FINAL ENVIRONMENTAL IMPACT STATEMENT

INTERNATIONAL MARKET PLACE REVITALIZATION PROJECT

Appendix 10

Preliminary Engineering Report

Preliminary Engineering Report

International Market Place and Miramar Redevelopment

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March 2012

PRELIMINARY ENGINEERING REPORT
International Market Place Revitalization Project

Waikiki, Oahu, Hawaii
Tax Map Key 2-6-22: 36, 37, 38, 39, and 43

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EXECUTIVE SUMMARY

This Preliminary Engineering Report for the International Market Place Revitalization Project (which includes the IMP, Waikiki Town Center, and the Miramar at Waikiki Hotel) was conducted to review the existing site infrastructure and utilities systems, determine proposed project demands, and describe improvements to storm drainage, sanitary sewer, and potable water proposed as part of the project.

Site Grading, Flooding, and Storm Drainage System: In general, the project site is relatively flat with elevations along the Kuhio Avenue property boundary ranging from about 4.75 to 5.50 feet. The elevations along Kalakaua Avenue and Duke's Lane are approximately 7.0 and 5.5 feet respectively. Elevations within the interior areas of the market place are slightly higher.

The Flood Insurance Rate Map (FIRM) indicates the project site is located in two zones with the majority of the project site within Zone AE with base flood elevations determined to be elevation 5.8 feet. A small portion of the Kalakaua Avenue frontage is located within Zone XS with 1% chance of flood with average depths of less than 1 foot or with drainage areas less than 1 square mile.

At a minimum, the proposed finished floor elevations of the new buildings should be set above the base flood elevation of 5.8 feet. However, since the existing elevations along Kalakaua Avenue are approximately 7.0 feet, a higher finished floor elevation above 7.0 feet should be considered during the design phase to ensure positive drainage flow away from the building entrances.

The municipal drainage system fronting the project site consists of an 18- and 24-inch drainline along Kuhio Avenue and an 18-inch drainline along Kalakaua Avenue. Both the Kuhio and Kalakaua Avenue drainage systems convey flows in the westerly direction to Seaside Avenue where the system continues along Ala Wai Boulevard and discharges to the Ala Wai Canal near the intersection of Kanekapolei Place and Ala Wai Boulevard through an 18-inch reinforced concrete pipe.

Sanitary Sewer System: The municipal sanitary sewer system is operated by the City and County of Honolulu's Department of Environmental Services. The sewer mains in the vicinity of the project site consist of two 18- and one 16-inch sewer mains along Kuhio Avenue and a 12- and 8-inch sewer main along Kalakaua Avenue. Although portions of the City's collection system downstream of the project site is currently at or near capacity, we do not anticipate any off-site sewer improvements since the wastewater flow generated under the proposed project is less than what is presently generated. A new Sewer Connection Application will be submitted to confirm adequacy of the City's sewer collection system to support the revitalization project.

Water System: Potable water service is provided and operated by the City & County of Honolulu's Board of Water Supply (BWS). Potable water service is currently adequate to support the proposed redevelopment. A water availability letter was received from BWS stating the existing water system is currently adequate to accommodate the revitalization project. In the vicinity of the project site, there is an 8-inch water main extending along Kalakaua Avenue and a 24- and 16-inch water main located along Kuhio Avenue. Currently, 6 domestic water meters of various sizes serve the project site.

1. INTRODUCTION

Based on the concept plans prepared for TRG, IMP LLC by BKBC Architects Inc. dated April 25, 2011, this Preliminary Engineering Report presents the preliminary engineering assessment of the project's infrastructure and utility systems. The objective of the report is to review existing infrastructure systems, determine project demands, identify possible constraints based on the projected demands, and describe proposed improvements relative to storm drainage, sanitary sewer, and potable water. The proposed improvements are subject to change based on refinement of plans and availability of more detailed information.

1.1 PROJECT LOCATION AND PROPERTY DATA

The International Market Place Revitalization Project (which includes the IMP, Waikiki Town Center, and the Miramar Hotel at Waikiki) is located in the Waikiki resort area on the island of Oahu (see Figure 1). The project site is bordered by Kalakaua Avenue to the southwest, Kuhio Avenue to the northeast, the Waikiki Beachcomber Hotel, and Aqua Waikiki Wave Hotel to the west, and the Princess Kaiulani Hotel to the southeast, (see Figure 2). The site, identified by Tax Map Keys (TMKs) 2-6-22: 36, 37, 38, 39, and 43 (see Figure 3), encompasses a total of 5.98 acres or 260,591 square feet (SF) with the following easements as indicated on the tax map.

- A 5-ft water pipeline easement and a 20-ft walkway easement on the Diamond Head side of the International Market Place parcel.

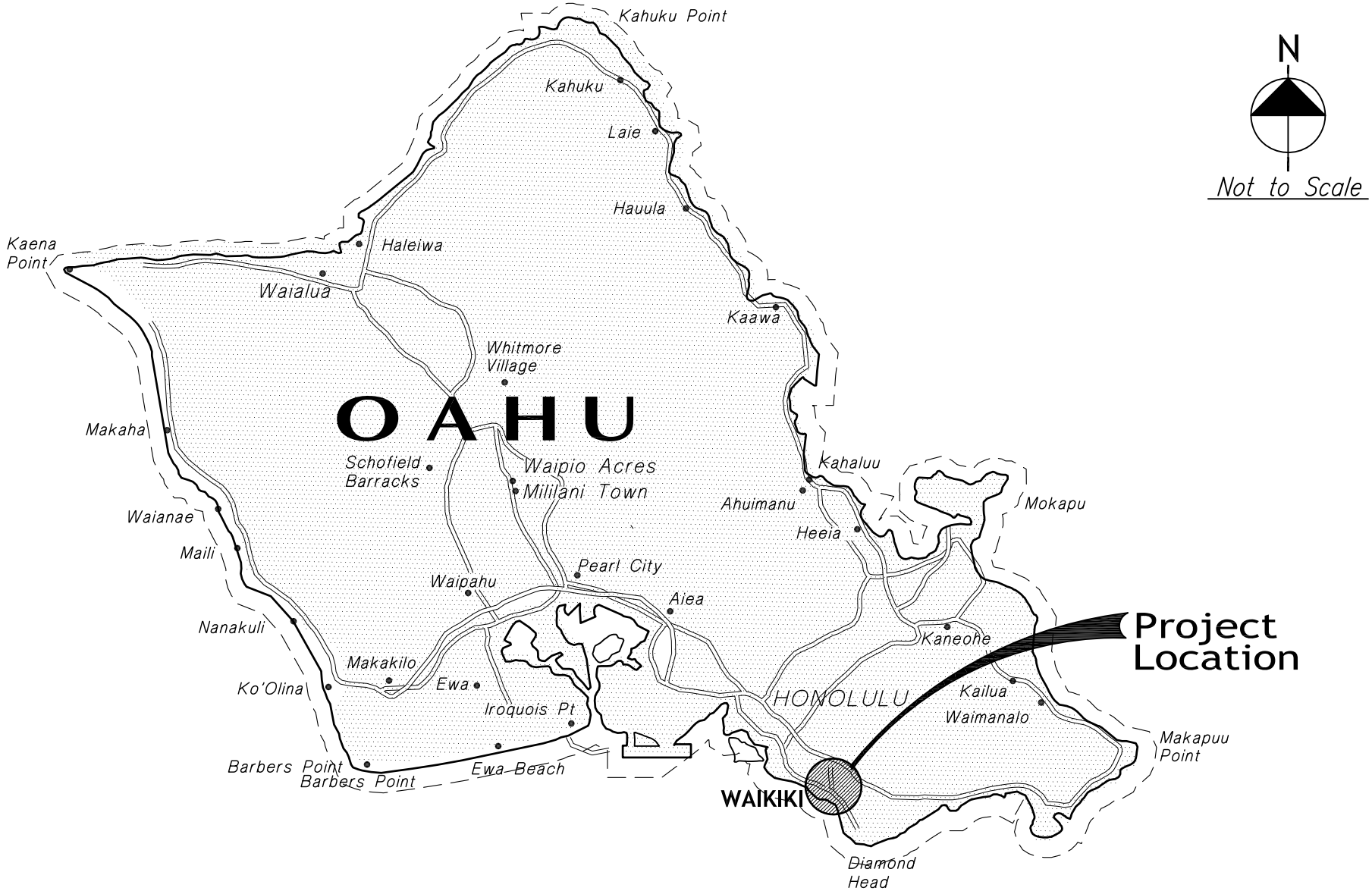
- A footpath easement and Road Easement on the Diamond Head and Ewa sides of the Miramar Hotel parcel.

- A 20-ft wide easement which appears to be part of an access/roadway easement on the Ewa side of the International Market Place property designated by TMK 2-6-22:38.

- A 10-ft wide sewerline easement bisecting the northern corner of the parcel designated by TMK 2-6-22:43 or the Waikiki Town Center parcel.

- Other utility easements along the Kalakaua Avenue and Kuhio Avenue frontages of the properties.

Any of these easements that impact the new redevelopment plans, may be relocated, replaced, or extinguished with permissions from their 'benefactors' and proper procedures.



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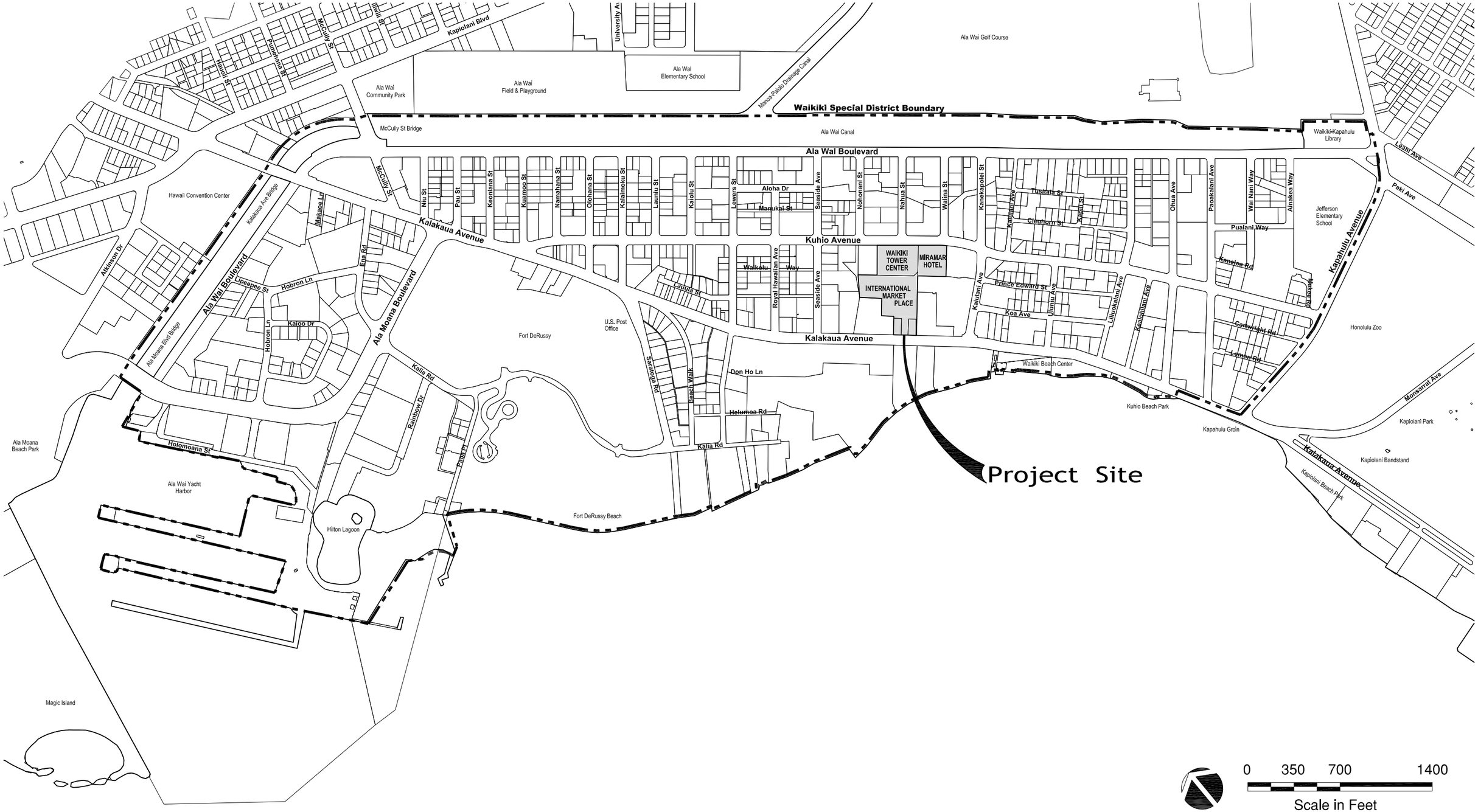
INTERNATIONAL MARKET PLACE AND MIRAMAR HOTEL REDEVELOPMENT

VICINITY MAP

FIGURE 1



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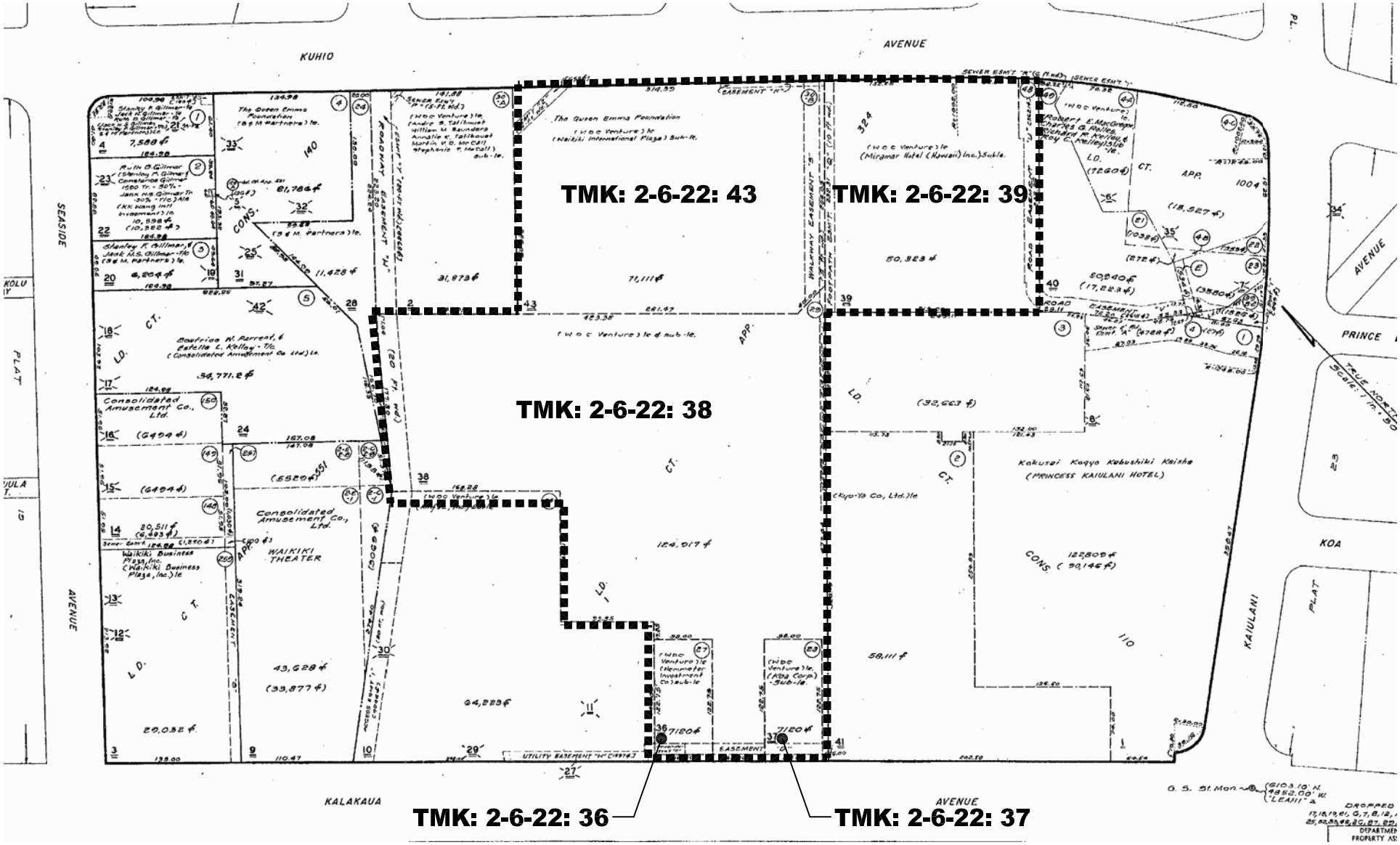
INTERNATIONAL MARKET PLACE AND
MIRAMAR HOTEL REDEVELOPMENT

PROJECT LOCATION MAP

FIGURE
2



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INTERNATIONAL MARKET PLACE AND MIRAMAR HOTEL REDEVELOPMENT

TMK: 2-6-22: 36, 37, 38, 39, and 43

FIGURE 3

1.2 PROJECT DESCRIPTION

Based on information provided to date, it is our understanding that the proposed redevelopment consists of the demolition of the existing Miramar Hotel, Waikiki Town Center, and International Market Place. The demolition will remove 357 existing hotel units, 172,259 gross square feet of existing commercial and retail space, and 40,762 gross square feet of existing restaurant space. The proposed improvements include construction of 300,000 square feet of commercial and retail gross leasable area and 55,000 square feet of restaurant gross leasable area. Other improvements include landscaped gardens, water features, a new parking structure and other supporting facilities.

2. SITE CONDITION

2.1 SITE ELEVATIONS

The existing site is relatively flat with elevations along Kalakaua Avenue at approximately 7.0 feet. Elevations along the Kuhio Avenue boundary ranges from about 4.75 to 5.50 feet. Elevations within the interior areas of the market place are slightly higher.

At a minimum, the proposed finished floor elevations of the new buildings should be set above the base flood elevation of 5.8 feet. However, since the existing elevations along Kalakaua Avenue are approximately 7.0 feet, a higher finished floor elevation above 7.0 feet should be considered during the design phase to ensure positive drainage flow away from the building entrances.

2.2 ROADWAYS AND ACCESS

The existing International Market Place is located between two major roadways, Kalakaua Avenue and Kuhio Avenue in Waikiki. Kalakaua Avenue is a 4-lane, one-way eastbound roadway while Kuhio Avenue is a 4-lane roadway with 2-way traffic in the Diamond-Head and Ewa direction. The market place is located about mid-block on Kalakaua Avenue between Seaside Avenue and Kaiulani Avenue.

2.3 FLOOD HAZARD

The Flood Insurance Rate Map (FIRM), Community Panel Number 15003C03686, indicates the majority of the project site to be within Zone AE with base flood elevations determined at 5.8 feet (see Figures 4 and 5). A portion of the Kalakaua

Avenue frontage is located within Zone XS with 1% chance of flood with average depths of less than 1 foot or with drainage areas less than 1 square mile. Zone XS is not regulated by FEMA and the City and County of Honolulu.

ZONE LEGEND:

AE Corresponds to the 100-year floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

XS Area within the 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood. No base flood elevations or depths are shown within this zones.

X Area determined to be outside of the 0.2% annual chance floodplain. No base flood elevations or depths are shown within this zones.

Reference:

Hawaii - National Flood Insurance Program Flood Assesment Tool Website: gis.hawaiifip.org

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INTERNATIONAL MARKET PLACE AND MIRAMAR HOTEL REDEVELOPMENT

FLOOD ZONE MAP

FIGURE 4

Table 2. Floodway Data

FLOODING SOURCE		FLOODWAY			BASE FLOOD ELEVATION			
Cross Section	Distance	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet per Second)	Regulatory (Feet)	Without Floodway (Feet)	With Floodway (Feet)	Increase (Feet)
Manoa Stream (Cont'd)								
Y	16,490[1]	160	717	12.0	185.5	185.5	185.5	0.0
Z	17,290[1]	82	564	15.0	195.0	195.0	195.0	0.0
AA	18,690[1]	57	405	16.8	214.7	214.7	214.7	0.0
AB	19,290[1]	47	364	18.7	222.0	222.9	222.9	0.0
AC	20,690[1]	69	446	14.6	253.7	253.7	253.7	0.0
AD	21,290[1]	43	303	21.5	261.2	261.2	261.2	0.0
Palolo Stream								
A	-320[2]	50	315	16.8	52.8	52.8	52.8	0.0
B	80[2]	53	387	13.6	76.6	76.6	76.6	0.0
C	740[2]	57	376	14.0	84.9	84.9	84.9	0.0
D	1,410[2]	34	306	17.3	95.5	95.5	95.5	0.0
Ala Wai Canal								
A	6,700[3]	265	6,797	0.6	5.8	5.8	5.8	0.0
B	7,200[3]	265	6,322	0.5	5.8	5.8	5.8	0.0
C	7,700[3]	265	4,088	0.7	5.8	5.8	5.8	0.0
D	8,200[3]	265	4,261	0.7	5.8	5.8	5.8	0.0
E	8,670[3]	225	5,247	0.8	5.8	5.8	5.8	0.0
F	9,170[3]	190	4,002	0.9	5.8	5.8	5.8	0.0
G	9,350[3]	225	2,321	1.2	5.8	5.8	5.8	0.0

[1]Feet Above Confluence With Ala Wai Canal
[2]Feet From St. Louis High School Access Road
[3]Feet Above Mouth

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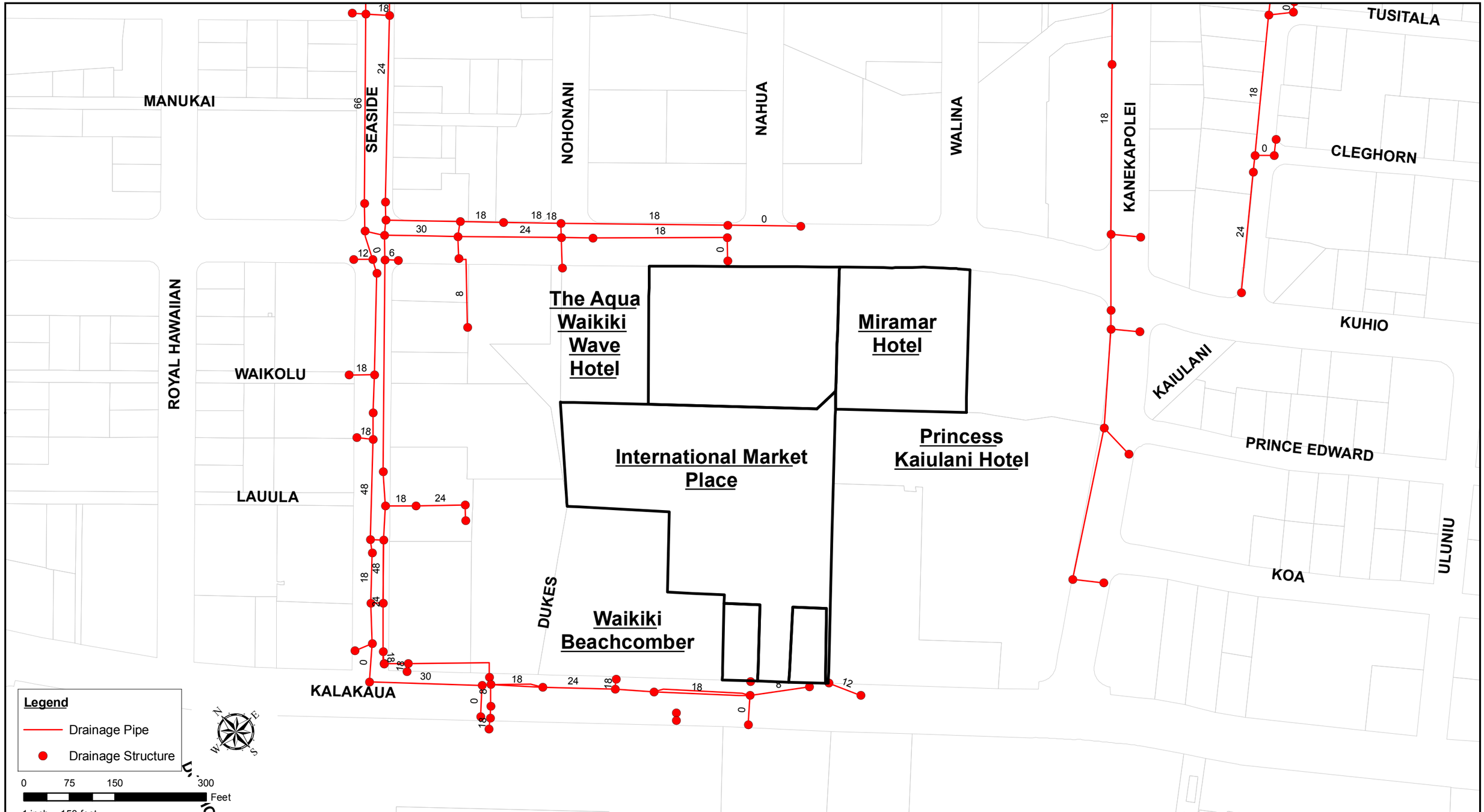
INTERNATIONAL MARKET PLACE AND MIRAMAR HOTEL REDEVELOPMENT

FLOOD ELEVATION TABLE

FIGURE 5



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INTERNATIONAL MARKET PLACE AND
MIRAMAR HOTEL REDEVELOPMENT

CITY AND COUNTY OF HONOLULU DRAINAGE SYSTEM

FIGURE
6

2.4 STORM DRAINAGE SYSTEM

The existing storm drainage system fronting the project site consists of an 18- and 24-inch drainline along Kuhio Avenue and an 18-inch drainline along Kalakaua Avenue (see Figure 6). Both of the Kuhio and Kalakaua Avenue drainage systems collect runoff and convey flows in the westerly direction to Seaside Avenue where the system continues along Ala Wai Boulevard and discharges into The Ala Wai Canal near the intersection of Seaside Avenue and Ala Wai Boulevard through a 66-inch reinforced concrete pipe. A private system consisting of a 12-, 15-, and 18-drainline is located within Duke's Lane and connects to the City's system at the intersection of Kuhio Avenue and Nohonani Street.

The City's existing storm drainage system appears to be functioning well and adequate for the collection of rainfall runoff and delivery of flow towards the Seaside Avenue system before discharging into the Ala Wai Canal.

The existing site is in an urbanized, fully-developed, and built-up district. Based on the review of the existing topographic survey map for the International Market Place, it appears that the portion of the project site fronting Kalakaua Avenue or approximately 1/3 of the project site drains to the Kalakaua Avenue system, the middle 1/3 of the project site drains to the Duke's Lane system, and the remaining 1/3 of the project site adjacent to Kuhio Avenue drains to the Kuhio Avenue system. Although the topographic survey map does not cover the Miramar Hotel property, it is assumed that all of the storm drainage flows generated by the hotel drains to the Kuhio Avenue system.

2.5 PROJECTED STORM WATER CALCULATION

During the design phase of the project, a Storm Drainage Report will be required to confirm the pre and post storm drainage flows generated by the site including a detailed breakdown of the distribution of the flows to the City's system. As noted above, since the existing site is an urbanized, fully-developed, and built-up district, we do not expect any increase in the storm water quantity generated by the proposed project. The proposed storm drainage flow pattern will follow existing conditions to avoid redistribution of the project storm water flow to the City's offsite drainage system.

2.6 PROPOSED IMPROVEMENTS

The proposed on-site storm drainage system is likely to consist of a combination of drain inlets, storm drain manholes, and underground piping. Line sizes and inlet locations will be determined during the design phase of the project.

The City also requires all developments to include a site-specific Water Quality Management Plan, which will incorporate Best Management Practices (BMPs) for both the construction and operational phases of the development.

For commercial developments greater than 5 acres in area, the BMP measures to address the storm water quality requirements will need to incorporate one of the following structural measures:

- A detention based water quality control designed to accommodate the entire runoff volume that would occur from the area contributing to the detention facility by a 1-inch rain storm. For project sites less than or equal to 20 acres of drainage area, the total draw-down time for the basin is a minimum 36 hours, with the lower half of the detention volume draw-down time of 24 hours.

- Flow-through water quality control designed to accommodate the runoff that would be produced from a rainfall intensity of 0.4 inches per hour. This rate must be maintainable for a minimum of three hours.

- Combination of a short-term detention and flow-through quality control system.

Since the project site is anticipated to be fully developed, space for a detention based system will be limited. It is likely that a pre-manufactured storm drainage filter will be required at each storm drain connection to the City's system. The pre-manufactured system will need to be accompanied by a certification from a licensed civil engineer that the filter/device will remove a minimum of 80 percent of the total suspended solids from the design flow rate.

We also understand that the Department of Planning and Permitting Rules Related to Storm Drainage Standards ("Rules") are scheduled to be revised in 2012 to include Low Impact Development (LID) measures as required by the City's MS4 permit. We further understand that it is anticipated the revisions will be applicable to developments and redevelopments that disturb five or more acres, and will address treating rainfall events up to 1-inch with LID techniques through infiltration, evapotranspiration, or reuse, if feasible per established criteria. The Project will comply with applicable Rules related to LID.

3. SANITARY SEWER SYSTEM

3.1 EXISTING SYSTEM

Sanitary sewer system servicing the Waikiki area and the project site is owned by the City and County of Honolulu, and maintained by its Department of Environmental Services (ENV). The project site is located within the Sand Island collection system where wastewater flow is discharged into the Beach Walk Wastewater Pump Station (WWPS) and then conveyed to the City's Sand Island Wastewater Treatment Plant (WWTP) which serves the Honolulu area from Kuliouou to Moanalua.

Based on the information obtained from the City, sewerlines in Kuhio Avenue and Kalakaua Avenue collect wastewater from the project area and other parcels in the vicinity, then convey flows in the Ewa direction to the Beach Walk WWPS, which is located on Kuhio Avenue in a lot south of Kaiolu Street (See Figure 7). The Beach Walk WWPS receives wastewater flows throughout most of Waikiki, then pumps those flows to a gravity system near the Waikiki Yacht Club at Ala Moana Beach Boulevard, and ultimately to the Sand Island WWTP.

Existing sewerlines in the vicinity of the project site include:

- Kalakaua Avenue - 12-inch sewerline on the makai side of Kalakaua Avenue and 8-inch sewerline on the mauka side along Kalakaua Avenue.

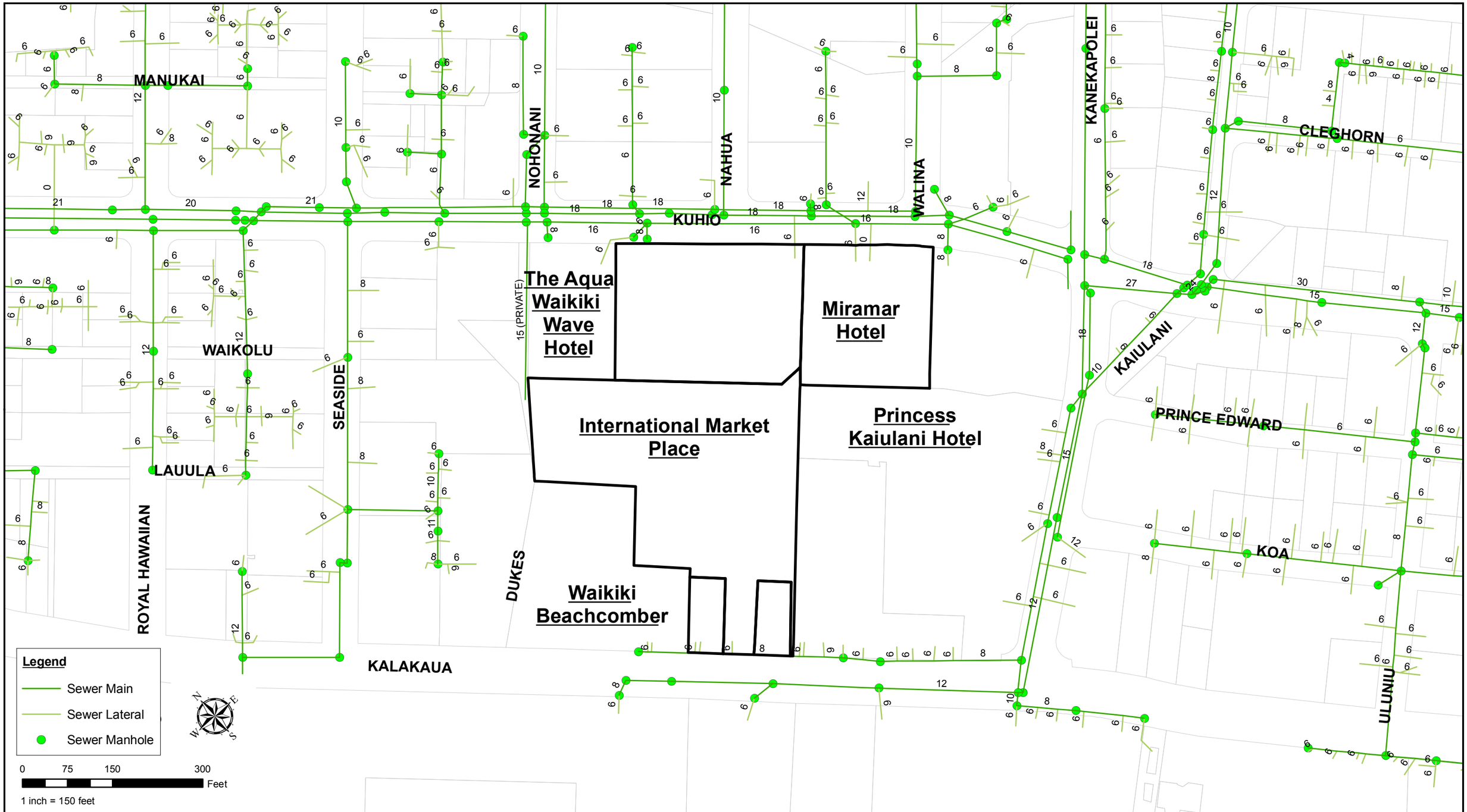
- Kuhio Avenue - two 18-inch and one 16-inch sewerline along Kuhio Avenue.

Currently, flows from the International Market Place are connected to both the City's Kuhio and Kalakaua Avenue systems. It appears that majority of the flow is connected to the sewerlines along Kuhio Avenue.

Existing sewer laterals servicing the International Market Place and the Miramar Hotel include:

- A private 15-inch sewerline within Duke's Lane appears to provide connection for both the Waikiki Beachcomber and the International Market Place to the 16-inch sewerline in Kuhio Avenue.

- A 10-inch and a 6-inch lateral from the Miramar Hotel are connected to the 16-inch sewerline in Kuhio Avenue.



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INTERNATIONAL MARKET PLACE AND
MIRAMAR HOTEL REDEVELOPMENT

CITY AND COUNTY OF HONOLULU SEWER SYSTEM

FIGURE
7

- Other 6-inch and 8-inch sewer laterals provide connection to the Kuhio Avenue and Kalakaua Avenue systems.
- A 6-inch lateral from the Aqua Waikiki Wave Hotel located within a sewer easement appears to cross under the northern corner of the Waikiki Town Center building.

3.2 PROJECTED WASTEWATER QUANTITY

Sanitary sewer volumes for the redevelopment project were derived using the project's program requirements provided for TRG IMP LLC by BKBC Architects Inc. and generalized simulation of projected demands for similar developments. Line sizes will be determined during the design phase of the project.

An average sanitary sewer flow of 187,500 gpd is projected for the redevelopment project based on City and County guidelines for wastewater contribution. This projected sewer flow is approximately 13 percent lower than the existing flow of 216,506 gpd. (See Appendix A).

3.4 PROPOSED IMPROVEMENTS

Although it has not been re-confirmed by the City, the Sewer Connection Application approved under the previous development plans in 2005, required all of the wastewater generated from the project site be conveyed to the City's Kuhio Avenue system. Therefore, it is anticipated that removal of wastewater from the project site will be via an existing or new connection(s) to the City's existing 16-inch or 18-inch gravity sewer mains located along Kuhio Avenue. The existing private 15-inch sewerline located in Duke's Lane is also available for connection since it appears that a good portion of the existing International Market Place is currently served by it. The proposed connection(s) will likely consist of a new lateral connection to an existing sewer manhole or constructing a new sewer manhole over an existing line. Final connection point(s) is dependent upon the plan and layout of the on-site improvements and the underground sewer collection system. Other site improvements may consist of underground gravity sewerlines, sewer manholes, and clean outs to grade. If portions of the proposed project cannot be connected by a gravity sewerline, a sewage lift station will be required.

Although portions of the City's collection system downstream of the project site is currently at or near capacity, we do not anticipate any off-site sewer improvements since the wastewater flow generated under the proposed project is less than what is presently generated. A new Sewer Connection Application will be submitted to confirm adequacy of the City's sewer collection system to support the redevelopment project.

4. WATER SYSTEM

4.1 EXISTING CONDITION

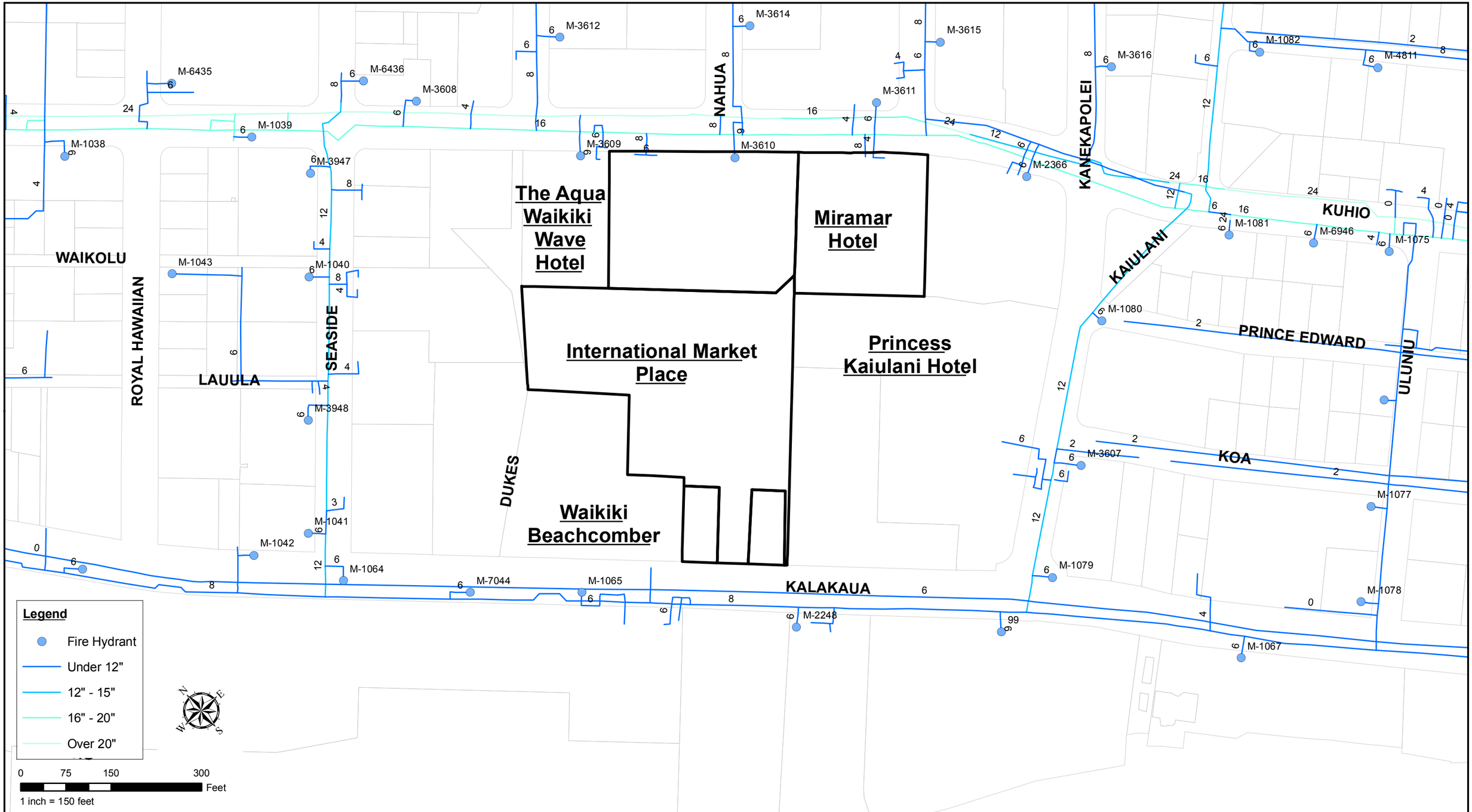
Water supply for the project is provided by the Board of Water Supply, (BWS) City and County of Honolulu. The BWS water system consists of transmission mains, distribution lines, service laterals, water meters and fire hydrants in the vicinity of the project site in Kuhio Avenue and Kalakaua Avenue. Existing 16-inch and 24-inch water mains run along Kuhio Avenue, and 6-inch and 8-inch water lines along Kalakaua Avenue (see Figure 8). An existing 8-inch private waterline is located within the project site in an easement parallel to Kuhio Avenue fronting a portion of the Waikiki Town Center building. The 8-inch private waterline and easement continues between the Waikiki Town Center and Miramar Hotel and extends along the property line where it continues into the Sheraton Princess Kaiulani Hotel. It is our understanding that waterline is privately owned and services the Sheraton Princess Kaiulani, Moana Surfrider, Royal Hawaiian, and Sheraton Waikiki Hotels.

Water service to the existing buildings within the International Market Place is provided by existing water lateral and meter connections off a 6-inch and/or 8-inch main running along Kalakaua Avenue and a 16-inch main along Kuhio Avenue. Water service for the Miramar Hotel is provided by existing water lateral and meter connections off the 16-inch main along Kuhio Avenue.

Based on available BWS records and field reconnaissance, there are six (6) domestic water meters servicing the International Market Place and the Miramar Hotel project site. Information on the meters are tabulated as follows:

Table 1 Water Meter Information

Business	Premise ID	Size/Type	TMK
Queen Emma Land Company	1060886	¾-inch (Domestic)	2-6-22:37
Queen Emma Land Company	1060887	3-inch (Compound)	2-6-22:38
Miramar Hotel Inc.	1086893	1-1/2-inch (Domestic)	2-6-22:39
Miramar Hotel Inc.	1086895	4-inch (Compound)	2-6-22:39
Denny's Restaurant	1086894	1-1/2-inch (Domestic)	2-6-22:39
Waikiki Town Center	1086890	2-inch (Domestic)	2-6-22:43



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INTERNATIONAL MARKET PLACE AND
MIRAMAR HOTEL REDEVELOPMENT

CITY AND COUNTY OF HONOLULU POTABLE WATER SYSTEM

FIGURE
8

There are seven existing fire hydrants located in the vicinity of the project site. Three existing hydrants are located in front of the market place or on the opposite side across Kalakaua Avenue. Four existing hydrants are located in front of the Waikiki Town Center or on the opposite side across Kuhio Avenue.

4.2 PROJECTED DEMANDS

Potable water demands for the project site were derived using the project's program requirements provided for TRG IMP LLC by BKBC Architects Inc. and generalized simulation of projected demands for similar developments. Line sizes will be determined during the design phase of the project.

Based on City and County Board of Water Supply demand factors, an average daily demand of 92,500 gpd was determined for potable water for the revitalization project. This average daily demand represents a 38.0 percent decrease compared to the existing demand of 150,093 gpd. (See Appendix B)

An availability letter was received from BWS on January 24, 2011 stating the existing water system is presently adequate to accommodate the proposed development (see Appendix 3). Hydrants along Kalakaua Avenue have a calculated static pressure, residual pressure, and flow of 76 pounds per square inch (psi), 20 psi, and 4,000 gallons per minute (gpm) respectively. Hydrants along Kuhio Avenue have a calculated static pressure, residual pressure, and flow of 76 psi, 55 psi, and 4,000 gpm respectively. (See Appendix C)

4.3 PROPOSED IMPROVEMENTS

The potable water supply for the International Market Place Revitalization Project is anticipated to be via connection to the existing 16-inch water main located along Kuhio Avenue. Standard improvements will consist of a connection to the 16-inch water main, water meter vault, reduced pressure backflow preventer, and necessary distribution waterline piping to the various site structures.

Fire protection will consist of a detector check meter and waterlines extending to the project site. Existing fire hydrants along Kalakaua and Kuhio Avenue will be utilized to provide the required project fire flow demand. During the design process, the Honolulu Fire Department will be consulted to determine the need for additional fire hydrants due to the layout of the proposed buildings and location of the required access locations.

APPENDICES

Appendix A Sanitary Sewer Calculations

Assumptions:

Average Daily per capita Flow:

- Hotel and Timeshare = 80 gallons per day
- Commercial = 25 gallons per day
- Restaurant = 25 gallons per seat per day

Density:

- Hotel = 2.0 capita per hotel unit (with twin-bed)
- Hotel = 2.8 capita per hotel unit (with 3 or more beds)
- Commercial = 1.0 capita per 150 sq. ft.
- Retail Cart = 1.0 capita per Cart
- Restaurant = 1.0 seat per 30 sf, 3 seats per day

2011 Sewer Flow Calculations
International Market Place and Miramar Hotel Redevelopment

EXISTING

Name	Hotel			Office	Restaurant		Retail					Ave. Sewer Demand Flow (Gallons Per	Cumulative Ave. Sewer Daily Flow (Gallons Per Day)
	Number of Units	Capita Per Unit	Total Capita	No. of Employees	Seats/Day	Restaurant Area (Sq. Ft.)	Number of Carts	Capita Per Cart	Retail Area (Sq. Ft.)	Capita Per 150 Sq. Ft.	Total Capita		
International Market Place Commercial							87	1	74,081	1	581	14,522	14,522
International Market Place Restaurant & Waikiki Town Center Restaurant					4,000							100,000	114,522
Waikiki Town Center Commercial							5	1	51,503	1	348	8,709	123,231
Miramar Commercial									21,505	1	143	3,584	126,815
Miramar Restaurant					1,203							30,075	156,890
Miramar Hotel (2 beds)	318	2	636									50,880	207,770
Miramar Hotel (3 beds)	39	2.8	109.2									8,736	216,506
TOTAL													**216,506**

PROPOSED

Name	Hotel			Office	Restaurant		Retail					Ave. Sewer Demand Flow (Gallons Per	Cumulative Ave. Sewer Daily Flow (Gallons Per Day)
	Number of Units	Capita Per Unit	Total Capita	No. of Employees	Seats/Day	Restaurant Area (Sq. Ft.)	Number of Carts	Capita Per Cart	Retail Area (Sq. Ft.)	Capita Per 150 Sq. Ft.	Total Capita		
International Market Place Commercial									300,000	1	2,000	50,000	50,000
International Market Place Restaurant					5,500	55,000						137,500	187,500
TOTAL													**187,500**
DIFFERENCE (MGD)													**-29,006**

Retail Flow based on 25 gal/capita/day
Restaurant Flow based on 25 gal/seat/day
Proposed IMP Restaurant Seats/Day based on 30 sf/seat. Total seats x 3 for total seats per day. 55,000 sf / 30sf/seat x 3 = 5,500 seats per day

Appendix B Potable Water Calculation

Average daily potable water demand volumes based on the BWS "Water System Standards" (2002), are as follows:

- Resort = 350 gallons per unit
- Existing Commercial = 100 gallons per 1,000 sq. ft.
- Proposed Commercial = 200 gallons per 1,000 sq. ft.
  (may include non-restaurant type food service such as ice cream store, yogurt store, coffee shop, etc…)
- Restaurant = 500 gallons per 1,000 sq. ft.

Estimated irrigation and water feature average daily demand of 5,000 gallon per day.

2011 Potable Water Calculation
International Market Place and Miramar Hotel Redevelopment

	Hotel			Commercial/Restaurant				
Name	Number of Units	Gallons/ Unit-Day	Total Hotel Gallons	Area (Sq. Ft.)	Gallons/ 1000 sq. ft.-Day	Total Retail Gallons	Total Gallons	Cummulative Ave. Daily Demand (Gallons)
EXISTING								
International Market Place								
Commercial				74,081	100	7,408	7,408	7,408
Restaurant				13,178	500	6,589	6,589	13,997
Waikiki Town Center								
Commercial				51,503	100	5,150	5,150	19,147
Restaurant				11,992	500	5,996	5,996	25,143
Miramar Hotel	357	350	124,950				124,950	150,093
PROPOSED								
International Market Place Restaurant				55,000	500	27,500	27,500	27,500
International Market Place Retail				300,000	200	60,000	60,000	87,500
Irrigation							5,000	92,500
There will be a proposed decrese of	-57,593	Gallons						

Appendix C BWS Availability Letter

WH

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

January 24, 2011

PETER B. CARLISLE, MAYOR

RANDALL Y. S. CHUNG, Chairman
ANTHONY R. GUERRERO, JR.
WILLIAM K. MAHOE
THERESIA C. McMURDO
ADAM C. WONG

GEORGE "KEOKI" MIYAMOTO, Ex-Officio
GLENN M. OKIMOTO, Ex-Officio

WAYNE M. HASHIRO, P.E.
Manager and Chief Engineer

DEAN A. NAKANO
Deputy Manager

Mr. Wayne Higa
Wilson Okamoto Corporation
1907 South Beretania Street
Honolulu, Hawaii 96826

RECEIVED
JAN 28 2011
WILSON OKAMOTO CORPORATION

Dear Mr. Higa:

Subject: Your Letter Dated January 6, 2011 Requesting Water Availability, Flow and Pressure Data for the International Marketplace Renovation Project, TMK:2-6-22: 36-39 & 43

Thank you for your letter on the proposed International Marketplace Renovation Project.

The existing water system is presently adequate to accommodate the proposed development. Please be advised that this information is based upon current data and, therefore, the Board of Water Supply reserves the right to change any position or information stated herein up until the final approval of your building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

We have suspended fire flow tests on fire hydrants as a water conservation measure. However, you may use the following calculated flow data for the following fire hydrants on Kalakaua and Kuhio Avenues:

Fire Hydrant Number	Location	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)
M-7044	Kalakaua Ave	76	20	4000
M-2248	Kalakaua Ave	76	20	4000
M-1065	Kalakaua Ave	76	20	4000
M-3609	Kuhio Ave	76	55	4000
M-3610	Kuhio Ave	76	55	4000
M-3611	Kuhio Ave	76	55	4000
M-2366	Kuhio Ave	76	55	4000