

# Victoria Ward Redevelopment

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## Sewer Master Plan Update

Kaka'ako Mauka, Honolulu, Hawai'i

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**SEWER MASTER PLAN UPDATE FOR  
VICTORIA WARD REDEVELOPMENT**

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## ACRONYMS

CIPP	Cured In Place Pipe
City	City and County of Honolulu
DDC	Department of Design and Construction
DPP	Department of Planning and Permitting
ENV	Department of Environmental Services
ESMH	Existing Sewer Manhole
gad	Gallons per acre per day
gpcd	Gallon per capita per day
HCDA	Hawai'i Community Development Authority
I/I	Infiltration/Inflow
KCDD	Kaka'ako Community Development District
LF	Linear feet
mgd	Million gallons per day
Plan	Sewer Master Plan
Project	Victoria Ward Redevelopment
RCP	Reinforced Concrete Pipe
SCA	Sewer Connection Application
SMH	Sewer Manhole
3010952	City sewer id number
sf	Square feet
TCP	Teracotta Pipe
TMK	Tax Map Key
VCP	Vitrified Clay Pipe
VWL	Victoria Ward Limited
WWB	Department of Planning and Permitting, Wastewater Branch
WWPS	Wastewater Pump Station
WWTP	Wastewater Treatment Plant

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**EXECUTIVE SUMMARY**

Victoria Ward, Ltd. (VWL) is creating a master planned, mixed-use urban neighborhood on approximately 60 acres in the Kaka’ako Mauka area on the island of O’ahu. The project will be built in five phases consisting of approximately 6,150 residential units, and approximately 1 million square feet of retail and restaurant space. Construction of the project began in 2014 and is anticipated to be completed by 2027.

<b>VICTORIA WARD, LTD. PROJECT PHASES</b>	
<b>Project Phase &amp; Block</b>	<b>Anticipated Completion</b>
Phase 1 Block C East Block K Block M Block O	2016 2017 2018 2019
Phase 2 Block N East Block I Victoria Park Block C West	2020 2021 2021 2021
Phase 3 Block A Block G East Block F West Block F East	2022 2022 2022 2023
Phase 4 Block B East Block B West Block G West Block N West	2023 2024 2024 2024
Phase 5 Block D Block H North Block H South Block E West	2025 2026 2026 2027

An analysis of the existing downstream City and County of Honolulu (“City”) conveyance system was performed to evaluate the necessary improvements to support each phase of the development. The evaluation was based on three components:

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1. The city design standard peak flows generated by each block of the proposed development programming.
2. Information from the city INFIX Adjusted model that records the hydraulic capacity of the sewer system serving the Project Area. The model includes an inventory of the types and sizes of pipe segments comprising the system as well as the wastewater flow conditions of the system in 1995 (then existing condition) and projected to 2020.
3. Hydraulic pipe capacity of sewer main segments that could be affected by surcharge from the Project Area blocks.

It is recommended that some improvements to the existing city sewer system be made to accommodate certain blocks within the Project Area. These include replacing a portion of the East End Relief sewer main, installing new sewer mains, and installing new sewer laterals. A summarization of improvements per each block is described as follows:

<b>PROPOSED SEWER IMPROVEMENTS BY PHASE</b>				
<b>Project Phase</b>	<b>Block</b>	<b>Projected Design Sewer Peak Flow</b>	<b>Proposed Sewer Improvements</b>	<b>Anticipated Sewer Improvement Completion Date</b>
Phase 1	Block C East	0.300 mgd	New 10-inch lateral from block to existing Kamakee Street 48-inch main at existing SMH 3010952.	2016
	Block K	0.412 mgd	New 12-inch lateral from block to existing Kamakee Street 36-inch main at existing SMH 4075941.	2017
	Block M	0.962 mgd	New 16-inch lateral from block to existing Kamakee Street 36-inch main at new SMH.	2018
	Block O	0.507 mgd	New Ward Avenue 24-inch main from upstream existing SMH 342321 to downstream existing Auahi Street 78-inch main at existing SMH 379890.  New 12-inch lateral from block to new Ward Avenue 24-inch main.	2019

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<b>(CONTINUED) PROPOSED SEWER IMPROVEMENTS BY PHASE</b>				
<b>Project Phase</b>	<b>Block</b>	<b>Projected Design Sewer Peak Flow</b>	<b>Proposed Sewer Improvements</b>	<b>Anticipated Sewer Improvement Completion Date</b>
Phase 2	Block N East	0.870 mgd	New 12-inch lateral from block to existing Cummins Street 48-inch East End Relief main at existing SMH 379795.	2020
	Block I	2.146 mgd	New Auahi Street 24-inch main to existing Auahi Street 48-inch East End Relief main at existing SMH 379979.	2021
			New 12-inch lateral from block to new Auahi Street 24-inch main.	
	Victoria Park	0.000 mgd	None.	2021
Block C West	0.466 mgd	New 12-inch lateral from block to new Auahi Street 24-inch main.	2021	
Phase 3	Block A	0.524 mgd	New Auahi Street 12-inch main to new Phase 1 Ward Avenue 24-inch main.	2022
			New 12-inch lateral from block to new Auahi Street 12-inch main.	
	Block G East	1.302 mgd	New Pohukaina Street 12-inch main to new Phase 1 Ward Avenue 24-inch main.	2022
			New 12-inch lateral from block to new Pohukaina Street 12-inch main.	
Block F West	0.609 mgd	New Auahi Street 12-inch main extension of new Auahi Street 12-inch main.	2022	
		New 12-inch lateral from block to new Auahi Street 12-inch main extension.		
Block F East	0.640 mgd	New 12-inch lateral to new Auahi Street 12-inch main.	2023	
Phase 4	Block B East	0.448 mgd	New 12-inch lateral to new Phase 2 Auahi Street 24-inch main.	2023



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<b>(CONTINUED) PROPOSED SEWER IMPROVEMENTS BY PHASE</b>				
<b>Project Phase</b>	<b>Block</b>	<b>Projected Design Sewer Peak Flow</b>	<b>Proposed Sewer Improvements</b>	<b>Anticipated Sewer Improvement Completion Date</b>
Phase 4 (continued)	Block B West	0.352 mgd	New 12-inch lateral to existing Auahi Street 48-inch main at new SMH.	2024
	Block G West	1.303 mgd	New Pohukaina Street 12-inch main extension of new Phase 3 Pohukaina Street 12-inch main.  New 12-inch lateral from block to new Pohukaina Street 12-inch main extension.	2024
	Block N West	0.876 mgd	New Ward Avenue 48-inch East End Relief main from upstream Queen Street 48-inch East End Relief main to downstream Auahi Street 48-inch East End Relief main.	2024
Phase 5	Block D	0.376 mgd	New Auahi Street 18-inch main to existing 36-inch Kamakee Street main at existing SMH 380287.  New 12-inch lateral from block to new Auahi Street 18-inch main.	2025
	Block H North	0.939 mgd	New 12-inch lateral from block to new Phase 4 Ward Avenue 48-inch East End Relief main.	2026
	Block H South	1.076 mgd	New 12-inch lateral from block to existing 48-inch East End Relief main on Auahi Street.	2026
	Block E West	0.367 mgd	New Auahi Street 18-inch main extension of new 18-inch Auahi Street main.  New 12-inch lateral from block to new Auahi Street 18-inch main.	2027

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Individual Sewer Connection Applications will be submitted to the city Department of Planning and Permitting (DPP) for each block within each phase. This Plan serves as a guide for the overall sewer infrastructure development and will be updated as project phases are completed. VWL and its consultants will coordinate these updates with DPP Wastewater Branch (WWB) and the Department of Environmental Services (ENV).

# **SEWER MASTER PLAN UPDATE FOR VICTORIA WARD REDEVELOPMENT**

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## **1. INTRODUCTION**

VWL is in the process of redeveloping approximately 60 acres in the Kaka‘ako area of Honolulu on the island of Oahu. The Victoria Ward Redevelopment Project (“Project” and “Project Area”) is generally bounded by Ala Moana Boulevard to the south, Queen Street to the north, Cooke Street to the west and Queen Lane to the east. Major streets through the Project Area include Ward Avenue and Kamakee Street in the north-south (mauka-makai) direction and Auahi Street and Halekauwila Street in the east-west (Diamond Head-Ewa) direction. The Project Area will be developed with uses for residential, retail, restaurant, parking and parks in five phases. Construction began in 2014 with anticipated completion in 2027.

The DPP WWB requested that the previously prepared May 2013 Sewer Master Plan (“Plan”) for the Project be updated to reflect the current development programming and recommended VWL sewer system infrastructure improvements to support each phase of completion. An analysis of the estimated wastewater flows generated by each block in the Project Area in addition to the current and future capacities of the City systems were utilized to determine locations of deficiency that require improvements. Any changes to the project phase scheduling, development programming and construction start dates will require notification of WWB, which may in turn require further revision and resubmittal of this Sewer Master Plan.

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## 2. VICTORIA WARD REDEVELOPMENT

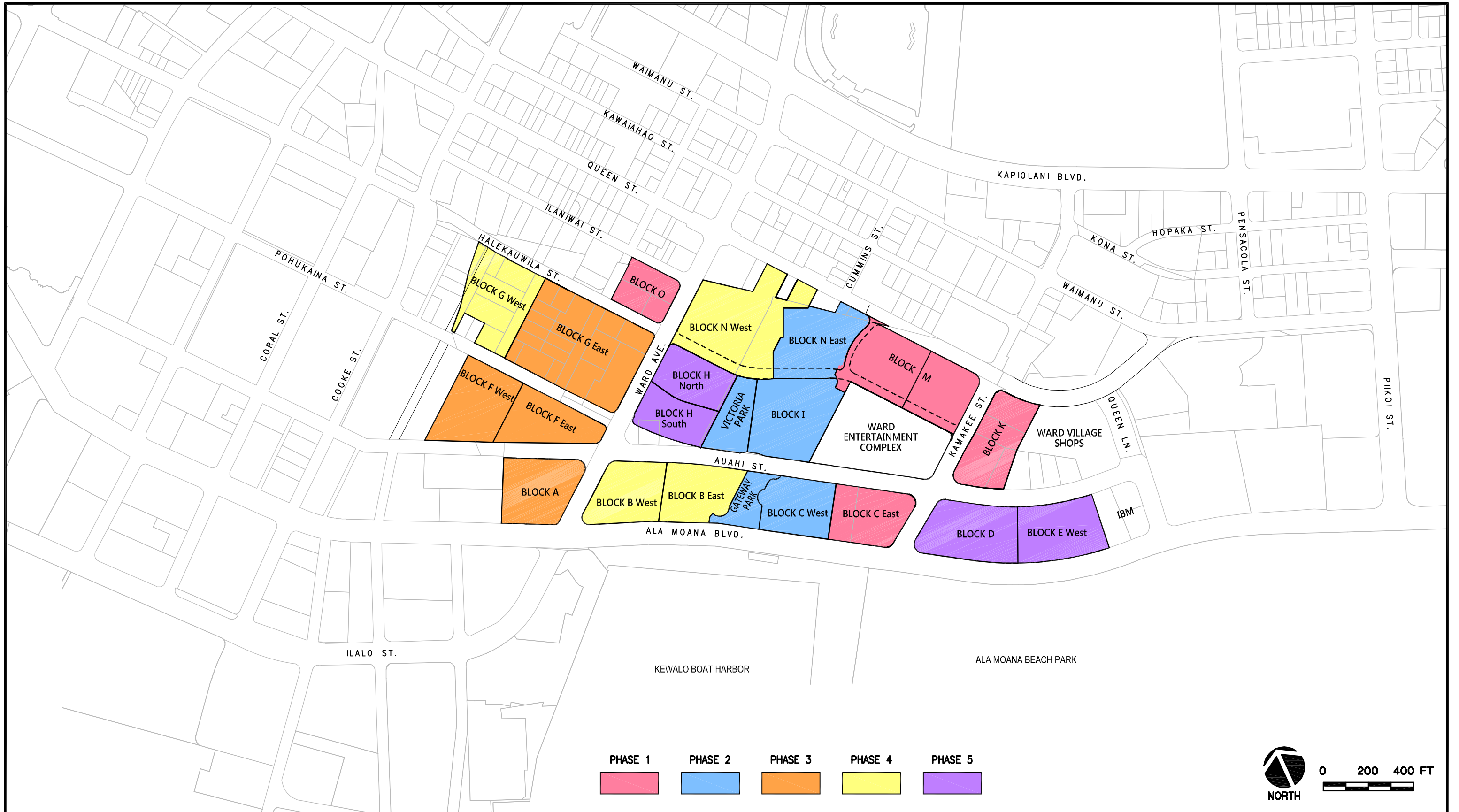
The Project Area is located within the Kaka’ako Community Development District (KCDD) of Honolulu, which is under the jurisdiction of the Hawai’i Community Development Authority (HCDA)—a State agency established to oversee the renewal and development of designated community districts. The KCDD Mauka and Makai Area Plans and Rules are the guiding documents for the redevelopment of the KCDD into a mixed-use and pedestrian-oriented urban community.

Guided by the Mauka Area Plan and the current Draft Transit Oriented Development Overlay Plan (May 20, 2013), VWL is in the process of redeveloping approximately 60 acres of the Victoria Ward properties as a mixed-use urban neighborhood that includes high-rise and low-rise residences, retail, dining, recreation and entertainment. The redevelopment plan also incorporates pedestrian-friendly and transit-oriented design elements, sustainable design strategies, and open space.

### 2.1 Phase Descriptions

The Project is currently proceeding in five phases into which various specific projects identified as blocks have been divided. Table 2-1 presents the phases, the blocks associated with each phase and the anticipated completion years. A description of each block is summarized below and illustrated in Figure 2-1.

<b>TABLE 2-1 VICTORIA WARD DEVELOPMENT PHASES</b>	
	<b>Anticipated Completion</b>
Phase 1 – Blocks C East, K, M and O	2016-2019
Phase 2 – Blocks N East, I, Victoria Park and C West	2020-2021
Phase 3 – Blocks A, G East, F West and F East	2022-2023
Phase 4 – Blocks B East, B West, G West and N West	2023-2024
Phase 5 – Blocks D, H North, H South and E West	2025-2027



VICTORIA WARD, LTD. REDEVELOPMENT

GENERAL PLAN

FIGURE  
2-1



## SEWER MASTER PLAN UPDATE FOR VICTORIA WARD REDEVELOPMENT

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### 2.1.1 Phase 1 – Blocks C East, K, M and O

#### Block C East

TMK: 2-3-001: 001 & 004  
Former Use: Parking lot (demolished)  
Adjoining Streets/Uses: Auahi Street, Ward Warehouse Shopping Center, Ala Moana Boulevard, and Kamakee Street  
Proposed Use: 37-story condominium and ground level retail building  
Anticipated Completion: Under construction since 2014, anticipated completion 2016  
Sewer Connection: Auahi Street – sewer connection application approved under No. 2015/SCA-0046 (see Appendix A)

#### Block K

TMK: 2-3-005: 013, 017, 019 & 022  
Former Use: Pier One Imports and parking (demolished)  
Adjoining Streets/Uses: Queen Street, Kamakee Street, Auahi Street, and Ward Village Shops  
Proposed Use: 39-story condominium and ground level retail building  
Anticipated Completion: Under construction since 2015, anticipated completion 2017  
Sewer Connection: Kamakee Street – sewer connection application approved under No. 2015/SCA-0260 (see Appendix A)

#### Block M

TMK: 2-3-002: 001  
Former Use: Office Depot, Nordstrom Rack and parking (demolished)  
Adjoining Streets/Uses: Queen Street, warehouses, Ward Entertainment Complex, and Kamakee Street  
Proposed Use: 41-story condominium and ground level retail and restaurant building  
Anticipated Completion: Under construction 2016, anticipated completion 2018  
Sewer Connection: Kamakee Street - sewer connection application approved under No. 2014/SCA-0686 (see Appendix A). Updated application currently under review.

#### Block O

TMK: 2-1-050: 001, 061 & 062  
Current Use: Various office, retail (Pacific Home) and restaurant (Kanpai Bar & Grill, and California Rock'n Sushi)  
Adjoining Streets/Uses: Ilaniwai Street, Kauhale Kakaako Apartments, Halekauwila Street, and Ward Avenue  
Proposed Use: 44-story condominium and ground level retail building

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Anticipated Completion: Anticipated construction start 2016, anticipated completion 2019  
Sewer Connection: Auahi Street – sewer connection application approved under No. 2015/SCA-0813 (see Appendix A)

### 2.1.2 Phase 2 – Blocks N East, I, Victoria Park and C West

#### Block N East

TMK: 2-3-002: 001  
Current Use: Warehouses  
Adjoining Streets/Uses: Queen Street, Ross Dress for Less, Marukai Market Place and warehouses, and Block M – under construction (formerly Office Depot/Nordstrom Rack and parking)  
Proposed Use: Condominium and ground level retail and restaurant building  
Anticipated Completion: Anticipated construction start 2019, anticipated completion 2020  
Sewer Connection: Cummins Street – sewer connection application currently under review

#### Block I

TMK: 2-3-002: 001  
Current Use: Marukai Market Place, parking (portion) and warehouses (portion)  
Adjoining Streets/Uses: Marukai Market Place (portion), warehouses (portion), Auahi Street, and Ward Entertainment Complex  
Proposed Use: Condominium and ground level retail and restaurant building  
Anticipated Completion: Anticipated construction start 2019, anticipated completion 2021  
Sewer Connection: Auahi Street – sewer connection application currently under review

#### Victoria Park

TMK: 2-3-002: 001  
Current Use: Marukai Market Place and parking (portion), warehouses (portion)  
Adjoining Streets/Uses: Marukai Market Place and parking (portion), warehouses (portion), Auahi Street, Sports Authority Starbuck's Coffee, Jamba Juice, Wahoo's Fish Taco and parking  
Proposed Use: Park

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Anticipated Completion: Anticipated construction start 2020, anticipated completion 2021

Sewer Connection: None

### Block C West

TMK: 2-3-001: 005

Current Use: Ward Warehouse (portion)

Adjoining Streets/Uses: Auahi Street, Ward Warehouse (portion), Ala Moana Boulevard, and Block C East (under construction)

Proposed Use: 28-story condominium and ground level restaurant building

Anticipated Completion: Anticipated construction start 2019, anticipated completion 2021

Sewer Connection: Auahi Street – sewer connection application currently under review

### **2.1.3 Phase 3 - Blocks A, G East, F West and F East**

#### Block A

TMK: 2-1-056: 001

Current Use: Ward Plaza office building

Adjoining Streets/Uses: Auahi Street, office building and car dealership, Ala Moana Boulevard, and Ward Avenue

Proposed Use: Condominium and ground level retail and restaurant building

Anticipated Completion: Anticipated construction start 2020, anticipated completion 2022

Sewer Connection: Auahi Street – proposed

#### Block G East

TMK: 2-1-052: 012, 020, 022, 024, 027, 028, 031, 032, 011, 033, 040, 052, 039, 051, 038, 034, 036, 035, and 053

Current Use: Low-rise retail and office buildings and parking

Adjoining Streets/Uses: Halekauwila Street, Ahui Street, Pohukaina Street, and Ward Avenue

Proposed Use: Condominium and ground level retail and restaurant building

Anticipated Completion: Anticipated construction start 2020, anticipated completion 2022

Sewer Connection: Pohukaina Street - proposed

#### Block F West

TMK: 2-1-053: 001

Current Use: Retail and office buildings



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Adjoining Streets/Uses: Pohukaina Street, UFC Gym Honolulu, Auahi Street, and Kamani Street  
Proposed Use: Condominium and ground level retail and restaurant building  
Anticipated Completion: Anticipated construction start 2020, anticipated completion 2022  
Sewer Connection: Auahi Street - proposed

### Block F East

TMK: 2-1-053: 001, 030  
Current Use: Retail and office buildings  
Adjoining Streets/Uses: Pohukaina Street, retail and office buildings, Auahi Street, and Ward Avenue  
Proposed Use: Condominium and ground level retail and restaurant building  
Anticipated Completion: Anticipated construction start 2021, anticipated completion 2023  
Sewer Connection: Auahi Street - proposed

### **2.1.4 Phase 4 – Blocks B East, B West, G West and N West**

#### Block B East

TMK: 2-3-001: 005  
Current Use: Ward Warehouse (portion)  
Adjoining Streets/Uses: Auahi Street, Ala Moana Boulevard, and Ward Warehouse (portion)  
Proposed Use: 35-story condominium and ground level restaurant building  
Anticipated Completion: Anticipated construction start 2021, anticipated completion 2023  
Sewer Connection: Auahi Street – sewer connection application currently under review

#### Block B West

TMK: 2-3-001: 005  
Current Use: Ward Warehouse (portion)  
Adjoining Streets/Uses: Auahi Street, Ward Avenue, Ala Moana Boulevard, and Ward Warehouse (portion)  
Proposed Use: Condominium and ground level retail and restaurant building  
Anticipated Completion: Anticipated construction start 2022, anticipated completion 2024  
Sewer Connection: Auahi Street – proposed

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### Block G West

TMK: 2-1-052: 017, 022, 042, 043, 045, and 046  
Current Use: Retail and office buildings, parking lot  
Adjoining Streets/Uses: Halekauwila Street, Koula Street, Pohukaina Street, and Ahui Street  
Proposed Use: Condominium and ground level retail and restaurant building  
Anticipated Completion: Anticipated construction start 2022, anticipated completion 2024  
Sewer Connection: Pohukaina Street – proposed

### Block N West

TMK: 2-3-002: 059, 067, 086, 087  
Current Use: Ross Dress for Less, parking lot  
Adjoining Streets/Uses: Queen Street and TMK 2-3-002: 057 and 58, Ward Avenue, Sports Authority, and warehouses  
Proposed Use: Condominium and ground level retail and restaurant building  
Anticipated Completion: Anticipated construction start 2022, anticipated completion 2024  
Sewer Connection: Ward Avenue – proposed

### **2.1.5 Phase 5 – Blocks D, H North, H South and E West**

#### Block D

TMK: 2-3-005: 006  
Current Use: Ward Centre (portion)  
Adjoining Streets/Uses: Auahi Street, Kamakee Street, Ala Moana Boulevard, and Ward Centre (portion)  
Proposed Use: Condominium and ground level retail and restaurant building  
Anticipated Completion: Anticipated construction start 2023, anticipated completion 2025  
Sewer Connection: Ala Moana Boulevard – proposed

#### Block H North

TMK: 2-3-002: 002 and 059  
Current Use: Sports Authority  
Adjoining Streets/Uses: Ross Dress for Less, Ward Avenue, Marukai Market Place and parking lot  
Proposed Use: Condominium and ground level retail and restaurant building  
Anticipated Completion: Anticipated construction start 2024, anticipated completion 2026

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Sewer Connection: Ward Avenue – proposed

### Block H South

TMK:

2-3-002: 002 and 059

Current Use:

Sports Authority

Adjoining Streets/Uses:

Ward Avenue, Auahi Street, Marukai Market Place and parking lot

Proposed Use:

Condominium and ground level retail and restaurant building

Anticipated Completion:

Anticipated construction start 2024, anticipated completion 2026

Sewer Connection:

Ward Avenue – proposed

### Block E West

TMK:

2-3-005: 006

Current Use:

Ward Centre (portion)

Adjoining Streets/Uses:

Auahi Street, Ward Centre (portion), Ala Moana Boulevard, IBM building

Proposed Use:

Condominium and ground level retail and restaurant building

Anticipated Completion:

Anticipated construction start 2025, anticipated completion 2027

Sewer Connection:

Auahi Street – proposed

## **SEWER MASTER PLAN UPDATE FOR VICTORIA WARD REDEVELOPMENT**

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### **3. EXISTING SEWER SYSTEM**

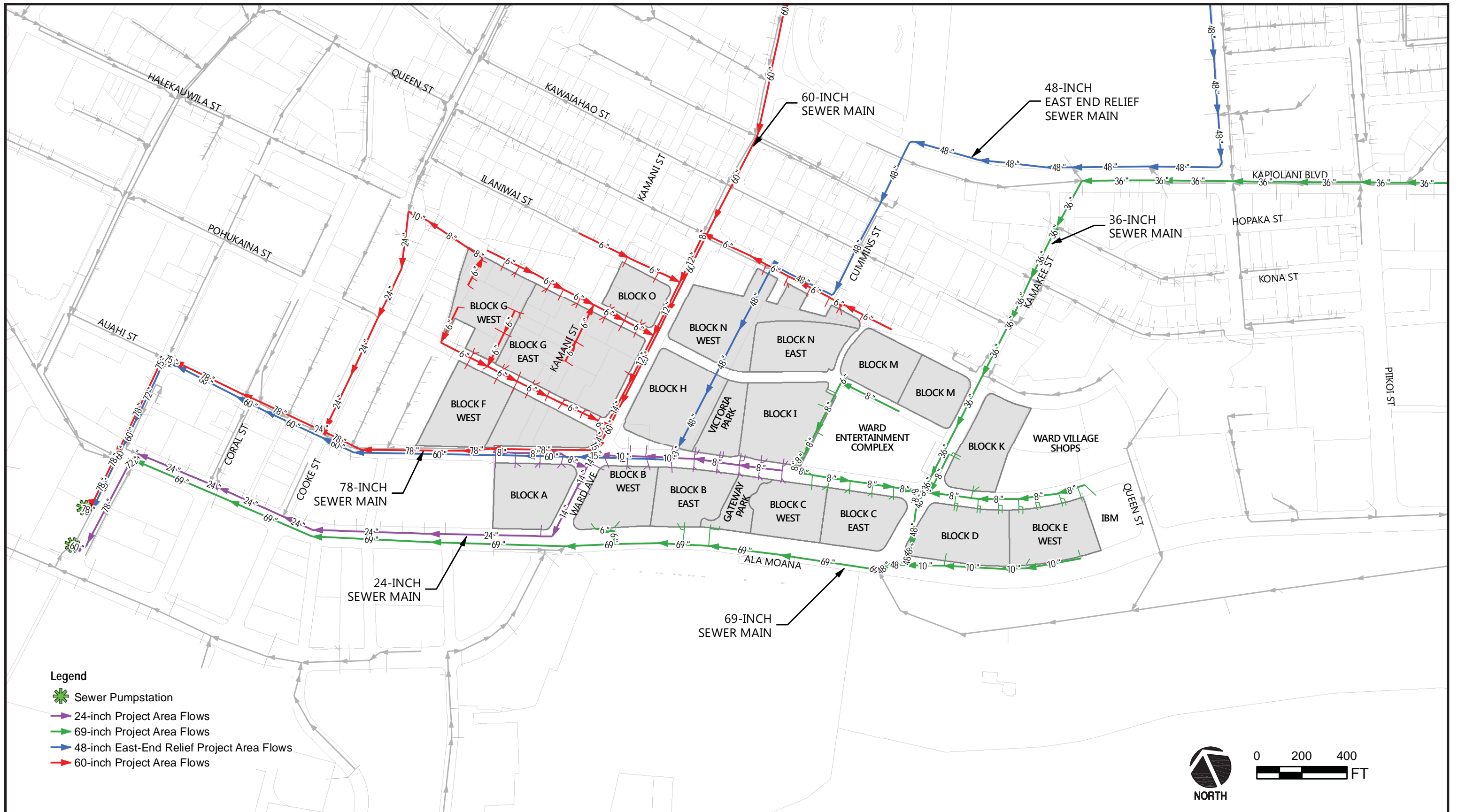
The Project Area is part of the City and County of Honolulu ENV East Mamala Bay Sewerage District, which encompasses approximately 79 square miles extending from Salt Lake/Aliamanu Crater/Red Hill area in the west to Niu Valley in the east. All wastewater within the district is served by the Sand Island Wastewater Treatment Plant (WWTP) through fifteen (15) different wastewater pump stations. The Ala Moana Wastewater Pump Station (WWPS), located on Keawe Street and makai of Ala Moana Boulevard, collects wastewater flow from the Project Area in Kaka'ako to Pauoa/Dowsett Highlands in the west to Niu Valley in the east. The Ala Moana WWPS contains two pumping stations with two force mains that operate in parallel to convey wastewater flows beneath Honolulu Harbor to the Sand Island WWTP for treatment and disposal.

#### **3.1 Existing Sewer Collection System Serving Project Phase Areas**

Wastewater generated from the Project Area is collected by several 6-inch sewer laterals that flow into a network of gravity collector and trunk sewer mains that convey water to the Ala Moana WWPS. The sewer mains consist of reinforced concrete pipes (RCP), vitrified clay pipes (VCP), terracotta pipes (TCP), cured in place pipes (CIPP), and slip-lined pipes that range in size from 6-inches to 78-inches in diameter. Four (4) major trunk sewer mains currently serve the Project Area downstream:

1. A 69-inch sewer main flowing northwest on Ala Moana Boulevard collects flows via sewer laterals and a 48-inch sewer main on Kamakee Street from the southeastern end and some makai portions of the Project Area up to Ward Avenue.
2. A 24-inch sewer main flowing northwest on Ala Moana Boulevard collects flows via a 14-inch sewer main on Ward Avenue from the Project Area parcels along Auahi Street, on either side of Ward Avenue.
3. A 78-inch sewer main flowing northwest on Auahi Street collects flows via a 14-inch sewer main and a 60-inch sewer main on Ward Avenue from the mauka and northern portion of the Project Area along Queen Street, Ward Avenue, Ilaniwai Street, Halekauwila Street and Pohukaina Street.
4. A sewer main referred to as the "East End Relief" traverses the Project Area, entering from the northeast mid-block east of Ward Avenue as a 48-inch sewer which then turns northwest at Auahi Street and changes in size before continuing as a 60-inch sewer main. Within the Project Area, the only development served by this main is the Sports Authority.

A map of the overall existing sewer system is illustrated in Figure 3-1. A more detailed description of the existing sewer system and the Project blocks they serve is provided in the following sections.



VICTORIA WARD, LTD. REDEVELOPMENT

EXISTING SEWER MAP

FIGURE  
3-1



## **SEWER MASTER PLAN UPDATE FOR VICTORIA WARD REDEVELOPMENT**

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### **3.1.1 69-inch Sewer Main on Ala Moana Boulevard**

Wastewater flows from the southeastern end and some makai portions of the Project Area are collected by a 69-inch RCP sewer main that conveys wastewater northwest along Ala Moana Boulevard to the Ala Moana WWPS. The 69-inch RCP sewer main receives flows directly from sewer laterals located on the makai portion of Ward Centre and from a 48-inch RCP sewer main flowing in the makai direction along Kamakee Street. Downstream, the 69-inch RCP sewer main converges with a 24-inch CIPP sewer main near the intersection of Ala Moana Boulevard and Keawe Street. At this point, the combined wastewater flow is discharged into a 78-inch RCP sewer main on Keawe Street that conveys it directly to the WWPS.

The 48-inch RCP sewer main flowing in the makai direction on Kamakee Street receives wastewater from three 8-inch VCP collector sewer mains near the intersection of Kamakee Street and Auahi Street. The 8-inch main running along the interior northern and northeastern edge of the Ward Entertainment Center collects flows from Blocks M, I (Ward Industrial Gateway), C West (portion of Ward Warehouse), and C East before turning southeast and discharging into the 48-inch main on Kamakee Street. The 8-inch VCP sewer main flowing northwest on Auahi Street collects flows from the former IBM Building, and Blocks D, E West (Ward Centre) and Block K before discharging into the 48-inch main on Kamakee Street. The 8-inch VCP sewer main extending a short distance in the mauka direction on Kamakee Street from the 48-inch sewer main only serves Block K. A 36-inch CIPP sewer main on Kamakee Street also discharges into the 48-inch RCP sewer main, but it does not currently serve parcels the existing Project Area.

The 48-inch RCP sewer main also receives wastewater from a 10-inch CIPP sewer main on Ala Moana Boulevard that serves the makai portions of Block D and E West (Ward Centre). The 10-inch CIPP sewer main discharges into the 48-inch RCP sewer main near the intersection of Kamakee Street and Ala Moana Boulevard.

After receiving flows from the 48-inch RCP sewer main, the 69-inch sewer main continues northwest along Ala Moana Boulevard and receives wastewater from three laterals serving the Ward Warehouse complex, which comprises Blocks C West, Gateway Park and Blocks B East, and B West, all of which are currently occupied by the Ward Warehouse.

### **3.1.2 24-inch Sewer Main on Ala Moana Boulevard**

Wastewater flows from the parcels along Auahi Street, on either side of Ward Avenue, are collected by a 24-inch CIPP sewer main that conveys wastewater northwest along Ala Moana Boulevard to the Ala Moana WWPS. The 24-inch CIPP sewer main receives flows directly from a sewer lateral located on the makai side of Block A (Ward Plaza) and from a 14-inch CIPP sewer main extending in the mauka direction along Ward Avenue. Downstream, the 24-inch CIPP sewer main collects

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wastewater from additional sewer mains outside of the Project Area before converging with the 69-inch RCP sewer main near the intersection of Ala Moana Boulevard and Keawe Street, as discussed previously. At this point wastewater is discharged into a larger 78-inch RCP sewer main on Keawe Street that conveys wastewater directly to the WWPS.

The 14-inch CIPP sewer main extending in the mauka direction on Ward Avenue accepts wastewater from an 8-inch VCP sewer main from the northwest and a short segment of a 15-inch VCP sewer main that immediately transitions to a 10-inch VCP sewer main from the southeast along Auahi Street. The 8-inch VCP sewer main from the northwest serves the mauka side of Block A (Ward Plaza) while the 10-inch VCP sewer main collects flows from the mauka side of Blocks B West, and B East (portion of Ward Warehouse) and Block H (Sports Authority and Wahoo's Fish Taco/Starbucks Coffee/Jamba Juice). Continuing southeast on Auahi, the 10-inch VCP sewer main further reduces into an 8-inch VCP sewer main collecting flows from the mauka side of Blocks B East and B West (portion of Ward Warehouse) and Block I and Victoria Park (Ward Industrial Gateway).

### **3.1.3 78-inch Sewer Main on Auahi Street**

Wastewater flows from the mauka and northern portion of the Project Area along Queen Street, Ward Avenue, Ilaniwai Street, Halekauwila Street and Pohukaina Street are collected by a 78-inch RCP sewer main that conveys wastewater northwest along Auahi Street to the Ala Moana WWPS. The 78-inch RCP sewer main receives flows from a short segment of a 15-inch VCP sewer main that immediately transitions to a 14-inch TCP sewer main that receives flows between Queen Street and Auahi Street on Ward Avenue. A 60-inch RCP sewer main on Ward Avenue also discharges into the 78-inch RCP sewer main, but it does not currently serve parcels in the existing Project Area.

At the upstream end of the Project Area, a 12-inch TCP sewer main on Ward Avenue receives flows from a 6-inch TCP sewer main extending southeast on Queen Street to serve Blocks N West and N East. Farther downstream on the 12-inch TCP sewer main, a 6-inch TCP extending northwest on Ilaniwai Street serves the mauka side of Block O. Continuing downstream of the 12-inch TCP sewer main, a 6-inch TCP sewer main extending northwest on Halekauwila Street serves the mauka side of Blocks G East and G West, and the makai side of Block O. Even farther downstream, the 12-inch TCP sewer main enlarges to the 14-inch TCP midway to the Pohukaina Street intersection. At the intersection, it receives flows from a 6-inch TCP sewer main extending northwest to collect flows from various office, retail and restaurant buildings on the makai side of Blocks G East, G West, and the mauka side of Blocks F East and F West.

The Block G West site is additionally served by a 6-inch TCP sewer main that conveys wastewater northwest, beyond the Project Area, along Halekauwila Street

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through an 8-inch sewer main and a 10-inch VCP sewer main to a 24-inch VCP sewer main located along Cooke Street. The 24-inch sewer main discharges into the 78-inch RCP sewer main near the intersection of Cooke Street and Auahi Street.

### 3.1.4 East End Relief Sewer Main

The East End Relief sewer main enters the Project Area crossing Queen Street mid-block east of Ward Avenue as a 48-Inch RCP sewer main. It continues in the makai direction to collect wastewater flows from the Sports Authority complex in Block H before turning northwest on Auahi Street where it becomes a 42-inch slip-lined sewer main. After crossing Ward Avenue, it becomes a 60-inch slip-lined sewer main and continues toward the Ala Moana WWPS.

It should be noted that the existing 60-inch sewer main was originally a 72-inch box sewer main that was scheduled to be slip-lined with a 60-inch pipe in 2013. The project name is Ala Moana Boulevard/Auahi Street Sewer Rehabilitation Phase 2, Job No. W10-11. The slip-line sewer rehabilitation project started on Keawe Street and ended on Auahi Street at existing sewer manhole SMH 684051.

## 3.2 INFIX Adjusted Flow Model

In December 1999, the City, Department of Design and Construction (DDC), completed the *Final Sewer Infiltration and Inflow Plan (I/I Plan)* which describes the rehabilitation program that the City will be implementing over the next 20 years to address deficiencies in the City's sewer collection system. In the *Final Sewer I/I Plan*, hydraulic capacity of the sewer collection system was evaluated using numerical models that identified hydraulic deficiencies. The City developed modeling program such as XP-SWMM and a simpler static modeling program (INFIX Adjusted) available and could be utilized to evaluate the critical trunk sewers, and the less critical sewers. Results of the modeling were used to prioritize implementation of recommended improvements based on the severity of the hydraulic deficiencies in the sewer system.

Existing sewer mains serving the Project Area were evaluated by the INFIX Adjusted flow model as part of the I/I Plan for the 1995 existing condition, when it was prepared, as well as for the 2020 future condition based on projected flows. INFIX Adjusted existing and future model output runs including pipe size, peak design flow, pipe capacity and pipe surcharge percentage for the sewer systems serving the Project Area are shown in Appendix B and summarized in Tables 3-1 and 3-2. These results do not include the proposed design peak flows from the Project.



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**TABLE 3-1  
SEWER SYSTEM HYDRAULIC PIPE SURCHARGE % FOR INFIX ADJUSTED  
(1995) MODEL FLOW FOR EXISTING CONDITION**

Pipe Location	Pipe Size (inch)	INFIX (1995) Flow (mgd)*	Total Pipe Capacity (mgd)	Surcharge (%)
Auahi St east of Kamakee St	8	0.20	0.42	48
Auahi St west of Kamakee St	8	0.20	0.51	39
Kamakee St	8	0.06	0.42	15
Kamakee St	36	13.35	9.89	<b>135- Inadequate**</b>
Queen Lane	30	NA	NA	NA
Ala Moana Blvd	10	0.44	1.00	44
Queen St	6	0.03	0.19	16
Ward Ave	14	0.92	2.41	38
Ward Ave	60	83.35	67.61	<b>123- Inadequate</b>
Easement under Sports Auth	48	15.89	57.00	28
Pohukaina St	6	0.20	0.24	80
Auahi St – East of Ward Ave	10	0.09	0.57	22
Halekauwila St	6	0.08	0.24	34
Ilaniwai St	6	0.08	0.24	33
Kamani St	6	0.02	0.24	9
Ahui St	6	0.03	0.22	12
Ohe St	6	0.06	0.24	27
Ala Moana Blvd	69	38.31	59.47	64
Ala Moana Blvd	24	0.36	4.35	8
Auahi/Keawe St	78	110.63	73.88	<b>150- Inadequate**</b>
Auahi/Keawe St	72	33.77	82.72	41
Cooke St	24	6.22	9.98	62
Ala Moana Blvd	36	13.35	55.14	24
Ala Moana Blvd	6	NA	NA	NA
Queen St	10	NA	NA	NA

NOTE: Refer to Figure 3-2 for location of inadequate sewer mains. Information for 48-inch on Kamakee Street was not available at the time.

\*Does not include proposed design peak flows from Project.

\*\*Based on INFIX Adjusted Model Run; City DPP (see 3.2.1 INFIX Adjusted Flow Model Results).

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<b>TABLE 3-2 SEWER SYSTEM HYDRAULIC PIPE SURCHARGE % FOR INFIX ADJUSTED (2020) MODEL FLOW FOR FUTURE CONDITION</b>				
<b>Pipe Location</b>	<b>Pipe Size (inch)</b>	<b>INFIX (2020) Flow (mgd)*</b>	<b>Total Pipe Capacity (mgd)</b>	<b>Surcharge (%)</b>
Auahi St east of Kamakee St	8	0.24	0.42	57
Auahi St west of Kamakee St	8	0.24	0.51	47
Kamakee St	8	0.09	0.42	21
Kamakee St	36	15.05	9.89	<b>158- Inadequate**</b>
Queen Lane	30	NA	NA	NA
Ala Moana Blvd	10	0.40	1.00	40
Queen St	6	0.04	0.19	21
Ward Ave	14	0.85	2.41	23
Ward Ave	60	83.35	67.61	<b>123- Inadequate</b>
Easement under Sports Auth	48	16.56	57.00	29
Pohukaina St	6	0.23	0.24	96
Auahi St – East of Ward Ave	10	0.28	0.57	49
Halekauwila St	6	0.12	0.24	50
Ilaniwai St	6	0.09	0.24	38
Kamani St	6	0.03	0.24	13
Ahui St	6	0.03	0.22	14
Ohe St	6	0.09	0.24	38
Ala Moana Blvd	69	41.61	59.47	70
Ala Moana Blvd	24	0.38	4.35	9
Auahi/Keawe St	78	113.01	73.88	<b>153- Inadequate**</b>
Auahi/Keawe St	72	36.87	82.72	45
Cooke St	24	6.78	9.98	68
Ala Moana Blvd	36	15.05	55.14	27
Ala Moana Blvd	6	NA	NA	NA
Queen St	10	NA	NA	NA

NOTE: Refer to Figure 3-2 for location of inadequate sewer mains. Information for 48-inch on Kamakee Street was not available at the time.

\*Does not include proposed design peak flows from Project.

\*\* Based on INFIX Adjusted Model Run; City DPP (see 3.2.1 INFIX Adjusted Flow Model Results).

### **3.2.1 INFIX Adjusted Flow Model Results**

There were three (3) sewer mains determined to be hydraulically inadequate (surcharge percentage greater than 100%) for both existing and future conditions within the Project area and downstream of the sewer system based on INFIX Adjusted model results that did not include the proposed design peak flows from the Project.

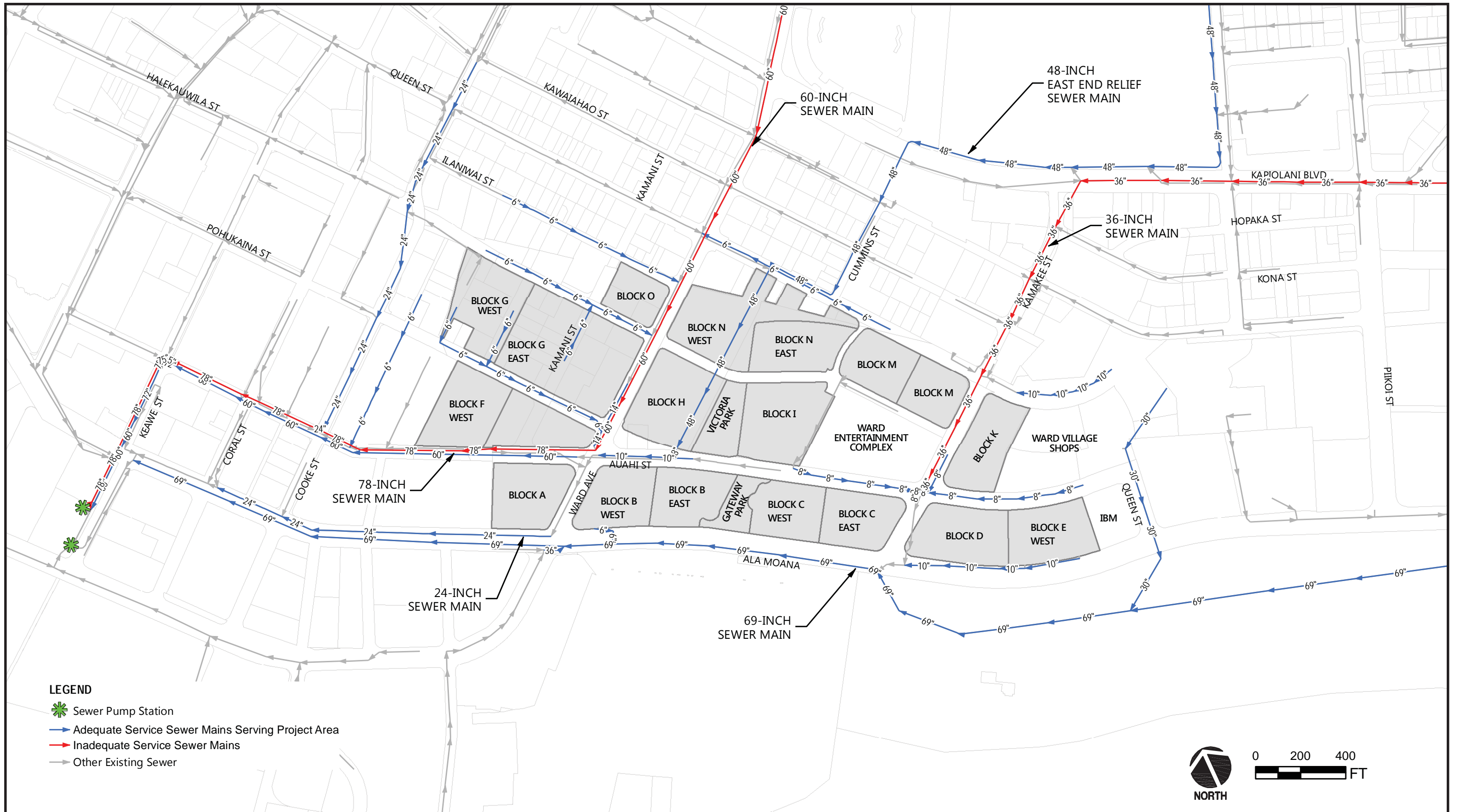
1. The existing 36-inch sewer main on Kamakee Street has a 135% and 158% surcharge under the existing and future condition, respectively. This sewer main discharges into the 69-inch sewer main on Ala Moana Boulevard and the Ala Moana WWPS. Since the existing 36-inch sewer main on Kamakee Street is surcharged, the upstream 8-inch collector sewer mains on Auahi Street and Kamakee Street and the 36-inch sewer main will not be used to accommodate future project flow.

NOTE: The DPP, Wastewater Branch using its internal flow model and calculations has determined the 36-inch and 48-inch sewer mains on Kamakee Street as having adequate pipe capacity for existing and future sewer flows. The pipe analysis used pipe capacity as-built information from a recent reconstruction project.

2. The existing 78-inch sewer main on Auahi Street and Keawe Street has a 150% and 153% surcharge under the existing and future condition, respectively. This sewer main conveys flows to the Ala Moana WWPS.

NOTE: The DPP, Wastewater Branch using its internal flow model and calculations has determined the 78-inch sewer main on Auahi Street as having adequate pipe capacity for existing and future sewer flows.

3. The existing 60-inch sewer main on Ward Avenue has a 123% surcharge under the existing and future condition. This sewer main discharges flow into the 78-inch sewer main and then to the Ala Moana WWPS. The existing 14-inch sewer main on Ward Avenue between Beretania Street and Auahi Street feeds into the 78-inch sewer main.



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 INFIX ADJUSTED MODEL EVALUATION OF EXISTING SYSTEM

FIGURE  
**3-2**

#### **4. SEWER SYSTEM EVALUATION**

An analysis of the existing wastewater collection system was done to evaluate the accommodation of the Project at full completion.

Projected design peak flows from each Project Area block were added to the INFIX Adjusted 2020 model flows at the locations where they would be received by the sewer system. The increase in total flow was then evaluated against the hydraulic pipe capacities of the sewer system for adequacy.

Four steps were involved in the evaluation process:

1. Average Daily Flow: An average daily flow, based on City design standards, was calculated for each block using the proposed block programming and assumed per capita flow generation.
2. Design Peak Flow: A design peak flow, based on City design standards, was calculated for each block by incorporating a max flow factor as well as dry and wet weather infiltration to the average daily flow.
3. Pipe Capacity: An analysis of pipe capacity was conducted using the Manning's Formula and information from the City INFIX Adjusted 2020 computer model program of the sewer systems serving the Project Area.
4. Hydraulic Adequacy Evaluation: The hydraulic capacities of pipe segments affected by surcharge from the Project Area blocks were determined based on the capacity of each affected pipe segment to convey the wastewater at a minimum flow velocity standard. A hydraulic capacity deficiency was identified when the surcharged flow exceeded the capacity of a pipe segment(s).

##### **4.1 Average Daily Flow**

Wastewater flows for the Project are based on the proposed development program for uses that generate wastewater. For the Project, these uses include residences, retail, and restaurants. An overview of the proposed development program, by phase and block, for these uses is shown in Table 4-1.

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<b>TABLE 4-1 VICTORIA WARD DEVELOPMENT PROGRAM</b>											
<b>Phase</b>	<b>Block</b>	<b>Residential Units by Bedroom Count</b>								<b>Retail</b>	<b>Restaurant</b>
		<b>Studio</b>	<b>1BR</b>	<b>2BR</b>	<b>3BR</b>	<b>4BR</b>	<b>5BR</b>	<b>6BR</b>	<b>7BR</b>	<b>Sq. Ft.</b>	<b>Sq. Ft.</b>
Phase 1	Block C East	—	26	50	84	10	5	—	—	8,505	—
Phase 1	Block K	20	93	132	67	4	2	—	—	17,000	—
Phase 1	Block M	47	182	177	60	—	—	—	—	72,073	9,326
Phase 1	Block O	—	161	187	76	—	—	—	—	30,000	—
Phase 2	Block N East	300	300	128	23	—	—	—	—	15,000	5,000
Phase 2	Block I	240	240	96	24	—	—	—	—	37,500	37,500
Phase 2	Victoria Park	—	—	—	—	—	—	—	—	—	—
Phase 2	Block C West	—	19	71	24	8	3	—	1	5,000	5,000
Phase 3	Block A	45	91	68	23	—	—	—	—	15,000	5,000
Phase 3	Block G East	48	72	40	—	—	—	—	—	67,500	22,500
Phase 3	Block F West	105	140	88	18	—	—	—	—	15,000	5,000
Phase 3	Block F East	93	124	78	16	—	—	—	—	18,750	6,250
Phase 4	Block B East	—	—	71	32	6	—	2	—	4,865	4,865
Phase 4	Block B West	35	70	52	17	—	—	—	—	7,657	2,553
Phase 4	Block G West	49	73	41	—	—	—	—	—	67,500	22,500
Phase 4	Block N West	240	240	120	—	—	—	—	—	22,500	7,500
Phase 5	Block D	—	54	99	27	—	—	—	—	7,500	2,500
Phase 5	Block H North	175	200	100	25	—	—	—	—	30,000	10,000
Phase 5	Block H South	66	132	99	33	—	—	—	—	45,000	15,000
Phase 5	Block E West	—	56	102	28	—	—	—	—	6,696	2,232

The average daily flow for each block is calculated as the sum of average daily per capita flow and all other average flows. Based on the City's *Design Standards of the Department of Wastewater Management Volume 1*, July 1993 ("Design Standards"), the calculation of average flows were based on the following assumptions:

- a. Retail
  - 1 capita per 150 sf
  - 25 gallons per capita per day
- b. Restaurant
  - 9 seatings per 20 sf
  - 25 gallons per capita per day
- c. Residential
  - Studio 2.0 capita per unit
  - One-Bedroom 2.0 capita per unit
  - Two-Bedroom 2.8 capita per unit
  - Three-Bedroom 4.0 capita per unit
  - Four-Bedroom 5.0 capita per unit
  - Five-Bedroom 6.0 capita per unit

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Six-Bedroom	7.0 capita per unit
Seven-Bedroom	8.0 capita per unit
	80 gallons per capita per day

The resulting average daily flow for the proposed development program is summarized in Table 4-2. Detailed calculations of the average daily flow are shown in Appendix C Table 1.

### 4.2 Design Peak Flow

The design peak flow is derived from the average daily flow for each phase of the Project. As referenced from the City's Design Standards, the following factors are considered in calculating the design peak flow:

- a) Average – sum of average daily per capita flow and all other average flows
- b) Maximum – average flow multiplied by a maximum flow factor.
- c) Design Average – average flow plus dry weather infiltration/inflow rate.
- d) Design Maximum – maximum flow plus dry weather infiltration/inflow rate.
- e) Design Peak – design maximum flow plus wet weather infiltration/inflow rate.

The maximum flow factor is determined by Babbit's Curve, Figure 22.2.4 of the City's Design Standards; the dry weather infiltration/inflow rate is equal to 5 gallons per capita per day (gpcd) above and 35 gpcd below normal ground water table; and the wet weather infiltration/inflow rate is equal to 1,250 gallons per acre per day (gad) above and 2,750 gad below normal ground water table.

The resulting design peak flow for the proposed development program is summarized in Table 4-2. Detailed calculations of the design peak flow are shown in Appendix C Table 2.

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<b>TABLE 4-2 WASTEWATER FLOW SUMMARY</b>		
	<b>Average Daily Flow (mgd)</b>	<b>Design Peak Flow (mgd)</b>
Phase 1 Block C East	0.050	0.300
Phase 1 Block K	0.074	0.412
Phase 1 Block M	0.212	0.962
Phase 1 Block O	0.097	0.507
Subtotal	0.434	2.181
Phase 2 Block N East	0.191	0.870
Phase 2 Block I	0.534	2.146
Phase 2 Victoria Park	0.000	0.000
Phase 2 Block C West	0.089	0.466
Subtotal	0.814	3.482
Phase 3 Block A	0.103	0.524
Phase 3 Block G East	0.293	1.302
Phase 3 Block F West	0.123	0.609
Phase 3 Block F East	0.131	0.640
Subtotal	0.650	3.074
Phase 4 Block B East	0.085	0.448
Phase 4 Block B West	0.064	0.352
Phase 4 Block G West	0.293	1.303
Phase 4 Block N West	0.192	0.876
Subtotal	0.634	2.980
Phase 5 Block D	0.069	0.376
Phase 5 Block H North	0.208	0.939
Phase 5 Block H South	0.241	1.076
Phase 5 Block E West	0.067	0.367
Subtotal	0.584	2.758
Total	3.116	14.475



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### 4.3 Pipe Capacity

Pipe capacity is determined by multiplying the cross-sectional pipe area by the flow velocity,

$$Q = v A$$

where, Q is the pipe capacity in cubic feet per second  
A is the pipe area in square feet  
v is the velocity in feet per second (fps)

Velocity is determined by the Manning's Formula,

$$v \text{ (velocity)} = \frac{1.486 R^{2/3} S^{1/2}}{n}$$

where, R is the hydraulic radius  
S is the pipe slope in feet per foot (determined from as-built information)  
n is the Manning's friction coefficient (0.013 for pipes larger than 18 inches in diameter, and 0.015 for pipes 18 inches and smaller in diameter in addition to cast in place reinforced concrete conduit)

The Design Standards stipulate that the minimum flow velocity shall not be less than 2.0 fps (feet per second) at full flow.

### 4.4 Hydraulic Adequacy Evaluation

An evaluation of hydraulic adequacy is determined by dividing the total design peak flow by the pipe capacity to calculate a surcharge percentage. The total design peak flow is the sum of the Project flows and the INFIX Adjusted 2020 model flows. Sewer mains with surcharge percentages greater than 100% are considered hydraulically inadequate, however, further evaluation by WWB and ENV in the past has led to conclusions of adequacy. See Evaluation of Existing Sewer Systems in Appendix C Table 3.

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**5. RECOMMENDATIONS**

It was determined that portions of the existing sewer system are both hydraulically adequate and inadequate to convey the project flows. Therefore, it is recommended that new mains be installed to replace hydraulically inadequate parts of the system and existing mains be maintained in hydraulically adequate parts of the system; see Table 5-1 Recommended Sewer Improvements by Phase. These preliminary recommendations are based on past coordination with WWB and ENV, thus final recommendations are contingent upon current WWB and ENV review and approval in addition to field conditions as detailed in the future connection construction plans.

Sewer Connection Applications for permits will be submitted for each phase of the Project to WWB for review and approval. Completion dates and sequence order of phase development are subject to possible change by VWL. As Project phasing or programming changes are proposed by VWL, WWB shall be consulted and this Plan shall be updated by VWL when deemed necessary by the city.

**TABLE 5-1  
RECOMMENDED SEWER IMPROVEMENTS BY PHASE**

<b>Project Phase</b>	<b>Block</b>	<b>Existing Sewers Initially Discharged to</b>	<b>Recommended Sewer Improvements</b>	<b>Anticipated Sewer Improvement Completion Date</b>
Phase 1	Block C East	8-inch on Auahi / 48-inch on Kamakee / 69-inch on Ala Moana	New 10-inch lateral from block to existing Kamakee Street 48-inch main at existing SMH 3010952.	2016
	Block K	8-inch on Kamakee / 48-inch on Kamakee / 69-inch on Ala Moana	New 12-inch lateral from block to existing Kamakee Street 36-inch main at existing SMH 4075941.	2017
	Block M	8-inch along NW edge of Victoria Ward Entertainment Center property / 8-inch on Auahi / 48-inch on Kamakee / 69-inch on Ala Moana	New 16-inch lateral from block to existing Kamakee Street 36-inch main at new SMH.	2018
	Block O	6-inch on Ilaniwai and 6-inch on Halekauwila / 12-inch on Ward / 14-inch on Ward / 15-inch on Ward / 78-inch on Auahi	New Ward Avenue 24-inch main from upstream existing SMH 342321 to downstream existing Auahi Street 78-inch main at existing SMH 379890.	2019

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<b>TABLE 5-1 (CONTINUED) RECOMMENDED SEWER IMPROVEMENTS BY PHASE</b>				
<b>Project Phase</b>	<b>Block</b>	<b>Existing Sewers Initially Discharged to</b>	<b>Recommended Sewer Improvements</b>	<b>Anticipated Sewer Improvement Completion Date</b>
Phase 1 (continued)	Block O (continued)		New 12-inch lateral from block to new Ward Avenue 24-inch main.	
Phase 2	Block N East	6-inch on Queen / 12-inch on Ward / 14-inch on Ward / 15-inch on Ward / 78-inch on Auahi	New 12-inch lateral from block to existing Cummins Street 48-inch East End Relief main at existing SMH 379795.	2020
	Block I	8-inch on Auahi / 10-inch on Auahi / 15-inch on Auahi / 14-inch on Ward / 24-inch on Ala Moana	New Auahi Street 24-inch main to existing Auahi Street 48-inch East End Relief main at existing SMH 379979.  New 12-inch lateral from block to new Auahi Street 24-inch main.	2021
	Victoria Park	8-inch on Auahi / 10-inch on Auahi / 15-inch on Auahi / 14-inch on Ward / 24-inch on Ala Moana	None.	2021
	Block C West	8-inch on Auahi / 48-inch on Kamakee / 69-inch on Ala Moana  8-inch on Auahi / 10-inch on Auahi / 15-inch on Auahi / 14-inch on Ward / 24-inch on Ala Moana	New 12-inch lateral from block to new Auahi Street 24-inch main.	2021
Phase 3	Block A	8-inch on Auahi / 14-inch on Ward / 24-inch on Ala Moana	New Auahi Street 12-inch main to new Phase 1 Ward Avenue 24-inch main.  New 12-inch lateral from block to new Auahi Street 12-inch main.	2022

**SEWER MASTER PLAN UPDATE FOR  
VICTORIA WARD REDEVELOPMENT**

<b>TABLE 5-1 (CONTINUED) RECOMMENDED SEWER IMPROVEMENTS BY PHASE</b>				
<b>Project Phase</b>	<b>Block</b>	<b>Existing Sewers Initially Discharged to</b>	<b>Recommended Sewer Improvements</b>	<b>Anticipated Sewer Improvement Completion Date</b>
Phase 3 (continued)	Block G East	6-inch that bisects property / 6-inch on Halekauwila / 12-inch on Ward / 14-inch on Ward / 15-inch on Ward / 78-inch on Auahi  6-inch on G West property / 6-inch on Pohukaina / 14-inch on Ward / 15-inch on Ward / 78-inch on Auahi	New Pohukaina Street 12-inch main to new Phase 1 Ward Avenue 24-inch main.  New 12-inch lateral from block to new Pohukaina Street 12-inch main.	2022
	Block F West	6-inch on Pohukaina / 14-inch on Ward / 15-inch on Ward / 78-inch on Auahi	New Auahi Street 12-inch main extension of new Auahi Street 12-inch main.  New 12-inch lateral from block to new Auahi Street 12-inch main extension.	2022
	Block F East	6-inch on Pohukaina / 14-inch on Ward / 15-inch on Ward / 78-inch on Auahi	New 12-inch lateral to new Auahi Street 12-inch main.	2023
Phase 4	Block B East	8-inch on Auahi / 10-inch on Auahi / 15-inch on Auahi / 14-inch on Ward / 24-inch on Ala Moana	New 12-inch lateral to new Phase 2 Auahi Street 24-inch main.	2023
	Block B West	10-inch on Auahi / 15-inch on Auahi / 14-inch on Ward / 24-inch on Ala Moana  6-inch on Ala Moana / 69-inch on Ala Moana	New 12-inch lateral to existing Auahi Street 48-inch main at new SMH.	2024

**SEWER MASTER PLAN UPDATE FOR  
VICTORIA WARD REDEVELOPMENT**

<b>TABLE 5-1 (CONTINUED)</b>				
<b>RECOMMENDED SEWER IMPROVEMENTS BY PHASE</b>				
<b>Project Phase</b>	<b>Block</b>	<b>Existing Sewers Initially Discharged to</b>	<b>Recommended Sewer Improvements</b>	<b>Anticipated Sewer Improvement Completion Date</b>
Phase 4 (continued)	Block G West	6-inch on Halekauwila / 12-inch on Ward / 14-inch on Ward / 15-inch on Ward / 78-inch on Auahi  Two (2) 6-inch on makai portion of G West property / 6-inch on Pohukaina / 14-inch on Ward / 15-inch on Ward / 78-inch on Auahi  6-inch on mauka portion of property / 8-inch on Halekauwila / 10-inch on Halekauwila / 24-inch on Cooke / 78-inch on Auahi	New Pohukaina Street 12-inch main extension of new Phase 3 Pohukaina Street 12-inch main.  New 12-inch lateral from block to new Pohukaina Street 12-inch main extension.	2024
	Block N West	6-inch on Queen / 12-inch on Ward / 15-inch on Ward / 78-inch on Auahi  48-inch on property / 42-inch on Auahi / 60-inch on Auahi (East End Relief)	New Ward Avenue 48-inch East End Relief sewer main from upstream Queen Street 48-inch East End Relief main to downstream Auahi Street 48-inch East End Relief main.	2024
Phase 5	Block D	8-inch on Auahi / 48-inch on Kamakee / 69-inch on Ala Moana  10-inch on Ala Moana / 48-inch on Ala Moana / 69-inch on Ala Moana	New Auahi Street 18-inch main to existing 36-inch Kamakee Street main at existing SMH 380287.  New 12-inch lateral from block to new Auahi Street 18-inch main.	2025
	Block H North	48-inch on property / 42-inch on Auahi / 60-inch on Auahi (East End Relief)	New 12-inch lateral from block to new Phase 4 Ward Avenue 48-inch East End Relief main.	2026

**SEWER MASTER PLAN UPDATE FOR  
VICTORIA WARD REDEVELOPMENT**

<b>TABLE 5-1 (CONTINUED) RECOMMENDED SEWER IMPROVEMENTS BY PHASE</b>				
<b>Project Phase</b>	<b>Block</b>	<b>Existing Sewers Initially Discharged to</b>	<b>Recommended Sewer Improvements</b>	<b>Anticipated Sewer Improvement Completion Date</b>
Phase 5 (continued)	Block H South	10-inch on Auahi / 15-inch on Ward / 14-inch on Ward / 24-inch on Ala Moana  48-inch on property / 42-inch on Auahi / 60-inch on Auahi (East End Relief)	New 12-inch lateral from block to existing 48-inch East End Relief main on Auahi Street.	2026
	Block E West	8-inch on Auahi / 48-inch on Kamakee / 69-inch on Ala Moana  10-inch on Ala Moana / 48-inch on Ala Moana / 69-inch on Ala Moana	New Auahi Street 18-inch main extension of new 18-inch Auahi Street main.  New 12-inch lateral from block to new Auahi Street 18-inch main.	2027

**5.1 Phase Recommendations**

Recommended sewer improvements for the VWL Development involve installing new connections and laterals to the existing City sewer system, replacing a portion of an existing 48-inch sewer main (East End Relief sewer main) with a new 48-inch sewer main on Ward Avenue, constructing new sewer mains, and installing new connections and laterals to those mains. Improvements will be installed in phases to meet projected wastewater design peak flows within the Project Area as development progresses towards completion.

**5.1.1 Phase 1 – Blocks C East, K, M and O**

Phase 1 involves installing a new 10-inch sewer lateral from Block C East that will connect to the existing 48-inch sewer main on Kamakee Street at existing SMH 3010952 (see Figure 5-1). A 12-inch sewer lateral originating from Block K will also be installed and connect to the existing 36-inch sewer main on Kamakee Street at existing SMH 4075941 (see Figure 5-2). Wastewater from both lines is collected downstream by the existing 69-inch sewer main that flows northwest along Ala Moana Boulevard. A new 16-inch sewer lateral will also be installed originating from the Block M property. The new 16-inch lateral will extend in the mauka direction and continue southeast on Queen Street until Kamakee Street. From this point, it will extend in the mauka direction and discharge to the existing 36-inch sewer main on Kamakee Street (see Figure 5-3).

## **SEWER MASTER PLAN UPDATE FOR VICTORIA WARD REDEVELOPMENT**

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Phase 1 will also involve installing a new 24-inch sewer main on Ward Avenue between Ilaniwai Street and Auahi Street. The new 24-inch sewer main will connect to the existing 78-inch sewer main that flows northwest along Auahi Street. A new 12-inch sewer lateral from Block O will be installed along Halekauwila Street and connect to the new 24-inch sewer main on Ward Avenue (see Figure 5-4).

### **5.1.2 Phase 2 – Blocks N East, I, Victoria Park and C West**

Phase 2 involves installing a new 12-inch sewer lateral in the northeast corner of Block N East (warehouses) that will cross Queen Street in the mauka direction and continue northwest across Cummins Street to discharge to the existing 48-inch sewer main of the East End Relief on Cummins Street at existing SMH 379795 (see Figure 5-5).

Phase 2 will also involve installing a new 24-inch relief sewer main on Auahi Street between Ward Avenue and Kamakee Street. The 24-inch relief sewer main will discharge to the existing 48-inch sewer main of the East End Relief on Auahi Street at existing SMH 379979. Wastewater from this main is collected downstream by the existing 60-inch sewer main that flows northwest along Auahi Street to the Ala Moana WWPS. Connection to the new 24-inch main will be by new 12-inch laterals originating from Block I (Ward Industrial and Gateway), Victoria Park and Block C West (portion of Ward Warehouse) (see Figure 5-6 and 5-7).

### **5.1.3 Phase 3 – Blocks A, G East, F West and F East**

Phase 3 involves installing a new 12-inch sewer lateral from Block A that extends southeast along Auahi Street (see Figure 5-8). A new 12-inch sewer lateral from Block G East will also be installed and extend southeast along Pohukaina Street (see Figure 5-9). Both mains will discharge to the new 24-inch sewer main on Ward Avenue that was constructed in Phase 1 of the Project. The 24-inch sewer main discharges downstream to the existing 78-inch sewer main that flows northwest along Auahi Street to the Ala Moana WWPS.

Phase 3 also involves installing an extension of the new 12-inch sewer main on Auahi Street in the northwest direction. Connection to the extension will be by a new 12-inch lateral from Block F West (see Figure 5-10). Block F East will also connect to the 12-inch sewer main with a new 12-inch lateral (see Figure 5-11).

### **5.1.4 Phase 4 – Blocks B East, B West, G West and N West**

Phase 4 involves installing a new 12-inch sewer lateral from Block B East that will discharge to the new 24-inch sewer main on Auahi Street built in Phase 2 of the Project (see Figure 5-12). A 12-inch lateral from Block B West will also be installed and discharged to the existing 48-inch main on Auahi Street (see Figure 5-13).

## **SEWER MASTER PLAN UPDATE FOR VICTORIA WARD REDEVELOPMENT**

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An extension of the new 12-inch sewer main on Pohukaina Street in the northwest direction, built in Phase 3 of the project, will also be installed. Connection to the extension will be by a new 12-inch lateral from Block G West (see Figure 5-14).

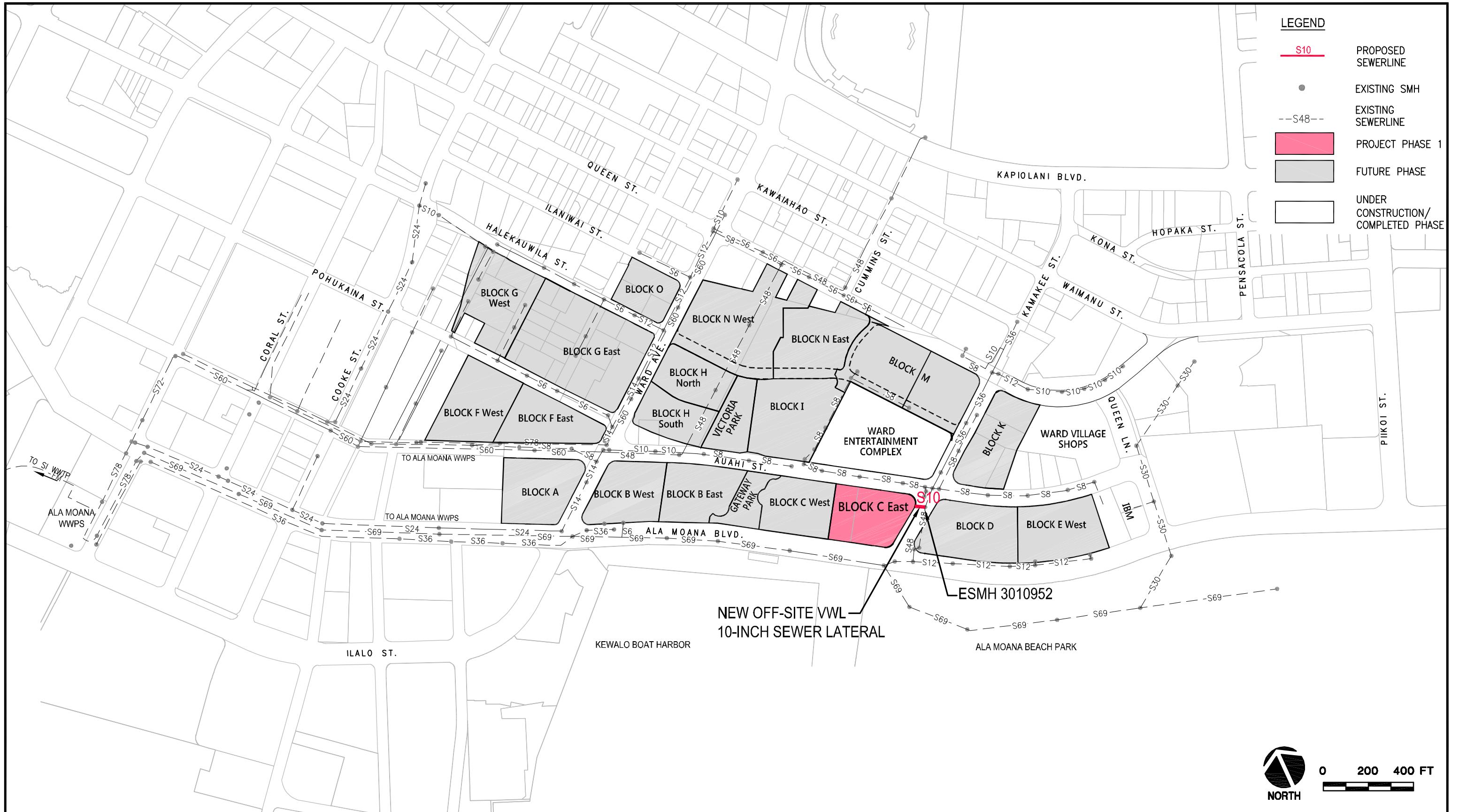
Phase 4 also involves installing a new 48-inch sewer main beginning at Queen Street, east of Ward Avenue, which will turn southwest at Ward Avenue until it reaches Auahi Street. The new main will discharge near the intersection of Ward Avenue and Auahi Street to the existing downstream 48-inch sewer main of the East End Relief on Auahi Street. The flows from this main are collected farther downstream by the 60-inch sewer main located on Auahi Street. Connection to the new 48-inch sewer main will be made from Block N West on Ward Avenue. The new 48-inch sewer will replace the portion of the existing East End Relief sewer main that bisects the Block N West and Block H properties. This portion of the existing East End Relief sewer main will be demolished and abandoned in place (see Figure 5-15).

### **5.1.5 Phase 5 – Blocks D, H North, H South and E West**

Phase 5 involves installing a new 18-inch sewer relief main along Auahi Street, east of Kamakee Street (see Figure 5-16). The line will discharge to the existing 48-inch sewer main near the intersection of Kamakee Street and Auahi Street at existing SMH 380287. Connections to the new line will be by a 12-inch sewer lateral from Block D and a new 12-inch sewer lateral originating from Block E West.

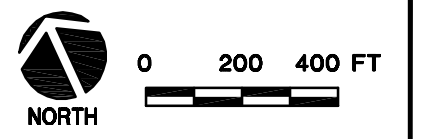
Phase 5 also involves installing a new 12-inch sewer lateral from Block H North that will discharge to the 48-inch East End Relief sewer main on Ward Avenue that was built in Phase 4 of the Project (see Figure 5-17). A new 12-inch sewer lateral originating from Block H South will also be installed and connect to the existing 48-inch sewer main on Auahi Street at existing SMH 379979 (see Figure 5-18). Wastewater flows from both are collected downstream by the 60-inch sewer main located on Auahi Street.

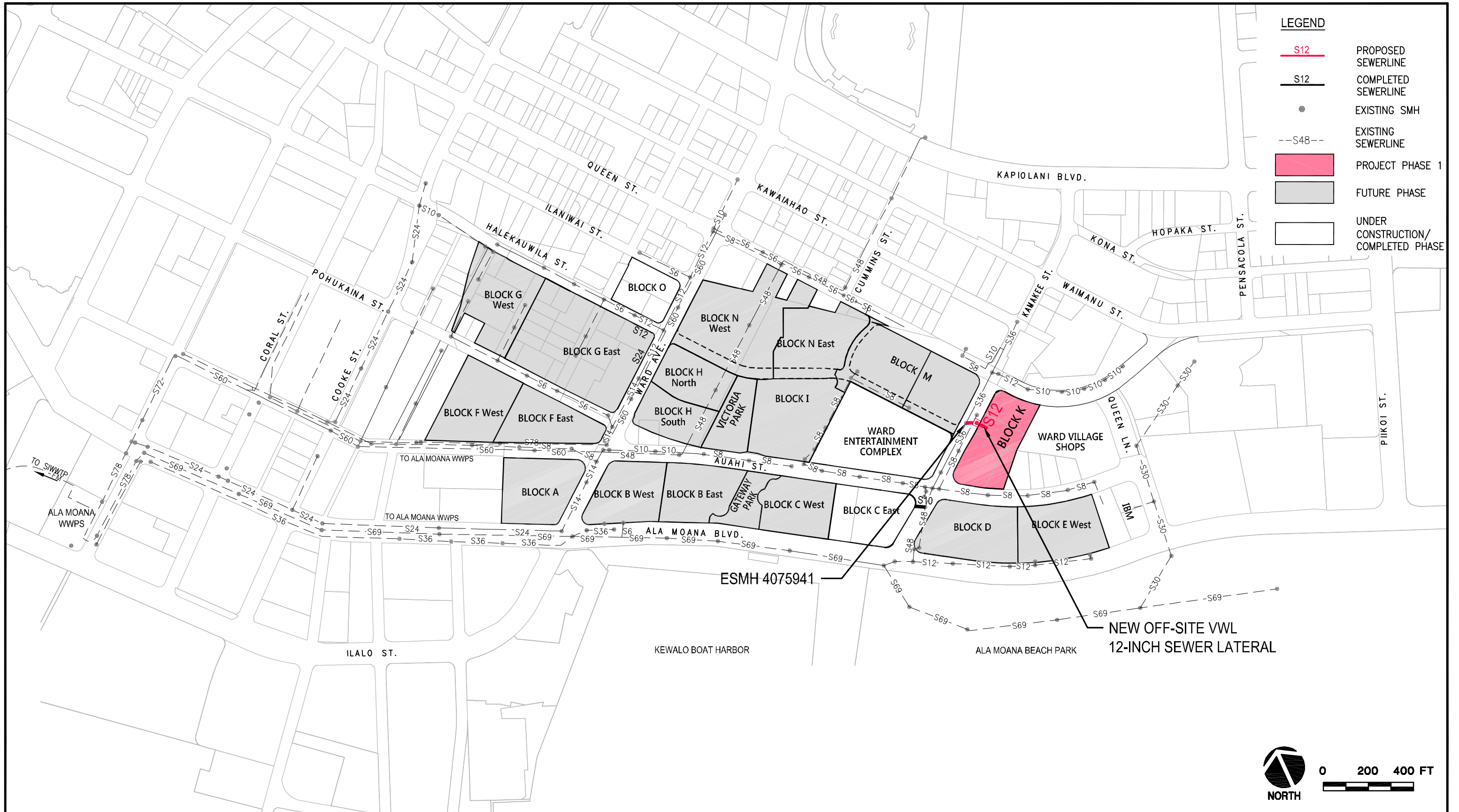




VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK C East (Phase 1-2016)**  
**PROPOSED SEWER IMPROVEMENTS**

FIGURE  
**5-1**

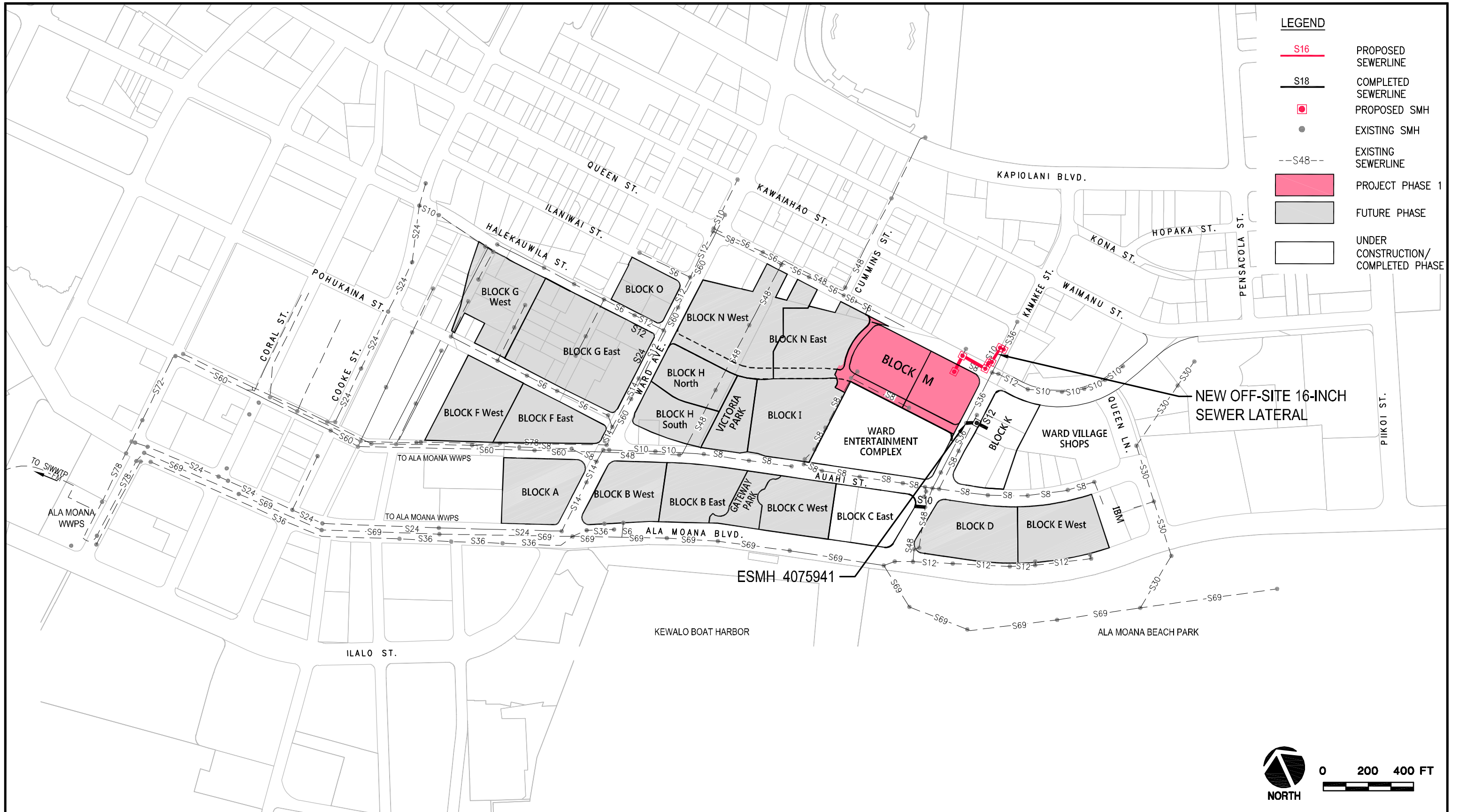




VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK K (Phase 1-2017)**  
**PROPOSED SEWER IMPROVEMENTS**

FIGURE  
**5-2**



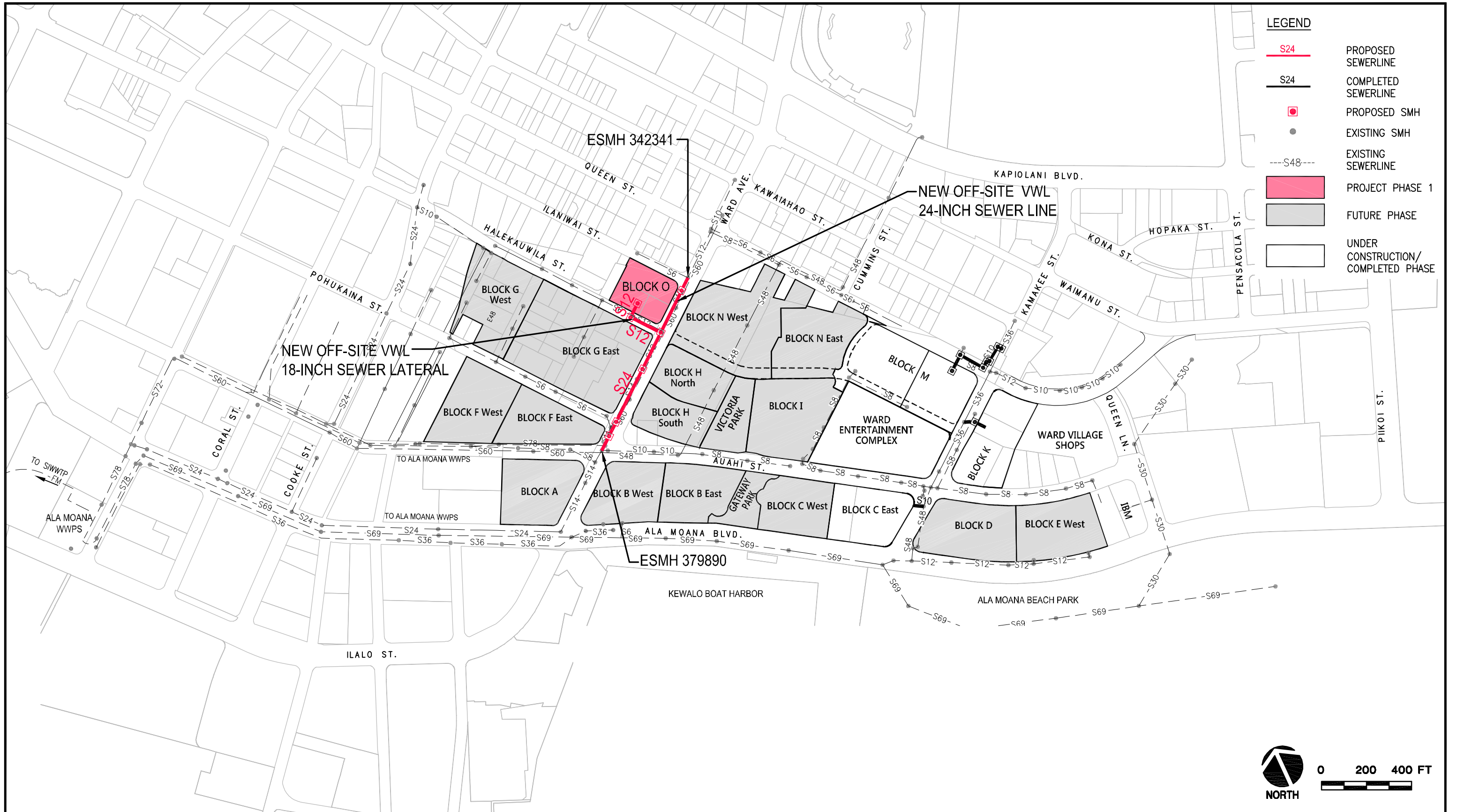


VICTORIA WARD, LTD. REDEVELOPMENT

**BLOCK M (Phase 1-2018)  
PROPOSED SEWER IMPROVEMENTS**

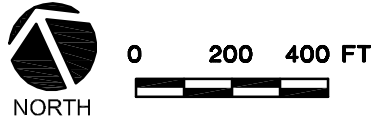
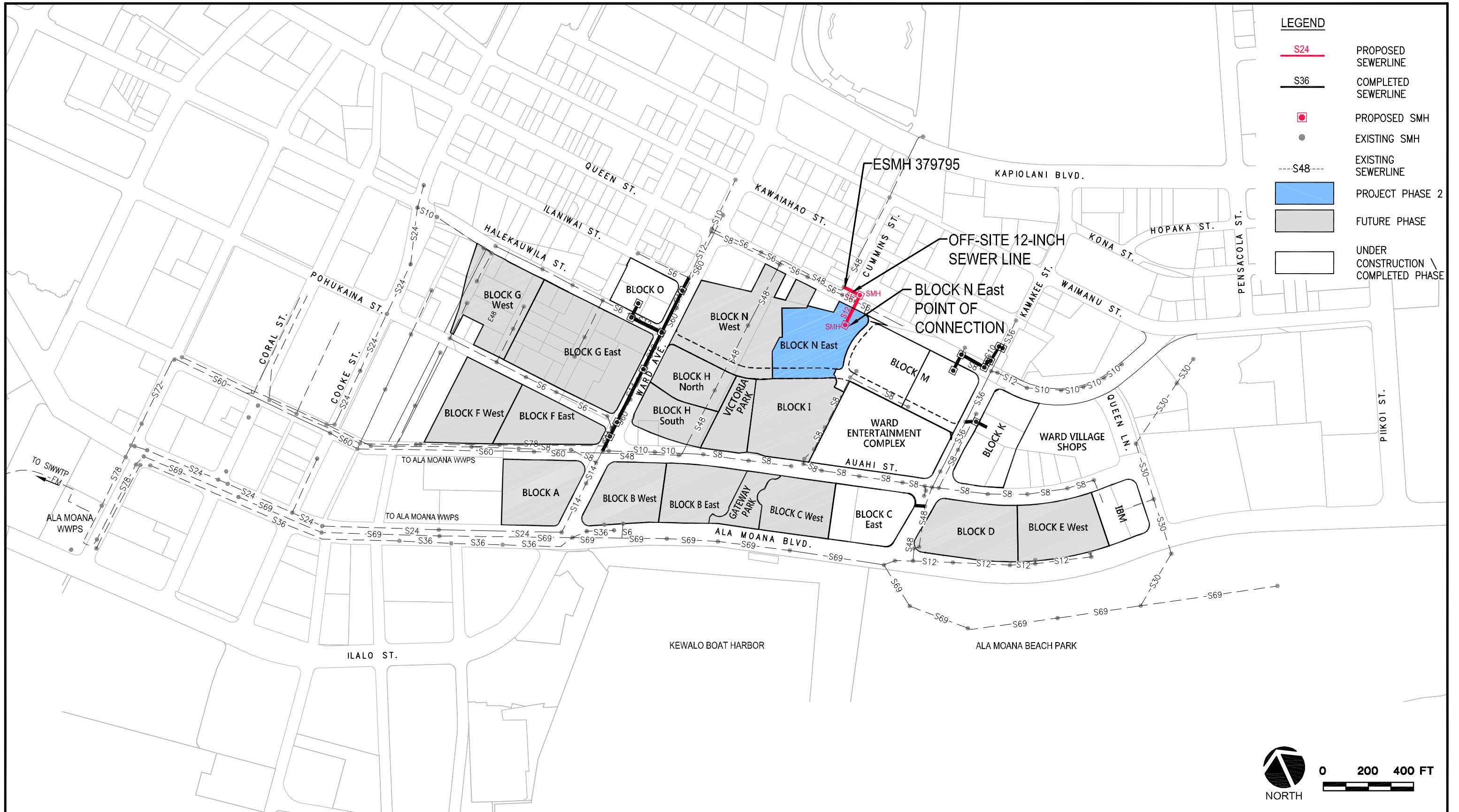
**FIGURE  
5-3**





VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK O (Phase 1-2019)**  
**PROPOSED SEWER IMPROVEMENTS**

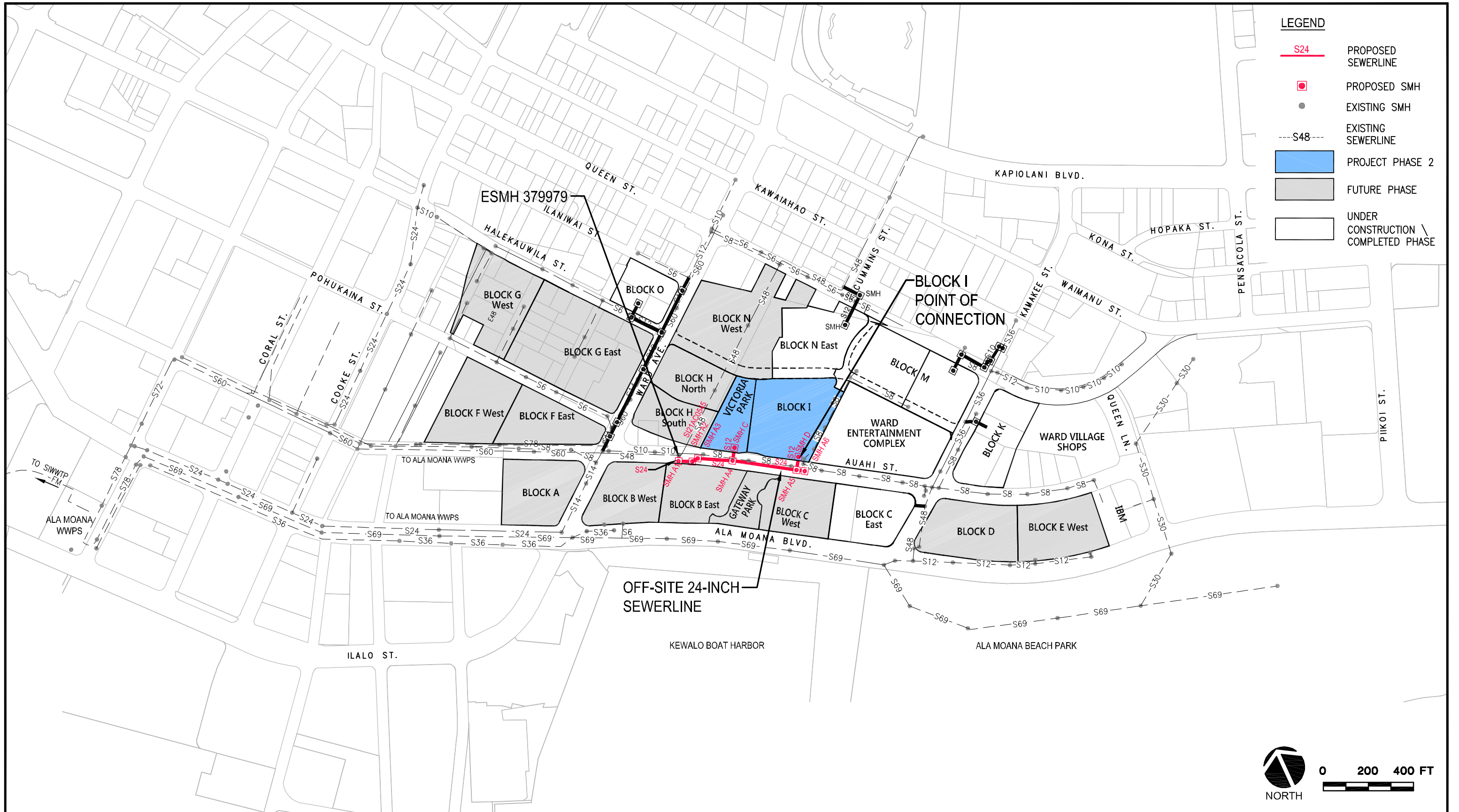
FIGURE  
**5-4**



VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK N East (Phase 2-2020)**  
**PROPOSED SEWER IMPROVEMENTS**

**FIGURE**  
**5-5**

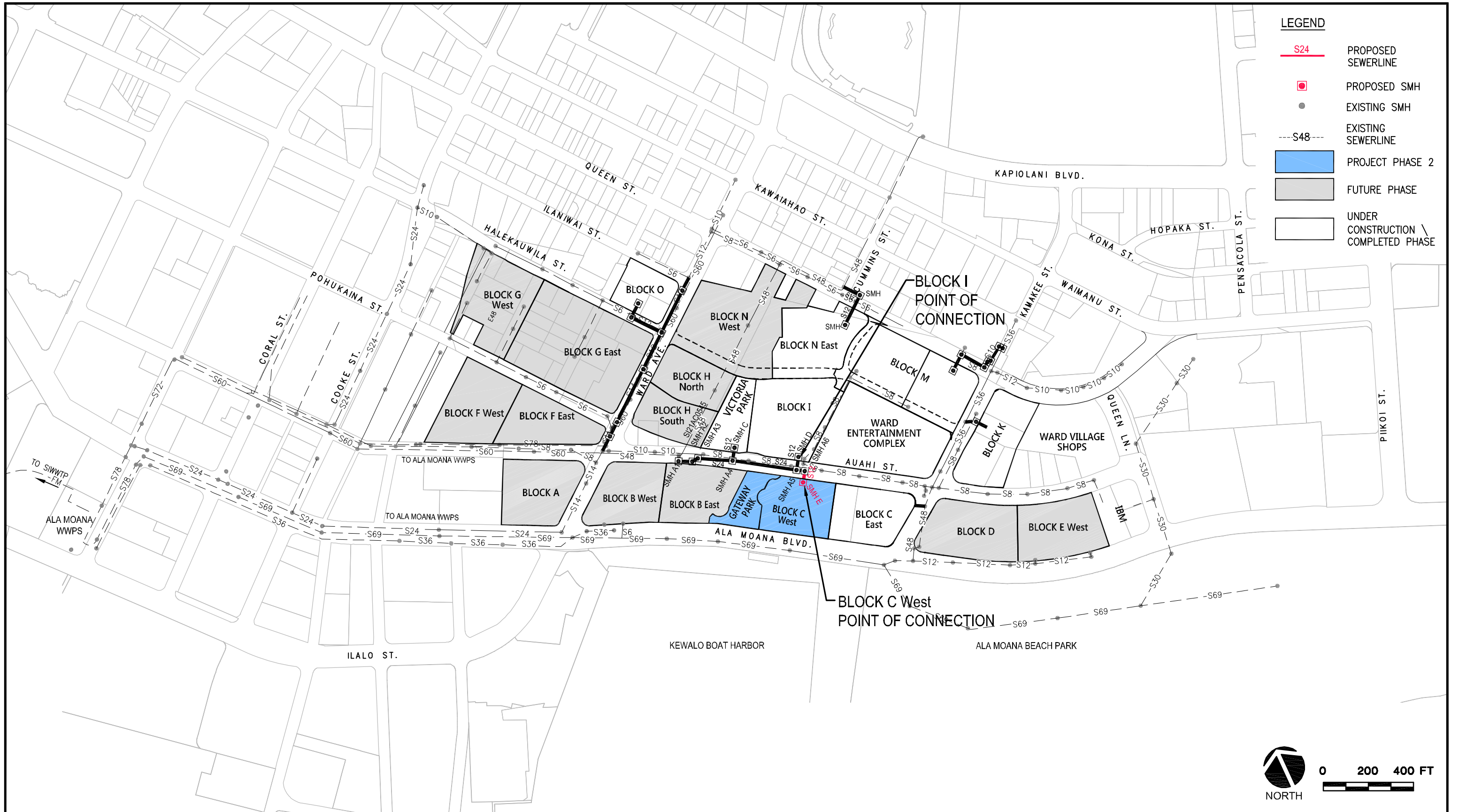




VICTORIA WARD, LTD. REDEVELOPMENT  
 BLOCK I, and VICTORIA PARK (Phase 2-2021)  
 PROPOSED SEWER IMPROVEMENTS

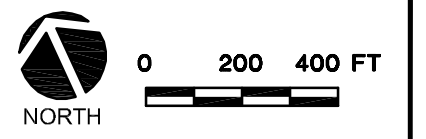
FIGURE  
**5-6**

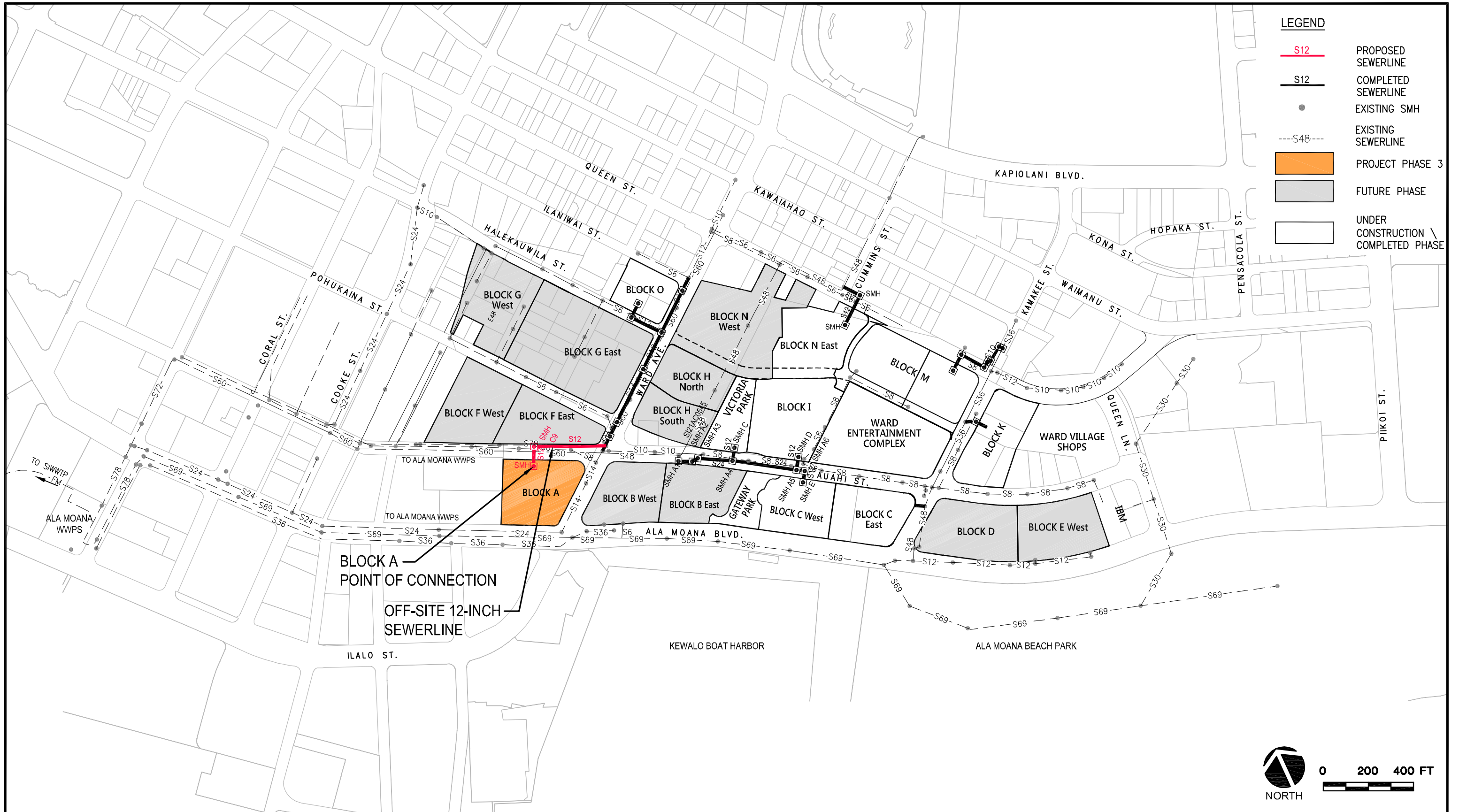




VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK C West (Phase 2-2021)**  
**PROPOSED SEWER IMPROVEMENTS**

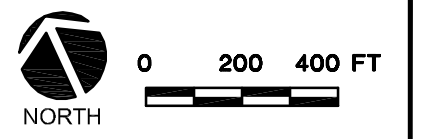
FIGURE  
**5-7**



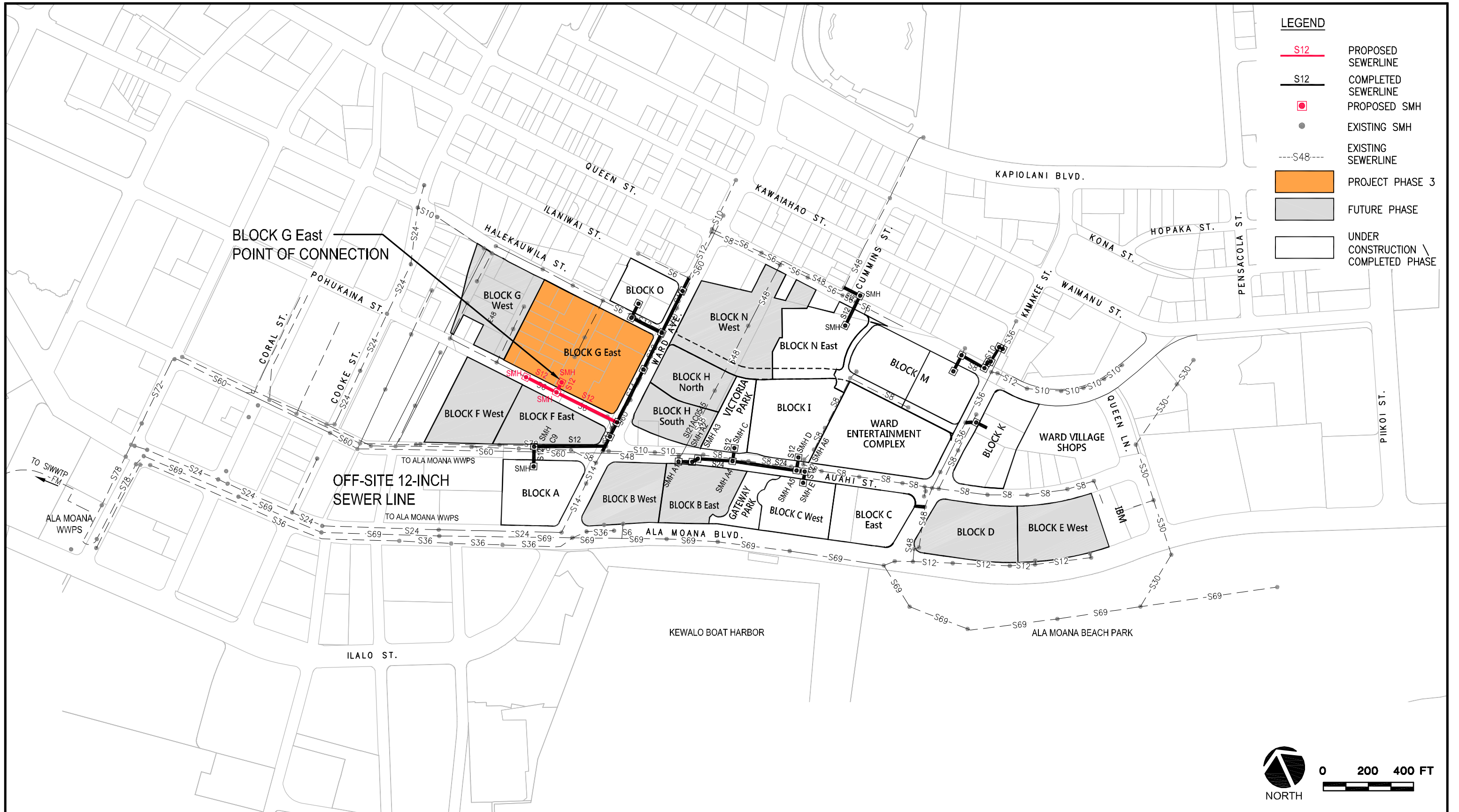


VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK A (Phase 3-2022)**  
**PROPOSED SEWER IMPROVEMENTS**

FIGURE  
**5-8**

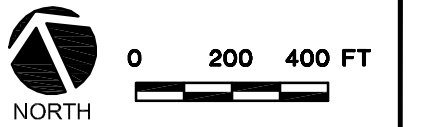






**LEGEND**

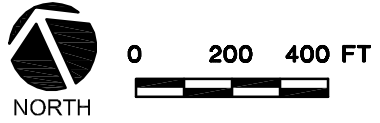
- S12 PROPOSED SEWERLINE
- S12 COMPLETED SEWERLINE
- PROPOSED SMH
- EXISTING SMH
- S48 EXISTING SEWERLINE
- PROJECT PHASE 3
- FUTURE PHASE
- UNDER CONSTRUCTION \ COMPLETED PHASE



VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK G East (Phase 3-2022)**  
**PROPOSED SEWER IMPROVEMENTS**

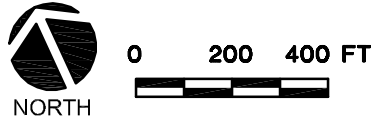
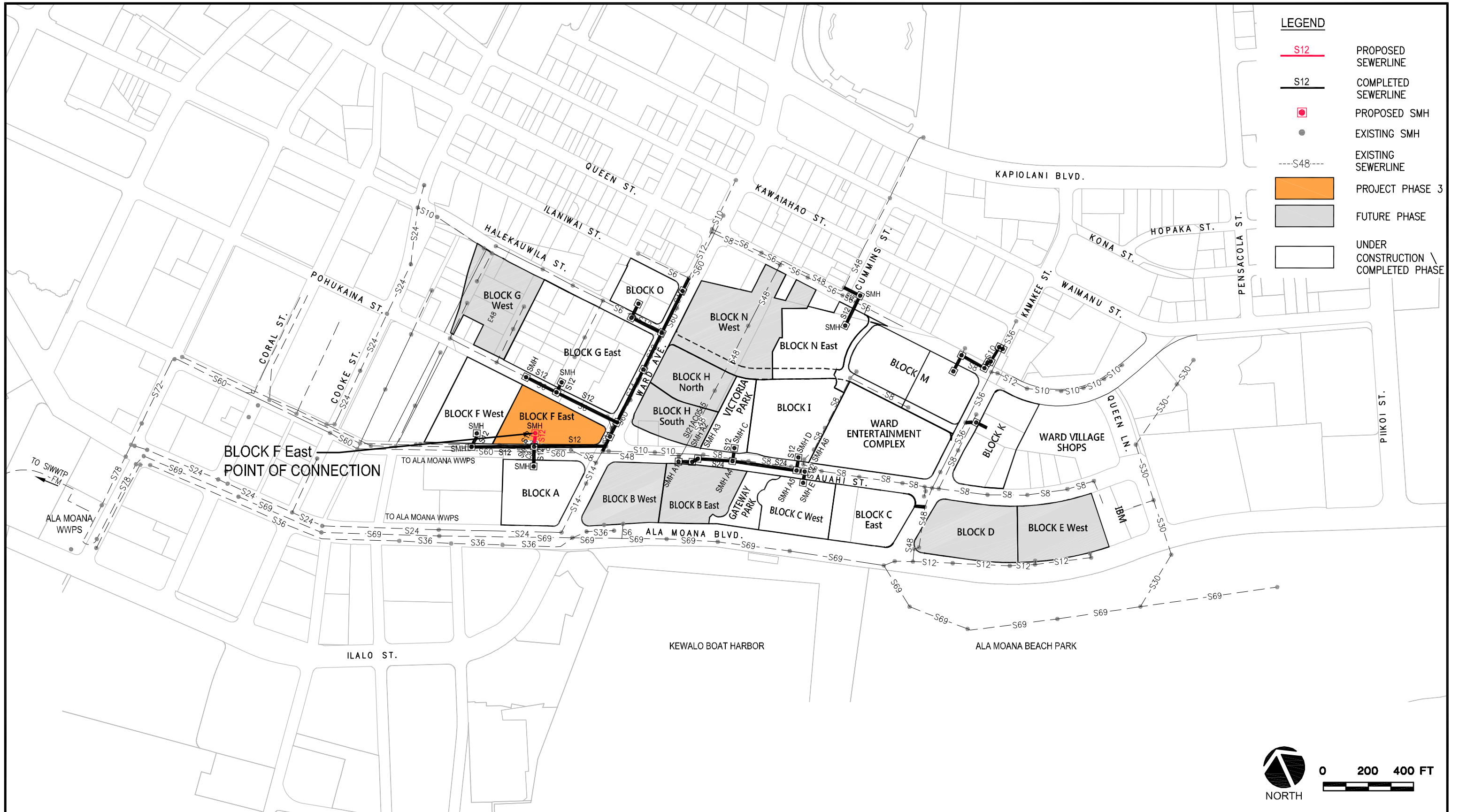
FIGURE  
**5-9**





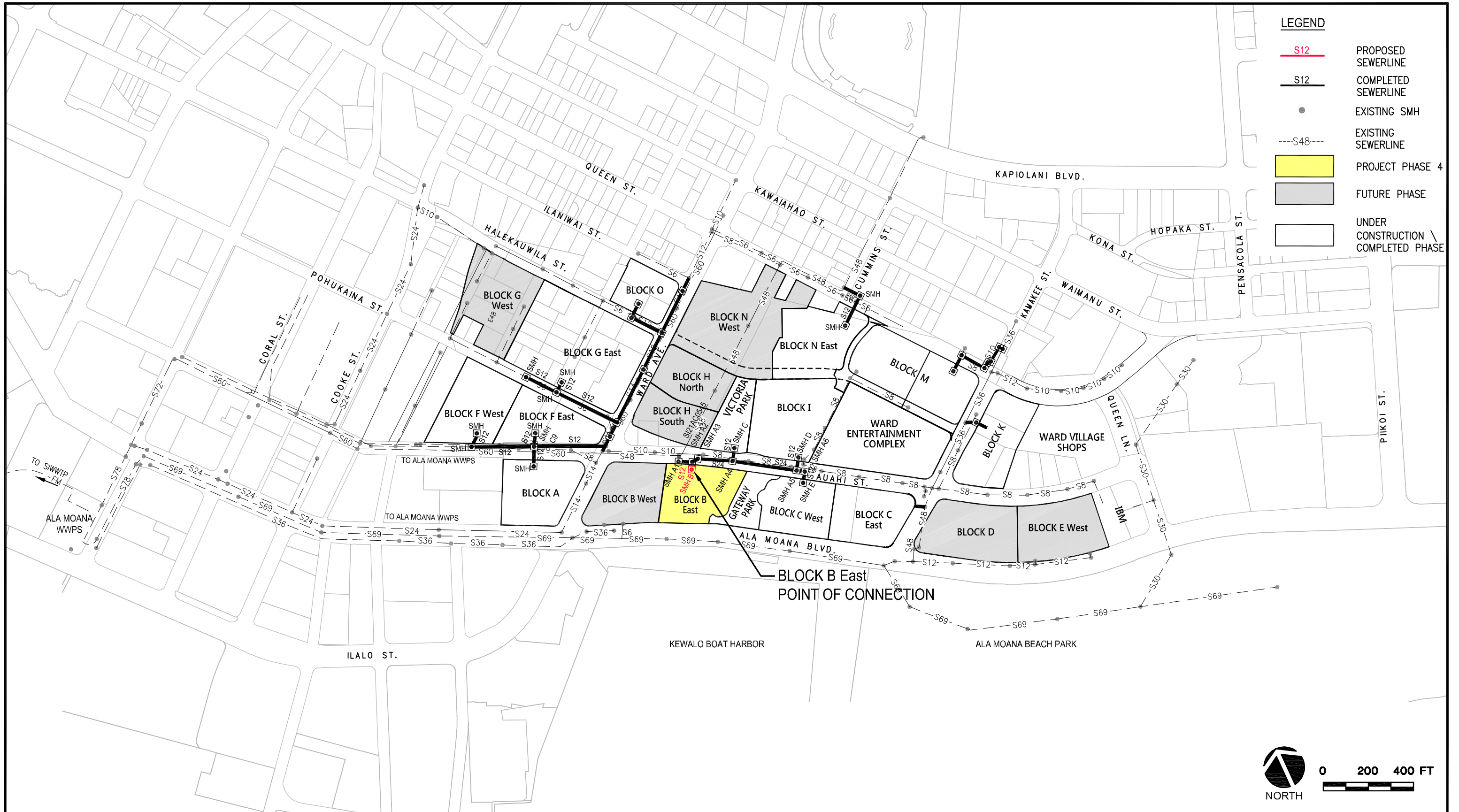
VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK F West (Phase 3-2022)**  
**PROPOSED SEWER IMPROVEMENTS**

FIGURE  
**5-10**



VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK F East (Phase 3-2022)**  
**PROPOSED SEWER IMPROVEMENTS**

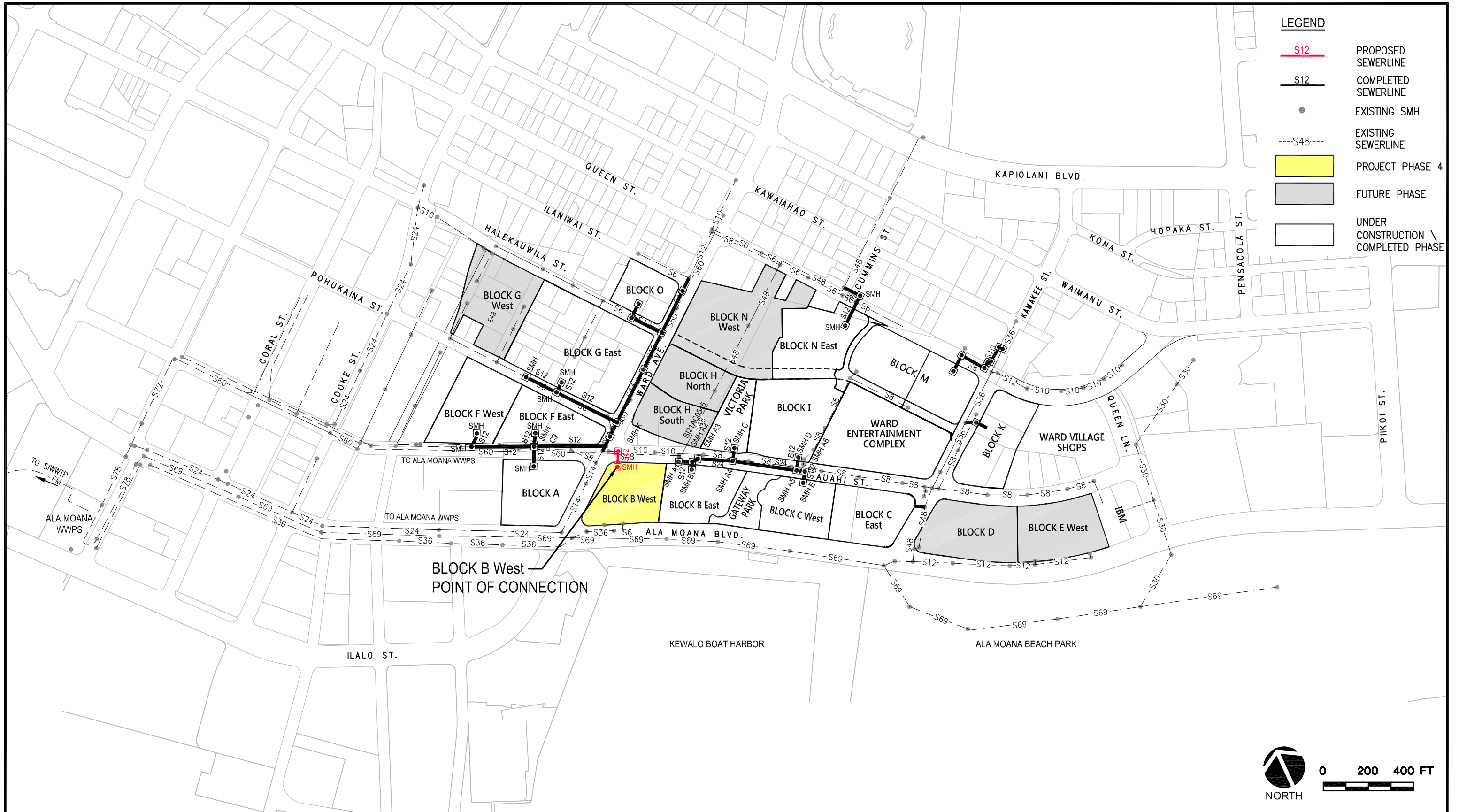
FIGURE  
**5-11**



VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK B East (Phase 4-2023)**  
**PROPOSED SEWER IMPROVEMENTS**

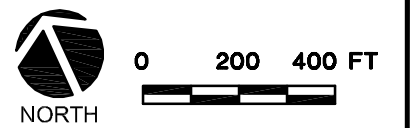
FIGURE  
**5-12**

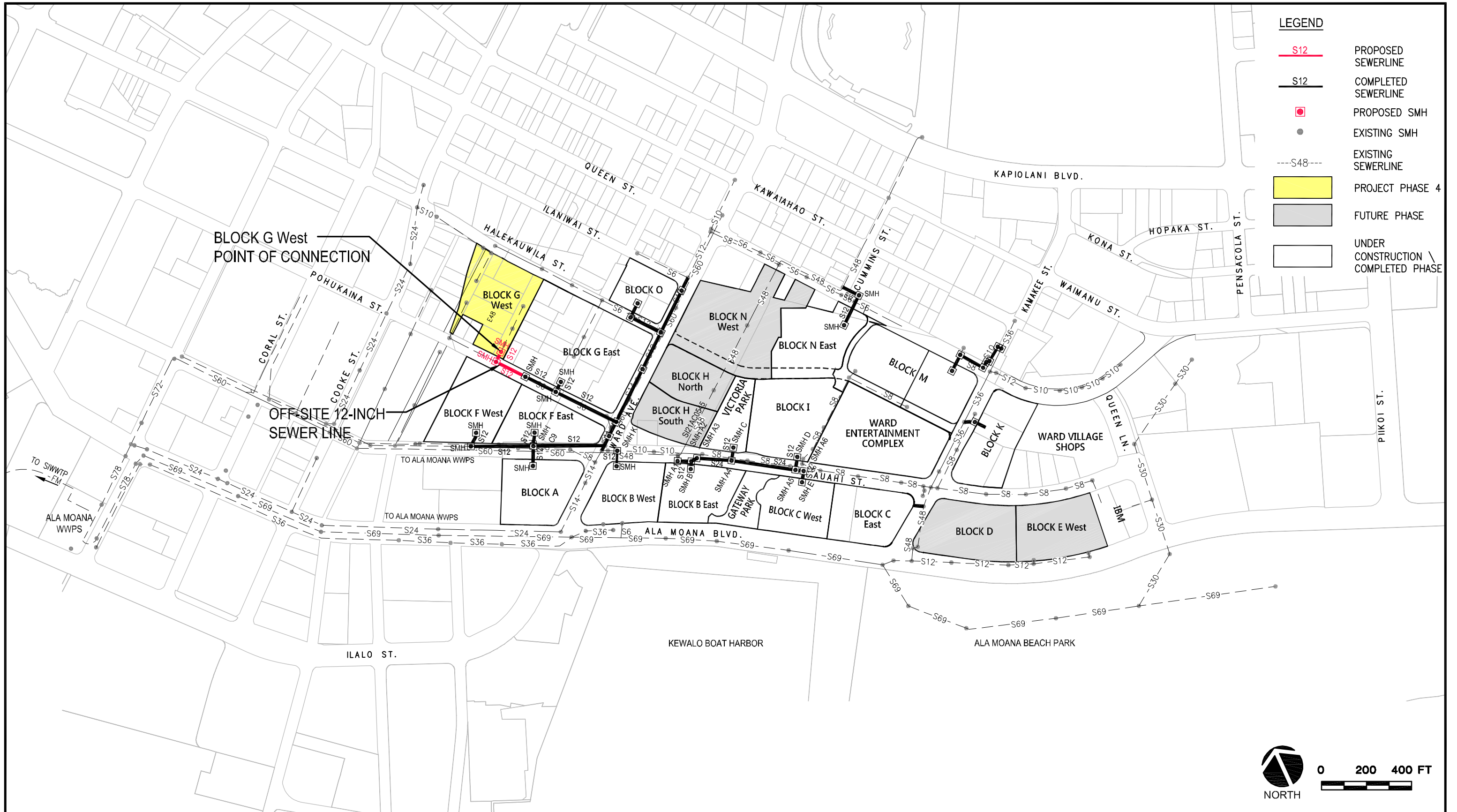




VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK B West (Phase 4-2024)**  
**PROPOSED SEWER IMPROVEMENTS**

FIGURE  
**5-13**



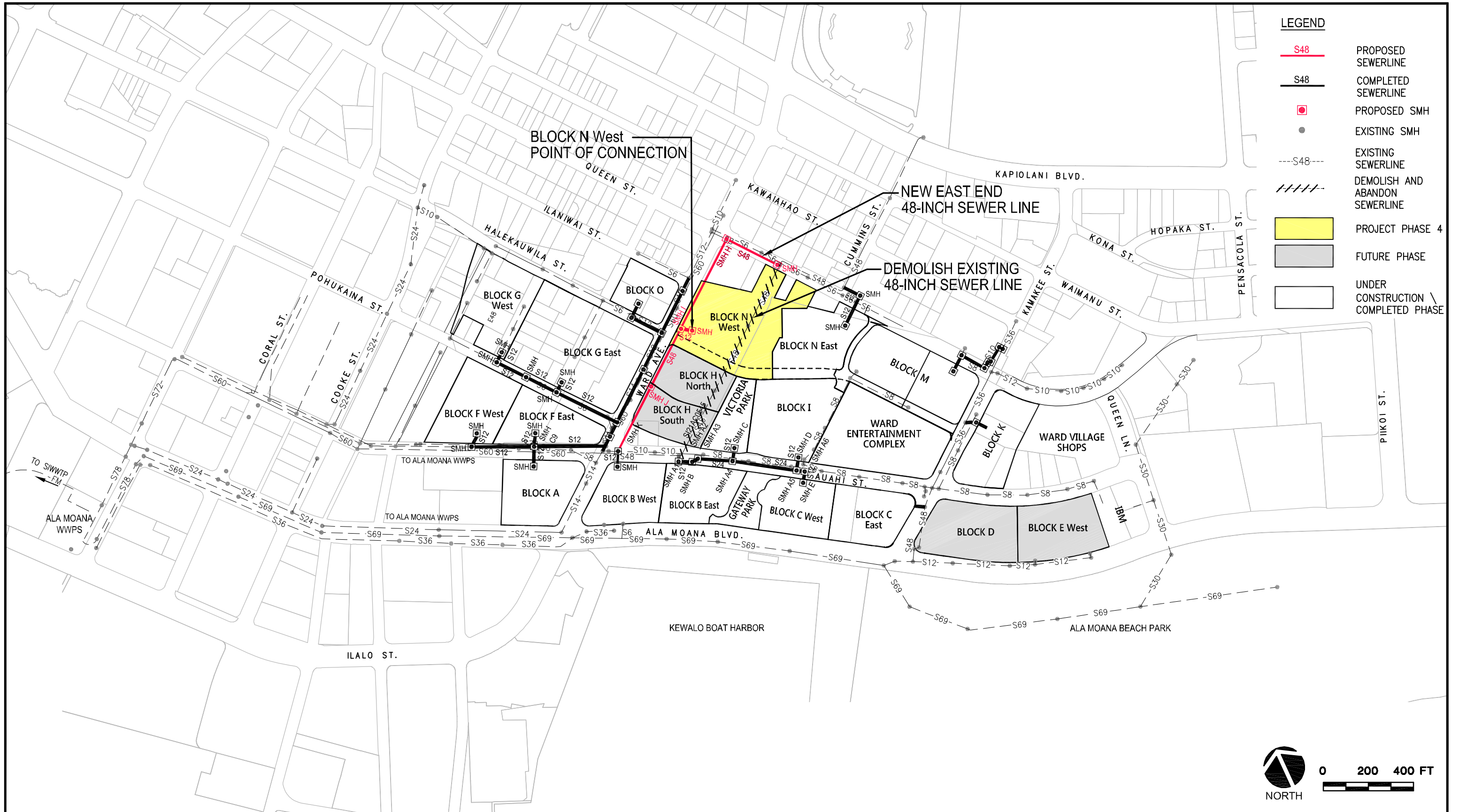


VICTORIA WARD, LTD. REDEVELOPMENT

**BLOCK G West (Phase 4-2024)  
PROPOSED SEWER IMPROVEMENTS**

**FIGURE  
5-14**

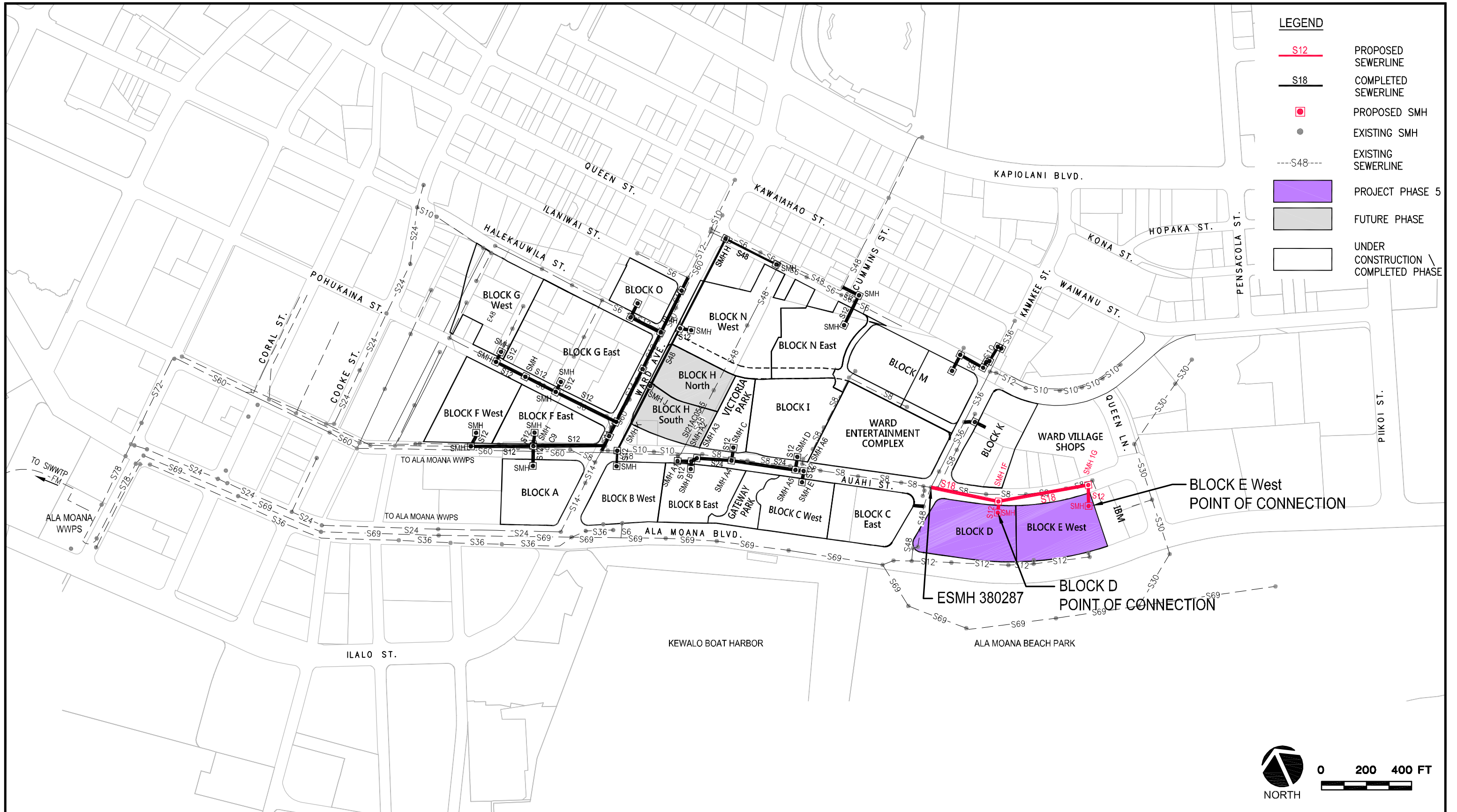




VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK N West (Phase 4-2024)**  
 PROPOSED SEWER IMPROVEMENTS

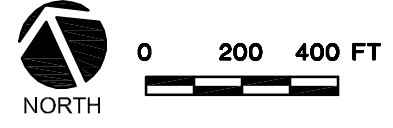
FIGURE  
**5-15**



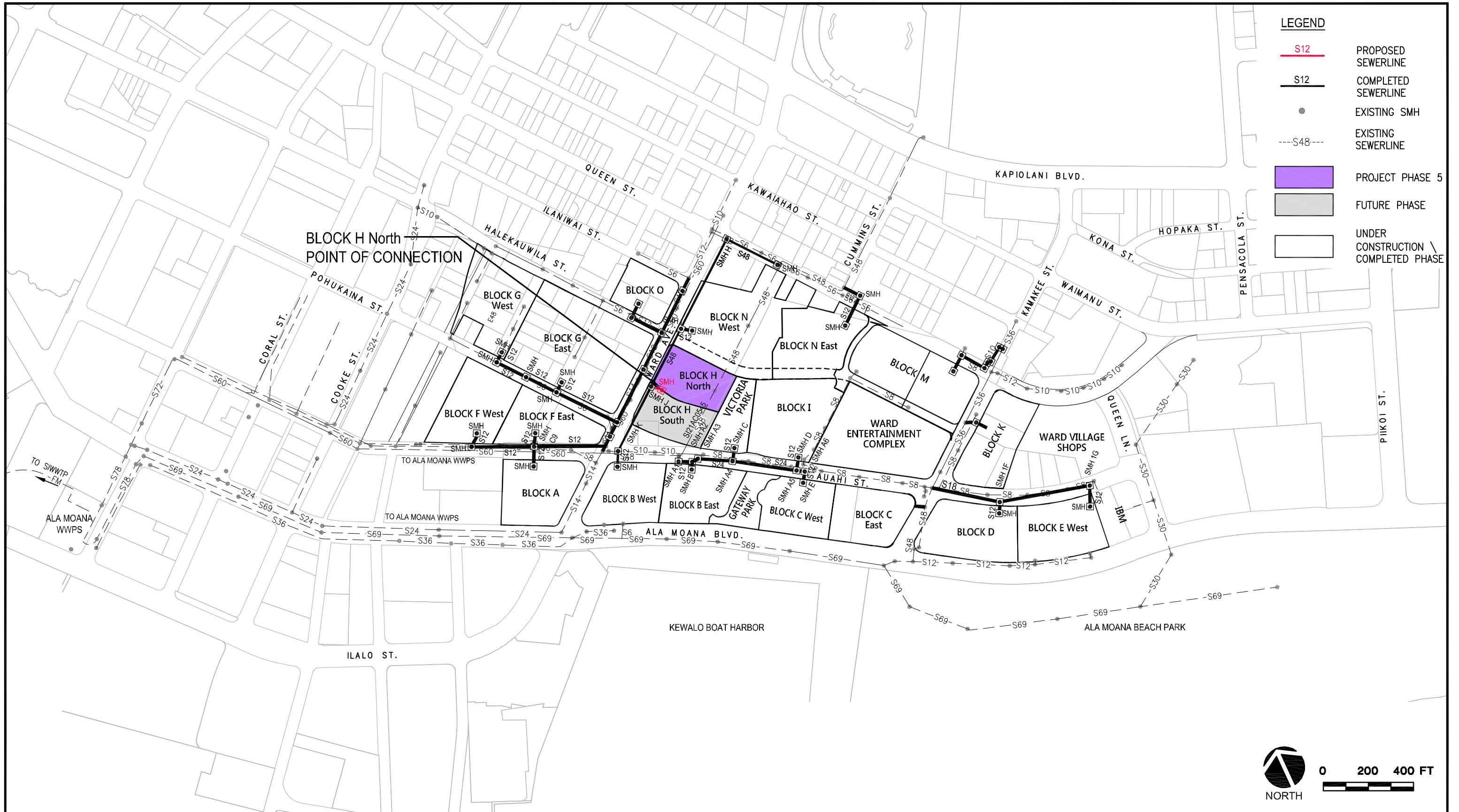


VICTORIA WARD, LTD. REDEVELOPMENT  
 BLOCK D & E West (Phase 5-2025)  
 PROPOSED SEWER IMPROVEMENTS

FIGURE  
 5-16

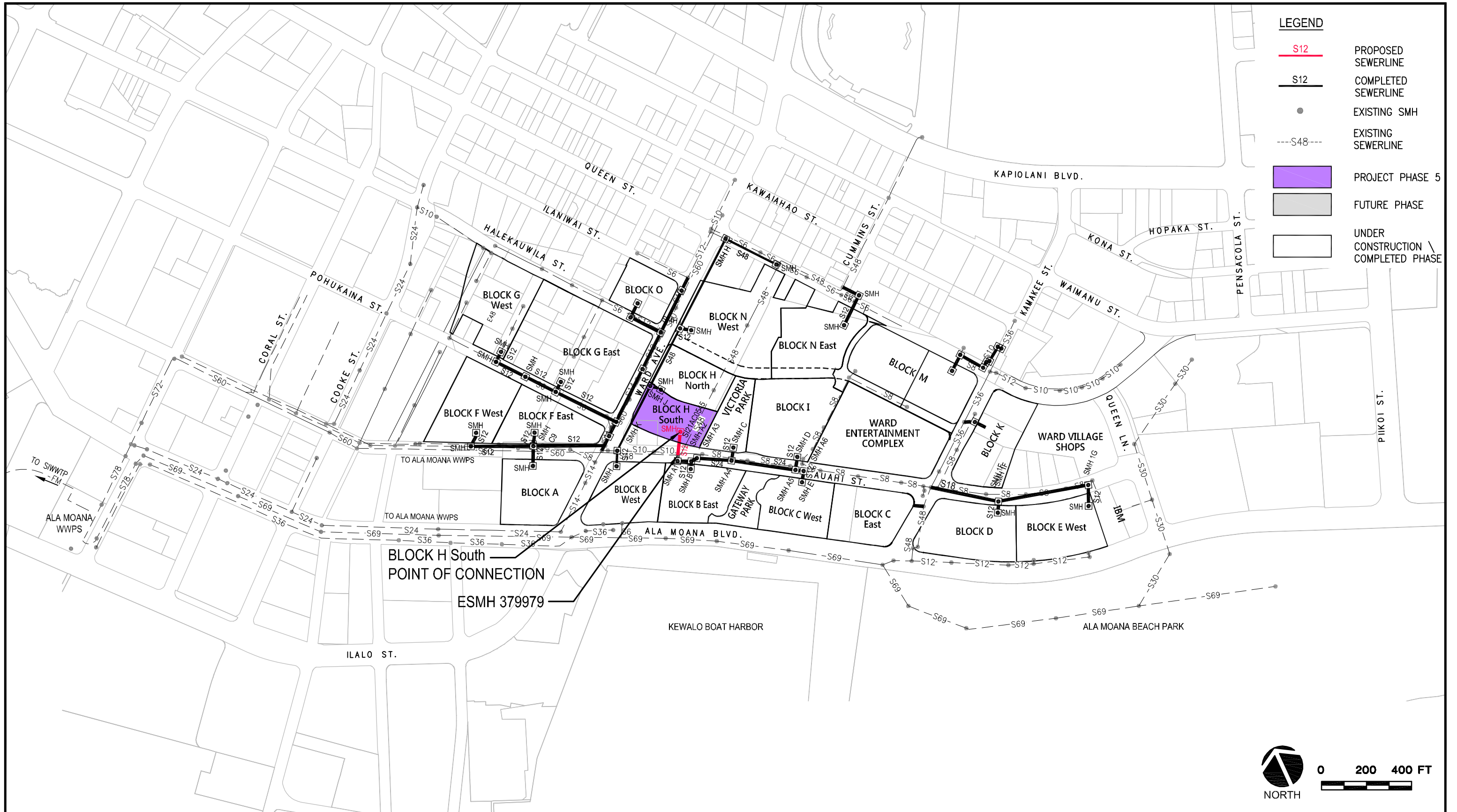






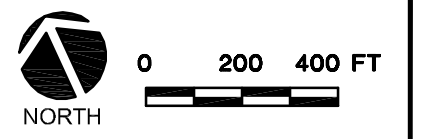
VICTORIA WARD, LTD. REDEVELOPMENT  
 BLOCK H North (Phase 5-2026)  
 PROPOSED SEWER IMPROVEMENTS

FIGURE  
 5-17



VICTORIA WARD, LTD. REDEVELOPMENT  
**BLOCK H South (Phase 5-2026)**  
 PROPOSED SEWER IMPROVEMENTS

FIGURE  
**5-18**



## SEWER MASTER PLAN UPDATE FOR VICTORIA WARD REDEVELOPMENT

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### 6. REFERENCES

1. City and County of Honolulu, Department of Budget and Fiscal Services, Division of Purchasing, *Construction Documents of Various Projects*, 2008 to 2011.
2. City and County of Honolulu, Department of Budget and Fiscal Services, Division of Purchasing, *City Executive Capital Budget and Program*, 2002 to 2012
3. City and County of Honolulu, Department of Environment Services, *2010 Wastewater Global Consent Decree*, 2010.
4. City and County of Honolulu, Department of Environment Services, Collection Systems Maintenance, *IDIQ 2 and IDIQ 3 Projects*, 2011.
5. Fukunaga and Associates, Inc., *Final Sewer I/I Plan*, December 1999.
6. Hawai'i Community Development Authority, *Mauka Area Plan Kaka'ako Community Development District*, June 2005
7. R.M. Towill Corporation, *Spill Reduction Action Plan Engineering Report, Chapters 1-5 Volume 1 of V*, November 1995.
8. City and County of Honolulu, *Design Standards of the Department of Wastewater Management*, Volume 1, July 1993.
9. Ala Moana Boulevard/Auahi Street Sewer Rehabilitation Phase 2, Job No. W10-11, 2012.

**APPENDIX A: City and County of Honolulu, Department of Planning and Permitting, Approved Sewer Connection Applications**



DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET \* HONOLULU, HAWAII 96813  
 Phone: (808) 768-8209 \* Fax: (808) 768-4210

# SEWER CONNECTION APPLICATION

APPLICATION NO.: **2015/SCA-0046**

STATUS: **Approved with conditions**

**\$800,078.80**

DATE RECEIVED: **01/22/2015**

IWDP APP. NO.:

Estimated Wastewater  
System Facility Charge\*

PROJECT NAME: **2015/SCA-0046 Victoria Ward Block C Tower**

LOCATION:

**APR 27 2015**

Zone	Section	Plat	Parcel
<b>2</b>	<b>3</b>	<b>001</b>	<b>004</b>
Zone	Section	Plat	Parcel
<b>2</b>	<b>3</b>	<b>001</b>	<b>001</b>

**1122 ALA MOANA Honolulu / Down**

**25,000 Sq. Ft.**

**56,446 Sq. Ft.**

SPECIFIC LOCATION: **1140 Ala Moana Blvd.**

APPLICANT: **HOWARD HUGHES CORP**  
 1240 ALA MOANA BLVD 601  
 HONOLULU, HI 96814

DEVELOPMENT TYPE: **Dwelling, Multi-family**

SEWER CONNECTION WORK DESIRED:

OTHER USES: **Retail, 8,505 SF**

NON-RESIDENTIAL AREA: **8,505.00 s.f.**

APPROXIMATE DATE OF CONNECTION: **06/01/2015**

PROPOSED UNITS

No. of New Units: **175**

Studios:

1-Bedroom: **26**  
 2-Bedroom: **50**  
 3-Bedroom: **84**  
 4-Bedroom: **10**  
 5-Bedroom:  
 6-Bedroom:

EXISTING UNITS

No. of Existing Units: **0**

Studios:

1-Bedroom:  
 2-Bedroom:  
 3-Bedroom:  
 4-Bedroom:  
 5-Bedroom:  
 6-Bedroom:

UNITS TO BE DEMOLISHED

No. of Units to be Demolished: **0**

Studios:

1-Bedroom:  
 2-Bedroom:  
 3-Bedroom:  
 4-Bedroom:  
 5-Bedroom:  
 6-Bedroom:

REMARKS **Application supersedes 2013/SCA-0027 and is conditionally approved with the re-design of the sewer connection to the 48-inch on Kamakee Street. The Victoria Ward Block C project must connect to the 48-inch sewer via a new 10-inch sewer with crown-to-crown matching elevations. Submit construction plans for review and approval.**

APPROVAL DATE: **04/21/2015**

*Valid 2-years after approval date. Construction plans shall be completed and approved within this 2-year period. Construction shall commence within 1-year after approval of plans.*

EXPIRATION DATE: **04/20/2017**

*\* Applicable WSFC shall be collected at the prevailing rate in accordance with ROH 1990, Chapter 14, Sections 14-10.3, 14-10.4, 14-10.5 and Appendix 14-D.*

REVIEWED BY: **Tessa Ching**

Site Development Division, Wastewater Branch



DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET \* HONOLULU, HAWAII 96813  
 Phone: (808) 768-8209 \* Fax: (808) 768-4210

# SEWER CONNECTION APPLICATION

APPLICATION NO.: **2015/SCA-0260** STATUS: **Approved**  
 DATE RECEIVED: **04/06/2015** IWDP APP. NO.:  
 PROJECT NAME: **2015/SCA-0260 Victoria Ward Limited - Block K Auahi Tower**

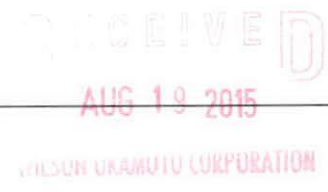
<b>\$1,436,406.40</b>
Estimated Wastewater System Facility Charge*

LOCATION:

Zone	Section	Plat	Parcel
<b>2</b>	<b>3</b>	<b>005</b>	<b>022</b>

**19,570** Sq. Ft.

SPECIFIC LOCATION: **1108 Auahi St.**



APPLICANT: **Wilson Okamoto Corporation**  
 Attn: **Wayne Higa**  
 1907 South Beretania St., #400  
 Honolulu, HI 96826

DEVELOPMENT TYPE: **Dwelling, Multi-family**

SEWER CONNECTION WORK DESIRED:

OTHER USES: **Retail**

NON-RESIDENTIAL AREA: **17,000.00** s.f.

APPROXIMATE DATE OF CONNECTION: **06/01/2015**

PROPOSED UNITS

No. of New Units: **318**

- Studios: **20**
- 1-Bedroom: **93**
- 2-Bedroom: **132**
- 3-Bedroom: **67**
- 4-Bedroom: **4**
- 5-Bedroom:
- 6-Bedroom:

EXISTING UNITS

No. of Existing Units: **0**

- Studios:
- 1-Bedroom:
- 2-Bedroom:
- 3-Bedroom:
- 4-Bedroom:
- 5-Bedroom:
- 6-Bedroom:

UNITS TO BE DEMOLISHED

No. of Units to be Demolished: **0**

- Studios:
- 1-Bedroom:
- 2-Bedroom:
- 3-Bedroom:
- 4-Bedroom:
- 5-Bedroom:
- 6-Bedroom:

REMARKS

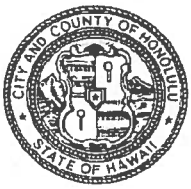
APPROVAL DATE: **08/14/2015**

EXPIRATION DATE: **08/13/2017**

*Valid 2-years after approval date. Construction plans shall be completed and approved within this 2-year period. Construction shall commence within 1-year after approval of plans.  
 \* Applicable WSFC shall be collected at the prevailing rate in accordance with ROH 1990, Chapter 14, Sections 14-10.3, 14-10.4, 14-10.5 and Appendix 14-D.*

REVIEWED BY: **Mindy Yoneshige**

Site Development Division, Wastewater Branch



DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET \* HONOLULU, HAWAII 96813  
 Phone: (808) 768-8209 \* Fax: (808) 768-4210

# SEWER CONNECTION APPLICATION

APPLICATION NO.: **2014/SCA-0686**

STATUS: **Approved with conditions**

**\$2,064,116.00**

DATE RECEIVED: **09/15/2014**

IWDP APP. NO.:

Estimated Wastewater System Facility Charge\*

PROJECT NAME: **2014/SCA-0686 VWL Block M**

LOCATION:

Zone	Section	Plat	Parcel
<b>2</b>	<b>3</b>	<b>002</b>	<b>001</b>

**477,582** Sq. Ft.

SPECIFIC LOCATION: **330 Kamakee St.**

APPLICANT: **Wilson Okamoto Corporation**  
 Attn: **Eric Kadooka**  
 1907 South Beretania Street, Suite 400  
 Honolulu, Hawaii 96826

DEVELOPMENT TYPE: **Dwelling, Multi-family**

SEWER CONNECTION WORK DESIRED:

OTHER USES: **Retail and Restaurant**

NON-RESIDENTIAL AREA: **96,790.00** s.f.

APPROXIMATE DATE OF CONNECTION:

PROPOSED UNITS

EXISTING UNITS

UNITS TO BE DEMOLISHED

No. of New Units: **466**

No. of Existing Units: **0**

No. of Units to be Demolished: **0**

Studios:

Studios:

Studios:

1-Bedroom: **117**

1-Bedroom:

1-Bedroom:

2-Bedroom: **233**

2-Bedroom:

2-Bedroom:

3-Bedroom: **116**

3-Bedroom:

3-Bedroom:

4-Bedroom:

4-Bedroom:

4-Bedroom:

5-Bedroom:

5-Bedroom:

5-Bedroom:

6-Bedroom:

6-Bedroom:

6-Bedroom:

REMARKS **Approval is based on completion of upgrades to the Sand Island solids handling capabilities (anticipated in 2017) and connection to the 36-inch sewerline at 0.11% slope on Kamakee St. Additional WSFC fees may be required for the retail and restaurant facilities. An IWDP is required for restaurants.**

APPROVAL DATE: **10/31/2014**

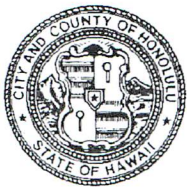
*Valid 2-years after approval date. Construction plans shall be completed and approved within this 2-year period. Construction shall commence within 1-year after approval of plans.*

EXPIRATION DATE: **10/30/2016**

*\* Applicable WSFC shall be collected at the prevailing rate in accordance with ROH 1990, Chapter 14, Sections 14-10.3, 14-10.4, 14-10.5 and Appendix 14-D.*

REVIEWED BY: **Tessa Ching**

Site Development Division, Wastewater Branch



DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET \* HONOLULU, HAWAII 96813  
 Phone: (808) 768-8209 \* Fax: (808) 768-4210

RECEIVED  
 OCT 22 2015  
 WILSON OKAMOTO CORPORATION

# SEWER CONNECTION APPLICATION

APPLICATION NO.: **2015/SCA-0813** STATUS: **Approved with conditions**  
 DATE RECEIVED: **10/09/2015** IWDP APP. NO.:  
 PROJECT NAME: **2015/SCA-0813 VWL Block O**

<b>\$1,913,067.20</b>
Estimated Wastewater System Facility Charge*

LOCATION:

Zone	Section	Plat	Parcel
<b>2</b>	<b>1</b>	<b>050</b>	<b>001</b>
Zone	Section	Plat	Parcel
<b>2</b>	<b>1</b>	<b>050</b>	<b>061</b>
Zone	Section	Plat	Parcel
<b>2</b>	<b>1</b>	<b>050</b>	<b>062</b>

**988 HALEKAUWILA ST Honolulu / I 15,000 Sq. Ft.**

**901 ILANIWAI ST Honolulu / Downt 27,124 Sq. Ft.**

**404 WARD AVE Honolulu / Downto 9,644 Sq. Ft.**

*KG*

SPECIFIC LOCATION: **988 Halekauwila St.**

APPLICANT: **Wilson Okamoto Corporation**  
 Attn: **Kevin Goto**  
 1907 South Beretania Street, Suite 400  
 Honolulu, Hawaii 96826

DEVELOPMENT TYPE: **Dwelling, Multi-family**

SEWER CONNECTION WORK DESIRED: **New**

OTHER USES: **Retail**

NON-RESIDENTIAL AREA: **30,000.00** s.f.

APPROXIMATE DATE OF CONNECTION: **12/31/2017**

PROPOSED UNITS

No. of New Units: **424**  
 Studios: **0**  
 1-Bedroom: **161**  
 2-Bedroom: **187**  
 3-Bedroom: **76**  
 4-Bedroom:  
 5-Bedroom:  
 6-Bedroom:

EXISTING UNITS

No. of Existing Units: **0**  
 Studios:  
 1-Bedroom:  
 2-Bedroom:  
 3-Bedroom:  
 4-Bedroom:  
 5-Bedroom:  
 6-Bedroom:

UNITS TO BE DEMOLISHED

No. of Units to be Demolished: **0**  
 Studios:  
 1-Bedroom:  
 2-Bedroom:  
 3-Bedroom:  
 4-Bedroom:  
 5-Bedroom:  
 6-Bedroom:

REMARKS **Approval is contingent on the construction of the proposed 24-inch sewer line on Ward Avenue that will connect to the existing 78-inch on Auahi Street. Submit construction plans for review and approval.**

APPROVAL DATE: **10/19/2015**

*Valid 2-years after approval date. Construction plans shall be completed and approved within this 2-year period. Construction shall commence within 1-year after approval of plans.*

EXPIRATION DATE: **10/18/2017**

*\* Applicable WSFC shall be collected at the prevailing rate in accordance with ROH 1990, Chapter 14, Sections 14-10.3, 14-10.4, 14-10.5 and Appendix 14-D.*

REVIEWED BY: **Keith Miyashiro**

*Keith Miyashiro*

Site Development Division, Wastewater Branch



**APPENDIX B: Wastewater Flow Data from the Department of Design and Construction, INFIX Adjusted Model Results for Existing Condition (1995) and Future Condition (2020)**









**APPENDIX C: Victoria Ward Master Plan Sewerage Calculations  
by Block:**

**Table 1 – Average Flow**

**Table 2 – Design Peak Flow**

**Table 3 – Evaluation of Existing Sewer System**

APPENDIX C

Table 1

AVERAGE FLOW

Phase	Projected Occupancy Date	Property Description	Retail			Restaurant			Multi-Family High-Rise									Average Flow (gpd)	Average Flow (mgd)	
			Area (sf)	Capita	Flow Rate (gpd)	Area (sf)	Capita (seatings)	Flow Rate (gpd)	Studio (units)	1-Bedroom (units)	2-Bedroom (units)	3-Bedroom (units)	4-Bedroom (units)	5-Bedroom (units)	6-Bedroom (units)	7-Bedroom (units)	Capita			Flow Rate (gpd)
Phase 1	2016	Block C East	8,505	57	1,418	0	0	0	0	26	50	84	10	5	0	0	608	48,640	50,058	0.050
Phase 1	2017	Block K	17,000	113	2,833	0	0	0	20	93	132	67	4	2	0	0	896	71,648	74,481	0.074
Phase 1	2018	Block M	72,073	480	12,012	9,326	4,197	104,918	47	182	177	60	0	0	0	0	1,194	95,488	212,418	0.212
Phase 1	2019	Block O	30,000	200	5,000	0	0	0	0	161	187	76	0	0	0	0	1,150	91,968	96,968	0.097
		Subtotal	127,578	851	21,263	9,326	4,197	104,918	67	462	546	287	14	7	0	0	3,847	307,744	433,925	0.434
Phase 2	2020	Block N East	15,000	100	2,500	5,000	2,250	56,250	300	300	128	23	0	0	0	0	1,650	132,032	190,782	0.191
Phase 2	2021	Block I	37,500	250	6,250	37,500	16,875	421,875	240	240	96	24	0	0	0	0	1,325	105,984	534,109	0.534
Phase 2	2021	Victoria Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000
Phase 2	2021	Block C West	5,000	33	833	5,000	2,250	56,250	0	19	71	24	8	3	0	1	399	31,904	88,987	0.089
		Subtotal	57,500	383	9,583	47,500	21,375	534,375	540	559	295	71	8	3	0	1	3,374	269,920	813,878	0.814
Phase 3	2022	Block A	15,000	100	2,500	5,000	2,250	56,250	45	91	68	23	0	0	0	0	554	44,352	103,102	0.103
Phase 3	2022	Block G East	67,500	450	11,250	22,500	10,125	253,125	48	72	40	0	0	0	0	0	352	28,160	292,535	0.293
Phase 3	2022	Block F West	15,000	100	2,500	5,000	2,250	56,250	105	140	88	18	0	0	0	0	808	64,672	123,422	0.123
Phase 3	2023	Block F East	18,750	125	3,125	6,250	2,813	70,313	93	124	78	16	0	0	0	0	716	57,312	130,750	0.131
		Subtotal	116,250	775	19,375	38,750	17,438	435,938	291	427	274	57	0	0	0	0	2,431	194,496	649,809	0.650
Phase 4	2023	Block B East	4,865	32	811	4,865	2,189	54,731	0	0	71	32	6	0	2	0	371	29,664	85,206	0.085
Phase 4	2024	Block B West	7,657	51	1,276	2,553	1,149	28,721	35	70	52	17	0	0	0	0	424	33,888	63,885	0.064
Phase 4	2024	Block G West	67,500	450	11,250	22,500	10,125	253,125	49	73	41	0	0	0	0	0	359	28,704	293,079	0.293
Phase 4	2024	Block N West	22,500	150	3,750	7,500	3,375	84,375	240	240	120	0	0	0	0	0	1,296	103,680	191,805	0.192
		Subtotal	102,522	683	17,087	37,418	16,838	420,953	324	383	284	49	6	0	2	0	2,449	195,936	633,976	0.634
																				0.000
Phase 5	2025	Block D	7,500	50	1,250	2,500	1,125	28,125	0	54	99	27	0	0	0	0	493	39,456	68,831	0.069
Phase 5	2026	Block H North	30,000	200	5,000	10,000	4,500	112,500	175	200	100	25	0	0	0	0	1,130	90,400	207,900	0.208
Phase 5	2026	Block H South	45,000	300	7,500	15,000	6,750	168,750	66	132	99	33	0	0	0	0	805	64,416	240,666	0.241
Phase 5	2027	Block E West	6,696	45	1,116	2,232	1,004	25,110	0	56	102	28	0	0	0	0	510	40,768	66,994	0.067
		Subtotal	89,196	595	14,866	29,732	13,379	334,485	241	442	400	113	0	0	0	0	2,938	235,040	584,391	0.584
		<b>Total</b>	493,046	3,287	82,174	162,726	73,227	1,830,668	1,463	2,273	1,799	577	28	10	2	1	15,039	1,203,136	3,115,978	3.116

Assumptions:

- Retail Capita = 0.0067 capita/sf (1 person / 150 sf)
- Restaurant Capita = 0.45 seatings/sf (9 seatings / 20 sf)
- Studio Capita = 2.0 capita/unit
- 1-Bedroom Capita = 2.0 capita/unit
- 2-Bedroom Capita = 2.8 capita/unit
- 3-Bedroom Capita = 4.0 capita/unit
- 4-Bedroom Capita = 5.0 capita/unit
- 5-Bedroom Capita = 6.0 capita/unit
- 6-Bedroom Capita = 7.0 capita/unit
- 7-Bedroom Capita = 8.0 capita/unit
  
- Retail Flow = 25 gal/capita/day
- Restaurant Flow = 25 gal/capita/day
- MFHR Flow = 80 gal/capita/day

APPENDIX C  
TABLE 2  
DESIGN PEAK FLOW

Phase	Projected Occupancy Date	Property Description	Area (acres)	Capita	Average Flow Rate (mgd)	Max Flow Factor	Max Flow (mgd)	Dry Weather I/I (mgd)	Design Avg. Flow (mgd)	Design Max Flow (mgd)	Wet Weather I/I (mgd)	Design Peak Flow (mgd)
Phase 1	2016	Block C East	1.86	665	0.050	5.43	0.272	0.023	0.073	0.295	0.005	0.300
Phase 1	2017	Block K	1.80	1,009	0.074	4.99	0.372	0.035	0.110	0.407	0.005	0.412
Phase 1	2018	Block M	4.04	5,871	0.212	3.51	0.745	0.205	0.418	0.951	0.011	0.962
Phase 1	2019	Block O	1.18	1,350	0.097	4.71	0.457	0.047	0.144	0.504	0.003	0.507
		Subtotal	8.88	8,894	0.434		1.845	0.311	0.745	2.157	0.024	2.181
Phase 2	2020	Block N East	2.71	4,000	0.191	3.79	0.723	0.140	0.331	0.863	0.007	0.870
Phase 2	2021	Block I	3.30	18,450	0.534	2.79	1.491	0.646	1.180	2.136	0.009	2.146
Phase 2	2021	Victoria Park	2.71	0	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Phase 2	2021	Block C West	2.55	2,682	0.089	4.10	0.365	0.094	0.183	0.459	0.007	0.466
		Subtotal	11.27	25,132	0.814		2.579	0.880	1.694	3.459	0.024	3.482
Phase 3	2022	Block A	2.10	2,904	0.103	4.04	0.417	0.102	0.205	0.518	0.006	0.524
Phase 3	2022	Block G East	4.52	10,927	0.293	3.10	0.907	0.382	0.675	1.289	0.012	1.302
Phase 3	2022	Block F West	3.00	3,158	0.123	3.97	0.490	0.111	0.234	0.601	0.008	0.609
Phase 3	2023	Block F East	2.68	3,654	0.131	3.86	0.504	0.128	0.259	0.632	0.007	0.640
		Subtotal	12.30	20,644	0.650		2.318	0.723	1.372	3.041	0.034	3.074
Phase 4	2023	Block B East	1.83	2,592	0.085	4.13	0.352	0.091	0.176	0.443	0.005	0.448
Phase 4	2024	Block B West	1.89	1,623	0.064	4.54	0.290	0.057	0.121	0.347	0.005	0.352
Phase 4	2024	Block G West	4.48	10,934	0.293	3.10	0.908	0.383	0.676	1.291	0.012	1.303
Phase 4	2024	Block N West	2.76	4,821	0.192	3.65	0.700	0.169	0.361	0.869	0.008	0.876
		Subtotal	10.96	19,971	0.634		2.250	0.699	1.333	2.949	0.030	2.980
Phase 5	2025	Block D	2.38	1,668	0.069	4.51	0.311	0.058	0.127	0.369	0.007	0.376
Phase 5	2026	Block H North	1.60	5,830	0.208	3.51	0.731	0.204	0.412	0.935	0.004	0.939
Phase 5	2026	Block H South	1.60	7,855	0.241	3.31	0.797	0.275	0.516	1.072	0.004	1.076
Phase 5	2027	Block E West	2.14	1,559	0.067	4.58	0.307	0.055	0.122	0.361	0.006	0.367
		Subtotal	7.72	16,912	0.584		2.145	0.592	1.176	2.737	0.021	2.758
		<b>Total</b>	51.13	91,553	3.116		11.137	3.204	6.320	14.342	0.133	14.475



