

2. Introduction

Purpose

The City of Manhattan Beach (City) operates and maintains an extensive storm drain system consisting of approximately 21 miles of storm drain pipelines. The purpose of the current study is to update the previous citywide storm drain master plan completed in 1996 (Kennedy/Jenks, 1996). The updated citywide Storm Drain Master Plan includes development of a hydrologic & hydraulic (H&H) model of the existing storm drain system within the City limits. The H&H model was used to determine the existing capacity of the storm drain system and identify locations where the existing system lacked capacity to convey the design storms. The updated master plan utilized high resolution light detection and ranging (LIDAR) digital topographic survey, two-dimensional (2D) hydraulic modeling, and was completed in accordance with the latest Los Angeles County Hydrology Manual (LACPW, 2006). The master plan also utilized the existing H & H model for Manhattan Beach Pump Station (MBPS) developed for Los Angeles (LA) county by Michael Baker International (MBI, 2019).

In addition, this report provides a summary of recommendations for drainage capital improvement projects. The City completed a storm drain condition assessment (Anderson Penna, 2013) to document structural and operational condition of the existing storm drain system and provided recommendations for improving the City's highest at rise storm drains. This report provides an updated 20-year Capital Improvement Project (CIP) list based on the H&H model results, recommendations from the 2013 Condition Assessment Report, and the City's flood protection goals. The CIP list was developed utilizing a prioritization method that assesses and prioritizes projects according to set framework of criteria that is transparent and consistently applied.

Background

The City of Manhattan Beach is an urban city within the South Bay region of Los Angeles County (County), CA. The City is located approximately 19 miles southwest of downtown Los Angeles on the southerly end of Santa Monica Bay. The city is approximately 3.9 square miles in area, with approximately 48 acres consisting of open space (i.e. parks), in addition to 21 acres consisting of the Manhattan Beach Veterans Parkway. Approximately 1224 acres of the City is designated as residential and there are approximately 120 miles of paved City streets. Other landuses within the City consist of shopping areas such as the Manhattan Village Mall; beachfront real estate including The Strand; and commercial developments.

The majority of the City is within the Santa Monica Bay Watershed (2,078 acres, or 86%). The remaining area is within the Dominguez Channel Watershed (350 acres, or 14%). The elevation range within the City varies from 3 feet above sea level to approximately 120 feet above sea level. Average annual rainfall is approximately 12 inches per year and most precipitation occurs between December and March. January and July are the coldest and warmest months of the year (LACPW, 2006). The City is surrounded by El Segundo to the north; Hawthorne, Lawndale and Redondo Beach to the east; and Hermosa Beach to the south.

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) show the majority of the City designated as Unshaded Zone X, which is defined as an area with a minimal flood hazard. Areas along the coast are mapped as Zone A, which are defined as areas subject to inundation by the 1-percent-annual-chance (i.e. 100-year) flood event. Zone A special flood areas are determined using approximate methods and base flood elevations or flood depths are not shown on the maps (FEMA, 2008).