Stantec

Memo

To:	Marie Thoming, DOTI PM City and County of Denver	From:	Monica Chapman, PE Stantec Consulting, Inc.
Project/File:	11th and Quebec - 1817250067	Date:	June 19, 2026

Reference: 11th and Quebec Improvements – preliminary drainage analysis

In conjunction with the preliminary (30%) design and construction document preparation for the intersection of East 11th Avenue and Quebec Street, Stantec has performed a preliminary drainage analysis of the four corners of the intersection. We have evaluated the existing and proposed conditions with respect to street capacity and storm sewer facilities. Below is a summary of our analysis:

Northeast corner:

The existing drainage pattern on Quebec Street conveys runoff from north to south along the east curb & gutter on Quebec Street to an existing combination sump inlet near the intersection. Similarly, the existing drainage pattern on 11th Avenue conveys runoff from east to west along the north curb & gutter on 11th Street to the same existing inlet on Quebec Street. There are existing storm sewer pipes from the adjacent property on the northeast corner of the intersection which connects into the street inlet. Roadway and adjacent property runoff are conveyed via 15” RCP to the west. A Green Infrastructure facility has recently been constructed along 11th Avenue and will not be modified with this project.

The existing street section along the east side of Quebec Street is approximately 20’ wide from the crown to the flowline. The proposed condition, which adds a bulbout and narrows the street section along Quebec Street, will reduce the available street capacity in this area. Therefore, a proposed inlet will be placed just north of the bulbout to intercept runoff prior to the street section becoming narrower. The new inlet will be connected to the existing storm sewer system via 15” RCP. The existing street section on the north side of 11th Avenue is not being modified until the bulbout begins.

Southeast corner:

The existing drainage pattern on 11th Avenue conveys runoff from east to west along the south curb & gutter on 11th Avenue, and from south to north along the east curb & gutter on Quebec Street, to an existing curb opening sump inlet near the intersection. Roadway runoff is conveyed via 12” RCP to the main trunkline which flows west.

The existing street section along the south side of 11th Avenue and the east side of Quebec Street will not be modified, except for a smaller curb return radius at the intersection. A proposed inlet will be located at the low point and will be connected to the existing storm sewer system via 15” RCP.

Reference: 11th & Quebec Preliminary Drainage Analysis

Southwest corner:

The existing drainage pattern on 11th Avenue conveys runoff from west to east along the south curb & gutter on 11th Avenue, and from south to north along the west curb & gutter on Quebec Street, to an existing combination sump inlet at the curb return. Roadway runoff is conveyed via RCP to the main trunkline which flows west.

The existing street section along the south side of 11th Avenue will not be modified with this project. The proposed condition along Quebec Street adds a bulbout and narrows the street section on Quebec Street, which will reduce the available street capacity in this area. A proposed inlet will be placed at the low point and will be connected to the existing storm sewer system via 15" RCP. As design progresses, street capacity will be evaluated on Quebec Street to determine if another inlet is warranted south of the bulbout.

Northwest corner:

The existing drainage pattern on 11th Avenue conveys runoff from west to east along the north curb & gutter on 11th Avenue, and from north to south along the west curb & gutter on Quebec Street, to an existing combination sump inlet near the intersection. Roadway runoff is conveyed via 18" RCP to the main trunkline which flows west. There is some overland runoff from the adjacent property at the northwest corner of the intersection which flows to the roadway curb & gutter.

The existing street section along the north side of 11th Avenue is approximately 29' wide from the crown to the flowline. The proposed condition, which adds a bulbout and narrows the street section on Quebec Street, will reduce the available street capacity in this area. Therefore, a proposed inlet will be placed just north of the bulbout to intercept runoff prior to the street section becoming narrower. The new inlet will be connected to the existing storm sewer system via 15" RCP. Another inlet will be located at the low point in the curb return, which matches the existing condition. The existing street section along the west side of Quebec Street is not being modified.

Additional general comments:

Per Denver's Interactive Map – Storm Drainage Master Plan (SDMP 2026), this area has known localized flood areas up to 3' in depth, particularly along the northwest section of the intersection. See attached map for reference. It is not in the scope of this intersection project to evaluate the entire drainage basin tributary to this intersection, nor to evaluate the existing storm sewer infrastructure to determine adequacy, nor to attempt to solve the existing drainage problems in this area. The goal of this project is to avoid making the drainage situation worse, or perhaps offer improvements that can be completed within the limitations of this project to make the drainage situation better.

As the design progresses, we will obtain more detailed utility information as part of the SUE process. This will help identify conflicts between the proposed storm sewer and other existing utilities, as well as provide the required information to design the storm sewer vertical profiles. All attempts will be made to avoid the need to relocate utilities, if possible.

The project design team considered if there are any opportunities to incorporate Green Infrastructure (GI) into the proposed improvements; however, the current design does not provide areas to add water quality

Reference: **11th & Quebec Preliminary Drainage Analysis**

elements due to the small areas between sidewalk and ADA ramps, as well as the need to provide inlets upstream from bulbout areas, which intercepts the runoff prior to an opportunity to convey through a GI element.

As design progresses, inlet sizing and street capacity calculations will be provided and construction plans will be updated accordingly. Please contact us if you have any questions or would like to discuss further.

Sincerely,

Stantec Consulting Services Inc.

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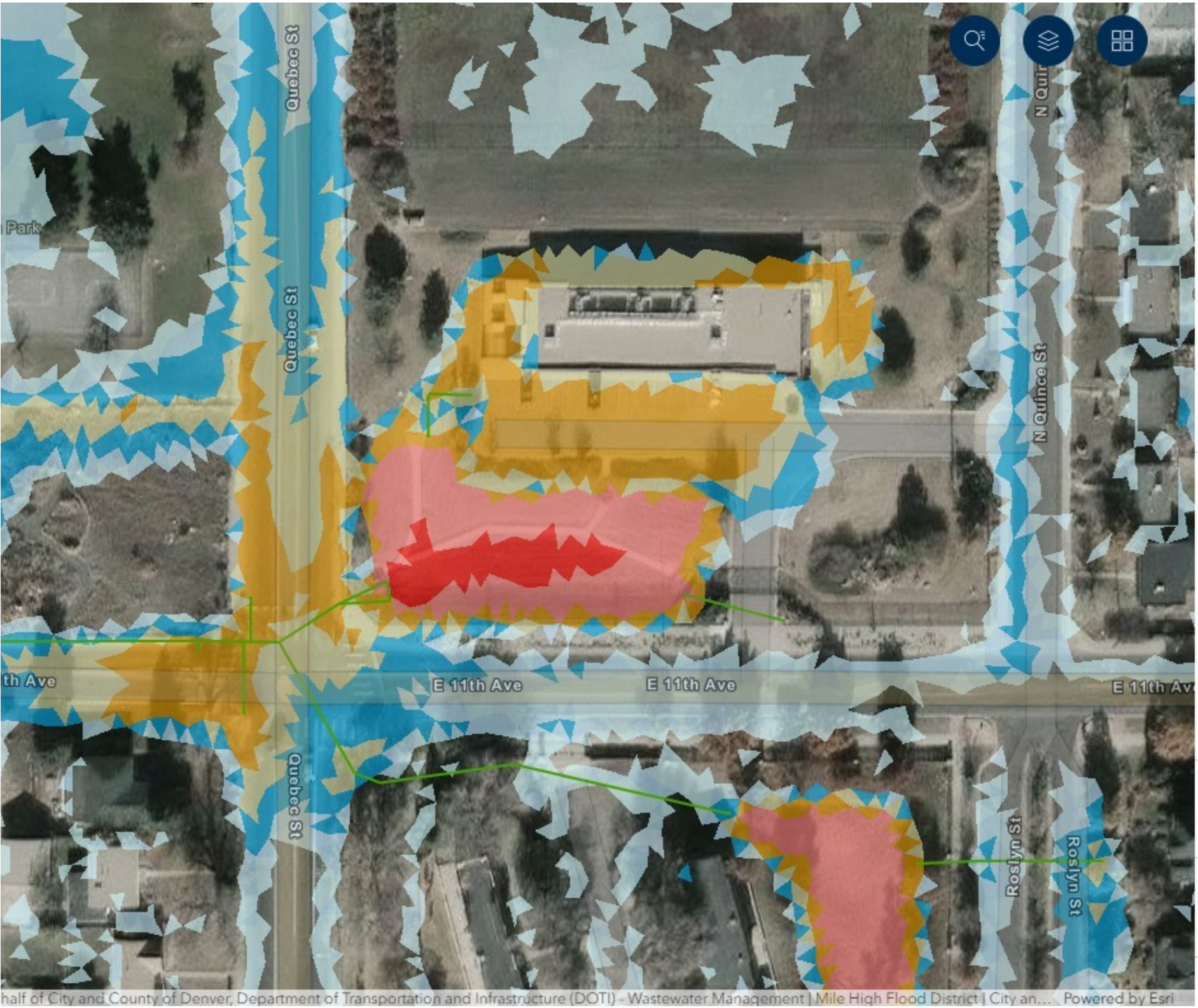
Attachments: Denver's Storm Drain Master Plan Exhibit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