



# Hermosa Beach Storm Drain Master Plan



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CONSULTING CIVIL ENGINEERS

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# Executive Summary

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This storm drain master plan (SDMP) establishes a prioritized capital improvements program to reduce the risk of flooding and storm drain issues within the City of Hermosa Beach (City). The identified storm drain system capital improvement projects prolong the life of existing infrastructure and provide a 10-year (10% annual exceedance) storm capacity throughout the City.

## Study Objectives

The basic objective of this master plan document is to provide an examination of the flood risks within the City limits and recommend actions necessary to accomplish appropriate levels of service for storm drain systems so as to appropriately manage flood risks. Several tasks have been undertaken and completed as part of this study:

- Review of existing storm drain data including archives, record drawings, and geographic information systems (GIS) data
- Collection of field data to build an existing conditions model of the storm drainage network
- Establishment of updated geographic information system (GIS) data which reflects the City's current storm drainage network
- Assessment of the performance of existing storm drainage systems
- Identification of capital improvements to reduce flood risk
- Prioritization of capital improvements for risk reduction and cost benefit
- Establishment of a prioritized Capital Improvement Program (CIP) for storm drainage
- Estimation of project costs for the prioritized CIP based on current ENR indices
- Review of current stormwater regulatory requirements
- Analysis of potential climate change vulnerability throughout the City

## Background

The City's storm drainage system consists of City and County owned storm drain pipes with outfalls to the ocean. The majority of the City's system does not have capacity for the 10-year storm in the pipes, although most flooding is confined to the streets. Some known, recurring problem areas have been identified by City staff and are incorporated in this SDMP. In general, Hermosa Beach drains from east to west. Surface runoff collects in the storm drainage system by inlets and eventually discharges into sandy outfalls along the beach adjacent to the Pacific Ocean.

## Work Products

This master plan is intended to function as a multipurpose storm drain system resource guide for the City's staff and residents. City engineers responsible for the storm drain capital improvements should find sufficient background information and data in this document to serve as the basis for storm drainage Capital Improvement Program (CIP) implementation and/or modification. Improvement descriptions, maps, project costs, and other modeling data have been included in the appendices of this report.



## System Evaluation

A rainfall-runoff model has been developed for the City using the hydraulic modeling software MIKE URBAN. Detailed review, field investigations, analysis, and modeling of the area’s storm drainage system lead to several conclusions. These conclusions have been utilized to recommend improvements to the system intended to reduce flood risk within the City. The recommended improvements are preliminary in nature and are based on currently available information. Detailed project designs will ultimately require more data, including utility locations, which remain to be obtained. One and two dimensional model results have been used to analyze the extent of flooding within the City. Flooding greater than a foot in depth, as measured from the ground surface, is regarded as problematic regardless of whether such flooding results in significant property damage.

## Capital Improvement Program

A Capital Improvement Program, consisting of projects with four priority levels, has been developed based on model results and suggested improvements. The \$19.5 million in improvements recommended by this master plan are based on the capacity of the existing system and the need to correct identified deficiencies. Improvements are broken down into four priority levels shown in Table ES.1. Recommended improvements are intended for public rights-of-way and other City-owned property, not private facilities or private property.

**Table ES.1: Summary of Prioritized SDMP CIP - Project Costs**

Priority	City Owned CIP Cost	County Owned CIP Cost
Highest Priority Capital Improvements	\$1,200,000	\$2,600,000
High Priority Capital Improvements	\$380,000	\$8,700,000
Moderate Priority Capital Improvements	—	5,600,000
Low Priority Capital Improvements	\$2,700,000	—
<b>Total Priority Capital Improvements</b>	<b>\$2,500,000</b>	<b>\$17,000,000</b>

## Future Development

The CIP does not include the cost of new facilities related solely to new development (e.g., pipeline extensions to serve areas that are currently undeveloped). These new facilities would be constructed as part of the new developments, and are not included in the CIP. The CIP discussed within this report does not account for future land use changes as it is anticipated that any future development will not significantly impact the City’s storm drainage system.

## Conclusion

This Master Plan provides a tool for citizens and officials of the City to use in their efforts to reduce both nuisance flooding, and the likelihood of more serious storm water related hazards to private and/or public property. This study and proposed CIP is merely the conceptual starting point. It is anticipated that City staff and/or their consultants will perform more detailed studies and alternatives analyses to identify the most affordable and effective improvement projects with information gathered as part of the design process, including detailed topography, utility conflicts, available easements and rights-of-way, construction impacts, and long-term operation and maintenance.

# Chapter 1 - Data

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Schaaf & Wheeler reviewed and utilized readily available land use, topographic, geological, geographical, and storm drain system data within the Hermosa Beach Storm Drain Master Plan Area (study area). Efforts have been made to improve and add to the collective data where data were missing or incorrect. Where necessary, assumptions and engineering judgment were used to complete remaining data gaps. This chapter summarizes the findings and data acquired as part of the Hermosa Beach Storm Drain Master Plan (HBSDMP). Data limitations, assumptions, and impacts are also summarized herein.

## Land Use Data and Runoff Characteristics

### Topography and Aerial Imagery

All project data and results are in vertical datum NAVD88 (feet) and the State Plane (California Zone V) coordinate system. The City of Hermosa Beach's 2006 2-foot contour maps, derived from light detection and ranging (LiDAR) point data, have been obtained from the City's GIS database. LiDAR is a remote sensing method used to measure distance with a pulsed laser light and sensor. LiDAR data is often collected from an aircraft, measuring the distance to the surface of Earth. This high resolution aerial data provides topographic information with an accuracy of 0.6 feet (plus or minus 0.6 feet) for ground returns where no water ponding occurs. To perform hydrologic and hydraulic analyses, a terrain model of the City and surrounding area has been built from these LiDAR-based datasets. In addition, 2006 high-resolution aerial imagery from the USGS library and Google satellite imagery have been used.

### Land Use

Models have been built to represent current land use conditions. Current land use categories and zoning designations are delineated in the City's land use GIS dataset as shown in Figure 1.1 and 1.2. Existing land use in the Hermosa Beach model area is summarized in Table 1.1.

**Table 1.1: Land Use Summary**

Land Use Designation	Area (Acre)	Percent
Beach Parks	63.8	6.96
Communication Facilities	3.1	0.33
Developed Local Parks and Recreation	49.6	5.41
Elementary Schools	16.2	1.77
Fire Stations	0.4	0.04
Government Offices	3.4	0.37
High-Density Single Family Residential	384.6	41.97
Hotels and Motels	2.9	0.32
Low- and Medium-Rise Major Office Use	1.4	0.15
Low-Rise Apartments and Condominiums	28.2	3.07
Manufacturing, Assembly, and Industrial	7.3	0.80
Medium-Rise Apartments and Condominiums	9.8	1.07
Mixed Residential	217.1	23.69
Modern Strip Development	63.4	6.92
Older Strip Development	30.6	3.34
Other Public Facilities	6.0	0.66
Police and Sheriff Stations	1.1	0.12
Religious Facilities	3.3	0.37
Retail Centers	17.0	1.86
Mobile Home Courts	4.2	0.46
Water Storage Facilities	2.9	0.32



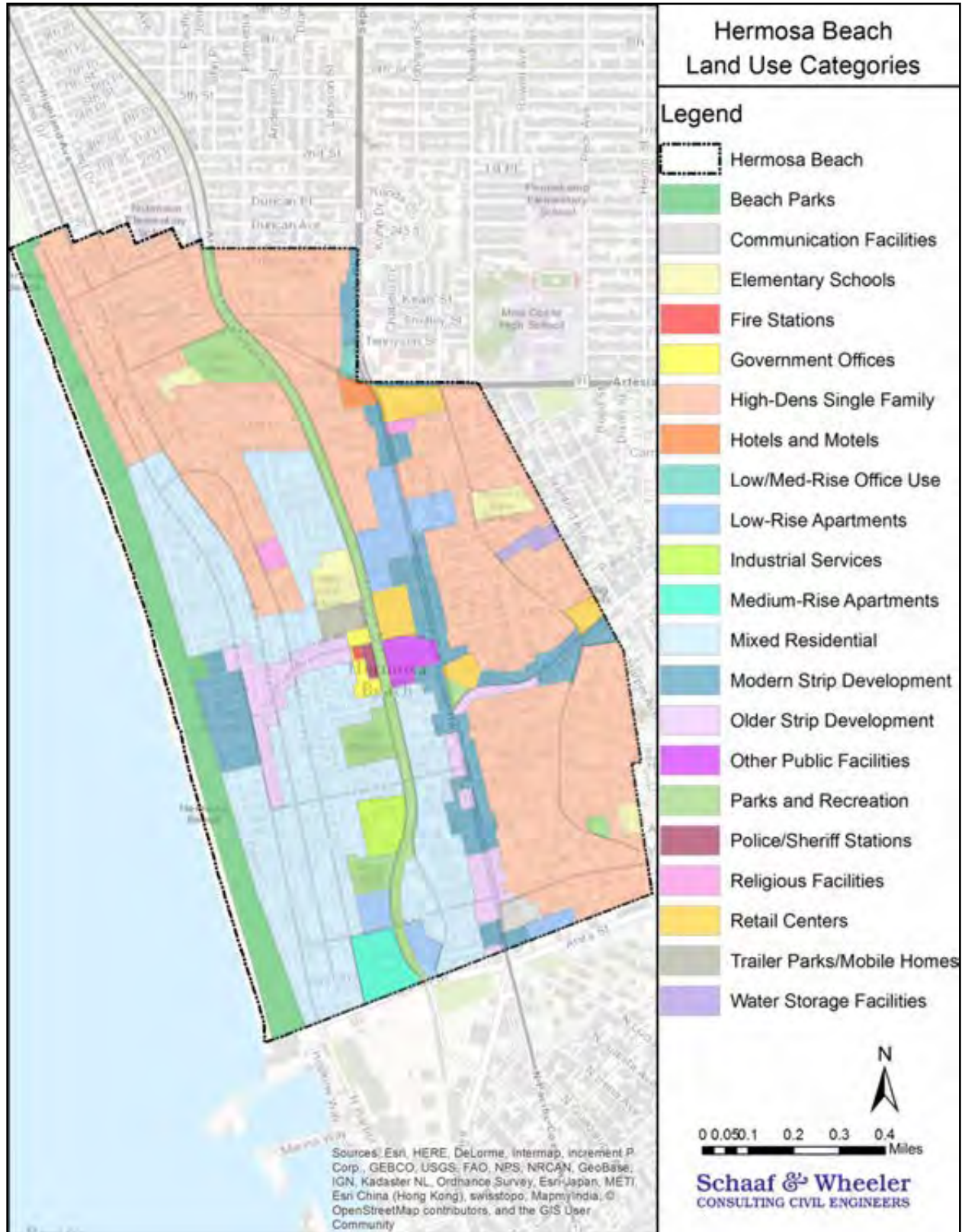


Figure 1.1: Hermosa Beach Current Land Use Categories

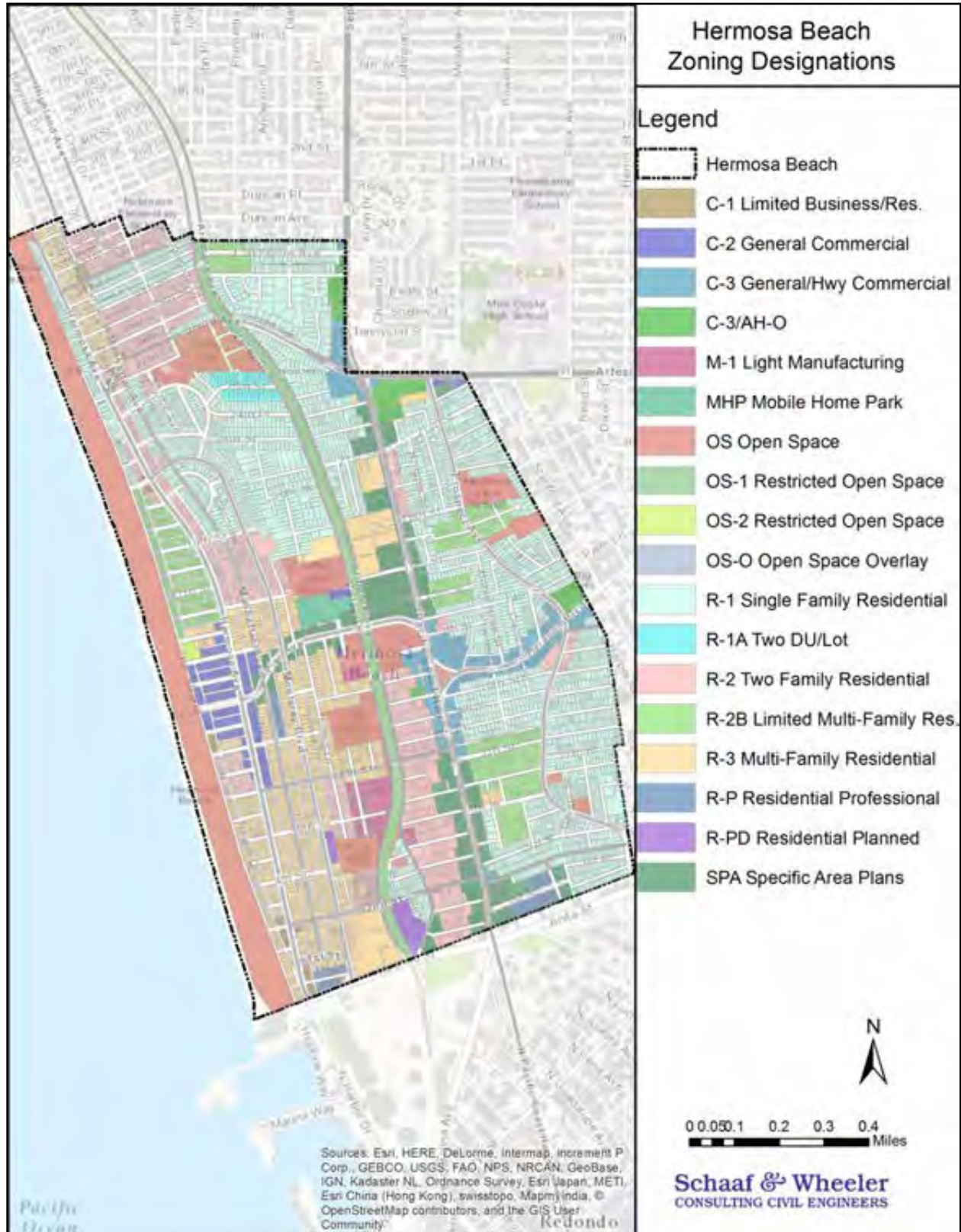


Figure 1.2: Hermosa Beach Current Zoning Designations



## Future Land Use

The City is currently close to build-out with only 33 vacant lots. The majority of future development will involve the redevelopment of sites, which will have minimal effect on impervious percent or surface runoff. It is not anticipated that future development will significantly impact the City’s storm drainage system.

## Percent Impervious Surface

The percent impervious surface is the percentage of the area covered by materials that are impenetrable by water including roads, parking lots, rooftops, driveways, sidewalks, and compacted soils. The percent impervious for the current land use categories were estimated using aerial imagery. Representative samples were taken from each of the City’s 21 land use categories and the percent impervious for each category was approximated using aerial imagery to identify impervious surfaces. Percent impervious values for each land use type are summarized in Table 1.2.

**Table 1.2: Percent Impervious Surface Model Values**

Land Use Type	Percent Impervious (%)
Beach Parks	9
Communication Facilities	98
Elementary Schools	80
Fire Stations	95
Government Offices	95
High-Density Single Family Residential	80
Hotels and Motels	91
Local Parks and Recreation	42
Low- and Medium-Rise Office Use	93
Low-Rise Apartments and Condominiums	91
Industrial Services	96
Mid-Rise Apartments and Condominiums	84
Mixed Residential	66
Modern Strip Development	99
Older Strip Development	98
Other Public Facilities	79
Police and Sheriff Stations	90
Religious Facilities	88
Retail Centers	96
Mobile Home Courts	93
Water Storage Facilities	37

## Soil Classification

The NRCS has classified soils into four hydrologic soil groups (A, B, C, and D) according to their infiltration rates. Group A soils have low runoff potential when thoroughly wet and typically consist of sand or gravel type soils. Group B soils are moderately well draining when thoroughly wet and consist of loamy sand or sandy loam textures. Group C soils have moderately high runoff potential when thoroughly wet and consist of loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Group D soils have high runoff potential when thoroughly wet and consist of clayey textures. The City of Hermosa



Beach soils are classified as either Class A or Class B soils. Figure 1.3 and Table 1.3 show the distribution of soil types within the City.

**Table 1.3: Soil Type Distribution**

Hydrologic Soil Group	Area (acres)	Percentage of Total Area
A	495.84	53%
B	434.62	47%

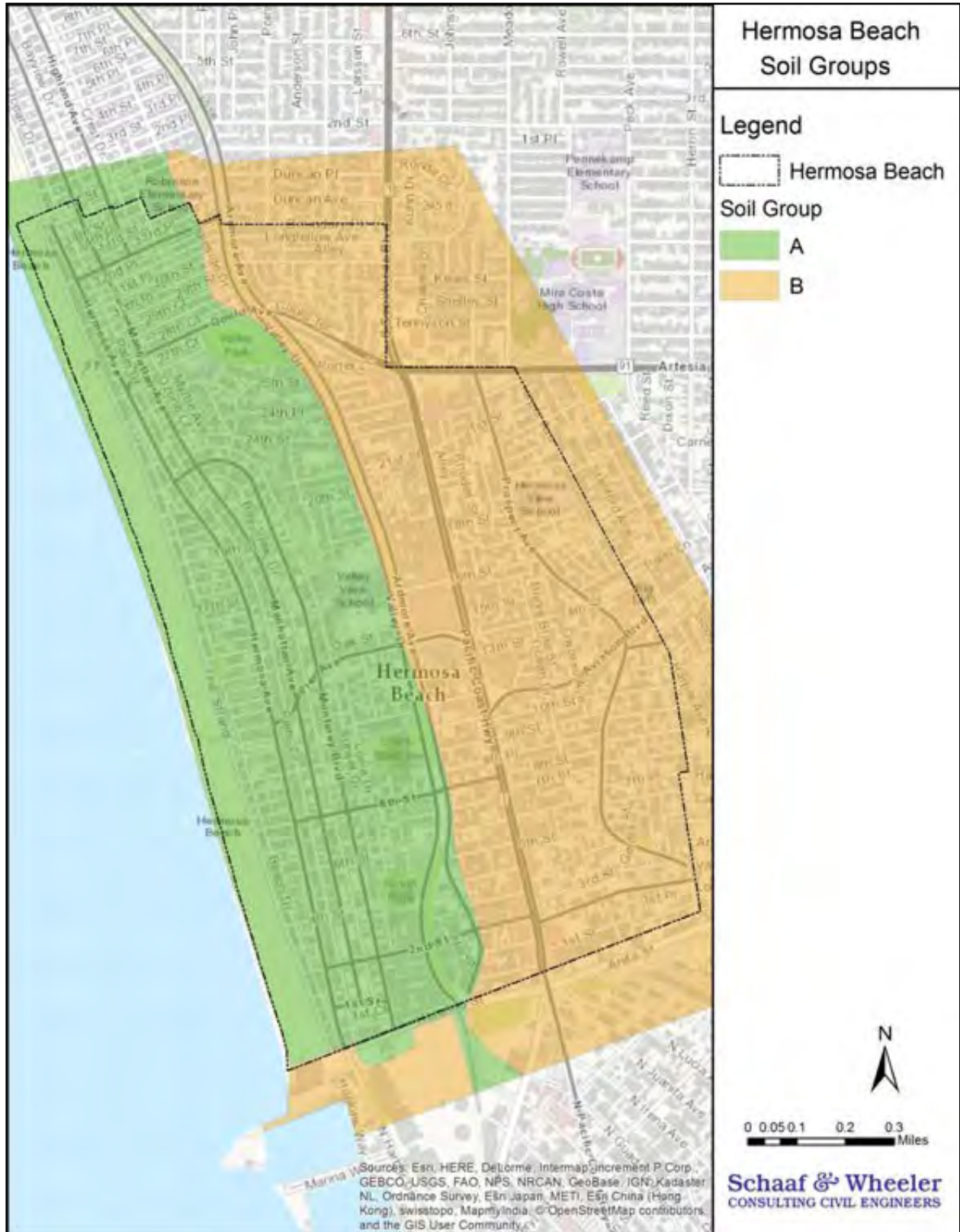


Figure 1.3: NRCS Soil Classification in Study Area and Immediate Vicinity



## Data Sources

### GIS Data

The most current City system data was provided to Schaaf & Wheeler in a GIS shapefile format. The City's storm drain data includes: storm drain mains, storm drain inlets, and storm drain outfalls. All inlets and outfalls were combined to create a node shapefile. These layers have an attribute describing ownership, but are lacking structure properties such as size, material, and node invert and rim elevations. Los Angeles County storm drain GIS data was obtained in order to supplement missing data within the City's dataset. The County's storm drain data includes: storm drain mains, storm drain manholes and inlets, and storm drain outfalls. These layers have attributes describing pipe shape, size, and material.

The City's storm mains are owned in part by both Hermosa Beach and Los Angeles County. The distribution of ownership is presented in Table 1.4.

**Table 1.4: Storm Main Ownership Breakdown**

Storm Main Owner	Number of Pipes	Percent of Total
City of Hermosa Beach	97	20%
County of Los Angeles	385	80%

Table 1.5 summarizes the total number manholes, inlets, and outfalls contained within the nodes shapefile. The manhole, inlet, and outfall shapefiles did not contain invert depth or invert elevation attributes.

**Table 1.5: Node Summary**

Node Type	Total
Manhole	124
Inlet	312
Outfall	11
Total	447

The City's 2005 land use dataset was used to estimate the imperviousness of each land use type in the City, a process described in detail in Land Use Data and Runoff Characteristics section below. USDA-NRCS Soil Survey Geographic (SSURGO) data was obtained from the National Cooperative Soil Survey (NRCS) and used to categorize the City's soils by hydrologic soil group. Other GIS data used for this master plan include city boundaries, parcels, and land use zoning.

Schaaf & Wheeler identified missing attributes in the data provided by the City and County, as well as items in need of verification. Information needed to create an accurate model of the system included:

- Missing pipe diameters
- Inlet and manhole depths
- Inlet, manhole, and outfall elevations
- Verification of some pipe diameters



Measures have been taken to obtain or approximate data necessary to complete a master plan level analysis. These steps include and estimation techniques described in the Field Measurements and Record Drawings Section below.

## Field Measurements and Record Drawings

Schaaf & Wheeler examined system attributes and identified irregularities in the modeled system data (e.g. potentially incorrect pipe diameters). City and County record drawings were reviewed to verify data and fill data gaps. Record drawings are assumed to be accurate and up-to-date. Where record drawings are not sufficient to complete system verification, field measurements of pipe sizes, layout, and invert depth have been taken. A survey of the storm drain network was conducted by Kier & Wright Civil Engineers and Surveyors, Inc. to measure manhole and catch basin rim elevations. Field information including node depth, pipe diameter, and network layout was collected by Schaaf & Wheeler. Corrections were entered into the storm drain network GIS files with data sources noted. Interpolation was used to determine missing information not available from GIS data, survey, or record drawings.

## Catchments

Catchments were delineated in GIS using the City's 2-foot contour elevation data, ArcGIS basemap imagery, and the City's storm drain database. A catchment is an area where runoff drains into a common storm drain inlet. Including all pipes and nodes in the model with a higher level of detail better reflects the way drainage physically enters the storm drain network and preserves the full capacity of the system. Delineation of the catchments relies on elevations and grades from the terrain model, aerial imagery, street and pipe network layouts, and the location of catch basins. The MIKE URBAN storm drain model contains 212 catchments, averaging an area of 3.8 acres.

## Modeled Data Assumptions

There is some inconsistency in the quality and accuracy of the available GIS data. The City's GIS data is inconsistent in its spatial accuracy, and is lacking the attribute data required to accurately model the storm drain system. The County's GIS data is spatially accurate but is missing some attribute data.

There are 124 manholes, 312 inlets, 11 outfalls, and 482 pipes in the study area. A nodes shapefile containing all manholes, inlets and outfalls in the study area was used in the hydraulic model. The GIS database does not contain node invert depth or elevation attributes. The number of pipes is based on the number of individual pipe segments within the provided shapefile, which may include multiple pipe segments between two manholes. The provided pipe data includes 81% of pipe diameters; pipes with known and unknown diameters are illustrated in Figure 1.4. Table 1.6 summarizes the pipes found in the City's database, and the distribution of various pipe sizes in the City's database may be seen in Figure 1.5 and 1.6. The upstream and downstream pipe inverts are not provided in the City's GIS database.

In order to create an accurate ground surface for hydraulic modeling, invert elevations at all system nodes have been calculated using rim elevations and depths gathered from field studies. The node depth was subtracted from the rim elevation to obtain the invert elevation. Where node depths were not available, two methods were used to estimate invert elevations. Elevations were linearly interpolated between upstream and downstream nodes with assigned invert elevations using the interpolated tool in the MIKE URBAN model. In areas where this data was not available, node inverts were assigned assuming a pipe cover of three feet. Inverts and ground elevations have been manually checked for irregularity (e.g. ground elevations below the top of pipes, negative pipe slopes, and incorrect pipe diameters), and corrected as necessary. Record drawings were reviewed for node invert elevations where possible.

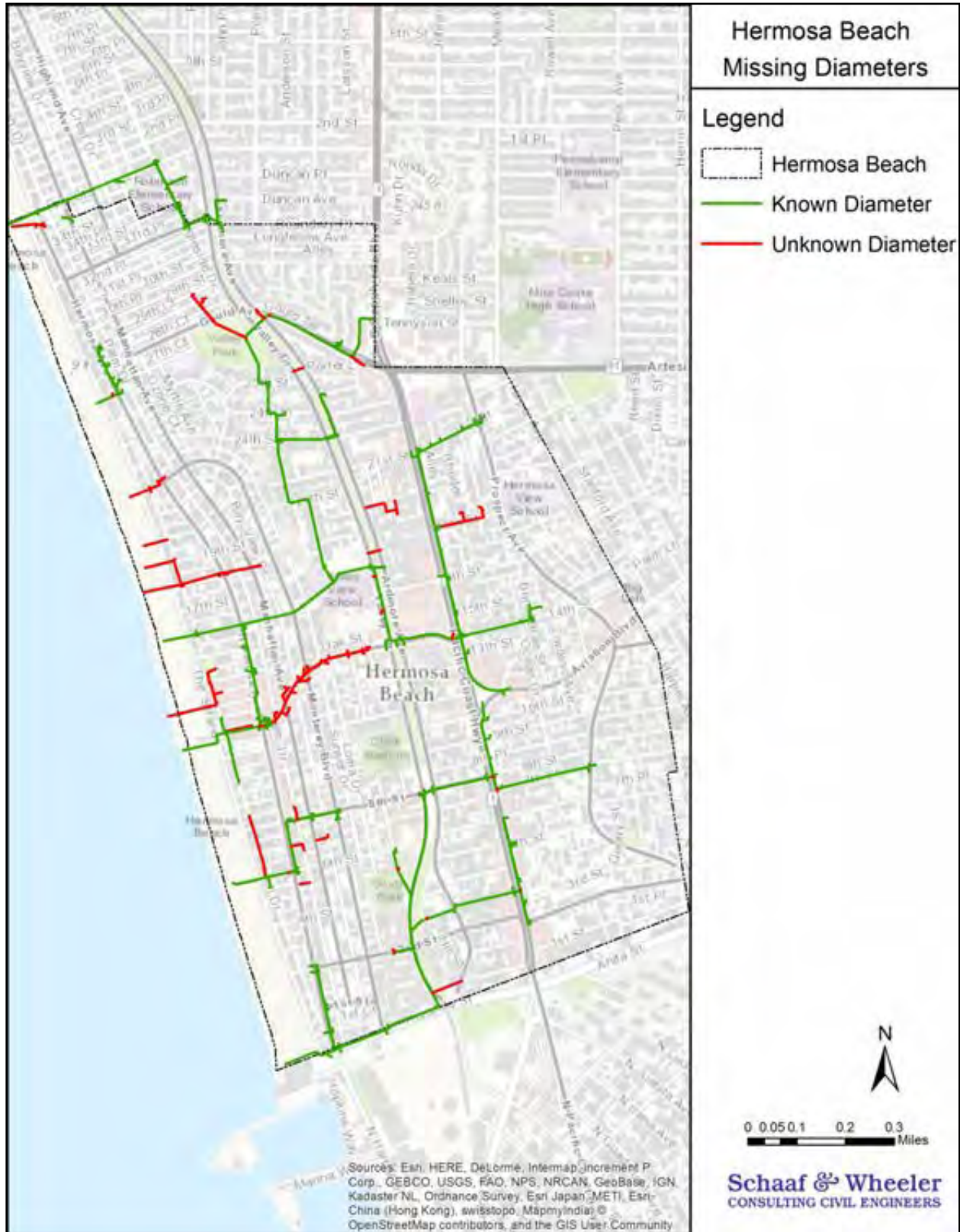


Figure 1.4: Storm Main Missing Diameters





Table 1.6: Pipe Summary

Pipe Diameter	Length (miles)	Number of Pipes
4"	0.04	4
6"	0.03	5
8"	0.04	4
10"	0.29	9
12"	0.36	27
15"	0.25	16
18"	1.65	211
21"	0.23	25
24"	2.40	68
27"	0.26	10
30"	0.79	17
33"	0.11	2
36"	0.69	19
39"	0.58	13
42"	0.27	10
45"	0.11	3
48"	0.51	16
51"	0.12	2
54"	0.08	3
60"	0.48	8
63"	0.07	2
72"	0.26	2
108"	0.05	1
132"	0.17	2
134"	0.06	3
Total	9.9	482

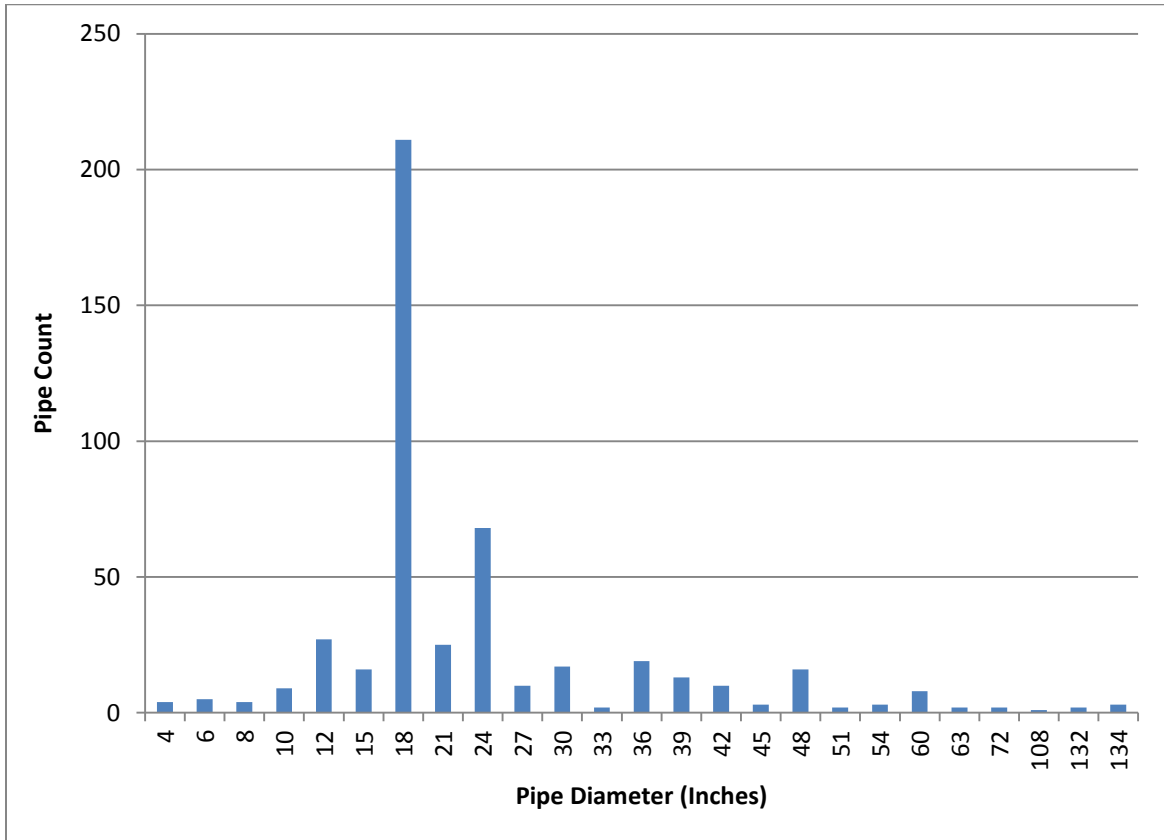


Figure 1.5: Distribution of Pipe Size

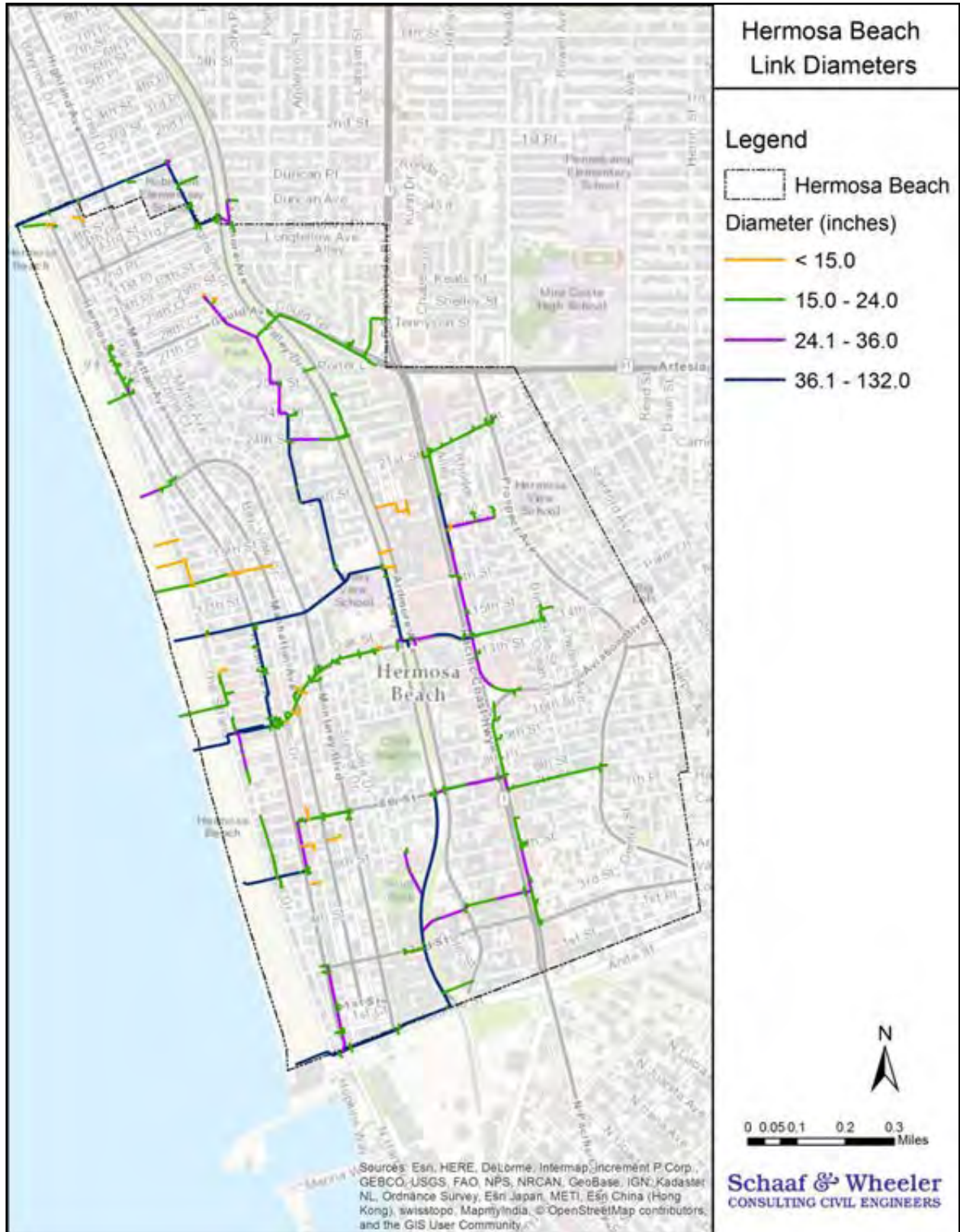


Figure 1.6: Storm Main Diameter Distribution

# Chapter 2 -Master Planning Methodology

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## Overview

The criteria used to evaluate storm drain system performance must be technically sound yet simple to understand and apply. Ideally, the same methodology used to analyze system performance for this report will continue to be used for future infrastructure design. Schaaf & Wheeler initially applied the Los Angeles County (County) modified rational method using the HydroCalc Calculator as detailed in the 2006 County Hydrology Manual. After careful analysis of model results, it was determined that this method did not accurately model watershed properties. This will be discussed in further detail in Modified Design Storm section. In order to address these inaccuracies, a modified method was applied to the watershed. This method is being used alongside MIKE URBAN by DHI and the US EPA SWMM5 engine storm drain modeling software to evaluate system performance, identify deficiencies and recommend necessary improvements. Physical parameters used in the model are based on the City and County GIS data and other information as detailed in Chapter 1 - Data.

## Model Parameters and Evaluation Criteria

Horton's Method was used to estimate storm water infiltration and runoff in the Hermosa Beach model. Horton's Method uses soil infiltration rates to estimate the amount of rainfall that will infiltrate into pervious catchment areas in response to a given design storm.

The storm duration used for rainfall simulation in the City's model is 24 hours, and a design storm was created to match local rainfall statistics. Using this design storm, rainfall-runoff and one dimensional (1-D) hydraulic models have been created for the 10-year event. The 10-year level-of-service is consistent with the City's design standard for general storm drain system conveyance.

This master plan effort includes modeling the hydrology (rainfall-runoff) for the 10-year storm event, which is used as the design event for the storm water drainage conveyance system. For the purposes of this report, improvements are recommended that reduce the hydraulic grade line to no higher than 0.5 feet above the gutter elevation at any node such that the maximum hydraulic grade is the top of curb elevation. This will minimize the flood damage risk to private property and maximize public safety.

## Modeling Software

The Danish Hydraulic Institute (DHI) MIKE-URBAN (MU) software was selected to model the Hermosa Beach storm drain system because it is tested and reliable software with a GIS interface. MU is a package of software programs designed by DHI for the analysis, design and management of urban drainage systems, including storm water sewers and sanitary sewers. The MU model works within the ArcMap GIS interface and can simulate runoff, open channel flow, pipe flow, water quality, sediment transport, and two dimensional surface flow. The US EPA's Storm Water Management Model (SWMM version 5.1.009) engine is imbedded in MU. SWMM5 is a dynamic hydrologic-hydraulic water quality simulation model that is used for the planning, analysis, and design of storm water runoff in urban areas.



The City's modeling package consists of two interrelated products:

1. The one dimensional (1-D) computation was run using MU/SWMM5. MU provides a graphical user interface for data input and editing and serves as a bridge between ArcMap GIS and the SWMM5 modeling program. MU can be used to import and export model data, present results including plan, longitudinal, cross-section views, animation of results, and node flooding. SWMM5 uses sub-catchment areas that receive precipitation and generates runoff which is routed through a network of pipes, channels, storage/treatment devices, pumps, and regulators. SWMM5 tracks the amount of runoff within each catchment, as well as the flow rate, flow depth, and quality of water in each pipe.
2. Two dimensional (2-D) computations were run using MIKE FLOOD. MIKE FLOOD (MIKE 21) is a 2-D modeling module which simulates flows, waves, sediments, and overland flows. It computes two dimensional flows over a given surface using an implicit finite difference solver method with elevation and manning's roughness valued defined on a rectangular grid. This module can be run in conjunction with the MU/SWMM5 model results. For Hermosa Beach this model was run as a check on results from the 1-D computation and to help prioritize improvements.

The City's storm drain network is modeled as one area, containing 212 catchments, 450 nodes, and 517 links seen below in Figure 2.1.

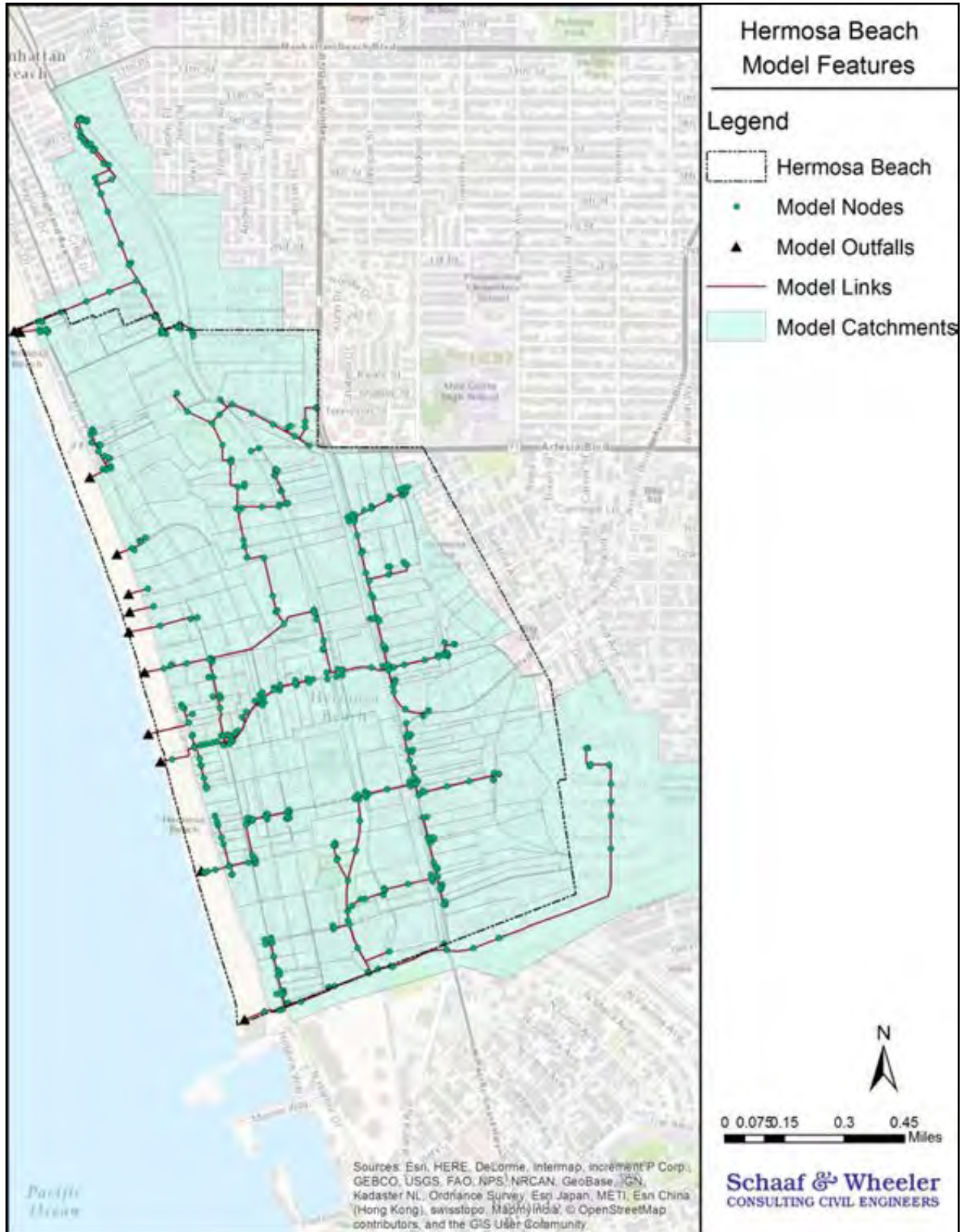


Figure 2.1: Mike Urban Model Features



## Operation

Two separate calculations are performed by the SWMM5 portion of the MU/SWMM5 model for the City model. First, a runoff calculation estimates the amount of water entering the storm drain system during a design rainfall event. Second, a network flow calculation replicates how the storm drain system will convey flows to outlet locations. Flows resulting from the runoff calculation are used as inflows for the subsequent network flow calculation.

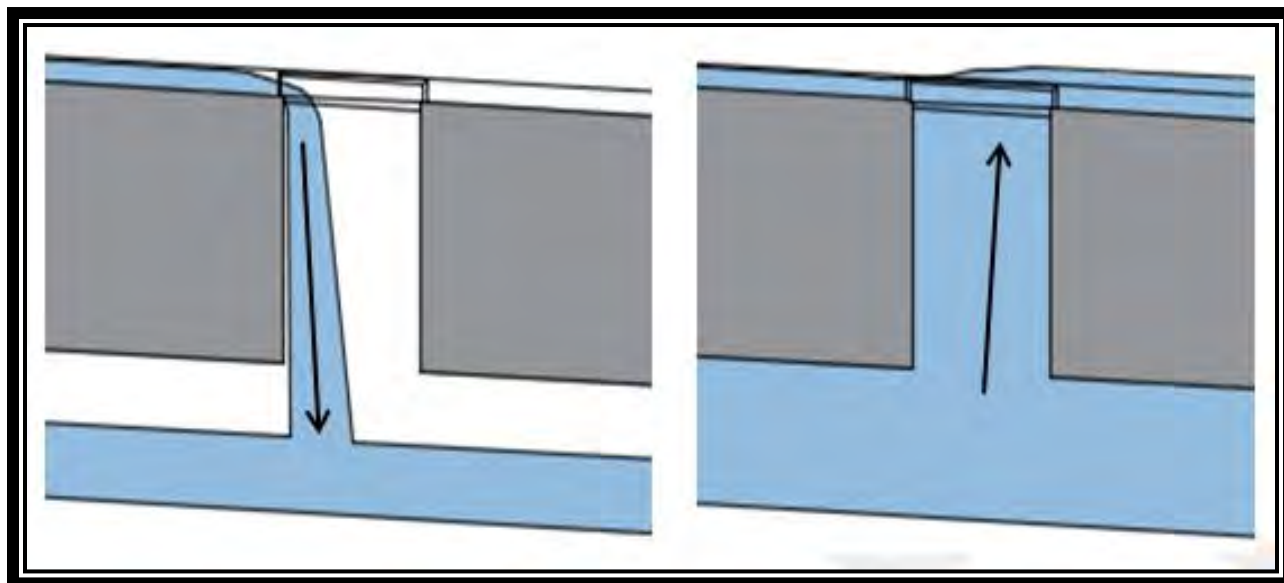


Figure 2.2: Flow into SD System from Surface (L) and Surcharging Flow to Surface from SD (R)

SWMM5 gives the option of four infiltration methods: Horton, Green Ampt, NRCS curve number, and Modified Horton. The Hermosa Beach storm drain models use the Horton loss method to calculate surface runoff. A simulation can be started at any point during the chosen design storm to assess surface runoff for any period of the design storm, with computations made based on a user-specified time step.

The MU/SWMM5 network flow model also offers a choice of three flow description approximations distinguished by the set of forces each takes into account: Steady State, Dynamic Wave, and Kinematic Wave. The Hermosa Beach storm drain model uses the most comprehensive flow description, Dynamic Wave, which incorporates the effects of gravitational, friction, pressure gradient and inertial forces. Because it accounts for all major forces affecting flow conditions, this equation allows the model to more accurately simulate fast transients and backwater profiles. For a one-dimensional pipe flow simulation, flooding at a node is accommodated by the insertion of an artificial “basin” above the node which will store water when the water level rises above the ground level. The surface area of the “basin” is user defined; surface area can vary depending on the ground slope, node proximity, and other physical barriers. The rising water levels at the node replicate the effects of flooding.

Water stored in the “basin” begins to reenter the system when the outflow from the node becomes greater than the inflow. The pipe flow simulation can be executed using either a constant or variable time step, and can be run for any portion of the time interval specified by the input rainfall time series and corresponding calculated runoff hydrograph.



## Input and Output

MU/SWMM5 surface runoff calculations requires two types of input data: boundary data and urban catchment data. Boundary data for the run-off computation consists of an input rainfall time series representing the design storm event for the model and water surface elevation time series at the outlet nodes representing the 100-year tidal curves. Urban catchment data includes the pipe network and boundaries of each drainage catchment, along with relevant physical and hydrologic parameters including surface area, basin width, flow length, slope, and percent impervious. Drainage catchments for the study area are shown in Figure 2.3.

MU/SWMM5 network flow calculations require two types of inputs: network element data (links and nodes), and boundary data (rainfall and tidal water surface elevations). Network elements consist of nodes (including manholes, catch basins, and outfalls) and links (pipes, culverts, and open channels). Attributes required to describe links include the name of upstream and downstream nodes, shape and dimensions, material or roughness, and upstream and downstream node invert elevation. Geometry and data corresponding to network elements are imported from GIS shapefiles. Connections to urban catchments are defined within the MU/SWMM5 interface as node elements where catchment runoff enters the network. Boundary data can include direct results of runoff calculations based on rainfall input, external loadings, inflow discharges, or external water levels at interaction points with receiving waters (outfalls), or pump performance curves. Currently there are no storm drain pump stations in Hermosa Beach, only a small stormwater diversion pump near the pier that is not modeled.

Output from the pipe flow computation includes the calculated water level at each node, discharges, water level in network branches, discharge in network branches, velocity in network branches, water volume in the system, and time step data. Output is viewed using GIS, MU/SWMM5, or the MIKE-VIEW program. Results may be displayed in plan-view or as a profile for a selected network section, and may be viewed as a temporal animation or at maximum or minimum values. Additional outputs which can be derived from MU/SWMM5 pipe flow results using GIS and include: water depth, flooding level, pressure in closed conduits, percentage pipe filling, and the flow calculated for each link.



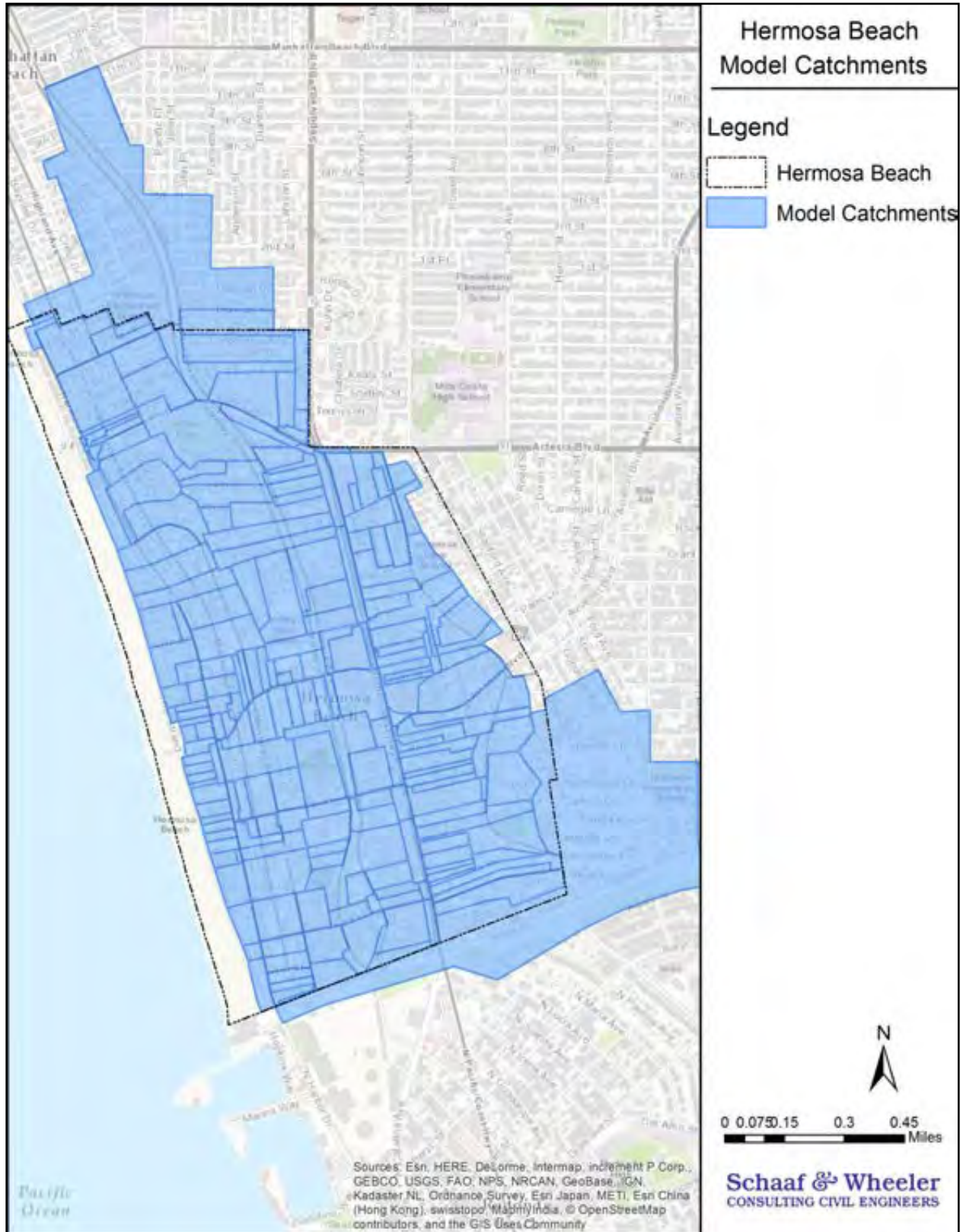


Figure 2.3: Hermosa Beach Storm Drain Model Catchments



## Hydrologic Calculations

Methods used in this master plan to estimate peak storm water flow rates and volumes require the input of precipitation data. Since it is impossible to anticipate the impact of every conceivable storm, precipitation frequency analyses are often used to design facilities that control storm runoff. A common practice is to construct a design storm, which is a rainfall pattern used in hydrologic models to estimate surface runoff. A design storm is used in lieu of a single historic storm event to ensure that local rainfall statistics (i.e. depth, duration and frequency) are preserved. When combined with regional specific data for land use and loss rates, the rainfall-runoff model should produce runoff estimates that are consistent with frequency analyses of gauged stream-flow in the Hermosa Beach area. In other words, the 10-year design storm pattern used for MU/SWMM5 modeling creates results consistent with a 10-year storm runoff event.

Precipitation frequency analyses are based on concepts of probability and statistics. Engineers generally assume that the frequency (probability) of a rainfall event is coincident with frequency of direct storm water runoff. However, runoff is determined by a number of factors (particularly land use conditions in the basin and antecedent rainfall) in addition to the precipitation event.

### County Methodology

Los Angeles County's modified rational method was initially used to model Hermosa Beach's storm drain network. This method uses the County's HydroCalc Calculator to determine the runoff resulting from a given design storm in each catchment. Along with catchment area and a unique catchment name, the HydroCalc Calculator requires the following catchment parameters:

#### *Longest Flow Path*

The longest flow path represents the longest distance water must travel within a catchment until it reaches its outlet. The flow path is estimated using aerial imagery and elevation data. HydroCalc requires input of the longest flow path length and slope.

#### *24-hour, 50-year Rainfall Depth*

The 24-hour rainfall depth for a 50-year design storm frequency required by HydroCalc is determined using isohyet maps provided by the County of Los Angeles. The isohyet map for the Hermosa Beach area is shown in Figure 2.4.

#### *Impervious Percent*

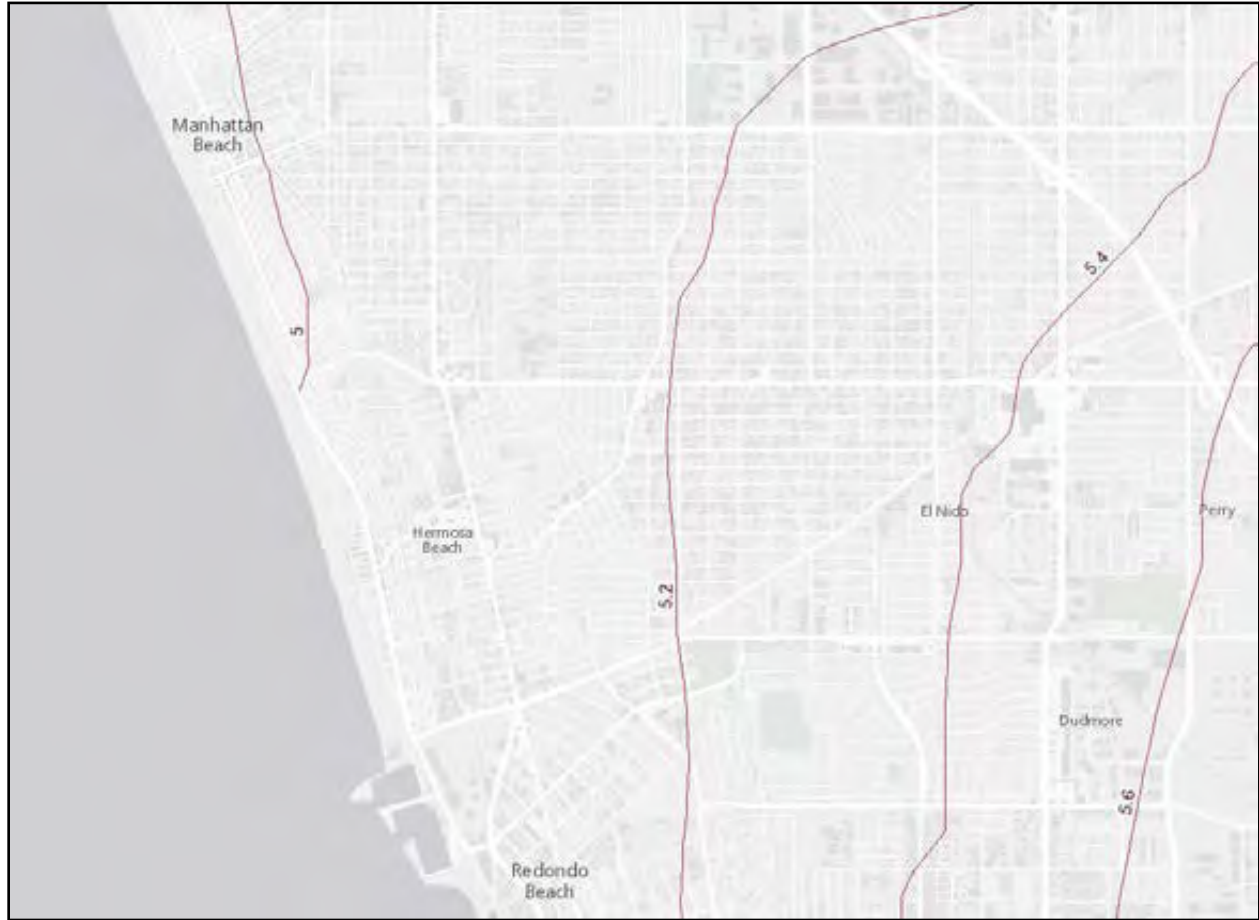
The percent impervious surface is the percentage of the area within a catchment covered by materials that are impenetrable by water. The percent impervious is based on the land use type in the catchment and is estimated using aerial imagery. Hermosa Beach contains a large amount of highly impervious surface.

#### *Soil Type*

The HydroCalc Calculator requires the input of one of the 179 undeveloped runoff coefficient curves corresponding to different soil types within the County of Los Angeles. A weighted average soil type is assigned to each catchment using soil data provided by LA County.

#### *Design Storm Frequency*

Various design storm frequencies are available to choose from in the calculator. For the purpose of this master plan, the 10-year design storm was used.



**Figure 2.4: Isohyet Map for Hermosa Beach Area (Values Shown are in Inches)**

Using these inputs, HydroCalc calculates the intensity, time of concentration, discharge, runoff volume, and a 24-hour runoff hydrograph for each catchment. These hydrographs are imported into MU/SWMM5 and used to simulate runoff within each catchment. MU/SWMM5 uses the flows resulting from the runoff calculation as inflows for a network calculation which routes the flow through the storm drain network. Using the Node Flood tool in MU/SWMM5, the height of water above the ground surface elevation at each node can be seen. Figure 2.5 shows node flood levels resulting from a 10-year, 24-hour storm using this methodology. This methodology results in minimal flooding throughout the city.

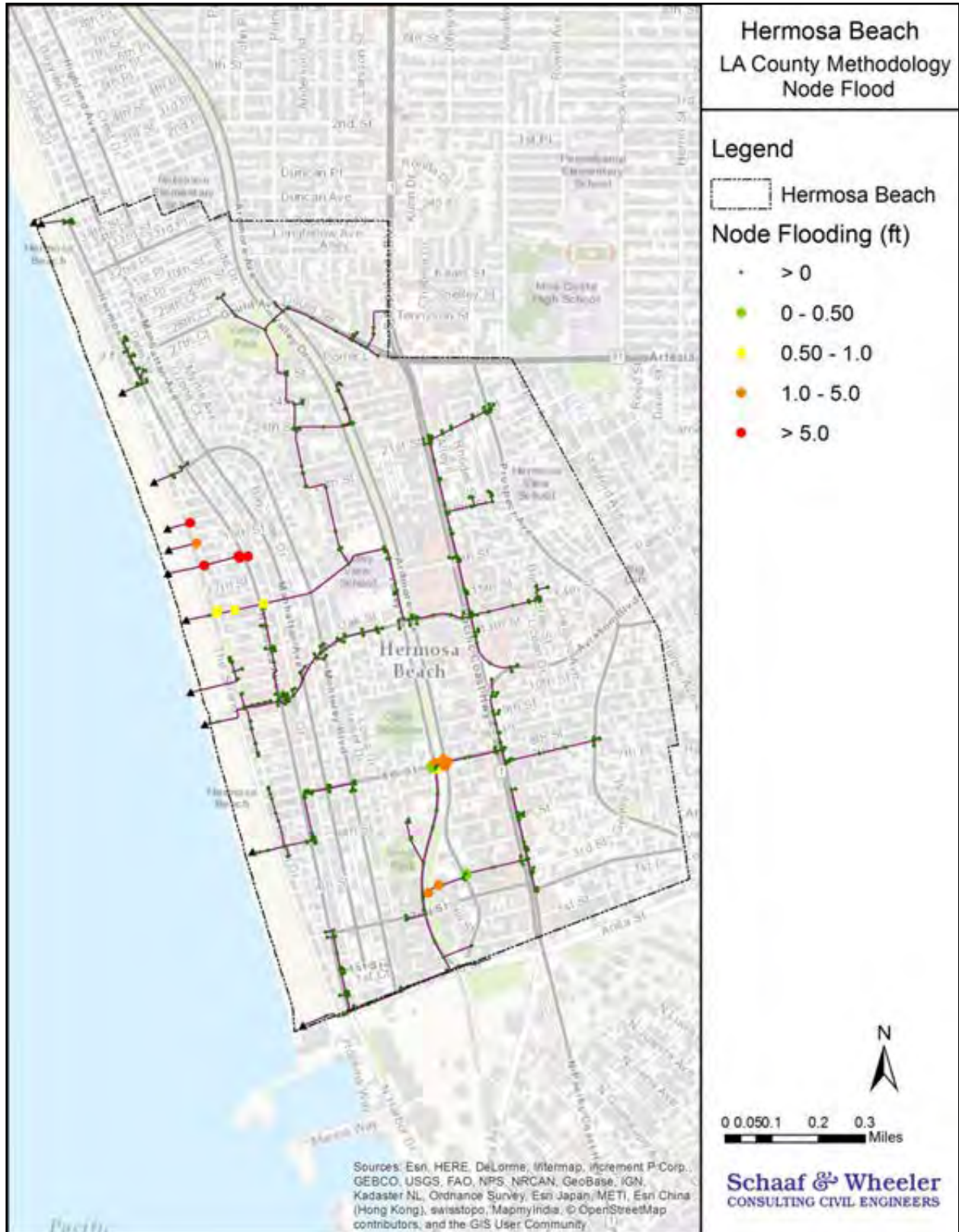


Figure 2.5: LA County Methodology 10-year, 24-hour Node Flood Results



## Modified Methodology

The intensities at short durations produced using Los Angeles County's modified rational method do not match statistical data gathered from NOAA in the Hermosa Beach area, resulting in low flows entering the storm drain system. An alternate design storm was created to more accurately simulate the effects of a 10-year storm on the study area. The modified design storm is discussed in more detail in the following section. The modified design storm more closely matches statistics gathered from NOAA, and results in a greater amount of storm runoff entering the storm drain system.

## Modified Rainfall Depth and Pattern

The rainfall intensities at short durations using the HydroCalc are too low. A comparison to NOAA Atlas 14 values is shown in Table 2.1. Schaaf & Wheeler modified the design storm utilized in HydroCalc to better match regional statistics. The resulting storm pattern is shown in Figure 2.6 and the comparison of the statistics is shown in Figure 2.7.

Table 2.1: 10-year Rainfall Statistics

Duration	County Method (inches)	NOAA Atlas 14 (inches)	Difference (%)
5 minute	0.17	0.26	-36%
10 minute	0.26	0.37	-30%
15 minute	0.32	0.45	-28%
30 minute	0.47	0.61	-24%
60 minute	0.68	0.87	-22%
2 hour	0.98	1.25	-22%
3 hour	1.21	1.52	-20%
6 hour	1.75	2.13	-18%
12 hour	2.52	2.74	-8%
24 hour	3.63	3.59	1%

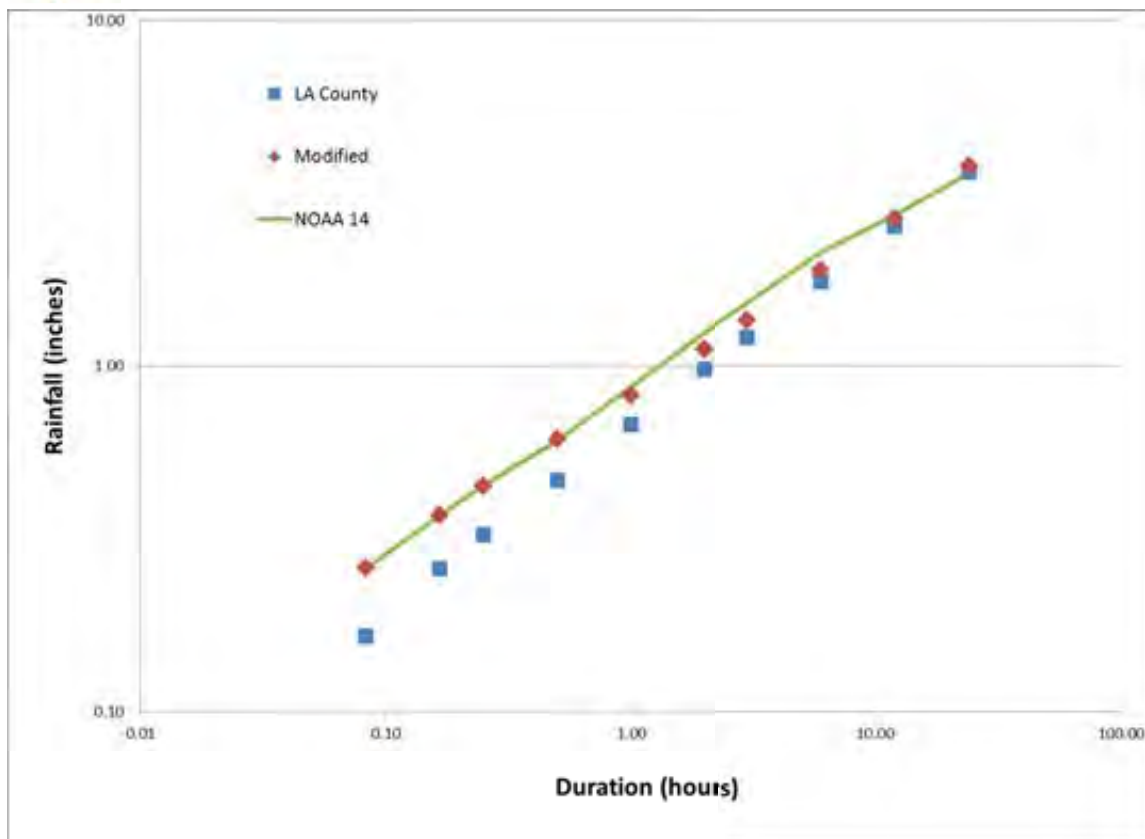


Figure 2.6: County, NOAA and Modified 10-year Rainfall Statistics

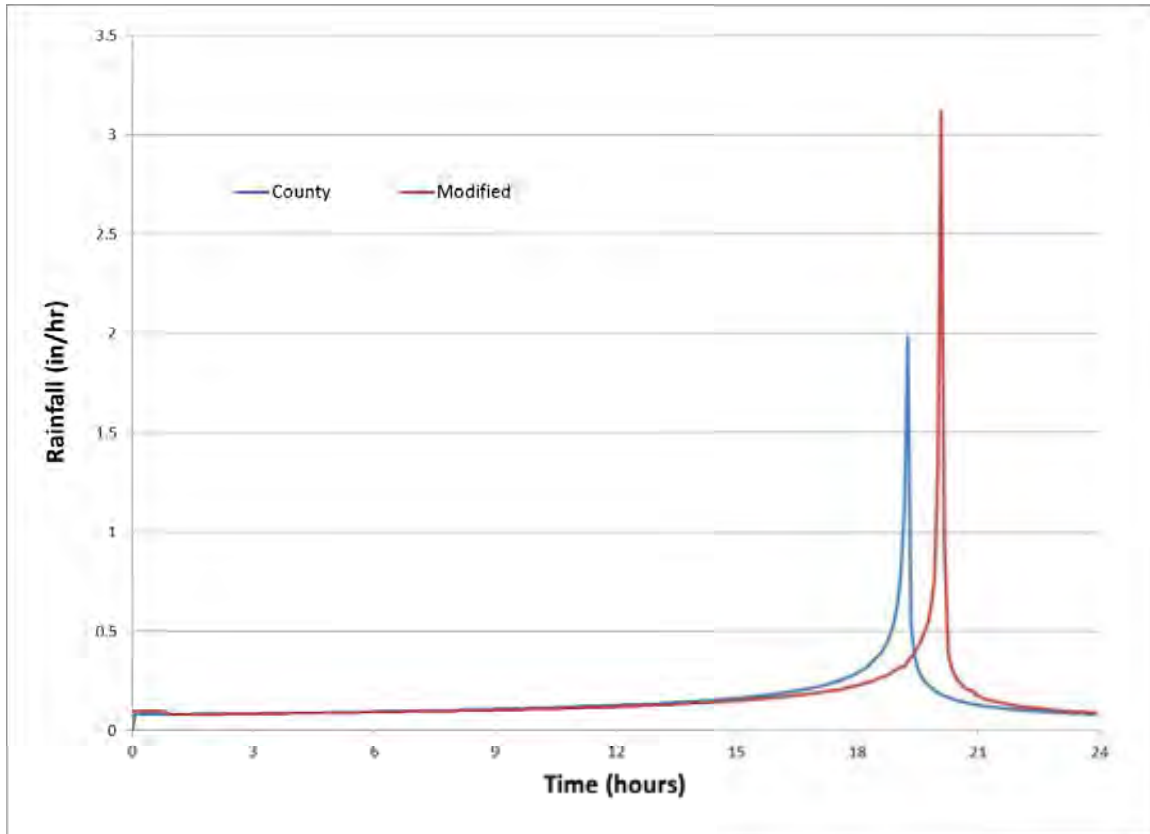


Figure 2.7: Modified 10-year Design Storm

### Infiltration Rate

Soil infiltration rates developed for using the County method are applied directly to this modified approach.

### Basin Lag

Basin lag, or lag time, is defined as the time elapsed between rain fall occurring within a basin and runoff occurring at an outlet point. MU/SWMM5 uses basin slope (S), Manning's roughness coefficient (N), and basin width (W) to determine lag time. Slope is expressed in percent, roughness values for pervious (N-pervious) and impervious (N-impervious) are dimensionless, and width (W) is expressed in feet. SWMM does not provide detailed documentation of how width is calculated. The SWMM User's Manual defines it as:

*The characteristic width of the overland flow path for sheet flow runoff (feet or meters). Adjustments should be made to the width parameter to produce good fits to measured runoff hydrographs.<sup>1</sup>*

The basin width can initially be assumed to be the total catchment area divided by the average maximum overland flow length. The maximum overland flow length is the length of the flow path from the furthest drainage point of the subcatchment before the flow becomes channelized. A width parameter equal to two times the maximum overland flow length was used for this master plan and is consistent with previous

<sup>1</sup> Storm Water Management Model User's Manual Version 5.1, US Environmental Protection Agency, September 2015



studies in the City and the SWMM Hydrology Manual<sup>2</sup>. The 10-year storm generated using the LA County Methodology was applied to the subcatchments, and the resulting peak runoff values were compared to HydroCalc results. The margin of error between the two sets of results was small, and it was determined that this width parameter produces runoff hydrographs that match basin characteristics.

## Model Hydraulic Calculations

MU/SWMM5 pipe flow calculations require network data, operational data, and boundary data as input. Network data consists of the pipe network elements including nodes (manholes, outlets, and storage nodes) and links (pipes, culverts, and open channels).

Detailed analyses of peak storm water discharge are performed by the MU/SWMM5 program, which also determines the flow condition in each drainage system element. The MU and SWMM technical manuals may be referenced for a more detailed description.

## Links

Parameters required to describe model links include the unique identifiers of stream and downstream nodes, pipe shape and dimensions, material or roughness, and upstream and downstream inverts. Boundary data for the pipe flow computation can include any external loading, inflow discharges, water levels at interaction points with receiving waters, as well as the results of a run-off calculation.

Pipes are modeled as one-dimensional closed conduit links which connect two nodes in the models. The conduit link is described by a constant cross-section along its length, constant bottom slope, and straight alignment. Unsteady flow in closed conduits is calculated using conservation of continuity and momentum equations, distinguishing between pipes flowing partially full (free surface flow), and those flowing full (pressurized flow). Most pipes within the Hermosa Beach model are modeled as reinforced concrete pipe (RCP) with a Manning's 'n' of 0.013 or corrugated metal pipe (CMP) with an 'n' of 0.024.

## Junction Losses

Parameters required to describe nodes include x and y coordinates of the node, a unique identifiers, node type (junction, outfall, storage basins), depth and invert levels, and water levels at outlets. Hydraulic losses at junctions (manholes, inlets, intersections) can be significant in pressurized drainage systems. Losses can vary due to construction methods, condition, and shape. An entry and exit loss coefficient of 0.1 was used at most junctions for this master plan study.

## Outlet Boundary Conditions

Pipe network outlets can be modeled with either a free outfall or a water surface elevation (fixed or variable with time) which captures backwater effects due to receiving water levels. The modeled system contains 11 outfalls. All outlets are tidally influenced and are modelled using the 100-year tidal elevation curve, as shown in Figure 2.8. Tidal statistics for the Santa Monica tide station, located approximately twelve miles north of the SDMP study area, were used in the model. Tidal statistics were obtained from the National Oceanic and Atmospheric Administration (NOAA). The modeled diurnal tidal cycle was developed such that the low-high tidal peak occurs coincident to the rainfall peak





<sup>2</sup> Storm Water Management Model Reference Manual Volume I – Hydrology, US Environmental Protection Agency, January 2016

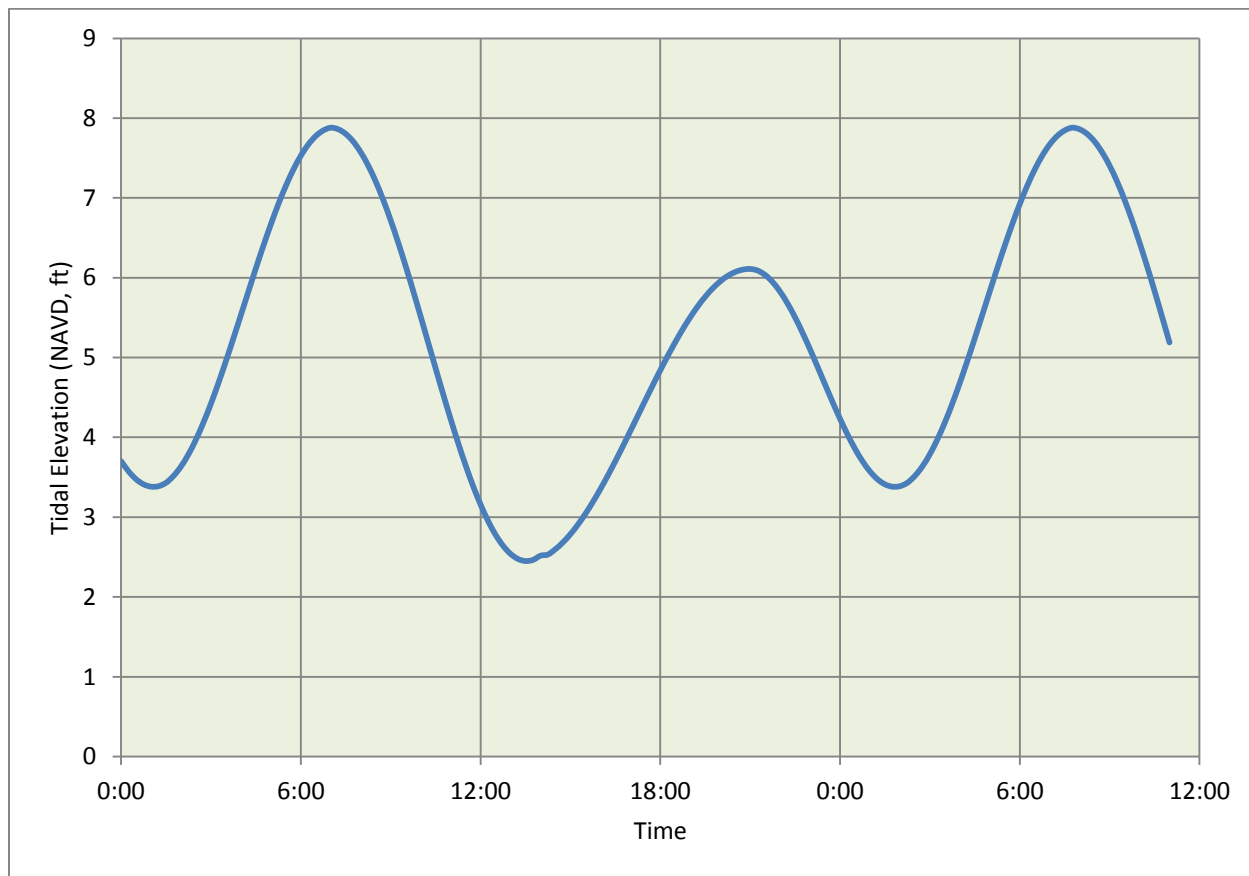


Figure 2.8: 100-Year Tidal Elevation

# Chapter 3 - Evaluation of Storm Drain Systems

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## Overview

A performance analysis of Hermosa Beach's storm drain system is the primary focus of the storm drain master plan. This chapter describes in detail Hermosa Beach's storm drainage facilities and known drainage system issues within Hermosa Beach. Flooding depths predicted by the model are presented for 10-year events assuming the existing land use condition. Improvement projects that are required to alleviate or minimize flooding based on the 10-year performance standards are identified and prioritized herein.

## Evaluation of Storm Drain Capacity

Hermosa Beach's storm drain system has been analyzed with current land use conditions to determine its performance during the 10-year design storm. Areas of significant flooding based on past occurrences and results of the MIKE URBAN (MU) models are discussed herein, and improvement projects are recommended based on required additional flow capacity.

Additional flow capacity requirements are determined by upsizing existing pipes in the MU/SWMM5 model until the hydraulic grade is reduced to no higher than 0.5 feet above the gutter elevation at any node. It is impractical to entirely remove predicted flooding throughout the project area, either due to local topography (for example, at minor, localized 'bathtub' areas) or infeasibility of improvements, but the majority of model predicted flooding can be mitigated with the capital improvements proposed herein. To determine the depth of flooding at any particular node in the MU model, the maximum hydraulic grade line (HGL) and ground elevation were utilized, as shown in the following equation:

$$\text{Depth of flooding} = \text{Max HGL} - \text{Ground Elevation}$$

For example, if the ground elevation is 7.5 feet at a node and MU computes a max hydraulic grade of 8.3 feet, the depth at flooding at this node would be 0.8 feet. Water is allowed to pond at the node, until there is there capacity in pipe system to accommodate the flow.

## Design Criteria

The City of Hermosa Beach's published drainage design criteria states that storm drain pipe systems shall be designed to convey the 10-year event flow. Initial city-wide models were developed to analyze the 10-year events for existing conditions. These models revealed that the majority of the City's storm drain system does not meet the published criteria in all areas. A CIP that limits node flooding to 0.5 feet above the gutter elevation will be developed.

## Prioritizing Deficiencies and Needed Capital Improvements

The Hermosa Beach storm drain system was modeled in a single hydraulic model. Storm drain systems in Hermosa Beach (both City-owned systems and those owned by others) convey the majority of storm water runoff toward the outlets through storm drain systems consisting of gutters, catch basins, and pipes. It should be noted that site-specific drainage characteristics (i.e. on the scale of individual parcels) have not been analyzed as that level of detail is not necessary to determine improvements at the master-



planning level. These models can be refined in the future to more precisely account for these site-specific drainage characteristics during the development of detailed drainage studies.

Recommended master plan improvements are described in Chapters 4 and in Appendix A. In some locations, the hydraulic grade line (HGL) predicted by the one-dimensional (1D) model at individual nodes in the system may be greater than actual water surface elevation during a storm event. This is due to limitations and assumptions inherent in the 1D modeling software. In order to ‘ground truth’ predictive model results, Schaaf & Wheeler compared model results to areas of observed flooding provided by the City. Locations for recommended system improvements are based on the results of this complete process, not solely on model results. As such, some locations predicted to have flooding surcharge based on model results alone are not recommended for improvements. For example, flooding may be observed the top of drainage system where water from a catchment is added to the storm drain network but in reality water enters that point through pipes smaller than 15-inches, resulting in little to no actual flooding. The recommended improvements were then prioritized based on the results of the above process, combined with the severity of flooding at each location and the benefit/cost relationship of proposed improvements. The following color code, as shown in Table 3.1, is used to highlight project prioritization within each drainage sub-area.

**Table 3.1: Project Prioritization Summary**

Priority	Description
Highest Priority	The projects under this category play a crucial role in the operation of the existing storm drain system. Completion of these projects is either required prior to completing high priority improvements, or are required in order to reduce flooding in an especially flood prone area.
High Priority	Projects under this category have a large area of flooding where the 10-year maximum flood depth is greater than 12-inches. These projects improve locations with the deepest and longest flooding situations. They may also be located at the downstream end of many projects, as they would logically be constructed first. Areas of significant historical flooding fall into this category.
Moderate Priority	This category has conditions similar to high priority, but has a smaller area affected by flooding. The length and depth of flooding is less than that of a high priority improvement.
Low Priority	Low priority improvements are generally smaller projects that generally address nuisance flooding. The area of flooding is much smaller and/or briefer in duration than that of moderate and high priority projects.

This chapter summarizes improvements needed to achieve a level of service characterized by alleviating or minimizing predicted flooding within the City of Hermosa Beach. Improvements have been grouped together to reflect projects that could feasibly be undertaken simultaneously. Project naming conventions use major street names where possible. Project names and unique numerical IDs assigned to each project identify improvements in maps and tables.



A complete set of CIP tables including existing pipe size, recommended pipe size, and improvement cost breakdowns for all priorities are provided in Appendix A.

## Hermosa Beach System Evaluation

The modeled drainage area is approximately 1.4 square miles. The modeled collection system within the Hermosa Beach City limits consists of 482 pipe segments, 436 nodes, and 11 outlets. The project area has a total of 46,000 linear feet (9 miles) of modeled storm drain pipe equal to or greater than 15 inches in diameter. Each collection system has been analyzed for the existing land use condition to determine its performance during the design 10-year storm. Areas of significant flooding are recognized herein and recommended improvements to establish system performance in accordance with criteria outlined in Chapter 2 - Methodologies, are summarized.

Some projects will also affect surrounding areas. As a result, “highest” and “high” priority projects in one drainage area may reduce the amount of flooding in other drainage areas where no “highest” or “high” priority are recommended. In some cases, the number of flooded parcels in an area does not decrease because localized low points have filled where there is a private catch basin that has not been included in the models as there are a large number of private systems with little information available. Projects in these areas are still beneficial in decreasing depth and duration of flooding surrounding localized low points.

### Evaluation of 2-D Flooding

Schaaf & Wheeler analyzed the two dimensional (2-D) overland flows using the 10-year design storm. Spills from the 1-D SWMM models were utilized in DHI’s MIKE-21 to trace spills. It was determined that there is no significant flooding due to 2-D surface flow. Results are shown in Figure 3.1. The depth of most spills are less than 0.5 feet and should be mainly contained within the City streets. However, there is some small potential for spills to pond in localized low areas (bowls) and reach depths greater than 0.5 feet.

### Hermosa Beach Systems

MU/SWMM5 flooding results for existing conditions during the 10-year return period events are presented in Figure 3.2. The 10-yr flooding extents in this figure include the storm drain system with tidal influence.

### Identified Deficiencies

There is significant flooding along Beach Drive between 18<sup>th</sup> and 20<sup>th</sup> Street during the 10-year rainfall event. The flooding occurs due to undersized pipes and lack of storm drain infrastructure in the area.

Significant flooding also occurs upstream of the 16<sup>th</sup> Street outfall. The flooding occurs due to undersized pipes.

### Known Problem Areas

The City documented a number of locations throughout the City which experiences flooding, as shown in Figure 3.4. The MU flooding results were compared to these locations to determine if the model is in agreement. Each known problem area is described in Table 3.4.

### Prioritized Improvements

Four highest priority projects summarized in Table 3.2 are recommended for the City to reduce significant modeled 10-year flooding combined with observed flooding.



Nine high, moderate, and low priority projects summarized in Table 3.3 are recommended to alleviate modeled 10-year flooding. The City may need to progressively reprioritize high and moderate priority projects based on funding, utility improvements, land use changes, and condition assessments.

Figure 3.3 shows the location of each CIP project.

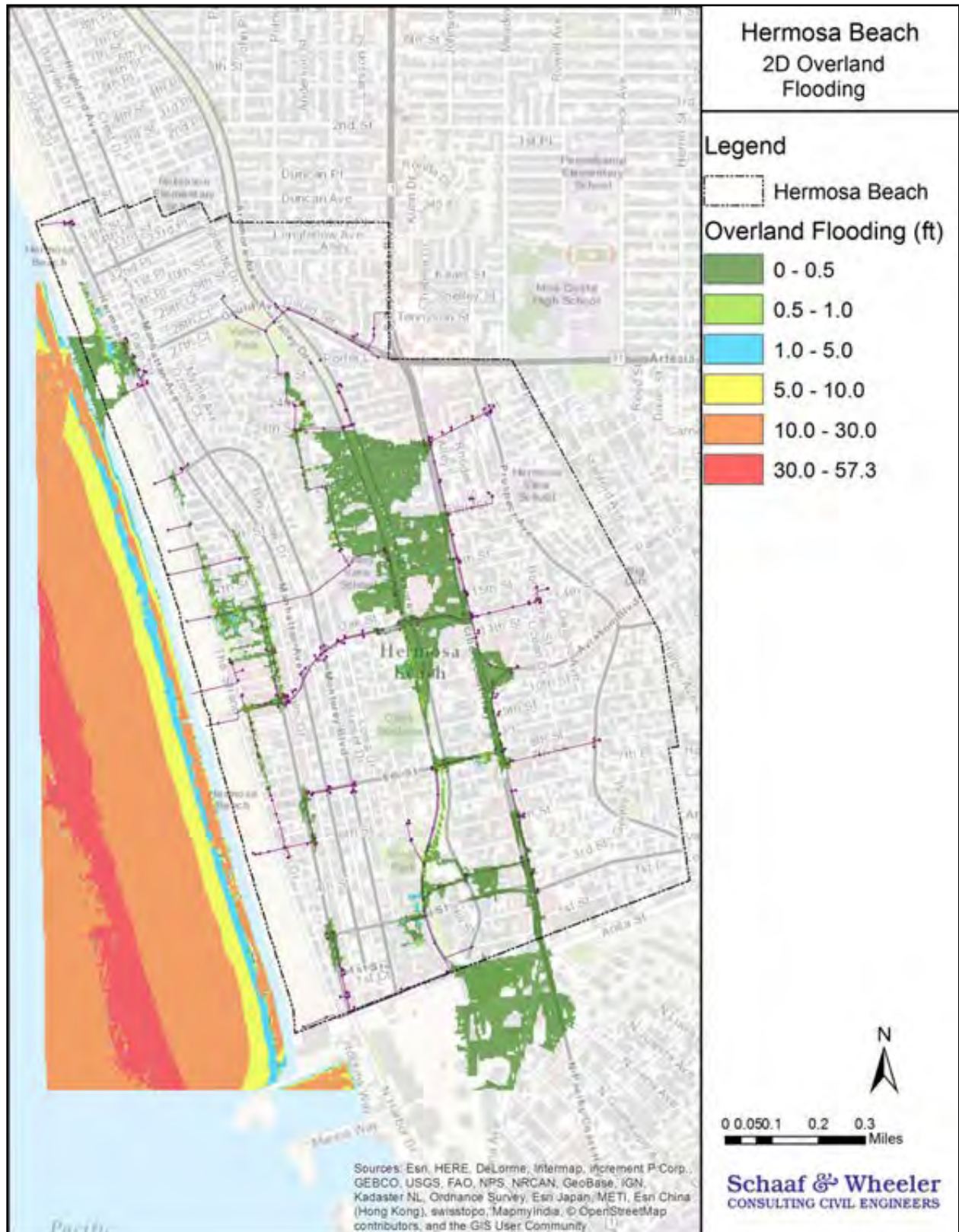


Figure 3.1: 2-D Overland Flooding During a 10-year Return Period Event

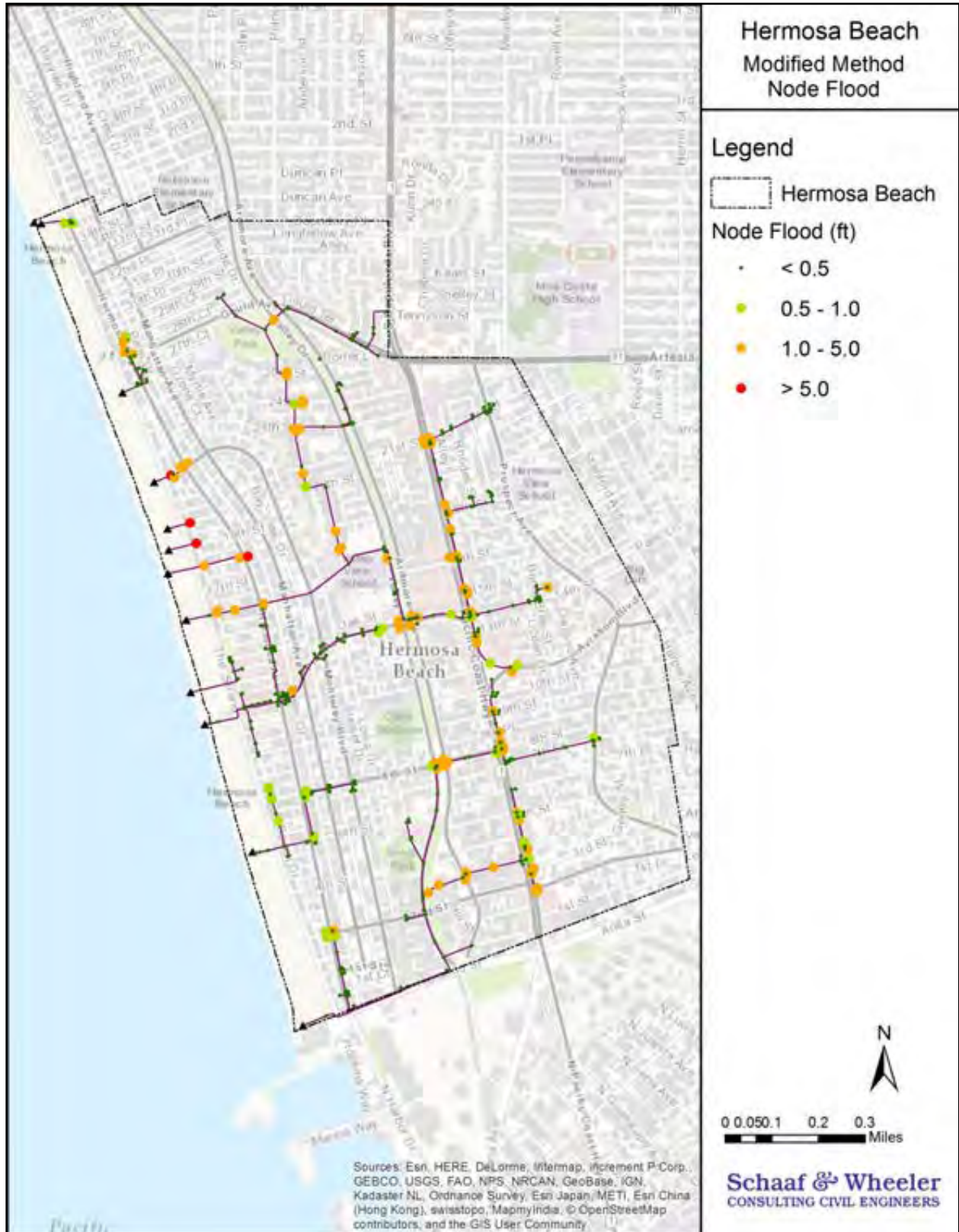


Figure 3.2: Existing Storm Drain Conditions During a 10-year Return Period Event

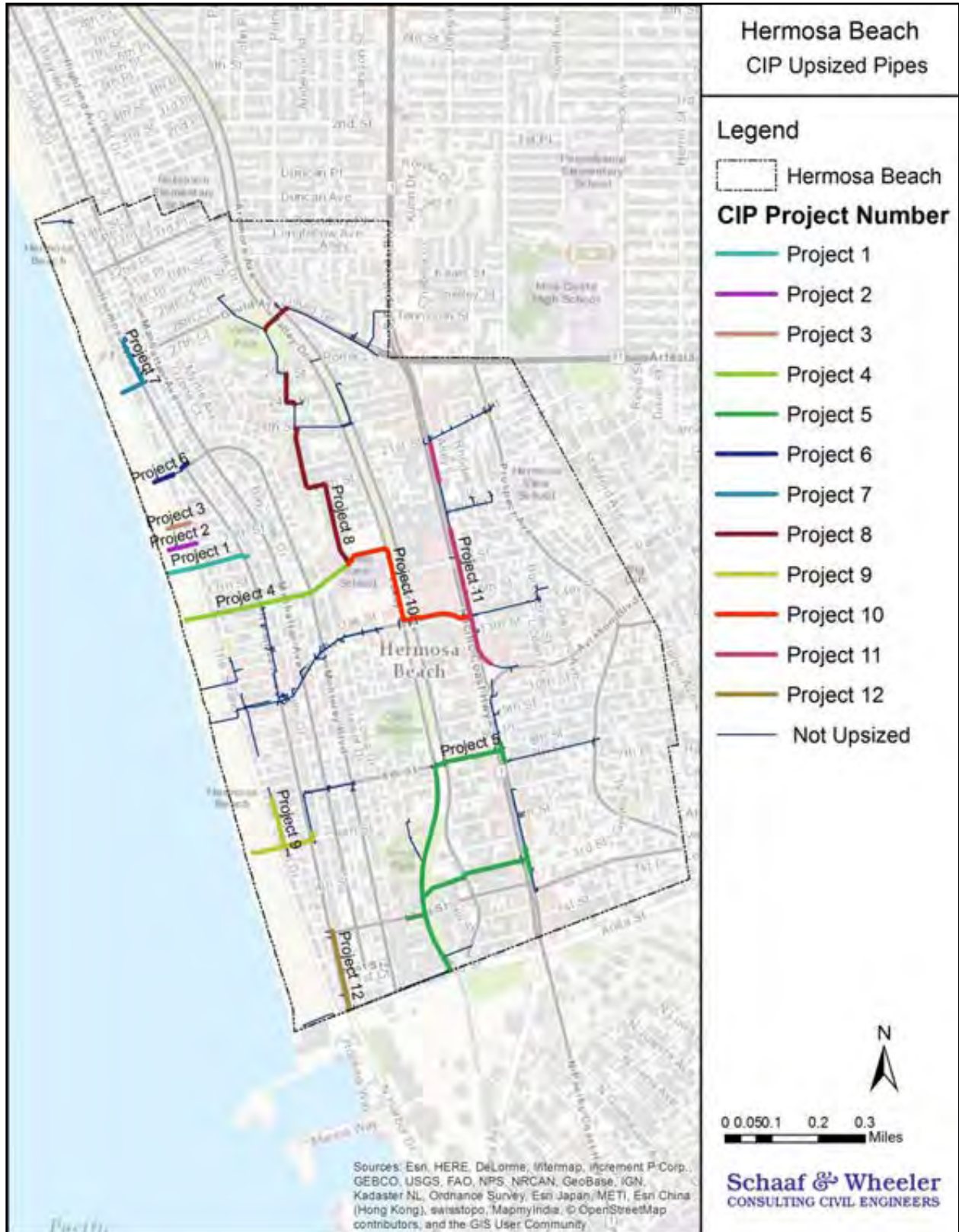


Figure 3.3: CIP Upsized Pipes





**Table 3.2: Highest Priority Projects for the Hermosa Beach Drainage Area**

Project No.	Project Name	Priority	Description
1	18th St. Outfall	Highest	Significant modeled and observed flooding occurs in the 18 <sup>th</sup> Street system due to undersized pipes and lack of storm drain infrastructure. Upsizing these pipes and potentially connecting them to a larger system is recommended to help eliminate 10-year flooding.
2	19th St. Outfall	Highest	Significant modeled and observed flooding occurs in the 19 <sup>th</sup> Street system due to undersized pipes and lack of storm drain infrastructure. Upsizing these pipes and potentially connecting them to a larger system is recommended to help eliminate 10-year flooding.
3	20th St. Outfall	Highest	Significant modeled flooding occurs in the 20 <sup>th</sup> Street system due to undersized pipes and lack of storm drain infrastructure. Upsizing these pipes and potentially connecting them to a larger system is recommended to help eliminate 10-year flooding.
4	16 <sup>th</sup> Street	Highest	Significant modeled and observed 10-yr flooding occurs at and upstream of 16 <sup>th</sup> Street between Beach Dr. and Loma Dr. Upsizing these pipes is recommended to alleviate 10-year flooding in this area, as well as in the upstream system.

**Table 3.3: High, Moderate, and Low Priority Projects for the Hermosa Beach Drainage Area**

Project No.	Project Name	Priority	Description
5	Valley Dr. at Herondo Ave.	High	Modeled and observed 10-year flooding occurs upstream of Valley Dr. between 2 <sup>nd</sup> and 8 <sup>th</sup> St due to undersized pipes. Upsizing these pipes is recommended.
6	22nd St. Outfall	High	Moderate modeled 10-year flooding occurs upstream of the 22 <sup>nd</sup> St. outfall due to undersized pipes. Upsizing these pipes is recommended.
7	Hermosa Ave. at 27 <sup>th</sup> St.	High	Moderate modeled 10-year flooding occurs upstream of the 26 <sup>th</sup> St. outfall due to undersized pipes. Upsizing these pipes is recommended.
8	Valley Park Ave.	High	Moderate modeled 10-year flooding occurs along Valley Park Ave. and in the upstream system due to undersized pipes and downstream flooding in the 16 <sup>th</sup> St. system. Upsizing these pipes is recommended.
9	6 <sup>th</sup> Street	Moderate	Some flooding occurs upstream of the 6 <sup>th</sup> St. outfall due to undersized pipes. Upsizing these pipes is recommended.
10	Pier Ave. at Valley Dr.	Moderate	Some modeled 10-year flooding occurs along Valley Dr. near Pier Ave. due to undersized pipes and downstream flooding in the 16 <sup>th</sup> St. system. Upsizing these pipes is recommended.
11	PCH at Pier Ave.	Moderate	Moderate flooding occurs on PCH between Aviate Blvd. and 21 <sup>st</sup> St. due to undersized pipes and downstream flooding. Upsizing these pipes is recommended.
12	Hermosa Ave. at Herondo St.	Low	Minimal flooding occurs on Hermosa Ave. at 2 <sup>nd</sup> St. due to undersized pipes. Upsizing these pipes is recommended.

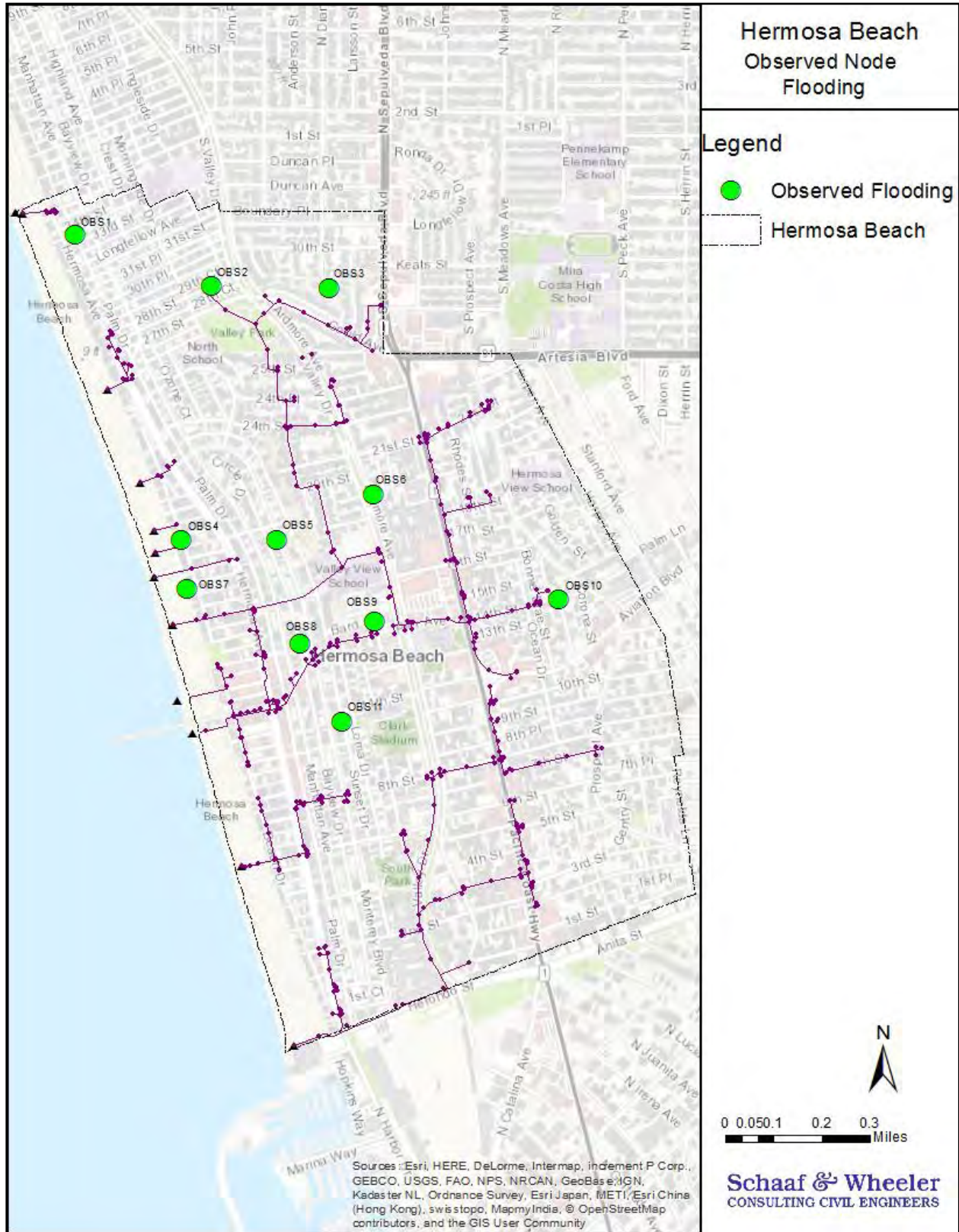


Figure 3.4: Observed Flooding in Hermosa Beach



**Table 3.4: Observed Flooding Area Description**

Project No.	Priority	Project Name	Description
OBS1	Low	3316 Hermosa Ave.	Minor flooding occurs in resident's garage due to storm drain in front of house that does not work properly. Connecting this area to an existing system is recommended.
OBS2	Low	437 28 <sup>th</sup> St.	Ponding occurs in street due to inadequate storm drain inlets. Similarly, flooding in alleyway occurs behind houses. Connecting this area to an existing system is recommended.
OBS3	Low	Tennyson Place	Flooding occurs at end of Tennyson Place cul-de-sac due to insufficient drainage at low elevation point. Connecting this area to an existing system is recommended.
OBS4	Low	The Strand at 19 <sup>th</sup> St.	Ponding occurs at this location due to insufficient drainage. Connecting this area to an existing system is recommended.
OBS5	Low	1823 Monterey Blvd.	Ponding occurs at this location due to insufficient drainage. Connecting this area to an existing system is recommended.
OBS6	Low	1910 Ardmore St.	Storm water is consistently flowing out of a curb outlet at this location. Installing a small grate inlet to drain across Ardmore into Hermosa Valley Greenbelt is recommended.
OBS7	Low	1712 The Strand	Flooding occurs due to clogged outfalls causing water to flow to Beach Dr. where storm water surpasses the storm drains. Water flowing north to south down Beach Drive (from 18th St and northward) is overwhelming the drains on Beach Dr. Increasing the outfall size is recommended.
OBS8	Low	1426 Bayview Dr.	Ponding occurs at this location due to insufficient drainage. Connecting this area to an existing system is recommended.
OBS9	Low	Marineland Community	Flooding occurs due to water not being routed to the storm drain. Water from Oak street runs down and is diverted into the Marineland community. Connecting this area to an existing system is recommended.
OBS10	Low	1045 14 <sup>th</sup> St.	Ponding in the street occurs at this location. Connecting this area to an existing system is recommended.
OBS11	Low	Sunset Dr.	Ponding in the street occurs at this location. Connecting this area to an existing system is recommended.

# Chapter 4 - Capital Improvement Plan

## Overview

Chapters 2 and 3 discuss Hermosa Beach’s storm drain collection system and recommend prioritized capital improvements to address known and modeled deficiencies. This chapter provides a Capital Improvement Program (CIP) that recognizes these priorities. The CIP provides an overall guideline for the City to use as a tool in preparing annual budgets. Exigent circumstances and future in-field experiences may necessitate deviations from the Storm Drain CIP. A master plan is intended to be a tool for planning. Capital improvement priorities are not intended to be hard and fast.

The CIP does not include the cost of new facilities related to new development (e.g., pipeline extensions to serve areas that are currently undeveloped). These new facilities may be constructed as part of the new developments, and are not included in the CIP.

## Capital Improvement Priorities

The proposed CIP for storm drainage in Hermosa Beach is broken into four priority levels for the purpose of funding and implementation. The total cost summary for CIP projects is shown for each priority level in Table 4.1 and summarized in Figure 4.1.

The costs summarized in Table 4.1 and Figure 4.1 includes an additional 50% for design, administration, and construction management, and contingency. Project subtotals (cost of pipe demolition and replacement), construction totals (including traffic control, mobilization, demobilization, and contingency), and CIP totals (including design and engineering costs) are detailed in Appendix A.

**Table 4.1: Summary of CIP Costs Based on Priority Level (total project cost)**

Priority	City Owned CIP Cost	County Owned CIP Cost
Highest Priority Capital Improvements	\$1,200,000	\$2,600,000
High Priority Capital Improvements	\$380,000	\$8,700,000
Moderate Priority Capital Improvements	—	5,600,000
Low Priority Capital Improvements	\$2,700,000	—
Total Priority Capital Improvements	\$2,500,000	\$17,000,000

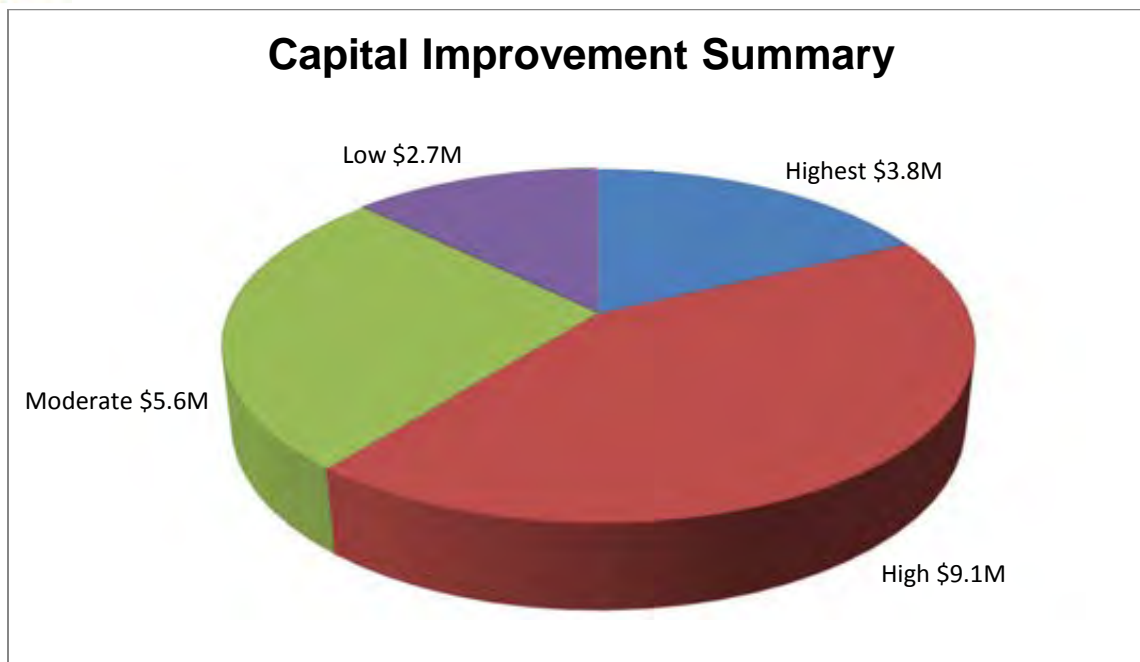


Figure 4.1: Hermosa Beach Storm Drain CIP Summary Chart

### Cost Basis for Improvements

Costs have been estimated using information from other projects, cost estimating guides (2017 Heavy Construction Costs, *RSMMeans*) and engineering judgment. The cost per linear foot of improvement used for the pipe cost estimates are given in Table 4.2, and assume replacement pipe is installed using the open trench method (*note that these costs do not include the cost of design, administration, and contingency included in all other tables*). Costs are likely to vary greatly depending on site specific circumstances and the economic climate at the time of bidding; in some cases it may be more practical to use trenchless methods or a parallel pipe for construction. These cost estimates are also based on larger scaled projects and thus, the replacement of shorter lengths of pipe as individual projects may incur significantly higher costs due to the nature of construction work.

As per our estimates, connection (manhole or catch basin) replacement cost estimates depend on connecting pipe diameters and depth and ranged from \$11,500 (24-inch pipe with three feet of cover) to \$19,400 (96-inch pipe with three feet of cover). New outfall costs are estimated to be \$40,000 per new outfall. It should be noted that wide variations in actual outfall costs are expected due to location of outfall, whether energy dissipation is required, environmental concerns, etc. Since most of these improvement projects are expected to qualify for negative declarations from permitting agencies, these costs do not include permitting or any environmental documentation. Unit costs for three feet of pipe cover are shown in Table 4.2. More detailed unit costs, accounting for greater pipe cover depths are provided in Appendix A.



Table 4.2: Storm Drain Replacement Unit Costs for 3 feet of pipe cover

Diameter (inches)	2017 Dollar per Linear foot of Pipe	2017 Dollar Per Connection
12	\$230	\$11,294
15	\$239	\$11,303
18	\$257	\$11,386
21	\$275	\$11,459
24	\$331	\$11,524
27	\$358	\$11,597
30	\$386	\$11,671
33	\$404	\$11,987
36	\$450	\$12,111
42	\$505	\$12,358
48	\$551	\$12,606
54	\$643	\$13,641
66	\$666	\$15,156
69	\$331	\$15,313
72	\$689	\$15,469
78	\$744	\$16,565
84	\$790	\$17,661
96	\$826	\$19,415

*Note: These costs do not include increases for design, administration, and for contingency included in all other tables. Unit costs are based on an average 3 feet of ground cover over the pipe. Greater cover will raise estimated costs.*

### Open Trench Improvements

Two essential types of projects are traditionally utilized to increase storm drain system capacity: install a new relief storm drain parallel to the system lacking capacity, or replace the overloaded pipe with larger diameter pipe in the same alignment. The CIP has been developed assuming pipe replacement with a larger diameter pipe. The two alternatives can be made equivalent to one another using the following formula, assuming that pipe material and length are equal:

$$D_R = (D_e^{2.63} + D_p^{2.63})^{0.38}$$

Where  $D_R$  = diameter of replacement pipe;  
 $D_e$  = diameter of overloaded pipe; and  
 $D_p$  = diameter of parallel relief drain.

Assuming the existing pipe is adequate in terms of condition, the installation of a new parallel pipe is typically more cost effective than pipe replacement because the required pipe size is smaller and the existing pipe does not need to be removed. This does not take into account the long term maintenance associated with a parallel system. The selection of a capacity improvement strategy will vary from project to project, and be governed by field constraints such as conflicting utilities, rights-of-way, environmental concerns, permit requirements and traffic control. Utility conflicts and potential relocation cost is not included in this SDMP.



## Trenchless Improvements

Traditional cut and cover methods of construction will likely be employed for a large portion of the storm drain improvements. However, the utilization of trenchless methods such as bore and jack, directional drilling, cured-in-place pipe (CIPP), slip-lining, pipe bursting, and others, may increasingly find application in special circumstances where existing development encroaches upon the pipe alignment, or disruption of other services and land uses is too costly. These trenchless methods also have their own constraints and should be chosen based on pipe material, access, and other site specific circumstances.

Rehabilitating corrugated metal pipes (CMPs) accounts for the majority of condition related improvement. Using a CIPP is the preferred method for rehabilitating CMP storm drains or culverts because of the ease of installation and the liner will provide structural stability. Although a CIPP decreases the diameter slightly, it will typically maintain or improve the hydraulic characteristics of the storm drain facility due to the lower roughness coefficients. A detailed analysis should be completed during detailed design to determine if a CIPP liner will maintain adequate capacity for a given site.

## Capital Improvement Program

### Storm Drain Improvement CIP

The CIP costs and pipe lengths based on priority level are summarized in Table 4.3. Individual costs for City projects are summarized in Table 4.4 and County projects in Table 4.5. Figures 4.2 show the location and priority of each CIP project while Figures 4.3 and 4.4 show the County and City projects and Maps of the improvement priorities with pipe diameters are shown in Chapter 3. Detailed project sheets with required improvement pipe lengths and diameters are included in Appendix A for the Highest Priority Capital Improvements.

The projects necessary to improve the various observed drainage issues within the City are listed in Table 4.6 and shown in Figure 4.5. These projects are rated as low priority and should be addressed as funding allows or other improvement projects, such as sewer upgrades, occur. Figure 4.6 shows the distribution of upsized pipes throughout the City.

**Table 4.3: Summary of Prioritized SDMP CIP - Project Costs**

Priority	Length (ft)	Cost
Highest Priority Capital Improvements	3,500	\$3.8M
High Priority Capital Improvements	8,800	\$9.1M
Moderate Priority Capital Improvements	5,500	\$5.6M
Low Priority Capital Improvements	3,800	\$2.7M
<b>Total Priority Capital Improvements</b>	<b>18,800</b>	<b>\$19.5M</b>



**Table 4.4: Prioritized City Owned Storm Drain System CIP**

Number	Pipe Improvements	Priority	Pipe Length (ft)	Upsized Diameter (in)	Number of Pipes	Manholes	Cost
1	18th St. Outfall	Highest	928	24-36	4	5	\$680,000
2	19th St. Outfall	Highest	320	30	1	2	\$250,000
3	20th St. Outfall	Highest	262	36	1	2	\$240,000
6	22nd St. Outfall	High	325	30-54	4	5	\$380,000
12	Hermosa Ave. at Herondo St.	Low	958	42-60	12	13	\$980,000

**Table 4.5: Prioritized County Owned Storm Drain System CIP**

Number	Pipe Improvements	Priority	Pipe Length (ft)	Upsized Diameter (in)	Number of Pipes	Manholes	Cost
4	16th Street	Highest	1978	84-96	5	6	\$2,600,000
5	Valley Dr. at Herondo Ave.	High	5225	42-84	38	39	\$5,000,000
7	Hermosa Ave. at 27 <sup>th</sup> St.	High	756	36-60	9	10	\$790,000
8	Valley Park Ave.	High	1887	30-84	10	11	\$2,900,000
9	6th Street	Med	1332	48-60	13	14	\$1,300,000
10	Pier Ave. at Valley Dr.	Med	2075	48-84	15	16	\$2,300,000
11	PCH at Pier Ave.	Med	2060	36-60	21	22	\$2,000,000



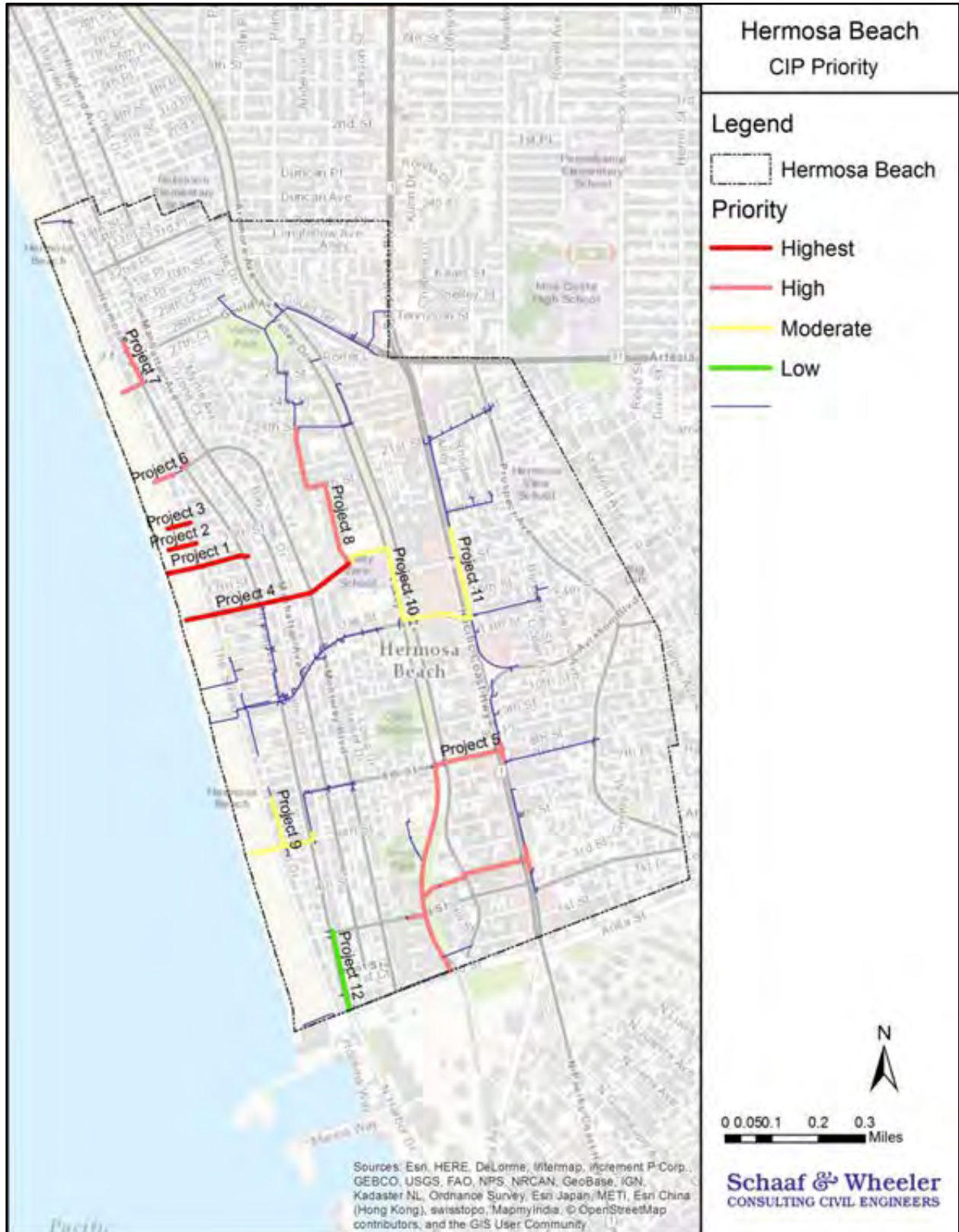


Figure 4.2: Hermosa Beach Storm Drain CIP Priority Summary

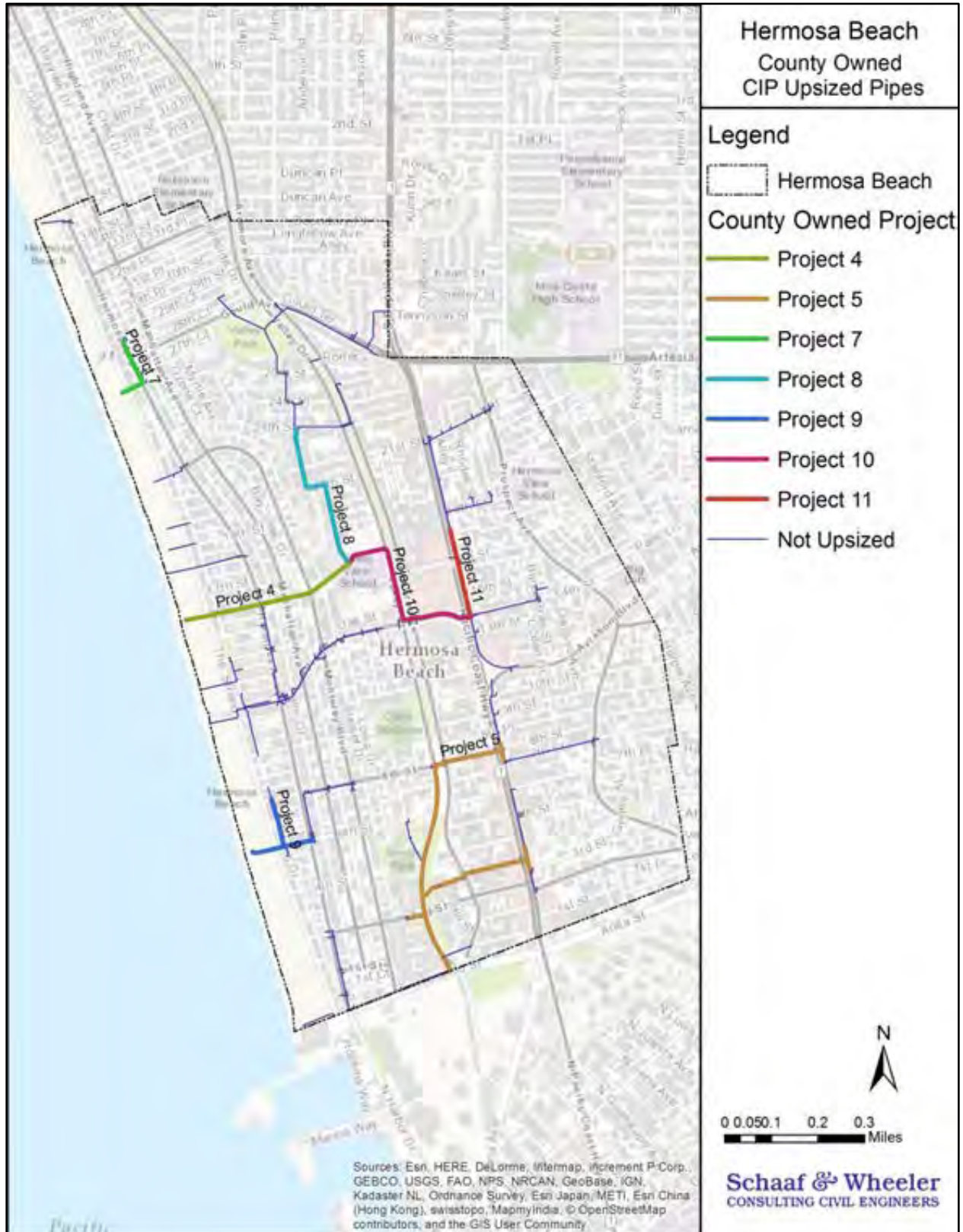


Figure 4.3: Hermosa Beach County Owned CIP Projects

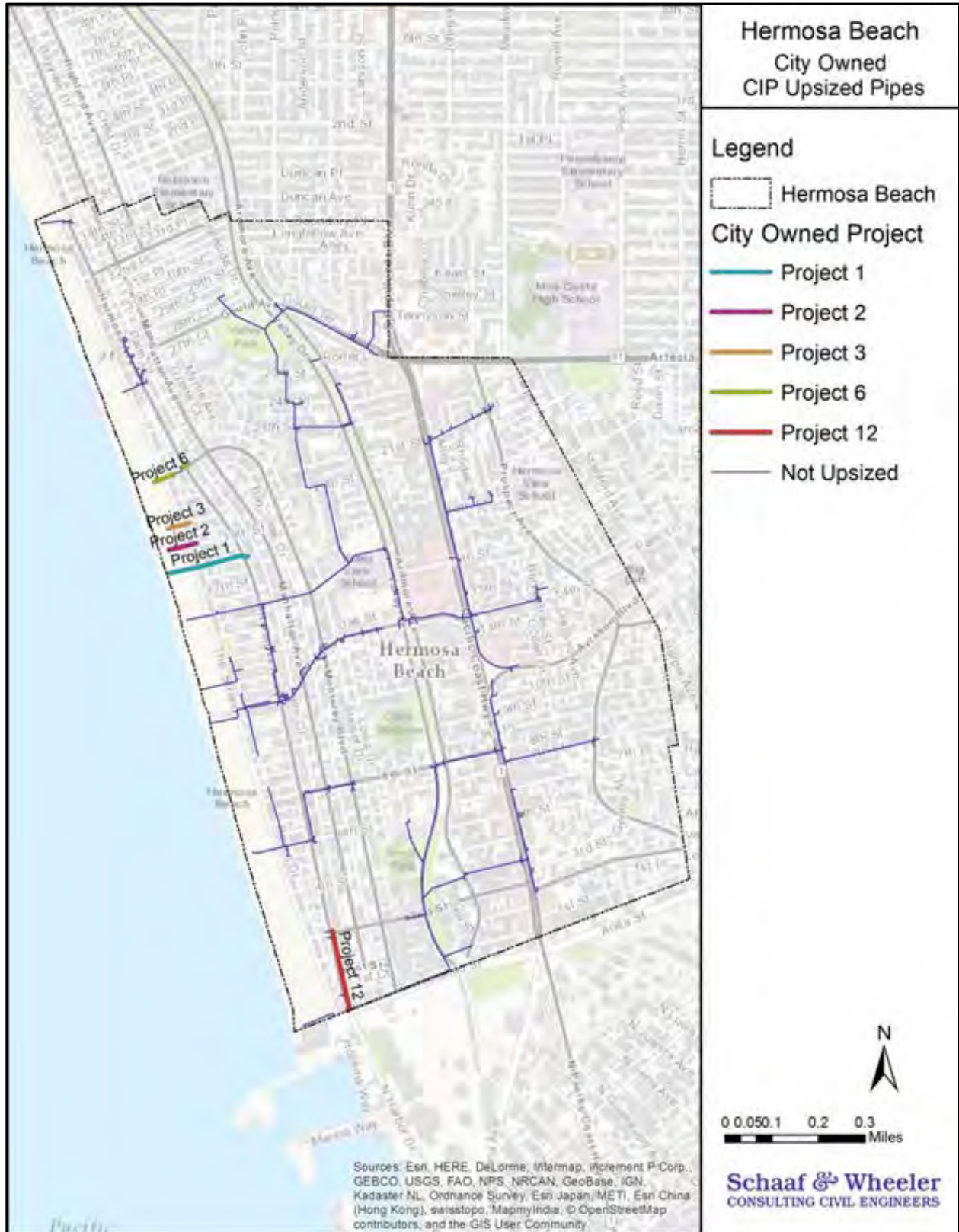


Figure 4.4: Hermosa Beach City Owned CIP Projects



Table 4.6: Observed Flooding CIP Summary

Number	Pipe Improvements	Priority	Pipe Length (ft)	Pipe Diameter (in)	Number of Pipes	Manholes	Cost
OBS1	3316 Hermosa Ave.	Low	474	24	1	2	\$260,000
OBS2	437 28 <sup>th</sup> St.	Low	122	24	3	3	\$110,000
OBS3	Tennyson Place	Low	367	24	1	2	\$210,000
OBS4	The Strand at 19 <sup>th</sup> St.	Low	76	18	1	2	\$63,000
OBS5	1823 Monterey Blvd.	Low	678	24	2	3	\$370,000
OBS6	1910 Ardmore St.	Low	28	12	1	1	\$27,000
OBS7	1712 The Strand	Low	405	24	1	1	\$210,000
OBS8	1426 Bayview Dr.	Low	264	18	1	2	\$140,000
OBS9	Marineland Community	Low	187	18	4	6	\$170,000
OBS10	1045 14 <sup>th</sup> St.	Low	239	18	1	2	\$130,000



Figure 4.5: Hermosa Beach Observed Problem Spot CIP Projects

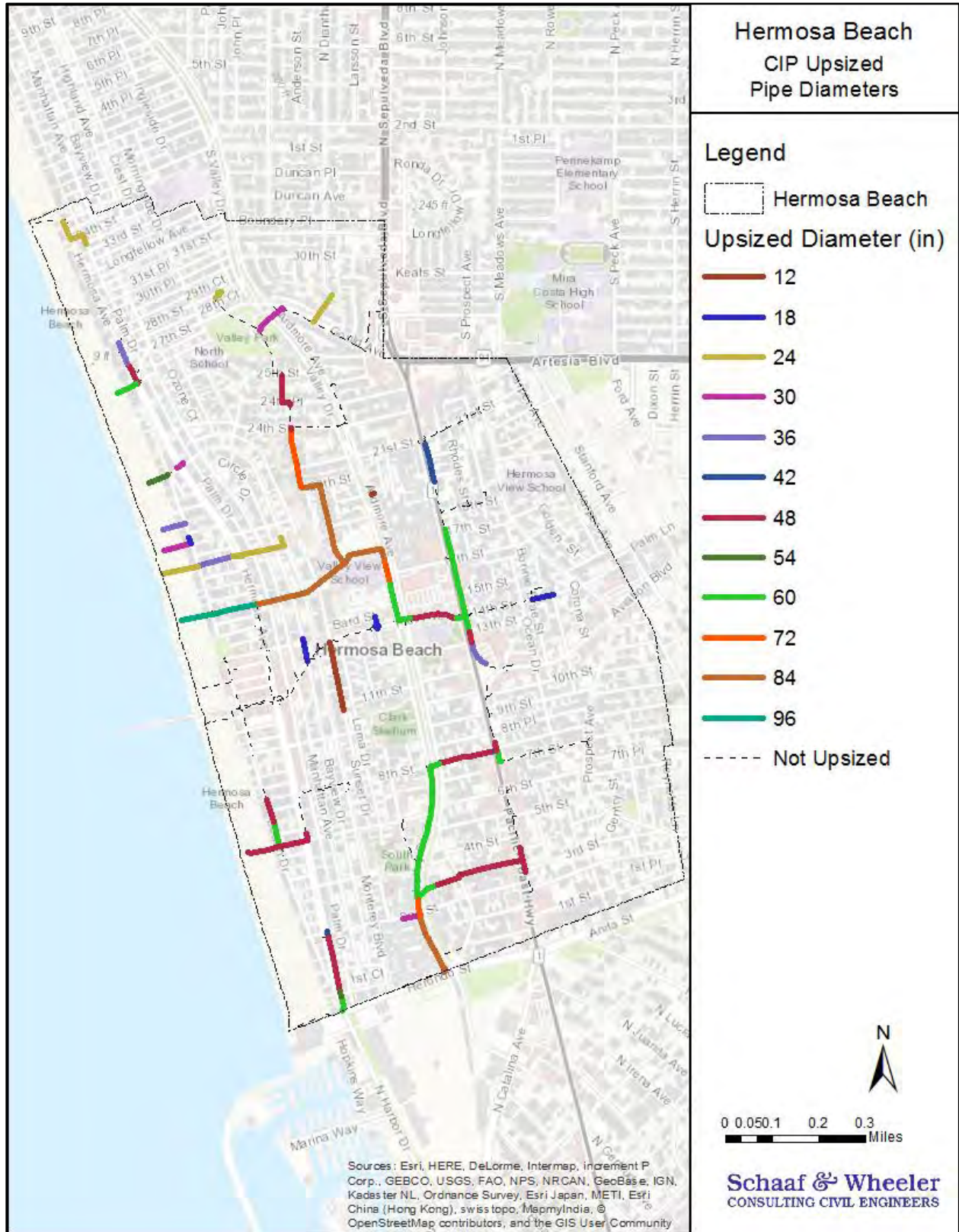


Figure 4.6: Hermosa Beach Upsized Diameter Distribution



## System Maintenance

To be able to accurately gauge the existing conditions and assess any serious problems in the system, Schaaf & Wheeler recommends cleaning and CCTV video coverage of entire the storm drain network. Due to budgetary constraints, this undertaking would likely be completed over the course of several years. A breakdown of the costs associated with obtaining video, assessing problem areas, and providing engineering recommendations for the entire network over a period of six to seven years is shown below in Table 4.7.

**Table 4.7: Annual Cleaning and CCTV Coverage Cost**

Action	Cost
Video Recording (5,000 ft)	\$5,000
Cleaning (Including Outfalls)	\$15,000
Detailed Condition Assessment	\$5,000
Technical Assessment/Recommendations	\$5,000
<b>Total</b>	<b>\$30,000</b>

The total number of feet cleaned and recorded per year is expected to be between 3,000 and 5,000. It is possible for the number of feet to be higher or lower due to the varying accessibility of individual pipe segments. The identified high and medium priority improvement systems should be televised the first few years inspection is funded. Coordinating the CCTV schedule with the City's pavement management program is highly recommended; this approach will minimize the potential for cutting into newly replaced roadways.

## Funding and County Coordination

The City does not currently have a dedicated funding source to address all the storm drain CIPs and the regulatory stormwater requirements. There are many approaches to funding these projects and the City should work with a financial advisor to determine the best approach. This report should serve as the engineering basis for any future fee.

The City should also coordinate with Los Angeles County on repairing and upgrading the portions of the system owned by the County outlined in this report. There may be cost sharing opportunities that can reduce the burden on the City. Sharing this document with the County would be an ideal starting point in this dialog.

# Chapter 5 – Climate Change

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## Introduction

Schaaf & Wheeler analyzed the impact of projected climate change on the Hermosa Beach storm drain system assuming the existing system was upgraded to reflect all the CIP projects presented in Chapter 4. Using current climate change research and understanding, this analysis considered both projected sea level rise (SLR) and increased storm intensity to determine the impact on the improved storm drain system. Our analysis analyzes storm drain system performance for the 10-year design storm with SLR and increased precipitation intensity. This chapter discusses the methods used to model climate change, the impact on system performance, and additional CIP projects to alleviate the effects of climate change.

## Climate Data

Rainfall patterns and tidal boundaries were modeled to reflect conditions in the year 2100. Future precipitation conditions were determined using projected extreme values for storm intensity as described in the Assessment of Climate Change in the Southwest United States.<sup>2</sup> Due to projected climate warming, more extreme precipitation events are expected to occur in the region, leading to a 13 to 14 percent increase in the intensity of precipitation events by 2100. While this percentage is for a 1-day rainfall duration, it was applied across the design storm evenly.

For the purpose of this analysis, only stillwater elevations were considered in SLR projections. Wave runup was determined to not significantly impact storm drain capacity and therefore was not modeled in this analysis. SLR projections were based on the Coastal Storm Modeling System for Southern California (CoSMoS 3.0). CoSMoS 3.0 provides coastal flooding predictions in the Southern California region. Based on CoSMoS 3.0 projections, stillwater elevations are expected to rise approximately 3.28 feet in the Hermosa Beach area by 2100. As outlined in *Rising Seas in California*, April 2017<sup>3</sup>, sea level at the La Jolla tide gauge station near Hermosa Beach is likely to rise between 1.8 and 3.6 feet above the 1991-2009 mean sea level by 2100 based on the RCP 8.5 emission trajectory. The CoSMoS 3.0 projection falls within this range. To model future conditions in Hermosa Beach, 3.28 feet was added to the model tidal boundaries.

## Model Methodology

The procedures described in the Chapter 2 of this study were adapted to account for climate change. The modified design storm as described in the “Modified Methodology” section was used to create a 10-year design storm. Precipitation intensity obtained from this method was increased by 14 percent to model projected future conditions, as specified in the Assessment of Climate Change in the Southwest United States.<sup>2</sup>

All outlets in the system are tidally influenced and are modeled using a 100-year tidal curve developed from existing NOAA gauge statistics for the Santa Monica tide station. The modeled diurnal tidal cycle was developed such that the low-high tidal peak occurs coincident to the rainfall peak. In order to account for SLR, 3.28 feet was added to the tidal curve. Projected SLR was applied in conjunction with increased precipitation intensity to model 2100 conditions on the Hermosa Beach storm drain system.

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<sup>2</sup> *Assessment of Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment*. Southwest Climate Alliance. 2013.

<sup>3</sup> *Rising Sea Levels in California: An Update on Sea-Level Rise Science*. California Ocean Science Trust. April 2017.





This analysis applies climate change scenarios to the storm drain system assuming all CIP projects discussed in Chapter 4 of this report were implemented within the City. Climate change CIP projects discussed herein are in addition to those discussed in Chapter 4.

## Climate Change Impacts

Portions of Hermosa Beach are susceptible to SLR due to their close proximity to the ocean and generally low ground elevations. Sea level rise results in two distinct problems for low lying areas: potential overland inundation resulting directly from higher ocean levels, and a decrease in storm drain capacity from higher tides at outfalls. Although elevations throughout the City vary, much of beach area at the western edge of the City is lower than the projected high tides when considering 3.28 feet of SLR. 58 percent of existing storm drain outfalls have invert elevations lower than projected high tide levels. The low-lying areas along the City's western edge are susceptible to flooding through direct overland flow during high tides. Increased water levels at the outfalls will contribute to interior flooding during storm events. Figure 5.1 shows the projected water depth within the City given 3.28 feet of SLR.

Increased precipitation intensity due to climate change will contribute to higher peak runoff throughout the City. Existing CIP storm drain capacity may not be able to accommodate higher levels of discharge entering the system. Increased runoff has the potential to inundate the storm drain system and contribute to flooding.

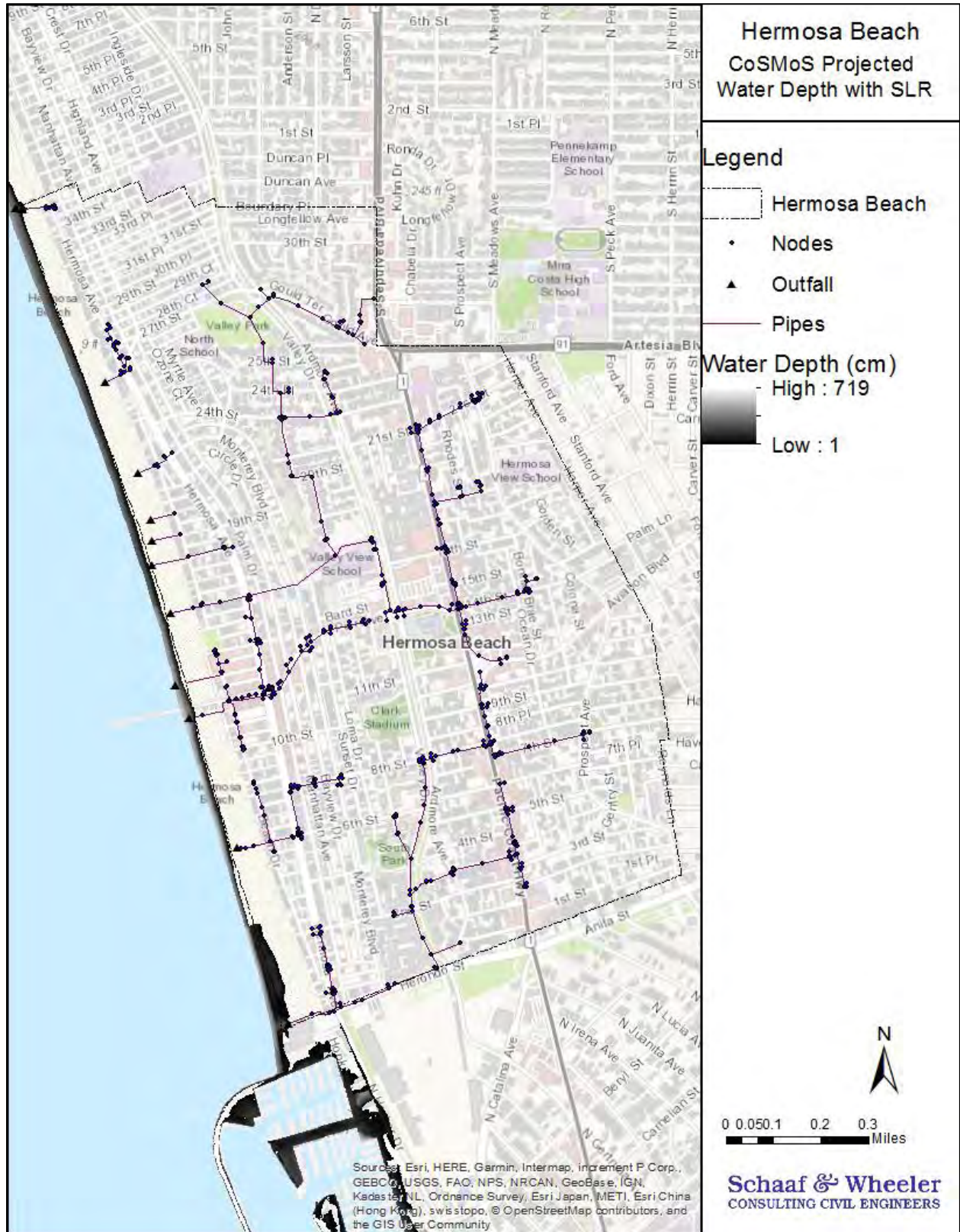


Figure 5.1: CoSMoS Projected Water Depth with 3.28 feet of SLR



## Results

In many locations throughout the City the existing CIP storm drain system cannot accommodate the climate change scenario flows caused by the projected 10-year storm event and increased tide levels. Figure 5.2 shows node flooding throughout the existing CIP system due to the climate change scenario.

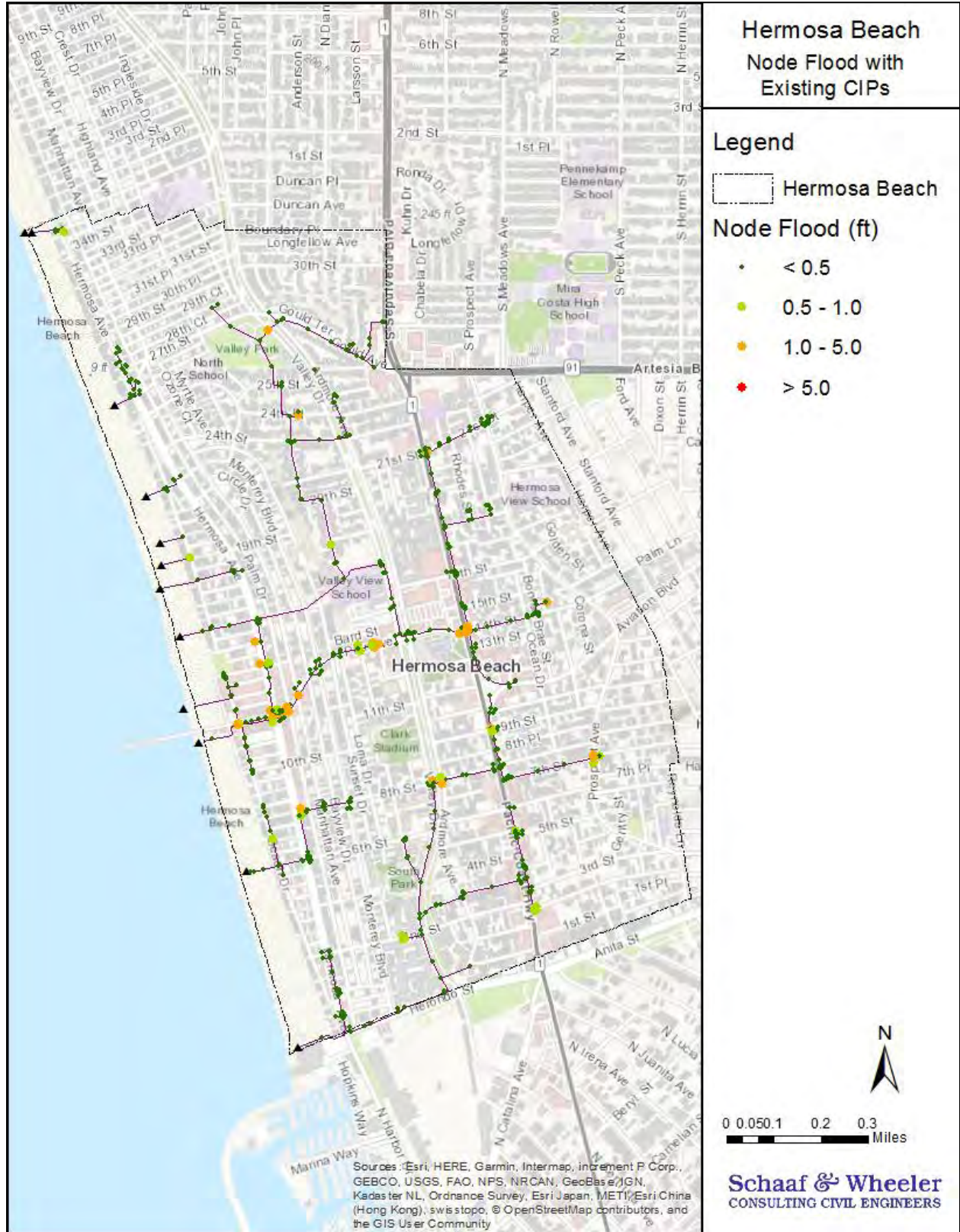


Figure 5.2: Storm Drain Conditions During a 10-year Return Period Event with Climate Change Scenarios Applied to the Upsized System



## Climate Change Improvement Projects

To address flooding due to projected climate change, additional CIP projects were identified. Identified CIP projects include the upsizing of pipes and the installation of flap gates on laterals. Figure 5.3 shows the identified project locations and Figure 5.4 details the changes made to the system at each location. Some improvement locations to address climate change overlap with those discussed in Chapter 4. The City may implement climate change CIP projects rather than making existing changes as they see fit.

The methods used to analyze project costs discussed in Chapter 4 were applied to the additional climate change CIP projects. Table 5.1 and Table 5.2 detail the cost associated with upsizing pipes and installing flap gates, respectively. All climate change CIP projects are considered low priority in this analysis.

Table 5.1 shows pipes which are upsized in both sets of CIP projects. Flooding throughout the City is significantly decreased as a result of these projects. Figure 5.5 shows node flooding throughout the City with the climate change CIP projects.

**Table 5.1: Climate Change CIP Pipe Upsizing Costs**

Number	Pipe Improvements	Priority	Pipe Length (ft)	Pipe Diameter (in)	Manholes	Cost
CC Upsized - 1	CC 14th Street	Low	523	30	4	\$ 360,000
CC Upsized - 2	CC 22nd St. and Valley Dr.	Low	442	36-84	5	\$ 570,000
CC Upsized - 3	CC 2nd St. and PCH	Low	249	24-36	3	\$ 210,000
CC Upsized - 4	CC 35th Street	Low	19	24	1	\$ 30,000
CC Upsized - 5	CC 6th Street	Low	594	48	2	\$ 490,000
CC Upsized - 6	CC 7th Street	Low	329	30	1	\$ 200,000
CC Upsized - 7	CC 8th Street and PCH	Low	329	36-60	1	\$ 200,000
CC Upsized - 8	CC Pier Ave	Low	2407	30-72	6	\$1,880,000
CC Upsized - 9	CC Pier Ave. and Valley Dr.	Low	538	60	2	\$ 490,000
CC Upsized - 10	CC Valley Drive	Low	867	60-72	3	\$ 870,000
CC Upsized - 11	CC Valley Park Ave	Low	698	36-84	5	\$ 710,000
<b>Total</b>						<b>\$6,170,000</b>



**Table 5.2: Climate Change CIP Flap Gate Installation Costs**

Number	Pipe Improvements	Priority	Pipe Diameter (in)	Flap Gates	Cost
CC Flap Gate - 1	24th Place	Low	18	1	\$ 4,900
CC Flap Gate - 2	PCH and 5th St.	Low	18	1	\$ 4,900
CC Flap Gate - 3	Valley Drive and 2nd St.	Low	72	1	\$ 27,300
CC Flap Gate - 4	Valley Drive and 8th St.	Low	18	5	\$ 24,400
<b>Total</b>					<b>\$ 61,000</b>

**Table 5.3: Pipes Present in both Existing System CIP and Climate Change CIP Projects**

Pipe ID	Length (ft)	Existing Diameter (in)	Project Number	Upsized Diameter (in)	CC Project Number	CC Upsized Diameter (in)
County_Pipe305	50	24	UPSIZED - 13	42	CC UPSIZED - 7	60
County_Lat267	202	24	UPSIZED - 13	30	CC UPSIZED - 2	72
County_Pipe194	177	33	UPSIZED - 9	48	CC UPSIZED - 9	60
County_Pipe196	321	48	UPSIZED - 9	60	CC UPSIZED - 10	72
County_Pipe199	460	51	UPSIZED - 9	84	CC UPSIZED - 10	96
County_Pipe22	208	39	UPSIZED - 9	48	CC UPSIZED - 9	60
County_Pipe301	198	24	UPSIZED - 13	48	CC UPSIZED - 7	60
County_Pipe36	131	39	UPSIZED - 9	48	CC UPSIZED - 9	60
County_Pipe68	124	51	UPSIZED - 13	72	CC UPSIZED - 2	84
County_Pipe96	392	54	Upsized 6	60	CC UPSIZED - 8	72
County_Pipe97	383	48	Upsized 6	60	CC UPSIZED - 8	72
MU_137	22	33	UPSIZED - 9	48	CC UPSIZED - 9	60
MU_138	86	48	UPSIZED - 9	60	CC UPSIZED - 10	72
MU_148	86	60	UPSIZED - 12	72	CC UPSIZED - 11	84
MU_149	151	60	UPSIZED - 12	72	CC UPSIZED - 11	84
MU_6	149	24	UPSIZED - 12	30	CC UPSIZED - 11	36
MU_76	53	51	UPSIZED - 13	72	CC UPSIZED - 2	84

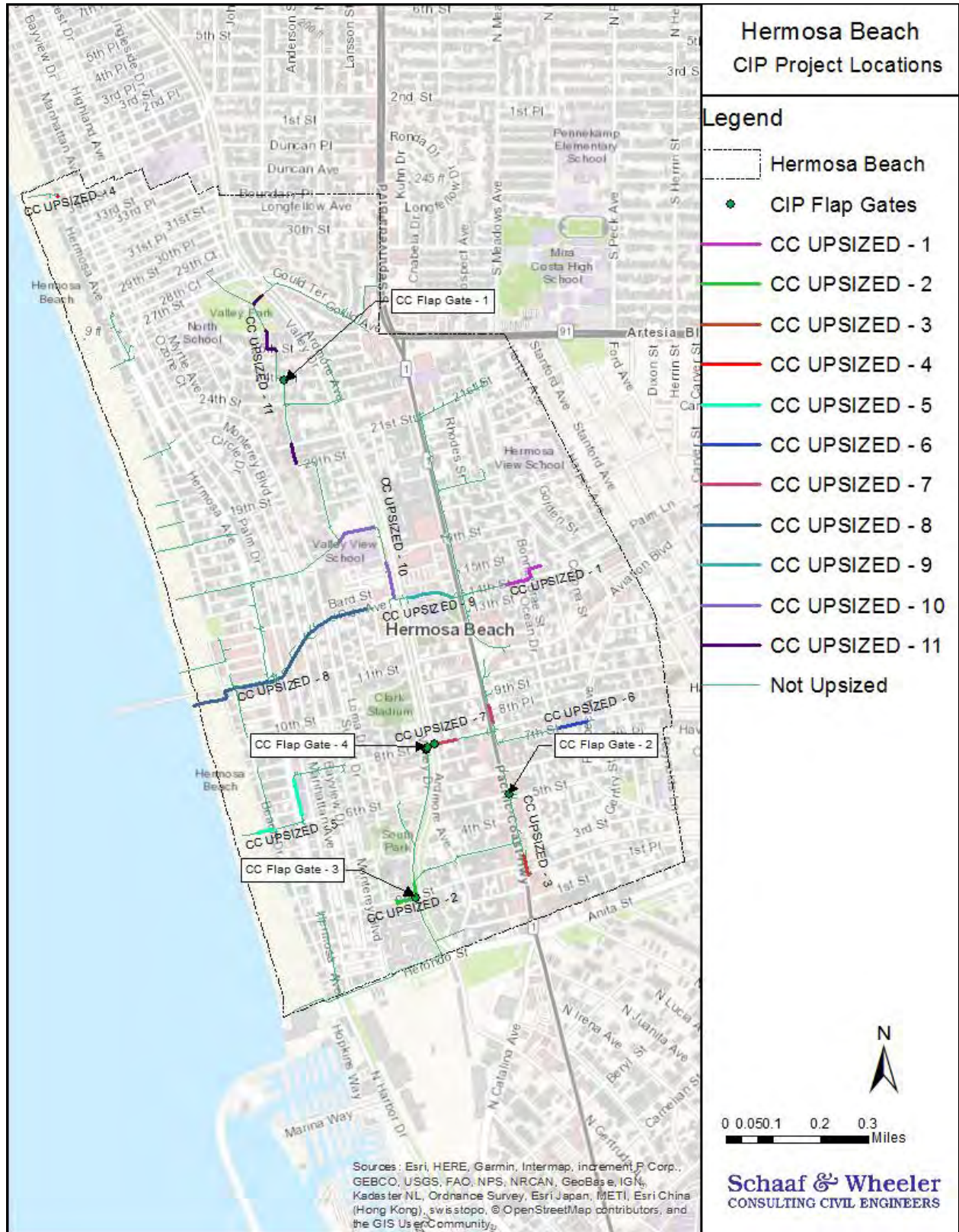


Figure 5.3: Climate Change CIP Locations

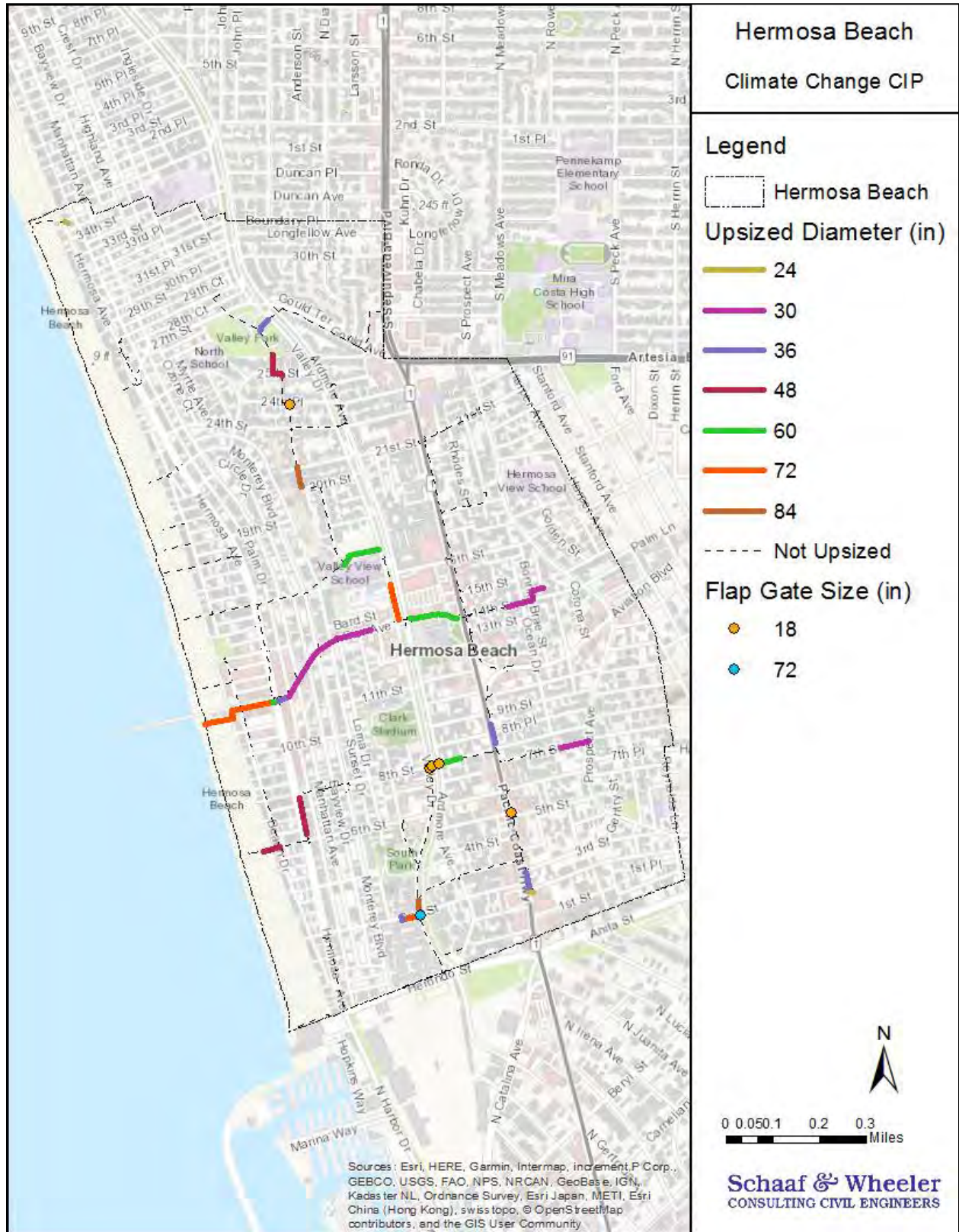


Figure 5.4: Climate Change CIP Details



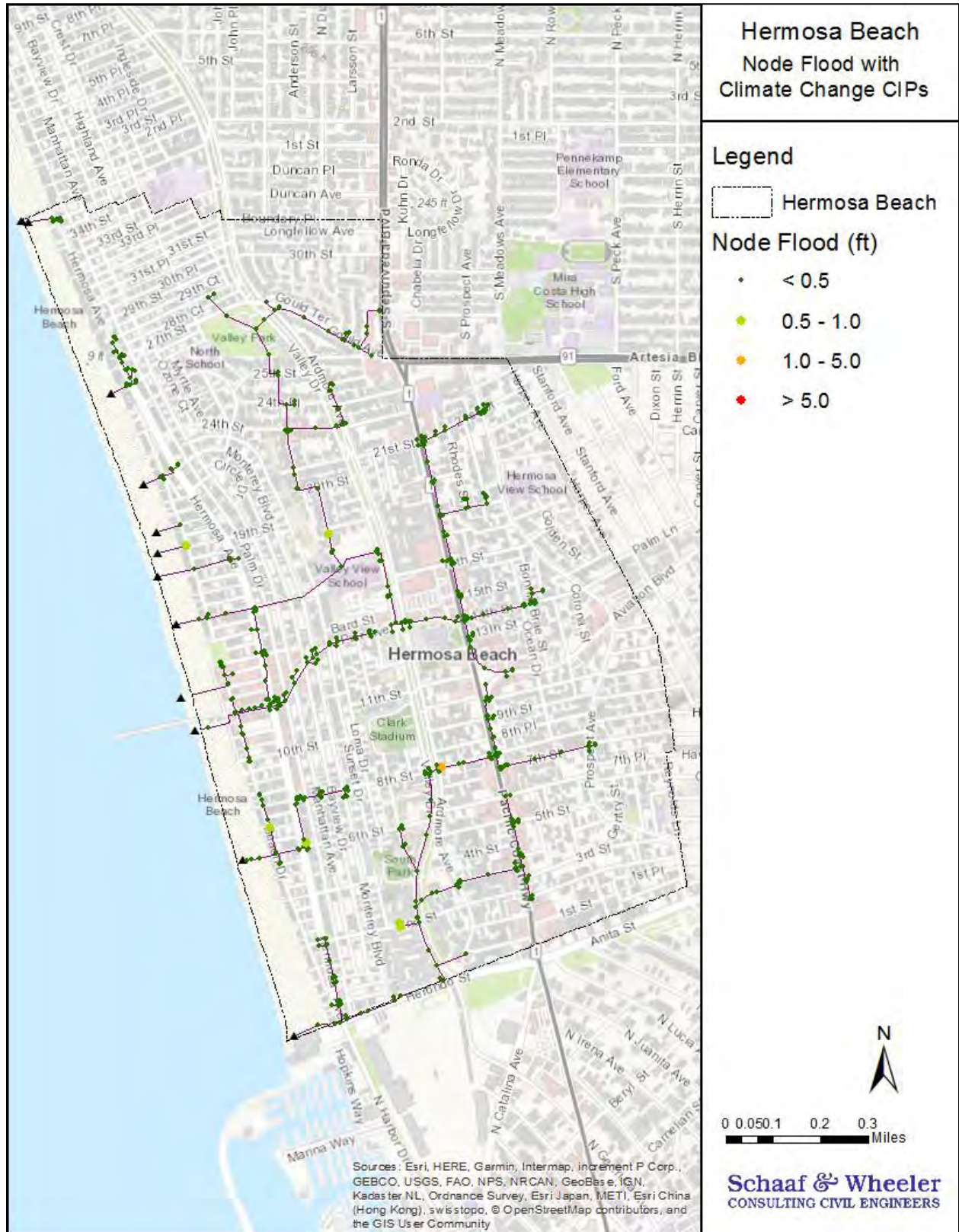


Figure 5.5: Node Flooding with Climate Change CIP Projects Implemented



## Conclusion

The City of Hermosa Beach will be impacted as the climate continues to change. Even with the CIP projects discussed in Chapter 4 implemented, the storm drain system does not have capacity to accommodate the runoff resulting from a higher intensity 10-year storm. Projected SLR may potentially inundate system outfalls, further restricting system capacity. Increased precipitation intensity, combined with projected SLR, may contribute increased levels of flooding throughout the City. Climate change CIP projects are necessary to mitigate flooding associated with SLR and increased precipitation intensity.

It is recommended that the effects of climate change be thoroughly considered before future development to minimize damages and flooding. Adherence to SLR standards set forth in CoSMoS 3.0 as well as Rising Seas in California, April 2017<sup>3</sup> is recommended prepare for projected SLR. Planning for projected increased precipitation intensity is also recommended to minimize flooding due to lack of system capacity.

Appendix C shows preliminary FEMA base flood elevations (BFE) as of October 28, 2016. The BFE in Hermosa Beach ranges from 18 feet at the southern end of the City, to 20 feet at the northern end of the City. This analysis includes risk associated with wave runup, rather than stillwater alone. As shown in Appendix C, flooding is assumed to terminate at the sea wall located along The Strand. With 3.28 feet of projected SLR, the BFE in the City will rise to approximately 21-23 feet including wave runup. Any shoreline improvements should consider this to maintain flood protection.

# Chapter 6 - Regulation and Permitting

## Applicability of Trash Capture, Green Infrastructure and Regional Multi-Benefit Projects to SDMP CIP

### Trash Capture

The City is subject to the Santa Monica Bay Nearshore and Offshore Debris TMDL. The City is currently in the process of meeting this TMDL requirement through the installation of connector pipe screen and automatic retractable screen devices on all City inlets. It may be possible to reduce the maintenance required for treatment by installing large scale trash capture devices on some of the City trunk lines in lieu of inlet level devices. Each highest and high priority CIP project has been analyzed for the potential to incorporate large scale trash capture devices (ex. Contech CDS) as summarized in the matrix by a rating of low, moderate, and high. Project costs have been included which are based on a cost of \$2,500 per acre treated. This assumes construction occurs as part of the larger CIP project and includes design and 30% contingency.

**Table 6.1: CIP Trash Capture Applicability Matrix**

CIP Project Number	CIP Project Name	Full Trash Capture Opportunity Rating	Number of Inlets	Ownership	Cost
Project 1	18th Street Outfall	Moderate	7	City	\$40,000
Project 2	19th Street Outfall	Low	2	City	\$20,000
Project 3	20th Street Outfall	Low	1	City	\$30,000
Project 4	16th Street	High	92*	County	\$760,000
Project 5	Valley Drive at Herondo Ave.	High	55	County	\$520,000
Project 6	22nd Street Outfall	Low	4	City	\$80,000
Project 7	Hermosa Ave. and Gould Ave.	Moderate	12	County	\$80,000
Project 8	Valley Park Ave.	High	28	County	\$320,000

\*Includes inlets in project number 8

In addition to incorporating full trash capture into the CIP projects, 5 locations were identified within the City's drainage system as optimal locations to install devices. Consideration was given to; drainage area, system depth, right-of-way ownership, maintenance access, hydraulics and upstream flooding and constructability. Note that Locations 2, 4 and 5 are subsets of Locations 1 and 3 and are alternatives if 1 or 3 are deemed infeasible. If the City elects to install large scale trash capture at any of the potential locations, storm drainage system hydraulics should be reviewed in detail to ensure that the device impacts are mitigated with the design, so that upstream flooding is not exacerbated. The 5 recommended devices are identified in the Figure below. The following Table accompanies the Figure to identify the drainage area to the device, system depth and size, and presence of upstream flooding. The number of inlets within the drainage area has also been provided to identify how many could be replaced by the installation of the large unit. Unless other projects are planned within the other drainage areas, small scale inlet screens are recommended treat the remainder of the City not within the limits of the drainage areas depicted in Figure 6.1.



Project costs are based on an average cost of \$3,000 per acre. This includes design, construction as a stand-alone project and 30% contingency. Costs are based on full trash capture devices installed below grade within public right of way. These costs do not include easement or property acquisition or environmental permitting.

**Table 6.2: Large Scale Trash Capture Opportunities**

Trash Location Number	Location Name	Drainage Area (ac)	Depth to Invert (ft)	Ex. Pipe Size (in)	Upstream Flooding	Number of Inlets	Cost
1	Hermosa Valley School	291*	19	72	Yes	88*	\$870,000
2	Valley Park	58	13	36	No	12	\$170,000
3	Valley Dr Green Belt at Herondo	206**	15	63	Yes	55**	\$620,000
4	Valley Dr Green Belt at 3 <sup>rd</sup> Street	65	11	27	Yes	22	\$200,000
5	Valley Dr Green Belt at 8 <sup>th</sup> Street	63	6	36	Yes	21	\$190,000

\*Includes Location 2

\*\*Includes Locations 4 and 5





## Green Infrastructure

The Los Angeles Region Water Quality Control Board NPDES Municipal Separate Storm Sewer (MS4) Permit (Order No. R4-2012-0175 as amended by WQ 2015-0075) allows for the development of a Watershed Management Programs to comply with the Receiving Water limitations and Total Maximum Daily Load Provisions. Hermosa Beach is part of the Beach Cities Watershed Management Group's Enhanced Watershed Management Plan (EWMP, February 2016) which has several requirements pertaining to Green Infrastructure Planning and Implementation, and incorporation of these principles into storm drain infrastructure design. It is the intent of this Master Plan to identify opportunities to integrate LID and green infrastructure components into the City's CIP projects and to guide future development. The extension of storm drainage infrastructure into underserved areas, as detailed by the Observed Flooding CIP, would serve as potentially great locations to implement green infrastructure practices.

The EWMP identifies 3 existing and 3 proposed structural BMPs within Hermosa Beach. One of the proposed BMPs is a regional project and described further in the Integrated and Multi-Benefit Project Opportunities section below. Existing City projects identified in the EWMP include the Pier Avenue Improvement Project, Hermosa Strand Infiltration Trench and Hermosa Avenue Green Street Project – North. Proposed City BMP projects include the Hermosa Beach Infiltration Trench and Hermosa Avenue Green Street Project – South. These proposed projects have a construction timeline within the 20-year planning horizon of the SDMP future condition.

## Integrated and Multi-Benefit Project Opportunities

Hermosa Beach accepts runoff from the Cities of Manhattan Beach and Redondo Beach and shares use of the County's Herondo storm drain trunk line with Redondo Beach and the City of Torrance. A joint benefit project has been identified in the EWMP and funded to construct an infiltration trench within the Hermosa Beach Greenbelt of Herondo Street. A moderate level project has been identified in the CIP as Project 5 which passes through the designated location of the infiltration project. This is a potential opportunity for the City to improve their drainage system at the same time as the infiltration project is designed and constructed. During design the required pipe sizes for CIP project 5 should be reviewed in conjunction with the infiltration design to discern if any efficiency can be made. This location was also identified for a full trash capture device. A trash capture device could be included as pretreatment of flows coming from the Hermosa Beach storm drain line before infiltration and could also accomplish full trash capture if sized to the 1-year, 1-hour event.

In addition to projects identified in the EWMP, the City has identified a potential for retrofitting a portion of Beach Drive near the intersection with Hermosa Avenue into a Green Street. The Beach Drive green street project is located on the south end of the City and could capture the Hermosa Avenue storm drain line for infiltration. This Hermosa Avenue storm pipe is the only portion of the City of Hermosa Beach draining to the Herondo storm drain which will not be captured by the multi-jurisdictional Hermosa Beach Greenbelt Infiltration project. The CIP identifies a low priority capacity project on Hermosa Avenue which could potentially be partially alleviated through infiltration on Beach Drive. This green street project would be multi-benefit as it would provide beautification, stormwater runoff control and treatment.

The City is pursuing the reconstruction of additional sections of Beach Drive as a Green Alley to use infiltration to treat nuisance flows and small storms. Reaches of Beach Drive have been identified and prioritized to serve as pilot projects based on historical flooding data provided by the City, the SDMP flooding results and site reconnaissance. The results of this prioritization is presented in the following Figure and Table. Note that there were no observed flooding locations identified on Beach Drive south of



Pier Avenue and therefore those locations are of lower priority. Additionally, road conditions were observed to be generally worse north of Pier Avenue.

**Table 6.3: Beach Drive Green Alley Prioritized Pilot Projects**

Priority	Reach Location	Observed Flooding	SDMP Flooding	Notes
1	15 <sup>th</sup> Street to 22 <sup>nd</sup> Street	Yes	Yes	Worse Road Conditions
2	2 <sup>nd</sup> to Hermosa Avenue	No	No	Infiltrate Hermosa Avenue Flows
3	Pier Avenue to 14 <sup>th</sup> Street	No	No	High foot traffic, worse road conditions
4	10 <sup>th</sup> Street to Pier Avenue	No	No	High foot traffic, worse road conditions
5	2 <sup>nd</sup> Street to 10 <sup>th</sup> Street	No	No	Good road condition

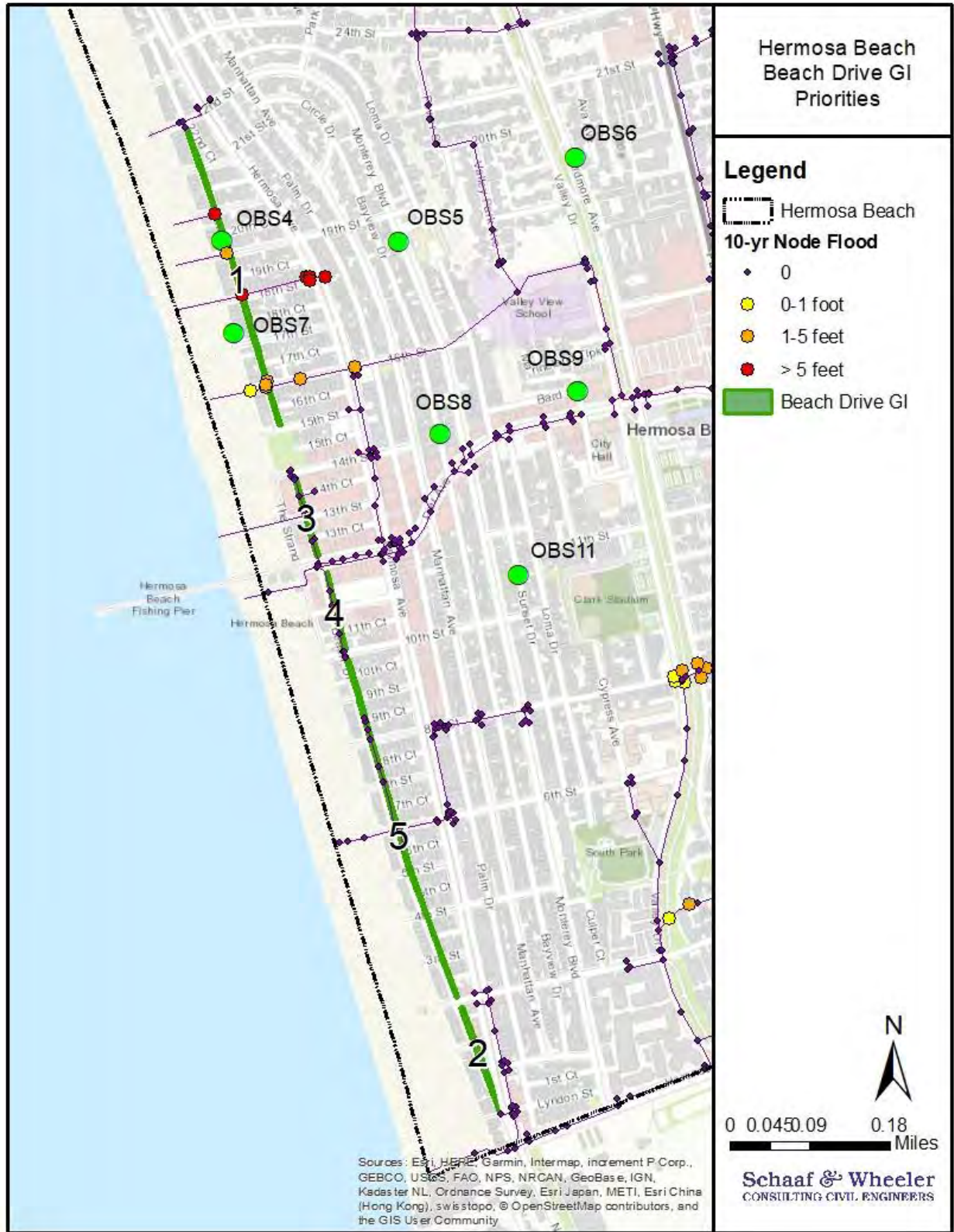


Figure 6.2: Beach Drive Green Alley Pilot Project Map





The observed flooding locations within the City identified in previously as low priority CIP projects were reviewed for the potential to install Green Infrastructure instead of extending or improving the piped storm drainage system. The model result CIP were also reviewed for similar opportunity. The results of this prioritization is presented in the following Tables.

Project 10 and 11 (not highest or high priority) pass through the Hermosa Beach Greenbelt and there is a potential to install infiltration within the Greenbelt to reduce the need to upsize pipes for projects 4, 10 and 11. This would be a multi-benefit project opportunity providing flood mitigation and improving water quality.

**Table 6.4: Observed Flooding Green Infrastructure Opportunities**

CIP Number	Location	Green Infrastructure Feasibility	Recommendation
OBS1	3316 Hermosa Avenue	High	Infiltrating Green Street or Pervious Paving
OBS2	437 28 <sup>th</sup> Street	Medium	Infiltration Trench
OBS3	Tennyson Place	Low	High slopes, connect to system
OBS4	The Strand at 19 <sup>th</sup> Street	High	Infiltrating Green Street or Pervious Paving
OBS5	1823 Monterey Boulevard	Medium	High slopes, Infiltration Trench
OBS6	1910 Ardmore Street	Low	High slopes, connect to system
OBS7	1712 The Strand	High	Infiltration Trench or Pervious Paving
OBS8	1426 Bayview Drive	Medium	High slopes, connect to nearby System
OBS9	Marineland Community	Low	High slopes, connect to nearby System
OBS9	Pier Avenue and Bard Street	High	Infiltrating Green Street or Pervious Paving
OBS10	1045 14 <sup>th</sup> Street	High	Infiltration Trench or Pervious Paving
OBS11	1049 Sunset	High	Infiltrating Green Street or Pervious Paving

**Table 6.5: Model CIP Green Infrastructure Opportunities**

CIP Number	Location	Green Infrastructure Feasibility	BMP Type
1	18th Street Outfall	Medium	Infiltration Trench in 18 <sup>th</sup> Street
2	19th Street Outfall	Medium	Infiltration Trench in 19 <sup>th</sup> Street
3	20th Street Outfall	Medium	Infiltration Trench in 20 <sup>th</sup> Street
4	16th Street	High	Infiltration in Green Belt
5	Valley Drive at Herondo Avenue	High	Infiltration in Green Belt
5	8 <sup>th</sup> Street and Valley Drive	High	Infiltration in Green Belt
6	22nd Street Outfall	Medium	Infiltration Trench in 22 <sup>nd</sup> Street
7	Hermosa Ave. and Gould Avenue	Medium	Infiltration in Hermosa Avenue Median
8	Valley Park Avenue	Low	Infiltration at Hermosa Valley School



## Regulatory Permitting as Applies to the CIP Projects

Below is a summary of the regulatory considerations for each of the highest and high priority CIP projects developed within this Master Plan. With respect to regulatory and resource agency permit requirements, the following is summarized: the expected permits needed for each CIP project, including identification of the local, state, and federal agencies which are expected to exercise jurisdiction over particular project elements, and an estimate of the permitting costs and timelines. Technical studies needed to support the acquisition of regulatory agency permits and approvals, as specific to each project are also identified. Any opportunities to reduce/minimize/streamline regulatory permitting and challenges are incorporated. Where applicable, a recommendation of programmatic permitting opportunities that may exist for the CIPs proposed within the SDMP, or a subset of CIPs, has been included.



Table 6.6: Summary of Permitting and Regulation Requirements

Hermosa Beach SDMP Permitting Matrix																
Project Number	Project Name	Agencies	CA Coastal Commission	Army Corps of Engineers	CA Dept of Fish and Wildlife	US Fish and Wildlife	National Marine Fisheries Service	CEQA Compliance	SWRCB	County of Los Angeles	Approximate Permitting Costs	Timeline (years)	Technical Studies Needed	EIR	Additional Technical Studies	Opportunities to Reduce Permitting and Perform Programmatic Permitting
1	18th Street Outfall		✓	✓	✓	✓	✓	✓	✓		\$ 200,000.00	1.5 - 2		✓		<ul style="list-style-type: none"> <li>Potential to permit with another outfall project: 2, 3, 4, 6, and/or 7</li> <li>Potential to include OSB5 and OSB7</li> </ul>
2	19th Street Outfall		✓	✓	✓	✓	✓	✓	✓		\$ 200,000.00	1.5 - 2		✓		<ul style="list-style-type: none"> <li>Potential to permit with another outfall project: 1, 3, 4, 6, and/or 7</li> <li>Potential to include OSB4</li> </ul>
3	20th Street Outfall		✓	✓	✓	✓	✓	✓	✓		\$ 200,000.00	1.5 - 2		✓		<ul style="list-style-type: none"> <li>Potential to permit with another outfall project: 1, 2, 4, 6, and/or 7</li> </ul>
4	16th Street		✓	✓	✓	✓	✓	✓	✓	✓	\$ 200,000.00	1.5 - 2		✓		<ul style="list-style-type: none"> <li>Potential to permit with another outfall project: 1, 2, 3, 6, and/or 7</li> <li>Potential to construct with projects OSB8, OSB9, and/or OSB10</li> <li>Potential to construct with projects 8 and/or 10 and 11</li> </ul>
5	Valley Drive at Herondo Ave.*							✓		✓	\$ 80,000 if CEQA is required	1			<ul style="list-style-type: none"> <li>Hydraulic impact to Herondo Drain</li> <li>CEQA for increased flows to Herondo Drain</li> </ul>	<ul style="list-style-type: none"> <li>Coordinate with Regional Infiltration project in Greenbelt</li> </ul>
6	22nd Street Outfall		✓	✓	✓	✓	✓	✓	✓		\$ 200,000.00	1.5 - 2		✓		<ul style="list-style-type: none"> <li>Potential to permit with another outfall project: 1, 2, 3, 4, and/or 7</li> </ul>
7	Hermosa Ave. and Gould Ave.		✓	✓	✓	✓	✓	✓	✓	✓	\$ 200,000.00	1.5 - 2		✓		<ul style="list-style-type: none"> <li>Potential to permit with another outfall project: 1, 2, 3, 4, and/or 6</li> </ul>
8	Valley Park Ave.									✓	-	-				<ul style="list-style-type: none"> <li>Potential to construct with project 4</li> </ul>

\* Potential for permit requirements if flows to the beach are increased. No permits required are assumed herein. This assumption should be validated during conceptual design.



## City Policy and Guidance Manual Review and Recommendations

Stormwater management intersects with multiple aspects of the City's planning policy and design guidance. These City policies and guidance are in turn influenced by the City's need to address regional and national policies and regulations. Schaaf & Wheeler completed a review of the City policy and guidance, as regards regional and national policies and regulations. Integration across planning policy and design guidance is particularly important as the City seeks a framework to manage the uncertainty stemming from climate change. By coordinating with other policies and guidance, the City can preserve future management flexibility in the face of this uncertainty.

Regional and National Policies Considered:

- Climate Action Plans
  - Draft PLAN Hermosa (March 2017)
  - Hermosa Beach Sustainability Plan (September 2011)
- Beach Cities EWMP
- Los Angeles Region Water Quality Control Board NPDES MS4 Permit

The following City policies and guidance were reviewed and recommendations made:

- Municipal Code Section 8.44 Stormwater and Urban Runoff Pollution Control Regulations
- The City may consider requiring disconnecting of downspouts for all new or redevelopment to create less directly connected impervious surface.
- The City may consider including a requirement for trash capture on private property storm drainage systems.
- Infiltration LID is required for 5000 sf new/replaced impervious surface, but doesn't regulate increases in flow. The City may consider including new and redevelopment sites to perform Hydromodification. This could include a section for SFH and other development creating or replacing 2500 sf of impervious surface to not increase impervious surface from existing or to match peak flows from a 2-year to 10-year event.
- Municipal Code Section 8.60 Efficient Landscaping
  - The ordinance could be revised to provide flat ponding area in landscaping for disconnected rainwater leaders to allow for additional infiltration.
- Municipal Code Section 17.38 Specific Plan Areas
  - None of the specific plan areas have any additional stormwater requirements besides 11 (below). All refer to 8.44.
  - The City may decide to include requirements for a reduction in impervious surface, disconnection of impervious surfaces and/or detention within the Specific Area Plans.
  - The City may include private property trash capture for all private storm drain systems.
  - There is no reference to City storm drainage standards or to detention requirements.



- 17.38.550 Specific Plan Area 11 Development Standards
- The plan reduces infiltration LID requirement from 5000 sf to 500 sf of new or replaced impervious surface.

The City developed a Sustainability Plan in 2011 related to greenhouse gas emission reductions; however, this plan does not address design for climate change impacts, namely sea level rise and increased storm intensity.

The City has drafted PLAN Hermosa, an integrated General Plan and Local Coastal Program that will replace the current outdated General Plan of 1980. Chapter 6 on Public Safety discusses Sea Level Rise and Climate Change as well as City policies to mitigate the impacts. Policies of note as they relate to the storm drainage system are to encourage additional green infrastructure requirements<sup>4</sup>, maintain the beach as a buffer to sea level rise impacts, and require development in the Coastal Area to design for sea level rise. The PLAN also encourages property owners in the Coastal Zone to prepare and protect against flooding and increased risk.

Additional policies that the City may consider implementing but are not explicitly discussed in PLAN Hermosa include: storm drainage system size increases to accommodate higher backwater and larger storm peaks, limiting development in areas prone to flooding from sea level rise, requiring retrofit of existing development and streets for green infrastructure and/or requiring retrofit of existing structures in the coastal zone to protect against flooding.

## Review and Recommendations for Drainage Design Standards

A review of the City's and County's current drainage design standards and criteria was completed. Recommended revisions (redlines) to these standards to meet existing and future needs were provided and summarized herein. The proposed revisions will make the City standards consistent with methods applied in this master planning effort and flood control measures of Los Angeles County, which operates important flood control facilities within Hermosa Beach. The recommendations to the drainage standards include:

- Modify the design storm for calculating runoff,
- Outfall design standards,
- A standard policy for development in the tidal zone,
- NPDES requirements.

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<sup>4</sup> *The Value of Green Infrastructure for Urban Climate Adaptation*, The Center for Clean Air Policy, February 2011

# Appendices

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**Appendix A**  
**CIP Cost Estimate**

**HERMOSA BEACH CAPACITY CIP  
DETAILED COST ESTIMATES**

Ownership	CIP ID	CIPName	MUID	Priority	Length (ft)	Diam (in)	Pipe Unit Cost	Pipe Cost	MH or HWS	MH Cost	Outfalls	Total	Project Cost w/ 50% Contingency
County	PROJECT - 4	16th Street	County_Pipe201	Highest	330.28	96	\$ 826	\$ 272,943	1	\$ 19,415		\$ 292,358	\$ 438,537
County	PROJECT - 4	16th Street	County_Pipe202	Highest	213.43	96	\$ 826	\$ 176,376	1	\$ 19,415		\$ 195,791	\$ 293,687
County	PROJECT - 4	16th Street	County_Pipe270	Highest	256.46	96	\$ 826	\$ 211,940	1	\$ 19,415	\$ 40,000	\$ 271,355	\$ 407,032
County	PROJECT - 4	16th Street	MU_147	Highest	91.20	96	\$ 826	\$ 75,366	1	\$ 19,415		\$ 94,781	\$ 142,171
					<b>1978</b>				<b>6</b>				<b>\$ 2,595,423</b>
City	PROJECT - 1	18th St. Outfall	City_Pipe60	Highest	94.91	24	\$ 312	\$ 29,630	1	\$ 11,524		\$ 41,154	\$ 61,731
City	PROJECT - 1	18th St. Outfall	MU_90	Highest	14.83	24	\$ 312	\$ 4,630	1	\$ 11,524		\$ 16,153	\$ 24,230
City	PROJECT - 1	18th St. Outfall	City_Pipe4	Highest	418.13	36	\$ 404	\$ 168,933	1	\$ 12,111	\$ 40,000	\$ 221,044	\$ 331,566
City	PROJECT - 1	18th St. Outfall	MU_13	Highest	400.51	36	\$ 404	\$ 161,813	1	\$ 12,111		\$ 173,924	\$ 260,886
					<b>928</b>				<b>5</b>				<b>\$ 678,413</b>
City	PROJECT - 2	19th St. Outfall	City_Pipe3	Highest	319.60	30	\$ 358	\$ 114,450	1	\$ 11,671	\$ 40,000	\$ 166,120	\$ 249,180
					<b>320</b>				<b>2</b>				<b>\$ 249,180</b>
City	PROJECT - 3	20th St. Outfall	City_Pipe2	Highest	262.35	36	\$ 404	\$ 105,992	1	\$ 12,111	\$ 40,000	\$ 158,103	\$ 237,155
					<b>262</b>				<b>2</b>				<b>\$ 237,155</b>
City	PROJECT - 6	22nd St. Outfall	City_Pipe102	High	84.45	30	\$ 358	\$ 30,240	1	\$ 11,671		\$ 41,911	\$ 62,866
City	PROJECT - 6	22nd St. Outfall	City_Pipe72	High	6.83	30	\$ 358	\$ 2,447	1	\$ 11,671		\$ 14,118	\$ 21,177
City	PROJECT - 6	22nd St. Outfall	City_Pipe1	High	206.06	54	\$ 551	\$ 113,526	1	\$ 13,641	\$ 40,000	\$ 167,167	\$ 250,751
City	PROJECT - 6	22nd St. Outfall	MU_95	High	27.89	54	\$ 551	\$ 15,368	1	\$ 13,641		\$ 29,009	\$ 43,514
					<b>325</b>				<b>5</b>				<b>\$ 378,308</b>
County	PROJECT - 9	6th Street	County_Pipe71	Med	17.03	48	\$ 505	\$ 8,599	1	\$ 12,606		\$ 21,205	\$ 31,807
County	PROJECT - 9	6th Street	County_Pipe75	Med	258.31	48	\$ 505	\$ 130,451	1	\$ 12,606		\$ 143,057	\$ 214,585
County	PROJECT - 9	6th Street	County_Pipe76	Med	183.01	48	\$ 505	\$ 92,425	1	\$ 12,606		\$ 105,031	\$ 157,546
County	PROJECT - 9	6th Street	County_Pipe77	Med	35.67	48	\$ 505	\$ 18,014	1	\$ 12,606	\$ 40,000	\$ 70,620	\$ 105,930
County	PROJECT - 9	6th Street	County_Pipe80	Med	43.59	48	\$ 505	\$ 22,015	1	\$ 12,606		\$ 34,620	\$ 51,931
County	PROJECT - 9	6th Street	County_Pipe84	Med	48.87	48	\$ 505	\$ 24,679	1	\$ 12,606		\$ 37,285	\$ 55,928
County	PROJECT - 9	6th Street	County_Pipe85	Med	100.26	48	\$ 505	\$ 50,635	1	\$ 12,606		\$ 63,241	\$ 94,861
County	PROJECT - 9	6th Street	MU_32	Med	164.94	48	\$ 505	\$ 83,296	1	\$ 12,606		\$ 95,902	\$ 143,853
County	PROJECT - 9	6th Street	MU_33	Med	94.81	48	\$ 505	\$ 47,879	1	\$ 12,606		\$ 60,485	\$ 90,728
County	PROJECT - 9	6th Street	MU_79	Med	10.16	48	\$ 505	\$ 5,131	1	\$ 12,606		\$ 17,737	\$ 26,606
County	PROJECT - 9	6th Street	MU_81	Med	65.71	48	\$ 505	\$ 33,186	1	\$ 12,606		\$ 45,792	\$ 68,688
County	PROJECT - 9	6th Street	MU_84	Med	13.83	48	\$ 505	\$ 6,984	1	\$ 12,606		\$ 19,589	\$ 29,384
County	PROJECT - 9	6th Street	County_Pipe10	Med	295.71	60	\$ 551	\$ 162,917	1	\$ 13,641		\$ 176,558	\$ 264,838
					<b>1332</b>				<b>14</b>				<b>\$ 1,336,685</b>
County	PROJECT - 7	Hermosa Ave. at Gould Ave.	County_Pipe145	High	101.40	36	\$ 404	\$ 40,969	1	\$ 12,111		\$ 53,080	\$ 79,620
County	PROJECT - 7	Hermosa Ave. at Gould Ave.	County_Pipe146	High	53.04	36	\$ 404	\$ 21,431	1	\$ 12,111		\$ 33,542	\$ 50,313
County	PROJECT - 7	Hermosa Ave. at Gould Ave.	MU_124	High	75.14	36	\$ 404	\$ 30,357	1	\$ 12,111		\$ 42,468	\$ 63,702
County	PROJECT - 7	Hermosa Ave. at Gould Ave.	MU_125	High	16.39	36	\$ 404	\$ 6,624	1	\$ 12,111		\$ 18,735	\$ 28,102
County	PROJECT - 7	Hermosa Ave. at Gould Ave.	County_Pipe139	High	104.54	48	\$ 505	\$ 52,794	1	\$ 12,606		\$ 65,399	\$ 98,099
County	PROJECT - 7	Hermosa Ave. at Gould Ave.	County_Pipe144	High	91.91	48	\$ 505	\$ 46,419	1	\$ 12,606		\$ 59,025	\$ 88,537
County	PROJECT - 7	Hermosa Ave. at Gould Ave.	County_Pipe256	High	83.05	48	\$ 505	\$ 41,942	1	\$ 12,606		\$ 54,548	\$ 81,821
County	PROJECT - 7	Hermosa Ave. at Gould Ave.	County_Pipe271	High	184.57	60	\$ 551	\$ 101,687	1	\$ 13,641	\$ 40,000	\$ 155,328	\$ 232,993
County	PROJECT - 7	Hermosa Ave. at Gould Ave.	MU_56	High	45.46	60	\$ 551	\$ 25,044	1	\$ 13,641		\$ 38,685	\$ 58,028
					<b>756</b>				<b>10</b>				<b>\$ 781,216</b>
City	PROJECT - 12	Hermosa Ave. at Herondo St.	MU_40	Low	67.37	42	\$ 450	\$ 30,311	1	\$ 12,358		\$ 42,670	\$ 64,004
City	PROJECT - 12	Hermosa Ave. at Herondo St.	County_Pipe242	Low	167.43	48	\$ 505	\$ 84,554	1	\$ 12,606		\$ 97,159	\$ 145,739
City	PROJECT - 12	Hermosa Ave. at Herondo St.	County_Pipe243	Low	203.29	48	\$ 505	\$ 102,663	1	\$ 12,606		\$ 115,269	\$ 172,904
City	PROJECT - 12	Hermosa Ave. at Herondo St.	County_Pipe79	Low	186.10	48	\$ 505	\$ 93,987	1	\$ 12,606		\$ 106,592	\$ 159,889
City	PROJECT - 12	Hermosa Ave. at Herondo St.	MU_41	Low	10.34	48	\$ 505	\$ 5,223	1	\$ 12,606		\$ 17,829	\$ 26,744
City	PROJECT - 12	Hermosa Ave. at Herondo St.	MU_82	Low	47.12	48	\$ 505	\$ 23,795	1	\$ 12,606		\$ 36,401	\$ 54,601
City	PROJECT - 12	Hermosa Ave. at Herondo St.	MU_83	Low	20.46	48	\$ 505	\$ 10,332	1	\$ 12,606		\$ 22,938	\$ 34,406
City	PROJECT - 12	Hermosa Ave. at Herondo St.	MU_42	Low	27.14	54	\$ 551	\$ 14,954	1	\$ 13,641		\$ 28,596	\$ 42,893
City	PROJECT - 12	Hermosa Ave. at Herondo St.	MU_43	Low	10.35	54	\$ 551	\$ 5,700	1	\$ 13,641		\$ 19,341	\$ 29,012
City	PROJECT - 12	Hermosa Ave. at Herondo St.	MU_44	Low	12.05	54	\$ 551	\$ 6,637	1	\$ 13,641		\$ 20,278	\$ 30,417



City	PROJECT - 12	Hermosa Ave. at Herondo St.	MU_45	Low	8.66	54	\$ 551	\$ 4,772	1	\$ 13,641	\$ 18,414	\$ 27,620
City	PROJECT - 12	Hermosa Ave. at Herondo St.	County_Pipe260	Low	197.25	60	\$ 551	\$ 108,671	1	\$ 13,641	\$ 122,312	\$ 183,468
					<b>958</b>				<b>13</b>			<b>\$ 971,698</b>
County	PROJECT - 11	PCH at Pier Ave.	County_Pipe33	Med	288.26	36	\$ 404	\$ 116,462	1	\$ 12,111	\$ 128,573	\$ 192,859
County	PROJECT - 11	PCH at Pier Ave.	County_Pipe26	Med	192.53	42	\$ 450	\$ 86,623	1	\$ 12,358	\$ 98,981	\$ 148,472
County	PROJECT - 11	PCH at Pier Ave.	County_Pipe27	Med	217.30	42	\$ 450	\$ 97,769	1	\$ 12,358	\$ 110,128	\$ 165,192
County	PROJECT - 11	PCH at Pier Ave.	MU_55	Med	19.69	42	\$ 450	\$ 8,859	1	\$ 12,358	\$ 21,218	\$ 31,827
County	PROJECT - 11	PCH at Pier Ave.	County_Pipe40	Med	75.85	48	\$ 505	\$ 38,308	1	\$ 12,606	\$ 50,914	\$ 76,371
County	PROJECT - 11	PCH at Pier Ave.	MU_66	Med	46.19	48	\$ 505	\$ 23,328	1	\$ 12,606	\$ 35,933	\$ 53,900
County	PROJECT - 11	PCH at Pier Ave.	County_Pipe250	Med	15.44	60	\$ 551	\$ 8,508	1	\$ 13,641	\$ 22,149	\$ 33,224
County	PROJECT - 11	PCH at Pier Ave.	County_Pipe30	Med	252.93	60	\$ 551	\$ 139,346	1	\$ 13,641	\$ 152,988	\$ 229,481
County	PROJECT - 11	PCH at Pier Ave.	County_Pipe38	Med	227.19	60	\$ 551	\$ 125,164	1	\$ 13,641	\$ 138,805	\$ 208,208
County	PROJECT - 11	PCH at Pier Ave.	County_Pipe41	Med	313.64	60	\$ 551	\$ 172,792	1	\$ 13,641	\$ 186,433	\$ 279,649
County	PROJECT - 11	PCH at Pier Ave.	MU_47	Med	16.29	60	\$ 551	\$ 8,974	1	\$ 13,641	\$ 22,616	\$ 33,923
County	PROJECT - 11	PCH at Pier Ave.	MU_48	Med	10.36	60	\$ 551	\$ 5,709	1	\$ 13,641	\$ 19,350	\$ 29,025
County	PROJECT - 11	PCH at Pier Ave.	MU_65	Med	54.23	60	\$ 551	\$ 29,877	1	\$ 13,641	\$ 43,518	\$ 65,278
County	PROJECT - 11	PCH at Pier Ave.	MU_69	Med	25.39	60	\$ 551	\$ 13,988	1	\$ 13,641	\$ 27,629	\$ 41,443
County	PROJECT - 11	PCH at Pier Ave.	MU_70	Med	18.63	60	\$ 551	\$ 10,266	1	\$ 13,641	\$ 23,907	\$ 35,861
County	PROJECT - 11	PCH at Pier Ave.	MU_71	Med	25.79	60	\$ 551	\$ 14,207	1	\$ 13,641	\$ 27,848	\$ 41,772
County	PROJECT - 11	PCH at Pier Ave.	MU_72	Med	22.46	60	\$ 551	\$ 12,374	1	\$ 13,641	\$ 26,015	\$ 39,023
County	PROJECT - 11	PCH at Pier Ave.	MU_73	Med	4.34	60	\$ 551	\$ 2,390	1	\$ 13,641	\$ 16,031	\$ 24,046
County	PROJECT - 11	PCH at Pier Ave.	MU_74	Med	40.73	60	\$ 551	\$ 22,440	1	\$ 13,641	\$ 36,081	\$ 54,122
County	PROJECT - 11	PCH at Pier Ave.	County_Pipe35	Med	169.72	60	\$ 551	\$ 93,502	1	\$ 13,641	\$ 107,143	\$ 160,715
County	PROJECT - 11	PCH at Pier Ave.	MU_68	Med	23.14	60	\$ 551	\$ 12,751	1	\$ 13,641	\$ 26,392	\$ 39,588
					<b>2060</b>				<b>22</b>			<b>\$ 1,983,978</b>
County	PROJECT - 10	Pier Ave. at Valley Dr.	County_Pipe194	Med	176.67	48	\$ 505	\$ 89,221	1	\$ 12,606	\$ 101,827	\$ 152,740
County	PROJECT - 10	Pier Ave. at Valley Dr.	County_Pipe22	Med	208.31	48	\$ 505	\$ 105,199	1	\$ 12,606	\$ 117,805	\$ 176,707
County	PROJECT - 10	Pier Ave. at Valley Dr.	County_Pipe36	Med	131.41	48	\$ 505	\$ 66,364	1	\$ 12,606	\$ 78,970	\$ 118,455
County	PROJECT - 10	Pier Ave. at Valley Dr.	MU_137	Med	21.77	48	\$ 505	\$ 10,993	1	\$ 12,606	\$ 23,599	\$ 35,398
County	PROJECT - 10	Pier Ave. at Valley Dr.	County_Pipe196	Med	321.48	60	\$ 551	\$ 177,116	1	\$ 13,641	\$ 190,757	\$ 286,135
County	PROJECT - 10	Pier Ave. at Valley Dr.	MU_138	Med	85.73	60	\$ 551	\$ 47,232	1	\$ 13,641	\$ 60,874	\$ 91,310
County	PROJECT - 10	Pier Ave. at Valley Dr.	MU_139	Med	36.35	60	\$ 551	\$ 20,028	1	\$ 13,641	\$ 33,669	\$ 50,503
County	PROJECT - 10	Pier Ave. at Valley Dr.	MU_140	Med	74.43	60	\$ 551	\$ 41,004	1	\$ 13,641	\$ 54,645	\$ 81,967
County	PROJECT - 10	Pier Ave. at Valley Dr.	MU_141	Med	37.58	60	\$ 551	\$ 20,703	1	\$ 13,641	\$ 34,345	\$ 51,517
County	PROJECT - 10	Pier Ave. at Valley Dr.	MU_142	Med	5.23	60	\$ 551	\$ 2,881	1	\$ 13,641	\$ 16,522	\$ 24,783
County	PROJECT - 10	Pier Ave. at Valley Dr.	MU_67	Med	83.84	60	\$ 551	\$ 46,191	1	\$ 13,641	\$ 59,832	\$ 89,748
County	PROJECT - 10	Pier Ave. at Valley Dr.	County_Pipe197	Med	294.69	72	\$ 689	\$ 202,943	1	\$ 15,469	\$ 218,412	\$ 327,618
County	PROJECT - 10	Pier Ave. at Valley Dr.	County_Pipe199	Med	459.79	84	\$ 790	\$ 363,078	1	\$ 17,661	\$ 380,739	\$ 571,108
County	PROJECT - 10	Pier Ave. at Valley Dr.	MU_143	Med	9.75	84	\$ 790	\$ 7,701	1	\$ 17,661	\$ 25,362	\$ 38,043
County	PROJECT - 10	Pier Ave. at Valley Dr.	MU_144	Med	128.21	84	\$ 790	\$ 101,245	1	\$ 17,661	\$ 118,906	\$ 178,359
					<b>2075</b>				<b>16</b>			<b>\$ 2,274,393</b>
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe291	High	63.32	42	\$ 450	\$ 28,490	1	\$ 12,358	\$ 40,848	\$ 61,272
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe305	High	49.55	42	\$ 450	\$ 22,293	1	\$ 12,358	\$ 34,651	\$ 51,977
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe307	High	7.32	42	\$ 450	\$ 3,292	1	\$ 12,358	\$ 15,650	\$ 23,476
County	PROJECT - 5	Valley Dr. at Herondo Ave.	City_Pipe42	High	155.27	48	\$ 505	\$ 78,415	1	\$ 12,606	\$ 91,021	\$ 136,531
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe231	High	51.09	48	\$ 505	\$ 25,800	1	\$ 12,606	\$ 38,406	\$ 57,609
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe292	High	313.77	48	\$ 505	\$ 158,462	1	\$ 12,606	\$ 171,068	\$ 256,602
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe293	High	316.48	48	\$ 505	\$ 159,828	1	\$ 12,606	\$ 172,434	\$ 258,651
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe294	High	63.55	48	\$ 505	\$ 32,096	1	\$ 12,606	\$ 44,702	\$ 67,052
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe295	High	50.00	48	\$ 505	\$ 25,251	1	\$ 12,606	\$ 37,857	\$ 56,786
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe301	High	198.00	48	\$ 505	\$ 99,994	1	\$ 12,606	\$ 112,600	\$ 168,900
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe311	High	298.65	48	\$ 505	\$ 150,824	1	\$ 12,606	\$ 163,430	\$ 245,145
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe44	High	119.00	48	\$ 505	\$ 60,098	1	\$ 12,606	\$ 72,703	\$ 109,055
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe69	High	238.77	48	\$ 505	\$ 120,582	1	\$ 12,606	\$ 133,188	\$ 199,782
County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_135	High	70.73	48	\$ 505	\$ 35,722	1	\$ 12,606	\$ 48,327	\$ 72,491
County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_136	High	20.60	48	\$ 505	\$ 10,404	1	\$ 12,606	\$ 23,010	\$ 34,515
County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_23	High	19.34	48	\$ 505	\$ 9,766	1	\$ 12,606	\$ 22,372	\$ 33,558
County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_64	High	5.81	48	\$ 505	\$ 2,936	1	\$ 12,606	\$ 15,542	\$ 23,313

County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_77	High	52.29	48	\$ 505	\$ 26,410	1	\$ 12,606	\$ 39,016	\$ 58,524
County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_78	High	9.23	48	\$ 505	\$ 4,661	1	\$ 12,606	\$ 17,267	\$ 25,900
County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_80	High	20.14	48	\$ 505	\$ 10,174	1	\$ 12,606	\$ 22,779	\$ 34,169
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe25	High	145.64	60	\$ 551	\$ 80,236	1	\$ 13,641	\$ 93,877	\$ 140,816
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe296	High	26.65	60	\$ 551	\$ 14,682	1	\$ 13,641	\$ 28,324	\$ 42,485
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe298	High	349.54	60	\$ 551	\$ 192,572	1	\$ 13,641	\$ 206,213	\$ 309,319
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe300	High	283.29	60	\$ 551	\$ 156,074	1	\$ 13,641	\$ 169,715	\$ 254,573
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe309	High	84.65	60	\$ 551	\$ 46,634	1	\$ 13,641	\$ 60,275	\$ 90,413
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe313	High	8.01	60	\$ 551	\$ 4,413	1	\$ 13,641	\$ 18,054	\$ 27,081
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe314	High	189.35	60	\$ 551	\$ 104,320	1	\$ 13,641	\$ 117,961	\$ 176,942
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe316	High	56.66	60	\$ 551	\$ 31,217	1	\$ 13,641	\$ 44,858	\$ 67,287
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe317	High	209.52	60	\$ 551	\$ 115,432	1	\$ 13,641	\$ 129,073	\$ 193,610
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe319	High	413.06	60	\$ 551	\$ 227,567	1	\$ 13,641	\$ 241,208	\$ 361,812
County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_156	High	151.20	60	\$ 551	\$ 83,300	1	\$ 13,641	\$ 96,941	\$ 145,412
County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_20	High	93.32	60	\$ 551	\$ 51,415	1	\$ 13,641	\$ 65,056	\$ 97,584
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe68	High	123.93	72	\$ 689	\$ 85,344	1	\$ 15,469	\$ 100,813	\$ 151,220
County	PROJECT - 5	Valley Dr. at Herondo Ave.	MU_76	High	52.53	72	\$ 689	\$ 36,178	1	\$ 15,469	\$ 51,647	\$ 77,471
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe257	High	185.34	84	\$ 790	\$ 146,354	1	\$ 17,661	\$ 164,015	\$ 246,022
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe32	High	199.11	84	\$ 790	\$ 157,229	1	\$ 17,661	\$ 174,890	\$ 262,334
County	PROJECT - 5	Valley Dr. at Herondo Ave.	County_Pipe67	High	328.55	84	\$ 790	\$ 259,442	1	\$ 17,661	\$ 277,103	\$ 415,655
County	PROJECT - 6	Valley Dr. at Herondo Ave.	County_Lat267	High	202.15	30	\$ 358	\$ 72,393	1	\$ 11,671	\$ 84,063	\$ 126,095
					<b>5225</b>				<b>38</b>			<b>\$ 5,161,440</b>
County	PROJECT - 8	Valley Park Ave.	MU_150	Med	14.55	84	\$ 790	\$ 11,487	1	\$ 17,661	\$ 29,148	\$ 43,722
County	PROJECT - 8	Valley Park Ave.	MU_114	High	13.28	48	\$ 505	\$ 6,708	1	\$ 12,606	\$ 19,314	\$ 28,971
County	PROJECT - 8	Valley Park Ave.	County_Pipe304	High	400.37	72	\$ 689	\$ 275,719	1	\$ 15,469	\$ 291,188	\$ 436,782
County	PROJECT - 8	Valley Park Ave.	MU_113	High	23.34	72	\$ 689	\$ 16,071	1	\$ 15,469	\$ 31,540	\$ 47,310
County	PROJECT - 8	Valley Park Ave.	MU_148	High	86.39	72	\$ 689	\$ 59,491	1	\$ 15,469	\$ 74,960	\$ 112,440
County	PROJECT - 8	Valley Park Ave.	MU_149	High	151.10	72	\$ 689	\$ 104,059	1	\$ 15,469	\$ 119,529	\$ 179,293
County	PROJECT - 8	Valley Park Ave.	County_Pipe203	High	248.27	84	\$ 790	\$ 196,051	1	\$ 17,661	\$ 213,712	\$ 320,568
County	PROJECT - 8	Valley Park Ave.	County_Pipe204	High	509.21	84	\$ 790	\$ 402,110	1	\$ 17,661	\$ 419,771	\$ 629,657
County	PROJECT - 8	Valley Park Ave.	County_Pipe205	High	199.75	84	\$ 790	\$ 157,738	1	\$ 17,661	\$ 175,399	\$ 263,099
County	PROJECT - 8	Valley Park Ave.	County_Pipe207	High	194.80	84	\$ 790	\$ 153,823	1	\$ 17,661	\$ 171,484	\$ 257,227
					<b>1841</b>				<b>10</b>			<b>\$ 2,319,068</b>
										<b>TOTAL</b>	<b>\$</b>	<b>18,970,000.00</b>

**HERMOSA BEACH HOTSPOT CIP  
DETAILED COST ESTIMATES**

Ownership	CIP ID	CIPName	MUID	Priority	Length (ft)	Diam (in)	Pipe Unit Cost	Pipe Cost	MH or HWs	MH Cost	Outfalls	Total	Project Cost w/ 50% Contingency
City	OBS1	3316 Hermosa Ave.	New_1	Low	474.43	24	\$ 312	\$ 148,113	2	\$ 23,047		\$ 171,161	\$ 256,741
					<b>474</b>		\$ 312		2				\$ 256,741
City	OBS10	1045 14th St.	New_2	Low	238.85	18	\$ 257	\$ 61,409	2	\$ 22,772		\$ 84,181	\$ 126,272
					<b>239</b>		\$ 257		2				\$ 126,272
City	OBS11	Sunset Drive	New_10	Low	783.79	12	\$ 230	\$ 179,922	1	\$ 11,294		\$ 191,216	\$ 286,824
					<b>784</b>		\$ 230		1				\$ 286,824
City	OBS2	437 28th St.	County_Lat321	Low	42.41	24	\$ 312	\$ 13,239	1	\$ 11,524		\$ 24,763	\$ 37,145
City	OBS2	437 28th St.	City_Pipe115	Low	19.54	24	\$ 312	\$ 6,101	1	\$ 11,524		\$ 17,624	\$ 26,437
City	OBS2	437 28th St.	County_Lat322	Low	59.99	24	\$ 312	\$ 18,729	1	\$ 11,524		\$ 30,252	\$ 45,379
					<b>122</b>		\$ 937		3				\$ 108,960
City	OBS3	Tennyson Place	New_3	Low	366.74	24	\$ 312	\$ 114,494	2	\$ 23,047		\$ 137,542	\$ 206,313
					<b>367</b>		\$ 312		2				\$ 206,313
City	OBS4	The Strand at 19th St.	New_4	Low	76.01	18	\$ 257	\$ 19,542	2	\$ 22,772		\$ 42,314	\$ 63,471
					<b>76</b>		\$ 257		2				\$ 63,471
City	OBS5	1823 Monterey Blvd.	New_5	Low	217.50	24	\$ 312	\$ 67,902	2	\$ 23,047		\$ 90,950	\$ 136,424
City	OBS5	1823 Monterey Blvd.	City_Pipe93	Low	460.10	24	\$ 312	\$ 143,641	1	\$ 11,524		\$ 155,165	\$ 232,747
					<b>678</b>		\$ 624		3				\$ 369,171
City	OBS6	1910 Ardmore St.	New_9	Low	28.01	12	\$ 230	\$ 6,431	1	\$ 11,294		\$ 17,725	\$ 26,587
					<b>28</b>				1				\$ 26,587
City	OBS7	1712 The Strand	City_Pipe4	Low	405.27	24	\$ 312	\$ 126,523	1	\$ 11,524	1	\$ 138,048	\$ 207,071

					<b>405</b>		\$ 312			1			\$ 207,071
City	OBS8	1426 Bayview Dr.	New_6	Low	263.67	18	\$ 257	\$ 67,790		2	\$ 22,772	\$ 90,562	\$ 135,843
					<b>264</b>		\$ 257			2			\$ 135,843
City	OBS9	Marineland Community	New_7	Low	126.29	18	\$ 257	\$ 32,469		2	\$ 22,772	\$ 55,241	\$ 82,861
City	OBS9	Marineland Community	City_Pipe113	Low	28.11	18	\$ 257	\$ 7,228		1	\$ 11,386	\$ 18,614	\$ 27,920
City	OBS9	Marineland Community	New_8		17.40	18	\$ 257	\$ 4,474		1	\$ 11,386	\$ 15,859	\$ 23,789
City	OBS9	Marineland Community	City_Pipe114		15.56	18	\$ 257	\$ 4,001		2	\$ 22,772	\$ 26,773	\$ 40,159
					<b>187</b>		\$ 1,028			6			\$ 174,730
												<b>TOTAL</b>	<b>\$ 1,960,000.00</b>

**HERMOSA BEACH CLIMATE CHANGE CIP  
DETAILED COST ESTIMATES**

Ownership	CIP ID	CIPName	MUID	Priority	Length (ft)	Diam (in)	Pipe Unit Cost	Pipe Cost	MH or HWs	MH Cost	Outfalls	Total	Project Cost w/ 50% Contingency
County	CC UPSIZED - 1	CC 14th Street	County_Lat126	Low	12.02	30	\$ 358	\$ 4,304	1	\$ 11,671		\$ 15,975	\$ 23,962
County	CC UPSIZED - 1	CC 14th Street	County_Pipe245	Low	175.16	30	\$ 358	\$ 62,727	1	\$ 11,671		\$ 74,398	\$ 111,597
County	CC UPSIZED - 1	CC 14th Street	County_Pipe246	Low	10.00	30	\$ 358	\$ 3,581		\$ -		\$ 3,581	\$ 5,371
County	CC UPSIZED - 1	CC 14th Street	County_Pipe248	Low	9.04	30	\$ 358	\$ 3,236		\$ -		\$ 3,236	\$ 4,854
County	CC UPSIZED - 1	CC 14th Street	County_Pipe252	Low	28.28	30	\$ 358	\$ 10,129	1	\$ 11,671		\$ 21,799	\$ 32,699
County	CC UPSIZED - 1	CC 14th Street	County_Pipe253	Low	8.14	30	\$ 358	\$ 2,913		\$ -		\$ 2,913	\$ 4,370
County	CC UPSIZED - 1	CC 14th Street	County_Pipe254	Low	97.47	30	\$ 358	\$ 34,904		\$ -		\$ 34,904	\$ 52,356
County	CC UPSIZED - 1	CC 14th Street	County_Pipe255	Low	69.55	30	\$ 358	\$ 24,906		\$ -		\$ 24,906	\$ 37,358
County	CC UPSIZED - 1	CC 14th Street	County_Pipe274	Low	113.36	30	\$ 358	\$ 40,597	1	\$ 11,671		\$ 52,267	\$ 78,401
					<b>523</b>				<b>4</b>				<b>\$ 350,969</b>
County	CC UPSIZED - 2	CC 22nd St. and Valley Dr.	County_Lat24	Low	23.10	36	\$ 404	\$ 9,334	1	\$ 12,111		\$ 21,445	\$ 32,167
County	CC UPSIZED - 2	CC 22nd St. and Valley Dr.	County_Lat267	Low	202.15	72	\$ 689	\$ 139,217	1	\$ 15,469		\$ 154,686	\$ 232,029
County	CC UPSIZED - 2	CC 22nd St. and Valley Dr.	County_Pipe338	Low	40.65	36	\$ 404	\$ 16,422	1	\$ 12,111		\$ 28,533	\$ 42,800
County	CC UPSIZED - 2	CC 22nd St. and Valley Dr.	County_Pipe68	Low	123.93	84	\$ 790	\$ 97,861	1	\$ 17,661		\$ 115,522	\$ 173,284
County	CC UPSIZED - 2	CC 22nd St. and Valley Dr.	MU_76	Low	52.53	84	\$ 790	\$ 41,484	1	\$ 17,661		\$ 59,145	\$ 88,718
					<b>442</b>				<b>5</b>				<b>\$ 568,997</b>
County	CC UPSIZED - 3	CC 2nd St. and PCH	City_Pipe41	Low	201.99	36	\$ 404	\$ 81,606	1	\$ 12,111		\$ 93,717	\$ 140,576
County	CC UPSIZED - 3	CC 2nd St. and PCH	County_Lat22	Low	24.43	24	\$ 312	\$ 7,626	1	\$ 11,524		\$ 19,150	\$ 28,725
County	CC UPSIZED - 3	CC 2nd St. and PCH	MU_102	Low	22.16	36	\$ 404	\$ 8,954	1	\$ 12,111		\$ 21,065	\$ 31,597
					<b>249</b>				<b>3</b>				<b>\$ 200,898</b>
City	CC UPSIZED - 4	CC 35th Street	City_Pipe106	Low	19.20	24	\$ 312	\$ 5,995	1	\$ 11,524		\$ 17,519	\$ 26,278
					<b>19</b>				<b>1</b>				<b>\$ 26,278</b>
County	CC UPSIZED - 5	CC 6th Street	County_Pipe76	Low	183.01	48	\$ 505	\$ 92,425	1	\$ 12,606		\$ 105,031	\$ 157,546
County	CC UPSIZED - 5	CC 6th Street	County_Pipe78		410.55	48	\$ 505	\$ 207,337	1	\$ 12,606		\$ 219,943	\$ 329,915
					<b>594</b>				<b>2</b>				<b>\$ 487,461</b>
County	CC UPSIZED - 6	CC 7th Street	County_Pipe46	Low	316.16	30	\$ 358	\$ 113,220	1	\$ 11,671		\$ 124,891	\$ 187,336
County	CC UPSIZED - 6	CC 7th Street	MU_75	Low	13.02	30	\$ 358	\$ 4,664		\$ -		\$ 4,664	\$ 6,996
					<b>329</b>				<b>1</b>				<b>\$ 194,332</b>
County	CC UPSIZED - 7	CC 8th Street and PCH	County_Pipe305	Low	49.55	60	\$ 551	\$ 27,297	1	\$ 13,641		\$ 40,938	\$ 61,408
County	CC UPSIZED - 7	CC 8th Street and PCH	County_Pipe19	Low	114.78	36	\$ 404	\$ 46,372	1	\$ 12,111		\$ 58,483	\$ 87,725
County	CC UPSIZED - 7	CC 8th Street and PCH	County_Pipe301	Low	198.00	60	\$ 551	\$ 109,084	1	\$ 13,641		\$ 122,725	\$ 184,088
County	CC UPSIZED - 7	CC 8th Street and PCH	MU_134	Low	108.70	36	\$ 404	\$ 43,916		\$ -		\$ 43,916	\$ 65,875
					<b>471</b>				<b>3</b>				<b>\$ 399,095</b>
City	CC UPSIZED - 8	CC Pier Ave	City_Pipe22	Low	75.77	36	\$ 404	\$ 30,612	1	\$ 12,111		\$ 42,723	\$ 64,085
City	CC UPSIZED - 8	CC Pier Ave	City_Pipe57	Low	176.16	30	\$ 358	\$ 63,082	1	\$ 11,671		\$ 74,753	\$ 112,129
City	CC UPSIZED - 8	CC Pier Ave	MU_161	Low	117.50	36	\$ 404	\$ 47,473		\$ -		\$ 47,473	\$ 71,209
City	CC UPSIZED - 8	CC Pier Ave	City_Pipe23	Low	277.36	30	\$ 358	\$ 99,323		\$ -		\$ 99,323	\$ 148,984
City	CC UPSIZED - 8	CC Pier Ave	MU_158	Low	83.10	30	\$ 358	\$ 29,758		\$ -		\$ 29,758	\$ 44,638
City	CC UPSIZED - 8	CC Pier Ave	MU_159	Low	72.75	30	\$ 358	\$ 26,054		\$ -		\$ 26,054	\$ 39,080
City	CC UPSIZED - 8	CC Pier Ave	MU_160	Low	57.09	30	\$ 358	\$ 20,443	1	\$ 11,671		\$ 32,114	\$ 48,171
City	CC UPSIZED - 8	CC Pier Ave	City_Pipe10	Low	159.10	30	\$ 358	\$ 56,975	1	\$ 11,671		\$ 68,646	\$ 102,968
City	CC UPSIZED - 8	CC Pier Ave	MU_92	Low	201.66	30	\$ 358	\$ 72,216	1	\$ 11,671		\$ 83,887	\$ 125,830
City	CC UPSIZED - 8	CC Pier Ave	MU_97	Low	215.84	30	\$ 358	\$ 77,294		\$ -		\$ 77,294	\$ 115,941
County	CC UPSIZED - 8	CC Pier Ave	County_Pipe115	Low	150.89	72	\$ 689	\$ 103,913		\$ -		\$ 103,913	\$ 155,869

County	CC UPSIZED - 8	CC Pier Ave	County_Pipe96	Low	391.64	72	\$ 689	\$ 269,706		\$ -	\$ 269,706	\$ 404,558
County	CC UPSIZED - 8	CC Pier Ave	County_Pipe97	Low	383.07	72	\$ 689	\$ 263,807		\$ -	\$ 263,807	\$ 395,710
City	CC UPSIZED - 8	CC Pier Ave	MU_60	Low	7.39	72	\$ 689	\$ 5,091		\$ -	\$ 5,091	\$ 7,636
City	CC UPSIZED - 8	CC Pier Ave	MU_61	Low	6.09	60	\$ 551	\$ 3,353		\$ -	\$ 3,353	\$ 5,029
City	CC UPSIZED - 8	CC Pier Ave	MU_85	Low	7.40	72	\$ 689	\$ 5,094		\$ -	\$ 5,094	\$ 7,641
City	CC UPSIZED - 8	CC Pier Ave	MU_91	Low	23.83	30	\$ 358	\$ 8,534	1	\$ 11,671	\$ 20,205	\$ 30,307
					<b>2407</b>				<b>6</b>			<b>\$ 1,879,786</b>
County	CC UPSIZED - 9	CC Pier Ave. and Valley Dr.	County_Pipe194	Low	176.67	60	\$ 551	\$ 97,332	1	\$ 13,641	\$ 110,973	\$ 166,460
County	CC UPSIZED - 9	CC Pier Ave. and Valley Dr.	County_Pipe22	Low	208.31	60	\$ 551	\$ 114,763		\$ -	\$ 114,763	\$ 172,144
County	CC UPSIZED - 9	CC Pier Ave. and Valley Dr.	County_Pipe36	Low	131.41	60	\$ 551	\$ 72,397	1	\$ 13,641	\$ 86,039	\$ 129,058
County	CC UPSIZED - 9	CC Pier Ave. and Valley Dr.	MU_137	Low	21.77	60	\$ 551	\$ 11,992		\$ -	\$ 11,992	\$ 17,989
					<b>538</b>				<b>2</b>			<b>\$ 485,650</b>
County	CC UPSIZED - 10	CC Valley Drive	County_Pipe196	Low	321.48	72	\$ 689	\$ 221,395	1	\$ 15,469	\$ 236,864	\$ 355,296
County	CC UPSIZED - 10	CC Valley Drive	County_Pipe199		459.79	96	\$ 826	\$ 379,965	2	\$ 38,830	\$ 418,795	\$ 628,192
County	CC UPSIZED - 10	CC Valley Drive	MU_138	Low	85.73	72	\$ 689	\$ 59,041		\$ -	\$ 59,041	\$ 88,561
					<b>867</b>				<b>3</b>			<b>\$ 1,072,049</b>
County	CC UPSIZED - 11	CC Valley Park Ave	County_Pipe131	Low	311.84	48	\$ 505	\$ 157,483	2	\$ 25,212	\$ 182,695	\$ 274,042
County	CC UPSIZED - 11	CC Valley Park Ave	MU_148	Low	86.39	84	\$ 790	\$ 68,216	1	\$ 17,661	\$ 85,877	\$ 128,816
County	CC UPSIZED - 11	CC Valley Park Ave	MU_149	Low	151.10	84	\$ 790	\$ 119,321	0	\$ -	\$ 119,321	\$ 178,982
County	CC UPSIZED - 11	CC Valley Park Ave	MU_6	Low	148.54	36	\$ 404	\$ 60,012	2	\$ 24,222	\$ 84,234	\$ 126,352
					<b>698</b>				<b>5</b>			<b>\$ 708,192</b>
											<b>TOTAL</b>	<b>\$ 6,370,000</b>

**HERMOSA BEACH ADDITIONAL CLIMATE CHANGE CIP  
DETAILED COST ESTIMATES**

CIP ID	CIPName	Pipe MUID	Priority	Diam (in)	Flap Gate Cost	Project Cost w/ 50% Contingency
CC Flap Gate - 1 24th Place		County_Lat252	Low	18	\$ 3,250	\$ 4,875
				<b>18</b>		<b>\$ 4,875</b>
CC Flap Gate - 2 PCH and 5th St.		County_Lat221	Low	18	\$ 3,250	\$ 4,875
				<b>18</b>		<b>\$ 4,875</b>
CC Flap Gate - 3 Valley Drive and 2nd County		County_Lat267	Low	72	\$ 18,200	\$ 27,300
				<b>72</b>		<b>\$ 27,300</b>
CC Flap Gate - 4 Valley Drive and 8th County		County_Lat248	Low	18	\$ 3,250	\$ 4,875
CC Flap Gate - 4 Valley Drive and 8th County		County_Lat268	Low	18	\$ 3,250	\$ 4,875
CC Flap Gate - 4 Valley Drive and 8th County		County_Lat269	Low	18	\$ 3,250	\$ 4,875
CC Flap Gate - 4 Valley Drive and 8th County		County_Lat270	Low	18	\$ 3,250	\$ 4,875
CC Flap Gate - 4 Valley Drive and 8th County		County_Lat273	Low	18	\$ 3,250	\$ 4,875
				<b>18</b>		<b>\$ 24,375</b>
					<b>TOTAL</b>	<b>\$ 61,000</b>

## **Appendix B**

### **CCTV Report**



### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 08:22
<b>Street</b>	2nd ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	CITY IN78	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	18	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	37.5
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 8:22:00 AM

Pipe Segment Reference:

Street: 2nd ST

Upstream MH: CITY IN78

Length Surveyed: 37.5




Downstream MH: COUNTY MH

Pacp Quick Overall Rating: 0000 Direction of Survey: Upstream

Height (Diameter): 18

Material: Reinforced Concrete Pipe

Street: 2nd ST

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
37.5	<p align="center"><b>Manhole</b> Severity: None Remarks: CITY IN78</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 8:22:00 AM

Street: 2nd ST

Length Surveyed: 37.5

Pacp Quick Overall Rating: 0000

Height (Diameter): 18

Street: 2nd ST

Pipe Segment Reference:

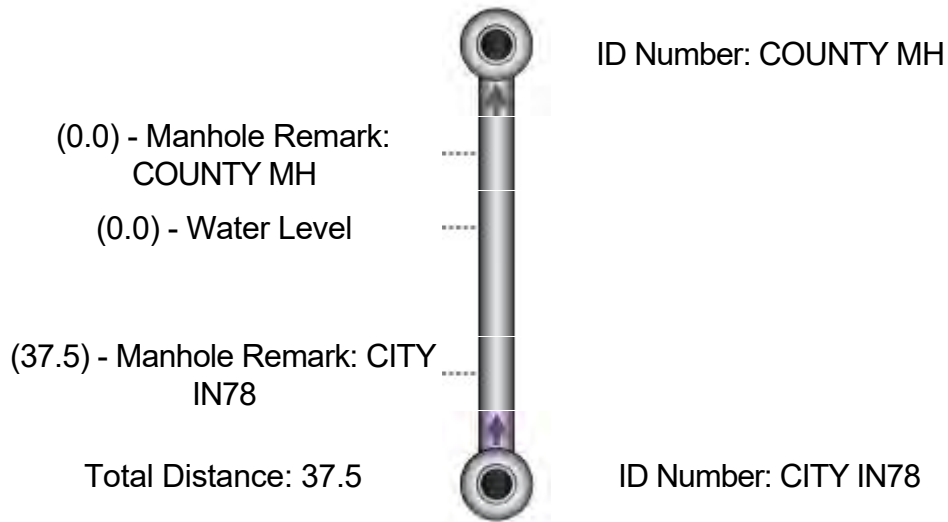
Upstream MH: CITY IN78

Downstream MH: COUNTY MH

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 08:28
<b>Street</b>	2nd ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY IN2	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	18	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	8.4
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 8:28:00 AM

Pipe Segment Reference:

Street: 2nd ST

Upstream MH: COUNTY IN2

Length Surveyed: 8.4

Downstream MH: COUNTY MH

Pacp Quick Overall Rating: 0000

Direction of Survey: Upstream

Height (Diameter): 18

Material: Reinforced Concrete Pipe

Street: 2nd ST

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
8.4	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY IN2</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 8:28:00 AM

Street: 2nd ST

Length Surveyed: 8.4

Pacp Quick Overall Rating: 0000

Height (Diameter): 18

Street: 2nd ST

Pipe Segment Reference:

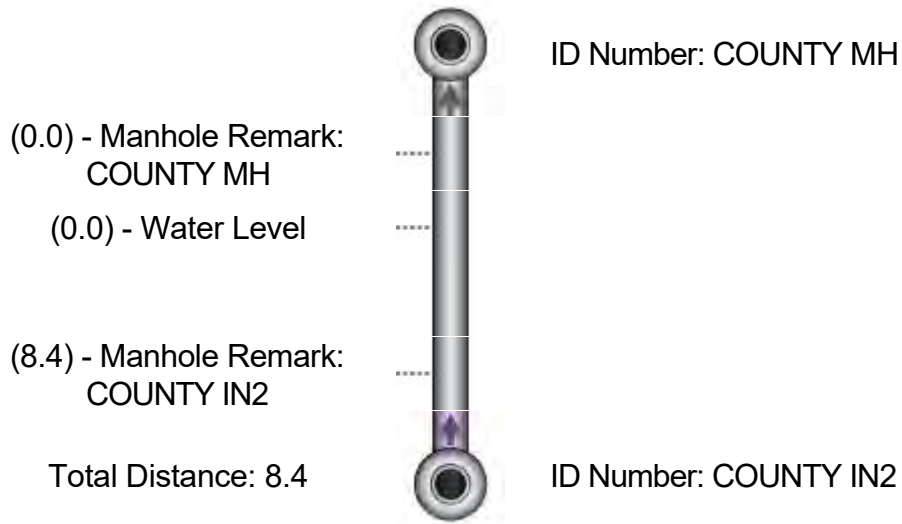
Upstream MH: COUNTY IN2

Downstream MH: COUNTY MH

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



Created with the  report generator



### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/6/2017 11:22
<b>Street</b>	GOULD AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY IN25	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH95	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	18	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	121.4
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 11:22:00 AM

Pipe Segment Reference:

Street: GOULD AVE

Upstream MH: COUNTY IN25

Length Surveyed: 121.4

Downstream MH: COUNTY MH95

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 18

Material: Reinforced Concrete Pipe

Street: GOULD AVE

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY IN25</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
121.4	<p align="center"><b>End of Pipe</b> Severity: None Remarks: COUNTY MH95 MAINLINE</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 11:22:00 AM

Street: GOULD AVE

Length Surveyed: 121.4

Pacp Quick Overall Rating: 0000

Height (Diameter): 18

Street: GOULD AVE

Pipe Segment Reference:

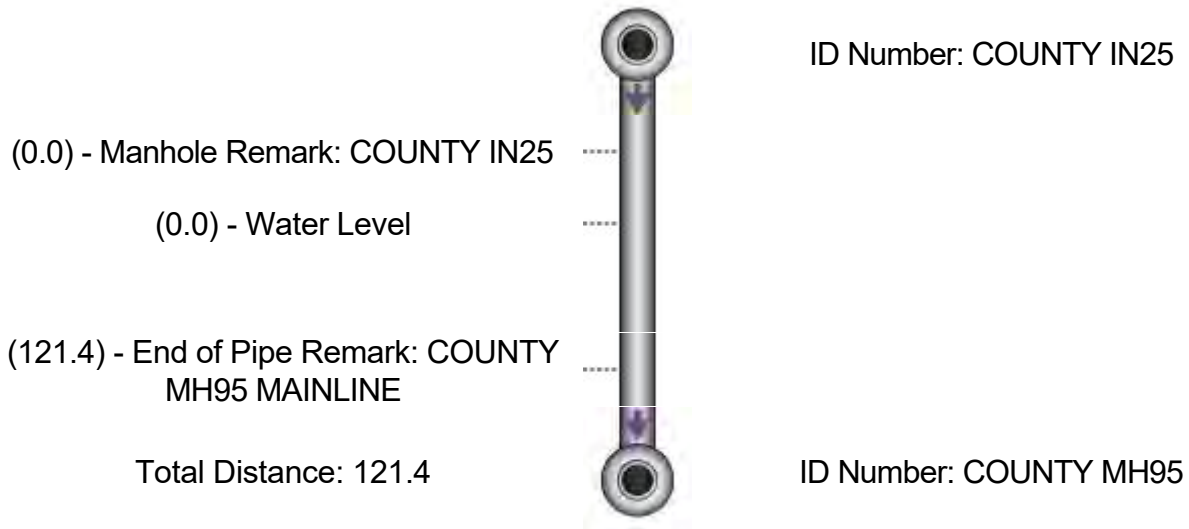
Upstream MH: COUNTY IN25

Downstream MH: COUNTY MH95

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/13/2017 10:43
<b>Street</b>	HERMOSA AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH 35	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH51	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	45	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	357.2
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Urban
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	5	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	No

# Project: CITY OF HERMOSA BEACH

Date: 3/13/2017 10:43:00 AM

Pipe Segment Reference:

Street: HERMOSA AVE

Upstream MH: COUNTY MH 35

Length Surveyed: 357.2




Downstream MH: COUNTY MH51

Pacp Quick Overall Rating: 3100 Direction of Survey: Downstream

Height (Diameter): 45




Material: Reinforced Concrete Pipe


Street: HERMOSA AVE

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH 35</b></p>	 <p>HERMOSA BEACH COUNTY MH 35 Downstream HERMOSA AVE COUNTY MH51</p> <p align="right">Manhole COUNTY MH 35</p> <p>45 10:44 Circular Reinforced Co 2017/03/13 0 FT</p>
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	 <p>HERMOSA BEACH COUNTY MH 35 Downstream HERMOSA AVE COUNTY MH51</p> <p align="right">Water Level 52</p> <p>45 10:43 Circular Reinforced Co 2017/03/13 0 FT</p>
21.4	<p align="center"><b>Tap Factory Active</b>  <b>Position: 10</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	 <p>HERMOSA BEACH COUNTY MH 35 Downstream HERMOSA AVE COUNTY MH51</p> <p align="right">Tap Factory Active 10 0'clock</p> <p>45 10:45 Circular Reinforced Co 2017/03/13 21.4 FT</p>



Distance	Fault Observation	Picture
48.7	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
68.0	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
86.5	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
110.2	<p><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 4</b></p>	
355.7	<p><b>Obstacle Other</b>  <b>Position: 4 To 8</b>  <b>Severity: None</b>  <b>Remarks: DEBRIS</b></p>	
355.7	<p><b>Picture Number: 2</b>  <b>Obstacle Other</b>  <b>Position: 4 To 8</b></p>	

Distance	Fault Observation	Picture
357.2	<p style="text-align: center;">Abandoned Survey Severity: None Remarks: DUE TO DEBRIS</p>	

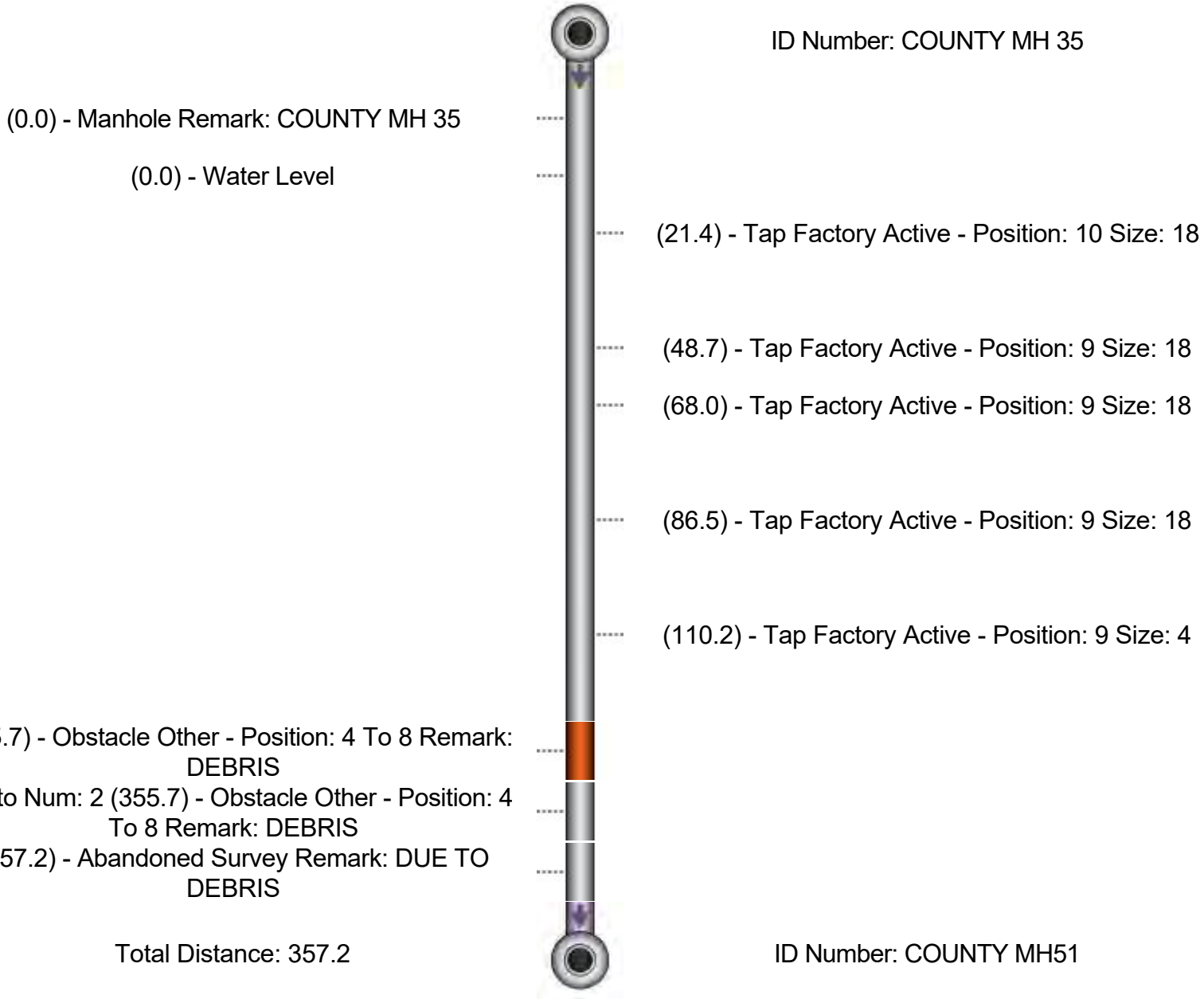
Created with the  report generator

# Project: CITY OF HERMOSA BEACH

**Date:** 3/13/2017 10:43:00 AM  
**Street:** HERMOSA AVE  
**Length Surveyed:** 357.2  
**Pacp Quick Overall Rating:** 3100  
**Height (Diameter):** 45  
**Street:** HERMOSA AVE

**Pipe Segment Reference:**  
**Upstream MH:** COUNTY MH 35  
**Downstream MH:** COUNTY MH51  
**Direction of Survey:** Downstream  
**Material:** Reinforced Concrete Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 04:14
<b>Street</b>	PIER AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH A	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH B	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	89.8
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Urban
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	No

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 4:14:00 AM

Pipe Segment Reference:

Street: PIER AVE

Upstream MH: COUNTY MH A

Length Surveyed: 89.8




Downstream MH: COUNTY MH B



Pacp Quick Overall Rating: 5100 Direction of Survey: Downstream

Height (Diameter): 24

Material: Reinforced Concrete Pipe

Street: PIER AVE

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH A</b></p>	 <p>HERMOSA BEACH COUNTY MH A Downstream PIER AVE COUNTY MH B                  Manhole COUNTY MH A                  24 04:23 Circular 2017/03/07 Reinforced Co 0 FT</p>
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	 <p>HERMOSA BEACH COUNTY MH A Downstream PIER AVE COUNTY MH B                  Water Level 0%                  24 04:24 Circular 2017/03/07 Reinforced Co 0 FT</p>
89.7	<p align="center"><b>Obstacle Other</b>  <b>Position: 3 To 9</b>  <b>Severity: None</b>  <b>Remarks: CEMENT WALL (BULKHEAD?)</b></p>	 <p>HERMOSA BEACH COUNTY MH A Downstream PIER AVE COUNTY MH B                  Obstacle Other 3 To 9 o'clock CEMENT WALL (BULKHEAD?) 50%                  24 04:27 Circular 2017/03/07 Reinforced Co 89.7 FT</p>

Distance	Fault Observation	Picture
89.7	<p>Picture Number: 2  Obstacle Other  Position: 3 To 9</p>	
89.8	<p>Abandoned Survey  Severity: None  Remarks: DUE TO BARRICADE</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 4:14:00 AM

Street: PIER AVE

Length Surveyed: 89.8

Pacp Quick Overall Rating: 5100

Height (Diameter): 24

Street: PIER AVE

Pipe Segment Reference:

Upstream MH: COUNTY MH A

Downstream MH: COUNTY MH B

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

(0.0) - Manhole Remark: COUNTY MH A

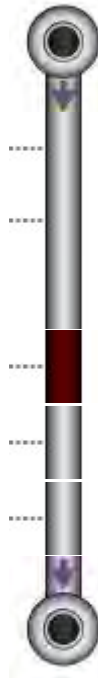
(0.0) - Water Level

(89.7) - Obstacle Other - Position: 3 To 9 Remark:  
CEMENT WALL (BULKHEAD?)

Photo Num: 2 (89.7) - Obstacle Other - Position: 3  
To 9 Remark: CEMENT WALL (BULKHEAD?)

(89.8) - Abandoned Survey Remark: DUE TO  
BARRICADE

Total Distance: 89.8



ID Number: COUNTY MH A

ID Number: COUNTY MH B





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 05:02
<b>Street</b>	PIER AVE & BARD ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH B	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH 51	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	36	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	732.7
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Urban
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	9	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	




### Pacp 6

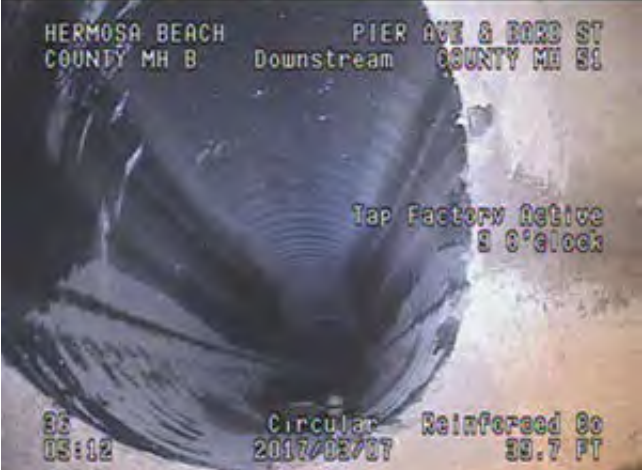


<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes


# Project: CITY OF HERMOSA BEACH




**Date:** 3/7/2017 5:02:00 AM  
**Street:** PIER AVE & BARD ST  
**Length Surveyed:** 732.7  
**Pacp Quick Overall Rating:** 0000  
**Height (Diameter):** 36  
**Street:** PIER AVE & BARD ST




**Pipe Segment Reference:**  
**Upstream MH:** COUNTY MH B  
**Downstream MH:** COUNTY MH 51  
**Direction of Survey:** Downstream  
**Material:** Reinforced Concrete Pipe


Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH B</b></p>	 <p>HERMOSA BEACH COUNTY MH B PIER AVE &amp; BARD ST Downstream COUNTY MH 51  Manhole  COUNTY MH B  48 05:09 Circular 2017/03/07 Reinforced Co 0 FT</p>
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	 <p>HERMOSA BEACH COUNTY MH B PIER AVE &amp; BARD ST Downstream COUNTY MH 51  Water Level  40%  48 05:10 Circular 2017/03/07 Reinforced Co 0 FT</p>
0.0	<p align="center"><b>General Observation</b>  <b>Severity: None</b>  <b>Remarks: PLANS CALL FOR A 24" LINE - NOT 24"</b></p>	 <p>HERMOSA BEACH COUNTY MH B PIER AVE &amp; BARD ST Downstream COUNTY MH 51  General Observation  PLANS CALL FOR A 24" LINE - NOT 24"  48 05:10 Circular 2017/03/07 Reinforced Co 0 FT</p>

Distance	Fault Observation	Picture
39.6	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
50.1	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
268.0	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
268.0	<p><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
268.0	<p><b>General Observation</b>  <b>Severity: None</b>  <b>Remarks: UNMARKED MANHOLE</b></p>	
479.5	<p><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 15</b></p>	

Distance	Fault Observation	Picture
479.5	<p>Tap Factory Active            Position: 9            Severity: None            Size: 18</p>	
479.5	<p>General Observation            Severity: None            Remarks: UNMARKED MANHOLE</p>	
559.3	<p>Tap Factory Active            Position: 3            Severity: None            Size: 18</p>	

Distance	Fault Observation	Picture
559.3	<p style="text-align: center;"><b>General Observation</b>  <b>Severity: None</b>  <b>Remarks: UNMARKED MANHOLE</b></p>	
620.1	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
732.7	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
732.7	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: UNMARKED MANHOLE</b>  <b>LOCATED ON MONTEREY BLVD</b>  <b>(EAST MANHOLE)</b></p>	

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# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 5:02:00 AM

Street: PIER AVE & BARD ST

Length Surveyed: 732.7

Pacp Quick Overall Rating: 0000

Height (Diameter): 36

Street: PIER AVE & BARD ST

Pipe Segment Reference:

Upstream MH: COUNTY MH B

Downstream MH: COUNTY MH  
51

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH B

(0.0) - Manhole Remark: COUNTY MH B

(0.0) - Water Level

(0.0) - General Observation Remark: PLANS CALL  
FOR A 24" LINE - NOT 24"

(39.6) - Tap Factory Active - Position: 9 Size: 18

(50.1) - Tap Factory Active - Position: 3 Size: 18

(268.0) - Tap Factory Active - Position: 3 Size: 18

(268.0) - Tap Factory Active - Position: 9 Size: 18

(268.0) - General Observation Remark:  
UNMARKED MANHOLE

(479.5) - Tap Factory Active - Position: 3 Size: 15

(479.5) - Tap Factory Active - Position: 9 Size: 18

(479.5) - General Observation Remark:  
UNMARKED MANHOLE

(559.3) - Tap Factory Active - Position: 3 Size: 18

(559.3) - General Observation Remark:  
UNMARKED MANHOLE

(620.1) - Tap Factory Active - Position: 3 Size: 18

(732.7) - Tap Factory Active - Position: 3 Size: 18

(732.7) - Manhole Remark: UNMARKED  
MANHOLE LOCATED ON MONTEREY BLVD  
(EAST MANHOLE)







### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 07:49
<b>Street</b>	2nd ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH 43	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	212.7
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 7:49:00 AM

Street: 2nd ST

Length Surveyed: 212.7

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 24

Street: 2nd ST

Pipe Segment Reference:

Upstream MH: COUNTY MH

Downstream MH: COUNTY MH

43

Material: Reinforced Concrete

Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
212.7	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH 43 (FLAPPER)</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 7:49:00 AM

Street: 2nd ST

Length Surveyed: 212.7

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: 2nd ST

Pipe Segment Reference:

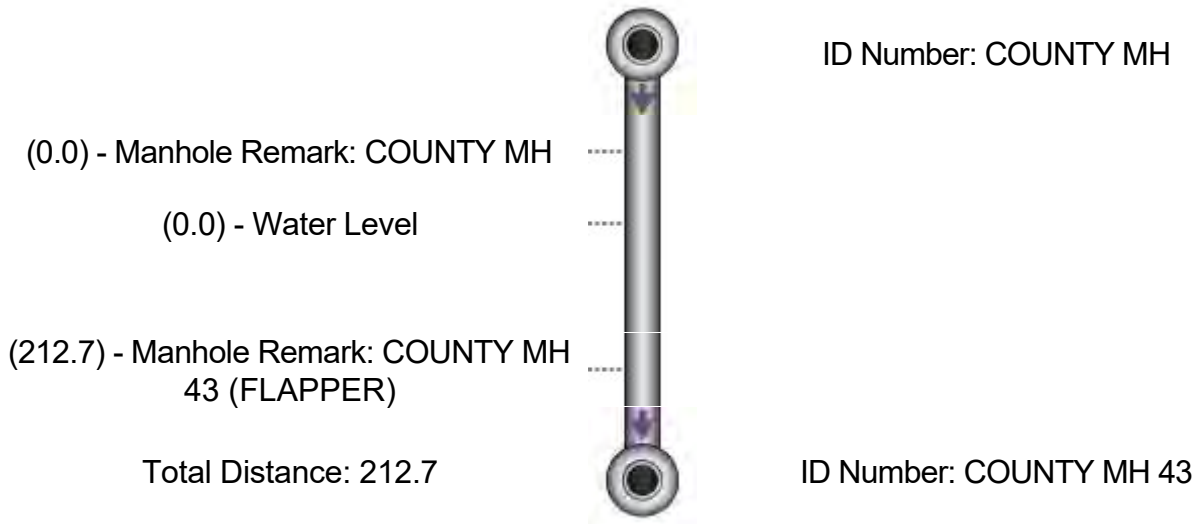
Upstream MH: COUNTY MH

Downstream MH: COUNTY MH  
43

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 06:44
<b>Street</b>	ARDMORE AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH54	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	108.9
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	1	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	1	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 6:44:00 AM

Street: ARDMORE AVE

Length Surveyed: 108.9

Pacp Quick Overall Rating: 2100

Height (Diameter): 24

Street: ARDMORE AVE




Pipe Segment Reference:



Upstream MH: COUNTY MH

Downstream MH: COUNTY MH54

Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH</b></p>	 <p>HERMOSA BEACH COUNTY MH Downstream ARDMORE AVE COUNTY MH54                  Manhole COUNTY MH                  24 06:47 Circular 2017/03/01 Reinforced Co 0 FT</p>
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	 <p>HERMOSA BEACH COUNTY MH Downstream ARDMORE AVE COUNTY MH54                  Water Level 52                  24 06:47 Circular 2017/03/01 Reinforced Co 0 FT</p>
0.0	<p align="center"><b>Deposits Settled Compacted</b>  <b>Position: 5 To 7</b>  <b>Severity: None</b></p>	 <p>HERMOSA BEACH COUNTY MH Downstream ARDMORE AVE COUNTY MH54                  Deposits Settled Compacted 5 to 7 O'clock 102                  24 06:48 Circular 2017/03/01 Reinforced Co 0 FT</p>

Distance	Fault Observation	Picture
10.8	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
108.9	<p style="text-align: center;"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH54</b></p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 6:44:00 AM

Street: ARDMORE AVE

Length Surveyed: 108.9

Pacp Quick Overall Rating: 2100

Height (Diameter): 24

Street: ARDMORE AVE

Pipe Segment Reference:

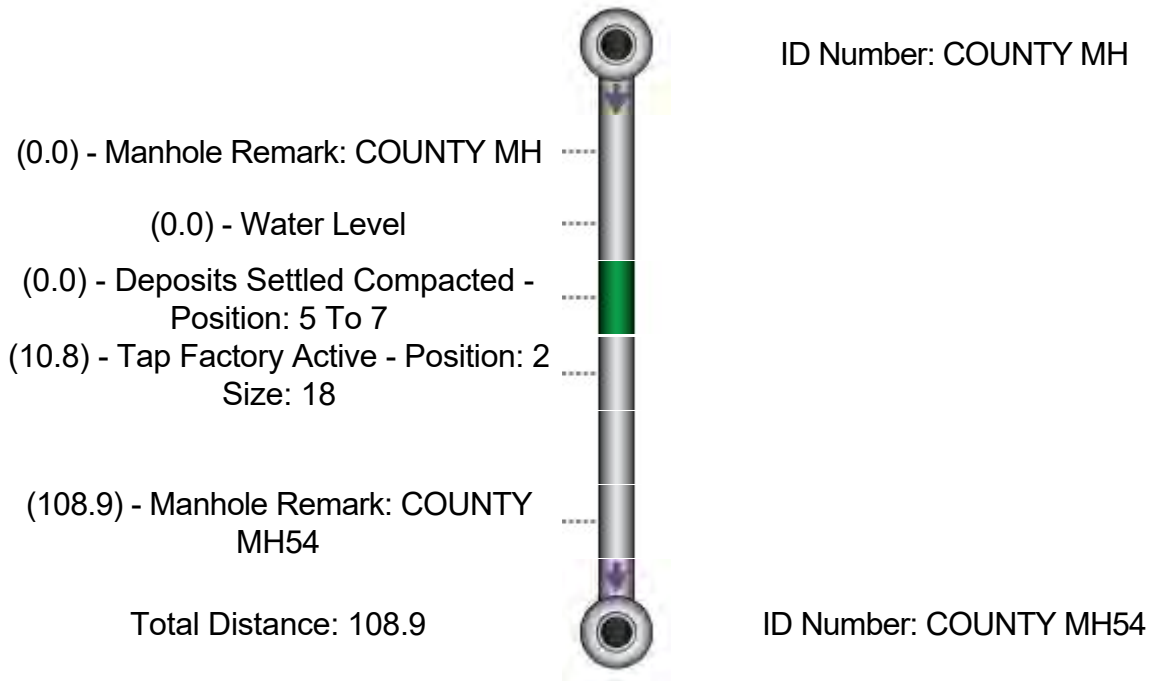
Upstream MH: COUNTY MH

Downstream MH: COUNTY MH54

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/2/2017 10:45
<b>Street</b>	HERMOSA AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH100	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH48	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	42	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	238.6
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Suburban/Rural
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes



# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 10:45:00 AM

Pipe Segment Reference:

Street: HERMOSA AVE

Upstream MH: COUNTY MH100

Length Surveyed: 238.6




Downstream MH: COUNTY MH48



Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 42

Material: Reinforced Concrete Pipe

Street: HERMOSA AVE

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH100</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
33.2	<p align="center"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
238.6	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
238.6	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH48</b> </p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 10:45:00 AM

Street: HERMOSA AVE

Length Surveyed: 238.6

Pacp Quick Overall Rating: 0000

Height (Diameter): 42

Street: HERMOSA AVE

Pipe Segment Reference:

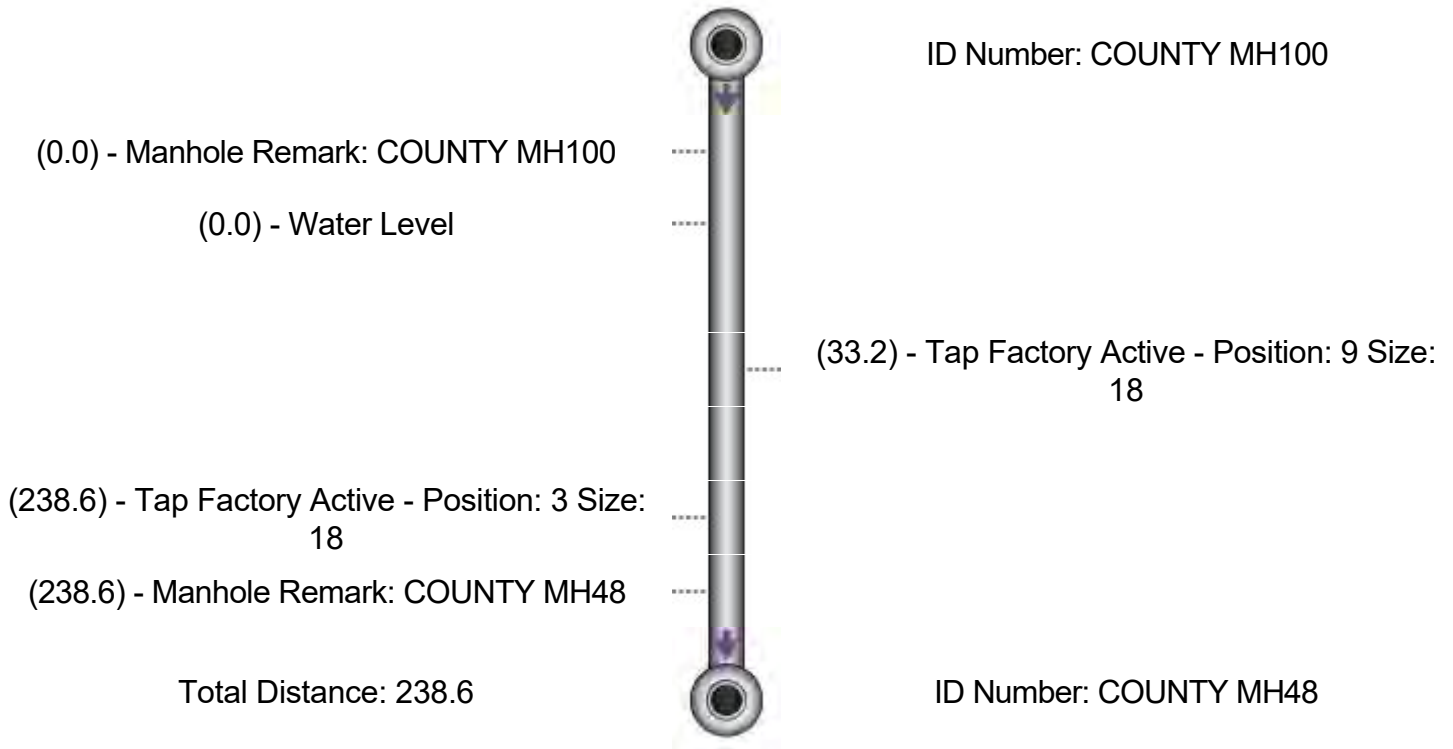
Upstream MH: COUNTY MH100

Downstream MH: COUNTY MH48

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/22/2017 10:11
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH101	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH18	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	27	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	297.3
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	4	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 10:11:00 AM

Pipe Segment Reference:

Street: EASEMENT

Upstream MH: COUNTY MH101

Length Surveyed: 297.3

Downstream MH: COUNTY MH18



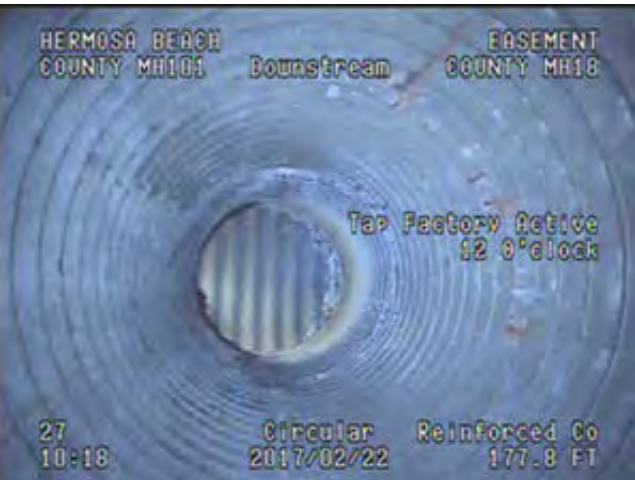
Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream


Height (Diameter): 27

Material: Reinforced Concrete Pipe

Street: EASEMENT

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH101</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
74.5	<p align="center"><b>Tap Factory Capped</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
92.7	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	 <p>HERMOSA BEACH COUNTY MH101 Downstream EASEMENT COUNTY MH18</p> <p style="text-align: right;">Tap Factory Active 3 o'clock</p> <p>27 10:16 Circular 2017/02/22 Reinforced Co 92.7 FT</p>
102.4	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	 <p>HERMOSA BEACH COUNTY MH101 Downstream EASEMENT COUNTY MH18</p> <p style="text-align: right;">Tap Factory Active 9 o'clock</p> <p>27 10:16 Circular 2017/02/22 Reinforced Co 102.4 FT</p>
177.8	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 12</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	 <p>HERMOSA BEACH COUNTY MH101 Downstream EASEMENT COUNTY MH18</p> <p style="text-align: right;">Tap Factory Active 12 o'clock</p> <p>27 10:18 Circular 2017/02/22 Reinforced Co 177.8 FT</p>

Distance	Fault Observation	Picture
297.3	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH18</b> </p>	

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# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 10:11:00 AM

Street: EASEMENT

Length Surveyed: 297.3

Pacp Quick Overall Rating: 0000

Height (Diameter): 27

Street: EASEMENT

Pipe Segment Reference:

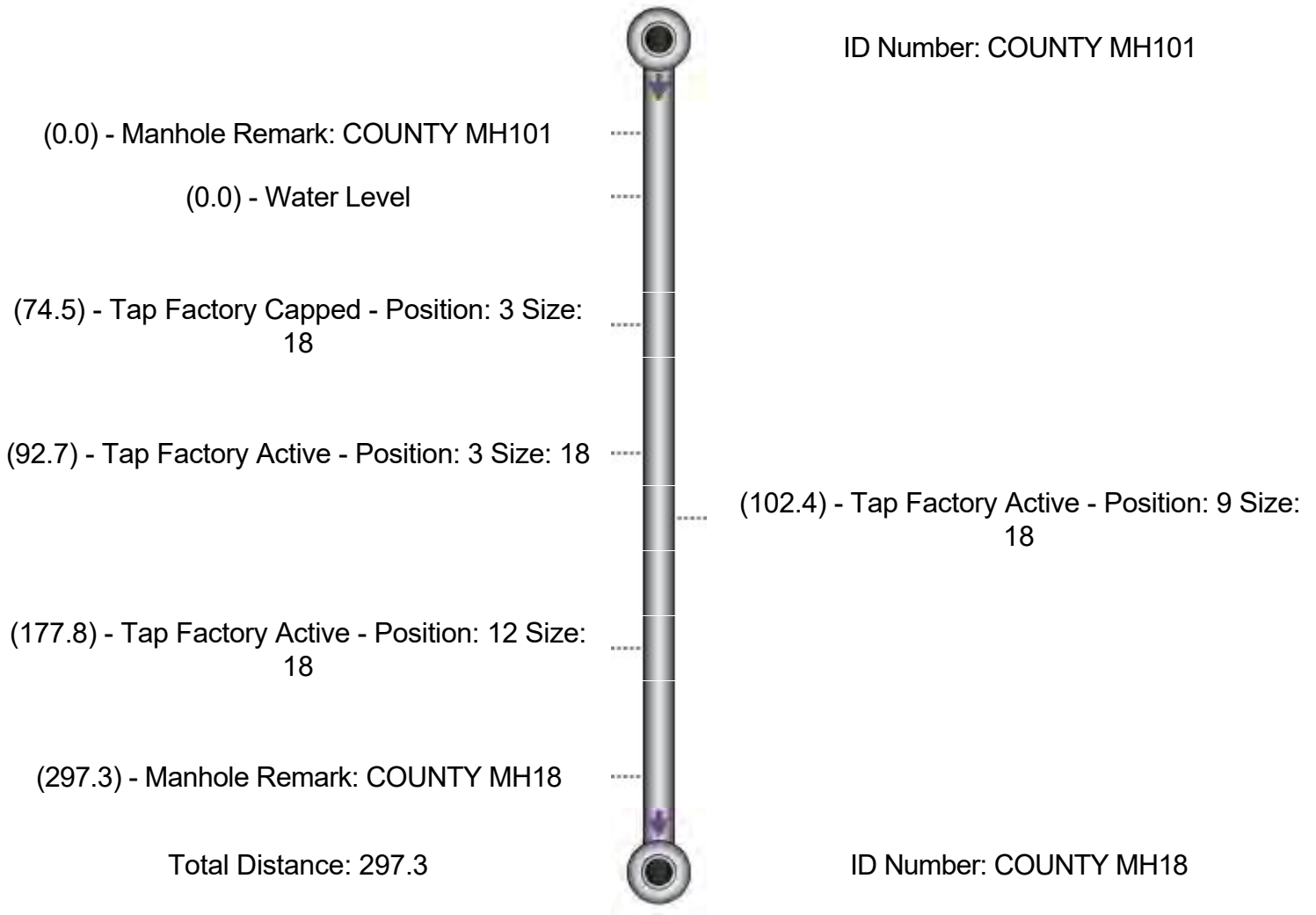
Upstream MH: COUNTY MH101

Downstream MH: COUNTY MH18

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe







### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/24/2017 07:16
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH139	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH59	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	30	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	361.4
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 7:16:00 AM

Pipe Segment Reference:

Street: EASEMENT

Upstream MH: COUNTY MH139

Length Surveyed: 361.4

Downstream MH: COUNTY MH59

Pacp Quick Overall Rating: 0000

Direction of Survey: Upstream

Height (Diameter): 30

Material: Reinforced Concrete  
Pipe

Street: EASEMENT

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH59</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
361.4	<p align="center"><b>Catch Basin</b> Severity: None Remarks: COUNTY MH139</p>	

# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 7:16:00 AM

Street: EASEMENT

Length Surveyed: 361.4

Pacp Quick Overall Rating: 0000

Height (Diameter): 30

Street: EASEMENT

Pipe Segment Reference:

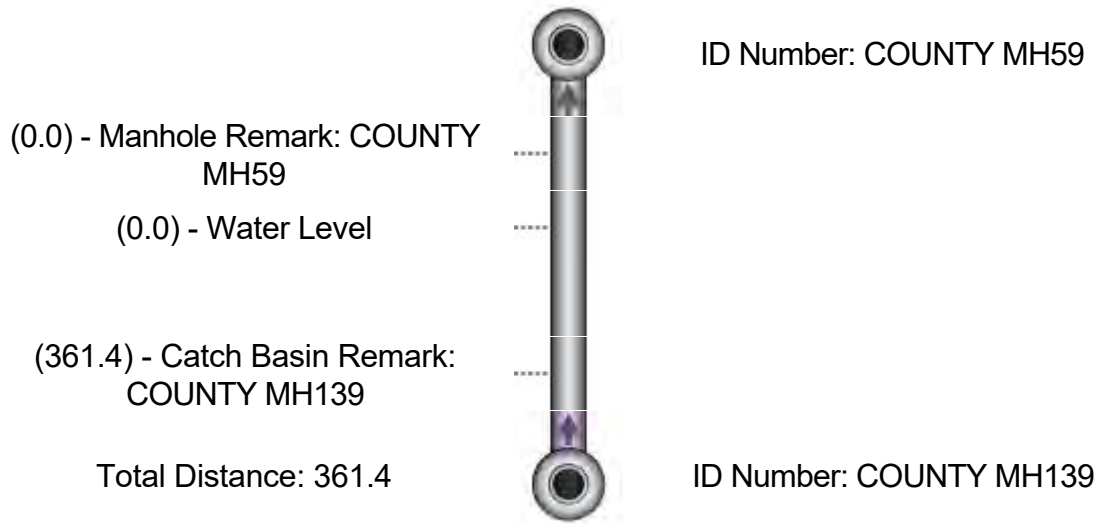
Upstream MH: COUNTY MH139

Downstream MH: COUNTY MH59

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/13/2017 07:07
<b>Street</b>	PACIFIC COAST HWY	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH17	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH2	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	39	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	542.9
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Urban
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	7	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/13/2017 7:07:00 AM

Pipe Segment Reference:

Street: PACIFIC COAST HWY

Upstream MH: COUNTY MH17

Length Surveyed: 542.9

Downstream MH: COUNTY MH2

Pacp Quick Overall Rating: 0000 Direction of Survey: Upstream

Height (Diameter): 39


Material: Reinforced Concrete Pipe

Street: PACIFIC COAST HWY

Distance	Fault Observation	Picture
0.0	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH2</b> </p>	
0.0	<p align="center"> <b>Water Level</b>  <b>Severity: None</b> </p>	
145.0	<p align="center"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
217.8	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 24</b> </p>	
229.6	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
245.3	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
275.3	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 1</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
473.7	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 1</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
519.2	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 1</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
542.9	<p style="text-align: center;"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH17</b></p>	

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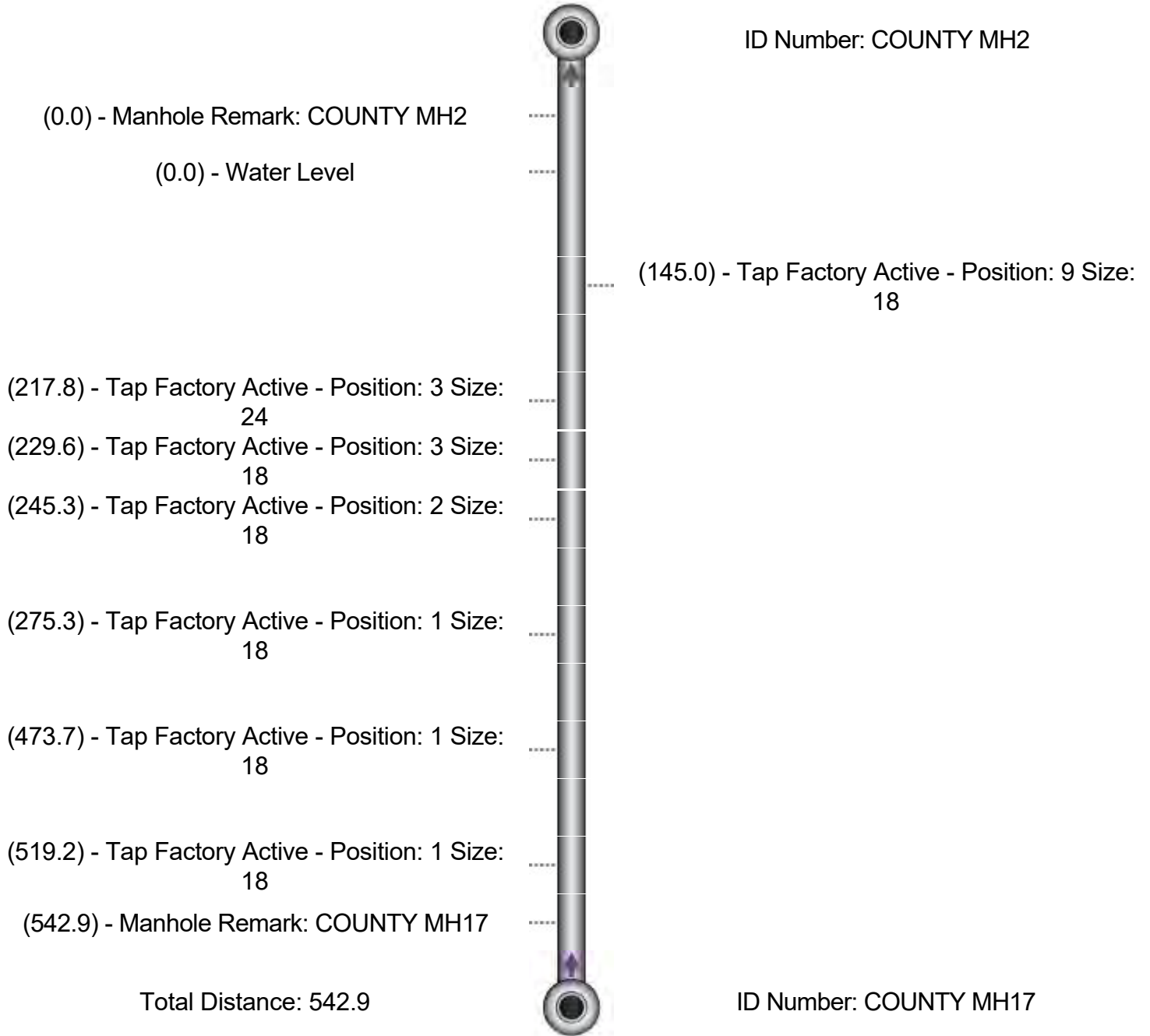


# Project: CITY OF HERMOSA BEACH

**Date:** 3/13/2017 7:07:00 AM  
**Street:** PACIFIC COAST HWY  
**Length Surveyed:** 542.9  
**Pacp Quick Overall Rating:** 0000  
**Height (Diameter):** 39  
**Street:** PACIFIC COAST HWY

**Pipe Segment Reference:**  
**Upstream MH:** COUNTY MH17  
**Downstream MH:** COUNTY MH2  
**Direction of Survey:** Upstream  
**Material:** Reinforced Concrete Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/21/2017 08:54
<b>Street</b>	VALLEY DR	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH18	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH43	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	51	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	175.9
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	4	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/21/2017 8:54:00 AM

Street: VALLEY DR

Length Surveyed: 175.9

Pacp Quick Overall Rating: 0000

Height (Diameter): 51

Street: VALLEY DR

Pipe Segment Reference:

Upstream MH: COUNTY MH18


Downstream MH: COUNTY MH43

Direction of Survey: Upstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH43</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
12.8	<p align="center"><b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 4</b></p>	

Distance	Fault Observation	Picture
42.2	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 4</b> </p>	
53.7	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 10</b>  <b>Severity: None</b>  <b>Size: 4</b> </p>	
167.0	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 4</b> </p>	

Distance	Fault Observation	Picture
175.9	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH18</b> </p>	

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# Project: CITY OF HERMOSA BEACH

Date: 2/21/2017 8:54:00 AM

Street: VALLEY DR

Length Surveyed: 175.9

Pacp Quick Overall Rating: 0000

Height (Diameter): 51

Street: VALLEY DR

Pipe Segment Reference:

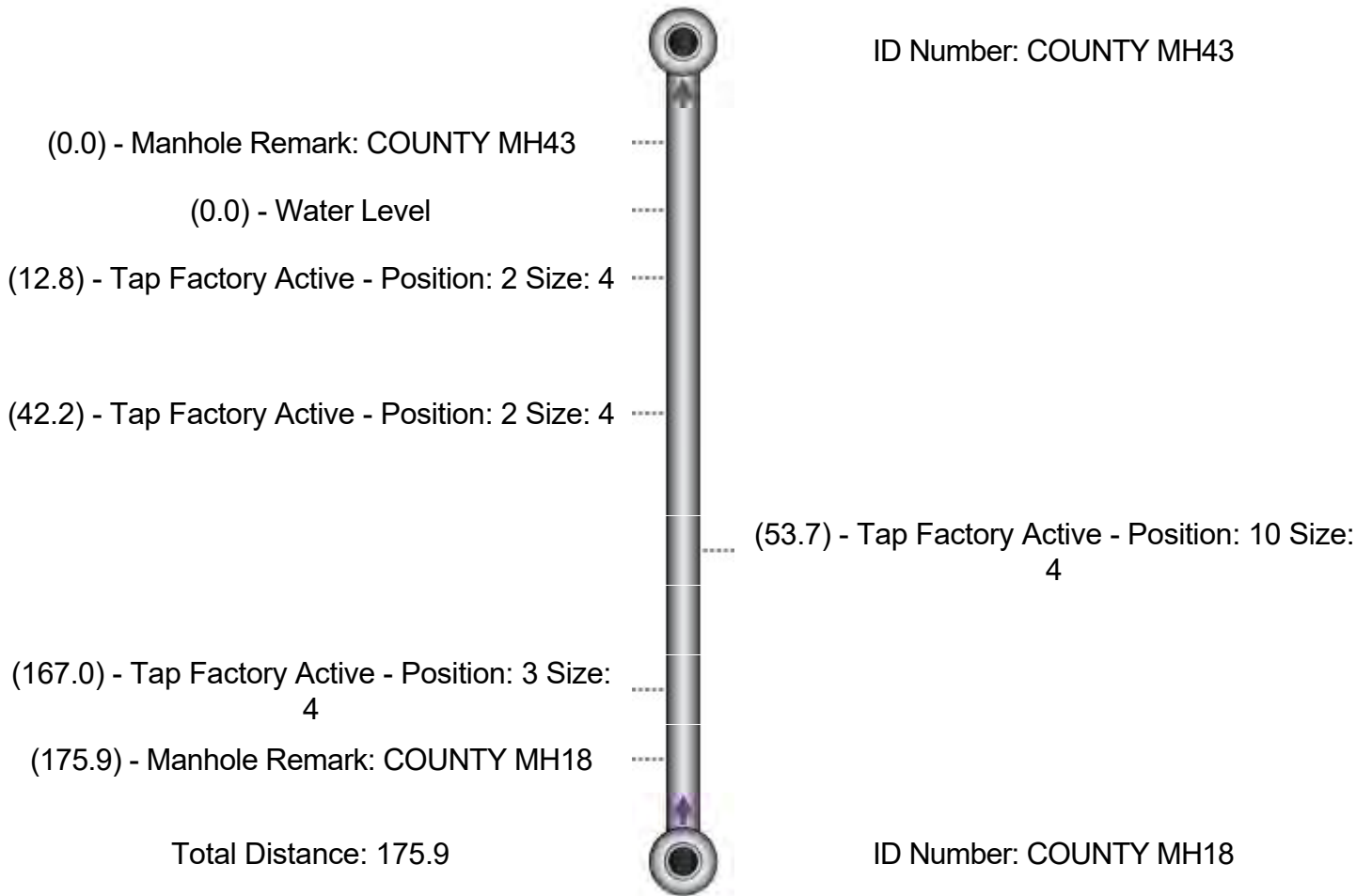
Upstream MH: COUNTY MH18

Downstream MH: COUNTY MH43

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 11:08
<b>Street</b>	PIER AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH2	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH75	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	33	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	404
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 11:08:00 AM

Pipe Segment Reference:

Street: PIER AVE

Upstream MH: COUNTY MH2

Length Surveyed: 404

Downstream MH: COUNTY MH75

Pacp Quick Overall Rating: 0000

Direction of Survey: Upstream



Height (Diameter): 33

Material: Reinforced Concrete Pipe

Street: PIER AVE

Distance	Fault Observation	Picture
0.0	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH75</b> </p>	
0.0	<p align="center"> <b>Water Level</b>  <b>Severity: None</b> </p>	
20.7	<p align="center"> <b>Tap Factory Active</b>  <b>Position: 11</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	



Distance	Fault Observation	Picture
161.4	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 10</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
404.0	<p style="text-align: center;"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH2</b></p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 11:08:00 AM

Street: PIER AVE

Length Surveyed: 404

Pacp Quick Overall Rating: 0000

Height (Diameter): 33

Street: PIER AVE

Pipe Segment Reference:

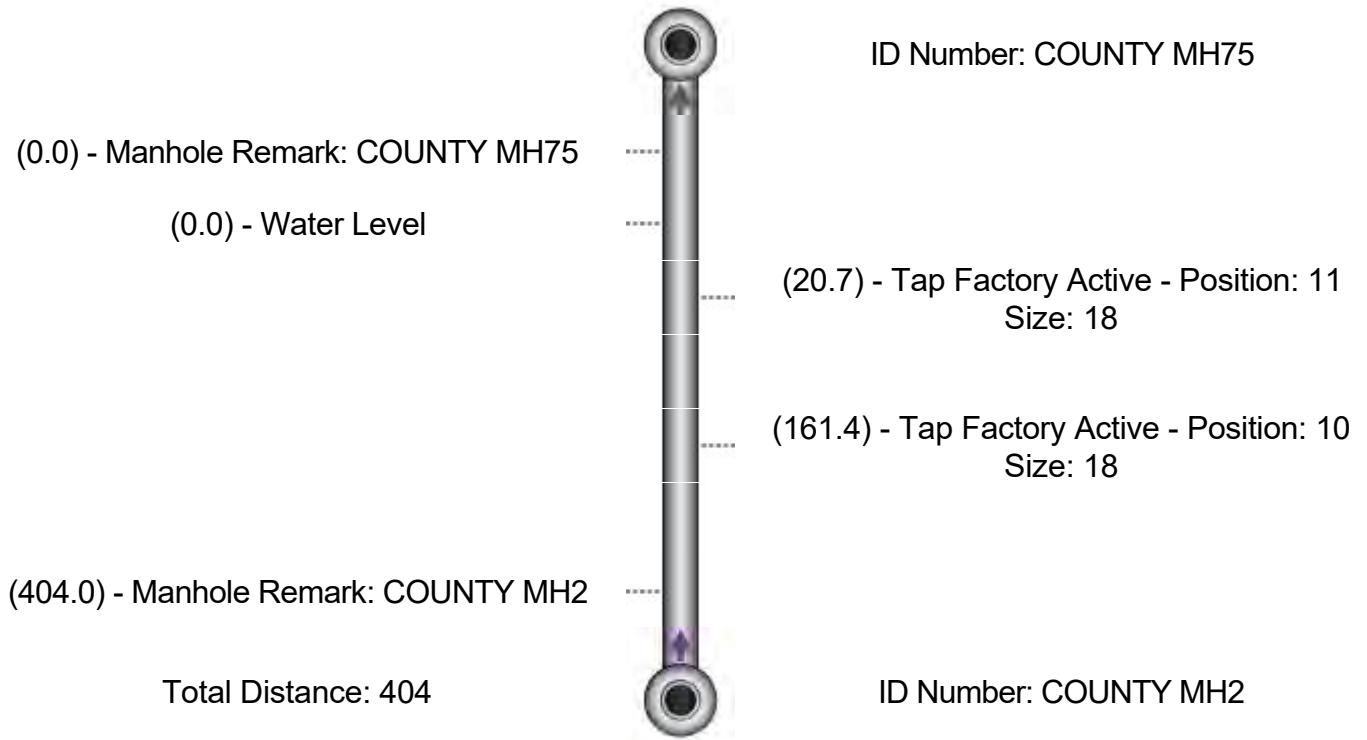
Upstream MH: COUNTY MH2

Downstream MH: COUNTY MH75

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 09:29
<b>Street</b>	14th ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH30	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH81	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	280.5
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 9:29:00 AM

Street: 14th ST

Length Surveyed: 280.5

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 24

Pipe Segment Reference:

Upstream MH: COUNTY MH30

Downstream MH: COUNTY MH81

Material: Reinforced Concrete Pipe

Street: 14th ST

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH30</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
280.5	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH81</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 9:29:00 AM

Street: 14th ST

Length Surveyed: 280.5

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: 14th ST

Pipe Segment Reference:

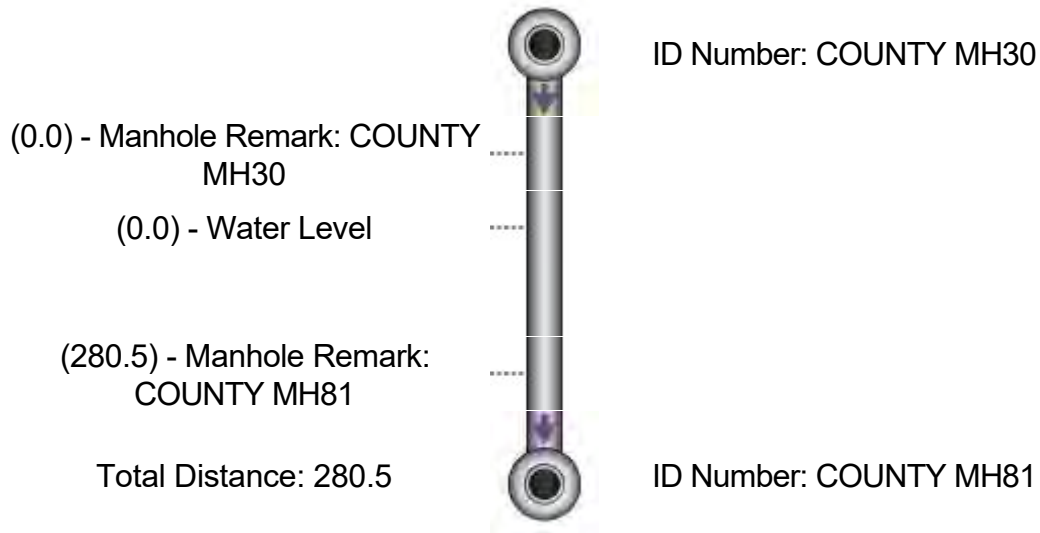
Upstream MH: COUNTY MH30

Downstream MH: COUNTY MH81

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



Created with the  report generator



### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 09:18
<b>Street</b>	14th ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH31	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH30	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	255.7
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 9:18:00 AM

Street: 14th ST

Length Surveyed: 255.7

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: 14th ST

Pipe Segment Reference:


Upstream MH: COUNTY MH31

Downstream MH: COUNTY MH30

Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH31</b> </p>	
0.0	<p align="center"> <b>Water Level</b>  <b>Severity: None</b> </p>	
68.8	<p align="center"> <b>Tap Factory Active</b>  <b>Position: 11</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
74.8	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
255.7	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH30</b> </p>	



# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 9:18:00 AM

Street: 14th ST

Length Surveyed: 255.7

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: 14th ST

Pipe Segment Reference:

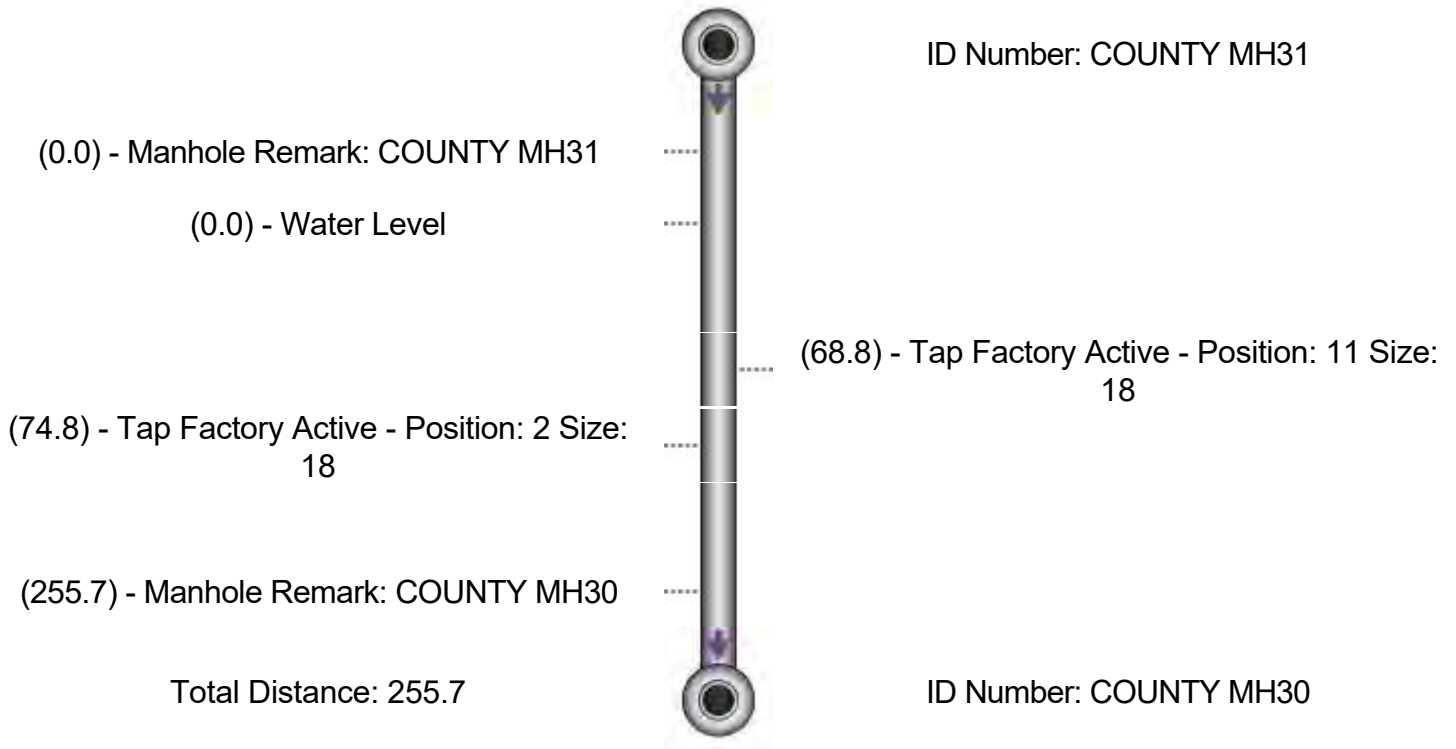
Upstream MH: COUNTY MH31

Downstream MH: COUNTY MH30

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 09:09
<b>Street</b>	JOY ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH32	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH31	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	255.5
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	4	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 9:09:00 AM

Street: JOY ST

Length Surveyed: 255.5

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: JOY ST

Pipe Segment Reference:



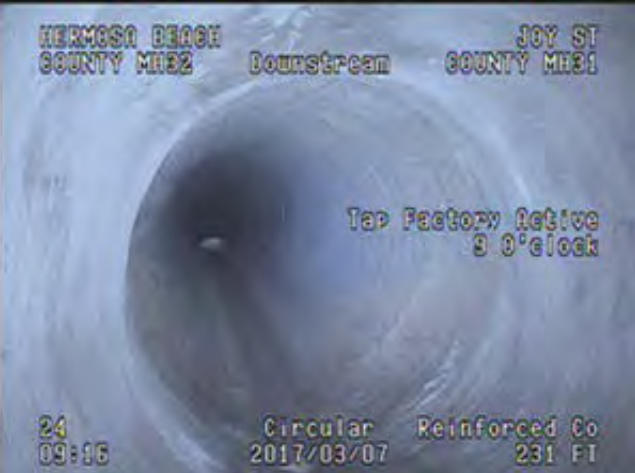
Upstream MH: COUNTY MH32


Downstream MH: COUNTY MH31

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH32</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
118.6	<p align="center"><b>Tap Factory Active</b> Position: 3 Severity: None Size: 18</p>	

Distance	Fault Observation	Picture
213.5	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	 <p>HERMOSA BEACH COUNTY MH32      Downstream      JOY ST COUNTY MH31</p> <p style="text-align: right;">Tap Factory Active 3 0'clock</p> <p>24      Circular      Reinforced Co 09:15      2017/03/07      213.5 FT</p>
221.4	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	 <p>HERMOSA BEACH COUNTY MH32      Downstream      JOY ST COUNTY MH31</p> <p style="text-align: right;">Tap Factory Active 9 0'clock</p> <p>24      Circular      Reinforced Co 09:15      2017/03/07      221.4 FT</p>
231.0	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	 <p>HERMOSA BEACH COUNTY MH32      Downstream      JOY ST COUNTY MH31</p> <p style="text-align: right;">Tap Factory Active 9 0'clock</p> <p>24      Circular      Reinforced Co 09:16      2017/03/07      231 FT</p>

Distance	Fault Observation	Picture
255.5	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH31</b> </p>	

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# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 9:09:00 AM

Street: JOY ST

Length Surveyed: 255.5

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: JOY ST

Pipe Segment Reference:

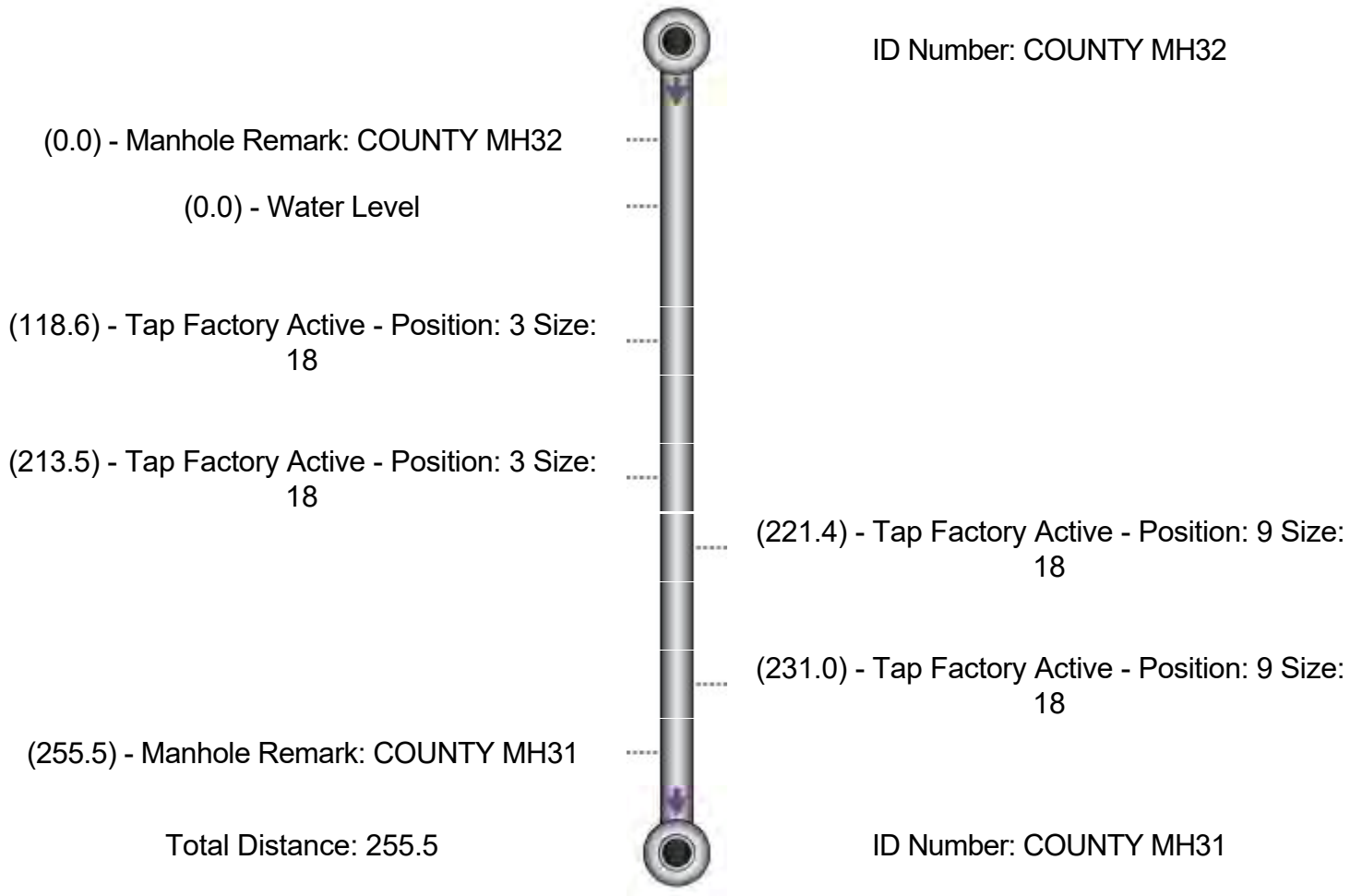
Upstream MH: COUNTY MH32

Downstream MH: COUNTY MH31

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/22/2017 09:50
<b>Street</b>	3rd STREET	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH38	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH82	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	318.1
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 9:50:00 AM

Pipe Segment Reference:

Street: 3rd STREET

Upstream MH: COUNTY MH38

Length Surveyed: 318.1

Downstream MH: COUNTY MH82

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 24

Material: Reinforced Concrete Pipe

Street: 3rd STREET

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH38</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
318.1	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH82</p>	



# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 9:50:00 AM

Street: 3rd STREET

Length Surveyed: 318.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: 3rd STREET

Pipe Segment Reference:

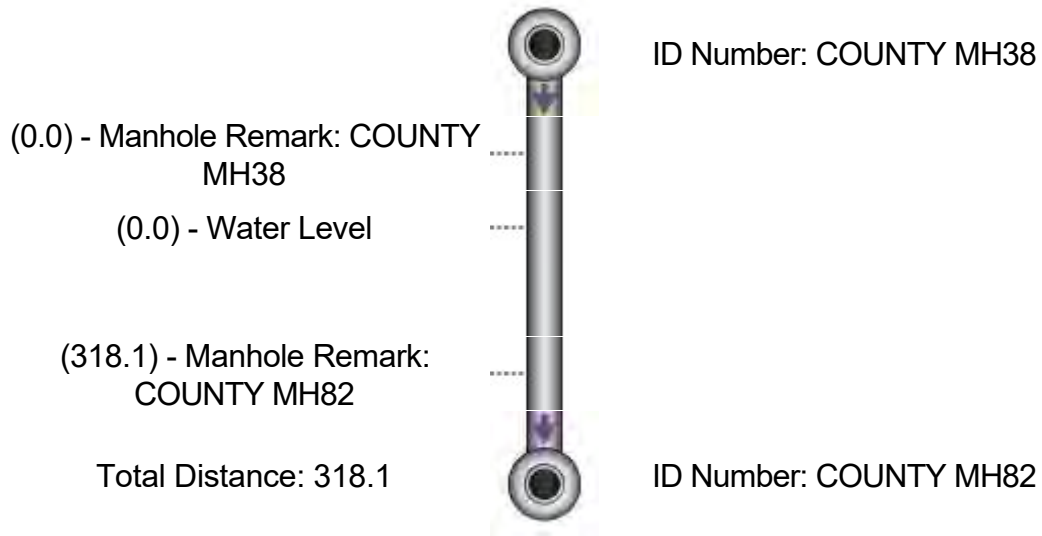
Upstream MH: COUNTY MH38

Downstream MH: COUNTY MH82

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/22/2017 07:38
<b>Street</b>	VALLEY DR	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH41	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH70	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	63	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	367.9
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	3	<b>Number of Roots</b>	1
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 7:38:00 AM

Pipe Segment Reference:

Street: VALLEY DR

Upstream MH: COUNTY MH41

Length Surveyed: 367.9

Downstream MH: COUNTY MH70

Pacp Quick Overall Rating: 4100


Direction of Survey: Downstream



Height (Diameter): 63

Material: Reinforced Concrete Pipe

Street: VALLEY DR

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH41</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
114.9	<p align="center"><b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 4</b></p>	

Distance	Fault Observation	Picture
114.9	<p>Roots Ball Lateral            Position: 2            Severity: None</p>	
114.9	<p>Picture Number: 2            Roots Ball Lateral            Position: 2</p>	
243.3	<p>Tap Factory Active            Position: 2            Severity: None            Size: 4</p>	

Distance	Fault Observation	Picture
324.0	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
367.9	<p style="text-align: center;"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH70</b></p>	

# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 7:38:00 AM

Street: VALLEY DR

Length Surveyed: 367.9

Pacp Quick Overall Rating: 4100

Height (Diameter): 63

Street: VALLEY DR

Pipe Segment Reference:

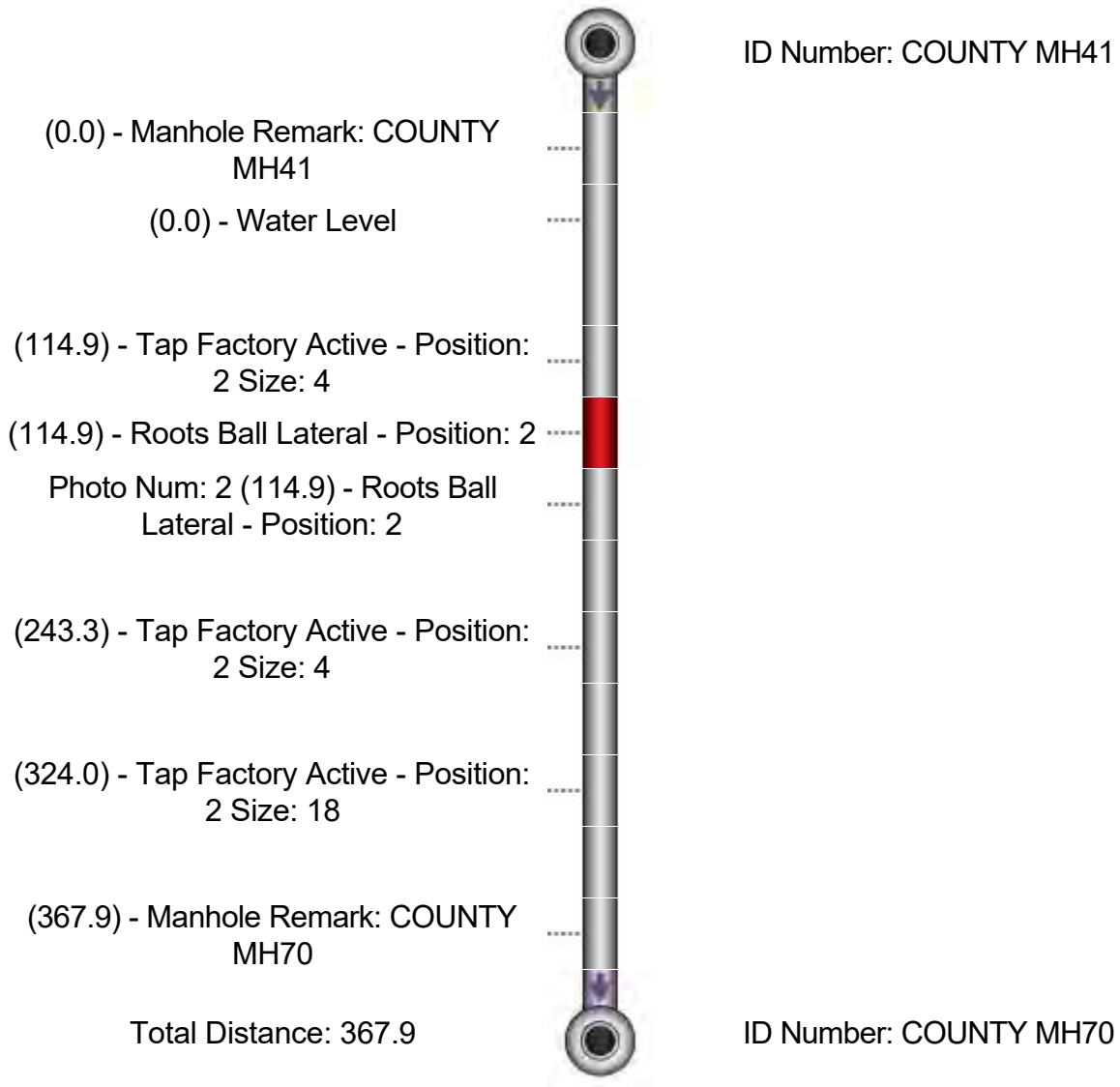
Upstream MH: COUNTY MH41

Downstream MH: COUNTY MH70

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/22/2017 07:27
<b>Street</b>	VALLEY DR	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH43	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH41	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	60	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	327.1
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	1	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 7:27:00 AM

Pipe Segment Reference:

Street: VALLEY DR

Upstream MH: COUNTY MH43

Length Surveyed: 327.1

Downstream MH: COUNTY MH41

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream


Height (Diameter): 60

Material: Reinforced Concrete  
Pipe

Street: VALLEY DR

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH43</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
14.0	<p align="center"><b>Tap Factory Active</b> Position: 10 Severity: None Size: 4</p>	



Distance	Fault Observation	Picture
327.1	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH41</b> </p>	 <p>HERMOSA BEACH VALLEY DR  COUNTY MH43 Downstream COUNTY MH41</p> <p align="right">Manhole  COUNTY MH41</p> <p>60 Circular Reinforced Co  07:37 2017/02/22 327.1 FT</p>

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# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 7:27:00 AM

Street: VALLEY DR

Length Surveyed: 327.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 60

Street: VALLEY DR

Pipe Segment Reference:

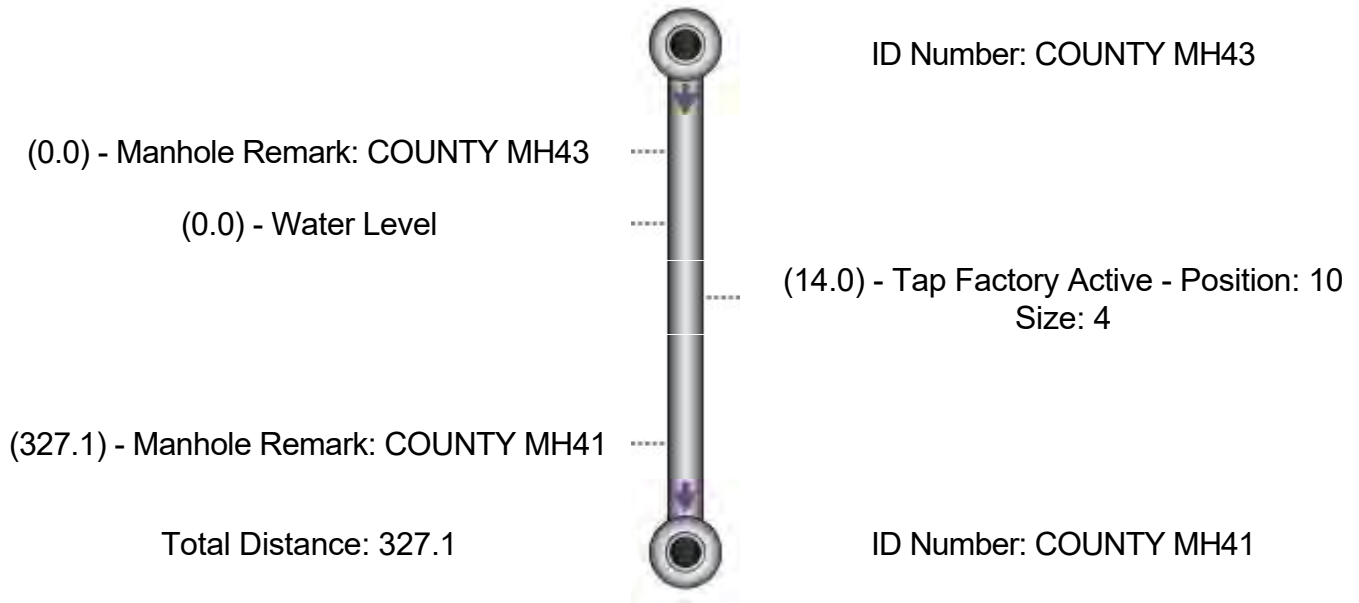
Upstream MH: COUNTY MH43

Downstream MH: COUNTY MH41

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/2/2017 10:57
<b>Street</b>	HERMOSA AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH48	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH49	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	42	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	415.8
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Suburban/Rural
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	5	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 10:57:00 AM

Street: HERMOSA AVE

Length Surveyed: 415.8

Pacp Quick Overall Rating: 0000

Height (Diameter): 42

Street: HERMOSA AVE




Pipe Segment Reference:

Upstream MH: COUNTY MH48




Downstream MH: COUNTY MH49


Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH48</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
0.0	<p align="center"><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
244.8	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
254.2	<p style="text-align: center;"> <b>Shape or Size Change</b>  <b>Severity: None</b>  <b>Size: 42</b>  <b>Remarks: RECTANGLE</b> </p>	
265.7	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
279.3	<p>Tap Factory Active            Position: 3            Severity: None            Size: 18</p>	 <p>HERMOSA BEACH COUNTY ME48      Bounstream      HERMOSA AVE COUNTY ME49</p> <p>Tap Factory Active 3 o'clock</p> <p>42      Circular      Reinforced Co 11:20      2017/03/02      279.3 FT</p>
293.4	<p>Tap Factory Active            Position: 9            Severity: None            Size: 18</p>	 <p>HERMOSA BEACH COUNTY ME48      Bounstream      HERMOSA AVE COUNTY ME49</p> <p>Tap Factory Active 9 o'clock</p> <p>42      Circular      Reinforced Co 11:21      2017/03/02      293.4 FT</p>
308.9	<p>Shape or Size Change            Severity: None            Size: 42            Remarks: CICULAR</p>	 <p>HERMOSA BEACH COUNTY ME48      Bounstream      HERMOSA AVE COUNTY ME49</p> <p>Shape or Size Change CICULAR</p> <p>42      Circular      Reinforced Co 11:21      2017/03/02      308.9 FT</p>

Distance	Fault Observation	Picture
415.8	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH49</b> </p>	

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# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 10:57:00 AM

Street: HERMOSA AVE

Length Surveyed: 415.8

Pacp Quick Overall Rating: 0000

Height (Diameter): 42

Street: HERMOSA AVE

Pipe Segment Reference:

Upstream MH: COUNTY MH48

Downstream MH: COUNTY MH49

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH48

(0.0) - Manhole Remark: COUNTY MH48

(0.0) - Water Level

(0.0) - Tap Factory Active - Position: 3 Size: 18

(244.8) - Tap Factory Active - Position: 9 Size: 18

(254.2) - Shape or Size Change Size: 42 Remark:  
RECTANGLE

(265.7) - Tap Factory Active - Position: 9 Size: 18

(279.3) - Tap Factory Active - Position: 3 Size: 18

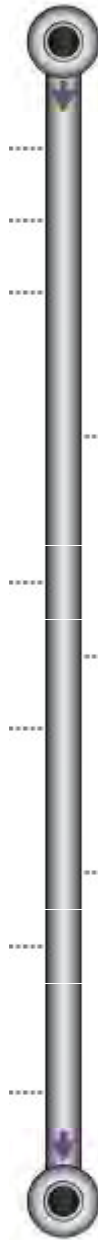
(293.4) - Tap Factory Active - Position: 9 Size: 18

(308.9) - Shape or Size Change Size: 42 Remark:  
CICULAR

(415.8) - Manhole Remark: COUNTY MH49

Total Distance: 415.8

ID Number: COUNTY MH49







### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/2/2017 11:24
<b>Street</b>	HERMOSA AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH49	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH35	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	42	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	378.1
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Suburban/Rural
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 11:24:00 AM

Street: HERMOSA AVE

Length Surveyed: 378.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 42

Street: HERMOSA AVE

Pipe Segment Reference:

Upstream MH: COUNTY MH49

Downstream MH: COUNTY MH35

Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH49</b> </p>	
0.0	<p align="center"> <b>Water Level</b>  <b>Severity: None</b> </p>	
184.2	<p align="center"> <b>Tap Factory Capped</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 21</b> </p>	

Distance	Fault Observation	Picture
184.2	<p>Shape or Size Change Severity: None Size: 45</p>	
378.1	<p>Tap Factory Active Position: 3 Severity: None Size: 18</p>	
378.1	<p>Manhole Severity: None Remarks: COUNTY MH35</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 11:24:00 AM

Street: HERMOSA AVE

Length Surveyed: 378.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 42

Street: HERMOSA AVE

Pipe Segment Reference:

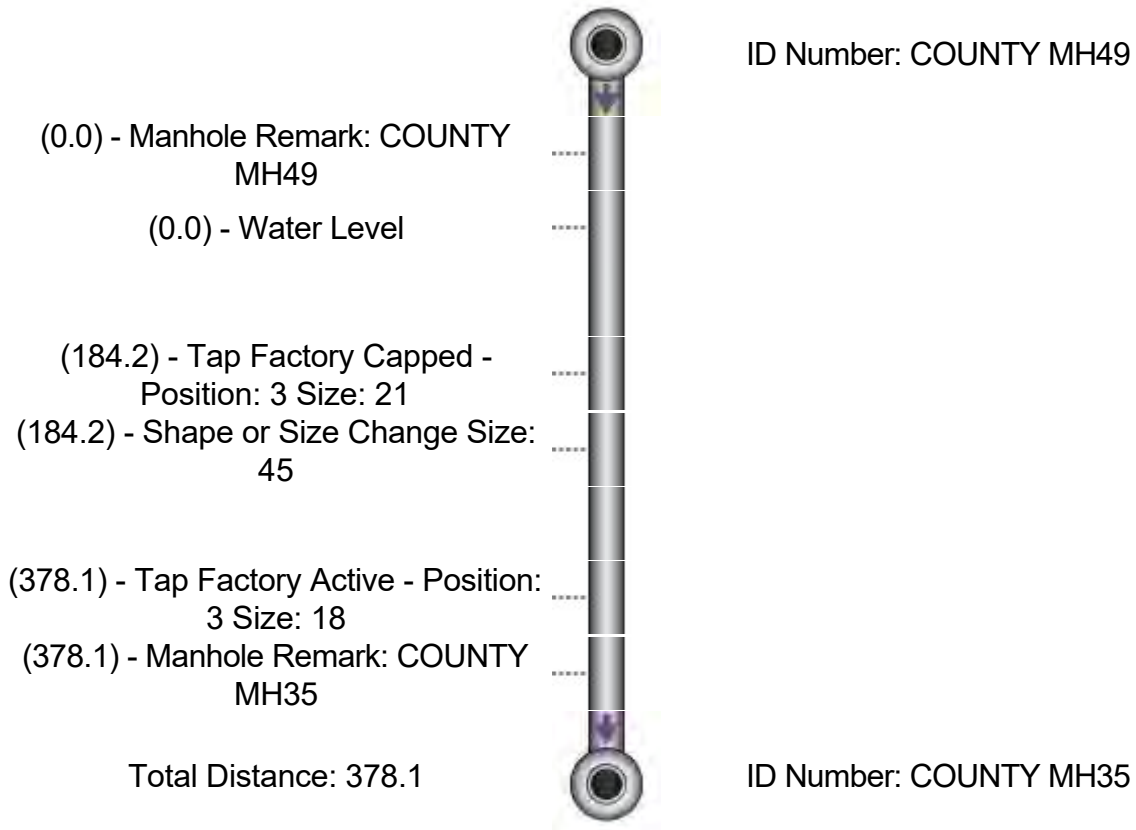
Upstream MH: COUNTY MH49

Downstream MH: COUNTY MH35

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/6/2017 08:07
<b>Street</b>	GOULD AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH52	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH95	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	316.9
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Alley
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 8:07:00 AM

Street: GOULD AVE

Length Surveyed: 316.9

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: GOULD AVE




Pipe Segment Reference:



Upstream MH: COUNTY MH52

Downstream MH: COUNTY MH95

Direction of Survey: Upstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH95</b> </p>	
0.0	<p align="center"> <b>Water Level</b>  <b>Severity: None</b> </p>	
70.3	<p align="center"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
244.1	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 1</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
316.9	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH52</b> </p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 8:07:00 AM

Street: GOULD AVE

Length Surveyed: 316.9

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: GOULD AVE

Pipe Segment Reference:

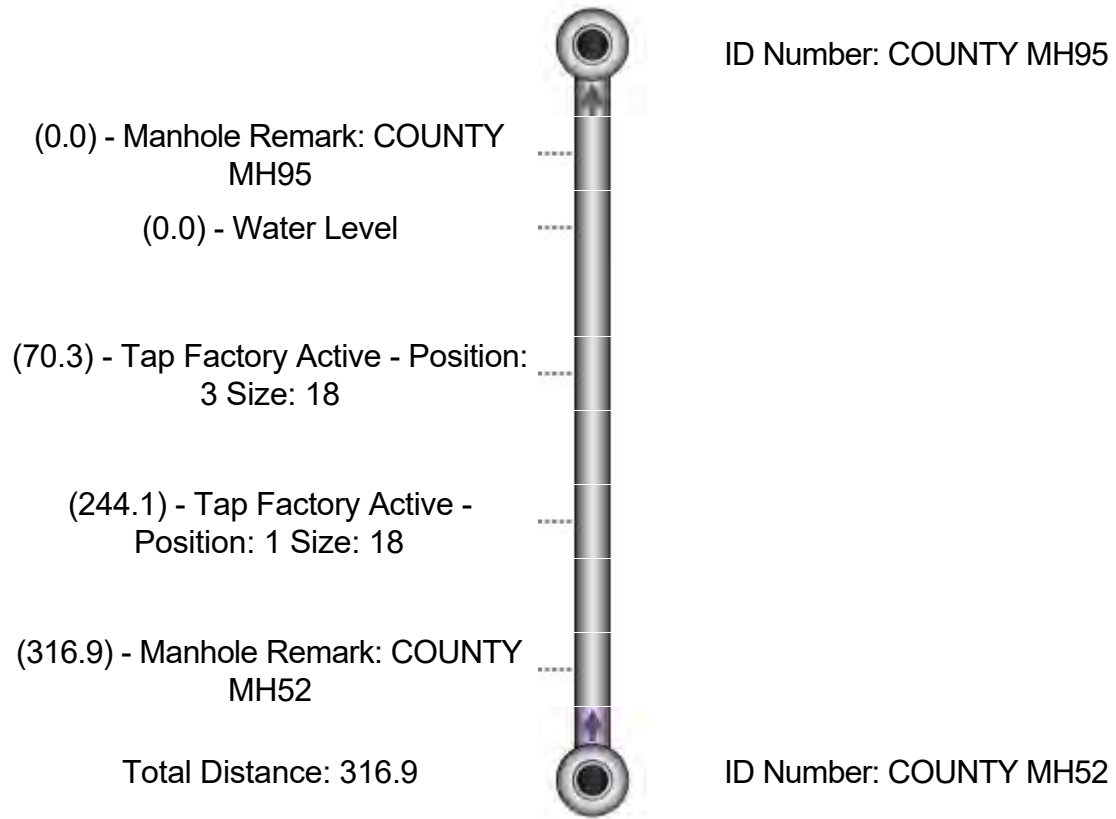
Upstream MH: COUNTY MH52

Downstream MH: COUNTY MH95

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe







### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/27/2017 09:41
<b>Street</b>	24th ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH53	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH68	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	30	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	317.6
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 9:41:00 AM

Pipe Segment Reference:

Street: 24th ST

Upstream MH: COUNTY MH53

Length Surveyed: 317.6

Downstream MH: COUNTY MH68

Pacp Quick Overall Rating: 0000 Direction of Survey: Upstream

Height (Diameter): 30

Material: Reinforced Concrete Pipe

Street: 24th ST

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH68</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
317.6	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH53</p>	

# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 9:41:00 AM

Street: 24th ST

Length Surveyed: 317.6

Pacp Quick Overall Rating: 0000

Height (Diameter): 30

Street: 24th ST

Pipe Segment Reference:

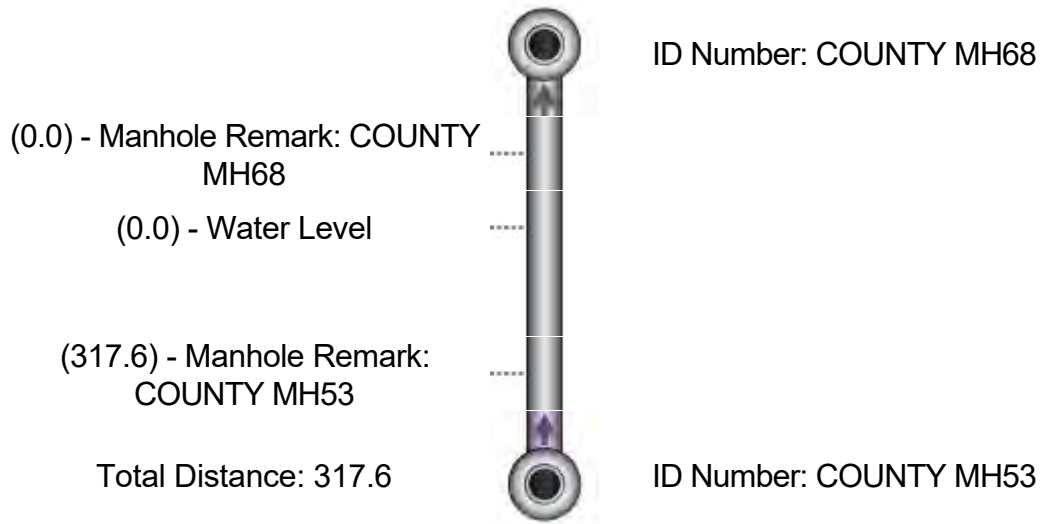
Upstream MH: COUNTY MH53

Downstream MH: COUNTY MH68

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



Created with the  report generator



### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 06:52
<b>Street</b>	ARDMORE AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH54	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH67	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	228.1
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 6:52:00 AM

Street: ARDMORE AVE

Length Surveyed: 228.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: ARDMORE AVE

Pipe Segment Reference:



Upstream MH: COUNTY MH54

Downstream MH: COUNTY MH67

Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH54</b> </p>	
0.0	<p align="center"> <b>Water Level</b>  <b>Severity: None</b> </p>	
0.0	<p align="center"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
227.2	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
228.1	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH67</b> </p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 6:52:00 AM

Street: ARDMORE AVE

Length Surveyed: 228.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: ARDMORE AVE

Pipe Segment Reference:

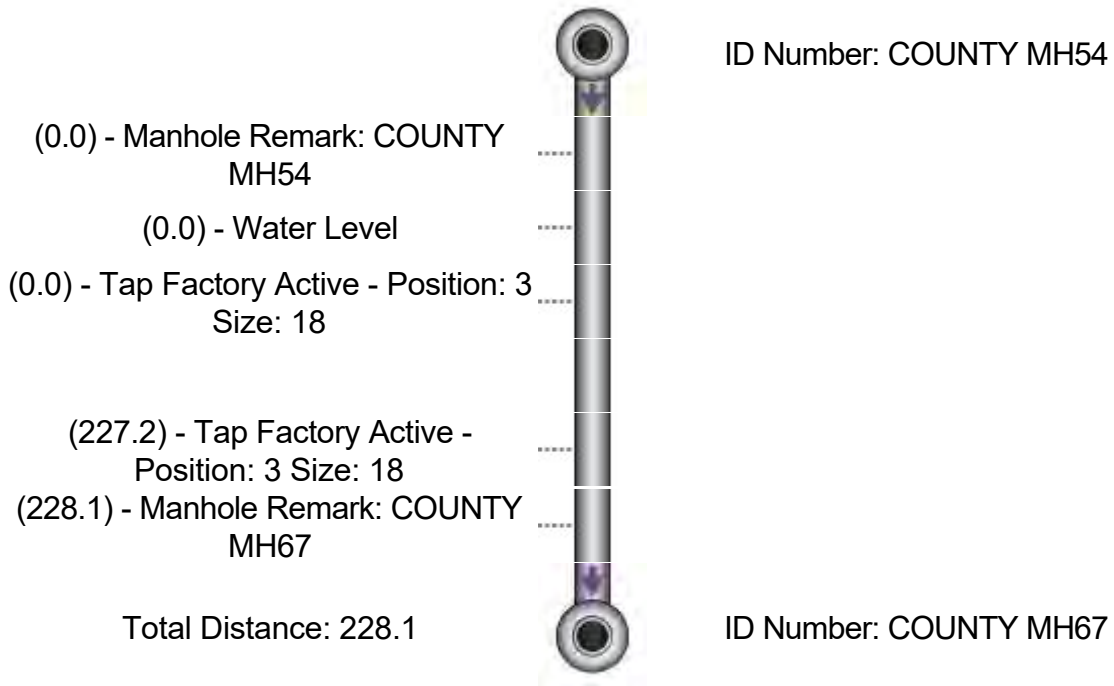
Upstream MH: COUNTY MH54

Downstream MH: COUNTY MH67

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/6/2017 09:34
<b>Street</b>	GOULD AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH55	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH97	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	310.8
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Urban
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes



# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 9:34:00 AM

Street: GOULD AVE

Length Surveyed: 310.8

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 24

Street: GOULD AVE

Pipe Segment Reference:

Upstream MH: COUNTY MH55

Downstream MH: COUNTY MH97

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH55</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
310.8	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH97</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 9:34:00 AM

Street: GOULD AVE

Length Surveyed: 310.8

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: GOULD AVE

Pipe Segment Reference:

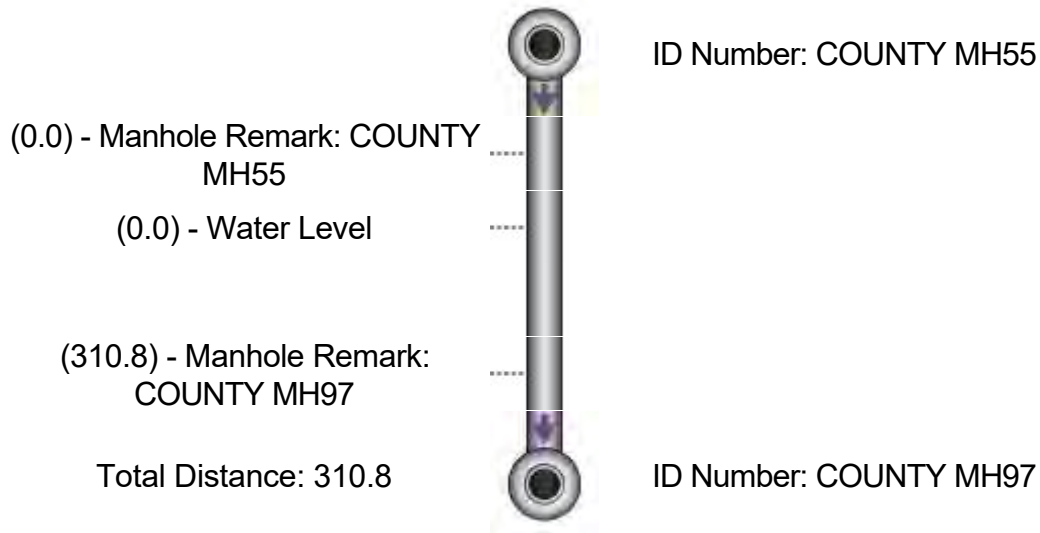
Upstream MH: COUNTY MH55

Downstream MH: COUNTY MH97

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



Created with the  report generator



### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/24/2017 08:47
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH56	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH99	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	36	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	325.1
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	1	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	No

# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 8:47:00 AM

Pipe Segment Reference:

Street: EASEMENT

Upstream MH: COUNTY MH56

Length Surveyed: 325.1




Downstream MH: COUNTY MH99


Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 36

Material: Reinforced Concrete Pipe

Street: EASEMENT

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH56</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
150.8	<p align="center"><b>Tap Factory Active</b>  <b>Position: 12</b>  <b>Severity: None</b>  <b>Size: 6</b></p>	

Distance	Fault Observation	Picture
325.1	<p style="text-align: center;"><b>Abandoned Survey</b>  <b>Severity: None</b>  <b>Remarks: WILL ATTEMPT A REV</b>  <b>PULL APROX 50FT FROM MH</b></p>	

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# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 8:47:00 AM

Street: EASEMENT

Length Surveyed: 325.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 36

Street: EASEMENT

Pipe Segment Reference:

Upstream MH: COUNTY MH56

Downstream MH: COUNTY MH99

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

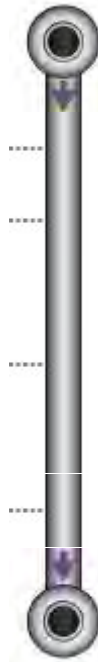
(0.0) - Manhole Remark: COUNTY MH56

(0.0) - Water Level

(150.8) - Tap Factory Active - Position: 12 Size: 6

(325.1) - Abandoned Survey Remark: WILL  
ATTEMPT A REV PULL APROX 50FT FROM MH

Total Distance: 325.1



ID Number: COUNTY MH56

ID Number: COUNTY MH99



### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/27/2017 09:13
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH56	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH99	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	36	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	84.4
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	No

# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 9:13:00 AM

Pipe Segment Reference:

Street: EASEMENT

Upstream MH: COUNTY MH56

Length Surveyed: 84.4

Downstream MH: COUNTY MH99




Pacp Quick Overall Rating: 0000

Direction of Survey: Upstream

Height (Diameter): 36

Material: Reinforced Concrete  
Pipe

Street: EASEMENT

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH99</p>	 <p>HERMOSA BEACH COUNTY MH56 Upstream EASEMENT COUNTY MH99 Manhole COUNTY MH99 36 09:15 Circular 2017/02/27 Reinforced Co 0 FT</p>
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	 <p>HERMOSA BEACH COUNTY MH56 Upstream EASEMENT COUNTY MH99 Water Level 36 09:15 Circular 2017/02/27 Reinforced Co 0 FT</p>
84.4	<p align="center"><b>Abandoned Survey</b> Severity: None Remarks: REVERSE PULL COMPLETE</p>	 <p>HERMOSA BEACH COUNTY MH56 Upstream EASEMENT COUNTY MH99 Abandoned Survey REVERSE PULL COMPLETE 36 09:18 Circular 2017/02/27 Reinforced Co 84.4 FT</p>



# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 9:13:00 AM

Street: EASEMENT

Length Surveyed: 84.4

Pacp Quick Overall Rating: 0000

Height (Diameter): 36

Street: EASEMENT

Pipe Segment Reference:

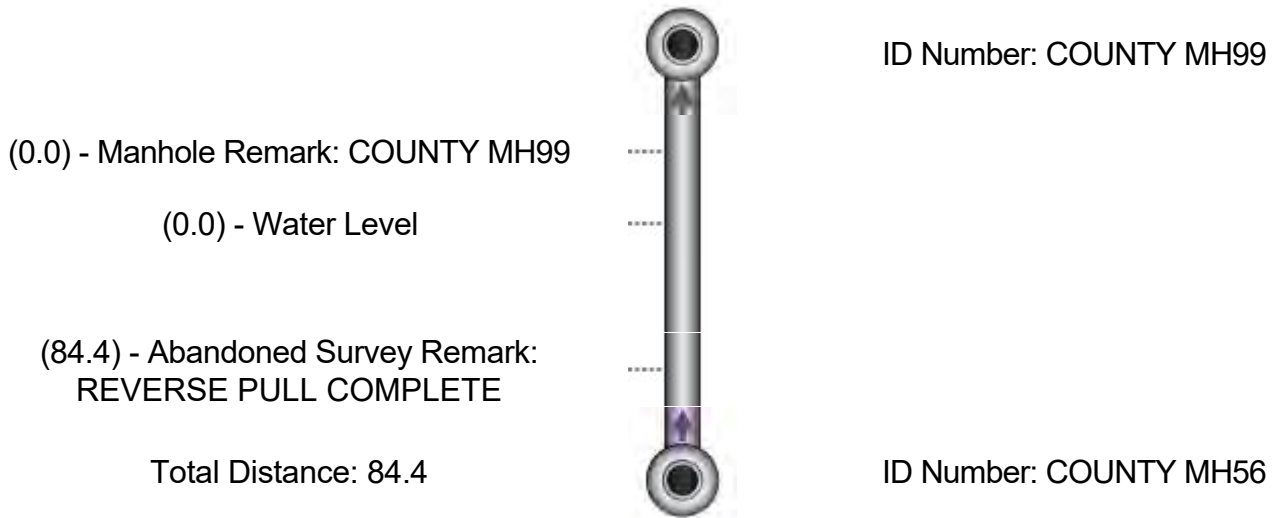
Upstream MH: COUNTY MH56

Downstream MH: COUNTY MH99

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/24/2017 07:53
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH57	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH59	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	335.1
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	4	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 7:53:00 AM

Pipe Segment Reference:

Street: EASEMENT

Upstream MH: COUNTY MH57

Length Surveyed: 335.1

Downstream MH: COUNTY MH59

Pacp Quick Overall Rating: 0000

Direction of Survey: Upstream



Height (Diameter): 24

Material: Reinforced Concrete Pipe

Street: EASEMENT

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH59</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
5.5	<p align="center"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 24</b></p>	

Distance	Fault Observation	Picture
202.1	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 12</b>  <b>Severity: None</b>  <b>Size: 4</b> </p>	
248.8	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 12</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
254.2	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
335.1	<p align="center"> <b>General Observation</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH140 NON EXSISTING MANHOLE</b> </p>	
335.1	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH57</b> </p>	

# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 7:53:00 AM

Street: EASEMENT

Length Surveyed: 335.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: EASEMENT

Pipe Segment Reference:

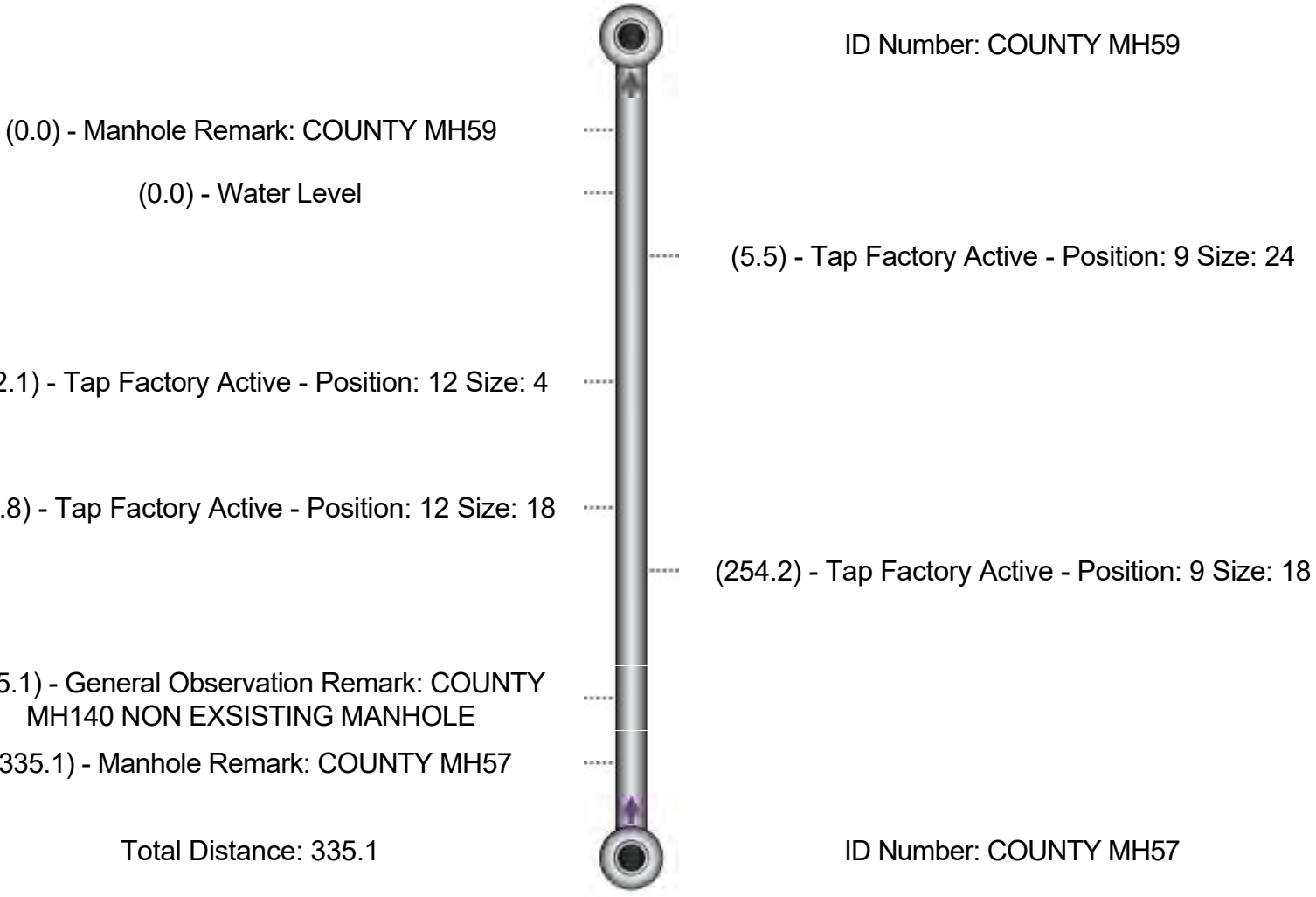
Upstream MH: COUNTY MH57

Downstream MH: COUNTY MH59

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/6/2017 10:20
<b>Street</b>	S SEPULVEDA BLVD	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH58	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH52	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	321.3
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Urban
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 10:20:00 AM

Street: S SEPULVEDA BLVD

Length Surveyed: 321.3

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: S SEPULVEDA BLVD

Pipe Segment Reference:

Upstream MH: COUNTY MH58

Downstream MH: COUNTY MH52

Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH58</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
321.3	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH52</p>	



# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 10:20:00 AM

Street: S SEPULVEDA BLVD

Length Surveyed: 321.3

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: S SEPULVEDA BLVD

Pipe Segment Reference:

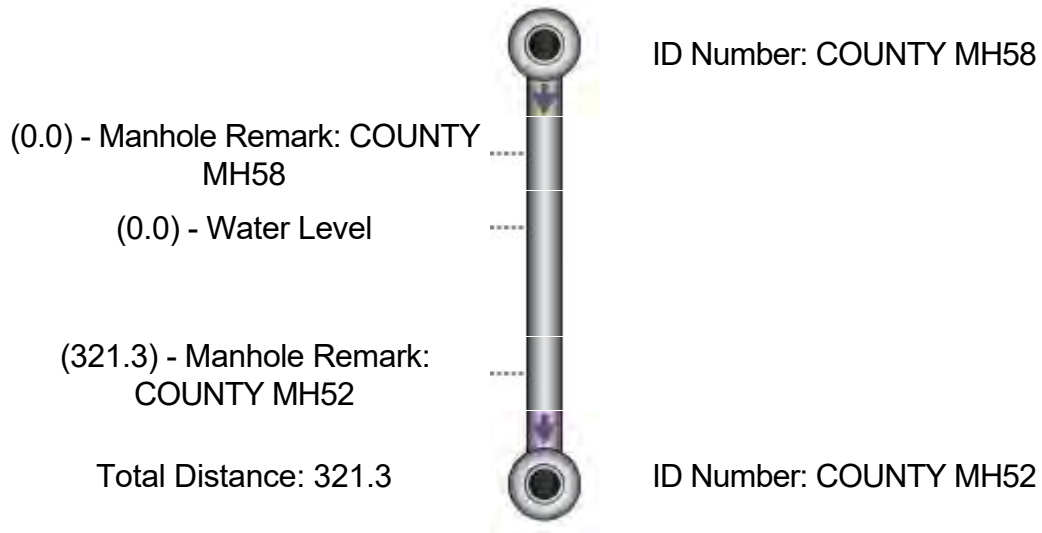
Upstream MH: COUNTY MH58

Downstream MH: COUNTY MH52

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/24/2017 08:11
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH59	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH60	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	36	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	312.1
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	1	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 8:11:00 AM

Pipe Segment Reference:

Street: EASEMENT

Upstream MH: COUNTY MH59

Length Surveyed: 312.1

Downstream MH: COUNTY MH60


Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 36

Material: Reinforced Concrete Pipe

Street: EASEMENT

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH59</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
140.5	<p align="center"><b>Tap Factory Active</b>  <b>Position: 10</b>  <b>Severity: None</b>  <b>Size: 12</b></p>	

Distance	Fault Observation	Picture
312.1	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH60</b> </p>	

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# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 8:11:00 AM

Street: EASEMENT

Length Surveyed: 312.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 36

Street: EASEMENT

Pipe Segment Reference:

Upstream MH: COUNTY MH59

Downstream MH: COUNTY MH60

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH59

(0.0) - Manhole Remark: COUNTY MH59

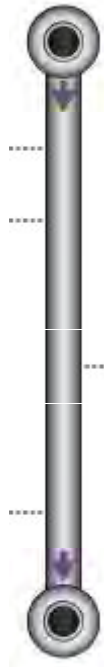
(0.0) - Water Level

(140.5) - Tap Factory Active - Position: 10  
Size: 12

(312.1) - Manhole Remark: COUNTY MH60

Total Distance: 312.1

ID Number: COUNTY MH60





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/24/2017 08:37
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH60	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH56	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	36	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	298.8
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 8:37:00 AM

Pipe Segment Reference:

Street: EASEMENT

Upstream MH: COUNTY MH60

Length Surveyed: 298.8




Downstream MH: COUNTY MH56

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 36

Material: Reinforced Concrete Pipe

Street: EASEMENT

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH60</p>	 <p>HERMOSA BEACH COUNTY MH60 Downstream EASEMENT COUNTY MH56 Manhole COUNTY MH60 36 08:38 Circular Reinforced Co 2017/02/24 0 FT</p>
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	 <p>HERMOSA BEACH COUNTY MH60 Downstream EASEMENT COUNTY MH56 Water Level SZ 36 08:39 Circular Reinforced Co 2017/02/24 0 FT</p>
298.8	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH56</p>	 <p>HERMOSA BEACH COUNTY MH60 Downstream EASEMENT COUNTY MH56 Manhole COUNTY MH56 36 08:45 Circular Reinforced Co 2017/02/24 298.8 FT</p>

# Project: CITY OF HERMOSA BEACH

Date: 2/24/2017 8:37:00 AM

Street: EASEMENT

Length Surveyed: 298.8

Pacp Quick Overall Rating: 0000

Height (Diameter): 36

Street: EASEMENT

Pipe Segment Reference:

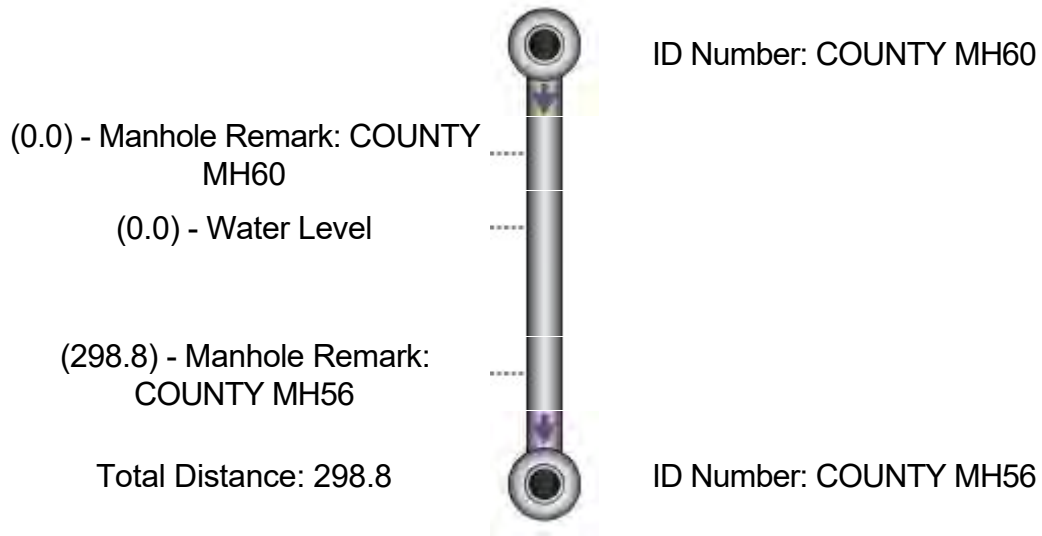
Upstream MH: COUNTY MH60

Downstream MH: COUNTY MH56

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/22/2017 09:25
<b>Street</b>	3rd STREET	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH63	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH38	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	36	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	318.4
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	1	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 9:25:00 AM

Pipe Segment Reference:

Street: 3rd STREET

Upstream MH: COUNTY MH63

Length Surveyed: 318.4

Downstream MH: COUNTY MH38


Pacp Quick Overall Rating: 0000 Direction of Survey: Upstream

Height (Diameter): 36

Material: Reinforced Concrete Pipe

Street: 3rd STREET

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH38</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
310.9	<p align="center"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
318.4	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH63</b> </p>	

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# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 9:25:00 AM

Street: 3rd STREET

Length Surveyed: 318.4

Pacp Quick Overall Rating: 0000

Height (Diameter): 36

Street: 3rd STREET

Pipe Segment Reference:

Upstream MH: COUNTY MH63

Downstream MH: COUNTY MH38

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH38

(0.0) - Manhole Remark: COUNTY MH38

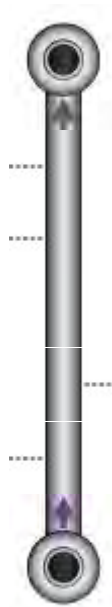
(0.0) - Water Level

(310.9) - Tap Factory Active - Position: 9  
Size: 18

(318.4) - Manhole Remark: COUNTY MH63

Total Distance: 318.4

ID Number: COUNTY MH63





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/27/2017 09:50
<b>Street</b>	24th ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH66	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH53	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	238.5
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 9:50:00 AM

Street: 24th ST

Length Surveyed: 238.5

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: 24th ST

Pipe Segment Reference:

Upstream MH: COUNTY MH66

Downstream MH: COUNTY MH53

Direction of Survey: Upstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH53</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
238.5	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH66</p>	

# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 9:50:00 AM

Street: 24th ST

Length Surveyed: 238.5

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: 24th ST

Pipe Segment Reference:

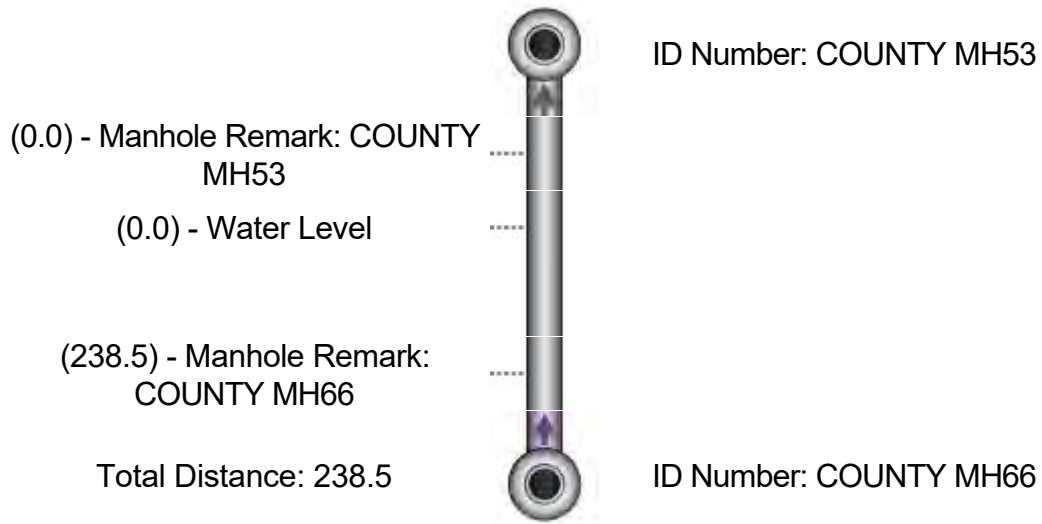
Upstream MH: COUNTY MH66

Downstream MH: COUNTY MH53

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 06:59
<b>Street</b>	ARDMORE AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH67	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH66	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	245.3
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	1	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes



# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 6:59:00 AM

Street: ARDMORE AVE

Length Surveyed: 245.3

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 24

Pipe Segment Reference:


Upstream MH: COUNTY MH67

Downstream MH: COUNTY MH66

Material: Reinforced Concrete Pipe

Street: ARDMORE AVE

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH67</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
168.8	<p align="center"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
245.3	<p style="text-align: center;"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH66</b></p>	

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# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 6:59:00 AM

Street: ARDMORE AVE

Length Surveyed: 245.3

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: ARDMORE AVE

Pipe Segment Reference:

Upstream MH: COUNTY MH67

Downstream MH: COUNTY MH66

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH67

(0.0) - Manhole Remark: COUNTY MH67

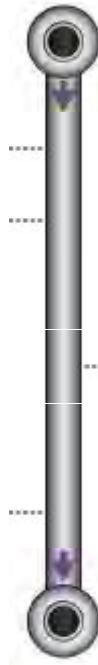
(0.0) - Water Level

(168.8) - Tap Factory Active - Position: 9  
Size: 18

(245.3) - Manhole Remark: COUNTY MH66

Total Distance: 245.3

ID Number: COUNTY MH66



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/27/2017 10:30
<b>Street</b>	POWER ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH68	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH96	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	48	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	399.8
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 10:30:00 AM

Pipe Segment Reference:

Street: POWER ST

Upstream MH: COUNTY MH68

Length Surveyed: 399.8

Downstream MH: COUNTY MH96

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 48

Material: Reinforced Concrete  
Pipe

Street: POWER ST

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH68</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
376.8	<p align="center"><b>Tap Factory Active</b> Position: 2 Severity: None Size: 18</p>	

Distance	Fault Observation	Picture
385.2	<p style="text-align: center;"> <b>Tap Factory</b>  <b>Position: 10</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
399.8	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH96</b> </p>	

# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 10:30:00 AM

Street: POWER ST

Length Surveyed: 399.8

Pacp Quick Overall Rating: 0000

Height (Diameter): 48

Street: POWER ST

Pipe Segment Reference:

Upstream MH: COUNTY MH68

Downstream MH: COUNTY MH96

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH68

(0.0) - Manhole Remark: COUNTY MH68

(0.0) - Water Level

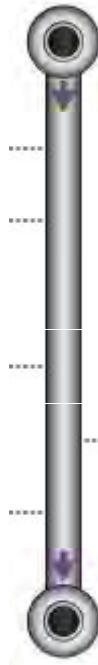
(376.8) - Tap Factory Active - Position: 2  
Size: 18

(385.2) - Tap Factory - Position: 10 Size: 18

(399.8) - Manhole Remark: COUNTY MH96

Total Distance: 399.8

ID Number: COUNTY MH96



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/2/2017 08:46
<b>Street</b>	16th ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH71	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH73	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	39	<b>Width</b>	72
<b>Shape</b>	Rectangular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	305.4
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Alley
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	3	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	1	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes



# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 8:46:00 AM

Pipe Segment Reference:

Street: 16th ST

Upstream MH: COUNTY MH71

Length Surveyed: 305.4




Downstream MH: COUNTY MH73




Pacp Quick Overall Rating: 3100 Direction of Survey: Downstream



Height (Diameter): 39

Material: Reinforced Concrete Pipe

Street: 16th ST

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH71</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
207.0	<p align="center"><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 15</b></p>	

Distance	Fault Observation	Picture
207.8	<p><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 15</b></p>	 <p>HERMOSA BEACH COUNTY MH71 Downstream 16th ST COUNTY MH73</p> <p>Tap Factory Active 9 0'clock</p> <p>39 08:51 Rectangular Reinforced Co 2017/03/02 207.8 FT</p>
209.6	<p><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 15</b></p>	 <p>HERMOSA BEACH COUNTY MH71 Downstream 16th ST COUNTY MH73</p> <p>Tap Factory Active 3 0'clock</p> <p>39 08:52 Rectangular Reinforced Co 2017/03/02 209.6 FT</p>
209.6	<p><b>Deposits Settled Other</b>  <b>Position: 4 To 8</b>  <b>Severity: None</b>  <b>Remarks:</b></p>	 <p>HERMOSA BEACH COUNTY MH71 Downstream 16th ST COUNTY MH73</p> <p>Deposits Settled Other 4 To 8 0'clock</p> <p>15%</p> <p>39 08:52 Rectangular Reinforced Co 2017/03/02 209.6 FT</p>

Distance	Fault Observation	Picture
209.6	<p>Picture Number: 2  Deposits Settled Other  Position: 4 To 8</p>	
305.4	<p>Manhole  Severity: None  Remarks: COUNTY MH73</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 8:46:00 AM

Street: 16th ST

Length Surveyed: 305.4

Pacp Quick Overall Rating: 3100

Height (Diameter): 39

Street: 16th ST

Pipe Segment Reference:

Upstream MH: COUNTY MH71

Downstream MH: COUNTY MH73

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH71

(0.0) - Manhole Remark: COUNTY MH71

(0.0) - Water Level

(207.0) - Tap Factory Active - Position: 3 Size: 15

(207.8) - Tap Factory Active - Position: 9 Size: 15

(209.6) - Tap Factory Active - Position: 3 Size: 15

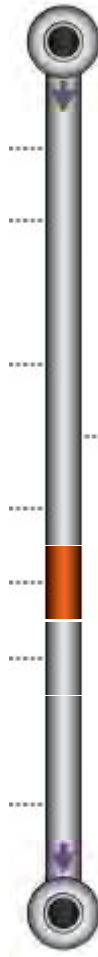
(209.6) - Deposits Settled Other - Position: 4 To 8  
Remark:

Photo Num: 2 (209.6) - Deposits Settled Other -  
Position: 4 To 8 Remark:

(305.4) - Manhole Remark: COUNTY MH73

Total Distance: 305.4

ID Number: COUNTY MH73





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 08:11
<b>Street</b>	VALLEY PARK AV	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH72	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH78	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	60	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	504.2
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	1	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	6	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 8:11:00 AM

Street: VALLEY PARK AV

Length Surveyed: 504.2

Pacp Quick Overall Rating: 2000 Direction of Survey: Downstream

Height (Diameter): 60

Pipe Segment Reference:




Upstream MH: COUNTY MH72




Downstream MH: COUNTY MH78

Material: Reinforced Concrete Pipe

Street: VALLEY PARK AV

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH72</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
41.2	<p align="center"><b>Deposits Settled Other</b>  <b>Position: 5 To 7</b>  <b>Severity: None</b>  <b>Remarks:</b></p>	

Distance	Fault Observation	Picture
54.1	<p><b>Deposits Settled Other</b>  <b>Position: 6</b>  <b>Severity: None</b>  <b>Remarks: ROCK</b></p>	
59.5	<p><b>Deposits Settled Other</b>  <b>Position: 5 To 7</b>  <b>Severity: None</b>  <b>Cont Defect: S01</b>  <b>Remarks:</b></p>	
167.2	<p><b>Deposits Settled Other</b>  <b>Position: 5 To 7</b>  <b>Severity: None</b>  <b>Cont Defect: F01</b>  <b>Remarks:</b></p>	

Distance	Fault Observation	Picture
276.9	<p><b>Deposits Settled Other</b>  <b>Position: 5 To 7</b>  <b>Severity: None</b>  <b>Cont Defect: S02</b>  <b>Remarks:</b></p>	 <p>HERMOSA BEACH COUNTY MH72      Downstream      VALLEY PARK AV COUNTY MH78</p> <p>Deposits Settled Other 5 To 7 O'clock</p> <p>SZ</p> <p>60      Circular      Reinforced Co 08:22      2017/03/01      276.9 FT</p>
281.4	<p><b>Tap Break-in Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 8</b></p>	 <p>HERMOSA BEACH COUNTY MH72      Downstream      VALLEY PARK AV COUNTY MH78</p> <p>Tap Break-in Active 2 O'clock</p> <p>60      Circular      Reinforced Co 08:22      2017/03/01      281.4 FT</p>
503.9	<p><b>Deposits Settled Other</b>  <b>Position: 5 To 7</b>  <b>Severity: None</b>  <b>Cont Defect: F02</b>  <b>Remarks:</b></p>	 <p>HERMOSA BEACH COUNTY MH72      Downstream      VALLEY PARK AV COUNTY MH78</p> <p>Deposits Settled Other 5 To 7 O'clock</p> <p>SZ F02</p> <p>60      Circular      Reinforced Co 08:34      2017/03/01      503.9 FT</p>



Distance	Fault Observation	Picture
504.2	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH78</b> </p>	

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# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 8:11:00 AM

Street: VALLEY PARK AV

Length Surveyed: 504.2

Pacp Quick Overall Rating: 2000 Direction of Survey: Downstream

Height (Diameter): 60

Street: VALLEY PARK AV

Pipe Segment Reference:

Upstream MH: COUNTY MH72

Downstream MH: COUNTY MH78

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH72

(0.0) - Manhole Remark: COUNTY MH72

(0.0) - Water Level

(41.2) - Deposits Settled Other - Position: 5 To 7  
Remark:

(54.1) - Deposits Settled Other - Position: 6  
Remark: ROCK

(59.5) - Deposits Settled Other - Position: 5 To 7 -  
Cont Def: S01 Remark:

(167.2) - Deposits Settled Other - Position: 5 To 7 -  
Cont Def: F01 Remark:

(276.9) - Deposits Settled Other - Position: 5 To 7 -  
Cont Def: S02 Remark:

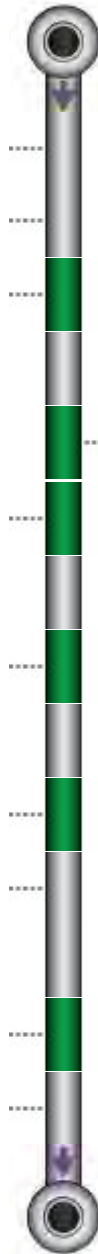
(281.4) - Tap Break-in Active - Position: 2 Size: 8

(503.9) - Deposits Settled Other - Position: 5 To 7 -  
Cont Def: F02 Remark:

(504.2) - Manhole Remark: COUNTY MH78

Total Distance: 504.2

ID Number: COUNTY MH78





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/2/2017 09:04
<b>Street</b>	16th ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH73	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY OUT4	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	39	<b>Width</b>	72
<b>Shape</b>	Rectangular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	148.8
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Alley
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	1	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	No

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 9:04:00 AM

Pipe Segment Reference:

Street: 16th ST

Upstream MH: COUNTY MH73

Length Surveyed: 148.8

Downstream MH: COUNTY OUT4

Pacp Quick Overall Rating: 3100 Direction of Survey: Downstream

Height (Diameter): 39

Material: Reinforced Concrete Pipe

Street: 16th ST

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH73</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
148.7	<p align="center"><b>Deposits Settled Other</b>  <b>Position: 4 To 8</b>  <b>Severity: None</b>  <b>Remarks:</b></p>	

Distance	Fault Observation	Picture
148.8	<p style="text-align: center;">Abandoned Survey Severity: None Remarks: DUE TO HEAVY AMOUNT OF DEBRIS</p>	

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# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 9:04:00 AM

Street: 16th ST

Length Surveyed: 148.8

Pacp Quick Overall Rating: 3100

Height (Diameter): 39

Street: 16th ST

Pipe Segment Reference:

Upstream MH: COUNTY MH73

Downstream MH: COUNTY OUT4

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

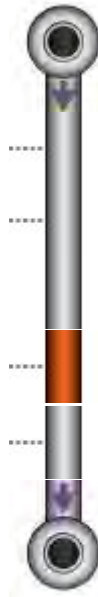
(0.0) - Manhole Remark: COUNTY MH73

(0.0) - Water Level

(148.7) - Deposits Settled Other - Position: 4 To 8  
Remark:

(148.8) - Abandoned Survey Remark: DUE TO  
HEAVY AMOUNT OF DEBRIS

Total Distance: 148.8



ID Number: COUNTY MH73

ID Number: COUNTY OUT4



### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 11:38
<b>Street</b>	ARDMORE AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH74	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH79	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	48	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	421.9
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	3	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 11:38:00 AM

Street: ARDMORE AVE

Length Surveyed: 421.9

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 48

Pipe Segment Reference:

Upstream MH: COUNTY MH74

Downstream MH: COUNTY MH79

Material: Reinforced Concrete  
Pipe

Street: ARDMORE AVE

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH74</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
372.5	<p align="center"><b>Tap Factory Active</b> Position: 2 Severity: None Size: 18</p>	



Distance	Fault Observation	Picture
404.4	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 10</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
421.9	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 4</b> </p>	
421.9	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH79</b> </p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 11:38:00 AM

Street: ARDMORE AVE

Length Surveyed: 421.9

Pacp Quick Overall Rating: 0000

Height (Diameter): 48

Street: ARDMORE AVE

Pipe Segment Reference:

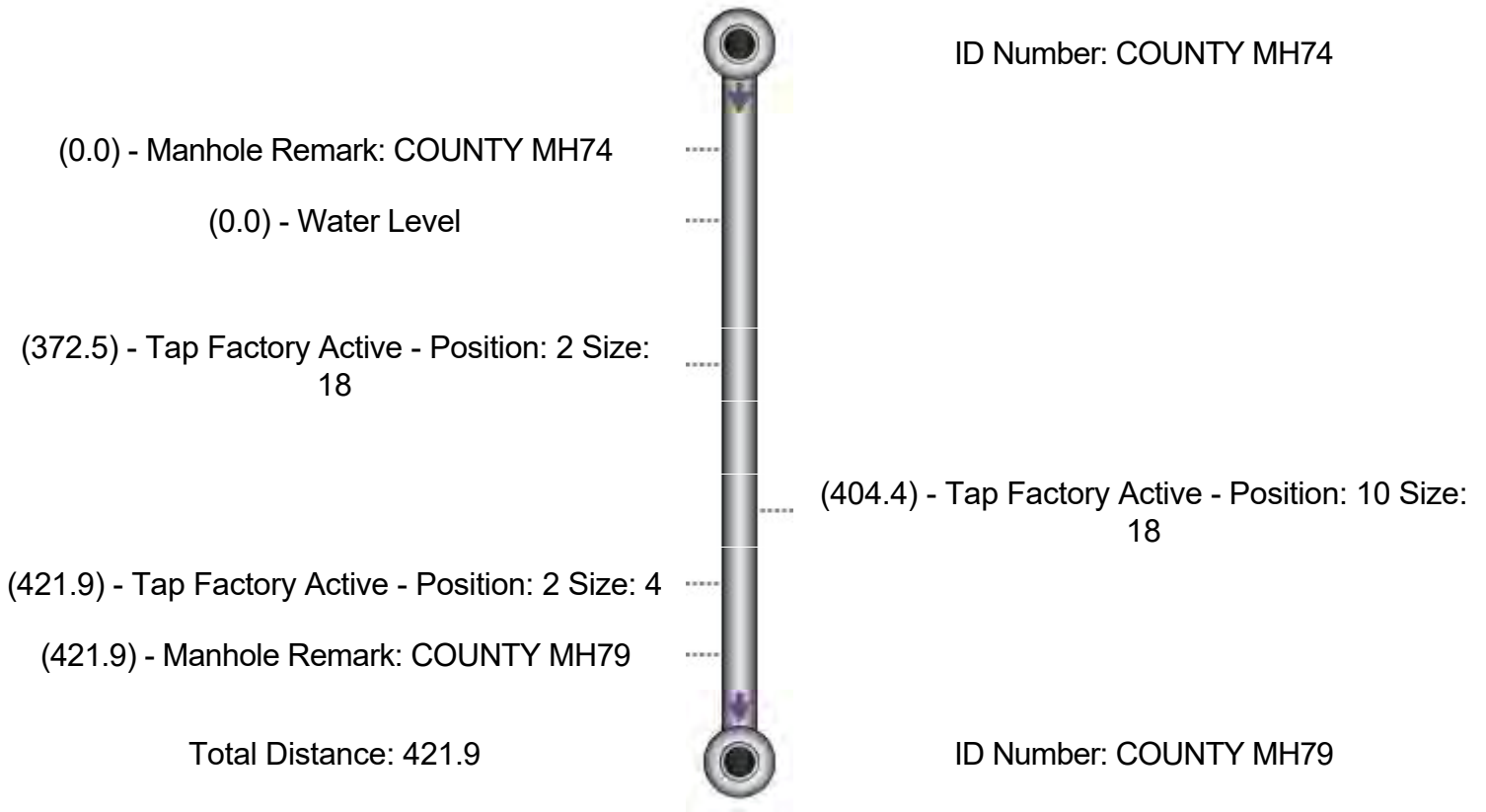
Upstream MH: COUNTY MH74

Downstream MH: COUNTY MH79

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 11:26
<b>Street</b>	ARDMORE AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH75	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH74	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	48	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	554.9
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	4	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 11:26:00 AM

Pipe Segment Reference:

Street: ARDMORE AVE

Upstream MH: COUNTY MH75

Length Surveyed: 554.9

Downstream MH: COUNTY MH74

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream


Height (Diameter): 48

Material: Reinforced Concrete Pipe

Street: ARDMORE AVE

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH75</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
10.6	<p align="center"><b>Tap Factory Active</b> Position: 9 Severity: None Size: 18</p>	

Distance	Fault Observation	Picture
40.3	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
73.7	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 39</b> </p>	
153.1	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 27</b> </p>	

Distance	Fault Observation	Picture
554.9	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH74</b> </p>	

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# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 11:26:00 AM

Street: ARDMORE AVE

Length Surveyed: 554.9

Pacp Quick Overall Rating: 0000

Height (Diameter): 48

Street: ARDMORE AVE

Pipe Segment Reference:

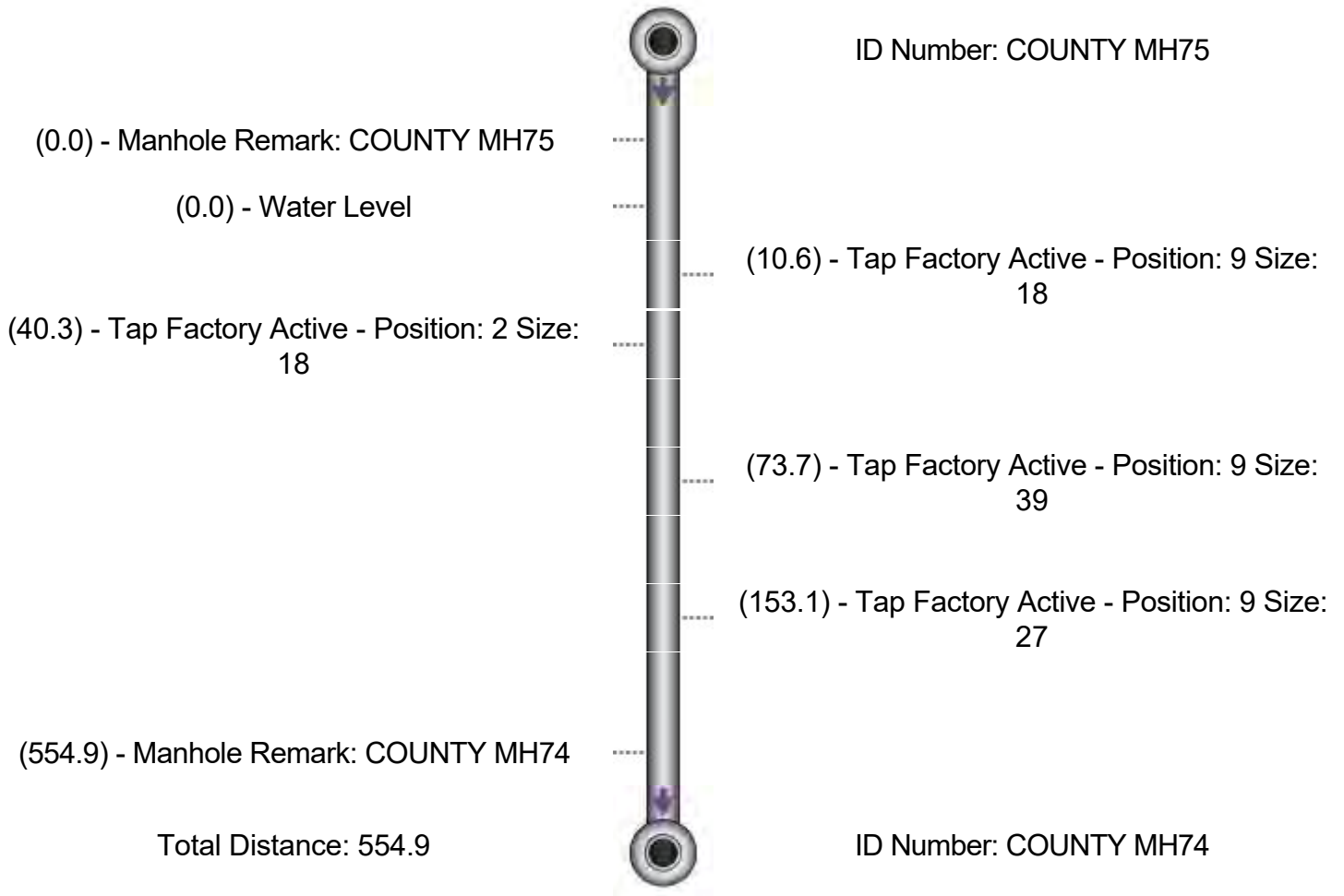
Upstream MH: COUNTY MH75

Downstream MH: COUNTY MH74

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/2/2017 08:28
<b>Street</b>	16th ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH76	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH71	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	39	<b>Width</b>	72
<b>Shape</b>	Rectangular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	328.4
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Alley
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	0	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes



# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 8:28:00 AM

Pipe Segment Reference:

Street: 16th ST

Upstream MH: COUNTY MH76

Length Surveyed: 328.4

Downstream MH: COUNTY MH71

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 39

Material: Reinforced Concrete Pipe

Street: 16th ST

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH76</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
328.4	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH71</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 8:28:00 AM

Street: 16th ST

Length Surveyed: 328.4

Pacp Quick Overall Rating: 0000

Height (Diameter): 39

Street: 16th ST

Pipe Segment Reference:

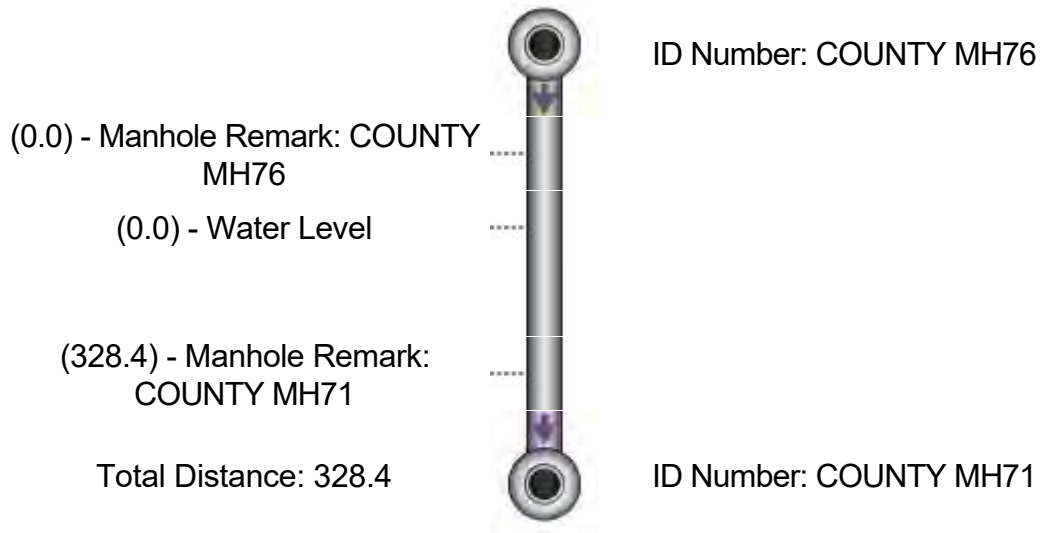
Upstream MH: COUNTY MH76

Downstream MH: COUNTY MH71

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



Created with the  report generator



### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/2/2017 06:57
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH77	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH76	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	72	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	1090.6
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	1	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 6:57:00 AM

Street: EASEMENT

Length Surveyed: 1090.6

Pacp Quick Overall Rating: 0000

Height (Diameter): 72

Street: EASEMENT




Pipe Segment Reference:


Upstream MH: COUNTY MH77

Downstream MH: COUNTY MH76

Direction of Survey: Upstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH76</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
1,082.0	<p align="center"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 60</b></p>	

Distance	Fault Observation	Picture
1,090.6	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH77</b> </p>	

Created with the  report generator

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 6:57:00 AM

Street: EASEMENT

Length Surveyed: 1090.6

Pacp Quick Overall Rating: 0000

Height (Diameter): 72

Street: EASEMENT

Pipe Segment Reference:

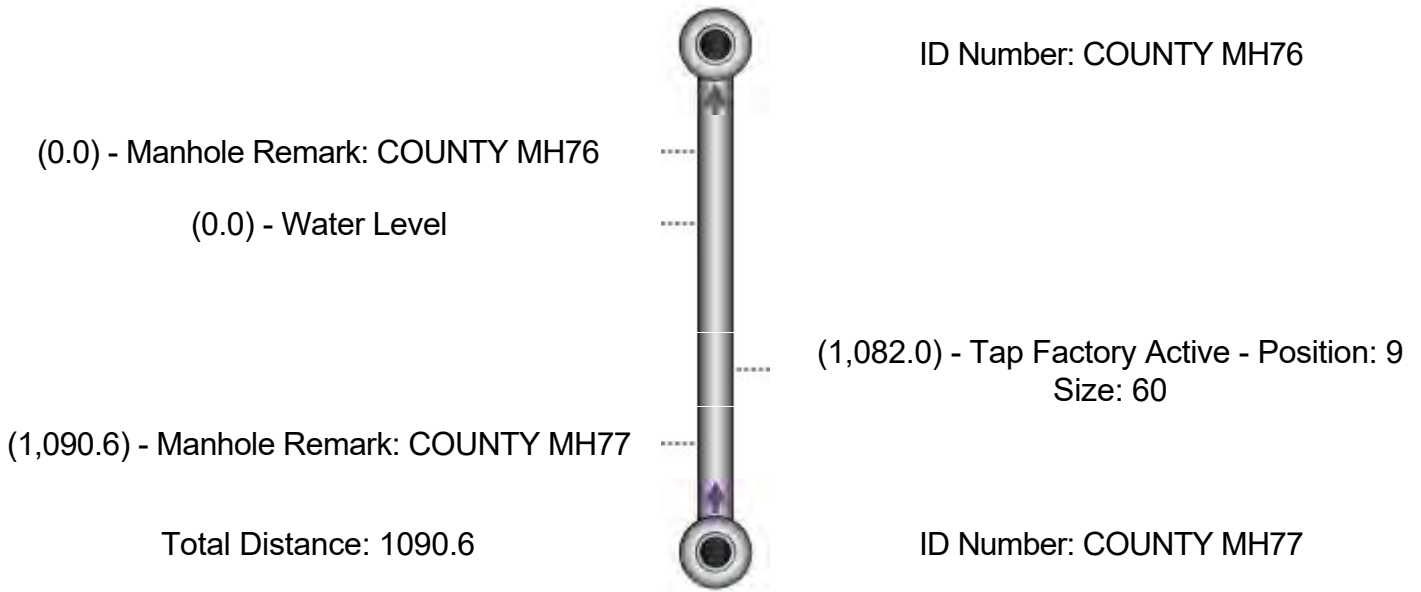
Upstream MH: COUNTY MH77

Downstream MH: COUNTY MH76

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 08:56
<b>Street</b>	VALLEY PARK AV	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH78	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH77	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	60	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	239.8
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	2	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	No

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 8:56:00 AM

Street: VALLEY PARK AV

Length Surveyed: 239.8

Pacp Quick Overall Rating: 2J00

Height (Diameter): 60

Street: VALLEY PARK AV

Pipe Segment Reference:

Upstream MH: COUNTY MH78




Downstream MH: COUNTY MH77


Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH78</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
0.0	<p align="center"><b>Deposits Settled Other</b>  <b>Position: 5 To 7</b>  <b>Severity: None</b>  <b>Cont Defect: S01</b>  <b>Remarks:</b></p>	



Distance	Fault Observation	Picture
186.6	<p><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 4</b></p>	
210.6	<p><b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
239.8	<p><b>Deposits Settled Other</b>  <b>Position: 5 To 7</b>  <b>Severity: None</b>  <b>Cont Defect: F01</b>  <b>Remarks:</b></p>	

Distance	Fault Observation	Picture
239.8	<p style="text-align: center;">Abandoned Survey Severity: None Remarks: DUE TO HEAVY AMOUNTS OF SAND</p>	

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# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 8:56:00 AM

Street: VALLEY PARK AV

Length Surveyed: 239.8

Pacp Quick Overall Rating: 2J00

Height (Diameter): 60

Street: VALLEY PARK AV

Pipe Segment Reference:

Upstream MH: COUNTY MH78

Downstream MH: COUNTY MH77

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH78

(0.0) - Manhole Remark: COUNTY MH78

(0.0) - Water Level

(0.0) - Deposits Settled Other - Position: 5 To 7 -  
Cont Def: S01 Remark:

(186.6) - Tap Factory Active - Position: 9 Size: 4

(210.6) - Tap Factory Active - Position: 2 Size: 18

(239.8) - Deposits Settled Other - Position: 5 To 7 -  
Cont Def: F01 Remark:

(239.8) - Abandoned Survey Remark: DUE TO  
HEAVY AMOUNTS OF SAND

Total Distance: 239.8

ID Number: COUNTY MH77





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/2/2017 05:45
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH79	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH77	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	51	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	444.7
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	3	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 5:45:00 AM

Pipe Segment Reference:

Street: EASEMENT

Upstream MH: COUNTY MH79

Length Surveyed: 444.7

Downstream MH: COUNTY MH77




Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 51

Material: Reinforced Concrete Pipe

Street: EASEMENT

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH79</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
5.7	<p align="center"><b>Tap Factory Active</b>  <b>Position: 10</b>  <b>Severity: None</b>  <b>Size: 8</b></p>	

Distance	Fault Observation	Picture
41.9	<p style="text-align: center;"> <b>Tap Break-in</b>  <b>Position: 12</b>  <b>Severity: None</b>  <b>Size: 8</b> </p>	 <p>HERMOSA BEACH COUNTY MH79 Downstream EASEMENT COUNTY MH77</p> <p>Tap Break-in 12 O'clock</p> <p>51 05:54 Circular 2017/03/02 Reinforced Co 41.9 FT</p>
422.9	<p style="text-align: center;"> <b>Tap Break-in</b>  <b>Position: 10</b>  <b>Severity: None</b>  <b>Size: 8</b> </p>	 <p>HERMOSA BEACH COUNTY MH79 Downstream EASEMENT COUNTY MH77</p> <p>Tap Break-in 10 O'clock</p> <p>51 06:00 Circular 2017/03/02 Reinforced Co 422.9 FT</p>
444.7	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH77</b> </p>	 <p>HERMOSA BEACH COUNTY MH79 Downstream EASEMENT COUNTY MH77</p> <p>Manhole COUNTY MH77</p> <p>51 06:01 Circular 2017/03/02 Reinforced Co 444.7 FT</p>

# Project: CITY OF HERMOSA BEACH

Date: 3/2/2017 5:45:00 AM

Street: EASEMENT

Length Surveyed: 444.7

Pacp Quick Overall Rating: 0000

Height (Diameter): 51

Street: EASEMENT

Pipe Segment Reference:

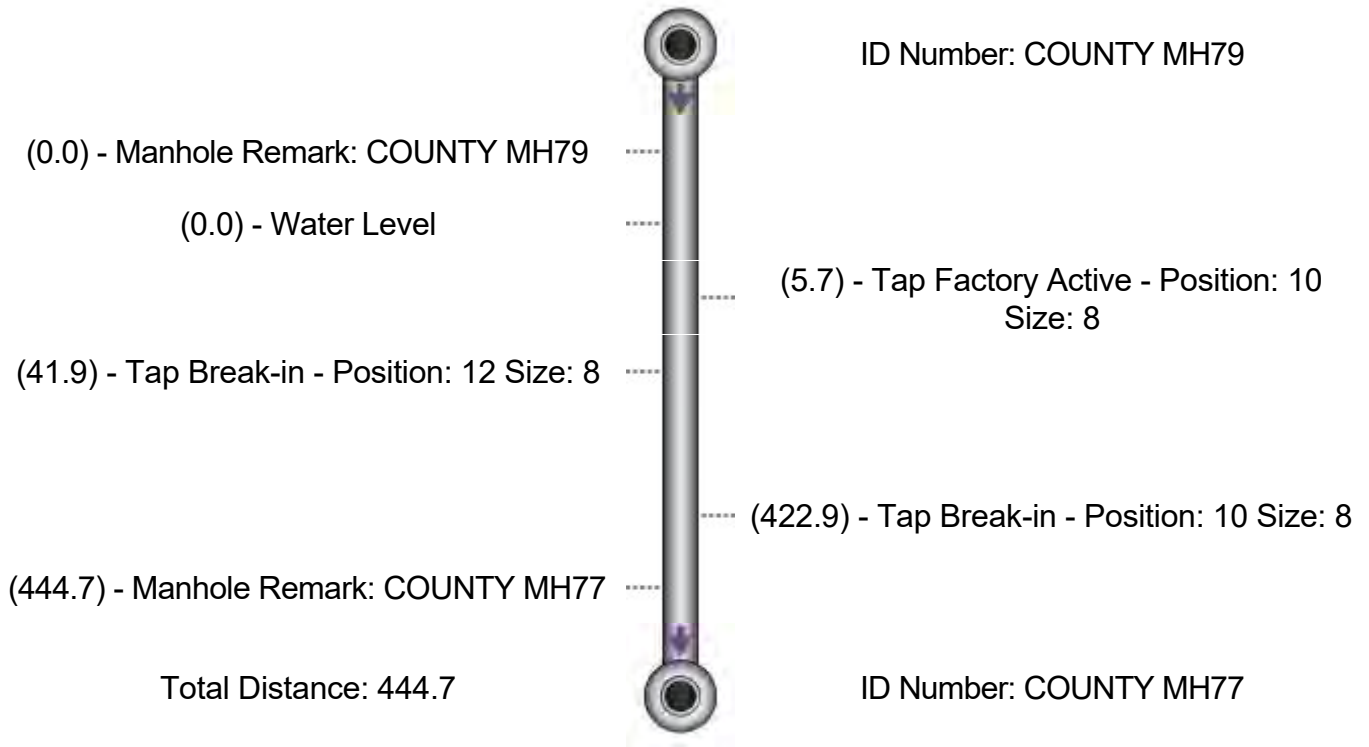
Upstream MH: COUNTY MH79

Downstream MH: COUNTY MH77

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe



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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 09:46
<b>Street</b>	14th ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH81	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	36in MAIN	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	221.4
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	1	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes



# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 9:46:00 AM

Street: 14th ST

Length Surveyed: 221.4

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 24

Pipe Segment Reference:


Upstream MH: COUNTY MH81

Downstream MH: 36in MAIN

Material: Reinforced Concrete Pipe

Street: 14th ST

Distance	Fault Observation	Picture
0.0	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH81</b> </p>	
0.0	<p align="center"> <b>Water Level</b>  <b>Severity: None</b> </p>	
212.7	<p align="center"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
221.4	<p style="text-align: center;"> <b>End of Pipe</b>  <b>Severity: None</b>  <b>Remarks: 36in MAIN</b> </p>	

Created with the  report generator

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 9:46:00 AM

Street: 14th ST

Length Surveyed: 221.4

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: 14th ST

Pipe Segment Reference:

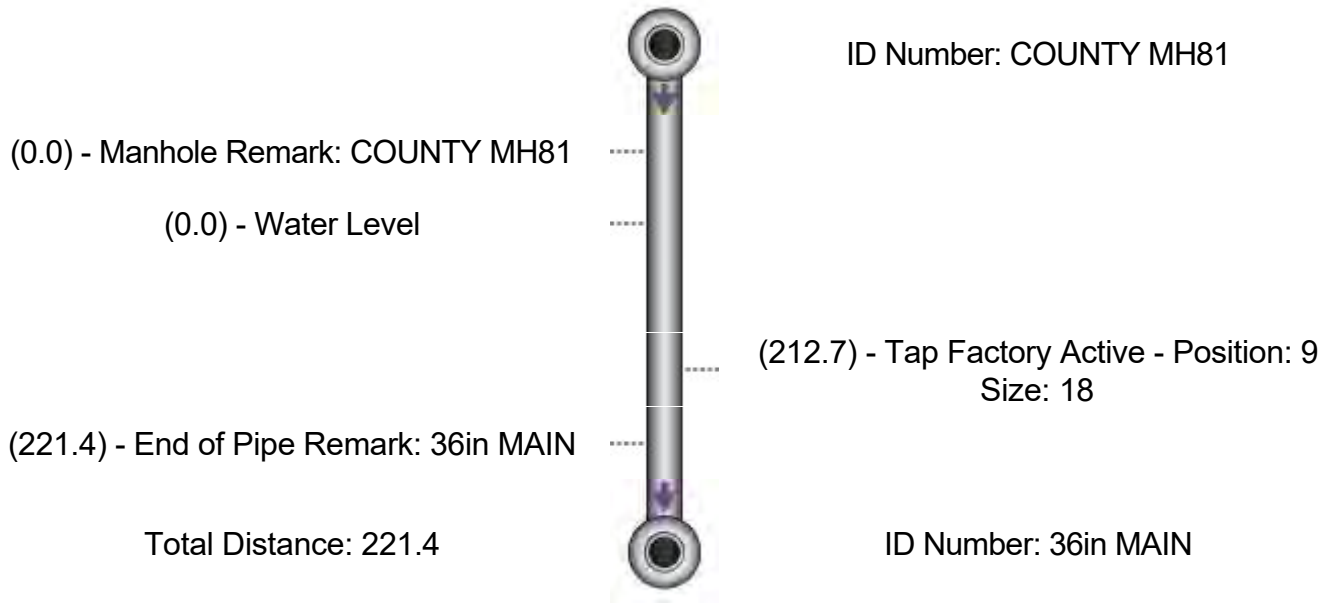
Upstream MH: COUNTY MH81

Downstream MH: 36in MAIN

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/22/2017 10:02
<b>Street</b>	3rd STREET	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH82	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH101	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	30	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	294.8
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 10:02:00 AM

Street: 3rd STREET

Length Surveyed: 294.8

Pacp Quick Overall Rating: 0000

Height (Diameter): 30

Street: 3rd STREET

Pipe Segment Reference:



Upstream MH: COUNTY MH82

Downstream MH: COUNTY MH101

Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH82</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
8.7	<p align="center"><b>Tap Factory Active</b> Position: 3 Severity: None Size: 18</p>	

Distance	Fault Observation	Picture
54.0	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
294.8	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH101</b> </p>	

# Project: CITY OF HERMOSA BEACH

Date: 2/22/2017 10:02:00 AM

Street: 3rd STREET

Length Surveyed: 294.8

Pacp Quick Overall Rating: 0000

Height (Diameter): 30

Street: 3rd STREET

Pipe Segment Reference:

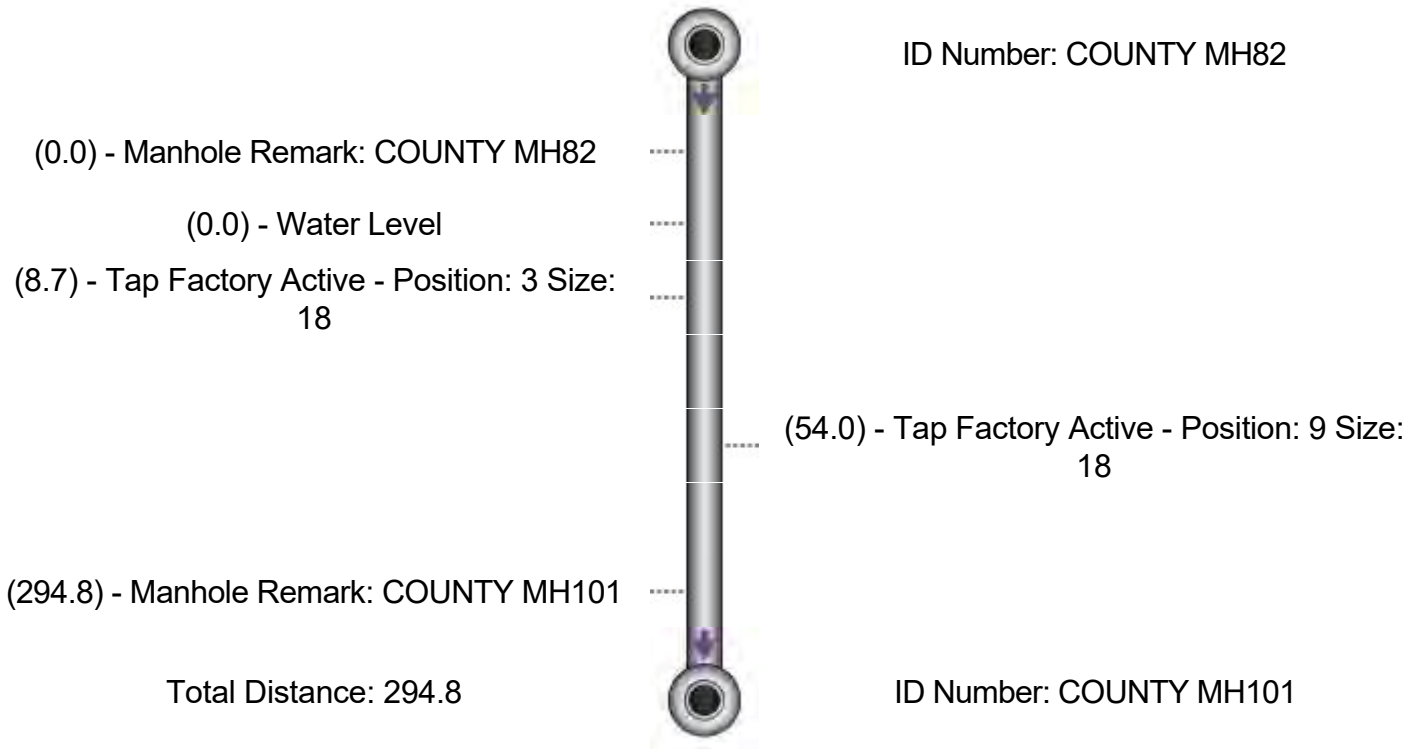
Upstream MH: COUNTY MH82

Downstream MH: COUNTY  
MH101

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/6/2017 07:51
<b>Street</b>	GOULD AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH95	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH55	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	325.3
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Suburban/Rural
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes



# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 7:51:00 AM

Street: GOULD AVE

Length Surveyed: 325.3

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: GOULD AVE

Pipe Segment Reference:



Upstream MH: COUNTY MH95

Downstream MH: COUNTY MH55

Direction of Survey: Upstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH55</b> </p>	
0.0	<p align="center"> <b>Water Level</b>  <b>Severity: None</b> </p>	
182.2	<p align="center"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
218.3	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
325.3	<p style="text-align: center;"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH95</b></p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 7:51:00 AM

Street: GOULD AVE

Length Surveyed: 325.3

Pacp Quick Overall Rating: 0000 Direction of Survey: Upstream

Height (Diameter): 24

Street: GOULD AVE

Pipe Segment Reference:

Upstream MH: COUNTY MH95

Downstream MH: COUNTY MH55

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: COUNTY MH55

(0.0) - Manhole Remark: COUNTY MH55

(0.0) - Water Level

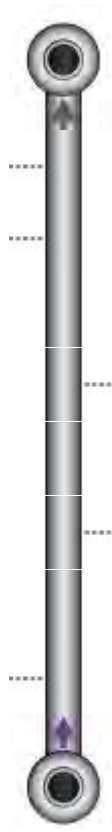
(182.2) - Tap Factory Active - Position: 9  
Size: 18

(218.3) - Tap Factory Active - Position: 9  
Size: 18

(325.3) - Manhole Remark: COUNTY MH95

Total Distance: 325.3

ID Number: COUNTY MH95





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 07:44
<b>Street</b>	POWER ST	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH96	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH72	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	60	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	473.3
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Light Highway
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	3	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	3	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 7:44:00 AM

Street: POWER ST

Length Surveyed: 473.3

Pacp Quick Overall Rating: 2700

Height (Diameter): 60

Street: POWER ST

Pipe Segment Reference:

Upstream MH: COUNTY MH96




Downstream MH: COUNTY MH72


Direction of Survey: Upstream

Material: Reinforced Concrete Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH72</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
129.6	<p align="center"><b>Deposits Settled Compacted</b>  <b>Position: 6</b>  <b>Severity: None</b></p>	

Distance	Fault Observation	Picture
129.6	<p>Picture Number: 2  Deposits Settled Compacted  Position: 6</p>	
241.1	<p>Tap Factory Active  Position: 10  Severity: None  Size: 4</p>	
268.8	<p>Deposits Settled Other  Position: 5 To 7  Severity: None  Cont Defect: S01  Remarks:</p>	

Distance	Fault Observation	Picture
299.4	<p><b>Deposits Settled Other</b>  <b>Position: 5 To 7</b>  <b>Severity: None</b>  <b>Cont Defect: F01</b>  <b>Remarks:</b></p>	
386.1	<p><b>Tap Factory Active</b>  <b>Position: 10</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
429.7	<p><b>Tap Factory Active</b>  <b>Position: 2</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
473.3	<p style="text-align: center;"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH96</b></p>	

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### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/6/2017 09:40
<b>Street</b>	GOULD AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH97	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH57	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	316.9
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Urban
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 9:40:00 AM

Street: GOULD AVE

Length Surveyed: 316.9

Pacp Quick Overall Rating: 0000 Direction of Survey: Downstream

Height (Diameter): 24




Pipe Segment Reference:

Upstream MH: COUNTY MH97

Downstream MH: COUNTY MH57

Material: Reinforced Concrete Pipe

Street: GOULD AVE

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH97</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
181.5	<p align="center"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
305.1	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	 <p>HERMOSA BEACH COUNTY MH57      Downstream      GOULD AVE COUNTY MH57</p> <p style="text-align: right;">Tap Factory Active 3 o'clock</p> <p>24 09:48      Circular 2017/03/06      Reinforced Co 305.1 FT</p>
316.9	<p style="text-align: center;"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH57</b> </p>	 <p>HERMOSA BEACH COUNTY MH57      Downstream      GOULD AVE COUNTY MH57</p> <p style="text-align: right;">Manhole COUNTY MH57</p> <p>24 09:48      Circular 2017/03/06      Reinforced Co 316.9 FT</p>

# Project: CITY OF HERMOSA BEACH

Date: 3/6/2017 9:40:00 AM

Street: GOULD AVE

Length Surveyed: 316.9

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: GOULD AVE

Pipe Segment Reference:

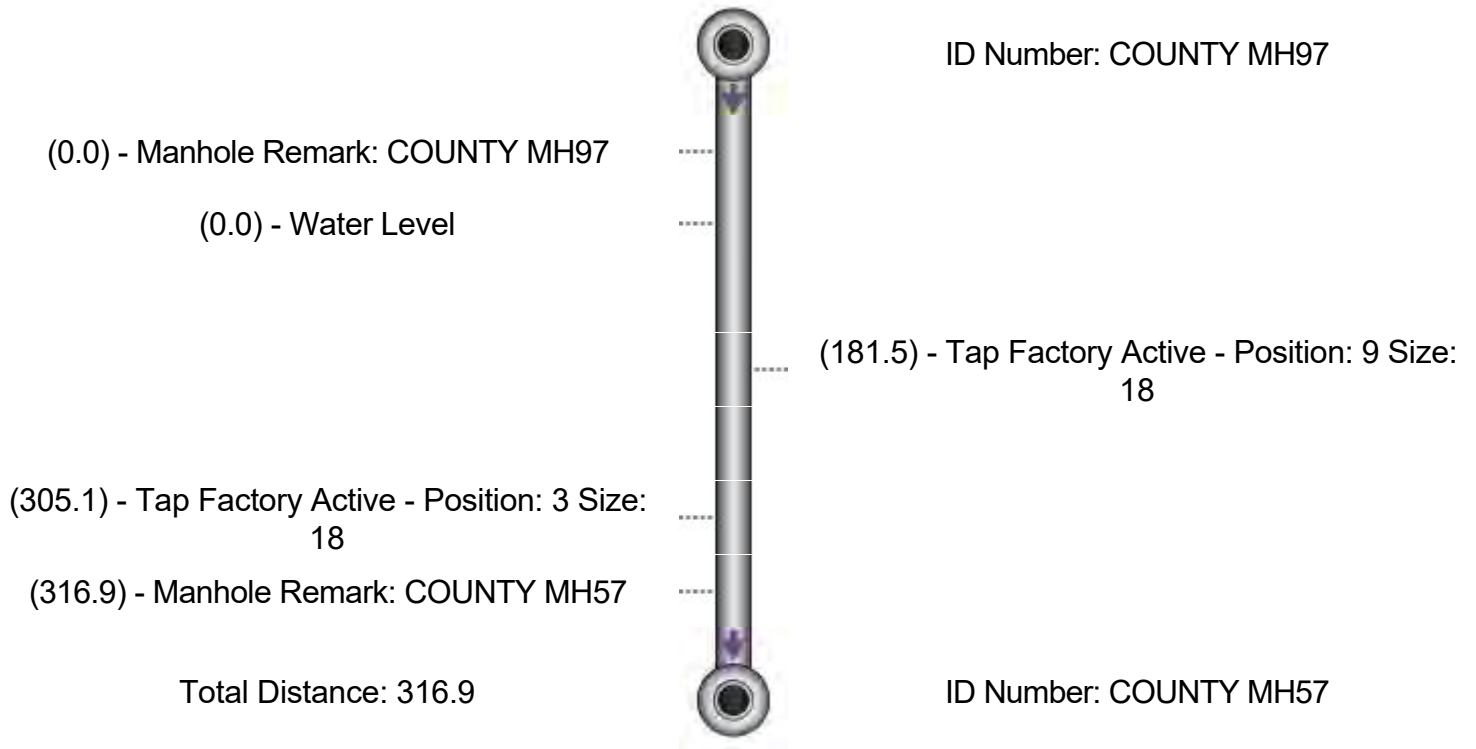
Upstream MH: COUNTY MH97

Downstream MH: COUNTY MH57

Direction of Survey: Downstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	2/27/2017 07:04
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	COUNTY MH99	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH68	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	45	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	309.1
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	4	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 7:04:00 AM

Pipe Segment Reference:

Street: EASEMENT

Upstream MH: COUNTY MH99

Length Surveyed: 309.1

Downstream MH: COUNTY MH68




Pacp Quick Overall Rating: 0000




Direction of Survey: Upstream

Height (Diameter): 45


Material: Reinforced Concrete Pipe

Street: EASEMENT

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH68</b></p>	 <p>HERMOSA BEACH COUNTY MH99 Upstream EASEMENT COUNTY MH68  Manhole COUNTY MH68  45 08:53 Circular 2017/02/27 Reinforced Co 0 FT</p>
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	 <p>HERMOSA BEACH COUNTY MH99 Upstream EASEMENT COUNTY MH68  Water Level  45 08:53 Circular 2017/02/27 Reinforced Co 0 FT</p>
15.1	<p align="center"><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	 <p>HERMOSA BEACH COUNTY MH99 Upstream EASEMENT COUNTY MH68  Tap Factory Active 3 O'clock  45 08:54 Circular 2017/02/27 Reinforced Co 15.1 FT</p>

Distance	Fault Observation	Picture
24.7	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 30</b> </p>	 <p>HERMOSA BEACH COUNTY MHS9 DL Tap Stream EASEMENT COUNTY MH68</p> <p style="text-align: center;">Tap Factory Active 3 o'clock</p> <p>45 09:07 Circular Reinforced Co 2017/02/27 24.7 FT</p>
40.6	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	 <p>HERMOSA BEACH COUNTY MHS9 Upstream EASEMENT COUNTY MH68</p> <p style="text-align: center;">Tap Factory Active 9 o'clock</p> <p>45 09:08 Circular Reinforced Co 2017/02/27 40.6 FT</p>
309.1	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	 <p>HERMOSA BEACH COUNTY MHS9 Upstream EASEMENT COUNTY MH68</p> <p style="text-align: center;">Tap Factory Active 3 o'clock</p> <p>45 09:12 Circular Reinforced Co 2017/02/27 309.1 FT</p>



Distance	Fault Observation	Picture
309.1	<p style="text-align: center;"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: COUNTY MH99</b></p>	

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# Project: CITY OF HERMOSA BEACH

Date: 2/27/2017 7:04:00 AM

Street: EASEMENT

Length Surveyed: 309.1

Pacp Quick Overall Rating: 0000

Height (Diameter): 45

Street: EASEMENT

Pipe Segment Reference:

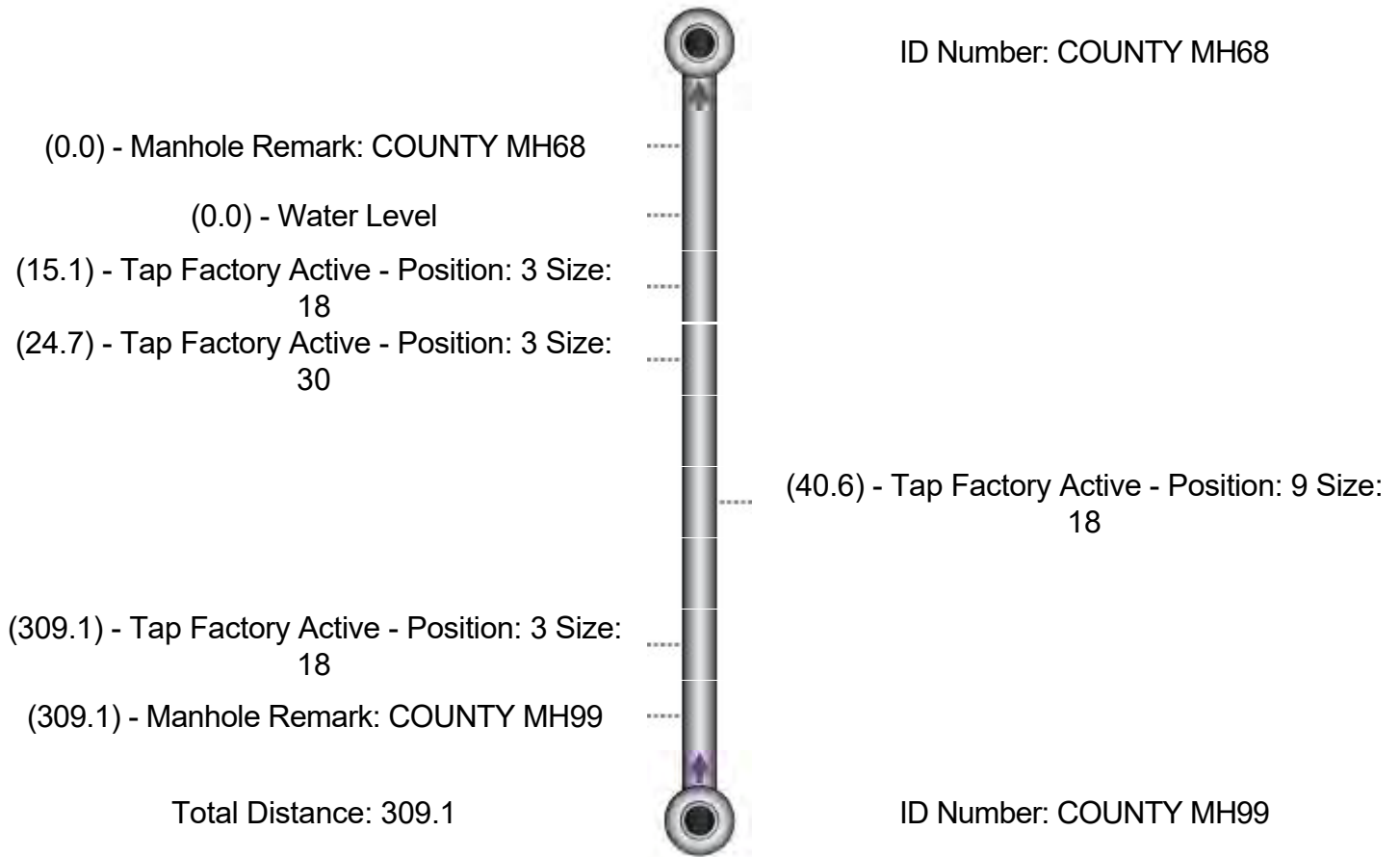
Upstream MH: COUNTY MH99

Downstream MH: COUNTY MH68

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/1/2017 09:47
<b>Street</b>	EASEMENT	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	INLET	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH139	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Upstream

### Pipe

<b>Height (Diameter)</b>	30	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	275.8
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Easement/Right of Way
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	2	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 9:47:00 AM

Street: EASEMENT

Length Surveyed: 275.8

Pacp Quick Overall Rating: 0000

Height (Diameter): 30

Street: EASEMENT

Pipe Segment Reference:




Upstream MH: INLET

Downstream MH: COUNTY  
MH139

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: COUNTY MH139</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
7.8	<p align="center"><b>Tap Factory Capped</b> Position: 11 Severity: None Size: 8</p>	

Distance	Fault Observation	Picture
175.4	<p>General Observation Severity: None Remarks: COUNTY IN20</p>	
184.8	<p>Tap Factory Active Position: 10 Severity: None Size: 8</p>	
275.8	<p>Manhole Severity: None Remarks: INLET</p>	

# Project: CITY OF HERMOSA BEACH

Date: 3/1/2017 9:47:00 AM

Street: EASEMENT

Length Surveyed: 275.8

Pacp Quick Overall Rating: 0000

Height (Diameter): 30

Street: EASEMENT

Pipe Segment Reference:

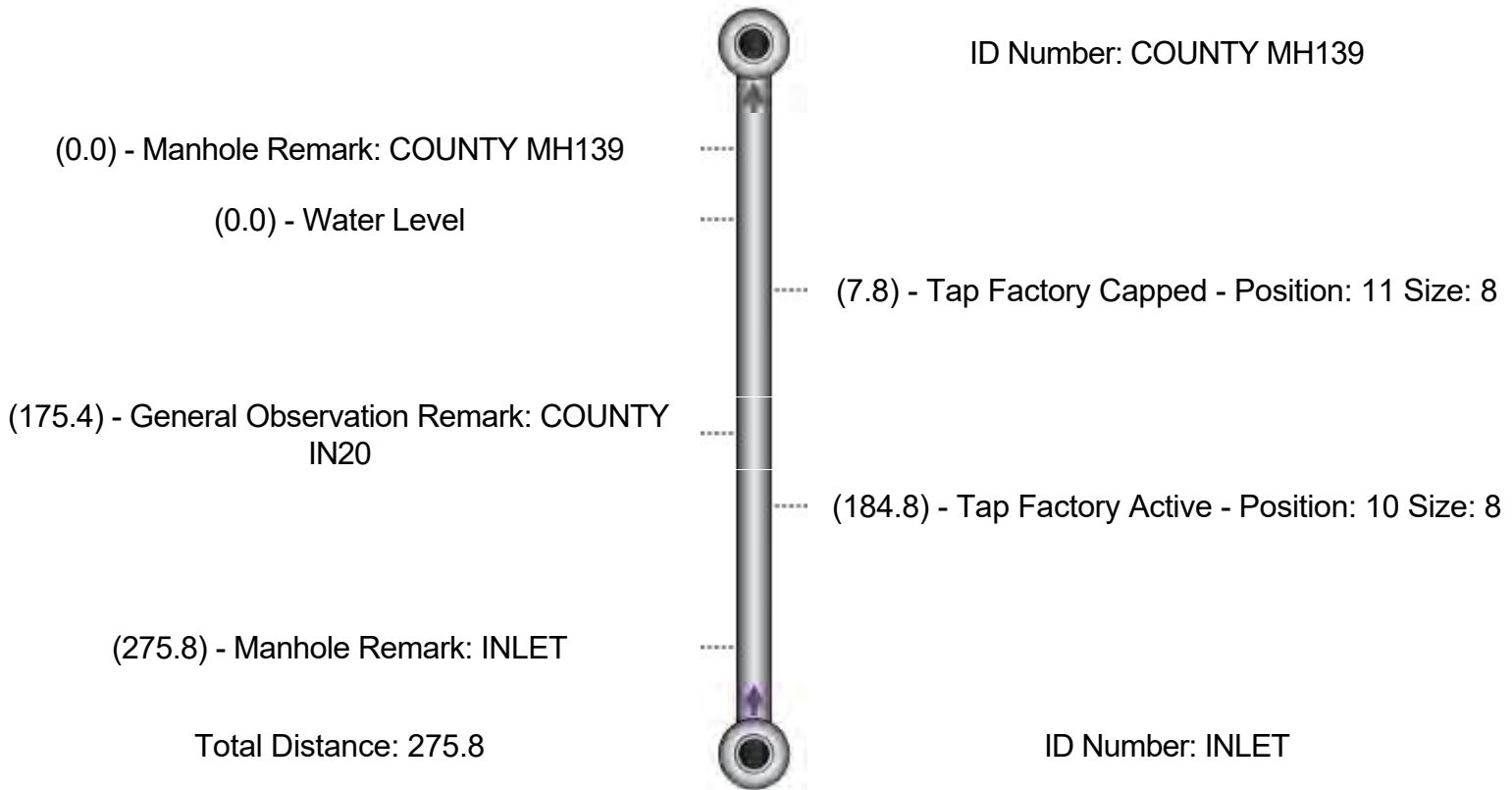
Upstream MH: INLET

Downstream MH: COUNTY  
MH139

Direction of Survey: Upstream

Material: Reinforced Concrete  
Pipe

Severity
Light
Moderate
Average
Heavy
Severe





### Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/13/2017 08:34
<b>Street</b>	PIER AVE	<b>City</b>	HERMOSA BEACH
<b>Comments</b>			

### Manhole

<b>Upstream MH</b>	MH E/O HERMOSA AVE	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH51	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

### Pipe

<b>Height (Diameter)</b>	18	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	131.3
<b>Year Laid</b>		<b>Year Renewed</b>	

### Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Urban
<b>Additional Info</b>		<b>Location Details</b>	

### Custom

<b>Number of Taps</b>	5	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

### Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/13/2017 8:34:00 AM

Pipe Segment Reference:

Street: PIER AVE

Upstream MH: MH E/O HERMOSA AVE

Length Surveyed: 131.3

Downstream MH: COUNTY MH51




Pacp Quick Overall Rating: 0000

Direction of Survey: Downstream

Height (Diameter): 18




Material: Reinforced Concrete Pipe

Street: PIER AVE

Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b> Severity: None Remarks: MH E/O HERMOSA AVE</p>	
0.0	<p align="center"><b>Water Level</b> Severity: None</p>	
25.5	<p align="center"><b>General Observation</b> Severity: None Remarks: MANHOLE EAST OF HERMOSA AVE (COUNTY IN 95)</p>	



Distance	Fault Observation	Picture
25.5	<p style="text-align: center;">Shape or Size Change Severity: None Size: 24 Remarks: MAINLINE TIE IN</p>	
27.2	<p style="text-align: center;">Tap Factory Active Position: 3 Severity: None Size: 18</p>	
43.2	<p style="text-align: center;">Tap Factory Active Position: 9 Severity: None Size: 24</p>	

Distance	Fault Observation	Picture
58.3	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 21</b></p>	
81.4	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 4</b></p>	
87.7	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
131.3	<p style="text-align: center;"> <b>End of Pipe</b>  <b>Severity: None</b>  <b>Remarks: MAINLINE 48in</b> </p>	<p>HERMOSA BEACH MH E/O HERMO Downstream PIER AVE COUNTY MH51</p> <p>End of Pipe MAINLINE 48in</p> <p>18 08:54 Circular 2017/03/13 Reinforced Co 131.3 FT</p>

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# Project: CITY OF HERMOSA BEACH

Date: 3/13/2017 8:34:00 AM

Street: PIER AVE

Length Surveyed: 131.3

Pacp Quick Overall Rating: 0000

Height (Diameter): 18

Street: PIER AVE

Pipe Segment Reference:

Upstream MH: MH E/O HERMOSA AVE

Downstream MH: COUNTY MH51

Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Severity

Light

Moderate

Average

Heavy

Severe

ID Number: MH E/O HERMOSA AVE

(0.0) - Manhole Remark: MH E/O HERMOSA AVE

(0.0) - Water Level

(25.5) - General Observation Remark: MANHOLE EAST OF HERMOSA AVE (COUNTY IN 95)

(25.5) - Shape or Size Change Size: 24 Remark: MAINLINE TIE IN

(27.2) - Tap Factory Active - Position: 3 Size: 18

(43.2) - Tap Factory Active - Position: 9 Size: 24

(58.3) - Tap Factory Active - Position: 9 Size: 21

(81.4) - Tap Factory Active - Position: 3 Size: 4

(87.7) - Tap Factory Active - Position: 3 Size: 18

(131.3) - End of Pipe Remark: MAINLINE 48in

Total Distance: 131.3

ID Number: COUNTY MH51



## Project Information

<b>Surveyor Name</b>	JACKSON NGO (PPT)	<b>Certificate Number</b>	U-805-3428
<b>Owner</b>	SCHAAF & WHEELER	<b>Customer</b>	
<b>Drainage Area</b>		<b>PO Number</b>	
<b>Pipe Segment Reference</b>		<b>Date</b>	3/7/2017 06:25
<b>Street</b>	PIER AVE & MONTEREY BLVD	<b>City</b>	HERMOSA BEACH

### Comments

## Manhole

<b>Upstream MH</b>	MH WEST ON MONTEREY	<b>Rim to Invert (U)</b>	
<b>Grade to Invert (U)</b>		<b>Rim to Grade (U)</b>	
<b>Downstream MH</b>	COUNTY MH 51	<b>Rim to Invert (D)</b>	
<b>Grade to Invert (D)</b>		<b>Rim to Grade (D)</b>	
<b>Sewer Use</b>	Stormwater	<b>Direction of Survey</b>	Downstream

## Pipe

<b>Height (Diameter)</b>	24	<b>Width</b>	
<b>Shape</b>	Circular	<b>Material</b>	Reinforced Concrete Pipe
<b>Lining Method</b>		<b>Pipe Joint Length</b>	
<b>Total Length</b>		<b>Length Surveyed</b>	595.4
<b>Year Laid</b>		<b>Year Renewed</b>	

## Misc

<b>Flow Control</b>	Not Controlled	<b>Media Label</b>	
<b>Purpose</b>	Routine Assessment	<b>Sewer Category</b>	
<b>Pre-Cleaning</b>	No Pre-Cleaning	<b>Date Cleaned</b>	
<b>Weather</b>	Dry	<b>Location Code</b>	Main Highway - Urban
<b>Additional Info</b>		<b>Location Details</b>	

## Custom

<b>Number of Taps</b>	8	<b>Number of Roots</b>	0
<b>Num Cracks / Fractures</b>	0	<b>Number of Broken / Holes / Collapse</b>	0
<b>Number of Deposits</b>	0	<b>Custom6</b>	
<b>Custom7</b>		<b>Struct Grade</b>	
<b>OM Grade</b>		<b>Overall Grade</b>	

## Pacp 6

<b>Reverse Setup ID</b>	0	<b>Sheet (Group) Number</b>	0
<b>Imperial Units (US)</b>	True	<b>Pressure Value</b>	0
<b>Work Order</b>		<b>Project</b>	CITY OF HERMOSA BEACH
		<b>Completed</b>	Yes

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 6:25:00 AM

Street: PIER AVE & MONTEREY BLVD

Length Surveyed: 595.4

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: PIER AVE & MONTEREY BLVD

Pipe Segment Reference:




Upstream MH: MH WEST ON MONTEREY

Downstream MH: COUNTY MH 51

Direction of Survey: Downstream




Material: Reinforced Concrete Pipe




Distance	Fault Observation	Picture
0.0	<p align="center"><b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: MH WEST ON MONTEREY</b></p>	
0.0	<p align="center"><b>Water Level</b>  <b>Severity: None</b></p>	
81.0	<p align="center"><b>Tap Factory Active</b>  <b>Position: 4</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	


Distance	Fault Observation	Picture
191.5	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 8</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
259.4	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
320.0	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	

Distance	Fault Observation	Picture
320.0	<p style="text-align: center;"><b>General Observation</b>  <b>Severity: None</b>  <b>Remarks: UNMARKED MANHOLE</b></p>	
468.2	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	
468.2	<p style="text-align: center;"><b>General Observation</b>  <b>Severity: None</b>  <b>Remarks: UNMARKED MANHOLE</b></p>	



Distance	Fault Observation	Picture
533.4	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	
533.5	<p style="text-align: center;"> <b>General Observation</b>  <b>Severity: None</b>  <b>Remarks: UNMARKED MANHOLE</b> </p>	
593.9	<p style="text-align: center;"> <b>Tap Factory Active</b>  <b>Position: 3</b>  <b>Severity: None</b>  <b>Size: 18</b> </p>	

Distance	Fault Observation	Picture
593.9	<p style="text-align: center;"><b>Tap Factory Active</b>  <b>Position: 9</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	 <p>HERMOSA BEACH PIER AVE &amp; MONTEREY  MH WEST ON MO Downstream COUNTY MH 51</p> <p>Tap Factory Active  9 o'clock</p> <p>24 Circular Reinforced Co  06:57 2017/03/07 593.9 FT</p>
593.9	<p style="text-align: center;"><b>General Observation</b>  <b>Severity: None</b>  <b>Remarks: UNMARKED MANHOLE</b></p>	 <p>HERMOSA BEACH PIER AVE &amp; MONTEREY  MH WEST ON MO Downstream COUNTY MH 51</p> <p>General Observation  UNMARKED MANHOLE</p> <p>24 Circular Reinforced Co  06:57 2017/03/07 593.9 FT</p>
595.4	<p style="text-align: center;"><b>Shape or Size Change</b>  <b>Severity: None</b>  <b>Size: 18</b></p>	 <p>HERMOSA BEACH PIER AVE &amp; MONTEREY  MH WEST ON MO Downstream COUNTY MH 51</p> <p>Shape or Size Change</p> <p>24 Circular Reinforced Co  07:13 2017/03/07 595.4 FT</p>

Distance	Fault Observation	Picture
595.4	<p align="center"> <b>Manhole</b>  <b>Severity: None</b>  <b>Remarks: MANHOLE EAST OF</b>  <b>HERMOSA AVE</b> </p>	

Created with the  report generator

# Project: CITY OF HERMOSA BEACH

Date: 3/7/2017 6:25:00 AM

Street: PIER AVE & MONTEREY BLVD

Length Surveyed: 595.4

Pacp Quick Overall Rating: 0000

Height (Diameter): 24

Street: PIER AVE & MONTEREY BLVD

Pipe Segment Reference:

Upstream MH: MH WEST ON MONTEREY

Downstream MH: COUNTY MH 51

Direction of Survey: Downstream

Material: Reinforced Concrete Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: MH WEST ON MONTEREY

(0.0) - Manhole Remark: MH WEST ON MONTEREY

(0.0) - Water Level

(81.0) - Tap Factory Active - Position: 4 Size: 18

(191.5) - Tap Factory Active - Position: 8 Size: 18

(259.4) - Tap Factory Active - Position: 3 Size: 18

(320.0) - Tap Factory Active - Position: 3 Size: 18

(320.0) - General Observation Remark:  
UNMARKED MANHOLE

(468.2) - Tap Factory Active - Position: 9 Size: 18

(468.2) - General Observation Remark:  
UNMARKED MANHOLE

(533.4) - Tap Factory Active - Position: 3 Size: 18

(533.5) - General Observation Remark:  
UNMARKED MANHOLE

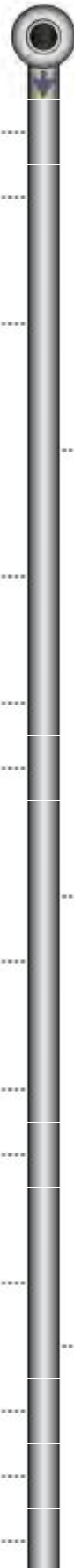
(593.9) - Tap Factory Active - Position: 3 Size: 18

(593.9) - Tap Factory Active - Position: 9 Size: 18

(593.9) - General Observation Remark:  
UNMARKED MANHOLE

(595.4) - Shape or Size Change Size: 18

(595.4) - Manhole Remark: MANHOLE EAST OF HERMOSA AVE



**Appendix C**  
**FEMA Flood Hazard Map**



**FLOOD HAZARD INFORMATION**

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP  
 THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING  
 DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT  
[HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)

	Without Base Flood Elevation (BFE) Zone A, V, A99
	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway
	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee See Notes. Zone X
	Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
	Area of Undetermined Flood Hazard Zone D
	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
	Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
	Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary

**NOTES TO USERS**

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

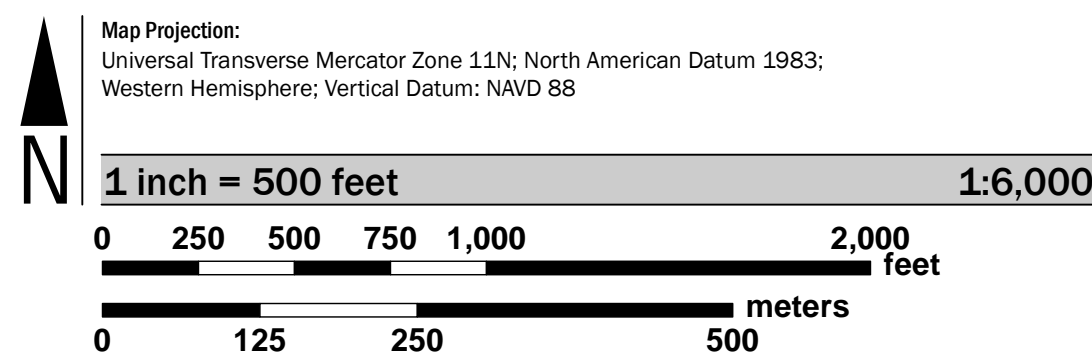
Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

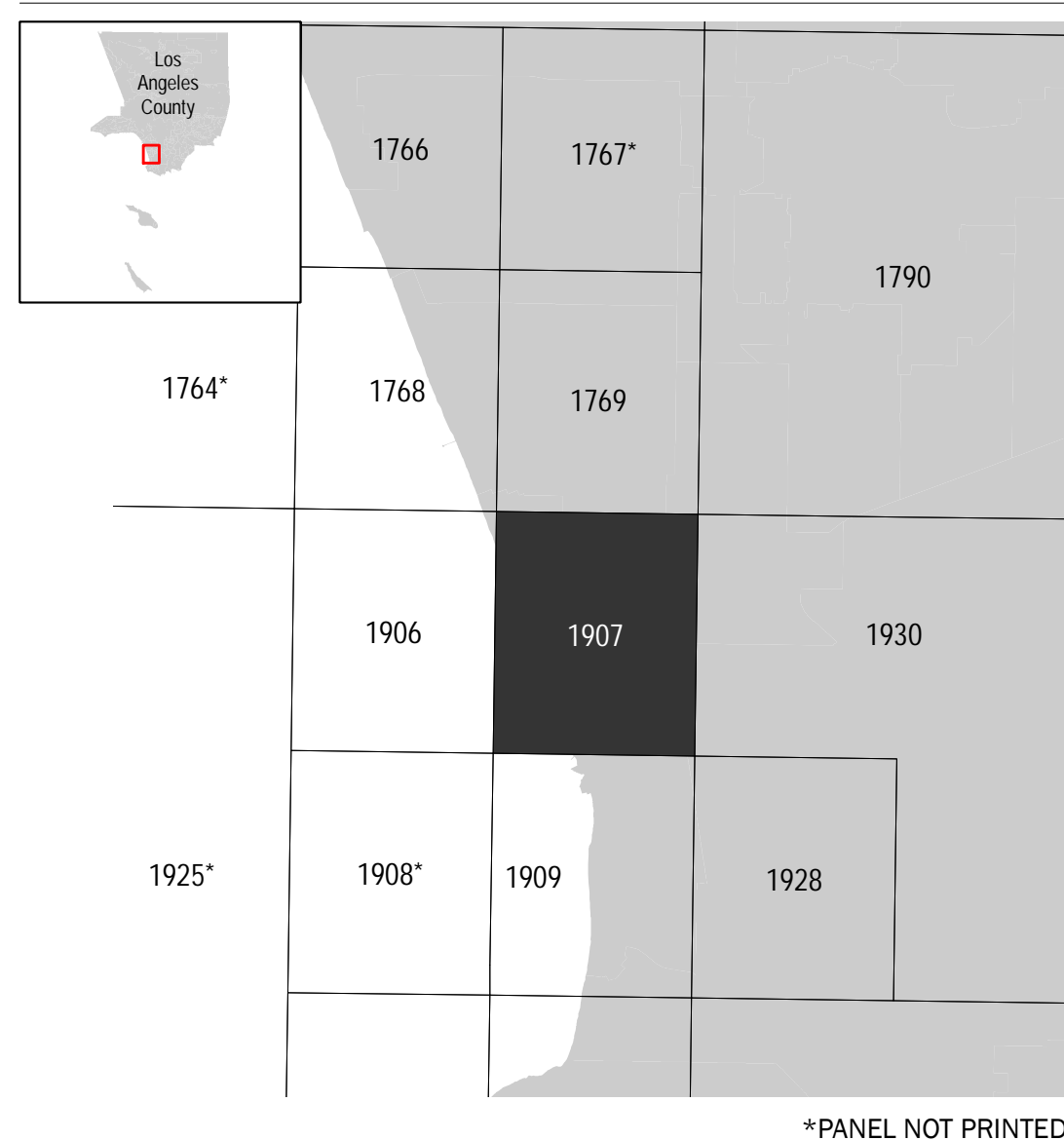
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was derived from digital orthophotography collected by the Coastal Service Center and U.S. Department of Agriculture Farm Service Agency. Coastal Service Center imagery was flown in 2011 and was produced with a sub-meter ground sample distance. Department of Agriculture imagery was flown in 2014 and was produced with a 1-meter ground sample distance.

**SCALE**



**PANEL LOCATOR**



**National Flood Insurance Program**

**NATIONAL FLOOD INSURANCE PROGRAM**  
**FLOOD INSURANCE RATE MAP**  
**LOS ANGELES COUNTY,**  
**CALIFORNIA**  
 and Incorporated Areas  
**PANEL 1907 OF 2350**

**FEDERAL EMERGENCY MANAGEMENT AGENCY**

**PRELIMINARY**  
**10/28/2016**

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
HERMOSA BEACH, CITY OF	060124	1907	G
MANHATTAN BEACH, CITY OF	060138	1907	G
REDONDO BEACH, CITY OF	060150	1907	G
TORRANCE, CITY OF	060165	1907	G

VERSION NUMBER  
2.3.3.3  
 MAP NUMBER  
06037C1907G  
 MAP REVISED