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**WATER SYSTEM NARRATIVE**

**FOR THE**

**BOARDWALK RESIDENCES AT MARINA BAY**

**QUINCY, MA**

Prepared by:  
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Howard/Stein-Hudson Associates, Inc.  
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Howard/Stein-Hudson Associates, Inc. has coordinated a hydrant flow test with MacRitchie Engineering, Inc. (MacRitchie). The purpose of the test is to evaluate if adequate water service is available to the proposed development without adversely impacting the local water distribution system.

A test was performed on October 12, 2012 by MacRitchie. The non-flow hydrant was located to the north of 500 Victory Road and the flowed hydrant was located to the north of the Boat Storage Building No. 2 (See Figure H1). The available flow is 1,294 gallons per minute (gpm) with a residual pressure of 76 pounds per square inch (psi).

Maximum day water demands for the proposed development were determined from the design sewer flows provided in 314 CMR 7.00-Sewer System Extension and Connection Permit Program as summarized in Table 1 plus an added factor to account for water consumption and system losses. The flows provided in these regulations are conservative; additionally, we have assumed that three restaurants will be provided in the proposed retail spaces of the buildings so we could analyze a worse-case sewer generation and water use scenario. The estimated maximum day water demand for the entire development is 96,300 gallons per day or 67 gpm. The peak hour demand is estimated at 167 gpm using a ratio of maximum day to peak hour demand of 2.5. Based on the hydrant flow test, there is sufficient water supply available for the development. The water system will still provide significantly more pressure than the 35 psi recommended in the Massachusetts Department of Environmental Protection (DEP) Guidelines and Policies for Public Water Systems after development of the project.

The project's fire protection engineer (Cosentini) has indicated that the water supply system has sufficient capacity to serve the proposed buildings' fire protection needs without significantly reducing the water pressure in the current distribution system in Victory Road and the city distribution system in the related area. Please see the Fire Protection Design Narrative for more detail.



**MacRITCHIE ENGINEERING INCORPORATED**

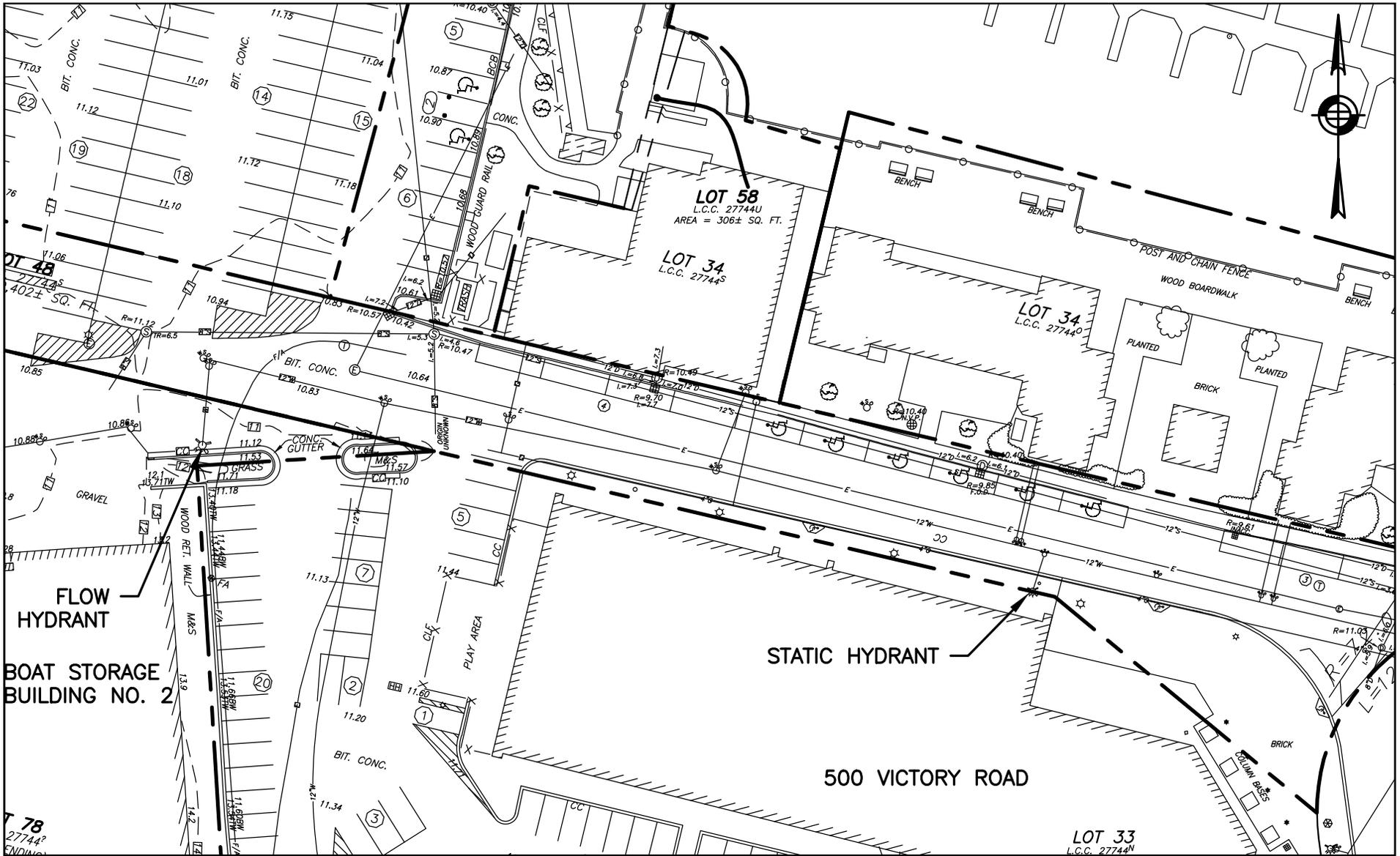
197 Quincy Avenue, Braintree, MA 02184

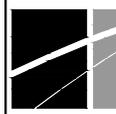
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**HYDRANT FLOW TEST**

Date and time of test:	17-Oct-12	8:40 AM
Project Name:	Marina Bay	
Location:	600 Victory Road, Quincy Massachusetts	
Attendees:	Paul Moody (COQ), J. Park/ A. DeMattia, Richard Lantini, Alex Kayiales Lawrence Beals (Beals)	
Static pressure (S):	102.0 psi	Note: Water supply curve shall be adjusted <b>0.00 psi none</b> to compensate for difference in hydrant elevations.
Residual pressure (R):	76.0 psi	
Pitot pressure (P):	62.0 psi	
Size of butt flowed (D):	2.50 inches	
Number of butts flowed (N):	1	
Coefficient of butt (C):	0.88	
Elevations of hydrants:		Location of hydrants:
Gauge	1.5 feet	Gauge NE Corner of 600 Victory Road
Flow	1.5 feet	Flow 305' West on Victory Road (NE Corner of Boat Storage Building)
Flow (Q):	1293.58 gpm	$Q = 29.87 \times C \times D^2 \times P^{1/2} \times N$
Flow at 20 psi (Q <sub>20</sub> ):	2405.29 gpm	$Q_{20} = Q \times [(S - 20)/(S - R)]^{0.54}$

Note: MWRA Supply to City of Quincy. The water main in victory road is a 12" dead-end main. The alternate closest main (not looped at this time) is an unknown diameter dead-end at the ferry parking area on the haul road, running parallel to the boat house west wall. The hydrants on the access road are owned by DCR and could not be flowed at the time of testing. An additional hydrant in front of the Ocean Club was opened, but the system has been winterized and disconnected for the season.




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# MARINA BAY HYDRANT FLOW TEST LOCATION

FIGURE:	H1
DATE:	10/17/2012
JOB	11140.01
SCALE:	1"=50'
REV: 0	BY: HSH

**Table 1**  
**Projected Sanitary Sewer Flows**

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Residential Units (Phase 1)	322 beds	110 gpd/bedroom	35,420 gpd
Residential Units (Phase 2)	244 beds	110 gpd/bedroom	26,840 gpd
Restaurant (Phase 1)	667 seats	35 gpd/seat	23,345 gpd
Restaurant (Phase 2)	167 seats	35 gpd/seat	5,845 gpd
Retail (Phase 1)	4,140 sf	50 gpd/1,000 sf	207 gpd
Retail (Phase 2)	900 sf	50 gpd/1,000 sf	45 gpd
<b>Total</b>			<b>91,702 gpd</b>

Proposed Maximum Daily Flow = 91,702 gpd = 63.68 gpm

Proposed Peak Hour Flow = 159 gpm

Total Maximum Daily Flow = 63.68 gpm + 52 gpm = 116 gpm

Total Peak Hour Flow = 159 gpm + 80 gpm = 239 gpm

52 gpm = 45 gpm (maximum daily flow from monitoring) X 15% (safety factor)

80 gpm = 70 gpm (peak hour from monitoring) x 15% (safety factor)