

DSN028-STOR-1 (KC) or MEBI-King-KC-STOR

Alternative DSN028-STOR-1 (KC) controls King County's King St CSOs by building a storage tank near the King St Regulator Station. This alternative is an independent alternative and only controls King County CSOs.

Design Criteria

- King County Storage Volume Requirement: 2.63 MG (King St)
- King County CSO Peak Flow Rate for Sizing Conveyance to Storage: 56.0 MGD (King St)
- Storage tank is required to drain within 12 hours of event.

Description

Alternative DSN028-STOR-1 (KC) consists of a storage tank to control King County King St CSOs. A CSO control volume of approximately 2.63 MG is required to reduce overflows at the King St CSO Outfall to an average of one untreated discharge per year. Storage of this volume could be provided with an offline storage tank located within or adjacent to the approximate boundary shown in Figure G.3.4-1. See Section 6.1 Planning-Level Sizing Assumptions for criteria and assumptions used in establishing the approximate boundary.

The main components of this alternative would include:

- 2.63-MG offline storage tank with pumps to empty the storage tank.
- Facilities building(s) to house electrical/control/odor control equipment and a standby generator.
- Modifications to King St Regulator Station.
- Up to approximately 740 ft of 18-inch-diameter force main, depending on the location selected for the offline storage tank within or adjacent to the approximate boundary shown in Figure G.3.4-1.
- Up to approximately 1,480 ft of 48-inch-diameter influent gravity sewer, depending on the location selected for the offline storage tank within or adjacent to the approximate boundary shown in Figure G.3.4-1.

Storage Tank

The CSO control volume for King County could be stored in a buried, rectangular structure, approximately 250 feet long and 90 feet wide with a sidewater depth of approximately 20 feet.

Flows would enter the storage tank during a wet-weather event. The tank may be configured with multiple chambers, so that only those chambers required to store the volume of the wet-weather event would be used. Storage of flows would start in the first chamber and as that chamber fills and reaches capacity, flows would be transferred into subsequent chambers until either the wet-weather event ends or the capacity of the storage tank is reached. Each chamber would contain equipment for flushing and self-cleaning, and only chambers used in a wet-weather event would require flushing. Control of odors and sediment in the storage chambers may require regularly-scheduled cleaning between events.

Facilities Building(s)

Facilities building(s) would be located above or below ground level and would contain an odor control system, electrical controls, and a standby generator. The actual contents of the building(s) will be determined during preferred alternative development. The representative footprint shown in Figure G.3.4-1 for this alternative locates the facilities buildings adjacent to the storage tank for conservative purposes; however, the facilities buildings could be located above the storage tank to minimize space requirements.

Flow Diversion and Discharge

One regulator station will be required to divert King County flows from the King St Regulator Station to the storage tank. For this planning phase, it is assumed that the diversion would occur at the King St Regulator Station. Evaluation of whether flows can be diverted upstream of the King St Regulator Station will be completed during preferred alternative development. Diverted King County flow would discharge to the location of the storage tank via a 48-inch-diameter influent gravity sewer. The length of the influent gravity sewer will vary depending on the selected location of the offline storage tank, which will be evaluated during preferred alternative development. The influent gravity sewer can be up to 1,480 feet long based on the criteria and assumptions listed in Section 6.1.

After a wet-weather event, the chambers inside the storage tank would drain to a common sump. Submersible pump(s) would transfer stored sewage from the sump back into the King County Elliott Bay Interceptor through a 18-inch-diameter force main that is up to approximately 740 feet in length. The length of the force main will vary depending on the selected location of the offline storage tank, which will be evaluated during preferred alternative development.

Construction Assumptions

King County's Tabula cost estimating program was used to develop a Class 5 estimate for this alternative. The attached documentation lists the construction assumptions used.