When a project adjacent to the canal is in development, there may be opportunities to utilize the canal for stormwater conveyance or water quality treatment. The Master Plan should be used as a guide to understand where certain uses of the canal may be permissible and what additional measures may need to be implemented prior to utilization of the canal. However, the intent is to utilize the Model to assess the validity of a proposed use, whether the project is constructed by a governmental entity or by a private land developer. The following outlines the procedure for gaining acceptance of use of the canal:

1. A developer/consultant indicates interest in using the canal to the presiding local government.
2. The local government provides the High Line Canal Use Approval Guidelines to the developer/consultant and directs them to contact UDFCD.
3. The developer/consultant contacts UDFCD for the operational model and to inform of intent to submit.
4. UDFCD provides the developer/consultant with a spliced version of the operational model containing the segment of interest for the proposed project.
5. The developer/consultant sends an initial submittal containing all of the items listed within these Guidelines to the local government.
6. The local government forwards the initial submittal to UDFCD.
7. UDFCD checks submittal for completeness and returns to developer/consultant if incomplete.
8. UDFCD reviews submittal (either internally or through a third party reviewer) and provides a response within 3 weeks.
9. If comments need to be addressed, UDFCD provides those comments directly to the developer/consultant and cc's the local government.
10. Developer/consultant addresses comments and resubmits directly to UDFCD and cc's local government.
11. If there are no further comments, UDFCD sends approval letter to local government and cc's developer/consultant.

[insert flow chart]

Submittal Requirements

The following shall be included in each submittal to UDFCD. All submittal material shall be in electronic format and submitted via email. Upon receipt of submittal, UDFCD will do an initial check for completeness. If any of the required items are missing, the submittal will be considered incomplete and returned to the developer/consultant. The review time does not begin until a complete submittal has been received.

Hydrologic Models:
- CUHP model used to define new inflow to canal
- A modified version of the spliced operational SWMM model that was sent to the developer/consultant (separate models created by the developer/consultant shall not be reviewed)

- All modified elements shall be appropriately named to easily identify changes made (e.g. *Firm_HLC_315285, Development_HLC_315285, Development_new_315286, or similar)*
- All SWMM elements shall be appropriately georeferenced (spliced operation model provided is georeferenced)

Narrative:
- Discussion of overall design goal and intended use of canal
- Discussion of the boundary conditions on the canal (both upstream and downstream)
- List of all modified/changed elements in the SWMM model
- Discussion of any new canal inflows (e.g. from development or existing storm sewer)
- Discussion of any new canal outflows (e.g. constructed overflows)
- Discussion of pre-improvement vs. post-improvement conditions
  - Impact on freeboard (including how freeboard is calculated)
  - Impact on spills
  - Impact on canal geometry
  - Impact on stream crossings
- Discussion of CUHP model used to quantify new flow into canal (including imperviousness assumptions)

Figures:
- General conceptual plan drawing
- CUHP basin delineation with routing for any new flow into canal

GIS shapefiles:
- Subcatchment boundaries
- Longest flow path
- Longest centroidal flow path

Approval of Proposed Use

Once the submittal has been reviewed and all outstanding comments have been addressed, UDFCD will issue an Approval of Modeling for Proposed Use of the High Line Canal memorandum (Attachment 1). **This memorandum constitutes an approval of the proposed use from a technical modeling standpoint only.** Any entity wishing to utilize the canal must enter into a High Line Canal Storm Water Agreement with Denver Water. Once an agreement is in place, the local government and Denver Water will be responsible for reviewing and approving construction plans for any structural modifications to the canal.

During the design and/or construction process, if there is a design change that may have an impact to the hydrologic function of the canal different from what was included in the approved model submittal, the developer/consultant shall submit to UDFCD a Notice of Change to Approved Model form (Attachment 2). UDFCD will review the request and either approve the request by sending the signed form to the local government and Denver Water for signature or reject the request and return to the developer/consultant.

The local government and/or Denver Water are responsible for inspecting construction along the canal and confirming modifications are made in accordance with the accepted proposed model. When construction is complete, as-built documents shall be submitted to UDFCD to ensure the Model reflects existing conditions.