

4. Storm Drain System

General System Overview

City Storm Drain Facilities

The City owns, operates, and maintains approximately 21-miles of storm drain facilities within the city boundary (3.9-square miles), including open channels, closed conduits, catch basins, laterals, manholes, pump stations, and other related facilities. Most of the City's storm drain system was built after 1960 and is conveyed through reinforced and non-reinforced concrete, asbestos cement, corrugated metal, plastic, steel, and vitrified clay pipes ranging from 2-inches to 72-inches in diameter.

The City previously contracted Anderson Penna to conduct a conditions assessment of its facilities 2013 as a follow up to the previous Storm Drain Master Plan (SDMP) dated July 1996. This study conducted Closed Circuit Television (CCTV) to investigate the current structural and operational condition of the City's storm drain system, and based on a study of the CCTV, it is also intended to provide recommendations for improving the City's highest risk storm drains. The City is currently implementing portions of the recommendations of this assessment through spot repair and lining of the most at-risk facilities.

Within the City limits are storm drains that are owned by the County Public Works, City, and privately owned systems. Figure 4-1 illustrates storm drain ownership. The 1996 SDMP determined that the County (County) facilities (downstream of City facilities) were designed prior to current standards and are significantly undersized. The SDMP prepared by AECOM has confirmed that much of the County Storm Drains are surcharged in the 10-year storm event, which create tailwater conditions that impact the City's system. This study includes considerations for joint effort projects that may address regional issues.

There are multiple stormwater facilities within the City limits. These facilities are either City owned, County owned, and/or privately owned. Figure 4-2 illustrates the stormwater facilities incorporated into the hydraulic model.

Existing City Storm Drain Mainlines and Laterals

The following section provide brief descriptions of some major City-owned storm drain systems:

Manhattan Beach Blvd System: Existing 24-inch storm drain mainline that discharges underneath the Manhattan Beach Pier. Laterals to the mainline collect stormwater runoff from the Civic Center area.

Bell Avenue System: 24-inch CMP that eventually transitions to a 54-inch RCP before connecting to County System BI 0286 at the intersection of Bell Avenue and 27th Street. The City has identified areas where the existing CMP is deteriorating and is moving forward with plans to slip line the existing storm drain as part of a future storm drain rehabilitation project.

North Herrin Avenue System: The North Herrin Avenue storm drain system collects drainage from the subdivision north of Polliwog Park, including stormwater for the 23rd Street and Peck Avenue pump station. The mainline along Herrin Avenue transitions from 24-inch RCP to a 42-inch RCP near 21st Street. The storm drain then transitions to a 63-inch RCP before discharging to the Polliwog Park pond.

Aviation Blvd and Manhattan Village System: The system collects drainage from the Manhattan Village (including westdrift Golf Course), as well as retail, office (e.g. Northrop Grumman), and open spaces (e.g. Marine Avenue Park). The storm drain mainline runs along Artesia Blvd and connects to a City of Redondo Beach 57-inch storm drain at the intersection of Artesia Blvd and Marine Avenue. Stormwater from this system is ultimately discharged to Dominguez channel.

Pacific Avenue: This existing storm drain system includes two storm drain laterals that join at the intersection of Maple Avenue and 31st Street. The lateral along Maple Avenue continues north to Rosecrans Avenue; the lateral along 31st Street continues east towards North Valley Drive, where it branches out and continues north along Pine Avenue while the other branch crosses the greenbelt and terminates at North Ardmore Avenue. The storm drain along Pacific Avenue is a 48-inch RCP and joins LACPW system BI 0286 at the intersection of Pacific Avenue and 27th Street.

Existing Stormwater Facilities within the City

There are multiple stormwater facilities throughout the City. These facilities are either City-owned, County-owned, or privately owned. Figure 4-2 illustrates the facilities incorporated into the hydraulic model.

- **Pump Stations:**
 - **westdrift – Manhattan Village Golf Course pump station (City):** This pump station was originally designed in 1983 with four pumps (two 150 GPM pumps and two 1500 GPM pumps). These four pumps were replaced by two 47 HP (1750 GPM) Flygt® pumps. The stormwater vertical 6-inch ductile iron discharge pipe was replaced in 2017.
 - **23rd Street and Peck Avenue pump station (City):** This pump station is on 23rd Street near the intersection of 23rd Street and Peck Avenue. The pump station has three pumps: a 5 HP sump pump with 0.5 cfs capacity; a 50 HP primary pump with 64 cfs capacity; and 75 HP secondary pump with 216 cfs capacity. The pump station force main discharges to the gravity storm drain located within Herrin Avenue.
 - **Polliwog Park/Manhattan Beach Blvd (County):** County-owned pump station is located in Polliwog Park and has a tributary area of 488 acres. The pump station has two flood control pumps (150 HP and 170 HP) that operate in parallel during large storm events.
 - **Johnson St (County):** Pump station and detention basin that discharges to County system BI 0552 Line A along north Meadows Avenue. This pump station has two 1800 GPM flood control pumps and one 300 GPM sump pump. The detention basin is an underground vault with a capacity of 4 acre-feet.
- **Infiltration Basins:** The following three infiltration basins were included in the hydrologic model. Infiltration rates used in the model were estimated based on percolation test data provided by the City.
 - 15th Street and American Martyrs School (City): an infiltration rate of 17 in/hr was used for the model.
 - Bryant Place (City): an infiltration rate of 2.1 in/hr was used for the model.
 - Nelson Ave (City): an infiltration rate of 2.1 in/hr was used for the model.

- **Retention Basin:** The following three retention areas were included in the model.
 - westdrift Golf Course (Private)
 - Polliwog Park (Pond is within City property)
 - Rowell Avenue and Voorhees Avenue (City, area adjacent to basin is private)
- **Infiltration System**
 - 2nd Street Infiltration Project (City): Underground infiltration system constructed in 2012 and located along the greenbelt area located along Ardmore Avenue. An infiltration rate of 2.1 in/hr was used in the model.

Existing Stormwater Treatment Facilities

Within the City there are multiple CDS units and water quality basins. Figure 4-3 displays the stormwater treatment facilities contained in the hydraulic model. An infiltration rate of 0.3 in/hr was used in the water quality basins due to the sandy loam soils in the Strand. These existing water quality basins were designed as drainage inlets without a concrete bottom slab to allow for infiltration. A head loss through the Stormceptor System was modeled using a K value of 1.3 at the CDS unit locations.

County Storm Drain Facilities

The majority of the storm drain mainlines within the City are owned and maintained by LACPW. The majority of the City storm drain lines connect to LACPW mainlines, which have been found to be lacking in capacity based on results from the 1996 City Master Plan and 2019 Manhattan Beach Pump Station report. The County systems included in the hydrologic model include Projects 286, 552, 718, 9815, 5450, and 5401