Amended Preliminary Master Plan - Planned Unit Developement

Somerville,
Massachusetts

Prepared for

Federal Realty Investment Trust
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Prepared by

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Introduction

1. INTRODUCTION

1.1 Report

This report is submitted in connection with the site plan submission entitled, "Amended Preliminary Master Plan, Planned Unit Development, Assembly Square Drive (APMP PUD ASD), Somerville, Massachusetts", dated May 2014 (the "Project") and the previously approved "Amended Preliminary Master Plan, Planned Unit Development, Assembly Square Drive (PMP PUD ASD), Somerville, Massachusetts", dated June 2010.

For Site Location Map refer to Figure 1.

For existing utilities referenced in this report please refer to the drawings in the Site Plans entitled:

- Utility As-Builts SV-1 thru SV-13 dated March 9, 2012

For proposed utilities referenced in this report please refer to the drawings submission entitled:

- Grading, Drainage and Utility Plans 1 thru 5 dated May 2014.

1.2 Study Description

This report confirms and updates findings in a report by Green International Affiliates, Inc., (GIA), which analyzed for the Somerville Office of Housing and Community development (OHCD), all existing utilities, and future improvements within the Assembly Square Revitalization Area (ASRA). The GIA report is entitled "Utility Analysis Report (UAR) for Assembly Square Revitalization Area Somerville, Massachusetts" and was completed in November, 2001. The report describes the locations, sizes and capacities of the following existing utility systems: sanitary sewers, water mains, storm-water surface drainage, telephone, gas, electric, cable TV, communication and fire alarms. The OHCD developed a potential build-out scenario in that report for the entire ASRA which was used as the base for the existing utility analyses and to identify the necessary improvements needed to support the potential build-out.

This report confirms the existing utility findings in the GIA Report and suggests proposed utility improvements in a similar format as was presented in the GIA report to support this Project.

This report was prepared using some of the information contained in the 2001 GIA Utility Analyses. In order to avoid repeated references to the GIA 2001 Utility Analyses, this report contains all the utility existing information, data and analyses that are valid for current conditions. Any additional information regarding existing utility information that has been recognized since the previously approved PMP PUD is also reflected in this report.

1.3 *Existing Utilities*

Existing utilities information within the PUD area were obtained from actual on the ground instrument survey preformed by Vanasse Hangen Brustlin, Inc. (VHB) in March of 2010 and March of 2012. Some underground utilities are based on field observation and information of record. They are not warranted to be exact.

1.4 Existing Utility Improvements follow-up

The master developer, Federal Realty Investment Trust, has constructed all necessary utility infrastructure for the full buildout of the Project in the proposed streets of the PUD area in 2010 and 2012.

2

Water Distribution System

Existing Conditions

2 WATER SUPPLY AND DISTRIBUTION SYSTEM

2.1 *Existing Water Supply and Distribution System*

The City of Somerville owns and maintains the public water distribution system that services the Assembly Square Revitalization Area (ASRA). The City's water distribution system supplies both domestic and fire protection water to the area. This system is part of a city-wide interconnected network that is supplied by the Massachusetts Water Resources Authority (MWRA) through seven metered connections. The City is supplied by both MWRA's high service and low service pressure systems. The water distribution system within the Assembly Square area is part of the City's low service system.

MWRA Meter 91 is located at the intersection of the Fellsway West and Middlesex Avenue and provides the closest supply of water to the Assembly Square area from a 48-inch cast iron water main located in Middlesex Fells Parkway (Fellsway). The City does not have any water storage facilities or any pumping stations that service this area.

The MWRA has preformed water main improvements to Meter 91 and the existing 48-inch water main located in Middlesex Fells Parkway. The water main improvements consisted of cleaning, cement-mortar lining, internally sealed joints, 48-inch restrained joint pipe and valving.

Information provided by the MWRA concerning Meter 91 is as follows:

The Average Hydraulic Grade Line Elevations is 184 ft. (Boston City Base Datum)

Refer to Appendix "B" for the MWRA Meter 91 water readings and Somerville's total daily water flows between 2004 and 2006.

The existing system is comprised of water mains ranging in age from 1917 to 1982 and in varying conditions. The water distribution system is described as follows:

- More that half of the system was installed in the 1920's while most of the remaining mains were installed during the 1970's and 1980's.
- The City's water mains sizes are all 8-inch diameter and larger which meets the minimum recommended size for adequate fire flows.
- The primary connection to the MWRA meter is a 20-inch diameter cast iron main installed in 1925 by the City within and along Middlesex Avenue.
- Several branch lines of varying diameter feed off the 20-inch main between Middlesex Avenue and the Fellsway.
- The remainder of the system along Foley Street, Assembly Square Drive and Mystic Avenue consist of a 12-inch diameter pipe interconnected to create several loops.

- The piping network in this area, for the most part, was installed to create a looped system around buildings sites and is interconnected to the city-wide network at several locations.
- The piping has generally been installed within the limits of the City's roadway system and has sufficient valving at most intersections to facilitate isolation and redirection of the flow during emergency or maintenances situations.
- As part of the ongoing approved work a portion of the existing 12-inch water main within Assembly Square Drive was replaced due to its poor condition. Also, a 20-inch water main has been constructed within Foley Street and the future extension of Assembly Square Drive in order to service the future development.

2.1.2 *Existing Water System Demands*

Average Day and Maximum Day Demands

Currently, the ASRA is primarily being used for retail, office and industrial purposes. Existing water demand was calculated for the average day and the maximum day demand based on the existing uses that make up the ASRA. Based on existing information the flow rates calculated for the existing uses for the average day demand and maximum day demand were 64 GPM and 115 GPM, respectively.

Needed Fire Flow

The water system within the Project area provides both domestic and fire flow water supply. The City's existing water distribution network within this area has, on average, fire hydrants located 300 feet apart throughout the entire area. This spacing meets the typical maximum recommended distance between hydrants in an urban setting.

The minimum Needed Fire Flow (NFF) for MWRA Meter 91 and maximum Insurance Services Office (ISO) requirements for a Community are:

	Fire Flowrate
Estimated minimum NFF requirements to be supplied by MWRA for meter 91:	2,000 gpm
Maximum requirements a community is required to supply according to the ISO:	3,500 gpm

The required minimum residual pressure at any location within the distribution system during a fire flow situation is 20 psi.

2.1.3 *Existing Water System Analysis*

Computer hydraulic analysis was performed by GIA, and confirmed by VHB, for the existing ASRA area water distribution system to determine system capacity and to provide a baseline for comparison of future system demands. The analysis included a limited computer network model on order to simulate several scenarios including:

1. Existing Average Day Demand
2. Existing Maximum Day Demand
3. Existing Maximum Day Demand Plus 2,000 gpm Fire Flow

The computer hydraulic analysis has indicated that the existing system has sufficient capacity for all scenarios.

2.2 PROPOSED WATER SYSTEM

2.2.1 Proposed System Demands

The full build out of Amended Preliminary Master Plan within the Project area will result in an increase in the water demands on the existing system. The future average day flowrates and maximum day flowrates were developed by utilizing proposed land use areas as shown in Figure 3.2.

2.2.2 Proposed System Analysis

VHB performed a preliminary computer hydraulic analysis of the proposed conditions utilizing information obtained from the MWRA and hydrant flow test information to further explore the availability of water flow at the higher flow rate set by the ISO. The computer model was calibrated based on a hydrant flow test performed by VHB on September 13, 2006, at the intersections of McGrath Highway and Kensington Avenue with Middlesex Avenue. This hydrant is connected to the 20-inch water main in Middlesex Avenue. The hydrant flow test computation converted to a base of 20 psi resulted in a flow of 5,645 gpm. VHB performed additional hydrant flow tests on March 14, 2007 and August 18, 2011, September 12, 2014 and November, 2015 in order to further refine and confirm the computer model. Refer to Appendix "A" for hydrant flow test computations.

A preliminary hydraulic analysis was preformed for future demands on the existing/proposed water distribution systems. The analysis includes utilizing the Future conditions model and performing several scenarios including:

1.	Future Average Day Demand	704 gpm
2.	Future Maximum Day Demand	1,060 gpm
3.	Future Maximum Day Demand Plus 2,000 gpm Fire Flow	3,060 gpm
4.	Future Maximum Day Demand Plus 3,500 gpm Fire Flow	4,560 gpm

A fire flow of 3,500 gpm is the maximum requirement a community is required to supply according to the ISO standards.

Based on VHB analysis the Future Maximum Day Demand and 3,500 gpm fire flow can be achieved within the Project area after the proposed water improvements are constructed.

2.3 Proposed Water System Improvements

The following proposed water mains will be installed or have already been constructed as part of the ongoing approved work in order to provide loop connections throughout the Assembly Square PUD area.

- Connected a new 20-inch water main from the existing 20-inch water main in Middlesex Avenue, continued along the future extension of Assembly Square drive to Foley Street then continued west along Foley Street to Middlesex Avenue where the new 20-inch water main was connected back into the existing 20-inch water main in Middlesex Avenue. The newly constructed 20-inch main in Foley Street replaced the existing 12-inch water main installed in 1928.

- Extended water mains, ranging in size from 8 to 20-inch, from the newly constructed 20-inch water main in Grand Union Boulevard along Artisan Way, Great River Road, Canal Street, Foley Street and Revolution Drive where they are interconnected in order to create multiple looped systems.

- Loop a proposed 12-inch water main on the Parcel 11A site from the recently replaced 12-inch water main in Grand Union Boulevard to Revolution Drive.

3

Sanitary Sewer

Existing Conditions

3.1 *Existing Sewer System*

The City of Somerville owns and maintains the sanitary sewer system in the ASRA area. The sanitary sewer system within the area is a separated system with storm drainage collected in an independent system.

All of the master planned sanitary sewer mains have been installed in the ASRA. The pipe starts as an 8” at the north end of the Site. The pipe sizes increase to an 18” as they discharge towards the southern end of the Site. The reconfigured and reconstructed sewer system in N. Union Street connects to a 24” pipe prior to discharging to the City of Somerville Regulator Manhole, which is the connection to the MWRA system.

Proposed Conditions

3.2.1 Proposed Sewer System

All of the sewer mains in the ASRA have been constructed as part of the previous construction phases of the project. All of the improvements have been consistent with the Preliminary Master Plan and PUD approval processes. The total amout of sewer flow from the project is essentially unchanged. The distribution of the sewer flow to the system is also basically unchanged. The sewer system has adequate capacity to handle the sewer flows from the project as proposed.

3.2.2 Proposed Sewer System Analysis

The average daily wastewater flows rates used in the analysis are based on Commonwealth of Massachusetts, Sewer System Extension and Connection, regulation 314 CMR 7. Wastewater peak flows rates were determined by multiplying the average daily flow by a peaking factor of four. The proposed land use areas and calculated flow rates are shown on Figure 3.2. The proposed development in the PUD-ASD area will increase wastewater flows to the MWRA interceptor sewer.

3.2.2 Proposed System Improvements

Based on the sewerage flows generated by the proposed development it was necessary to replace the existing 12-inch sewer lines within Assembly Square Drive with proposed 18-inch and 12-inch sewer trunk lines. These improvements have already been made as part of the ongoing approved work. The total peak sewer flows from the proposed development will generate 3.11 +/- mgd. The 18-inch sewer trunk line has a design capacity of 5.1 +/- mgd at a slope of 0.003 +/- with an average velocity of 5 ft per second. The 18-inch sewer trunk line will have the capacity to handle all peak sewer demands of the Proposed Development with an excess capacity of 2.0 +/- mgd.

To address existing sewer configuration issues at the intersection of Assembly Square Drive and North Union Street, the following new sewer alignment and connections were constructed and are shown on the submitted PUD drawings:

- The new 18-inch trunk line within North Union Street will pick up the sewer flows from the existing 12-inch sewer, which collects sewer discharge from the Home Depot and Circuit City at SMH 32.

- The installation of a Special Drop Sewer Manhole will be constructed over the existing 24-inch sewer and 18-inch metal sewer at the existing drop connection of the existing 12-inch sewer. The new 18-inch trunk line connects into the Special Drop Sewer Manhole.

3.2.4 Sewer Mitigation

The Project has received two Sewer Extension and Connection Permits from DEP for discharging into the municipal and MWRA collection system. The first permit was approved on October 8, 2009 (Permit No. X229252) and included details of the sewer mitigation plan. Mitigation to offset flows is required to be implemented as part of the conditions for granting the connection. The mitigation program has been approved by the reviewing agencies. The second permit dated November 10, 2011 (Permit No. X239330) was for the connection of additional flow from a new phase of the development consistent with the master plan. A sewer permit application for the remaining flows from the entire project has been reviewed and approved by the City of Somerville Engineering and DPW departments. The proposed mitigation for the entire project has remained unchanged.

The mitigation took measures to reduce and/or eliminate non-sanitary sewerage flows, including the completed sewer improvements in Assembly Square Drive, the completed improvements in Foley Street and Mystic Avenue, off-site improvements completed in the Ten Hills neighborhood, removal of illicitly-connected catch basins on Mystic Avenue, Lombardi Street and Broadway, reduction of flows into the Somerville Marginal Conduit and a financial contribution to the City of Somerville in the form of funds specifically designated for I/I improvements.

The specific inflows and infiltration to be removed from the system are as follows:

Total Build Out (District A-1 and B-1 minus Yacht Club)

Proposed Project Added Total Sewer Flows =	777,116 gpd
Minus Existing Redeveloped Areas within District B-1 =	30,361 gpd
Proposed Net Increase in Sewer Flows=	746,755 gpd
Required DEP 4:1 Mitigation=	2,987,020 gpd

Proposed Mitigation @4:1 (Completed)

- The proponent has constructed improvements in the Ten Hills Area including sewer main replacement, sewer manhole replacement and pipe lining to complete the Sewer Inflow and Infiltration mitigation requirements for 610,000 gallons.

- Infiltration into the existing vitrified clay sewer pipes within the entire PUD area has been eliminated with the installation of approximately 1,800 feet of new 18-inch sewer pipes and 3,400 feet of 12-inch sewer pipes. Flow metering of existing pipes determined the potential for elimination of 78,000 gallons per day. The conditions of the sewer extension permit require future flow monitoring to determine if this volume reduction has been achieved.

- Disconnection of illicitly-connected catch basins on Mystic Avenue, Lombardi Street and Broadway that will remove approximately 294,000 gallons per day has been completed.

- Approximately 1,200,000 gallons per day will be removed from the Somerville Marginal Conduit by stormwater improvements in the PUD.

- The proponent has made a financial contribution to the City of Somerville specifically designated for Infiltration/Inflow removal projects, offsetting 810,000 gpd of new sewer flows.

Summary:

- Proposed Project Total Sewer Flows = 777,116 gpd

- Required Mitigation = 2,987,020 gpd

- Mitigation Description / Sewer Flows

Mitigation Description	Sewer Flows
Ten Hills Area =	610,000 gpd
I/I reduction from existing PUD sewers =	56,000 gpd
Illicitly Connected CB disconnection =	73,553 gpd
Removal of flows from SMC =	1,200,000 gpd
Financial Contribution offset =	1,047,467 gpd
	Total = 2,987,020 gpd

4

Stormwater Drainage System

Pre-Existing Conditions

4.1 Pre-Existing Drainage System

In 2001 Green International Affiliates, Inc. (GIA) prepared a Utility Analysis Report (UAR) of the Assembly Square Revitalization Area for the City of Somerville, Office of Housing and Community Development (OHCD). This report contains an inventory and analysis of the existing stormwater drainage infrastructure as well as some recommendations for drainage improvements during future development of the area. The GIA Report was used in conjunction with field survey information to analyze the existing stormwater drainage system for this Amended Preliminary Master Plan, Planned Unit Development (PUD) submission.

The proposed Project Site is located on Assembly Square Drive in the City of Somerville, Massachusetts. The majority of the Project Site was previously covered with existing buildings, roadways, and parking lots or areas that were previously developed and demolished. The Project Site is generally flat, ranging from approximate elevation 9 feet (NGVD) to 12 feet (NGVD) with the exception of a portion of Assembly Square Drive that slopes rapidly to reach an elevation of 30 feet (NGVD) at its connection to Mystic Avenue. The majority of the Project Site is covered by impervious or near-impervious surfaces. NRCS Soil Maps for Middlesex County (NRCS Web Soil Survey, 4-13-95) show the existing soils to be Urban land with wet substratum (603) and Udorthents with wet substratum (655). Geotechnical information available at the time of this report classifies the soils as hydrologic soils group D, which has low infiltration potential. Detailed soils information and a soils map are included in Appendix C. The cover condition and soils present in the Project Site result in minimal infiltration of stormwater under existing conditions. Areas at the north and east of the Project Site that were historically occupied with railroad and manufacturing facilities are currently vacant or unmaintained. Under pre-existing conditions, much of the stormwater collected in the Project Site discharges untreated to the existing Massachusetts Water Resources Authority (MWRA) 84-inch Somerville Marginal Conduit (SMC) or to the Mystic River as overland flow or via pipe upstream of the Amelia Earhart Dam. The MWRA 84-inch SMC discharges downstream of the Amelia Earhart Dam to the tidally influenced portion of the Mystic River. Stormwater runoff discharging to the MWRA 84-inch SMC has been an ongoing area of concern for the MWRA as the SMC currently acts as a combined sewer overflow (CSO) during some large storm events and high tide conditions at the outfall.

Under current conditions, a new dedicated 72-inch drainage outfall discharges downstream of the Amelia Earhart Dam to redirect stormwater flows and to help alleviate the potential for CSOs into the Mystic River. This is consistent with the goals for improving water quality in the Mystic River.

Proposed Conditions

4.2 Proposed Stormwater Management System

The Project was designed to comply fully with the Massachusetts Stormwater Management Regulations for a re-development project and the applicable City of Somerville requirements. The Proponent constructed improvements to existing roadways, construction of new roadways and drives, expansion of the DCR waterfront park and the expansion and upgrade of underground utility infrastructure. The proposed design includes LID and water quality measures that will protect the surrounding natural resources, as described in this report, from degradation as a result of stormwater runoff.

The design options for the storm drain system required close consideration of the adjacent properties, including the MBTA Orange Line, the existing DCR waterfront park and existing commercial uses. Another key consideration of the storm drain system in the Assembly Square area is the existing 36-inch connection to the MWRA 84-inch SMC. As previously mentioned, during large storm events and high tide conditions at the SMC outfall, the SMC has historically experienced combined sewer overflows into the non-tidal portion of the Mystic River, upstream of the Amelia Earhart Dam. In order to avoid any increased impacts to the MWRA 84-inch SMC, it is proposed to abandon the existing 36-inch connection to the MWRA 84-inch SMC and construct a new 72-inch storm drain trunk line that will discharge at a new outfall downstream of the Amelia Earhart Dam, in the tidal portion of the Mystic River. The MWRA has analyzed the benefits that the disconnection of the 36-inch pipe will have on the MWRA 84-inch SMC. This new storm drain trunk line includes a tide-gate near the outfall to prevent tidal waters from entering and surcharging the new drainage system during periods of high tide.

The new trunk line proposed for the Project was constructed within the extension of Foley Street, and then continued under the MBTA tracks and through property owned by the Commonwealth of Massachusetts. A portion of this pipe was constructed in 2009 as part of the infrastructure necessary for the approved Phase 1-AA. See attached plans for the location of the 72-inch storm drain outfall. This design will significantly decrease stormwater runoff to the Mystic River above the Amelia Earhart Dam, and eliminate stormwater flows from the Project Site to the MWRA 84-inch SMC. As a result, the design would help alleviate backups within the MWRA 84-inch SMC and decrease the amount of combined sewer overflows (CSOs) above the Amelia Earhart Dam.

Goals for the design of the proposed drainage system for the Project include the following:

- Reduce discharge to the MWRA 84-inch SMC.
- Incorporate LID techniques into the design to the maximum extent practicable.
- Design systems for long-term efficiency by providing concise operation and maintenance requirements.
- Upgrade existing drainage system components to ensure adequate capacity is provided for a 10-year storm event at a minimum.
- Improve the water quality of runoff for the proposed redevelopment areas.

These goals are fulfilled through many design components as described below.

The full-build drainage system follows the Stormwater Management Regulations and Best Management Practices as outlined in this report in order to provide long-term protection of natural resources in and around the Project.

Stormwater runoff from the Project will be collected in deep-sump catch basins with oil/debris traps and treated in off-line water quality units before discharging to the new 72-inch stormwater outfall. Regular sweeping programs for roads, parking and loading areas and a scheduled catch basin cleaning program are proposed for pollutant source reduction. LID stormwater management techniques have been incorporated into the design as much as possible for stormwater quality and temperature control and are further described in this report.

Water Quantity and Quality Control

The proposed stormwater management system includes a number of proprietary structural and non-structural Best Management Practices (BMPs) to provide water quality mitigation for land uses with higher potential pollutant loads (LUHPPL) due to high intensity use. It should be noted that in the full build out condition the majority of the proposed parking spaces that attribute to the high intensity use of the Project will be in underground or structured garages rather than large surface parking lots. Any oil and grit in the runoff from the garages will be captured in structured separators prior to discharge to the sanitary sewer system rather than the stormwater closed pipe drainage system. Proposed surface parking facilities utilized during interim phases will discharge to the stormwater closed pipe drainage system and will be in compliance with the Massachusetts Stormwater Management Regulations. Additionally, upon completion of the MBTA Orange Line Station the number of vehicle trips to the Project Site will be significantly reduced further reducing the impacts of oil and grit. Stormwater runoff from the small percentage of proposed on-street parking, in addition to street sweeping and deep sump catch basins, will be treated by specific structural stormwater BMPs that are suitable for such an application. Although the 72-inch stormwater outfall will discharge into the tidal portion of the Mystic River which is currently a “Prohibited” shellfish growing area, the first inch of runoff has been designed to be treated consistent with the DEP requirement for treatment of one inch for critical areas. Water quality BMPs are designed to provide at least 80 percent total suspended solids (TSS) removal in accordance with the Massachusetts Stormwater Management Regulations. Source control, an operation and maintenance program, snow management, and spill prevention BMPs will be implemented within the Project. Other BMPs that may be used throughout the Project include water quality units, bioretention basins, biofiltration islands, green roofs, tree filter boxes, rainwater recovery, permeable asphalt and permeable pavers. Specific BMPs will be evaluated and reviewed for each future individual phase by the Somerville Conservation Commission (SCC).

4.2.1 Analysis of Stormwater Management Revisions

The proposed changes to the hydrology of the Site since the Amended Preliminary Master Plan revision dated June 2010 to the present application includes a reduction in impervious material cover type that will result in a reduction in stormwater runoff. The revisions to the Project areas are summarized in the following :

- The revisions to Block 6 include a larger roof area and a removal of the small rain garden. The rain garden was provided for water quality purposes only and did not provide detention volume. Water quality treatment will be provided with a suitable structure for parking deck rooftop.
- The revisions to both Block 7 and 8 include a reduction in block area to account for the additional area located in the median (Median Park) of Assembly Row. For the purposes of the closed pipe calculations this additional park area was analyzed as entirely impervious as a conservative assumption.
- The revisions to Parcel 11A consist of a large increase in landscaped area as compared to the previous designs and submissions.

The peak discharge from the project site has been reduced from the previously approved discharge rates. See following table of closed pipe calculations for the peak discharge rates using StormCAD and the high tide elevation for a tailwater condition.

Closed Pipe Calculations - Peak Discharge Rates (cubic feet per second)

	10-year	25-year	100-year
72" Stormwater Outfall			
Previous Design	108.9	156.7	221.2
Current Design	104.2	139.4	181.1

4.2.2 Proposed Stormwater Management System Improvements

The purpose of the Stormwater Management Plan (the Plan) is to provide long-term protection of natural resources in and around the Project Site. This is achieved by implementing water quality and quantity control measures designed to decrease the amount of pollutants discharged from the Project Site, increase the quality of stormwater recharged on the Project Site, and control discharge rates. A final stormwater management plan for each future individual phase will be locally reviewed and approved by the Somerville Conservation Commission.

Low Impact Development (LID) Features

Low impact development techniques combine functional site design with pollution prevention in order to reduce impacts to nearby water resources. LID can be very effective for new and ultra urban areas, where space is a limiting factor, by selecting LID practices that focus on decentralizing stormwater management at the Project Site and incorporating vegetated stormwater management techniques into the design as much as possible to reduce peak runoff rates and provide treatment to improve water quality. The practices that may be implemented include: green roofs, bioretention basins (rain gardens), biofiltration islands, tree box filters, porous pavements, and rainwater recovery. In addition to improving water quality, these LID practices will also reduce the temperature of the stormwater discharging at the proposed 72-inch outfall.

Mitigation Measures

The Project will include mitigation measures to safely protect surrounding resource areas from the discharge of runoff. The stormwater management system has been designed to meet or exceed the standards contained in the DEP Stormwater Management Regulations.

After being collected in the Project’s closed pipe drainage system, the Project's stormwater runoff will be treated and then discharged via the proposed 72-inch stormwater outfall that was constructed by the Proponent for the City of Somerville. The outfall pipe was included in those activities and granted a waiver from further review under MEPA in the Final Record of Decision on this Project. The proposed 72-inch storm drain will be operational prior to the opening of the first building constructed as part of the mixed use development.
In addition to the proposed 72-inch stormwater outfall, the Project Site will feature multiple LID measures and over two and half miles of brand new stormwater drainage infrastructure including the replacement of aged existing drainage systems where necessary.

Over 3 million gallons of combined sewer overflows from the MWRA 84-inch SMC entered the Mystic River during wet weather events in 2006. Stormwater runoff entering the MWRA 84-inch SMC from the Project Site will be redirected to the proposed 72-inch outfall and will therefore reduce the amount of combined sewer overflows to the Mystic River. The MWRA has performed an analysis of the benefits of removing the flows from the SMC. The analysis shows that removal of flows will reduce the average annual treated combined sewer overflow volume at Outfall MWR205A located near the Fellsway by Wellington Bridge from 2.35 million gallons to 1.70 million gallons, a 28% reduction in annual discharge volume. Outfall MWR205A discharges treated combined sewer flows to the upstream portion of the Mystic River during high tide and extreme wet weather events. A reduction of discharges in this location will present a direct environmental benefit by improving the water quality of the Mystic River.

Long-Term Maintenance Program

The Proponent has entered into a long term maintenance agreement with the City of Somerville to provide for the Proponent's commitments to the City in order to maintain sidewalks within the Project and to maintain the non-standard stormwater quality structures. The City will be responsible for the maintenance of the streets, sewer, water and standard drainage structures (e.g. catch basins, manholes, pipes). The Proponent will maintain the streetscape and plaza landscaping within the Project as part of its responsibilities under the long-term maintenance agreement. A sample Long-Term BMP Maintenance/Evaluation Checklist is included in Appendix C.

5

Gas

Existing Conditions

5.1 *Existing Gas Distribution System*

NationalGrid, formerly the Keyspan Company, is the provider of the gas to the Project area. The closest gas source to the area is a low pressure 16-inch to 20-inch welded steel gas line located in an easement which runs across the MBTA tracks near Assembly Square Drive and North Union Street. Other gas lines within the Project area branch off of the 20-inch line.

Proposed Conditions

5.2 Proposed Gas System Requirements

In past communications between VHB and NationalGrid, NationalGrid has stated that the findings in the GIA report are not relevant today. VHB has provided information to NationalGrid regarding the building program and approximate loads in order for NationalGrid to estimate and identify the size, sources and costs for their gas system improvements. NationalGrid ran an analysis of the existing and proposed systems and determined that due to the size of the development that a higher pressure gas system than is currently available will be required to service the Project.

5.3 Proposed Gas System Improvements

The nearest source of the higher pressure gas to the Project is located in Pinckney Street in East Somerville. A 12-inch steel gas line was installed from Pinckney Street to the Project along Pearl Street, Mt. Vernon Street, Lombardi, and Assembly Square Drive. The gas line mains have been installed into the project area for connection to the future development blocks.

6

Electrical Distribution System

Existing Conditions

6.1 *Existing Electrical Distribution System*

Eversource supplies electricity to the Assembly Square area with four 13.8 kV electrical services lines in the Assembly Square Revitalization Area. The four 13.8 kV service lines serve the following

- Assembly Square Marketplace
- Foley Street
- Office Building/Vacant Theater
- Back-up

Proposed Conditions

6.2 Proposed Electrical Distribution System Requirements

In past communications between VHB and NStar, Nstar has stated that the findings in the GIA report are not relevant today. VHB has provided information to NStar regarding the building program and approximate loads in order for NStar to estimate and identify the size, sources and costs for their electrical system improvements. VHB will design the conduit and manhole system in conjunction with NStar in order to accommodate the required electrical infrastructure.

6.3 Proposed Electrical Distribution System Improvements

The electrical infrastructure, including ductbanks and manholes, have been constructed by the Proponent in the ASRA for the future electrical system improvements.

7

Telephone Distribution System

Existing Conditions

Existing Telephone Distribution System

Verizon supplies telephone service to the Project area. The system consists of underground lines and overhead telephone wires between poles.

Proposed Conditions

7.2 Proposed Telephone Distribution System Requirements

In past communications between VHB and Verizon, Verizon stated the findings in the GIA report are not relevant today. VHB has provided information to Verizon regarding the building program and approximate loads in order for NStar to estimate and identify the size, sources and costs for their telephone system improvements. VHB will design the conduit and manhole system in conjunction with Verizon in order to accommodate the required telephone infrastructure.

7.3 Proposed Telephone Distribution System Improvements

The telephone infrastructure, including ductbanks and manholes, have been constructed by the Proponent in the ASRA for the future telecommunications system improvements.

8

Fire Alarm System

Existing Conditions

8.1 *Existing Fire Alarm System*

The City of Somerville's Electric Lines and Light Department has jurisdictions over the fire alarm systems within the City. The fire alarm system consists of manholes and fire boxes within the Project area.

Proposed Conditions

8.2 Proposed Fire Alarm system Requirements and Improvements

The City of Somerville has requested that a wireless radio frequency fire alarm system be used to serve the Project area. In order to provide sufficient coverage and equipment for the wireless system VHB has coordinated final locations of the fire boxes with the City's Fire Chief.

9

Cable TV

Existing Conditions

9. **Cable TV**

9.1 **Existing Cable Television System**

The only location that is serviced by Comcast/RCN cable within the Project area is along Middlesex Avenue near Foley Street and the Assembly Square Marketplace.

Proposed Conditions

9.2 Proposed Cable Television System Requirements and Improvements

VHB contacted the current suppliers of cable and telecommunications who service the Project area to determine the level of services offered and the magnitude of the improvements. Sufficient conduit and manholes have been provided to support future cable and telecommunications providers.

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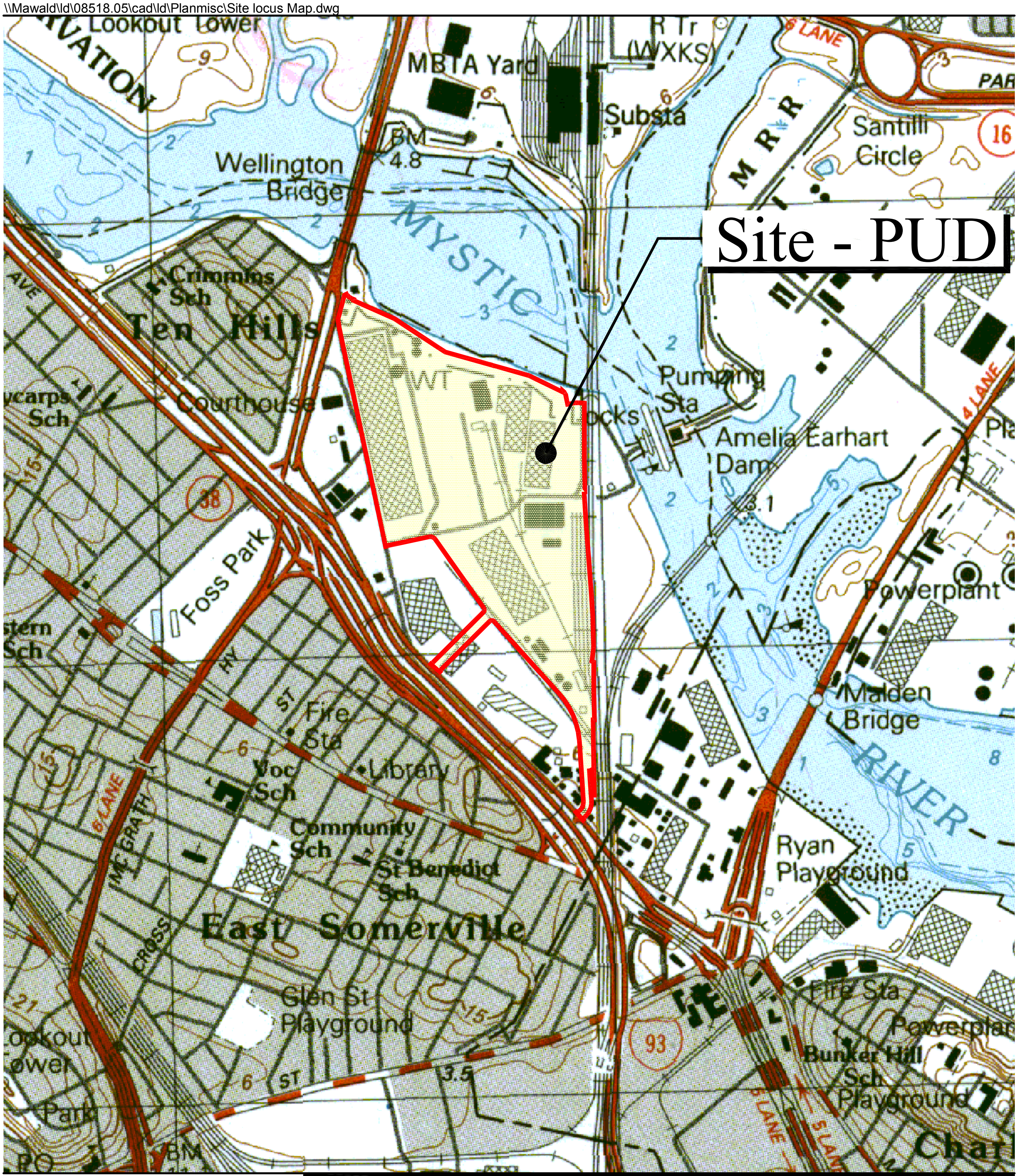
Summary

10. SUMMARY

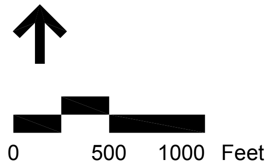
The proposed buildings and utilities within the Project area will be constructed in multiple phases over the course of the project. All necessary infrastructure for the full build out of the Project has been constructed in the streets of the PUD area. The construction of the utility infrastructure began in 2009. Coordination with private utilities is ongoing and will continue throughout the construction of the Project. The water system adequately provides water during the average day demand and peak fire flow conditions. The sewer system is sized to carry all flows from the proposed development and adjacent properties to the Medford-Somerville branch sewer. The sewer flows generated will be mitigated at a 4:1 ratio. The stormwater management system has been sufficiently designed to meet all applicable local and state regulations. All future phases of the Project will be reviewed by the City of Somerville as part of the Special Permit with Site Plan Review (SPSR) process.

List of Figures

\\Mawald\ld\08518.05\cad\ld\Planmisc\Site locus Map.dwg



Vanasse Hangen Brustlin, Inc.



Site Location Map
Assembly Row
at Assembly Square
Amended Preliminary Master Plan
Planned Unit Development
Somerville, MA

Figure 1
July 2010

VHB ***Vanasse Hangen Brustlin, Inc.***
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02172
(617) 924-1770

Figure 2: Existing Water Demand

Project: Assembly Square Planned Unit Development
Location: Somerville, Massachusetts

Proj. No. : 8518.05
Date: 6/8/2010
Rev. Date
Computed by: MVG
Checked by:

File: \\Mawald\ld\08518.05\docs\VARIOUS\AmPUD\Utilities\Water\[08518.05 Existing Water Demand.xml]Water Demands Fig 4

1. Average flows for Massachusetts are based on 314 CMR 7: Sewer System Extension and Connection Program.

Existing Uses to remain out side of Phase 1-AA but within the Planned Unit Development

Building Identification	Use	Square Feet	Quantity	Unit	Unit Flow (gal/Unit)	Average Flow (GPD)	Total Bldg. Flow (GPM)	Total Peak Bldg. Flow (GPM)[1]
Assembly Marketplace	*Retail*	*328,806*	*329*	*1,000 SF*	*50*	*16,440*	11	20
Yacht Club	*Marina*	*-*	*80*	*Slip*	*10*	*800*	1	1
Amelia Earhart Dam	*Offices*	*1,000*	*1*	*1000 SF*	*75*	*75*	0	1
Spaulding Brick	*Industrial*	*11,700*	*12*	*1000 SF*	*75*	*878*	1	1
Trucking Company	*Industrial*	*26,910*	*27*	*1000 SF*	*75*	*2,018*	1	2
La Quinta Inn	*Hotel*	*77,678*	*172*	*1 Bedroom*	*110*	*18,920*	13	23
Religious	*Institutional*	*15,842*	*16*	*1000 SF*	*50*	*792*	1	1
County	*Institutional*	*32,432*	*32*	*1000 SF*	*75*	*2,432*	2	3
Sunrise Cuisine	*Restaurant*	*4,326*	*40*	*1 Seat*	*35*	*1,400*	1	2
Dunkin Donuts	*Restaurant*	*4,006*	*12*	*1 Seat*	*20*	*240*	0	1
Warehouse	*Industrial*	*8,369*	*8*	*1000 SF*	*75*	*628*	0	1
99 Restaurant	*Restaurant*	*11,382*	*393*	*1 Seat*	*35*	*13,755*	10	17
Office	*Offices*	*114,559*	*115*	*1000 SF*	*75*	*8,592*	6	10
Loew's Cinema	*Cinema*	*80,000*	*2,400*	*1 Seat*	*5*	*12,000*	8	15
Home Depot	*Retail*	*147,608*	*148*	*1000 SF*	*50*	*7,380*	5	9
Circuit City	*Retail*	*33,488*	*33*	*1000 SF*	*50*	*1,674*	1	2
Enterprise Rent A Car	*Retail*	*2,000*	*2*	*1000 SF*	*50*	*100*	0	1
Hillside Service Center	*Commercial*	*4,656*	*Min Allow*	*2*	*150*	*300*	0	1
Ashton Fuel	*Commerical*	*15,405*	*15*	*1,000*	*50*	*770*	1	1
Tracer Technologies	*Industrial*	*30,995*	*31*	*1,000*	*75*	*2,325*	2	3
						91,520	**64**	**115**

1) Maximum Day Demand Peaking Factor = 1.75 Times Average Day Demand. Minimum peak flow =1 PGM

Amended Preliminary Master Plan
Existing Sewer Generation within Assembly Square Revitalization Area
Somerville, MA

Building Identification	Use	Building (SF. Ft.)	Number	Unit	Unit Flow Rate (GPD)	Flows Removed Phase 1	Flows Removed Full Build	Flows To Remain
85 Foley St.- Cab repair[1]	Gasoline Station with Service Bays	3,677	1	Island	300		300	
			4	Bay	125		500	
99 Foley St.- Central Steel[1]	Industrial[2]	51,217	13	Person	15		195	
	Office	2,961	3	1000 SF	75		222	
123 Foley St.- Spaulding Brick[1]	Industrial[3]	16,880	5	Person	15	75		
	Office	2,920	3	1000 SF	75	219		
147 Foley St. American Propane	Office	1,050	1	1000 SF	75	79		
100 Sturtevant	Industrial[2]	22,760	15	Person	15	225		
	Office	3,772	4	1000 SF	75	283		
Yacht Club	Marina		80	slip	10			800
Goodtime Billiards[4]	-	109,232						
	Restaurant/ Tavern/ Lounge		508	Seat	35	17,780		
	Bowling Alley		4	Alley	100	400		
	Function Hall		438	Seat	15	6,570		
Boston Paintball	Retail	39,162	39	1000 SF	50	1,958		
World Gym	Retail	26,606	27	1000 SF	50	1,330		
Graybar	Industrial[3]	26,609	15	Person	15	225		
Home Depot	Retail	147,608	148	1000 SF	50			7,380
Circuit City	Retail	33,488	33	1000 SF	50			1,675
Amelia Earhart Dam	Office	1,000	1	1000 SF	75			75
					Totals:	**29,144**	**1,217**	**9,930**

1. Flows to be removed before next phases.

2. Population for Industrial uses based on available parking spaces.

3. Assumed population.

4. Goodtime sewer generation based on floor plan received from City of Somerville Inspectional Services on August 4, 2009.

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02172
(617) 924-1770

Figure 3.2 - Estimated Sewer Generation and Water Demand

Project: Assembly Square Planned Unit Development
Full Build Sewer Generation - 2014 Program
Location: Somerville, Massachusetts

Proj. No.: 08518.05
Date: 4/28/2014
Computed by: HGH
Checked by:

Development Program and Projected Sewer Flows

Phase	Block	Comments[1]	Use[2]	Area[1] (SF)	Unit	Quantity	Unit Flow[3] (Gal/Unit)	Average Flow (GPD)	Total Block Flow (GPD)	Total Phase Flow (GPD)[5,6]	Water Flow GPM	Peak Water GPM
1AA	**10**	4,500	Restaurant	4,500	1 Seat	98	20	1,960	1,960	172,244	120	209
1A	**1**	*67,530*	Retail	43,818	1,000 SF	44	50	2,191	76,421			
			Apartments	225,615	1 Bedroom	293	110	32,230				
			Apartments		Dwelling Units	195						
			Restaurant	23,712	1 Seat	1,200	35	42,000				
	2B		Office	93,183	1,000 SF	93	75	6,989	21,889			
		30,000	Retail	18,000	1,000 SF	18	50	900				
			Restaurant	12,000	1 Seat	400	35	14,000				
	3	*122,914*	Retail	113,914	1,000 SF	114	50	5,696	21,896			
			Cinema	60,000	1 Seat	1,590	5	7,950				
			Bowling	0	1 Lane	0	100	0				
			Restaurant	4,500	1 Seat	150	35	5,250				
			Fast Food	4,500	1 Seat	150	20	3,000				
	4		Apartments	249,964	1 Bedroom	389	110	42,790	48,539			
			Apartments		Dwelling Units	253						
		43,975	Retail	40,775	1,000 SF	41	50	2,039				
			Restaurant	3,200	1 Seat	106	35	3,710				
	KIOSK	*3,605*	Fast Food	3,605	1 Seat	77	20	1,540	1,540			
Full Build Remaining Phases	**5**	*60,000*	Retail	43,200	1,000 SF	43	50	2,160	57,805	602,376	418	732
			Office	250,000	1,000 SF	250	75	18,750				
			Apartments	0	1.7 Bedroom	0	187	0				
			Fast Food	3,800	1 Seat	152	20	3,040				
			Hotel	104,550	1 Bedroom	170	110	18,700				
			Restaurant	13,000	1 Seat	433	35	15,155				
	6A	*35,000*	Retail	25,000	1,000 SF	25	50	1,250	12,000			
			Office	0	1,000 SF	0	75	0				
			Fast Food	2,500	1 Seat	100	20	2,000				
			Restaurant	7,500	1 Seat	250	35	8,750				
	6B		Condo	486,000	1.7 Bedroom	405	187	75,735	75,735			
		-	Retail	0	1,000 SF	0	50	0				
			Fast Food	0	1 Seat	0	20	0				
			Restaurant	0	1 Seat	0	35	0				
	7	*48,500*	Retail	30,000	1,000 SF	30	50	1,500	175,230			
			Office	450,000	1,000 SF	450	75	33,750				
			Office	0	1,000 SF	0	75	0				
			Condo	768,000	1.7 Bedroom	640	187	119,680				
			Fast Food	3,500	1 Seat	140	20	2,800				
			Restaurant	15,000	1 Seat	500	35	17,500				
	8	*36,000*	Retail	20,000	1,000 SF	20	50	1,000	125,136			
			Office	553,150	1,000 SF	553	75	41,486				
			Fast Food	4,000	1 Seat	160	20	3,200				
			Restaurant	12,000	1 Seat	400	35	14,000				
			Condo	420,000	1.7 Bedroom	350	187	65,450				
	9		Office	300,000	1,000 SF	300	75	22,500	22,500			
	11	*75,000*	Retail	40,000	1,000 SF	40	50	2,000	133,970			
			Office	1,155,000	1,000 SF	1,155	75	86,625				
			Fast Food	15,000	1 Seat	600	20	12,000				
			Restaurant	20,000	1 Seat	667	35	23,345				
			Health Club	50,000	1 Locker	500	20	10,000				
				5,692,486				774,620	**FULL BUILD TOTAL**	**774,620**	538	941

Notes:

1) *Retail was space allocated at by 20.3% for estimated restaurant areas and by 6.0% for fast food within all future Blocks. Future Phase Building Program info taken from Street-Works LLC Proposed Phasing Schedule dated 2/13/09. Total restaurant area - 121,701 square feet (includes Block 10 and IKEA).*
2) *Restaurant seats are based on 30 square feet per seat within future phases.*
3) *Average flows for Massachusetts are based on 314 CMR 7: Sewer System Extension and Connection Program.*
4) *Not used.*
5) The previously permitted sewer flow for both Phase 1AA and Phase 1A is 173,146 gpd. The current building program from actual tenanting information for Phase 1AA and 1A is 1,257 gpd less than permitted. The surplus sewer flow will be applied to the Full Build Remaining Phases.
6) *The Full Build Remaining Phases requested permit flows are 650,003 gpd. The sewer flow shown on this table for the Full Build Remaining Phases includes surplus sewer flow from previous phases (1,257 gpd).*

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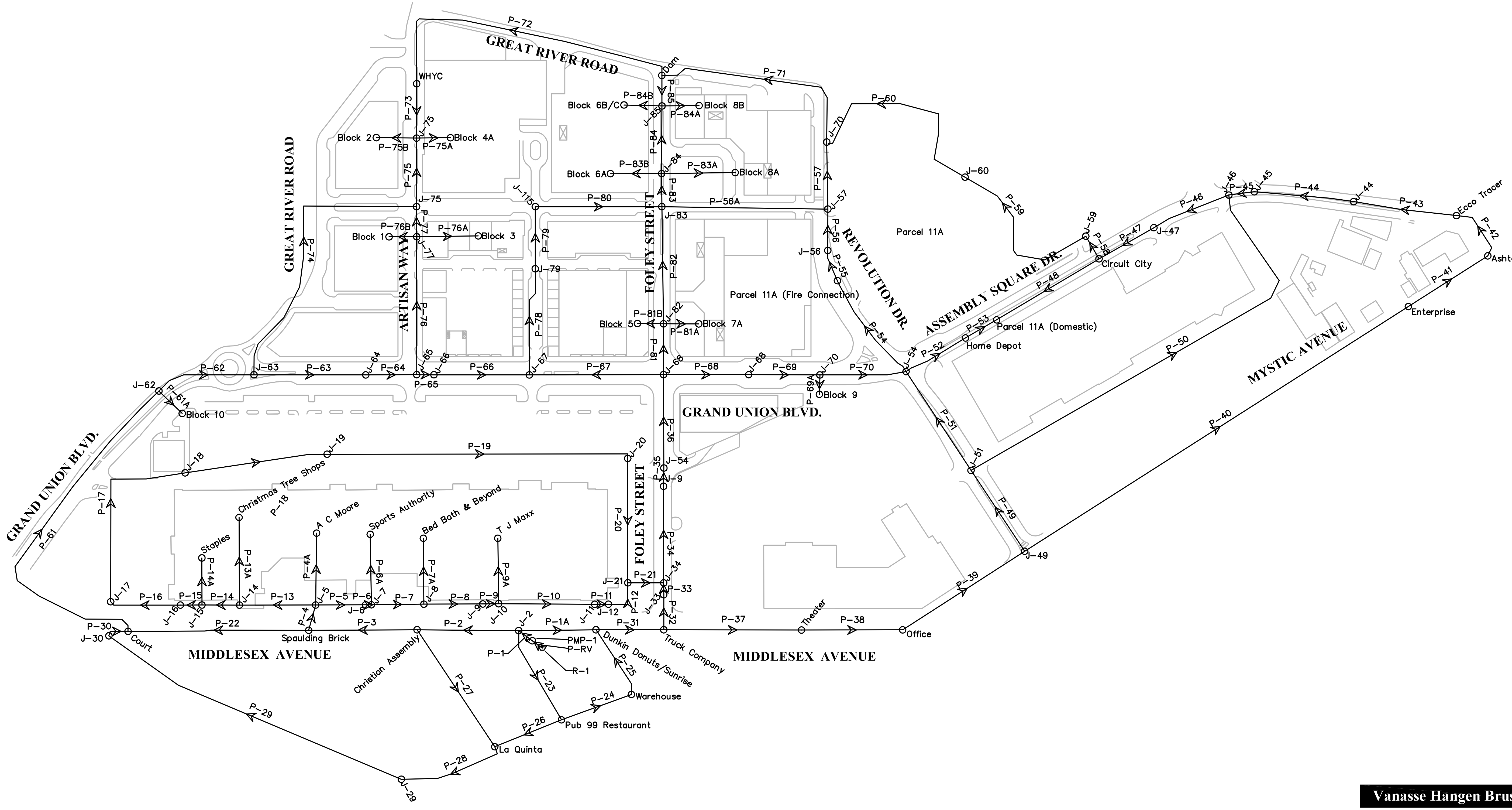
Appendix A

Water System Analysis



Vanasse Hangen Brustlin, Inc.

Water Model May 2, 2014

Water Plan Full Build Out
Assembly Square PUD
Assembly Square Drive
Somerville, Massachusetts

VHB

Flow Test Information Sheet

VHB project number: 11496.00

VHB project name: BLOCK 1 & BLOCK 4

Location of test: ASSEMBLY SQUARE DRIVE (NEW SECTION)
(Fire hydrant number if any)

Date & time of test: Date: 8/18/2011 Time: 9:00 [✓ (am)] (pm)

Temperature: 80° (F)

Test conducted by: RICHARD P. MATHEWS JR. PE - VHB

Test witnessed by: TIMOTHY HAYES - VHB SOMERVILLE WATER DEPT

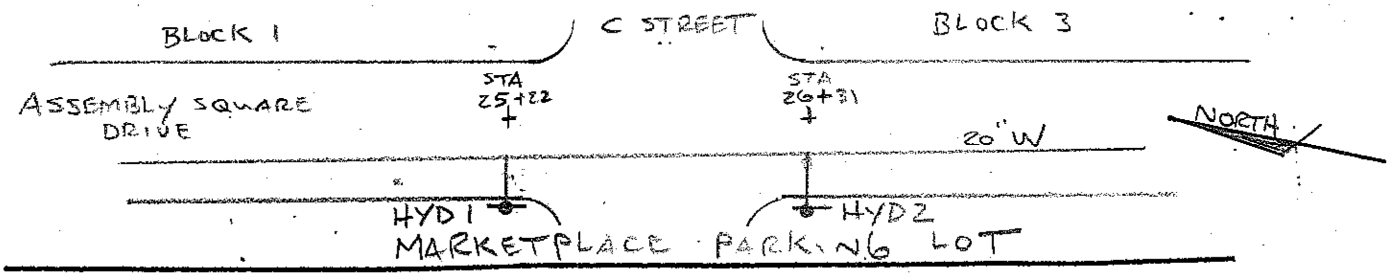
Name of Water District: CITY OF SOMERVILLE

Name of Fire District: " " "

Source of Water Supply: Gravity ☐ Pump ☐ Other MWRA

Is water supply provided by: PRV STA's ☐ YES ☐ NO ☐

Area Map: (Draw Sketch showing property location: bounding streets and names, north arrow, hydrant location and indentification numbers, distances from hydrants to property, elevations of hydrants and building floors & grade, all water mains and sizes interconnection valves, etc.)



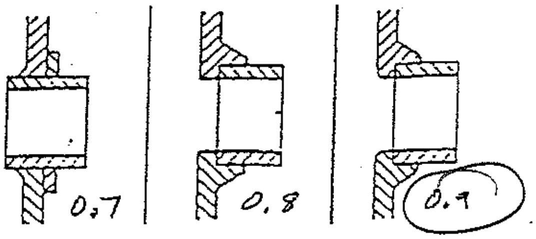
Flow Test Data:

Flow at Hydr. No.	Elevation at Hydr	Static at Hydr. No.	Static PSIG	Residual PSIG	Flow PSIG	Outlet size and coeficient		GPM
2	13 13	1	77	69	57	2.5"	0.9	1265

Miscellanous comments: HYDRANTS ARE M&H MODEL 929 5¼" w/ 2½" HOSE CONNECTIONS

Signed:

Witness:



Flow Test Information Sheet

VHB project number: 08518.03

VHB project name: Assembly Square PUD

Location of test: Middlesex Ave @ Memory Ln / McGrath Highway / Kensington
(Fire hydrant number if any)

Date & time of test: Date: 9/13/06 Time: 10:20 [✓ (am)] (pm)

Temperature: (F)

Test conducted by: Lenny Dodge & Dennis Grecci

Test witnessed by:

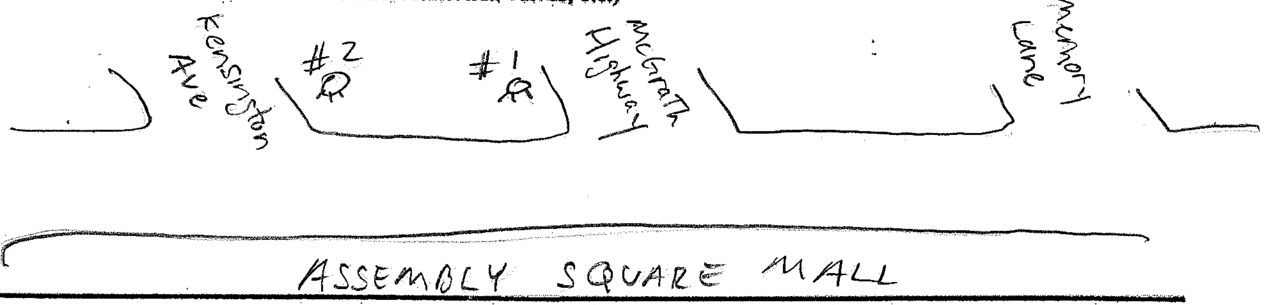
Name of Water District: Somerville, MA

Name of Fire District: Somerville, MA

Source of Water Supply: Gravity ☐ Pump ☑ Other

Is water supply provided by: PRV STA's ☐ YES ☐ NO ☐

Area Map: (Draw Sketch showing property location; bounding streets and names, north arrow, hydrant location and indentification numbers, distances from hydrants to property, elevations of hydrants and building floors & grade, all water mains and sizes interconnection valves, etc.)



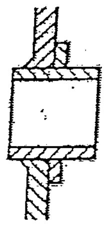
Flow Test Data:

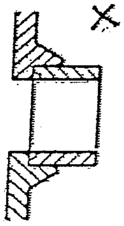
Flow at Hydr. No.	Elevation at Hydr.	Static at Hydr. No.	Static PSIG	Residual PSIG	Flow PSIG	Outlet size and coefficient		GPM Q_R (@ 20)
1		2	72	69	52	2½	0.9	5645

Miscellaneous comments:

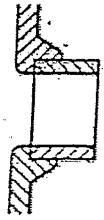
Signed:

Witness:


Outlet Square and projecting into Barrel Coef 0.70



Outlet Square and Sharp Coef 0.80


Outlet Smooth and Rounded Coef 0.90

Project: ASSEMBLY SQUARE
Project # 08518.03
Location: SOMERVILLE, MA
Sheet 1 of 1
Calculated by: DAG
Date: 9/13/06
Checked by: MVG
Date: 9/13/06
Title

HYDRANT FLOW TEST

RESIDUAL HYDRANT - #2

FLOWED HYDRANT - #1

2½" ORIFICE
OUTLET SMOOTH AND ROUNDED - $C = 0.9$

STATIC PRESSURE #2 = 72 PSI
RESIDUAL PRESSURE #2 = 69 PSI
FLOWING PITOT PRESSURE #1 = 52 PSI
(VELOCITY HEAD)

THEORETICAL FLOW = 1344 GPM

ACTUAL FLOW = 0.9 (1344)
= 1210 GPM

⇒ CONVERSION TO BASE OF 20 PSI

$$Q_R = Q_F \times \frac{h_r^{.54}}{h_f^{.54}}$$

$$Q_R = 1210 \times \frac{(72-20)^{.54}}{(72-69)^{.54}} \qquad \frac{(8.46)}{(1.81)}$$

Q_R = 5645 GPM @ 20 PSI

VHB Flow Test Information Sheet

VHB project number: 08518.03
VHB project name: ASSEMBLY SQUARE - IKEA

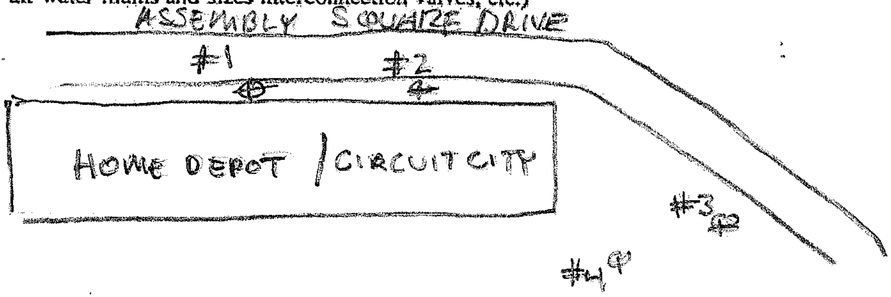
Location of test: SOMERVILLE, MA @ ASSEMBLY SQUARE DRIVE.
(Fire hydrant number if any)

Date & time of test: Date: 3/14/07 Time: 1:45 (am) [✓ (pm)]
Temperature: 71° (F)
Test conducted by: DENNIS GRIECCI & MICHAEL GOODMAN
Test witnessed by:

Name of Water District:
Name of Fire District:

Source of Water Supply: Gravity ☐ Pump ☐ Other
Is water supply provided by: PRV STA's ☐ YES ☐ NO ☐

Area Map: (Draw Sketch showing property location; bounding streets and names, north arrow, hydrant location and indentification numbers, distances from hydrants to property, elevations of hydrants and building floors & grade, all water mains and sizes interconnection valves, etc.)



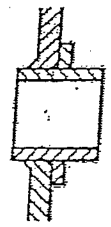
Flow Test Data:

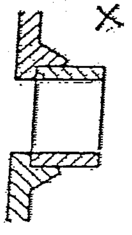
Flow at Hydr. No.	Elevation at Hydr.	Static at Hydr. No.	Static PSIG	Residual PSIG	Flow PSIG	Outlet size and coefficient		GPM Q_R (20)
1		2	73	68	58	2½"	0.9	4573
3		4	66	61	48	2½"	0.9	3855

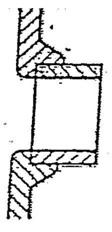
Miscellaneous comments:

Signed: Marc Re

Witness:


Outlet Square and projecting into Barrel Coef 0.70


Outlet Square and Sharp Coef 0.80


Outlet Smooth and Rounded Coef 0.90

Project: ASSEMBLY SQ / IKEA
Project # 08518.02
Location: SOMERVILLE, MA
Sheet 1 of
Calculated by: DAG
Date: 3/16/07
Checked by: MVG
Date: 3/16/07
Title

HYDRANT FLOW TEST #1

RESIDUAL HYDRANT - # 2

FLOWED HYDRANT - # 1

$2\frac{1}{2}''$ ORIFICE
OUTLET SMOOTH & ROUNDED $C = 0.90$

STATIC PRESSURE @ #2 = 73 PSI
RESIDUAL PRESSURE @ #2 = 68 PSI
FLOWING PITOT PRESSURE @ #1 = 58

THEORETICAL FLOW: $Q = 2983\, Cd^2 \sqrt{P}$

$$Q = 29.83(.9)(2.5^2)(\sqrt{58}) = 1277.9 \text{ GPM}$$

⇒ CONVERSION TO BASE OF 20 PSI

$$Q_R = Q_F \times \frac{H_R^{.54}}{H_F^{.54}}$$

$$Q_R = 1278 \times \frac{(73-20)^{.54}}{(73-68)^{.54}} = \underline{4573 \text{ GPM} @ 20 \text{ PSI}}$$

Project:
Location:
Calculated by: DAG
Checked by:
Title

Project # 08518.03
Sheet 2 of 2
Date: 3/14/07
Date:

HYDRANT FLOW TEST #2

RESIDUAL HYDRANT - #3

FLOWED HYDRANT - #4

2½" ORIFICE
OUTLET SMOOTH & ROUNDED $C = 0.90$

STATIC PRESSURE @ #3 = 66 PSI
RESIDUAL PRESSURE @ #3 = 61 PSI
FLOWING PRESSURE @ #4 = 48 PSI

THEORETICAL FLOW: $Q = 29.83\, C d^2 \sqrt{P}$

$$Q = 29.83(.9)(2.5^2)\sqrt{48} = 1162.5 \text{ GPM}$$

⇒ CONVERSIONS TO BASE OF 20 PSI

$$Q_R = Q_F \times \frac{H_R^{.54}}{H_F^{.54}}$$

$$Q_R = 1163 \times \frac{(66-20)^{.54}}{(66-61)^{.54}} = \underline{3855 \text{ GPM @ } 20 \text{ PSI}}$$

Flow Test Information Sheet

VHB project number: 08518.05

VHB project name: Assembly Row

Location of test: Block 6
(Fire hydrant number if any)

Date & time of test: Date: 09-12-2014 Time: 10:30 am (am) (pm)

Temperature: 68°F (F)

Test conducted by: Richard Mathews - VHB ; Mi Lian - VHB

Test witnessed by: (Water Dept) P. Brennan - WSP

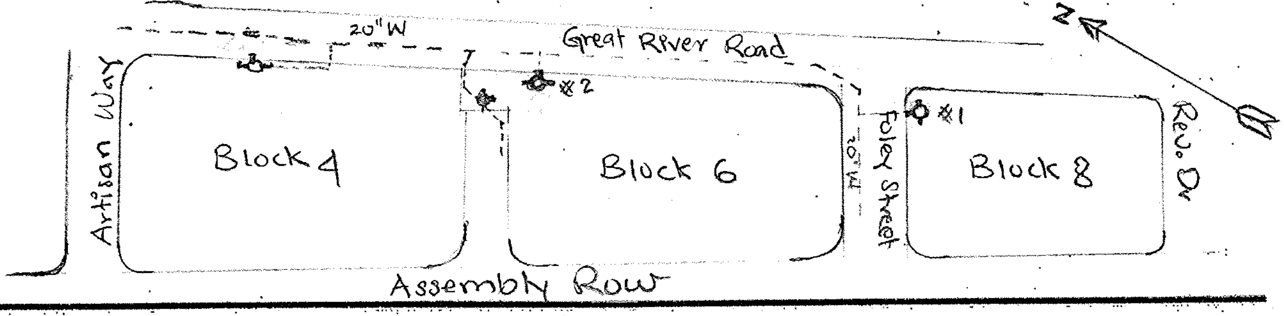
Name of Water District: Somerville Water Department

Name of Fire District: Somerville Fire Department

Source of Water Supply: Gravity ☐ Pump ☐ Other MWRA

Is water supply provided by: PRV STA's ☐ YES ☐ NO ☐

Area Map: (Draw Sketch showing property location; bounding streets and names, north arrow, hydrant location and indentification numbers, distances from hydrants to property, elevations of hydrants and building floors & grade, all water mains and sizes interconnection valves, etc.)



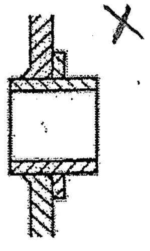
Flow Test Data:

Flow at Hydr. No.	Elevation at Hydr.	Static at Hydr. No.	Static PSIG	Residual PSIG	Flow PSIG	Outlet size and coefficient		GPM
#2	13.5	#1	68	66	52	2 ½	0.9	1210

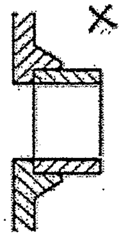
Miscellaneous comments: Hydrants are M&H model 929 5¼" w/ 2½" hose connections

Signed: ______________________

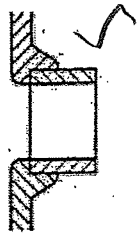
Witness: ______________________



Outlet Square and projecting into Barrel Coef 0.70



Outlet Square and Sharp Coef 0.80



Outlet Smooth and Rounded Coef 0.90

Project: Assembly Row
Project #: 08518.05
Location: Block 6
Sheet: 1 of 2
Calculated by: Ni Lian
Date: 9-12-2014
Checked by: R. Mathews
Date: 9-15-2014
Title: Flow Test - Block 6

Hydrant Flow Test

Residual Hydrant - #1

Flowed Hydrant - # 2

$2\frac{1}{2}$" Orifice

Outlet Smooth and Rounded . C = 0.90

Static Pressure # 1 = 68 psi

Residual Pressure # 1 = 66 psi

flowing pitot pressure #2 = 52 psi

Actual flow → $Q_f = 29.83\ C \cdot d^2 \cdot \sqrt{P}$

$= 29.83 \times 0.90 \times 2.5^2 \cdot \sqrt{52}$

$= 1209.98$

$= 1210$ GPM

Project: Assembly Row
Project # 08518.05
Location: Block 6
Sheet 2 of 2
Calculated by: N. Lian
Date: 9-12-2014
Checked by: R. Mathews
Date: 9-15-2014
Title Flow Test - Block 6

Conversion To Base Of 20 psi

$$Q_r = Q_f \cdot \frac{h_r^{0.54}}{h_f^{0.54}} \quad \frac{(\text{Pressure drop to desired Pressure})^{0.54}}{(\text{Pressure drop during test})^{0.54}}$$

$$= 1210 \cdot \frac{(68-20)^{0.54}}{(68-66)^{0.54}}$$

$$= 1210 \cdot 5.563$$

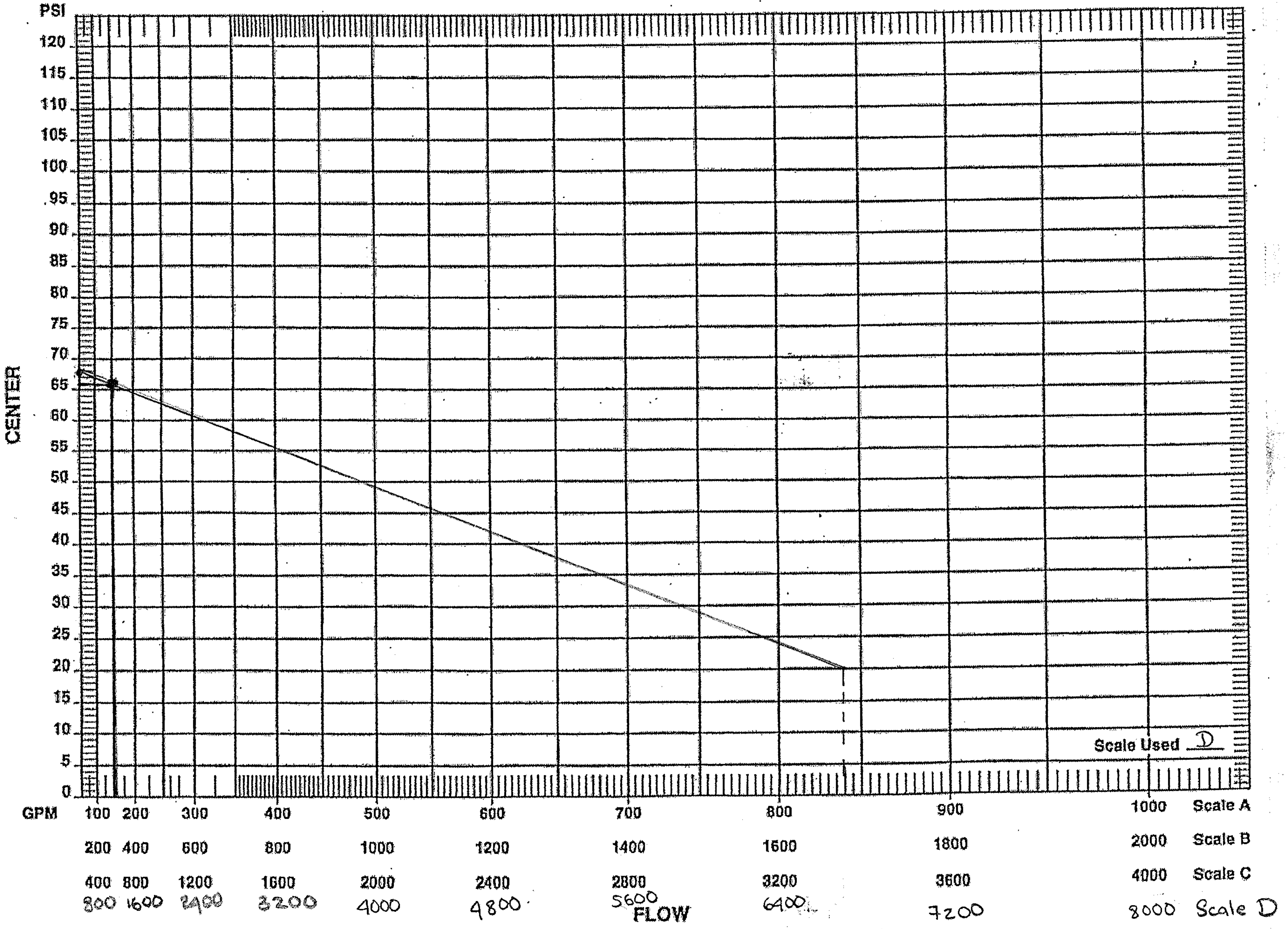
$$= 6731 \text{ GPM @ } 20 \text{ psi}$$

VHB

Water Flow Test Summary Sheet

Conducted by Richard Mathews Location Block 6 Date 09-12-2014

Hydrant coefficient 0.90 Elevation 13.5 Static 68 Residual 66 @Flow 1210 gpm



Flow Test Information Sheet

VHB project number: 08518.05

VHB project name: Block 5

Location of test: Canal St
(Fire hydrant number if any)

Date & time of test: Date: 11/19/15 Time: 10:15 [✓ (am)] (pm)

Temperature: 49°F (F)

Test conducted by: Dale Horsman, PE -VHB Richard Mathews Jr, PE VHB

Test witnessed by: Richard Mathews Jr. PE-VHB SOMERVILLE WATER DEPT.

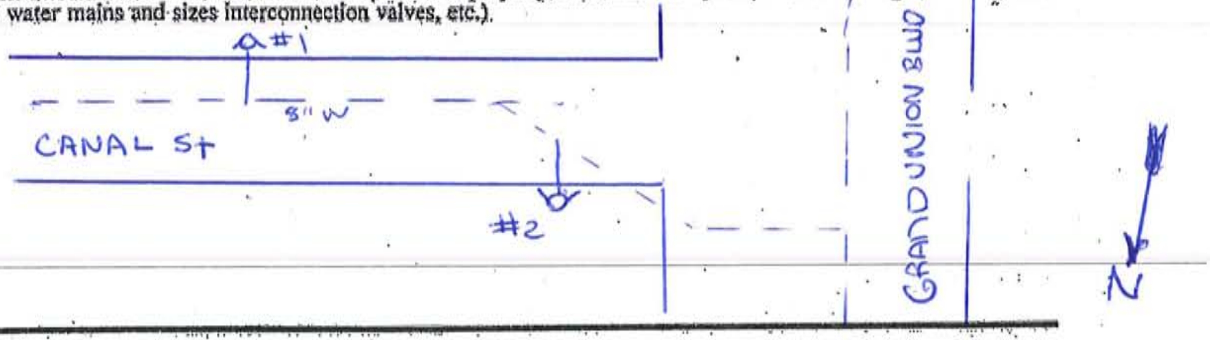
Name of Water District: City of Somerville

Name of Fire District: " " "

Source of Water Supply: Gravity ☐ Pump ☐ Other MWRA

Is water supply provided by: PRV STA's ☐ YES ☐ NO ☐

Area Map: (Draw Sketch showing property location; bounding streets and names, north arrow, hydrant location and indentification numbers, distances from hydrants to property, elevations of hydrants and building floors & grade, all water mains and sizes interconnection valves, etc.)



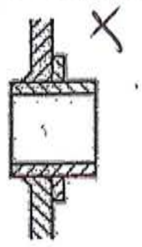
Flow Test Data:

Flow at Hydr. No.	Elevation at Hydr.	Static at Hydr. No.	Static PSIG	Residual PSIG	Flow PSIG	Outlet size and coefficient		GPM
1	13.0	2	72	70	60	2½	0.9	1300

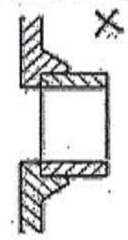
Miscellaneous comments: HYDRANTS ARE M&H MODEL 929 5¼" W 2½ HOSE CONNECTIONS

Signed: Dale A Horsman, PE

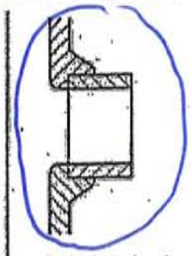
Witness: PE



Outlet Square and projecting into Barrel Coef 0.70



Outlet Square and Sharp Coef 0.80



Outlet Smooth and Rounded Coef 0.90

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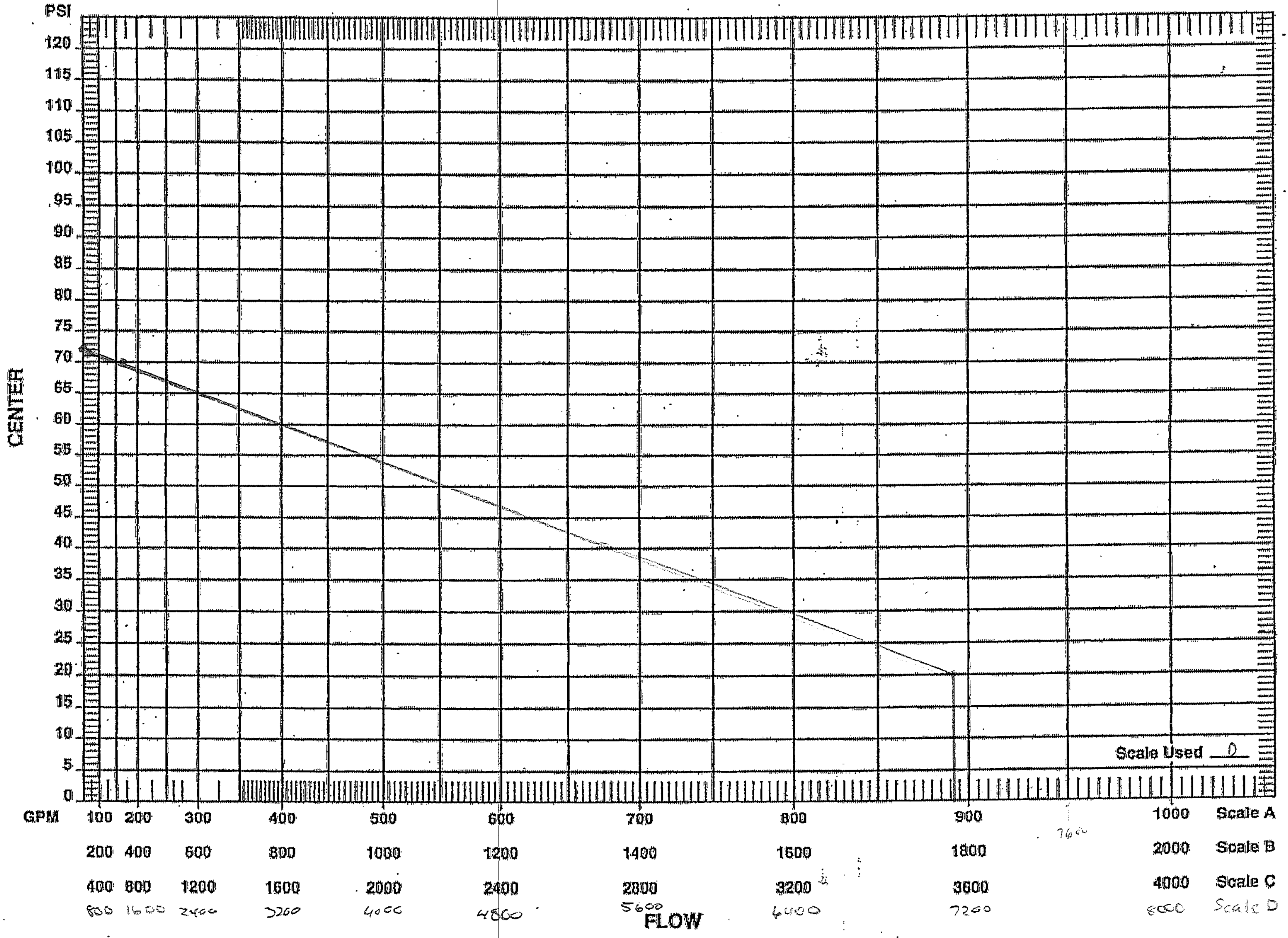
Water Flow Test Summary Sheet

Conducted by Dale Harsman Location Block 5 Canal St Date 11/17/15

Hydrant coefficient .90 Elevation ______ Static 72 Residual 20 @Flow 1300



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VHB *Computations*

Project: Block 5 Canal St. Project # 08518.05
Location: SOMERVILLE MA Sheet 2 of 2
Calculated by: DAH Date: 11/19/15
Checked by: R.M. Date:
Title Flow Test - Block 5 Canal ST.

HYDRANT FLOW TEST

RESIDUAL HYDRANT #2

FLOWED HYDRANT - #1

2½ ORIFICE, OUTLET SMOOTH AND ROUNDED C=0.9

STATIC PRESSURE #2 = 72psi
RESIDUAL PRESSURE #2 = 70psi
FLOWING PILOT PRESSURE #1 = 60psi

Actual FLOW ⇒ $Q_F = 29.83\, c d^2 * \sqrt{P}$
$= 29.83 * .90 \times 2.5^2 \sqrt{60}$
$= 1299.72 \approx 1200$ GPM

Conversion to Base 20 psi

$$Q_r = Q_f \frac{h_r^{0.54}}{h_f^{0.54}} = \frac{(\text{Pressure drop to desired Pressure})^{0.54}}{(\text{Pressure drop during test})^{.054}}$$

$$= 1300 * \left(\frac{(72-20)^{0.54}}{(72-70)^{0.54}}\right)$$

$$= 1300 \times 5.809$$

≈ 7551.43 GPm @ 20psi

VHB Flow Test Information Sheet

VHB project number: 08518.05

VHB project name: Block 5

Location of test: Foley St.
(Fire hydrant number if any)

Date & time of test: Date: 11/19/15 Time: 10:00 [✓ (am)] (pm)

Temperature: 49°F (F)

Test conducted by: Dale Horsman, PE - VHB Richard Mathews JR, PE VHB

Test witnessed by: Richard Mathews JR., PE. VHB . SOMERVILLE WATER DEPT.

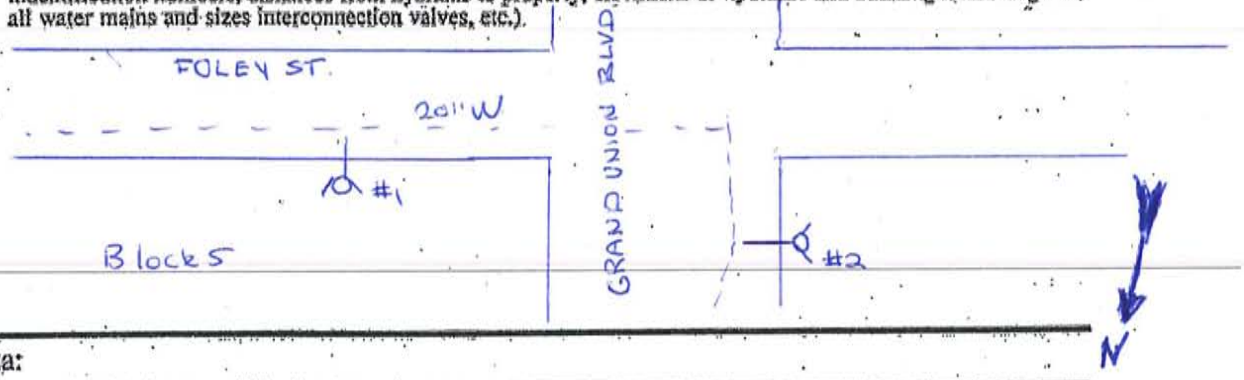
Name of Water District: City of SOMERVILLE

Name of Fire District: " " "

Source of Water Supply: Gravity ☐ Pump ☐ Other MWRA

Is water supply provided by: PRV STA's ☐ YES ☐ NO ☐

Area Map: (Draw Sketch showing property location; bounding streets and names, north arrow, hydrant location and indentification numbers, distances from hydrants to property, elevations of hydrants and building floors & grade, all water mains and sizes interconnection valves, etc.)



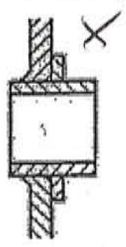
Flow Test Data:

Flow at Hydr. No.	Elevation at Hydr.	Static at Hydr. No.	Static PSIG	Residual PSIG	Flow PSIG	Outlet size and coefficient		GPM
1	12.25	2	74	72	62	2½"	0.9	1321

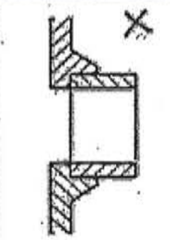
Miscellaneous comments: HYDRANTS ARE M&H MODEL 929 5¼" w/ 2½ HOSE CONNECTIONS

Signed: Dale A. Horsman, PE

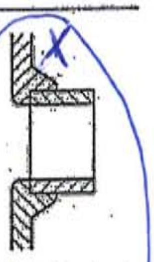
Witness: PE



Outlet Square and projecting into Barrel Coef 0.70



Outlet Square and Sharp Coef 0.80

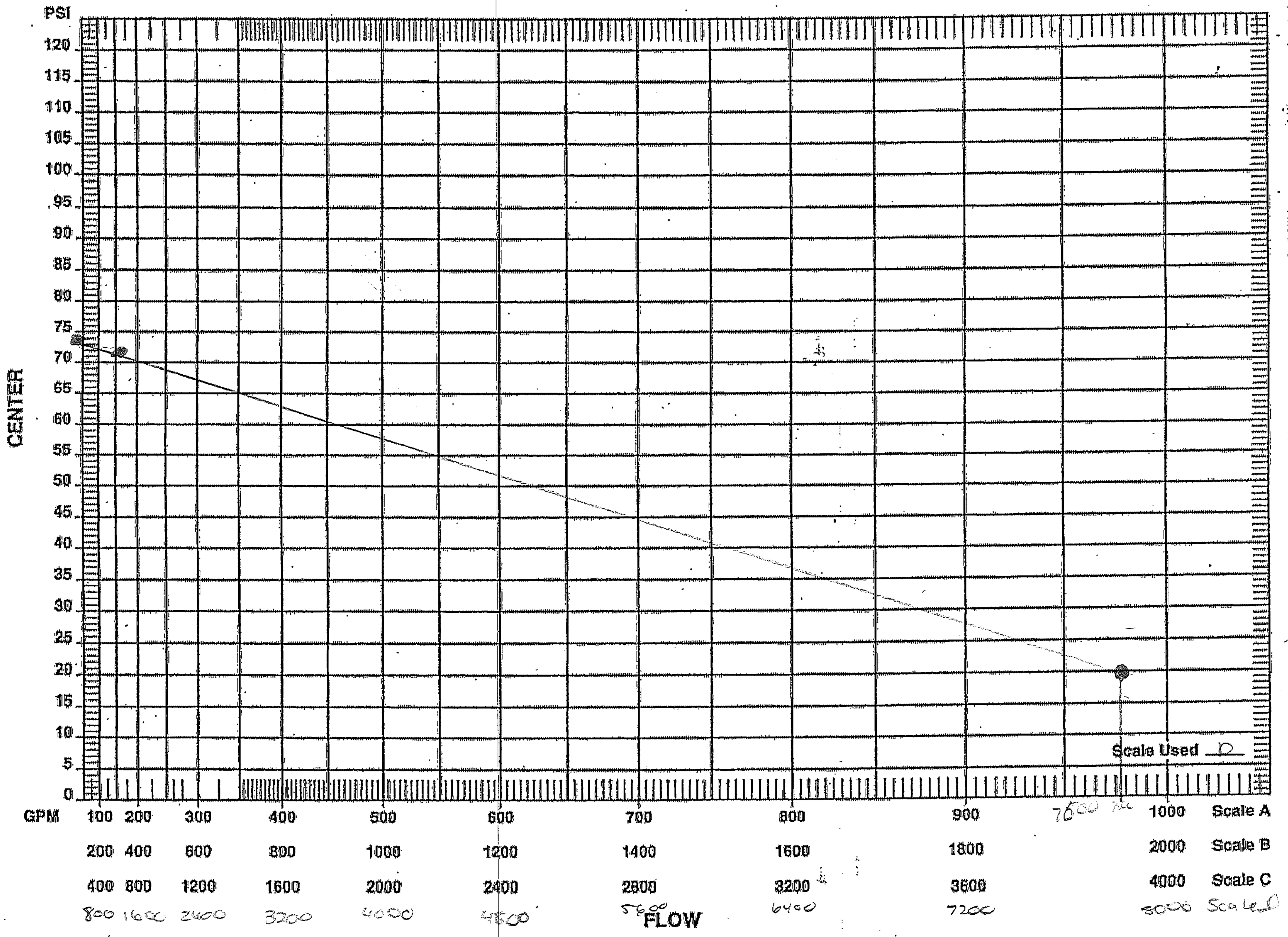


Outlet Smooth and Rounded Coef 0.90

Water Flow Test Summary Sheet

Conducted by Dale Horsman Location Block 5 Foley St Date 11/19/15

Hydrant coefficient .90 Elevation ______ Static 74 Residual 72 @Flow 1321



kirk\admin\ld\mcneil\waterflow.p65

VHB *Computations*

Project: ASSEMBLY SQARE BLOCK 5 FOLEY ST
Project # 08518.05
Location: SOME
Sheet 2 of 2
Calculated by: DAH
Date: 11/19/15
Checked by:
Date:
Title

HYDRANT FLOW TEST

RESIDUAL HYDRANT - #2

FLOWED HYDRANT - #1

2-½" ORIFICE , OUTLET SMOOTH AND ROUNDED C=0.9

STATIC PRESSURE #2 = 74 psi
RESIDUAL PRESSURE #2 = 72 psi
FLOWING PILOT PRESSURE #1 = 62 psi

Actual Flow → $Q_F = 29.83\, c d^2 \sqrt{P}$

$$= 29.83 \times .90 \times 2.5^2 \times \sqrt{62}$$

$$= 1321.21 \approx 1321 \text{ GPM}$$

Conversions to base 20 psi

$$Q_r = Q_f \times \frac{h_r^{0.54}}{h_f^{0.54}} \quad \frac{(\text{PRESSURE DROP TO DESIRED PRESSURE})^{0.54}}{(\text{PRESSURE DROP DURING TEST})^{0.54}}$$

$$= 1321 \text{ GPM} \times \left(\frac{(74-20)^{0.54}}{(74-72)^{0.54}} \right)$$

$$= 1321 \text{ GPM} \times 5.928$$

$$= 7831.40 \text{ GPM @ } 20 \text{ psi}$$

Scenario: 3,500 ISO
Current Time Step: 0.000 Hr
Fire Flow Node FlexTable: Fire Flow Report

Label	Zone	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)
A C Moore	Zone	11	False	3,500.00	2,247.37	3,503.00	2,250.37	20.0
Ashton Fuel/Hillside	Zone	4	False	3,500.00	3,190.13	3,502.00	3,192.13	20.0
Bed Bath & Beyond	Zone	9	False	3,500.00	2,923.59	3,503.00	2,926.59	20.0
Block 1	Zone	4	True	3,500.00	4,166.05	3,583.00	4,249.05	20.0
Block 2	Zone	4	True	3,500.00	4,119.76	3,540.00	4,159.76	20.0
Block 3	Zone	4	True	3,500.00	4,054.81	3,660.00	4,214.81	20.0
Block 4A	Zone	4	True	3,500.00	4,136.68	3,570.00	4,206.68	20.0
Block 5	Zone	4	True	3,500.00	4,157.55	3,604.00	4,261.55	20.0
Block 6A	Zone	4	True	3,500.00	4,082.57	3,524.00	4,106.57	20.0
Block 6B/C	Zone	4	True	3,500.00	4,116.45	3,601.00	4,217.45	20.0
Block 7A	Zone	4	True	3,500.00	4,111.53	3,636.00	4,247.53	20.0
Block 8A	Zone	4	True	3,500.00	4,017.12	3,543.00	4,060.12	20.0
Block 8B	Zone	4	True	3,500.00	4,121.07	3,581.00	4,202.07	20.0
Block 9	Zone	4	True	3,500.00	4,131.42	3,545.00	4,176.42	20.0
Block 10	Zone	3	True	3,500.00	3,608.71	3,511.00	3,619.71	20.0
Christian Assembly	Zone	4	True	3,500.00	4,337.15	3,501.00	4,338.15	20.0
Christmas Tree Shops	Zone	10	False	3,500.00	2,387.65	3,504.00	2,391.65	20.0
Circuit City	Zone	4	True	3,500.00	4,224.06	3,502.00	4,226.06	20.0
Court	Zone	4	True	3,500.00	4,250.56	3,503.00	4,253.56	20.0
Dam	Zone	4	True	3,500.00	4,288.47	3,501.00	4,289.47	20.0
Dunkin Donuts/Sunrise	Zone	4	True	3,500.00	4,359.93	3,503.00	4,362.93	20.0
Ecco Tracer	Zone	3	False	3,500.00	3,370.73	3,503.00	3,373.73	20.0
Enterprise	Zone	4	False	3,500.00	3,153.23	3,501.00	3,154.23	20.0
H-2	<None>	4	True	3,500.00	3,698.38	3,500.00	3,698.38	20.0
H-3	<None>	4	True	3,500.00	4,148.00	3,500.00	4,148.00	20.0
Home Depot	Zone	4	True	3,500.00	4,201.57	3,509.00	4,210.57	20.0
J-2	Zone	5	True	3,500.00	4,397.65	3,500.00	4,397.65	20.0
J-5	Zone	4	True	3,500.00	4,183.30	3,500.00	4,183.30	20.0
J-6	Zone	3	False	3,500.00	3,480.22	3,500.00	3,480.22	20.0
J-7	Zone	3	False	3,500.00	3,415.77	3,500.00	3,415.77	20.0
J-8	Zone	4	False	3,500.00	3,253.81	3,500.00	3,253.81	20.0
J-9	Zone	4	False	3,500.00	3,161.09	3,500.00	3,161.09	20.0
J-9	Zone	5	True	3,500.00	4,363.44	3,500.00	4,363.44	20.0
J-10	Zone	4	False	3,500.00	3,160.21	3,500.00	3,160.21	20.0
J-11	Zone	3	False	3,500.00	3,323.55	3,500.00	3,323.55	20.0
J-12	Zone	3	False	3,500.00	3,417.63	3,500.00	3,417.63	20.0
J-14	Zone	4	False	3,500.00	3,179.46	3,500.00	3,179.46	20.0
J-15	Zone	9	False	3,500.00	2,932.48	3,500.00	2,932.48	20.0
J-16	Zone	10	False	3,500.00	2,829.30	3,500.00	2,829.30	20.0
J-17	Zone	10	False	3,500.00	2,620.32	3,500.00	2,620.32	20.0
J-18	Zone	11	False	3,500.00	2,459.28	3,500.00	2,459.28	20.0
J-19	Zone	10	False	3,500.00	2,471.68	3,500.00	2,471.68	20.0
J-20	Zone	9	False	3,500.00	2,938.55	3,500.00	2,938.55	20.0
J-21	Zone	4	True	3,500.00	3,828.23	3,500.00	3,828.23	20.0
J-29	Zone	4	False	3,500.00	2,986.81	3,500.00	2,986.81	20.0
J-30	Zone	4	True	3,500.00	4,239.23	3,500.00	4,239.23	20.0
J-33	Zone	5	True	3,500.00	4,411.58	3,500.00	4,411.58	20.0
J-34	Zone	5	True	3,500.00	4,403.80	3,500.00	4,403.80	20.0
J-44	Zone	4	True	3,500.00	3,739.90	3,500.00	3,739.90	20.0
J-45	Zone	4	True	3,500.00	3,992.06	3,500.00	3,992.06	20.0
J-46	Zone	4	True	3,500.00	4,044.44	3,500.00	4,044.44	20.0
J-47	Zone	4	True	3,500.00	4,109.79	3,500.00	4,109.79	20.0
J-49	Zone	4	True	3,500.00	4,088.97	3,500.00	4,088.97	20.0
J-51	Zone	4	True	3,500.00	4,175.76	3,500.00	4,175.76	20.0
J-54	Zone	5	True	3,500.00	4,366.35	3,500.00	4,366.35	20.0
J-54	Zone	4	True	3,500.00	4,291.90	3,500.00	4,291.90	20.0
J-56	Zone	4	True	3,500.00	4,242.00	3,500.00	4,242.00	20.0
J-57	Zone	4	True	3,500.00	4,260.68	3,500.00	4,260.68	20.0
J-59	Zone	4	True	3,500.00	4,155.64	3,500.00	4,155.64	20.0
J-60	Zone	4	True	3,500.00	4,096.89	3,500.00	4,096.89	20.0
J-62	Zone	4	True	3,500.00	4,282.19	3,500.00	4,282.19	20.0
J-63	Zone	4	True	3,500.00	4,268.72	3,500.00	4,268.72	20.0

J-64	Zone	4	True	3,500.00	4,332.45	3,500.00	4,332.45	20.0
J-65	Zone	4	True	3,500.00	4,313.64	3,500.00	4,313.64	20.0
J-66	Zone	4	True	3,500.00	4,299.40	3,500.00	4,299.40	20.0
J-67	Zone	4	True	3,500.00	4,290.76	3,500.00	4,290.76	20.0
J-68	Zone	4	True	3,500.00	4,297.96	3,500.00	4,297.96	20.0
J-68	Zone	4	True	3,500.00	4,233.26	3,500.00	4,233.26	20.0
J-70	Zone	4	True	3,500.00	4,293.58	3,500.00	4,293.58	20.0
J-70	Zone	4	True	3,500.00	4,260.99	3,500.00	4,260.99	20.0
J-75	Zone	4	True	3,500.00	4,292.65	3,500.00	4,292.65	20.0
J-75	Zone	4	True	3,500.00	4,319.20	3,500.00	4,319.20	20.0
J-77	Zone	4	True	3,500.00	4,319.67	3,500.00	4,319.67	20.0
J-79	Zone	3	True	3,500.00	3,588.90	3,500.00	3,588.90	20.0
J-82	Zone	4	True	3,500.00	4,290.11	3,500.00	4,290.11	20.0
J-83	Zone	4	True	3,500.00	4,287.28	3,500.00	4,287.28	20.0
J-84	Zone	4	True	3,500.00	4,285.59	3,500.00	4,285.59	20.0
J-85	Zone	4	True	3,500.00	4,285.99	3,500.00	4,285.99	20.0
J-115	Zone	3	True	3,500.00	3,561.61	3,500.00	3,561.61	20.0
J-159	<None>	5	True	3,500.00	4,687.00	3,500.00	4,687.00	20.0
J-160	<None>	5	True	3,500.00	4,489.73	3,500.00	4,489.73	20.0
J-161	<None>	4	True	3,500.00	4,185.66	3,500.00	4,185.66	20.0
J-162	<None>	4	True	3,500.00	3,970.62	3,500.00	3,970.62	20.0
La Quinta	Zone	3	True	3,500.00	3,647.98	3,523.00	3,670.98	20.0
Office	Zone	4	True	3,500.00	4,128.02	3,510.00	4,138.02	20.0
Parcel 11A (Domestic)	Zone	4	True	3,500.00	4,168.72	3,620.00	4,288.72	20.0
Parcel 11A (Fire Connection)	Zone	4	True	3,500.00	4,257.46	3,500.00	4,257.46	20.0
Pub 99 Restaurant	Zone	4	True	3,500.00	4,281.75	3,517.00	4,298.75	20.0
Spaulding Brick	Zone	4	True	3,500.00	4,300.10	3,501.00	4,301.10	20.0
Sports Authority	Zone	4	False	3,500.00	3,043.81	3,503.00	3,046.80	20.0
Staples	Zone	10	False	3,500.00	2,575.26	3,503.00	2,578.26	20.0
T J Maxx	Zone	4	False	3,500.00	2,984.14	3,504.00	2,988.14	20.0
Theater	Zone	4	True	3,500.00	4,308.47	3,515.00	4,323.48	20.0
Truck Company	Zone	5	True	3,500.00	4,378.08	3,502.00	4,380.08	20.0
Warehouse	Zone	4	True	3,500.00	4,281.17	3,501.00	4,282.17	20.0
WHYC	Zone	4	True	3,500.00	4,285.77	3,501.00	4,286.77	20.0

\\Vhb\proj\Wat-LD\08518.05\tech\WaterCad\0851805 Water AmPUD MAY-2014.wtg

Scenario: 3,500 ISO
Current Time Step: 0.000 Hr
Pipe FlexTable:

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)
P-63	308.53	J-63	J-64	20.0	Ductile Iron	130.0	0.390
P-66	263.28	J-66	J-67	20.0	Ductile Iron	130.0	0.390
P-32	96.71	J-33	Truck Company	20.0	Ductile Iron	130.0	1.280
P-22	498.70	Spaulding Brick	Court	20.0	Ductile Iron	80.0	0.390
P-64	140.75	J-64	J-65	20.0	Ductile Iron	130.0	0.390
P-65	47.49	J-65	J-66	20.0	Ductile Iron	130.0	0.390
P-36	257.64	J-68	J-54	20.0	Ductile Iron	130.0	0.390
P-35	50.22	J-54	J-9	20.0	Ductile Iron	130.0	0.390
P-49	267.82	J-49	J-51	12.0	Ductile Iron	110.0	1.280
P-31	187.12	Truck Company	Dunkin Donuts/Sunrise	20.0	Ductile Iron	80.0	0.390
P-3	299.22	Christian Assembly	Spaulding Brick	20.0	Ductile Iron	80.0	0.390
P-24	205.30	Pub 99 Restaurant	Warehouse	16.0	Ductile Iron	100.0	0.390
P-25	207.72	Warehouse	Dunkin Donuts/Sunrise	12.0	Ductile Iron	80.0	0.390
P-23	278.25	J-2	Pub 99 Restaurant	16.0	Ductile Iron	80.0	0.390
P-68	235.11	J-68	J-68	20.0	Ductile Iron	130.0	1.280
P-69	196.43	J-68	J-70	20.0	Ductile Iron	130.0	0.390
P-70	238.60	J-70	J-54	20.0	Ductile Iron	130.0	1.280
P-46	226.19	J-47	J-46	12.0	Ductile Iron	130.0	0.390
P-45	70.90	J-46	J-45	12.0	Ductile Iron	130.0	0.390
P-44	275.57	J-45	J-44	12.0	Ductile Iron	110.0	0.390
P-43	286.46	J-44	Ecco Tracer	12.0	Ductile Iron	110.0	0.390
P-42	167.96	Ecco Tracer	Ashton Fuel/Hillside	12.0	Ductile Iron	110.0	0.390
P-12	113.26	J-12	J-21	8.0	Ductile Iron	100.0	0.800
P-20	343.17	J-21	J-20	8.0	Ductile Iron	110.0	0.390
P-19	842.47	J-20	J-19	8.0	Ductile Iron	110.0	0.390
P-18	395.68	J-19	J-18	8.0	Ductile Iron	110.0	0.390
P-17	544.73	J-18	J-17	8.0	Ductile Iron	110.0	0.390
P-16	196.86	J-17	J-16	8.0	Ductile Iron	100.0	0.390
P-5	138.06	J-5	J-6	8.0	Ductile Iron	100.0	0.390
P-30	62.05	Court	J-30	20.0	Ductile Iron	80.0	1.280
P-27	387.48	Christian Assembly	La Quinta	8.0	Ductile Iron	80.0	0.390
P-26	198.54	La Quinta	Pub 99 Restaurant	8.0	Ductile Iron	100.0	0.390
P-29	903.03	J-30	J-29	8.0	Ductile Iron	90.0	1.280
P-28	299.41	J-29	La Quinta	8.0	Ductile Iron	100.0	0.390
P-34	266.62	J-9	J-34	20.0	Ductile Iron	130.0	0.390
P-33	32.58	J-34	J-33	20.0	Ductile Iron	130.0	0.390
P-21	99.15	J-21	J-34	8.0	Ductile Iron	110.0	0.390
P-39	400.51	Office	J-49	12.0	Ductile Iron	100.0	0.800
P-41	259.85	Ashton Fuel/Hillside	Enterprise	12.0	Ductile Iron	90.0	0.800
P-40	1,255.92	Enterprise	J-49	12.0	Ductile Iron	90.0	0.800
P-15	59.46	J-16	J-15	8.0	Ductile Iron	100.0	0.390
P-14A	129.72	J-15	Staples	6.0	Ductile Iron	120.0	0.390
P-14	103.47	J-15	J-14	8.0	Ductile Iron	100.0	0.390
P-13A	241.80	J-14	Christmas Tree Shops	6.0	Ductile Iron	120.0	1.280
P-6	15.75	J-6	J-7	8.0	Ductile Iron	100.0	0.390
P-6A	194.43	J-7	Sports Authority	8.0	Ductile Iron	120.0	0.390
P-13	210.30	J-14	J-5	8.0	Ductile Iron	100.0	0.390
P-4A	198.17	J-5	A C Moore	6.0	Ductile Iron	120.0	0.390
P-7	144.89	J-7	J-8	8.0	Ductile Iron	100.0	0.390
P-8	162.77	J-8	J-9	8.0	Ductile Iron	100.0	0.390
P-9	43.65	J-9	J-10	8.0	Ductile Iron	100.0	0.390
P-10	265.23	J-10	J-11	8.0	Ductile Iron	100.0	0.390
P-11	37.85	J-11	J-12	8.0	Ductile Iron	100.0	0.390
P-9A	180.47	J-10	T J Maxx	8.0	Ductile Iron	120.0	0.390
P-7A	181.77	J-8	Bed Bath & Beyond	8.0	Ductile Iron	120.0	0.390
P-4	72.49	J-5	Spaulding Brick	12.0	Ductile Iron	100.0	0.390
P-RV	26.87	R-1	PMP-1	30.0	Ductile Iron	130.0	0.000
P-1	49.52	PMP-1	J-65	30.0	Ductile Iron	130.0	0.000
P-57	179.00	J-70	J-57	20.0	Ductile Iron	130.0	0.390
P-56	114.20	J-57	J-56	20.0	Ductile Iron	130.0	0.390
P-47	172.73	Circuit City	J-47	12.0	Ductile Iron	130.0	0.390
P-51	326.19	J-51	J-54	12.0	Ductile Iron	110.0	0.390
P-52	188.85	J-54	Home Depot	12.0	Ductile Iron	130.0	0.390
P-50	1,286.01	J-46	J-51	10.0	Ductile Iron	110.0	0.390

P-67	370.36	J-67	J-68	20.0	Ductile Iron	130.0	0.390
P-77	83.16	J-75	J-77	20.0	Ductile Iron	130.0	0.390
P-76	380.49	J-77	J-65	20.0	Ductile Iron	130.0	0.390
P-75	188.99	J-75	J-75	20.0	Ductile Iron	130.0	0.390
P-73	149.94	J-75	WHYC	20.0	Ductile Iron	130.0	0.390
P-81	140.24	J-68	J-82	20.0	Ductile Iron	130.0	0.390
P-78	299.65	J-67	J-79	8.0	Ductile Iron	130.0	0.390
P-79	171.30	J-79	J-115	8.0	Ductile Iron	130.0	0.390
P-85	84.37	Dam	J-85	20.0	Ductile Iron	130.0	0.390
P-84	186.51	J-85	J-84	20.0	Ductile Iron	130.0	0.390
P-76B	76.22	Block 1	J-77	12.0	Ductile Iron	130.0	0.390
P-75B	111.32	Block 2	J-75	12.0	Ductile Iron	130.0	0.390
P-81B	72.10	J-82	Block 5	12.0	Ductile Iron	130.0	0.390
P-84B	104.77	Block 6B/C	J-85	12.0	Ductile Iron	130.0	0.390
P-83A	203.07	Block 8A	J-84	12.0	Ductile Iron	130.0	0.390
P-84A	102.44	Block 8B	J-85	12.0	Ductile Iron	130.0	0.390
P-69A	53.57	Block 9	J-70	12.0	Ductile Iron	130.0	0.390
P-55	241.85	J-56	Parcel 11A (Fire Connection)	20.0	Ductile Iron	130.0	0.390
P-54	162.57	Parcel 11A (Fire Connection)	J-54	20.0	Ductile Iron	130.0	0.390
P-37	380.14	Truck Company	Theater	20.0	Ductile Iron	80.0	0.800
P-38	279.28	Theater	Office	12.0	Ductile Iron	100.0	0.800
P-60	675.92	J-60	J-70	12.0	Ductile Iron	130.0	0.390
P-58	83.19	Circuit City	J-59	12.0	Ductile Iron	130.0	0.390
P-59	398.81	J-59	J-60	12.0	Ductile Iron	130.0	0.390
P-53	99.53	Home Depot	Parcel 11A (Domestic)	12.0	Ductile Iron	130.0	0.390
P-48	330.28	Parcel 11A (Domestic)	Circuit City	12.0	Ductile Iron	130.0	0.390
P-76A	169.97	J-77	Block 3	12.0	Ductile Iron	130.0	0.390
P-75A	93.56	J-75	Block 4A	12.0	Ductile Iron	130.0	0.390
P-83B	141.24	Block 6A	J-84	12.0	Ductile Iron	130.0	0.390
P-61	1,024.72	Court	J-62	20.0	Ductile Iron	130.0	0.800
P-62	277.24	J-62	J-63	20.0	Ductile Iron	130.0	0.800
P-61A	89.16	J-62	Block 10	8.0	Ductile Iron	130.0	0.390
P-71	612.22	Dam	J-70	20.0	Ductile Iron	130.0	0.390
P-82	323.16	J-83	J-82	20.0	Ductile Iron	130.0	0.390
P-83	91.32	J-84	J-83	20.0	Ductile Iron	130.0	0.390
P-2	280.48	Christian Assembly	J-2	20.0	Ductile Iron	80.0	0.390
P-1A	213.28	J-2	Dunkin Donuts/Sunrise	20.0	Ductile Iron	80.0	0.390
P-74	819.64	J-63	J-75	8.0	Ductile Iron	130.0	0.390
P-81A	97.06	Block 7A	J-82	12.0	Ductile Iron	130.0	0.390
P-80	349.19	J-115	J-83	8.0	Ductile Iron	130.0	0.390
P-56A	458.24	J-57	J-83	12.0	Ductile Iron	130.0	0.390
P-242	517.45	WHYC	J-159	20.0	Ductile Iron	130.0	0.390
P-243	374.38	J-159	Dam	20.0	Ductile Iron	130.0	0.390
P-244	151.05	J-159	J-160	12.0	Ductile Iron	130.0	0.000
P-245	281.80	J-160	J-161	12.0	Ductile Iron	130.0	0.000
P-247	11.17	J-160	H-3	6.0	Ductile Iron	130.0	0.000
P-248	34.32	J-161	J-162	8.0	Ductile Iron	130.0	0.000
P-249	12.61	J-162	H-2	6.0	Ductile Iron	130.0	0.000

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Scenario: 3,500 ISO
Current Time Step: 0.000 Hr
Junction FlexTable:

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
Court	12.60	3.00	168.88	67.6
J-63	13.40	0.00	168.89	67.3
J-64	12.00	0.00	168.90	67.9
J-66	13.20	0.00	168.90	67.4
J-67	13.00	0.00	168.88	67.4
J-68	12.50	0.00	168.87	67.7
J-9	10.00	0.00	168.87	68.7
J-33	8.20	0.00	168.87	69.5
Truck Company	9.10	2.00	168.87	69.1
Spaulding Brick	10.70	1.00	168.87	68.4
J-65	13.00	0.00	168.90	67.5
J-70	12.00	0.00	168.86	67.9
J-56	13.50	0.00	168.86	67.2
J-54	10.00	0.00	168.87	68.7
J-49	12.00	0.00	168.86	67.9
J-51	10.70	0.00	168.86	68.4
Dunkin Donuts/Sunrise	9.20	3.00	168.87	69.1
Christian Assembly	9.50	1.00	168.87	69.0
Pub 99 Restaurant	9.20	17.00	168.87	69.1
Warehouse	8.40	1.00	168.87	69.4
J-2	7.80	0.00	168.87	69.7
J-68	14.00	0.00	168.86	67.0
J-70	13.00	0.00	168.86	67.4
J-54	12.00	0.00	168.86	67.9
Home Depot	11.00	9.00	168.86	68.3
J-47	10.50	0.00	168.86	68.5
J-46	11.00	0.00	168.86	68.3
J-45	11.30	0.00	168.86	68.2
J-44	15.50	0.00	168.86	66.4
Ecco Tracer	26.00	3.00	168.86	61.8
Ashton Fuel/Hillside	31.50	2.00	168.86	59.4
J-12	9.00	0.00	168.87	69.2
J-21	9.50	0.00	168.87	69.0
J-20	9.10	0.00	168.87	69.1
J-19	10.80	0.00	168.87	68.4
J-18	11.50	0.00	168.87	68.1
J-17	12.00	0.00	168.87	67.9
J-16	10.70	0.00	168.87	68.4
J-5	10.70	0.00	168.87	68.4
J-6	10.10	0.00	168.87	68.7
J-10	8.00	0.00	168.87	69.6
J-30	12.20	0.00	168.88	67.8
La Quinta	10.50	23.00	168.87	68.5
J-29	11.50	0.00	168.87	68.1
J-34	8.50	0.00	168.87	69.4
Office	9.80	10.00	168.86	68.8
Enterprise	31.50	1.00	168.86	59.4
J-15	10.10	0.00	168.87	68.7
Staples	11.40	3.00	168.87	68.1
J-14	8.40	0.00	168.87	69.4
Christmas Tree Shops	11.40	4.00	168.87	68.1
J-7	10.30	0.00	168.87	68.6
Sports Authority	10.80	3.00	168.87	68.4
A C Moore	11.40	3.00	168.87	68.1
J-8	7.50	0.00	168.87	69.8

J-9	8.00	0.00	168.87	69.6
J-11	9.50	0.00	168.87	69.0
T J Maxx	10.60	4.00	168.87	68.5
Bed Bath & Beyond	11.10	3.00	168.87	68.3
J-57	13.00	0.00	168.86	67.4
Circuit City	9.00	2.00	168.86	69.2
J-83	12.50	0.00	168.86	67.7
J-115	12.20	0.00	168.87	67.8
J-75	11.90	0.00	168.87	67.9
WHYC	12.60	1.00	168.87	67.6
Dam	12.50	1.00	168.86	67.7
J-77	12.00	0.00	168.88	67.9
J-75	12.50	0.00	168.87	67.7
J-82	12.50	0.00	168.86	67.7
J-79	12.00	0.00	168.88	67.9
J-84	12.50	0.00	168.86	67.7
J-85	12.50	0.00	168.86	67.7
Block 1	13.00	83.00	168.87	67.4
Block 2	13.00	40.00	168.87	67.4
Block 3	13.00	160.00	168.86	67.4
Block 4A	13.00	70.00	168.87	67.4
Block 5	13.00	104.00	168.86	67.4
Block 6A	13.00	24.00	168.86	67.4
Block 6B/C	13.00	101.00	168.86	67.4
Block 7A	13.50	136.00	168.86	67.2
Block 8A	13.00	43.00	168.86	67.4
Block 8B	13.00	81.00	168.86	67.4
Block 9	14.20	45.00	168.86	66.9
Parcel 11A (Fire Connection)	13.00	0.00	168.86	67.4
Theater	9.31	15.00	168.87	69.0
J-60	11.00	0.00	168.86	68.3
J-59	10.30	0.00	168.86	68.6
Parcel 11A (Domestic)	11.00	120.00	168.86	68.3
J-62	12.50	0.00	168.89	67.7
Block 10	12.00	11.00	168.89	67.9
J-159	0.00	0.00	168.87	73.1
J-160	0.00	0.00	168.87	73.1
J-161	0.00	0.00	168.87	73.1
J-162	0.00	0.00	168.87	73.1

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Appendix B

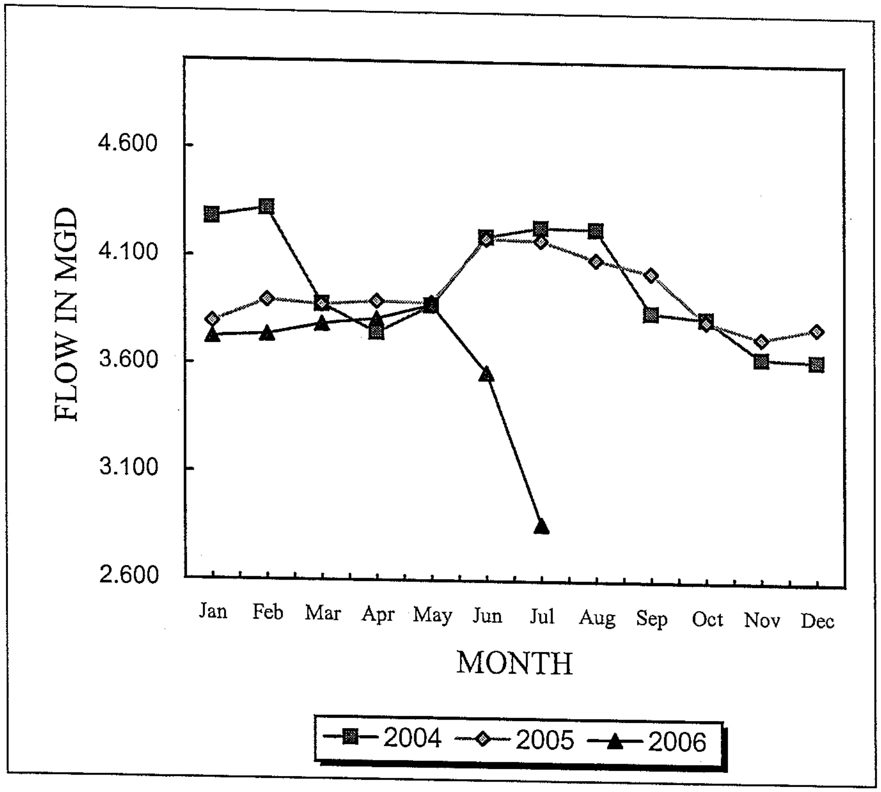
MWRA Meter 91 Readings

8/8/2006

Somerville - Total Daily Flow

Low Service

Month	2004 Flow (MGD)	2005 Flow (MGD)	2006 Flow (MGD)
Jan	4.280	3.796	3.727
Feb	4.321	3.897	3.739
Mar	3.879	3.878	3.789
Apr	3.750	3.895	3.814
May	3.877	3.889	3.880
Jun	4.196	4.187	3.564
Jul	4.240	4.181	2.864
Aug	4.234	4.093	
Sep	3.852	4.034	
Oct	3.826	3.813	
Nov	3.642	3.736	
Dec	3.632	3.787	
Average	3.978	3.929	



Meter 91 Flows:

MWRA Meter 91 daily Flows

Time	CH 1 High Flow	CH 2 Pressure (HGL)
12/9/2003 0:00	1.053	
12/10/2003 0:00	1.042	
12/11/2003 0:00	1.081	
12/12/2003 0:00	1.079	
12/13/2003 0:00	1.103	
12/14/2003 0:00	1.121	
12/15/2003 0:00	1.212	
12/16/2003 0:00	1.046	
12/17/2003 0:00	1.019	
12/18/2003 0:00	1.026	
12/19/2003 0:00	0.998	
12/20/2003 0:00	0.96	
12/21/2003 0:00	0.95	
12/22/2003 0:00	1.021	
12/23/2003 0:00	0.912	
12/24/2003 0:00	0.874	
12/25/2003 0:00	0.822	
12/26/2003 0:00	0.953	
12/27/2003 0:00	0.976	
12/28/2003 0:00	0.976	
12/29/2003 0:00	1.046	
12/30/2003 0:00	1.077	
12/31/2003 0:00	1.071	
1/1/2004 0:00	0.959	
1/2/2004 0:00	0.943	
1/3/2004 0:00	0.928	
1/4/2004 0:00	0.949	
1/5/2004 0:00	0.941	
1/6/2004 0:00	1.027	
1/7/2004 0:00	1.094	186.27
1/8/2004 0:00	1.132	186.61
1/9/2004 0:00	1.127	187.009
1/10/2004 0:00	1.159	186.525
1/11/2004 0:00	1.199	187.002
1/12/2004 0:00	1.238	187.934
1/13/2004 0:00	1.103	184.955
1/14/2004 0:00	1.079	183.661
1/15/2004 0:00	1.093	184.041
1/16/2004 0:00	1.128	183.913
1/17/2004 0:00	1.163	183.674
1/18/2004 0:00	1.083	183.203
1/19/2004 0:00	1.131	183.886
1/20/2004 0:00	1.11	184.27
1/21/2004 0:00	1.094	184.339
1/22/2004 0:00	1.08	183.91
1/23/2004 0:00	1.096	184.261
1/24/2004 0:00	1.134	183.889
1/25/2004 0:00	1.127	183.916
1/26/2004 0:00	1.162	184.783

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Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
1/27/2004 0:00	1.188	184.651
1/28/2004 0:00	1.176	184.672
1/29/2004 0:00	1.29	184.858
1/30/2004 0:00	1.147	184.736
1/31/2004 0:00	1.169	184.103
2/1/2004 0:00	1.172	184.044
2/2/2004 0:00	1.156	184.602
2/3/2004 0:00	1.15	184.545
2/4/2004 0:00	1.188	184.682
2/5/2004 0:00	1.168	184.376
2/6/2004 0:00	1.105	184.078
2/7/2004 0:00	1.127	183.566
2/8/2004 0:00	1.119	183.341
2/9/2004 0:00	1.111	183.88
2/10/2004 0:00	1.12	183.813
2/11/2004 0:00	1.096	183.707
2/12/2004 0:00	1.147	184.23
2/13/2004 0:00	1.151	184.278
2/14/2004 0:00	1.179	183.346
2/15/2004 0:00	1.152	183.133
2/16/2004 0:00	1.179	183.671
2/17/2004 0:00	1.224	184.984
2/18/2004 0:00	1.293	185.555
2/19/2004 0:00	1.26	184.254
2/20/2004 0:00	1.135	183.789
2/21/2004 0:00	1.104	182.821
2/22/2004 0:00	1.126	182.732
2/23/2004 0:00	1.107	183.268
2/24/2004 0:00	1.085	182.854
2/25/2004 0:00	1.079	183.323
2/26/2004 0:00	1.052	182.972
2/27/2004 0:00	1.051	183.495
2/28/2004 0:00	1.087	183.115
2/29/2004 0:00	1.057	183.172
3/1/2004 0:00	1.05	183.546
3/2/2004 0:00	1.024	183.23
3/3/2004 0:00	0.998	183.318
3/4/2004 0:00	0.913	183.468
3/5/2004 0:00	0.896	183.562
3/6/2004 0:00	0.928	183.358
3/7/2004 0:00	0.937	183.492
3/8/2004 0:00	0.898	183.907
3/9/2004 0:00	0.894	183.808
3/10/2004 0:00	0.917	184.006
3/11/2004 0:00	0.911	178.064
3/12/2004 0:00	0.887	184.164
3/13/2004 0:00	1.14	183.785
3/14/2004 0:00	0.949	183.044
3/15/2004 0:00	0.92	183.777
3/16/2004 0:00	0.883	184.157
3/17/2004 0:00	0.901	184.455

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
3/18/2004 0:00	0.896	184.393
3/19/2004 0:00	0.907	184.771
3/20/2004 0:00	0.952	184.715
3/21/2004 0:00	0.941	184.932
3/22/2004 0:00	0.898	185.155
3/23/2004 0:00	0.904	185.471
3/24/2004 0:00	0.911	185.2
3/25/2004 0:00	0.904	185.309
3/26/2004 0:00	0.908	185.167
3/27/2004 0:00	0.945	185.037
3/28/2004 0:00	0.947	184.92
3/29/2004 0:00	0.919	185.067
3/30/2004 0:00	0.901	185.161
3/31/2004 0:00	0.896	184.609
4/1/2004 0:00	1.07	184.851
4/2/2004 0:00	1.098	184.303
4/3/2004 0:00	1.034	184.423
4/4/2004 0:00	0.986	183.897
4/5/2004 0:00	0.908	183.592
4/6/2004 0:00	0.919	184.742
4/7/2004 0:00	0.914	184.556
4/8/2004 0:00	0.901	184.444
4/9/2004 0:00	0.924	184.554
4/10/2004 0:00	0.953	184.119
4/11/2004 0:00	0.905	183.978
4/12/2004 0:00	0.905	183.985
4/13/2004 0:00	0.95	184.309
4/14/2004 0:00	0.914	183.866
4/15/2004 0:00	0.896	183.84
4/16/2004 0:00	0.9	183.918
4/17/2004 0:00	0.944	183.671
4/18/2004 0:00	0.922	183.498
4/19/2004 0:00	0.945	183.555
4/20/2004 0:00	0.942	183.431
4/21/2004 0:00	0.917	183.004
4/22/2004 0:00	0.944	182.497
4/23/2004 0:00	0.878	182.829
4/24/2004 0:00	0.931	182.881
4/25/2004 0:00	0.928	183.059
4/26/2004 0:00	0.888	182.84
4/27/2004 0:00	0.903	182.996
4/28/2004 0:00	0.911	182.905
4/29/2004 0:00	0.931	182.59
4/30/2004 0:00	0.959	182.481
5/1/2004 0:00	0.969	181.757
5/2/2004 0:00	0.958	181.638
5/3/2004 0:00	0.925	181.967
5/4/2004 0:00	0.916	181.415
5/5/2004 0:00	0.931	181.994
5/6/2004 0:00	0.913	182.41
5/7/2004 0:00	0.936	181.368

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
5/8/2004 0:00	0.931	182.06
5/9/2004 0:00	0.905	182.338
5/10/2004 0:00	0.919	182.568
5/11/2004 0:00	0.982	181.67
5/12/2004 0:00	0.971	181.285
5/13/2004 0:00	0.964	180.856
5/14/2004 0:00	0.954	181.781
5/15/2004 0:00	1.384	181.6
5/16/2004 0:00	0.994	180.943
5/17/2004 0:00	0.994	181.465
5/18/2004 0:00	1.006	181.987
5/19/2004 0:00	0.992	181.153
5/20/2004 0:00	1.016	181.083
5/21/2004 0:00	1.025	181.117
5/22/2004 0:00	1.016	180.858
5/23/2004 0:00	1.029	181.418
5/24/2004 0:00	0.97	181.776
5/25/2004 0:00	0.966	182.062
5/26/2004 0:00	0.968	182.125
5/27/2004 0:00	0.983	182.003
5/28/2004 0:00	0.962	182.169
5/29/2004 0:00	0.982	182.22
5/30/2004 0:00	0.953	182.047
5/31/2004 0:00	1.05	181.508
6/1/2004 0:00	0.976	181.894
6/2/2004 0:00	1.046	180.872
6/3/2004 0:00	1.037	180.715
6/4/2004 0:00	1.025	180.56
6/5/2004 0:00	0.988	180.576
6/6/2004 0:00	0.972	180.926
6/7/2004 0:00	0.989	180.982
6/8/2004 0:00	1.125	180.521
6/9/2004 0:00	1.148	180.085
6/10/2004 0:00	1.025	180.566
6/11/2004 0:00	1.073	180.752
6/12/2004 0:00	1.095	180.918
6/13/2004 0:00	1.106	180.879
6/14/2004 0:00	1.116	180.995
6/15/2004 0:00	1.202	180.671
6/16/2004 0:00	1.185	180.985
6/17/2004 0:00	1.151	181.841
6/18/2004 0:00	1.077	180.721
6/19/2004 0:00	1.083	181.318
6/20/2004 0:00	1.037	181.308
6/21/2004 0:00	1.09	181.206
6/22/2004 0:00	1.131	183.46
6/23/2004 0:00	1.147	182.82
6/24/2004 0:00	1.168	183.442
6/25/2004 0:00	1.127	182.216
6/26/2004 0:00	1.025	181.045
6/27/2004 0:00	1.027	180.998

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
6/28/2004 0:00	1.18	181.958
6/29/2004 0:00	1.202	182.761
6/30/2004 0:00	1.269	183.446
7/1/2004 0:00	1.257	183.088
7/2/2004 0:00	1.162	179.79
7/3/2004 0:00	1.085	178.764
7/4/2004 0:00	1.047	179.172
7/5/2004 0:00	1.068	179.666
7/6/2004 0:00	1.176	181.74
7/7/2004 0:00	1.222	180.83
7/8/2004 0:00	1.221	182.651
7/9/2004 0:00	1.236	183.054
7/10/2004 0:00	1.181	181.521
7/11/2004 0:00	1.157	182.012
7/12/2004 0:00	1.269	183.443
7/13/2004 0:00	1.179	182.362
7/14/2004 0:00	1.171	183.765
7/15/2004 0:00	1.218	184.137
7/16/2004 0:00	1.257	183.798
7/17/2004 0:00	1.244	184.4
7/18/2004 0:00	1.201	183.184
7/19/2004 0:00	1.2	183.704
7/20/2004 0:00	1.281	184.344
7/21/2004 0:00	1.316	184.086
7/22/2004 0:00	1.352	184.327
7/23/2004 0:00	1.328	184.797
7/24/2004 0:00	1.17	182.528
7/25/2004 0:00	1.151	181.981
7/26/2004 0:00	1.212	182.973
7/27/2004 0:00	1.149	182.429
7/28/2004 0:00	1.112	182.124
7/29/2004 0:00	1.191	183.06
7/30/2004 0:00	1.242	183.112
7/31/2004 0:00	1.195	182.185
8/1/2004 0:00	1.146	181.463
8/2/2004 0:00	1.266	182.715
8/3/2004 0:00	1.298	183.515
8/4/2004 0:00	1.26	182.979
8/5/2004 0:00	1.193	183.007
8/6/2004 0:00	1.17	182.869
8/7/2004 0:00	1.211	182.123
8/8/2004 0:00	1.117	181.966
8/9/2004 0:00	1.237	183.096
8/10/2004 0:00	1.261	185.377
8/11/2004 0:00	1.249	185.825
8/12/2004 0:00	1.264	185.782
8/13/2004 0:00	1.074	178.869
8/14/2004 0:00	0.992	175.663
8/15/2004 0:00	0.969	176.109
8/16/2004 0:00	0.983	174.155
8/17/2004 0:00	0.984	176.065

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
8/18/2004 0:00	1.005	176.332
8/19/2004 0:00	1.06	176.159
8/20/2004 0:00	1.059	176.332
8/21/2004 0:00	0.99	176.454
8/22/2004 0:00	0.972	176.978
8/23/2004 0:00	0.992	176.799
8/24/2004 0:00	0.99	177.245
8/25/2004 0:00	0.992	177.728
8/26/2004 0:00	1.024	177.547
8/27/2004 0:00	1.029	177.271
8/28/2004 0:00	1.03	176.625
8/29/2004 0:00	1.036	176.519
8/30/2004 0:00	1.081	177.385
8/31/2004 0:00	1.017	177.284
9/1/2004 0:00	1.283	177.398
9/2/2004 0:00	1.089	177.502
9/3/2004 0:00	1.056	177.377
9/4/2004 0:00	1.033	177.49
9/5/2004 0:00	0.978	177.856
9/6/2004 0:00	1.041	177.858
9/7/2004 0:00	0.991	178.084
9/8/2004 0:00	0.991	177.752
9/9/2004 0:00	0.991	178.02
9/10/2004 0:00	0.991	178.09
9/11/2004 0:00	0.991	178.283
9/12/2004 0:00	0.991	178.35
9/13/2004 0:00	0.991	178.677
9/14/2004 0:00	0.991	178.976
9/15/2004 0:00	0.991	178.792
9/16/2004 0:00	0.991	166.019
9/17/2004 0:00	1.18	179.504
9/18/2004 0:00	1.148	178.918
9/19/2004 0:00	1.107	178.561
9/20/2004 0:00	1.087	179.848
9/21/2004 0:00	1.065	179.491
9/22/2004 0:00	1.111	179.482
9/23/2004 0:00	1.09	178.981
9/24/2004 0:00	1.076	179.343
9/25/2004 0:00	1.062	178.417
9/26/2004 0:00	1.044	177.903
9/27/2004 0:00	1.071	178.944
9/28/2004 0:00	1.073	179.298
9/29/2004 0:00	1.006	178.267
9/30/2004 0:00	1	179.083
10/1/2004 0:00	1.042	179.808
10/2/2004 0:00	1.004	178.111
10/3/2004 0:00	1.014	178.165
10/4/2004 0:00	1.04	179.028
10/5/2004 0:00	1.079	179.589
10/6/2004 0:00	1.058	179.419
10/7/2004 0:00	1.128	180.397

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
10/8/2004 0:00	1.077	179.566
10/9/2004 0:00	1.067	179.171
10/10/2004 0:00	1.017	178.905
10/11/2004 0:00	1.08	178.803
10/12/2004 0:00	0.584	180.482
10/13/2004 0:00	0	
10/14/2004 0:00	0	179.427
10/15/2004 0:00	0	180.108
10/16/2004 0:00	0	179.818
10/17/2004 0:00	0	180.116
10/18/2004 0:00	0	180.443
10/19/2004 0:00	0	180.634
10/20/2004 0:00	0	180.856
10/21/2004 0:00	0	180.836
10/22/2004 0:00	0	181.1
10/23/2004 0:00	0	180.885
10/24/2004 0:00	0	180.967
10/25/2004 0:00	0	180.918
10/26/2004 0:00	0	181.25
10/27/2004 0:00	0	181.761
10/28/2004 0:00	0	181.049
10/29/2004 0:00	0	181.437
10/30/2004 0:00	0	180.827
10/31/2004 0:00	0	181.313
11/1/2004 0:00	0	181.22
11/2/2004 0:00	0	181.52
11/3/2004 0:00	0	181.647
11/4/2004 0:00	0	181.696
11/5/2004 0:00	0	182.076
11/6/2004 0:00	0	181.405
11/7/2004 0:00	0	181.162
11/8/2004 0:00	0	182.304
11/9/2004 0:00	0	182.229
11/10/2004 0:00	0	182.317
11/11/2004 0:00	0	182.328
11/12/2004 0:00	0	182.349
11/13/2004 0:00	0	181.755
11/14/2004 0:00	0	181.686
11/15/2004 0:00	0	182.213
11/16/2004 0:00	0	181.919
11/17/2004 0:00	0	182.318
11/18/2004 0:00	0	182.77
11/19/2004 0:00	0	182.737
11/20/2004 0:00	0	182.039
11/21/2004 0:00	0	182.158
11/22/2004 0:00	0	182.998
11/23/2004 0:00	0	182.492
11/24/2004 0:00	0	182.355
11/25/2004 0:00	0	181.467
11/26/2004 0:00	0	181.736
11/27/2004 0:00	0	181.499

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
11/28/2004 0:00	0	181.882
11/29/2004 0:00	0	166.426
11/30/2004 0:00	0	
12/1/2004 0:00	0	
12/2/2004 0:00	0	
12/3/2004 0:00	0	
12/4/2004 0:00	0	
12/5/2004 0:00	0	
12/6/2004 0:00	0	
12/7/2004 0:00	0	
12/8/2004 0:00	0	
12/9/2004 0:00	0	
12/10/2004 0:00	0	
12/11/2004 0:00	0	
12/12/2004 0:00	0	
12/13/2004 0:00	0	
12/14/2004 0:00	0	
12/15/2004 0:00	0	
12/16/2004 0:00	0	
12/17/2004 0:00	0	
12/18/2004 0:00	0	
12/19/2004 0:00	0	
12/20/2004 0:00	0	
12/21/2004 0:00	0	
12/22/2004 0:00	0	
12/23/2004 0:00	0	
12/24/2004 0:00	0	
12/25/2004 0:00	0	
12/26/2004 0:00	0	
12/27/2004 0:00	0	
12/28/2004 0:00	0	
12/29/2004 0:00	0	
12/30/2004 0:00	0	
12/31/2004 0:00	0	
1/1/2005 0:00	0	
1/2/2005 0:00	0	
1/3/2005 0:00	0	
1/4/2005 0:00	0	
1/5/2005 0:00	0	
1/6/2005 0:00	0	
1/7/2005 0:00	0	
1/8/2005 0:00	0	
1/9/2005 0:00	0	
1/10/2005 0:00	0	
1/11/2005 0:00	0	
1/12/2005 0:00	0	
1/13/2005 0:00	0	
1/14/2005 0:00	0	
1/15/2005 0:00	0	
1/16/2005 0:00	0	
1/17/2005 0:00	0	

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
1/18/2005 0:00	0	
1/19/2005 0:00	0	
1/20/2005 0:00	0	
1/21/2005 0:00	0	
1/22/2005 0:00	0	
1/23/2005 0:00	0	
1/24/2005 0:00	0	
1/25/2005 0:00	0	
1/26/2005 0:00	0	
1/27/2005 0:00	0	
1/28/2005 0:00	0	
1/29/2005 0:00	0	
1/30/2005 0:00	0	
1/31/2005 0:00	0	
2/1/2005 0:00	0	
2/2/2005 0:00	0	
2/3/2005 0:00	0	
2/4/2005 0:00	0	
2/5/2005 0:00	0	
2/6/2005 0:00	0	
2/7/2005 0:00	0	
2/8/2005 0:00	0	
2/9/2005 0:00	0	
2/10/2005 0:00	0	
2/11/2005 0:00	0	
2/12/2005 0:00	0	
2/13/2005 0:00	0	
2/14/2005 0:00	0	
2/15/2005 0:00	0	
2/16/2005 0:00	0	
2/17/2005 0:00	0	
2/18/2005 0:00	0	
2/19/2005 0:00	0	
2/20/2005 0:00	0	
2/21/2005 0:00	0	
2/22/2005 0:00	0	
2/23/2005 0:00	0	
2/24/2005 0:00	0	
2/25/2005 0:00	0	
2/26/2005 0:00	0	
2/27/2005 0:00	0	
2/28/2005 0:00	0	
3/1/2005 0:00	0	
3/2/2005 0:00	0	
3/3/2005 0:00	0	
3/4/2005 0:00	0	
3/5/2005 0:00	0	
3/6/2005 0:00	0	
3/7/2005 0:00	0	
3/8/2005 0:00	0	
3/9/2005 0:00	0	

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
3/10/2005 0:00	0	
3/11/2005 0:00	0	
3/12/2005 0:00	0	
3/13/2005 0:00	0	
3/14/2005 0:00	0	
3/15/2005 0:00	0	
3/16/2005 0:00	0	
3/17/2005 0:00	0	
3/18/2005 0:00	0	
3/19/2005 0:00	0	
3/20/2005 0:00	0	
3/21/2005 0:00	0	
3/22/2005 0:00	0	
3/23/2005 0:00	0	
3/24/2005 0:00	0	
3/25/2005 0:00	0	
3/26/2005 0:00	0	
3/27/2005 0:00	0	
3/28/2005 0:00	0	
3/29/2005 0:00	0	
3/30/2005 0:00	0	
3/31/2005 0:00	0	
4/1/2005 0:00	0	
4/2/2005 0:00	0	
4/3/2005 0:00	0	
4/4/2005 0:00	0	
4/5/2005 0:00	0	
4/6/2005 0:00	0	
4/7/2005 0:00	0	
4/8/2005 0:00	0	
4/9/2005 0:00	0	
4/10/2005 0:00	0	
4/11/2005 0:00	0	
4/12/2005 0:00	0	
4/13/2005 0:00	0	
4/14/2005 0:00	0	
4/15/2005 0:00	0	
4/16/2005 0:00	0	
4/17/2005 0:00	0	
4/18/2005 0:00	0	
4/19/2005 0:00	0	
4/20/2005 0:00	0	
4/21/2005 0:00	0	
4/22/2005 0:00	0	
4/23/2005 0:00	0	
4/24/2005 0:00	0	
4/25/2005 0:00	0	
4/26/2005 0:00	0	
4/27/2005 0:00	0	
4/28/2005 0:00	0	
4/29/2005 0:00	0	

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
4/30/2005 0:00	0	
5/1/2005 0:00	0	
5/2/2005 0:00	0	
5/3/2005 0:00	0	
5/4/2005 0:00	0	
5/5/2005 0:00	0	
5/6/2005 0:00	0	
5/7/2005 0:00	0	
5/8/2005 0:00	0	
5/9/2005 0:00	0	
5/10/2005 0:00	0	
5/11/2005 0:00	0	
5/12/2005 0:00	0	
5/13/2005 0:00	0	
5/14/2005 0:00	0	
5/15/2005 0:00	0	
5/16/2005 0:00	0	
5/17/2005 0:00	0	
5/18/2005 0:00	0	
5/19/2005 0:00	0	
5/20/2005 0:00	0	
5/21/2005 0:00	0	
5/22/2005 0:00	0	
5/23/2005 0:00	0	
5/24/2005 0:00	0	
5/25/2005 0:00	0	
5/26/2005 0:00	0	
5/27/2005 0:00	0	
5/28/2005 0:00	0	
5/29/2005 0:00	0	
5/30/2005 0:00	0	
5/31/2005 0:00	0	
6/1/2005 0:00	0	
6/2/2005 0:00	0	
6/3/2005 0:00	0	
6/4/2005 0:00	0	
6/5/2005 0:00	0	
6/6/2005 0:00	0	
6/7/2005 0:00	0	
6/8/2005 0:00	0	178.778
6/9/2005 0:00	0	179.743
6/10/2005 0:00	0	179.731
6/11/2005 0:00	0	179.585
6/12/2005 0:00	0	179.552
6/13/2005 0:00	0	179.738
6/14/2005 0:00	0	179.71
6/15/2005 0:00	0	180.619
6/16/2005 0:00	0	180.673
6/17/2005 0:00	0	180.159
6/18/2005 0:00	0	180.443
6/19/2005 0:00	0	180.54

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
6/20/2005 0:00	0	184.007
6/21/2005 0:00	0	183.715
6/22/2005 0:00	0	183.694
6/23/2005 0:00	0	182.204
6/24/2005 0:00	0	179.489
6/25/2005 0:00	0	179.167
6/26/2005 0:00	0	179.359
6/27/2005 0:00	0	179.436
6/28/2005 0:00	0	179.393
6/29/2005 0:00	0	180.196
6/30/2005 0:00	0	179.392
7/1/2005 0:00	0	179.025
7/2/2005 0:00	0	178.21
7/3/2005 0:00	0	176.216
7/4/2005 0:00	0	176.991
7/5/2005 0:00	0	179.828
7/6/2005 0:00	0	178.701
7/7/2005 0:00	0	177.141
7/8/2005 0:00	0	176.871
7/9/2005 0:00	0	177.005
7/10/2005 0:00	0	177.516
7/11/2005 0:00	0	179.832
7/12/2005 0:00	0.437	179.18
7/13/2005 0:00	0.951	179.172
7/14/2005 0:00	0.95	179.186
7/15/2005 0:00	0.964	178.716
7/16/2005 0:00	0.959	178.191
7/17/2005 0:00	0.919	177.526
7/18/2005 0:00	0.906	179.276
7/19/2005 0:00	0.934	179.747
7/20/2005 0:00	0.903	171.863
7/21/2005 0:00	0.952	178.842
7/22/2005 0:00	0.967	178.547
7/23/2005 0:00	0.927	175.731
7/24/2005 0:00	0.912	175.446
7/25/2005 0:00	0.928	178.679
7/26/2005 0:00	0.947	178.626
7/27/2005 0:00	0.94	177.945
7/28/2005 0:00	0.928	176.61
7/29/2005 0:00	0.934	176.213
7/30/2005 0:00	0.947	174.174
7/31/2005 0:00	0.903	173.532
8/1/2005 0:00	0.91	176.486
8/2/2005 0:00	0.889	177.711
8/3/2005 0:00	0.905	176.298
8/4/2005 0:00	0.908	176.413
8/5/2005 0:00	0.923	176.74
8/6/2005 0:00	0.921	174.201
8/7/2005 0:00	0.919	174.525
8/8/2005 0:00	0.952	177.352
8/9/2005 0:00	0.922	177.524

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
8/10/2005 0:00	0.939	178.47
8/11/2005 0:00	0.947	178.147
8/12/2005 0:00	0.907	176.591
8/13/2005 0:00	0.937	175.812
8/14/2005 0:00	0.916	173.769
8/15/2005 0:00	0.875	174.934
8/16/2005 0:00	0.884	175.127
8/17/2005 0:00	0.908	176.467
8/18/2005 0:00	0.904	175.172
8/19/2005 0:00	0.911	175.499
8/20/2005 0:00	0.926	174.413
8/21/2005 0:00	0.924	174.483
8/22/2005 0:00	0.917	176.677
8/23/2005 0:00	0.908	176.175
8/24/2005 0:00	0.884	174.914
8/25/2005 0:00	0.885	175.422
8/26/2005 0:00	0.902	176.273
8/27/2005 0:00	0.925	174.463
8/28/2005 0:00	0.917	174.145
8/29/2005 0:00	0.958	175.93
8/30/2005 0:00	0.86	174.187
8/31/2005 0:00	0.884	175.645
9/1/2005 0:00	0.884	175.717
9/2/2005 0:00	0.904	175.61
9/3/2005 0:00	0.899	174.95
9/4/2005 0:00	0.861	174.534
9/5/2005 0:00	0.9	175.304
9/6/2005 0:00	0.903	175.901
9/7/2005 0:00	0.911	176.147
9/8/2005 0:00	0.905	176.166
9/9/2005 0:00	0.891	175.862
9/10/2005 0:00	0.948	175.743
9/11/2005 0:00	0.944	175.997
9/12/2005 0:00	0.921	176.633
9/13/2005 0:00	0.909	176.256
9/14/2005 0:00	0.918	176.407
9/15/2005 0:00	0.892	176.021
9/16/2005 0:00	0.88	175.432
9/17/2005 0:00	0.913	175.499
9/18/2005 0:00	0.927	175.991
9/19/2005 0:00	0.895	176.551
9/20/2005 0:00	0.867	175.64
9/21/2005 0:00	0.878	175.193
9/22/2005 0:00	0.868	175.261
9/23/2005 0:00	0.856	175.246
9/24/2005 0:00	0.893	175.013
9/25/2005 0:00	0.887	175.148
9/26/2005 0:00	0.859	175.513
9/27/2005 0:00	0.869	175.072
9/28/2005 0:00	0.864	174.8
9/29/2005 0:00	1.106	174.576

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
9/30/2005 0:00	1.234	174.197
10/1/2005 0:00	1.273	174.007
10/2/2005 0:00	1.271	174.215
10/3/2005 0:00	1.27	174.357
10/4/2005 0:00	1.251	174.326
10/5/2005 0:00	1.269	174.419
10/6/2005 0:00	1.257	174.325
10/7/2005 0:00	1.234	174.242
10/8/2005 0:00	1.247	174.04
10/9/2005 0:00	1.254	173.99
10/10/2005 0:00	1.24	174.245
10/11/2005 0:00	1.22	174.483
10/12/2005 0:00	1.213	174.484
10/13/2005 0:00	1.215	174.386
10/14/2005 0:00	1.21	174.811
10/15/2005 0:00	1.35	174.804
10/16/2005 0:00	1.29	174.718
10/17/2005 0:00	1.222	175.237
10/18/2005 0:00	1.201	175.432
10/19/2005 0:00	1.22	176.173
10/20/2005 0:00	1.21	176.242
10/21/2005 0:00	1.207	176.491
10/22/2005 0:00	1.238	176.751
10/23/2005 0:00	1.251	176.914
10/24/2005 0:00	1.212	176.839
10/25/2005 0:00	1.252	176.918
10/26/2005 0:00	1.267	175.423
10/27/2005 0:00	0.709	174.367
10/28/2005 0:00	0.32	174.691
10/29/2005 0:00	0.458	174.674
10/30/2005 0:00	0.464	174.638
10/31/2005 0:00	0.345	174.866
11/1/2005 0:00	0.398	174.855
11/2/2005 0:00	0.435	174.934
11/3/2005 0:00	1.437	174.207
11/4/2005 0:00	1.124	174.356
11/5/2005 0:00	0.652	174.466
11/6/2005 0:00	0.872	174.743
11/7/2005 0:00	0.752	174.937
11/8/2005 0:00	0.348	175.146
11/9/2005 0:00	0.339	175.233
11/10/2005 0:00	0.228	175.208
11/11/2005 0:00	0.322	175.33
11/12/2005 0:00	0.297	175.343
11/13/2005 0:00	0.422	175.144
11/14/2005 0:00	0.548	175.552
11/15/2005 0:00	0.576	166.964
11/16/2005 0:00	0.647	165.286
11/17/2005 0:00	0.568	152.151
11/18/2005 0:00	0.54	143.553
11/19/2005 0:00	0.603	143.463

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
11/20/2005 0:00	0.61	143.485
11/21/2005 0:00	0.533	145.071
11/22/2005 0:00	0.453	161.341
11/23/2005 0:00	0.224	173.361
11/24/2005 0:00	0.29	174.633
11/25/2005 0:00	0.224	174.952
11/26/2005 0:00	0.271	174.979
11/27/2005 0:00	0.292	175.034
11/28/2005 0:00	0.274	175.206
11/29/2005 0:00	0.287	175.02
11/30/2005 0:00	0.224	175.199
12/1/2005 0:00	0.211	175.305
12/2/2005 0:00	0.168	175.32
12/3/2005 0:00	0.268	175.377
12/4/2005 0:00	0.218	175.507
12/5/2005 0:00	0.151	175.514
12/6/2005 0:00	0.137	175.426
12/7/2005 0:00	0.14	175.637
12/8/2005 0:00	0.113	175.68
12/9/2005 0:00	0.062	175.691
12/10/2005 0:00	0.209	175.806
12/11/2005 0:00	0.275	175.661
12/12/2005 0:00	0.166	175.979
12/13/2005 0:00	0.169	175.318
12/14/2005 0:00	0.15	176.032
12/15/2005 0:00	0.098	176.009
12/16/2005 0:00	0.081	176.034
12/17/2005 0:00	0.223	176.036
12/18/2005 0:00	0.249	176.151
12/19/2005 0:00	0.16	176.236
12/20/2005 0:00	0.101	176.084
12/21/2005 0:00	0.082	177.485
12/22/2005 0:00	0.056	177.875
12/23/2005 0:00	0.076	178.366
12/24/2005 0:00	0.174	179.076
12/25/2005 0:00	0.063	180.414
12/26/2005 0:00	0.104	179.782
12/27/2005 0:00	0.056	178.803
12/28/2005 0:00	0.265	178.355
12/29/2005 0:00	0.393	177.788
12/30/2005 0:00	0.347	177.929
12/31/2005 0:00	0.432	178.072
1/1/2006 0:00	0.274	178.522
1/2/2006 0:00	0.475	178.845
1/3/2006 0:00	0.233	177.998
1/4/2006 0:00	0.239	178.147
1/5/2006 0:00	0.215	176.263
1/6/2006 0:00	0.207	176.093
1/7/2006 0:00	0.331	176.173
1/8/2006 0:00	0.345	176.251
1/9/2006 0:00	0.214	176.289

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
1/10/2006 0:00	0.241	176.242
1/11/2006 0:00	0.349	176.283
1/12/2006 0:00	0.255	176.245
1/13/2006 0:00	0.213	176.352
1/14/2006 0:00	0.376	176.299
1/15/2006 0:00	0.389	176.565
1/16/2006 0:00	0.466	176.546
1/17/2006 0:00	0.269	176.379
1/18/2006 0:00	0.246	176.315
1/19/2006 0:00	0.283	176.197
1/20/2006 0:00	0.215	176.202
1/21/2006 0:00	0.26	178.156
1/22/2006 0:00	0.288	178.68
1/23/2006 0:00	0.115	178.294
1/24/2006 0:00	0.202	176.093
1/25/2006 0:00	0.209	176.199
1/26/2006 0:00	0.206	176.128
1/27/2006 0:00	0.177	176.198
1/28/2006 0:00	0.297	176.14
1/29/2006 0:00	0.383	176.226
1/30/2006 0:00	0.247	176.36
1/31/2006 0:00	0.184	176.375
2/1/2006 0:00	0.202	176.144
2/2/2006 0:00	0.197	176.084
2/3/2006 0:00	0.149	176.154
2/4/2006 0:00	0.334	176.193
2/5/2006 0:00	0.358	176.156
2/6/2006 0:00	0.236	176.332
2/7/2006 0:00	0.215	176.122
2/8/2006 0:00	0.285	176.189
2/9/2006 0:00	0.257	176.182
2/10/2006 0:00	0.169	176.285
2/11/2006 0:00	0.303	176.21
2/12/2006 0:00	0.278	176.509
2/13/2006 0:00	0.309	176.668
2/14/2006 0:00	0.225	176.422
2/15/2006 0:00	0.267	176.428
2/16/2006 0:00	0.261	176.429
2/17/2006 0:00	0.245	176.58
2/18/2006 0:00	0.366	176.706
2/19/2006 0:00	0.348	176.766
2/20/2006 0:00	0.416	176.745
2/21/2006 0:00	0.285	176.767
2/22/2006 0:00	0.32	176.872
2/23/2006 0:00	0.261	176.638
2/24/2006 0:00	0.303	176.735
2/25/2006 0:00	0.334	176.749
2/26/2006 0:00	0.468	176.856
2/27/2006 0:00	0.301	176.801
2/28/2006 0:00	0.317	176.686
3/1/2006 0:00	0.357	176.801

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
3/2/2006 0:00	0.322	176.773
3/3/2006 0:00	0.338	176.865
3/4/2006 0:00	0.502	176.821
3/5/2006 0:00	0.502	176.649
3/6/2006 0:00	0.4	172.988
3/7/2006 0:00	0.44	176.71
3/8/2006 0:00	0.361	176.524
3/9/2006 0:00	0.391	176.46
3/10/2006 0:00	0.364	176.189
3/11/2006 0:00	0.499	176.233
3/12/2006 0:00	0.491	176.367
3/13/2006 0:00	0.446	176.323
3/14/2006 0:00	0.373	176.208
3/15/2006 0:00	0.381	176.365
3/16/2006 0:00	0.396	176.351
3/17/2006 0:00	0.347	176.203
3/18/2006 0:00	0.441	176.241
3/19/2006 0:00	0.609	176.313
3/20/2006 0:00	0.356	176.357
3/21/2006 0:00	0.325	176.18
3/22/2006 0:00	0.348	176.396
3/23/2006 0:00	0.371	176.341
3/24/2006 0:00	0.335	176.304
3/25/2006 0:00	0.489	176.441
3/26/2006 0:00	0.496	176.541
3/27/2006 0:00	0.438	176.401
3/28/2006 0:00	0.451	176.262
3/29/2006 0:00	0.386	176.098
3/30/2006 0:00	0.404	172.936
3/31/2006 0:00	0.527	176.511
4/1/2006 0:00	0.51	176.321
4/2/2006 0:00	0.595	176.199
4/3/2006 0:00	0.432	176.219
4/4/2006 0:00	0.41	176.159
4/5/2006 0:00	0.387	176.138
4/6/2006 0:00	0.504	176.178
4/7/2006 0:00	0.441	176.176
4/8/2006 0:00	0.65	176.207
4/9/2006 0:00	0.66	176.194
4/10/2006 0:00	0.408	176.202
4/11/2006 0:00	0.186	178.228
4/12/2006 0:00	0.02	182.513
4/13/2006 0:00	0	
4/14/2006 0:00	0	
4/15/2006 0:00	0	
4/16/2006 0:00	0	
4/17/2006 0:00	0	
4/18/2006 0:00	0	
4/19/2006 0:00	0	
4/20/2006 0:00	0	
4/21/2006 0:00	0	

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
4/22/2006 0:00	0	
4/23/2006 0:00	0	
4/24/2006 0:00	0	
4/25/2006 0:00	0	
4/26/2006 0:00	0	
4/27/2006 0:00	0	
4/28/2006 0:00	0	
4/29/2006 0:00	0	
4/30/2006 0:00	0	
5/1/2006 0:00	0	
5/2/2006 0:00	0	
5/3/2006 0:00	0	
5/4/2006 0:00	0	
5/5/2006 0:00	0	
5/6/2006 0:00	0	
5/7/2006 0:00	0	
5/8/2006 0:00	0	
5/9/2006 0:00	0	
5/10/2006 0:00	0	
5/11/2006 0:00	0	
5/12/2006 0:00	0	
5/13/2006 0:00	0	
5/14/2006 0:00	0	
5/15/2006 0:00	0	
5/16/2006 0:00	0	
5/17/2006 0:00	0	
5/18/2006 0:00	0	
5/19/2006 0:00	0	
5/20/2006 0:00	0	
5/21/2006 0:00	0	
5/22/2006 0:00	0	
5/23/2006 0:00	0	
5/24/2006 0:00	0	
5/25/2006 0:00	0	
5/26/2006 0:00	0	
5/27/2006 0:00	0	
5/28/2006 0:00	0	
5/29/2006 0:00	0	
5/30/2006 0:00	0	
5/31/2006 0:00	0	
6/1/2006 0:00	0	
6/2/2006 0:00	0	
6/3/2006 0:00	0	
6/4/2006 0:00	0	
6/5/2006 0:00	0	
6/6/2006 0:00	0	
6/7/2006 0:00	0	
6/8/2006 0:00	0	
6/9/2006 0:00	0	
6/10/2006 0:00	0	179.307
6/11/2006 0:00	0	180.548

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
6/12/2006 0:00	0	180.373
6/13/2006 0:00	0	161.397
6/14/2006 0:00	0	181.393
6/15/2006 0:00	0	183.282
6/16/2006 0:00	0	182.698
6/17/2006 0:00	0	182.917
6/18/2006 0:00	0	182.987
6/19/2006 0:00	0	180.912
6/20/2006 0:00	0	181.422
6/21/2006 0:00	0	181.867
6/22/2006 0:00	0	182.414
6/23/2006 0:00	0	182.402
6/24/2006 0:00	0	183.475
6/25/2006 0:00	0	184.122
6/26/2006 0:00	0	180.388
6/27/2006 0:00	0	174.285
6/28/2006 0:00	0	197.152
6/29/2006 0:00	0	184.344
6/30/2006 0:00	0	177.105
7/1/2006 0:00	0	177.646
7/2/2006 0:00	0	177.383
7/3/2006 0:00	0	177.983
7/4/2006 0:00	0	177.526
7/5/2006 0:00	0	180.511
7/6/2006 0:00	0	179.699
7/7/2006 0:00	0	182.681
7/8/2006 0:00	0	182.513
7/9/2006 0:00	0	182.065
7/10/2006 0:00	0	182.907
7/11/2006 0:00	0	183.027
7/12/2006 0:00	0	156.681
7/13/2006 0:00	0	123.896
7/14/2006 0:00	0	181.623
7/15/2006 0:00	0	182.634
7/16/2006 0:00	0	182.863
7/17/2006 0:00	0	176.754
7/18/2006 0:00	0	184.419
7/19/2006 0:00	0	183.642
7/20/2006 0:00	0	183.437
7/21/2006 0:00	0	183.693
7/22/2006 0:00	0	181.864
7/23/2006 0:00	0	182.056
7/24/2006 0:00	0.321	181.855
7/25/2006 0:00	0.591	182.123
7/26/2006 0:00	0.605	182.035
7/27/2006 0:00	0.603	181.673
7/28/2006 0:00	0.587	181.791
7/29/2006 0:00	0.607	182.919
7/30/2006 0:00	0.608	182.999
7/31/2006 0:00	0.626	182.508
8/1/2006 0:00	0.625	182.061

Meter 91 Flows:

Time	CH 1 High Flow	CH 2 Pressure (HGL)
8/2/2006 0:00	0.614	180.981

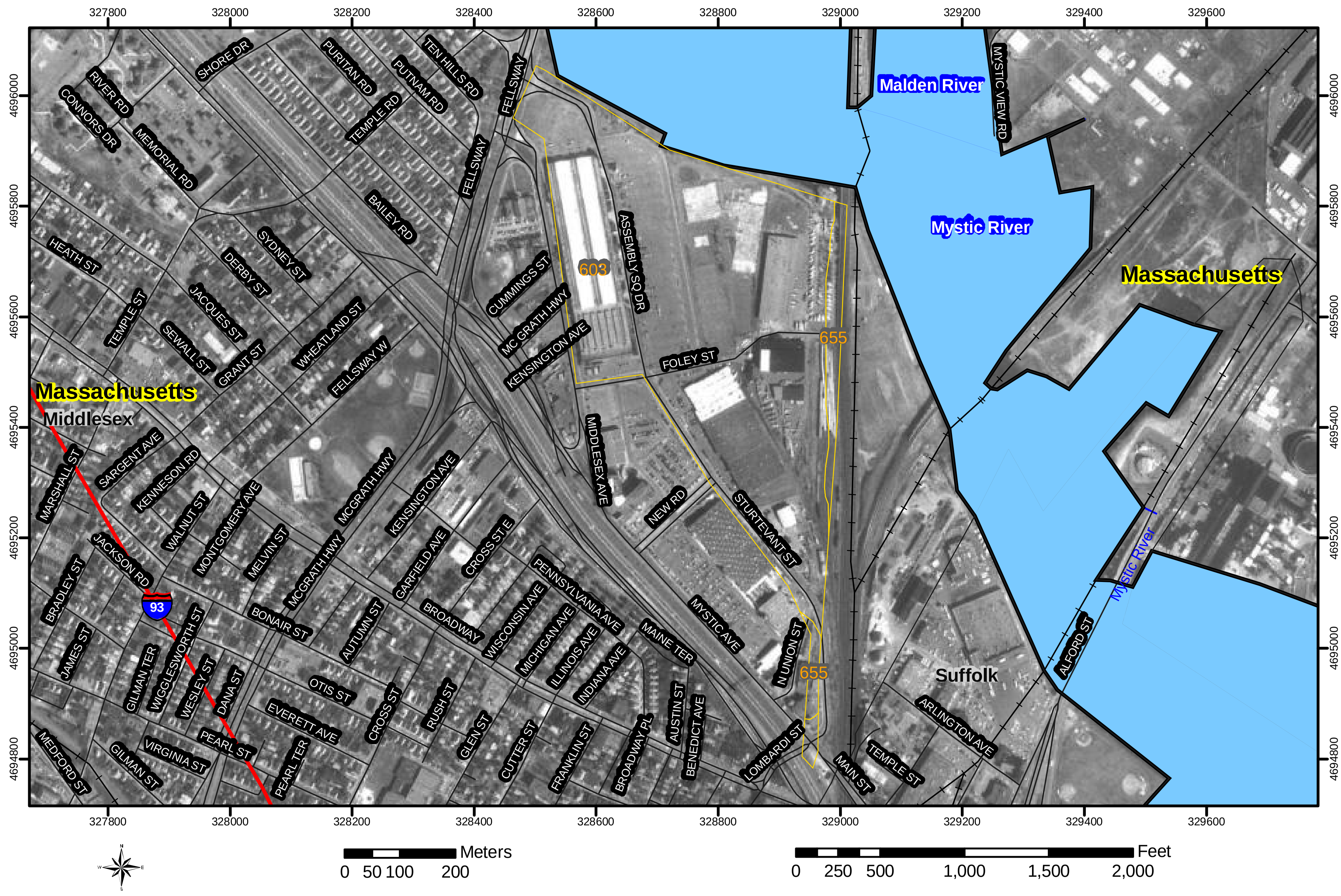
Appendix C

Stormwater Drainage System Analysis

NRCS Soil Survey Information

SOIL SURVEY OF MIDDLESEX COUNTY, MASSACHUSETTS

Assembly Square Full Build



SOIL SURVEY OF MIDDLESEX COUNTY, MASSACHUSETTS

Assembly Square Full Build

MAP LEGEND

🟨	Soil Map Units
●	Cities
▭	Detailed Counties
▭	Detailed States
🟥	Interstate Highways
—	Roads
┼	Rails
🟦	Water
—	Hydrography
🟦	Oceans
▲▼▲▼	Escarpment, bedrock
∨∧∨∧	Escarpment, non-bedrock
∿∿∿	Gulley
▮▮▮▮	Levee
⋯⋯	Slope
◡	Blowout
☒	Borrow Pit
⋇	Clay Spot
◆	Depression, closed
≑	Eroded Spot
⤧	Gravel Pit
∴	Gravelly Spot
∼	Gulley
⋀	Lava Flow
⊖	Landfill
⊥	Marsh or Swamp
◎	Miscellaneous Water
∨	Rock Outcrop
+	Saline Spot
⁘	Sandy Spot
≀	Slide or Slip
◇	Sinkhole
∅	Sodic Spot
≋	Spoil Area
○	Stony Spot
∞	Very Stony Spot
◉	Perennial Water
¥	Wet Spot

MAP INFORMATION

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov

Coordinate System: UTM Zone 19

Soil Survey Area: Middlesex County, Massachusetts
Spatial Version of Data: 3
Soil Map Compilation Scale: 1:25000

Map comprised of aerial images photographed on these dates:
4/3/1995

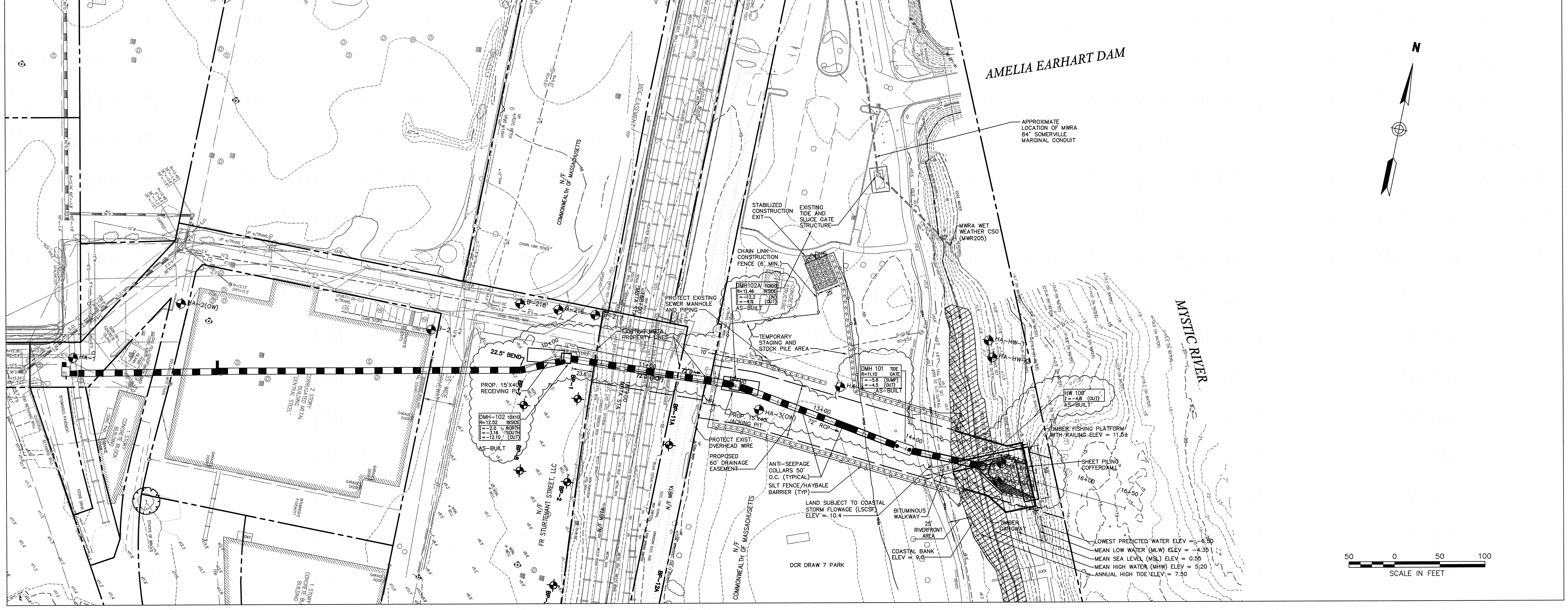
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend Summary

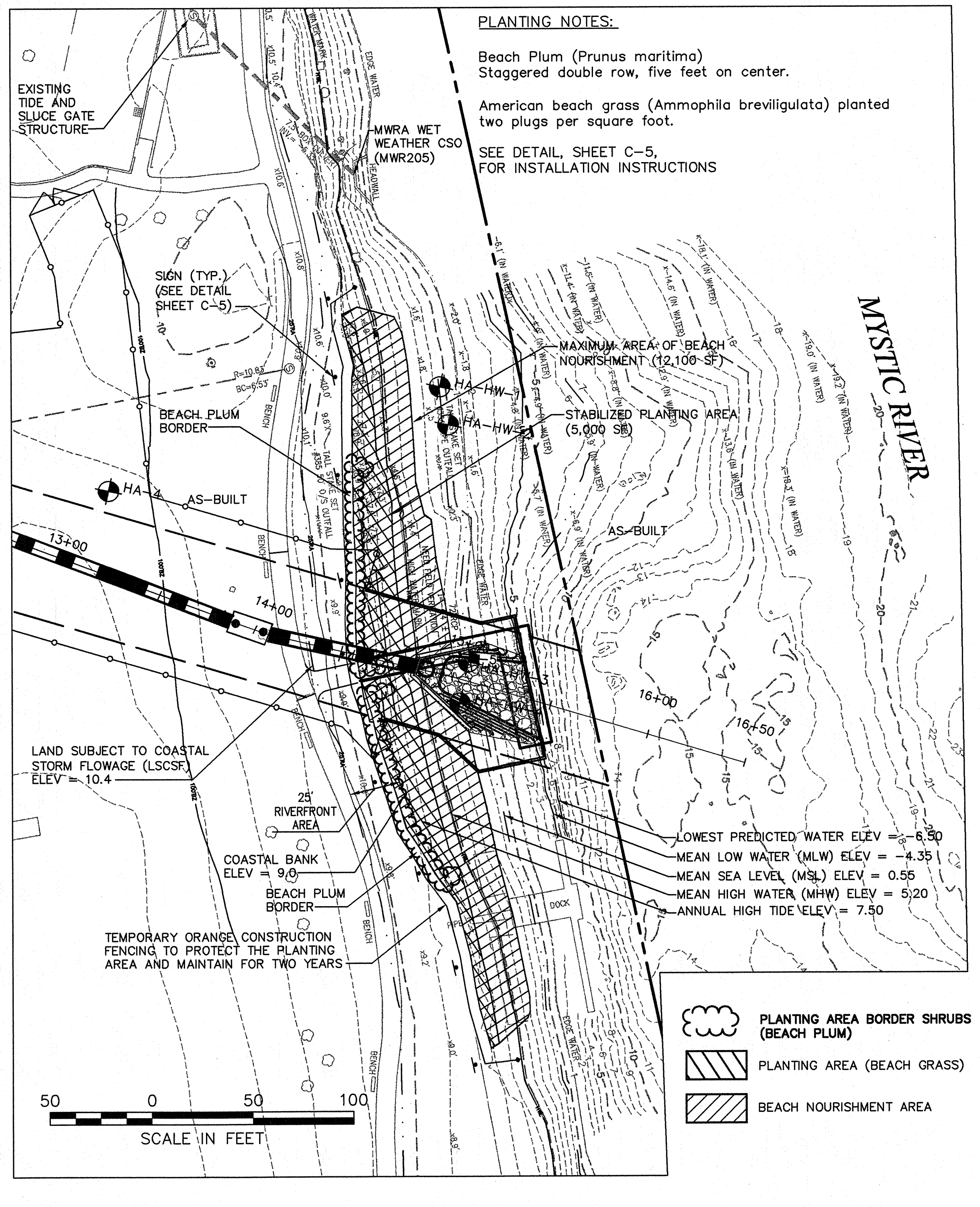
Middlesex County, Massachusetts

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
603	Urban land, wet substratum	72.0	94.8
655	Udorthents, wet substratum	3.9	5.2

72" Outfall As-Built Plan and Profile



DRAINAGE OUTFALL
PLAN VIEW



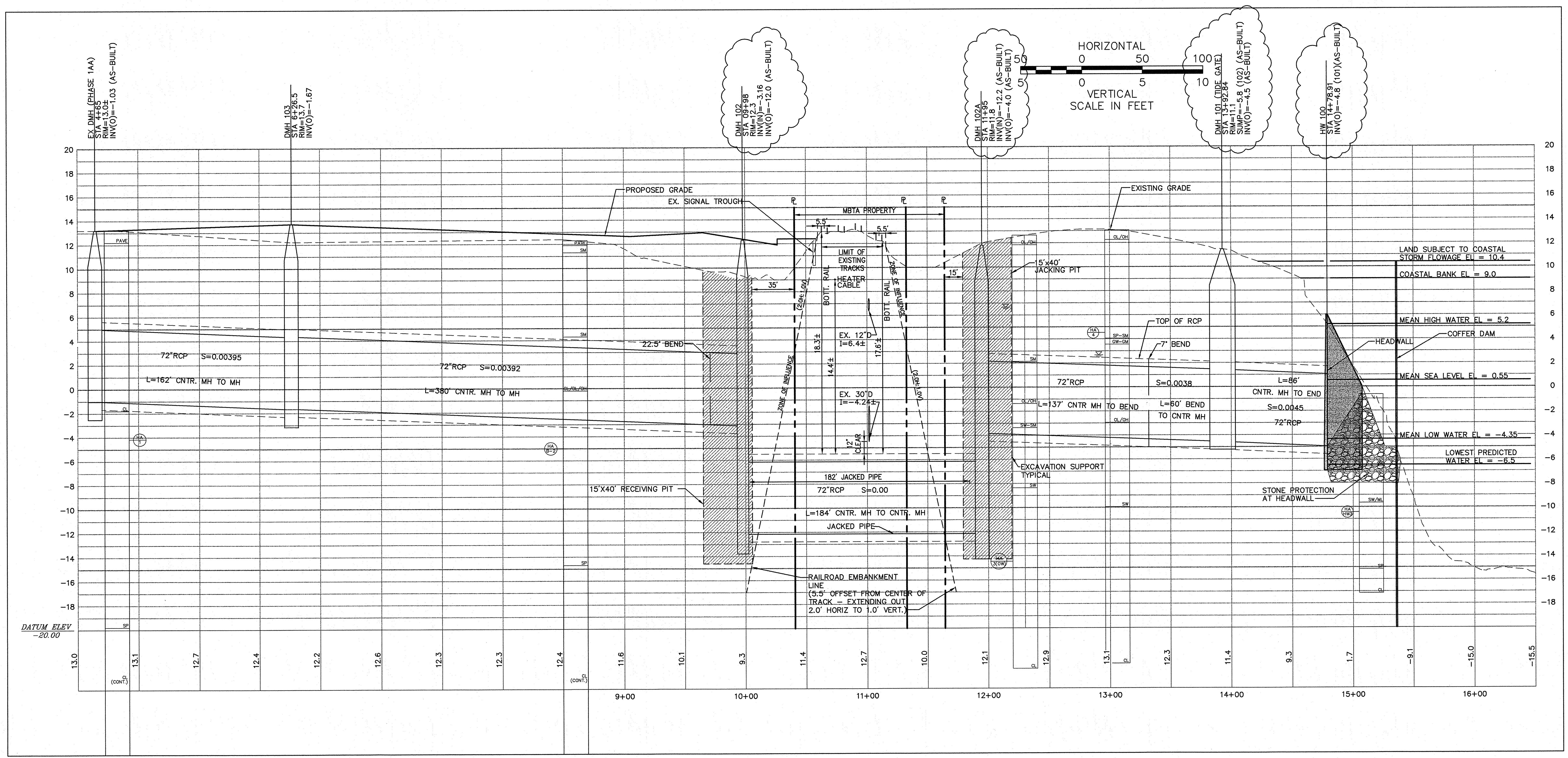
PLANTING NOTES:

Beach Plum (Prunus maritima)
Staggered double row, five feet on center.

American beach grass (Ammophila breviligulata) planted two plugs per square foot.

SEE DETAIL, SHEET C-5,
FOR INSTALLATION INSTRUCTIONS

BEACH NOURISHMENT PLAN



DRAINAGE OUTFALL PROFILE

VHB
Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471
617.924.1770 • FAX 617.924.2286

Notes:

1. UPLAND WORK ZONES, TEMPORARY STAGING AND STOCK PILE AREAS AND ACCESS ROUTES WITHIN THE DCR DRAW 7 PARK ARE SUBJECT TO DCR REVIEW AND APPROVAL AND MAY BE SUBJECT TO CHANGE BASED ON ACTUAL SITE AND CONSTRUCTION CONDITIONS.
2. SUBJECT TO DCR REVIEW AND APPROVAL, THE CONTRACTOR SHALL COORDINATE CONSTRUCTION SEQUENCING TO PROVIDE SECURE AND SAFE PUBLIC ACCESS TO THE SOUTHERLY PART OF DRAW 7 PARK THROUGHOUT CONSTRUCTION.
3. FINAL DESIGN OF THE FISHING PLATFORM IS SUBJECT TO DCR REVIEW AND APPROVAL.
4. CONSTRUCTION DEWATERING SHALL BE DISCHARGED TO A DEWATERING FILTER BAG OR A DEWATERING HAYBALE BASIN PRIOR TO OVERLAND DISCHARGE. DISCHARGE FROM THESE DEWATERING BMPS SHALL BE LOCATED WITHIN THE TEMPORARY STAGING AND STOCKPILE AREA SEDIMENTATION AND EROSION CONTROLS.
5. AT THE COMPLETION OF CONSTRUCTION, THE CONTRACTOR IS TO REMOVE ALL COFFERDAM SHEETING THAT IS PERPENDICULAR TO THE SHORE LINE. THE COFFERDAM SHEETING THAT IS PARRALLEL TO THE SHORE LINE IS TO BE CUT DOWN TO AN ELEVATION OF 1 FOOT BELOW OCEAN FLOOR AND LEFT IN PLACE IN THE GROUND.
6. CONTRACTOR SHOULD NOTE THAT MBTA SIGNAL CABLES THAT CROSS THE RAILROAD RIGHT OF WAY TRANSVERSELY HAVE 4' MINIMUM COVER. THIS CONDITION IS NOT ANTICIPATED DIRECTLY AT THE STORM DRAIN CROSSING LOCATION, BUT IS NOTED IN CASE OF UNKNOWN CONDITIONS.

Beach Nourishment Notes:

1. ALL EXCAVATED SOILS FROM THE COFFERDAM AREA SHALL BE EXAMINED BY THE ENVIRONMENTAL MONITOR/ENGINEER FOR BEACH NOURISHMENT SUITABILITY. SUITABLE SOILS WILL BE SANDS AND COARSE SANDS (SIMILAR TO EXISTING BEACH SOILS). UNSUITABLE SOILS WILL BE SILTS, CLAYS, ROCK AND OTHER DEBRIS.
2. BOTH SUITABLE AND UNSUITABLE SOILS WILL BE STOCKPILED SEPARATELY WITH EROSION CONTROLS AND BE ALLOWED TO DEWATER.
3. UNSUITABLE SOILS WILL BE REMOVED FROM THE SITE ONCE ADEQUATELY DEWATERED.
4. SUITABLE SOILS WILL BE USED IN THE BEACH NOURISHMENT. THE BEACH NOURISHMENT SOIL WILL BE PLACED AT THE OUTFALL HEADWALL AND WORK AWAY IN BOTH DIRECTIONS. THE BEACH NOURISHMENT SOILS WILL BE SPREAD UNTIL THERE IS NO MORE SUITABLE SOIL. NO ADDITIONAL SOILS WILL BE REQUIRED. THE LIMITS ON THE PLAN SHOW THE MAXIMUM AREA OF BEACH NOURISHMENT.

4	AS-BUILT INFORMATION	3-09-12	RPM
3	JACKING REVISIONS (CONFLICTS)	10-28-11	RPM
2	JACKING ALIGNMENT REVISIONS	10-20-11	RPM
1	MBTA COMMENTS	6-22-11	RPM
No.	Revision	Date	Appvd.

Designed by
Drawn by
Checked by
CAD checked by
Approved by
Scale As Noted
Date May 13, 2011

Project Title
Assembly on the Mystic

Assembly Square Drive
Somerville, Massachusetts

Issued for
MBTA Review

Not Approved for Construction

Drawing Title
Plan and Profile

Drawing Number
C-2

Sheet 2 of 5

Project Number
08518.05

RICHARD P. MATHEWS JR.
CIVIL
No. 41545

3/9/12

Scenario: 10 Year with Tailwater
Current Time Step: 0.000Hr
Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Length (Unified) (ft)	System CA (acres)	System Intensity (in/h)	System Rational Flow (ft³/s)	Capacity (Full Flow) (ft³/s)	Velocity (Average) (ft/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
CB-G6N	DMH-G6	14.0	0.118	5.300	0.63	5.04	4.37	7.50	7.22	0.020	7.83	7.46
CB-G4E	DMH-G4	9.0	0.273	5.300	1.46	5.04	5.55	7.00	6.82	0.020	7.65	7.68
DCB-G2E	DMH-G2	12.0	0.232	5.300	1.24	5.14	1.58	5.00	4.75	0.021	7.72	7.70
CB-G1E	DMH-G1	43.0	0.179	5.300	0.96	3.56	1.22	4.00	3.57	0.010	7.74	7.71
CB-G1NE	DMH-G1	56.0	0.098	5.300	0.52	3.56	0.67	4.00	3.44	0.010	7.73	7.71
DMH-G1	DMH-G2	45.0	0.277	5.062	1.41	77.20	0.11	2.90	2.77	0.003	7.70	7.70
DMH-G2	DMH-G3	42.0	0.509	3.929	2.02	79.91	0.16	2.77	2.64	0.003	7.68	7.68
DMH-G3	DMH-G4	155.0	0.509	3.438	1.76	79.09	0.14	2.64	2.17	0.003	7.68	7.68
DMH-G4	DMH-G5	203.0	0.782	2.435	1.92	62.14	0.15	2.17	1.79	0.002	7.65	7.65
RG-G1	DMH-G5	65.0	0.046	5.300	0.24	8.13	6.74	5.32	4.29	0.016	8.72	7.65
DMH-G5	DMH-G6	118.0	0.827	1.807	1.51	137.41	0.76	1.79	0.71	0.009	7.36	7.35
DMH-G6	DMH-G7	38.0	1.060	1.733	1.85	80.72	0.79	-0.73	-0.85	0.003	6.70	6.69
DMH-G7	DMH-G8	11.0	1.060	1.710	1.83	212.16	0.78	-0.85	-1.09	0.022	6.69	6.69
DMH-G8	DMH-G9	70.0	1.060	1.704	1.82	78.67	0.78	-1.09	-1.30	0.003	6.68	6.68
CB-F7NE	DMH-F7	12.0	0.219	5.300	1.17	5.24	5.37	9.00	8.74	0.022	9.46	9.08
CB-F7NW	DMH-F7	13.0	0.000	5.300	0.00	5.04	0.00	9.00	8.74	0.020	9.00	8.92
CB-F6NE	DMH-F6	12.0	0.195	5.300	1.04	5.24	5.20	9.00	8.74	0.022	9.43	9.49
CB-F6NW	DMH-F6	13.0	0.000	5.300	0.00	5.04	0.00	9.00	8.74	0.020	9.49	9.49
CB-F5NW	DMH-F5	13.0	0.000	5.300	0.00	5.04	0.00	9.00	8.74	0.020	10.32	10.32
CB-F5NE	DMH-F5	13.0	0.212	5.300	1.13	5.04	1.44	9.00	8.74	0.020	10.33	10.32
CB-F4NW	DMH-F4	13.0	0.121	5.300	0.65	3.56	0.83	9.00	8.87	0.010	10.56	10.56
CB-F4NE	DMH-F4	12.0	0.123	5.300	0.66	3.71	0.83	9.00	8.87	0.011	10.56	10.56
CB-F3NE	DMH-F3	10.0	0.240	5.300	1.28	5.04	1.63	8.50	8.30	0.020	11.26	11.25
CB-F1NE	DMH-F1	9.0	0.083	5.300	0.44	3.76	0.56	9.90	9.80	0.011	11.35	11.34
DMH-F1	DMH-F2	78.0	0.514	5.255	2.72	6.83	1.54	8.30	7.97	0.004	11.34	11.29
DCB-F2E	DMH-F2	77.0	0.404	5.300	2.16	5.10	1.76	8.70	8.22	0.006	11.38	11.29
DMH-F2	DMH-F3	36.0	0.917	5.111	4.73	12.50	1.50	7.47	7.36	0.003	11.26	11.25
DMH-F3	DMH-C5	129.0	1.157	5.043	5.88	12.44	1.87	7.36	6.97	0.003	11.22	11.13
CB-C4SW	DMH-C4	12.0	0.075	5.300	0.40	5.04	0.51	9.10	8.86	0.020	11.22	11.22
CB-C4NW	DMH-C4	12.0	0.050	5.300	0.27	5.04	0.34	9.10	8.86	0.020	11.22	11.22
CB-C3SW	DMH-C3	12.0	0.028	5.300	0.15	11.12	0.19	9.60	8.43	0.098	11.22	11.22
CB-C3NW	DMH-C3	12.0	0.025	5.300	0.13	11.12	0.17	9.60	8.43	0.098	11.22	11.22
DMH-C3	DMH-C4	40.0	0.141	5.099	0.73	10.37	0.41	8.43	8.04	0.010	11.22	11.22
DMH-C4	DMH-C5	57.0	0.733	4.824	3.56	10.50	2.02	8.04	7.47	0.010	11.21	11.13
DMH-C5	DMH-C6	33.0	1.890	4.744	9.04	12.45	2.88	6.97	6.87	0.003	11.08	11.02
CB-C7SE	DMH-C7	14.0	0.106	5.300	0.57	5.04	0.72	9.20	8.92	0.020	11.37	11.37
CB-C7NE	DMH-C7	14.0	0.117	5.300	0.63	5.13	0.80	9.20	8.91	0.021	11.37	11.37
CB-C8SE	DMH-C8	14.0	0.146	5.300	0.78	5.04	0.99	10.70	10.42	0.020	12.55	12.54
CB-C8NE	DMH-C8	14.0	0.082	5.300	0.44	5.04	0.56	10.70	10.42	0.020	12.54	12.54
DMH-C8	DMH-C7	178.0	1.598	5.229	8.42	6.82	4.77	8.51	7.76	0.004	12.54	11.37
DMH-C7	DMH-C6	92.0	2.175	5.123	11.23	14.73	3.58	7.26	6.87	0.004	11.25	11.02
DMH-C6	DMH-F4	116.0	4.183	4.711	19.86	22.85	4.05	6.37	6.01	0.003	10.87	10.56
DMH-F4	DMH-F5	122.0	4.789	4.630	22.35	34.16	3.16	5.51	5.19	0.003	10.48	10.32
DMH-F5	DMH-D5	108.0	5.332	4.521	24.29	38.51	3.44	5.19	4.83	0.003	10.25	10.08
CB-D4NW	DMH-D4	12.0	0.112	5.300	0.60	3.56	3.36	10.30	10.18	0.010	10.62	10.46
CB-D4SW	DMH-D4	13.0	0.117	5.300	0.62	3.42	3.31	10.30	10.18	0.009	10.63	10.47
DMH-D4	DMH-D5	90.0	0.452	5.289	2.41	10.50	1.36	8.34	7.44	0.010	10.12	10.08
DCB-D6S	DMH-D6	12.0	0.434	5.300	2.32	5.04	4.11	8.80	8.56	0.020	11.51	11.41
CB-D7E	DMH-D7	54.0	0.133	5.300	0.71	5.18	0.91	8.83	7.69	0.021	11.59	11.57
DMH-D7	DMH-D6	53.0	0.995	5.131	5.15	7.90	2.91	7.69	7.39	0.006	11.54	11.41
DMH-D6	DMH-D5	179.0	1.428	5.080	7.31	8.08	4.65	7.39	6.33	0.006	11.23	10.08
DMH-D5	DMH-F6	123.0	7.212	4.432	32.22	36.58	4.69	4.83	4.46	0.003	9.86	9.49
DMH-F6	DMH-F7	122.0	7.870	4.357	34.57	36.73	5.02	4.46	4.09	0.003	9.35	8.92
DMH-F7	DMH-F8	23.0	8.089	4.288	34.97	43.98	5.08	4.09	3.99	0.004	8.15	8.07
DMH-F8	DMH-F9	10.0	8.089	4.275	34.86	94.32	5.06	3.99	3.79	0.020	7.92	7.89
DMH-F9	DMH-F10	79.0	8.089	4.270	34.82	36.76	5.05	3.79	3.55	0.003	7.74	7.45
CB-E2SE	DMH-E2	8.0	0.195	5.300	1.04	5.19	5.16	7.80	7.63	0.021	8.23	8.14
CB-E2NE	DMH-E2	49.0	0.154	5.300	0.82	3.56	3.69	7.80	7.31	0.010	8.18	8.14
DMH-E2	DMH-E1	33.0	0.348	5.262	1.85	3.56	4.58	7.31	6.98	0.010	8.08	8.03
DMH-E1	MH-68	9.0	0.348	5.242	1.84	3.36	2.34	5.56	5.48	0.009	8.03	8.01
CB-21	DMH-22	5.0	0.496	5.300	2.65	4.51	3.37	6.82	6.74	0.016	8.52	8.49
CB-20	DMH-22	49.0	0.428	5.300	2.29	3.53	2.91	6.82	6.34	0.010	8.70	8.49
CB-18	DMH-19	6.0	0.140	5.300	0.75	5.44	4.86	8.74	8.60	0.023	9.24	9.26
CB-17	DMH-19	49.0	0.141	5.300	0.75	3.60	3.62	8.74	8.24	0.010	9.26	9.26
CB-11	DMH-12	5.0	0.530	5.300	2.83	3.90	3.60	6.66	6.60	0.012	10.64	10.61
CB-10	DMH-12	49.0	0.419	5.300	2.24	3.56	2.85	6.66	6.17	0.010	10.80	10.61
CB-A6SE	DMH-A6	14.0	0.367	5.300	1.96	3.56	2.49	8.08	7.94	0.010	11.44	11.40
CB-A6N	DMH-A6	15.0	0.169	5.300	0.90	3.56	1.15	8.09	7.94	0.010	11.41	11.40
DMH-A6	DMH-A5	93.0	0.777	5.263	4.12	5.76	2.33	7.94	7.66	0.003	11.72	11.58
DMH-A5	DMH-A4	126.0	0.777	5.150	4.03	5.77	2.28	7.66	7.28	0.003	11.55	11.36
CB-A4S	DMH-A4	14.0	0.041	5.300	0.22	5.04	0.28	10.00	9.72	0.020	11.36	11.36
CB-A4N	DMH-A4	14.0	0.053	5.300	0.28	5.13	0.36	10.00	9.71	0.021	11.36	11.36
DMH-A4	DMH-A3	178.0	0.871	4.994	4.39	12.34	1.40	7.28	6.75	0.003	11.34	11.27
DMH-A3	DMH-A2	42.0	1.360	4.632	6.35	12.59	2.02	6.75	6.62	0.003	11.25	11.21
CB-A1S	DMH-A2	15.0	0.159	5.300	0.85	4.69	1.08	7.50	7.24	0.017	11.22	11.21
CB-A1N	DMH-A2	13.0	0.089	5.300	0.48	5.93	0.61	7.60	7.24	0.028	11.22	11.21
DMH-A2	DMH-A1	23.0	1.642	4.574	7.57	14.92	2.41	6.62	6.52	0.004	11.19	11.16
DMH-A1	DMH-8	93.0	1.642	4.546	7.53	12.19	2.40	6.49	6.22	0.003	11.12	11.01
CB-8B	DMH-8	22.0	0.058	5.300	0.31	3.13	0.39	8.45	8.28	0.008	11.02	11.01
CB-8C	DMH-8	61.0	0.151	5.300	0.80	3.41	1.02	8.20	7.64	0.009	11.05	11.01
CB-8A	DMH-8	65.0	0.229	5.300	1.22	2.42	1.56	8.29	7.99	0.005	11.09	11.01
DMH-8	DMH-9	83.0	2.079	4.436	9.30	11.10	2.96	6.22	6.02	0.002	10.95	10.81
DMH-9	DMH-12	97.0	2.079	4.357	9.13	11.25	2.91	6.00	5.76	0.002	10.76	10.61
DMH-12	DMH-13	242.0	3.028	4.262	13.01	20.93	2.65	5.26	4.63	0.003	10.52	10.27
CB-C1N	DMH-C1	24.0	0.064	5.300	0.34	5.04	0.44	10.00	9.52	0.020	11.30	11.30
CB-C1SE	DMH-C1	17.0	0.056	5.300	0.30	4.96	0.38	10.00	9.67	0.019	11.30	11.30
CB-C2NE	DMH-C2	23.0	0.071	5.300	0.38	5.04	0.48	8.80	8.34	0.020	11.86	11.86
CB-C2SE	DMH-C2	13.0	0.073	5.300	0.39	5.04	0.50	8.90	8.64	0.020	11.86	11.86
DMH-C2	DMH-C1	77.0	1.629	5.165	8.48	10.50	4.80	7.63	6.86	0.010	11.80	11.30
DMH-C1	DMH-13	123.0	1.749	5.120	9.03	10.50	5.11	6.86	5.63	0.010	11.18	10.27
DMH-13	DMH-16	64.0	4.777	4.004	19.28	21.14	3.93	4.63	4.46	0.003	10.03	9.89
CB-14	DMH-16	49.0	0.081	5.300	0.43	3.60	3.09	9.21	8.71	0.010	9.89	9.89

CB-15	DMH-16	12.0	0.078	5.300	0.42	2.30	2.22	9.19	9.14	0.004	9.89	9.89
DMH-16	DMH-19	240.0	4.936	3.958	19.69	20.85	4.01	4.46	3.84	0.003	9.82	9.26
DMH-19	DMH-D1	42.0	5.217	3.788	19.92	33.91	2.82	3.34	3.23	0.003	9.20	9.16
DMH-D3	DMH-D2	46.0	1.280	5.300	6.84	7.74	3.87	6.52	6.27	0.005	10.64	10.44
CB-D2S	DMH-D2	29.0	0.214	5.300	1.14	3.17	2.95	7.00	6.77	0.008	10.56	10.44
DMH-D2	DMH-D1	104.0	1.808	5.266	9.60	11.52	6.09	5.77	4.52	0.012	10.25	9.16
DMH-D1	DMH-22	194.0	7.024	3.746	26.52	33.91	3.92	3.23	2.73	0.003	8.83	8.49
DMH-22	DMH-23	122.0	7.948	3.606	28.89	51.52	3.12	2.23	1.91	0.003	8.39	8.28
DMH-23	DMH-24	11.0	7.948	3.559	28.51	95.92	3.09	1.86	1.76	0.009	8.24	8.23
DMH-24	DMH-105	30.0	7.948	3.555	28.48	91.84	3.08	1.71	1.46	0.008	8.18	8.16
CB-30	DMH-31	47.0	0.320	5.300	1.71	3.52	2.18	7.41	6.95	0.010	9.11	9.00
CB-32O	DMH-32M	54.0	0.000	5.300	0.00	3.43	0.00	4.00	3.50	0.009	9.70	9.70
CB-32R	DMH-32P	37.0	0.386	5.300	2.06	3.31	2.63	7.64	7.32	0.009	10.04	9.92
CB-32Q	DMH-32P	22.0	0.288	5.300	1.54	2.94	1.96	7.48	7.33	0.007	9.96	9.92
DMH-32P	DMH-32M	53.0	1.266	5.260	6.71	10.99	3.80	3.02	2.44	0.011	9.92	9.70
CB-32N	DMH-32M	12.0	0.313	5.300	1.67	2.91	2.13	6.88	6.80	0.007	9.73	9.70
CB-F15	DMH-F13	17.0	0.146	5.300	0.78	5.04	0.99	7.10	6.76	0.020	11.06	11.05
CB-F14	DMH-F13	16.0	0.206	5.300	1.10	5.19	1.40	7.10	6.76	0.021	11.06	11.05
CB-F13	DMH-F12	10.0	0.151	5.300	0.81	5.04	1.03	9.30	9.10	0.020	11.45	11.44
CB-F12	DMH-F11	12.0	0.145	5.300	0.77	5.04	0.99	9.30	9.06	0.020	11.50	11.49
DMH-F11	DMH-F12	128.0	0.388	5.265	2.06	10.50	1.17	7.19	5.91	0.010	11.49	11.44
DMH-F12	DMH-F13	140.0	1.066	4.954	5.32	10.50	3.01	5.91	4.51	0.010	11.41	11.05
DMH-F13	DMH-32T	76.0	1.418	4.823	6.89	10.29	3.90	4.51	3.78	0.010	10.99	10.66
CB-32Z	DMH-32Y	31.0	0.000	5.300	0.00	2.56	5.37	3.86	3.70	0.005	11.40	10.96
DMH-32Y	DMH-32U	47.0	0.000	5.284	0.00	6.85	2.39	3.69	3.49	0.004	10.75	10.67
CB-32V	DMH-32U	27.0	0.255	5.300	1.36	3.22	1.74	6.59	6.37	0.008	10.71	10.67
CB-32W	DMH-32U	18.0	0.212	5.300	1.13	3.03	1.45	6.39	6.26	0.007	10.69	10.67
CB-32X	DMH-32U	38.0	0.217	5.300	1.16	3.32	1.47	6.29	5.96	0.009	10.71	10.67
DMH-32U	DMH-32T	119.0	1.083	5.227	5.71	6.88	5.62	3.39	2.88	0.004	11.72	10.66
DMH-32T	DMH-32S	171.0	2.501	4.767	12.02	21.96	3.31	2.78	2.29	0.003	10.47	10.20
DMH-32S	DMH-32M	277.0	2.501	4.621	11.65	22.45	3.23	2.27	1.44	0.003	10.12	9.70
DMH-32M	DMH-32L	24.0	4.081	4.378	18.01	22.15	4.53	1.42	1.35	0.003	9.57	9.50
DMH-32L	DMH-32K	9.0	4.081	4.363	17.95	43.23	4.52	1.30	1.20	0.011	9.40	9.37
DMH-32K	DMH-32	17.0	4.081	4.358	17.92	24.37	4.51	1.15	1.09	0.004	9.28	9.23
CB-34N	CB-34M	32.0	0.206	5.300	1.10	10.24	0.62	6.81	6.63	0.006	10.60	10.60
CB-34M	CB-34L	40.0	0.415	5.155	2.16	10.35	1.22	6.63	6.40	0.006	10.60	10.59
CB-34L	CB-34K	93.0	0.633	5.062	3.23	10.41	1.83	6.40	5.86	0.006	10.59	10.54
CB-34K	CB-34J	25.0	0.880	4.917	4.36	10.22	2.47	5.86	5.72	0.006	10.54	10.51
CB-34J	CB-34I	51.0	1.114	4.889	5.49	10.12	3.11	5.72	5.44	0.005	10.51	10.43
CB-34I	CB-34H	48.0	1.330	4.842	6.49	22.46	2.07	5.44	5.16	0.006	10.43	10.40
CB-34H	CB-34G	41.0	1.560	4.776	7.51	22.03	2.39	5.16	4.93	0.006	10.40	10.38
CB-34G	CB-34F	41.0	1.776	4.728	8.46	22.50	2.69	4.93	4.69	0.006	10.38	10.34
CB-34F	CB-34E	42.0	1.983	4.685	9.36	22.23	2.98	4.69	4.45	0.006	10.34	10.30
CB-34E	CB-34D	41.0	2.190	4.645	10.26	22.03	3.26	4.45	4.22	0.006	10.30	10.25
CB-34D	CB-34C	41.0	2.418	4.609	11.24	22.50	3.58	4.22	3.98	0.006	10.25	10.19
CB-34C	DMH-34A	18.0	2.641	4.577	12.18	19.61	3.88	3.98	3.90	0.004	10.19	10.16
CB-34B	DMH-34A	32.0	0.043	5.300	0.23	3.73	0.29	4.90	4.55	0.011	10.16	10.16
DMH-34A	DMH-34	67.0	2.683	4.564	12.34	23.12	3.93	3.90	3.20	0.010	10.01	9.81
CB-39D	CB-39C	70.0	0.152	5.300	0.81	3.56	1.03	6.00	5.30	0.010	9.55	9.51
CB-39C	DMH-39A	23.0	0.152	5.108	0.78	5.75	0.99	5.30	4.70	0.026	9.51	9.50
CB-39B	DMH-39A	16.0	0.258	5.300	1.38	3.56	1.75	5.11	4.95	0.010	9.52	9.50
DMH-39A	DMH-38	50.0	0.409	5.042	2.08	6.13	1.70	4.70	4.25	0.009	9.76	9.71
CB-38A	DMH-38	35.0	0.000	5.300	0.00	7.94	2.33	3.40	3.20	0.006	9.76	9.71
CB-40A	DMH-41	12.0	0.214	5.300	1.14	2.72	1.46	5.57	5.50	0.006	9.50	9.49
CB-43	DMH-44	26.0	0.161	5.300	0.86	1.56	1.09	6.16	6.11	0.002	9.66	9.65
CB-42	DMH-44	19.0	0.220	5.300	1.17	4.90	1.49	6.15	5.79	0.019	9.67	9.65
CB-45A	DMH-45	35.0	0.164	5.300	0.88	3.56	1.12	7.12	6.77	0.010	10.32	10.29
CB-46B	DMH-46A	45.0	0.146	5.300	0.78	2.19	1.43	7.75	7.30	0.010	11.12	11.06
CB-46E	DMH-46C	7.0	0.439	5.300	2.34	-2.50	6.72	10.60	10.90	-0.043	12.78	12.52
CB-46D	DMH-46C	40.0	0.195	5.300	1.04	-1.05	2.99	10.60	10.90	-0.008	12.81	12.52
CB-46H	DMH-46F	8.0	0.481	5.300	2.57	1.35	7.37	14.30	14.20	0.013	15.22	14.85
CB-46G	DMH-46F	39.0	0.138	5.300	0.74	-1.37	2.11	13.70	14.20	-0.013	14.94	14.78
CB-46M	CB-46L	58.0	0.111	5.300	0.59	1.23	3.49	16.60	16.00	0.010	16.96	16.51
CB-46L	DMH-46K	46.0	0.216	5.253	1.15	1.26	4.09	16.00	15.50	0.011	16.51	16.00
CB-46Q	DMH-46N	7.0	0.086	5.300	0.46	4.86	3.89	17.20	17.07	0.019	17.53	17.56
CB-46O	DMH-46N	23.0	0.099	5.300	0.53	1.38	3.69	17.37	17.07	0.013	17.71	17.56
CB-46P	DMH-46N	22.0	0.073	5.300	0.39	1.24	3.14	17.30	17.07	0.010	17.59	17.56
DMH-46N	DMH-46K	137.0	0.258	5.280	1.37	13.52	4.91	17.07	14.80	0.017	17.51	15.82
DMH-46K	DMH-46J	37.0	0.474	5.201	2.49	13.38	5.79	14.80	14.20	0.016	15.40	14.89
DMH-46J	DMH-46I	12.0	0.474	5.183	2.48	13.56	5.84	14.20	14.00	0.017	14.80	14.80
DMH-46I	DMH-46F	52.0	0.474	5.177	2.47	11.28	5.12	14.00	13.40	0.012	14.74	14.78
DMH-46F	DMH-46C	150.0	1.094	5.148	5.68	15.34	8.03	13.40	10.20	0.021	14.32	12.52
DMH-46C	DMH-46A	149.0	1.728	5.096	8.88	14.40	5.02	10.10	7.30	0.019	12.13	11.06
DMH-46A	DMH-45	78.0	1.874	5.011	9.47	12.47	5.36	7.30	6.20	0.014	10.93	10.29
CB-45B	DMH-45	8.0	0.169	5.300	0.90	3.31	2.59	6.80	6.20	0.075	10.34	10.29
CB-45C	DMH-45	33.0	0.188	5.300	1.01	-2.63	1.28	6.85	7.03	-0.005	10.32	10.29
DMH-45	DMH-44	182.0	2.396	4.970	12.00	23.36	3.82	6.20	4.26	0.011	10.16	9.65
DMH-44	DMH-41	186.0	2.776	4.835	13.53	46.13	1.91	4.16	3.27	0.005	9.57	9.49
CB-40	DMH-41	3.0	0.120	5.300	0.64	5.44	0.81	5.48	5.41	0.023	9.49	9.49
CB-39	DMH-41	38.0	0.264	5.300	1.41	3.37	1.80	5.23	4.89	0.009	9.55	9.49
DMH-41	DMH-38	60.0	3.374	4.560	15.51	58.08	1.61	3.22	3.02	0.003	9.72	9.71
DMH-38A(Partners)	DMH-38	123.0	6.562	5.300	35.06	55.92	3.64	3.40	3.02	0.003	9.86	9.71
DMH-38	DMH-37	431.0	10.345	4.454	46.45	74.52	4.02	3.02	1.86	0.003	10.53	10.00
CB-36	DMH-37	3.0	0.510	5.300	2.73	6.50	3.47	5.72	5.62	0.033	10.02	10.00
CB-35	DMH-37	36.0	0.438	5.300	2.34	3.51	2.98	5.80	5.45	0.010	10.16	10.00
DMH-37	DMH-34	101.0	11.294	4.151	47.25	74.26	4.09	1.84	1.57	0.003	9.94	9.81
DMH-34	DMH-33B	71.0	13.977	4.081	57.50	78.12	4.90	1.56	1.35	0.003	9.64	9.51
DMH-33B	DMH-33A	12.0	13.977	4.040	56.92	131.12	4.86	1.30	1.20	0.008	9.40	9.38
DMH-33A	DMH-32	24.0	13.977	4.033	56.82	77.57	4.85	1.15	1.08	0.003	9.27	9.23
CB-32D	DMH-32B	39.0	0.140	5.300	0.75	3.33	0.95	6.62	6.28	0.009	9.28	9.26
CB-32C	DMH-32B	21.0	0.134	5.300	0.72	3.21	0.91	6.90	6.73	0.008	9.27	9.26
CB-32I	DMH-32H	17.0	0.183	5.300	0.98	1.31	2.80	6.70	6.50	0.012	9.48	9.37
CB-32J	DMH-32H	48.0	0.171	5.300	0.91	1.23	2.61	6.40	5.90	0.010	9.65	9.37
DMH-32H	DMH-32E	119.0	0.353	5.248	1.87	22.14	0.60	5.90	4.76	0.010	9.31	9.30
CB-32G	DMH-32E	44.0	0.088	5.300	0.47	1.21	1.34	5.71	5.27	0.010	9.36	9.30
CB-32F	DMH-32E	15.0	0.087	5.300	0.46	5.04	0.59	6.34	6.04	0.020	9.30	9.30
DMH-32E	DMH-32B	182.0	0.528	4.681	2.49	22.62	0.79	4.76	2.94	0.010	9.28	9.26
DMH-32B	DMH-32A	54.0	0.802	4.031	3.26	22.62	1.04	2.94	2.40	0.010	9.25	9.24
DMH-32A	DMH-32	34.0	0.802	3.883	3.14	43.03	1.00	2.40	1.17	0.036	9.23	9.23
DMH-32	DMH-31	63.0	18.860	3.787	71.99	168.72	2.84	1.07	0.97	0.002	9.03	9.00
DMH-31	DMH-29	180.0	19.180	3.724	71.99	178.56	2.84	0.97	0.65	0.002	8.94	8.88
CB-29B	CB-29A	46.0	0.225	5.300	1.20	2.78	1.53	5.13	4.85	0.006	9.14	9.09
CB-29A	DMH-29	99.0	0.917	5.215	4.82	10.24	2.73	4.75	3.81	0.009	9.09	8.88
DMH-29												

	DMH-28	165.0	20.097	3.578	72.48	180.57	2.86	0.65	0.35	0.002	8.80	8.74
DMH-28	DMH-25	158.0	20.587	3.514	72.92	178.27	2.87	0.35	0.07	0.002	8.70	8.64
CB-27	DMH-25	5.0	0.262	5.300	1.40	2.76	3.53	8.42	8.39	0.006	8.92	8.89
CB-26	DMH-25	48.0	0.205	5.300	1.09	3.53	3.96	8.41	7.94	0.010	8.85	8.64
DMH-25	DMH-105	61.0	21.054	3.453	73.28	179.83	2.89	0.07	-0.04	0.002	8.18	8.16
CB-24C	DMH-24B	34.0	0.050	5.300	0.27	3.56	0.34	5.23	4.89	0.010	8.33	8.33
CB-24G	DMH-24E	41.0	0.072	5.300	0.38	4.98	0.49	5.90	5.10	0.020	8.45	8.44
CB-24J	DMH-24I	9.0	0.156	5.300	0.83	1.45	2.39	5.80	5.67	0.014	9.01	8.97
CB-24K	DMH-24I	54.0	0.183	5.300	0.98	1.87	2.80	6.70	5.41	0.024	9.32	8.97
DMH-24I	DMH-24H	173.0	0.339	5.245	1.79	3.61	2.28	5.41	3.63	0.010	8.96	8.52
DMH-24H	DMH-24E	23.0	0.339	5.030	1.72	5.04	2.19	3.53	3.07	0.020	8.50	8.44
CB-24M	DMH-24L	18.0	0.456	5.300	2.44	6.50	3.10	3.10	2.50	0.033	8.88	8.79
CB-24P	DMH-24N	23.0	0.675	5.300	3.61	5.25	4.59	4.60	4.10	0.022	8.86	8.62
CB-24O	DMH-24N	21.0	0.548	5.300	2.93	7.38	3.73	5.00	4.10	0.043	8.76	8.62
CB-24Q	DMH-24N	154.0	0.071	5.300	0.38	3.63	0.48	5.60	4.00	0.010	8.64	8.62
CB-24S	DMH-24R	26.0	0.171	5.300	0.91	4.42	1.16	6.60	6.20	0.015	9.39	9.37
CB-24T	DMH-24R	11.0	0.775	5.300	4.14	-11.77	5.27	5.40	6.60	-0.109	9.52	9.37
CB-24U	DMH-24R	116.0	0.161	5.300	0.86	2.96	1.09	7.10	6.30	0.007	9.44	9.37
DMH-24R	DMH-24N	300.0	1.106	4.999	5.57	8.58	3.15	6.10	4.10	0.007	9.47	8.62
DMH-24N	DMH-24L	294.0	2.400	4.394	10.63	16.16	3.38	4.00	2.50	0.005	9.44	8.79
DMH-24L	DMH-24E	80.0	2.856	4.148	11.94	14.96	3.80	2.50	2.15	0.004	8.67	8.44
CB-24F	DMH-24E	15.0	0.136	5.300	0.73	3.05	0.93	5.73	5.62	0.007	8.45	8.44
DMH-24E	DMH-24B	37.0	3.403	4.089	14.02	75.96	1.98	1.35	0.87	0.013	8.34	8.33
CB-24D	DMH-24B	35.0	0.121	5.300	0.65	1.51	1.85	6.65	6.10	0.016	8.43	8.33
DMH-24B	DMH-24A	47.0	3.574	4.036	14.54	63.05	2.06	0.87	0.45	0.009	8.29	8.27
DMH-24A	DMH-105	199.0	3.574	3.971	14.31	25.90	2.02	0.30	0.00	0.002	8.25	8.16
DMH-105	MH-68	43.0	32.577	3.429	112.61	266.27	4.32	-0.04	-0.21	0.004	8.05	8.01
MH-68	DMH-107	222.0	32.925	3.418	113.45	258.94	4.35	-0.21	-1.04	0.004	7.89	7.70
DMH-107	DMH-F10	172.0	34.723	3.362	117.66	256.30	4.50	-1.04	-1.67	0.004	7.61	7.45
DMH-F10	DMH-G9	374.0	42.812	3.319	143.24	267.30	5.43	-1.67	-3.16	0.004	7.17	6.68
CB-G12SE	DMH-G12	13.0	0.075	5.300	0.40	5.13	3.90	8.00	7.73	0.021	8.26	7.92
CB-G13SE	DMH-G13	13.0	0.107	5.300	0.57	5.04	4.25	7.50	7.24	0.020	8.08	8.09
DMH-63B	DMH-G14	23.0	1.193	3.600	4.33	2.97	7.94	4.75	4.50	0.011	9.87	9.34
CB-G15SE	DMH-G15	13.0	0.082	5.300	0.44	5.04	0.56	7.70	7.44	0.020	9.35	9.35
MH-74	DMH-G15	10.0	0.037	5.300	0.20	4.63	0.25	4.90	4.80	0.010	9.35	9.35
DMH-G15	DMH-G14	24.0	0.122	5.188	0.64	9.83	0.36	4.71	4.50	0.009	9.34	9.34
CB-G14SW	DMH-G14	17.0	0.062	5.300	0.33	5.11	0.42	7.80	7.45	0.021	9.34	9.34
DMH-G14	DMH-G13	167.0	1.714	3.597	6.21	9.34	3.52	4.50	3.18	0.008	8.67	8.09
CB-G13SW	DMH-G13	13.0	0.103	5.300	0.55	4.84	4.09	7.50	7.26	0.018	8.08	8.09
DMH-G13	DMH-G12	149.0	2.364	3.544	8.44	20.13	2.69	2.68	1.50	0.008	8.02	7.82
CB-G12SW	DMH-G12	13.0	0.045	5.300	0.24	5.13	3.35	8.00	7.73	0.021	8.20	7.88
DMH-G12	DMH-G11	47.0	2.590	3.482	9.09	20.34	2.89	1.50	1.12	0.008	7.21	7.14
CB-E6SW	DMH-E6	9.0	0.247	5.300	1.32	3.56	4.20	8.61	8.52	0.010	9.10	8.95
CB-E6NW	DMH-E6	26.0	0.247	5.300	1.32	3.56	4.20	8.78	8.52	0.010	9.27	8.94
CB-E3SW	DMH-E3	12.0	0.156	5.300	0.83	3.56	1.06	9.10	8.98	0.010	10.12	10.11
CB-E3NW	DMH-E3	26.0	0.151	5.300	0.81	3.63	3.72	10.19	9.92	0.010	10.57	10.24
DMH-E3	DMH-E4	140.0	0.307	5.268	1.63	10.50	0.92	8.09	6.69	0.010	9.66	9.63
CB-E4NW	DMH-E4	26.0	0.134	5.300	0.71	4.99	4.51	9.50	8.99	0.020	9.85	9.63
CB-E4SW	DMH-E4	9.0	0.176	5.300	0.94	5.18	5.01	9.50	9.31	0.021	9.91	9.62
DMH-E4	DMH-E5	122.0	0.617	4.838	3.01	10.50	1.70	6.69	5.47	0.010	9.50	9.39
DMH-E10	DMH-E5	36.0	0.490	5.300	2.62	22.62	0.83	5.33	4.97	0.010	9.39	9.39
CB-E8NE	DMH-E8	10.0	0.075	5.300	0.40	5.04	0.51	8.90	8.70	0.020	10.44	10.44
DMH-E8	DMH-E9	114.0	0.695	5.244	3.67	6.46	2.99	8.45	7.31	0.010	10.41	10.04
CB-E9NE	DMH-E9	10.0	0.097	5.300	0.52	5.04	0.66	8.90	8.70	0.020	10.04	10.04
DMH-E9	DMH-E5	118.0	1.390	5.136	7.20	10.50	4.07	7.06	5.88	0.010	9.96	9.39
DMH-E5	DMH-E6	104.0	2.819	4.635	13.17	22.62	4.19	4.97	3.93	0.010	9.15	8.72
DMH-E6	DMH-E7	56.0	3.313	4.565	15.25	22.62	4.85	3.93	3.37	0.010	7.89	7.58
DMH-E7	DMH-G11	41.0	3.313	4.532	15.14	31.99	4.82	2.28	1.46	0.020	7.36	7.14
DMH-G11	DMH-G10	10.0	5.921	3.464	20.68	66.13	4.21	0.62	0.36	0.026	6.85	6.82
DMH-G10	DMH-G9	18.0	5.921	3.462	20.66	41.01	4.21	0.36	0.18	0.010	6.72	6.68
DMH-G9	MH-75	128.0	49.794	1.662	83.40	0.00	3.60	-12.15	-12.15	0.000	6.68	6.44
MH-75	DMH-110	82.0	49.794	1.645	82.56	405.01	3.57	-3.16	-3.91	0.009	6.25	6.10
DMH-110	DMH-111	211.0	49.794	1.634	82.02	260.76	3.55	-3.91	-4.71	0.004	5.88	5.50
DMH-111	O-1	67.0	49.794	1.606	80.61	258.68	3.50	-4.71	-4.96	0.004	5.32	5.20
CB-2	DMH-3	20.0	0.223	5.300	1.19	3.90	4.36	7.72	7.48	0.012	8.18	7.86
CB-1	DMH-3	72.0	0.203	5.300	1.09	3.09	3.58	7.55	7.01	0.008	7.99	7.79
DMH-3	DMH-4	57.0	0.426	5.243	2.25	10.13	4.61	6.91	6.38	0.009	7.48	7.05
DMH-4	O-2	218.0	0.426	5.208	2.24	10.98	4.88	6.38	4.00	0.011	6.94	4.85

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Scenario: 25-year with tailwater
Current Time Step: 0.000Hr
Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Length (Unified) (ft)	System CA (acres)	System Intensity (in/h)	System Rational Flow (ft³/s)	Capacity (Full Flow) (ft³/s)	Velocity (Average) (ft/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
CB-G6N	DMH-G6	14.0	0.118	6.000	0.71	5.04	0.91	7.50	7.22	0.020	10.16	10.15
CB-G4E	DMH-G4	9.0	0.273	6.000	1.65	5.04	2.10	7.00	6.82	0.020	10.17	10.15
DCB-G2E	DMH-G2	12.0	0.232	6.000	1.40	5.14	1.78	5.00	4.75	0.021	9.52	9.50
CB-G1E	DMH-G1	43.0	0.179	6.000	1.08	3.56	1.38	4.00	3.57	0.010	9.44	9.40
CB-G1NE	DMH-G1	56.0	0.098	6.000	0.59	3.56	0.76	4.00	3.44	0.010	9.42	9.40
DMH-G1	DMH-G2	45.0	0.277	5.778	1.61	77.20	0.13	2.90	2.77	0.003	9.50	9.50
DMH-G2	DMH-G3	42.0	0.509	4.726	2.42	79.91	0.19	2.77	2.64	0.003	10.15	10.15
DMH-G3	DMH-G4	155.0	0.509	4.144	2.13	79.09	0.17	2.64	2.17	0.003	10.15	10.15
DMH-G4	DMH-G5	203.0	0.782	2.971	2.34	62.14	0.19	2.17	1.79	0.002	10.15	10.15
RG-G1	DMH-G5	65.0	0.000	6.000	0.00	8.13	7.08	5.32	4.29	0.016	11.34	10.16
DMH-G5	DMH-G6	118.0	0.782	2.426	1.91	137.41	0.84	1.79	0.71	0.009	10.15	10.14
DMH-G6	DMH-G7	38.0	1.015	2.356	2.41	80.72	0.88	-0.73	-0.85	0.003	10.14	10.14
DMH-G7	DMH-G8	11.0	1.015	2.334	2.39	212.16	0.88	-0.85	-1.09	0.022	9.53	9.53
DMH-G8	DMH-G9	70.0	1.015	2.328	2.38	78.67	0.88	-1.09	-1.30	0.003	9.53	9.52
CB-F7NE	DMH-F7	12.0	0.219	6.000	1.32	5.24	1.69	9.00	8.74	0.022	10.65	10.63
CB-F7NW	DMH-F7	13.0	0.000	6.000	0.00	5.04	0.00	9.00	8.74	0.020	10.64	10.64
CB-F6NE	DMH-F6	12.0	0.195	6.000	1.18	5.24	1.50	9.00	8.74	0.022	11.17	11.16
CB-F6NW	DMH-F6	13.0	0.000	6.000	0.00	5.04	0.00	9.00	8.74	0.020	11.17	11.17
CB-F5NW	DMH-F5	13.0	0.000	6.000	0.00	5.04	0.00	9.00	8.74	0.020	11.59	11.59
CB-F5NE	DMH-F5	13.0	0.212	6.000	1.28	5.04	1.63	9.00	8.74	0.020	11.60	11.58
CB-F4NW	DMH-F4	13.0	0.121	6.000	0.73	3.56	0.93	9.00	8.87	0.010	11.76	11.75
CB-F4NE	DMH-F4	12.0	0.123	6.000	0.74	3.71	0.94	9.00	8.87	0.011	11.76	11.75
CB-F3NE	DMH-F3	10.0	0.240	6.000	1.45	5.04	1.85	8.50	8.30	0.020	12.48	12.46
CB-F1NE	DMH-F1	9.0	0.083	6.000	0.50	3.76	0.64	9.90	9.80	0.011	12.56	12.56
DMH-F1	DMH-F2	78.0	0.514	5.958	3.08	6.83	1.75	8.30	7.97	0.004	12.51	12.44
DCB-F2E	DMH-F2	77.0	0.404	6.000	2.44	5.10	1.99	8.70	8.22	0.006	12.60	12.49
DMH-F2	DMH-F3	36.0	0.917	5.824	5.38	12.50	1.71	7.47	7.36	0.003	12.42	12.40
DMH-F3	DMH-C5	129.0	1.157	5.761	6.72	12.44	2.14	7.36	6.97	0.003	12.39	12.28
CB-C4SW	DMH-C4	12.0	0.075	6.000	0.46	5.04	0.58	9.10	8.86	0.020	12.41	12.40
CB-C4NW	DMH-C4	12.0	0.050	6.000	0.30	5.04	0.39	9.10	8.86	0.020	12.41	12.41
CB-C3SW	DMH-C3	12.0	0.028	6.000	0.17	11.12	0.22	9.60	8.43	0.098	12.32	12.32
CB-C3NW	DMH-C3	12.0	0.025	6.000	0.15	11.12	0.19	9.60	8.43	0.098	12.32	12.32
DMH-C3	DMH-C4	40.0	0.141	5.812	0.83	10.37	0.47	8.43	8.04	0.010	12.32	12.32
DMH-C4	DMH-C5	57.0	0.733	5.556	4.10	10.50	2.32	8.04	7.47	0.010	12.30	12.21
DMH-C5	DMH-C6	33.0	1.890	5.483	10.45	12.45	3.33	6.97	6.87	0.003	12.15	12.08
CB-C7SE	DMH-C7	14.0	0.106	6.000	0.64	5.04	0.81	9.20	8.92	0.020	12.68	12.67
CB-C7NE	DMH-C7	14.0	0.117	6.000	0.71	5.13	0.90	9.20	8.91	0.021	12.68	12.68
CB-C8SE	DMH-C8	14.0	0.146	6.000	0.88	5.04	1.12	10.70	10.42	0.020	13.61	13.60
CB-C8NE	DMH-C8	14.0	0.082	6.000	0.50	5.04	0.63	10.70	10.42	0.020	13.60	13.60
DMH-C8	DMH-C7	178.0	1.598	5.934	9.56	6.82	5.41	8.51	7.76	0.004	13.93	12.46
DMH-C7	DMH-C6	92.0	2.175	5.835	12.79	14.73	4.07	7.26	6.87	0.004	12.41	12.12
DMH-C6	DMH-F4	116.0	4.183	5.453	22.99	22.85	4.68	6.37	6.01	0.003	11.93	11.57
DMH-F4	DMH-F5	122.0	4.789	5.379	25.97	34.16	3.67	5.51	5.19	0.003	11.55	11.36
DMH-F5	DMH-D5	108.0	5.332	5.279	28.37	38.51	4.01	5.19	4.83	0.003	11.34	11.14
CB-D4NW	DMH-D4	12.0	0.112	6.000	0.68	3.56	0.86	10.30	10.18	0.010	11.73	11.73
CB-D4SW	DMH-D4	13.0	0.117	6.000	0.71	3.42	0.90	10.30	10.18	0.009	11.73	11.73
DMH-D4	DMH-D5	90.0	0.452	5.957	2.71	10.50	1.54	8.34	7.44	0.010	11.69	11.63
DCB-D6S	DMH-D6	12.0	0.434	6.000	2.62	5.04	4.73	8.80	8.56	0.020	13.23	13.10
CB-D7E	DMH-D7	54.0	0.133	6.000	0.81	5.18	1.03	8.83	7.69	0.021	13.43	13.40
DMH-D7	DMH-D6	53.0	0.995	5.842	5.86	7.90	3.31	7.69	7.39	0.006	13.26	13.10
DMH-D6	DMH-D5	179.0	1.428	5.794	8.34	8.08	5.34	7.39	6.33	0.006	13.07	11.63
DMH-D5	DMH-F6	123.0	7.212	5.198	37.79	36.58	5.50	4.83	4.46	0.003	11.09	10.67
DMH-F6	DMH-F7	122.0	7.870	5.131	40.71	36.73	5.91	4.46	4.09	0.003	10.62	10.14
DMH-F7	DMH-F8	23.0	8.089	5.069	41.33	43.98	6.00	4.09	3.99	0.004	10.08	9.99
DMH-F8	DMH-F9	10.0	8.089	5.058	41.24	94.32	5.99	3.99	3.79	0.020	9.17	9.13
DMH-F9	DMH-F10	79.0	8.089	5.053	41.20	36.76	5.98	3.79	3.55	0.003	9.07	8.75
CB-E2SE	DMH-E2	8.0	0.195	6.000	1.18	5.19	1.50	7.80	7.63	0.021	9.43	9.42
CB-E2NE	DMH-E2	49.0	0.154	6.000	0.93	3.56	1.18	7.80	7.31	0.010	9.44	9.41
DMH-E2	DMH-E1	33.0	0.348	5.876	2.06	3.56	2.63	7.31	6.98	0.010	9.33	9.22
DMH-E1	MH-68	9.0	0.348	5.838	2.05	3.36	2.61	5.56	5.48	0.009	9.07	9.04
CB-21	DMH-22	5.0	0.496	6.000	3.00	4.51	3.82	6.82	6.74	0.016	10.17	10.14
CB-20	DMH-22	49.0	0.428	6.000	2.59	3.53	3.30	6.82	6.34	0.010	10.47	10.21
CB-18	DMH-19	6.0	0.140	6.000	0.85	5.44	1.08	8.74	8.60	0.023	10.70	10.69
CB-17	DMH-19	49.0	0.141	6.000	0.85	3.60	1.08	8.74	8.24	0.010	10.82	10.79
CB-11	DMH-12	5.0	0.530	6.000	3.20	3.90	4.08	6.66	6.60	0.012	10.96	10.92
CB-10	DMH-12	49.0	0.419	6.000	2.53	3.56	3.23	6.66	6.17	0.010	11.17	10.92
CB-A6SE	DMH-A6	14.0	0.367	6.000	2.22	3.56	2.82	8.08	7.94	0.010	11.45	11.40
CB-A6N	DMH-A6	15.0	0.169	6.000	1.02	3.56	1.30	8.09	7.94	0.010	11.41	11.40
DMH-A6	DMH-A5	93.0	0.777	5.965	4.67	5.76	2.64	7.94	7.66	0.003	12.40	12.22
DMH-A5	DMH-A4	126.0	0.777	5.860	4.59	5.77	2.60	7.66	7.28	0.003	12.16	11.92
CB-A4S	DMH-A4	14.0	0.041	6.000	0.25	5.04	0.32	10.00	9.72	0.020	11.94	11.94
CB-A4N	DMH-A4	14.0	0.053	6.000	0.32	5.13	0.41	10.00	9.71	0.021	11.95	11.95
DMH-A4	DMH-A3	178.0	0.871	5.714	5.02	12.34	1.60	7.28	6.75	0.003	11.91	11.82
DMH-A3	DMH-A2	42.0	1.360	5.380	7.38	12.59	2.35	6.75	6.62	0.003	11.74	11.70
CB-A1S	DMH-A2	15.0	0.159	6.000	0.96	4.69	1.22	7.50	7.24	0.017	11.71	11.70
CB-A1N	DMH-A2	13.0	0.089	6.000	0.54	5.93	0.69	7.60	7.24	0.028	11.70	11.70
DMH-A2	DMH-A1	23.0	1.642	5.326	8.82	14.92	2.81	6.62	6.52	0.004	11.83	11.80
DMH-A1	DMH-8	93.0	1.642	5.302	8.78	12.19	2.79	6.49	6.22	0.003	11.78	11.64
CB-8B	DMH-8	22.0	0.058	6.000	0.35	3.13	0.44	8.45	8.28	0.008	11.59	11.58
CB-8C	DMH-8	61.0	0.151	6.000	0.91	3.41	1.16	8.20	7.64	0.009	11.68	11.64
CB-8A	DMH-8	65.0	0.229	6.000	1.38	2.42	1.76	8.29	7.99	0.005	11.68	11.58
DMH-8	DMH-9	83.0	2.079	5.202	10.90	11.10	3.47	6.22	6.02	0.002	11.39	11.19
DMH-9	DMH-12	97.0	2.079	5.130	10.75	11.25	3.42	6.00	5.76	0.002	11.14	10.92
DMH-12	DMH-13	242.0	3.028	5.045	15.40	20.93	3.14	5.26	4.63	0.003	12.08	11.74
CB-C1N	DMH-C1	24.0	0.064	6.000	0.39	5.04	0.49	10.00	9.52	0.020	13.30	13.30
CB-C1SE	DMH-C1	17.0	0.056	6.000	0.34	4.96	0.43	10.00	9.67	0.019	13.30	13.30
CB-C2NE	DMH-C2	23.0	0.071	6.000	0.43	5.04	0.55	8.80	8.34	0.020	13.20	13.20
CB-C2SE	DMH-C2	13.0	0.073	6.000	0.44	5.04	0.57	8.90	8.64	0.020	13.20	13.20
DMH-C2	DMH-C1	77.0	1.629	5.874	9.65	10.50	5.46	7.63	6.86	0.010	13.95	13.30
DMH-C1	DMH-13	123.0	1.749	5.832	10.28	10.50	5.82	6.86	5.63	0.010	13.35	12.17
DMH-13	DMH-16	64.0	4.777	4.814	23.18	21.14	4.72	4.63	4.46	0.003	11.67	11.47
CB-14	DMH-16	49.0	0.081	6.000	0.49	3.60	0.62	9.21	8.71	0.010	11.92	11.92

CB-15	DMH-16	12.0	0.078	6.000	0.47	2.30	0.60	9.19	9.14	0.004	11.80	11.80
DMH-16	DMH-19	240.0	4.936	4.773	23.75	20.85	4.84	4.46	3.84	0.003	11.40	10.59
DMH-19	DMH-D1	42.0	5.217	4.624	24.32	33.91	3.44	3.34	3.23	0.003	10.57	10.51
DMH-D3	DMH-D2	46.0	1.280	6.000	7.74	7.74	4.38	6.52	6.27	0.005	12.05	11.80
CB-D2S	DMH-D2	29.0	0.214	6.000	1.30	3.17	3.46	7.00	6.77	0.008	11.97	11.80
DMH-D2	DMH-D1	104.0	1.808	5.968	10.88	11.52	6.96	5.77	4.52	0.012	12.33	10.91
DMH-D1	DMH-22	194.0	7.024	4.588	32.48	33.91	4.80	3.23	2.73	0.003	10.47	9.96
DMH-22	DMH-23	122.0	7.948	4.466	35.78	51.52	3.87	2.23	1.91	0.003	9.94	9.77
DMH-23	DMH-24	11.0	7.948	4.372	35.02	95.92	3.79	1.86	1.76	0.009	9.26	9.25
DMH-24	DMH-105	30.0	7.948	4.363	34.96	91.84	3.78	1.71	1.46	0.008	9.22	9.18
CB-30	DMH-31	47.0	0.320	6.000	1.94	3.52	2.47	7.41	6.95	0.010	9.59	9.45
CB-32O	DMH-32M	54.0	0.000	6.000	0.00	3.43	0.00	4.00	3.50	0.009	11.09	11.09
CB-32R	DMH-32P	37.0	0.386	6.000	2.34	3.31	2.97	7.64	7.32	0.009	11.85	11.69
CB-32Q	DMH-32P	22.0	0.288	6.000	1.74	2.94	2.22	7.48	7.33	0.007	11.71	11.66
DMH-32P	DMH-32M	53.0	1.266	5.963	7.61	10.99	4.31	3.02	2.44	0.011	11.37	11.09
CB-32N	DMH-32M	12.0	0.313	6.000	1.89	2.91	2.41	6.88	6.80	0.007	11.12	11.09
CB-F15	DMH-F13	17.0	0.146	6.000	0.88	5.04	1.12	7.10	6.76	0.020	11.31	11.30
CB-F14	DMH-F13	16.0	0.206	6.000	1.25	5.19	1.59	7.10	6.76	0.021	11.32	11.30
CB-F13	DMH-F12	10.0	0.000	6.000	0.00	5.04	0.00	9.30	9.10	0.020	12.12	12.12
CB-F12	DMH-F11	12.0	0.145	6.000	0.88	5.04	1.12	9.30	9.06	0.020	11.64	11.63
DMH-F11	DMH-F12	128.0	0.145	5.968	0.87	10.50	0.49	7.19	5.91	0.010	11.63	11.62
DMH-F12	DMH-F13	140.0	0.915	5.189	4.79	10.50	2.71	5.91	4.51	0.010	11.59	11.30
DMH-F13	DMH-32T	76.0	1.267	5.034	6.43	10.29	3.64	4.51	3.78	0.010	11.67	11.39
CB-32Z	DMH-32Y	31.0	0.000	6.000	0.00	2.56	5.87	3.86	3.70	0.005	11.62	11.10
DMH-32Y	DMH-32U	47.0	0.000	5.984	0.00	6.85	2.61	3.69	3.49	0.004	10.76	10.67
CB-32V	DMH-32U	27.0	0.255	6.000	1.54	3.22	1.97	6.59	6.37	0.008	10.72	10.67
CB-32W	DMH-32U	18.0	0.212	6.000	1.28	3.03	1.64	6.39	6.26	0.007	10.69	10.67
CB-32X	DMH-32U	38.0	0.217	6.000	1.31	3.32	1.67	6.29	5.96	0.009	10.72	10.67
DMH-32U	DMH-32T	119.0	1.083	5.930	6.47	6.88	6.27	3.39	2.88	0.004	12.62	11.29
DMH-32T	DMH-32S	171.0	2.350	4.971	11.78	21.96	3.34	2.78	2.29	0.003	11.11	10.84
DMH-32S	DMH-32M	277.0	2.350	4.818	11.41	22.45	3.26	2.27	1.44	0.003	10.66	10.24
DMH-32M	DMH-32L	24.0	3.930	4.563	18.07	22.15	4.62	1.42	1.35	0.003	10.04	9.97
DMH-32L	DMH-32K	9.0	3.930	4.547	18.01	43.23	4.61	1.30	1.20	0.011	9.55	9.52
DMH-32K	DMH-32	17.0	3.930	4.542	17.99	24.37	4.60	1.15	1.09	0.004	9.46	9.40
CB-34N	CB-34M	32.0	0.206	6.000	1.25	10.24	0.71	6.81	6.63	0.006	10.76	10.75
CB-34M	CB-34L	40.0	0.415	5.864	2.45	10.35	1.39	6.63	6.40	0.006	10.75	10.74
CB-34L	CB-34K	93.0	0.633	5.777	3.69	10.41	2.09	6.40	5.86	0.006	10.74	10.67
CB-34K	CB-34J	25.0	0.880	5.644	5.01	10.22	2.83	5.86	5.72	0.006	10.67	10.64
CB-34J	CB-34I	51.0	1.114	5.617	6.31	10.12	3.57	5.72	5.44	0.005	10.64	10.53
CB-34I	CB-34H	48.0	1.330	5.574	7.47	22.46	2.38	5.44	5.16	0.006	10.53	10.50
CB-34H	CB-34G	41.0	1.560	5.514	8.67	22.03	2.76	5.16	4.93	0.006	10.54	10.50
CB-34G	CB-34F	41.0	1.776	5.469	9.79	22.50	3.12	4.93	4.69	0.006	10.95	10.91
CB-34F	CB-34E	42.0	1.983	5.430	10.85	22.23	3.45	4.69	4.45	0.006	10.91	10.85
CB-34E	CB-34D	41.0	2.190	5.393	11.91	22.03	3.79	4.45	4.22	0.006	10.85	10.78
CB-34D	CB-34C	41.0	2.418	5.361	13.07	22.50	4.16	4.22	3.98	0.006	10.78	10.70
CB-34C	DMH-34A	18.0	2.641	5.331	14.19	19.61	4.52	3.98	3.90	0.004	10.71	10.67
CB-34B	DMH-34A	32.0	0.043	6.000	0.26	3.73	0.33	4.90	4.55	0.011	10.67	10.67
DMH-34A	DMH-34	67.0	2.683	5.319	14.39	23.12	4.58	3.90	3.20	0.010	10.83	10.56
CB-39D	CB-39C	70.0	0.152	6.000	0.92	3.56	1.17	6.00	5.30	0.010	9.56	9.51
CB-39C	DMH-39A	23.0	0.152	5.820	0.89	5.75	1.13	5.30	4.70	0.026	9.51	9.50
CB-39B	DMH-39A	16.0	0.258	6.000	1.56	3.56	1.98	5.11	4.95	0.010	9.53	9.50
DMH-39A	DMH-38	50.0	0.409	5.759	2.38	6.13	1.94	4.70	4.25	0.009	9.78	9.71
CB-38A	DMH-38	35.0	0.000	4.030	0.00	7.94	8.65	3.40	3.20	0.006	10.45	9.71
CB-40A	DMH-41	12.0	0.214	6.000	1.30	2.72	1.65	5.57	5.50	0.006	9.51	9.49
CB-43	DMH-44	26.0	0.124	6.000	0.75	1.56	0.95	6.16	6.11	0.002	9.65	9.64
CB-42	DMH-44	19.0	0.220	6.000	1.33	4.90	1.69	6.15	5.79	0.019	9.69	9.67
CB-45A	DMH-45	35.0	0.185	6.000	1.12	3.56	1.43	7.12	6.77	0.010	10.67	10.64
CB-46B	DMH-46A	45.0	0.146	6.000	0.88	2.19	1.62	7.75	7.30	0.010	11.38	11.31
CB-46E	DMH-46C	7.0	0.439	6.000	2.65	-2.50	7.60	10.60	10.90	-0.043	13.52	13.19
CB-46D	DMH-46C	40.0	0.168	6.000	1.01	-1.05	2.90	10.60	10.90	-0.008	13.46	13.18
CB-46H	DMH-46F	8.0	0.481	6.000	2.91	1.35	8.34	14.30	14.20	0.013	15.33	14.86
CB-46G	DMH-46F	39.0	0.138	6.000	0.84	-1.37	2.39	13.70	14.20	-0.013	14.92	14.65
CB-46M	CB-46L	58.0	0.111	6.000	0.67	1.23	3.60	16.60	16.00	0.010	16.99	16.57
CB-46L	DMH-46K	46.0	0.216	5.952	1.30	1.26	4.10	16.00	15.50	0.011	16.57	16.04
CB-46Q	DMH-46N	7.0	0.086	6.000	0.52	4.86	4.03	17.20	17.07	0.019	17.53	17.57
CB-46O	DMH-46N	23.0	0.099	6.000	0.60	1.38	3.82	17.37	17.07	0.013	17.73	17.56
CB-46P	DMH-46N	22.0	0.073	6.000	0.44	1.24	3.24	17.30	17.07	0.010	17.61	17.56
DMH-46N	DMH-46K	137.0	0.258	5.980	1.55	13.52	5.09	17.07	14.80	0.017	17.54	15.47
DMH-46K	DMH-46J	37.0	0.474	5.899	2.82	13.38	6.00	14.80	14.20	0.016	15.44	14.94
DMH-46J	DMH-46I	12.0	0.474	5.880	2.81	13.56	6.05	14.20	14.00	0.017	14.84	14.73
DMH-46I	DMH-46F	52.0	0.474	5.875	2.81	11.28	5.30	14.00	13.40	0.012	14.64	14.43
DMH-46F	DMH-46C	150.0	1.094	5.845	6.44	15.34	8.30	13.40	10.20	0.021	14.38	12.77
DMH-46C	DMH-46A	149.0	1.700	5.791	9.92	14.40	5.62	10.10	7.30	0.019	12.66	11.33
DMH-46A	DMH-45	78.0	1.846	5.711	10.63	12.47	6.01	7.30	6.20	0.014	11.16	10.37
CB-45B	DMH-45	8.0	0.169	6.000	1.02	3.31	2.93	6.80	6.20	0.075	10.44	10.38
CB-45C	DMH-45	33.0	0.188	6.000	1.14	-2.63	1.45	6.85	7.03	-0.005	10.67	10.64
DMH-45	DMH-44	182.0	2.389	5.672	13.66	23.36	4.35	6.20	4.26	0.011	10.29	9.63
DMH-44	DMH-41	186.0	2.732	5.547	15.28	46.13	2.16	4.16	3.27	0.005	9.59	9.49
CB-40	DMH-41	3.0	0.120	6.000	0.72	5.44	0.92	5.48	5.41	0.023	9.49	9.49
CB-39	DMH-41	38.0	0.264	6.000	1.60	3.37	2.04	5.23	4.89	0.009	9.57	9.49
DMH-41	DMH-38	60.0	3.330	5.289	17.75	58.08	1.85	3.22	3.02	0.003	9.73	9.71
DMH-38A(Partners)	DMH-38	123.0	6.562	6.000	39.69	55.92	4.12	3.40	3.02	0.003	9.90	9.71
DMH-38	DMH-37	431.0	10.302	4.024	41.79	74.52	4.54	3.02	1.86	0.003	10.68	10.00
CB-36	DMH-37	3.0	0.510	6.000	3.09	6.50	3.93	5.72	5.62	0.033	10.02	10.00
CB-35	DMH-37	36.0	0.438	6.000	2.65	3.51	3.38	5.80	5.45	0.010	10.20	10.00
DMH-37	DMH-34	101.0	11.250	3.898	44.20	74.26	4.73	1.84	1.57	0.003	10.48	10.30
DMH-34	DMH-33B	71.0	13.934	3.869	54.35	78.12	5.54	1.56	1.35	0.003	10.23	10.07
DMH-33B	DMH-33A	12.0	13.934	3.852	54.11	131.12	5.52	1.30	1.20	0.008	9.56	9.53
DMH-33A	DMH-32	24.0	13.934	3.850	54.07	77.57	5.52	1.15	1.08	0.003	9.49	9.43
CB-32D	DMH-32B	39.0	0.140	6.000	0.85	3.33	1.08	6.62	6.28	0.009	9.79	9.77
CB-32C	DMH-32B	21.0	0.134	6.000	0.81	3.21	1.03	6.90	6.73	0.008	9.74	9.73
CB-32I	DMH-32H	17.0	0.183	6.000	1.11	1.31	3.17	6.70	6.50	0.012	9.67	9.53
CB-32J	DMH-32H	48.0	0.171	6.000	1.03	1.23	2.96	6.40	5.90	0.010	9.88	9.53
DMH-32H	DMH-32E	119.0	0.353	5.951	2.12	22.14	0.67	5.90	4.76	0.010	9.52	9.51
CB-32G	DMH-32E	44.0	0.088	6.000	0.53	1.21	1.52	5.71	5.27	0.010	9.61	9.53
CB-32F	DMH-32E	15.0	0.087	6.000	0.52	5.04	0.67	6.34	6.04	0.020	9.53	9.53
DMH-32E	DMH-32B	182.0	0.528	5.422	2.88	22.62	0.92	4.76	2.94	0.010	9.51	9.48
DMH-32B	DMH-32A	54.0	0.802	4.827	3.90	22.62	1.24	2.94	2.40	0.010	9.48	9.46
DMH-32A	DMH-32	34.0	0.802	4.697	3.80	43.03	1.21	2.40	1.17	0.036	9.45	9.44
DMH-32	DMH-31	63.0	18.665	3.844	72.32	168.72	3.26	1.07	0.97	0.002	9.37	9.34
DMH-31	DMH-29	180.0	18.985	3.818	73.07	178.56	3.29	0.97	0.65	0.002	9.31	9.22
CB-29B	CB-29A	46.0	0.225	6.000	1.36	2.78	1.73	5.13	4.85	0.006	9.57	9.50
CB-29A	DMH-29	99.0	0.917	5.920	5.47	10.24	3.10	4.75	3.81	0.009	9.63	9.36
DMH-29												

	DMH-28	165.0	19.902	3.745	75.13	180.57	3.36	0.65	0.35	0.002	9.21	9.12
DMH-28	DMH-25	158.0	20.393	3.680	75.64	178.27	3.38	0.35	0.07	0.002	9.11	9.03
CB-27	DMH-25	5.0	0.262	6.000	1.59	2.76	3.64	8.42	8.39	0.006	9.19	9.18
CB-26	DMH-25	48.0	0.205	6.000	1.24	3.53	4.09	8.41	7.94	0.010	9.22	9.18
DMH-25	DMH-105	61.0	20.860	3.617	76.06	179.83	3.39	0.07	-0.04	0.002	9.02	8.99
CB-24C	DMH-24B	34.0	0.050	6.000	0.30	3.56	0.39	5.23	4.89	0.010	9.22	9.22
CB-24G	DMH-24E	41.0	0.072	6.000	0.43	4.98	0.55	5.90	5.10	0.020	9.26	9.25
CB-24J	DMH-24I	9.0	0.156	6.000	0.94	1.45	2.70	5.80	5.67	0.014	9.02	8.97
CB-24K	DMH-24I	54.0	0.183	6.000	1.10	1.87	3.16	6.70	5.41	0.024	9.42	8.97
DMH-24I	DMH-24H	173.0	0.339	5.949	2.03	3.61	2.58	5.41	3.63	0.010	9.83	9.26
DMH-24H	DMH-24E	23.0	0.339	5.748	1.96	5.04	2.50	3.53	3.07	0.020	9.22	9.15
CB-24M	DMH-24L	18.0	0.456	6.000	2.76	6.50	3.51	3.10	2.50	0.033	9.16	9.05
CB-24P	DMH-24N	23.0	0.675	6.000	4.08	5.25	5.20	4.60	4.10	0.022	8.92	8.62
CB-24O	DMH-24N	21.0	0.548	6.000	3.31	7.38	4.22	5.00	4.10	0.043	8.80	8.62
CB-24Q	DMH-24N	154.0	0.071	6.000	0.43	3.63	0.55	5.60	4.00	0.010	8.64	8.62
CB-24S	DMH-24R	26.0	0.171	6.000	1.03	4.42	1.31	6.60	6.20	0.015	9.39	9.37
CB-24T	DMH-24R	11.0	0.775	6.000	4.69	-11.77	5.97	5.40	6.60	-0.109	9.56	9.37
CB-24U	DMH-24R	116.0	0.161	6.000	0.97	2.96	1.24	7.10	6.30	0.007	9.46	9.37
DMH-24R	DMH-24N	300.0	1.106	5.719	6.38	8.58	3.61	6.10	4.10	0.007	9.73	8.62
DMH-24N	DMH-24L	294.0	2.400	5.153	12.47	16.16	3.97	4.00	2.50	0.005	9.94	9.05
DMH-24L	DMH-24E	80.0	2.856	4.931	14.20	14.96	4.52	2.50	2.15	0.004	9.54	9.23
CB-24F	DMH-24E	15.0	0.136	6.000	0.82	3.05	1.05	5.73	5.62	0.007	9.26	9.25
DMH-24E	DMH-24B	37.0	3.403	4.878	16.73	75.96	2.37	1.35	0.87	0.013	9.14	9.12
CB-24D	DMH-24B	35.0	0.121	6.000	0.73	1.51	2.09	6.65	6.10	0.016	9.36	9.23
DMH-24B	DMH-24A	47.0	3.574	4.831	17.40	63.05	2.46	0.87	0.45	0.009	9.10	9.07
DMH-24A	DMH-105	199.0	3.574	4.773	17.20	25.90	2.43	0.30	0.00	0.002	9.05	8.92
DMH-105	MH-68	43.0	32.382	3.593	117.29	266.27	4.90	-0.04	-0.21	0.004	8.82	8.77
MH-68	DMH-107	222.0	32.731	3.581	118.16	258.94	4.93	-0.21	-1.04	0.004	8.72	8.48
DMH-107	DMH-F10	172.0	34.528	3.521	122.56	256.30	5.09	-1.04	-1.67	0.004	8.43	8.23
DMH-F10	DMH-G9	374.0	42.617	3.476	149.34	267.30	6.07	-1.67	-3.16	0.004	8.16	7.54
CB-G12SE	DMH-G12	13.0	0.075	6.000	0.46	5.13	0.58	8.00	7.73	0.021	12.20	12.20
CB-G13SE	DMH-G13	13.0	0.107	6.000	0.65	5.04	0.82	7.50	7.24	0.020	11.80	11.80
DMH-63B	DMH-G14	23.0	0.241	6.000	1.46	2.97	2.68	4.75	4.50	0.011	12.16	12.10
CB-G15SE	DMH-G15	13.0	0.082	6.000	0.49	5.04	0.63	7.70	7.44	0.020	11.80	11.80
MH-74	DMH-G15	10.0	1.029	4.200	4.36	4.63	5.55	4.90	4.80	0.010	11.89	11.80
DMH-G15	DMH-G14	24.0	1.113	4.198	4.71	9.83	2.67	4.71	4.50	0.009	12.15	12.10
CB-G14SW	DMH-G14	17.0	0.062	6.000	0.38	5.11	0.48	7.80	7.45	0.021	12.10	12.10
DMH-G14	DMH-G13	167.0	1.754	4.186	7.40	9.34	4.19	4.50	3.18	0.008	12.63	11.80
CB-G13SW	DMH-G13	13.0	0.103	6.000	0.62	4.84	0.79	7.50	7.26	0.018	11.80	11.80
DMH-G13	DMH-G12	149.0	2.399	4.132	9.99	20.13	3.18	2.68	1.50	0.008	12.49	12.20
CB-G12SW	DMH-G12	13.0	0.045	6.000	0.27	5.13	0.35	8.00	7.73	0.021	12.20	12.20
DMH-G12	DMH-G11	47.0	2.639	4.070	10.83	20.34	3.45	1.50	1.12	0.008	13.01	12.90
CB-E6SW	DMH-E6	9.0	0.247	6.000	1.49	3.56	1.90	8.61	8.52	0.010	12.12	12.10
CB-E6NW	DMH-E6	26.0	0.247	6.000	1.49	3.56	1.90	8.78	8.52	0.010	12.15	12.10
CB-E3SW	DMH-E3	12.0	0.156	6.000	0.94	3.56	1.20	9.10	8.98	0.010	13.21	13.20
CB-E3NW	DMH-E3	26.0	0.151	6.000	0.91	3.63	1.16	10.19	9.92	0.010	13.22	13.20
DMH-E3	DMH-E4	140.0	0.307	5.933	1.84	10.50	1.04	8.09	6.69	0.010	13.25	13.21
CB-E4NW	DMH-E4	26.0	0.134	6.000	0.81	4.99	1.03	9.50	8.99	0.020	13.52	13.51
CB-E4SW	DMH-E4	9.0	0.176	6.000	1.07	5.18	1.36	9.50	9.31	0.021	13.45	13.44
DMH-E4	DMH-E5	122.0	0.617	5.529	3.44	10.50	1.95	6.69	5.47	0.010	13.19	13.06
DMH-E10	DMH-E5	36.0	0.963	6.000	5.83	22.62	1.85	5.33	4.97	0.010	12.83	12.80
CB-E8NE	DMH-E8	10.0	0.075	6.000	0.45	5.04	0.58	8.90	8.70	0.020	13.00	13.00
DMH-E8	DMH-E9	114.0	0.695	5.948	4.17	6.46	3.39	8.45	7.31	0.010	13.57	13.10
CB-E9NE	DMH-E9	10.0	0.097	6.000	0.59	5.04	0.75	8.90	8.70	0.020	13.10	13.10
DMH-E9	DMH-E5	118.0	1.390	5.847	8.19	10.50	4.64	7.06	5.88	0.010	14.12	13.40
DMH-E5	DMH-E6	104.0	2.971	5.341	15.99	22.62	5.09	4.97	3.93	0.010	12.62	12.10
DMH-E6	DMH-E7	56.0	3.464	5.279	18.44	22.62	5.87	3.93	3.37	0.010	13.07	12.70
DMH-E7	DMH-G11	41.0	3.464	5.251	18.34	31.99	5.84	2.28	1.46	0.020	13.17	12.90
DMH-G11	DMH-G10	10.0	6.122	4.052	25.00	66.13	5.09	0.62	0.36	0.026	12.84	12.80
DMH-G10	DMH-G9	18.0	6.122	4.049	24.99	41.01	5.09	0.36	0.18	0.010	12.87	12.80
DMH-G9	MH-75	128.0	49.754	2.288	114.77	0.00	5.16	-12.15	-12.15	0.000	7.38	7.23
MH-75	DMH-110	82.0	49.754	2.276	114.15	405.01	5.14	-3.16	-3.91	0.009	7.23	7.13
DMH-110	DMH-111	211.0	49.754	2.268	113.75	260.76	5.12	-3.91	-4.71	0.004	7.02	6.78
DMH-111	O-1	67.0	49.754	2.247	112.71	258.68	5.09	-4.71	-4.96	0.004	5.28	5.20
CB-2	DMH-3	20.0	0.223	6.000	1.35	3.90	4.51	7.72	7.48	0.012	8.21	7.89
CB-1	DMH-3	72.0	0.203	6.000	1.23	3.09	3.70	7.55	7.01	0.008	8.02	7.58
DMH-3	DMH-4	57.0	0.426	5.942	2.55	10.13	4.77	6.91	6.38	0.009	7.52	7.09
DMH-4	O-2	218.0	0.426	5.906	2.54	10.98	5.05	6.38	4.00	0.011	6.98	4.85

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Scenario: 100 Year with tailwater
Current Time Step: 0.000Hr
Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Length (Unified) (ft)	System CA (acres)	System Intensity (in/h)	System Rational Flow (ft³/s)	Capacity (Full Flow) (ft³/s)	Velocity (Average) (ft/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
CB-G6N	DMH-G6	14.0	0.118	7.400	0.88	5.04	1.12	7.50	7.22	0.020	12.01	12.00
CB-G4E	DMH-G4	9.0	0.273	7.400	2.03	5.04	2.59	7.00	6.82	0.020	11.63	11.60
DCB-G2E	DMH-G2	12.0	0.232	7.400	1.73	5.14	2.20	5.00	4.75	0.021	9.53	9.50
CB-G1E	DMH-G1	43.0	0.179	7.400	1.34	3.56	1.70	4.00	3.57	0.010	9.46	9.40
CB-G1NE	DMH-G1	56.0	0.098	7.400	0.73	3.56	0.93	4.00	3.44	0.010	9.42	9.40
DMH-G1	DMH-G2	45.0	0.277	7.190	2.01	77.20	0.16	2.90	2.77	0.003	9.50	9.50
DMH-G2	DMH-G3	42.0	0.509	6.204	3.18	79.91	0.25	2.77	2.64	0.003	10.30	10.30
DMH-G3	DMH-G4	155.0	0.509	5.624	2.88	79.09	0.23	2.64	2.17	0.003	11.60	11.60
DMH-G4	DMH-G5	203.0	0.782	4.394	3.46	62.14	0.28	2.17	1.79	0.002	12.01	12.01
RG-G1	DMH-G5	65.0	0.000	7.400	0.00	8.13	7.72	5.32	4.29	0.016	13.42	12.02
DMH-G5	DMH-G6	118.0	0.782	3.620	2.85	137.41	0.98	1.79	0.71	0.009	12.01	12.00
DMH-G6	DMH-G7	38.0	1.015	3.540	3.62	80.72	1.04	-0.73	-0.85	0.003	12.30	12.30
DMH-G7	DMH-G8	11.0	1.015	3.516	3.60	212.16	1.04	-0.85	-1.09	0.022	12.40	12.40
DMH-G8	DMH-G9	70.0	1.015	3.509	3.59	78.67	1.04	-1.09	-1.30	0.003	12.81	12.80
CB-F7NE	DMH-F7	12.0	0.219	7.400	1.63	5.24	2.08	9.00	8.74	0.022	13.23	13.20
CB-F7NW	DMH-F7	13.0	0.000	7.400	0.00	5.04	0.00	9.00	8.74	0.020	13.20	13.20
CB-F6NE	DMH-F6	12.0	0.195	7.400	1.46	5.24	1.85	9.00	8.74	0.022	13.22	13.20
CB-F6NW	DMH-F6	13.0	0.000	7.400	0.00	5.04	0.00	9.00	8.74	0.020	13.20	13.20
CB-F5NW	DMH-F5	13.0	0.000	7.400	0.00	5.04	0.00	9.00	8.74	0.020	13.10	13.10
CB-F5NE	DMH-F5	13.0	0.212	7.400	1.58	5.04	2.01	9.00	8.74	0.020	13.13	13.10
CB-F4NW	DMH-F4	13.0	0.121	7.400	0.91	3.56	1.15	9.00	8.87	0.010	13.21	13.20
CB-F4NE	DMH-F4	12.0	0.123	7.400	0.92	3.71	1.17	9.00	8.87	0.011	13.21	13.20
CB-F3NE	DMH-F3	10.0	0.240	7.400	1.79	5.04	2.28	8.50	8.30	0.020	12.93	12.90
CB-F1NE	DMH-F1	9.0	0.083	7.400	0.62	3.76	0.79	9.90	9.80	0.011	12.90	12.90
DMH-F1	DMH-F2	78.0	0.514	7.360	3.81	6.83	2.16	8.30	7.97	0.004	13.06	12.95
DCB-F2E	DMH-F2	77.0	0.404	7.400	3.01	5.10	2.45	8.70	8.22	0.006	13.17	13.00
DMH-F2	DMH-F3	36.0	0.917	7.233	6.69	12.50	2.13	7.47	7.36	0.003	12.93	12.90
DMH-F3	DMH-C5	129.0	1.157	7.174	8.37	12.44	2.66	7.36	6.97	0.003	13.98	13.80
CB-C4SW	DMH-C4	12.0	0.075	7.400	0.56	5.04	0.72	9.10	8.86	0.020	13.40	13.40
CB-C4NW	DMH-C4	12.0	0.050	7.400	0.37	5.04	0.48	9.10	8.86	0.020	13.40	13.40
CB-C3SW	DMH-C3	12.0	0.028	7.400	0.21	11.12	0.27	9.60	8.43	0.098	13.40	13.40
CB-C3NW	DMH-C3	12.0	0.025	7.400	0.19	11.12	0.24	9.60	8.43	0.098	13.40	13.40
DMH-C3	DMH-C4	40.0	0.141	7.222	1.03	10.37	0.58	8.43	8.04	0.010	13.40	13.40
DMH-C4	DMH-C5	57.0	0.733	6.982	5.16	10.50	2.92	8.04	7.47	0.010	13.94	13.80
DMH-C5	DMH-C6	33.0	1.890	6.914	13.17	12.45	4.19	6.97	6.87	0.003	14.18	14.07
CB-C7SE	DMH-C7	14.0	0.106	7.400	0.79	5.04	1.00	9.20	8.92	0.020	13.41	13.40
CB-C7NE	DMH-C7	14.0	0.117	7.400	0.87	5.13	1.11	9.20	8.91	0.021	13.41	13.40
CB-C8SE	DMH-C8	14.0	0.146	7.400	1.09	5.04	1.38	10.70	10.42	0.020	13.61	13.60
CB-C8NE	DMH-C8	14.0	0.082	7.400	0.61	5.04	0.78	10.70	10.42	0.020	13.60	13.60
DMH-C8	DMH-C7	178.0	1.598	7.337	11.82	6.82	6.69	8.51	7.76	0.004	15.65	13.40
DMH-C7	DMH-C6	92.0	2.175	7.244	15.88	14.73	5.06	7.26	6.87	0.004	14.58	14.13
DMH-C6	DMH-F4	116.0	4.183	6.886	29.03	22.85	5.91	6.37	6.01	0.003	13.78	13.20
DMH-F4	DMH-F5	122.0	4.789	6.817	32.91	34.16	4.66	5.51	5.19	0.003	13.40	13.10
DMH-F5	DMH-D5	108.0	5.332	6.726	36.15	38.51	5.11	5.19	4.83	0.003	14.22	13.90
CB-D4NW	DMH-D4	12.0	0.112	7.400	0.83	3.56	1.06	10.30	10.18	0.010	13.41	13.40
CB-D4SW	DMH-D4	13.0	0.117	7.400	0.87	3.42	1.11	10.30	10.18	0.009	13.41	13.40
DMH-D4	DMH-D5	90.0	0.452	7.359	3.35	10.50	1.90	8.34	7.44	0.010	13.99	13.90
DCB-D6S	DMH-D6	12.0	0.434	7.400	3.24	5.04	5.80	8.80	8.56	0.020	13.30	13.10
CB-D7E	DMH-D7	54.0	0.133	7.400	0.99	5.18	1.27	8.83	7.69	0.021	13.44	13.40
DMH-D7	DMH-D6	53.0	0.995	7.251	7.27	7.90	4.11	7.69	7.39	0.006	13.35	13.10
DMH-D6	DMH-D5	179.0	1.428	7.206	10.38	8.08	6.62	7.39	6.33	0.006	16.12	13.90
DMH-D5	DMH-F6	123.0	7.212	6.652	48.36	36.58	7.03	4.83	4.46	0.003	13.88	13.20
DMH-F6	DMH-F7	122.0	7.870	6.591	52.28	36.73	7.58	4.46	4.09	0.003	13.99	13.20
DMH-F7	DMH-F8	23.0	8.089	6.534	53.28	43.98	7.72	4.09	3.99	0.004	13.39	13.24
DMH-F8	DMH-F9	10.0	8.089	6.524	53.20	94.32	7.71	3.99	3.79	0.020	12.42	12.35
DMH-F9	DMH-F10	79.0	8.089	6.519	53.16	36.76	7.71	3.79	3.55	0.003	12.22	11.69
CB-E2SE	DMH-E2	8.0	0.195	7.400	1.45	5.19	1.85	7.80	7.63	0.021	12.01	12.00
CB-E2NE	DMH-E2	49.0	0.154	7.400	1.15	3.56	1.46	7.80	7.31	0.010	12.05	12.00
DMH-E2	DMH-E1	33.0	0.348	7.283	2.56	3.56	3.26	7.31	6.98	0.010	12.67	12.50
DMH-E1	MH-68	9.0	0.348	7.247	2.54	3.36	3.24	5.56	5.48	0.009	12.25	12.21
CB-21	DMH-22	5.0	0.496	7.400	3.70	4.51	4.71	6.82	6.74	0.016	11.13	11.08
CB-20	DMH-22	49.0	0.428	7.400	3.20	3.53	4.07	6.82	6.34	0.010	11.47	11.08
CB-18	DMH-19	6.0	0.140	7.400	1.04	5.44	1.33	8.74	8.60	0.023	12.40	12.40
CB-17	DMH-19	49.0	0.141	7.400	1.05	3.60	1.34	8.74	8.24	0.010	12.64	12.60
CB-11	DMH-12	5.0	0.530	7.400	3.95	3.90	5.03	6.66	6.60	0.012	10.98	10.92
CB-10	DMH-12	49.0	0.419	7.400	3.13	3.56	3.98	6.66	6.17	0.010	11.30	10.92
CB-A6SE	DMH-A6	14.0	0.367	7.400	2.73	3.56	3.48	8.08	7.94	0.010	11.48	11.40
CB-A6N	DMH-A6	15.0	0.169	7.400	1.26	3.56	1.60	8.09	7.94	0.010	11.42	11.40
DMH-A6	DMH-A5	93.0	0.777	7.367	5.77	5.76	3.27	7.94	7.66	0.003	12.78	12.50
DMH-A5	DMH-A4	126.0	0.777	7.268	5.69	5.77	3.22	7.66	7.28	0.003	12.42	12.05
CB-A4S	DMH-A4	14.0	0.041	7.400	0.31	5.04	0.39	10.00	9.72	0.020	12.08	12.08
CB-A4N	DMH-A4	14.0	0.053	7.400	0.39	5.13	0.50	10.00	9.71	0.021	12.10	12.10
DMH-A4	DMH-A3	178.0	0.871	7.131	6.26	12.34	1.99	7.28	6.75	0.003	12.03	11.89
DMH-A3	DMH-A2	42.0	1.360	6.818	9.35	12.59	2.98	6.75	6.62	0.003	11.77	11.70
CB-A1S	DMH-A2	15.0	0.159	7.400	1.18	4.69	1.51	7.50	7.24	0.017	11.72	11.70
CB-A1N	DMH-A2	13.0	0.089	7.400	0.67	5.93	0.85	7.60	7.24	0.028	11.70	11.70
DMH-A2	DMH-A1	23.0	1.642	6.769	11.20	14.92	3.57	6.62	6.52	0.004	11.86	11.80
DMH-A1	DMH-8	93.0	1.642	6.746	11.17	12.19	3.55	6.49	6.22	0.003	12.34	12.11
CB-8B	DMH-8	22.0	0.058	7.400	0.43	3.13	0.55	8.45	8.28	0.008	12.03	12.02
CB-8C	DMH-8	61.0	0.151	7.400	1.12	3.41	1.43	8.20	7.64	0.009	12.17	12.11
CB-8A	DMH-8	65.0	0.229	7.400	1.71	2.42	2.17	8.29	7.99	0.005	12.17	12.02
DMH-8	DMH-9	83.0	2.079	6.655	13.95	11.10	4.44	6.22	6.02	0.002	11.69	11.37
DMH-9	DMH-12	97.0	2.079	6.589	13.81	11.25	4.40	6.00	5.76	0.002	11.28	10.92
DMH-12	DMH-13	242.0	3.028	6.512	19.88	20.93	4.05	5.26	4.63	0.003	13.47	12.90
CB-C1N	DMH-C1	24.0	0.064	7.400	0.48	5.04	0.61	10.00	9.52	0.020	13.30	13.30
CB-C1SE	DMH-C1	17.0	0.056	7.400	0.42	4.96	0.53	10.00	9.67	0.019	13.30	13.30
CB-C2NE	DMH-C2	23.0	0.071	7.400	0.53	5.04	0.68	8.80	8.34	0.020	13.21	13.20
CB-C2SE	DMH-C2	13.0	0.073	7.400	0.55	5.04	0.70	8.90	8.64	0.020	13.20	13.20
DMH-C2	DMH-C1	77.0	1.629	7.281	11.96	10.50	6.77	7.63	6.86	0.010	14.30	13.30
DMH-C1	DMH-13	123.0	1.749	7.241	12.77	10.50	7.23	6.86	5.63	0.010	14.72	12.90
DMH-13	DMH-16	64.0	4.777	6.303	30.35	21.14	6.18	4.63	4.46	0.003	13.79	13.44
CB-14	DMH-16	49.0	0.081	7.400	0.61	3.60	0.77	9.21	8.71	0.010	13.45	13.44

CB-15	DMH-16	12.0	0.078	7.400	0.58	2.30	0.74	9.19	9.14	0.004	13.44	13.44
DMH-16	DMH-19	240.0	4.936	6.267	31.18	20.85	6.35	4.46	3.84	0.003	13.59	12.20
DMH-19	DMH-D1	42.0	5.217	6.134	32.26	33.91	4.56	3.34	3.23	0.003	12.15	12.05
DMH-D3	DMH-D2	46.0	1.280	7.400	9.55	7.74	5.40	6.52	6.27	0.005	12.18	11.80
CB-D2S	DMH-D2	29.0	0.214	7.400	1.60	3.17	4.22	7.00	6.77	0.008	12.05	11.80
DMH-D2	DMH-D1	104.0	1.808	7.370	13.43	11.52	8.57	5.77	4.52	0.012	14.85	12.69
DMH-D1	DMH-22	194.0	7.024	6.102	43.21	33.91	6.36	3.23	2.73	0.003	11.96	11.08
DMH-22	DMH-23	122.0	7.948	5.995	48.03	51.52	5.17	2.23	1.91	0.003	12.25	11.95
DMH-23	DMH-24	11.0	7.948	5.913	47.37	95.92	5.10	1.86	1.76	0.009	12.08	12.05
DMH-24	DMH-105	30.0	7.948	5.905	47.31	91.84	5.10	1.71	1.46	0.008	12.39	12.32
CB-30	DMH-31	47.0	0.320	7.400	2.39	3.52	3.04	7.41	6.95	0.010	12.19	11.98
CB-32O	DMH-32M	54.0	0.000	7.400	0.00	3.43	0.00	4.00	3.50	0.009	11.09	11.09
CB-32R	DMH-32P	37.0	0.386	7.400	2.88	3.31	3.67	7.64	7.32	0.009	11.93	11.69
CB-32Q	DMH-32P	22.0	0.288	7.400	2.15	2.94	2.73	7.48	7.33	0.007	11.77	11.69
DMH-32P	DMH-32M	53.0	1.266	7.365	9.40	10.99	5.32	3.02	2.44	0.011	11.51	11.09
CB-32N	DMH-32M	12.0	0.313	7.400	2.33	2.91	2.97	6.88	6.80	0.007	11.14	11.09
CB-F15	DMH-F13	17.0	0.146	7.400	1.09	5.04	1.38	7.10	6.76	0.020	11.32	11.30
CB-F14	DMH-F13	16.0	0.206	7.400	1.54	5.19	1.96	7.10	6.76	0.021	11.33	11.30
CB-F13	DMH-F12	10.0	0.000	7.400	0.00	5.04	0.00	9.30	9.10	0.020	12.65	12.65
CB-F12	DMH-F11	12.0	0.145	7.400	1.08	5.04	1.38	9.30	9.06	0.020	11.86	11.85
DMH-F11	DMH-F12	128.0	0.145	7.369	1.08	10.50	0.61	7.19	5.91	0.010	11.84	11.83
DMH-F12	DMH-F13	140.0	0.915	6.634	6.12	10.50	3.46	5.91	4.51	0.010	11.78	11.30
DMH-F13	DMH-32T	76.0	1.267	6.492	8.29	10.29	4.69	4.51	3.78	0.010	11.86	11.39
CB-32Z	DMH-32Y	31.0	0.000	7.400	0.00	2.56	7.92	3.86	3.70	0.005	12.04	11.10
DMH-32Y	DMH-32U	47.0	0.000	7.386	0.00	6.85	3.52	3.69	3.49	0.004	10.83	10.67
CB-32V	DMH-32U	27.0	0.255	7.400	1.90	3.22	2.42	6.59	6.37	0.008	10.75	10.67
CB-32W	DMH-32U	18.0	0.212	7.400	1.58	3.03	2.02	6.39	6.26	0.007	10.71	10.67
CB-32X	DMH-32U	38.0	0.217	7.400	1.62	3.32	2.06	6.29	5.96	0.009	10.75	10.67
DMH-32U	DMH-32T	119.0	1.083	7.335	8.01	6.88	8.05	3.39	2.88	0.004	13.57	11.39
DMH-32T	DMH-32S	171.0	2.350	6.436	15.25	21.96	4.37	2.78	2.29	0.003	12.41	11.94
DMH-32S	DMH-32M	277.0	2.350	6.299	14.92	22.45	4.31	2.27	1.44	0.003	11.83	11.09
DMH-32M	DMH-32L	24.0	3.930	6.074	24.06	22.15	6.17	1.42	1.35	0.003	11.50	11.37
DMH-32L	DMH-32K	9.0	3.930	6.060	24.00	43.23	6.16	1.30	1.20	0.011	11.54	11.49
DMH-32K	DMH-32	17.0	3.930	6.055	23.98	24.37	6.15	1.15	1.09	0.004	11.71	11.62
CB-34N	CB-34M	32.0	0.206	7.400	1.54	10.24	0.87	6.81	6.63	0.006	10.90	10.90
CB-34M	CB-34L	40.0	0.415	7.271	3.04	10.35	1.72	6.63	6.40	0.006	10.90	10.88
CB-34L	CB-34K	93.0	0.633	7.190	4.59	10.41	2.60	6.40	5.86	0.006	10.88	10.77
CB-34K	CB-34J	25.0	0.880	7.065	6.27	10.22	3.55	5.86	5.72	0.006	10.77	10.72
CB-34J	CB-34I	51.0	1.114	7.040	7.90	10.12	4.47	5.72	5.44	0.005	10.72	10.55
CB-34I	CB-34H	48.0	1.330	7.000	9.38	22.46	2.99	5.44	5.16	0.006	10.55	10.50
CB-34H	CB-34G	41.0	1.560	6.944	10.92	22.03	3.48	5.16	4.93	0.006	10.56	10.50
CB-34G	CB-34F	41.0	1.776	6.902	12.35	22.50	3.93	4.93	4.69	0.006	11.10	11.03
CB-34F	CB-34E	42.0	1.983	6.866	13.72	22.23	4.37	4.69	4.45	0.006	11.03	10.94
CB-34E	CB-34D	41.0	2.190	6.832	15.09	22.03	4.80	4.45	4.22	0.006	10.94	10.83
CB-34D	CB-34C	41.0	2.418	6.802	16.58	22.50	5.28	4.22	3.98	0.006	10.83	10.70
CB-34C	DMH-34A	18.0	2.641	6.775	18.03	19.61	5.74	3.98	3.90	0.004	10.74	10.67
CB-34B	DMH-34A	32.0	0.043	7.400	0.32	3.73	0.41	4.90	4.55	0.011	10.67	10.67
DMH-34A	DMH-34	67.0	2.683	6.764	18.30	23.12	5.82	3.90	3.20	0.010	11.00	10.56
CB-39D	CB-39C	70.0	0.152	7.400	1.13	3.56	1.44	6.00	5.30	0.010	9.59	9.52
CB-39C	DMH-39A	23.0	0.152	7.230	1.10	5.75	1.41	5.30	4.70	0.026	9.52	9.50
CB-39B	DMH-39A	16.0	0.258	7.400	1.92	3.56	2.45	5.11	4.95	0.010	9.55	9.50
DMH-39A	DMH-38	50.0	0.409	7.173	2.96	6.13	2.41	4.70	4.25	0.009	9.81	9.71
CB-38A	DMH-38	35.0	0.000	5.387	0.00	7.94	11.58	3.40	3.20	0.006	11.04	9.71
CB-40A	DMH-41	12.0	0.214	7.400	1.60	2.72	2.03	5.57	5.50	0.006	9.51	9.49
CB-43	DMH-44	26.0	0.124	7.400	0.92	1.56	1.18	6.16	6.11	0.002	9.75	9.73
CB-42	DMH-44	19.0	0.220	7.400	1.64	4.90	2.09	6.15	5.79	0.019	9.81	9.77
CB-45A	DMH-45	35.0	0.185	7.400	1.38	3.56	1.76	7.12	6.77	0.010	11.35	11.30
CB-46B	DMH-46A	45.0	0.146	7.400	1.09	2.19	1.99	7.75	7.30	0.010	12.01	11.90
CB-46E	DMH-46C	7.0	0.439	7.400	3.27	-2.50	9.38	10.60	10.90	-0.043	14.53	14.02
CB-46D	DMH-46C	40.0	0.168	7.400	1.25	-1.05	3.58	10.60	10.90	-0.008	14.45	14.02
CB-46H	DMH-46F	8.0	0.481	7.400	3.59	1.35	10.29	14.30	14.20	0.013	15.80	15.09
CB-46G	DMH-46F	39.0	0.138	7.400	1.03	-1.37	2.95	13.70	14.20	-0.013	15.42	15.14
CB-46M	CB-46L	58.0	0.111	7.400	0.83	1.23	3.78	16.60	16.00	0.010	17.19	16.93
CB-46L	DMH-46K	46.0	0.216	7.346	1.60	1.26	4.59	16.00	15.50	0.011	16.93	16.09
CB-46Q	DMH-46N	7.0	0.086	7.400	0.64	4.86	4.28	17.20	17.07	0.019	17.60	17.63
CB-46O	DMH-46N	23.0	0.099	7.400	0.74	1.38	4.02	17.37	17.07	0.013	17.78	17.62
CB-46P	DMH-46N	22.0	0.073	7.400	0.54	1.24	3.43	17.30	17.07	0.010	17.65	17.61
DMH-46N	DMH-46K	137.0	0.258	7.378	1.92	13.52	5.41	17.07	14.80	0.017	17.59	15.55
DMH-46K	DMH-46J	37.0	0.474	7.289	3.48	13.38	6.36	14.80	14.20	0.016	15.51	15.03
DMH-46J	DMH-46I	12.0	0.474	7.269	3.47	13.56	6.42	14.20	14.00	0.017	14.91	14.98
DMH-46I	DMH-46F	52.0	0.474	7.262	3.47	11.28	5.62	14.00	13.40	0.012	14.90	14.93
DMH-46F	DMH-46C	150.0	1.094	7.230	7.97	15.34	8.77	13.40	10.20	0.021	14.88	14.02
DMH-46C	DMH-46A	149.0	1.700	7.170	12.29	14.40	6.95	10.10	7.30	0.019	13.94	11.90
DMH-46A	DMH-45	78.0	1.846	7.095	13.20	12.47	7.47	7.30	6.20	0.014	12.09	10.86
CB-45B	DMH-45	8.0	0.169	7.400	1.26	3.31	3.61	6.80	6.20	0.075	10.97	10.88
CB-45C	DMH-45	33.0	0.188	7.400	1.41	-2.63	1.79	6.85	7.03	-0.005	11.36	11.31
DMH-45	DMH-44	182.0	2.389	7.058	17.00	23.36	5.41	6.20	4.26	0.011	10.73	9.70
DMH-44	DMH-41	186.0	2.732	6.940	19.12	46.13	2.70	4.16	3.27	0.005	9.64	9.49
CB-40	DMH-41	3.0	0.120	7.400	0.89	5.44	1.14	5.48	5.41	0.023	9.49	9.49
CB-39	DMH-41	38.0	0.264	7.400	1.97	3.37	2.51	5.23	4.89	0.009	9.61	9.49
DMH-41	DMH-38	60.0	3.330	6.700	22.49	58.08	2.34	3.22	3.02	0.003	9.74	9.71
DMH-38A(Partners)	DMH-38	123.0	6.562	7.400	48.95	55.92	5.09	3.40	3.02	0.003	10.00	9.71
DMH-38	DMH-37	431.0	10.302	5.376	55.82	74.52	6.07	3.02	1.86	0.003	11.22	10.00
CB-36	DMH-37	3.0	0.510	7.400	3.81	6.50	4.85	5.72	5.62	0.033	10.03	10.00
CB-35	DMH-37	36.0	0.438	7.400	3.27	3.51	4.16	5.80	5.45	0.010	10.30	10.00
DMH-37	DMH-34	101.0	11.250	5.223	59.24	74.26	6.34	1.84	1.57	0.003	10.87	10.56
DMH-34	DMH-33B	71.0	13.934	5.199	73.02	78.12	7.44	1.56	1.35	0.003	11.56	11.26
DMH-33B	DMH-33A	12.0	13.934	5.184	72.81	131.12	7.42	1.30	1.20	0.008	11.43	11.38
DMH-33A	DMH-32	24.0	13.934	5.181	72.77	77.57	7.42	1.15	1.08	0.003	11.72	11.62
CB-32D	DMH-32B	39.0	0.140	7.400	1.04	3.33	1.33	6.62	6.28	0.009	10.47	10.44
CB-32C	DMH-32B	21.0	0.134	7.400	1.00	3.21	1.28	6.90	6.73	0.008	10.41	10.39
CB-32I	DMH-32H	17.0	0.183	7.400	1.36	1.31	3.91	6.70	6.50	0.012	10.04	9.83
CB-32J	DMH-32H	48.0	0.171	7.400	1.27	1.23	3.65	6.40	5.90	0.010	10.36	9.83
DMH-32H	DMH-32E	119.0	0.353	7.354	2.62	22.14	0.83	5.90	4.76	0.010	9.82	9.80
CB-32G	DMH-32E	44.0	0.088	7.400	0.65	1.21	1.87	5.71	5.27	0.010	9.93	9.80
CB-32F	DMH-32E	15.0	0.087	7.400	0.65	5.04	0.82	6.34	6.04	0.020	9.80	9.80
DMH-32E	DMH-32B	182.0	0.528	6.855	3.64	22.62	1.16	4.76	2.94	0.010	10.01	9.97
DMH-32B	DMH-32A	54.0	0.802	6.305	5.10	22.62	1.62	2.94	2.40	0.010	9.96	9.93
DMH-32A	DMH-32	34.0	0.802	6.189	5.00	43.03	1.59	2.40	1.17	0.036	11.64	11.62
DMH-32	DMH-31	63.0	18.665	5.176	97.39	168.72	4.39	1.07	0.97	0.002	12.03	11.98
DMH-31	DMH-29	180.0	18.985	5.154	98.63	178.56	4.43	0.97	0.65	0.002	12.69	12.53
CB-29B	CB-29A	46.0	0.225	7.400	1.68	2.78	2.13	5.13	4.85	0.006	9.60	9.50
CB-29A	DMH-29	99.0	0.917	7.325	6.77	10.24	3.83	4.75	3.81	0.009	13.26	12.85
DMH-29												

	DMH-28	165.0	19.902	5.091	102.12	180.57	4.56	0.65	0.35	0.002	12.50	12.35
DMH-28	DMH-25	158.0	20.393	5.034	103.49	178.27	4.60	0.35	0.07	0.002	12.32	12.17
CB-27	DMH-25	5.0	0.262	7.400	1.96	2.76	2.49	8.42	8.39	0.006	12.52	12.51
CB-26	DMH-25	48.0	0.205	7.400	1.53	3.53	1.95	8.41	7.94	0.010	12.59	12.51
DMH-25	DMH-105	61.0	20.860	4.981	104.73	179.83	4.65	0.07	-0.04	0.002	12.14	12.08
CB-24C	DMH-24B	34.0	0.050	7.400	0.37	3.56	0.48	5.23	4.89	0.010	10.42	10.42
CB-24G	DMH-24E	41.0	0.072	7.400	0.54	4.98	0.68	5.90	5.10	0.020	10.09	10.08
CB-24J	DMH-24I	9.0	0.156	7.400	1.16	1.45	3.33	5.80	5.67	0.014	9.05	8.97
CB-24K	DMH-24I	54.0	0.183	7.400	1.36	1.87	3.90	6.70	5.41	0.024	9.66	8.97
DMH-24I	DMH-24H	173.0	0.339	7.352	2.51	3.61	3.19	5.41	3.63	0.010	10.76	9.90
DMH-24H	DMH-24E	23.0	0.339	7.162	2.44	5.04	3.11	3.53	3.07	0.020	10.19	10.08
CB-24M	DMH-24L	18.0	0.456	7.400	3.40	6.50	4.33	3.10	2.50	0.033	9.21	9.05
CB-24P	DMH-24N	23.0	0.675	7.400	5.04	5.25	6.41	4.60	4.10	0.022	9.08	8.62
CB-24O	DMH-24N	21.0	0.548	7.400	4.09	7.38	5.20	5.00	4.10	0.043	8.90	8.62
CB-24Q	DMH-24N	154.0	0.071	7.400	0.53	3.63	0.67	5.60	4.00	0.010	8.65	8.62
CB-24S	DMH-24R	26.0	0.171	7.400	1.27	4.42	1.62	6.60	6.20	0.015	9.40	9.37
CB-24T	DMH-24R	11.0	0.775	7.400	5.78	-11.77	7.36	5.40	6.60	-0.109	9.66	9.37
CB-24U	DMH-24R	116.0	0.161	7.400	1.20	2.96	1.53	7.10	6.30	0.007	9.50	9.37
DMH-24R	DMH-24N	300.0	1.106	7.134	7.96	8.58	4.50	6.10	4.10	0.007	10.34	8.62
DMH-24N	DMH-24L	294.0	2.400	6.599	15.97	16.16	5.08	4.00	2.50	0.005	10.51	9.05
DMH-24L	DMH-24E	80.0	2.856	6.396	18.42	14.96	5.86	2.50	2.15	0.004	10.61	10.08
CB-24F	DMH-24E	15.0	0.136	7.400	1.02	3.05	1.29	5.73	5.62	0.007	10.09	10.08
DMH-24E	DMH-24B	37.0	3.403	6.348	21.78	75.96	3.08	1.35	0.87	0.013	10.46	10.42
CB-24D	DMH-24B	35.0	0.121	7.400	0.90	1.51	2.58	6.65	6.10	0.016	10.61	10.42
DMH-24B	DMH-24A	47.0	3.574	6.306	22.72	63.05	3.21	0.87	0.45	0.009	10.89	10.84
DMH-24A	DMH-105	199.0	3.574	6.255	22.54	25.90	3.19	0.30	0.00	0.002	12.17	11.94
DMH-105	MH-68	43.0	32.382	4.961	161.92	266.27	6.73	-0.04	-0.21	0.004	11.71	11.62
MH-68	DMH-107	222.0	32.731	4.951	163.33	258.94	6.78	-0.21	-1.04	0.004	11.51	11.05
DMH-107	DMH-F10	172.0	34.528	4.900	170.53	256.30	7.04	-1.04	-1.67	0.004	10.94	10.56
DMH-F10	DMH-G9	374.0	42.617	4.862	208.85	267.30	8.44	-1.67	-3.16	0.004	10.40	9.21
CB-G12SE	DMH-G12	13.0	0.075	7.400	0.56	5.13	0.72	8.00	7.73	0.021	12.20	12.20
CB-G13SE	DMH-G13	13.0	0.107	7.400	0.80	5.04	1.01	7.50	7.24	0.020	11.81	11.80
DMH-63B	DMH-G14	23.0	0.241	7.400	1.80	2.97	3.30	4.75	4.50	0.011	12.19	12.10
CB-G15SE	DMH-G15	13.0	0.082	7.400	0.61	5.04	0.78	7.70	7.44	0.020	11.80	11.80
MH-74	DMH-G15	10.0	1.029	5.300	5.50	4.63	7.00	4.90	4.80	0.010	11.94	11.80
DMH-G15	DMH-G14	24.0	1.113	5.298	5.95	9.83	3.36	4.71	4.50	0.009	12.18	12.10
CB-G14SW	DMH-G14	17.0	0.062	7.400	0.46	5.11	0.59	7.80	7.45	0.021	12.10	12.10
DMH-G14	DMH-G13	167.0	1.754	5.287	9.35	9.34	5.29	4.50	3.18	0.008	13.12	11.80
CB-G13SW	DMH-G13	13.0	0.103	7.400	0.77	4.84	0.98	7.50	7.26	0.018	11.81	11.80
DMH-G13	DMH-G12	149.0	2.399	5.238	12.67	20.13	4.03	2.68	1.50	0.008	12.67	12.20
CB-G12SW	DMH-G12	13.0	0.045	7.400	0.34	5.13	0.43	8.00	7.73	0.021	12.20	12.20
DMH-G12	DMH-G11	47.0	2.639	5.180	13.78	20.34	4.39	1.50	1.12	0.008	13.07	12.90
CB-E6SW	DMH-E6	9.0	0.247	7.400	1.84	3.56	2.34	8.61	8.52	0.010	12.12	12.10
CB-E6NW	DMH-E6	26.0	0.247	7.400	1.84	3.56	2.35	8.78	8.52	0.010	12.17	12.10
CB-E3SW	DMH-E3	12.0	0.156	7.400	1.16	3.56	1.48	9.10	8.98	0.010	13.21	13.20
CB-E3NW	DMH-E3	26.0	0.151	7.400	1.13	3.63	1.43	10.19	9.92	0.010	13.23	13.20
DMH-E3	DMH-E4	140.0	0.307	7.337	2.27	10.50	1.28	8.09	6.69	0.010	13.70	13.63
CB-E4NW	DMH-E4	26.0	0.134	7.400	1.00	4.99	1.27	9.50	8.99	0.020	13.72	13.70
CB-E4SW	DMH-E4	9.0	0.176	7.400	1.32	5.18	1.68	9.50	9.31	0.021	13.71	13.70
DMH-E4	DMH-E5	122.0	0.617	6.955	4.33	10.50	2.45	6.69	5.47	0.010	13.61	13.40
DMH-E10	DMH-E5	36.0	0.963	7.400	7.19	22.62	2.29	5.33	4.97	0.010	13.26	13.23
CB-E8NE	DMH-E8	10.0	0.075	7.400	0.56	5.04	0.71	8.90	8.70	0.020	13.00	13.00
DMH-E8	DMH-E9	114.0	0.695	7.351	5.15	6.46	4.19	8.45	7.31	0.010	13.82	13.10
CB-E9NE	DMH-E9	10.0	0.097	7.400	0.73	5.04	0.93	8.90	8.70	0.020	13.10	13.10
DMH-E9	DMH-E5	118.0	1.390	7.256	10.17	10.50	5.75	7.06	5.88	0.010	14.51	13.40
DMH-E5	DMH-E6	104.0	2.971	6.781	20.30	22.62	6.46	4.97	3.93	0.010	12.94	12.10
DMH-E6	DMH-E7	56.0	3.464	6.724	23.48	22.62	7.47	3.93	3.37	0.010	13.30	12.70
DMH-E7	DMH-G11	41.0	3.464	6.698	23.39	31.99	7.45	2.28	1.46	0.020	13.34	12.90
DMH-G11	DMH-G10	10.0	6.122	5.163	31.87	66.13	6.49	0.62	0.36	0.026	12.86	12.80
DMH-G10	DMH-G9	18.0	6.122	5.161	31.85	41.01	6.49	0.36	0.18	0.010	12.91	12.80
DMH-G9	MH-75	128.0	49.754	3.464	173.72	0.00	7.53	-12.15	-12.15	0.000	8.86	8.54
MH-75	DMH-110	82.0	49.754	3.453	173.15	405.01	7.51	-3.16	-3.91	0.009	8.54	8.33
DMH-110	DMH-111	211.0	49.754	3.445	172.79	260.76	7.50	-3.91	-4.71	0.004	8.10	7.57
DMH-111	O-1	67.0	49.754	3.427	171.85	258.68	7.46	-4.71	-4.96	0.004	5.37	5.20
CB-2	DMH-3	20.0	0.223	7.400	1.66	3.90	4.77	7.72	7.48	0.012	8.27	7.94
CB-1	DMH-3	72.0	0.203	7.400	1.52	3.09	3.91	7.55	7.01	0.008	8.07	7.67
DMH-3	DMH-4	57.0	0.426	7.336	3.15	10.13	5.06	6.91	6.38	0.009	7.59	7.18
DMH-4	O-2	218.0	0.426	7.296	3.13	10.98	5.36	6.38	4.00	0.011	7.05	4.85

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Long Term Best Management Practices Checklist

Assembly Square PUD, Somerville, MA

Long Term Best Management Practices – Maintenance/ Evaluation Checklist

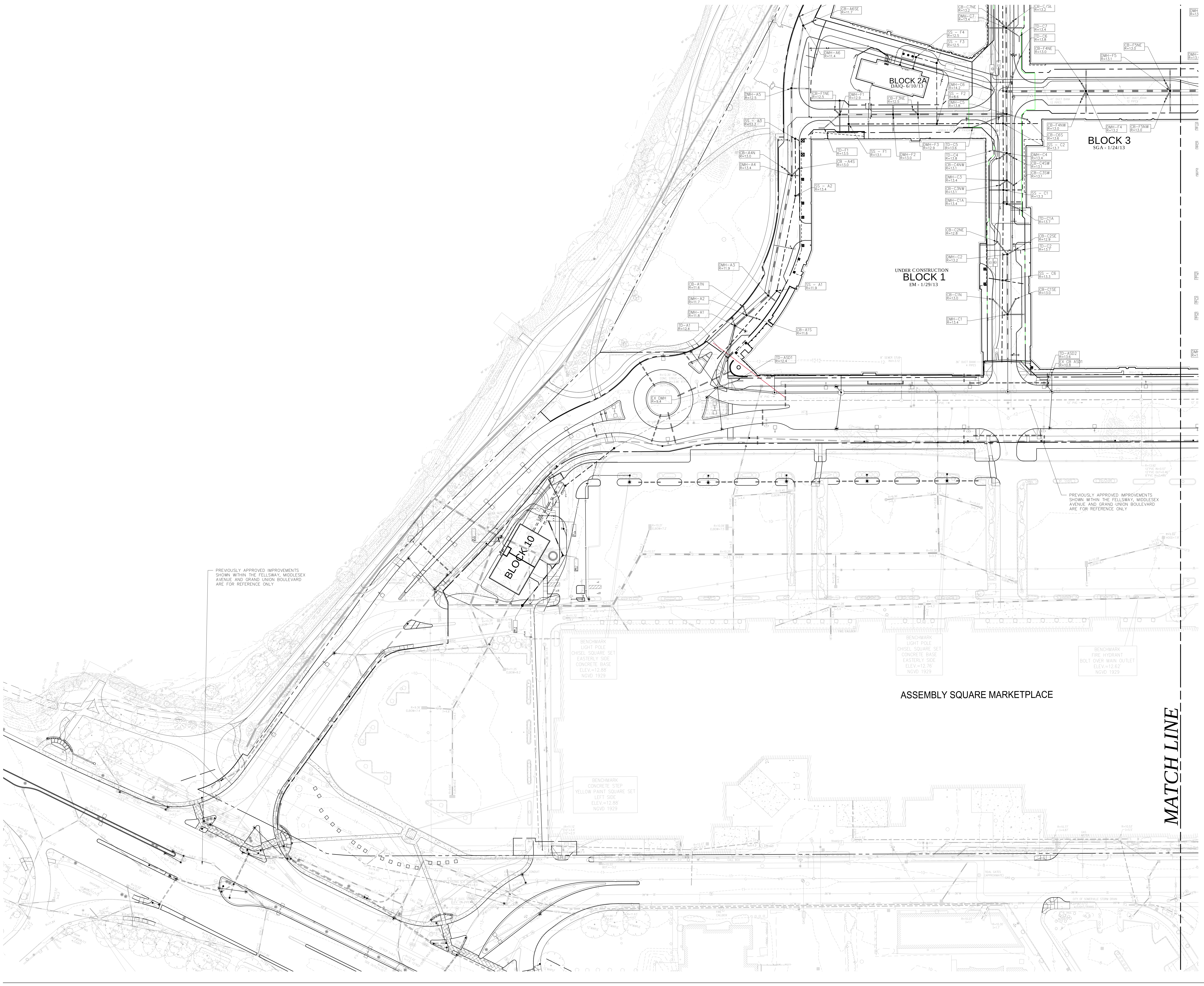
Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Pavement Sweeping	Minimum four times per year				☐yes ☐no		
Catch Basins with Deep Sumps & Oil/Debris Traps	Minimum four times per year			Sediment (if more than six inches deep) and/or floatable pollutants shall be pumped from the basin and disposed of at an approved offsite facility in accordance with all applicable regulations. Any structural damage or other indication of malfunction will be reported to the site manager and repaired as necessary. During colder periods, the catch basin grates must be kept free of snow and ice. During warmer periods, the catch basin grates must be kept free of leaves, litter, sand, and debris.	☐yes ☐no		
Subsurface Detention System	Monthly for first 3 months then annually			All subsurface detention systems shall be inspected at least once each year. If sediment is more than six inches deep, it must be suspended via flushing with clean water and removed using a vactor truck. System will be observed after rainfalls to see if it is properly draining.	☐yes ☐no		
Structural Water Quality Devices	Monthly for first 3 months then a minimum four times per year			Cleaned a minimum of at least once per year or when sediment depth reaches within six inches of the dry weather water surface elevation. Follow manufacturer instructions for inspection and cleaning and contact manufacturer if system is malfunctioning.	☐yes ☐no		
Bioretention Area and Sediment Forebay	2 times in the first year then annually			Invasive plants, weeds, erosion, litter, mulch depth and condition. Weeds and invasive plant species shall be removed by hand. Leaf litter and other detritus shall be removed twice per year. If needed to maintain aesthetic appearance, perennial plantings may be trimmed at the end of the growing season.	☐yes ☐no		
Green Roofs	Annually			Plant health, replace as necessary. Drains should be examined annually to ensure that they have not become clogged with sediment or organic debris.	☐yes ☐no		
Roof Drain Leaders	Quarterly			Keep roofs clean and free of debris. Keep roof drainage systems clear. Keep roof access limited to authorized personnel. Clean inlets draining to the subsurface bed twice per year as necessary.	☐yes ☐no		
Vegetated Areas	Bi-annually			Inspect planted areas on a semi-annual basis and remove any litter. Maintain planted areas adjacent to pavement to prevent soil washout. Immediately clean any soil deposited on pavement. Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming. Plant alternative mixture of grass species in the event of unsuccessful establishment. The grass vegetation should not be cut to a height less than four inches. No pesticides are to be used unless a single spot treatment is required for a specific control application. Fertilizer usage should be avoided. If deemed necessary, slow release fertilizer should be used. Fertilizer may be used to begin the establishment of vegetation in bare or damaged areas, but should not be applied on a regular basis unless necessary.	☐yes ☐no		
Permeable Pavers	Monthly for first 3 months then annually			Vacuum sweeping or pressure wash. Inspect once per year and clean as necessary. Shovel snow off permeable pavers as necessary. Do not apply abrasives such as sand or grit on or adjacent to permeable pavers. Avoid plowing of areas with permeable pavers.	☐yes ☐no		
Tide Gate/Stormwater Outfall	Monthly for first 3 months then annually			Follow manufacturer instructions for inspection and cleaning and contact manufacturer if system is malfunctioning. Ensure proper functioning and correct any areas that have settled or experienced washouts.	☐yes ☐no		

Stormwater Control Manager ________________________________

Appendix D

Grading, Drainage, and Utility Plans May 2014 (1 thru 5)

Saved Tuesday, May 06, 2014 1:21:37 PM TIMOTHYHAYES Plotted Tuesday, May 06, 2014 1:39:55 PM Hayes, Tim



VHB

Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

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Watertown, Massachusetts 02471
617.924.1770 • FAX 617.924.2286

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SCALE IN FEET

No.	Revision	Date	Appvd.

Designed by
Drawn by TAH
Checked by RPM
CAD checked by
Approved by HGH
Scale 1"=50'
Date May 15, 2014

Project Title

Planned Unit Development
Grand Union Boulevard
Somerville, Massachusetts

Issued for

Submission of Amended
Preliminary Master Plan

Not Approved for Construction

Drawing Title

Grading, Drainage and Utility Plan 1

Drawing Number

C-11

Sheet of
11 19

Project Number
08518.05

Saved Tuesday, May 06, 2014 1:21:37 PM TIMOTHYHAYES Plotted Tuesday, May 06, 2014 1:40:21 PM Hayes, Tim

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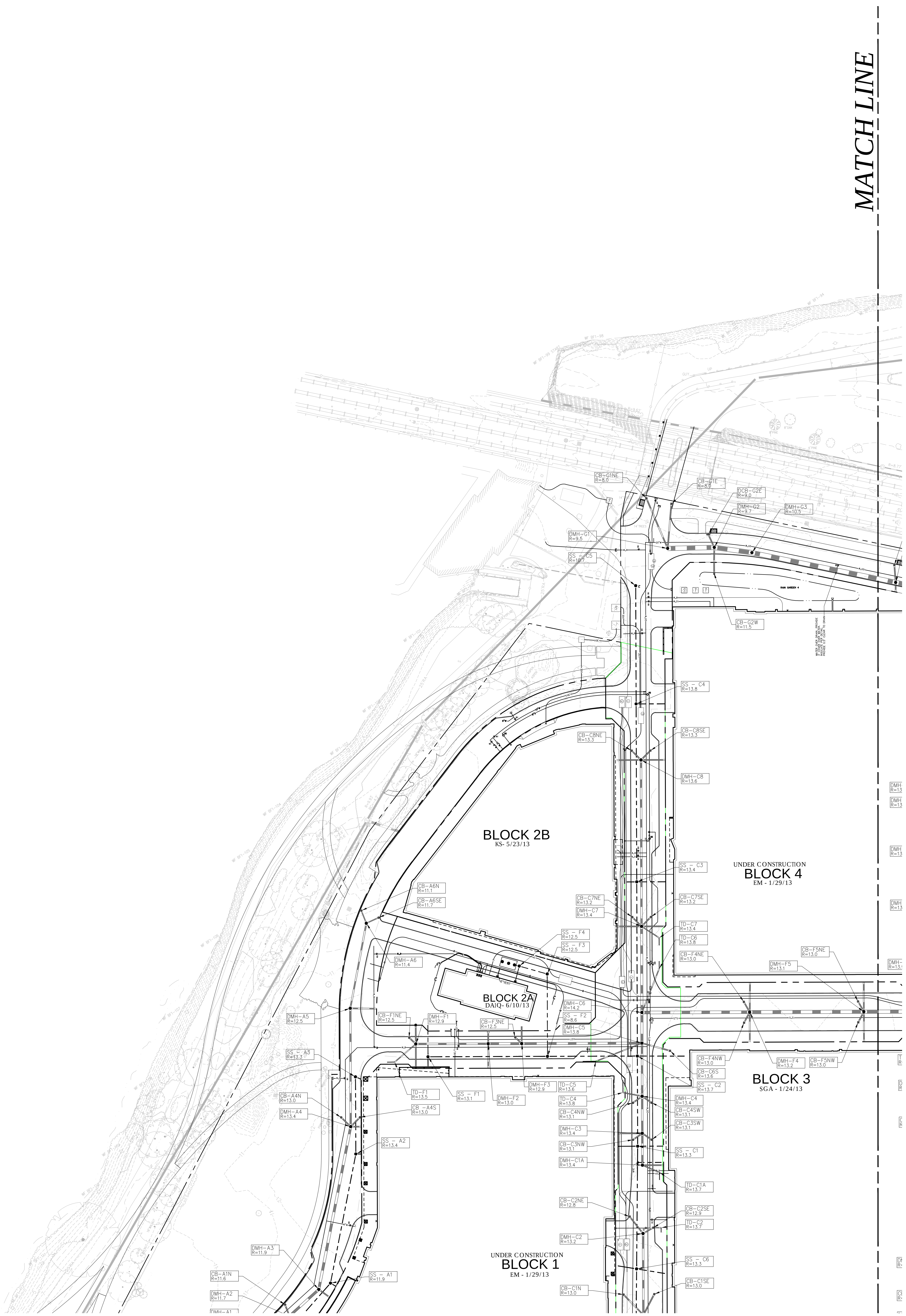

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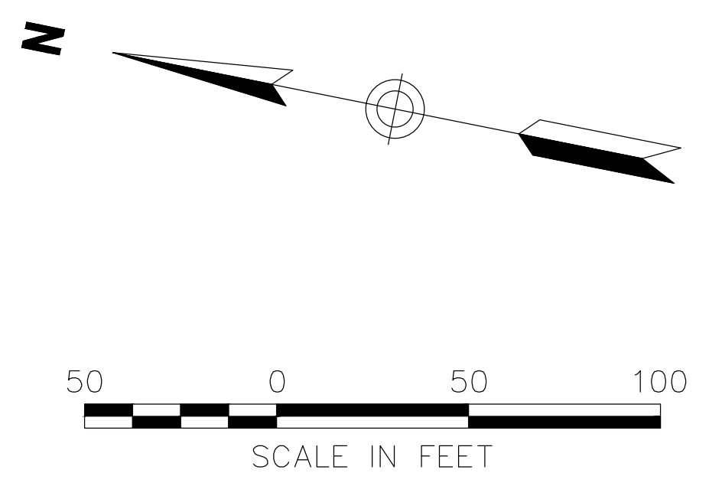

No.	Revision	Date	Appvd.

Designed by
Drawn by TAH
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CAD checked by
Approved by HGH
Scale 1"=50'
Date May 15, 2014

Project Title

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Grand Union Boulevard
Somerville, Massachusetts

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Drawing Title

Grading, Drainage and Utility Plan 2

Drawing Number

C-12

Sheet 12 of 19

Project Number
08518.05

Saved Tuesday, May 06, 2014 1:21:37 PM TWOHMAYES Plotted Tuesday, May 06, 2014 1:40:48 PM Hayes, Tim

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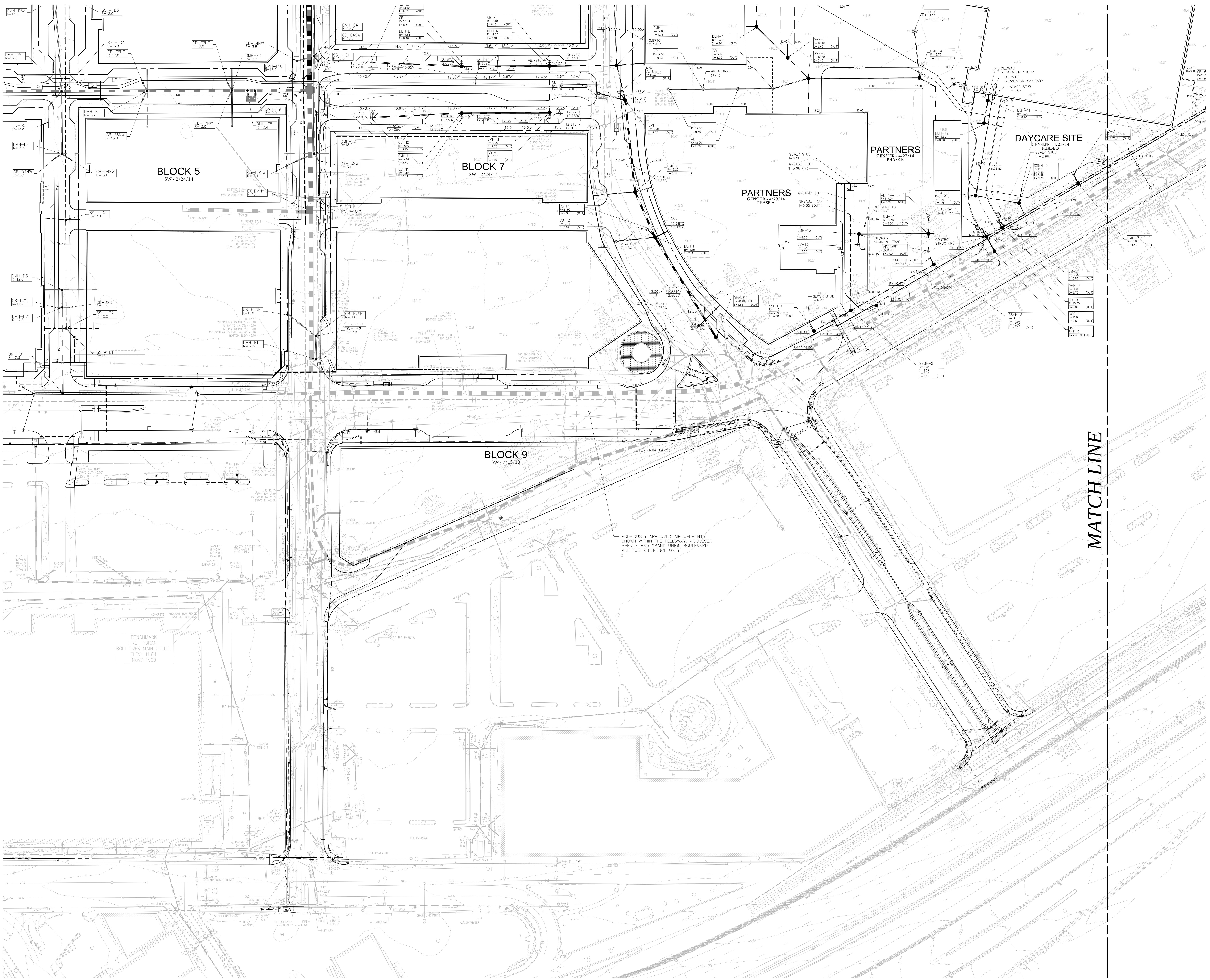

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Drawing Title

Grading, Drainage and Utility Plan 3

Drawing Number

C-13

Sheet 13 of 19

Project Number
08518.05

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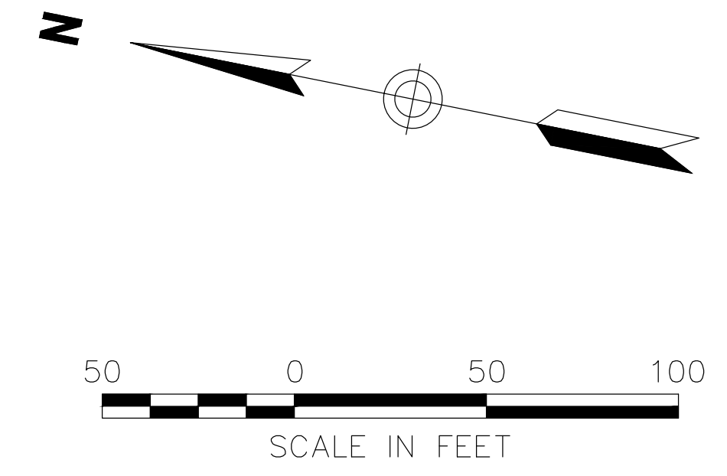

No.	Revision	Date	Appvd.

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Drawn by TAH
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CAD checked by
Approved by HGH
Scale 1"=50'
Date May 15, 2014

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Planned Unit Development
Grand Union Boulevard
Somerville, Massachusetts

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Drawing Title

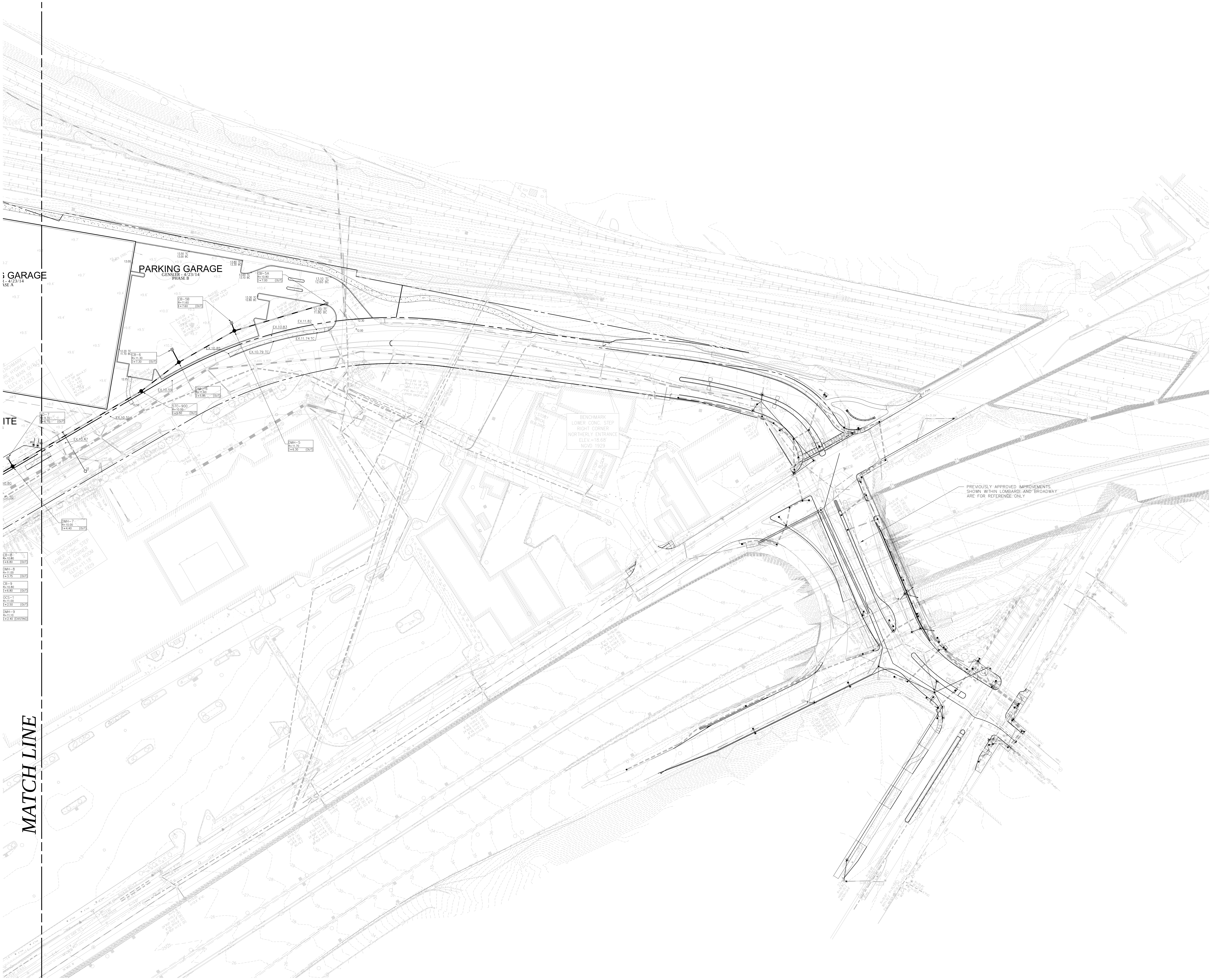
Grading, Drainage and Utility Plan 4

Drawing Number

C-14

Sheet of
14 19

Project Number
08518.05



VHB

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Drawn by TAH
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Approved by HGH
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Planned Unit Development
Grand Union Boulevard
Somerville, Massachusetts

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Preliminary Master Plan

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Drawing Title

Grading, Drainage and Utility Plan 5

Drawing Number

C-15

Sheet of
15 19

Project Number
08518.05

Memorandum

To: Rachel Kelly
Somerville Conservation Commission
Somerville City Hall
93 Highland Avenue
Somerville, MA 02143

Date: February 22, 2017

Project #: 08518.05

From: Peter Mara, EIT

Re: Block 8, Notice of Intent
Assembly Row at Assembly Square
Somerville, Massachusetts
Supplemental Memo

This memorandum summarizes the stormwater management system for the proposed Block 8 of the proposed redevelopment of the Assembly Square area in Somerville, Massachusetts, originally presented in the Assembly on the Mystic Proposed 72-inch Storm Drain and Outfall Notice of Intent (NOI) dated November 21, 2008 and issued an Order of Conditions on May 8, 2009. The stormwater management system design remains generally consistent with the stormwater management plan outlined in the previous site plan filings with the City of Somerville Planning Board and Conservation Commission.

As shown on the attached site plans titled "Block 8" dated February 22, 2017, the proposed building, landscape areas, sidewalks and utility associated infrastructure are in the area of Block 8 and contain less impervious areas than the approved master plan. The drainage patterns Block 8 are essentially unchanged from the August 11, 2011 Roadway NOI submission. As Described in the Roadway NOI, the overall site plan was modified to address design developments since the issuance of the Order of Conditions while maintaining the originally proposed redevelopment program. The modifications included alterations to the site circulation, minor amenity area reconfiguration, and site grading which had direct benefits to the stormwater management system design and function.

With the proposed interim parking lots and associated drainage system additions, the overall stormwater management system for the entire PUD area will continue to maintain peak flows at or below those described in the November 2008 NOI while providing 1-inch water quality treatment in accordance with the Massachusetts Stormwater Handbook as described in the original Outfall NOI Report. Drainage area maps for proposed conditions, Water Quality Unit (WQU) sizing and Total Suspended Solids (TSS) removal calculations are attached.

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Hydrologic Analysis:

Proposed Conditions

All stormwater runoff from the Block 8 will be routed through a series of catch basins with deep sumps and oil/debris traps, proprietary separators and drainage pipe networks on-site and in the right-of-way prior to discharging to the 72-inch outfall (Design Point 6). The stormwater runoff generated by the roof of the Block 8 building is collected by several roof drains that connect directly into the existing drain lines within Foley Street, Revolution Drive and Grand Union Boulevard, through the roadway system that eventually discharges to the 72-inch outfall. This runoff pattern is generally unchanged from the November 2008 NOI, though the layout of the roadways has been revised slightly and the Partners Office project has been included instead of the IKEA project on Parcel 11A. An updated version of the previously presented Table 2 provides a summary of the proposed conditions hydrologic data.

Table 2
Proposed Conditions Hydrologic Data

Description (Drainage Area #)	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
R-1	*Existing swale/depression*	*4*	*0.5*	*88*	*2.8*
O-1	*New 72-inch Outfall*	*6*	*63.5*	*95*	*16.2*
S-9	*Overland to Mystic River*	*5*	*1.8*	*82*	*11.5*
M-1	*84-inch SMC*	*1*	*9.6*	*95*	*5.3*
M-2	*84-inch SMC*	*1*	*10.7*	*97*	*11.6*
M-3	*84-inch SMC*	*1*	*2.5*	*95*	*4.9*
		Total:	88.6		

A revised hydrologic analysis was conducted for the site based on the input parameters described above. As in the previous submission, the rainfall-runoff response of the Site under existing and proposed conditions was evaluated for storm events with recurrence intervals of 2, 10, 25, and 100-years. Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm event for Middlesex County. Runoff coefficients for the existing and proposed conditions were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD.

Drainage areas used in the analyses are represented above and are depicted on the attached Figures 1 and 2. Figure 1 is unchanged from the November 2008 report. Table 3 presents a summary of the existing and proposed conditions peak discharge rates.

Table 3
Peak Discharge Rates (cubic feet per second)

Design Point	*2-year*	*10-year*	*25-year*	*100-year*
***Design Point 1**: MWRA 84-inch SMC*				
Existing	*117.8*	*172.1*	*206.9*	*249.2*
Proposed	*58.8*	*86.6*	*104.4*	*126.0*
***Design Point 2**: Mystic River (42-inch culvert)*				
Existing	*2.0*	*2.1*	*2.1*	*2.2*
Proposed	*0.0*	*0.0*	*0.0*	*0.0*
***Design Point 3**: Existing Swale/CBs*				
Existing	*1.3*	*2.1*	*2.7*	*3.3*
Proposed	*0.0*	*0.0*	*0.0*	*0.0*
***Design Point 4**: Existing Swale/CBs*				
Existing	*1.3*	*2.2*	*2.7*	*3.4*
Proposed	*1.3*	*2.2*	*2.7*	*3.4*
***Design Point 5:** Mystic River (Overland)*				
Existing	*29.7*	*50.4*	*63.9*	*80.5*
Proposed	*2.7*	*4.8*	*6.2*	*7.9*
***Design Point 6:** New 72-inch Outfall*				
Existing	*0.0*	*0.0*	*0.0*	*0.0*
Proposed	*138.0*	*205.1*	*247.9*	*300.0*

The revised stormwater management system analyses indicate that there will be a net improvement in terms of the peak rate of discharge and volume of runoff resulting from the site design modifications while maintaining the previous design intent in accordance with the Massachusetts Stormwater Handbook.

Water Quality

The revised stormwater management system provides the required treatment for a 1-inch water quality volume as required. The previously proposed treatment trains for all design points have been maintained. Water quality calculations are proved in Appendix A of the memorandum.

Water quality treatment for Block 8 runoff consists of an operation and maintenance program for water quality measures, a construction phase spill prevention plan and water quality units.

Operation and Maintenance (O&M) Program

A detailed Stormwater O&M program has been prepared for the Project. This plan includes detailed inspection criteria and identifies the responsible parties for implementing the program. In summary, The City of Somerville will be responsible for the maintenance and operation of the street drainage system, including street sweeping, catch basin and manhole cleaning, and maintenance of the street related structures. Federal Realty will be responsible for the maintenance and operation of the Block 8 stormwater management systems including inspection, cleaning and maintenance of the drainage structure, and water quality unit on the site. The maintenance and operation of the 72-inch stormwater outfall, associated tide gate and outfall erosion control measures will be the responsibility of the City of Somerville, in accordance with their EPA NPDES MS4 general permit that covers all stormwater outfalls in the City.

Spill Prevention

A spill prevention and control plan is an important BMP to help minimize potential sources of pollution to ground and surface waters both during construction and as part of the long term operation and maintenance measures of a development. Spill prevention is achieved with the proper storage and handling of hazardous materials. During construction, this is addressed in the Stormwater Pollution Prevention Plan (SWPPP) for Construction Activities to be prepared and implemented by the Site Contractor. The general response procedures for spills at any time are outlined in Chapter 8 of the Final Environmental Impact Report (FEIR) which includes a spill response procedure form, a sample hazardous waste/oil spill report, an emergency response equipment inventory and an emergency notification phone numbers form.

Catch Basins with Sumps and Oil/Debris Traps and Trench Drains

The Project proposes to relocate an existing shallow catch basin on Revolution Drive. The catch basin will have a deep sump and hood, and connects to the existing drainage infrastructure where the collected stormwater runoff will pass through a series of closed pipes, proprietary separators, and drainage structures before the 72-inch outfall. There are no new catch basins proposed in the Project Site.

Water Quality Units

The Contech Vortechs Units throughout the PUD roadways efficiently remove TSS and free oil from the stormwater runoff, including the runoff generated by the Block 8 sidewalks and roof prior to discharging to the 72-inch outfall on the Mystic River. The units prevent the re-suspension of settled material, and allow for safe and easy removal of collected undesirable material.

The water quality units will be inspected four times per year and cleaned a minimum of once per year, or when the sediment depth reaches within six inches of the dry weather water surface elevation.

Compliance with Massachusetts Department of Environmental Protection (DEP) - Stormwater Management Standards

As demonstrated below, the proposed Project fully complies with the DEP Stormwater Management Standards.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The stormwater runoff tributary to the new 72-inch outfall will receive water quality treatment in conformance with the Best Management Practices outlined in the Stormwater Management Performance Standards and Guidelines. The Block 8 redevelopment will result in improvements to the quality of stormwater discharged from the Project Site. These improvements will be achieved by a combination of structural and non-structural Best Management Practices (BMPs) implemented at the Project Site such as regular pavement sweeping and litter control program, installation of deep-sump catch basins with oil/debris traps and water quality structures. Outfall erosion protection sizing computations were provided in the November 2008 NOI.

Standard 2: Peak Rate Attenuation

The overall Project results in either no increase or a reduction in the peak discharge rate for the 2, 10, 25, and 100-year storm events for Design Points 1 through 5 (DP-1 – DP-5). Design Point 6 (DP-6) is a new design point for the proposed 72-inch outfall which is not present under existing conditions. Since there are no existing flows at this design point, the post-development flows are shown as an increase from existing conditions. However, because the stormwater is discharging into the tidal portion of the Mystic River it is not necessary for post-development peak discharge rates to be equal or less than those in pre-development as outlined in Standard 2 of the Massachusetts DEP Stormwater Management Regulations. The revised peak discharge rates to DP-6 included in Table 3 of this report are less than those presented in the November 2008 NOI, as required by Condition 62 of the May 8, 2009 Order of Conditions. The use of bioretention, subsurface detention and an upgraded drainage system contribute to a peak rate reduction. Appropriate measures are incorporated to protect against surcharging the system by use of a tide gate and against erosion and turbidity using riprap protection at the outlet. Although this is a new outfall, a large majority of the stormwater discharging at this outfall is not newly generated but is rerouted from the Somerville Marginal Conduit which also discharges below the Amelia Earhart Dam in the tidal portion of the Mystic River.

Standard 3: Stormwater Recharge

The pre-development condition of the Project Site was almost completely impervious and little if any infiltration existed. Also, soil on the Project Site is contaminated, compacted fill material, or poor quality material which makes it unsuitable for infiltration. Additionally, there are no drinking water supplies on or near the Project Site that require recharge. Finally, the Project is located at the terminus of the Mystic River and therefore any infiltration on the site is an insignificant portion of the flows that are supplying the river.

Standard 4: Water Quality

The Project Site is a dense ultra-urban redevelopment on a brownfield site. However, water quality treatment for runoff from the Project Site meets or exceeds the goal of 80 percent TSS Removal. TSS Removal worksheets are included in Attachment A of this memorandum. Due to the urban nature of the Project and the goal for maximizing dense development opportunities, water quality treatment techniques consistent with urban area constraints were selected.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The Project site is a brownfield site which is a LUHPPL. Stormwater management BMP's have been selected and designed to comply with this standard. Under existing conditions infiltration is not currently significant at the Project Site and as described above infiltration is not recommended or proposed. Water quality units, tree filter boxes, bioretention basins, and extensive operations and maintenance requirements address the concerns for LUHPPLs. Minimal surface parking is included on the Project Site with the majority of vehicle parking located in covered garages as part of future Project phases, therefore reducing the effect of the LUHPPL's impervious area to a level of typical roadways.

Standard 6: Critical Areas

The existing MWRA 84-inch SMC and the proposed 72-inch outfall will discharge to a "Prohibited" shellfish growing area. Stormwater discharging to this area is treated for 1-inch of runoff and will utilize the applicable stormwater management BMPs approved for critical areas.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project, while a redevelopment project as defined by the regulations, fully complies with all applicable stormwater standards. The proposed stormwater management system improves water quality and reduces flow to the frequently surcharged MWRA 84-inch SMC by reducing peak stormwater runoff from the Project Site.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project will disturb greater than 1 acre of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit. As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) will be developed and submitted before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls to be finalized in the SWPPP are unchanged from the November 2008 NOI.

Standard 9: Operation and Maintenance Plan

Recommended practices for operating and maintaining long term stormwater BMPs are unchanged from the November 2008 NOI.

Standard 10: Prohibition of Illicit Discharges

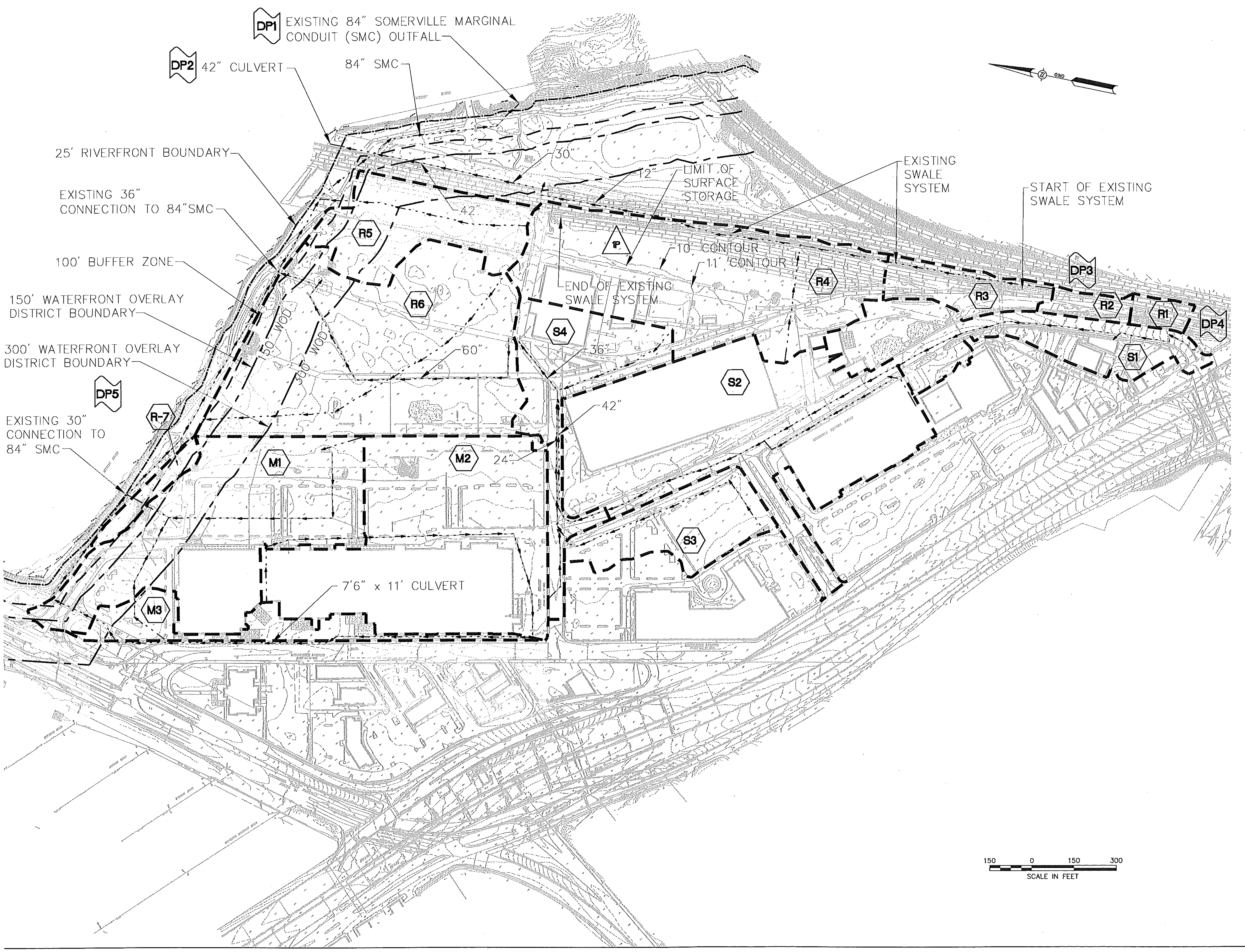
Sanitary sewer and storm drainage structures remaining from previous development which are part of the redevelopment area will be removed or will be incorporated into updated sanitary sewer and separate stormwater sewer systems. The design plans submitted with this report have been designed so that the components included therein are in full compliance with current standards. No statement is made with regard to the drainage and sanitary sewer systems in portions of the site not included in the redevelopment project area. The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges.

Conclusion:

The Stormwater Management Plan presented herein and as shown on the plans provides functionality for Block 8 while maintaining previously submitted design elements and intent. The proposed modifications include Best Management Practices for maintaining stormwater runoff quality both during and after construction, and are designed to protect downstream receiving waters from stormwater related impacts.

Appendix A
Computations and Supporting Information

- Figure 1 – Existing Conditions Drainage Areas
- Figure 2 – Proposed Conditions Drainage Areas
- TSS Removal Worksheets
- Block 8 Stormceptor Design Summary



VHB

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LEGEND

△1	POND
1	DESIGN POINT
1	REACH
⬡1	DRAINAGE AREA DESIGNATION
— — —	DRAINAGE AREA BOUNDARY
- - —▶	TIME OF CONCENTRATION FLOW LINE
— · —	100' BUFFER ZONE
4-220 — 4-218	WETLAND BOUNDARY
— - —	150' W.O.D. BOUNDARY
— - —	300' W.O.D. BOUNDARY
—·—	25' RIVERFRONT BOUNDARY

No.	Revision	Date	Appvd.

Designed by
Drawn by
Checked by
CAD checked by
Approved by
Scale 1"=150'
Date May 15, 2008

Project Title

Assembly Square
Planned Unit
Development (PUD)
Assembly Square Drive
Somerville, Massachusetts

Issued for

Stormwater Management Report

Not Approved for Construction

Drawing Title

Figure 1
Existing Conditions Full
Build Project Drainage Areas

Drawing Number

F-1

Sheet 1 of 1

Project Number
08518.05

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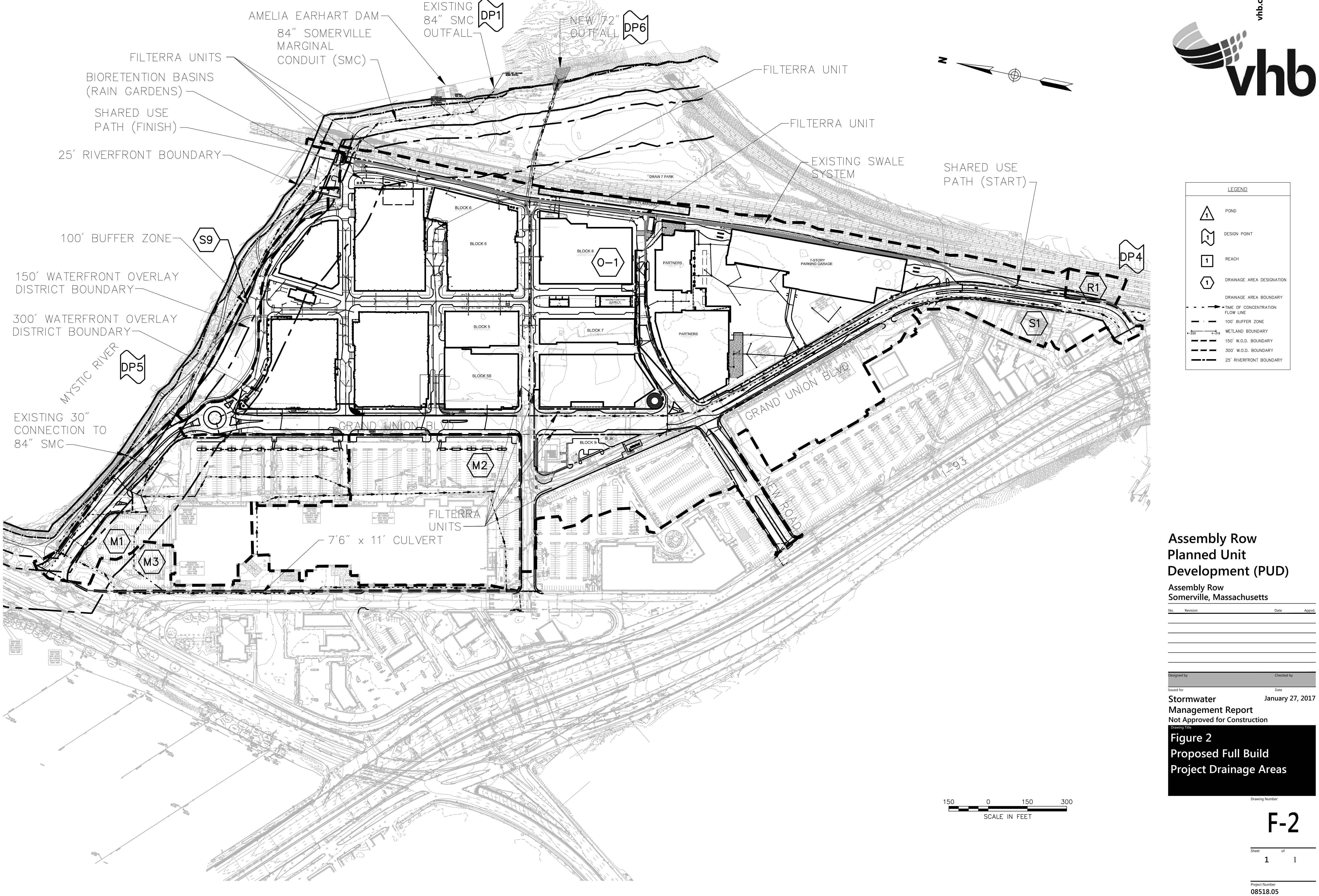

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Assembly Row
Planned Unit
Development (PUD)

Assembly Row
Somerville, Massachusetts

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Stormwater
Management Report
Not Approved for Construction

January 27, 2017

Drawing Title

Figure 2
Proposed Full Build
Project Drainage Areas

Drawing Number

F-2

Sheet 1 of 1

Project Number
08518.05

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TSS Removal Calculation Worksheet

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Project Name: **Block 5B**
Project Number: **08518.05**
Location: **Somerville, MA**
Discharge Point: **DP-6**
Drainage Area(s): **Sidewalks & Roads (O-1)**

Sheet: **1 OF 1**
Date: **January 2017**
Computed by: **DJM**
Checked by: **PTM**

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Stormceptor 450i***	**80%**	**1.00**	**0.80**	**0.20**
	0%	**0.20**	**0.00**	**0.20**
	0%	**0.20**	**0.00**	**0.20**
	0%	**0.20**	**0.00**	**0.20**
	0%	**0.20**	**0.00**	**0.20**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol.
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 94%. To be conservative, 80% removal is used for this calculation.

Treatment Train TSS Removal = **80%**