

APPENDIX C
UPDATED NINE MINIMUM CONTROLS PLAN 2010

Nine Minimum Controls Plan
Updated April 2010

FOR THE

CITY OF CAMBRIDGE, MASSACHUSETTS
Combined Sewer Overflow Permit
#MA0101974

Submitted to:

U.S. Environmental Protection Agency
Water Technical Unit

MA Department of Environmental Protection
Bureau of Resource Protection

Submitted by:

City of Cambridge
Department of Public Works



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Glossary of Acronyms

ACO	Administrative Consent Order
BMP	Best Management Practice
CCB	Cambridge City Base
CMH	Common Manhole
CSO	Combined Sewer Overflow
CSS	Combined Sewer System
DI	Ductile Iron
DPW	City of Cambridge Department of Public Works
DV5	Drain Vault 5
EOEA	Executive Office of Environmental Affairs
FOG	Fats, Oil and Grease
GIS	Geographic Information System
HHW	Household Hazardous Waste
LTCP	(MWRA) Long Term Control Plan
MIL	Minimum Implementation Level
MS4	Municipal Separate Storm Sewer System
MWRA	Massachusetts Water Resources Authority
NMC	Nine Minimum Controls
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
POTW	Publicly Owned Treatment Works
RCP	Reinforced Concrete Pipe
SD	Storm Drain
SOP	System Optimization Program
SS	Sanitary Sewer
VCP	Vitrified Clay Pipe
WWTP	Wastewater Treatment Plant

Executive Summary

Implementation of the Nine Minimum Controls (NMC) specified in Part I, Section A of National Pollutant Discharge Elimination System (NPDES) Permit No. MA0101974 is a required component of permit compliance. The permit authorizes the City of Cambridge to discharge twelve (12) Combined Sewer Overflows (CSOs) to receiving water bodies named in the permit only during wet weather and subject to certain effluent limitations and other requirements. There are 11 regulator structures associated with these 12 CSO's (CAM-002A and CAM-002B are separate outfalls controlled through the same regulator). The City of Cambridge's Nine Minimum Controls Plan was originally developed in 1997 and in conjunction with the previous NPDES permit, has served as the primary reference for operational controls and regulatory administration of the combined sewer outfalls within the City of Cambridge. The new NPDES CSO permit requires that the Plan be updated to reflect evaluations performed and enhancements proposed. The NMC Plan as presented in this report reflects the current operating protocols and implementation levels for all controls approved under the permit.

The Nine Minimum Controls are presented in the order presented in the original document and reflected in the NPDES CSO permit. The presentation format has been developed to provide the reader with a synopsis of the subject minimum control measure and its component parts as implemented and originally presented in 1997; the evaluations findings based on reviews undertaken to determine efficiency and/or effectiveness of controls in place; and, proposed enhancements (if necessary) resulting from the evaluations. In addition, the report updates infrastructure inventories, standard operating procedures and structure as-built drawings where relevant.

Significant proposed enhancements to the NMC Plan are as follows:

Control Measure	Proposed Enhancement
1. Proper Operation and Regular Maintenance Programs	<ul style="list-style-type: none"> • Adherence to recently developed detailed "Good Housekeeping Manual" to provide specific guidance and protocols for major Department of Public Works (DPW) tasks • Development and utilization of routine inspection forms and work order system • Update of infrastructure assets and nomenclature • Update of DPW organizational structure and budget figures
2. Maximization of Storage in the Collection System	<ul style="list-style-type: none"> • Update database of existing key regulator components • Establish procedure for documentation of purpose and benefits to any future modifications to existing structures
3. Review and Modification of Pretreatment Requirements	<ul style="list-style-type: none"> • Adherence to recently developed Wastewater and Stormwater Use Regulations, inspection frequencies and enforcement activities

Control Measure	Proposed Enhancement
4. Maximization of Flow to POTW	<ul style="list-style-type: none"> • Maintain updated inventory of CSO capital projects • Continue funding for annual cleaning and remedial repair and reconstruction contracts
5. Prohibition/Elimination of Dry Weather Discharges	<ul style="list-style-type: none"> • The City is unaware of any dry weather discharges to receiving waters from CSO outfalls
6. Control of Solid and Floatable Materials in CSOs	<ul style="list-style-type: none"> • Continue to implement floatable controls projects in conformance with revised Schedule Seven milestone deadlines • Continue to require compliance with new City Wastewater and Stormwater Use Regulations
7. Pollution Prevention Programs to Reduce Contaminants in CSOs	<ul style="list-style-type: none"> • Adherence to “Good Housekeeping Manual” guidance and protocols to reduce the City’s contribution of contaminants to stormwater • Adherence to the City’s Integrated Pest Management plan to reduce contributions of pesticides, fungicides, herbicides and fertilizer to run-off • Continue with public education and outreach activities • Compliance with City’s Wastewater and Stormwater Use Regulations
8. Public Notification	<ul style="list-style-type: none"> • Continue with 24-hour notification of CSO activations from CAM-401B through e-mails notification to EPA, DEP, local health agents and the Mystic River Watershed Association, and post such activations on the DPW website.
9. Monitoring to Characterize CSO Impacts and Efficacy of CSO Controls	<ul style="list-style-type: none"> • On a regulator site-specific basis, use revised weir equations and parameters and/or hydraulic models and analysis to estimate effluent volumes released during CSO events

1. PROPER OPERATION AND REGULAR MAINTENANCE PROGRAMS

Summary of 1997 NMC Plan Content:

- Sewer System Definitions
- Inventory of sewer system components/physical assets
- Description of nine (9) CSO facilities: CAM005, CAM007, CAM011, CAM017, CAM001, CAM002, CAM004, CAM400, CAM401
- CDPW Organizational Structure and budget
- Procedures for Routine Maintenance
- Common Manholes Project
- Inspections
- Training
- Periodic Review of O&M Plans

1.1 Evaluation Findings

- *Minimum Implementation Level (MIL) for this control measure under Permit No. MA0101974 includes a minimum of once per month inspection of each CSO structure/regulator, pumping station and/or tidegate within jurisdiction of the City of Cambridge. Future evaluation of the efficacy of this measure will include conformance with inspection requirements, and timeliness with which corrective measures are undertaken and documented. Documentation of inspection and corrective actions resulting from inspections is mandatory (8 year retention period for all records.)*
- The 1997 document provides system definitions that are still relevant and appropriate to the updated NMC.
- The composition and quantity of respective Combined Sewer System (CSS) infrastructure assets has changed over time. The current inventory provided in the updated NMC reflects changes achieved through abatement projects since 1997.
- Nomenclature associated with the CSO facilities described in the 1997 NMC Plan has changed; it has been updated to conform to permit terminology and conditions provided in the current permit.
- Organizational Structure and budgeting for DPW has changed and has been updated to reflect changes since 1997.
- Procedures for routine maintenance have evolved and certain standard protocols developed. These have been incorporated into the DPW’s Good Housekeeping Manual, the current reference for routine operations and maintenance of the municipal separate storm sewer system (MS4) as well as the CSS. These procedures are now incorporated explicitly or by reference where appropriate in this document.

- The Common Manholes (CMH) Project has advanced significantly and the total number of CMHs throughout the City has been reduced with 29 manholes remaining to be removed in separated areas of the City.
- Routine inspection procedures were not provided in detail, nor were inspection forms or processes described in the 1997 document. The DPW has developed schedules, procedures, standard protocols and template inspection forms that are now used by staff in performance of system inspections and monitoring. The Updated NMC Plan provides (or incorporates by reference) information on protocols, documentation methods and templates, and reporting frequencies.
- Training specific to CSS maintenance and management is a dynamic program that adjusts to equipment specific, regulation specific and service specific requirements. Programs identified in 1997 have evolved and new programs have been introduced in order that service efficiencies (e.g. use of Remedy, GIS and other technology-based tools) and BMP effectiveness may be realized.
- Operation and Maintenance of the CSS has been standardized to provide a consistent quality and measurable results, as described further in this document.

1.2 Proposed Program Enhancements

As part of the National Pollutant Discharge Elimination System (NPDES) Phase II permit for its MS4, the City of Cambridge adopted pollution prevention and good housekeeping controls intended to ensure that City operations and activities conducted at City-owned facilities do not contribute to stormwater pollution. The Best Management Practices (BMPs) to implement the controls provide a systematic, routine and effective means of administering the MS4 system. Although the combined sewer system (CSS) from which the permitted CSO's discharge is not technically part of the MS4, the City applies these BMPs comprehensively throughout the City. The Good Housekeeping Manual was first published in 2007 and in accordance with the policies under which it was adopted, it is reviewed and modified as necessary on an annual basis. Modifications can be the result of findings from inspections, updated or new City policies or procedures, or in response to regulatory changes or permit conditions. The most recent edition of the DPW's Good Housekeeping Manual has been appended to this document as **Appendix A**. The manual includes detailed Fact Sheets for BMPs relating to the following routine procedures:

- Road sand/salt application and storage
- Snow stockpiling/removal
- Materials management
- Hazardous materials storage
- Vehicle fueling, maintenance and storage
- Vehicle washing
- Spill prevention and response
- Lawn and grounds maintenance
- Street and parking lot sweeping
- Catch basin cleaning
- Stormwater, sanitary and water line maintenance
- Pet waste and litter
- Sidewalk cleaning and repair
- Graffiti cleaning
- Mosquito control

- Waste management
- Building Operations

Modifications to BMPs resulting from the annual review will be synopsisized and documented in the CSO NPDES Permit Annual Report; readers are referred to the Manual directly for detailed descriptions of current procedures.

In addition to the MS4/CSS BMPs included in the Good Housekeeping Manual, the City has developed a Sanitary Sewer System cleaning program and maintenance schedule that specifically targets problematic catchments, such as those that service a greater density of restaurants or other food establishments. This pro-active effort mitigates grease or detritus build-ups that contribute to potential contaminant introduction to the CSS. Further details on this program are provided in Section 3.

In order to ensure that the MILs for this control measure are achieved, the City has created routine inspection form templates that obligate trained inspectors to complete all required permit reporting data fields. A copy of the modified CSO inspection form template has been provided in **Appendix B**. The City’s work order system can automatically generate work orders for monthly inspections, institutionalizing the procedures and contributing to the pro-active system management the City has pursued. This will ensure that unintended lapses exceeding one month will be eliminated and allocate appropriate resources to the task. See Section 1.3.4 below for further information on the Work Order System.

Finally, the City has completely revised and updated its Wastewater and Stormwater Use Regulations and Ordinance and has developed new Land Disturbance Regulations, specifically to address requirements of the City’s MS4 permit. These regulations are applicable throughout the City including the CSS. These regulations and ordinance empowers the City to better control discharges and to properly enforce its regulations with regard to the CSS. The regulations and ordinance are provided in **Appendix O**.

1.3 Inventory/Data Updates

1.3.1 Definitions

The following definitions from the City’s Wastewater and Stormwater Use Regulations classify the several different types of sewer collection systems that are currently in the City:

Term	Definition
Combined Sewer	“Combined Sewer” shall mean a sewer designed to receive both wastewater and stormwater
Private Combined Sewer	“Private Combined Sewer” shall mean a combined sewer which is not owned by the City, DCR or the MWRA. Private combined sewers include, but are not limited to, building Drains (wastewater), building combined sewer laterals and manholes located on private property and not located within an easement held by the City or other public agencies. The owner of the private combined sewer is also responsible for the connection from a private sewer to the public wastewater system.

Term	Definition
Private Sewer	"Private Sewer" shall mean a sewer that is not owned by the City, DCR or the MWRA. Private sewers include, but are not limited to building Drains (wastewater), building sewer laterals and manholes located on private property and not located within an easement held by the City or other public agencies. The owner of the private sewer is also responsible for the connection from a private sewer to the public wastewater system.
Private Stormwater Drain	"Private Stormwater Drain" shall mean a stormwater Drain that is not owned by the City or the DCR. Private Stormwater Drains include, but are not limited to, building Drains (stormwater), building stormwater Drain laterals, catch basins and manholes located on private property and not located within an easement held by the City and other public agencies. The owner of the private stormwater Drain is also responsible for the connection from a private stormwater Drain to the public stormwater.
Public Combined Sewer	"Public Combined Sewer" shall mean a combined sewer that is owned by the City, DCR, or the MWRA
Public Sewer	"Public Sewer" means a sewer which is owned by the City, DCR or the MWRA or any of their successors.
Sanitary Sewer	"Sanitary Sewer" means a sewer designed to carry sewage.
Sewage	"Sewage" means the spent water of a community, which may be a combination of liquid and water-carried wastes from residences, commercial buildings, institutions and industrial facilities, together with leachate and construction site dewatering, and exclusive of groundwater, surface water, and/or stormwater.
Sewer	"Sewer" means a pipe or conduit for carrying sewage.
Stormwater	"Stormwater" shall mean any water resulting from rainfall or other precipitation that runs off surfaces during or after a storm.
Stormwater Drain	"Stormwater Drain" means a pipe or conduit that carries surface water, stormwater and groundwater or runoff and is exclusive of sewage.
Stormwater Drainage System	"Stormwater Drainage System" means pipes, conduits, pumping stations and appurtenances, including tidegates, catch basins, and manholes used in the collection and transport of stormwater, groundwater and runoff.
Wastewater	"Wastewater" shall mean Sewage, together with any Groundwater, Stormwater and surface water that may be present.
Wastewater System	"Wastewater System" shall mean totality of the devices, equipment or works used in transportation, pumping, storage, treatment, recycling, or reclamation of Wastewater or in the disposal of the effluent.

1.3.2 Infrastructure Inventory

Inventory of the Cambridge sewer/storm drain/combined sewer infrastructure system currently reflects the following major components:

Table 1-1
Inventory of Infrastructure Assets, March 2010

Type of Systems	Pipe Lengths (miles)
Sanitary Sewers (SS)	110
Storm Drains (SD)	93
Combined Sewers	39
Length of SS/SD served by Common Manholes	33.5
Manholes	Total No.
Sanitary Sewer	2,902
Storm Drain	2,979
Combined Sewer	845
Common Manholes	289

Data above has changed since the 1997 report. Some of the changes are due to completed and ongoing infrastructure improvements as documented in this report. It is also the result of a more accurate compilation of assets as recorded and managed through the City’s Geographic Information System (GIS) database which is routinely updated to reflect current conditions. The City’s current stormwater infrastructure is shown on **Figure 1- Common Manholes and Stormwater Catchment Areas**.

1.3.3 Combined Sewer Outfall Facilities

The City of Cambridge currently has 12 permitted Combined Sewer Overflows (CSOs) discharging combined sewer and drain overflow through 11 regulator structures to the Charles River and Alewife Brooks under wet weather conditions. Of the 12 permitted CSOs, nine are presently active and three are temporarily plugged. Recent field investigations have been completed to confirm details of these CSO structures, including weir heights, weir lengths, structure dimensions, presence of floatables control baffles, and dimension of outlet pipes. These results, along with proposed CSO improvements scheduled for construction in 2010 and 2011 under the Contract 4 Alewife Floatables Control Project, are presented for reference in the attached **Appendix C Table 1** – “Summary of Charles River and Alewife Brook CSO Characteristics.”

In conjunction with the summary table, **Appendix C** provides sketches, photos, and drawings depicting both the existing conditions in each structure, as well as the proposed design improvements to be completed in 2010/2011.

Alewife Brook CSOs

CAM 001: This CSO regulator structure is located at the intersection of Foch Street and Alewife Brook Parkway. Dry weather flows pass through a 12” diameter underflow to the MWRA 29” x 37” sewer, while overflows leave the regulator through a short 18” diameter brick connector into another structure, and from here to the Alewife Brook through a 15” VCP outfall.

The 18" connector includes a stainless steel bracket on the downstream end with a short weir plate bolted to this discharge at elevation 14.4-ft CCB. Historically, an additional wooden weir was bolted to this 18" discharge at elevation 15.2-ft CCB. The City is presently re-examining the efficacy of reinstalling this wooden system optimization program (SOP) weir, given level of service concerns within the community. It is expected that future 2011 conditions will allow for this weir discharge to once again be raised to 15.2-ft CCB.

CAM 002A/B: This CSO regulator structure is located at the intersection of Massachusetts Avenue and Alewife Brook Parkway. Dry weather flows currently pass through a 15" diameter underflow to 29" x 37" MWRA sewer, while overflows leave the regulator through a 36" x 40" brick outfall (CAM 002A) to the Alewife Brook after cresting an existing wooden weir at elevation 17.4-ft CCB. The CAM 002B overflow has been completely plugged with brick and mortar on the bottom half and a wooden plate on the top half of this 36" x 42" brick outlet. Future 2011 conditions calls for continued blockage of CAM 002B and a new overflow weir at CAM 002A equal to 17.3-ft CCB. CAM002B will be unplugged following the completion of the Long Term Combined Sewer Overflow Control Plan for Alewife Brook.

CAM 004: This CSO is now controlled by a regulator structure called Drain Vault 5 (DV5) located along Concord Avenue near the intersection with Wheeler Street at the Alewife Rotary. Dry weather sanitary flows are directed to the MWRA 48" sewer, via two (2) twenty four (24") pipes just upstream of the DV5 structure. During smaller storms, separated drainage flows from a 60" RCP drain (servicing the areas separated along Fresh Pond Parkway) through the structure and discharges to a 6' x 5' box culvert. During storms greater than a 3-month storm, additional flow from a 10' x 4' combined sewer box culvert spills over several weir walls in the structure and combines with the drain flows to discharge through the 6' x 5' box culvert discharging to the Alewife Brook. The lower weir is approximately 8-ft long at a crest elevation of 14.49-ft CCB and the higher weirs total approximately 17-ft long at an elevation of 15.16-ft CCB. This structure also includes a flushing chamber that can capture and store stormwater flows to later be released through a flushing gate to provide scouring of sediments within this downstream box culvert. The scouring takes place under dry weather conditions and the discharge is conveyed downstream of the box culvert to the sanitary sewer system.

CAM 400: This CSO regulator structure is located just off of Alewife Brook Parkway, adjacent to Harrison Avenue. Dry weather flows currently pass through a 10" diameter underflow to the 66" MWRA trunk sewer, while overflows spill over a high weir at elevation 14.9-ft CCB and discharge to the Alewife Brook through a 32" diameter brick and concrete outfall pipe. Future 2011 conditions show that this CSO regulator will be eliminated and the present CSO overflow pipeline will be converted to a storm drain outfall, following sewer separation of the CAM400 drainage area.

CAM 401A: This CSO regulator structure is located along Sherman Street, between Pemberton Street and the railroad tracks. Combined sewer flows currently enter the structure through a 45" x 45" combined sewer from the south and discharges on the north side into a 60"W x 66"H storm drain. Additional wet weather flow from a 48" diameter FRP pipe mixes with the combined sewerage at the structure inlet and can lead to surcharging of the regulator structure. When this happens, flow is diverted over the weir at elevation 14.8-ft CCB, equipped with a 32" diameter floatables control mechanical brush screen, and overflows continue into the existing 96"W x 76"H Sherman Street Drain culvert.

CAM 401B: This CSO regulator structure is located at the intersection of Massachusetts Avenue and Alewife Brook Parkway. Dry weather flows currently pass through a 10” diameter orifice underflow to the 66” MWRA trunk sewer, while overflows leave the regulator through a 30” reinforced concrete pipe outfall to the Alewife Brook. Future 2011 conditions will include a floatables control baffle installed upstream of this overflow pipe in a separate precast concrete structure.

Charles River CSOs

CAM 005: This CSO regulator structure is located on Mt. Auburn Street at the intersection with Lowell Street near Mt. Auburn Hospital. Dry weather flow comes into the regulator through a 54” RCP sewer and is diverted into a 42” RCP relief sewer. During storm conditions, overflows are directed under an existing floatables control baffle and over a 3.9-ft weir set at elevation 14.8-ft CCB, discharging into a 54” diameter RCP outfall to the Charles River. Several other sewers including a 30” DI and 24” x 28” brick sewer also may contribute to the overflows as these sewers also connect to the 42” relief. This regulator was reconstructed by the Massachusetts Water Resources Authority (MWRA) in 2003. The floatables control baffle was installed between two existing pipes that penetrate the structure, causing constraints to the ability for flows to surcharge over the baffle. Recent field investigations in the Charles River have confirmed that at the outlet in the Charles River appears to be almost completely plugged with river sediment settling immediately adjacent to the outfall. The City is presently examining the permitting necessary to relieve this outfall.

CAM 007: The CAM 007 CSO regulator is located within the path between Memorial Drive and the Charles River at the intersection with Hawthorne Street. Dry weather flow enters the regulator through a 42” RCP, a 48” RCP, and a 36” RCP combined sewer and discharges into a 60” RCP. During storm conditions, overflows are directed under a recently constructed floatables control baffle and over a 6.3-ft weir set at elevation 13.2-ft CCB, discharging through a 48” x 48” flap gate into a secondary structure, and then into a 56” x 56” outfall to the Charles River. It is noticed that during the months of September, October and November, that the Charles River is maintained at a higher elevation and this can cause backflows into this regulator.

CAM 009: This regulator is located near Memorial Drive just west of JFK Street. This overflow outfall was temporarily plugged in 2007 with a brick and mortar bulkhead such that combined sewer flows can no longer reach the Charles River at this location. This CSO is presently inactive and the city is continuing to monitor upstream service levels so as to make a final determination as to whether this combined sewer overflow can be plugged permanently.

CAM 011: This regulator is located near Memorial Drive and Plympton Street. This overflow outfall was temporarily plugged in 2007 with a brick and mortar bulkhead such that combined sewer flows can no longer reach the Charles River at this location. This CSO is presently inactive and the city is continuing to monitor upstream service levels so as to make a final determination as to whether this combined sewer overflow can be plugged permanently.

CAM 017: The CAM 017 CSO regulator is located within Land Blvd at the intersection with Binney Street. Dry weather flow approach through an 8’ x 8’-4” brick drain and are diverted to a 6’ x 5’ brick drain. During heavy storm events, overflows are directed under a recently constructed floatables control baffle and over a weir set at elevation 14.5-ft CCB, discharging

through an 84" x 84" flap gate into a secondary structure, and then into an 8' x 8'-4" outfall to the Charles River.

Changes to naming conventions and status of some facilities have resulted in minor changes to identified facilities subject to this permit. Current facilities for which this NMC update has been prepared are presented below in Table 1-2. The nomenclature and references are derived directly from the language of the permit with the exception that Attachment A and Attachment B of the permit (CSOs for the Charles River and Alewife Brook, respectively) have been combined into a single table. Footnotes have been re-numbered consecutively, but reflect the same information as provided in the permit.

Table 1-2
City of Cambridge Permitted CSO Outfalls

Receiving Water	Outfall Number	Discharge Location	Interim Effluent Limitations		Effluent Limitations	
			Annual Activation Frequency	Annual Volume (MM Gals)	Annual Activation Frequency	Annual Volume (MM Gals)
Charles River ¹	CAM-005	Lowell St. @Mt. Auburn	N/A		3	0.84
	CAM-007	Memorial Dr. @ Hawthorne St.	N/A		1	0.03
	CAM-009	Memorial Dr. @Old Murray Road	N/A		2 ²	0.01
	CAM-011	Plympton St.	N/A		0 ²	0
	CAM-017	Binney St. @ Land Blvd.	N/A		1	0.45
Alewife Brook ³	CAM-001	Foch St. @ Alewife Brook Pkwy	0	0.0	5	0.19
	CAM-002A ⁴ CAM-002B ⁴	Alewife Brook Pkwy @ Mass. Ave.	7	1.52	4	0.69
	CAM-004	Concord Ave. Rotary	14	7.69	0 ⁵	0
	CAM-400	Alewife Brook @ Harrison Ave. Ext.	10	0.78	0 ⁶	0
	CAM-401A	Sherman St. & Alewife Brook @ B&M RR	7	2.77	5	1.61

Receiving Water	Outfall Number	Discharge Location	Interim Effluent Limitations		Effluent Limitations	
			Annual Activation Frequency	Annual Volume (MM Gals)	Annual Activation Frequency	Annual Volume (MM Gals)
	CAM-401B	Alewife Brook Pkwy @ Mass. Ave.	25	10.7	7	2.15

¹ These discharges will be consistent with the performance of the Long Term Control Plan (LTCP), as defined in Exhibit B of the Second Stipulation incorporated into the Federal Court Order on April 27, 2006.

² Outfalls CAM-009 and CAM-011 have been temporarily sealed.

³ These discharges will be limited in accordance with the performance of the Revised Recommended Plan, as characterized in the Final Variance Report for Alewife Brook and the Upper Mystic River and supplemental letter report.

⁴ These two CSOs are at the same location and are associated with a single CSO regulator.

⁵ This CSO is scheduled to be closed.

⁶ CAM400 CSO scheduled to be closed but storm outfall will remain open after sewer separation.

The CSOs listed above are those specifically cited in the NPDES Permit No. MA0101974. This table differs from the CSO facilities originally identified in the 1997 NMC as follows:

- CAM-009 was not originally included in the 1997 NMC;
- CAM-002 was listed as a single outfall; current nomenclature includes CAM-002A and CAM-002B which are co-located individual outfalls associated with a single regulator;
- CAM-401 location was given as Alewife Brook @ B&M Railroad; current nomenclature refers to this outfall as CAM-401A;
- CAM-401B was not originally included in the 1997 NMC.
- CAM-004, while listed in 1997, has since been replaced by a complex weir system and structure and is scheduled to be closed when the Long Term Control Plan for the Alewife Brook is fully constructed.

1.3.4 Organizational Structure

An organization chart reflecting the current structure and personnel in the Department of Public Works has been provided as **Appendix D**.

1.3.5 Routine Maintenance Operating Protocols

As noted in Section 1.2, procedures relative to maintenance of system infrastructure have been organized and are managed in accordance with BMPs referenced in the DPW Good Housekeeping Manual. The manual is an extensively detailed guidance document and the basis for DPW operations relative both to the MS4 and the CSS. Details in Good Housekeeping Manual significantly improve upon the generalized descriptions of activity provided in the 1997 NMC. The Manual is provided as **Appendix A** of this NMC Plan and is also available for review at the DPW. Sanitary and Stormwater Pump Stations are maintained in accordance with customary procedures and standards and associated manufacturer operation and maintenance manuals. An example of a pump station O&M manual is provided in **Appendix E**.

In April 2005, the City of Cambridge DPW completed its transition from the Hansen Integrated Infrastructure Management System to a new software package called Remedy. This system is widely used at the Public Works Department to track work orders and manage assets. Since its inception, over 8033 sewer and storm water work orders have been entered into the system, as well as over 16,000 related assets.

The City of Cambridge has also just completed an extensive update to the sewer and storm water GIS layers. This data is used directly in the Remedy system. All sewer and stormwater work that is updated in the GIS system is incorporated in Remedy on a periodic basis. All updates to the GIS layers are also shown in Remedy. The Engineering Division at Public Works updates the GIS data on as-builts regularly, ensuring that the maps used by Public Works remain current and accurate.

The GIS layers are easily accessible through a new web viewer, which can either be launched through Remedy or opened independently. For example, City staff can open an online viewer in Remedy, select a CSO regulator structure, and review the work history and GIS attributes for that asset.

The Remedy system has been expanded to include all permit applications for excavation involving sewer and storm water repairs. More than 833 permits have been issued since the Remedy system was expanded. Required monthly inspections of all CSO structures are automatically generated via this system, which will hereafter provide the supporting documentation required. A copy of a typical work order request form and work sheet has been provided as **Appendix F**. As referenced above, a copy of a CSO inspection form template to be used by trained inspectors is provided as **Appendix B**.

2. MAXIMIZATION OF STORAGE IN THE COLLECTION SYSTEM

<p>Summary of 1997 NMC Content:</p> <ul style="list-style-type: none"> • Status of MWRA/City Program • Status of City System Optimization Program (SOP) as of 12/6/96
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2.1 Evaluation Findings

- *MIL for this control measure includes a minimum of once per month inspection of each CSO structure/regulator, pumping station and/or tidegate within jurisdiction of the City of Cambridge. Future evaluation of the efficacy of this measure will include conformance with inspection requirements, and timeliness with which corrective measures are undertaken and documented.*
- 1997 NMC provided “project status” of current and proposed projects. The project listing in this updated Plan also provides a snap-shot inventory of project status.

2.2 Proposed Program Enhancements

The objective of the control measure is to maximize the use of the collection system for storage by making relatively simple modifications to the CSS to enable the system to store wet weather flows until downstream facilities can handle them. A narrative description of existing key components of each regulator structure with CSO discharge is provided in Section 1.3.3. As referenced previously, engineering drawings and a summary table of regulator characteristics are provided in **Appendix C**. Both the summary table and the plans/drawings include existing and proposed conditions at locations for which ongoing design and construction projects exist. Historical drawings or record/design drawings for each structure, where available, have been provided. This documentation has been integrated with the City’s GIS database (or is currently in process) and is available through the web viewer and/or the Remedy system as described previously.

The City has undertaken multiple projects that address sewer solids and collection system storage. This is a particularly complex problem for the City due to its flat topography. System storage optimization must be balanced against significant maintenance requirements associated with pipe systems with slopes that are frequently inadequate to generate necessary velocities for self cleansing. In addition, since both receiving water bodies are impounded by dams, the City system’s ability to convey adequate flows during significant events is compromised. Incorporation of added weir heights at CSO regulators is a continuing concern.

Appendix G provides a description of BMPs that have been incorporated into infrastructure improvement projects throughout the City. BMPs that specifically address system storage optimization include: integration of infiltration basins; sanitary and storm system flushing;

provision of storage tanks; installation of bending weirs; ongoing sewer separation; use of swales; and, implementation of a development ordinance that requires new developments to provide storage of excess runoff between the 2-year existing storm and the 25-year future storm event. The manner in which these BMPs have been employed, the areas of the City impacted and the specific CSOs which realize the benefits of the completed and/or proposed project are further detailed in **Appendix G**.

Annual Reports for future reporting periods will provide summary updates of modifications to existing structures, with a statement explaining purpose and benefit of the modification. A summary of major capital projects undertaken in conformance to the LTCP (since development of the 1997 NMC) is included in the Annual Report and provided here as **Appendix H**. In the future, performance efficacy will be based in part on continued improvement in water quality metrics employed and reported upon by the MWRA in their annual report on CSO abatement project progress. The City contributes to improved performance through implementation of stipulated CSO abatement projects.

2.3 *Inventory/Data Updates*

Please see appendices referenced above for updated data on existing CSO structures.

3. REVIEW AND MODIFICATION OF PRETREATMENT REQUIREMENTS

Summary of 1997 Content:

- | |
|---|
| <ul style="list-style-type: none"> • Inventory of Non Domestic Discharges to the Combined Sewer System • Assessment of Impact of Non Domestic Discharges to CSO's |
|---|

3.1 Evaluation Findings

- *MIL for this measure prohibits discharges to the CSS of septage, holding tank wastes or other material which may cause a visible oil sheen or containing floatable materials during wet weather when CSO discharges may be active.*
- The 1997 NMC references policies to be developed relative to grease. This updated Plan provides status of current efforts and administrative procedures for continuous evaluation of program effectiveness.
- The City of Cambridge is not authorized to administer its own pretreatment program for industrial dischargers. The MWRA administered the City's program in 1997 and still does.

3.2 Proposed Program Enhancements

The objective of the measure is to minimize the impacts of discharges from non-domestic sources during wet weather events and to minimize CSO occurrences by modifying inspection, reporting and oversight procedures within the approved pretreatment program.

As reported by the 1997 NMC, the City was in the process of developing a new program specifically targeting fats, oil and grease (FOG) discharges. That program has been completed and is currently administered by the DPW. In the past twelve months, DPW Compliance Officers reviewed plans or performed inspections at eight (8) new food facilities or facilities undergoing renovations (**Appendix I**). The City's Inspectional Services Department requires that the facilities notify DPW and submit kitchen and plumbing plans to DPW prior to obtaining signatures on building permits. This has been an effective method for ensuring that new and renovated facilities have properly sized grease traps or interceptors, and sampling location(s) where appropriate. In addition, the Plumbing Inspectors monitor for compliance with new State Plumbing Code revisions requiring any new kitchen floor drains to be connected to grease traps.

During 2009, DPW continued to perform inspections and sampling at existing food handling facilities, and expects to continue reviewing proposed new facility plans, and to inspect existing facilities undergoing renovations over the next reporting term. In addition, the City gave three (3) presentations on "Managing Food Wastes" to the managers of licensed liquor establishments,

including the managers of all the major restaurants and hotels at the mandatory annual liquor license renewal meeting held by the License Commission in November 2009. A copy of this presentation is included in **Appendix I**.

The City maintains a list of “problem areas” which it inspects on a routine basis. Fifty-five (55) locations are inspected every 2-3 weeks and remedial actions are taken if necessary. Another seven (7) locations are checked every three (3) months for FOG issues and biological agents are used to breakup any build up when necessary. A list of areas currently treated is included in **Appendix I**. This pro-active campaign to encourage businesses to manage grease and by-products appropriately, and maintain their sewer infrastructure regularly, has helped to reduce back-ups in the city infrastructure.

The City implements periodic sewer TV inspection and cleaning as part of its Sewer Maintenance Program. The Sewer Maintenance Routes and Maps are provided in **Appendix J**. City DPW crews are required to fill out daily worksheets on results of inspections and actions taken. This documentation is maintained by the Sewer Division for eight (8) years.

The City will continue to implement the programs as described above. Any modifications to the program, and descriptions of modification purpose, will be included in subsequent CSO annual reports.

3.3 *Inventory/Data Updates*

Spreadsheets detailing inspections performed are reported annually and retained by the DPW. The spreadsheet detailing plan reviews and inspections of pre-treatment facilities under the City’s FOG program for the 2009 calendar year is provided in **Appendix I**.

4. MAXIMIZATION OF FLOW TO THE POTW

Summary of 1997 Content:

- | |
|--|
| <ul style="list-style-type: none"> • Status of MWRA/City Program • City of Cambridge independent efforts |
|--|

4.1 Evaluation Findings

- *MIL for this control measure includes a minimum of once per month inspection of each CSO structure/regulator, pumping station and/or tidegate within jurisdiction of the City of Cambridge. Future evaluation of the efficacy of this measure will include conformance with inspection requirements, and timeliness with which corrective measures are undertaken and documented.*
- The 1997 NMC provided narrative description of the City’s efforts to develop a control plan to reduce CSO discharges. Several of the programs have been modified and advanced. This Plan provides information on current projects and adopted BMPs.

4.2 Proposed Program Enhancements

The objective of this measure is to reduce the magnitude, frequency, and duration of CSOs that flow untreated into receiving waters. It complements NMC# 2, and the enhancements are as described in that Section. **Appendix G** is a detailed narrative of BMPs adopted by the City to achieve maximization of flow to the POTW. Specific BMPs that address flow include sanitary and storm system flushing, and integration of storage tanks to contain wet weather flows.

Capital improvements associated with the described in **Appendix H** are largely intended to ensure continued optimal flow to the POTW. The City engages remediation contractors annually to conduct television camera inspections, cleaning and remedial reconstruction or repair of portions of the sanitary sewers, combined sewers and MS4.

Routine and proactive inspection procedures that will continue to be practiced were described above in Sections 1, 2, and 3 and the inspection form provided in **Appendix B**.

4.3 Inventory/Data Updates

Please refer to the BMPs description and capital projects update provided in **Appendices G and H**.

5. PROHIBITION/ELIMINATION OF DRY WEATHER DISCHARGES

Summary of 1997 Content:

- | |
|---|
| <ul style="list-style-type: none"> • Correction of Dry Weather Overflows |
|---|

5.1 *Evaluation Findings*

- *MIL for this measure prohibits dry weather overflows and requires reporting of all dry weather sanitary and/or industrial discharges from CSOs within 24 hours.*

5.2 *Proposed Program Enhancements*

The purpose of this measure is to eliminate CSO discharges during dry weather conditions. The City has implemented a significant long-term plan to control CSO discharges and has successfully eliminated discharges during dry weather conditions. No further actions, apart from those outlined through other control measures, are planned at this time.

5.3 *Inventory/Data Updates*

Not Applicable.

6. CONTROL OF SOLID AND FLOATABLE MATERIALS IN CSO'S

<p>Summary of 1997 Content:</p> <ul style="list-style-type: none"> • Considerations in removing floatables from the surface of receiving water bodies • Approach to address the floatable control issue
--

6.1 Evaluation Findings

- *MIL for this measure prohibits discharges to the CSS of septage, holding tank wastes or other material which may cause a visible oil sheen or containing floatable materials during wet weather when CSO discharges may be active.*
- The 1997 NMC reflected the current state of floatable control technology evaluation, although no final determinations had yet been made. This updated Plan provides clarification of final design for floatable control structures.
- The approach described was implemented by the City and resulted in the upgrades integrated into the capital improvements program spanning the past decade, details of which are provided in **Appendices G and H**.

6.2 Proposed Program Enhancements

The objective of this measure is to prevent, visible floatables and solids using relatively simple measures. The program has included considerable technical evaluation of alternatives, both in terms of capital costs and O&M considerations. Controls have been provided at those combined sewer regulators where activations are more frequent than one per year and the volume associated with such is deemed substantial, in accordance with the final condition of the MWRA CSO control plan.

A narrative description of BMPs adopted and recently completed projects that specifically address this measure has been provided in **Appendix G**. BMPs that specifically target control of solids and floatables include floatables control baffles and installation of floatables control brush screens. Baffles have been installed at CAM-401A, CAM-005, CAM-007, and CAM-017 regulator structures. Baffles within the CAM-001, CAM-002A and CAM-401B structures are scheduled for construction during 2010.

6.3 Inventory/Data Updates

Please refer to **Appendix C** for a summary of structural controls employed and as-built drawings of existing and near-future controls, and **Appendix G** for a narrative description of BMPs.

7. POLLUTION PREVENTION PROGRAMS TO REDUCE CONTAMINANTS IN CSO'S

Summary of 1997 Content:

- Street Cleaning
- Public Education Program
- Solid Waste Collection and Recycling
- Product Ban/Substitution
- Control of Products Use
- Illegal Dumping
- Bulk Refuse Disposal
- Hazardous Waste Collection
- Water Conservation
- Commercial/Industrial Pollution Prevention

7.1 Evaluation Findings

- *MIL for this measure prohibits discharges to the CSS of septage, holding tank wastes or other material which may cause a visible oil sheen or containing floatable materials during wet weather when CSO discharges may be active.*
- Pollution Prevention efforts detailed in the 1997 NMC Plan are primarily (although not exclusively) dedicated to public information campaigns or services provided to City residents and businesses by the DPW in an effort to minimize contaminants contributed by other than City-owned facilities and operations. The Good Housekeeping Manual updates all BMPs and operating protocols specific to DPW-related activities; updates on new or modified programs directed to residents is provided in this report.

7.2 Proposed Program Enhancements

The purpose of this NMC is to reduce, to the greatest extent possible, the amount of contaminants that enter the CSS. As described in Section 1, the DPW has developed a Good Housekeeping Manual that addresses operation and maintenance of City infrastructure, including the CSS. Implementation of the standard protocols documented in this manual will continue to improve City performance and reduce contaminants to storm water. In addition, the City has adopted an integrated pest management (IPM) approach for maintenance of passive and active recreation areas and open space. This policy will allow the City to reduce contributions of pesticides, fungicides and herbicides as well as fertilizers to stormwater run-off. A copy of the IPM policy in its entirety has been provided in **Appendix K**.

The City has aggressively instituted public information campaigns in the course of administering its MS4 program, which contributes to reduction in household use of potential contaminants. A

selection of brochures and other printed material distributed to residents and businesses as it relates to water quality protection and pollution prevention has been provided in **Appendix L**.

The City's effort to reduce potential surface water contaminants is also manifest in an aggressive recycling program, household hazardous waste drop-offs and street sweeping programs implemented by the Sanitation Department.

The recycling program is a well established program that is committed to assisting residents, businesses and public agencies to "consume less, reuse and donate materials, and recycle what cannot be eliminated or reused." The DPW has specific programs dedicated to residents, schools, and businesses that inform but also provide guidance on program implementation as well as regulatory obligations. The City's recycling website provides a valuable repository for this information: www.cambridgema.gov/TheWorks/departments/recycle. The City sponsors several household hazardous waste (HHW) collections each year, including April 24, June 19 and October 2 of 2010. That program is extensively described on the City's DPW web site, including detailed instructions regarding what may or may not be accepted at the drop-off and guidance on handling and safety tips.

The City's street sweeping program is frequently cited by other cities and towns as a model for other communities. The major street sweeping operation runs from April through December each year and covers residential streets and all City squares. During the months of April and December the City completes a tandem street sweeping operation combining a vacuum sweeping operation following along behind a mechanical sweeping operation. Approximately 11,000 street miles are cleaned each year while over 5,000 tons of street refuse is collected. At the end of each month, the sweepers also clean the industrial areas of the City. There are three street-cleaning crews working throughout the year. The City squares are cleaned seven days per week with both street sweepers and hand-cleaning crews. Copies of the City's 2009 street sweeping schedule and street sweeping map have been provided in **Appendix M**.

As previously described, **Appendix G** provides a narrative description of structural BMPs that have been adopted by the City to address a variety of control measures. Pollution prevention BMPs cited in the narrative include BMP catch basins (sumps and hoods) which entails replacement of shallow or no pump catch basins with catch basins constructed with a six-foot minimum sump. Other BMPs include sanitary and storm drain flushing to reduce "first flush" contaminant transport, installation of grit pits to provide additional solids capture, stormceptors to provide additional water quality treatment and integration of swales for greater infiltration and water quality benefits as well. Each of these is described in greater detail in **Appendix G**, including specific areas where BMPs have been employed, and respective CSOs effected.

7.3 Inventory/Data Updates

Copies of the City's 2009 street sweeping schedule and street sweeping map have been provided in **Appendix L**. The City intends to maintain a comparable cleaning schedule for 2010.

In 2009, the City collected a total of 1,909 tons of street sweepings and another 484 tons of catch basin debris. These are aggregated totals for City-wide cleaning operations. The City does not currently generate per catch basin, or per stormwater catchment area, volumes.

Please refer to cited Appendices for detailed data updates.

8. PUBLIC NOTIFICATION

<p>Summary of 1997 Content:</p> <ul style="list-style-type: none"> • Posting at Affected Use Areas • Posting at Selected Public Places • Long Term Program
--

8.1 Evaluation Findings

Minimum Implementation Levels:

- *MIL for this measure requires maintenance of identification signs for all CSO structures, readable from both the shore and from instream locations.*
- *In collaboration with the MWRA and the City of Somerville, the City shall maintain informational signs at John Wald Park and other public access locations identified by the MassDEP including the Community Sailing Program and local boathouses to advise the public of CSO discharges and potential health impacts and to provide contact information and website links.*
- *The City, in collaboration with MWRA and the City of Somerville, shall issue a joint press release by April 15 of each year which shall include a) general information on CSOs, b) their locations in the Alewife Brook/Mystic River watershed, and c) potential health risks.*
- *The City shall provide email notice to EPA, MassDEP, local health agents, and the Mystic River Watershed Association of CSO discharges in Alewife Brook within 24hrs from onset, using CAM401B activation as the trigger.*
- *The City shall update its website to include general information regarding CSOs, including their potential health impacts, locations, status of CSO abatement projects, weblinks to CSO communities and watershed advocacy groups, and most recent information on all CSO activations in the Charles River and Alewife Brook watersheds.*

8.2 Proposed Program Enhancements

The purpose of this measure is to inform the public of the location of CSO Outfalls, the actual occurrences of CSOs, the possible health and environmental effects of CSOs, and the recreational or commercial activities curtailed as a result of CSOs.

The City maintains identification signs for all CSO outfall structures. The signs are readable both from shore and from waterways. An example of a typical sign is provided in **Appendix N**. In collaboration with the MWRA and the City of Somerville, the City maintains an informational sign at John Wald Park (**Appendix N**). The City also collaborated with MWRA in the development of printed posters to be distributed to boat houses and other locations where residents access the Charles River. A copy of the notice that accompanied the poster is included in **Appendix N**.

The City collaborates with the MWRA and the City of Somerville to distribute an annual press release to stakeholders on information on CSOs within the Alewife. An example of the most recent letter is provided in **Appendix N**.

The City provides 24-hour email notice to the Board of Health, EPA, MassDEP, and watershed associations when CAM401B activates. The real time activation is triggered by SCADA monitoring. The City of Cambridge also provides notification of CSO activations at CAM-401B through the DPW Sewer Division website CSO page:

<http://www.cambridgema.gov/TheWorks/departments/swrMnt/csomonitor.html>

The CSO webpage also provides a map of CSO locations, and historical monitoring results of CSO activations.

Another web resource for public notification is the DPW's stormwater website:

<http://www.cambridgema.gov/TheWorks/stormwater/index.html> . This website provides links to reports on the status of CSO abatement projects, and links to watershed groups. The City provides health advisory information within its emailed notices and in warnings on the Sewer Division website in the event of a CSO activation. The City will be updating its website to include additional general information regarding the potential health impacts of CSOs.

8.3 *Inventory/Data Updates*

Refer to **Appendix N** and the web links above for updated information to address the MILs.

9. MONITORING TO CHARACTERIZE CSO IMPACTS AND EFFICACY OF CSO CONTROLS

<p>Summary of 1997 Content:</p> <ul style="list-style-type: none"> • Identification of CSO Locations in the CSS • Telephone Hotline Information
--

9.1 Evaluation Findings

- *MIL for this measure requires quantification and documentation of all discharges from CSOs and retention of records for minimum of eight (8) years.*
- In addition to telephone hotlines, the City has developed a web site that allows individuals to contact the City to report spills, odors or back-ups that allows for efficient and timely response to problems. This report provides further information regarding the City's efforts to publicize means by which the public may contact the City regarding conditions related to the CSS.
- The City has recently completed an analysis of the CSO monitoring procedures and recommended revisions to the CSO Monitoring Plan, as described below.

9.2 Proposed Program Enhancements

The objective of this measure is to provide an ongoing characterization of the CSS, and to collect and document information on overflow occurrences and related known water quality problems and incidents that reflect use impairments caused by CSO's. The NPDES CSO Permit requires an Annual Report in which all CSO activations are summarized. The 2009 Annual Report also provides an evaluation of the existing CSO Monitoring Plan, and recommendations for improvements relative to quantification of effluent volumes.

Please refer to Section 2 of the 2009 Annual Report for a complete description of the recommended CSO monitoring procedures.

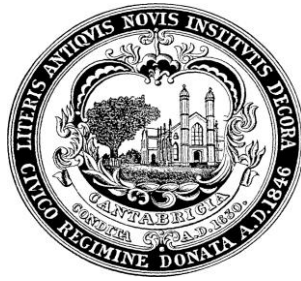
9.3 Inventory/Data Updates

Refer to City of Cambridge 2009 Annual Report for CSO Monitoring Plan results which document and report events for the 2009 calendar year.

APPENDIX A
DPW GOOD HOUSEKEEPING MANUAL

City of Cambridge

Department of Public Works



Municipal Good Housekeeping Manual



March 2007

**THE
WORKS**
CAMBRIDGE
DEPARTMENT
OF PUBLIC

**City of Cambridge, MA
Department of Public Works
Implementation of Stormwater Management Plan
Inspector's Good Housekeeping Manual**

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SECTION 1.0 INTRODUCTION

As part of the National Pollutant Discharge Elimination System (NPDES) Phase II Permit, the City of Cambridge (City) has adopted pollution prevention and good housekeeping controls intended to ensure that City operations and activities conducted at City-owned facilities do not contribute to stormwater pollution. In most urbanized areas such as Cambridge, stormwater is conveyed through a system of catch basins and pipes commonly referred to as a stormwater drainage system. Stormwater pollution can be conveyed through the stormwater drainage system and affects the quality of the City's surface waters including Little River/Alewife Brook, Blair Pond, Charles River, Wellington Brook, and Fresh Pond.

These good housekeeping controls, referred to as best management practices (BMPs), are standard operating procedures for City personnel and for use at all City-owned facilities. These BMPs are intended to serve as guidance for properly conducting City-wide operations such as street sweeping, cleaning out catch basins, and general maintenance of the stormwater drainage system, and City-owned facilities including vehicle maintenance, vehicle washing, lawn care, and materials management.

SECTION 1.1 MANUAL PURPOSE AND SCOPE

The purpose of the Good Housekeeping Manual (Manual) is to provide standard operating procedures for typical municipal operations and facility activities to reduce and eliminate contamination that may enter the City's stormwater drainage system and combined sewer. These standard operating procedures are referred to as best management practices (BMPs) in this manual.

The BMPs in this Manual were selected based on a review and inventory of City operations and activities at numerous City-owned or operated facilities. The BMPs are intended to provide straightforward and up-to-date procedures for personnel to follow in conducting their day-to-day activities. The Manual should be reviewed annually and periodically revised whenever City operations and/or activities at City-owned facilities change, or in response to regulatory changes or permit conditions.

SECTION 1.1.1 USERS OF MANUAL

The Good Housekeeping Manual is a guidance document prepared by the Department of Public Works (DPW) in cooperation with other municipal departments, for all City staff. Specific users and department with activities at facilities, which interact with stormwater, include the following departments and divisions:

- DPW Department Division Staff
 - Administration
 - Engineering
 - Public Buildings
 - Vehicle Maintenance
 - Cambridge Cemetery
 - Parks and Urban Forestry
 - Recycling
 - Street Maintenance
 - Sewer Maintenance
 - Sanitation
 - Street Cleaning

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- Traffic, Parking, and Transportation
- School Department
- Fire Department
- Water Department
- Police Department
- Libraries
- Human Services Program

SECTION 1.1.2 ORGANIZATION OF MANUAL

The Good Housekeeping Manual is organized into the following sections:

- **Section 1.0:** Provides an overview of the Manual's purpose, content, and the Environmental Protection Agency's (EPA's) regulatory requirements. In addition, requirements for lessees and City contractors are stipulated.
- **Section 2.0:** Provides a listing of documented City policies and procedures related to good housekeeping controls and practices that serve as additional references for facility personnel to use.
- **Section 3.0:** Provides BMP fact sheets for operations and activities conducted at City-owned facilities. These BMP fact sheets are intended to be used as guidance that include suggested best management practices, inspection procedures, and maintenance procedures. Each BMP fact sheet includes a list of targeted facilities and pollutant constituents. These fact sheets are simple (two to three pages), intended to be copied and distributed as necessary to facility personnel.
- **Section 4.0:** Provides an overview of the Good Housekeeping Inspection Form, Schedules for conducting activities and inspections, and inspection protocols.
- **Appendix A:** Includes facility site drainage locus maps for select buildings inspected as part of the good housekeeping inspections. The maps identify the location of storm drainage and sewer system components including the location of catch basins that facility personnel should be consonant of during their daily activities to ensure proper measures are taken to eliminate discharges to them.
- **Appendix B:** Includes a Good Housekeeping Inspection Form that should be used at each facility on an annual basis. It serves as a checklist for facility managers to ensure that BMPs are being properly implemented and that if any new activities are being conducted, additional BMPs are implemented.

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SECTION 1.1.3 MANUAL UPDATES

The Good Housekeeping Manual should be reviewed and updated on an annual basis after the Good Housekeeping Inspection Form (Appendix A) is completed for the various City facilities. If during any Citywide facility inspections, additional activities are identified, additional BMPs should be placed in this Manual. In addition, BMPs should be revised based on updated procedures and protocols adopted by the City, or in response to regulatory changes or permit conditions.

SECTION 1.2 STORMWATER POLLUTANTS, OUTFALL MAPS AND IMPACTS ON WATER QUALITY

Pollutant impacts to the receiving surface waters of Cambridge can be attributable to an extent by contaminated runoff that enters the City's stormwater drainage system and discharges through outfalls. DPW and other City department activities as previously identified can have an impact.

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SECTION 1.2.1 CITY WATERSHEDS AND POLLUTANTS OF CONCERN

Receiving surface waters and pollutants of concern for Cambridge include the following:

RECEIVING WATER	WATERSHED	NO. OF OUTFALLS	IMPAIRED?	IMPAIRMENT
Alewife Brook (includes Little River)	Boston Harbor: Mystic River	3	YES	<ul style="list-style-type: none"> • Metals • Nutrients • Organic Enrichment/Low Dissolved Oxygen • Pathogens • Oil and Grease • Taste • Odor and Color • Objectionable deposits
Charles River	Charles River	27	YES	<ul style="list-style-type: none"> • Unknown Toxicity • Priority Organics • Metals • Nutrients • Organic Enrichment/Low Dissolved Oxygen • Pathogens • Oil and Grease • Taste • Odor and Color • Noxious Plants • Turbidity
Wellington Brook	Boston Harbor: Mystic River	2	NO	
Fresh Pond	Boston Harbor: Mystic River	2	NO	
Blacks Nook	Fresh Pond		YES	<ul style="list-style-type: none"> • Nutrients • Noxious Plants
Unnamed Tributary ("Millers River")	Charles River		YES	<ul style="list-style-type: none"> • Organics • Metals • Oil and Grease • Taste, odor, color

The MS4 outfalls that are covered by the NPDES permit are provided on the storm drainage system maps on file at the DPW. These maps also provide details on the layout of the storm

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drainage system including catch basins, manholes, and drainage flow paths. The outfall maps provide important information to guide actions described in this Manual.

SECTION 1.2.2 POLLUTANT IMPACTS ON WATER QUALITY

Typical pollutants, including environmental effects and sources, found in stormwater runoff include the following:

- Sediment**
 - Sediment is often viewed as the largest pollutant load associated with stormwater runoff in an urban setting. The loadings have been shown to be exceptionally high in the case of construction activity.
 - Sediment is associated with numerous impacts in surface waters including increased turbidity, effects on aquatic and benthic habitat and reduction in capacity of impoundments.
 - A number of other pollutants often attach to, and are carried by, sediment particles.

- Nutrients**
 - The nutrients most often identified in stormwater runoff are phosphorus and nitrogen.
 - In surface waters, these nutrient loads can lead to heavy algae growth, eutrophication and low dissolved oxygen levels. Nutrients enter the storm drainage system in a variety of ways, including landscaping practices in parks and recreation areas, leaks from sanitary sewers, and animal wastes.

- Organic Matter**
 - Various forms of organic matter may be carried by stormwater in urban areas. Decomposition of this material by organisms in surface waters results in depleted oxygen levels.
 - Low levels of dissolved oxygen severely impact water quality and life within surface waters.
 - Sources of organic matter include garbage and yard waste.

- Bacteria**
 - High bacterial levels may be found in stormwater runoff as a result of garbage, pet waste, illegal connections to sanitary sewers, and/or combined sewer overflows (CSOs).
 - The impacts of bacteria on surface waters may affect recreational uses and aquatic life as well as impose health risks.

- Oil and Grease**
 - Numerous activities in urban areas produce oil, grease, and lubricating agents that are readily transported by stormwater.
 - The intensity of activities, including vehicle traffic, maintenance and fueling activities, leaks and spills, and manufacturing processes within an urban setting contribute heavily to the level of these pollutants present in adjacent surface waters.

- Heavy Metals**
 - Heavy metals such as copper, lead, zinc, arsenic, chromium and cadmium may be typically found in urban stormwater runoff.
 - Metals in stormwater may be toxic to some aquatic life and may

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accumulate in aquatic animals.

- Urban sources of metals in stormwater may include automobiles, paints, preservatives, motor oil and various urban activities.

- Temperature**
- Stormwater runoff increases in temperature as it flows over impervious surfaces. In addition, water stored in shallow, unshaded ponds and impoundments can increase in temperature.
 - Removal of natural vegetation (such as tree canopy) opens up water bodies to direct solar radiation.
 - Elevated water temperatures can impact a water body's ability to support certain fish and aquatic organisms.

- Pesticides and Herbicides**
- Pesticides and herbicides in stormwater runoff can be toxic, even at low concentrations, to aquatic life and the birds that feed on them.

- Trash and Debris**
- Trash and debris including floatables, plant debris, animal wastes, street litter, and other material may contain pollutants including metals, pesticides, bacteria, and other toxins.
 - Trash and debris can harbor bacteria, vectors, and lower dissolved oxygen concentrations in surface waters affecting aquatic life.

- Vectors**
- Vectors including mosquitoes and rodents can frequent in standing waters, including drainage structures, and eventually live and reproduce in such structures resulting in disease spread and a City nuisance.

SECTION 1.3 REGULATORY REQUIREMENTS

Stormwater rules promulgated under the 1987 Clean Water Act Amendments are found in Title 40 Code of Federal Regulations (CFR) Parts 122-124. These rules establish an application process for obtaining NPDES stormwater discharge permits and categorizes stormwater discharges as either "Phase I" or "Phase II." Stormwater in Cambridge is regulated under Phase II.

SECTION 1.3.1 CLEAN WATER ACT

Pollutants in stormwater have a significant impact on water quality in the U.S. In response to the need for comprehensive requirements to control the discharge of pollutants in stormwater, Congress amended the Clean Water Act (CWA) in 1987 requiring the EPA to establish a phased schedule for the submittal of National Pollutant Discharge Elimination System (NPDES) permits. The NPDES permit provides a mechanism by which the EPA can implement programs and practices to control polluted stormwater runoff.

SECTION 1.3.2 STORMWATER PHASE II RULE

In December 1999, the EPA promulgated the second phase of the stormwater regulations (Phase II) with the intent of capturing all of the stormwater polluting sources that were not already regulated under Phase I including runoff from housing and large parking areas, construction sites



SECTION 1.0 INTRODUCTION

between 1 and 5 acres, and Municipal Separate Storm Sewer Systems (MS4s) serving less than 100,000. The City of Cambridge is a Phase II community.

SECTION 1.4 GLOSSARY OF TERMS

Activities: Daily practices that occur at City-owned facilities and as part of City-wide operations.

Best Management Practices (BMPs): Includes schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent, eliminate, or reduce the pollution of the receiving waters. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Catch Basin: An underground structure used to collect runoff and divert it to the stormwater or combined sewer system.

Clean Water Act (CWA): (33 U.S.C. 1251 et seq.) Requirements of the NPDES program are defined under Sections 307, 402, 318 and 405 of the CWA.

Construction Activity: Includes clearing, grading, excavation, and contractor activities that result in soil disturbance.

Discharge: A release or flow from a canal, conduit, sewer, drain, outfall, pump, stack, tank or treatment process, or any emission, intentional or unintentional, including but not limited to, flow resulting from spilling, leaking, seeping, pumping, pouring, emitting, emptying, depositing, dumping, releasing, injecting, escaping, leaching or infiltration whether direct or indirect.

Hazardous Waste: A waste or combination of wastes that, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either cause or significantly contribute to an increase in mortality or an increase in serious irreversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed. This type of waste possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity) or appears on special EPA or Massachusetts Department of Environmental Protection (DEP) lists. Regulated under the federal Resource Conservation and Recovery Act.

Illicit Discharges: Any direct or indirect discharge to the stormwater drainage system that is not in compliance with applicable laws and regulations as discussed in this document.

Integrated Pest Management (IPM): An ecosystem-based strategy that focuses on long term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism.

Municipal Separate Storm Sewer System (MS4): A conveyance or system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system. Street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention

SECTION 1.0 INTRODUCTION

basin, natural or manmade or altered drainage channel, reservoir, and other drainage structure that together comprise the stormwater drainage system owned or operated by the City.

Non-Stormwater Discharge: Any discharge to a municipal separate storm sewer (MS4) that is not composed entirely of stormwater.

Non-point Source Pollution: Pollution which occurs when water runs over land or through the ground and picks up natural and human-made pollutants, and discharges them in surface waters or introduces them into groundwater.

NPDES Permit: NPDES is an acronym for National Pollutant Discharge Elimination System. The NPDES Permit is the permit required and issued by EPA to control point source discharges of pollutants to waters of the United States or separate stormwater drainage systems. It shall also mean the permit issued to the City by EPA for its combined sewer and stormwater discharges.

Oil/Water Separator: A receptacle designed to separate petroleum-based oil and grease from water body, wetland or land surface. Also called a trap or interceptor.

Outfall: The point of discharge from a stormwater drain or combined sewer overflow to a water body, wetland or land surface. Also called an outlet.

Point Source: Any discernible, confined, and discrete conveyance from which pollutants are or may be discharged.

Pollutant: An element, constituent, or property of wastewater, or of agricultural, industrial, manufacturing, or commercial process water, or leachate, or any other substance which causes the alteration of chemical, physical, biological, or radiological integrity of water through its introduction therein. Generally, any substance introduced into the environment that adversely affects the usefulness of a resource.

Pollution Prevention: Practices and actions that reduce or eliminate the generation of pollutants.

Pretreatment: The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater to a less harmful state prior to or in lieu of discharging or otherwise introducing such pollutants into the wastewater system. Pretreatment shall include the reduction or alteration of pollutants by physical, chemical or biological processes, process changes, or other means. Except as prohibited by 40 CFR Part 403. Dilution is not pretreatment.

Runoff: Water originating from rainfall, melted snow, or irrigation water, which is not absorbed into the ground. Instead, it flows over the land into streams, other surface bearing water or drainage structures.

Run-on: Off-site stormwater surface flow or other surface flows which enters your site.

Secondary Containment: Structures, usually dikes or berms, surrounding tanks or other storage containers, designed to catch spilled materials from the storage containers.

SECTION 1.0 INTRODUCTION

Sedimentation: The process of depositing soil particles, clays, sands, or other sediments that were picked up by runoff.

Sediments: Soil, sand, and minerals washed from land into water, usually after rain, that collect in reservoirs, rivers, and harbors, destroying fish nesting areas and clouding the water, thus preventing sunlight from reaching aquatic plants. Farming, mining, and building activities without proper implementation of BMPs will expose sediment materials, allowing them to be washed off the land after rainfalls.

Significant Materials: Includes (but not limited to): raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designed under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with stormwater discharges.

Significant Quantities: The volume, concentrations, or mass of a pollutant in stormwater discharge that can cause or threaten to cause pollution, contamination, or nuisance that adversely impact human health or the environment and cause or contribute to a violation of any applicable water quality standards for receiving water.

Source Control BMPs: Operational practices that reduce potential pollutants at the source.

Source Reduction (also Source Control): The technique of stopping and/or reducing pollutants at their point of generation so that they do not come into contact with stormwater.

Stormwater: Defined as any water resulting from rainfall or other precipitation that runs off surfaces during or after a storm.

Stormwater Drainage System: Above- and below-ground structures for transporting stormwater to streams or outfalls for flood control purposes.

Toxicity: Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.



SECTION 2.0 CITY POLICIES AND PROTOCOLS

SECTION 2.1 STORMWATER MANAGEMENT POLICY

The City of Cambridge recognizes and is in full agreement with the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems. The City's approach and detailed implementation schedule is provided in the Stormwater Management Plan (draft dated July 2003). A copy is available at the Department of Public Works.

SECTION 2.2 OTHER RELATED CITY POLICIES AND PROTOCOLS

The City's current documented policies and protocols that are applicable to good housekeeping include the following:

- **Road Sand/Salt Application and Storage:** *"Cambridge Public Works Snow Operations"*.
- **Snow Stockpiling/Removal:** *"Cambridge Public Works Snow Operations"*.
- **Sidewalk Repair:** "Standard Specifications for Street Excavations and Construction", Section II, 2F Sidewalks, Curbing, and Bicycle Racks.

In addition, the DPW has the following guidance document for Vehicle Maintenance and Storage and Spill Prevention and Response: DPW's *"Spill Prevention, Control, and Countermeasure Plan (SPCC) Plan"*. These documents supplement the above referenced BMPs for further information. The most recent versions of these documents reside with the DPW. The Assistant Commissioner for Operations can be contacted on how to receive a copy of any one of these.

SECTION 2.3 REQUIREMENTS OF LEASES

The following is an example language that can be inserted into City leases:

"The City of Cambridge has submitted a Notice of Intent (NOI) to the Massachusetts DEP and EPA to obtain coverage under the NPDES Small MS4 General Permit. A copy of the NOI is available for review. In order to comply with the Permit requirements, the City has developed Best Management Practices (BMPs) that parties leasing City owned properties must adhere to. These BMPs contain pollution prevention and source control techniques to minimize the impact of those activities upon dry-weather urban runoff, stormwater runoff, and receiving water quality.

Activities performed at the facility leased shall conform to the Permit and BMPs, and must be performed as described within all applicable BMPs. The lessee shall fully understand the BMPs applicable to activities conducted at the facility leased prior to conducting them and maintain copies of the BMPs at the leased facility throughout the agreement duration.

Evaluation (or cost) of activities performed at the facility leased may be conducted by the City to verify compliance with BMP requirement and may be required through lessor self-evaluation as determined by the City."

SECTION 2.4 REQUIREMENTS OF CONTRACTORS ON CITY PROPERTY

The following is example language that can be inserted into municipal field program contracts:



SECTION 2.0 CITY POLICIES AND PROTOCOLS

“The City of Cambridge has submitted a Notice of Intent (NOI) to the Massachusetts DEP and EPA to obtain coverage under the NPDES Small MS4 General Permit. A copy of the NOI is available for review. In order to comply with Permit requirements, the City has developed Best Management Practices (BMPs) that parties conducting the municipal activities must adhere to. These BMPs apply to any party conducting municipal activities and contain pollution prevention and source control techniques to minimize the impact of those activities upon dry-weather urban runoff, stormwater runoff, and receiving water quality.

Work performed under this CONTRACT shall conform to the Permit requirements and BMPs, and must be performed as described within all applicable BMPs. The CONTRACTOR shall fully understand the BMPs applicable to activities that are being conducted under this CONTRACT prior to conducting them and maintain copies of the BMPs throughout the CONTRACT duration. The applicable BMPs are included as Exhibit ___ of this CONTRACT.

Evaluation of activities subject to BMPs performed under this CONTRACT may be conducted to verify compliance with BMP requirements and may be required through CONTRACTOR self-evaluation as determined by the City.”



SECTION 3.0

BEST MANAGEMENT PRACTICE FACT SHEETS

Guidance on good housekeeping BMPs to be performed in the City of Cambridge is presented using the fact sheets provided in this section. Each of the fact sheets provides a description of the practice, the pollution prevention approach, suggested practices, inspection procedures, and maintenance procedures. In addition, the targeted facilities, operations, and pollutant constituents are identified. All of the suggested Best Management Practices do not need to be implemented for the targeted facilities and operations. The BMPs that reduce an influx of pollutants to the stormwater drainage system to the maximum extent practicable should be considered for implementation.

Appendix A includes facility drainage locus maps for the specific City properties and facilities inspected. Attributes including stormwater drainage and sewer system components (storm drains, sewers, manholes, catch basins, and gravity mains) and, if applicable, discharge points (stormwater outfalls and CSOs) are shown for each inspected facility and the immediate surrounding area.



BMP 1 - ROAD SAND/SALT APPLICATION AND STORAGE

DESCRIPTION

DPW's policy is to strictly use salt on street rights-of-way. A few facilities do use sand/salt mixtures. Proper road salt and facility sand/salt applications storage is necessary to prevent contamination to surface and ground water supplies. Salts are very soluble—once in contact with water there is no way to remove salt. The major reasons for keeping salt covered and controlling use are that salt:

- Kills vegetation
- Corrodes infrastructure
- Blocks storm drains and swales
- Increases sedimentation to streams and rivers
- Small quantities (5% road salt) contain phosphorus, nitrogen, copper, and cyanide

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

Proper Storage

Storage facilities for salt and sand/salt mixtures should have the following key elements:

- Covered structure on impervious surface.
- Drainage should be diverted away from storage facility.
- Sand/salt handling should be done within storage facility.
- Should not be located in a water supply watershed or within 100 year floodplain.

Proper Disposal

Disposal of sand/salt mixtures should not be done in the following areas:

- Wetlands
- Any surface waters
- Well locations and public drinking supplies

Proper Removal

- Street cleaning of all City roadways once per month.
- Catch basin cleaning completed as necessary.

Proper Use

- Establish a low salt area near any water bodies or residential areas.
- When feasible, use higher percentage of sand in sand/salt mixture.
- Regulate the amount of road salt applied to prevent over-salting of motorways and increasing runoff concentrations.
- Vary the amount of salt applied to reflect site-specific characteristics, such as road width and design, traffic concentration, and proximity to

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- Street Rights-of-Way

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

REFERENCE

- “Cambridge Public Works Snow Operations”

BMP 1 - ROAD SAND/SALT APPLICATION AND STORAGE

surface waters.

- Provide calibration devices for spreaders in trucks to aid maintenance workers in the proper application of road salts.
- Establish air temperature and snow depth conditions favorable for successful use of salt.
- Use alternative materials, such as sand or gravel, in especially sensitive areas.
- Use alternative products such as Magic Salt.

INSPECTION PROCEDURES

- Inspect salt storage shed for leaks on a regular basis including Fall and Spring.
- Inspect salt application equipment including calibration equipment and spreaders.
- Inspect salt regularly for lumping or water contamination.
- Inspect surface areas for evidence of runoff – salt stains in ground near and around the salt storage shed, loading area, or downslope.
- Inspect for excessive amounts of salt on roads.

MAINTENANCE PROCEDURES

- Service trucks and calibrated spreaders regularly to ensure accurate, efficient distribution of salt.
- Educate and train operators on hazards of over-salting to roads and environment at the beginning of the snow season as part of meetings with supervisors and drivers.
- Repair salt storage shed leaks.



BMP 2 - SNOW STOCKPILING/REMOVAL

DESCRIPTION

Proper snow management in terms of stockpiling and removal can prevent or minimize runoff and pollutant loading impacts. Snow piles can contain trash, nutrients, sediments, salt, sand, and vehicle pollutants (petroleum, antifreeze, and oil) that can directly be carried into surface waters during snowmelt.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

The City's Policy is to restrict stockpiling of snow. During extreme conditions when stockpiling is necessary the following practices should be applied:

- Do not stockpile snow near or within direct drainage to surface waters.
- Do not stockpile snow in wooded areas, around trees, or in vegetated buffer zones due to sediment and salt damage to vegetation.
- Stockpile snow in pervious areas where it can slowly infiltrate.
- During plowing activities on pervious surfaces, blading (plow lowers blade below ground surface level and plows the upper layers of soil in addition to overlying snow) should be avoided to prevent erosion.

INSPECTION PROCEDURES

- Check snow piles for debris that could be windblown.

MAINTENANCE PROCEDURES

- Contain sediments as snow melts and removed every Spring from snow storage areas. This includes sweeping roadways and parking lots or other impervious areas.
- During plowing activities, avoid blocking drainage structures including catch basins, swales, and channels.

TARGETED FACILITIES AND OPERATIONS

- City-Wide Operations
- Street Rights-of-Way

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Oil & Grease

REFERENCE

- "Cambridge Public Works Snow Operations"

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BMP 3 - MATERIALS MANAGEMENT

DESCRIPTION

Materials management entails the selection of the individual product, the correct use and storage of the product, and the proper disposal of associated waste(s). It is important to be responsible with common chemicals and solvents including paints, cleaners, and automotive products to reduce contamination to stormwater runoff.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- All Fleet Vehicle and Equipment Operations

POLLUTION PREVENTION APPROACH

Proper management reduces the likelihood of accidental spills or releases of hazardous materials into storm drains or during storm events. In addition, health and safety conditions at the facility will improve.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

SUGGESTED BEST MANAGEMENT PRACTICES

Material Inventory

- Identify all hazardous and non-hazardous substances by reviewing purchase orders and conducting a walk-through of facility.
- Compile Material Safety Data Sheets (MSDS) for all chemicals. These should be readily accessible to all facility employees.
- Label all containers of significant materials that include cleaners, fuels, and other hazards.
- Identify handling, storage, and disposal requirements of all chemicals.
- Use environmentally friendly or non-hazardous substitutes when appropriate that include but not limited to H₂Orange₂, Orange Thunder, and Simple Green®.
- Keep hazardous materials and waste off the ground.
- All drums and containers should be in good condition and properly labeled.
- Loose materials including any gravel piles should be covered or placed in shelter.

Solid Waste

- Trash storage bins, dumpsters, and disposal areas should be clean and free of debris, especially those located near catch basins.
- Dumpsters maintained in good condition and securely closed at all times.
- Clean up equipment and materials.
- Dispose of within local, state, and federal laws. This includes Section 8.24 of the City Ordinance.
- Temporary trash storage should be inspected weekly before taken to the local privately owned transfer station.



BMP 3 - MATERIALS MANAGEMENT

- Debris piled including sweepings, construction, and wood debris should be inspected weekly before removed off site.

INSPECTION PROCEDURES

- Physical on-site verification of sealed floor drains (or redirected to sanitary sewer).
- Regular inspection of material storage areas (inside and outside) to verify items are not exposed to precipitation and are covered or in enclosed areas.
- Regular inspection and cleaning of oil/water separators by qualified contractor or facility personnel.
- Inspect stormwater discharge locations and onsite stormwater drainage infrastructure (e.g., catch basins) regularly (for contaminants, soil staining, plugged discharge lines).

MAINTENANCE PROCEDURES

- Repair or replace any leaking/defective containers, and replace labels as necessary.
- Maintain caps and/or covers on containers.
- Maintain aisle space for inspection of products/wastes.
- Routinely clean work spaces.
- Properly collect/dispose of waste.
- Routinely maintain and inspect vehicles and equipment.
- Train employees routinely and when new products enter the facility on proper use, storage, disposal, and safety concerns. MSDS sheets should be reviewed and readily accessible in central facility location.
- Review any Spill Prevention, Control, and Countermeasure (SPCC) Plan. Plans in place for a specific facility for petroleum products.



BMP 4 - HAZARDOUS MATERIAL STORAGE

DESCRIPTION

It is important to properly store hazardous materials to prevent them from contaminating stormwater runoff. Hazardous materials include:

- Cleaning agents: solvents, drain cleaners, and bleach
- Vehicle maintenance fluids: motor oil, gasoline, antifreeze, degreasers, and radiator flush
- Water treatment chemicals
- Paints

Refer to Appendix A for list of typical hazardous materials at specific City Facilities.

POLLUTION PREVENTION APPROACH

Proper management reduces the likelihood of accidental spills or releases of hazardous materials during storm events. In addition, health and safety conditions at the facility will improve.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

Loading/Unloading

- All facilities should have proper procedures in place for loading and/or unloading hazardous materials received, especially areas located near catch basins.
- Do not conduct loading and unloading of exposed hazards during wet weather, whenever possible.
- If feasible, load and unload all materials and equipment in covered areas such as building overhangs at loading docks.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections.

Storage

- When possible, store indoors.
- Storage of reactive, ignitable, or flammable liquids must comply with the Massachusetts Fire Prevention Regulations for the Storage of Flammable and Combustible Materials (527 CMR 14.03).
- Place containers in a designated area that is paved, free of cracks and gaps, and impervious in order to contain leaks and spills. The area should also be covered.
- Provide secondary containment for hazardous materials and waste placed outdoors.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- All Fleet Vehicle and Equipment Operations

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

BMP 4 - HAZARDOUS MATERIAL STORAGE

- Keep containers away from high traffic areas.
- Cover all containers and drums or place under shelter, if stored outdoors.
- MSDSs should be supplied for all stored materials at a specific facility, and in readily accessible location for all facility employees.
- Maintain a log inventory of materials stored at the facility.
- Chemicals should be kept in original labeled containers.
- Containers should not be overfilled.
- Store containers on pallets.
- Properly stack containers and drums.
- Storage areas should be enclosed.
- Minimize storage onsite.
- Keep storage areas clean and organized. Certain materials are collected by the DPW on Household Hazardous Waste Collections conducted several times each year.
- Contractors should be responsible for delivery, storage and waste disposal practices.
- Containers should not be glass.
- Segregate reactive/incompatible materials (such as chlorine and ammonia).
- Place drip pans under container spouts.
- Install overfill protection on storage tanks/drums.
- Lock storage areas and provide warning signs.

INSPECTION PROCEDURES

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.
- Inspect storage areas regularly for leaks or spills.
- Conduct routine inspections and check for external corrosion of material containers.
- Check for structural failure, spills and overfills due to operator error, failure of piping system.
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Replace containers that are leaking, corroded, or otherwise deteriorating with ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums.
- Label new or secondary containers with the product name and hazards.

MAINTENANCE PROCEDURES

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Sweep area regularly with dry broom.
- Conduct major clean-out of loading and unloading area and any sumps prior to October 1 of each year.
- Repair or replace any leaking/defective containers, and replace labels as necessary.
- Maintain caps and/or covers on containers.
- Maintain aisle space for inspection of products/wastes.
- Train employees on proper procedures and when new hazardous materials are used.

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BMP 5 - VEHICLE FUELING, MAINTENANCE AND STORAGE

DESCRIPTION

Vehicle repair and service (e.g. parts cleaning and fueling), replacement of fluids (e.g. oil change), and outdoor equipment storage and parking (dripping engines) can impact water quality if stormwater runoff from areas with these activities occurring on them becomes polluted by a variety of contaminants. Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals to stormwater runoff. It only takes 1 gallon of oil to contaminate 1 million gallons of drinking water.

POLLUTION PREVENTION APPROACH

It is important to properly store and discard vehicle fluids including oil, transmission fluid, antifreeze, and lubricants to prevent surface and groundwater contamination from spills or improper disposal.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

General Practices

- Store fluids in labeled, plastic or metal container with a lid away from drains and catch basins.
- Place flammables in a fire safe cabinet.
- Place drip pans under leaking vehicles, valves, spigots, and pumps.
- Routinely check for leaking vehicles.
- Do not do any vehicle maintenance near storm drains.
- Vehicle maintenance should be done in covered facility.
- Install inlet catch basin equipped with a small sedimentation basin or grit chamber to remove large particles from stormwater in highly impervious areas.

Fueling

- Ensure that all fueling activities are not conducted near storm drains and dry wells or that procedures are in place to control any spills.
- Fuel storage tanks should be placed on impervious surfaces with no cracks or gaps; secondary containment is recommended.
- Provide barriers such as posts, guard rails, or bollards where tanks are exposed, to prevent collision damage with vehicles.
- Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against "topping off" of vehicle fuel tanks.
- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, to a storm drain or into a drywall.

Vehicle Maintenance

- Provide a designated area for vehicle maintenance on an impervious surface.

TARGETED FACILITIES AND OPERATIONS

- DPW Garage
- Police Maintenance Garage
- Cemetery Facilities
- Water Department
- Cambridge Golf Course Garage
- Cambridge Rindge and Latin School Facilities
- Fire Departments & Headquarters
- All Fleet Vehicle and Equipment Operations
- Police Maintenance Facility
- DPW Maintenance Facility

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Hydrocarbons

BMP 5 - VEHICLE FUELING, MAINTENANCE AND STORAGE

- Keep equipment clean; don't allow excessive build-up of oil and grease.
- If possible, perform all vehicle fluid removal or changing inside or under cover:
 - Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts.
 - Promptly transfer used fluids to the proper waste or recycling drums. Don't leave drip pans or other open containers lying around.
 - Keep drip pans or containers under vehicles or equipment that might drip during repairs.
 - Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- If temporary work is being conducted outside: Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips.
- If equipment (e.g., radiators, axles) is to be stored outdoors, oil and other fluids should be drained first. This is also applicable to vehicles being stored and not used on a regular basis.

Disposal

- Recycle or properly dispose of fluids.
- Dump full pans into 55-gallon drums.
- Dispose of debris including oil filters, oil cans, rags, and clean-up supplies.
- Do not dump vehicle fluids down storm drains.
- Interior floor drains should discharge to holding tanks or be sealed.

Used Oil

- Recycle used oil.
- Do not mix wastes with used oil.

INSPECTION PROCEDURES

- Identify locations of floor drains and catch basins and know where they discharge to. Floor drains should be connected to the sanitary sewer system and catch basins should be connected to the stormwater drainage system.
- Regularly inspect vehicles and equipment for leaks and repair immediately.
- Inspect fuel storage tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Inspect fueling areas, catch basin inserts, containment areas, and drip pans on a regular schedule.

MAINTENANCE PROCEDURES

- Sweep the maintenance area on a regular basis, if it is paved, to collect loose particles. Wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.



BMP 5 - VEHICLE FUELING, MAINTENANCE AND STORAGE

- Clean oil/water separators, sumps and on-site treatment/recycling units at appropriate intervals.
- Keep ample supplies of spill cleanup materials onsite. Cleanup spills immediately.
- Properly train employees on fueling and handling oil and waste oil.

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BMP 6 - VEHICLE WASHING

DESCRIPTION

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff.

POLLUTION PREVENTION APPROACH

If possible, take vehicles to commercial car wash facilities. Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

General

- Use biodegradable, phosphate-free detergents for washing vehicles as appropriate. Products include Simple Green® biodegradable car wash cleaner.
- Mark the area clearly as a wash area.
- Post signs stating that only washing is allowed in wash area and that discharges to the storm drain are prohibited. Facility employees should know where catch basins are.
- Provide a trash container in wash area.
- Those that use facility to wash vehicles (e.g., students) should be informed of proper washing protocols.

Vehicle and Equipment Cleaning

- Install sumps or drain lines to collect wash water or construction of a berm around the designated area and grading of the area to collect wash water as well as prevent stormwater run-on.
- Consider washing vehicles and equipment inside the building if washing/cleaning must occur on-site.
- If washing must occur on-site and outdoors:
 - Use designated paved wash areas. Designated wash areas must be well marked with signs indicating where and how washing must be done. This area must be covered or bermed to collect the wash water and graded to direct the wash water to a treatment or disposal facility.
 - Cover the wash area when not in use to prevent contact with rain water.
- Use hoses with nozzles that automatically turn off when left unattended. Use high-pressure, low-volume sprays.
- Perform pressure cleaning and steam cleaning off-site to avoid generating runoff with high pollutant concentrations. If done on-site, no pressure cleaning and steam cleaning should be done in areas designated as protection areas for public water supply.

TARGETED FACILITIES AND OPERATIONS

- DPW Garage
- Cemetery Facilities
- Water Department
- Cambridge Golf Course Garage
- Amigos and King Schools
- Cambridge Rindge and Latin Schools
- Tobin School
- Fire Departments & Headquarters
- All Fleet Vehicle and Equipment Operations

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics

Disposal

- Filter and recycle wash water if possible.
- If discharging to an oil/water separator, do not use detergents that disperse oil in wash water and make oil/water separators ineffective with oil passing to the sanitary sewer system. It is best to use high pressure water with no cleaning agent. If using a cleaner it must be a non-emulsifying products such as QOR-110 (“Quick Oil Release”).

INSPECTION PROCEDURES

- Inspect floor drain systems regularly – use only those that discharge to a sanitary sewer.
- Identify the need for cleaning of catch basins, oil/water separators.

MAINTENANCE PROCEDURES

- Maintain a map of on-site storm drain locations to avoid discharges to the storm drainage system.
- Take precautions against excess use of and spillage of detergents.
- Clean vehicles only where wastes can be captured for proper disposal.



BMP 7 - SPILL PREVENTION AND RESPONSE

DESCRIPTION

It is important to have a plan in place in the event a spill should occur so contaminants do not mix with stormwater runoff. A spill prevention and response plan can be effective at reducing the risk of contamination to surface and groundwater contamination—but only with proper personnel training, the availability of cleanup supplies, and when management ensures procedures are followed.

POLLUTION PREVENTION APPROACH

- Create a well thought out and implemented spill prevention and response plan.
- Post a response checklist in any hazardous waste storage area with contact information (including emergency phone numbers), and spill containment procedures.
- Train personnel.
- Regularly update plan, checklists, and contact information.
- Regularly inspect spill potential areas.
- Facilities with aboveground storage tanks (ASTs) and underground storage tanks (USTs) greater than 1,320 gallons and 42,000 gallons must have SPCC Plans in place.

SPILL PREVENTION AND RESPONSE PLAN

An effective Spill Prevention and Response Plan may include one or more of the following:

- Description of the facilities, the address, activities and materials involved.
- Identification of key spill response personnel and hospital contacts.
- Identification of the potential spill areas or operations prone to spills/leaks.
- Identification of which areas should be or are bermed to contain spills/leaks.
- Facility map identifying the key locations of areas, activities, materials, structural BMPs, etc.
- Material handling procedures and safety measures for each kind of waste.
- Spill response procedures including:
 - Assessment of the site and potential impacts
 - Containment of the material
 - Notification of the proper personnel and evacuation procedures
 - Clean up of the site
 - Disposal of the waste material
 - Proper record keeping procedures
- Plan to protect all storm drains in the event of a spill.
- Descriptions of spill response equipment, including safety and cleanup equipment.

TARGETED FACILITIES AND OPERATIONS

- All City Owned Buildings
- Street and Public Rights-of-Way

TARGETED CONSTITUENTS

- Nutrients
- Metals
- Oil & Grease
- Hydrocarbons
- Organics

REFERENCE

- DPW's SPCC Plan

SUGGESTED BEST MANAGEMENT PRACTICES

Spill/Leak Prevention

- If possible, move material handling indoors, under cover, or away from storm drains or sensitive water bodies.
- Properly label all containers so that the contents are easily identifiable.
- Berm storage areas so that if a spill or leak occurs, the material is contained.
- Cover outside storage areas either with a permanent structure or with a seasonal one such as a tarp so that rain will not come into contact with the materials.
- Check containers (and any containment sumps) often for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with containers in good condition. Collect all spilled liquids and properly dispose of them.
- Store, contain and transfer liquid materials in such a manner that if the container is ruptured or the contents spilled, they will not discharge, flow or be washed into the storm drainage system, surface waters, or groundwater.
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during the filling and unloading of containers. Any collected liquids or soiled absorbent materials should be reused/recycled or properly disposed of.
- For City programs that involve material transport, only transport the minimum amount of material needed for the daily activities and transfer materials between containers at a municipal yard where leaks and spills are easier to control.
- If paved, sweep and clean storage areas monthly, do not use water to hose down the area unless all of the water will be collected and disposed of properly (e.g., in an oil/water separator).
- Install a spill control device (such as a tee section) in any catch basins that collect runoff from any storage areas if the materials stored are oil, gas, or other materials that separate from and float on water. This will allow for easier cleanup if a spill occurs.
- If necessary, protect catch basins while conducting field activities so that if a spill occurs, the material will be contained.
- Keep ample supplies of spill cleanup materials including Speedi Dry and absorbent boom pads onsite.

Spill Clean Up

- Small non-hazardous spills:
 - Use a rag, damp cloth or absorbent materials for general clean up of liquids.
 - Use brooms or shovels for the general clean up of dry materials
 - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
 - Dispose of any waste materials properly.

- Clean or dispose of any equipment used to clean up the spill properly.
- Large non-hazardous spills
 - Use absorbent materials for general clean up of liquids.
 - Use brooms, shovels or street sweepers for the general clean up of dry materials.
 - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
 - Dispose of any waste materials properly.
 - Clean or dispose of any equipment used to clean up the spill properly.
- For hazardous or very large spills, the Fire Department and/or a private cleanup contractor may need to be contacted to assess the situation and conduct the cleanup and disposal of the materials.
- Chemical cleanups of material can be achieved with the use of absorbents, gels, and foams.
- Remove the adsorbent materials promptly and dispose of according to regulations.
- If the spilled material is hazardous, then the used cleanup materials, including rags, are also hazardous and must be sent to a certified laundry facility or disposed of as hazardous waste.

Reporting

- Report any spills immediately to the identified key municipal spill response personnel.
- Report spills in accordance with applicable reporting laws. Spills that pose an immediate threat to human health or the environment must be reported immediately to the City's Health Department at 617-665-3824, DPW at 617-349-4800 and the Fire Department at 911.
- Large spills including those over 10 gallons should be reported to the DPW at 617-349-4800 and the Fire Department at 911.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour). An oil spill over 10 gallons that reaches a surface water, sewer, storm drain, ditch, or culvert leading thereto requires Massachusetts DEP notification at 508-792-7650.
- After the spill has been contained and cleaned up, a detailed report about the incident should be generated and kept on file. The incident may also be used in briefing staff about proper procedures.

INSPECTION PROCEDURES

- Inspect secondary containment systems and oil/water separators periodically to identify any operational problems.
- Inspect containers for leaks, areas near storm receiver inlets and outlets, and floor drains for indications of spills.



BMP 7 - SPILL PREVENTION AND RESPONSE

MAINTENANCE PROCEDURES

- Pump out oil water separators as needed.
- Protect drains with oil absorbent materials.
- Clean out receivers on regular schedule.
- Remove spilled salt from salt loading areas, including the City's Salt Shed.



BMP 8 - LAWN AND GROUNDS MAINTENANCE

DESCRIPTION

Nutrient loads generated by suburban lawns as well as municipal properties can be significant, and recent research has shown that lawns produce more surface runoff than previously thought. Pesticide runoff can contribute pollutants that contaminate drinking water supplies and are toxic to both humans and aquatic organisms.

POLLUTION PREVENTION APPROACH

It is important to reduce pesticides, herbicides, fertilizers, and lawn debris from entering surface and ground water supplies by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater drainage system.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

Landscaping Activities

- Do not apply any chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by the Massachusetts DEP.
- Use mulch or other erosion control measures on exposed soils.
- Check irrigation schedules so pesticides will not be washed away and to minimize non-stormwater discharge.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the stormwater drainage system.
- Use hand or mechanical weeding where practical.
- Employ mowing techniques to maintain a healthy lawn and minimize chemical use—no more than 1” of lawn should be removed from each mowing (grasses kept at 2.5” to 3.0” high are more heat resistant than close-cropped grass).
- Keep mower blades sharp and leave clippings in place after mowing.
- Water plants in the early morning.

Fertilizer and Pesticide Management

- Follow manufacturers’ recommendations and label directions.
- Do not apply insecticides within 100 feet of surface waters such as lakes, ponds, wetlands, and streams.
- Use less toxic pesticides that will do the job, whenever possible and use the minimum amount needed. Avoid use of copper-based pesticides if possible.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities with lawns and grounds
- Street and Public Rights-of-Way

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Bacteria
- Oil and Grease
- Organics
- Low Dissolved Oxygen

BMP 8 - LAWN AND GROUNDS MAINTENANCE

- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Calibrate fertilizer distributors to avoid excessive application.
- Apply pesticides only when wind speeds are low.
- Work fertilizers into the soil rather than dumping or broadcasting them onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Dispose of empty pesticide containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and the Massachusetts Department of Agricultural Resources.
- Provide secondary containment for pesticides.

Debris Removal

- Use yard waste as mulch and topsoil.
- Compost or mulch yard waste.
- Sweep up yard debris instead of hosing down.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Do not leave yard waste in the street or sweep it into storm drains or streams.

INSPECTION PROCEDURES

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring.
- Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect and remove accumulated debris from grounds.
- Routinely monitor lawns to identify problems during their early stages.
- Identify nutrient/water needs of plants.
- Inspect for problems by testing soils.

MAINTENANCE PROCEDURES

- Sweep paved areas regularly to collect loose particles.
- Wipe up spills with rags and other absorbent material immediately.
- Do not hose down the area to a storm drain.
- Keep mower blades sharp.



BMP 9 - STREET AND PARKING LOT SWEEPING

DESCRIPTION

Street and parking lot sweeping includes self-propelled equipment to remove sediment from paved surfaces that can enter storm drains or receiving waters. Sweeping is most effective for removing coarse particles, leaves, and trash. Regularly sweeping reduces catch basin cleaning. The City's Policy is to sweep every street once per month between April through December (weather permitting) and every square (including Harvard, Porter, and Davis) daily.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

- Adhere to the City's cleaning schedule – every roadway swept once per month (April through December).
- City parking lots should be checked regularly by Facility personnel and swept when needed.
- Any visible sediment should be swept up (including sand/salt mixtures and granular material).
- Control the number of points where vehicles leave the Facilities to allow sweeping to be focused on certain areas in parking lots.
- Sweep up the smallest particles feasible.
- Sweep in pattern to keep spilled material from being pushed into catch basins.
- Before sweeping, manually rake sand from any turf areas on surfaces to be swept.
- Use hand-held tools to assist with mechanical equipment.
- If possible, recycle Fall leaf sweepings by composting.
- The DPW should maintain a log or schedule of sweeping activities they conduct. Information should include mileage, amount of sweepings removed, and heavily sedimented areas for street rights-of-way.
- Facilities should maintain a log or schedule for their facility parking lots. Information should include amount of sweepings removed, heavily sedimented catch basins, and date of sweeping activities. By recording heavily sedimented areas, prioritizations can be made to sweep these areas or clean catch basins more frequently.

INSPECTION PROCEDURES

- Regularly inspect streets and City-owned parking lots for debris.

MAINTENANCE PROCEDURES

- Adjust broom frequently to maximize efficiency of sweeping operations.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- Street Rights-of-Way

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

BMP 9 - STREET AND PARKING LOT SWEEPING

- After sweeping is finished, properly dispose of sweeper wastes.
- Do not use kick brooms or sweeper attachments that tend to spread dirt.
- When unloading sweeper, make sure there is no dust or sediment release.
- Inspect sweepers to check that the contractor properly maintains and repairs them.



BMP 10 - CATCH BASIN CLEANING

DESCRIPTION

It is important to remove sediments from catch basins that can have a high concentration of pollutants including metals and hydrocarbons. These sediments can clog downstream drainage systems and transport pollutants to nearby water bodies.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

- EPA recommends cleaning basins when solids reach one-third the depth from the basin bottom to the invert of the lowest pipe into or out of the basin.
- Target cleaning for early Spring or late Fall.
- Clean manually or with equipment (i.e., bucket loaders).
- Properly dispose of catch basin material or store until contractor picks up cleanings (Massachusetts DEP and EPA requires chemical analysis to determine if substance is hazardous waste).
- Repair damaged catch basins including outlet traps.
- Install hoods if catch basins do not have them.
- Inform employees that catch basins are part of the stormwater drainage system and not the sanitary sewer system.
- The DPW should maintain a log of cleaning activities (including the Cambridge Request System formerly the Hansen Request System). Information should include amount of cleanings removed and areas with heavily filled basins.
- Facilities should maintain a log of cleaning activities on their parking lots. Information should include amount of cleanings removed, heavily filled catch basins, and dates cleaned by DPW.

INSPECTION PROCEDURES

- Inspect catch basins, grates, and ditches at least twice per year (best times are before the start and before the end of the rainy season).
- Inspections should be incorporated during routine cleaning, as part of reconstruction contracts, and through requests made by residents or other City departments.

MAINTENANCE PROCEDURES

- Clean catch basins on an annual basis. Catch basins should be checked for sediment levels in sump. Those in areas that accumulate a significant amount of sediment should be cleaned more frequently.
- During catch basin repairs, any hoods missing should be replaced.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- Street Rights-of-Way
- Disposal of Removed Solids

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

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BMP 11 - STORMWATER, SANITARY AND WATER LINE MAINTENANCE

DESCRIPTION

Some operation and maintenance activities of public utilities and accidents can result in the discharge of pollutants that can pose a threat to both human health and the quality of receiving waters if they enter the storm drainage system. Sewage incident response and investigation may involve a coordinated effort between staff from a number of different departments/agencies. Storm drainage systems need to be cleaned regularly. Routine cleaning reduces the amount of pollutants, trash, and debris both in the storm drainage system and in receiving waters.

POLLUTION PREVENTION APPROACH

Inspect potential non-stormwater discharge flow paths and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).

SUGGESTED BEST MANAGEMENT PRACTICES

Stormwater Drainage Maintenance

- Cleaning the storm drain by flushing is more successful for pipes smaller than 36 inches in diameter.
- A water source is necessary for cleaning. The wastewater must be collected and treated once flushed through the system.
- Depending on the condition of the wastewater, it may or may not be disposed to sanitary sewer systems.
- The efficiency of storm system flushing decreases when the length of sewer line being cleaned exceeds 700 feet.

Sanitary Sewer Maintenance

- Clean sewer lines on a regular basis to remove grease, grit, and other debris that may lead to sewer backups.
- Establish routine maintenance program. Cleaning should be conducted at an established minimum frequency and more frequently for problem areas such as restaurants that are identified.
- Cleaning activities may require removal of tree roots and other identified obstructions.
- During routine maintenance and inspection note the condition of sanitary sewer structures and identify areas that need repair or maintenance. Items to note may include the following:
 - Cracked/deteriorating pipes
 - Leaking joints/seals at manhole
 - Frequent line plugs
 - Line generally flows at or near capacity
 - Suspected infiltration or exfiltration
- Prioritize repairs based on the nature and severity of the problem. Immediate clearing of blockage or repair is required where an overflow is currently occurring or for urgent problems that may cause an

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- Street Rights-of-Way

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen



BMP 11 - STORMWATER, SANITARY AND WATER LINE MAINTENANCE

imminent overflow (e.g. pump station failures, sewer line ruptures, sewer line blockages). These repairs may be temporary until scheduled or capital improvements can be completed.

- Review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure.

Spills and Overflows

- Identify and track sanitary sewer discharges. Identify dry weather infiltration and inflow first. Wet weather overflow connections are very difficult to locate.
- The City’s 13 permitted combined sewer overflows to the Charles River and the Alewife Brook should be checked monthly and monitored more frequently during wet weather conditions.
- Locate wet weather overflows and leaking sanitary sewers using conventional source identification techniques such as monitoring and field screening. Techniques used to identify other illicit connection sources can also be used for sewer system evaluation surveys.
- Implement community awareness programs for monitoring sanitary sewer wet weather overflows. A citizen’s hotline for reporting observed overflow conditions should be established to supplement field screening efforts.
- Establish lead department/agency responsible for spill response and containment. Provide coordination within departments.
- When a spill, leak, and/or overflow occurs and when disinfecting a sewage contaminated area, take every effort to ensure that the sewage, disinfectant and/or sewage treated with the disinfectant is not discharged to the storm drainage system or receiving waters. Methods may include:
 - Blocking storm drain inlets and catch basins.
 - Containing and diverting sewage and disinfectant away from open channels and other storm drain fixtures (using sandbags, inflatable dams, etc.).
 - Removing the material with vacuum equipment.
- Record required information at the spill site.
- Perform field tests as necessary to determine the source of the spill.
- Develop notification procedures regarding spill reporting.

Septic Systems

- Document on a map the City’s septic systems.

Planned Water Line Maintenance

- Discharge to a sanitary sewer system with approval.
- Discharge to the storm drainage rain system using applicable pollution control measures. (Only available to clean water discharges such as water main/ water storage tank/water hydrant flushing).
- If water is discharged to a storm drain, control measures must be put in place to control potential pollutants (i.e. sediment, chlorine, etc.). Examples of some storm drain protection options include:

- Silt fence – appropriate where the inlet drains a relatively flat area.
- Gravel and wire mesh sediment filter – Appropriate where concentrated flows are expected.
- Wooden weir and fabric – use at curb inlets where a compact installation is desired.
- Prior to discharge, inspect discharge flow path and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).
- General Design considerations for inlet protection devices include the following:
 - The device should be constructed such that cleaning and disposal of trapped sediment is made easy, while minimizing interference with discharge activities.
 - Devices should be constructed so that any standing water resulting from the discharge will not cause excessive inconvenience or flooding/damage to adjacent land or structures.
- The effectiveness of control devices must be monitored during the discharge period and any necessary repairs or modifications made.

Unplanned Water Line Maintenance

- Stop the discharge as quickly as possible.
- Minor discharges would include direction from the DPW. In most cases, catch basins are protected with filter fabric.
- Major discharges would require the MWRA or Massachusetts DEP to be contacted.
- Inspect flow path of the discharged water:
 - Identify erodible areas which may need to be repaired or protected during subsequent repairs or corrective actions.
 - Identify the potential for pollutants to be washed into the waterway.
- If repairs or corrective action will cause additional discharges of water, select the appropriate procedures for erosion control, chlorine residual, turbidity, and chemical additives. Prevent potential pollutants from entering the flow path.

INSPECTION PROCEDURES

- Inspect for root infiltration. Tree roots are a major cause of backups.
- Inspect for water inflow/infiltration. Rain water entering the sewer pipe causes overflows.
- Inspect for solids. Typical solids that buildup in the pipe and cause backups are grease, dirt, bones, tampons, paper towels, diapers, broken dishware, garbage, concrete, and debris.
- Inspect for structural defects in pipes and manholes - Sags in the line, cracks, holes, protruding laterals, misaligned pipe, and offset joints are all possible causes of backups.

MAINTENANCE PROCEDURES

- Repair structural defects in pipes and manholes immediately.
- Refurbish portions of the utility lines periodically.
- Repairs should adhere to the facility prioritization:
 - High Priority: public health risk, major structural problems, collapsed catch basins with road plates, and illicit connections.
 - Medium Priority: Main pipe lines with significant structural problems, non-functioning catch basins, and street pavements failures caused by minor pipe defects.
 - Low Priority: Installation of non-critical structures and service laterals.
- All maintenance activities should be documented through the Cambridge Request System (formerly the Hansen Request System).



BMP 12 - PET WASTE AND LITTER

DESCRIPTION

Pet droppings have been found to be important contributors of pollution in estuaries and bays where there are high populations of dogs. It has been estimated that for a small bay watershed (up to 20 square miles), 2 to 3 days of droppings from a population of 100 dogs contribute enough bacteria, nitrogen, and phosphorus to temporarily close a bay to swimming and shell fishing. The Cambridge Municipal Code, Title 6 Animals, Chapter 6.04 (Section 6.04.060 Dogs – Removal of Waste Required) clearly states that individuals must pick up their pet’s waste.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Parks, Playgrounds, and Reservations
- Sidewalk and Street Rights-of-Way

POLLUTION PREVENTION APPROACH

Provide pet awareness and education programs with the following elements:

- Encouraging residents to clean up after their pets and to properly dispose of such wastes that may be deposited in their yards, streets and parks.
- Posting signs in local parks describing the problem and urging cleanup and proper disposal of pet wastes.

TARGETED CONSTITUENTS

- Nutrients
- Organics
- Low Dissolved Oxygen

SUGGESTED BEST MANAGEMENT PRACTICES

- Put waste in the trash.
- Restrict dog access to areas of parks where swales, steep slopes and streams are.
- Provide vegetated buffers of prescribed widths between dog parks and waterways, swales, storm drain inlets, gulleys and steep slopes.
- Add pooper scooper stations with free sanitary "pick-up" bags and proper receptacles to all City-Owned parks, playgrounds, and reservations.
- Incorporate public outreach elements like signage and informational brochures into and around parks.

INSPECTION PROCEDURES

- Routinely inspect common dog walking areas for pet waste.

MAINTENANCE PROCEDURES

- Remove and properly dispose of pet waste.
- Enforce Cambridge Municipal Code: Section 6.04.060 Dogs – Removal of Waste Required.

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BMP 13 - SIDEWALK CLEANING AND REPAIR

DESCRIPTION

Pollutants on sidewalks and other pedestrian traffic areas and plazas are typically due to littering and vehicle use.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

Sidewalk Cleaning

- Post “No Littering” signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Cover litter receptacles and clean out frequently to prevent leaking/spillage or overflow.
- Regularly broom (dry) sweep sidewalk, plaza and parking lot areas to minimize cleaning with water.
- Dry cleanup first (sweep, collect, and dispose of debris and trash) when cleaning sidewalks or plazas, then wash with or without soap.
- Use biodegradable soaps and detergents to wash down sidewalks.
- Block the entrance to the storm drainage system by using filter fabric to block catch basins. Discharge wash water to landscaping or collect water and pump to a tank or discharge to sanitary sewer if allowed.
- Use deicing salts and sands only when snow or ice is present (not as a preventive measure) and apply sparingly. Shoveling of snow is always preferred to dumping excessive amounts of deicing materials in an effort to avoid shoveling. If deicing salts are used, the residues and remaining granules should be swept up when the snow and ice has melted, and reused or disposed of in your garbage. Un-shoveled or icy sidewalks can be reported to the DPW’s Snow Hotline at 617-349-4903, as identified in DPW’s “Snow: Our Winter Challenge” brochure.

Sidewalk Repair

- Refer to “Standard Specification from Street Excavations and Construction (Section II, 2F).
- Schedule surface removal activities for dry weather if possible.
- Avoid creating excess dust when breaking asphalt or concrete.
- Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g. filter fabric or sand bags around inlets).
- Clean afterwards by sweeping up as much material as possible.
- Designate an area for clean up and proper disposal of excess materials.
- Remove and recycle as much of the broken pavement as possible to avoid contact with rainfall and stormwater runoff.
- When making saw cuts in pavement, use as little water as possible.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- Sidewalk and Street Rights-of-Way

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics

REFERENCE

- “Standard Specifications for Street Excavations and Construction”, Section II, 2F)
- DPW’s “Snow: Our Winter Challenge” brochure

BMP 13 - SIDEWALK CLEANING AND REPAIR

Cover each storm drain inlet completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site.

- Always dry sweep first to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains. Once dry sweeping is complete, the area may be hosed down if needed. Wash water should be directed to the sanitary sewer as allowed by the DPW.

INSPECTION PROCEDURES

- Inspect sidewalks regularly for trash items and stains.

MAINTENANCE PROCEDURES

- Sweep sidewalks at least as necessary to collect loose dirt and debris rather than pushing it into the street or gutter or hosing it down. Collected materials must be disposed of as regular garbage.
- Conduct spot stain removal instead of washing entire sidewalk.



BMP 14 - GRAFFITI CLEANING

DESCRIPTION

Graffiti cleaning often results in the discharge of wastewater to the storm drainage system, unless the equipment operator takes steps to collect and dispose of it legally. Discharge of pressure washing wastewater to the storm drainage system is prohibited because it contains pollutants from the cleaning compounds used and/or from the objects or surfaces being cleaned.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

- Avoid graffiti abatement activities during rain events.
- When graffiti is removed by painting over, ensure that the catch basin inlets are protected.
- Direct runoff from sand blasting and hot water pressure washing (with no cleaning agents) into a dirt or landscaped area after treating with an appropriate filtering device.
- Use hot water for pressure washing. If using a biodegradable soap, plug nearby storm drain inlets and vacuum/pump wash water to the sanitary sewer if a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound).
- Ensure that a non-hazardous cleaning compound is used or dispose as hazardous waste, as appropriate.

INSPECTION PROCEDURES

- Regularly inspect facilities for graffiti.

MAINTENANCE PROCEDURES

- Remove graffiti as necessary, according to the suggested Best Management Practices.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

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BMP 15 - MOSQUITO CONTROL

DESCRIPTION

Larvicides are placed in the City's catch basins one to three times per year.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

[TBD]

INSPECTION PROCEDURES

[TBD]

MAINTENANCE PROCEDURES

[TBD]

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

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BMP 16 - WASTE MANAGEMENT

DESCRIPTION

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff.

POLLUTION PREVENTION APPROACH

The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing runoff and runoff.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

General

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater runoff and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses.

Controlling Litter

- Post “No Littering” signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean before contractor picks up.
- Inspect solid waste containers for structural damage or leaks regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

- Place waste containers under cover if possible.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

Good Housekeeping

- Use the entire product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g. sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Stencil storm drains on the facility's property with prohibitive message regarding waste disposal.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers protected from vandalism, and in compliance with fire and hazardous waste codes.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.

Runon/Runoff Prevention

- Prevent stormwater runon from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent the waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

INSPECTION PROCEDURES

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

MAINTENANCE PROCEDURES

- Maintain equipment for material tracking program.

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BMP 16 - WASTE MANAGEMENT

DESCRIPTION

Typical building operations include cleaning operations such as outside pressure washing of buildup and repairs.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

TARGETED CONSTITUENTS

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a waste/water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash water runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement. Ensure that this practice does not kill grass.

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal. Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

BMP 16 - WASTE MANAGEMENT

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. In which case you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover with secondary containment during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

INSPECTION PROCEDURES

- Sweep paved areas regularly to collect loose particles, and wipe up spills with rags and other absorbent material immediately; do not hose down the area to a storm drain.



SECTION 4.0 GOOD HOUSEKEEPING FORM, SCHEDULES, AND INSPECTION PROTOCOLS

Appendix B includes a good housekeeping inspection form that should be completed on an annual basis or as necessary by facility personnel for specific City properties or for City operations. The form includes a BMP checklist to identify what BMPs are applicable to the site and an assessment of the effectiveness of the BMPs implemented. The effectiveness of the BMP depends on whether proper procedures and protocols identified in Section 3.0 are currently being implemented. The comments section serves to provide how inadequate BMPs will be addressed. The form includes a section on property changes to evaluate whether new BMPs should be incorporated into the day-to-day activities of the facility.

It is important to keep a record of the inspection forms at an appropriate department designated facility and also to forward a copy to the DPW Stormwater Project Manager. Inspection forms for facilities and City-wide operations should be completed during a time of the year that applicable activities are being conducted. For example, street sweeping activities for City-wide operations should be evaluated during the scheduled times of the year these activities take place. The City is required to submit an annual report to the Massachusetts DEP and EPA on May 1st that includes a status on good housekeeping control measures implemented. Therefore, good housekeeping inspection forms for a given permit year (May 1st to April 30th) should be completed and submitted to the DPW Stormwater Project Manager by February 15th (annually).



**City of Cambridge, MA
 Department of Public Works
 Implementation of Stormwater Management Plan
 Good Housekeeping Manual**

Appendix A: Facility Drainage Locus Maps Index

Bldg/Facility #	Site Name	Address
1	DPW Garage	147 Hampshire St
2	Police Vehicle Maintenance Garage	450 R Concord Ave
3	Cemetery Garage	76 Coolidge Ave
4	Water Department Garage	250 Fresh Pond Parkway
5	Cambridge Golf Course Garage	14 Blanchard Rd
6	East Cambridge Garage	51-69 First Street
7	Electrical Department Garage	Third & Gore Streets
8	Central Sq. (Green Street) Parking Garage	260 Green St
9	Amigos School and King School	100 Putnam Ave
10	Baldwin School	28 Sacramento St
11	Cambridge Rindge and Latin	459 Broadway
12	Cambridgeport School	89 Elm St
13	Fletcher / Maynard Academy	225 Windsor St
14	Graham & Parks Alternative School	44 Linnaean St
15	Haggerty School	110 Cushing St
16	High School Extension Program	359 Broadway
17	Kennedy / Longfellow School	158 Spring St
18	King Open School	850 Cambridge St
19	Martin Luther King, Jr. School	100 Putnam Ave
20	Morse School	40 Granite St
21	Peabody School	70 Rindge Ave
22	Rindge and Latin Auto Shop	456 Broadway
23	Rindge School of Technical Arts	459 Broadway
24	Tobin School	197 Vassal Ln
29	Police Headquarters	5 Western Ave
30	Fire Department Headquarters	491 Broadway
32	Fire Department Company 3	175 Cambridge St
36	Fire Department Company 8	113 Garden St
39	Cemetery Office	76 Coolidge Ave
40	City Hall	795 Massachusetts Ave
41	City Hall Annex	344 Broadway
42	DPW Administration	147 Hampshire St
44	Boudreau Branch Library	245 Concord Ave
45	Central Square Branch Library	45 Pearl St
46	Collins Branch Library	64 Aberdeen Ave
47	O'Connell Branch Library	48 Sixth St
48	O'Neill Branch Library	70 Rindge Ave
49	Valente Branch Library	826 Cambridge St
51	Walter J. Sullivan Water Purification Plant	250 Fresh Pond Parkway
53	Emergency Communications- This office is at Fire Headquarters	489 Broadway
56	Cambridge Golf Course - Clubhouse	691 Huron Ave
57	Cemetery Chapel	76 Coolidge Ave
58	Cemetery Garage	76 Coolidge Ave
59	Comfort Station - St.Peter's Field (Danehy Park)	Sherman St
60	Corporal Burns Shelter	26 Surrey Street
63	Gold Star Swimming Pool	off Berkshire St
67	Salt Shed	99 Sherman St
69	School Administration Building	159 Thorndike St
70	War Memorial Facility	1640 Cambridge St
75	Longfellow School (Temporarily Main Library)	Broadway
81	City Lot/Bus Yard w/Shed	Fulkerson
NA	Municipal Lot 02	Bennett
NA	Municipal Lot 05	Bishop Allen
NA	Sennott Park	Broadway at Norfolk St
NA	Ahern Field	Fulkerson St at Charles St
NA	Donnelly Field	Berkshire St at York St



**City of Cambridge, MA
Department of Public Works
Implementation of Stormwater
Management Plan**

**Good Housekeeping Inspection
Form**

Facility Name and ID: _____

Facility Manager: _____

Contact Information: _____

Date: _____

Previous Inspection Date: _____

Weather and approx Temp.: _____

Field Personnel: _____

Photo CD: _____

Separate Storm Sewer area:

Combined Sewer area:

Directions:

(1) For each activity, inspect whether the Best Management Practices (BMPs) listed are implemented at the Facility to the maximum extent practicable.

- Y = Yes
- N = No
- N/A = Not Applicable

(2) Indicate the overall effectiveness of the BMPs implemented.

- 1 = BMP not effective (improvement is possible)
- 2 = BMP effective

(3) Include any necessary comments. These include reasons why a BMP is not effective and the next course of action.

PART I: BMP CHECKLIST					
	ACTIVITY	BMP	BMP IMPLEMENTED	EFFECTIVENESS	COMMENTS
1	Road Sand/Salt Application and Storage	Proper Storage	Y N N/A	1 2	
		Proper Disposal	Y N N/A	1 2	
		Proper Removal	Y N N/A	1 2	
		Proper Use	Y N N/A	1 2	

PART I: BMP CHECKLIST

	ACTIVITY	BMP	BMP IMPLEMENTED	EFFECTIVENESS	COMMENTS
2	Snow Stockpiling/Removal	Proper Stockpiling Procedures	Y N N/A	1 2	
		Proper Plowing Procedures	Y N N/A	1 2	
3	Materials Management	Material Inventory	Y N N/A	1 2	
		Solid Waste	Y N N/A	1 2	
		Alternative Products	Y N N/A	1 2	
4	Hazardous Material Storage	Loading/Unloading	Y N N/A	1 2	
		Container Storage	Y N N/A	1 2	
		Maintenance	Y N N/A	1 2	
		Disposal	Y N N/A	1 2	
5	Vehicle Fueling, Maintenance and Storage	General Practices	Y N N/A	1 2	
		Fueling	Y N N/A	1 2	
		Vehicle Maintenance	Y N N/A	1 2	
		Disposal	Y N N/A	1 2	
		Used Oil Recycled	Y N N/A	1 2	
6	Vehicle Washing	General Wash Practices	Y N N/A	1 2	
		Vehicle and Equipment Cleaning	Y N N/A	1 2	
		Disposal	Y N N/A	1 2	
		Wash at Commercial Facility	Y N N/A	1 2	
7	Spill Prevention and Response	Implement Plan or SPCC	Y N N/A	1 2	
		Spill/Leak Prevention	Y N N/A	1 2	
		Spill Clean Up	Y N N/A	1 2	
		Reporting	Y N N/A	1 2	

PART I: BMP CHECKLIST

	ACTIVITY	BMP	BMP IMPLEMENTED	EFFECTIVENESS	COMMENTS
8	Lawn and Grounds Maintenance	Landscaping	Y N N/A	1 2	
		Fertilizer and Pesticide Management	Y N N/A	1 2	
		Debris Removal	Y N N/A	1 2	
9	Street and Parking Lot Sweeping	Sweep in the spring	Y N N/A	1 2	
		Properly dispose of sweep material	Y N N/A	1 2	
		Maintain a log of sweeping activities	Y N N/A	1 2	
10	Catch Basin Cleaning	Clean in the spring after sweeping activities	Y N N/A	1 2	
		Properly dispose of catch basin cleanings	Y N N/A	1 2	
		Maintain a log of cleaning activities	Y N N/A	1 2	
11	Stormwater, Sanitary and Water Line Maintenance	Protocols in Place	Y N N/A	1 2	
12	Pet Waste and Litter	Public Education (signs, pooper scooper stations)	Y N N/A	1 2	
13	Sidewalk Cleaning and Repair	Properly clean sidewalks	Y N N/A	1 2	
		Properly repair sidewalks	Y N N/A	1 2	
14	Graffiti Cleaning	Properly clean graffiti	Y N N/A	1 2	
15	Mosquito Control	Protocols in Place	Y N N/A	1 2	

PART I: BMP CHECKLIST

	ACTIVITY	BMP	BMP IMPLEMENTED	EFFECTIVENESS	COMMENTS
16	Waste Management	General	Y N N/A	1 2	
		Controlling Litter	Y N N/A	1 2	
		Waste Collection	Y N N/A	1 2	
		Good Housekeeping	Y N N/A	1 2	
		Chemical/Hazardous Waste	Y N N/A	1 2	
		Runon/Runoff Prevention	Y N N/A	1 2	
17	Building Operations	Outside Pressure Washing	Y N N/A	1 2	
		Building Repair, Remodeling, Construction	Y N N/A	1 2	

PART II: PERSONNEL AND PROPERTY CHANGES EVALUATION

Have any new staff personnel begun working at the Facility? Y N
 If yes, list names of new personnel and dates personnel were/are going to be trained to implement Good Housekeeping BMPs:

Are there new significant materials that could be exposed at the Facility? Y N
 If yes, describe the type, location conducted, purpose, and responsible City Department:

PART I: BMP CHECKLIST

ACTIVITY	BMP	BMP IMPLEMENTED	EFFECTIVENESS	COMMENTS
<p>Are there new activities that could expose significant materials at the Facility? Y N</p> <p>If yes, describe the type, location conducted, purpose, and responsible City Department:</p>				
<p>Are there new major changes to the Facility drainage (e.g., new construction, grading activities, etc.)? Y N</p> <p>If yes, describe:</p>				

PART I: BMP CHECKLIST

ACTIVITY	BMP	BMP IMPLEMENTED	EFFECTIVENESS	COMMENTS
<p>Suggested improvements (or new BMPs) include the following:</p>				

APPENDIX B
CSO INSPECTION FORM TEMPLATE

APPENDIX C
SUMMARY TABLE OF REGULATOR CHARACTERISTICS;
ENGINEERING DRAWINGS & PHOTOS

Table 1: Summary of Charles River and Alewife Brook CSO Characteristics

CSO Location	Recent 2009 Field Observed Conditions									Proposed Conditions (2011)							
	Weir in Structure or Orifice	Weir Elevation (ft CCB)	Weir Width (ft)	Remaining Orifice Clearance (ft)	Remaining Overflow Structure Clearance (ft)	Baffle	Outlet Pipe Size (in)	Downstream Area / Velocity Meter	Comments	Weir in Structure or Orifice	Plate or Weir Elevation (ft CCB)	Weir Width (ft)	Remaining Orifice Clearance (ft)	Remaining Overflow Structure Clearance (ft)	Baffle	Outlet Pipe Size (in)	Pipe Invert (ft CCB)
CAM 001	18" Orifice	14.52	1.2	1.1	2.1	No	15"	-	SOP on top of the aluminium weir will be reinstalled by ongoing contract.	18" Orifice	15.2	1.3	0.4	1.4	Yes	15.0	-
CAM 002A	Arch Orifice	17.36	4.0	1.8	2.6	No	36"W x 40"H	Yes	-	42" Orifice	17.3	3.0	2.5	3.0	Yes	36"W x 40"H	16.3
CAM 002B	-	-	-	-	-	-	-	-	Overflow Plugged. This overflow will eventually be reopened once the LTCP is complete.	-	-	-	-	-	-	-	-
CAM 004	Structure	14.49	8.0	-	2.8	No	6"W x 5'H	-	Actual Regulator is DV5. Includes one low level weir (8-ft) and two high level weirs (17-ft total)	-	-	-	-	-	-	-	-
		15.16	17.0		2.1			-									
CAM 400	Structure	14.94	7.3	-	1.0	No	32"	-	To be converted to drain outfall by the end of 2010	-	-	-	-	-	-	-	-
CAM 401A	Structure	17.04	17.0	-	4.8	Yes	(3) 48" x 60"	-	32" diameter floatables brush screen on top of weir	-	-	-	-	-	-	-	-
CAM 401B	30" Orifice	14.84	2.2	1.9	-	No	30"	-	-	30" Orifice	14.2	-	2.5	5.3	Yes	30.0	14.2
CAM 005	Structure	14.82	3.9	-	4.4	Yes	54"	Yes	Significant sediment at the river edge. This may be as a result of river sedimentation.	-	-	-	-	-	-	-	-
CAM 007	Structure	13.15	6.3	-	2.5	Yes	48" x 48" Flap Gate	-	-	-	-	-	-	-	-	-	-
CAM 009	-	-	-	-	-	-	-	-	Overflow temporarily plugged	-	-	-	-	-	-	-	-
CAM 011	-	-	-	-	-	-	-	-	Overflow temporarily plugged	-	-	-	-	-	-	-	-
CAM 017	Structure	14.49	10.1	-	2.5	Yes	84" x 84" Flap Gate	-	-	-	-	-	-	-	-	-	-

* Note: CCB = NGVD + 10.84

CAM 001

UTILITY PIPELINE SERVICES, INC.

14 Priscilla Lane
AUBURN, NH 03032
(603) 625-1212

JOB CAMBRIDGE, MA CSO METERING

SHEET NO. CAM 001

OF FOCH ST. & ALEWIFE

CALCULATED BY GW

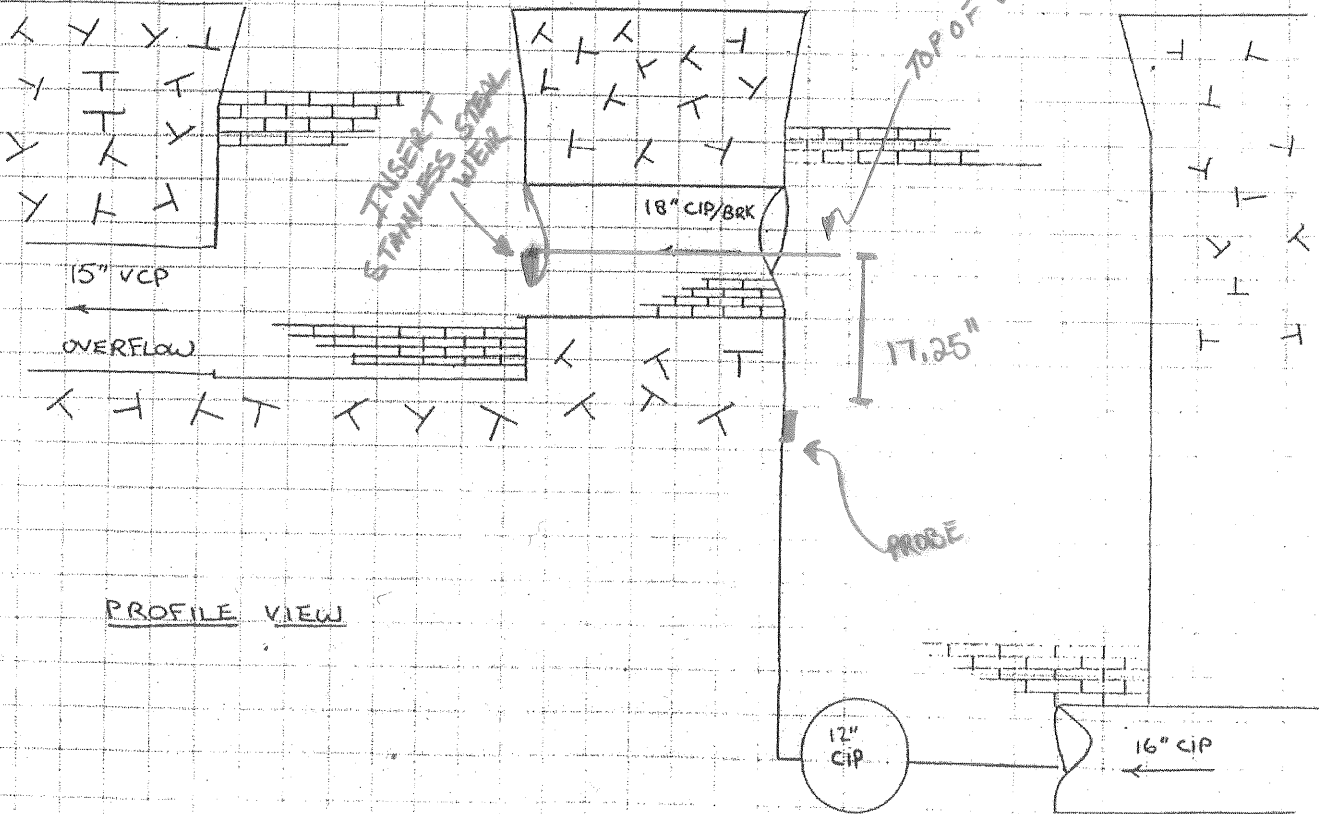
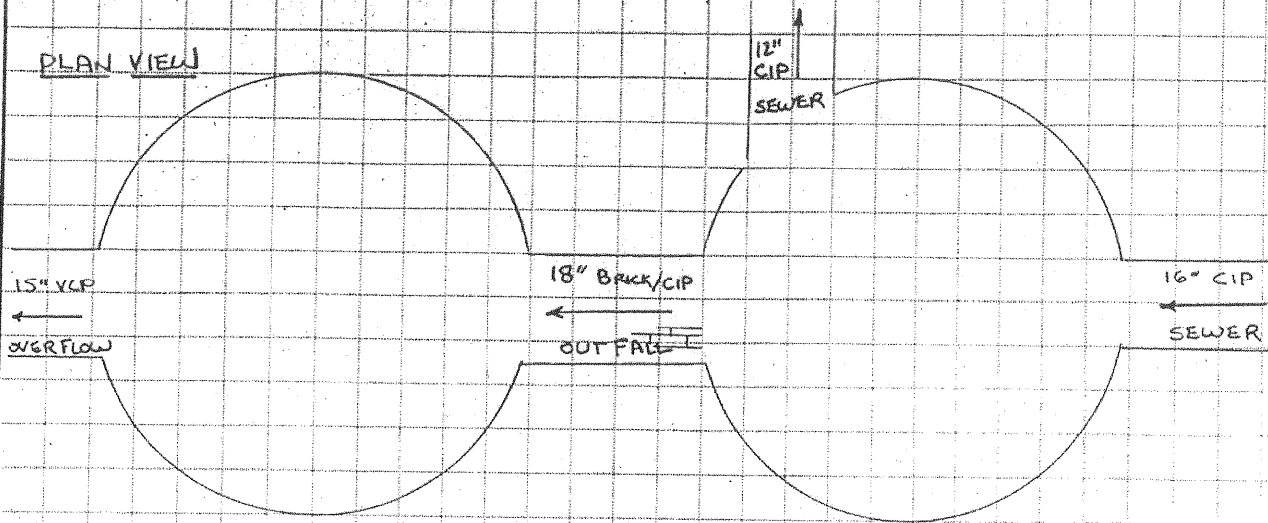
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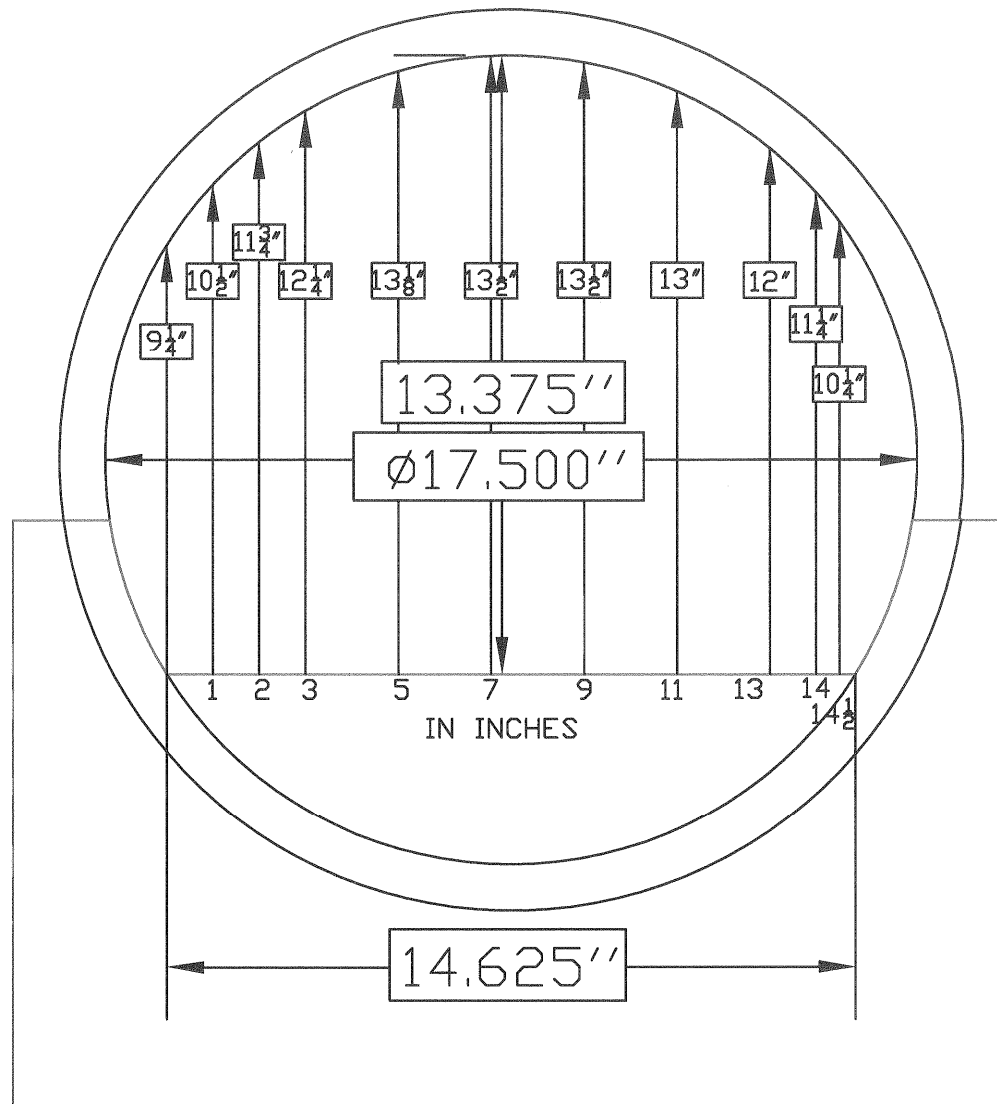
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DATE 1/4/96

SCALE NOT TO SCALE

PLAN VIEW





OUTFLOW

#1

DRAWING NOT TO SCALE

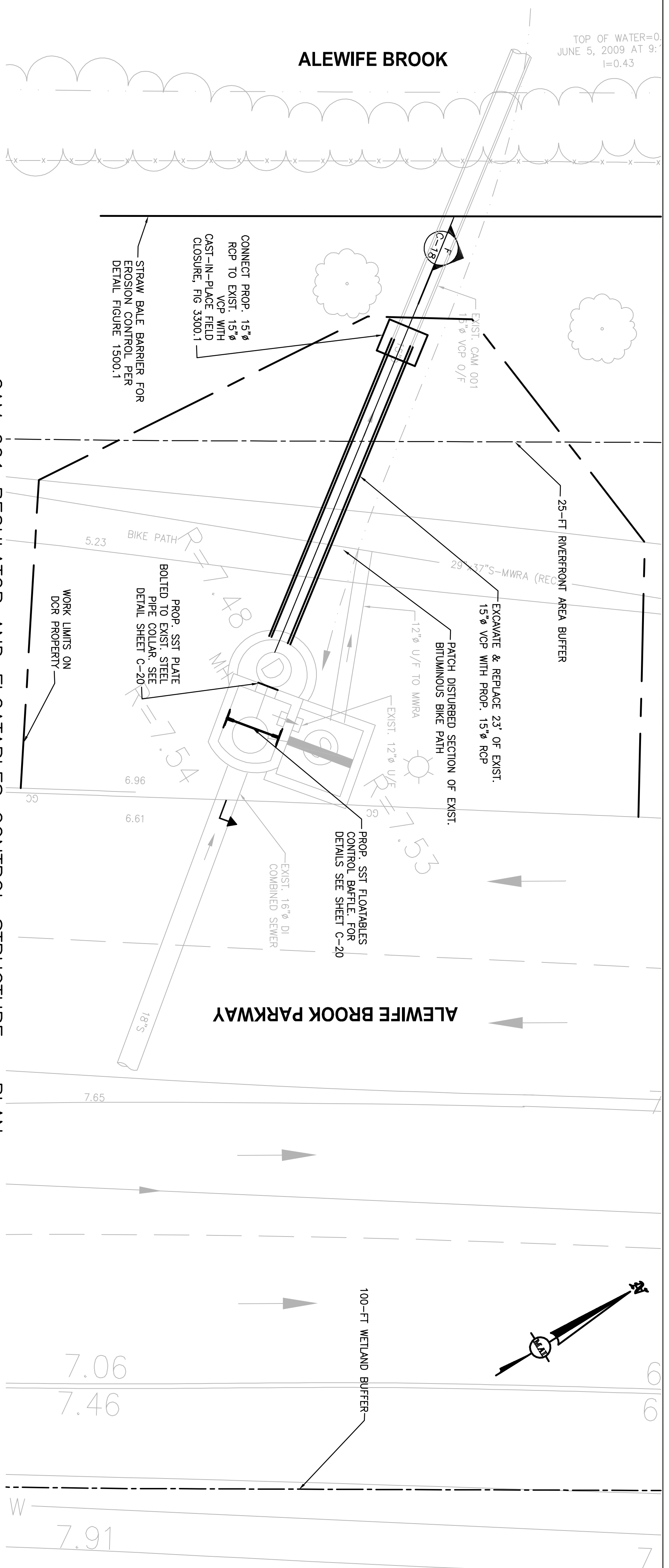




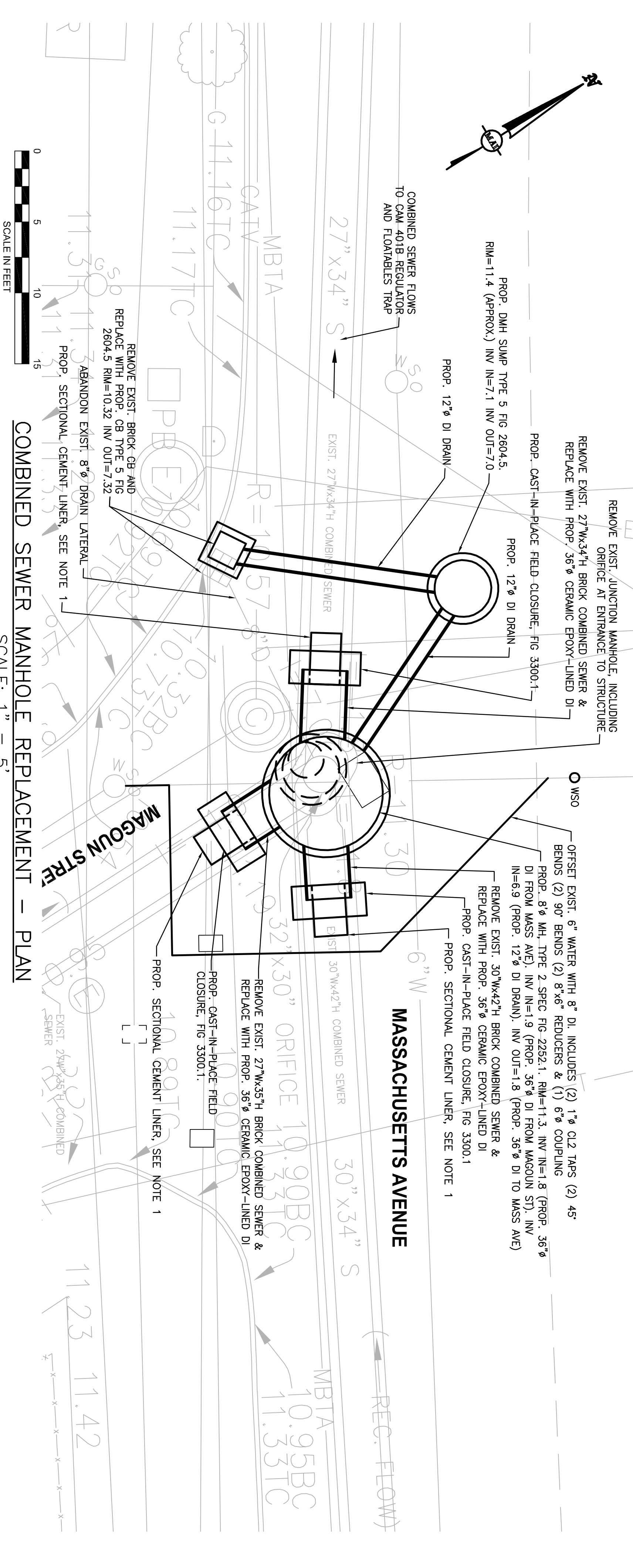




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JUNE 5, 2009 AT 9:
I=0.43



CAM 001 REGULATOR AND FLOATABLES CONTROL STRUCTURE - PLAN
SCALE: 1" = 5'

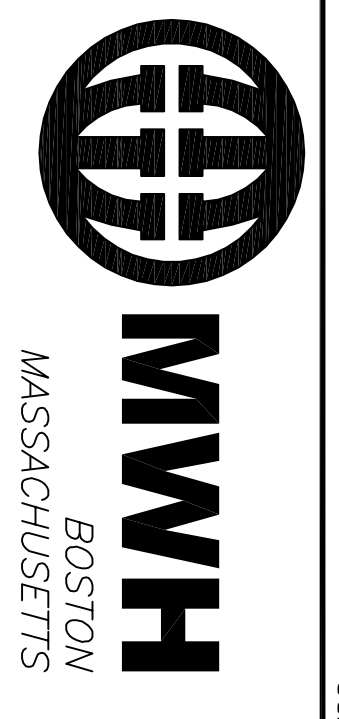


COMBINED SEWER MANHOLE REPLACEMENT - PLAN
SCALE: 1" = 5'

- NOTES:**
1. PRIOR TO EXCAVATION, APPLY #3 THICK, 4' LONG FIBERGLASS-REINFORCED CEMENT LINER (ALUMINALINER, OR EQUAL). 3' TO REMAIN WITHIN EXIST BRICK CONDUIT AFTER SAW-CUT. 1' TO BE WASTED BY INSTALLATION OF PROPOSED PIPE.
 2. DISTURBANCES TO ROADWAY PAVEMENT SHALL BE RESTORED PER PERMANENT PAVEMENT TRENCH DETAIL AND SPECIFICATIONS.
 3. EXISTING EXXON CONDUIT IN THE CAM 001 AREA IS NOW USED BY ONE COMMUNICATIONS AS A FIBER OPTICS CABLE CONDUIT. IT SHOULD BE PROTECTED AND SUPPORTED AS NECESSARY DURING CONSTRUCTION. IF IT IS DAMAGED TAKE PROPER PRECAUTIONS WITH RESPECT TO RESIDUAL PETROLEUM VAPORS THAT MAY STILL EXIST. COORDINATE WITH ONE COMMUNICATIONS WITH COMMUNICATIONS BELOW.
 5. WALL STREET BURLINGTON, MA 01803 T: 781-362-5700

ISSUED FOR BID

SEA CONSULTANTS INC.
Sustainable Infrastructure
CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE
ROCKY HILL, CONNECTICUT AUGUSTA, MAINE
FRAMINGHAM, MASSACHUSETTS

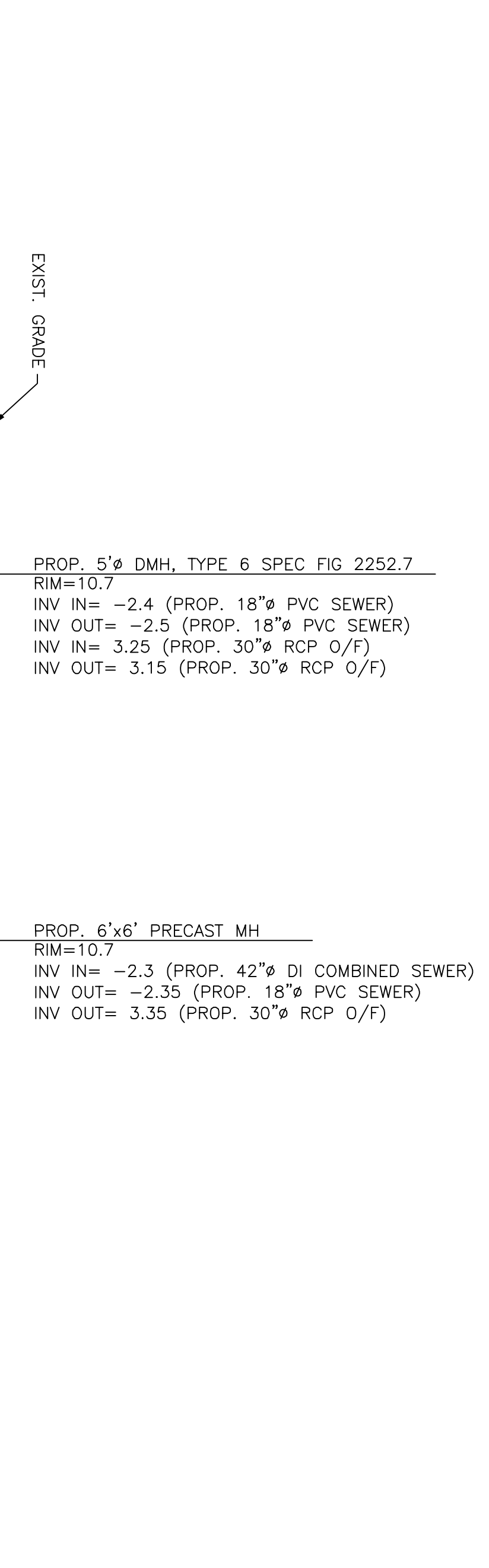


Scale	1"=5'
Date	NOVEMBER 19, 2009
Job No.	1006250
Designed by	MAW
Drawn by	MAW
Checked by	DHC
Approved by	WCP
Description	REVISIONS
Date	

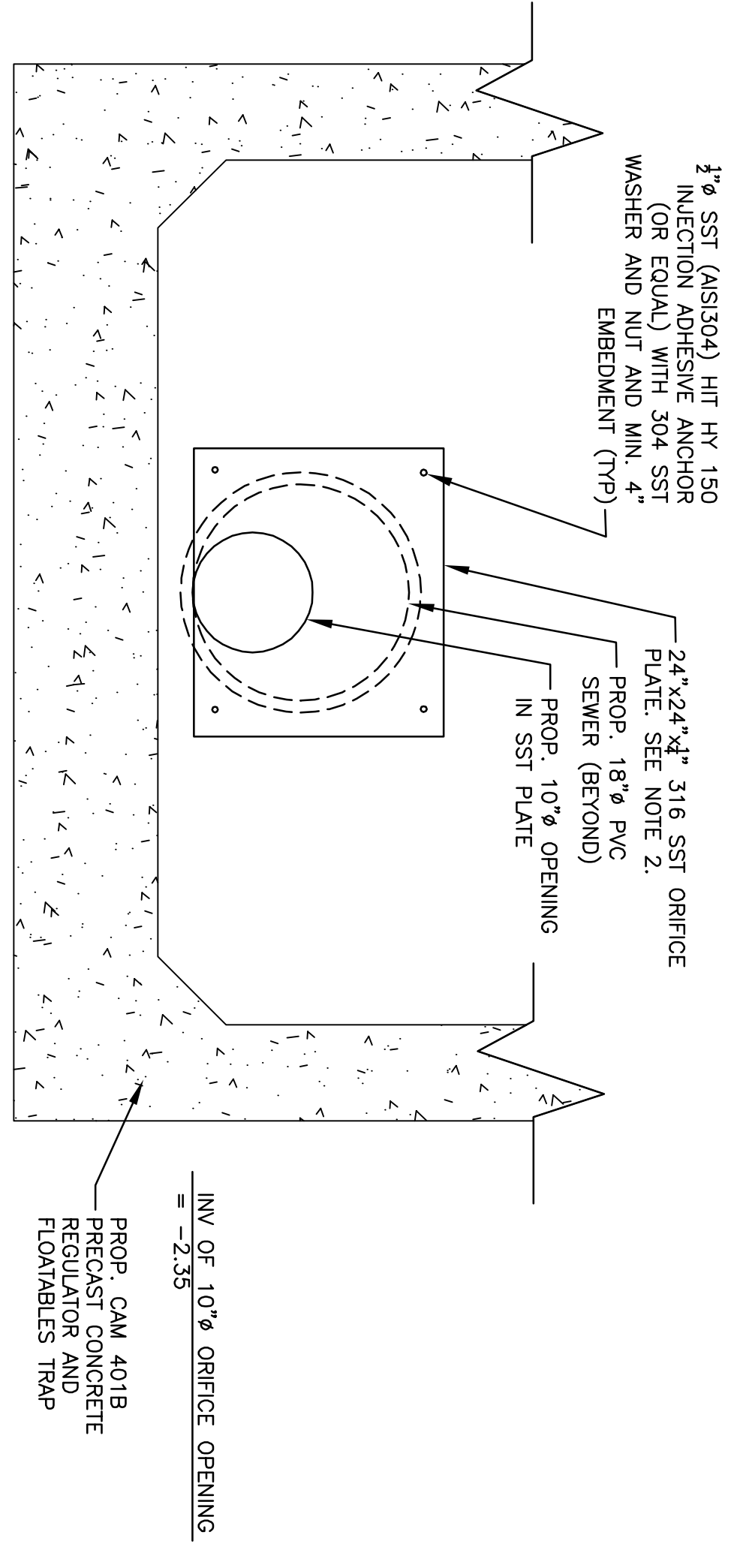


CITY OF CAMBRIDGE, MA
ALEWIFE BROOK FLOATABLES CONTROL (CONTRACT 4) AND
CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13)
CAM 001 FLOATABLES CONTROL & MAGOUN ST & MASS AVE
PLAN

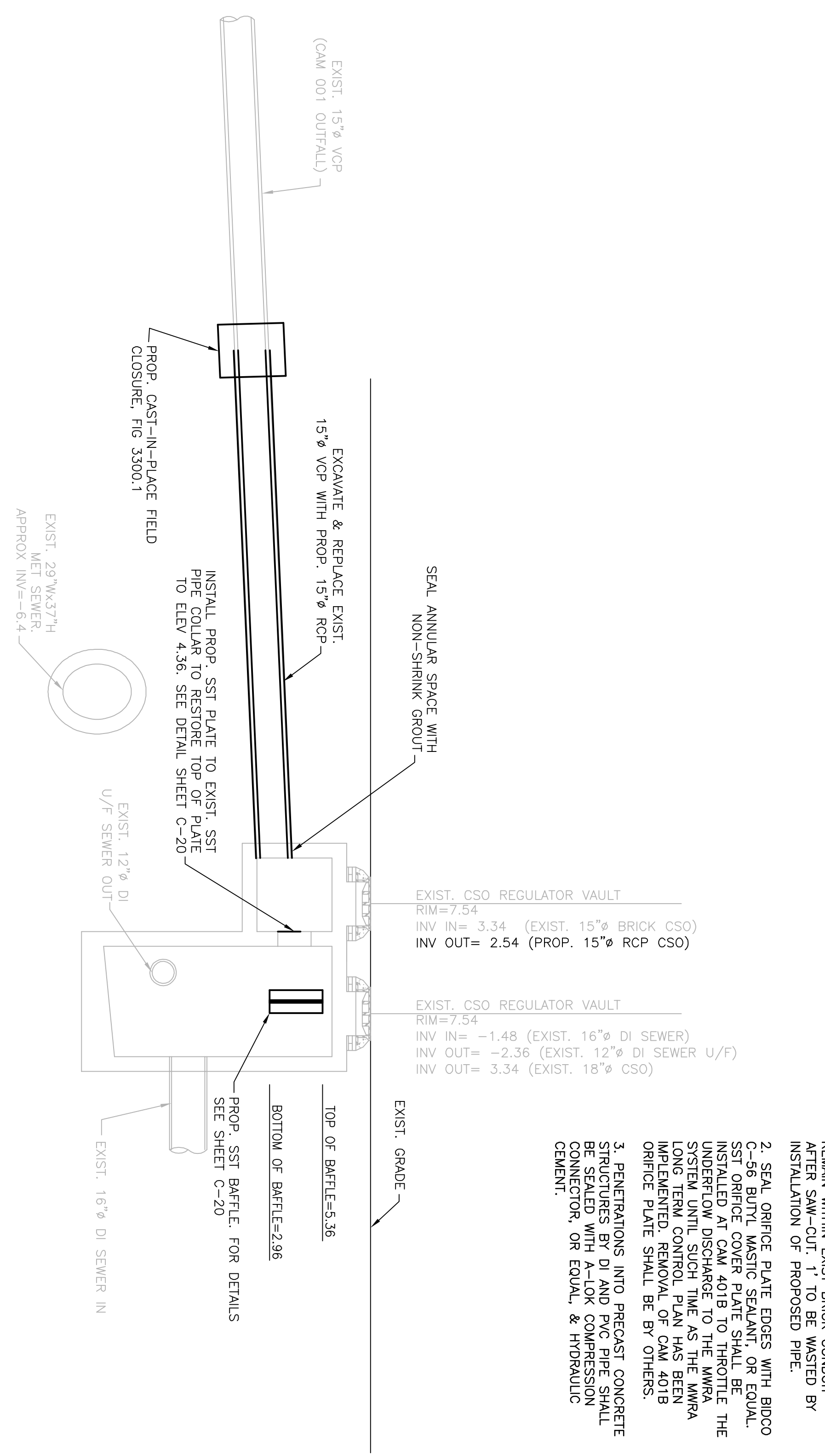
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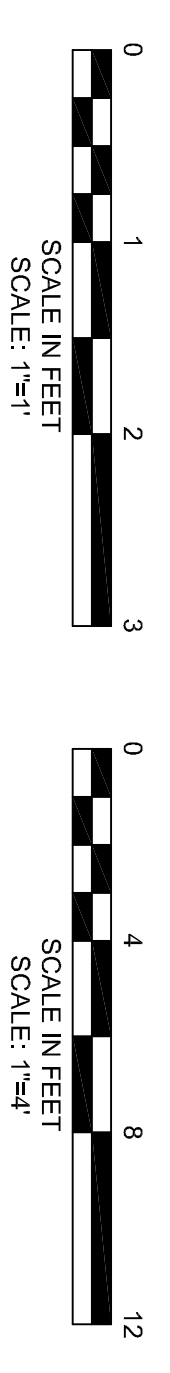
SECTION E
SCALE: 1" = 4'-15"



CAM 401B ORIFICE PLATE DETAIL
SCALE: 1" = 1"



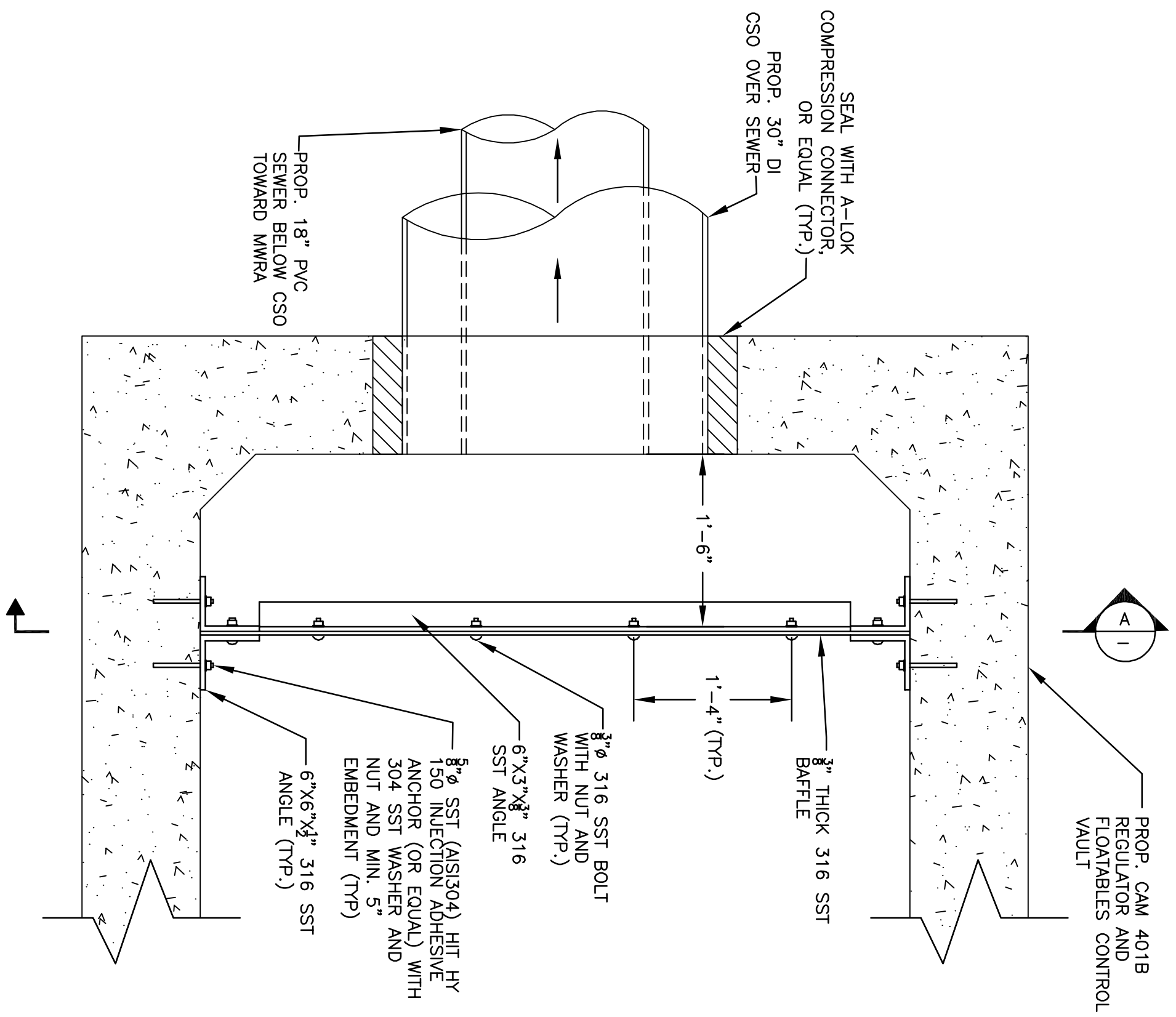
SECTION F
SCALE: 1" = 4'-16"



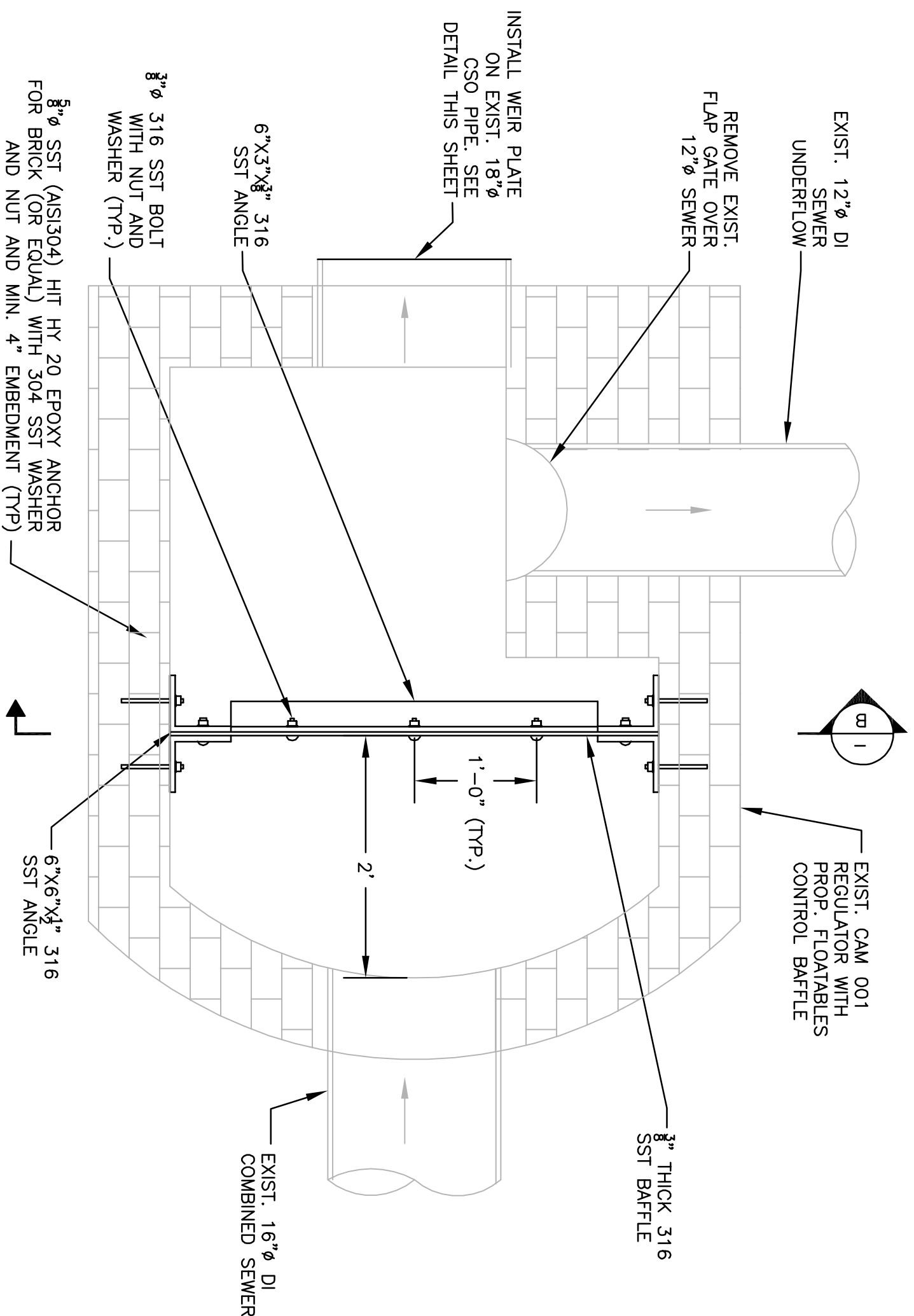
- NOTES:**
1. PRIOR TO EXCAVATION, APPLY 3" THICK, 4' LONG FIBERGLASS-REINFORCED CEMENT LINER (ALUMINUM LINER, OR EQUAL). 3" TO REMAIN WITHIN EXIST BRICK CONDUIT AFTER SAW-CUT; 1" TO BE WASTED BY INSTALLATION OF PROPOSED PIPE.
 2. SEAL ORIFICE PLATE EDGES WITH BIDCO C-56 BUTYL MASTIC SEALANT, OR EQUAL. SST ORIFICE COVER PLATE SHALL BE INSTALLED AT CAM 401B TO THROTTLE THE UNDERFLOW DISCHARGE TO THE MWA SYSTEM UNTIL SUCH TIME AS THE MWA LONG TERM CONTROL PLAN HAS BEEN IMPLEMENTED. REMOVAL OF CAM 401B ORIFICE PLATE SHALL BE BY OTHERS.
 3. PENETRATIONS INTO PRECAST CONCRETE STRUCTURES BY DI AND PVC PIPE SHALL BE SEALED WITH A-10K COMPRESSION CONNECTOR, OR EQUAL, & HYDRAULIC CEMENT.

ISSUED FOR BID

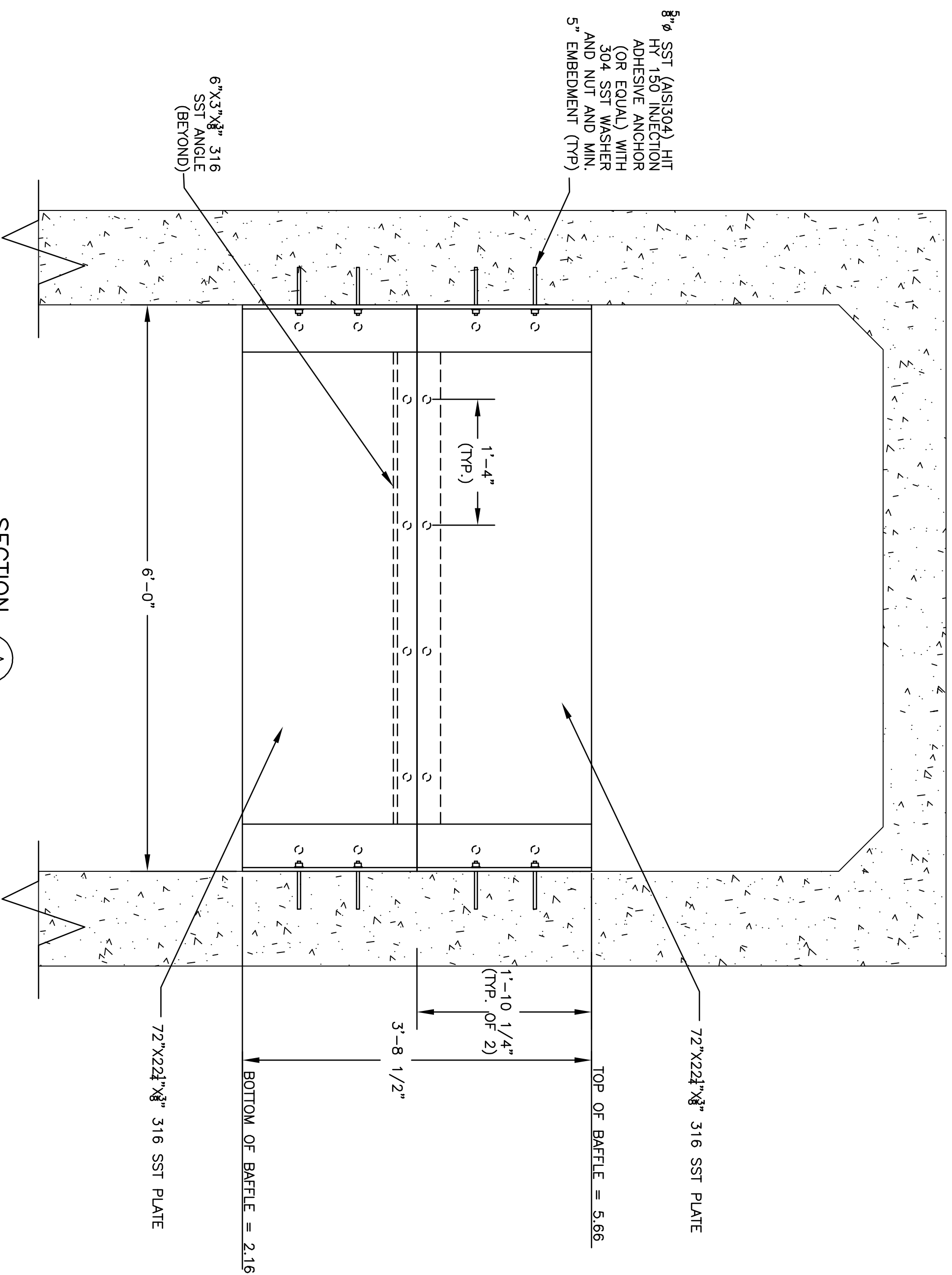
 SEA CONSULTANTS INC. Schematic Design/Architect CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE ROCKY HILL, CONNECTICUT AUGUSTA, MAINE FRAMINGHAM, MASSACHUSETTS	 MWH BOSTON MASSACHUSETTS	Scale	1"=4'
		Date	NOVEMBER 19, 2009
		Job No.	1006250
		Designed by	MAW
		Drawn by	MAW
		Checked by	DHC
		Approved by	WCP
		Description	REVISIONS
		No.	
		Date	
CITY OF CAMBRIDGE, MA ALEWIFE BROOK FLOATABLES CONTROL (CONTRACT 4) AND CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13) CAM 001 & CAM 401B FLOATABLES CONTROL SECTIONS		Sheet No.	C-18
		File No.	



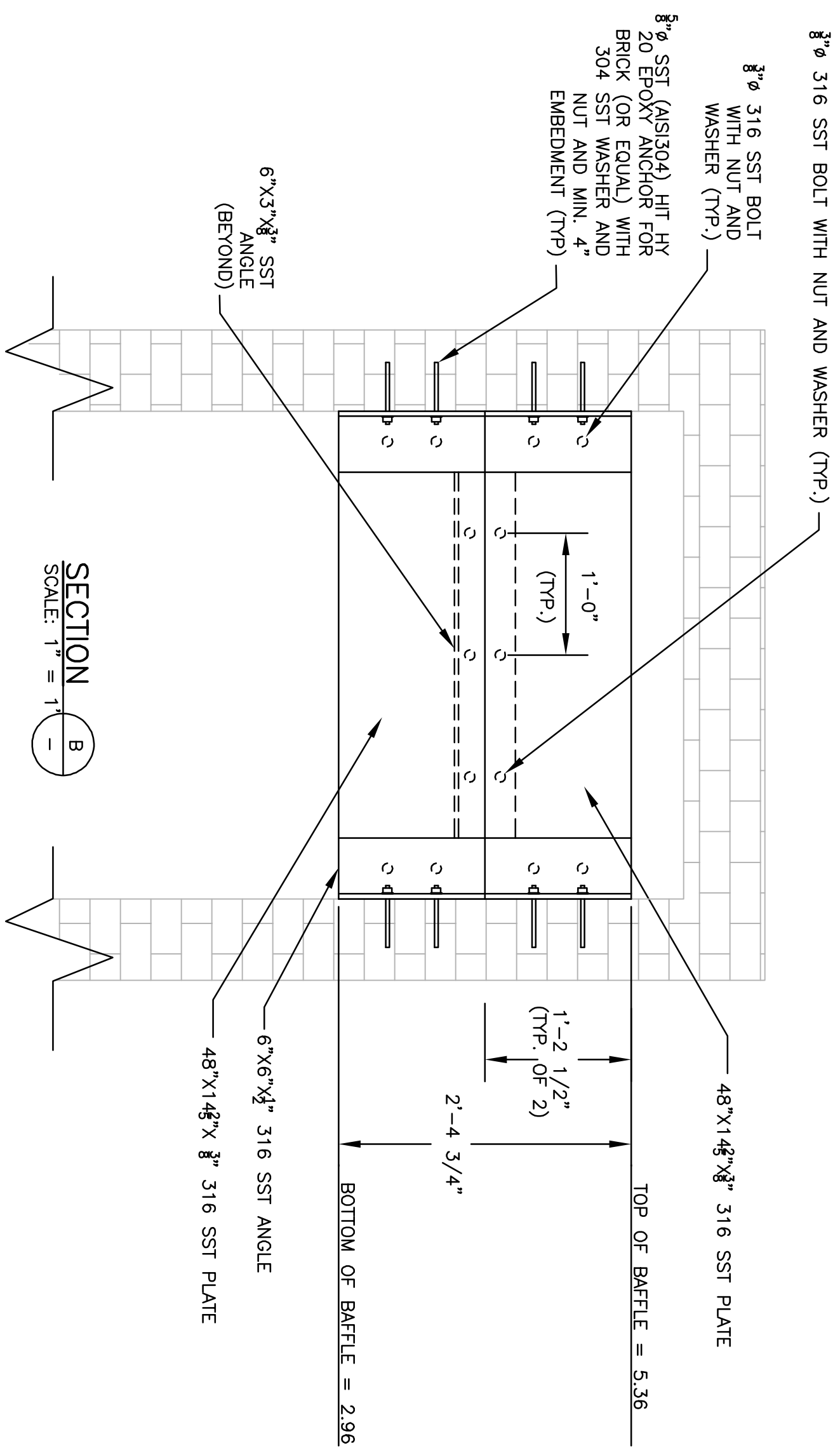
CAM 401B FLOATABLES BAFFLE-PLAN
SCALE: 1" = 1'



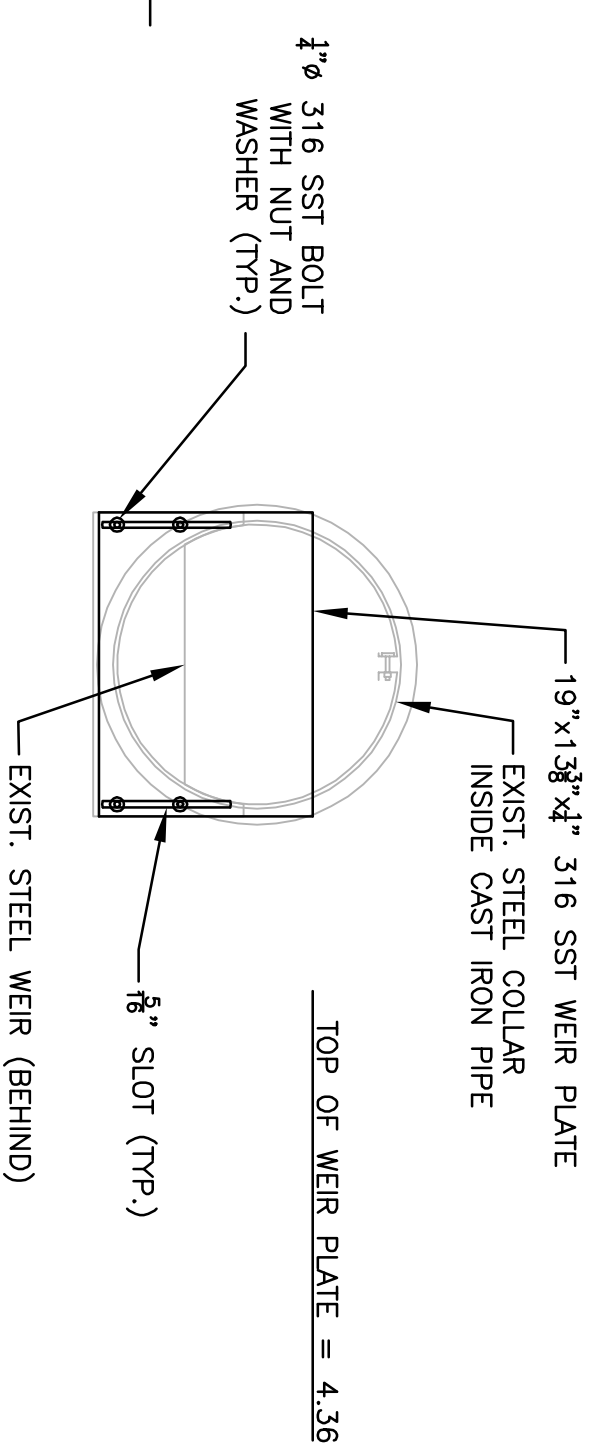
CAM 001 FLOATABLES BAFFLE-PLAN
SCALE: 1" = 1'



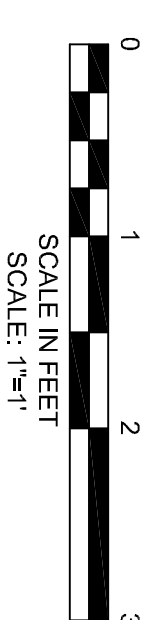
SECTION A
SCALE: 1" = 1'



SECTION B
SCALE: 1" = 1'



CAM 001 WEIR PLATE DETAIL
SCALE: 1" = 1'



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BID

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Sustainable Infrastructure
CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE
ROCKY HILL, CONNECTICUT AUGUSTA, MAINE
FRAMINGHAM, MASSACHUSETTS

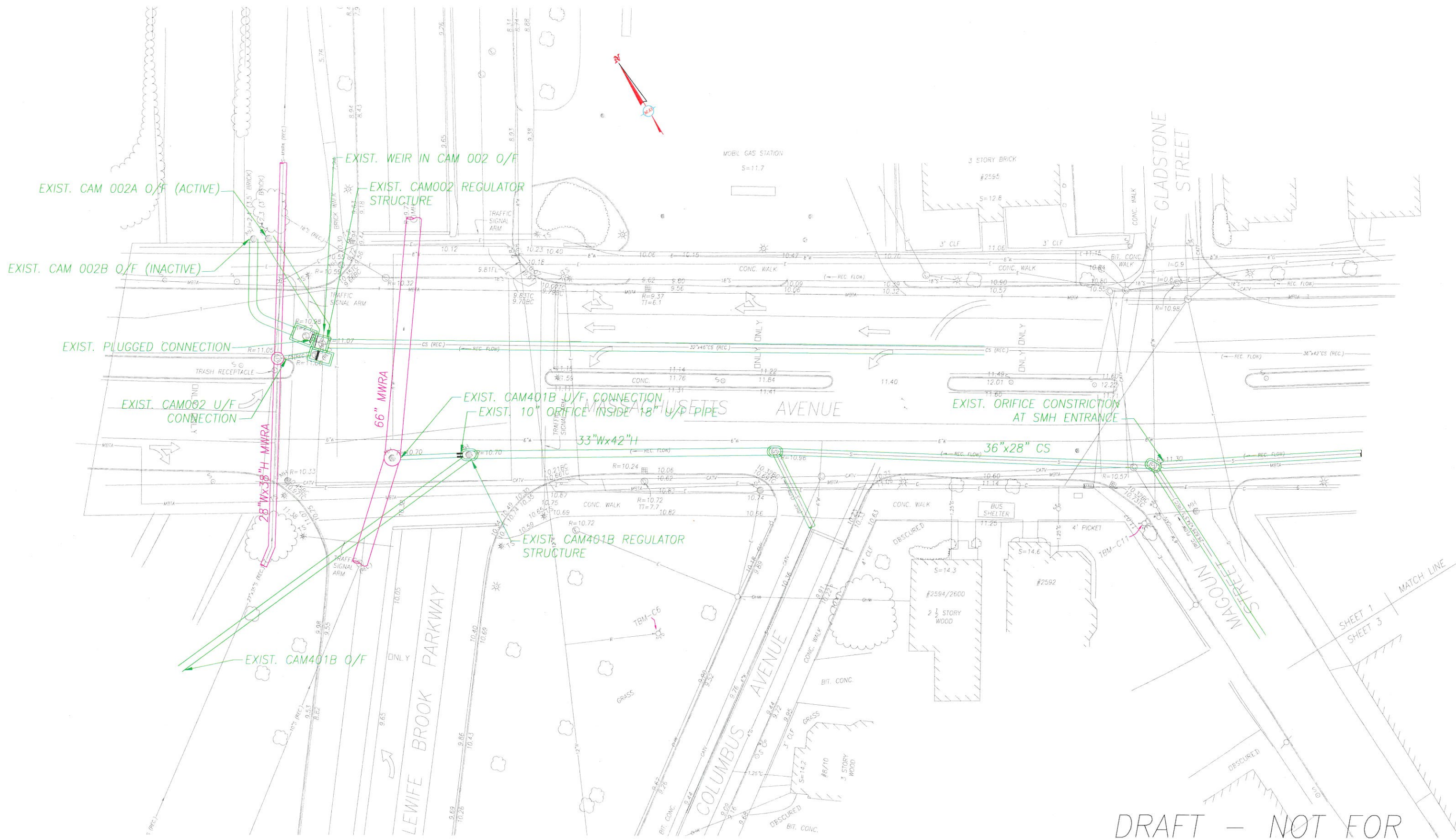
MWH
BOSTON
MASSACHUSETTS

Scale	NOTED
Date	NOVEMBER 19, 2009
Job No.	1006250
Designed by	MAW
Drawn by	MAW
Checked by	DHC
Approved by	WCP

THE WORLD'S
CAMBRIDGE
DEPARTMENT
OF PUBLIC
WORKS

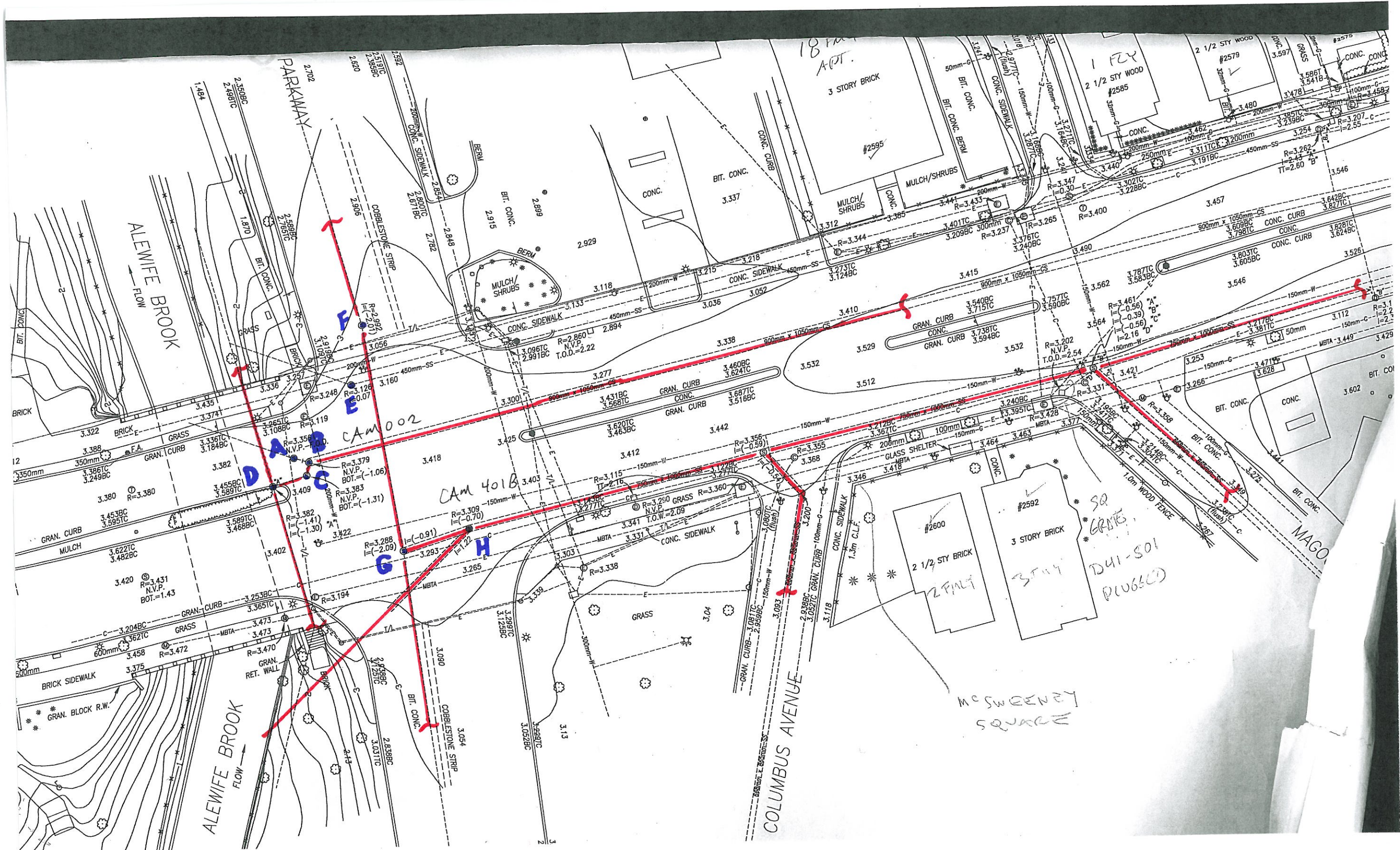
Description	Revisions	Date
CITY OF CAMBRIDGE, MA		
ALEWISSE BROOK FLOATABLES CONTROL (CONTRACT 4) AND		
CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13)		
CAM 401B FLOATABLES CONTROL		
BAFFLE DETAILS		
Sheet No.	C-20	
File No.		

CAM 002A / 002B



EXISTING CONDITIONS PLAN

DRAFT — NOT FOR CONSTRUCTION

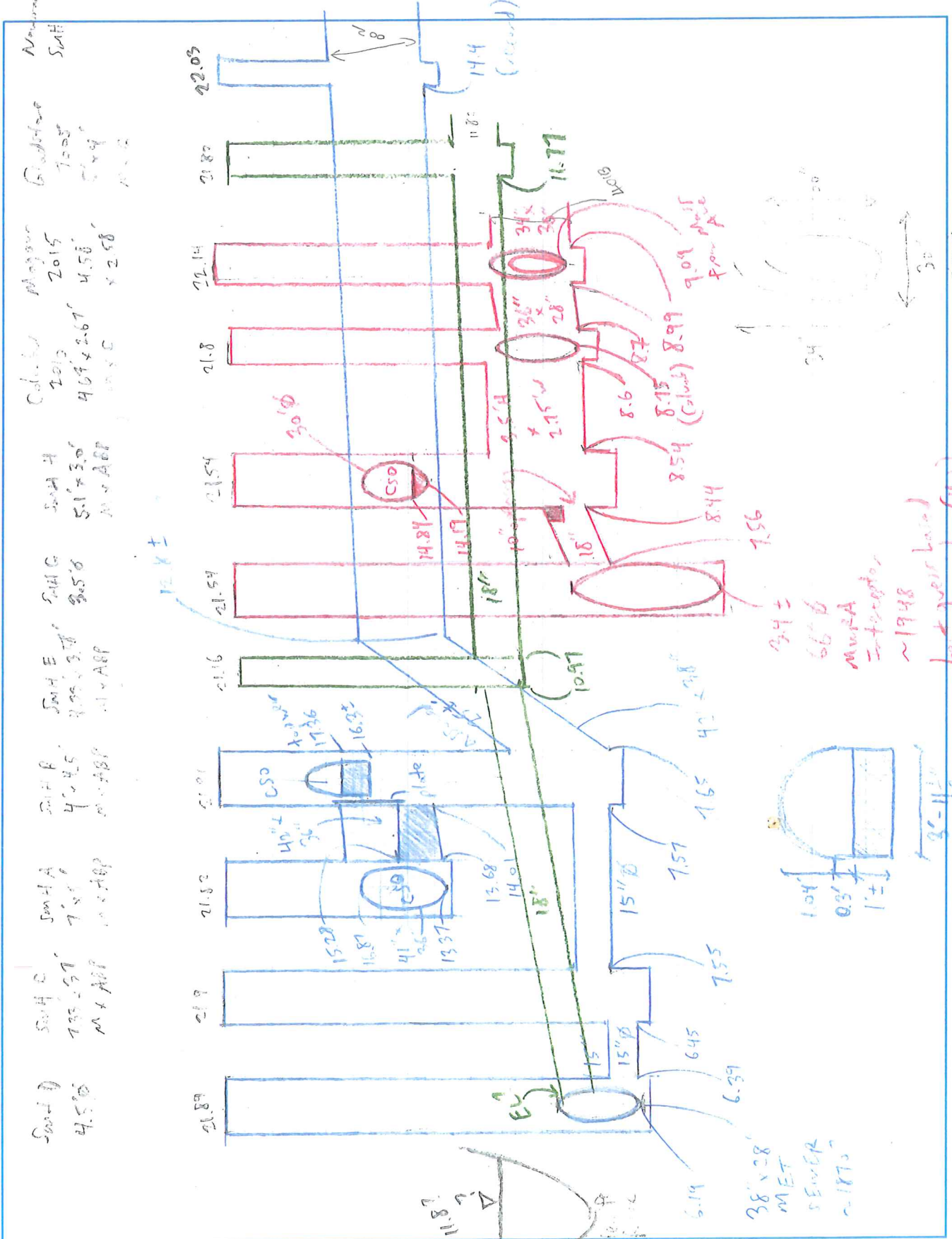


Summary of Field Findings

Jan-Feb 2009



By _____ Date _____ Client _____ Sheet _____ of _____
 Chkd. By _____ Description **CAM 4DIB, CAM 002A/B** Job No. _____



Contract 4
 CCB domain

Serial	Serial A	Serial B	Serial E	Serial G	Serial H	Calculator	Magnum	Graduate	Maximum
4.5.10	7.5.8	4.5.5	8.5.5	9.5.6	5.1 x 3.0	2013	2015	7.0.3	South
M x ABP	M x ABP	M x ABP	M x ABP	M x ABP	5.1 x 3.0	469 x 2.67	4.58	4.58	
					M x ABP		x 2.58		

Minimum restriction

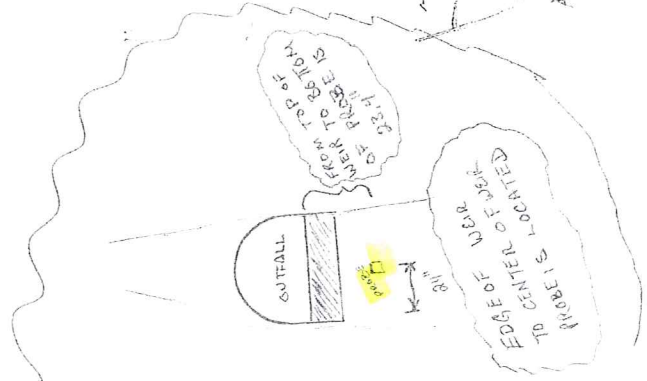
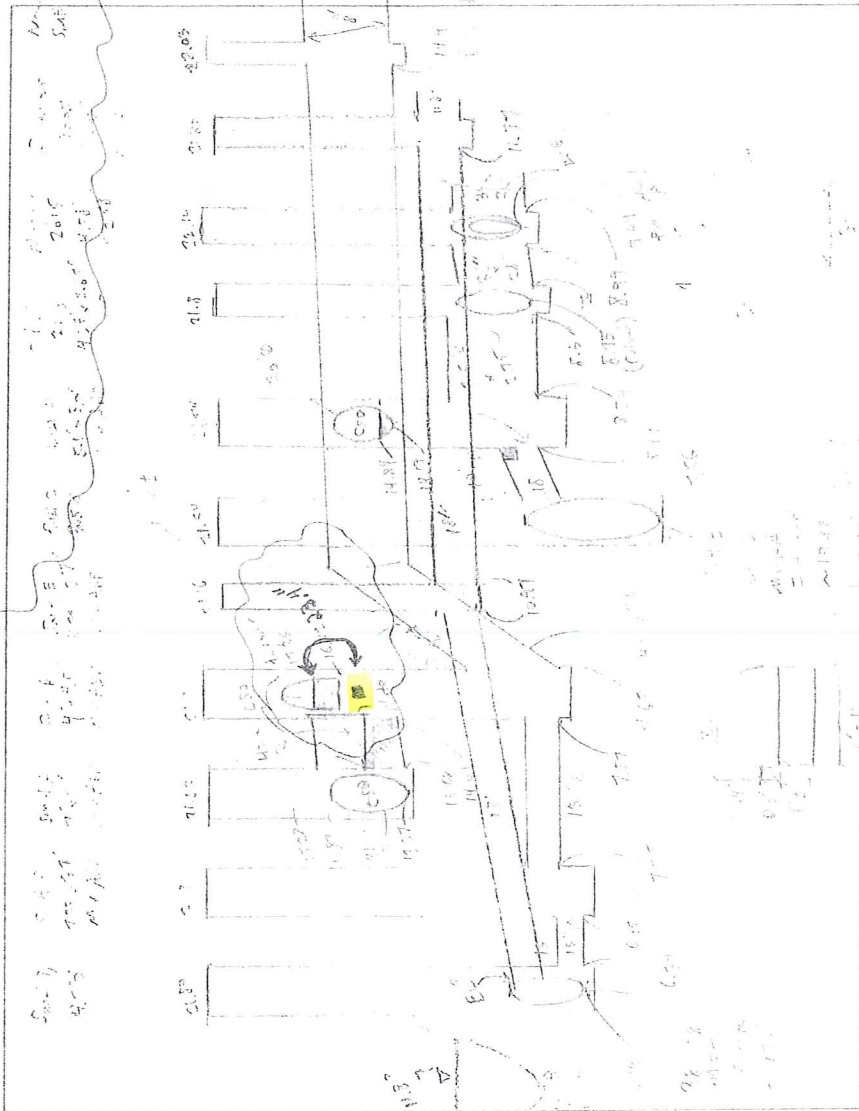
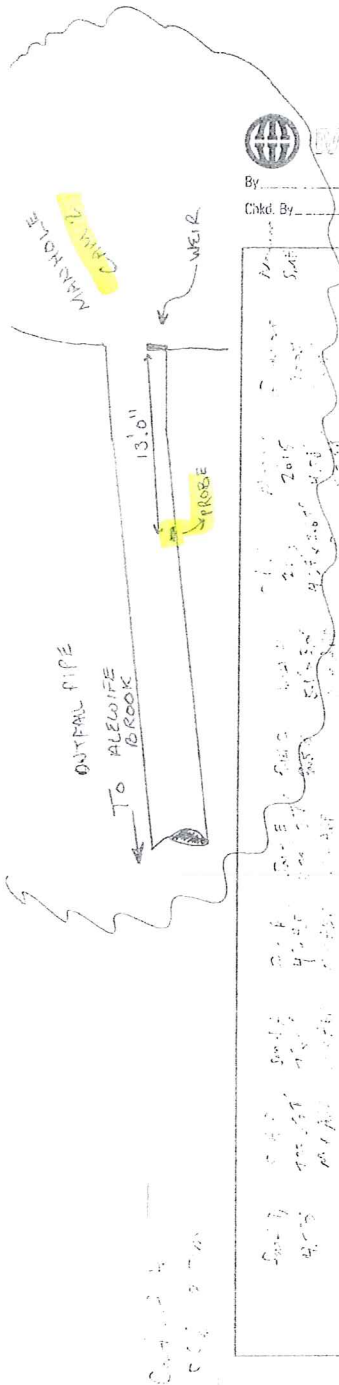
3.4 ±
 66 ±
 MURA
 Interceptor
 ~1948
 but never laid
 or design day (41)
 & averaged number

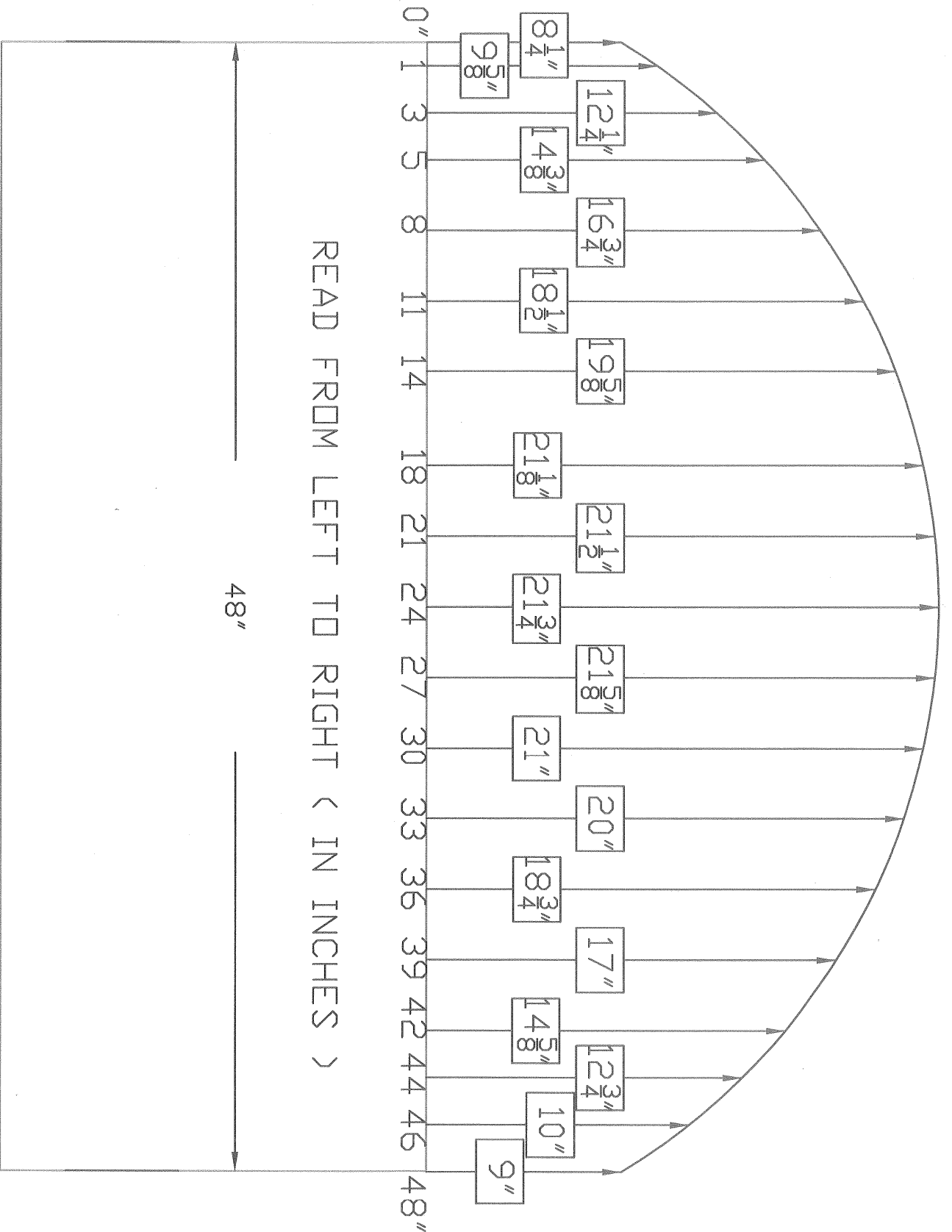
CS-6.6

Summary of Field Findings Jan-Feb 2009



By _____ Date _____ Client _____ Street _____ of _____
 Contd. By _____ Description CAH 4D10, CAH1002A/D No. 10

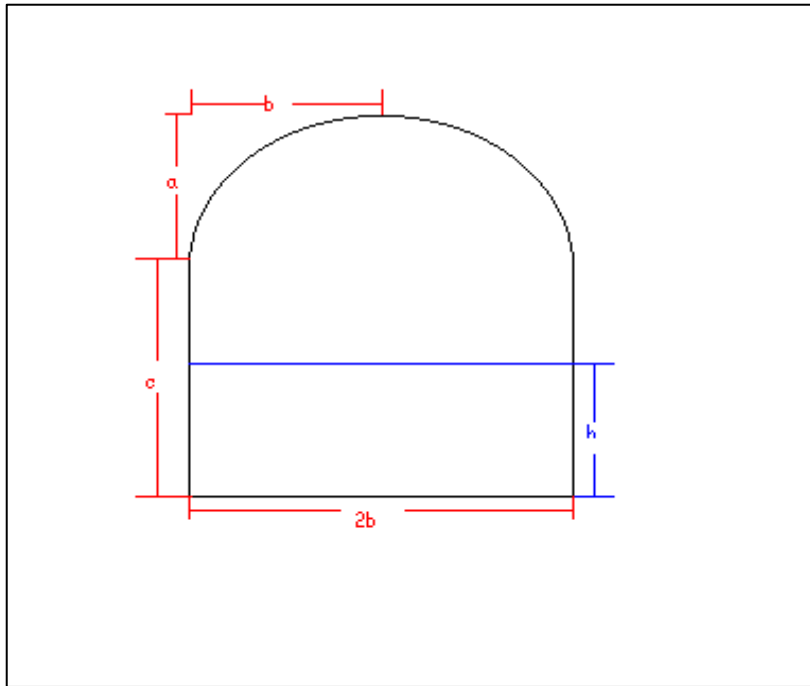




OUTFLOW

#2

DRAWING NOT TO SCALE



Note: All dimension required are in inches.
Area is returned in square inches.

b = Half width of Archway
 a = Height of round part of archway
 c = Height of straight wall portion of archway

h = Height of water
Area= Area of water in archway.

a	b	c
13.125	24	8.625

h	Area
2	96



CAM 002A Overflow (with partial weir blockage)



CAM 002A Overflow with weir



CAM 002A Overflow



CAM 002 Inlet

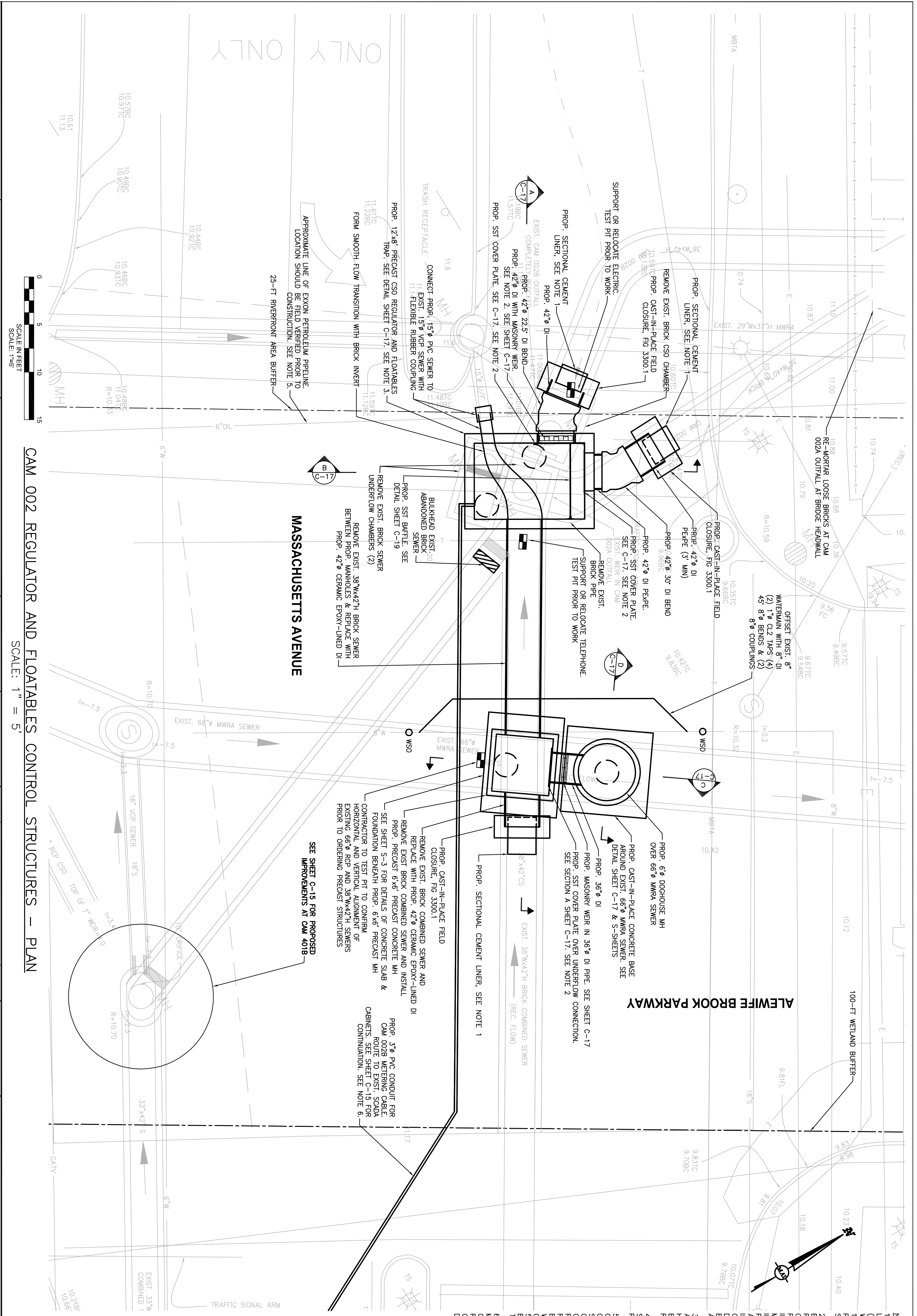


CAM 002 Underflow Outlet



CAM 002B Plugged Overflow





NOTES:

1. PRIOR TO EXCAVATION, APPLY 3" THICK, 4' LONG FIBERGLASS-REINFORCED CEMENT LINER (ALUMINUM LINER, OR EQUAL). 3' TO REMAIN WITHIN EXIST BRICK CHAMBER AFTER SAW-CUT.
1. TO BE WASTED BY INSTALLATION OF PROPOSED PIPE. CAM 002B IS EXCEPTED SINCE SAW-CUTTING IS ASSUMED AVOIDABLE.
2. SEAL SST PLATE EDGES WITH BIDCO C-56 BUTYL MASTIC SEALANT, OR EQUAL. SST COVER PLATE SHALL BE INSTALLED AT CAM 002A TO CONTROL CSO SPILL ELEVATION. SST COVER PLATE AT CAM 002B SHALL BE INSTALLED TO INACTIVATE CAM 002B UNTIL SUCH TIME AS THE MWRA LONG TERM CONTROL PLAN HAS BEEN IMPLEMENTED. REMOVAL OF CAM 002B COVER PLATE SHALL BE BY OTHERS. SST COVER PLATE AT CAM 002 DIVERSION STRUCTURE SHALL BE INSTALLED AFTER COMPLETION OF CONSTRUCTION ACTIVITIES AT CAM 002 SO THAT DIVERSION STRUCTURES CAN BE UTILIZED FOR BRASSON DRAINAGE FLOW DURING WORK AT CAM 002 REGULATOR.
3. PRIOR TO ORDERING MATERIALS FOR WORK AT CAM 002, CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL ALIGNMENTS OF EXISTING CSO OUTFALLS FROM THE EXISTING REGULATOR TO ALEWIFE BROOK.
4. DISTURBANCES TO ROADWAY PAVEMENT SHALL BE RESTORED PER PERMANENT PAVEMENT TRENCH DETAIL AND SPECIFICATIONS.
5. CONDUIT NOW USED BY ONE COMMUNICATIONS AS A FIBER OPTICS CABLE CONDUIT. IT SHOULD BE PROTECTED AND SUPPORTED AS NECESSARY DURING CONSTRUCTION. IF IT IS DAMAGED DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE PROPER PRECAUTIONS WITH RESPECT TO RESIDUAL PETROLEUM VAPORS THAT MAY STILL EXIST. COORDINATE WITH ONE COMMUNICATIONS ONE COMMUNICATIONS.
5. WALL STREET BURLINGTON, MA 01803 T: 781-362-5700
6. TELEMETRY CONDUIT ALIGNMENT SHALL BE MINIMUM 2 FT DEEP AND CONCRETE ENCASED. CONTRACTOR TO VERIFY UTILITY CONFLICTS AND ROUTE FROM CAM 002 TO EXISTING SCADA CABINETS AS REQUIRED TO MINIMIZE DISRUPTION.

ISSUED FOR BID

CAM 002 REGULATOR AND FLOATABLES CONTROL STRUCTURES - PLAN
SCALE: 1" = 5'



SCALE: 1" = 5'

SEA CONSULTANTS INC.
Sustainable Infrastructure
CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE
ROCKY HILL, CONNECTICUT AUGUSTA, MAINE
FRAMINGHAM, MASSACHUSETTS

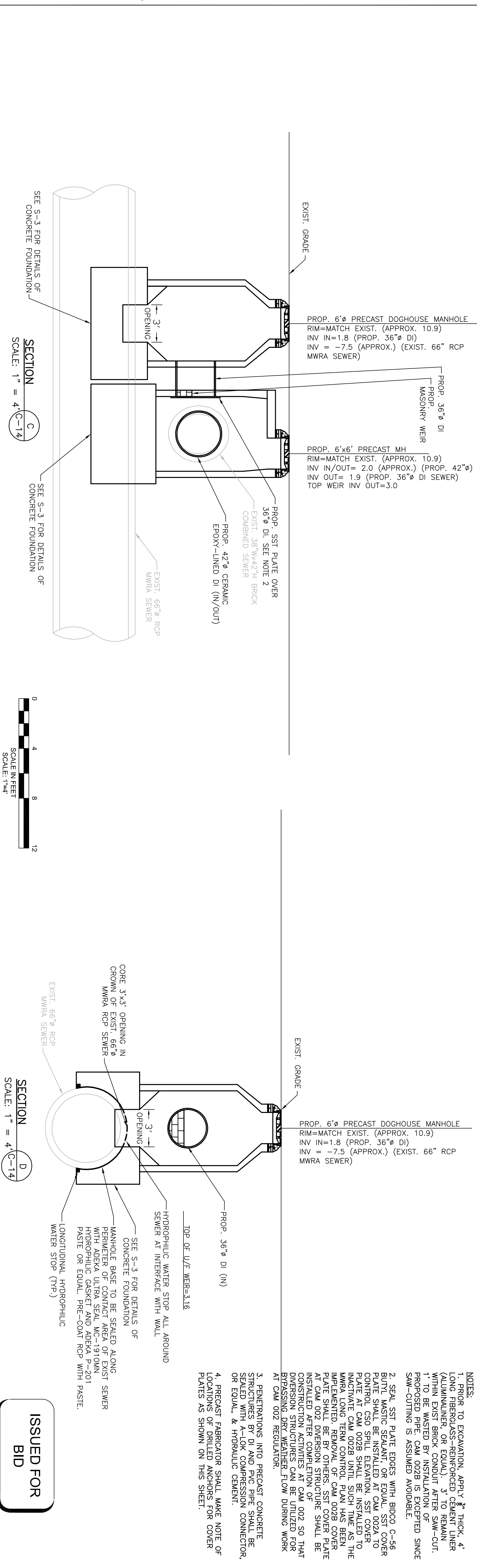
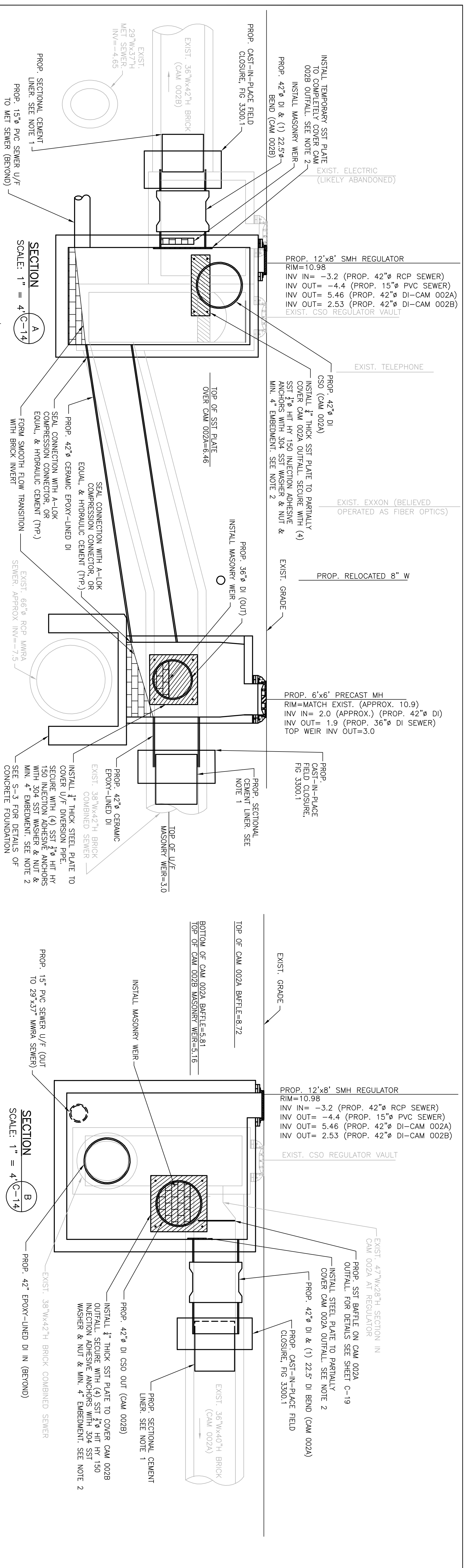


Scale	1"=5'
Date	NOVEMBER 19, 2009
Job No.	1006250
Designed by	MAW
Drawn by	MAW
Checked by	DHC
Approved by	WCP



CITY OF CAMBRIDGE, MA
ALEWIFE BROOK FLOATABLES CONTROL (CONTRACT 4) AND CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13)
CAM 002 REGULATOR & FLOATABLES CONTROL
PLAN

Sheet No. **C-14**
File No.



S E A

SEA CONSULTANTS INC.
Sustainable Infrastructure
CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE
ROCKY HILL, CONNECTICUT AUGUSTA, MAINE
FRAMINGHAM, MASSACHUSETTS

MWH

BOSTON
MASSACHUSETTS

Scale	1"=4'
Date	NOVEMBER 19, 2009
Job No.	1006250
Designed by	MAW
Drawn by	MAW
Checked by	DHC
Approved by	WCP

THE WORKS

CAMBRIDGE
OFFICE OF PUBLIC WORKS

CITY OF CAMBRIDGE, MA

ALEWIFE BROOK FLOATABLES CONTROL (CONTRACT 4) AND
CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13)

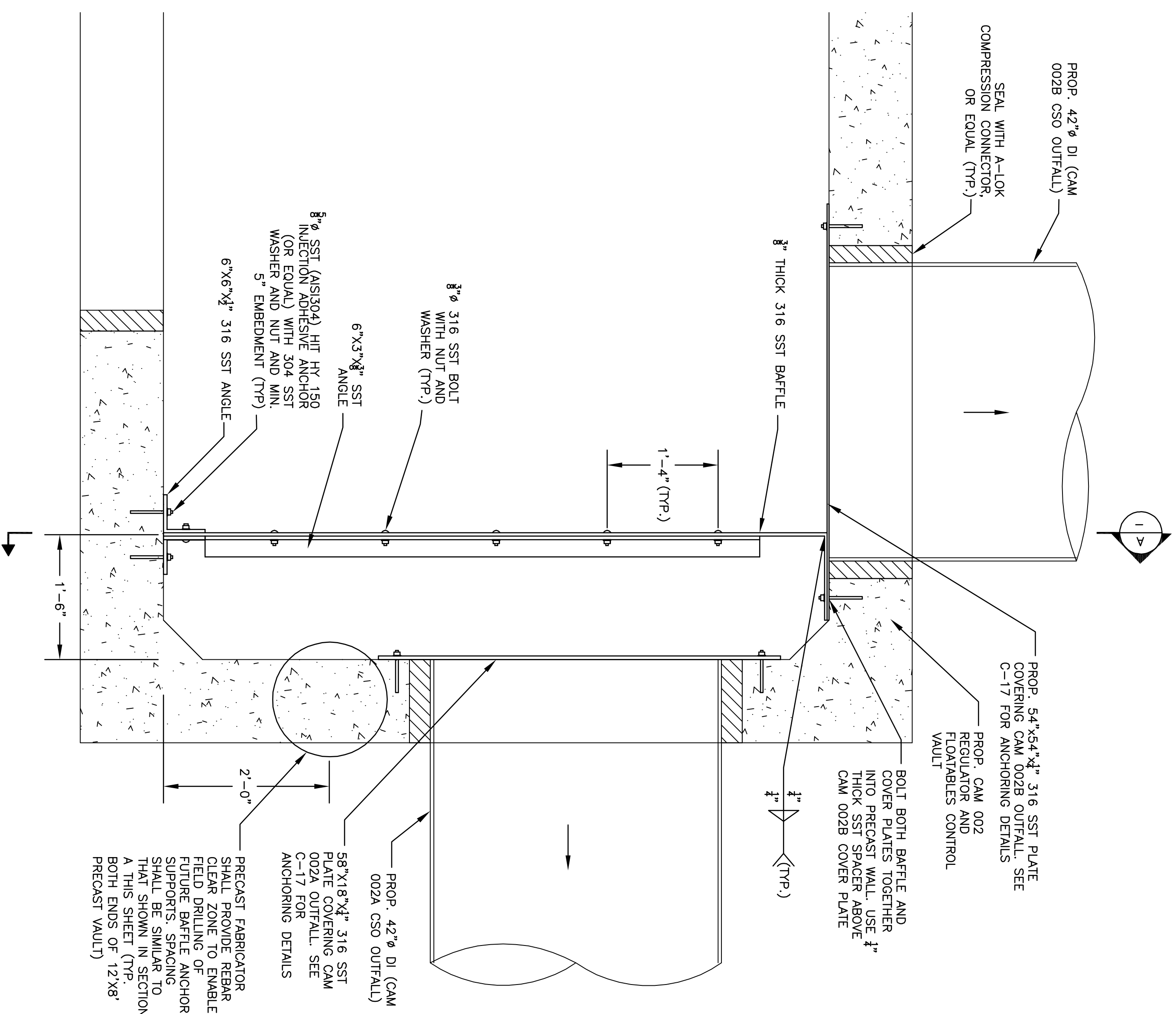
CAM 002 REGULATOR AND FLOATABLES CONTROL
SECTIONS

Sheet No. C-17

File No.

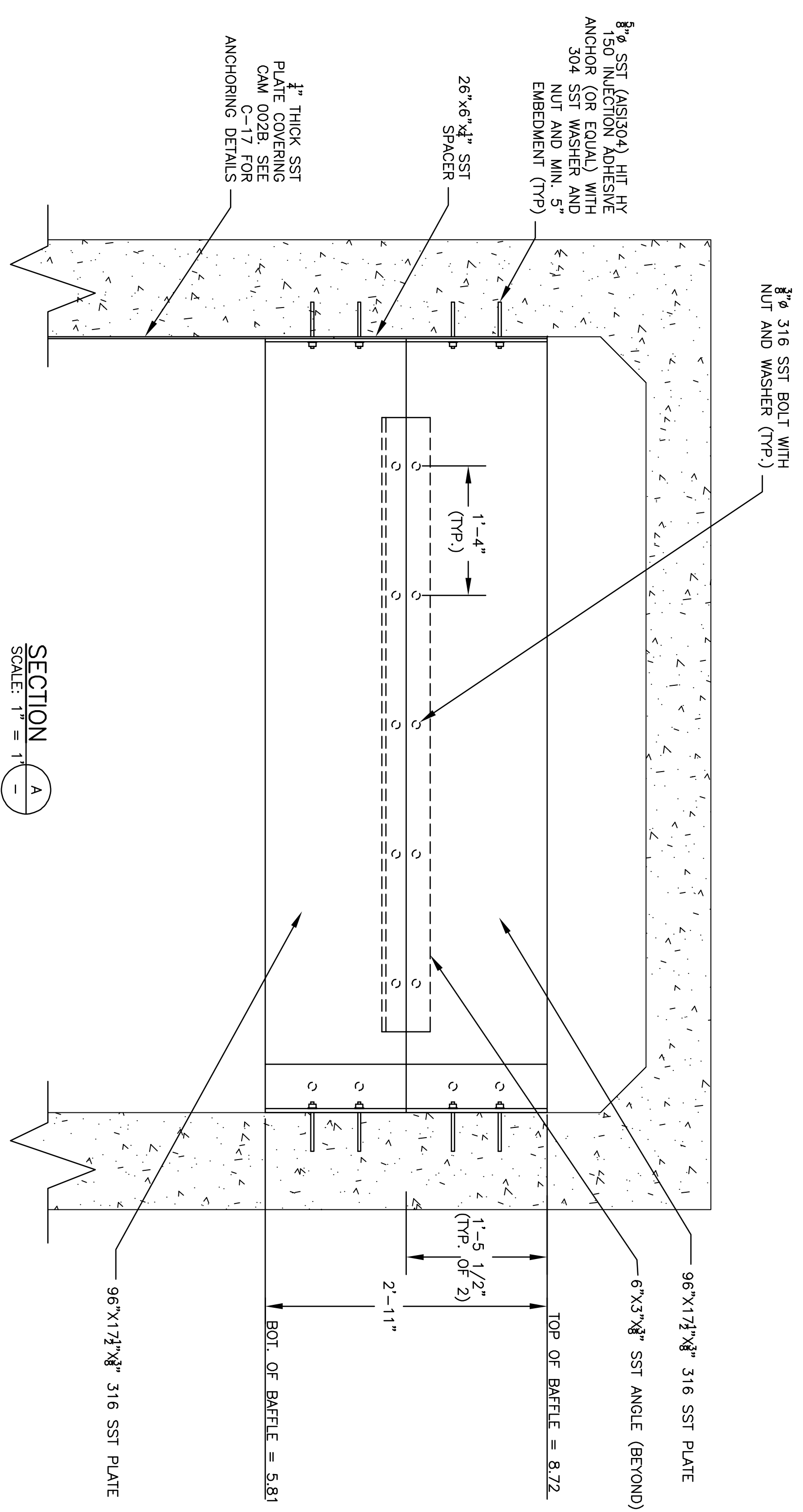
- NOTES:**
1. PRIOR TO EXCAVATION, APPLY 3/8" THICK, 4' LONG FIBERGLASS-REINFORCED CEMENT LINER (ALUMINUM LINER, OR EQUAL). 3 TO REMAIN WITHIN EXIST BRICK CONDUIT AFTER SAW-CUT. 1 TO BE WASTED BY INSTALLATION OF PROPOSED PIPE. CAM 002B IS EXCEPTED SINCE SAW-CUTTING IS ASSUMED AVOIDABLE.
 2. SEAL SST PLATE EDGES WITH BIDCOQ C-56 BUTYL MASTIC SEALANT, OR EQUAL. SST COVER PLATE SHALL BE INSTALLED ON CAM 002B CONTROL CSO. CSO SHALL BE INSTALLED TO INACTIVATE CAM 002B UNTIL SUCH TIME AS THE MWRA LONG TERM CONTROL PLAN HAS BEEN IMPLEMENTED. REMOVAL OF CAM 002B COVER PLATE SHALL BE BY OTHERS. SST COVER PLATE AT CAM 002 DIVERSION STRUCTURE SHALL BE INSTALLED AFTER COMPLETION OF CONSTRUCTION ACTIVITIES AT CAM 002 SO THAT DIVERSION STRUCTURES CAN BE UTILIZED FOR BYPASSING DRY WEATHER FLOW DURING WORK AT CAM 002 REGULATOR.
 3. PENETRATIONS INTO PRECAST CONCRETE STRUCTURES BY DI AND PVC PIPE SHALL BE SEALED WITH A-LOK COMPRESSION CONNECTOR, OR EQUAL, & HYDRAULIC CEMENT.
 4. PRECAST FABRICATOR SHALL MAKE NOTE OF LOCATIONS OF DRILLED ANCHORS FOR COVER PLATES AS SHOWN ON THIS SHEET.

ISSUED FOR
BID

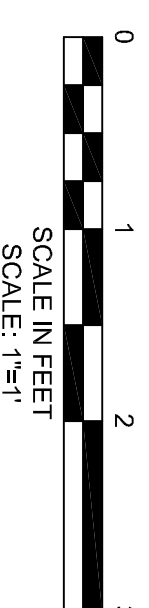


CAM 002 FLOATABLES BAFFLE DETAIL
SCALE: 1" = 1'

PRECAST FABRICATOR SHALL PROVIDE REBAR CLEAR ZONE TO ENABLE FIELD DRILLING OF FUTURE BAFFLE ANCHOR SUPPORTS. SPACING SHALL BE SIMILAR TO THAT SHOWN IN SECTION A THIS SHEET (TYP. BOTH ENDS OF 12'x8' PRECAST VAULT)



SECTION A
SCALE: 1" = 1'



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Sustainable Infrastructure
CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE
ROCKY HILL, CONNECTICUT AUGUSTA, MAINE
FRAMINGHAM, MASSACHUSETTS

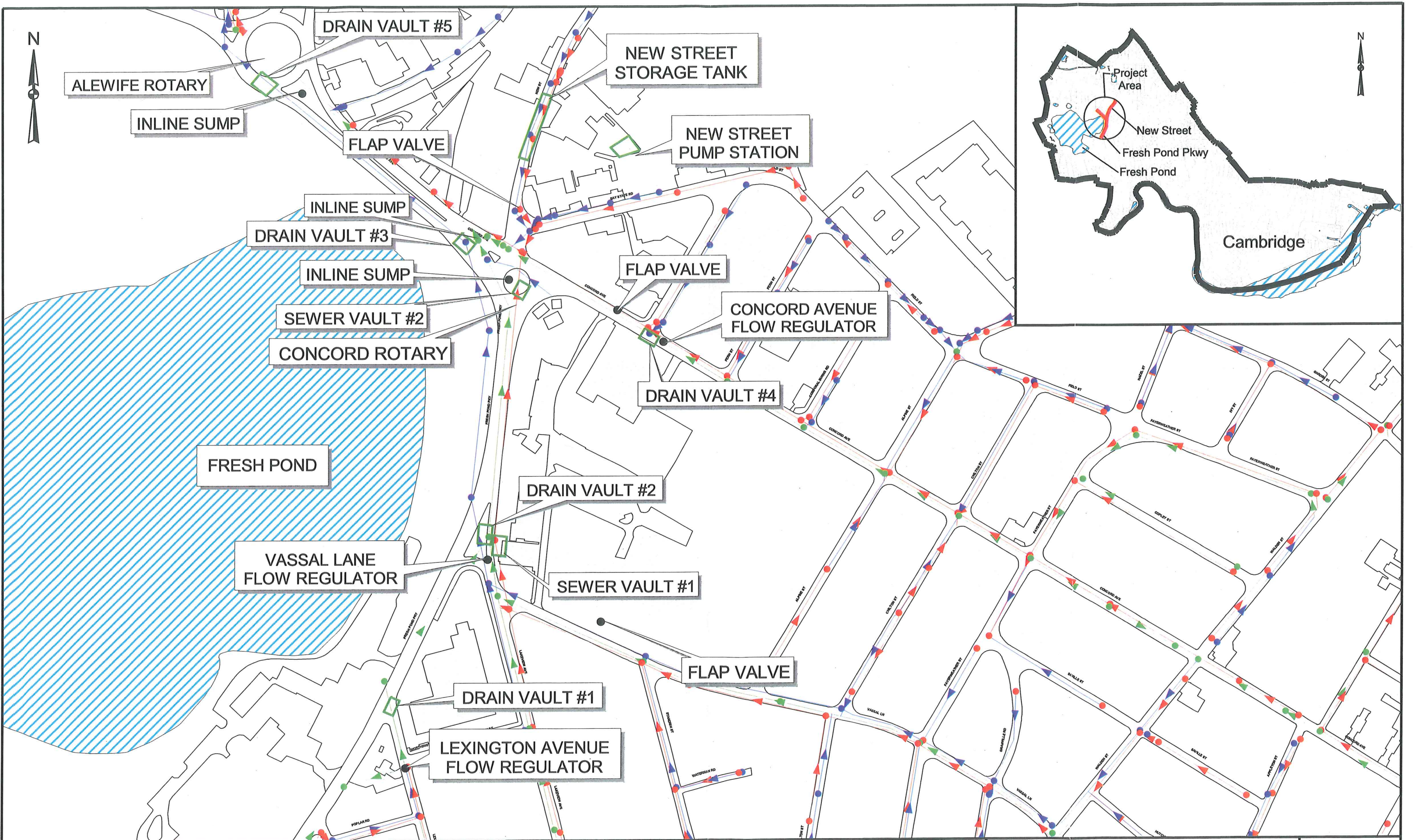
MWH
BOSTON
MASSACHUSETTS

Scale	NOTED
Date	NOVEMBER 19, 2009
Job No.	1006250
Designed by	MAW
Drawn by	MAW
Checked by	DHC
Approved by	WCP

THE WORKS
Cambridge
City of Public
Works

CITY OF CAMBRIDGE, MA	Sheet No.
ALEWIFE BROOK FLOATABLES CONTROL (CONTRACT 4) AND CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13)	File No.
CAM 002 FLOATABLES CONTROL BAFFLE DETAILS	C-19

CAM 004



ALEWIFE ROTARY

INLINE SUMP

DRAIN VAULT #5

NEW STREET STORAGE TANK

FLAP VALVE

NEW STREET PUMP STATION

INLINE SUMP

DRAIN VAULT #3

FLAP VALVE

CONCORD AVENUE FLOW REGULATOR

INLINE SUMP

SEWER VAULT #2

CONCORD ROTARY

DRAIN VAULT #4

FRESH POND

DRAIN VAULT #2

VASSAL LANE FLOW REGULATOR

SEWER VAULT #1

FLAP VALVE

DRAIN VAULT #1

LEXINGTON AVENUE FLOW REGULATOR



SEA Consultants Inc.
Scientists/Engineers/Architects



MWH
MONTGOMERY WATSON HARZA

SITE PLAN

O & M MANUAL
CONTRACT 2B FRESH POND PARKWAY

FIGURE NO.
1

P:\cam\2bnew_om.apr

LEGEND:

- TEST BORING (AUGUST 2000)
- MONITORING WELL (AUGUST 2000)
- TEST PIT (MARCH 2001)
- TEST BORING (MARCH 2001)
- TEST BORING (APRIL 2002)
- MONITORING WELL (AUGUST 2002)
- TEST BORING (JANUARY 2003)
- RCS-2** DEP REPORTABLE CONCENTRATION
- PAHs** POLYAROMATIC HYDROCARBONS
- MWRA** MASSACHUSETTS WATER RESOURCES AUTHORITY

OHM GENERAL NOTES:

- 1) INVESTIGATIONS COMPLETED DURING DESIGN INDICATE LEVELS OF CONTAMINANTS SUBJECT TO STATE ENVIRONMENTAL REGULATIONS AS SET FORTH IN 310 CMR 40.0000. THIS DRAWING INDICATES LOCATIONS WHERE SOIL HAS BEEN IDENTIFIED WITH CONTAMINANTS IN EXCESS OF DEP REPORTABLE CONCENTRATIONS (RCS-2). ENVIRONMENTAL CONDITIONS ARE PRESENTED FOR THE CONTRACTOR'S CONVENIENCE AND SHALL NOT BE RELIED ON AS COMPREHENSIVE. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE OIL AND HAZARDOUS MATERIALS REPORT AND VERIFYING ANALYTICAL LABORATORY RESULTS.
- 2) INITIAL GROUNDWATER TEST RESULTS INDICATE TOTAL METAL CONCENTRATIONS IN EXCESS OF MWRA DISCHARGE LIMITS. ALL GROUNDWATER DISCHARGED TO AN MWRA REGULATED COLLECTION SYSTEM IS SUBJECT TO THE MWRA ISSUED PERMIT CONDITIONS. ALL OTHER GROUNDWATER DISCHARGED IS SUBJECT TO EITHER DEP REGULATIONS OR NPDES REGULATIONS.
- 3) THE CONTRACTOR SHALL HANDLE ALL SOIL IN ACCORDANCE WITH SPECIFICATION SECTION 02080 SOIL AND FILL MANAGEMENT AND RELATED SECTIONS AS WELL AS ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
- 4) WELLS, BORINGS, AND TEST PIT LOCATIONS NOT TO SCALE. SOIL DATA AND SAMPLES WERE COLLECTED WITH A 2-INCH DIAMETER SPLIT SPOON.
- 5) SOILS ARE GENERALLY CONSISTENT WITH BACKGROUND CONDITIONS AS DEFINED IN 310 CMR 40. REFER TO OIL AND HAZARDOUS MATERIALS ASSESSMENT REPORT DATED AUGUST 13, 2001 FOR ANALYTICAL RESULTS.



SRE REVIEW
NOT FOR CONSTRUCTION
15-OCT-2004

SEA S E A Consultants Inc.
Science/Engineering/Architecture
CONCORD, NEW HAMPSHIRE ROCKY HILL, CONNECTICUT
CAMBRIDGE, MASSACHUSETTS

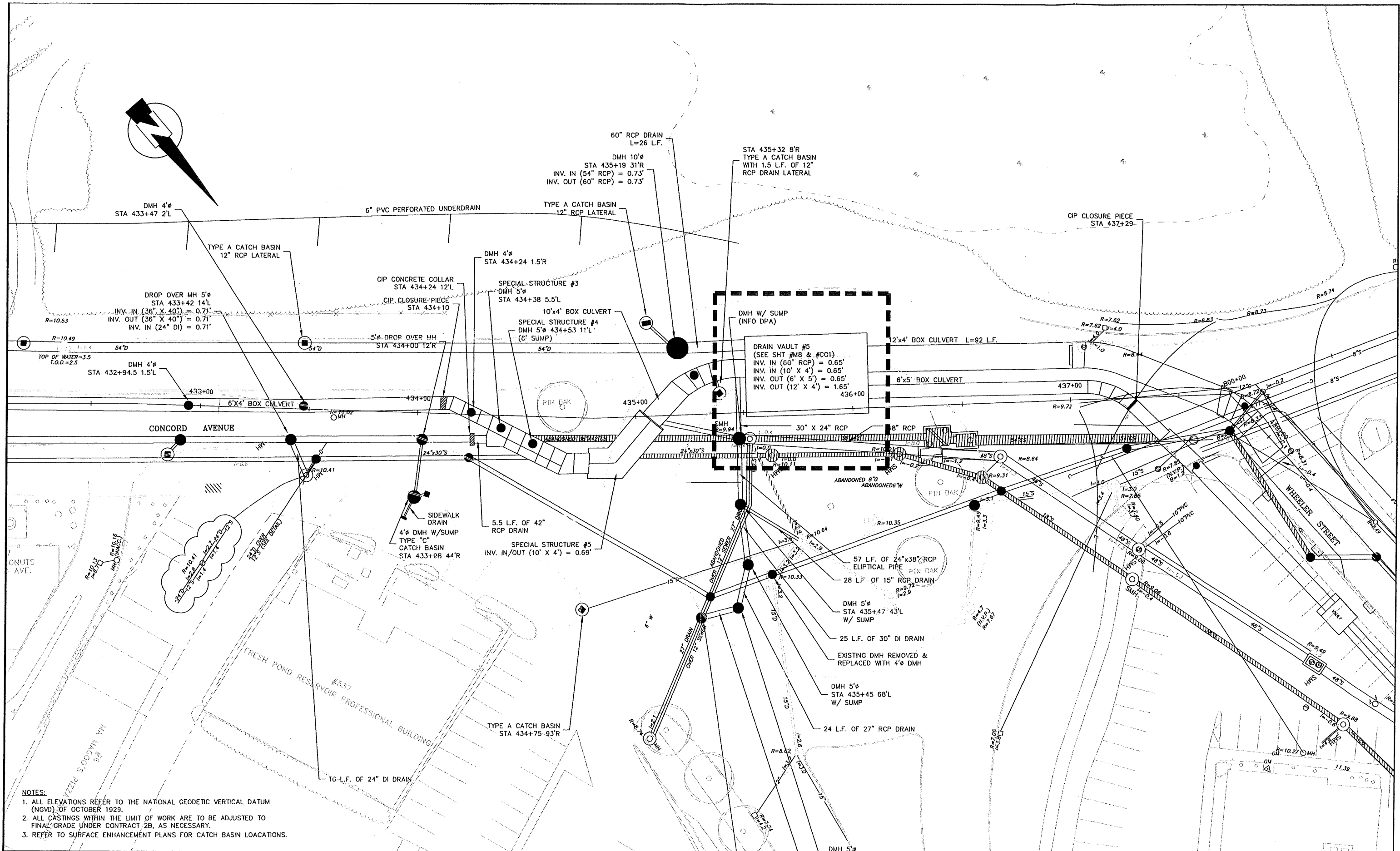


Scale	1" = 100'
Date	OCTOBER 2004
Job No.	1998400.12A
Designed by	MPF
Drawn by	NJE
Checked by	DPA
Approved by	VWS

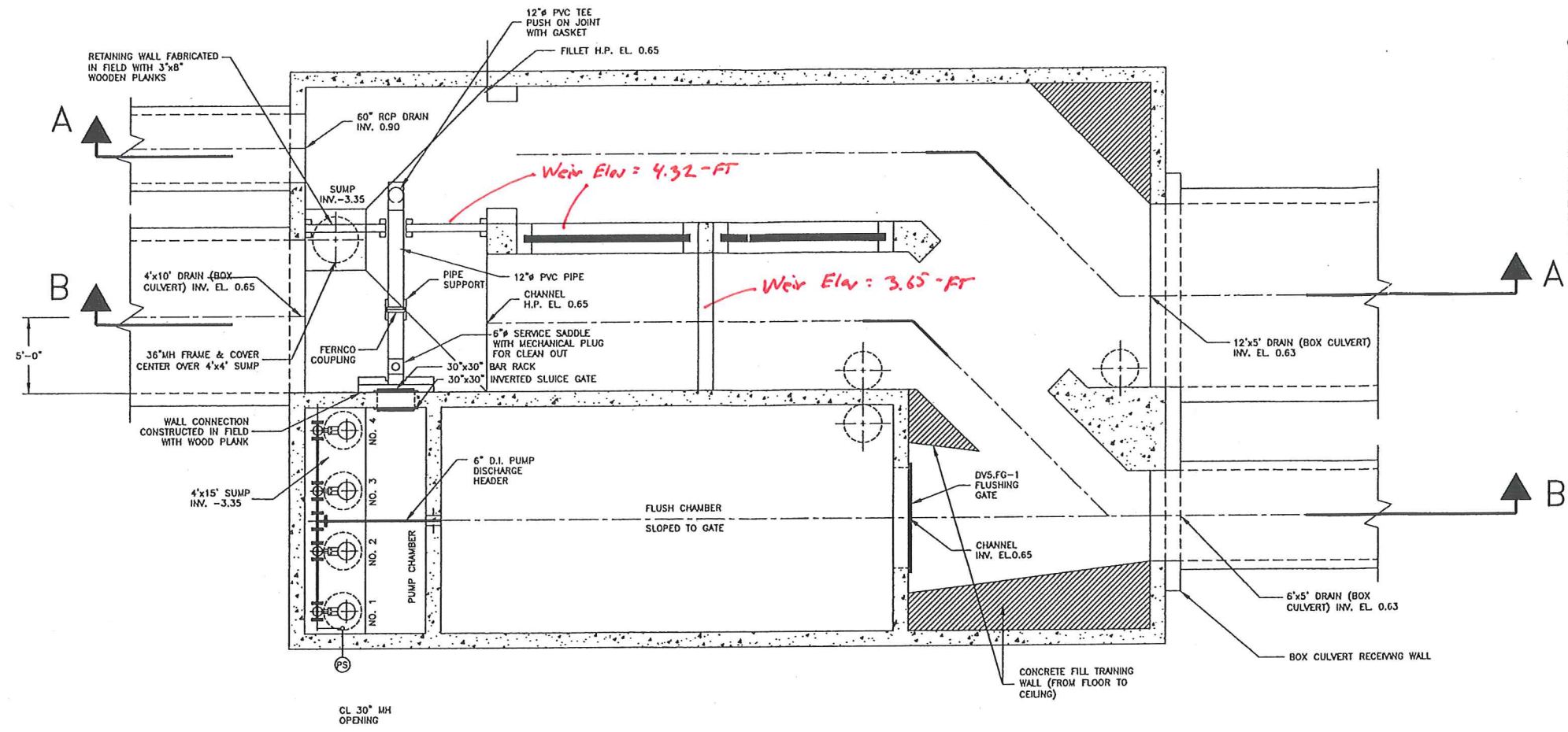


CITY OF CAMBRIDGE, MASSACHUSETTS
CAMBRIDGEPARK DRIVE AREA DRAINAGE IMPROVEMENTS
CONTRACT NO. 12
OHM PLAN WITH BORING LOCATIONS

Sheet No. **G-3**
File No.



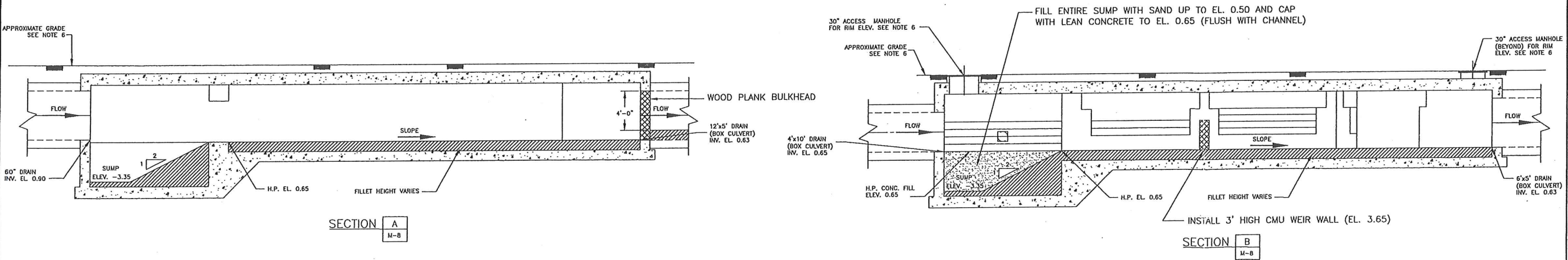
- NOTES:**
1. ALL ELEVATIONS REFER TO THE NATIONAL GEODETIC VERTICAL DATUM (NGVD) OF OCTOBER 1929.
 2. ALL CASTINGS WITHIN THE LIMIT OF WORK ARE TO BE ADJUSTED TO FINAL GRADE UNDER CONTRACT 2B, AS NECESSARY.
 3. REFER TO SURFACE ENHANCEMENT PLANS FOR CATCH BASIN LOCATIONS.



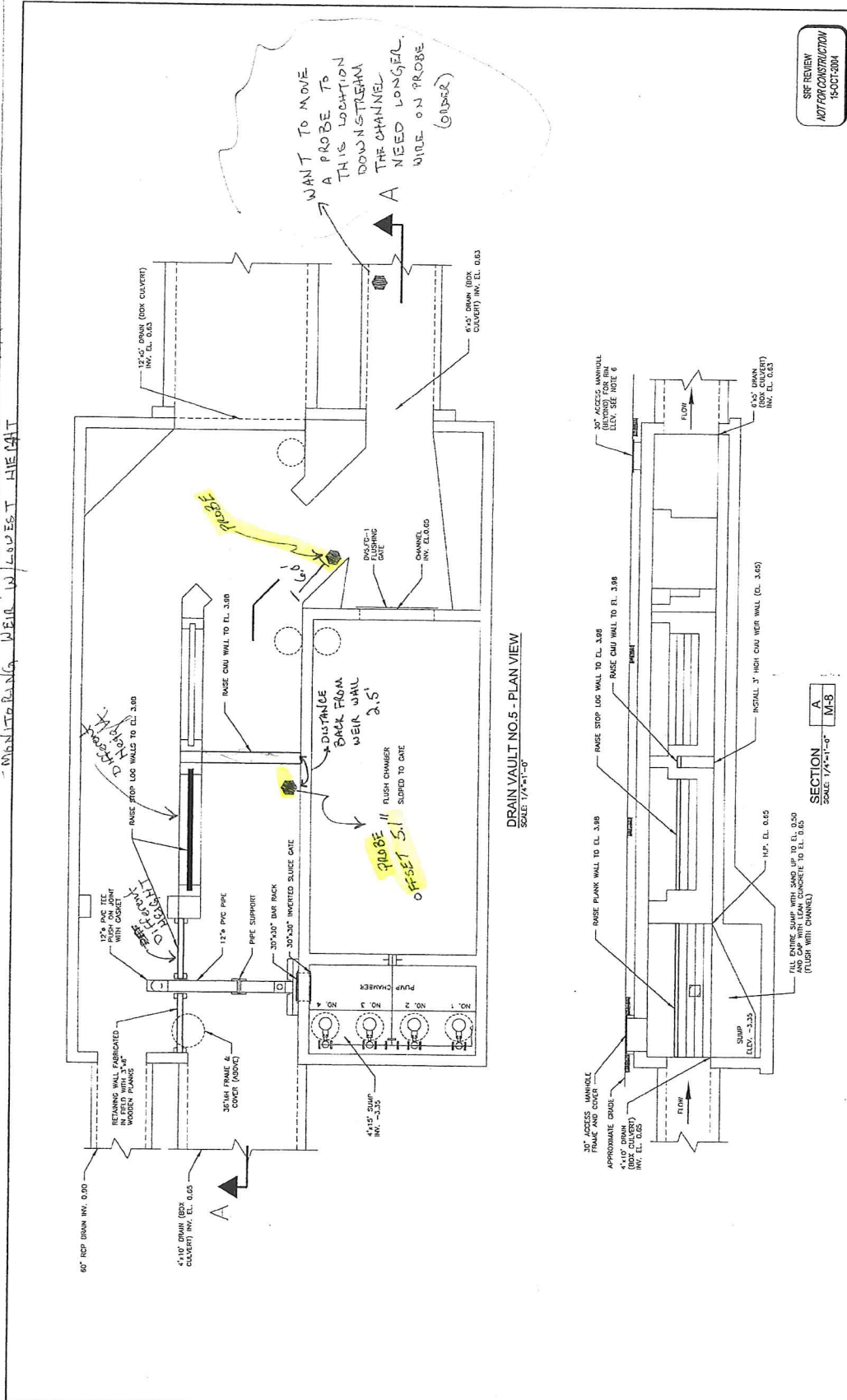
- GENERAL NOTES:
1. SEE DRAWING M-1 FOR MECHANICAL GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
 2. SEE CIVIL DRAWINGS SU-1 THRU SU-10 FOR SITE LOCATION OF VAULT AND YARD PIPING ARRANGEMENTS.
 3. SEE STRUCTURAL DRAWINGS ST-1 THRU ST-11 FOR VAULT DIMENSIONS AND ELEVATIONS.
 4. SEE ELECTRICAL DRAWINGS E-1 THRU E-18 FOR INSTRUMENTATION AND ELECTRICAL REQUIREMENTS.
 5. FOR DRAIN PIPE CONNECTIONS SEE DETAILS ON STRUCTURAL DRAWINGS.
 6. CONTRACTOR TO COORDINATE MANHOLE AND ACCESS HATCH RIM ELEVATIONS WITH GRADING AND DRAINAGE PLANS G-1 THRU G-12
 7. INSTALL A STRUCTURAL, WATERTIGHT MASONRY WALL TO CEILING IN ALL WEIR WALL OPENINGS. THIS WALL SHALL BE REMOVED WHEN 12'x5' DRAIN ACTIVATED

DRAIN VAULT NO.5 - PLAN

SLAB EL. -0.35 (EXCEPT PUMP CHAMBER)
 NOTE: TOP OF ROOF SLAB EL. 7.65+/-



- ALL NEW OPENINGS HAVE DIFFERENT HEIGHTS
 - MATCH TO RANG WELL IN LOWEST HEIGHT



WANT TO MOVE
 A PROBE TO
 THIS LOCATION
 DOWN STREAM
 THE CHANNEL
 A NEED LONGER
 WIDE ON PROBE
 (GURNE)

DRAIN VAULT NO. 5 - PLAN VIEW
 SCALE 1/4"=1'-0"

SECTION A
 SCALE 1/4"=1'-0"
 M-B

CITY OF CAMBRIDGE, MASSACHUSETTS
 CAMBRIDGE PARK DRIVE AREA DRAINAGE IMPROVEMENTS
 CONTRACT NO. 12
 DRAIN VAULT NO. 5 MODIFICATIONS
 PLAN AND SECTION



DATE	DESCRIPTION	BY	CHKD	APP'D
AS NOTED				
OCTOBER 11, 2004	REVISED	SH	SH	SH
	DESIGNED	SH	SH	SH
	CHECKED	SH	SH	SH
	APPROVED	SH	SH	SH



S.E.A. Consultants Inc.
 Scientific Engineering Architecture
 CONCORD, MARYLANDERS
 ROCKY HILL, CONNECTICUT
 CAMBRIDGE, MASSACHUSETTS

CAM 004





CAM 005



By CJH Date _____ Client _____ Sheet _____ of _____
 Chkd. By _____ Description CAMCO'S Piping Diagram Job No. _____

Pipe Lengths

- C-D = 8'
- D-E = 3'
- E-F = 3'
- C-B = 20'
- B-H = 25'
- H-F = 20'
- H-A = 8'

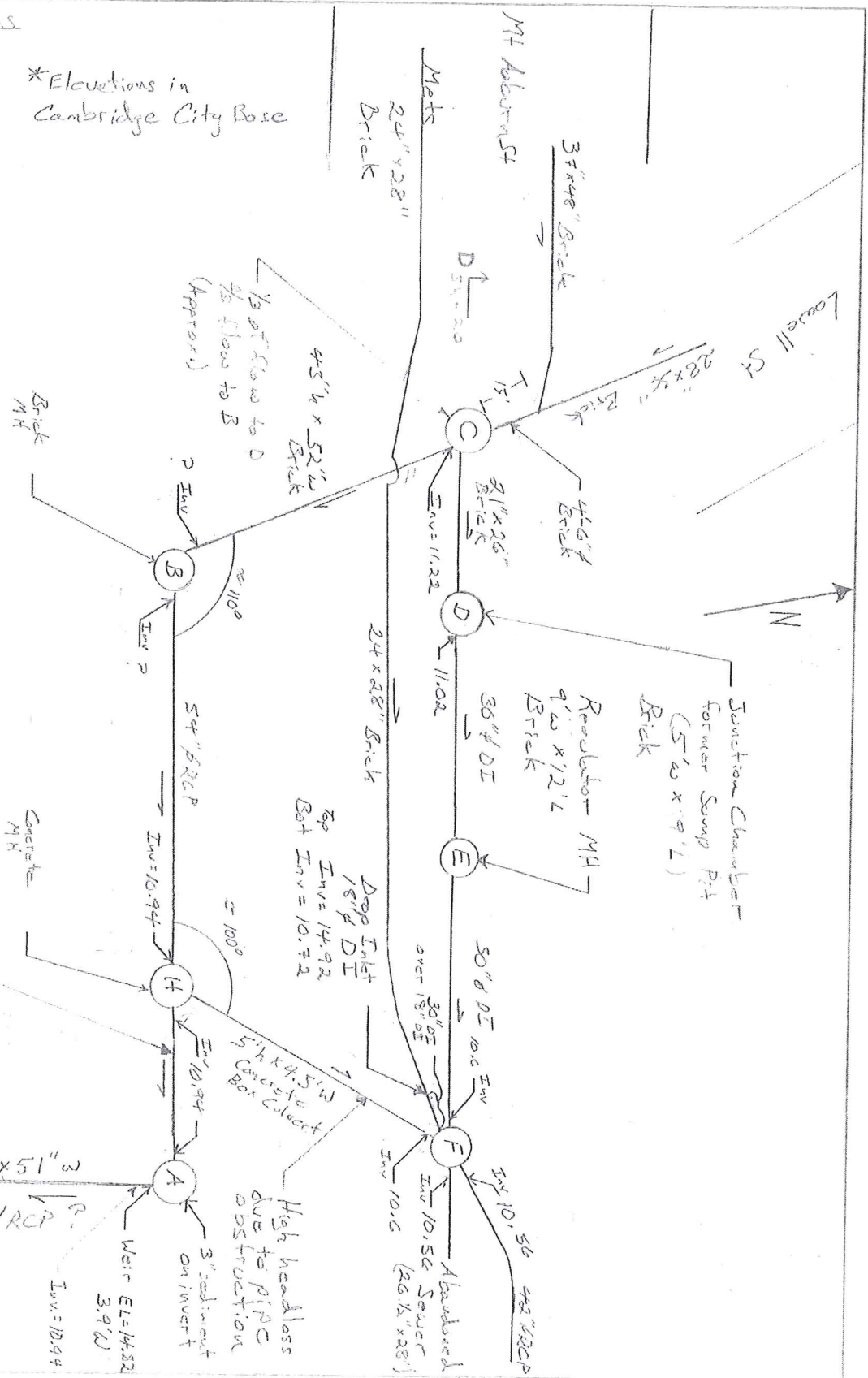
*Elevations in Cambridge City Base

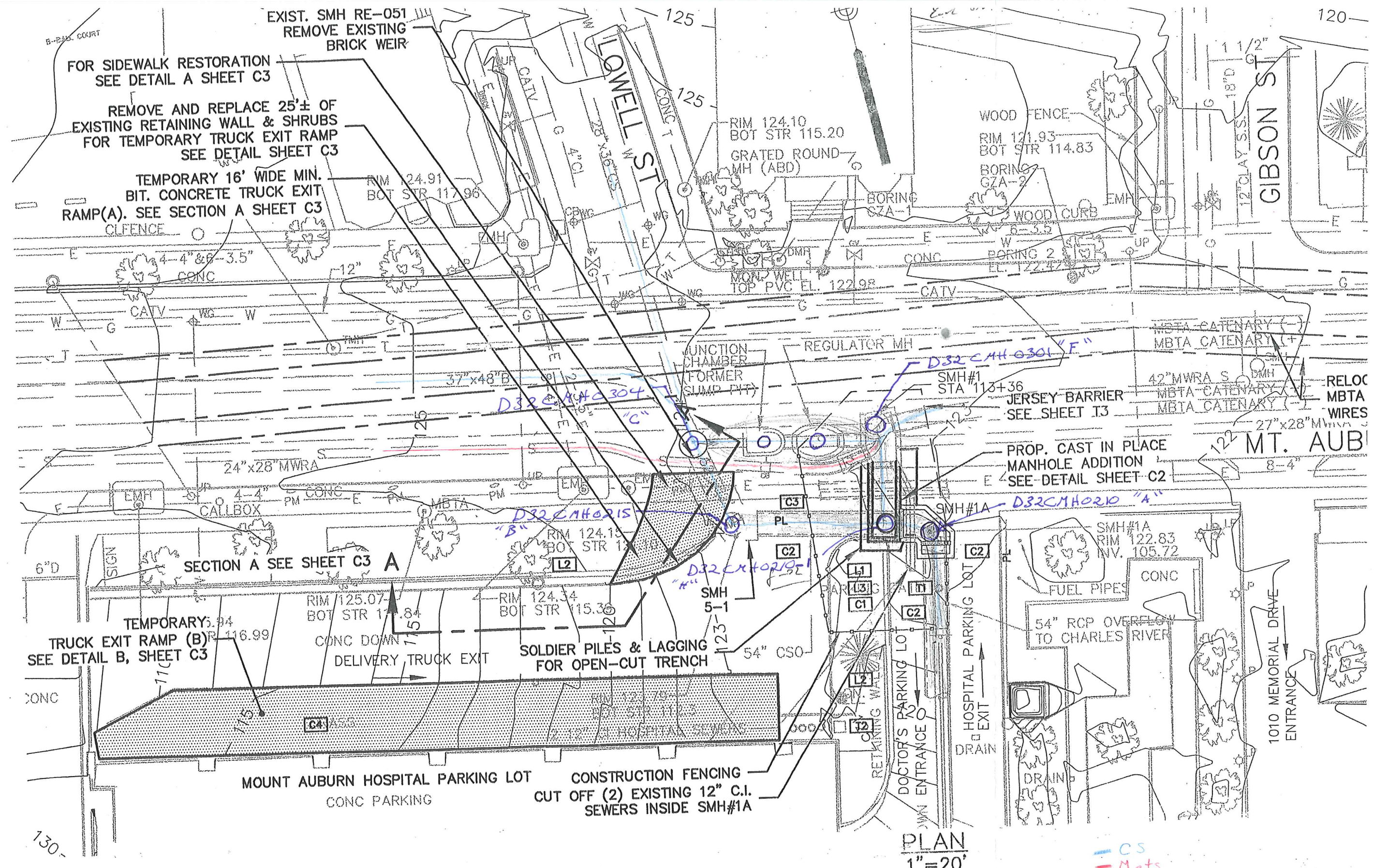
Rim EL's

- C = 28.82
- D = 28.42
- E = 28.22
- F = 28.55
- B = 29.01
- H = 28.05?
- A = 28.05

Flatables by File
 Bot EL = 13.22 - 3.5' is
 Resulting Pipe Cross-See
 54" dia Brick half-pipe
 Water Surface EL = 13.22 ±

To Ch River -
 per DHC only
 openings due to
 sediment build
 up





FOR SIDEWALK RESTORATION
SEE DETAIL A SHEET C3

REMOVE AND REPLACE 25'± OF
EXISTING RETAINING WALL & SHRUBS
FOR TEMPORARY TRUCK EXIT RAMP
SEE DETAIL SHEET C3

TEMPORARY 16' WIDE MIN.
BIT. CONCRETE TRUCK EXIT
RAMP(A). SEE SECTION A SHEET C3

SECTION A SEE SHEET C3

TEMPORARY
TRUCK EXIT RAMP (B)
SEE DETAIL B, SHEET C3

SOLDIER PILES & LAGGING
FOR OPEN-CUT TRENCH

MOUNT AUBURN HOSPITAL PARKING LOT
CONC PARKING

CONSTRUCTION FENCING
CUT OFF (2) EXISTING 12" C.I.
SEWERS INSIDE SMH#1A

PLAN
1"=20'

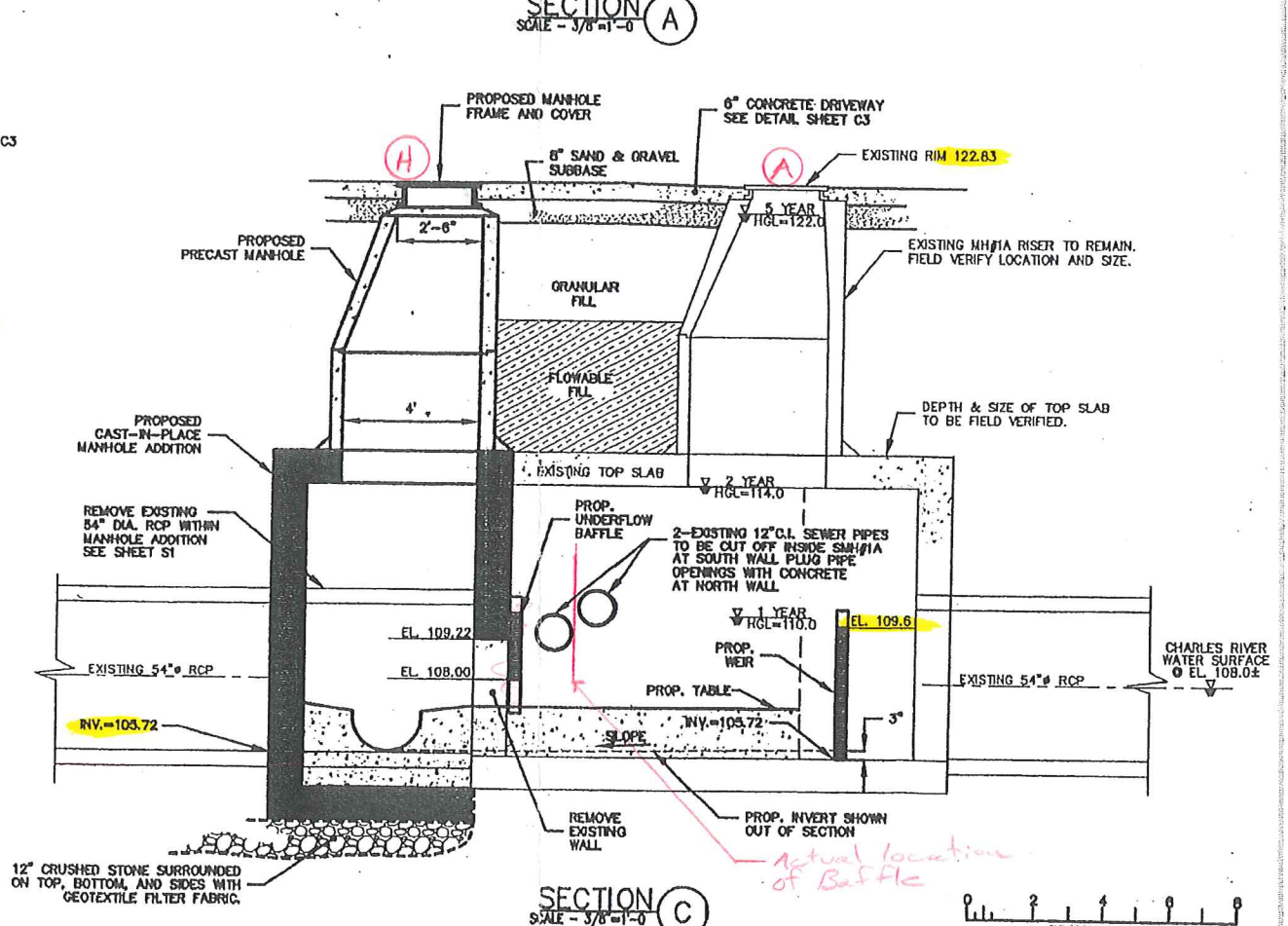
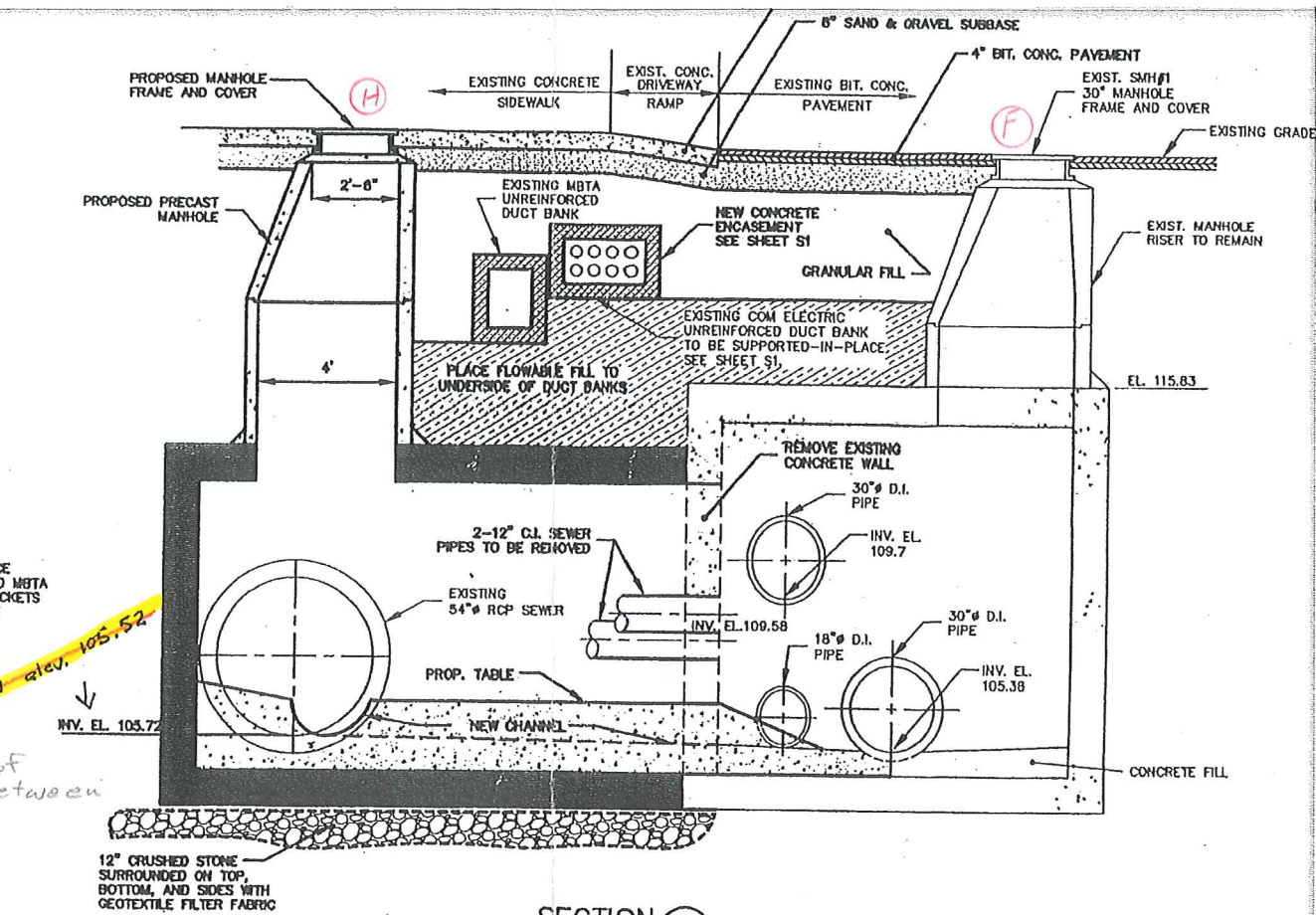
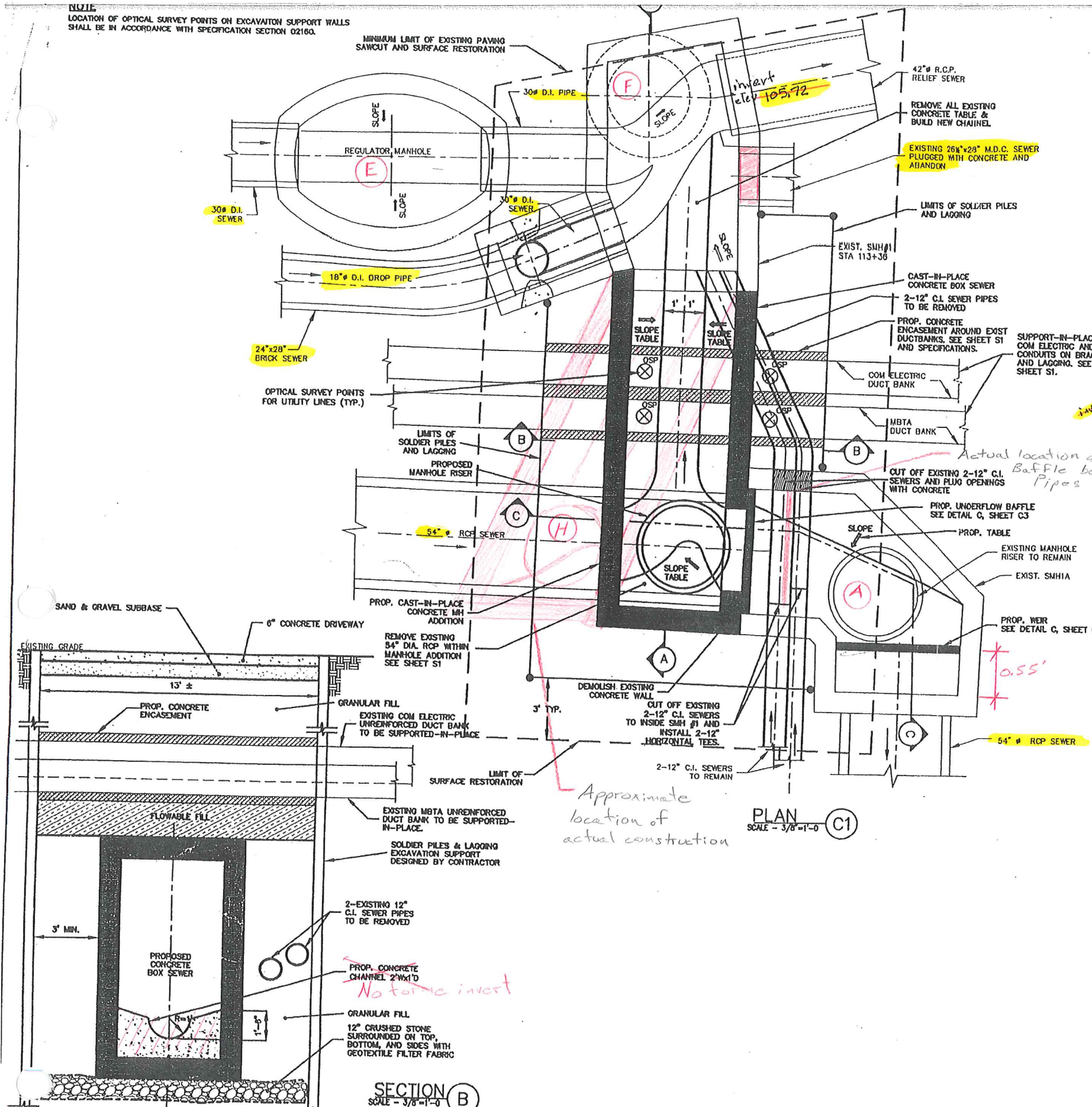
CS
Mets

#RE051	123.89	1 5-1	123.79	CAST IN PLACE IOLE ADDITION	2.83	#1 STA. 113+36	23.53
--------	--------	-------	--------	--------------------------------	------	----------------	-------

D. Block Temp

WMP

NOTE
 LOCATION OF OPTICAL SURVEY POINTS ON EXCAVATION SUPPORT WALLS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02160.



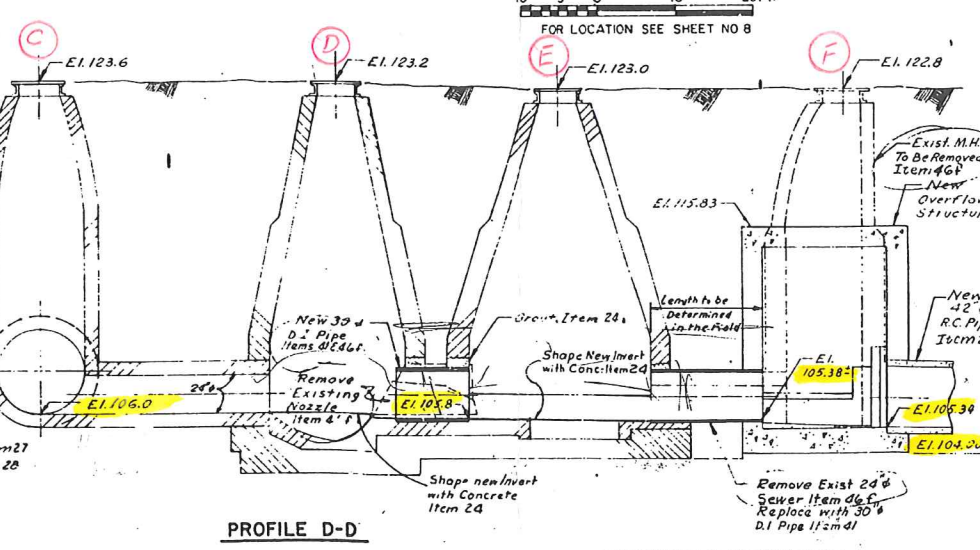
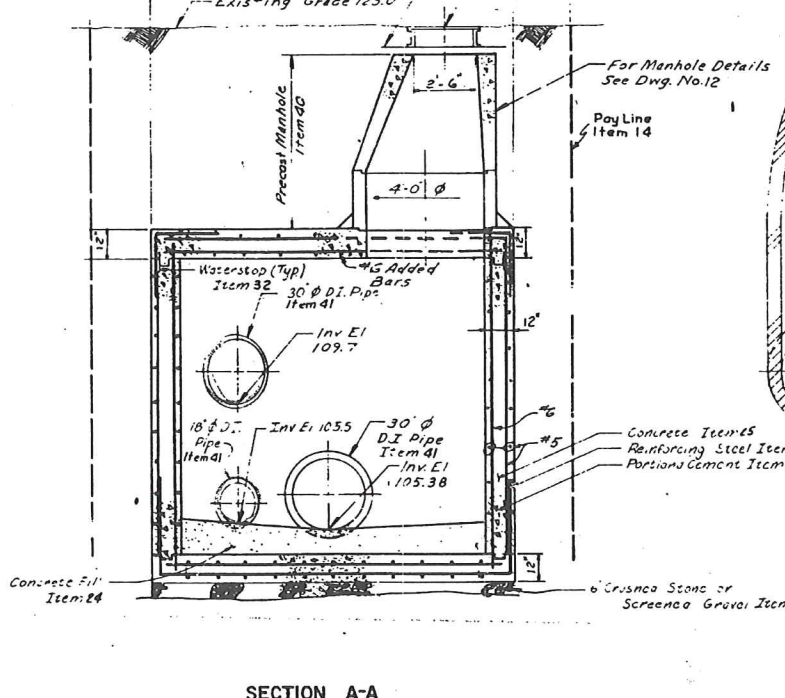
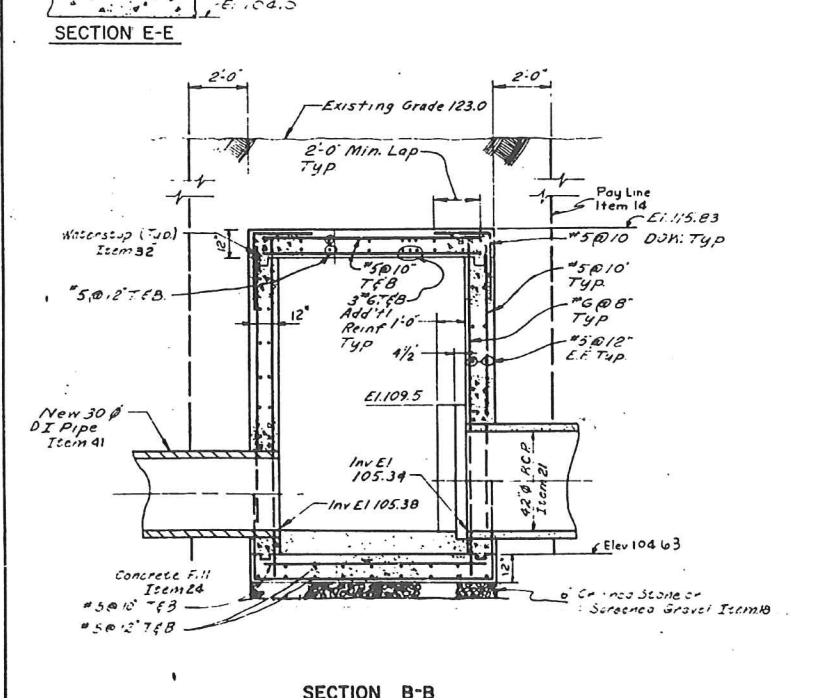
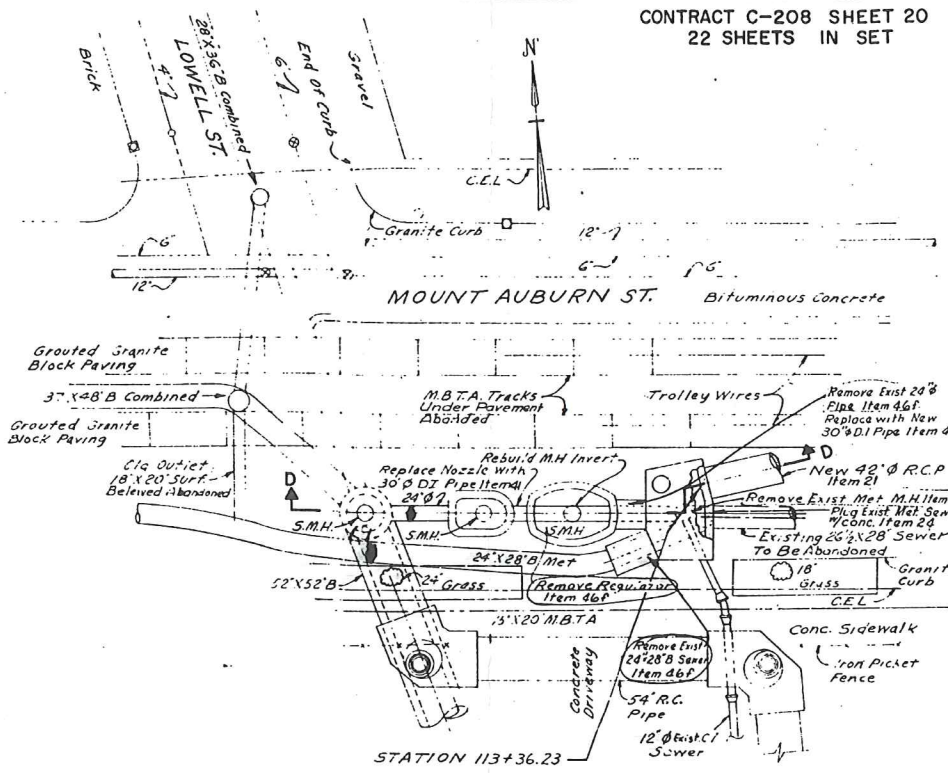
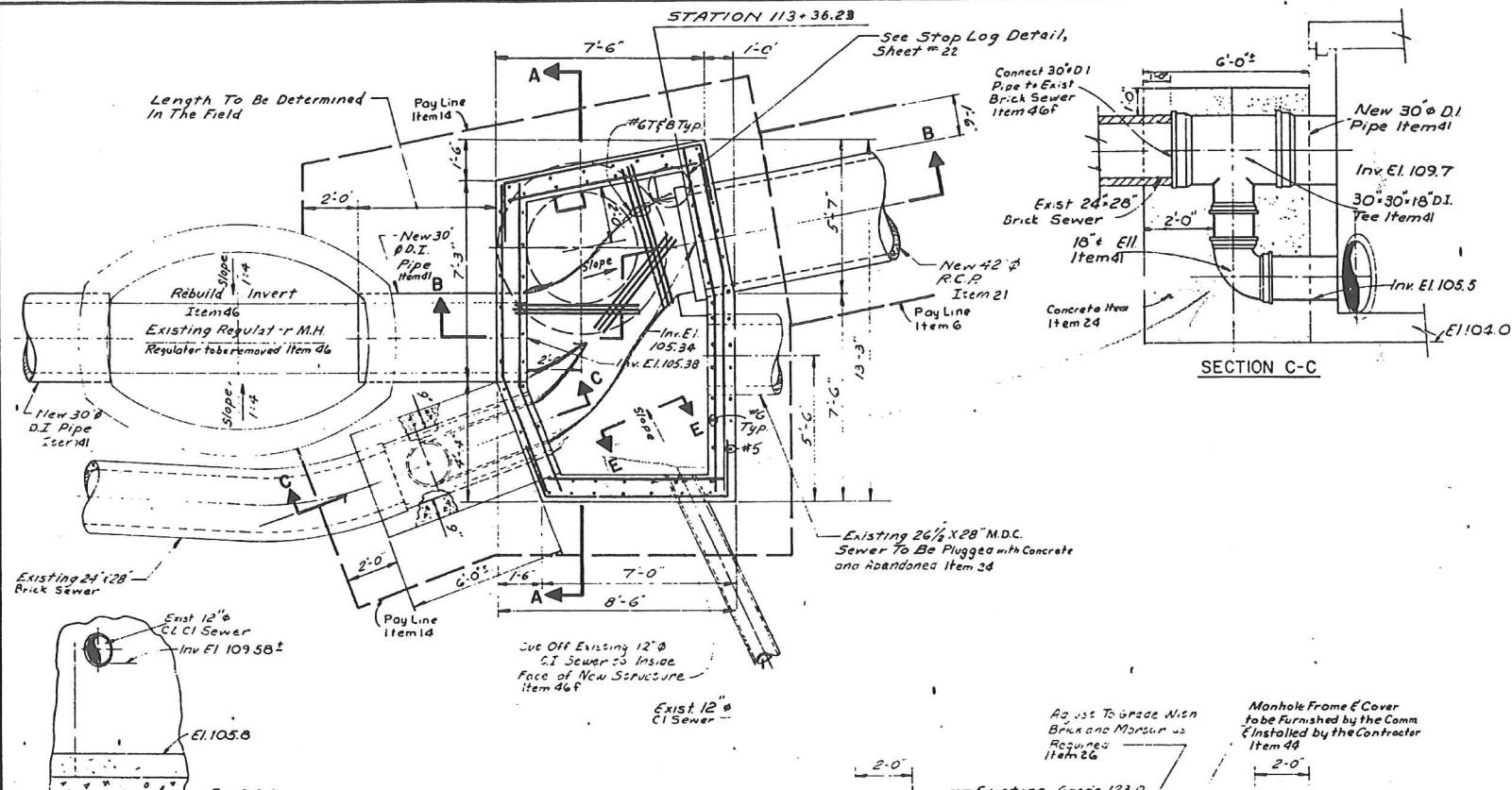
DEP PROJECT 20-0895-03	
Project No.	9170017.01
Prof. Designer	J.J. CLEARY
Drawn By	C.M. THERVAULT
Checked By	N.G. TRUE
Approved	W.V. TERRELL
Scale	AS SHOWN

WARREN WILLIAM TERRELL
 No. 27528
 REGISTERED PROFESSIONAL ENGINEER

PREPARED BY:
Dufresne-Henry, Inc.
 Consulting Engineers
 Westford, MA 01886
 Tel. (978) 892-1015 • FAX (978) 892-4578 • www.d-h-inc.com

MASSACHUSETTS WATER RESOURCES AUTHORITY
 CONTRACT NO. 6252
 CSO HYDRAULIC RELIEF PROJECTS

CAM 005
 PIPE PLAN AND DETAILS
 DRAWING NO. **C2**



COMMONWEALTH OF MASSACHUSETTS
METR. DIST. COMMISSION - ENGINEERING DIVISION
**NORTH CHARLES RELIEF SEWER
CONNECTION AT LOWELL STREET
STA. 113+36.23**
EXCEPT AS SHOWN
Scale: 3/8" = 1'-0"
ACC. 54980

Western Ave Sewer & Drainage System Improvements CAM005 – MT Auburn Hospital



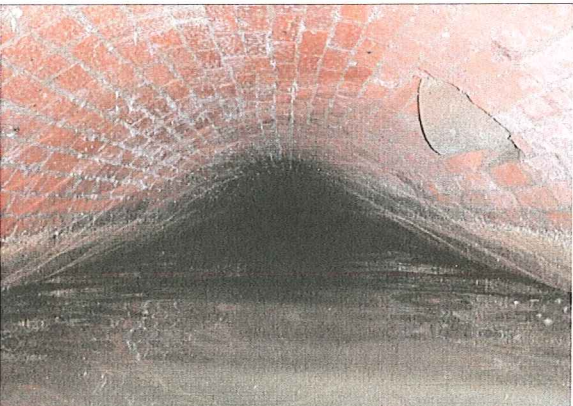
PC150075

Location of CAM005 overflow structures.



PC150007(MH A)

Location: D32CMH0210 (MH "A")
View: Overflow weir to outlet pipe.
Note: Weir is offset 0.55' from outlet pipe and top of weir is 0.5' below crown of pipe. Water level on D/S side of weir is higher than water level on U/S side of weir. (See Field Notes)



PC150039(MH G)

Location: MH "G" (DS MH "A")
View: D/S to CAM005 outfall.

Western Ave Sewer & Drainage System Improvements CAM005 – MT Auburn Hospital



PC150060(MH H baffle)

Location: D32CMH0210_1 (MH "H,"
US MH "A")

View: Abandoned pipe, floatables
baffle, hospital service(through)
between MH "A" and MH "H".



PC150066(MH H)

Location: D32CMH0210_1 (MH "H")
View: US to D32CMH0215 (MH "B").

Note: Wire dangling from US
manhole is catching a lot of debris,
purpose unknown.



PC150069

Location: D32CMH3210_1 (MH "H")
View: DS to D32CMH0301 (MH "F")
with drop inlet from hospital.

Note: There is little or no invert built
up to divert sewerage away from MH
"A" to MH "F."

Western Ave Sewer & Drainage System Improvements CAM005 – MT Auburn Hospital



PC150090(MH C)

Location: D32CMH0304 (MH "C")
View: Small outlet to MH "F" via MH's "D" & "E." Large outlet to overflow weir and MH "F" via MH's "B" & "H."



PC150105(MH F)

Location: D32CMH0301 (MH "F")
View: Drop inlet from MWRA sewer.
Approximately 3' from pipe invert to MH invert.



PC150142

Location: CAM005 outfall.
Sediment build up to approximately 6" below the crown of the outfall pipe.



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CAMBRIDGE, MASSACHUSETTS**

JOB CAM 005

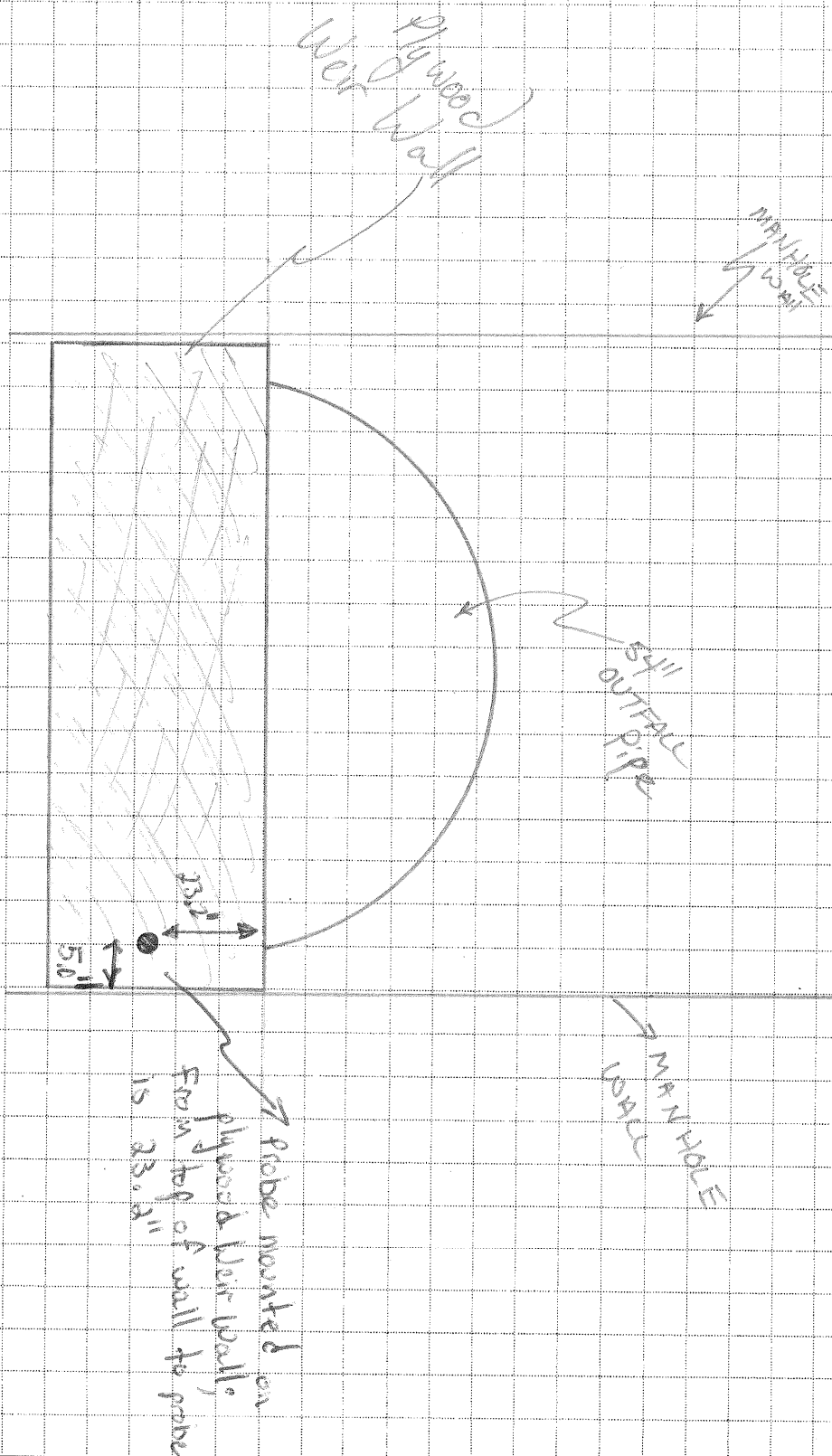
SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

CAM 005
MT. Auburn @ Lowell St.



Need to profile opening of
plywood and opening of
pipe and then insert equidistant
rod meter

Probe mounted on
plywood Weir Wall,
From top of wall to probe
is 33.8" "



OFFICE OF THE CITY ENGINEER
CAMBRIDGE, MASSACHUSETTS

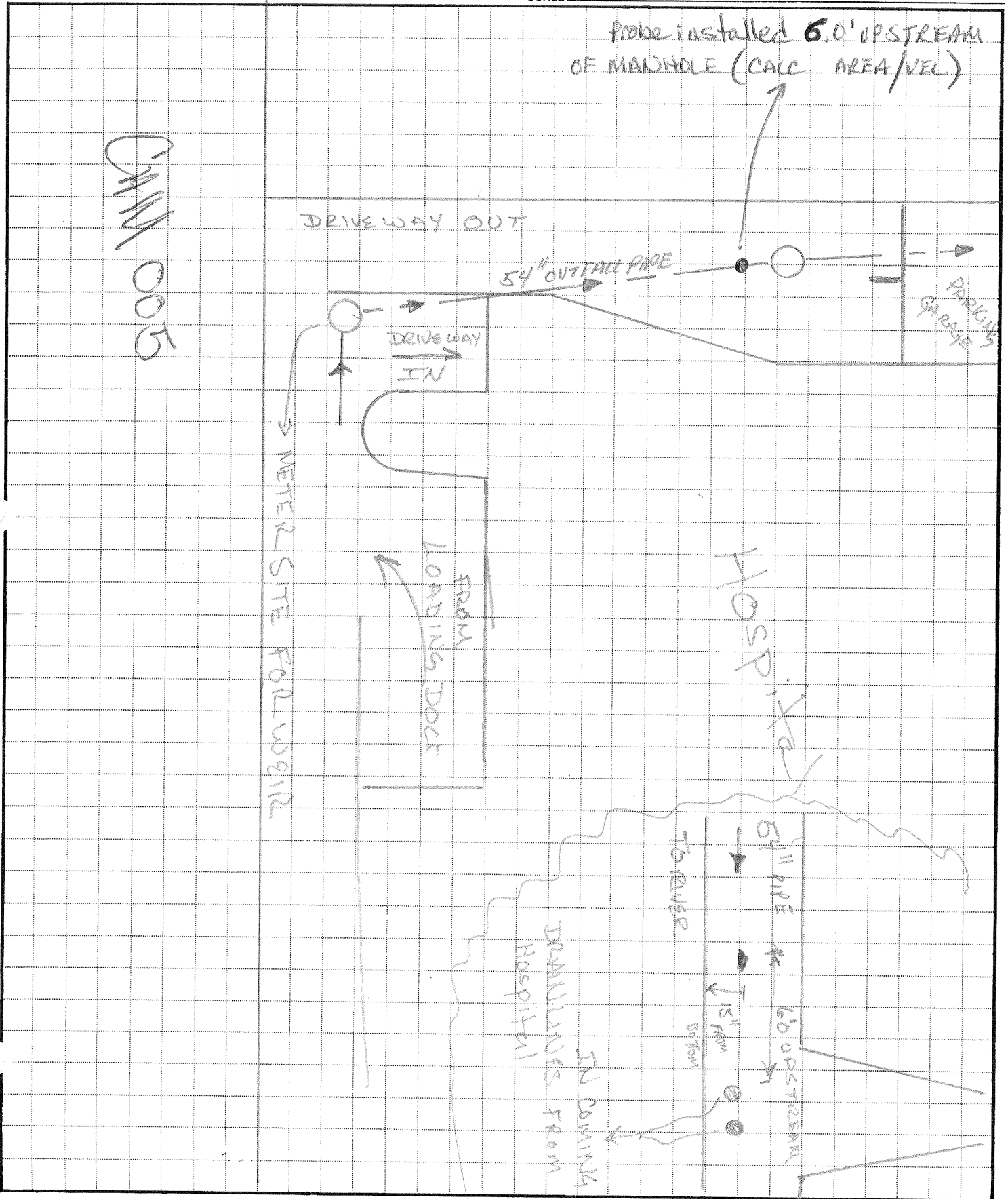
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SHEET NO. _____ OF _____

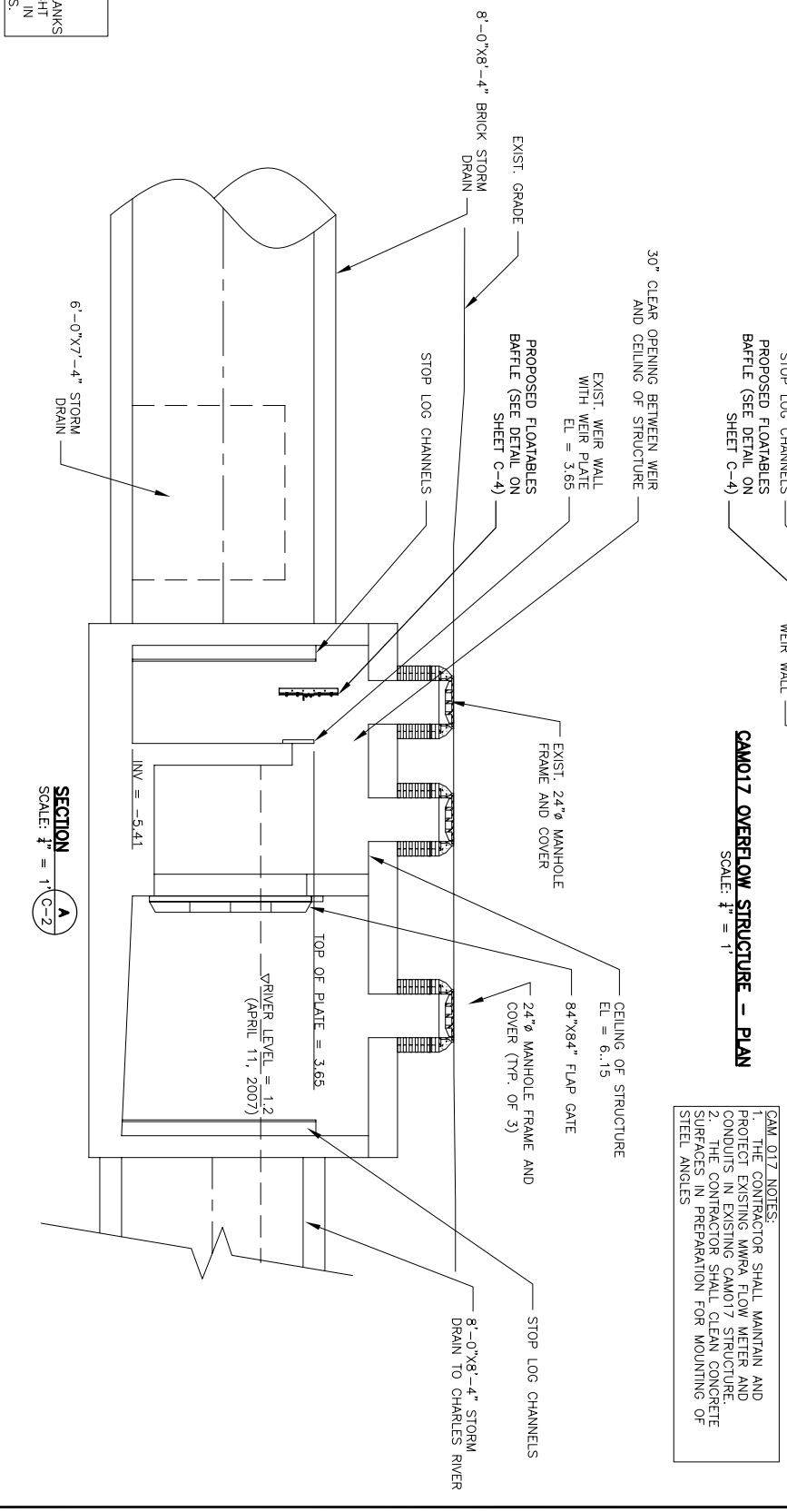
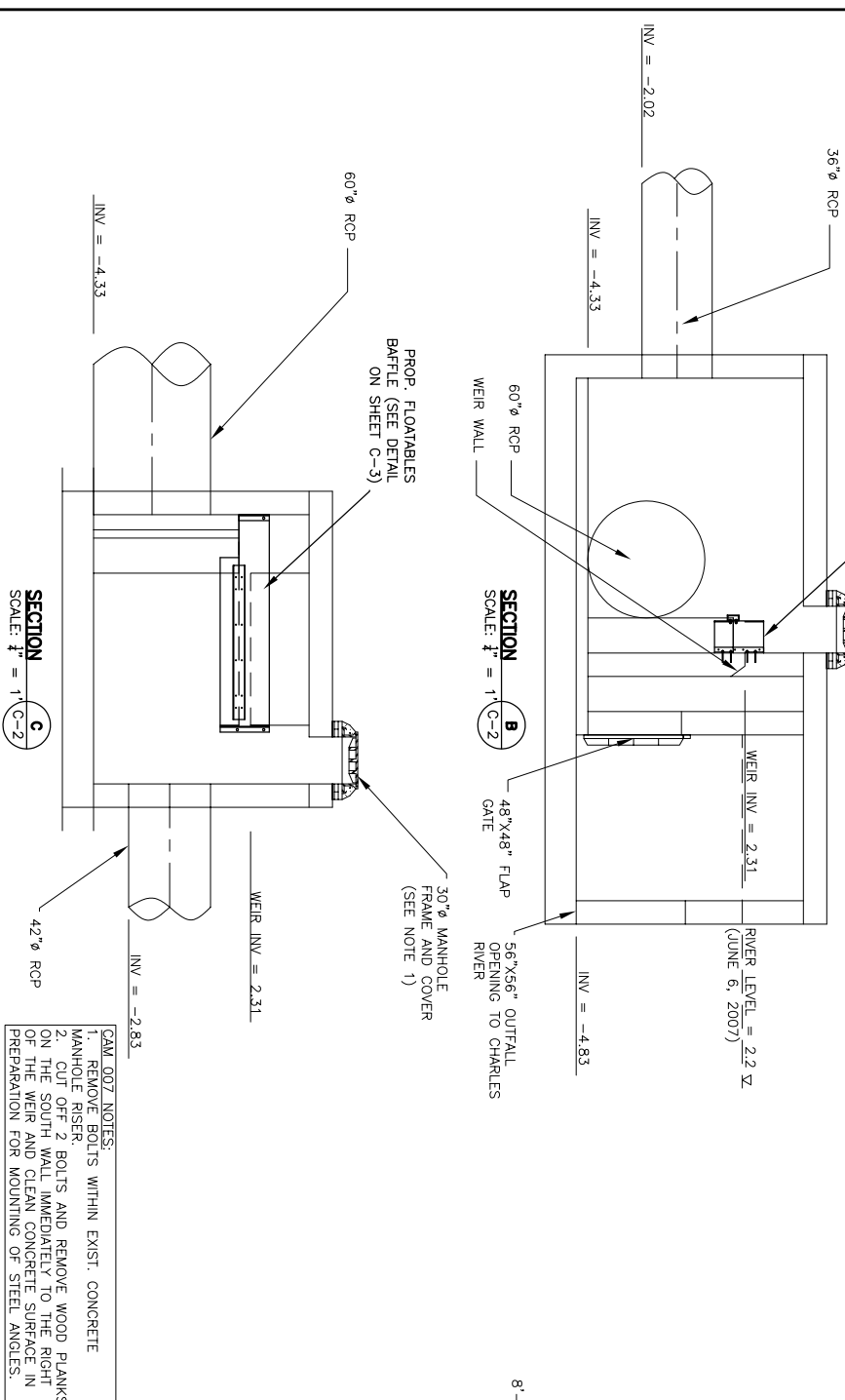
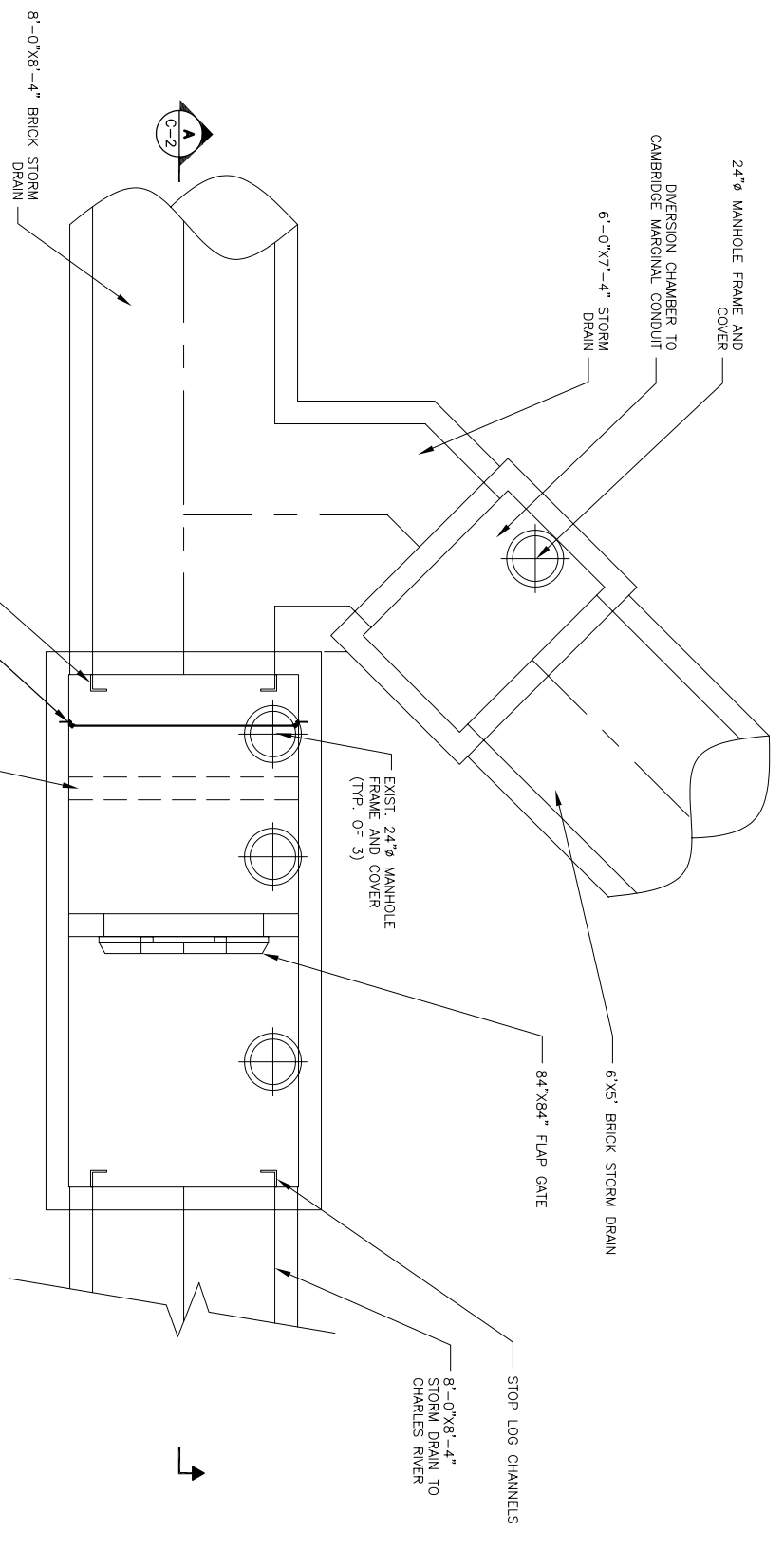
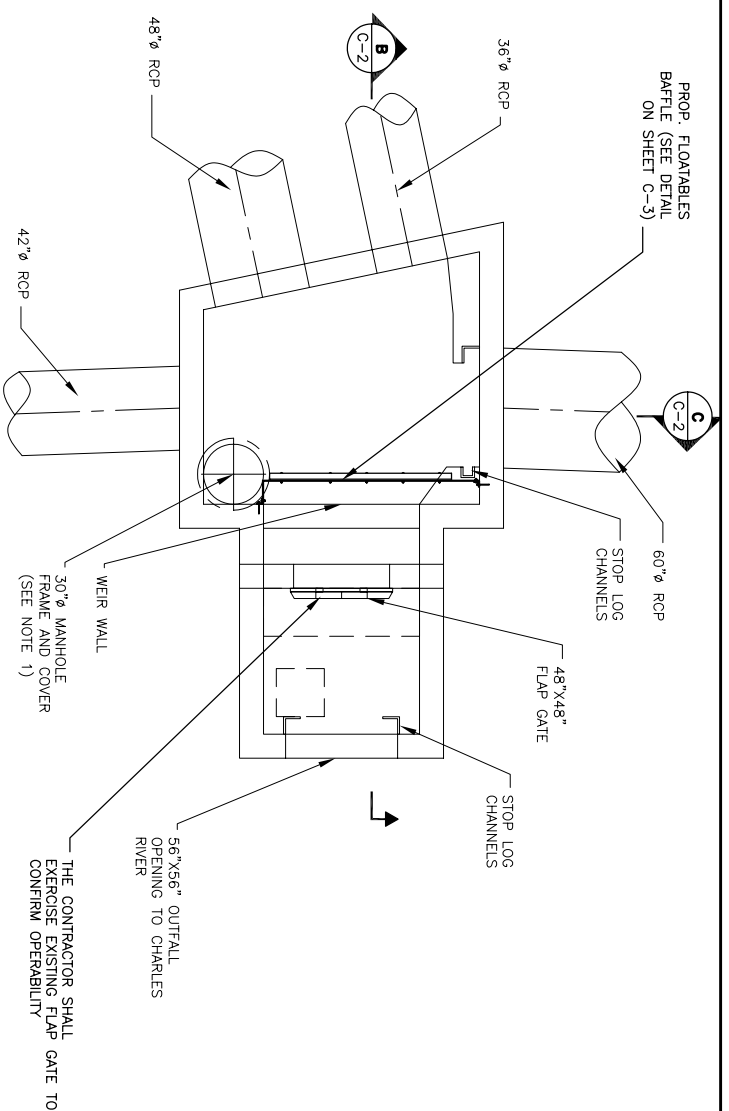
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CHECKED BY _____ DATE _____

SCALE _____



CAM 007

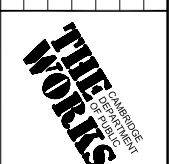


CAM 007 NOTES:
1. REMOVE BOLTS WITHIN EXIST. CONCRETE MANHOLE RISER.
2. CUT OFF 2 BOLTS AND REMOVE WOOD PLANKS ON THE SOUTH WALL IMMEDIATELY TO THE RIGHT OF THE WEIR AND CLEAN CONCRETE SURFACE IN PREPARATION FOR MOUNTING OF STEEL ANGLES.

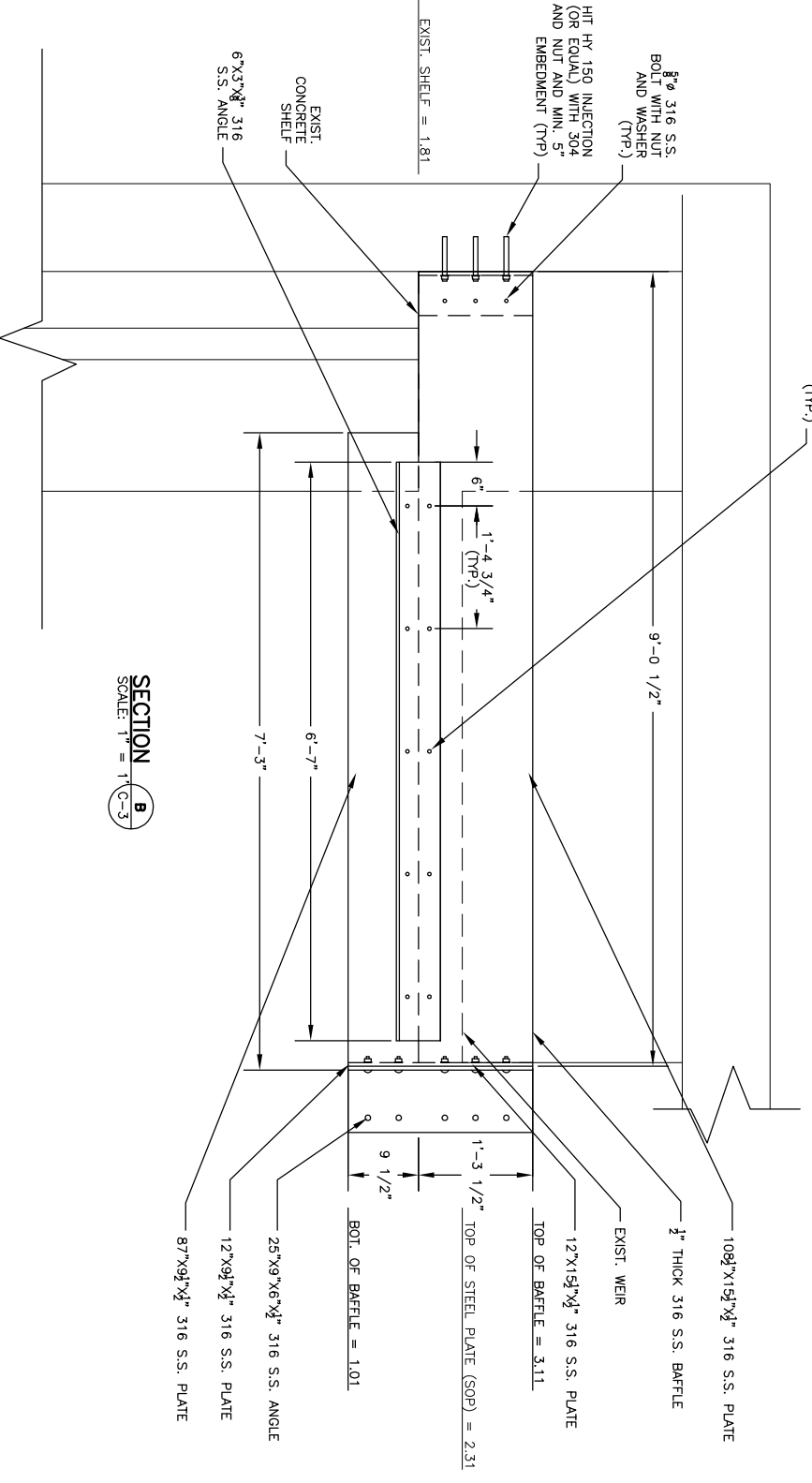
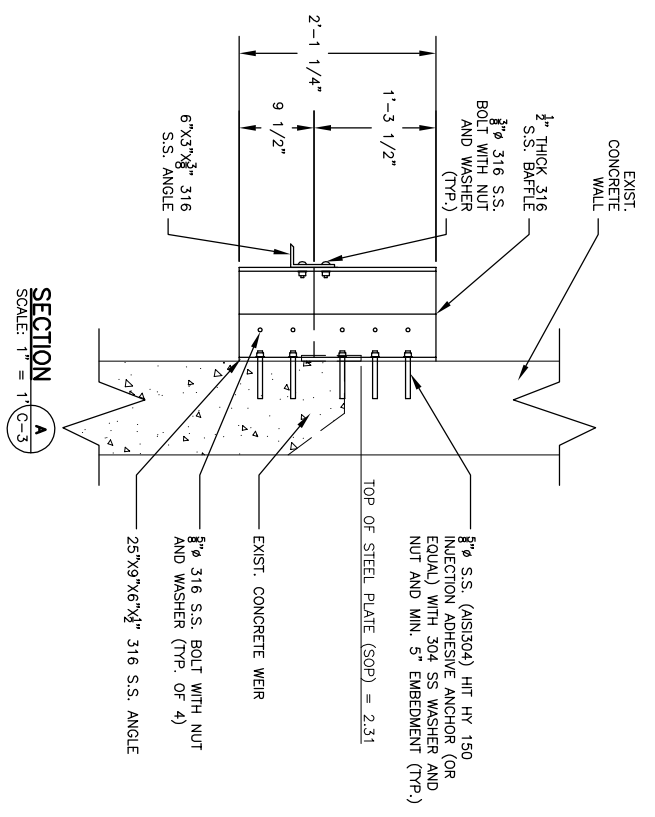
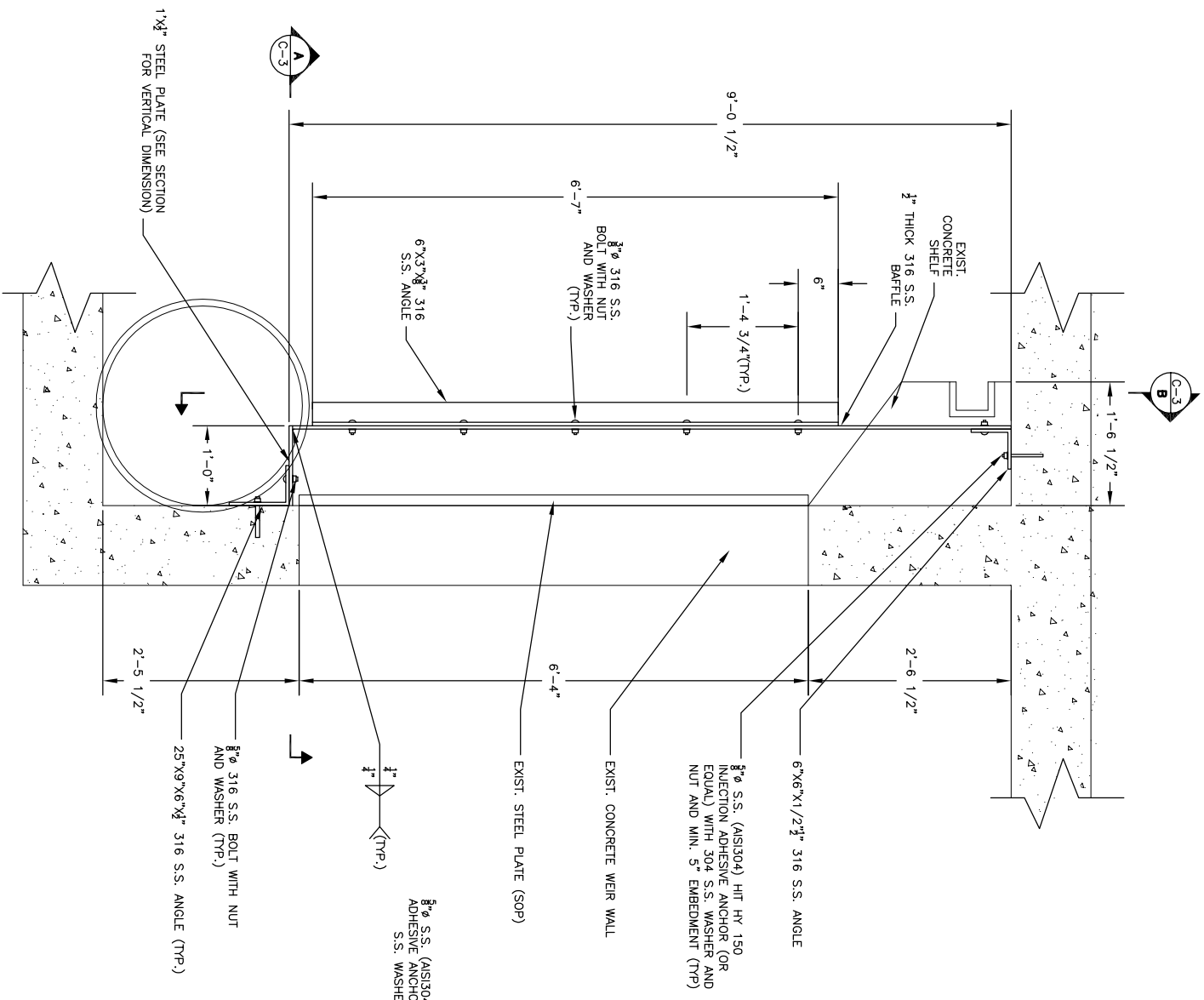


Scale	AS NOTED
Date	JUNE 2007
Job No.	2220367
Designed by	NJE
Drawn by	NJE
Checked by	DHC
Approved by	JGS

Description	No.	Date
REVISIONS		



CITY OF CAMBRIDGE, MASSACHUSETTS
REMEDIAL RECONSTRUCTION FY08 CONTRACT ADDENDUM NO. 2
CHARLES RIVER FLOATABLES CONTROL
REGULATOR OVERFLOW STRUCTURES
PLANS AND SECTIONS



FLOATABLES BAFFLE DETAIL

NOTES:
1. ALL STAINLESS STEEL SHALL BE TYPE 316 STAINLESS STEEL THAT CONFORMS TO ASTM A240.
UNLESS OTHERWISE NOTED.

SCALE: 1" = 1'

Scale	AS NOTED	1	ANGLE TO REPLACE BOX CHANNEL
Date	JUNE 2007		
Job No.	2220387		
Designed by	NLE		
Drawn by	NLE		
Checked by	DHC		
Approved by	JGS		

SECTION B

SCALE: 1" = 1'-0-3

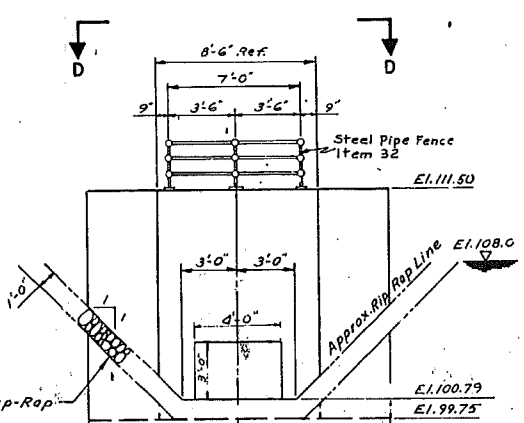
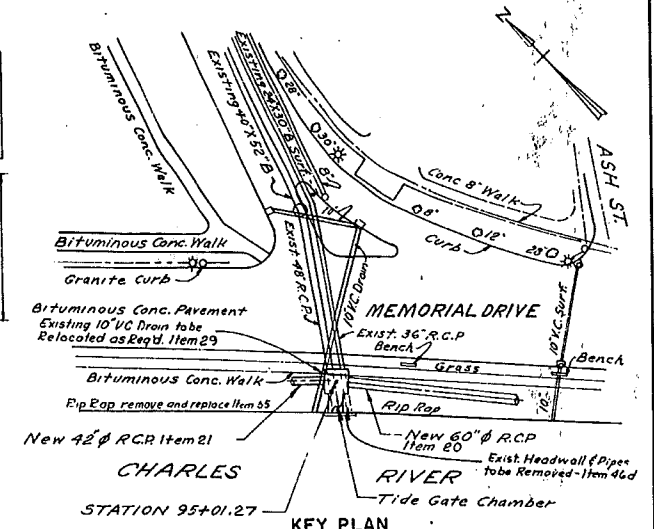
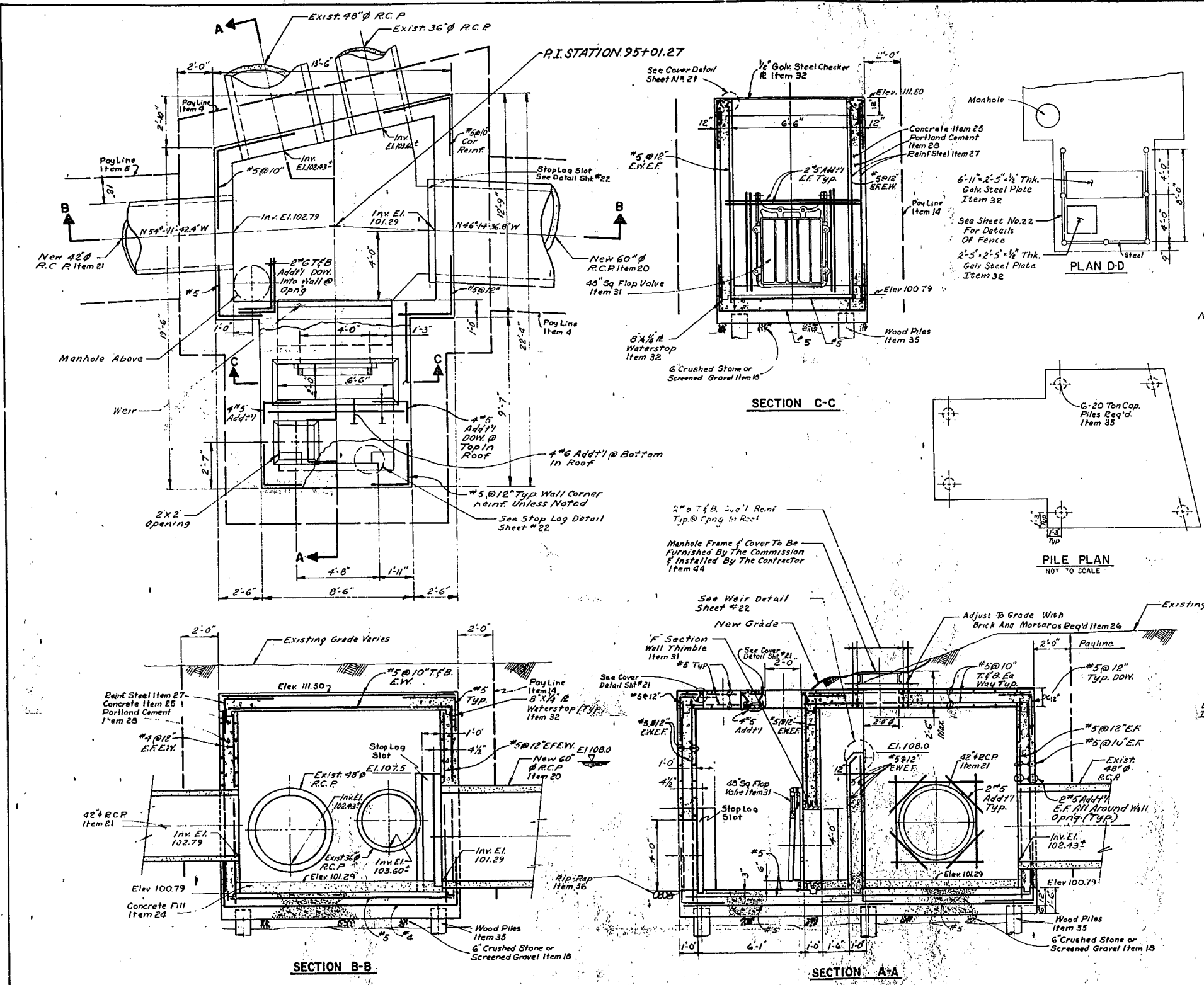


Scale	AS NOTED	1	ANGLE TO REPLACE BOX CHANNEL
Date	JUNE 2007		
Job No.	2220387		
Designed by	NLE		
Drawn by	NLE		
Checked by	DHC		
Approved by	JGS		



Description	Revisions	Date

CITY OF CAMBRIDGE, MASSACHUSETTS
REMEDIAL RECONSTRUCTION FY08 CONTRACT ADDENDUM NO. 2
CHARLES RIVER FLOATABLES CONTROL
CAM007 REGULATOR OVERFLOW STRUCTURE
BAFFLE DETAIL



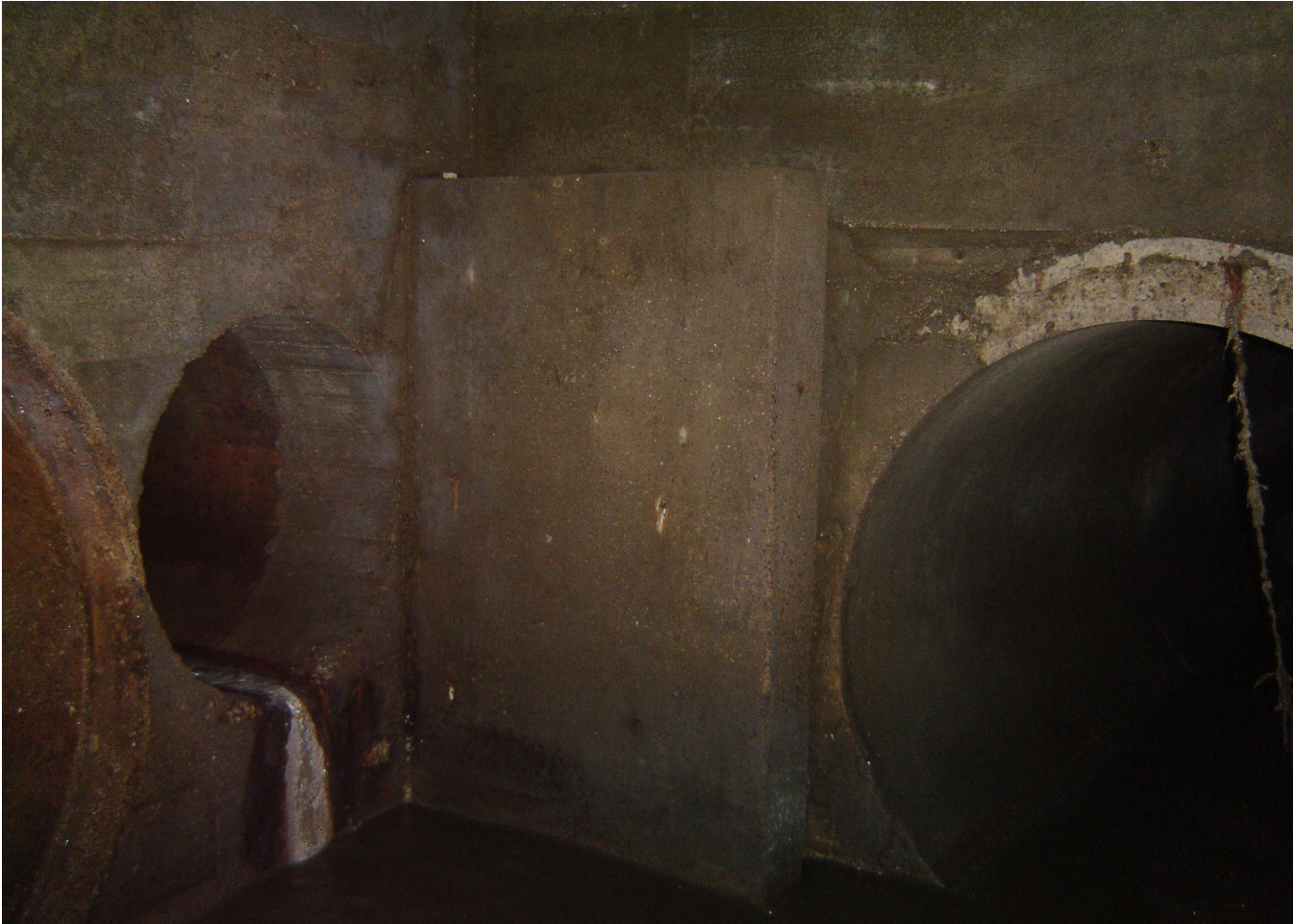
Notes:
1. For General Notes See Sheet No. 3
2. For Concrete Notes See Sheet No. 11
3. For Location of Structure See Sheet No. 7

ELEVATION
SCALE: 3/8" = 1'-0"

COMMONWEALTH OF MASSACHUSETTS
METR. DIST. COMMISSION — ENGINEERING DIVISION

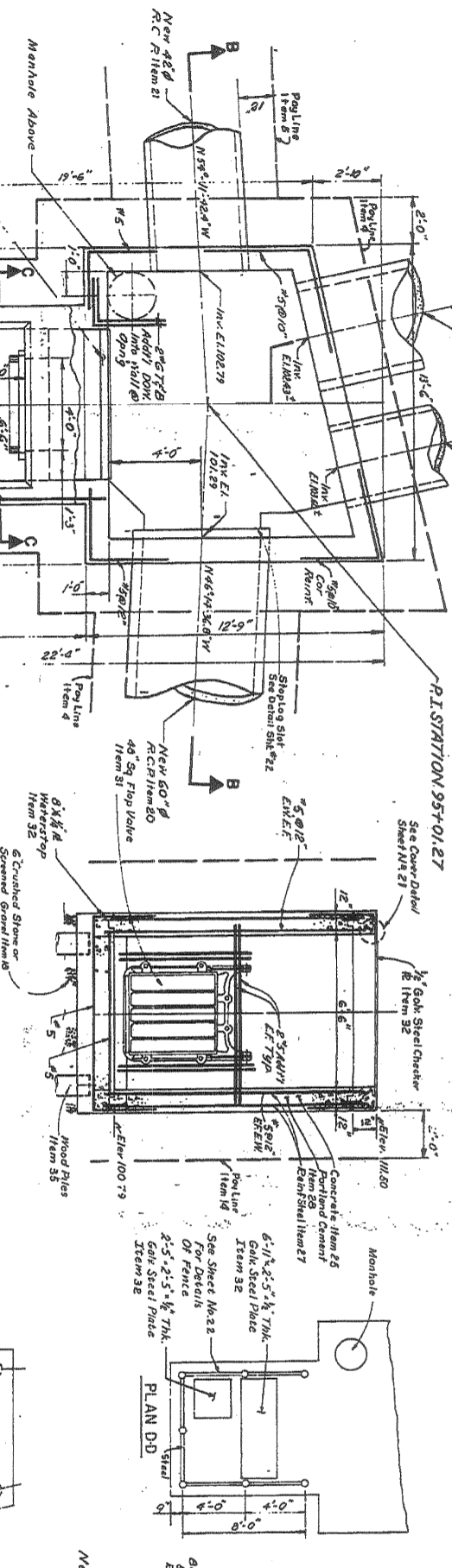
NORTH CHARLES RELIEF SEWER
STRUCTURE AT STA. 95+01.27

Scale: 3/8" = 1'-0"
EXCEPT AS SHOWN

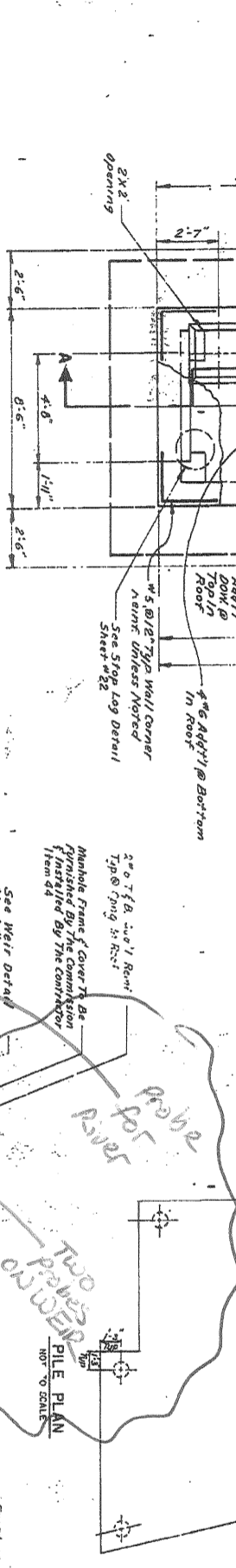




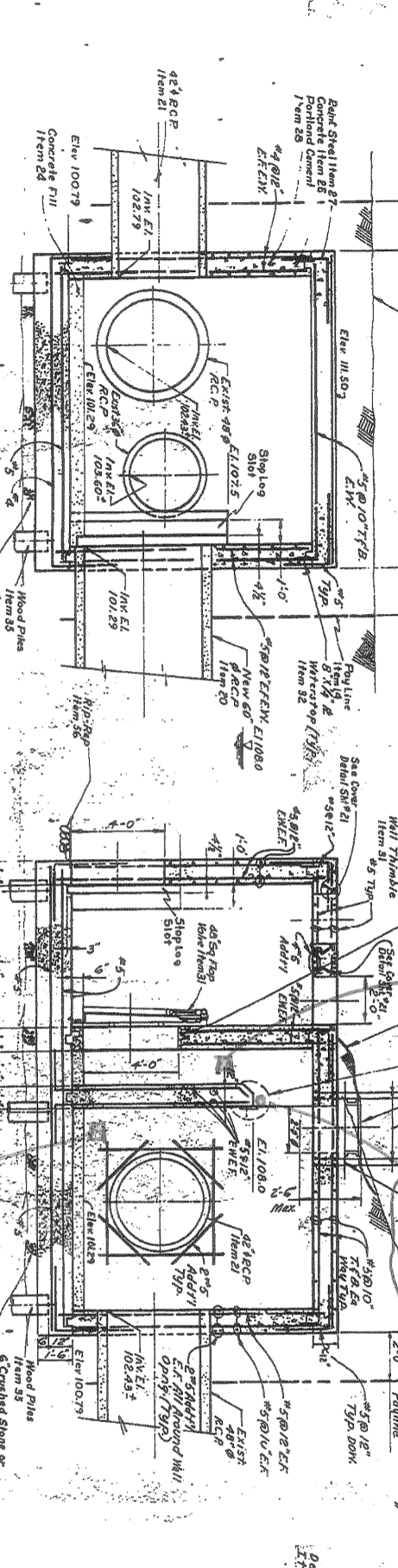




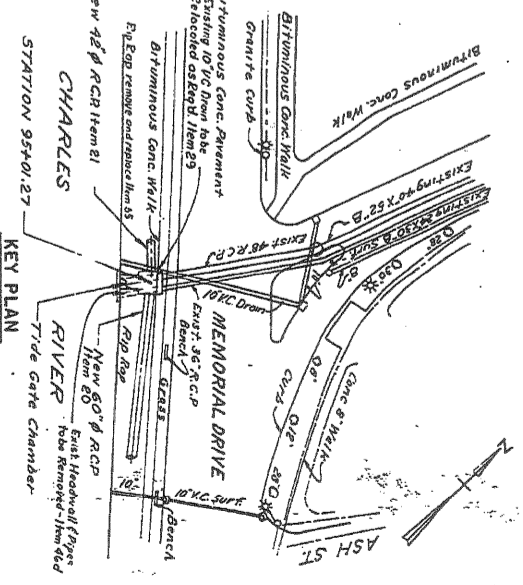
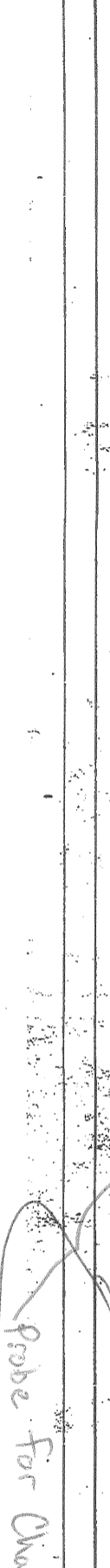
SECTION C-C



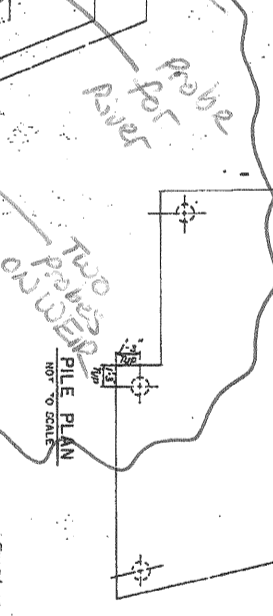
SECTION B-B



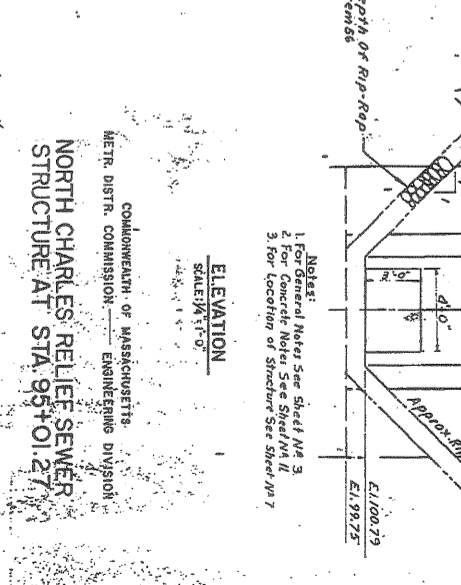
SECTION A-A



KEY PLAN



PILE PLAN



ELEVATION

Notes:
1. For General Notes See Sheet No. 3
2. For Concrete Notes See Sheet No. 11
3. For Location of Structure See Sheet No. 7

SCALE: 1" = 1'-0"
EXCEPT AS SHOWN

COMMONWEALTH OF MASSACHUSETTS
METR. DIST. COMMISSION ENGINEERING DIVISION
NORTH CHARLES RELIEF SEWER
STRUCTURE AT STA. 95+01.27

FILE CONT. C-208 6 31N-5
ACC. 54987

probe for Chamber

probe for River

Two Piles in PILE PLAN

Adjust to Grade with Bricks and Mortar as Equiv. Items 26

Existing Grade

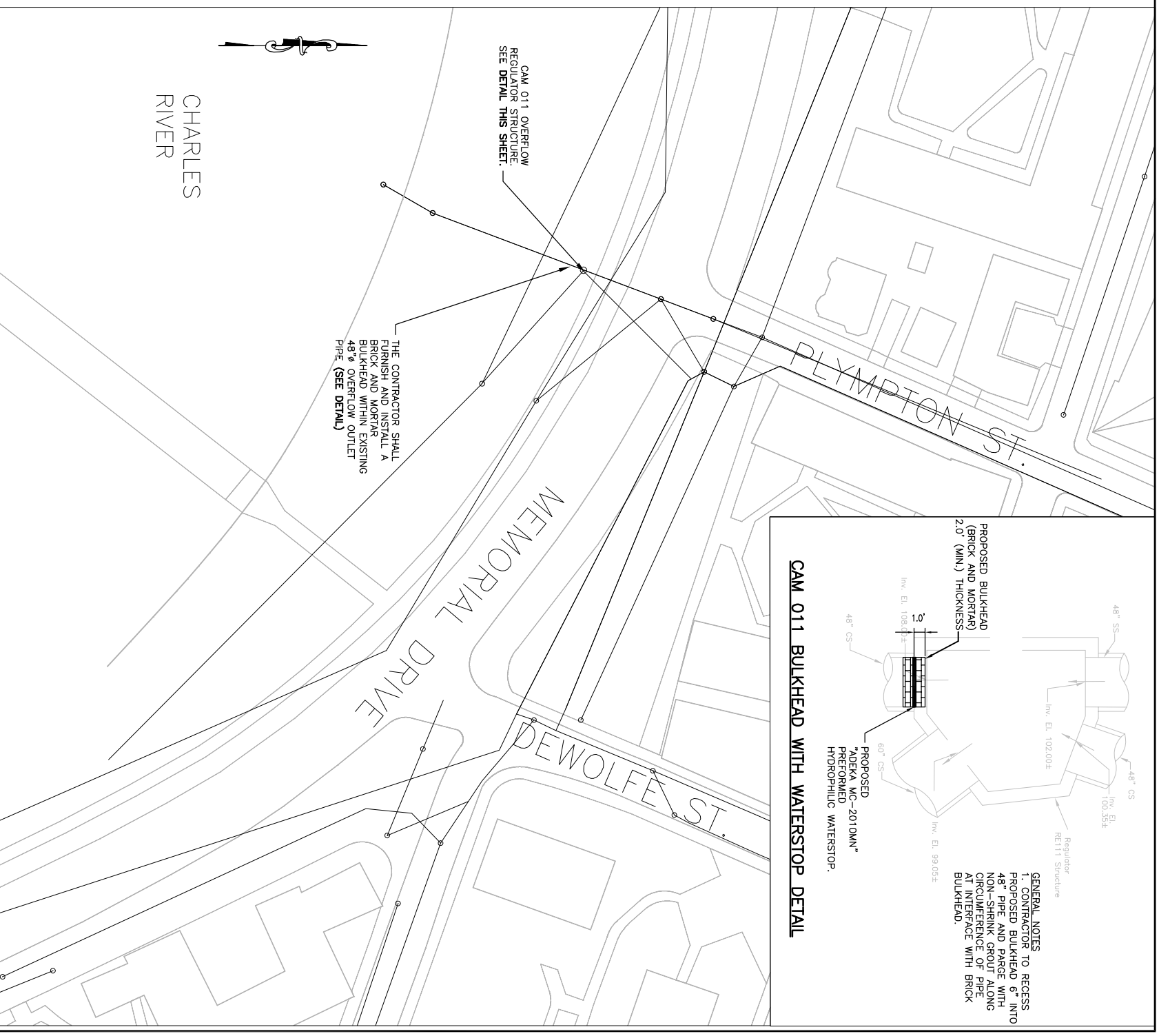
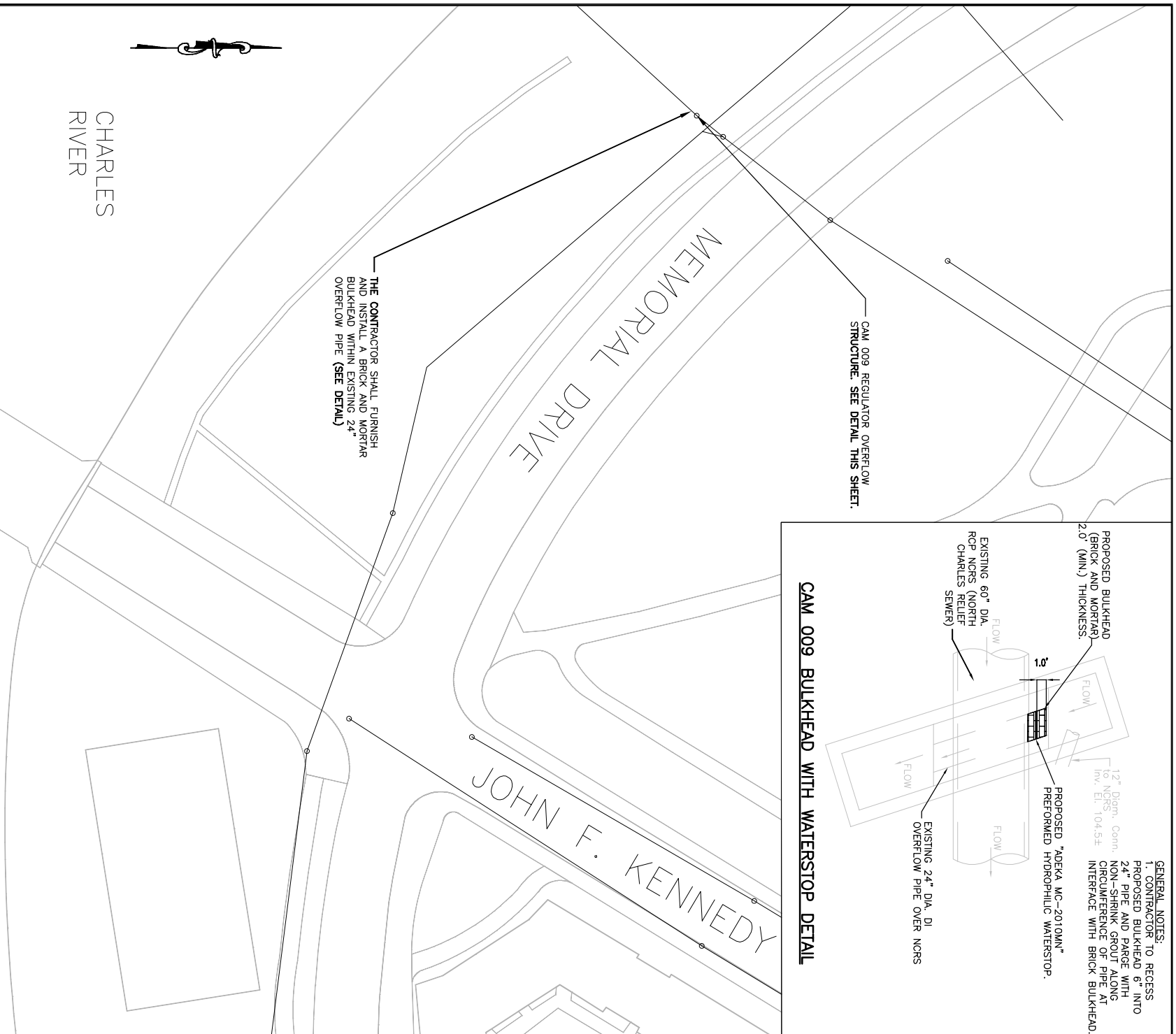
Depth of Rip-Rep. Items 26

Approx. Rip-Rep. Line ELEV. 100.80

ELEV. 100.79

ELEV. 100.75

CAM 009



CAM 009 REGULATOR OVERFLOW STRUCTURE PLAN

CAM 011 REGULATOR OVERFLOW STRUCTURE PLAN

CHARLES RIVER

CHARLES RIVER



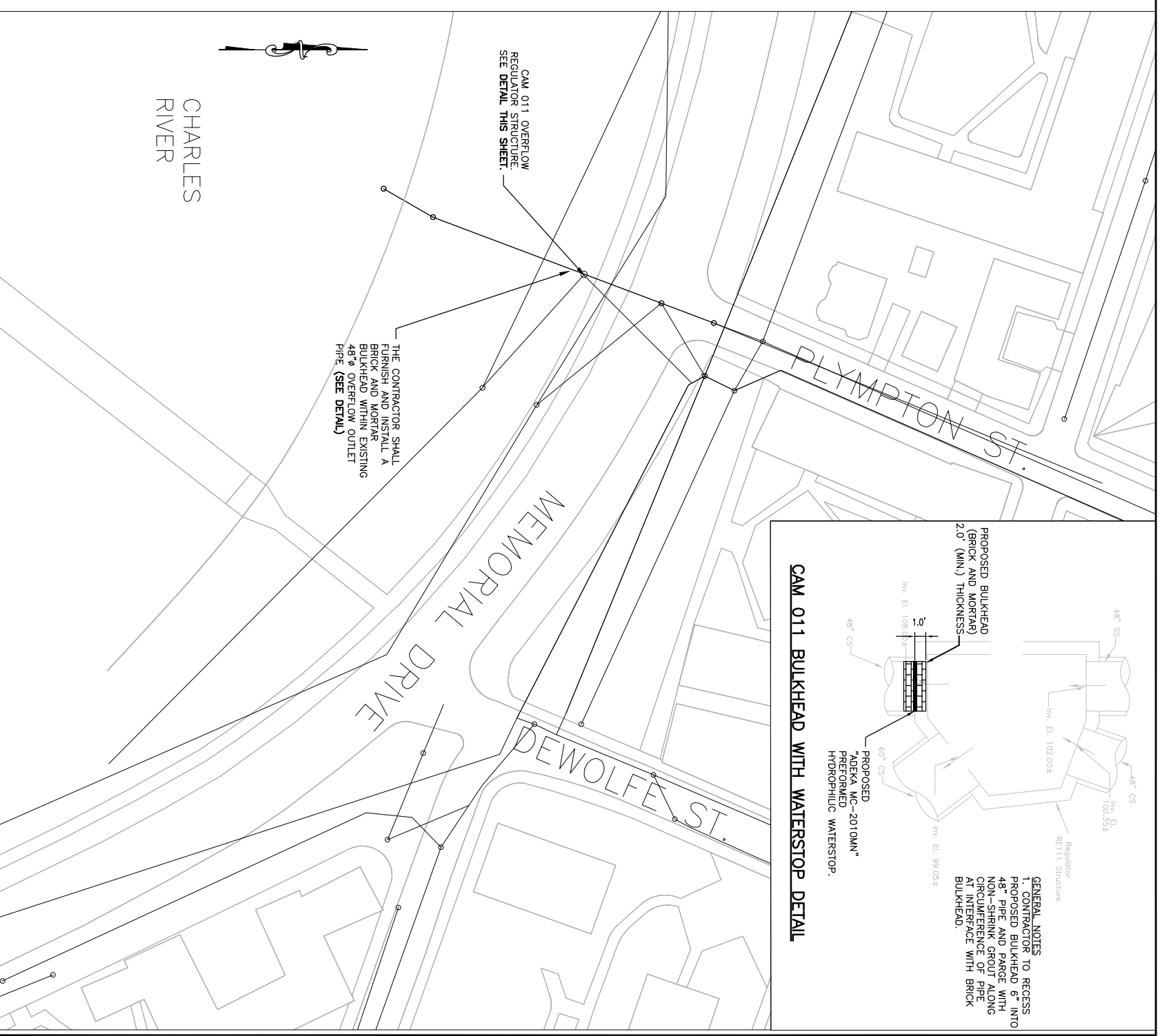
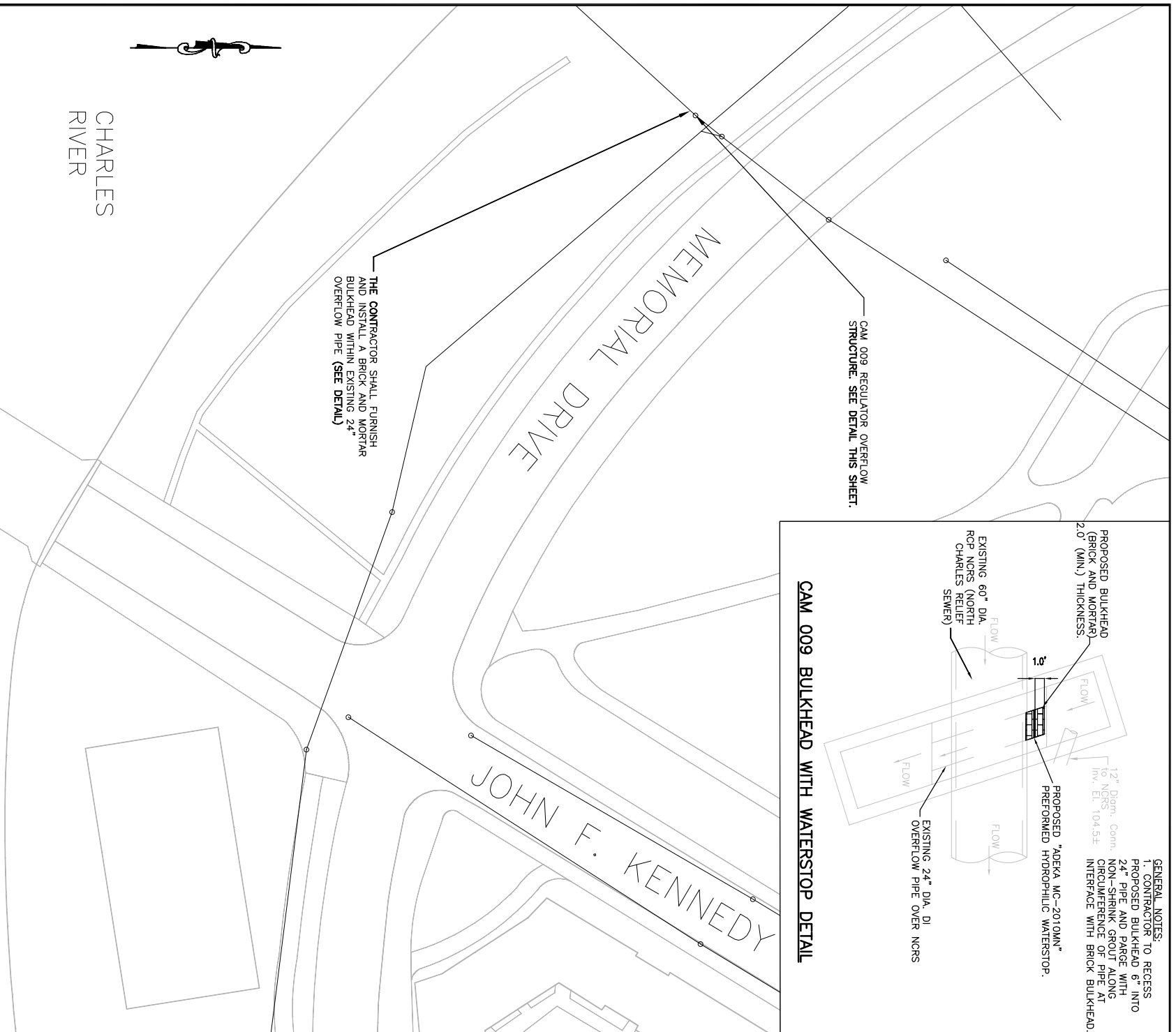
Scale	AS NOTED	1	BULKHEAD DETAILS ADDED TO DWG	09.11.07
Date	JUNE 2007			
Job No.	2220387			
Designed by	NJE			
Drawn by	NJE			
Checked by	DHC			
Approved by	JGS			



CITY OF CAMBRIDGE, MASSACHUSETTS
 REMEDIAL RECONSTRUCTION FY08 CONTRACT ADDENDUM NO. 2
 CHARLES RIVER FLOATABLES CONTROL
 CAM 009 AND CAM 011 REGULATOR OVERFLOW STRUCTURES
 PLAN


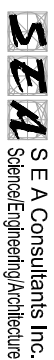


CAM 011



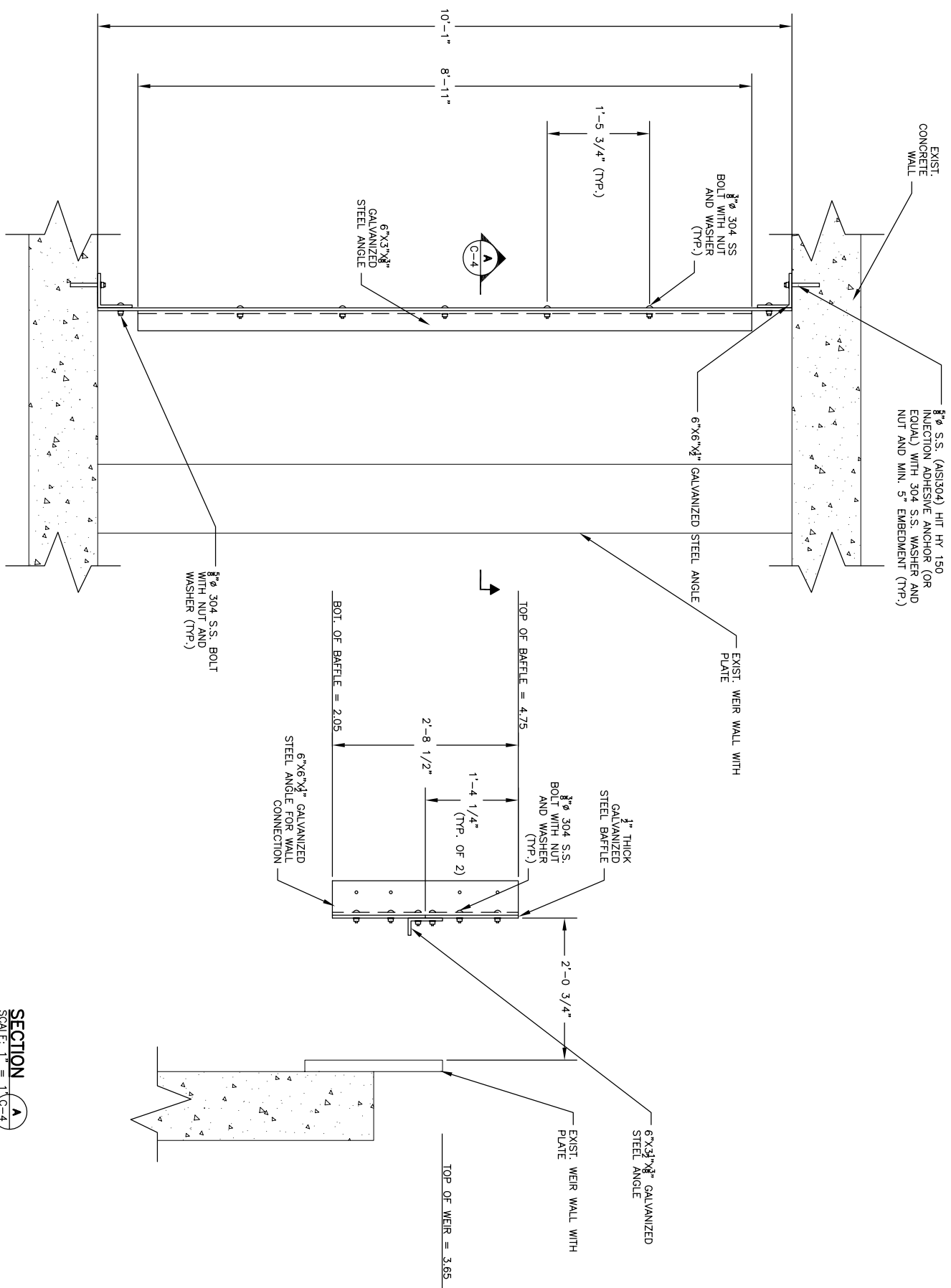
CAM 009 REGULATOR OVERFLOW STRUCTURE PLAN

CAM 011 REGULATOR OVERFLOW STRUCTURE PLAN

 MWH BOSTON MASSACHUSETTS	 S E A Consultants Inc. School of Engineering Architecture CONCORD, NEW HAMPSHIRE ROCKY HILL, CONNECTICUT CAMBRIDGE, MASSACHUSETTS	Scale	AS NOTED	1	BULKHEAD DETAILS ADDED TO DWG	09.11.07	CITY OF CAMBRIDGE, MASSACHUSETTS REMEDIAL RECONSTRUCTION FY08 CONTRACT ADDENDUM NO. 2 CHARLES RIVER FLOATABLES CONTROL CAM 009 AND CAM 011 REGULATOR OVERFLOW STRUCTURES PLAN	Sheet No.	C-5
		Date	JUNE 2007						
		Job No.	2220387						
		Designed by	NLE						
		Drawn by	NLE						
		Checked by	DHC						
		Approved by	JGS						



CAM 017



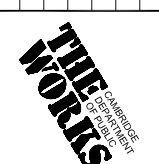
FLOATABLES BAFFLE DETAIL

SCALE: 1" = 1'

SECTION A-A
SCALE: 1" = 1'-0"

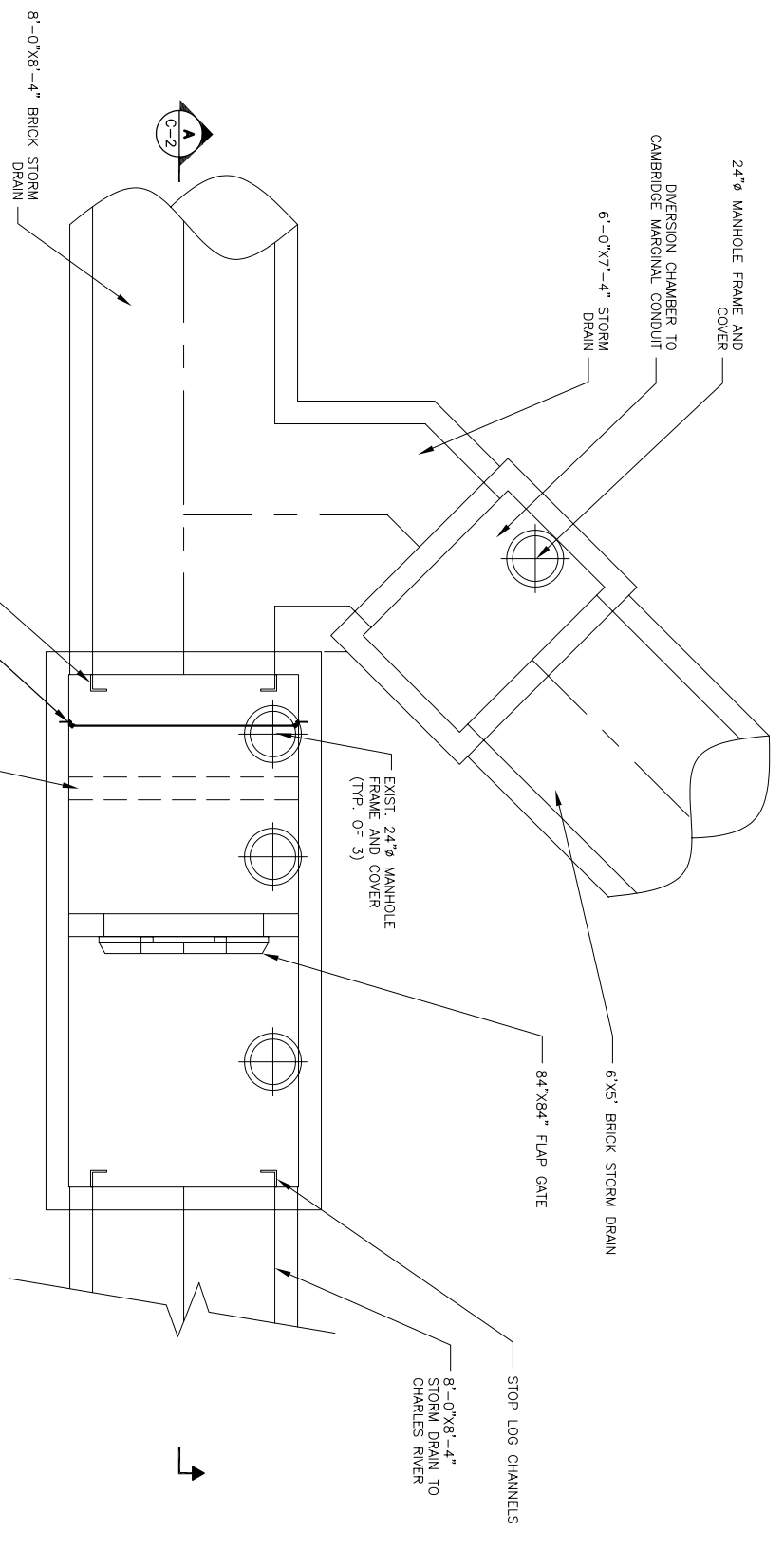
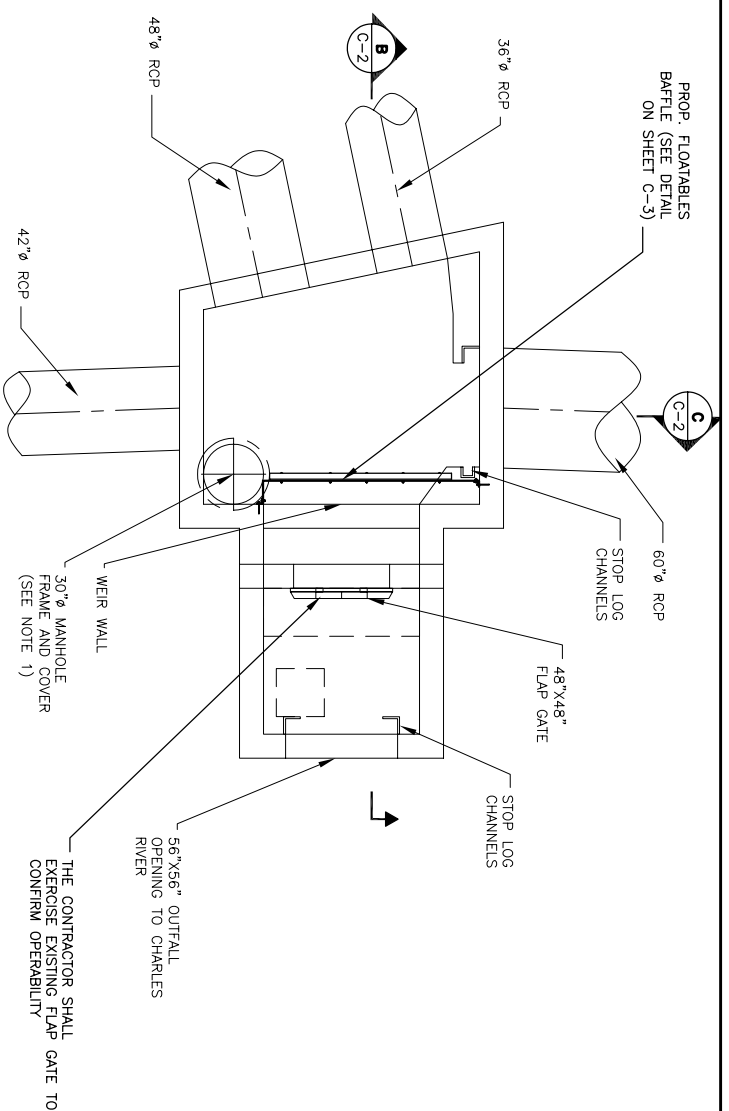


Scale	AS NOTED
Date	JUNE 2007
Job No.	2220367
Designed by	NJE
Drawn by	NJE
Checked by	DHC
Approved by	JGS



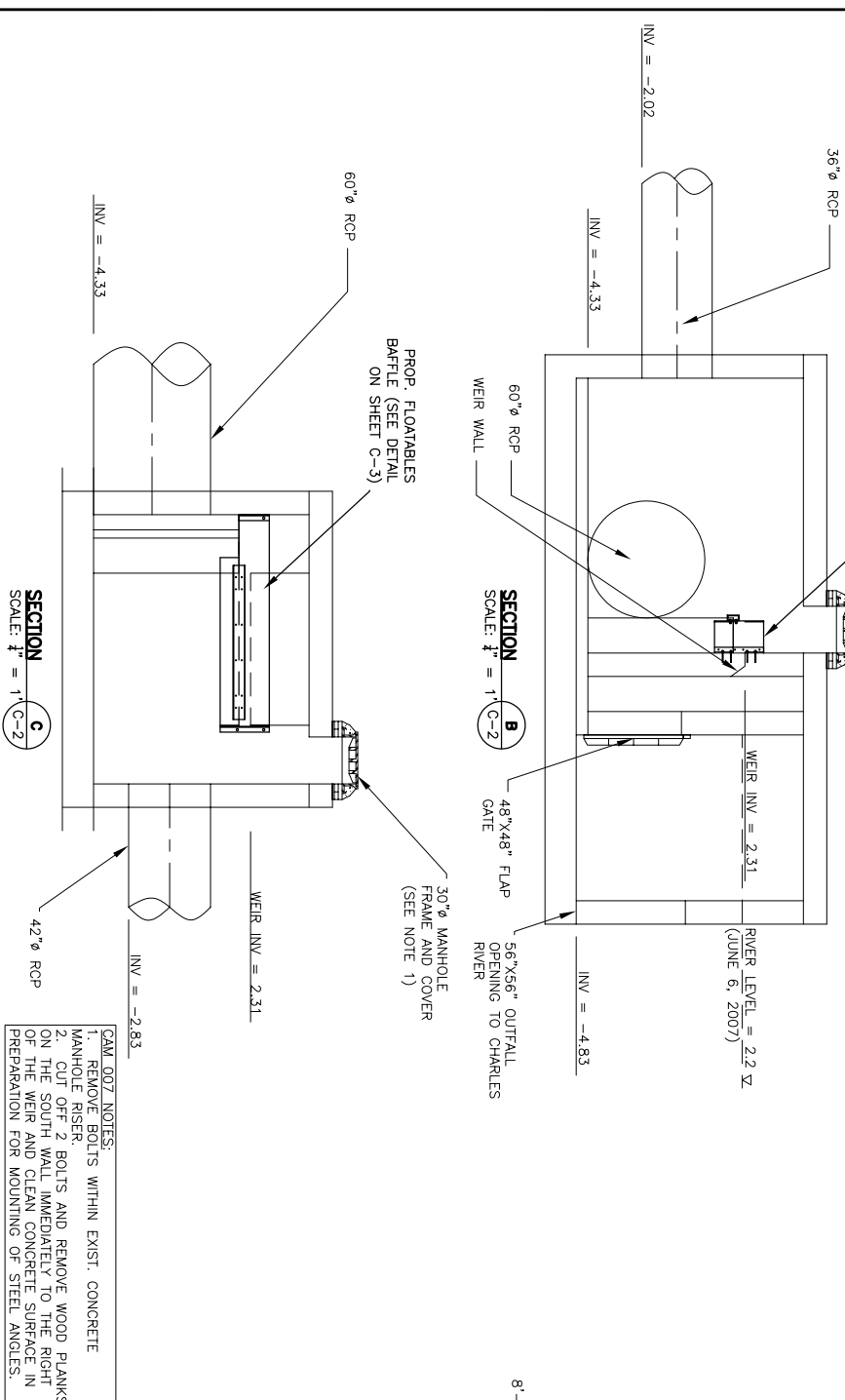
CITY OF CAMBRIDGE, MASSACHUSETTS
REMEDIAL RECONSTRUCTION FY08 CONTRACT ADDENDUM NO. 2
CHARLES RIVER FLOATABLES CONTROL
CAM017 REGULATOR OVERFLOW STRUCTURE
BAFFLE DETAIL

Sheet No.	C-4
File No.	



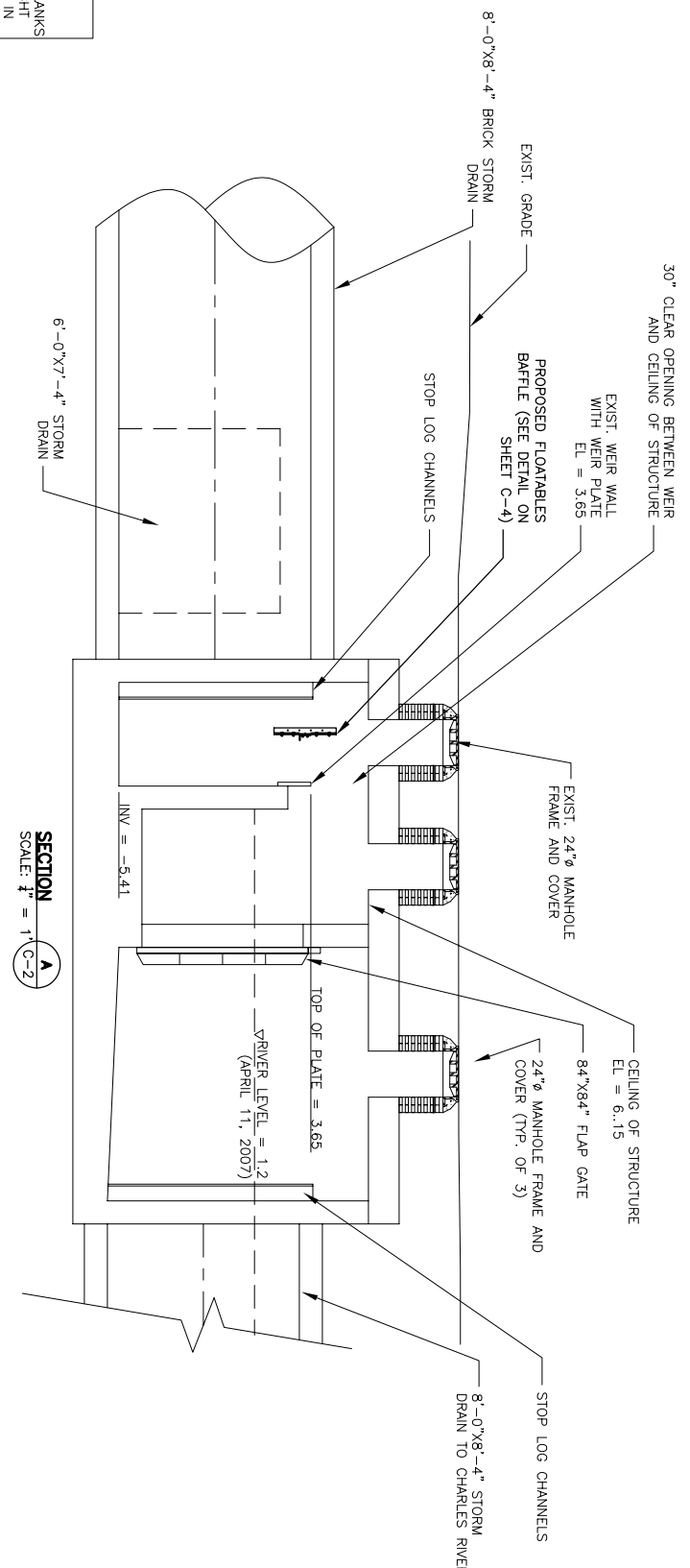
CAM 017 NOTES:

1. THE CONTRACTOR SHALL MAINTAIN AND PROTECT EXISTING MIRA FLOW METER AND CONDUITS IN EXISTING CAM017 STRUCTURE.
2. THE CONTRACTOR SHALL CLEAN CONCRETE SURFACES PREPARATION FOR MOUNTING OF STEEL ANGLES.



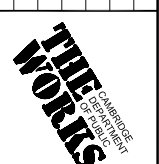
CAM 007 NOTES:

1. REMOVE BOLTS WITHIN EXIST. CONCRETE MANHOLE RISER.
2. CUT OFF 2 BOLTS AND REMOVE WOOD PLANKS ON THE SOUTH WALL IMMEDIATELY TO THE RIGHT OF THE WEIR AND CLEAN CONCRETE SURFACE IN PREPARATION FOR MOUNTING OF STEEL ANGLES.



Scale	AS NOTED
Date	JUNE 2007
Job No.	2220367
Designed by	NJE
Drawn by	NJE
Checked by	DHC
Approved by	JGS

Description	No.	Date
REVISIONS		



CITY OF CAMBRIDGE, MASSACHUSETTS

REMEDIAL RECONSTRUCTION FY08 CONTRACT ADDENDUM NO. 2

CHARLES RIVER FLOATABLES CONTROL

REGULATOR OVERFLOW STRUCTURES

PLANS AND SECTIONS

Sheet No.

C-2

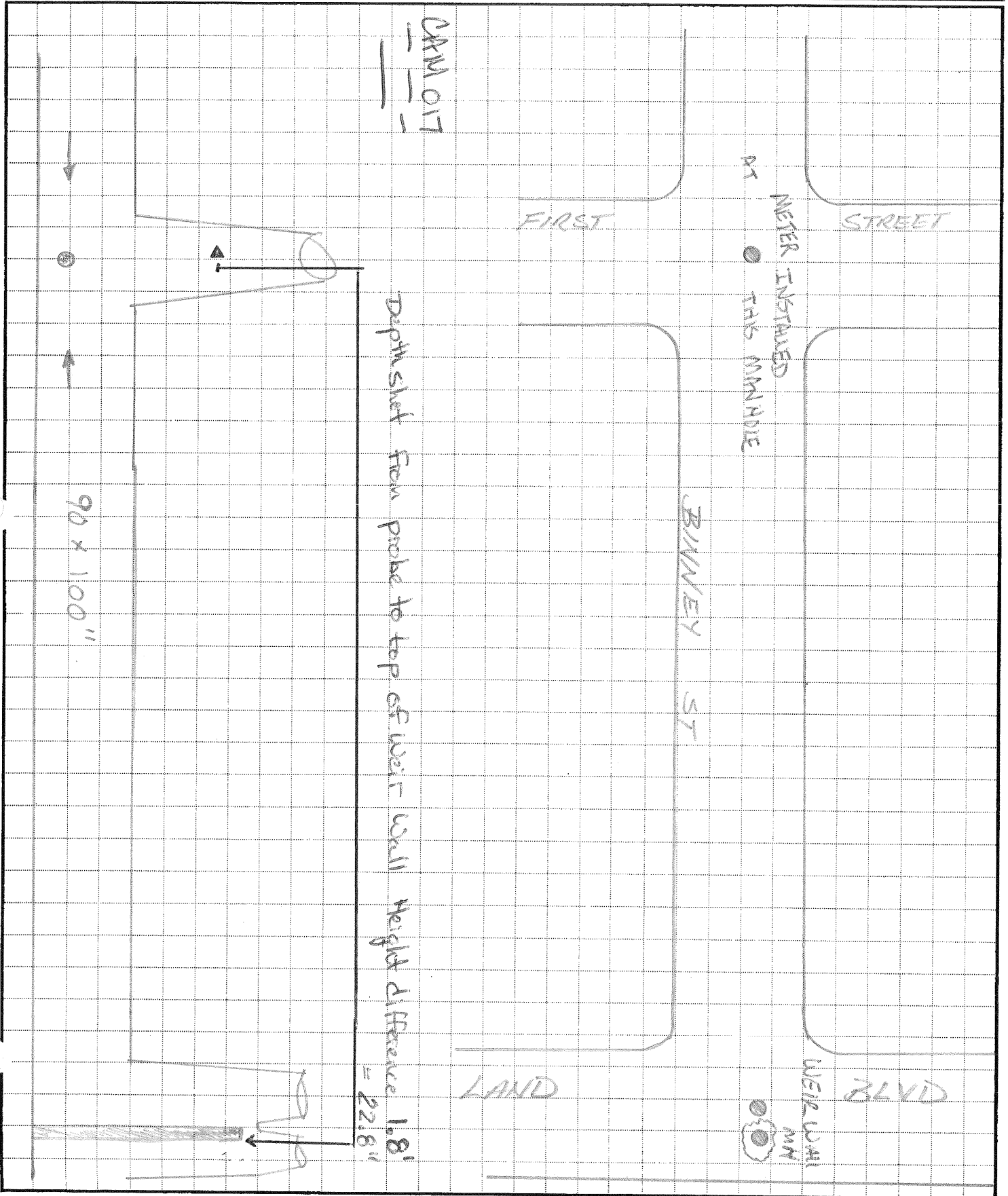
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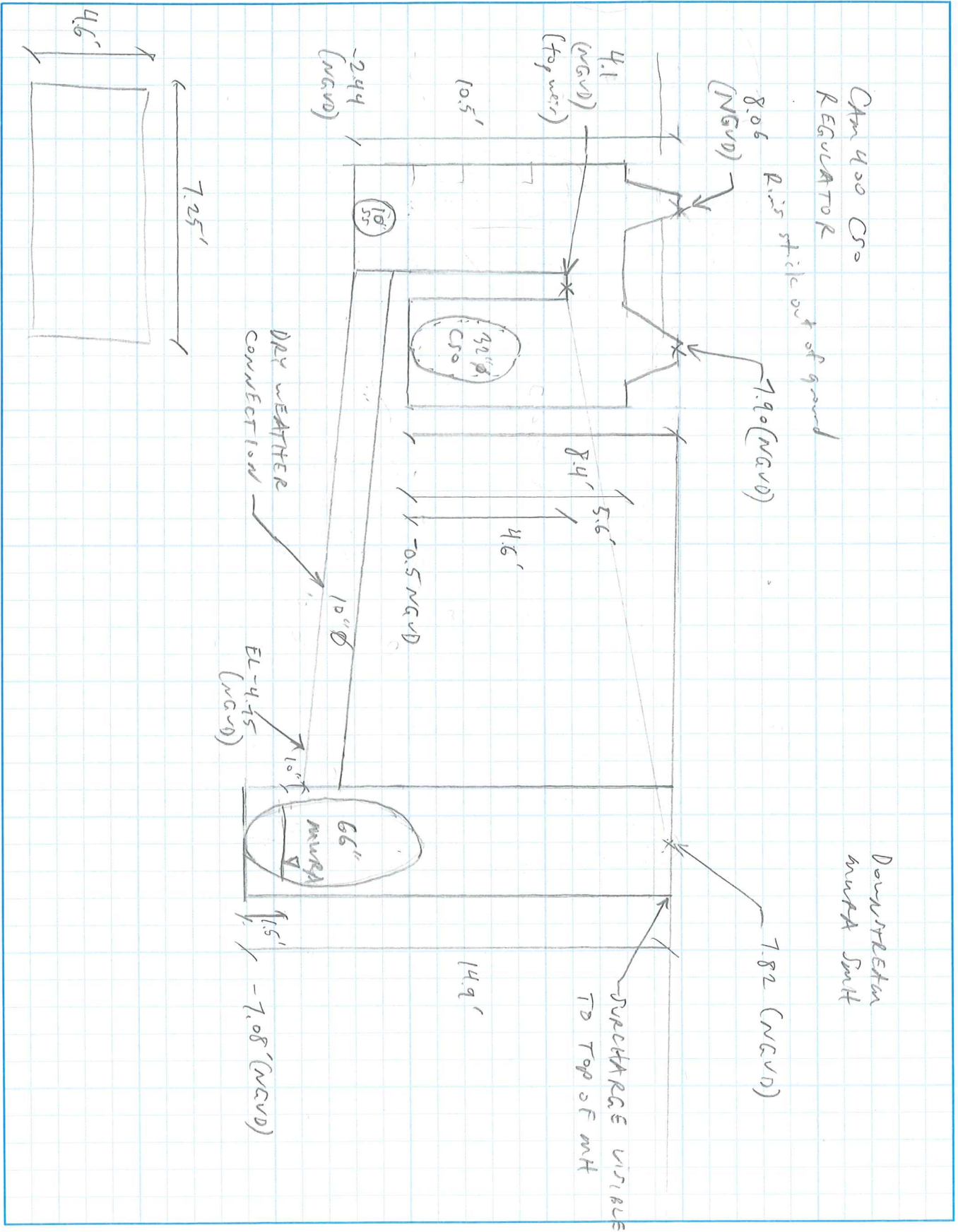
OFFICE OF THE CITY ENGINEER
CAMBRIDGE, MASSACHUSETTS

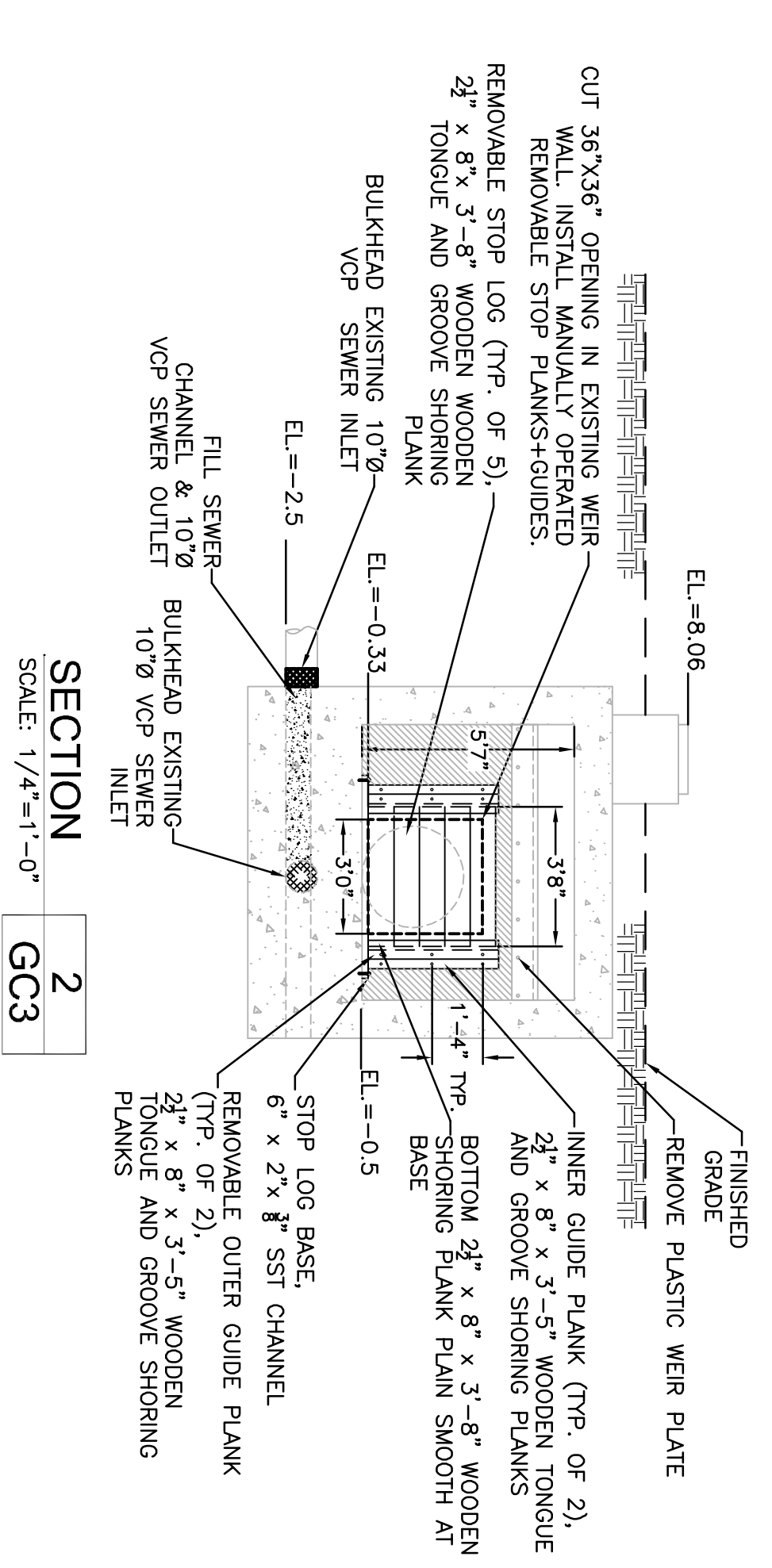
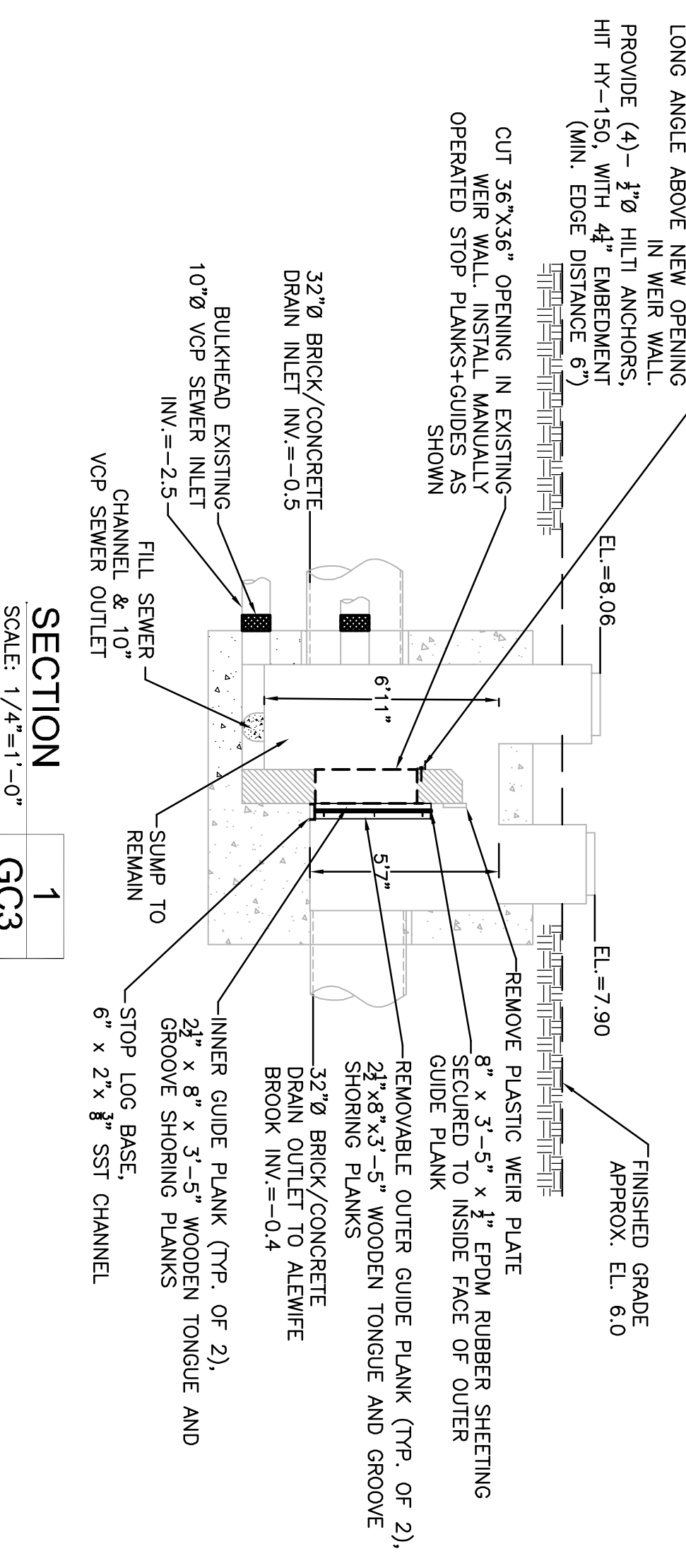
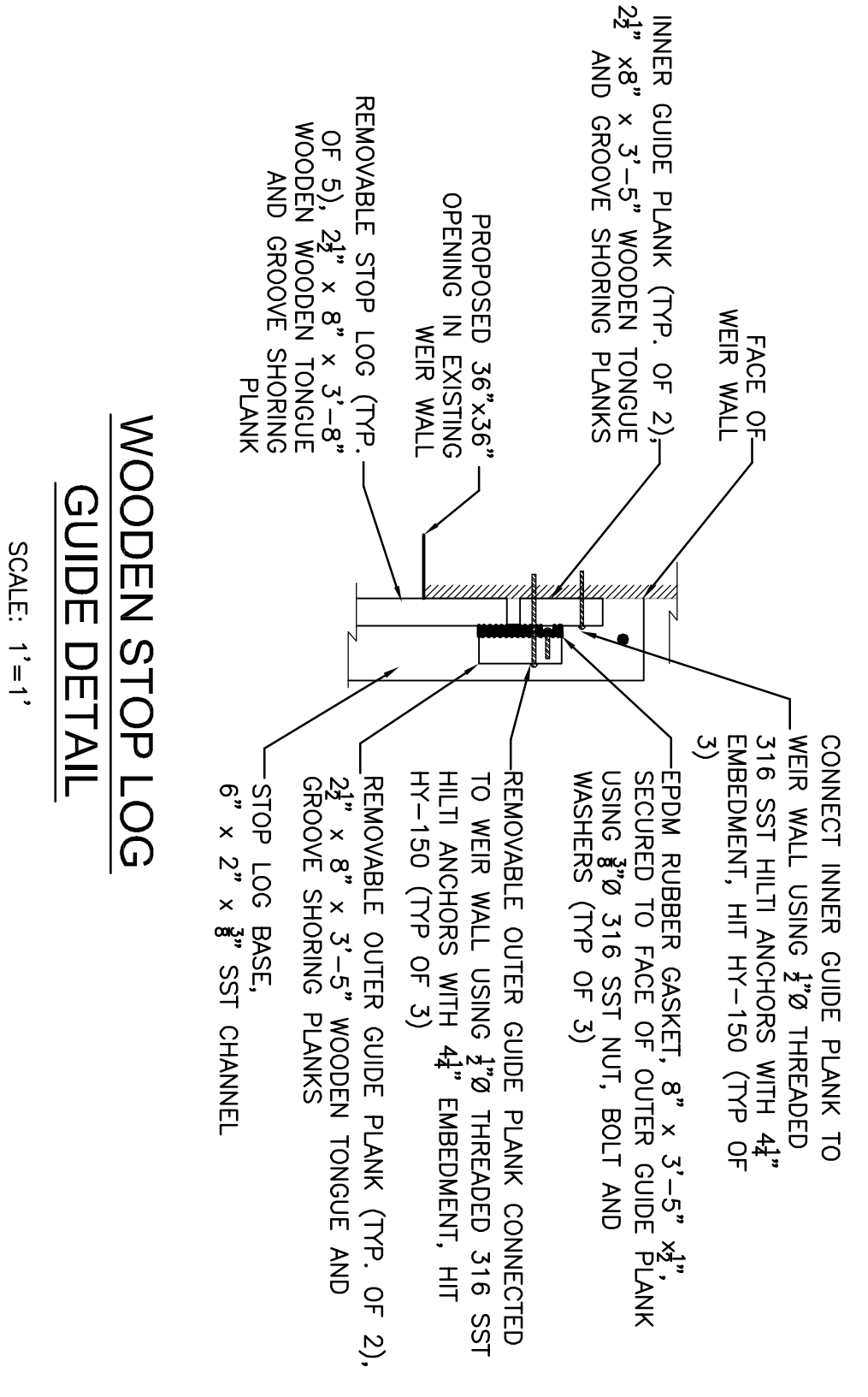
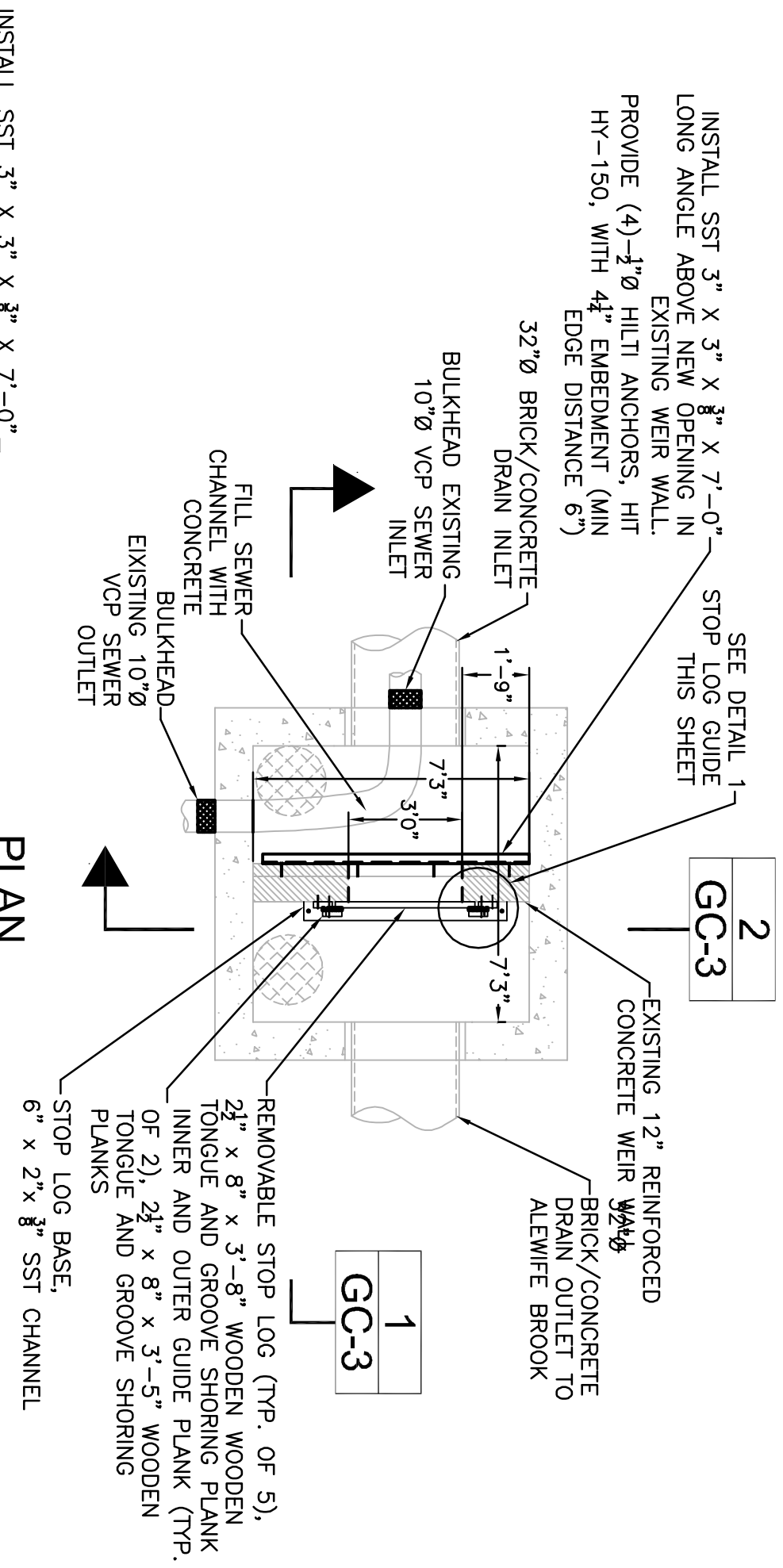
JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____



CAM 400

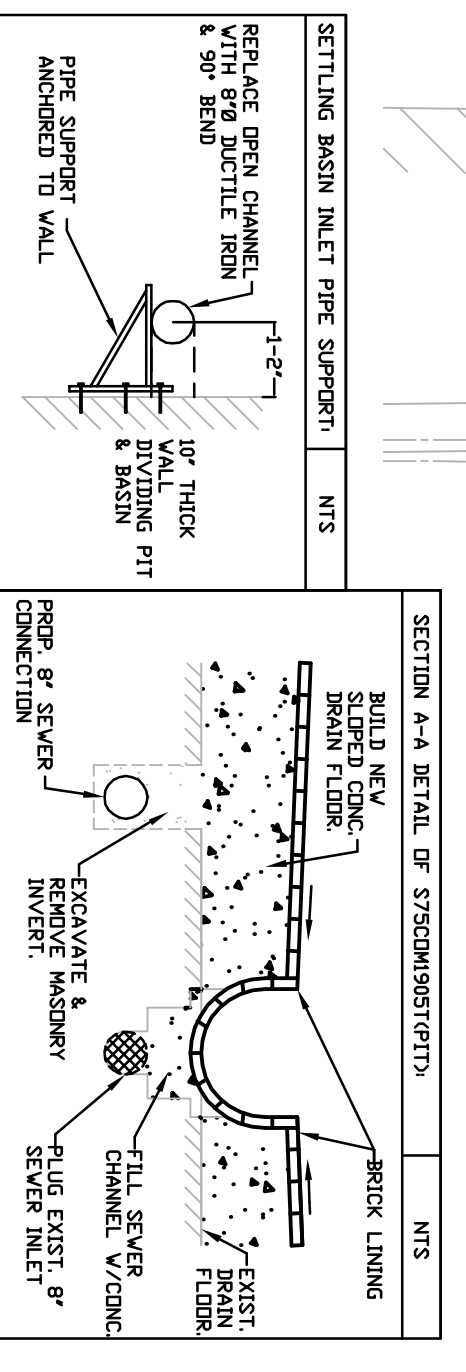
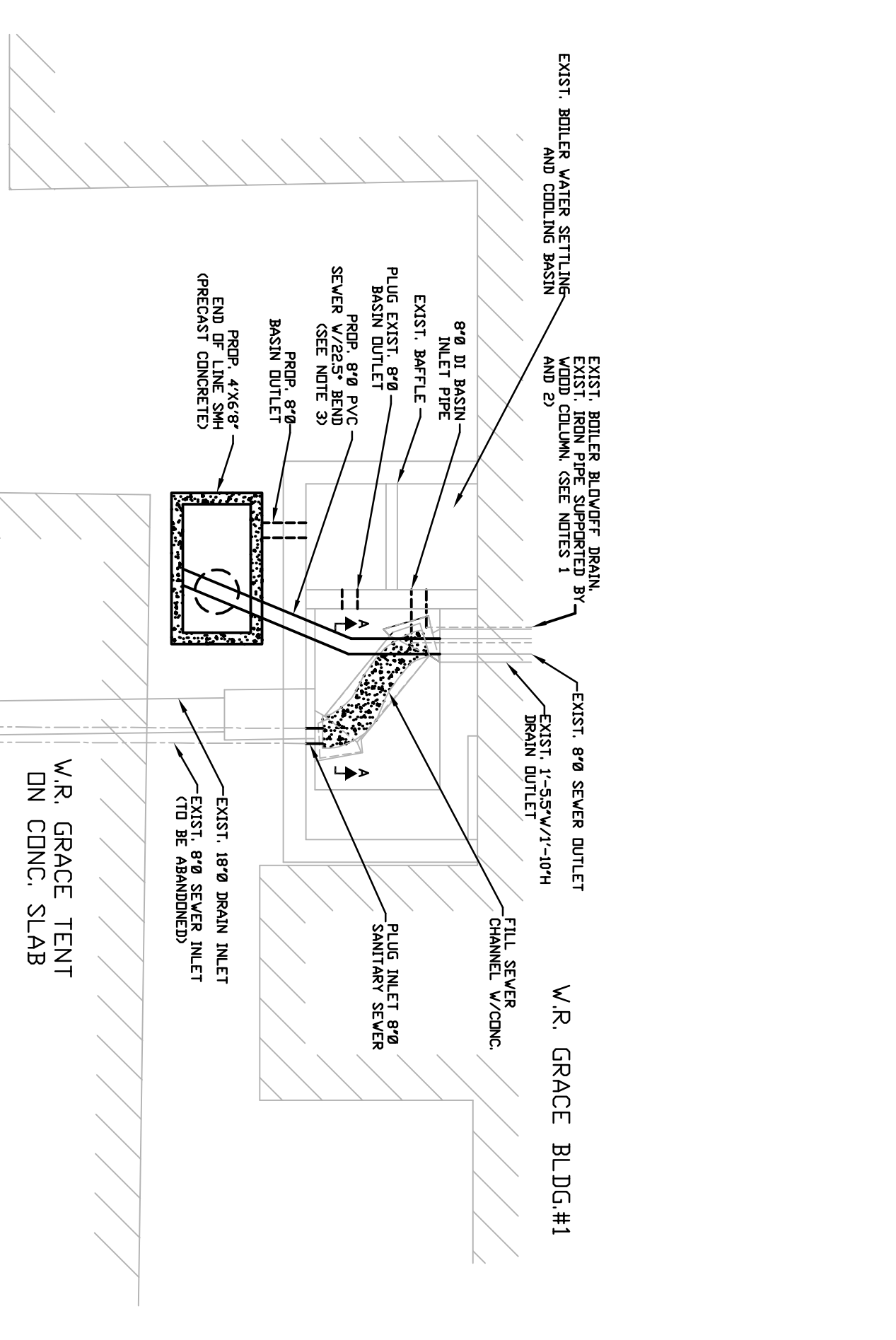
weir @ 400
regulator





**CAM400 REGULATOR STRUCTURE DETAIL
REGULATOR STRUCTURE TO BE CONVERTED TO DRAIN
MANHOLE WITH SUMP AND ISOLATION STOP PLANKS**

SCALE: 1"=4'



S75COM1905T (PIT) SEPARATION DETAIL
N.T.S.

S E A
SEA CONSULTANTS INC.
Sustainable Infrastructure
CAMBRIDGE MASSACHUSETTS CONCORD NEW HAMPSHIRE
ROCKY HILL CONNECTICUT AUGUSTA MAINE
FRAMINGHAM MASSACHUSETTS

MWH
BOSTON MASSACHUSETTS

Scale	AS NOTED
Date	NOVEMBER 19, 2009
Job No.	1006250
Designed by	AMF
Drawn by	AMF
Checked by	DHC
Approved by	WCP

THE WORKS
CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

CITY OF CAMBRIDGE, MA
ALEWEE BROOK FLOATABLES CONTROL (CONTRACT 4) AND
CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13)
GENERAL CIVIL - STRUCTURE DETAILS
CONTINUED

ISSUED FOR
BID

CAM 401A

(1) 12" GATE VALVE
(2) 12" DRESSER COUPLINGS

1" WATER SERVICE
RELOCATION TO HSE #140
(2) 22.5" BENDS (V)

(1) 12" DRESSER COUPLING
C.I.P. CONCRETE CONNECTION TO EXISTING
PIPE SEE SHEET S-2 FOR DETAILS

12" Ø WATER MAIN
INSULATED FROM 45' BEND TO
22.5" BEND (V)

(1) 12" x 10" x 10" TEE
(1) 10" GATE VALVE
JUNCTION STRUCTURE
SEE SHEET M-4R FOR DETAILS

C.I.P. CONCRETE
COLLAR FOR FRP CONNECTION
TO JUNCTION STRUCTURE

(2) 45' BENDS (V)
SINGLE CATCH BASIN
STA. 26+17
WITH 12" DI LATERAL
CONNECTED TO JUNCTION
STRUCTURE

EXISTING
TRACK REMOVED
BY MBCR

DIRECT BURIED
48" FIBERGLASS
PIPE (FRP)
DRAIN

CROSSING REPLACED
BY MBCR

12" Ø WATER MAIN
WITHIN 16" Ø DI SLEEVE OVER
18" Ø DI SLEEVE (FOR FUTURE USE)

(1) 12" DRESSER
(2) 45' BENDS

(2) 12" DRESSERS

8" DMH STA 24+61
RIM = 13.21
INV. IN (48" FRP) = 3.50
INV. IN (15" RCP) = 6.00
INV. OUT (48" FRP) = 3.85

(1) 45' BEND

EXISTING STRUCTURE
INV. OUT (48" FRP) = 3.54

(1) 48" Ø 45' DI BEND
(2) 45' BENDS

4" GAS SERVICE
RELOCATION

6" PVC SEWER SERVICE
RELOCATION

CAM 401A FLOATABLES
CONTROL STRUCTURE
SEE SHEETS M-4R &
M-5R FOR DETAILS

GATE VALVE
DRESSERS

10" DI WATER MAIN
RELOCATION -
INSULATED FROM
TEE TO 22.5" BEND

(2) 22.5"
BENDS
C.I.P. CONNECTION TO
EXISTING STRUCTURE
SEE SHEET S-2 FOR DETAIL

16" Ø FORCE MAIN DISCHARGE
GMU BULKHEAD

4' Ø DMH WITH 6' DEEP SUMP
STA. 26+28
WITH 12" DI LATERALS AND
3'X3'X3' INLET BOX
(2) 90° BENDS
INV = 7.87

SEE SHEET C-12 FOR
CROSS SECTION DETAIL
16" Ø FORCE MAIN
WITHIN 24" Ø DI
SLEEVE

(2) 48" FRP
COLLARS

(1) 45' BEND

EXISTING GRATE REPLACED
WITH CASCADE GRATE.
EXISTING HOOD REPLACED
WITH NEENAH L205 BOSTON
STANDARD 10" SNOUT.

EXISTING SMH - 2019
NEW 8" FLAP VALVE
INSTALLED

EXISTING GRA
REPLACED W
CASCADE GR

25+00

26+00

27+00

28+00

29+00

30+00

31+00

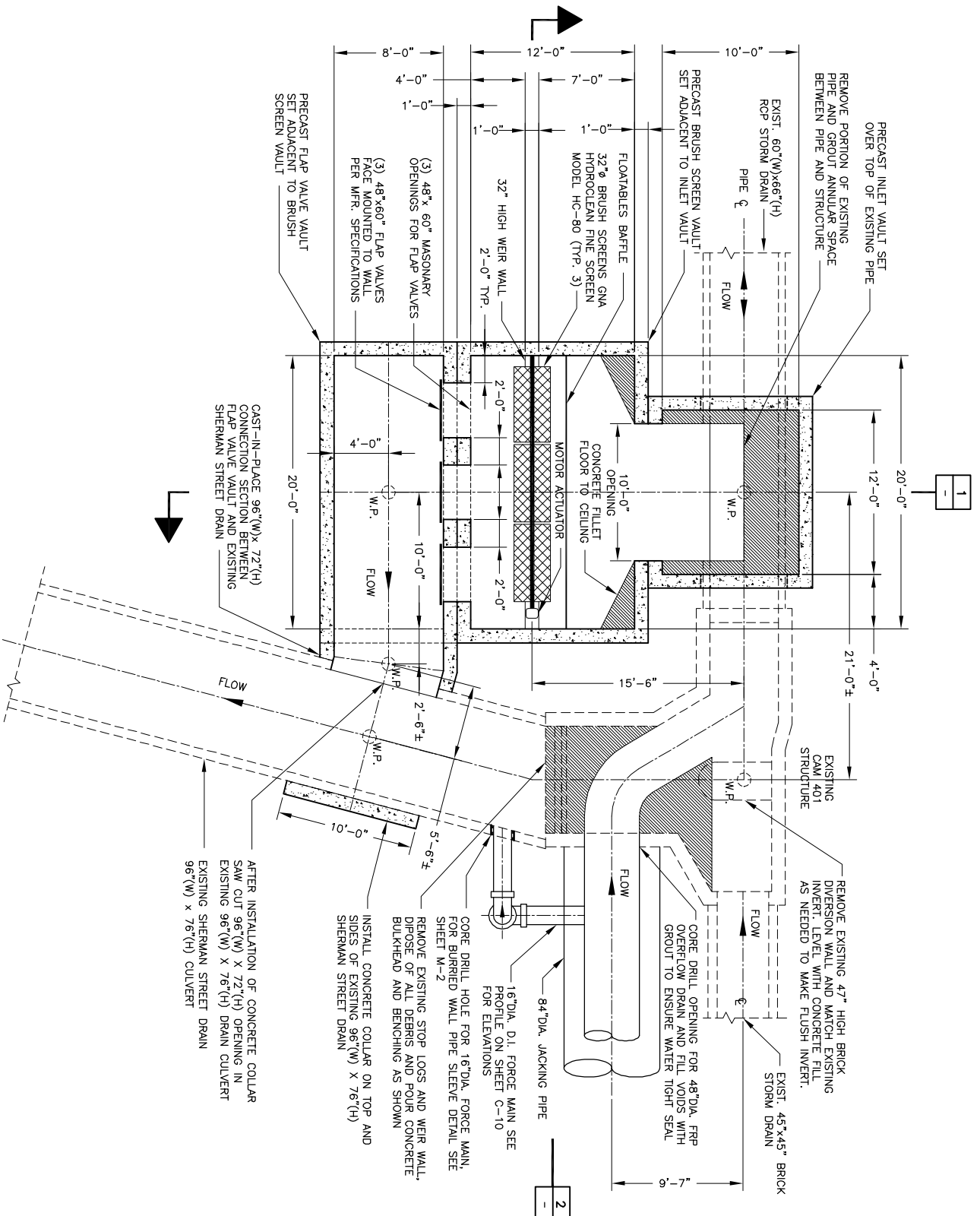
32+00

33+00

ST

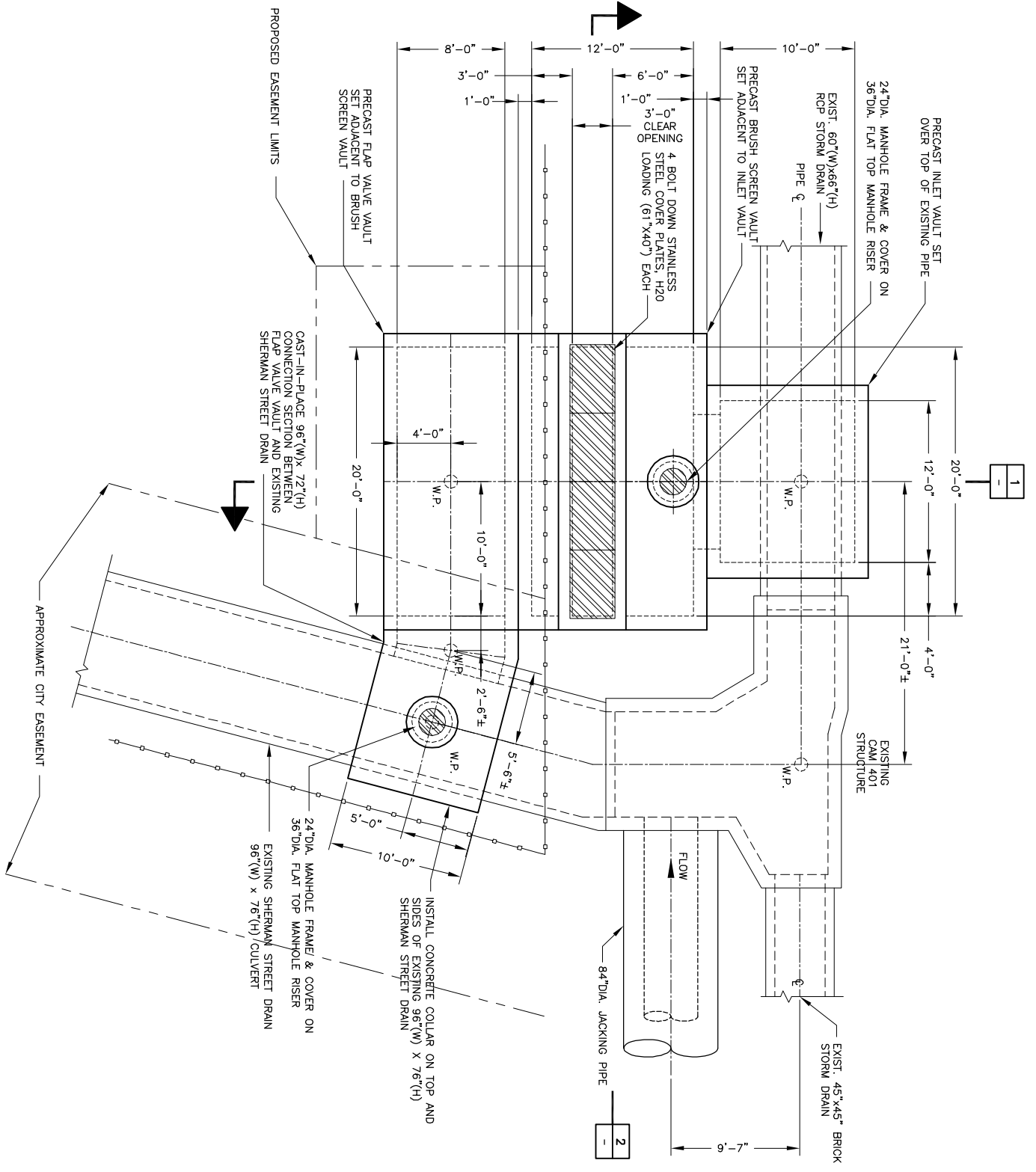
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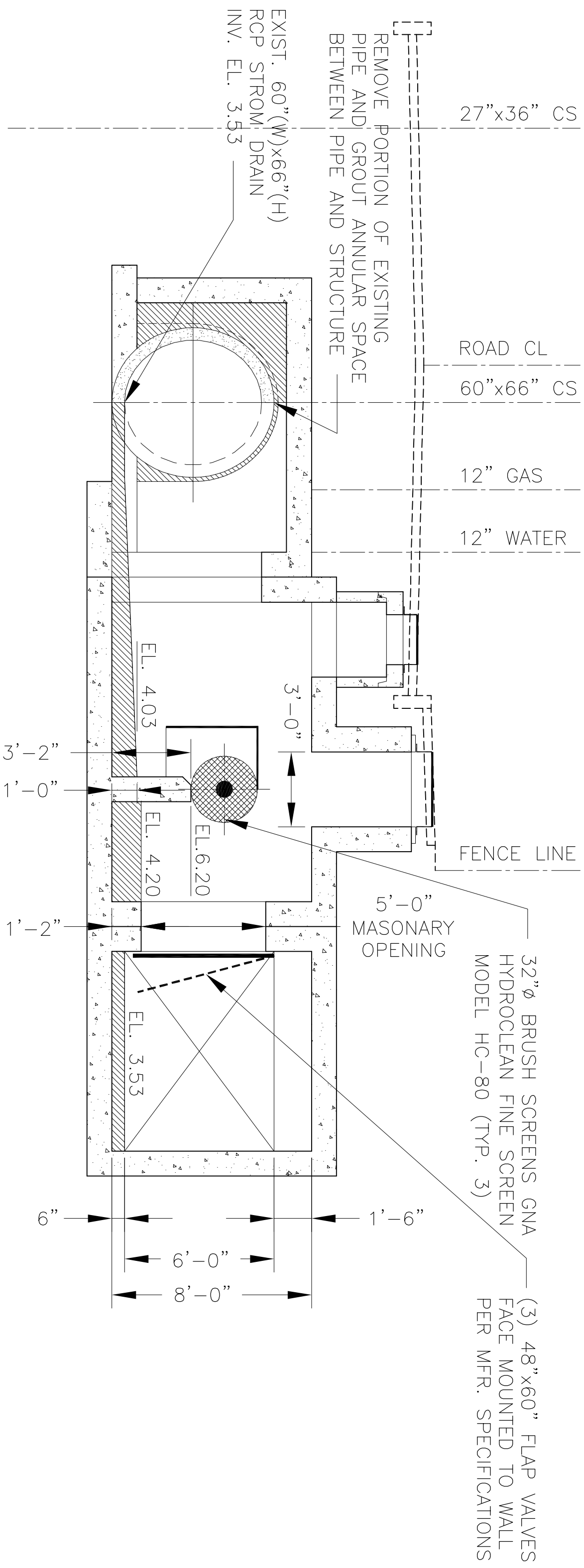
LOWER LEVEL-PLAN

FLOATABLE CONTROL STRUCTURE (CAM401)

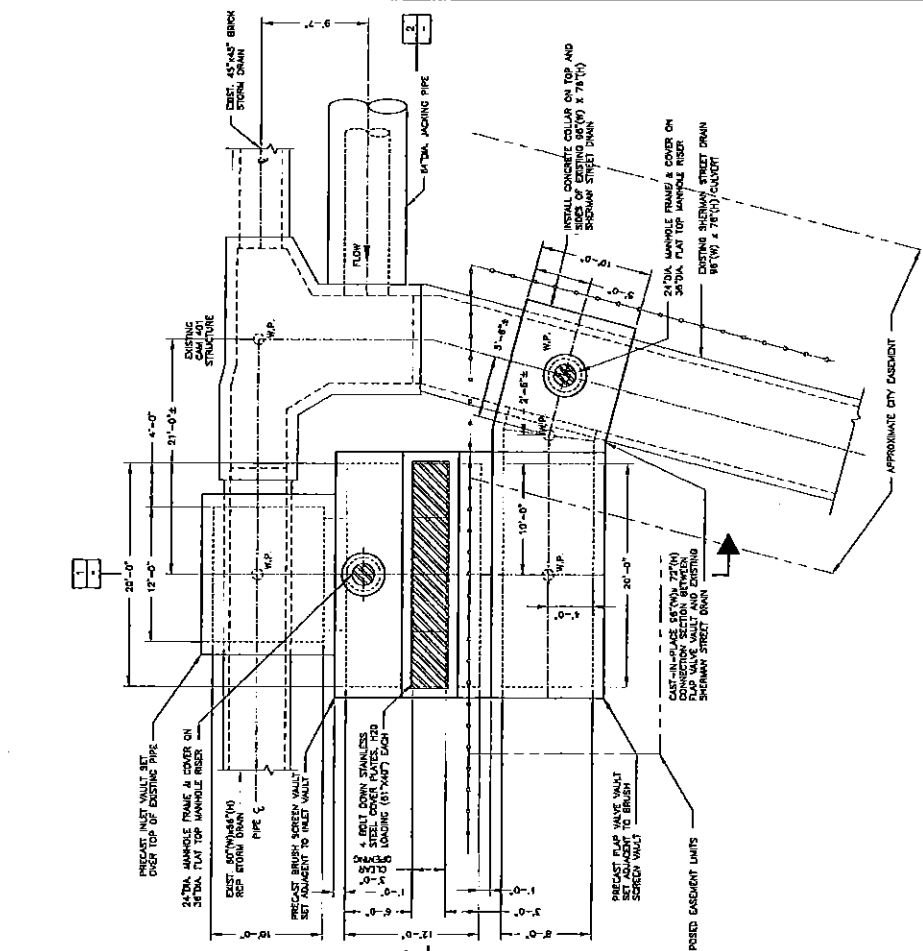


ROOF LEVEL-PLAN

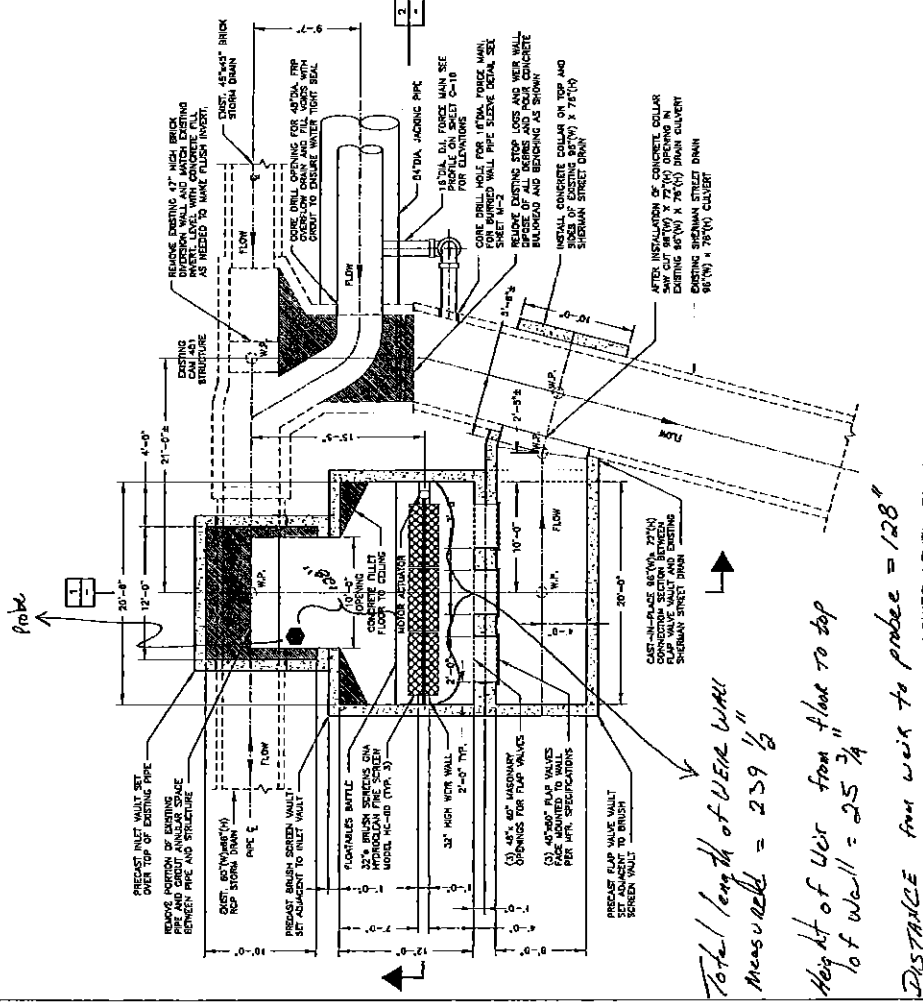
FLOATABLE CONTROL STRUCTURE (CAM401)







ROOF LEVEL-PLAN
 FLOATABLE CONTROL STRUCTURE (CAM401)



LOWER LEVEL-PLAN
 FLOATABLE CONTROL STRUCTURE (CAM401)

Total length of WEIR WALL measured = 259 1/2"

Height of Weir from floor to top of wall = 25 3/4"

DISTANCE from weir to probe = 128"

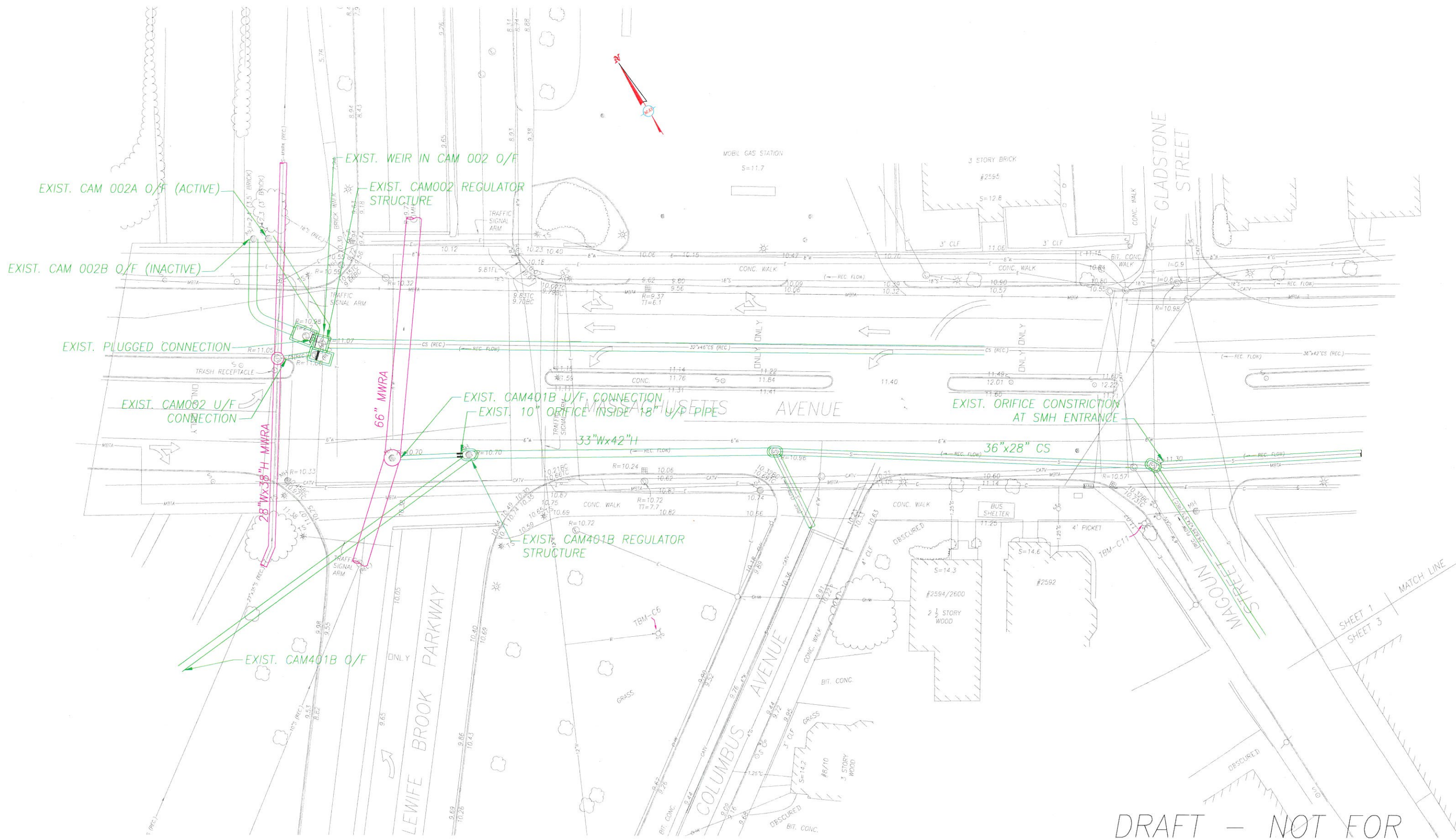
OFFSET From probe to top of weir wall = 17.5"

- SET AS Rectangular Weir.

SEA Consultants Inc. Science/Engineering/Architecture		MWH CONSULTING ENGINEERS		CITY OF CAMBRIDGE, MASSACHUSETTS BELLEFONTE / SHERMAN ST. Drainage Improvements		DRAWING NO. M-4R	
DATE	3/11/2008	DATE	07/20/08	DATE	08/01/08	DATE	08/01/08
DESIGNED BY		CHECKED BY		APPROVED BY		DATE	

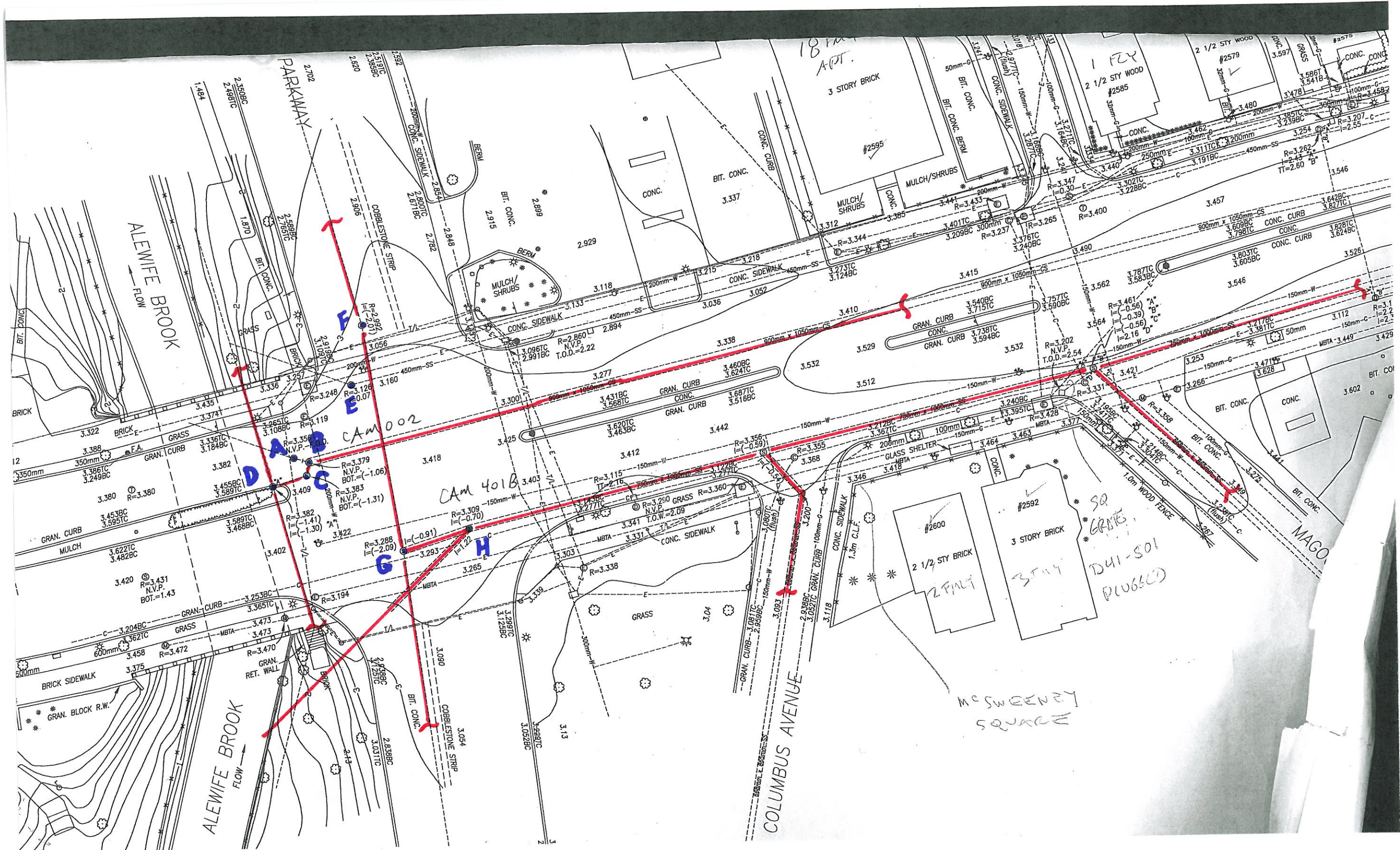
CAM 401 A

CAM 401B



EXISTING CONDITIONS PLAN

DRAFT — NOT FOR CONSTRUCTION



ALEWIFE BROOK
FLOW

ALEWIFE BROOK
FLOW

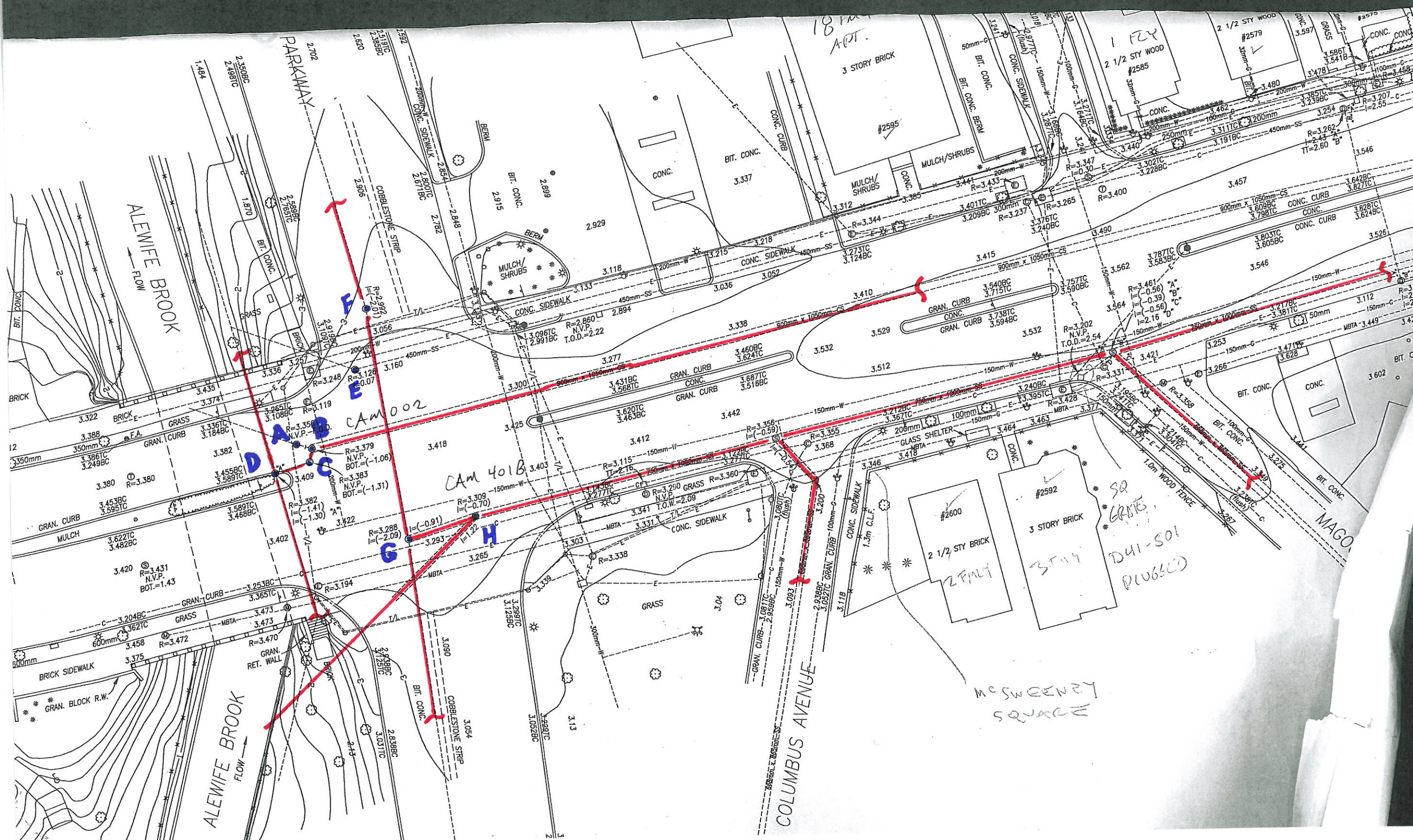
COLUMBUS AVENUE

MCSWEENEY SQUARE

CAM 401B

CAM 002

D41-S01
PLUGGED

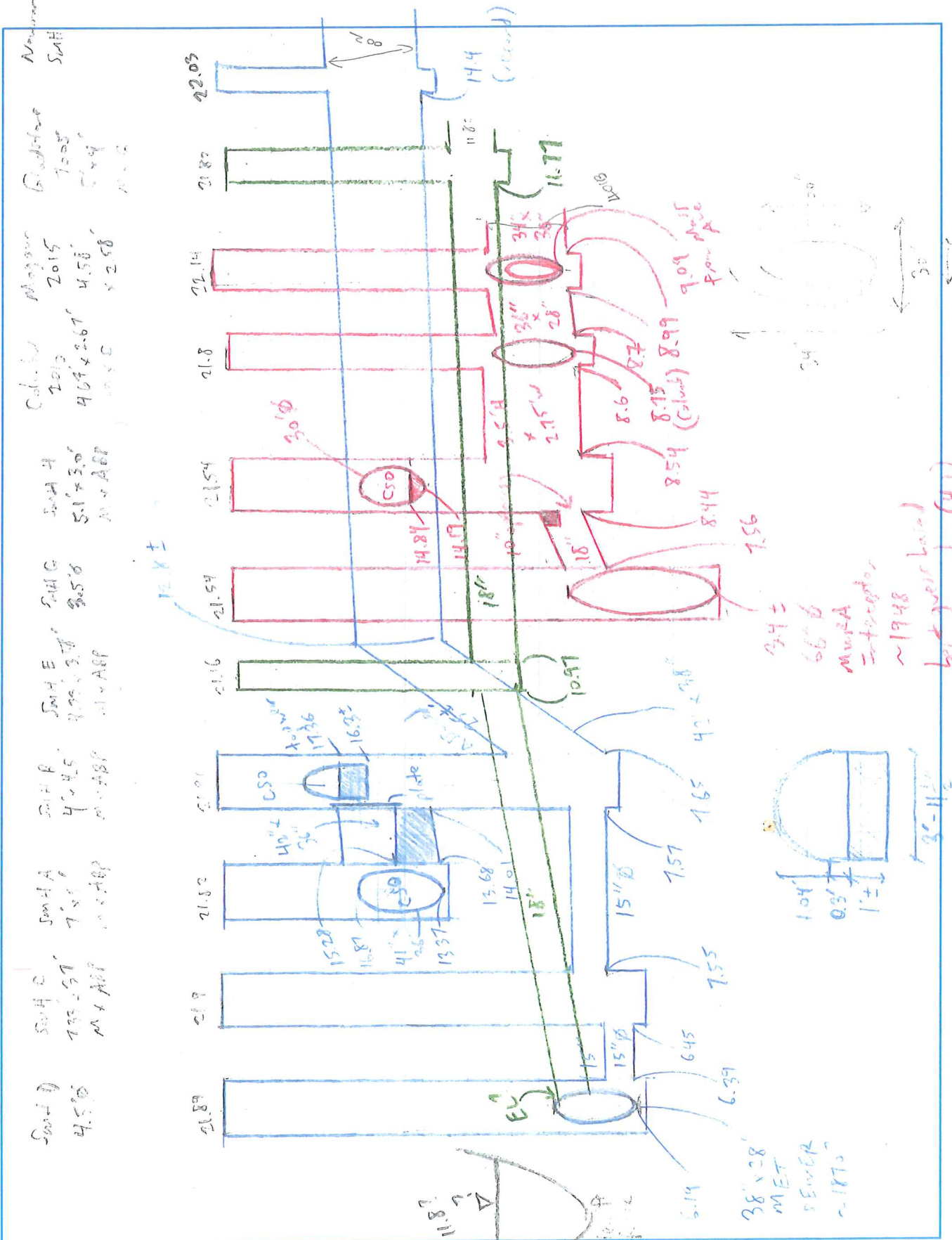


Summary of Field Findings

Jan-Feb 2009



By _____ Date _____ Client _____ Sheet _____ of _____
 Chkd. By _____ Description **CAM 4DIB, CAM 002A/B** Job No. _____



Contract 4
CCB down

Motor restriction

MURA Interrupter
~1948
but never failed
or design def. (41)
& averaged number

CS-66

38" x 28"
MET
SEWER
~1875



CAM 401B – Mass Ave & Magoun St sewer manhole. Orifice created due to break in by Mass Ave sewer at left. Mass Ave sewer reduces from 30"W x 41"H to 22"W x 30"H at manhole entrance



CAM 401B CSO Structure



CAM 401B - 10" Masonry orifice underflow



CAM 401B -Weir on 30" O/F



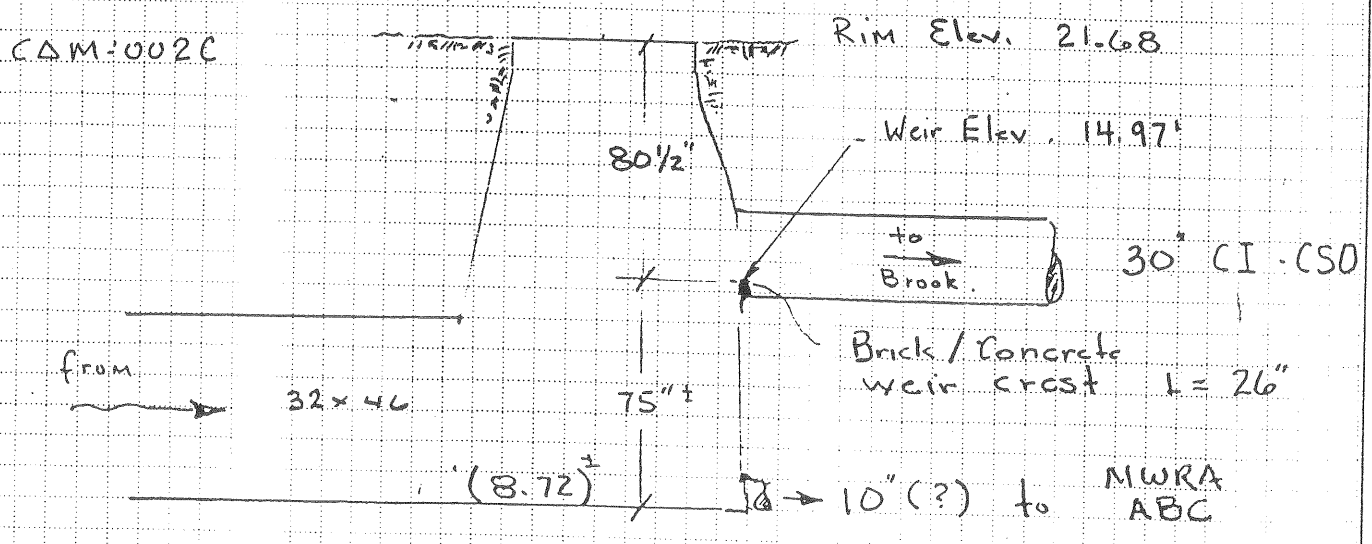
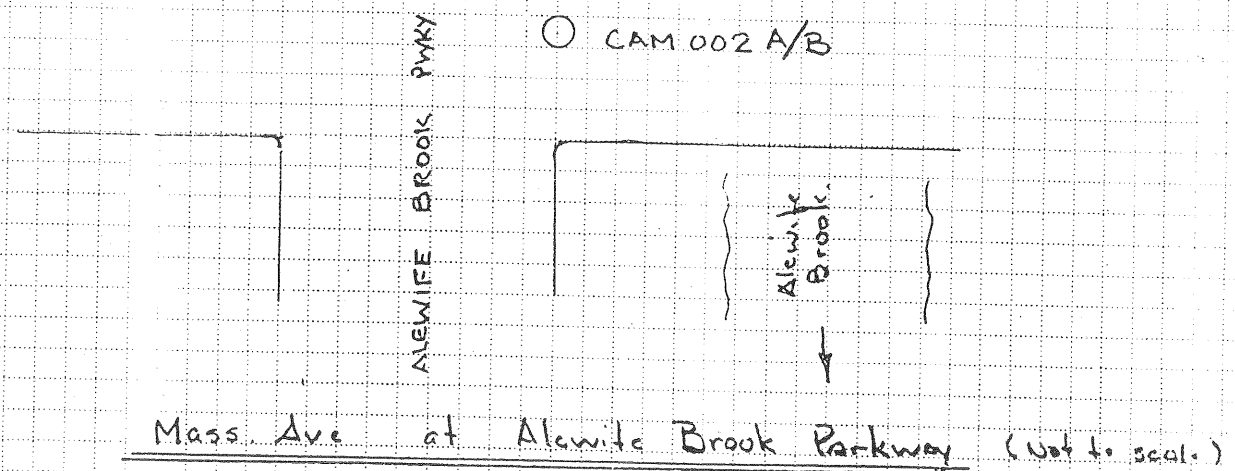
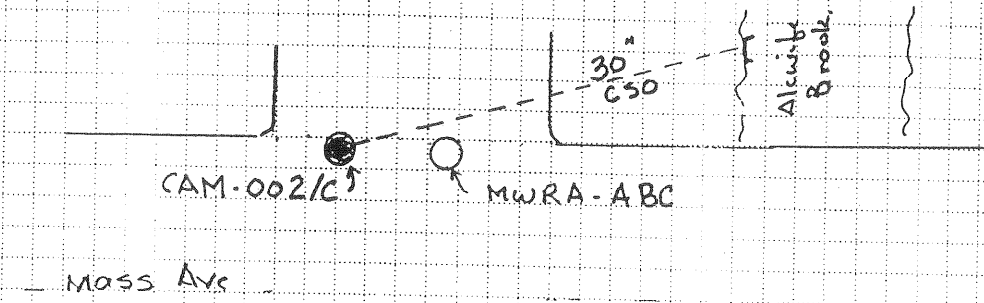
CAM 401B underflow – Looking upstream from junction with 66" MWRA Sewer into 18" pipe toward 401B regulator.
10" diameter masonry orifice visible at upstream end of pipe

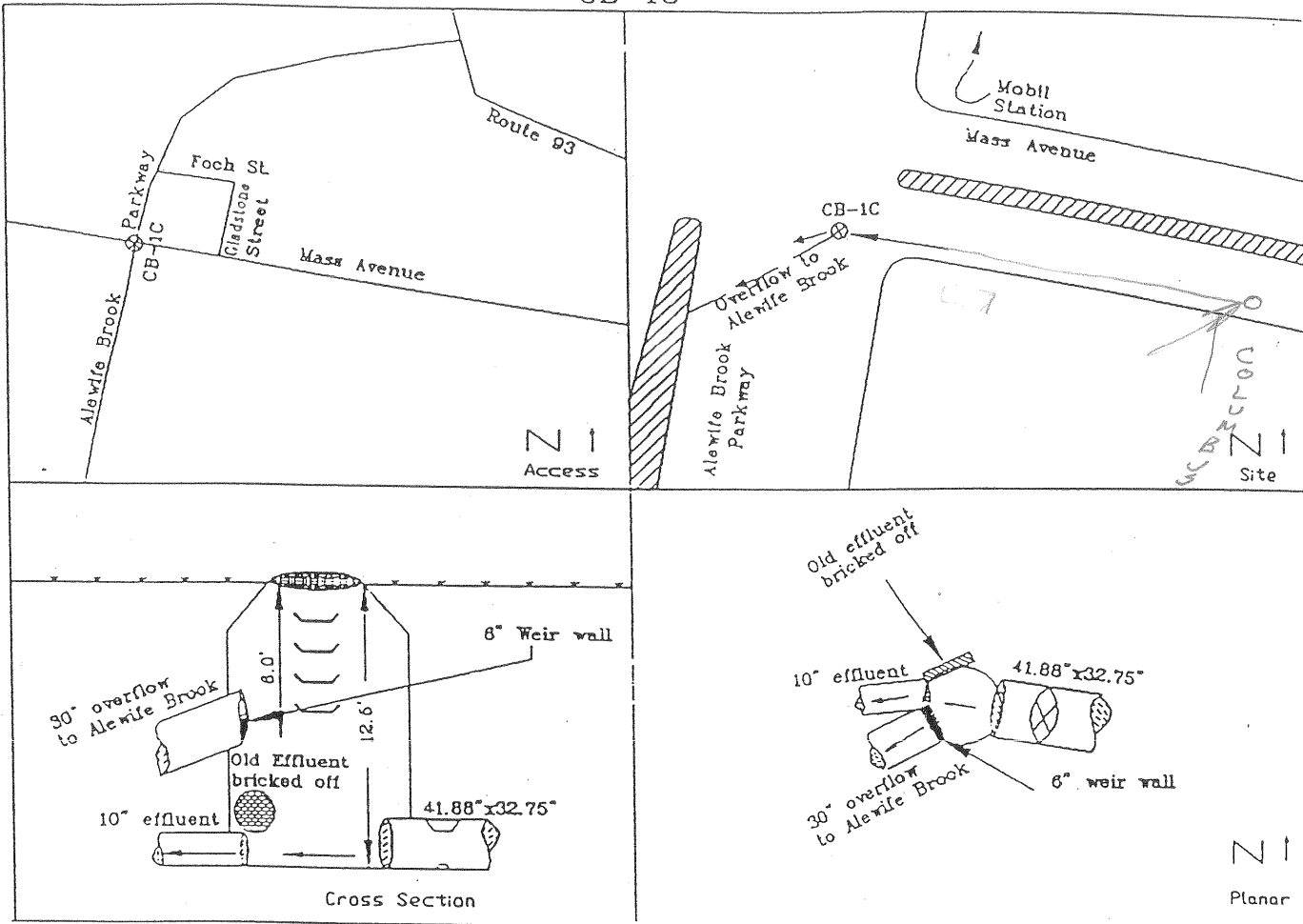
401B

Datum : CCB

CSD CAM-002/C DATA BASE

MWRA / CAMBRIDGE Rate Meter Location,
 Alewife Brook Parkway at Mass. Ave.





METERING SITE:		CB-1C	
Address	2596 Massachusetts Avenue		
Town:	Cambridge	Massachusetts	
Section:	-	Station:	-
Phone	(617) 492 - 2187	Access Pole#	1

METERING EQUIPMENT		
Instal Mount:	Special	
Monitor	Serial #	CPU Ver #
	5248	3.2
Ultrasonic	Serial #	Board Ver #
PO = 2.38"	2315	1.4
Velocity	Serial #	Board Ver #
	8079	3.9
Pressure Serial #:	1755	

INVESTIGATION			
Date:	08/09/93	Field Crew:	TM/SS
Pipe	Type:	Dimensions:	Shape:
	Brick	41.88 x 32.75	Odd
Hydraulics	Smooth hydraulics with some back-up in invert as flow exits through the 10" effluent. Peak velocity on left side of line looking upstream.		
	Surcharge height:	8'	Silt Level: 0.75
Upstream Manhole	Did not investigate.		
Downstream Manhole	Did not investigate.		

SAFETY:		Standard
M/H Depth:	12.5'	
M/H Condition:	Fair	
Gas Test:	Clear	
Traffic:	Heavy	
Detail Required:	Yes	

13 AUGUST, 04

W/THOM, CC

CAM-401-B

BOTTLE RESET

COLUMBUS / MASS AVE. MH rim = 21.84

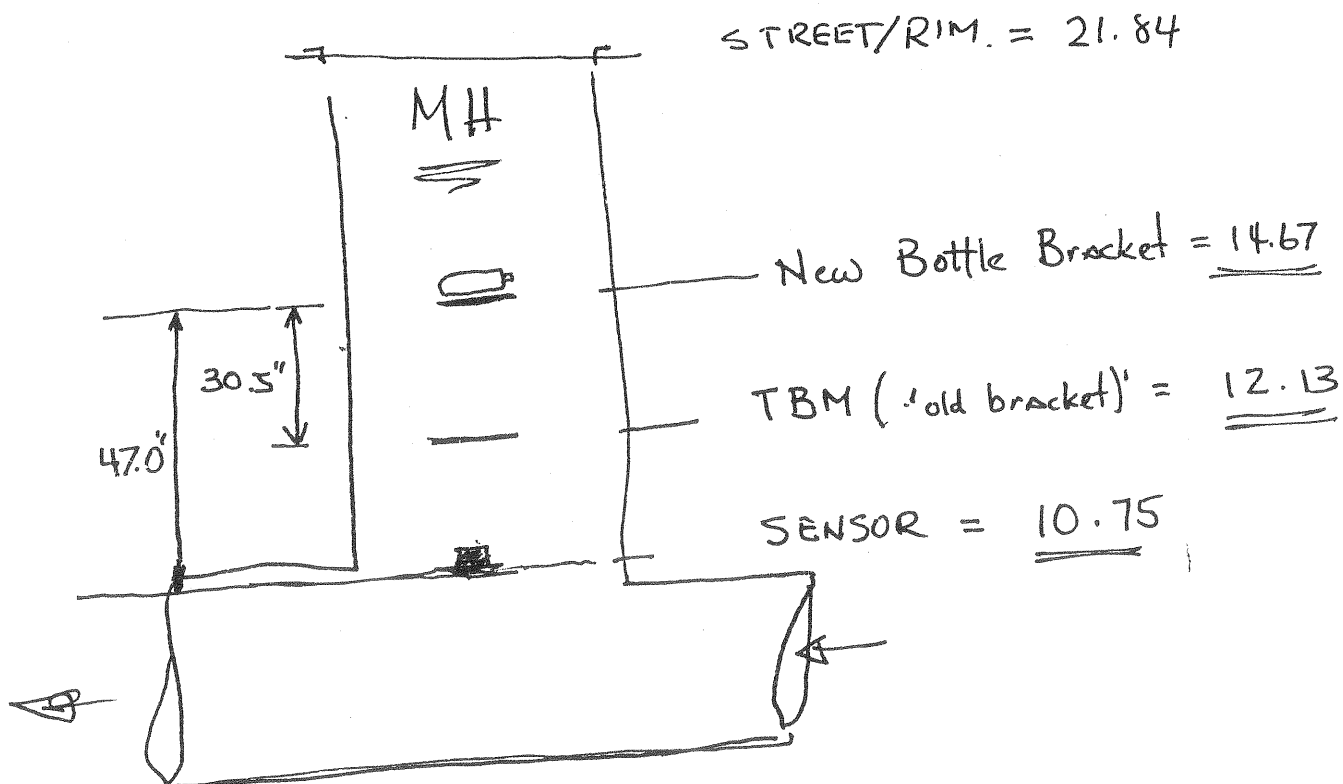
CSO WEIR = 14.67

Distance (OFF SET) From Rim to Weir Elev

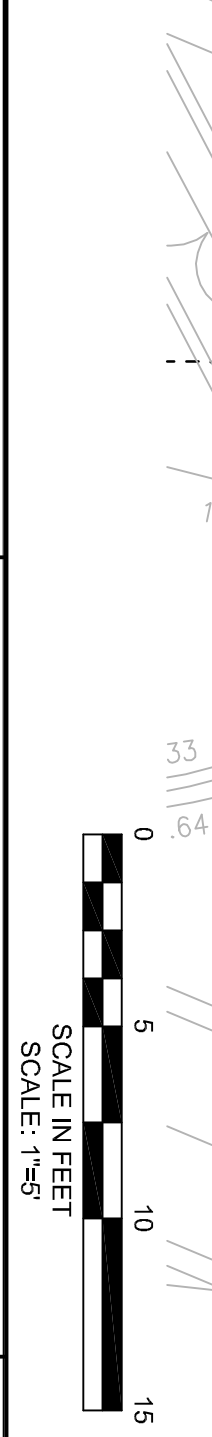
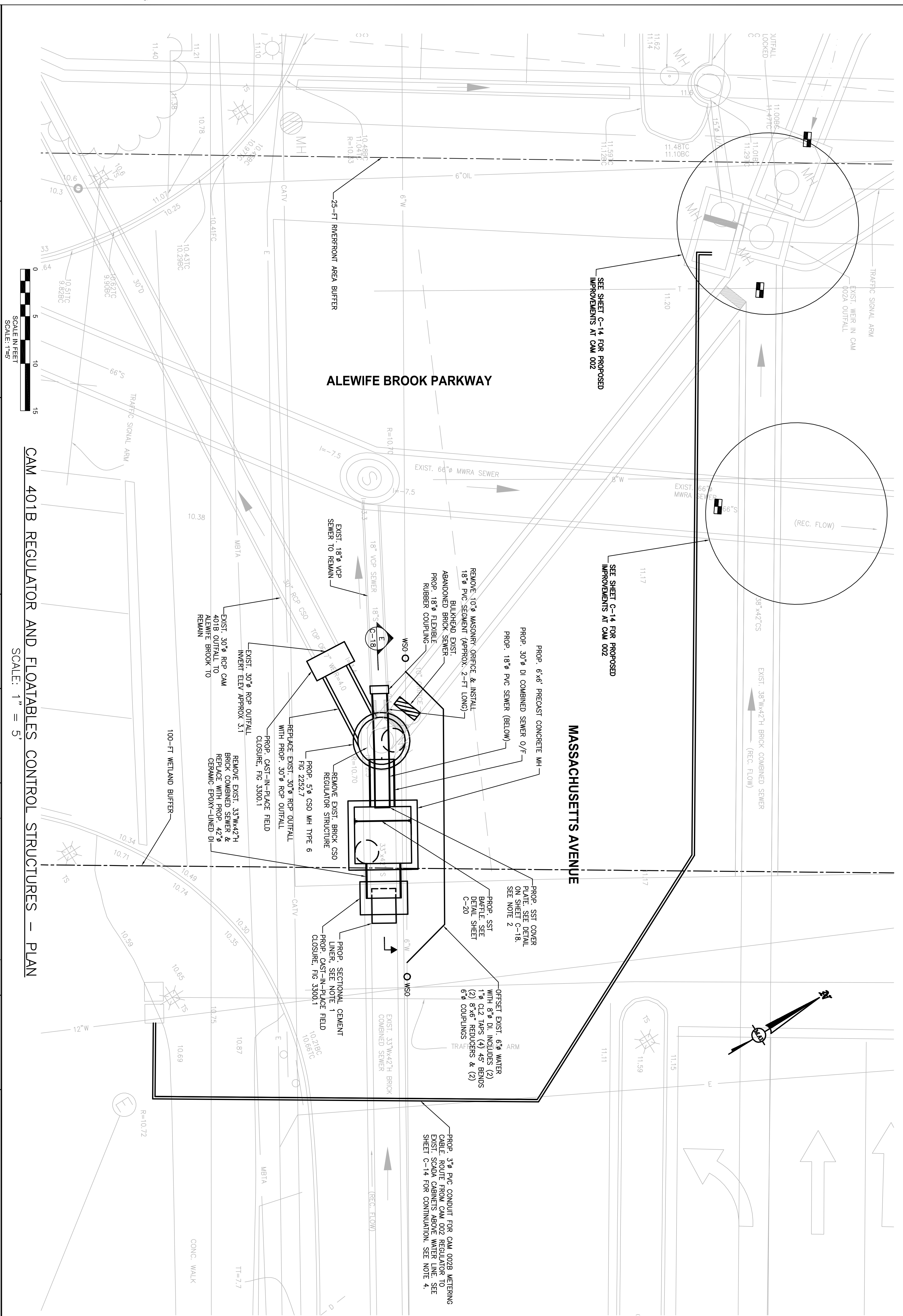
= 6.87 feet

or = 82.44 inches

New Bottle bracket
at Elev 14.67



- NOTES:
1. PRIOR TO EXCAVATION, APPLY 3" THICK, 4" LONG FIBERGLASS-REINFORCED CEMENT LINER (ALUMINUM LINER OR EQUAL), 3' TO REMAIN WITHIN EXIST BRICK CONDUIT AFTER SAW-CUT. 1' TO BE WASTED BY INSTALLATION OF PROPOSED PIPE.
 2. SEAL SST ORIFICE PLATE EDGES WITH BIODIC C-56 BUTYL MASTIC SEALANT, OR EQUAL. SST ORIFICE COVER PLATE SHALL BE INSTALLED AT CAM 401B TO THROTTLE THE UNDERFLOW DISCHARGE TO THE MWRA SYSTEM UNTIL SUCH TIME AS THE MWRA LONG TERM CONTROL PLAN HAS BEEN IMPLEMENTED. REMOVAL OF CAM 401B ORIFICE PLATE SHALL BE BY OTHERS.
 3. DISTURBANCES TO ROADWAY PAVEMENT SHALL BE RESTORED PER PERMANENT PAVEMENT RENOUGH DETAIL AND SPECIFICATIONS.
 4. TELEMETRY CONDUIT ALIGNMENT SHALL BE MINIMUM 2 FT DEEP AND CONCRETE ENCASED. CONTRACTOR TO VERIFY UTILITY CONFLICTS AND ROUTE FROM CAM 002 TO EXISTING SCADA CABINETS AS REQUIRED TO MINIMIZE DISRUPTION.



CAM 401B REGULATOR AND FLOATABLES CONTROL STRUCTURES - PLAN

SCALE: 1" = 5'

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Sustainable Infrastructure
CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE
ROCKY HILL, CONNECTICUT AUGUSTA, MAINE
FRAMINGHAM, MASSACHUSETTS



Scale	Date	Job No.	Designed by	Drawn by	Checked by	Approved by
1"=5'	NOVEMBER 19, 2009	1006250	MAW	MAW	DHC	WCP
Description		REVISIONS				
Date		Description				



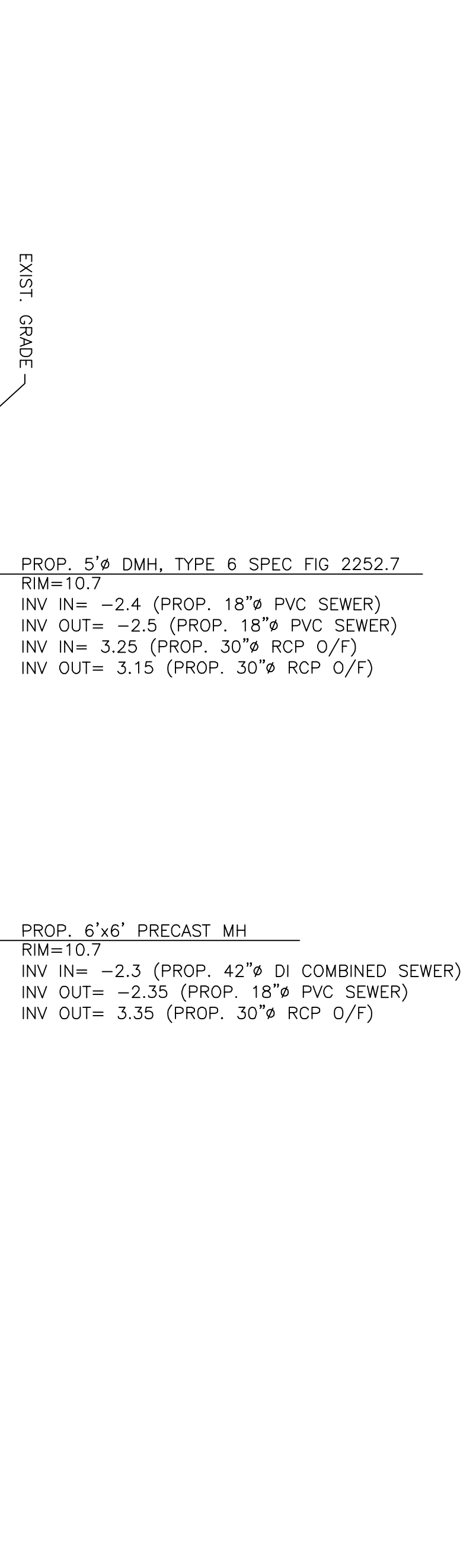
CITY OF CAMBRIDGE, MA

ALEWIFE BROOK FLOATABLES CONTROL (CONTRACT 4) AND CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13)

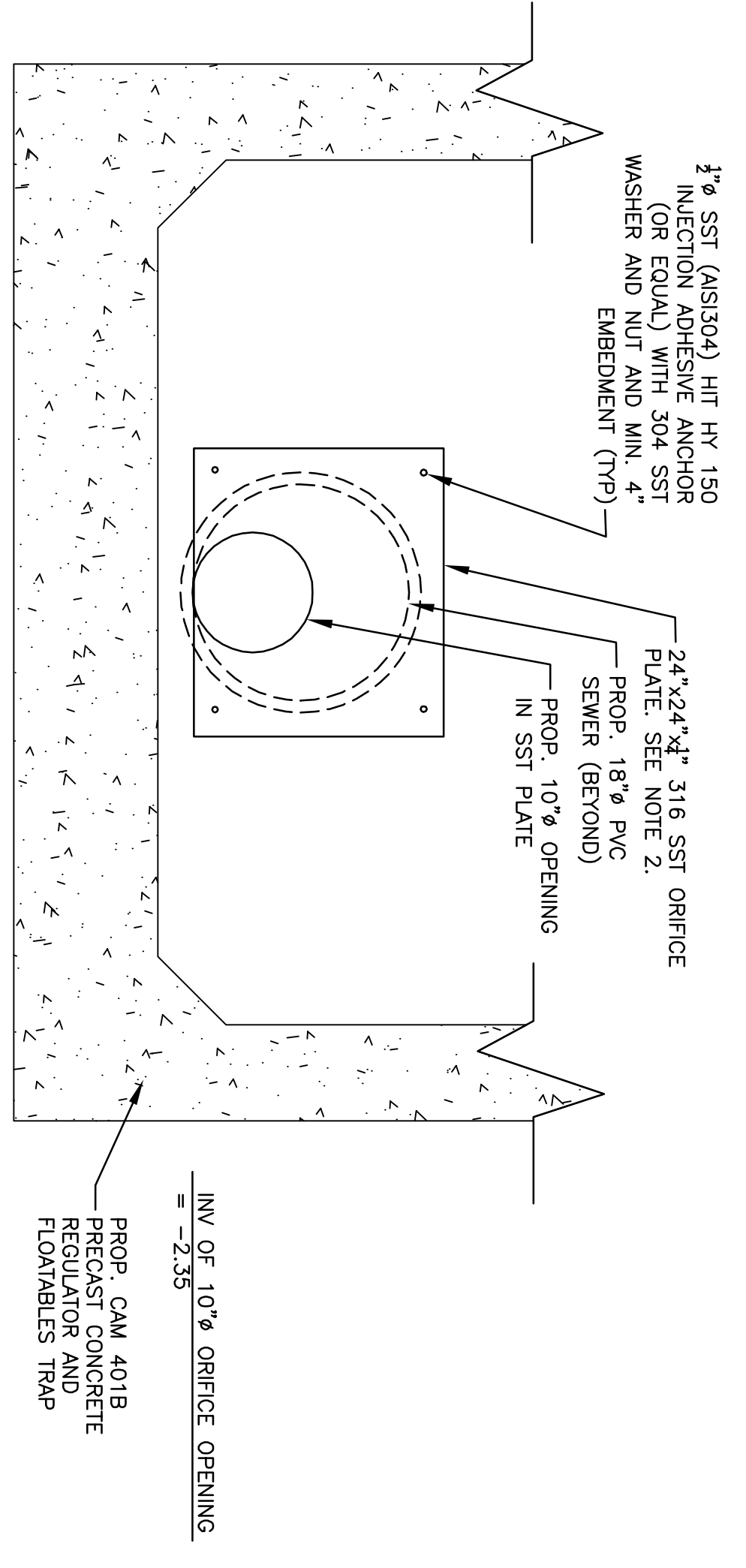
CAM 401B REGULATOR & FLOATABLES CONTROL PLAN

Sheet No. **C-15**

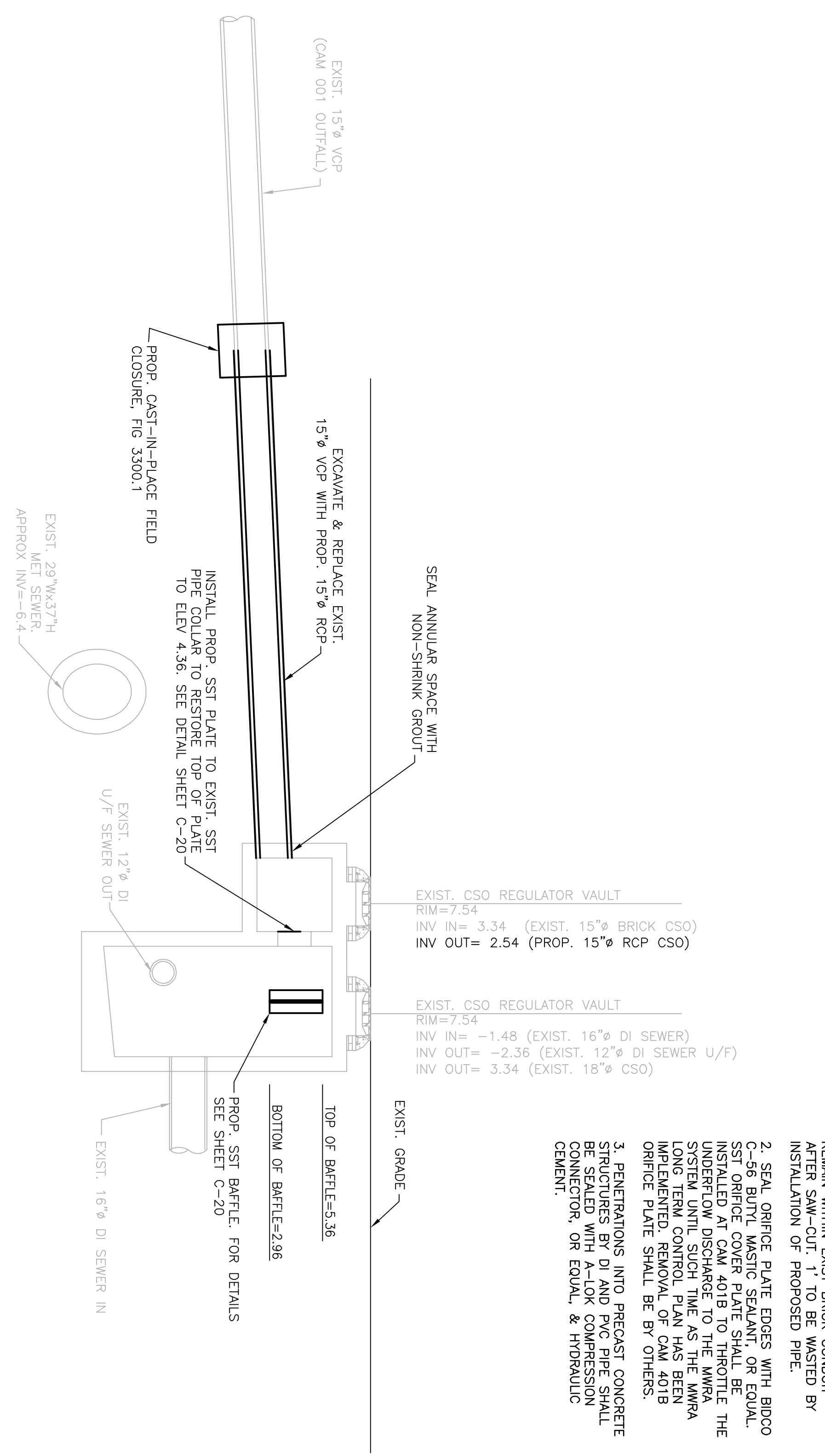
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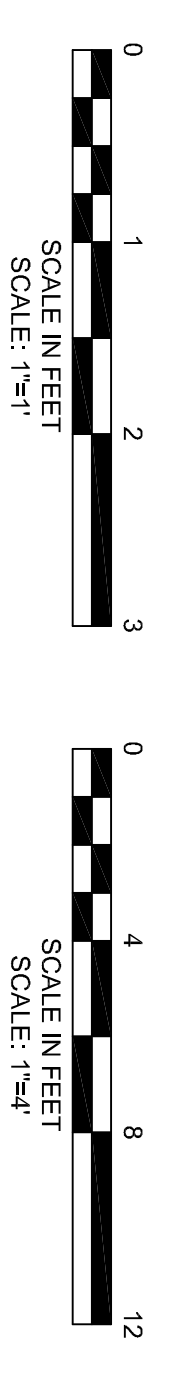
SECTION E
SCALE: 1" = 4'-0"



CAM 401B ORIFICE PLATE DETAIL
SCALE: 1" = 1'



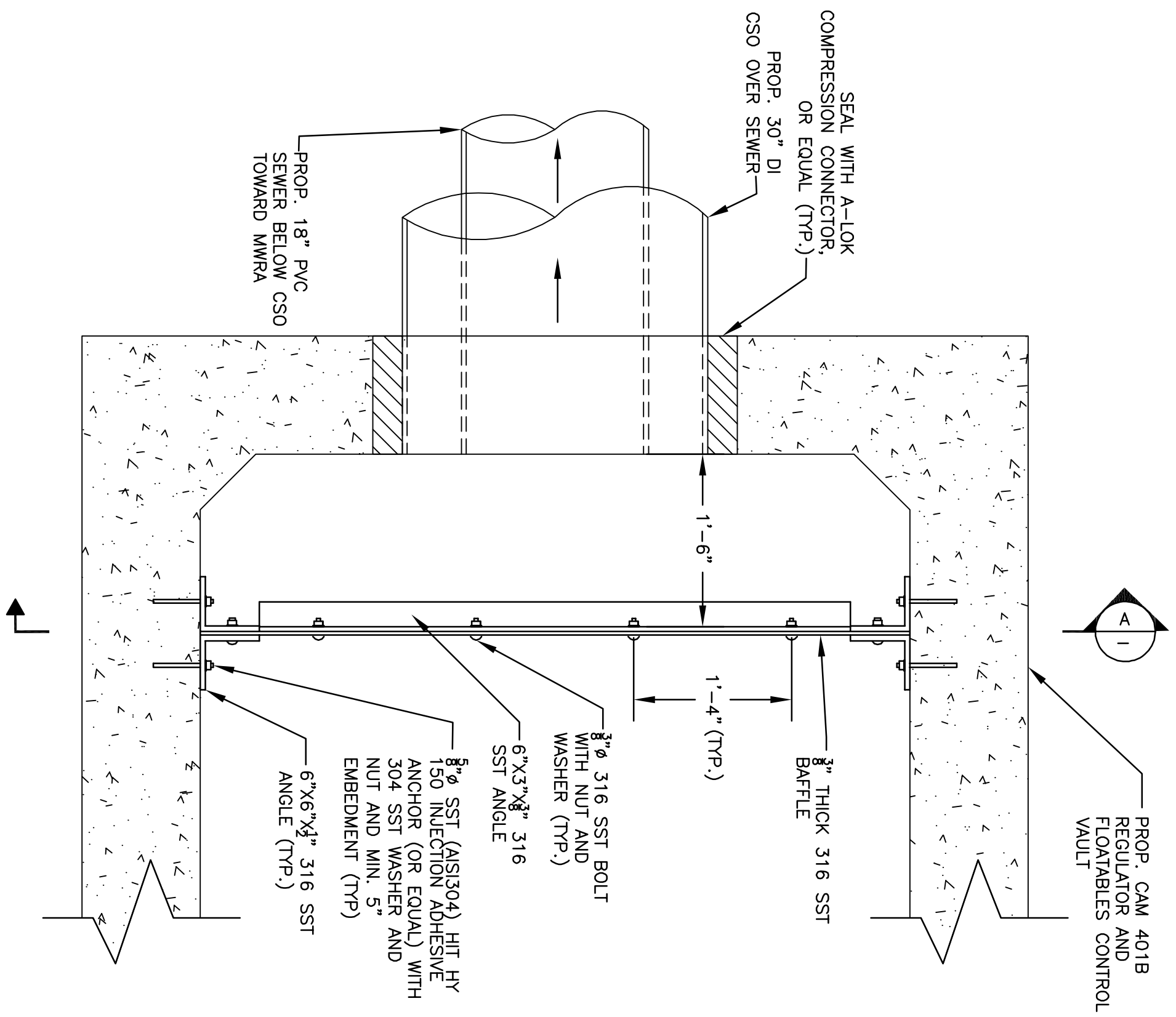
SECTION F
SCALE: 1" = 4'-0"



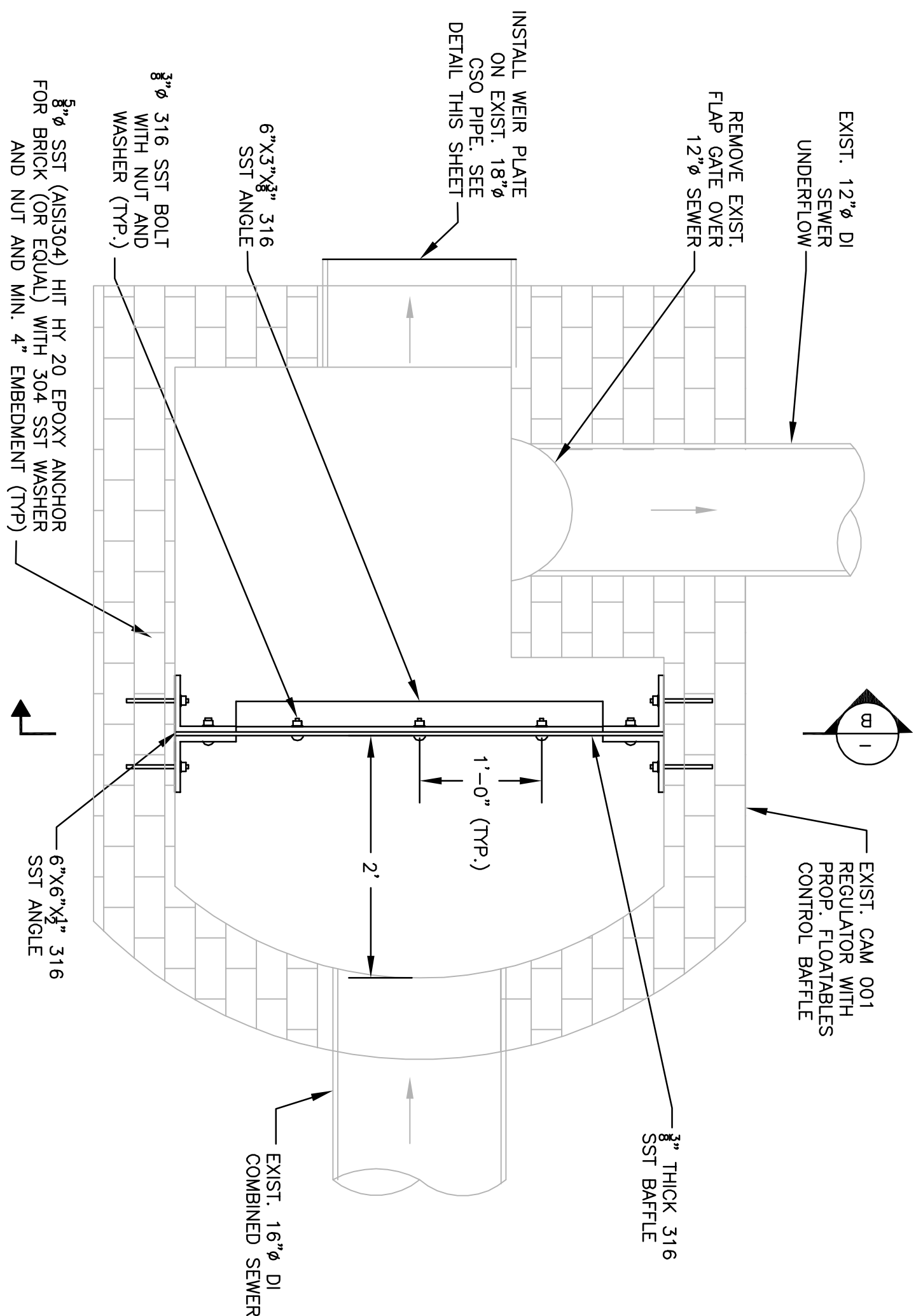
- NOTES:**
1. PRIOR TO EXCAVATION, APPLY 3" THICK, 4' LONG FIBERGLASS-REINFORCED CEMENT LINER (ALUMINUM LINER, OR EQUAL). 3" TO REMAIN WITHIN EXIST BRICK CONDUIT AFTER SAW-CUT; 1" TO BE WASTED BY INSTALLATION OF PROPOSED PIPE.
 2. SEAL ORIFICE PLATE EDGES WITH BIDCO C-56 BUTYL MASTIC SEALANT, OR EQUAL. SST ORIFICE COVER PLATE SHALL BE INSTALLED AT CAM 401B TO THROTTLE THE UNDERFLOW DISCHARGE TO THE MWA SYSTEM UNTIL SUCH TIME AS THE MWA LONG TERM CONTROL PLAN HAS BEEN IMPLEMENTED. REMOVAL OF CAM 401B ORIFICE PLATE SHALL BE BY OTHERS.
 3. PENETRATIONS INTO PRECAST CONCRETE STRUCTURES BY DI AND PVC PIPE SHALL BE SEALED WITH A-10K COMPRESSION CONNECTOR, OR EQUAL, & HYDRAULIC CEMENT.

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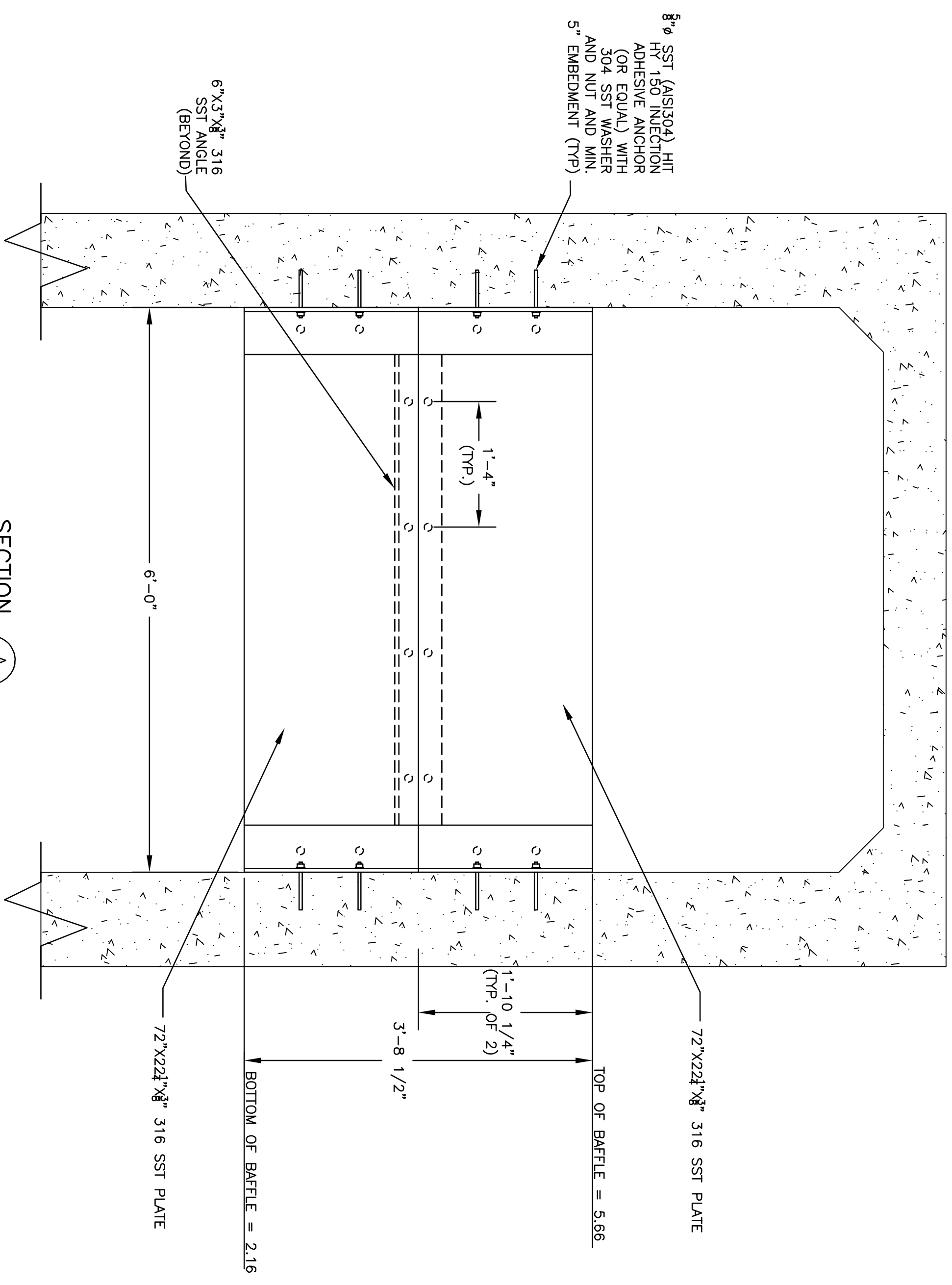
 SEA CONSULTANTS INC. Schematic Design/Architect CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE ROCKY HILL, CONNECTICUT AUGUSTA, MAINE FRAMINGHAM, MASSACHUSETTS	 MWH BOSTON MASSACHUSETTS	Scale	1"=4'
		Date	NOVEMBER 19, 2009
		Job No.	1006250
		Designed by	MAW
		Drawn by	MAW
		Checked by	DHC
		Approved by	WCP
		Description	REVISIONS
		No.	
		Date	
CITY OF CAMBRIDGE, MA ALEWIFE BROOK FLOATABLES CONTROL (CONTRACT 4) AND CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13) CAM 001 & CAM 401B FLOATABLES CONTROL SECTIONS		Sheet No.	C-18
		File No.	



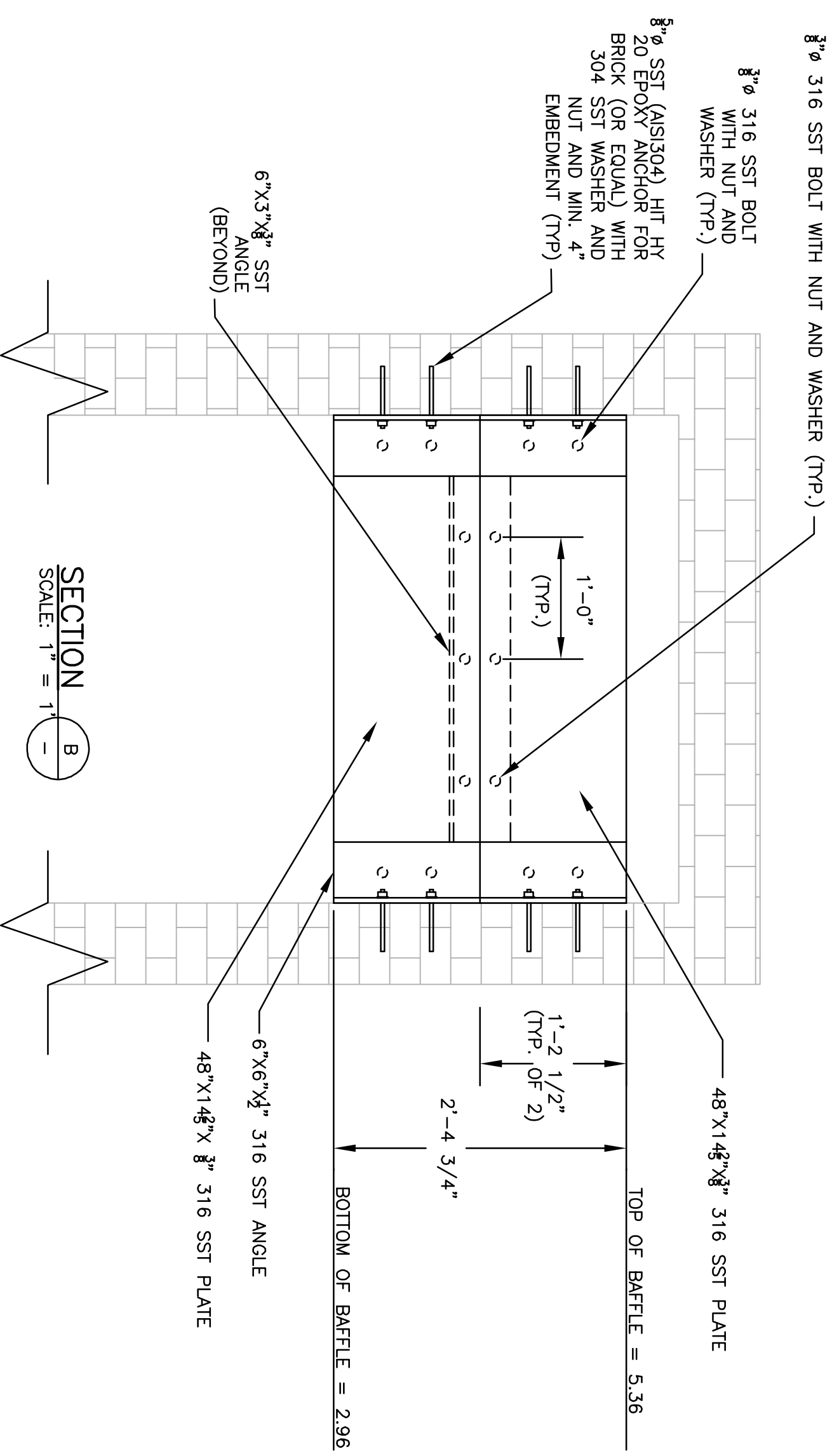
CAM 401B FLOATABLES BAFFLE-PLAN
SCALE: 1" = 1'



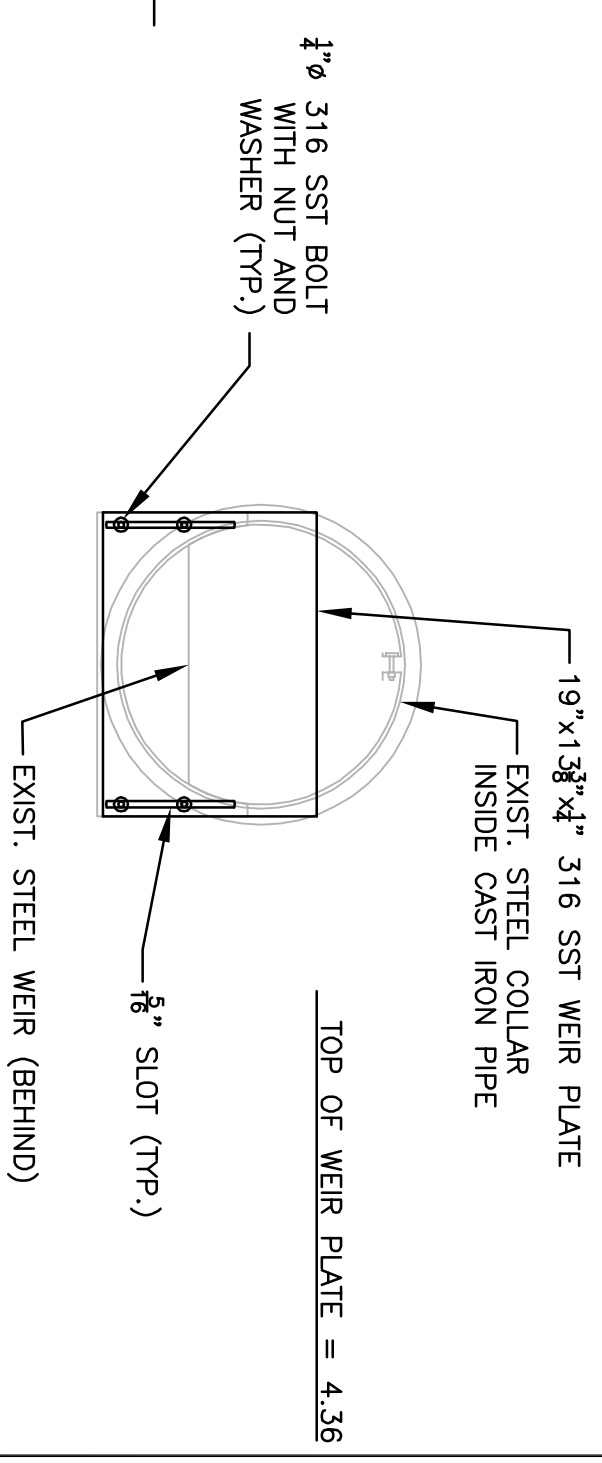
CAM 001 FLOATABLES BAFFLE-PLAN
SCALE: 1" = 1'



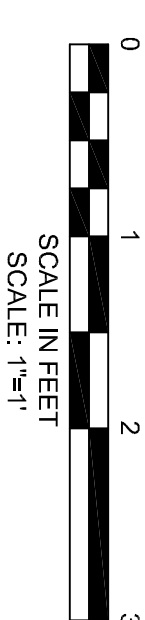
SECTION A
SCALE: 1" = 1'



SECTION B
SCALE: 1" = 1'



CAM 001 WEIR PLATE DETAIL
SCALE: 1" = 1'



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S E A
SEA CONSULTANTS INC.
Sustainable Infrastructure
CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE
ROCKY HILL, CONNECTICUT AUGUSTA, MAINE
FRAMINGHAM, MASSACHUSETTS

MWH
BOSTON
MASSACHUSETTS

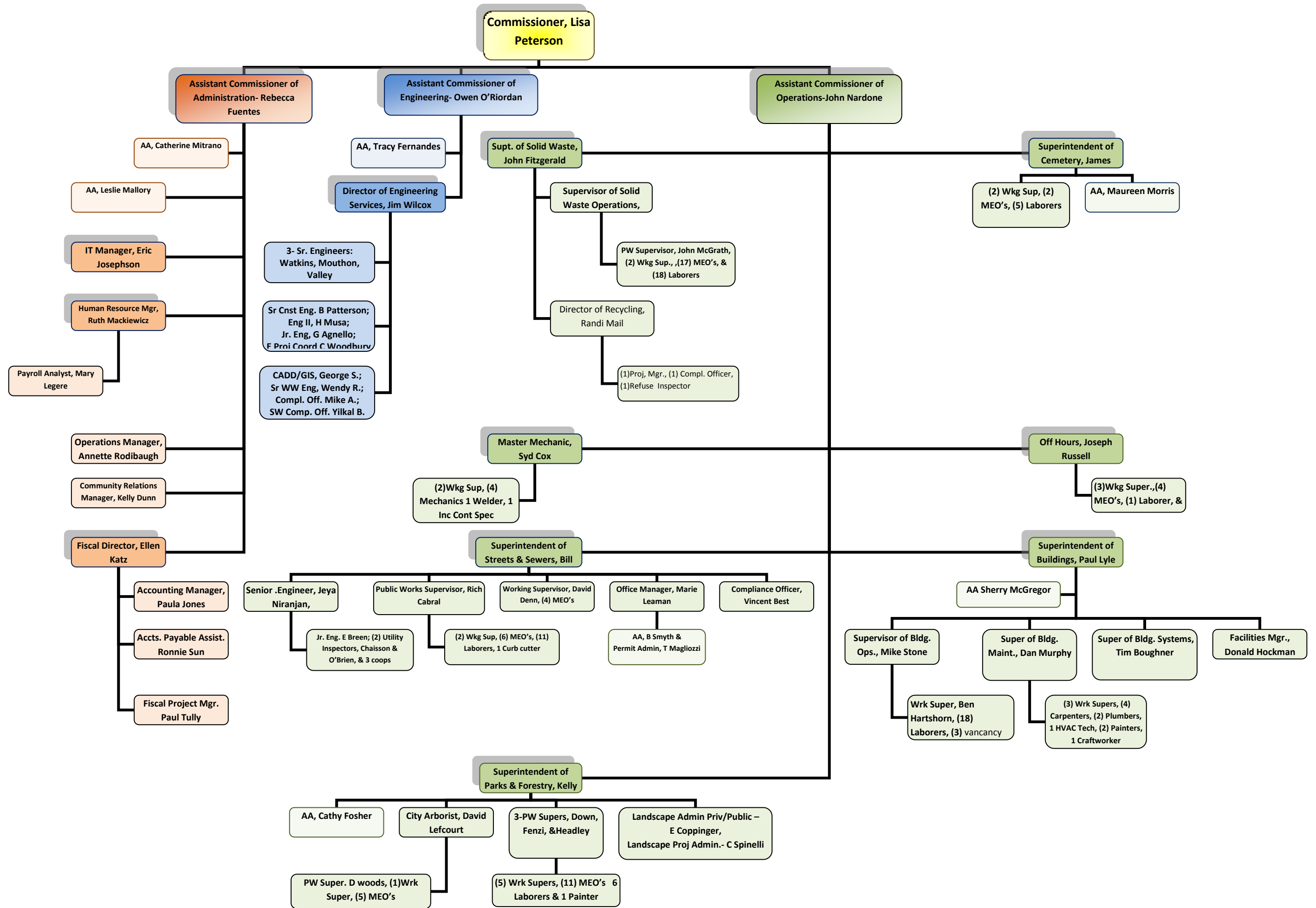
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Date	NOVEMBER 19, 2009
Job No.	1006250
Designed by	MAW
Drawn by	MAW
Checked by	DHC
Approved by	WCP

THE WORKS
CAMBRIDGE
DEPARTMENT
OF PUBLIC
WORKS

CITY OF CAMBRIDGE, MA
ALEWISSE BROOK FLOATABLES CONTROL (CONTRACT 4) AND
CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13)
CAM 401B FLOATABLES CONTROL
BAFFLE DETAILS

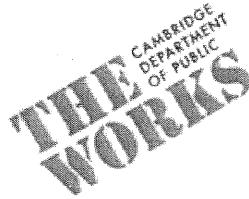
Sheet No. **C-20**
File No.

APPENDIX D
CITY OF CAMBRIDGE, DEPT. OF PUBLIC WORKS ORGANIZATIONAL CHART



APPENDIX E
PUMP STATION OPERATIONS & MAINTENANCE MANUAL

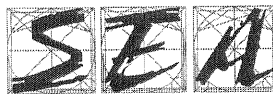
Cambridge Department of Public Works



**Operations, Maintenance and Safety Manual
for the
Bellis Circle / Sherman St. Drainage
Improvements Project**

**Danehy Park Pump Station & CAM 401A
Floatables Control Structure**

August 2004



S E A Consultants Inc.
Scientists/Engineers/Architects



MWH

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- 1.12 FLOW DIAGRAM DURING LOW FLOW – DANEHY PARK
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APPENDIX B Olympian Generator Operator's and Owner's Manual (under separate cover)
APPENDIX C GNA Vortex Valve Operator's and Owner's Manual (under separate cover)
APPENDIX D Auma Actuator Operator's and Owner's Manual (under separate cover)
APPENDIX E..... GNA Hydroclean Fine Screen Operator's and Owner's Manual (under separate cover)
APPENDIX F.....Fontaine Flap Valves Installation and Maintenance Manual (under separate cover)
APPENDIX G Contract Drawings Civil Sheets C-4, C-5, C-6 and C-7 (11"x17")

1.0 Introduction

This manual was prepared for the City of Cambridge, Department of Public Works (DPW) by MWH Americas, Inc. (MWH) and SEA Consultants, Inc. (SEA) to assist the DPW personnel in the operations and maintenance of the Danehy Park Pump Station and the CAM 401A Floatables Control Structure located underground in the area of Bellis Circle and Sherman Street. Construction of the pump station and floatables control structure was completed as part of the Bellis Circle / Sherman St. Drainage Improvements Project in 2003. The contents of this manual have been assembled with the intent of using the manual in conjunction with the project record drawings, detail records, and the operations and maintenance manuals provided by the equipment manufacturers. This manual should be used in conjunction with the following operations and maintenance manuals:

- ITT Flygt Corporation Pump Operator's and Owner's Manual (Appendix A)
- Olympian Generator Operator's and Owner's Manual (Appendix B)
- GNA Vortex Valve Operator's and Owner's Manual (Appendix C)
- Auma Actuator Operator's and Owner's Manual (Appendix D)
- GNA Hydroclean Fine Screen Operator's and Owner's Manual (Appendix E)
- Fontaine Flap Valves Installation and Maintenance Manual (Appendix F)

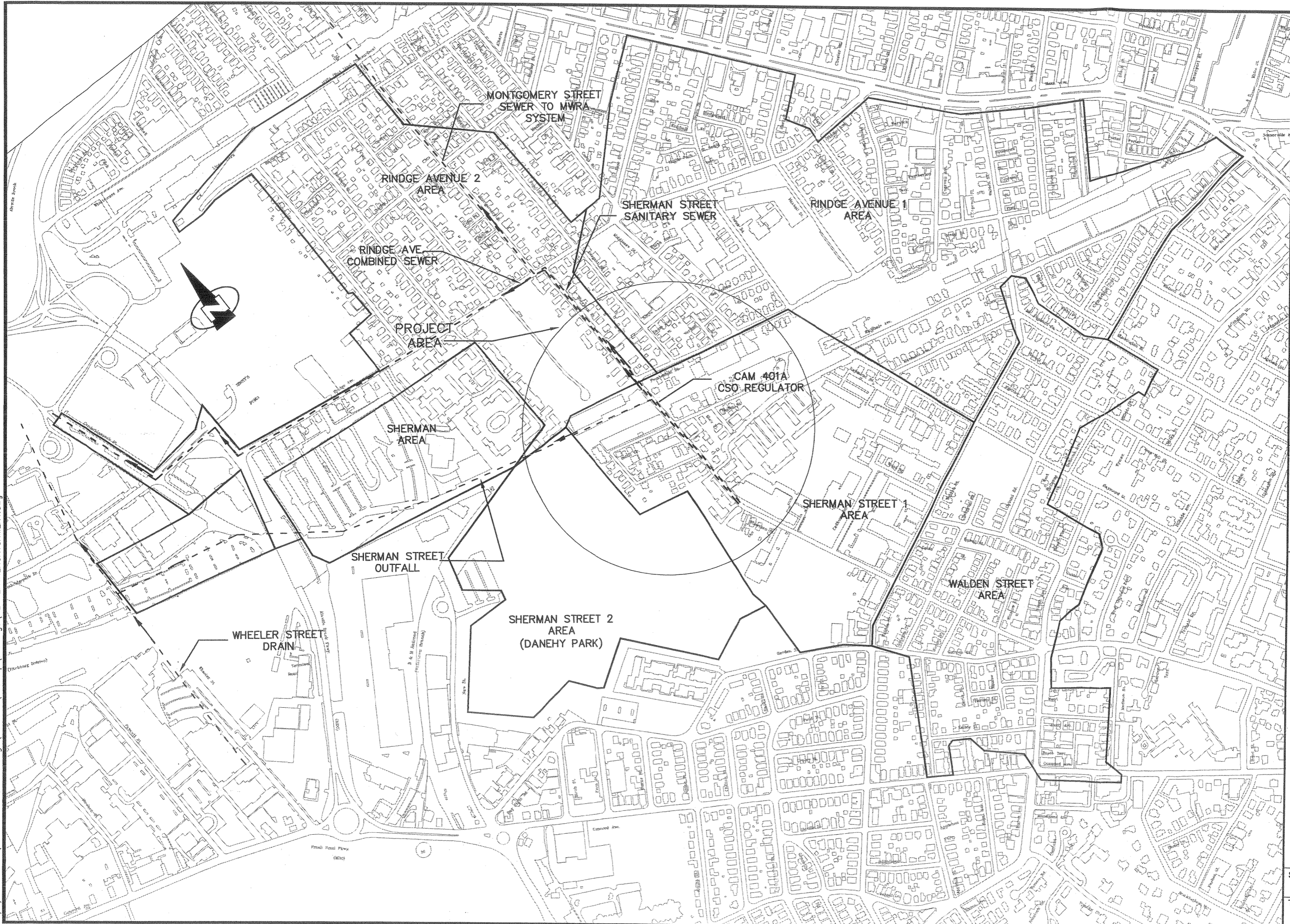
Presented in this manual are descriptions of the facilities, basic design criteria for the facilities, operating procedures for the system, and inspection and maintenance procedures.

1.1 Project History & Catchment Area

Figure 1.1 shows the Sherman Street subcatchment, as well as two other major subcatchments: the Walden Street area and the Rindge Avenue area. These three subcatchments comprise the CAM 401A wet weather catchment. Figure 1.2 shows the Bellis Circle drainage area within the Sherman Street 1 and Sherman Street 2 Areas shown on Figure 1.1. The Sherman Street 2 Area consists almost entirely of Danehy Park, which contains several large athletic fields and which was created by copping and landscaping an old landfill site.

Prior to the completion of the project, the residential properties along Bellis Circle near the north side of Danehy Park and along Sherman Street near the south side of the park had experienced severe and frequent flooding. Much of the water in the area entered the properties along the back lot line, adjacent to the park, and north of the Bellis Circle area. The large volume of runoff from Danehy Park and the inadequate capacity in the downstream drainage system contributed to this problem. Indications were that the water level in the Danehy Park detention pond (i.e. wetlands) could overflow the containment berm and the area along the railroad tracks resulting in flooding along Bellis Circle. Street flooding in general impacted all the area residents and properties. Figure 1.2 shows the storm water flow patterns in the area and the impacted locations.

8/5/2004 C:\Documents and Settings\nick_ellis\Desktop\Drawings\WETWEATHERCATCHMENT.dwg



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 ROCKY HILL, CONNECTICUT
 CAMBRIDGE, MASSACHUSETTS



Scale	No Scale
Date	8/4/04
Job No.	654
Designed by	DPA
Drawn by	NJE
Checked by	DPA
Approved by	

Client
CITY OF CAMBRIDGE

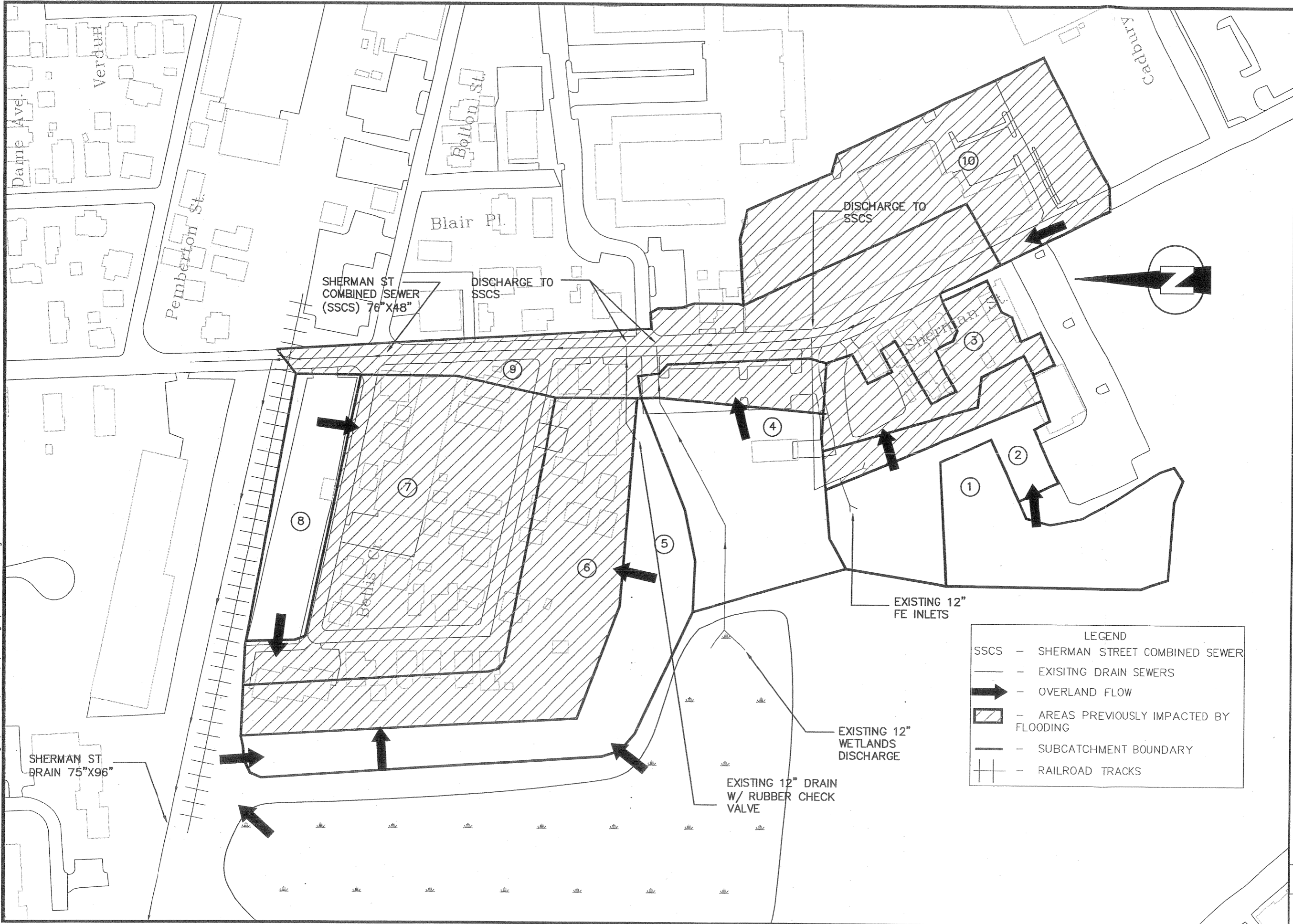
Project
**BELLIS AREA STORMWATER
 MANAGEMENT IMPROVEMENTS**

Drawing
**CAM 401 WET WEATHER
 CATCHMENT AREA**

Sheet
FIG. 1.1

Total Sheets

8/5/2004 C:\Documents and Settings\nick.ellis\Desktop\Drawings\overland flow.dwg



SEEA S E A Consultants Inc.
 Scientists/Engineers/Architects
 CONCORD, NEW HAMPSHIRE ROCKY HILL, CONNECTICUT
 CAMBRIDGE, MASSACHUSETTS



Scale	1" = 125'
Date	8/4/04
Job No.	664
Designed by	DPA
Drawn by	NJE
Checked by	DPA
Approved by	

Client	CITY OF CAMBRIDGE
Project	BELLIS AREA STORMWATER MANAGEMENT IMPROVEMENTS
Sheet	FIG. 1.2
Drawing	OVERLAND FLOW AND IMPACTED AREAS
Total Sheets	

LEGEND

- SSCS - SHERMAN STREET COMBINED SEWER
- EXISTING DRAIN SEWERS
- ➔ OVERLAND FLOW
- ▨ AREAS PREVIOUSLY IMPACTED BY FLOODING
- SUBCATCHMENT BOUNDARY
- ⊥ RAILROAD TRACKS

1.2 Facilities Description

The drainage improvements installed as part of this project include a box channel drain and a trench drain, regulator manhole, stormwater pump station and storage tank, flap valves, catch basins and a floatables control structure. The components installed are described below and locations are shown on the Bellis Circle / Sherman St. Record Drawings. Reduced copies (11"x17") of Civil Sheets C-4, C-5, C-6, and C-7 are included in Appendix G.

1.2.1 Box Channel and Trench Drain

A 1' deep by 2' wide concrete box channel transitioning to a 1' deep by 4' wide concrete box channel was installed along the northeast landfill vent trench of Danehy Park. The box channel drains to a collection structure located approximately 100' beyond the vent trench access fence at the Sherman St. Danehy Park parking area. The box channel collects stormwater run off from the Bellis Circle properties adjacent to Danehy Park. The stormwater flow discharges to the Sherman St. combined sewer during dry weather and to the pump station and storage tank during storm conditions when the combined sewer is surcharged. These structures are shown in Appendix G – Civil Sheet C-5.

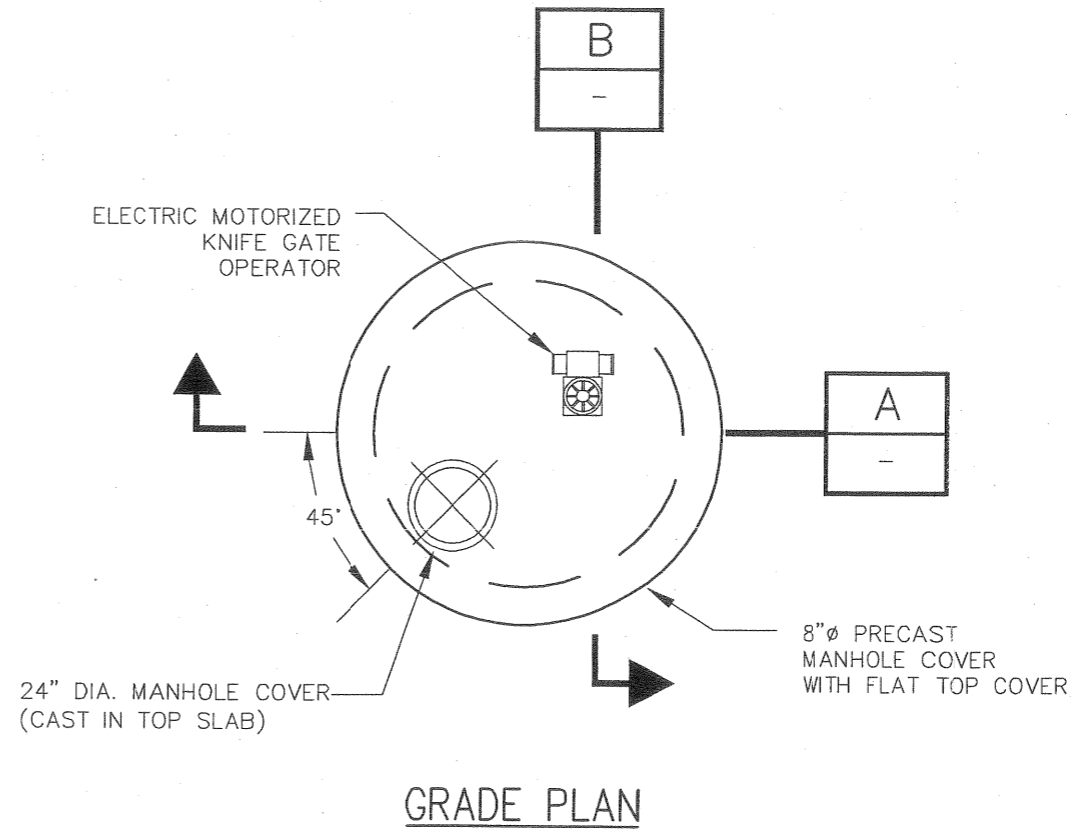
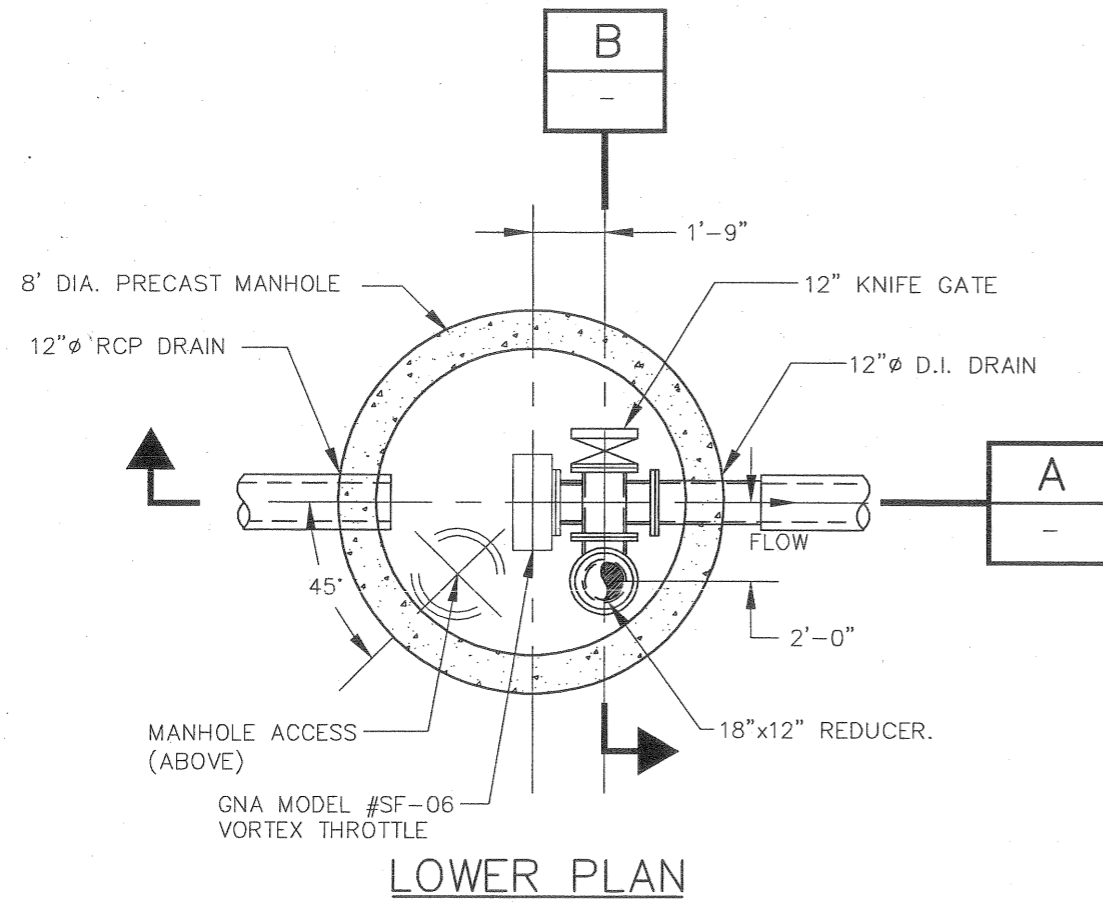
A beehive catchbasin is located at the low drainage end of the vent trench. This catch basin collects stormwater flow from the vent trench, which then drains into the box channel collection structure and then the combined sewer pump station during combined sewer discharge. See Appendix G – Civil Sheet C-5.

A 2' deep by 1' wide trench drain was installed along the southeast Danehy Park access path. The trench drain discharges into a collection structure located at the base of the path. The trench drain collects stormwater flow from the side slopes of Danehy Park. A 24" RCP drain conveys the stormwater flow from the trench drain collection structure to the Sherman St. combined sewer during dry weather and to the storage tank during storm conditions when the combined sewer is surcharged. See Appendix G – Civil Sheet C-5.

1.2.2 Regulator Manhole

A 6' inside diameter Regulator Manhole was installed on the existing 12" RCP drainage outlet of the Danehy Park wetland pond. The purpose of the regulator manhole is to optimize storage of runoff in the Danehy Park wetlands without causing the containment berm to overflow. Refer to Figure 1.3 & 1.4 "Regulator Manholes" and Appendix G – Civil Sheet C-5. The 12" RCP outlet discharges into the Regulator Manhole from the wetland pond. A vortex valve regulates normal flow out of the manhole to 2 cfs.

During a rain event the wetland pond water level will rise if flow out of the pond is greater than 2 cfs. The water level in the regulator manhole will maintain the same elevation as the pond water level. If the water rises to the crown of the 12" opening in the knife gate (elev. 11.25' NGVD) the gate will open and the flow will outlet through the gate depending on the flow condition in the downstream combined sewer. A float in Flap Valve Manhole No. 1 will not allow the knife



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Drawing
MECHANICAL DETAILS
REGULATOR MANHOLE

Sheet
FIGURE 1.3

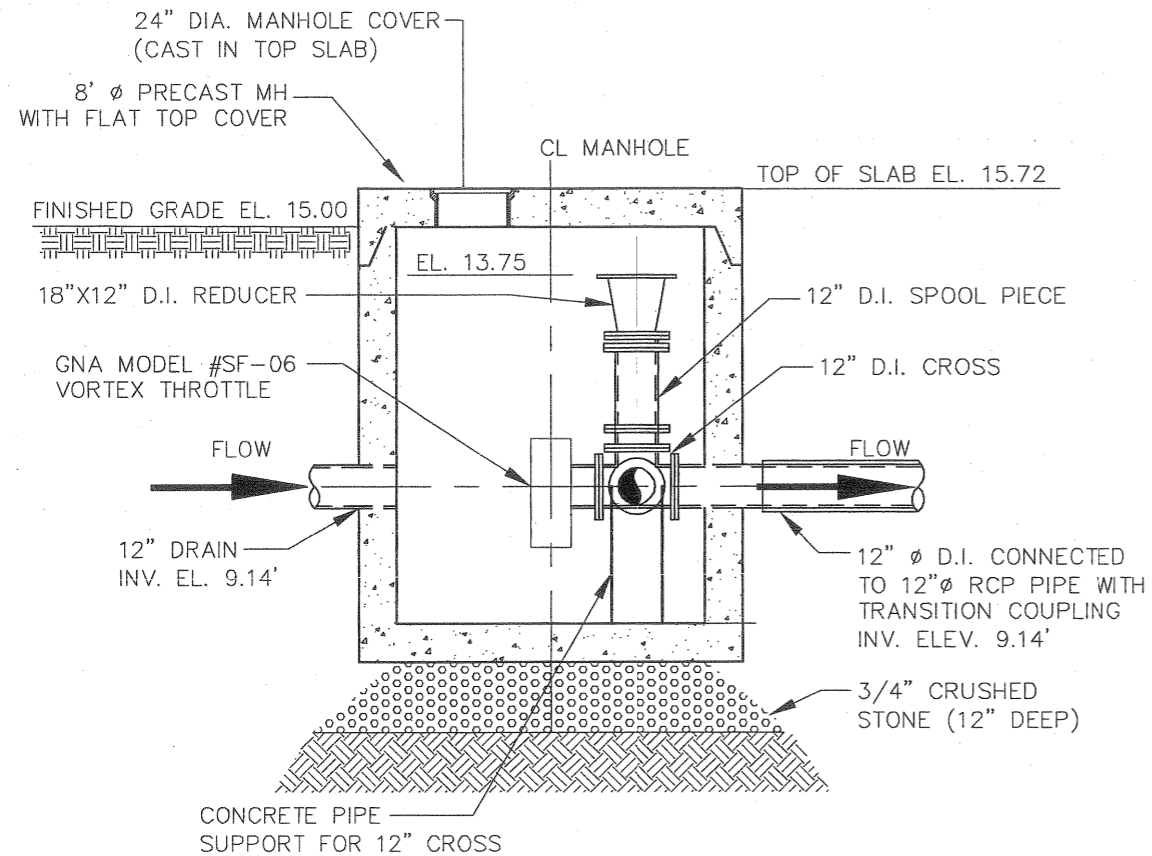
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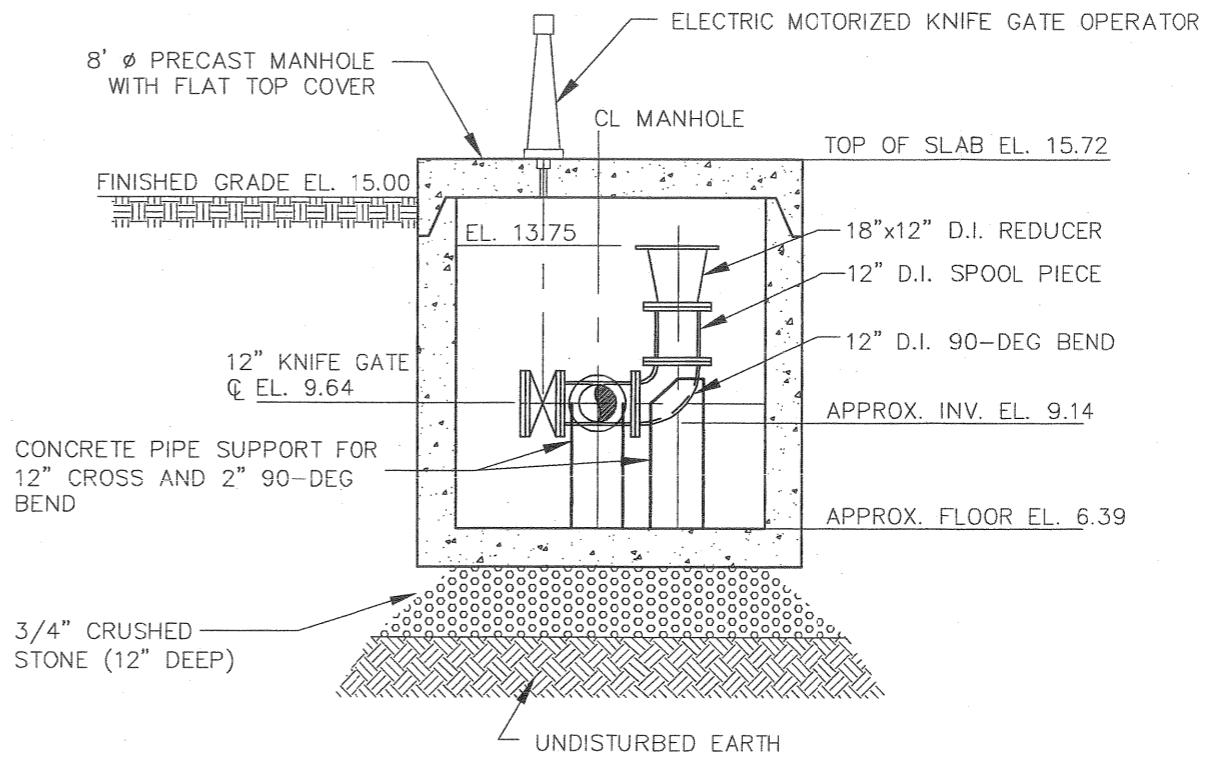


SECTION

A
-

REGULATOR MANHOLE

NOTES:
 1. REGULATOR MANHOLE FLOAT SWITCH SETTINGS ARE:
 LOW LEVEL = 10.25
 HIGH LEVEL = 11.25



SECTION

B
-



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Drawing	MECHANICAL DETAILS REGULATOR MANHOLE

Sheet	FIGURE 1.4
Total Sheets	15

gate to open whenever the surcharge level in the combined sewer is greater than elevation 6.75' NGVD.

The knife gate will open during high water level in the regulator manhole (11.75') and low level in the Sherman St. combined sewer (< 6.75'). If the knife gate is open and the water level in the combined sewer rises above 6.75', the gate will not close. The gate will close if the water level in the combined sewer rises to the second flap valve manhole float (7.75' NGVD). The gate will only re-open when the water level falls below 6.75' and there is still a high water condition in the regulator manhole.

If the pond level rises to an elevation of 13.75' NGVD, drainage from the pond will overflow into an 18" x 12" reducer opening and drops into the existing 12" RCP drain.

During low flow conditions, all flow from the Regulator Manhole discharges to the Sherman St. combined sewer. During surcharged conditions in the Sherman St. combined sewer, Flap Valve #1 closes and all flow from the Regulator Manhole discharges to the storage tank.

Table 1.1 below lists the equipment found in the Regulator Manhole.

Table 1.1 Regulator Manhole Equipment List

EQUIPMENT	SERVICE DESCRIPTION
Vortex valve	Regulates flow from the wetland pond to 2 cfs
Knife Gate	Outlets flow from the wetland pond at elevation 10.25'
Reducer	Outlets flow from the wetland pond at elevation 13.75'
Motorized Operator	Automatically opens / closes knife gate
Float Switch (High level and low level)	Controls opening and closing of knife gate depending on flow conditions in the Sherman St. combined sewer

1.2.3 Storage Tank

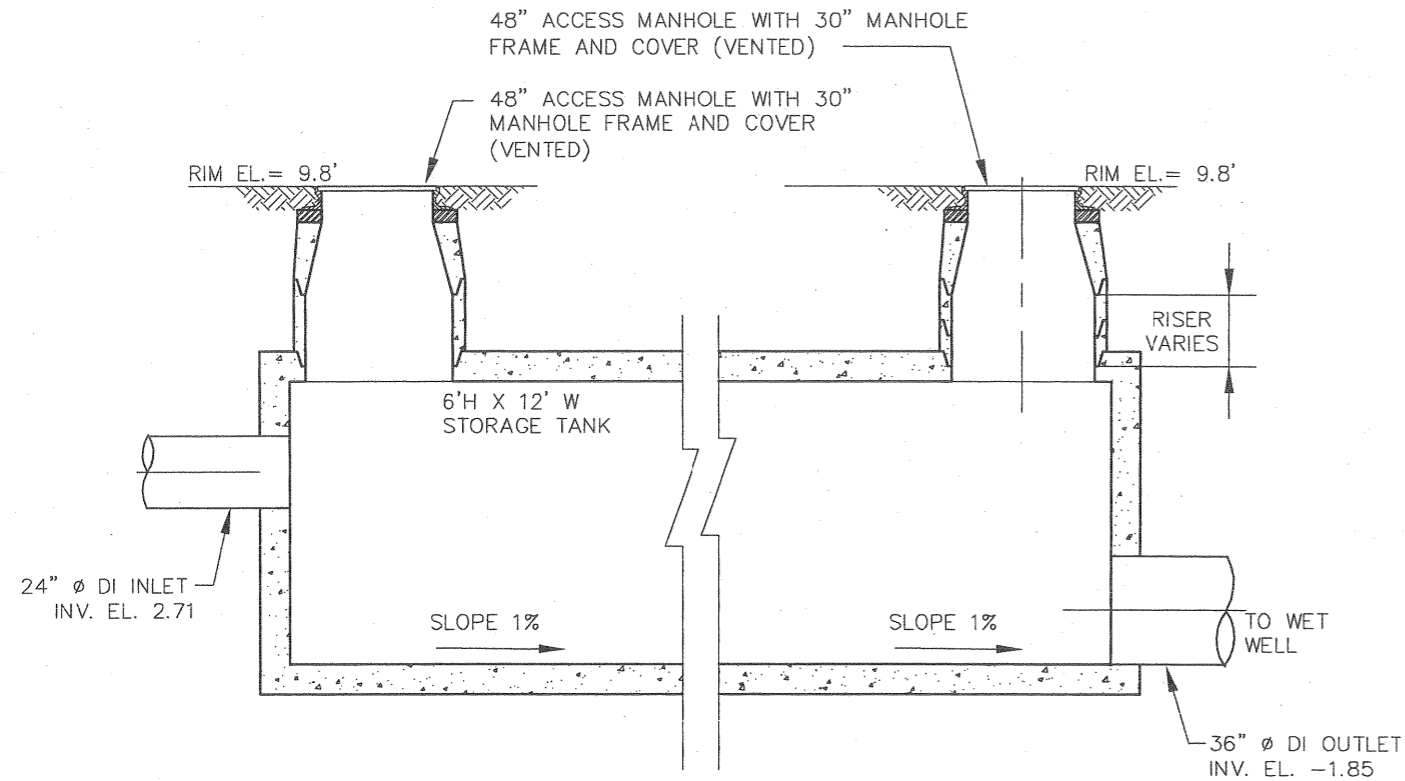
A 45,780 gallon precast storage tank (dimensions = 6' wide x 12' high x 85' long), located underground within the Danehy Park Sherman St. north parking area, provides stormwater storage during large rain events. Refer to Figure 1.5 "Storage Tank Details". The storage tank slopes 1% towards the pump station and discharges flow, by gravity, through a 36" DI drain. The invert is V-shaped with a 10% side slope that channels stormwater and sediments towards the centerline of the tank.

The tank was constructed with box sections connected with gaskets and sealed with cement to form a watertight joint. Access manholes are located at the north and south ends of the storage tank to facilitate maintenance and inspection.

The tank receives flow during Sherman St. combined sewer surcharge conditions from the following:

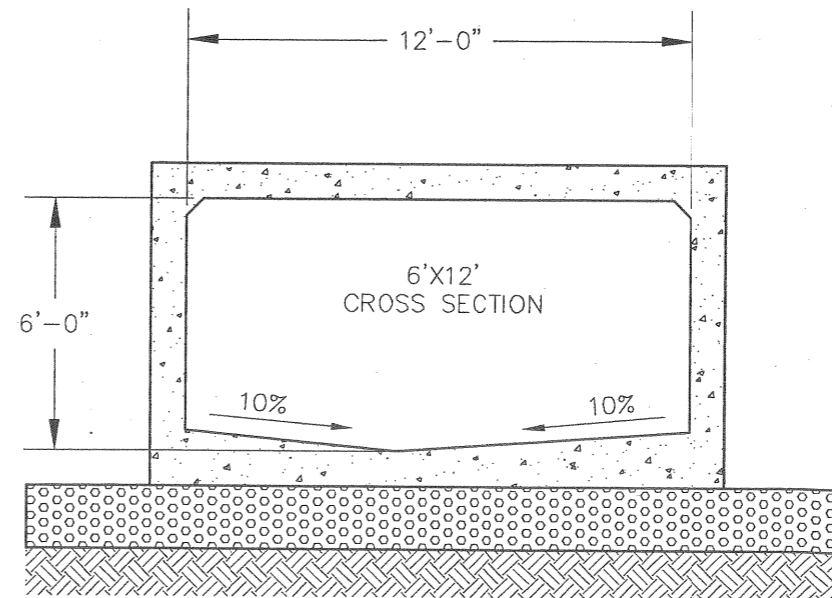
- (1) the Danehy Park wetland pond through the 12" RCP regulated outlet
- (2) the box channel

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STORAGE TANK DETAIL

N.T.S.



TYPICAL STORAGE TANK CROSS SECTION

N.T.S.

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Drawing
 STORAGE TANK DETAILS

Sheet
 FIGURE 1.5

Total Sheets

- (3) the Danehy Park 24" RCP drain, which collects flow from: the trench drain, the southeast vent trench, and the south Sherman St. parking area catch basins
- (4) the north Sherman St. parking area catch basins.

1.2.4 Pump Station

A 21,500 gallon, 12' x 16' x 16' deep, precast Pump Station wet well is located underground within the Danehy Park Sherman St. north parking area. Refer to Figure 1.6 "Pump Station Details".

The Pump Station was designed to receive stormwater flow from the box channel located along the northeast vent trench and from the storage tank during Sherman St. combined sewer surcharge conditions.

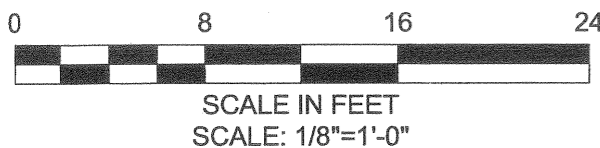
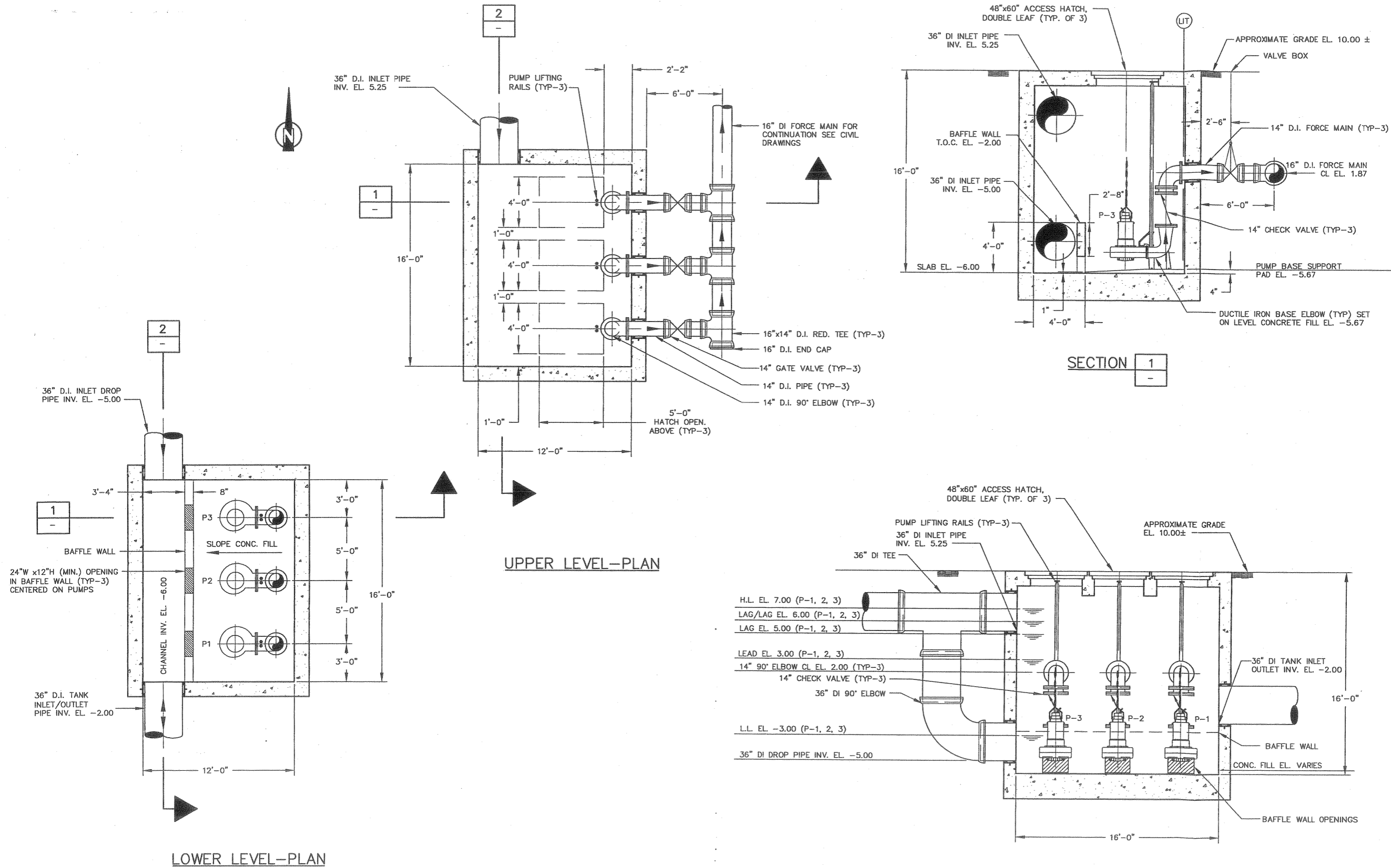
There are three 45 HP, 2700 gpm submersible ITT Flygt CP3300-809 pumps in the station's wet well placed on a pad above a sediment trap. Float switches are installed in the pump station's wet well to allow automatic operation controlled by the control panel located adjacent to the north parking area. Each pump is connected to a 14" DI discharge pipe with a 14" check valve and a 14" gate valve. The three discharge pipes connect to a 16" DI force main that conveys flow to the 96" x 75" box culvert outfall to the Alewife River at CAM 401A. The force main is connected to the outfall directly east of the CAM 401A outlet to the box culvert.

The control panel contains all control switches for the pumps. An automatic transfer switch is located adjacent to the control panel. If normal power fails, the transfer switch will automatically start the emergency generator. The emergency generator is located immediately east of the control panel and is enclosed within a padlocked chain link fence. The diesel generator provides 150KW, 3 phase 480 V back-up power at 60 Hz to the three submersible pumps and control panel.

For detailed information about the pumps, control panel, automatic transfer switch and emergency generator; refer to the manufacturer's operation and maintenance manuals appended.

Table 1.2 lists the essential equipment in the pump station and the service description of each item. Figure 1.6 "Pump Station Details" shows the equipment layout within the pump station.

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SHERMAN STREET PUMP STATION

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Drawing	PUMP STATION DETAILS

Sheet	FIGURE 1.6
Total Sheets	15

Table 1.2 Pump Station Equipment List

EQUIPMENT	SERVICE DESCRIPTION
14" Check Valve (3)	Check valves on each 14" DI discharge pipe
14" Gate Valve (3)	Isolation gate valves on each 14" DI pump discharge pipe.
Flygt Model No. CP3300-809 Pumps (3)	Submersible pumps that drain the wet well and storage tank
Float Switches	Float Switches are wired back to the control panel. They turn the pumps on or off and signal a high water alarm
Control Panel	Contains control logic for pump starters, selector switches, alarm lights, and regulator manhole motorized operator.
Automatic Transfer Switch	Starts generator during a power failure
Emergency Generator	Powers pump station during power failure

1.2.5 CAM 401A Floatables Control Structure

A precast floatables control structure is located adjacent to the Massachusetts Bay Transportation Authority (MBTA) Sherman St. crossing and within Sherman St. and an easement granted by the owners of #147 Sherman St. Refer to Figures 1.7, 1.8, and 1.9 "CAM 401A Floatables Control Structure Details".

The precast structure replaced the existing structure at the same location and is now the CAM 401A overflow. The floatables control structure contains an overflow weir at elevation 6.18' (NGUD), that replaces the previous weir wall, which has been bulkheaded. The invert of the previous CAM 401A structure has been modified to convey flows down the 60" x 66" Sherman St. combined sewer.

The CAM 401A floatable control structure consists of two chambers, (1) the brush screen chamber and (2) the flap valve chamber, which are described below:

Brush Screen Chamber

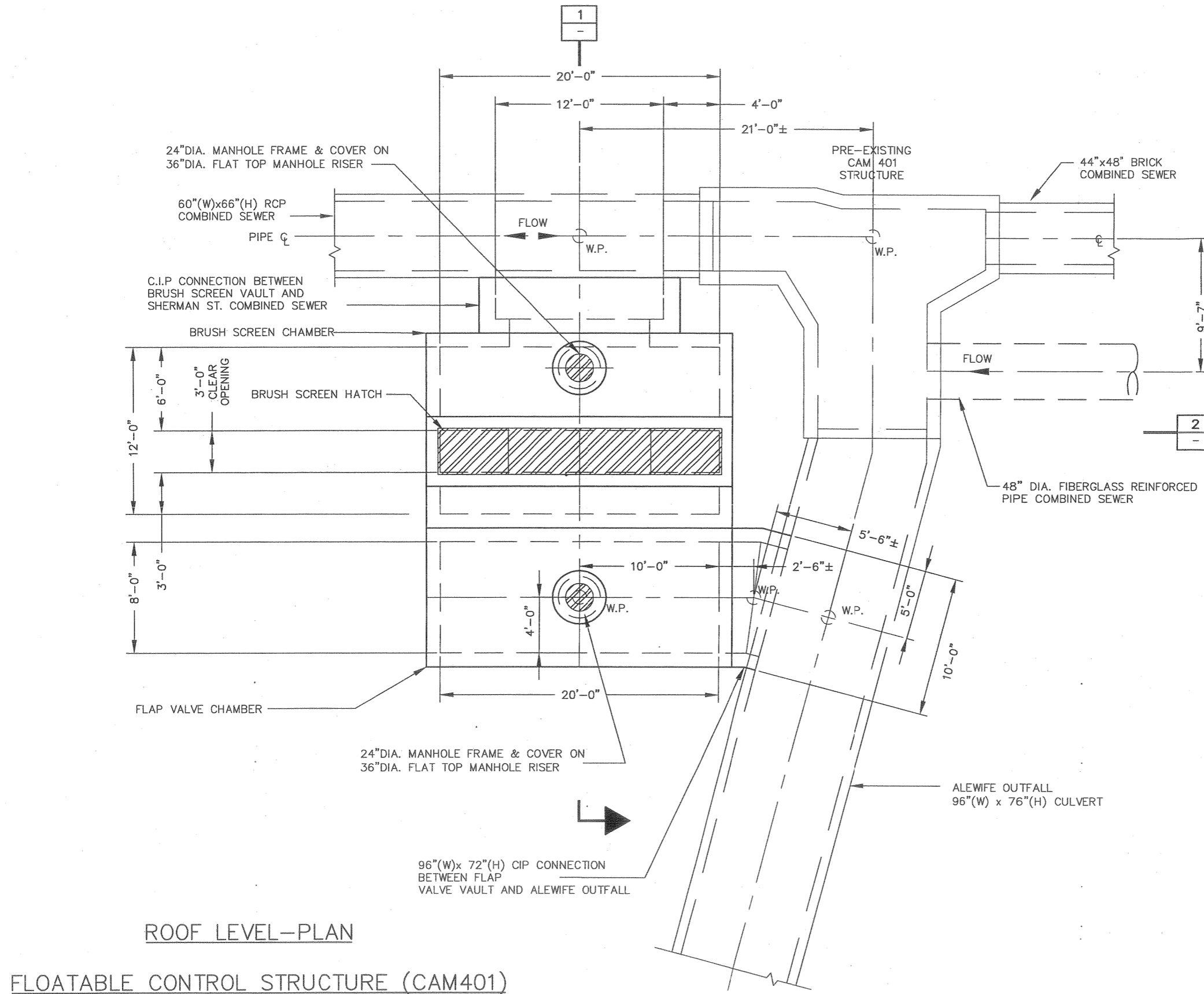
The brush screen chamber is a 20' wide by 12' long by 8' high precast structure. There are two access points to the chamber, the brush screen hatch located within the sidewalk and a manhole located within Sherman St. The brush screen chamber contains the Hydroclean Fine Screen, which is installed on the 6" wide by 27" high overflow weir. The control float switch and flow level meter are also located within this chamber.

The brush screen chamber is connected to the 60" x 66" Sherman St. combined sewer box culvert through a cast in place inlet with a 10' wide by 6' high opening. The invert of the brush screen chamber slopes back towards the combined sewer as shown on the details.



Flap Valve Chamber

The 20' wide by 8' long by 8' high precast flap valve chamber is located adjacent to the brush screen chamber. There is one manhole access point to the chamber located within the

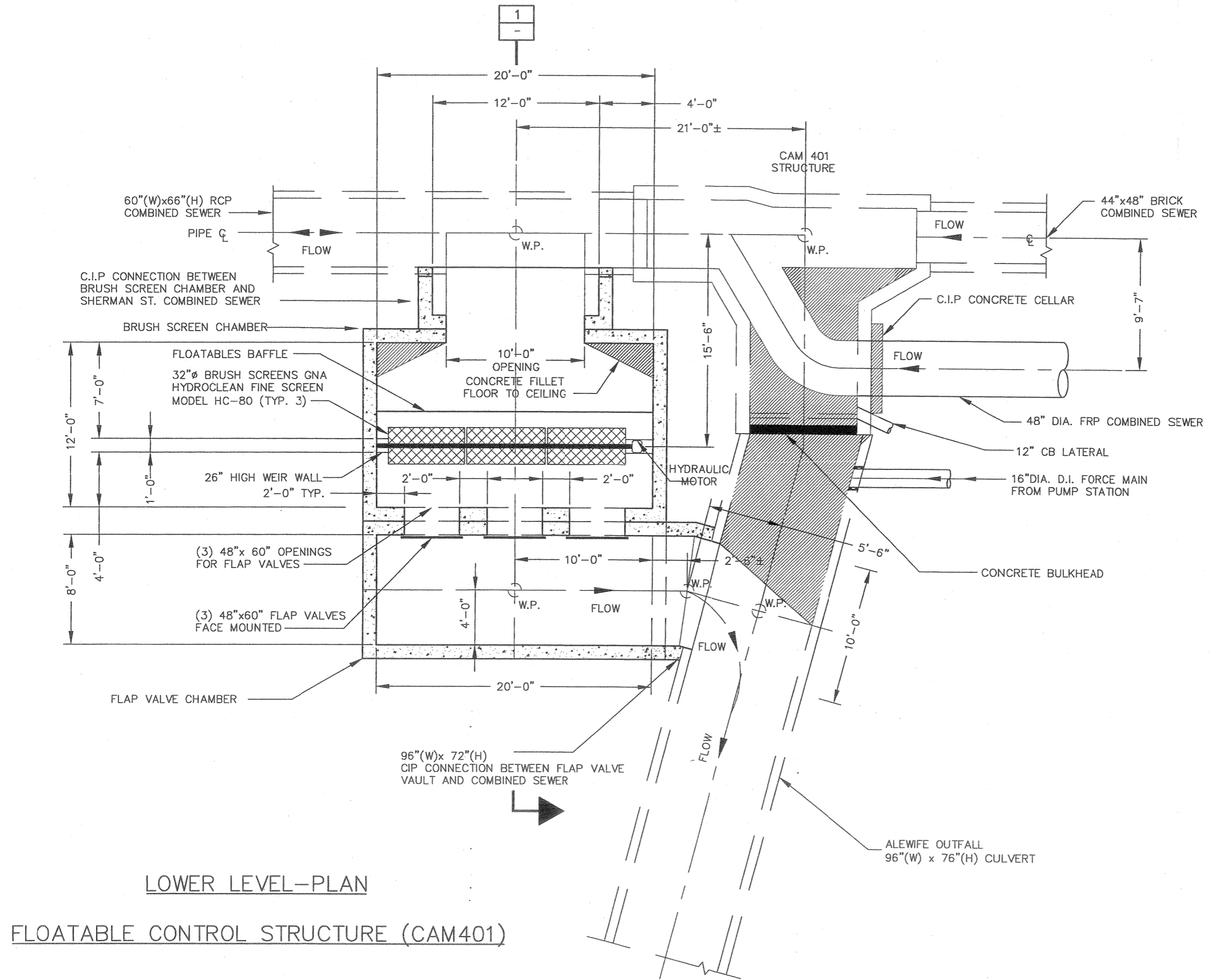
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ROOF LEVEL-PLAN
 FLOATABLE CONTROL STRUCTURE (CAM401)

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Project	BELLIS CIRCLE / SHERMAN STREET DRAINAGE IMPROVEMENTS PROJECT
Drawing	CAM 401A FLOATABLES CONTROL STRUCTURE
Scale	1/8" = 1'
Date	8/04
Job No.	1998400.45-A
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Sheet	FIGURE 1.7
Total Sheets	15

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LOWER LEVEL-PLAN
 FLOATABLE CONTROL STRUCTURE (CAM401)

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Drawing	CAM 401 A FLOATABLE CONTROL STRUCTURE DETAIL

Sheet	FIGURE 1.8
Total Sheets	15

weir, is activated by a float switch and rotates opposite of the direction of flow screening all floatables into debris storage bin, which rises and lowers automatically with the water level. The screened combined sewage then flows through the flap valves and into the flap valve chamber, which then discharges to the Alewife outfall.

The three (3) flap valves prevent high flows in the Alewife Brook from backflowing into the Sherman St. combined sewer.

After the high flow event subsides the debris storage bin lowers with the combined sewer flow and releases the collected debris to the 60" x 66" Sherman St. combined sewer low level flow.

Table 1.3 lists the essential equipment in the floatables control structure and the service description of each item. Figure 1.7, 1.8, and 1.9 "CAM 401A Floatables Control Structure Details" shows the equipment layout within the structure.

Table 1.3 CAM 401A Floatables Control Structure Equipment List

EQUIPMENT	SERVICE DESCRIPTION
Control Panel	Contains control logic for brush screen motor and alarm lights.
Float Switch	Float Switch is wired to the control panel. It turns the brush screen on and off
Flow Level Meter	Monitors level of flow within brush screen chamber
GNA Hydroclean Fine Screen HC-800/5000	Rotates opposite flow direction to screen combined sewerage passing over the weir wall.

1.3 Collection Systems

The Sherman St. combined sewer conveys the following:

- Combined sewer plows from areas south of the Sherman St. Danehy Park parking area
- stormwater flows from Danehy Park
- stormwater flows from Bellis Circle
- combined flows from Bolton St. and Pemberton St.

The Sherman St. combined sewer is connected to the Alewife Brook box culvert outfall at the CAM 401A floatables control structure (at the MBTA railroad crossing). An overflow weir at the CAM 401A floatables control structure regulates combined flows to the outfall.

The drainage collection system employs a mixture of single and double grate catchbasins. A total of eight (8) double grate catch basins and one (1) single grate catch basin were added on Sherman St. and one (1) single grate was converted to a double grate catch basin at the entrance to the north parking area. The new catch basins are typically 4 feet in diameter and have 6 foot sumps to collect sediments.

A dedicated sanitary sewer parallels the Sherman St. combined sewer.

Below are descriptions of system operation during low and during high flows.

The drainage collection system employs a mixture of single and double grate catchbasins. A total of eight (8) double grate catch basins and one (1) single grate catch basin were added on Sherman St. and one (1) single grate was converted to a double grate catch basin at the entrance to the north parking area. The new catch basins are typically 4 feet in diameter and have 6 foot sumps to collect sediments.

A dedicated sanitary sewer parallels the Sherman St. combined sewer.

Below are descriptions of system operation during low and during high flows.

1.3.1 Sanitary Sewer and Combined Sewer System at Low Flows

During low flows, the Sherman St. combined sewer conveys all flow to the Rindge Ave. combined sewer. All stormwater flows from Danehy Park, including the wetland pond, are conveyed directly to the combined sewer.

The sanitary sewer conveys flows to the MWRA sewer on Rindge Ave.

Refer to Figure 1.11 & 1.12 "Flow Diagram During Low Flow."

1.3.2 Sanitary Sewer and Combined Sewer System at High Flow

A two-year storm event creates a high flow situation for the sanitary sewer and combined sewer on Sherman St.

During high flow events, the Rindge Ave. combined sewer backflows to the Sherman St. combined sewer raising the level of flow in the pipe. The flap valves on all the Danehy Park drainage outlets (refer to section 1.3.3 below) close and all the stormwater flow from the park and wetland pond is discharged to the storage tank and pump station. The pump station flow is then discharged to the Alewife outfall, thus bypassing the Sherman St. combined sewer.

The Sherman St. combined sewer discharges over the weir at the CAM 401A floatables control structure into the Alewife outfall.

The Sherman St. sanitary sewer receives backflow from the Rindge Ave. sanitary sewer during high flow events. Two (2) flap valves installed on the Bellis Circle sanitary sewer (refer to section 1.3.3 below) close and prevent backflow into the Bellis Circle neighborhood.

Refer to Figure 1.13 & 1.14 "Flow Diagram During High Flow."

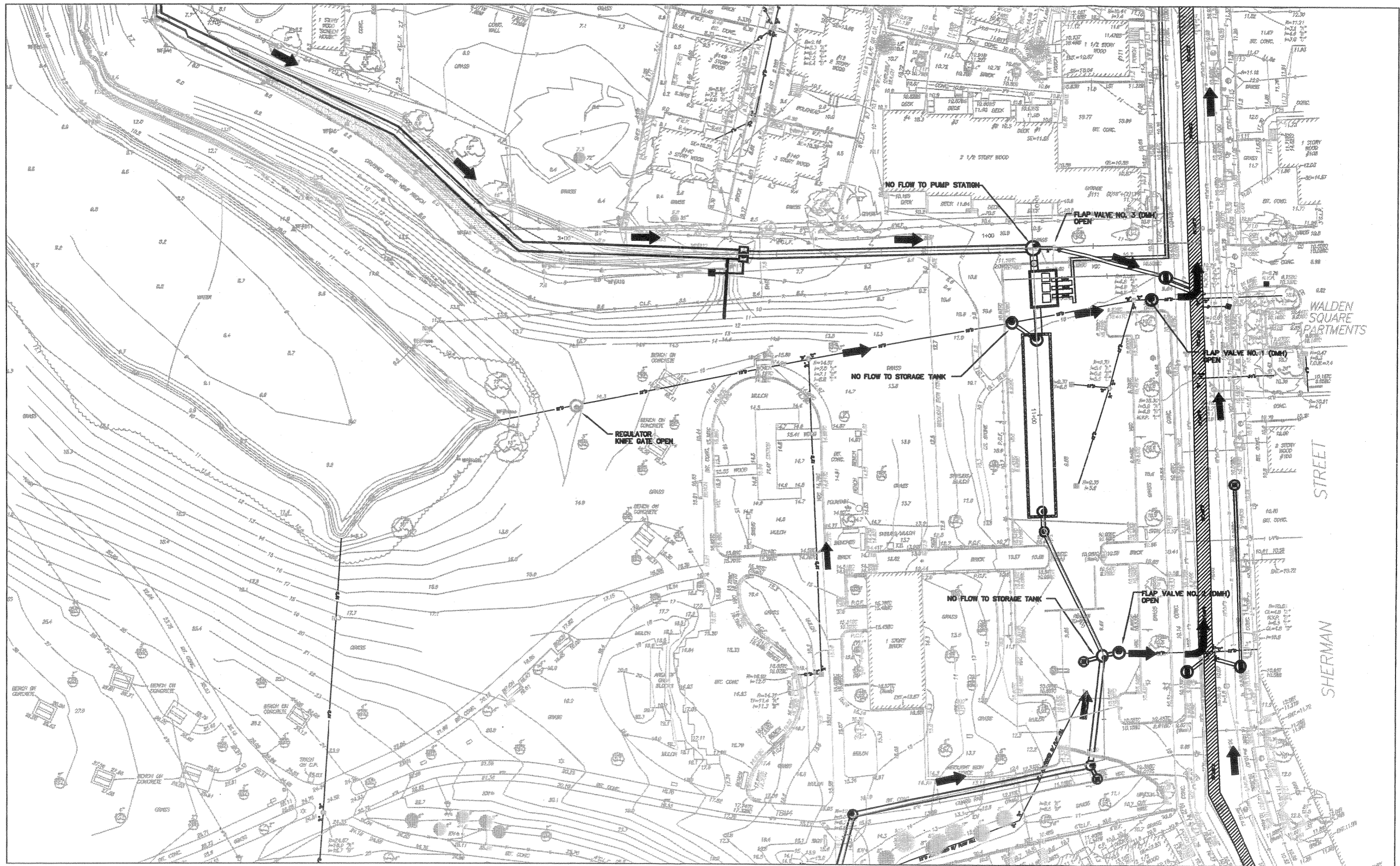
1.3.3 Flap Valves

Eight flap valves have been installed in the Sherman St. work area, two (2) on the sanitary sewer, three (3) on the Danehy Park outlets, and four (4) in the CAM 401A floatables control structure (see C-4 and C-5).

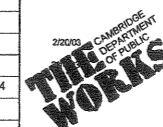


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BELLIS CIRCLE / SHERMAN ST.
 Drainage Improvements

FLOW DIAGRAM DURING LOW FLOW
 DANEHY PARK

Sheet No.

1.12

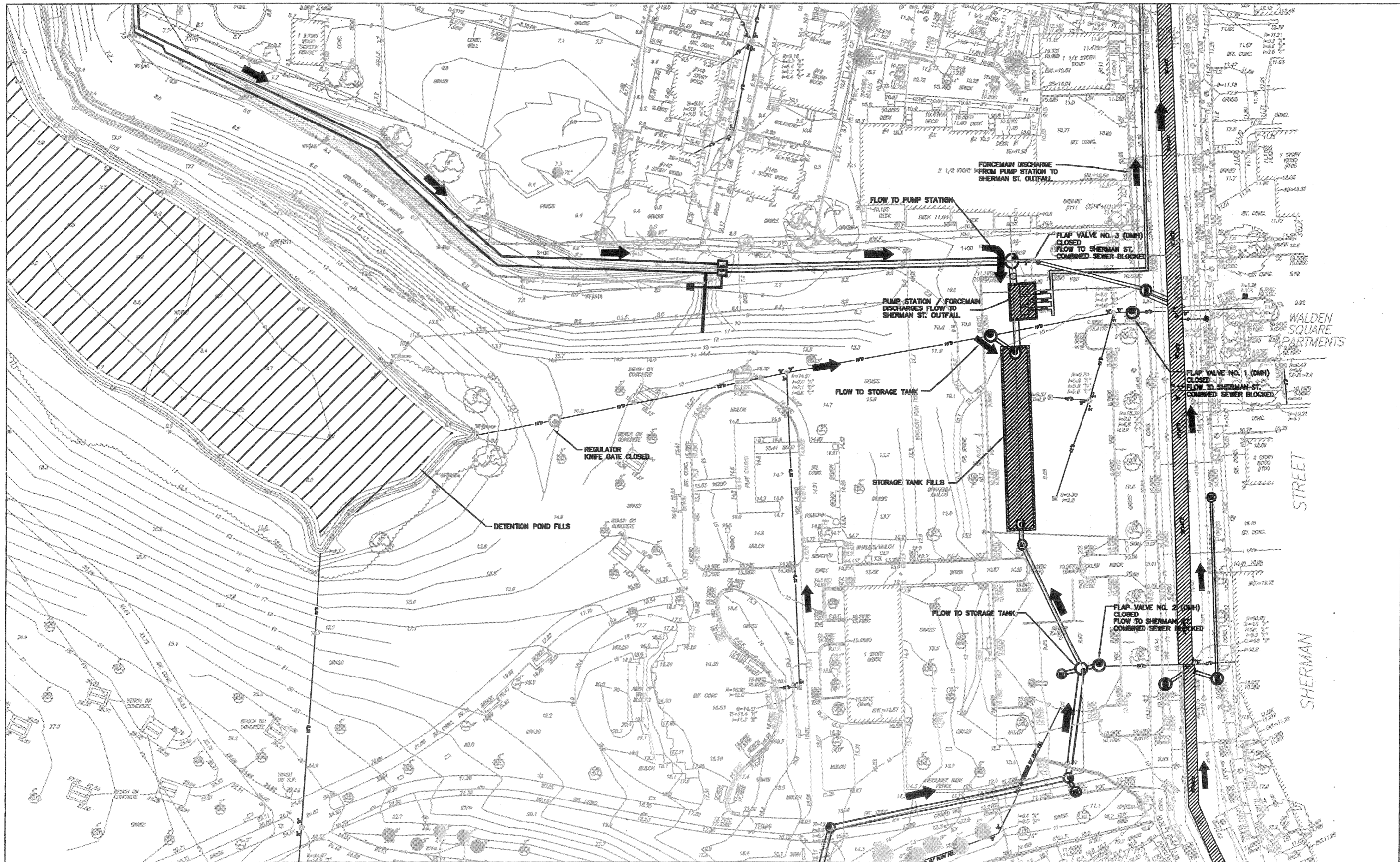
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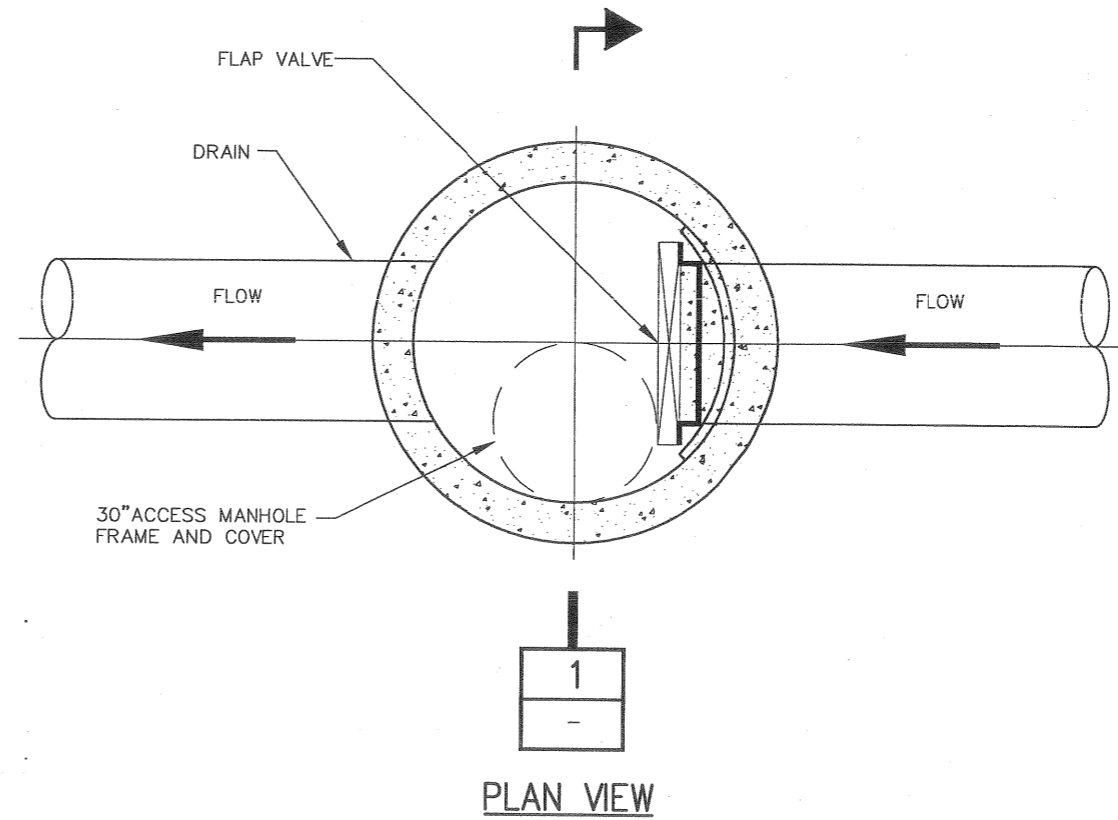
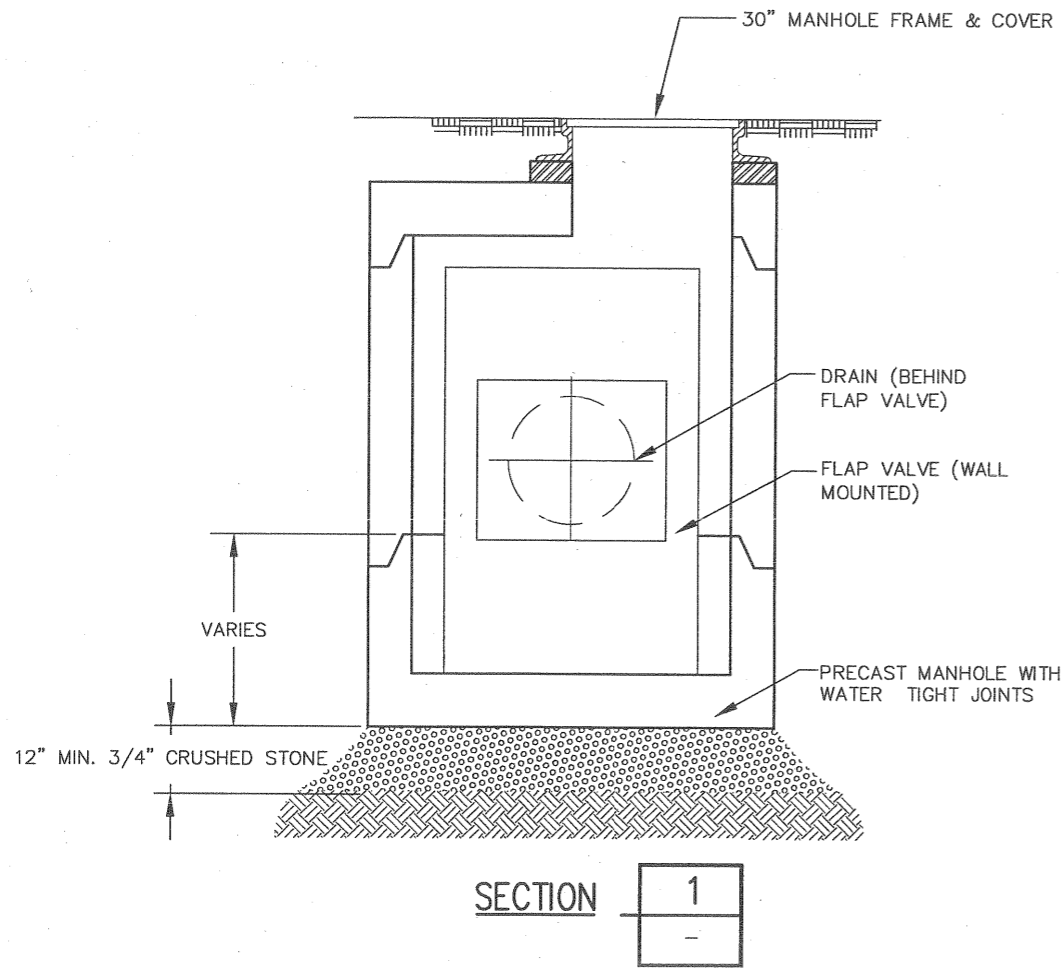
Flap Valve Manhole No. 1 contains a float switch, which controls the opening and closing of the knife gate within the Regulator Manhole.

The table below indicates the location, size and service description of each flap valve.

Table 1.4 Flap Valves

FLAP VALVE #	LOCATION	EQUIPMENT	SERVICE DESCRIPTION
1	North Sherman St. parking area entrance	15" Stainless Steel Flap Valve	Prevents backup of the Sherman St. combined sewer into the Danehy Park area (on Regulator Manhole outlet)
2	Landscape area adjacent to North Parking Area	16" Stainless Steel Flap Valve	Prevents backup of the Sherman St. combined sewer into the Danehy Park area (on box channel outlet)
3	South Sherman St. parking area	15" Stainless Steel Flap Valve	Prevents backup of the Sherman St. combined sewer into the Danehy Park area (on 24" RCP outlet)
4	Bellis Circle – North Sanitary Sewer Outlet	8" Stainless Steel Flap Valve	Prevents backup of the sanitary sewer into the Bellis Circle neighborhood.
5	Bellis Circle – South Sanitary Sewer Outlet	8" Stainless Steel Flap Valve	Prevents backup of the sanitary sewer into the Bellis Circle neighborhood.
6-8	CAM 401A Floatables Control Structure	48" x 60" Stainless Steel Flap Valves	Prevents backflow for the Alewife River into the Sherman St. combined sewer

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FLAP VALVE MANHOLE DETAIL

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 FLAP VALVE MANHOLE

Sheet
FIGURE 1.10

Total Sheets
 15

2.0 Operations

The Bellis Circle / Sherman St. automated pumping station, regulator manhole, flap valves and floatables control structure (CAM 401A) operations are summarized below.

2.1 Pump Station

The Pump Station operates real-time during storm events.

The three Flygt pumps located within the precast structure will operate automatically through a series of five floats. The float switches are hung from the roof of the wet well. Each float switch is described in Table 2.1 below:

Table 2.1 Pump Station Float Switch Functions

Float #	Elevation (NGVD)	Distance Above Invert	Description
1	-3.00	3.00	Low water level (pump shutdown)
2	3.00	6.00	Lead Pump Operation
3	5.00	8.00	Lag Pump Operation
4	6.00	9.00	Lag-Lag Pump Operation
5	7.00	10.00	High Water Alarm

The first float switch is the low water level shutdown. When the water level falls below the first float, the lead pump will shut off after it has been activated.

The second float switch sends a signal to the control panel, which will turn on the “lead” pump. The third float switch triggers that “lag” pump. When the water level falls below the first float, the lead and lag pump will shut off.

The system is designed to operate two pumps at one time at most, leaving the third pump as a backup in the event of a pump failure. Two pumps will operate at the same time when the lead and lag floats have been activated.

The fourth level switch senses failure of either the lead or lag pump and activates the standby pump. The fifth level switch is wired to a high water alarm in the control panel.

The pump system is controlled by float switches in the pump station wet well, which are connected to relays in the control panel. When set in hand mode, the operators will have manual control of the pumps.

A Flygt Triplexor automatically alternates the three pumps between lead and lag duty between operating periods. Alternating the pumps allows for an even run time for each pump. The pumps should remain set on automatic unless maintenance personnel are on-site.

When set on hand operator mode, the pumps can be shut off with the HOA switch or disconnected from the power supply by breakers at the panel.

The pumps are connected to an external run light, which is activated when any of the pumps are in operation.

Refer to the Flygt Control Panel Operator and Owner's Manual (Appendix A) for specific light operations, trouble shooting suggestions and wiring diagrams.

Backup Generator

An Olympian Emergency Generator has been installed should there be a power failure. The emergency generator should be in the standby state to allow for automatic operation. The engine control switch should be left in the "auto" position and the generator's circuit breaker in the "on" position. The system is equipped with an automatic transfer switch that activates the generator and transfers power to the control panel and pumps in the event of a power loss. When the power fails, the remote start contact in the transfer switch will close and complete a circuit to the automatic controls marked "E" in the control panel. As a result, the engine will start and come up to speed and voltage, and then transfer power to the pumps.

When the power returns, the pumps will transfer back to normal power after a programmable time delay. At that time, the remote start contact in the transfer switch will open and the unit will shutdown and be ready for the next power failure.

The generator operates on diesel fuel. After each power failure the fuel level should be checked and filled as necessary.

Refer to the Olympian Emergency Generator Operator's and Owner's Manual (Appendix B) before operation and for trouble shooting suggestions.

Regulator Manhole

The Regulator Manhole has two mechanical components, the vortex valve and the motorized knife gate.

The vortex valve is self-operating and should be monitored in accordance with the maintenance schedule indicated below.

The motorized knife gate is operated by the Auma Actuator located directly above the gate on the manhole flat top. The actuator is controlled by floats in the regulator manhole and Flap Valve Manhole #1, which operate through relays within the pump station control panel.

Float switches in the Regulator Manhole (Float #1, #2) and Flap Valve Manhole No. 1 (Float #3, #4) activate the opening and closing of the actuator according to the logic shown in Table 2.2 below.

Table 2.2 Float Settings for Control for Knife Gate

Float #	Elevation (NGVD)	Description
1	10.75'	Closes gate when water level in the Regulator Manhole falls below its elevation.
2	11.75'	Opens gate unless Float #3 is on indicating high water level in combined sewer. If Float #3 is turned on after the gate is opened by Float #2, the gate will remain open.
3	6.75'	Does not allow gate to open when turned on and opens gate if – water level in Flap Valve Manhole No. 1 falls below its elevation and water level in Regulator Manhole is above 10.75' (Float #1)
4	7.75'	Closes gate if gate is not already closed.

Two scenarios for the knife gate operation are shown in the tables below:

Table 2.3 Knife Gate Operations – Scenario 1
 Knife Gate Starts Closed

Chronological Order of Activation	Floats Activated	Floats Not Activated	Knife Gate Position (Open/Closed)
1	1	2,3,4	Closed
2	1,2	3,4	Open (Float 2 opens the gate)
3	1,2,3	4	Open
4	1,2,3,4	--	Closed (Float 4 closes the gate)
5	1,2,3	4	Closed
6	1,2	3,4	Open (Float 3 opens the gate)
7	1	2,3,4	Open
8	--	1,2,3,4	Closed (Float 1 closes the gate)

Table 2.4 Knife Gate Operations – Scenario 2
 Knife Gate Starts Closed

Chronological Order of Activation	Floats Activated	Floats Not Activated	Knife Gate Position (Open/Closed)
1	3	1,2,4	Closed
2	1,3	2,4	Closed
3	1,2,3	4	Closed
4	1,2,3,4	--	Closed
5	1,2,3	4	Closed
6	1,2	3,4	Open (Float 3 opens the gate)
7	1	2,3,4	Open
8	--	1,2,3,4	Closed (Float 1 closes the gate)

The vortex valve continuously outlets up to 2 cfs from the regulator manhole. If the wetland pond conveys a flow to the manhole greater than 2 cfs the level of water in the regulator manhole will rise in conjunction with the level in the wetland pond.

If the water level in the wetland pond and regulator manhole continues to rise, the flow will outlet through an 18" x 12" reducer near the top of the manhole.

2.2 CAM 401A Floatables Control Structure

During surcharged conditions in the Sherman St. combined sewer, flow will discharge through the CAM 401A floatable control structure brush screen chamber.

The float in the chamber is set to activate at Elevation 6.20' NGVD, which will automatically activate the brush screen hydraulic motor through a signal sent to the control panel. The brush screen will rotate in the opposite direction of the flow and discharge floatables to the debris storage bin.

The brush screen is controlled by float switches in the brush screen chamber, which are connected to relays in the control panel. When set in hand mode, the operators will have manual control of the brush screen.

High oil pressure, temperature and USWL alarms as well as a low oil level alarm will activate on the control panel as a result of the condition indicated.

An external run light has not been provided on the brush screen control panel, however a run time meter and run light are included on the control panel itself.

When the high flow subsides, the water level in the chamber will lower. Once past the float switch the brush screen will cease operation. The debris storage bin will lower with the flow discharging the contents to the Sherman St. combined sewer low level flow towards Rindge Ave.

2.3 Flap Valves

The eight flap valves installed in the Bellis Circle / Sherman St. area are self-operating. The flap valves are critical for the performance of the system and the protection of low-lying areas. Periodic inspection and maintenance of flap valves should not be overlooked.

3.0 Maintenance

3.1 Facilities

Basic maintenance, inspection and cleaning procedures for the pump station, storage tank and floatables control structure and the equipment are described below. For detailed maintenance and troubleshooting procedures, refer to the manufacturer's operations and maintenance manuals.

Stormwater Storage Tank Inspection and Cleaning

The storage tank should be internally inspected and cleaned of sediments as needed. Entry into the tank is considered a confined space entry and the Occupation Safety and Health Administration's (OSHA) procedures for confined space entry are to be followed for all inspections and cleaning. Table 3.1 presents the recommended inspection and maintenance checklist for the storage tank.

Table 3.1 Stormwater Storage Tank Preventative Maintenance/Inspection Requirements

EQUIPMENT	SUGGESTED MAINTENANCE	SUGGESTED FREQUENCY
Storage Tank	Open access openings and inspect storage tank for water to ensure it has emptied.	24 hours after large Rainfall Events
Access Openings	Inspect covers and seats to ensure they are properly seated and undamaged. Vent holes shall be unobstructed allowing air to exhaust from the tanks.	Annually
Storage Tank	Inspect tank invert for sediments and debris and inspect concrete tank walls for cracks and leakage. Inspect joints for leakage.	Every 3 months for the first year. Thereafter annually
Inlet/Outlet Pipe	Inspect inlet/outlet pipe for sediments and debris that may reduce hydraulic efficiency.	Annually

The storage tank should be cleaned on an as needed basis and in conjunction with the pump station cleaning when possible. Table 3.2 lists the procedures for cleaning the tanks.

Table 3.2 Storage Tank Cleaning Procedure

Procedure
1. Dewater the storage tank prior to entry.
2. A maintenance crewmember should enter the upstream end of the tanks in compliance with OSHA's confined space entry requirements and procedures.
3. Attach a hydraulic pressure cleaning hose with a backflow preventor valve to a nearby water hydrant.
4. Open the hydrant valve and wash down the tank walls. Flush sediments towards the outlet of the tank from the high end. Position vacator truck at the adjacent, downstream manhole to intercept washdown water containing debris and sediment
5. After completion of cleaning, remove all equipment from the tank interior.
6. Perform a visual internal inspection for leakage, cracks, and other damage and restore tank for start up operations.

Pump Station

Presented below is the inspection and maintenance procedure associated with the pump station. Table 3.3 includes mechanical and electrical equipment, and instrumentation requirements for the system. For specific step-by-step procedures for maintenance activities, trouble shooting, disassembly, and part replacement consult the Owner's Manuals provided by the suppliers.

Table 3.3 Pump Station Preventative Maintenance/Inspection Requirements

DESCRIPTION	INSPECTION AND MAINTENANCE REQUIREMENTS	FREQUENCY
Pump Wet Well	Inspect wet well for water to ensure wet well and tank has been drawn down after rain events.	After Rainfall Events
Pump Wet Well	Inspect wet well for debris or damage, ensure pumps and float switches are properly anchored and not fouled by debris.	Semi-Annually
Control Panel Cabinet	Inspect control panel cabinet for damage and tampering.	Semi-Annually
Control Panel	Inspect control panel for damage and test controls for functionality.	Annually
Check Valves	Check for proper operation and leakage from flanges. Tighten bolts if required.	Annually
Gate Valves	Exercise valves to prevent sticking.	Annually
Flygt NP 3300 Pumps	Cycle pumps and inspect for proper operation. Pull pumps to surface and inspect for damage.	Annually
Float Switches	Ensure that the float switches are floating free in the wet well structure to prevent accidental operation of the pumps or alarms.	After Rainfall Events

The Flygt submersible pumps operate most efficiently with regular inspection and preventative maintenance. The pumps should be inspected at least once a year and should have a major overhaul, or as described in the owner's manual recommendations after at least three years. The pumps were designed with guide rails and lifting chains to facilitate the installation and removal of the pumps. The pump maintenance crew must provide a portable crane to lift the pumps. When the pump is new or when the seals have been replaced, inspection is recommended after

one week of operation. Refer to the ITT Flygt Corporation Pump Operator's and Owner's Manual for specific information regarding the inspection and maintenance of the submersible pumps.

The pump wet well chamber should be cleaned on an as needed basis and in conjunction with the tank cleaning when possible. The City's lock-out/tag-out procedures should be followed prior to entering the wet well or performing any work on or around the pumps. Table 3.4 lists the cleaning procedures for cleaning the pump wet well chamber.

Table 3.4 Pump Wet Well Chamber Cleaning Procedure

Procedure
1. If cleaning the pump station and storage tank at the same time, clean the storage tank first.
2. The wet well should be dewatered using the wet well pumps to the extent possible. Disconnect power to pumps, remove the pumps from the wet well and then use a vactor truck to remove all remaining water and sediments.
3. Attach a hydraulic pressure cleaning hose with a backflow preventor valve to a nearby water hydrant.
4. Open the hydrant valve and wash down the wet well walls. Flush sediments to the sump and remove with a vactor truck.
5. After completion of cleaning, remove all cleaning equipment from the wet well.
6. A maintenance crew member should enter the wet well in compliance with OSHA's confined space entry requirements and perform an internal visual inspection for leakage, cracks and other damage.
7. Reinstall pumps and restore wet well chamber to automatic operating mode.

Regulator Manhole

Presented below is the inspection and maintenance procedure associated with the regulator manhole. Table 3.5 includes mechanical and electrical equipment, and instrumentation requirements for the system. For specific step-by-step procedures for maintenance activities, trouble shooting, disassembly, and part replacement consult the Owner's Manuals provided by the suppliers.

The regulator manhole controls are located on the pump station control panel at the north end of the Sherman St. Danehy Park parking area.

The regulator manhole should be cleaned annually. The City's lock-out/tag-out procedures should be followed prior to entering the manhole or performing any work on or around the knife gate.

Table 3.5 Regulator Manhole Preventative Maintenance/Inspection Requirements & Procedures

EQUIPMENT	SUGGESTED MAINTENANCE	SUGGESTED FREQUENCY
Manhole Chamber	The manhole should be dewatered using a portable pump to the maximum extent possible. Disconnect power to knife gate at the control panel and then use a vactor truck to remove all remaining water and sediments.	Annually
Knife Gate	Inspect gate opening to ensure no blockage exists. Operate gate manually to ensure proper functionality.	Annually
Inlet Pipe	Inspect inlet pipe for sediments and debris that may reduce hydraulic efficiency. Remove debris when found.	Annually
Vortex Valve	Inspect for sediment buildup that would reduce hydraulic efficiency. Remove sediments and debris when found.	Annually
18" x 12" Reducer	Inspect reducer for sediments and debris that may reduce hydraulic efficiency. Remove debris when found.	Annually
Motorized Operator	Evacuate all crewmembers from the manhole and reconnect the motorized knife gate at the control panel. Inspect operator for damage and test controls for functionality.	Annually

Floatable Control Structure & Hydroclean Fine Screen

The Hydroclean Fine Screen will require no further adjustments once installed. Should adjustments to the Hydroclean Fine Screen be required, consult GNA Inc. in advance in writing for approval of all maintenance work. Without notice to GNA, Inc. the warranty will be voided. Consult GNA, Inc and the Gabriel Novac & Associates, Inc. Hydroclean Fine Screen System Installation, Operation, and Maintenance Manual for information regarding maintenance procedures. Preventive maintenance should be performed on a regular basis. The following list of visual inspections was provided by GNA, Inc and is listed in the Gabriel Novac & Associates, Inc. Hydroclean Fine Screen System Installation, Operation, and Maintenance Manual:

- Visually inspect the hydraulic tubing and connections for any leaks, take corrective action if any are found.
- Visually inspect the hydraulic fluid level in the hydraulic power pack reservoir. If low, Fill to the ¾ mark on the sight glass on the reservoir. NOTE: Use only ESSO (EXXON) UNIVYS J26 to top off the hydraulic fluid. Using other types of hydraulic fluid will void the warranty. GNA, Inc. will supply this hydraulic fluid if more is required.
- Verify that the lights on the control panels are not burnt out by pushing the lamp test button.

Conduct visual inspections after the first two events and at regular three months intervals thereafter, preferably after an event.

If entering the Flap Valve Manhole Chamber of the Floatables Control Structure, the pump station must be locked out in accordance with OSHA’s Confined Space Entry Procedures. The pump station force main discharges to the Alewife Box Culvert just outside of the structure.

The CAM 401 Floatables Control Structure (concrete vault) inspection requirements are listed in Table 3.5 below:

Table 3.6 CAM 401A Floatable Control Structure Vaults Preventative Maintenance/Inspection Requirements

EQUIPMENT	SUGGESTED MAINTENANCE	SUGGESTED FREQUENCY
Access Openings	Inspect covers and seats to ensure they are properly seated and undamaged. Vent holes shall be unobstructed allowing air to exhaust from the tanks.	Annually
Vaults	Inspect vault inverts for sediments and debris and inspect concrete tank walls for cracks and leakage. Inspect joints for leakage.	Every 3 months for the first year. Thereafter annually
Inlet/Outlet Connections	Inspect inlet/outlet pipe for sediments and debris that may reduce hydraulic efficiency.	Annually

3.2 Stormwater Collection System

This section will present the inspection and maintenance procedures associated with the stormwater collection system. This includes the catch basins, collection structure sumps and the flap valves. Table 3.6 lists the inspection and maintenance requirements for the catch basins, sumps and flap valves.

Table 3.7 Stormwater Collection System Inspection and Maintenance Requirements

EQUIPMENT	SUGGESTED INSPECTION AND MAINTENANCE	SUGGESTED FREQUENCY
Catch Basins	Inspect grates, hoods and catch basins for debris and damage. Clear debris from grate. Remove sediment from catch basin if it is accumulated to one foot below pipe.	Inspect (semi-annually) Clean (as-needed)
Stainless Steel Flap Valve	Inspect the valve for debris and damage. Remove debris that may have caught or collected on the valve. Clean and lubricate gate hinges and seating faces. <i>Turn off and lock out pump station when working on Brush Screen Flap Valves.</i>	Inspect (semi-annually) Clean and Lubricate (as-needed)
Box Channel and Trench Drain Collection Structure Sumps	Inspect sumps for accumulated sediments. Use vactor truck to remove sediment if level of sediment is one foot below outlet pipe. Clean the collection structure screens of debris	Inspect (semi-annually)
Box Channel	Clean the box channel of all debris	Monthly
Trench Drain	Clean the trench drain of all debris	Semi-Annually

4.0 Safety

This safety section is an introduction to some basic safety needs and considerations. It is not all-inclusive and does not cover all situations that may be encountered. Rather, it identifies the basic needs and emphasizes key considerations when operating and maintaining the equipment. The following safety section does not supersede or replace the OSHA regulations, nor other standard safety policies issued for internal use by the City of Cambridge, Department of Public Works.

4.1 Safety Equipment

Types of safety and protective equipment used will vary depending on the particular situation and task. In all cases, the instruction furnished with the safety equipment should be reviewed and used as it pertains to the individual piece of equipment. A list of typical safety equipment follows. This is not intended to be a complete list. Refer to the equipment's owner's and operator's manual for specific safety equipment required.

- Portable fresh air blower and large diameter, flexible hose for ventilation of enclosed areas.
- Atmospheric testing equipment to identify oxygen deficiencies and explosive, toxic, and combustible gases.
- Self-contained air breathing apparatus for each person going underground and for stand-by rescue crew.
- Inhalator and resuscitator.
- First aid kits.
- Barricades, traffic cones, warning signs, and flashers.
- Explosive-proof portable lights.
- Safety harnesses, lifelines, and mechanical hauling/lifting devices.
- Protective clothing, including safety goggles, face shields, hard hats, gloves, rubber boots, safety shoes, and rain gear.

4.2 Motors and Electrical Panels

When working with electricity, it must be assumed that there is sufficient voltage and current present to cause injury. Whenever working on motors, variable-speed units, or electrical panels that are energized, operations and maintenance personnel should not use bare hands to perform any internal maintenance. The use of certified rubber electricians' gloves with protective leather gloves covering them is recommended.

The procedures listed below should be followed before working on any of the equipment. Refer to the owner and operator's manual for specific information about the equipment before conducting work.

1. Open (i.e., place in the "Off" position) ALL control switches for the unit,
2. Open the main and control power circuit breakers and lock them open. Remove any fuses in the circuit. The open circuit breaker should be tagged with a signed and dated "DO NOT OPERATE" tag indicating the reason for its being locked open,
3. Open any foreign voltage circuits (e.g., space heaters) that may be present, lock them, and tag them as described in Step 2,
4. Before starting work on any piece of equipment, check all exposed terminals or connections with a voltmeter before removing the rubber gloves.

Listed below are some precautions, which will reduce electrical accidents. This is not intended to be a complete list. Refer to each manufacturer's operator's and owner's manual for specific information regarding maintenance work.

- De-energize all sources of power before doing any work on the equipment.
- Do not ground yourself in water or on pipes or drains. Avoid them when working near any electricity.
- Allow only authorized people to work on electrical equipment and repairs.
- Keep all electrical controls accessible and well marked.
- Work in pairs around electrical equipment.
- When working on electrical equipment, turn off and lock out ALL of the circuits providing electrical power to the unit. The breakers and disconnect switches which must remain locked in the "Off" position should be tagged with a signed and dated "DO NOT OPERATE" tag indicating why the unit should not be operated.
- Never use metal ladders around electrical equipment.
- Handle all electric wires as though they were "live" wires.
- When there is a question about any electrical hazard, ask BEFORE you expose yourself to it.
- Do not use any part of your body to test a circuit.
- Ground all electrical tools.

4.3 Mechanical Equipment

Before working on any of the equipment, open, lock out, and tag the main and control power circuits with a signed and dated "DO NOT OPERATE" tag indicating the reason for shutdown. No piece of equipment should be worked on internally without first securing its drive motor.

Listed below are some precautions, which will reduce mechanical equipment accidents. This is not intended to be a complete list. Refer to all manufacturer's owner's and operator's manuals for each specific piece of equipment before conducting any work.

- Equipment should not be lubricated or adjusted while in motion where there is danger of injury.
- Equipment should not be operated unless they are in good working order and all safeguards are in place and in working condition.
- Repairs or adjustments should NOT be made on any equipment until the power has been cut off.
- Persons working around equipment with moving parts should be required to wear snug-fitting clothes.
- Equipment should not be operated without authorization.
- No person should operate any piece of equipment unless he has been instructed in its operation and is familiar with it.

4.4 Confined Space Entry

All structures constructed under this Contract are classified as confined spaces. Persons entering these structures must be trained and certified by the Occupational Safety and Health Administration (OSHA) in Confined Space Entry. It is not the objective or requirement of this manual to reiterate these policies and procedures. All structure entrances and inspections shall be performed in conformance with the OSHA requirements and the City of Cambridge, Department of Public Works confined space entry policy and procedures.

4.5 Traffic Management

Maintenance activities for the CAM 401A floatable control structure, catch basin cleaning and flap valve inspection will require proper placement of barricades, traffic cones, warning signs, and flashers to insure a safe work zone. Traffic management shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

5.0 Record Management

Detailed records should be maintained describing the physical and operational and maintenance characteristics of the system. These records will provide the information needed to optimize the performance of the system and to prepare annual budget estimates for power and replacement parts.

5.1 Physical Records

The physical records of the facility are either included in this manual or referenced here as separate documents. In either case, a copy of the following information should be available for use and reference by operation and maintenance personnel:

- Contract plans and specifications.
- Record drawings.
- Shop drawings and operating instructions for all equipment.
- Complete records of each piece of equipment, including the name of the manufacturer, model number, rated capacity, and the dates of purchase and installation.
- Record of preventative maintenance for each item of equipment. This reduces the possibility of oversight or neglect and serves as a guide in determining causes of abnormal wear and breakdown.

5.2 Maintenance Records

An accurate record of all maintenance activities should be kept. This is especially important during the initial period of operation since manufacturers can void the equipment warranties due to improper maintenance. All of the maintenance data contained in the preventative maintenance scheduling record system should come directly from the instruction manuals furnished by the equipment manufacturers. The equipment manufacturer should approve any deviations. Likewise, if the information in the instruction manuals is not appropriate for the equipment furnished, contact the manufacturer for specific maintenance recommendations.

The equipment installation, operation, and maintenance manuals are provided under this cover. The manuals are organized and indexed by major component. In all cases, the operation and maintenance staff is to refer to the manufacturer's instructions for detailed information concerning the manner and method of performing the equipment maintenance, including the preventative maintenance tasks scheduled by use of the maintenance record system.

5.3 O&M Cost Records

O&M cost records provide a basis for projecting future budgets. Records should be kept for accurate and complete time and cost reporting. Examples of which are time cards (or sheets), daily use of equipment, cost of outside services, usage of utilities (electrical power, potable water, and telephone), cost of rental equipment, cost of replacement parts, lubricants and maintenance supplies, cost of housekeeping, supplies, etc.

Appendix A

ITT Flygt Pump Owner's and Operator's Manual (under separate cover)

Appendix B

Olympian Generator Operator's and Owner's Manual (under separate cover)

Appendix C

GNA Vortex Valve Operator's and Owner's Manual

(under separate cover)

Appendix D

Auma Acuator Operator's and Owner's Manual

(under separate cover)

Appendix E

GNA Hydroclean Fine Screen Operator's and Owner's Manual
(under separate cover)

Appendix F

Fountain Flap Valve Installation and Maintenance Manual

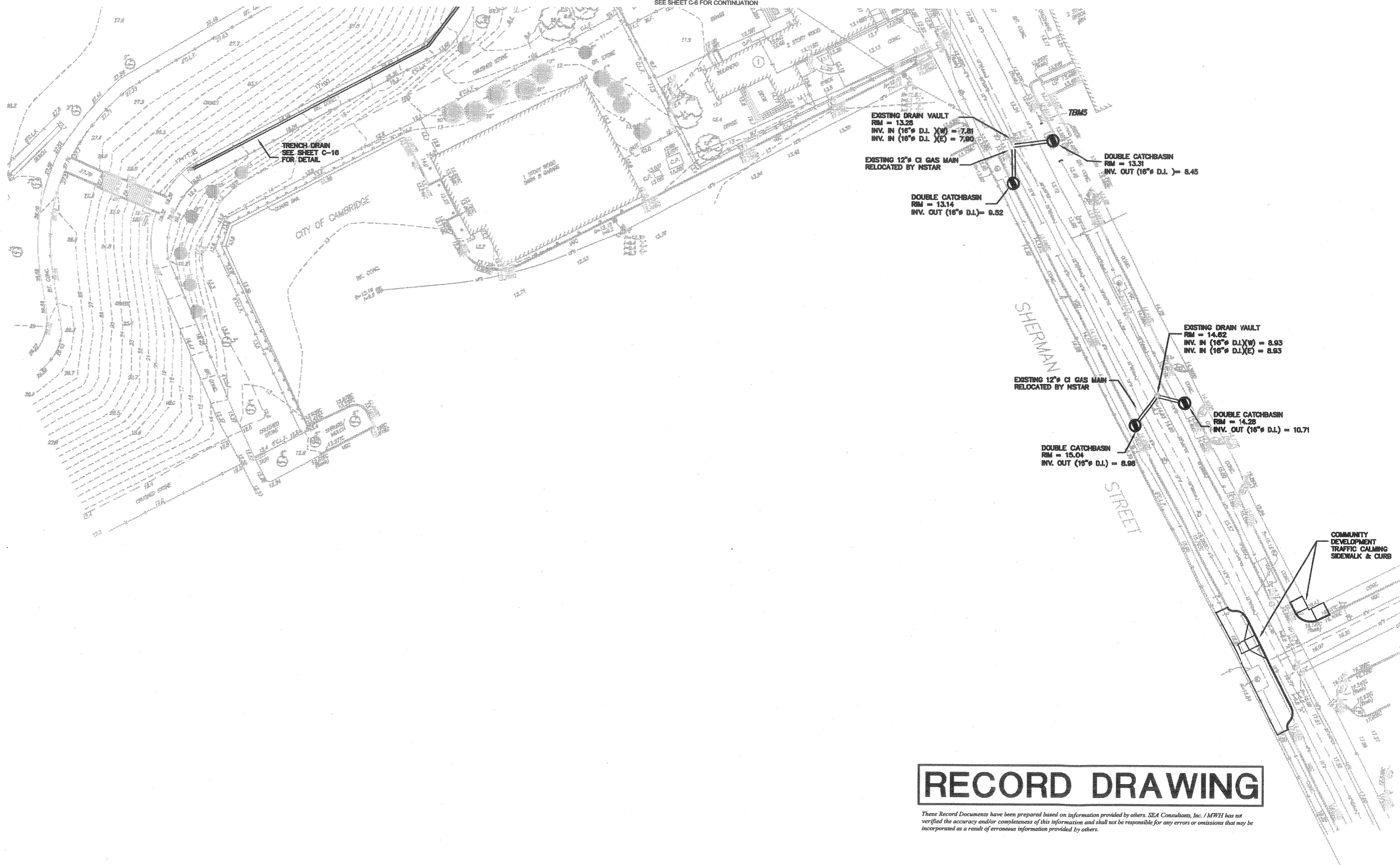
(under separate cover)

Appendix G

Contract Record Drawings Civil Sheets



SEE SHEET C-6 FOR CONTINUATION



RECORD DRAWING

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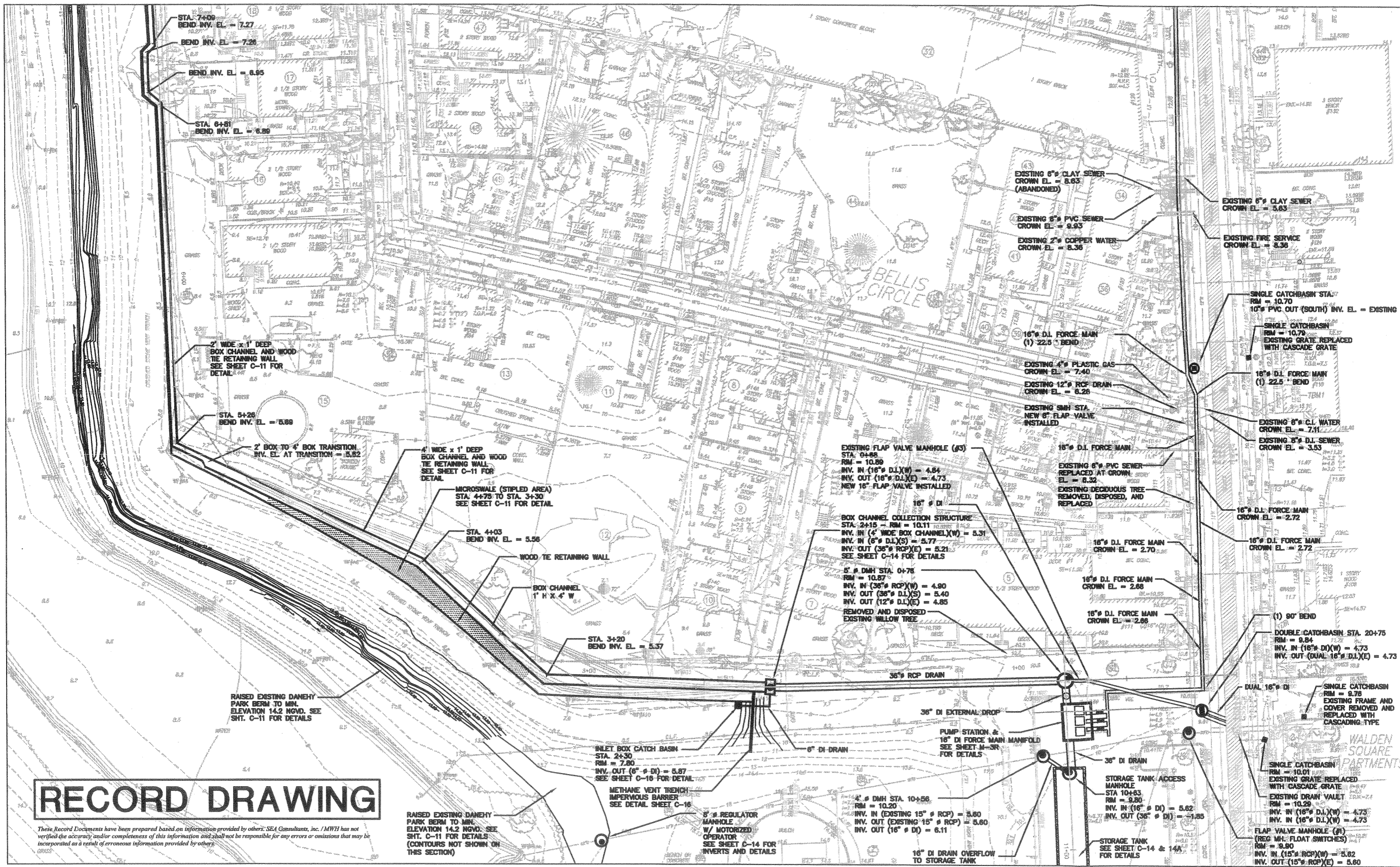
SEA SEA Consultants Inc.
Science/Engineering/Architecture
CONCORD, NEW HAMPSHIRE ROCKY HILL, CONNECTICUT
CAMBRIDGE, MASSACHUSETTS



Scale	1"=20'		
Date	04/17/2002		
Job No.	1301073.232688		
Designed by	JJU		
Drawn by	BZ	1	O&M MANUAL
Checked by	MDT	No.	Description
Approved by	WCP		REVISIONS



CITY OF CAMBRIDGE, MASSACHUSETTS		Sheet No.
BELLIS CIRCLE / SHERMAN ST. Drainage Improvements		C-7
CIVIL		File No.
SITE PLAN AREA 6		



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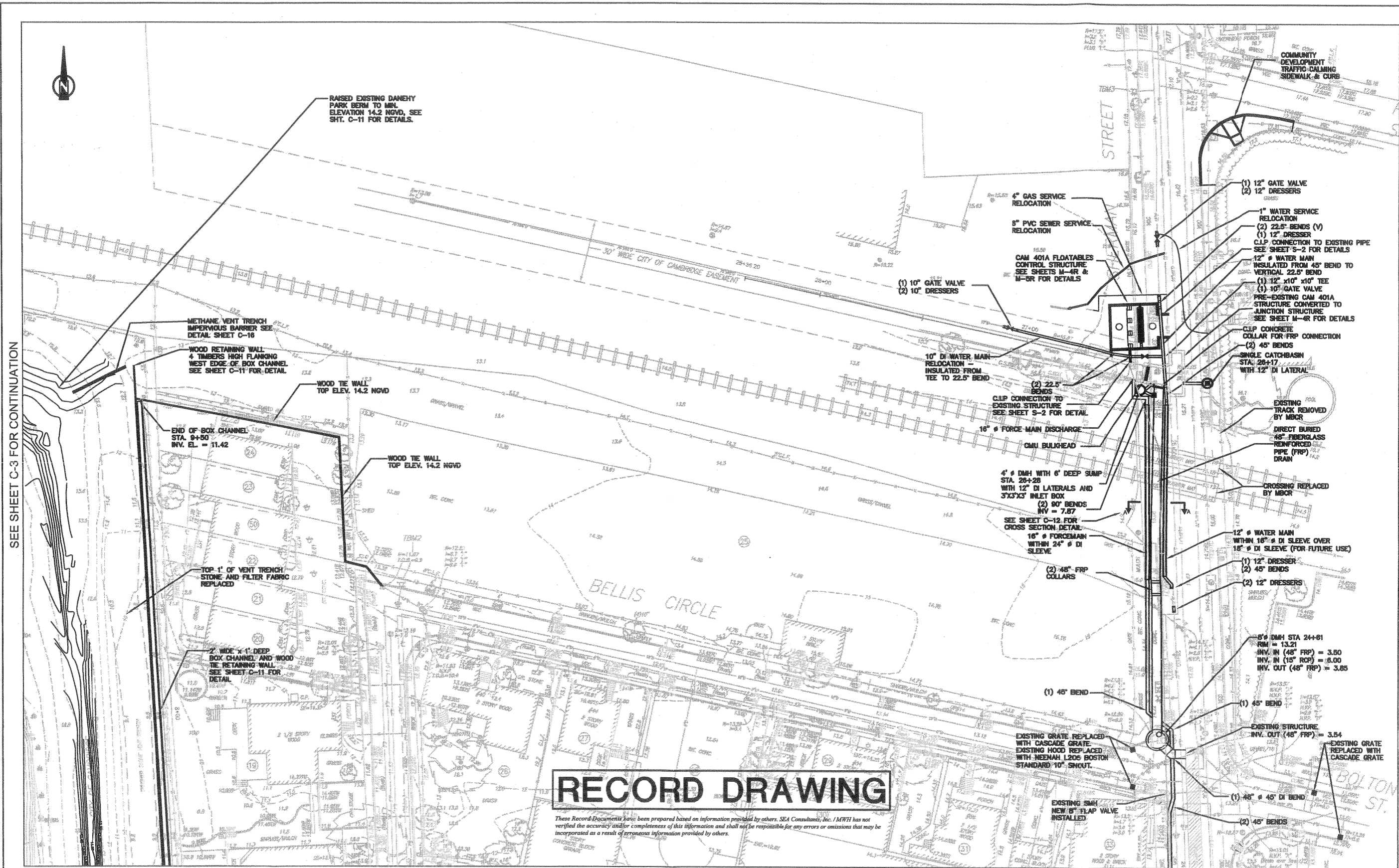
RAISED EXISTING DANEHY PARK BERM TO MIN. ELEVATION 14.2 NGVD. SEE SHT. C-11 FOR DETAILS (CONTOURS NOT SHOWN ON THIS SECTION)



Scale	1"=20'
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Job No.	1301073.232588
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CITY OF CAMBRIDGE, MASSACHUSETTS		Sheet No.
BELLIS CIRCLE / SHERMAN ST. Drainage Improvements		C-5
CIVIL		File No.
SITE PLAN AREA 4		



SEE SHEET C-3 FOR CONTINUATION

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CITY OF CAMBRIDGE, MASSACHUSETTS		Sheet No.
BELLIS CIRCLE / SHERMAN ST. Drainage Improvements		C-4
CIVIL		File No.
SITE PLAN AREA 3		

**BELLIS CIRCLE/SHERMAN ST.
CAMBRIDGE, MA**

**OPERATION & MAINTENANCE MANUALS
LARGE SUBMERSIBLE NON-CLOG PUMPS
SUBMITTAL #11149-02**

**TOTAL MECHANICAL SERVICE CORP.
1 PARK PLACE
PLYMOUTH, MA 02360**

***ITT FLYGT CORPORATION
78-K OLYMPIA AVENUE
WOBURN, MA 01801***

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NP 3300 LT
Serial Nos. 0350003, 0350004 &
0350005**

5

**CONTROL PANEL
A. Control Panel Specifications
B. Operation Instructions
C. Drawings
D. Component Specifications**

Sales, Parts, Rental & Service

Sales

Brian McCarthy
Dan McKallagat
Mike Pacillo
John Lord

Inside Sales / Customer Service

Shelly Dowd

Engineering

Dennis Murray

Administration

Jackie Leary

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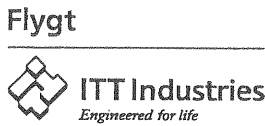
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Warranty



General Information

Issued: 4/01

Supersedes: 6/94

1

ITT FLYGT 5 YEAR (10,000 HOUR) PUMP WARRANTY MUNICIPAL: PERMANENT INSTALLATIONS

For the period defined below, ITT FLYGT offers a Commercial Warranty to the original End Purchaser against defects in workmanship and material covering Parts and Labor on its pumps when used in permanent installations, in compliance with the requirements of the ITT FLYGT Catalog and Technical Manual specifications, for use in Sewage Collection Systems or for intermittent (40% duty cycle or less) pumping of Raw Sewage, Municipal Wastewater, Potable or Raw Water, Storm Water or similar, abrasive free non-corrosive liquids ("Qualified Liquids").

ITT FLYGT Pumps used with Qualified Liquids in Sewage Lift Stations are Warranted for 5 years. ITT FLYGT pumps used for Sewage Treatment Processing or for more continuous (41% duty cycle or more) pumping of Qualified Liquids are Warranted for 10,000 hours of operation. Warranty begins on the date of shipment from ITT FLYGT. ITT FLYGT will pay the following share of the cost of replacement parts and labor provided the Pump, with Cable attached, is returned prepaid to an Authorized ITT FLYGT Service Facility for repairs. Cutting Plates and Impellers for FP Pumps are not included in this warranty.

	<u>TIME AFTER SHIPMENT</u>		
Months:	0-18	19-39	40-60
Hours:	0-3000	3000-6500	6500-10,000
Warranty:	100%	50%	25%

Unless otherwise specified by ITT FLYGT Corporate Headquarters, time after shipment shall be determined from shipping date, to date of receipt of defective product (or Warranty Claim) by ITT FLYGT or any of ITT FLYGT's Authorized Service Facilities.

Start-up report and electrical System Schematics (including Bills of Material) will be required to support any Warranty Claims. This Warranty shall not apply to any Product or Part of Product which has been subjected to misuse, accident, negligence, used in a manner contrary to ITT FLYGT's printed instructions or damaged due to a defective power supply, improper electrical protection or faulty installation or repair. The 5 year (or 10,000 hour) Warranty applies to the following Accessories if originally purchased with the pumps: Discharge Connection, Access Cover, HDL Valve, Guide Bar Bracket(s) and Pump Power Cable(s).

IMPORTANT: For warranty purposes, Monitoring devices supplied with specific pumps for protection must be connected and utilized. Failure to do so will invalidate the warranty.

ITT FLYGT's sole obligation under this Warranty shall be to Repair, Replace or Grant a Credit Reimbursement at its discretion, through its Warranty Processing Procedures for defective products when returned prepaid to ITT FLYGT and upon ITT FLYGT's exclusive examination found to be defective. Products repaired or replaced under this warranty will be returned freight prepaid.

ITT FLYGT neither assumes, nor authorizes any person or company to assume for it, any other obligation in connection with the sale of its equipment. Any enlargement or modification of this Warranty by a Representative, or other Selling Agent shall become his exclusive responsibility.

ITT Flygt will not be held responsible for travel expenses, rented equipment, outside contractor's fees, unauthorized repair shop expenses, or for pumps purchased or used without ITT Flygt supplied cable or controls unless suitable for the purpose and equal to ITT Flygt cables or controls. The warranties made herein by ITT Flygt are in lieu of any and all other warranties, expressed or implied and the implied warranties of merchantability and fitness for a particular purpose are hereby expressly disclaimed. ITT Flygt assumes no liability for loss of use or for any direct, indirect or consequential damages of any kind in respect to the use or operation of ITT Flygt products, or any equipment or accessories in connection therewith.

THE ITT FLYGT CORPORATION
FUS 4-2001



FLYGT

Care and Maintenance Manual

3300

**Bellis Circle
Cambridge, MA**

Pump models NP 3300.091.5537 with 809 impellers
for pumps with serial numbers:

3300.091.0350003

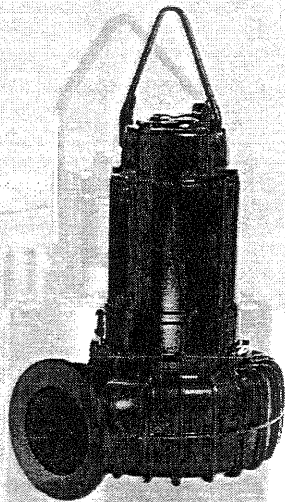
3300.091.0350004

3300.091.0350005



Approved

Class I Division 1 Group C and D
Class II Division 1 Group E, F and G



Flygt



ITT Industries

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SAFETY

This manual contains basic information on the installation, operating and maintenance and should be followed carefully. It is essential that these instructions are carefully read before installation or commissioning by both the installation crew as well as those responsible for operation or maintenance. The operating instructions should always be readily available at the location of the unit.

Identification of safety and warning symbols



General Danger:

Non-observance given to safety instructions in this manual, which could cause danger to life have been specifically highlighted with this general danger symbol.



High Voltage:

The presence of a dangerous voltage is identified with this safety symbol.

WARNING!

Non-observance to this warning could damage the unit or affect its function

Qualifications of personnel

An authorized (certified) electrician and mechanic shall carry out all work.

Safety regulations for the owner/operator

All government regulations, local health and safety codes shall be complied with.

All dangers due to electricity must be avoided (for details consult the regulations of your local electricity supply company).

Unilateral modification and spare parts manufacturing

Modifications or changes to the unit/installation should only be carried out after consulting with ITT Flygt.

Original spare parts and accessories authorized by the manufacturer are essential for compliance. The use of other parts can invalidate any claims for warranty or compensation.

Dismantling and re-assembly

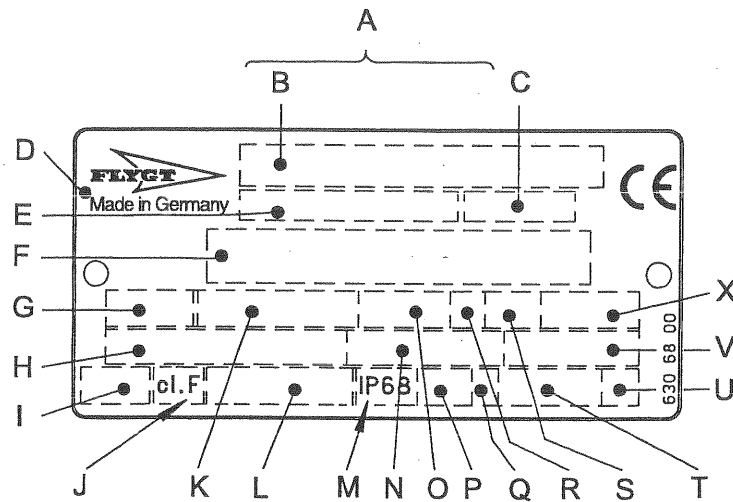
If the pump has been used to pump hazardous media, care must be taken that, when draining the leakage, personnel and environment are not endangered.

All waste and emissions such as used coolant must be appropriately disposed of. Coolant spills must be cleaned up and emissions to the environment must be reported.

The pumping station must be kept tidy and in good order at all times.

The pictures in this manual may differ somewhat from the delivered pump depending on the hydraulic end configuration.

DATA PLATE INTERPRETATION



- | | | | |
|---|-----------------------------------|---|--|
| A | Serial number | M | Degree of protection |
| B | Product code + Number | N | Rated current |
| C | Curve code / Propeller code | O | Rated speed |
| D | Country of origin | P | Max. submergence |
| E | Product number | Q | Direction of rotation: L=left, R=right |
| F | Additional information | R | Duty class |
| G | Phase; Type of current; Frequency | S | Duty factor |
| H | Rated voltage | T | Product weight |
| I | Thermal protection | U | Locked rotor code letter |
| J | Thermal class | V | Power factor |
| K | Rated shaft power | X | Max. ambient temperature |
| L | International standard | | |

PRODUCT DESCRIPTION

Introduction

Thank you for buying a submersible Flygt pump. In this Installation, Care and Maintenance manual you will find general information on how to install and service the 3300 pump to give it a long and reliable life. In the Parts List you will find all the specific technical data for your pump.

Application

This Installation, Care and Maintenance manual applies to a submersible Flygt pump. If you have bought an Ex-approved pump (please see approval plate on your pump or Parts List) special handling instructions apply as described in this document.

Depending on the hydraulic end, the pump is intended to be used for:

- pumping of waste water
- pumping of light liquid manure and urine
- pumping of sludge
- pumping of ground water
- pumping of sewage if the solids need to be cut into small pieces.

The pumps must not be used in highly corrosive liquids. See pH limits below.

The pump is available for permanent installation in a sump or portable installation with hose connection and stand.

In some applications, the pump is also available for a dry stationary installation on a base stand directly connected to the inlet and outlet lines.

For further information on applications, contact your nearest Flygt representative.

Specific technical data

For specific technical data regarding your pump, please see Parts List.

General technical data

Liquid temperature: max. 40°C (104°F). If the pump is not equipped with cooling jacket, the pump can be operated at full load only if at least half the stator housing is submerged.

The pump can be equipped for operation at temperatures up to 90°C (195°F). At increased temperatures, the pump must be completely submerged when operated at full load.

Higher temperatures than 40°C (104°F) are not permitted for Ex-approved pumps.

Liquid density: max. 1100 kg/m³ (9.2 lb per US gal.)

The pH of the pumped liquid: 5.5—14 (for cast iron pumps).

The pH of the pumped liquid: 3—14 (for stainless steel pumps).

Depth of immersion: max. 20 m (65 ft).



- In some installations and at certain operating points on the performance curve, the noise level of 70 dB or the noise level specified for the actual pump may be exceeded.
- Only Ex-approved pumps may be used in an explosive or flammable environment.

Warranty claim

Flygt pumps are high quality products with expected reliable operation and long life. However, should the need arise for a warranty claim, please contact your Flygt representative.

GENERAL DESIGN OF A FLYGT PUMP

Design

The pump is a submersible, electric motor-driven product.

1. Impeller

The pump is available with a wide range of impellers for different applications and capacities.

2. Shaft seals

The pump has two mechanical face seals – one inner and one outer, with an intermediate oil housing.

3. Shaft

The shaft is delivered with the rotor as an integral part. Shaft material: stainless steel or carbon steel.

4. Bearings

The support bearing of the rotor consists of a single-row roller bearing.

The main bearing of the rotor consists of a two-row angular contact ball bearing.

5. Oil housing

The oil lubricates and cools the seals and acts as a buffer between the pump housing and the electric motor.

6. Cooling

The stator is cooled by either the surrounding media or by forced circulation in a cooling jacket.

7. Motor

Squirrel-cage 1-phase or 3-phase induction motor for 50 Hz or 60 Hz.

The motor can be started by direct on-line or star-delta starting.

The motor can be run continuously or intermittently with a maximum of 15 evenly spaced starts per hour.

Flygt motors are tested in accordance with IEC 34-1.

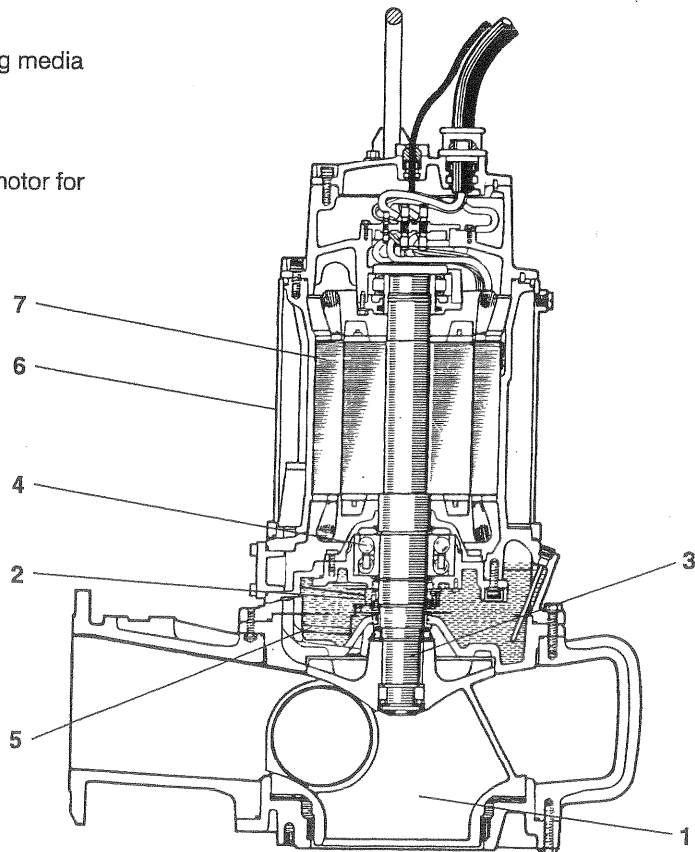
The stator is insulated in accordance with class H (180°C, 360°F). The motor is designed to deliver its rated output at $\pm 5\%$ variation from the rated voltage. Without overheating the motor, $\pm 10\%$ variation from the rated voltage can be accepted provided that the motor does not run continuously at full load. The motor is designed to operate at a voltage imbalance of up to 2% between the phases.

Monitoring equipment

The stator incorporates thermal contacts connected in series.

The pump can be equipped with sensors for sensing water in the oil* and/or stator housing.

*Not applicable to Ex-approved pumps.



INSTALLATION

Handling equipment

Lifting equipment is required for handling the pump.



- Stay clear of suspended loads.
- Always lift the pump by its lifting handle - never by the motor cable or the hose.

The minimum height between the lifting hook and the floor shall be sufficient to lift the pump out of the sump.

The lifting equipment shall be able to hoist the pump straight up and down in the sump, preferably without the need for resetting the lifting hook.

Oversize lifting equipment could cause damage if the pump should stick when being lifted.

Make sure that the lifting equipment is securely anchored.

General recommendations

To ensure proper installation, please see the dimensions on the dimensional drawing in the Parts List.

NOTE! The end of the cable must not be submerged. It must be above flood level, as water may penetrate through the cable into the junction box or the motor.

Check that the lifting handle and chain are in good condition.

For automatic operation of the pump (level control), it is recommended that the level regulators be used at low voltage. The data sheet delivered with the regulators gives the permissible voltage. Local rules may specify otherwise.

Clean out all debris from the sump before the pump is lowered down and the station is started.



Special rules apply to installation in explosive atmosphere.

- Intrinsically safe circuits are normally required (Ex i) for the automatic level control system by level regulators.
- Minimum stop level should be according to the dimensional drawing.
- The pump must never run dry.

Safety precautions

In order to minimize the risk of accidents in connection with the service and installation work, the following rules should be followed:

1. Never work alone. Use a lifting harness, safety line and a respirator as required. Do not ignore the risk of drowning!
2. Make sure there are no poisonous gases within the work area.
3. Check the explosion risk before welding or using electric hand tools.
4. Do not ignore health hazards. Observe strict cleanliness.
5. Bear in mind the risk of electrical accidents.
6. Make sure that the lifting equipment is in good condition.
7. Provide a suitable barrier around the work area, e.g a guard rail.
8. Make sure you have a clear path of retreat!
9. Use safety helmet, safety goggles and protective shoes.
10. All personnel who work with sewage systems must be vaccinated against diseases to which they may be exposed.
11. A first-aid kit must be close at hand.
12. Note that special rules apply to installation in explosive atmosphere.

Follow all other health and safety rules and local codes and ordinances.

WEIGHTS AND ELECTRICAL DATA

Weights

Weight including connections, but without motor cable in lb.

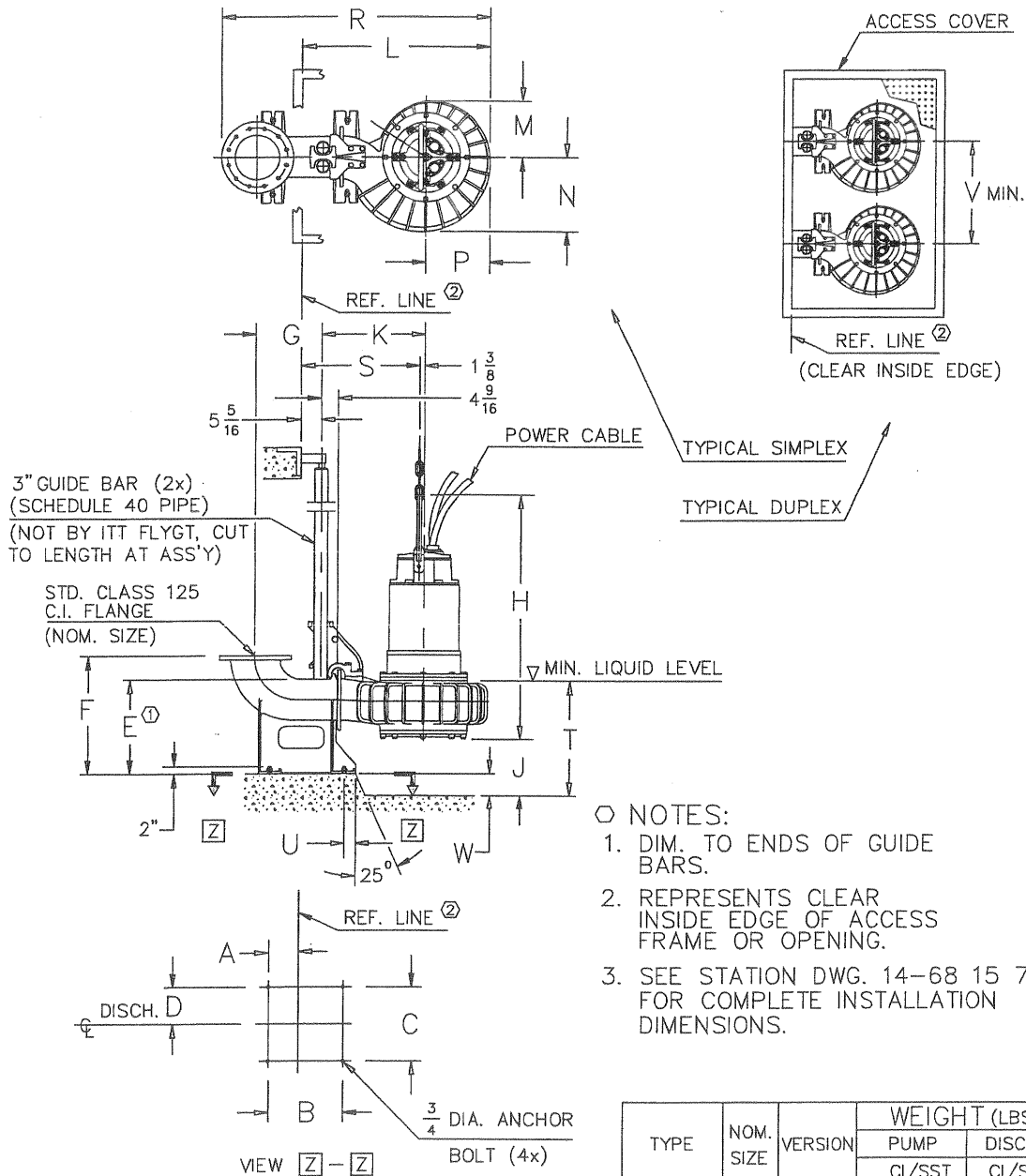
Pump type	With cooling jacket		Discharge connection
P 3300 LT	2350		465

Motor data

60 Hz, 45 hp, (34 kW) 875 r/min,
3~, 8-pole

Voltage V	Rated current A	Starting current A
460V Yser	60	280

DIMENSIONAL DRAWING



- NOTES:
1. DIM. TO ENDS OF GUIDE BARS.
 2. REPRESENTS CLEAR INSIDE EDGE OF ACCESS FRAME OR OPENING.
 3. SEE STATION DWG. 14-68 15 77 FOR COMPLETE INSTALLATION DIMENSIONS.

TYPE	NOM. SIZE	VERSION	WEIGHT (LBS)	
			PUMP	DISCH
			CI/SST	CI/SST
* CP	14"	LT	2350/2110	465/480

* ALSO AVAILABLE IN STAINLESS STEEL
 ** W = 6" IF OPTIONAL SUCTION BELL IS REQUIRED
 ALL DIMENSIONS IN INCHES

TYPE	NOM. SIZE	VERSION	DIMENSIONAL CHART																			
			A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W
* CP/NP	14"	LT	7 5/8	19 3/4	19 3/4	9 7/8	26 1/4	33 1/2	18 1/4	65	10	28 1/2	48 1/2	12 1/2	17 3/4	15	71 3/4	32 1/4	26	3	58	0

ELECTRICAL CONNECTIONS



- Before starting work on the pump, make sure that the pump and the control panel are isolated from the power supply and cannot be energized.
- If the pump is equipped with automatic level control, there is a risk of sudden restart.
- All electrical equipment must be earthed. This applies to both pump equipment and any monitoring equipment.

Failure to heed this warning may cause a lethal accident. Make sure that the earth lead is correctly connected by testing it.



NOTE for Ex version

- Electrical connections on the explosion-proof motor must be made by authorized personnel.

Flygt disclaims all responsibility for work done by untrained, un-authorized personnel.

- The pump may be used only in accordance with the approved motor data stated on the pump's plates.
- Thermal contacts must be connected to protection circuit intended for that purpose according to the approval of the product.

All electrical work shall be carried out under the supervision of an authorized electrician.

Local codes and regulations shall be complied with.

Check on the data plate which voltage supply is valid for your pump.

Check that the main voltage and frequency agree with the specifications on the pump data plate.

If the pump can be connected to different voltages, the connected voltage is specified by a yellow sticker.

Connect the motor cable to the starter equipment as illustrated in the wiring diagrams.

Conductors that are not in use must be isolated.

The cable should be replaced if the outer sheath is damaged. Contact a Flygt service shop.

Make sure that the cable does not have any sharp bends and is not pinched.

Under no circumstances may the starter equipment be installed in the sump.

NOTE! For safety reasons, the earth conductor should be approx. 50 mm (2.0") longer than the phase conductors. If the motor cable is jerked loose by mistake, the earth conductor should be the last conductor to come loose from its terminal. This applies to both ends of the cable.

Thermal contacts are incorporated in the stator. The thermal contacts can be connected to max 250 V, breaking current max 4 A. Flygt recommends that they be connected to 24 V over separate fuses to protect the other automatic equipment.

NOTE! If the pump optionally is equipped with thermistors in the stator winding, make sure that the thermistors are never exposed to voltages higher than 2.5 V. If the voltage exceeds this value, e.g. when the control circuit is being checked, the thermistors will be destroyed.

Make sure that the pump is correctly earthed (grounded).

When using a variable-frequency-drive (VFD) the shielded cable (type NSSHÖU.../3E+St) should be used. Contact your Flygt representative and ask your VFD-supplier for electrical limitations.

ELECTRICAL CONNECTIONS

Remember that the starting current in direct on-line starting can be up to six times higher than the rated current. Make sure that the fuses or circuit breakers are of the proper rating.

The Parts List gives rated current. Fuse rating and cable shall be selected in accordance with local rules and regulations. Note that with long cables, the voltage drop in the cable must be taken into consideration, since the motor's rated voltage is the voltage that is measured at the terminal board in the pump.

The overload protection (motor protection breaker) for direct on-line starting shall be set to the motor rated current as given on the data plate.

Check the phase sequence in the mains with the phase sequence indicator.

If intermittent operation is prescribed (see Data Plate), the pump shall be provided with control equipment that provides such operation.

Monitoring equipment

A plate in the junction box shows if the pump is equipped with sensors.

The FLS sensor consists of a small float switch for sensing water in the stator housing. Its design makes it suitable for pumps in vertical installations. The FLS sensor is installed in the bottom of the stator housing.

The sensor is then connected in series with the thermal switches. The leads are connected to a Mini CAS II alarm relay in accordance with the diagram below, figure 5.

A plate in the junction box shows that the pump is equipped with the sensor.

IMPORTANT: Be careful when disconnecting the pump's motor unit so that the leads are not damaged (disconnect the leads before lifting the rotor assembly and the stator casing completely apart). Also observe caution so that the sensors are not damaged.

Make sure that the leads are not pinched during installation.

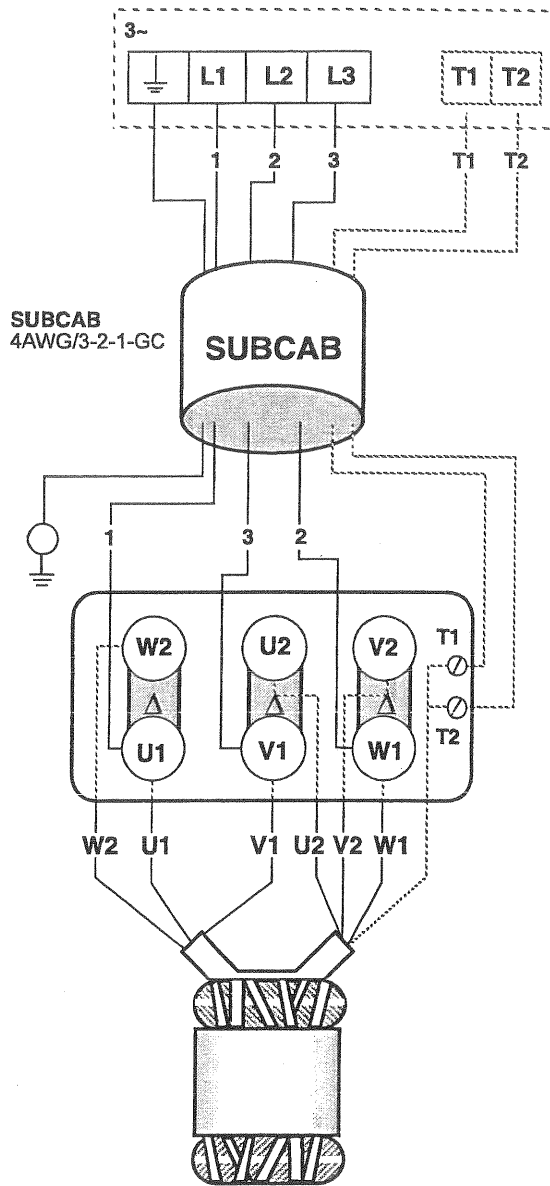
The **MiniCas II** is a monitoring relay to which FLS are connected.

Check:

- signals and tripping function.
- that relays, lamps, fuses and connections are intact.

Replace defective equipment.

CABLE CHART



3-phase, 460V D, direct-on-line starting

SUBCAB/SUBCAB AWG***

Connection starter	Conductors
1	red
2	white
3	black
Earth	yellow/green
GC**	yellow
T1*	T1/orange***
T2*	T2/blue***

Stator leads

U1	= red
V1	= brown
W1	= yellow
U2	= green
V2	= blue
W2	= black

* Terminal for connection of thermal contacts in the motor and monitoring equipment.

** GC = Ground Check

SUBCAB is a registered trademark of ITT Flygt AB for electrical cables.

TRANSPORTATION AND STORAGE

The pump can be transported and stored in a vertical or horizontal position.



- Always lift the pump by its lifting handle – never by the motor cable or the hose.
- Make sure that the pump cannot roll or fall over and injure people or damage property.

The pump is frostproof as long as it is operating or is immersed in the liquid. If the pump is raised when the temperature is below freezing, the impeller may freeze.

The pump shall be run for a short period after being raised in order to discharge all remaining water.

A frozen impeller can be thawed by allowing the pump to stand immersed in the liquid for a short period before it is started. Never use a naked flame to thaw the pump.

For longer periods of storage, the pump must be protected against moisture and heat. The impeller should be rotated occasionally (for example every other month) to prevent the seals from sticking together.

After a long period of storage, the pump should be inspected before it is taken into operation. Pay special attention to the seals and the cable entry.

Follow the instructions under the heading "Before

OPERATION

Before starting



- Before starting work on the pump, make sure that the pump is isolated from the power supply and cannot be energized.
- Make sure that the pump cannot roll or fall over and injure people or damage property.

Check that the visible parts on the pump and installation are undamaged and in good condition.

Check the oil level in the oil housing.

Remove the fuses or open the circuit breaker and check that the impeller can be rotated freely.

Check that the monitoring equipment (if any) works.

Check the direction of rotation. The impeller shall rotate clockwise, as viewed from above. When started, the pump will jerk in the opposite direction to the direction in which the impeller rotates. See the figure.

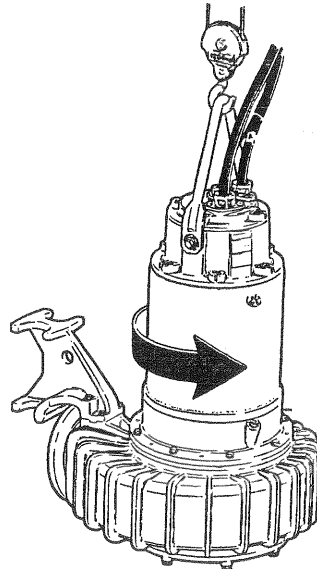
In the case of dry installation, check the direction of rotation through the inlet elbow access cover.

Transpose two phase leads if the impeller rotates in the wrong direction (3 ~).



In some installations the pump surface and the surrounding liquid may be hot. Bear in mind the risk of burn injuries.

Starting jerk



Watch out for the starting jerk, which can be powerful.

CARE AND MAINTENANCE



Before starting work on the pump, make sure that the pump is isolated from the power supply and cannot be energized.

This applies to the control circuit as well.



NOTE for Ex version

All work on the explosion-proof motor section must be performed by personnel authorized by Flygt.

Flygt disclaims all responsibility for work done by untrained, unauthorized personnel.



Make sure that the pump cannot roll or fall over and injure people or damage property.

The following points are important in connection with work on the pump:

- Make sure that the pump has been thoroughly cleaned.
- Beware of the risk of infection.
- Follow local safety regulations.

The pump is designed for use in liquids which can be hazardous to health. In order to prevent injury to the eyes and skin, observe the following points when working on the pump:

- Always wear goggles and rubber gloves.
- Rinse the pump thoroughly with clean water before starting work.
- Rinse the components in water after dismantling.
- The oil housing may be under pressure. Hold a rag over the oil screw to prevent splatter.

Proceed as follows if hazardous chemicals have splashed into your eyes:

- Rinse your eyes immediately in running water for 15 minutes. Hold your eyelids apart with your fingers.
- Contact an eye specialist.

On your skin:

- Remove contaminated clothes.
- Wash your skin with soap and water.
- Seek medical attention, if required.

Inspection

Regular inspection and preventive maintenance ensure more reliable operation.

The pump should be inspected at least once a year, but more frequently under severe operating conditions.

Under normal operating conditions, the pump should have a major overhaul in a service shop at least every third year for permanent installation and every year for portable pumps. This requires special tools and should be done by an authorized service shop.

If the seals have been replaced an inspection of the oil is recommended after one week of operation.

NOTE! Regular check of the condition of the lifting handle and chain is important.

Inspection of hot water applications

Pumps in hot water applications shall undergo inspection or overhaul at a service shop as follows, depending on the time they have been submerged in the hot water:

Temp.	Mode of operation	Inspection	Shop overhaul
≤70°C (160°F)	Continuous	1000 hours	4000 hours
< 70°C (160°F)	Intermittent	twice a year	once a year
≤90°C (195°F)	Cont./Int.	6 times a year	twice a year

OIL CHANGE

A check of the condition of the oil can show whether there has been leakage. Note! Air/oil mixture can be confused with water/oil mixture.

Insert a tube (or hose) into the oil hole. Cover the top end of the tube and take up a little oil from the bottom.

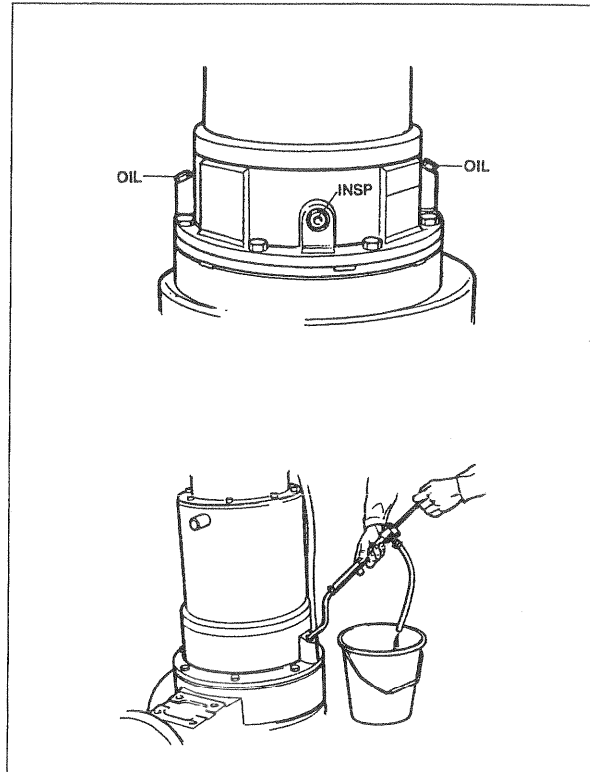
Change the oil if it contains too much water, i.e. if it is heavily emulsified (cream-like), or if the oil housing contains free water. Check again one week after changing the oil.



The oil housing may be under pressure. Hold a rag over the oil screw to prevent splatter.

3300

1. Unscrew the oil housing screw marked "oil out". Emptying the oil must be done through the "oil out" hole.
2. Pump out the oil. Using the oil drainage pump 83 95 42 or an equivalent pump. Make sure that the suction tube goes all the way down to the oil housing bottom.



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3. Install the "oil out" screw and fill with oil through the other hole. It is important that the oil be added through the hole marked "oil in" since the oil housing must contain some air for pressure equalization. A paraffin oil with viscosity close to ISO VG15 (e.g. Mobile Whiterex 309) is recommended. The pump is delivered from the factory with this type of oil. In applications where poisonous properties are of less concern, a mineral oil with viscosity up to ISO VG32 can be used.

Please see Parts List for the correct volume and tightening torque.

4. Always replace the O-rings under the oil housing screws with new ones.

HYDRAULIC END

REPLACING THE WEAR RING

When the clearance between the Rotating Wear Ring (item 158.1) and the Stationary Wear Ring (item 184) exceeds 2 mm (0.08 in), one or more of the following replacements must be made.

Removing the stationary Wear Ring

Remove the Pump Casing Bottom (item 191), see figure 9.

Using a hammer and a drift knock out the Stationary Wear Ring (item 184).

Replacing the stationary Wear Ring

Place the Stationary Wear Ring (item 184) into position inside the Pump Casing Bottom (item 191). Tap the Stationary Wear Ring (item 184) into place using a rubber mallet and a wood block to prevent deformation.

Removing the Rotating Wear Ring

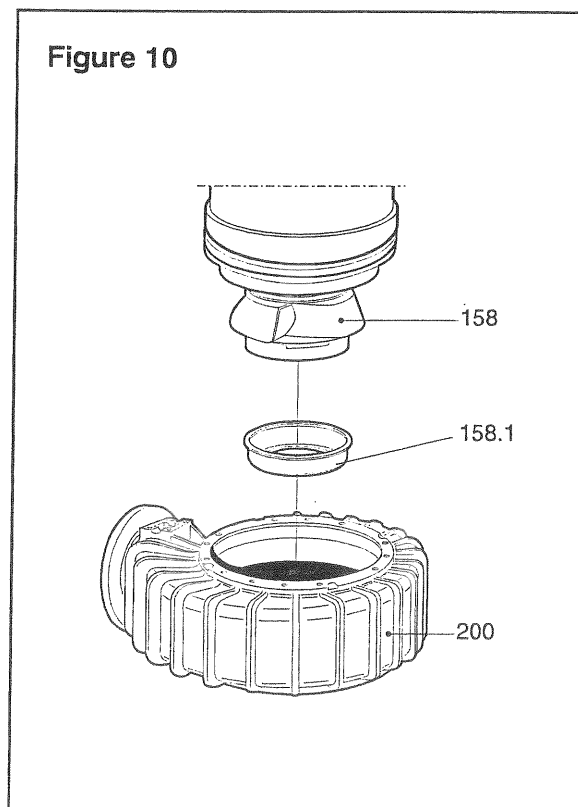
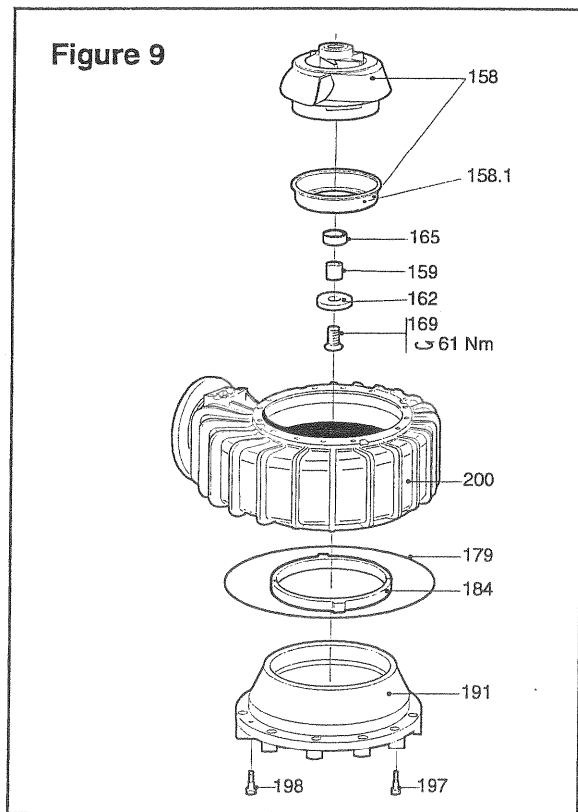
Disconnect and lift motor section from the Pump Casing (item 200), see figure 10.

Lay the motor section on its side, preferably on a couple of pieces of lumber.

The Rotating Wear Ring (item 158.1) may be removed by heating the Rotating Wear Ring (item 158.1) and tapping it off with a drift or it may be sawed off.

Replacing the Rotating Wear Ring

Replace the Rotating Wear Ring (item 158.1) by first applying heat to the Rotating Wear Ring (item 158.1), using protective gloves pick up and quickly place onto the impeller. Tap the Rotating Wear Ring (item 158.1) into place using a rubber mallet and a wood block



Impeller Locking Assembly Removal (for LT [Code 809] Pump Version)

Removing the motor housing

WARNING: Worn impellers often have very sharp edges.

Remove Allen Bolts (item 145) and lift the motor section off of the Pump Casing (item 200).

Lay the motor section on its side.

Remove Impeller Bolt (item 169).

Remove Protective Cap (item 162).

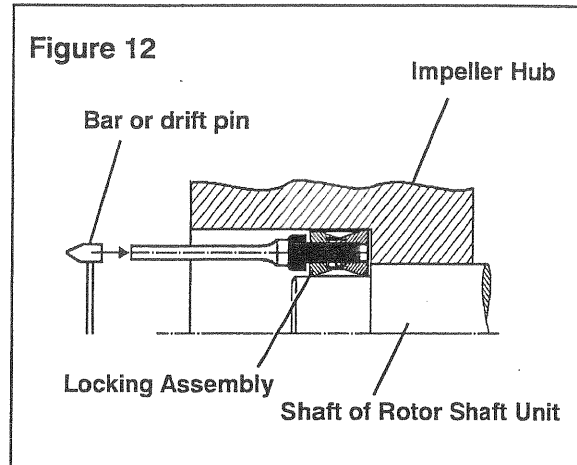
Remove Locking Assembly (item 165).

Removing Locking Assembly

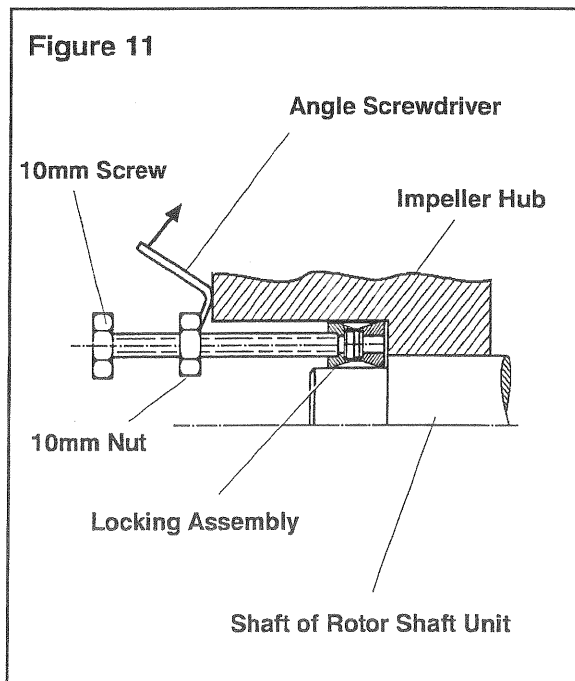
Loosen all screws on the Locking Assembly (item 165). Remove the three light colored screws and replace them with three 10 mm x 30 mm P/N 84 41 32 mm screws and 10 mm nuts P/N 82 23 58. (See Figure 11)

Using a bar or drift pin, tap the dark colored screws (See Figure 12). This will free the Locking Assembly from the Impeller's hub (item 158) and

Shaft. Remove Locking Assembly (item 165). If the Locking Assembly (item 165) cannot be removed by hand, use an angle screwdriver on the 10 mm nut to pry the Locking Assembly (item 169) out as shown in (see Figure 11).



Remove Impeller (item 158) using impeller puller specified below (see figure 13):



Impeller Removal (for MT [Code 809] Pump Version)

Pump Type	Curve Number Number	Puller Number
LT (HV)	809	84 20 49 plus 479 25 00 extension & 479 23 00 washer

Installing the impeller

Make sure that the end of the shaft is clean and free of burrs. Polish off any flaws with fine emery cloth.

Grease end of shaft.

Thread sextension 479 25 00 into the end of the shaft.

Arrange the legs of puller 84 20 49 so that the

puller hook of the legs are facing outward. Place washer 479 23 00 between the three legs of puller 84 20 49 and around the puller screw the puller 84 20 49. Press washer 479 23 00 up between the puller legs of puller 84 20 49 so that the legs can not move inwards when the impeller is being pulled. Pull of the impeller.

Do **not** pry off the Impeller (item 158), since it can easily be damaged.

Place impeller on the floor or a bench on it's edge, the impeller hub will be at a 90° angle to the floor or bench.

Heat heating tab (P/N 400 53 00) to a temperature of 750° F (400°C).

Using protective gloves pick up the heating tab and place inside of impeller hub. Leave the heating tab in for two minutes.

Left impeller using lifting equipment and place onto the shaft.

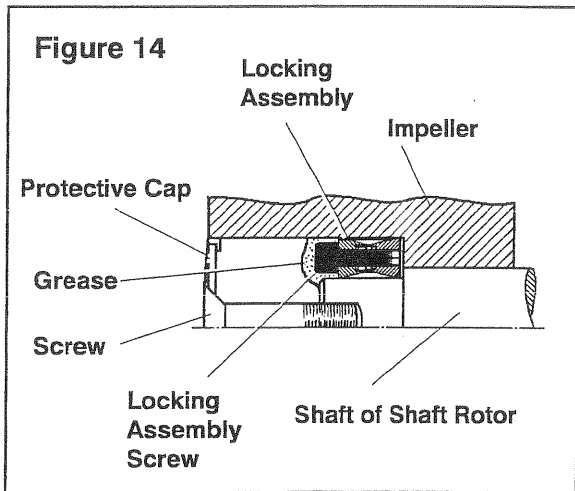
Using Impeller Washer (162) and Impeller Bolt (item 169) press the Impeller (item 158) onto the shaft. Torque the impeller bolt to 40-50 Nm (30-37 ft lb).

Remove the Impeller Bolt (item 169) and Washer (item 162).

Installing Locking Assembly

Mount Locking Assembly (item 165) between the Impeller's hub (item 158) and Shaft as described below:

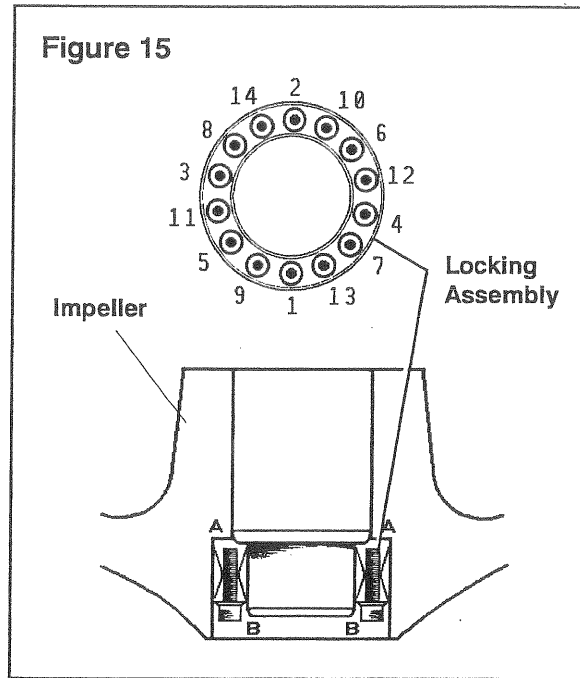
1. All contact surfaces shall be cleaned and lubricated with a thin oil film.
Do not use molybdenum disulphide (MoS₂).
2. Coat the Locking Assembly with a 3 mm (1.8") layer of ball bearing grease and fit the Locking Assembly to shaft, (see Figure 14).



3. Diametrically placed screws shall be tightened in pairs by hand by means of an Allen Key. (Figure 15). Should be tightened in the following sequence:

- | | |
|---------|----------------|
| Step 1. | screws 1 & 2 |
| Step 2. | screws 3 & 4 |
| Step 3. | screws 5 & 6 |
| Step 4. | screws 7 & 8 |
| Step 5. | screws 9 & 10 |
| Step 6. | screws 11 & 12 |
| Step 7. | screws 13 & 14 |

Control the position of the locking assembly.



4. The screws should now be tightened to 7 ft. lbs with a torque wrench in the same sequence as step 3.
5. The screws should now be tightened to 26 ft. lbs with a torque wrench in the same sequence as step 3.
6. Cover the Locking Assembly's screws heads with ball bearing grease (see Figure 14).

Check that the impeller can be rotated by hand.

Install Protective Cap (item 162) and Impeller Bolt (item 169), torque to 61 Nm (45 ft. lb.)

Install O-Ring (item 130) onto the Oil Casing (item 129). Left pump motor section and fit onto Pump Casing (120) making sure that the Pump Casing has the right orientation. Secure with washer and bolts.

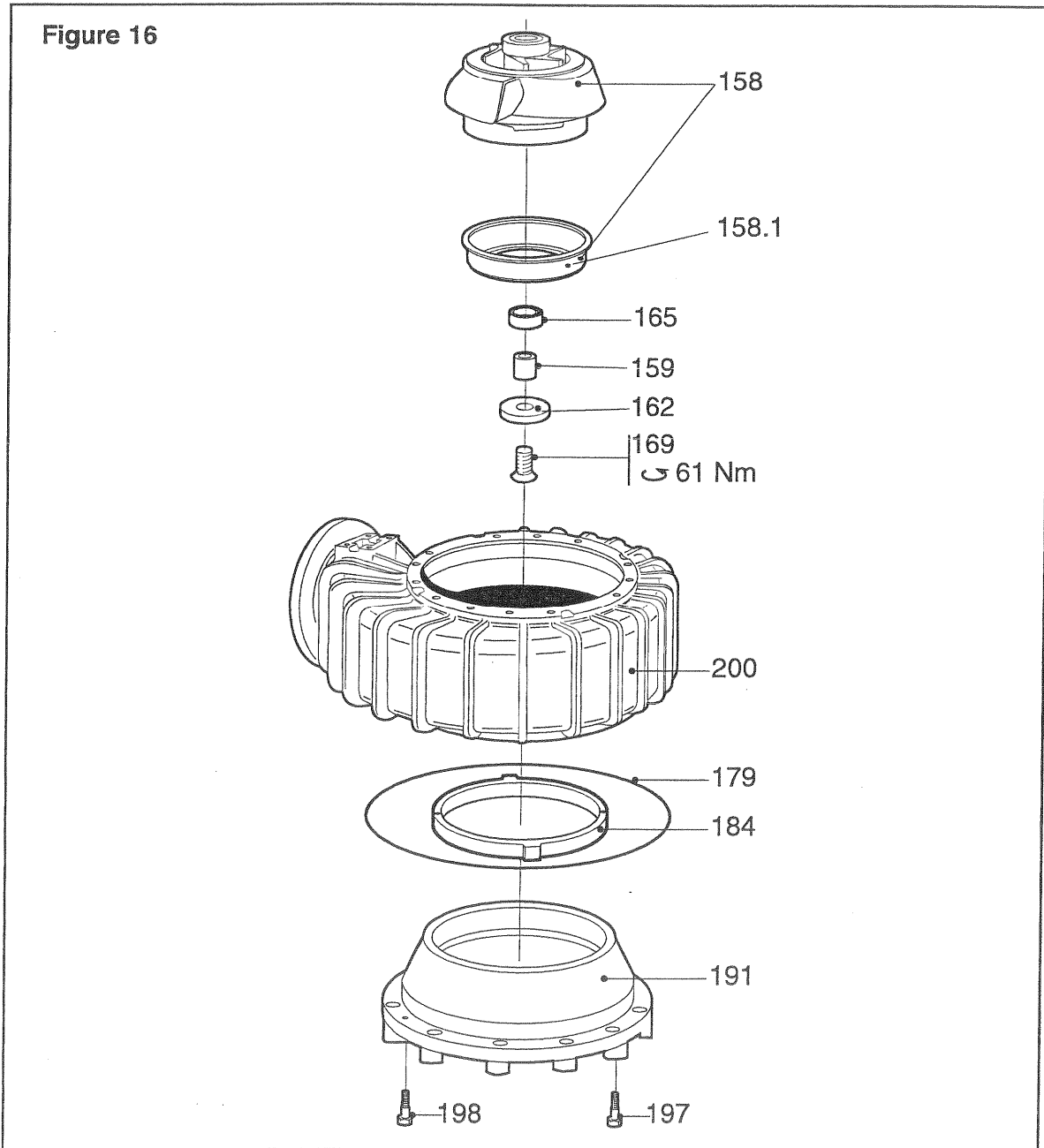
Installing The Pump Casing and Pump Casing Bottom

Lay the pump in its side.

Install O-Ring (item 179) onto the Pump Casing Bottom (item 191). Install Pump Casing Bottom (item 191) and secure with Bolts (item 198) and (item 197), see figure 16.

Tighten bolts (item 197) to a torque of 200 Nm (147 ft. lbs).

More extensive repairs require special tools and should be carried out by an ITT Flygt trained technician.



TOOLS

Besides ordinary standard tools, the following tools are required in order to perform the necessary care and maintenance of the pump:

Order No.	Description	Order No.	Description
83 95 42	Oil Pump	84 15 51	Extension bar
84 13 04	Socket, n = 6 mm	84 15 61	Swivel handle 1/2"
84 13 06	Socket, n = 10 mm	84 15 66	Torque wrench, 0—137 Nm
84 13 96	Socket, n = 24 mm	84 16 71	Screwdriver
84 13 06	Hex. bit adaptor, n = 10 mm	84 16 73	Screwdriver
		-	Socket, n = 22 mm, PI only
		385 66 01	Mounting-dismounting tool for inspection screw.

For impeller pullers, see table below.

For further information on tools, see Flygt's Tool Catalog.

Impeller Pullers		
Pump type	Curve Number (stated on the data plate)	Puller Number
LT (HV)	809	84 20 49 Puller plus 479 23 00 extension & 479 23 00 washer

SERVICE LOG

Most recent service date	Pump No.	Hours of operation	Remarks	Sign.

SERVICE LOG

Most recent service date	Pump No.	Hours of operation	Remarks	Sign.

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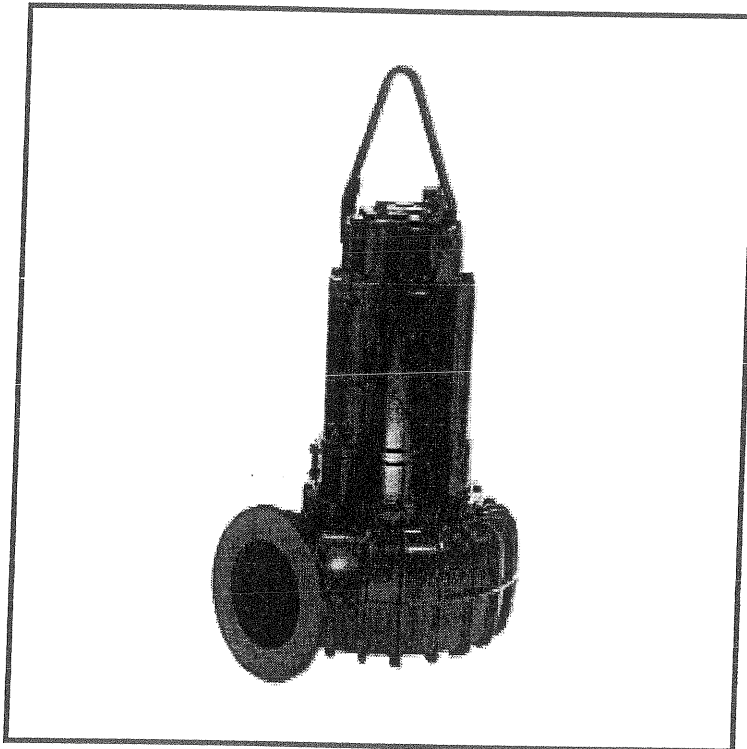


APPROVED

FLYGT SUBMERSIBLE PUMP

PARTS LIST CP 3300 LT

SERIAL NO 3300.091 0350003



**ITT FLYGT CORPORATION
35 NUTMEG DRIVE**

**TRUMBULL, CT 06611
USA
TELEPHONE NO: 203-3804700**

Flygt

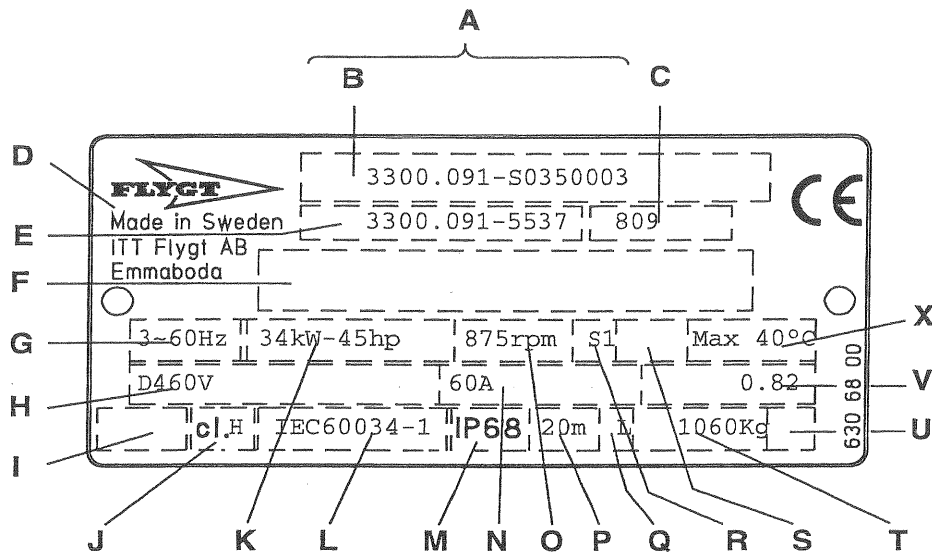


ITT Industries

FLYGT CP 3300 LT

DATE: 2003-09-30

SERIAL NO: 3300.091 0350003



Dataplate interpretation:

- | | |
|--|--|
| A Serial number | M Degree of protection |
| B Product code + Number | N Rated current |
| C Curv code / Propeller code | O Rated speed |
| D Country of origin | P Max. submergence |
| E Product number | Q Direction of rotation R=right, L=left |
| F Additional information | R Duty class |
| G Phase; Type of current; Frequency | S Duty factor |
| H Rated voltage | T Product weight |
| I Thermal protection | U Locked rotor code letter |
| J Thermal class | V Power factor |
| K Rated shaft power | X Max. ambient temperature |
| L International standard | |
- (1 kg = 2.2 pound, 1 Lit=0.26 US gallon, 1 l = 0,22 UK gallon)

Recommended spare parts:

See REC. column: **A** = Parts for inspection and maintenance
 B = Parts for major overhaul

For service;

To ensure long operating life use Flygt Bearing Grease 90 20 61 (Cartridge).
 Lubrication kit 84 15 40 contains two 90 20 61 and one 84 15 30 (Grease gun).

The O-ring kit contains a full set of O-rings. Position no 800.

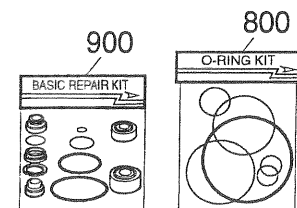
The Basic Repair kits contain both inner and outer Mechanical seals, bearings and a O-ring kit. Position no 900.

A complete set of tools can be ordered for repair and maintenance work, i.e. standard hand tools and special tools for seal change and hydraulic-end use.

Order:

This partlist can be used as an order form by marking out the number of parts in the Qty/Order column.

Please send or fax the form to your Flygt representative.



PARTS LIST

FLYGT CP 3300 LT

SERIAL NO 3300.091 0350003

Item no	Partno	Rec	Denomination	Qty/ord.
1	342 10 00		Lifting handle compl	1
2	84 34 07	B	Hexagon head screw M16X60-A2-70	2
3	342 20 00	B	Sleeve	2
5	342 21 00		Plain washer	2
6	83 38 94	B	Disc spring B-56X28,5X2-1	2
7	83 45 59		Cable tie 200X2,4 PA 6/6 -55+105	1
8	630 68 00		Data plate USE 6306801 AS SPARE PART	2
8	630 70 00		Certificate plate FM APPROVED	2
9	426 71 00		Connection plate	1
9	427 13 00		Marking tape	1
9	550 22 00		Connection plate (FLS)	1
9	550 24 00		Connection plate	1
10	82 20 88		Drive screw 4X5-A2-70	16
11	81 41 04	B	Hexagon head screw M8X20-A2-70	2
13	303 09 00	B	Earthing plate	2
23	94 21 10	B (s)	Motor cable SUBC 4AWG/3-2-1-GC 33-35	26.8 m
24	591 56 02		Motor cable entr.uni	1
24.1	82 00 34	B	Hex.socket hd screw M8X25-A2-70	4
24.4	590 64 00	B	Clamp	2
24.5	590 57 00		Entrance flange	1
26	82 00 69		Hex.socket hd screw M12X30-A2-70	2
28	82 41 01	AB	Plain washer 35,5X60X2-A2-70(33)-35	2
29	84 44 15	AB	Seal sleeve (33)-35 MM	1
32	319 03 06		Entrance cover	1
33	82 75 00	AB	O-ring 269,3X5,7 NBR	1
34	80 30 46		Parallel pin CP-H8-8X16-2346	1
35	82 01 05		Hex.socket hd screw M16X40-A2-70	4
37	391 30 02		Bearing housing	1
38	82 75 06	B	O-ring 359,3X5,7 NBR	1
39	80 30 46		Parallel pin CP-H8-8X16-2346	1
40	82 01 05		Hex.socket hd screw M16X40-A2-70	6
43	426 82 00		Con.term.board unit	1
44	82 74 81	B	O-ring 139,5X3,0 NBR	1
45	81 41 06		Hexagon head screw M8X25-A2-70	4
46	82 35 16		Plain washer 8-A2-A 140	4

Ordered by:

Company:.....Ref:.....Tel:.....Date:.....

PARTS LIST

Item no	Partno	Rec	Denomination	Qty/ord.
49	83 42 30	B	End sleeve 6.0MM2; L=10MM	9
49	83 42 34	B	End sleeve 25,0MM2; L=15MM	3
49	83 42 36	B	End sleeve 0.75MM2; L=6MM	2
49	83 42 39	B	End sleeve 16,0MM2; L=12MM	1
52	94 05 15	B	Insulating hose pvc	0.78 m
53	81 41 04		Hexagon head screw M8X20-A2-70	4
56	303 09 00	B	Earthing plate	4
57	441 41 00		Protective disc	1
58	391 32 00	B	Cover	1
59	82 59 21	B	Retaining ring SGA 72	1
59	82 59 21	B	Retaining ring SGA 72	1
60	393 03 00		Plain washer	1
61	84 53 75	B	Roller bearing ECP(75X160X37)	1
65	391 33 00		Bearing cover	1
66	391 31 00		Ring	1
67	82 73 30	B	Seal strip	1
68	81 41 32		Hexagon head screw M10X30-A2-70	4
69	531 43 01		Stator housing	1
70	82 01 05		Hex.socket hd screw M16X40-A2-70	4
79	427 40 38		Stator 35-24-8a	1
82	319 12 01		Outer casing	1
83	82 75 10	B	O-ring 439,3X5,7 NBR	1
84	82 78 88	B	O-ring 460,0X8,0-1 NBR	1
86	283 13 01		Slotted head screw	2
87	82 73 91		O-ring 22,2X3,0 NBR	2
89	279 76 01		Pipe	1
92	374 81 03		Plate	1
93	81 73 42		Slotted head screw M4X12-A4-70	2
101	504 78 11		Cable unit (FLS)	1
103	518 89 02		Leakage detect.unit (FLS)	1
105	503 45 02		Bearing housing	1
106	84 25 72	B	Seal ring	1
107	374 56 00	B	Retaining ring	2
108	82 44 26		Supporting washer 90X110X3,5	2
109	83 37 03	B	Ball bearing 3318 C3 GLAPP(90X190X73)	1
110	526 34 00		Bearing cover	1
111	82 75 02	B	O-ring 289,3X5,7 NBR	1
112	81 41 55		Hexagon head screw M12X30-A2-70	4
114	617 99 01	B	Mechanical seal WCCR/WCCR	1
114.7	82 81 94		O-ring	1
114.8	641 25 00		Spring housing unit	1

Ordered by:

Company:.....Ref:.....Tel:.....Date:.....

PARTS LIST

Item no	Partno	Rec	Denomination	Qty/ord.
117	374 57 00		Washer	1
118	319 19 00		End washer	1
119	81 73 86		Slotted head screw M8X12-A4-70	4
120	428 22 01	B	Inspection screw	2
122	82 73 90	AB	O-ring 19.2X3.0 NBR	6
126	411 16 01		Cover EN/FM/PTB	1
127	82 74 07	AB	O-ring 74.2X5.7 NBR	1
128	82 00 52		Hex.socket hd screw M10X30-A2-70	4
129	620 78 00		Oil housing	1
130	82 75 12	B	O-ring 479.3X5.7 NBR	2
132	646 59 00	B	Gasket compl.	1
133	81 41 34		Hexagon head screw M10X40-A2-70	5
134	319 20 00		Washer	1
135	306 73 00		Hexagon head screw	9
136	302 21 00		Compression spring	9
141	337 79 11	B	Mechanical seal WCCR/WCCR-TYPE S	1
141.1	82 81 54		O-ring	1
141.2	82 81 55		O-ring 89,1X5,7 FPM	1
141.6	669 75 72		Retaining ring	1
141.11	574 26 00		Seal ring	1
158	601 65 88	B	Impeller	1
159	440 44 00		Sleeve	1
162	341 86 00	B	Special washer	1
165	84 59 12		Locking assembly 55X85	1
169	82 13 97		Hex.socket hd screw 16X100-A4-70	1
179	82 75 12		O-ring 479.3X5.7 NBR	1
184	379 71 01	AB	Wear ring compl.	1
191	437 82 02	B	Suction cover	1
197	82 01 11		Hex.socket hd screw	16
198	81 41 55		Hexagon head screw M12X30-A2-70	2
200	319 34 22		Pump housing	1
201	82 27 28		Lock nut M10-A4-70	2
202	80 95 07		Stud 10X45-A2-70	2
203	433 56 00		Cover	1
204	502 53 00		Gasket	1
209	305 79 00		Guiding claw	1
210	84 34 37		Hexagon head screw M20X110-A2-70	2
214	84 34 30		Hexagon head screw M20X60-A2-70	2
229	667 40 01		Sticker	2
800	80 32 41		O-rings kit 3300.090,091,180,181	1
900	601 89 24		Basic repair kit 3300.090,091,180,181	1

Ordered by:

Company:.....Ref:.....Tel:.....Date:.....

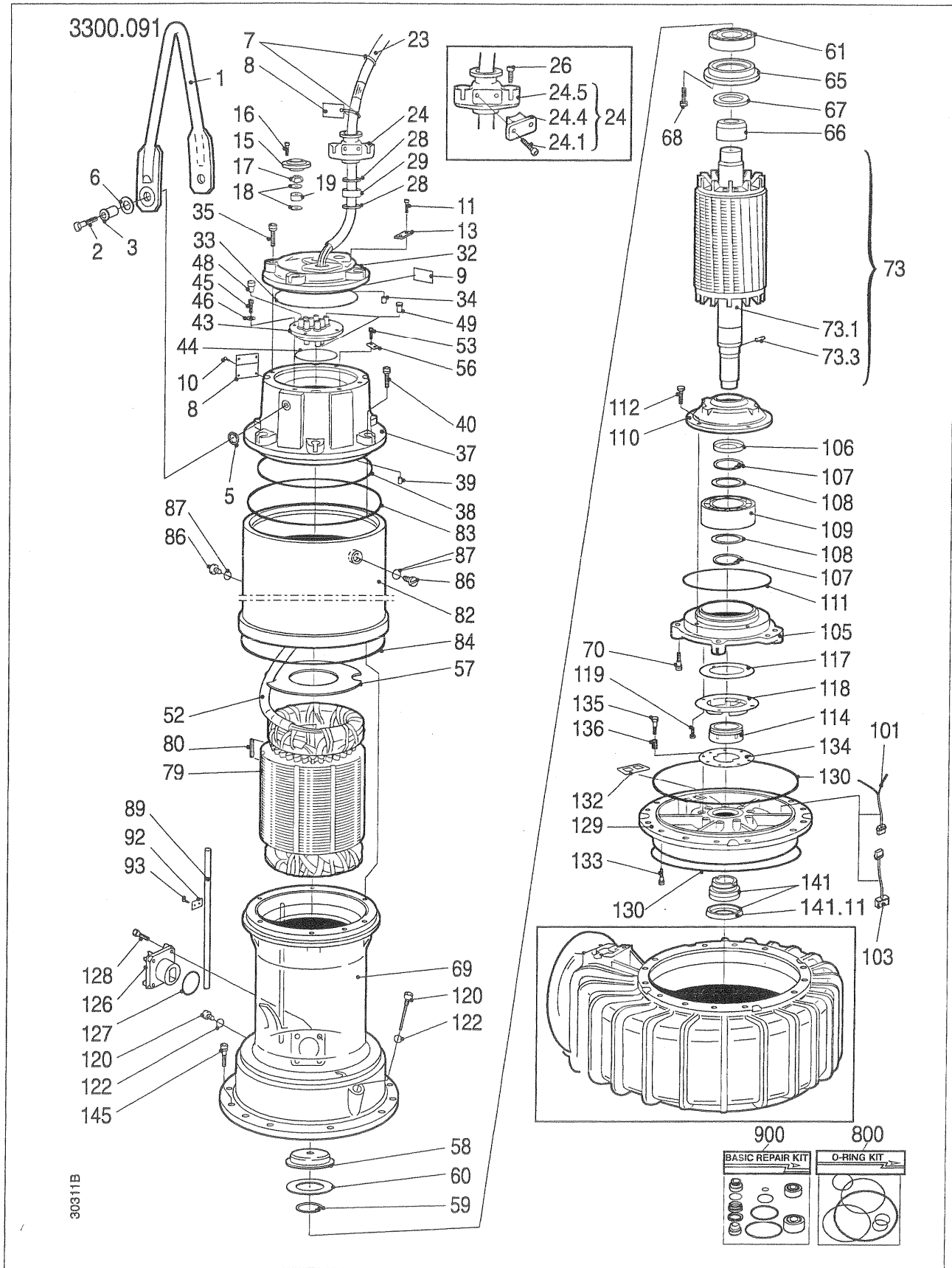
PARTS LIST

Item no	Partno	Rec	Denomination	Qty/ord.
	90 17 52		Paraffin oil	13 l
	90 20 54		Bearing grease ESSO UNIREX N3	0.16 kg
...
...
...
...

Ordered by:

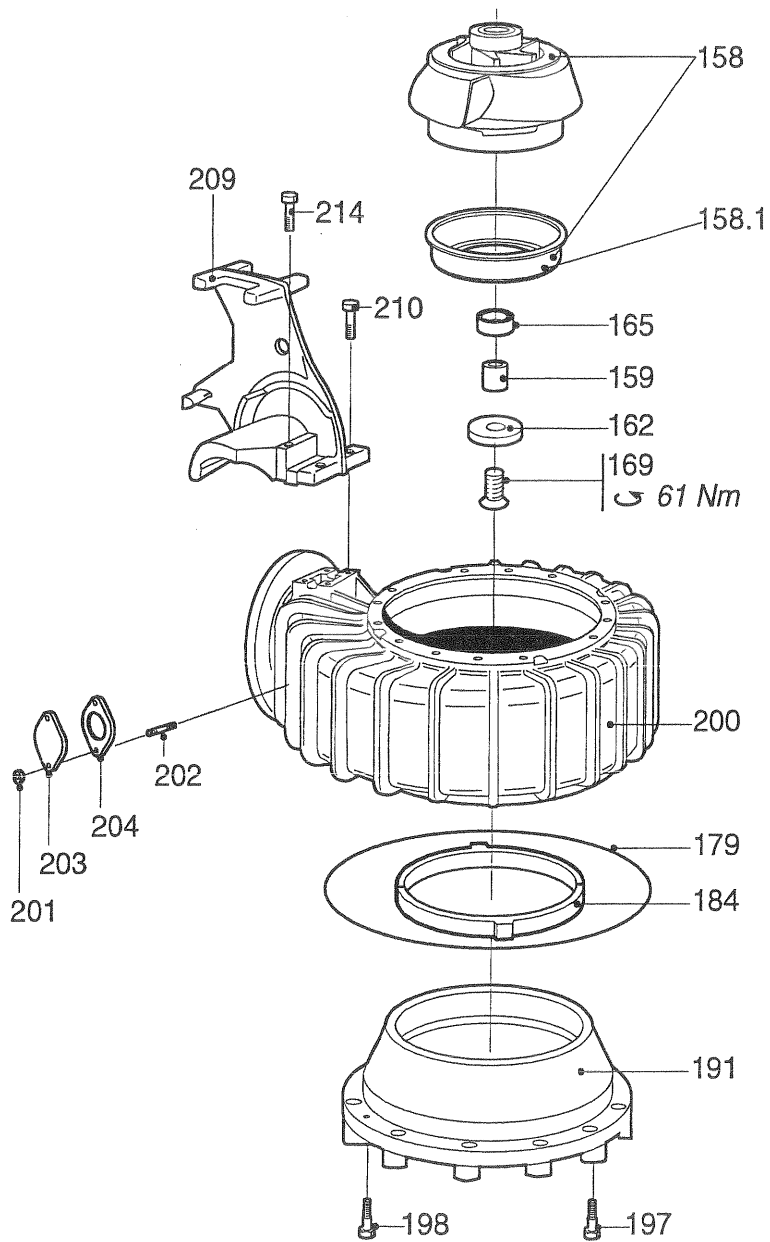
Company:.....Ref:.....Tel:.....Date:.....

EXPLODED VIEW



HYDRAULIC PARTS

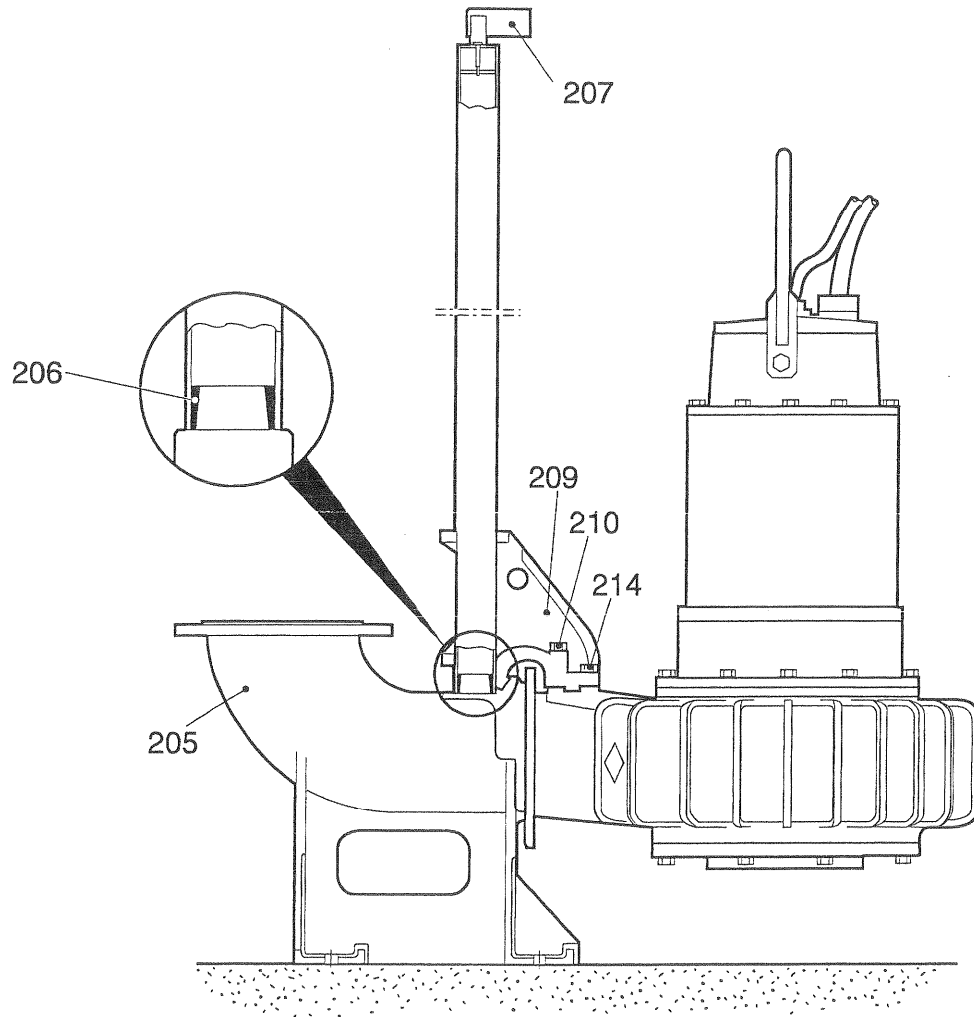
CP 3300 LT



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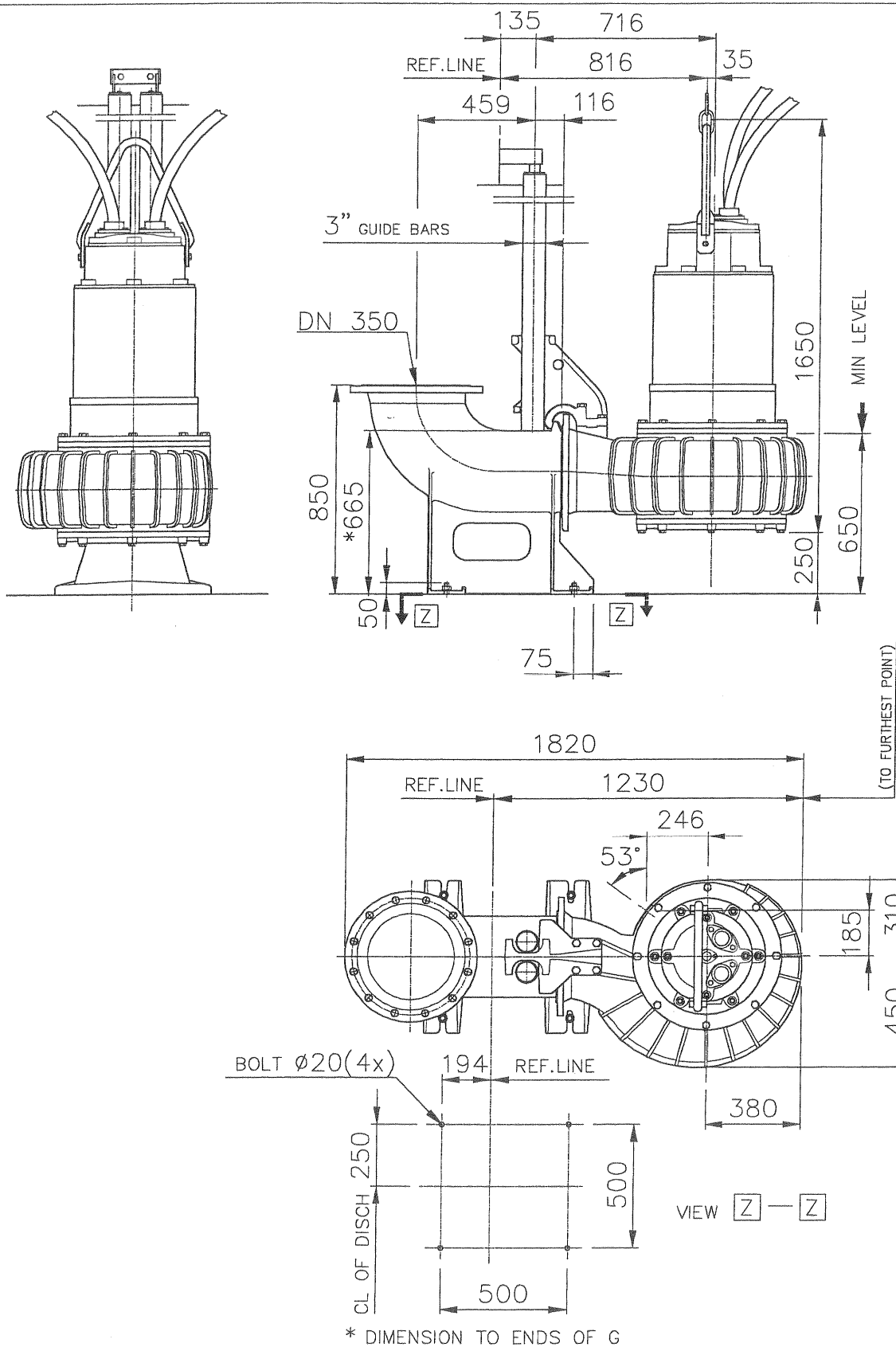
CONNECTION

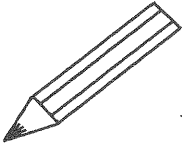
CP 3300.091/181



30389

DIMENSIONAL DRAWING





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Flygt



ITT Industries

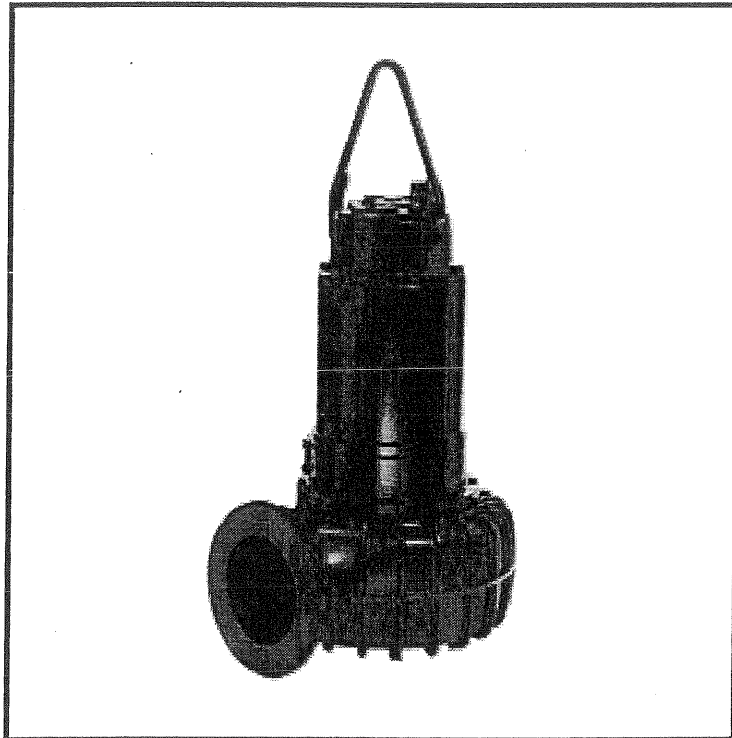
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FLYGT SUBMERSIBLE PUMP

PARTS LIST CP 3300 LT

SERIAL NO 3300.091 0350004



**ITT FLYGT CORPORATION
35 NUTMEG DRIVE**

**TRUMBULL, CT 06611
USA
TELEPHONE NO: 203-3804700**

Flygt



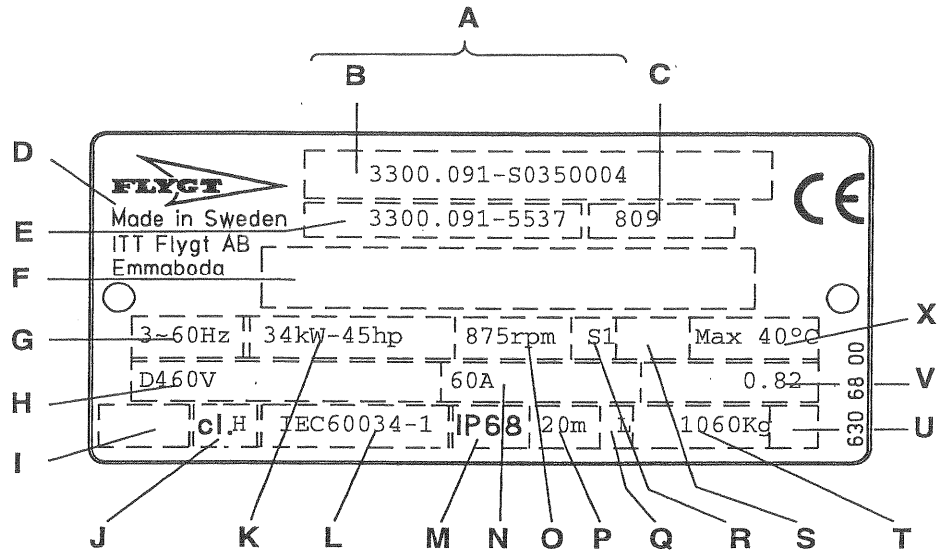
ITT Industries

DATAPLATE

FLYGT CP 3300 LT

DATE: 2003-09-30

SERIAL NO: 3300.091 0350004



Dataplate interpretation:

- | | |
|--|--|
| A Serial number | M Degree of protection |
| B Product code + Number | N Rated current |
| C Curv code / Propeller code | O Rated speed |
| D Country of origin | P Max. submergence |
| E Product number | Q Direction of rotation R=right, L=left |
| F Additional information | R Duty class |
| G Phase; Type of current; Frequency | S Duty factor |
| H Rated voltage | T Product weight |
| I Thermal protection | U Locked rotor code letter |
| J Thermal class | V Power factor |
| K Rated shaft power | X Max. ambient temperature |
| L International standard | |
- (1 kg = 2.2 pound, 1 Lit=0.26 US gallon, 1 l = 0,22 UK gallon)

Recommended spare parts:

See REC. column: **A** = Parts for inspection and maintenance
B = Parts for major overhaul

For service;

To ensure long operating life use Flygt Bearing Grease 90 20 61 (Cartridge).
 Lubrication kit 84 15 40 contains two 90 20 61 and one 84 15 30 (Grease gun).

The O-ring kit contains a full set of O-rings. Position no 800.

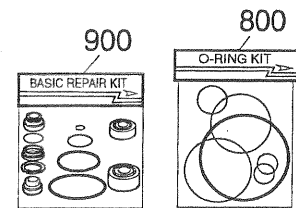
The Basic Repair kits contain both inner and outer Mechanical seals, bearings and a O-ring kit. Position no 900.

A complete set of tools can be ordered for repair and maintenance work, i.e. standard hand tools and special tools for seal change and hydraulic-end use.

Order:

This partlist can be used as an order form by marking out the number of parts in the Qty/Order column.

Please send or fax the form to your Flygt representative.



PARTS LIST

FLYGT CP 3300 LT

SERIAL NO 3300.091 0350004

Item no	Partno	Rec	Denomination	Qty/ord.
1	342 10 00		Lifting handle compl	1
2	84 34 07	B	Hexagon head screw M16X60-A2-70	2
3	342 20 00	B	Sleeve	2
5	342 21 00		Plain washer	2
6	83 38 94	B	Disc spring B-56X28,5X2-1	2
7	83 45 59		Cable tie 200X2,4 PA 6/6 -55+105	1
8	630 68 00		Data plate USE 6306801 AS SPARE PART	2
8	630 70 00		Certificate plate FM APPROVED	2
9	426 71 00		Connection plate	1
9	427 13 00		Marking tape	1
9	550 22 00		Connection plate (FLS)	1
9	550 24 00		Connection plate	1
10	82 20 88		Drive screw 4X5-A2-70	16
11	81 41 04	B	Hexagon head screw M8X20-A2-70	2
13	303 09 00	B	Earthing plate	2
23	94 21 10	B (s)	Motor cable SUBC 4AWG/3-2-1-GC 33-35	26.8 m
24	591 56 02		Motor cable entr.uni	1
24.1	82 00 34	B	Hex.socket hd screw M8X25-A2-70	4
24.4	590 64 00	B	Clamp	2
24.5	590 57 00		Entrance flange	1
26	82 00 69		Hex.socket hd screw M12X30-A2-70	2
28	82 41 01	AB	Plain washer 35,5X60X2-A2-70(33)-35	2
29	84 44 15	AB	Seal sleeve (33)-35 MM	1
32	319 03 06		Entrance cover	1
33	82 75 00	AB	O-ring 269,3X5,7 NBR	1
34	80 30 46		Parallel pin CP-H8-8X16-2346	1
35	82 01 05		Hex.socket hd screw M16X40-A2-70	4
37	391 30 02		Bearing housing	1
38	82 75 06	B	O-ring 359,3X5,7 NBR	1
39	80 30 46		Parallel pin CP-H8-8X16-2346	1
40	82 01 05		Hex.socket hd screw M16X40-A2-70	6
43	426 82 00		Con.term.board unit	1
44	82 74 81	B	O-ring 139,5X3,0 NBR	1
45	81 41 06		Hexagon head screw M8X25-A2-70	4
46	82 35 16		Plain washer 8-A2-A 140	4

Ordered by:

Company:.....Ref:.....Tel:.....Date:.....

PARTS LIST

Item no	Partno	Rec	Denomination	Qty/ord.
49	83 42 30	B	End sleeve 6.0MM2; L=10MM	9
49	83 42 34	B	End sleeve 25,0MM2; L=15MM	3
49	83 42 36	B	End sleeve 0.75MM2; L=6MM	2
49	83 42 39	B	End sleeve 16,0MM2; L=12MM	1
52	94 05 15	B	Insulating hose pvc	0.78 m
53	81 41 04		Hexagon head screw M8X20-A2-70	4
56	303 09 00	B	Earthing plate	4
57	441 41 00		Protective disc	1
58	391 32 00	B	Cover	1
59	82 59 21	B	Retaining ring SGA 72	1
59	82 59 21	B	Retaining ring SGA 72	1
60	393 03 00		Plain washer	1
61	84 53 75	B	Roller bearing ECP(75X160X37)	1
65	391 33 00		Bearing cover	1
66	391 31 00		Ring	1
67	82 73 30	B	Seal strip	1
68	81 41 32		Hexagon head screw M10X30-A2-70	4
69	531 43 01		Stator housing	1
70	82 01 05		Hex.socket hd screw M16X40-A2-70	4
79	427 40 38		Stator 35-24-8a	1
82	319 12 01		Outer casing	1
83	82 75 10	B	O-ring 439,3X5,7 NBR	1
84	82 78 88	B	O-ring 460,0X8,0-1 NBR	1
86	283 13 01		Slotted head screw	2
87	82 73 91		O-ring 22,2X3,0 NBR	2
89	279 76 01		Pipe	1
92	374 81 03		Plate	1
93	81 73 42		Slotted head screw M4X12-A4-70	2
101	504 78 11		Cable unit (FLS)	1
103	518 89 02		Leakage detect.unit (FLS)	1
105	503 45 02		Bearing housing	1
106	84 25 72	B	Seal ring	1
107	374 56 00	B	Retaining ring	2
108	82 44 26		Supporting washer 90X110X3,5	2
109	83 37 03	B	Ball bearing 3318 C3 GLAPP(90X190X73)	1
110	526 34 00		Bearing cover	1
111	82 75 02	B	O-ring 289,3X5,7 NBR	1
112	81 41 55		Hexagon head screw M12X30-A2-70	4
114	617 99 01	B	Mechanical seal WCCR/WCCR	1
114.7	82 81 94		O-ring	1
114.8	641 25 00		Spring housing unit	1

Ordered by:

Company:.....Ref:.....Tel:.....Date:.....

PARTS LIST

Item no	Partno	Rec	Denomination	Qty/ord.
117	374 57 00		Washer	1
118	319 19 00		End washer	1
119	81 73 86		Slotted head screw M8X12-A4-70	4
120	428 22 01	B	Inspection screw	2
122	82 73 90	AB	O-ring 19.2X3.0 NBR	6
126	411 16 01		Cover EN/FM/PTB	1
127	82 74 07	AB	O-ring 74.2X5.7 NBR	1
128	82 00 52		Hex.socket hd screw M10X30-A2-70	4
129	620 78 00		Oil housing	1
130	82 75 12	B	O-ring 479.3X5.7 NBR	2
132	646 59 00	B	Gasket compl.	1
133	81 41 34		Hexagon head screw M10X40-A2-70	5
134	319 20 00		Washer	1
135	306 73 00		Hexagon head screw	9
136	302 21 00		Compression spring	9
141	337 79 11	B	Mechanical seal WCCR/WCCR-TYPE S	1
141.1	82 81 54		O-ring	1
141.2	82 81 55		O-ring 89,1X5,7 FPM	1
141.6	669 75 72		Retaining ring	1
141.11	574 26 00		Seal ring	1
158	601 65 88	B	Impeller	1
159	440 44 00		Sleeve	1
162	341 86 00	B	Special washer	1
165	84 59 12		Locking assembly 55X85	1
169	82 13 97		Hex.socket hd screw 16X100-A4-70	1
179	82 75 12		O-ring 479.3X5.7 NBR	1
184	379 71 01	AB	Wear ring compl.	1
191	437 82 02	B	Suction cover	1
197	82 01 11		Hex.socket hd screw	16
198	81 41 55		Hexagon head screw M12X30-A2-70	2
200	319 34 22		Pump housing	1
201	82 27 28		Lock nut M10-A4-70	2
202	80 95 07		Stud 10X45-A2-70	2
203	433 56 00		Cover	1
204	502 53 00		Gasket	1
209	305 79 00		Guiding claw	1
210	84 34 37		Hexagon head screw M20X110-A2-70	2
214	84 34 30		Hexagon head screw M20X60-A2-70	2
229	667 40 01		Sticker	2
800	80 32 41		O-rings kit 3300.090,091,180,181	1
900	601 89 24		Basic repair kit 3300.090,091,180,181	1

Ordered by:

Company:.....Ref:.....Tel:.....Date:.....

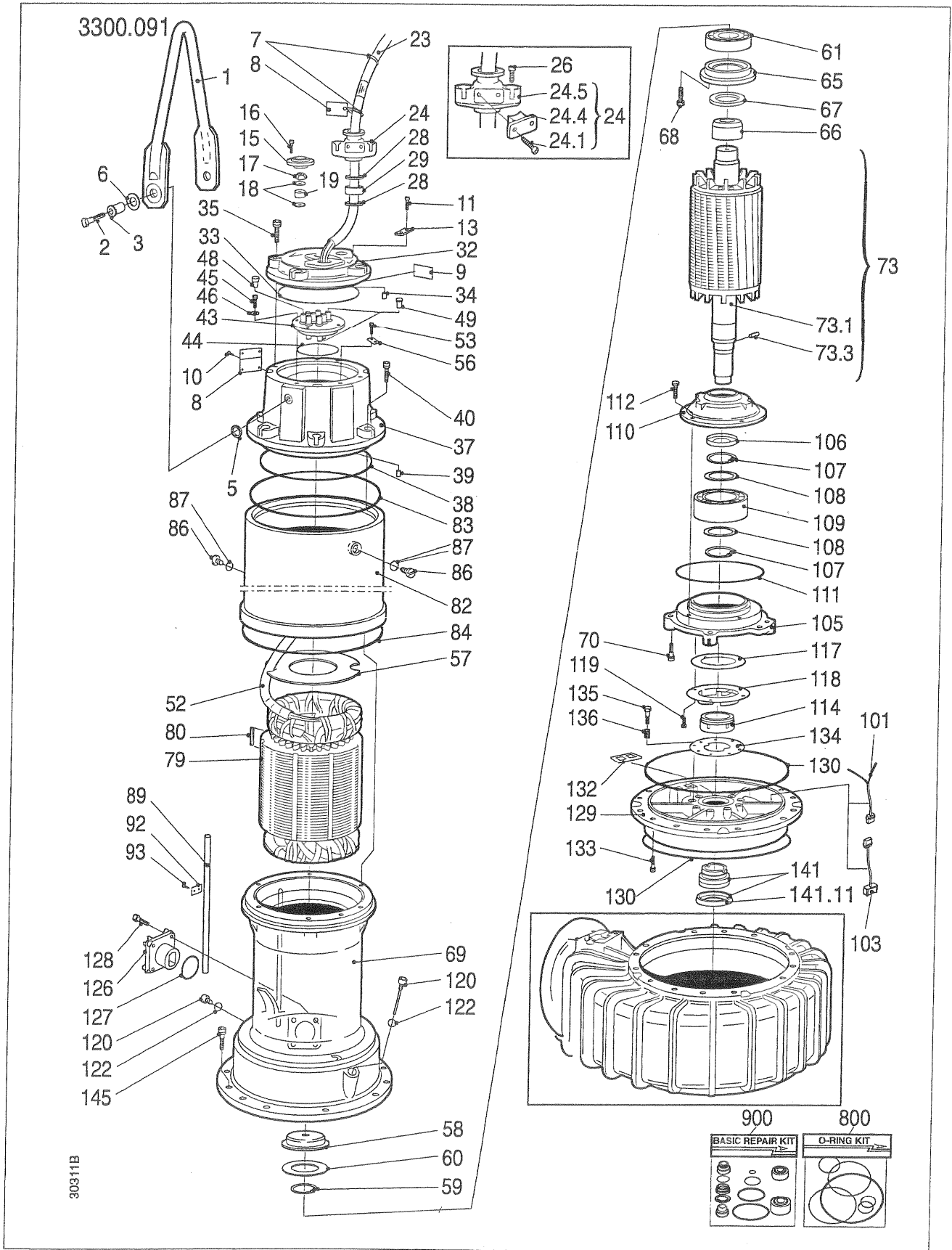
PARTS LIST

Item no	Partno	Rec	Denomination	Qty/ord.
	90 17 52		Paraffin oil	13 l
	90 20 54		Bearing grease ESSO UNIREX N3	0.16 kg
...
...
...
...

Ordered by:

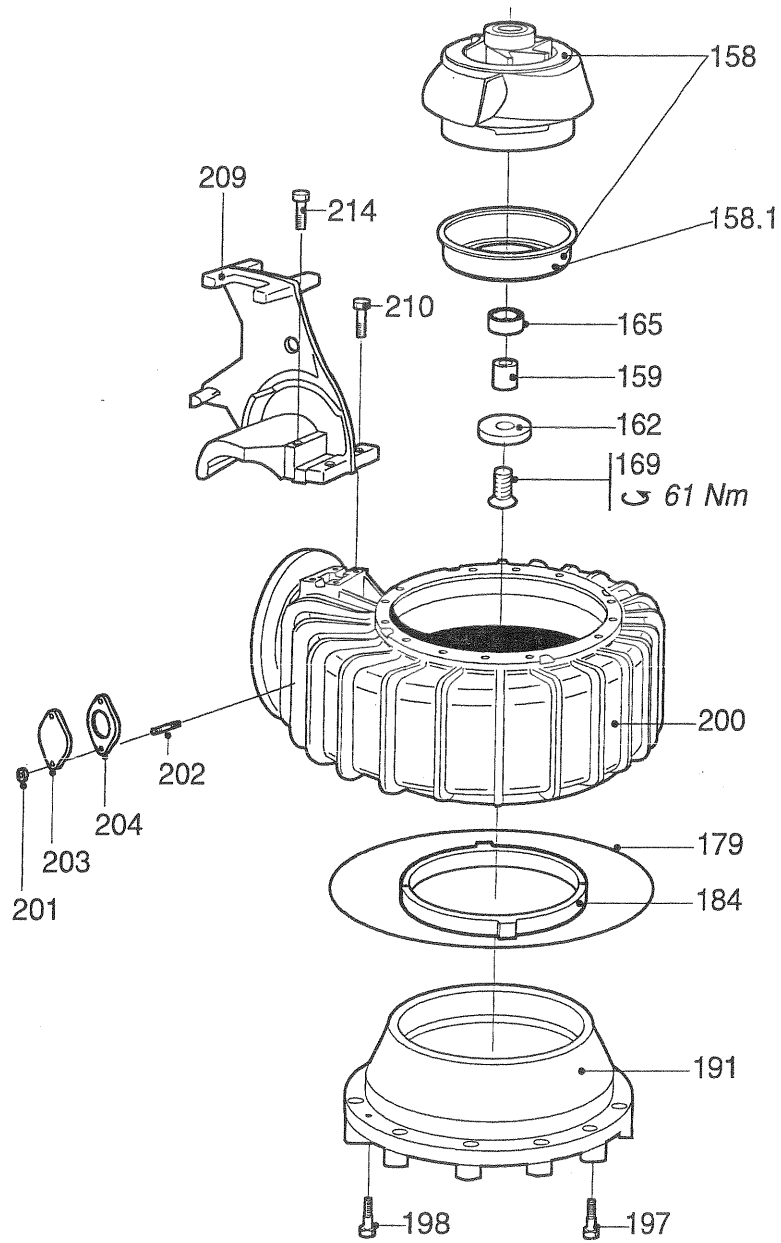
Company:.....Ref:.....Tel:.....Date:.....

EXPLODED VIEW



HYDRAULIC PARTS

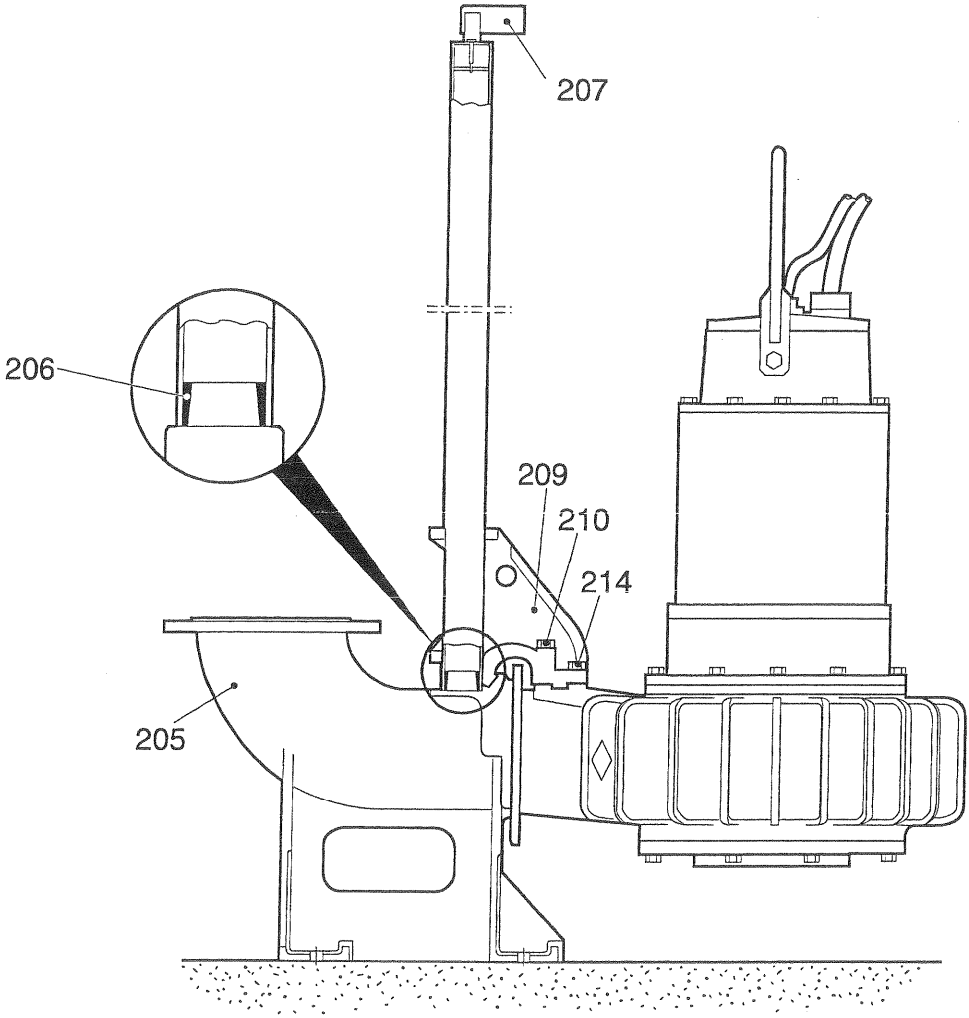
CP 3300 LT



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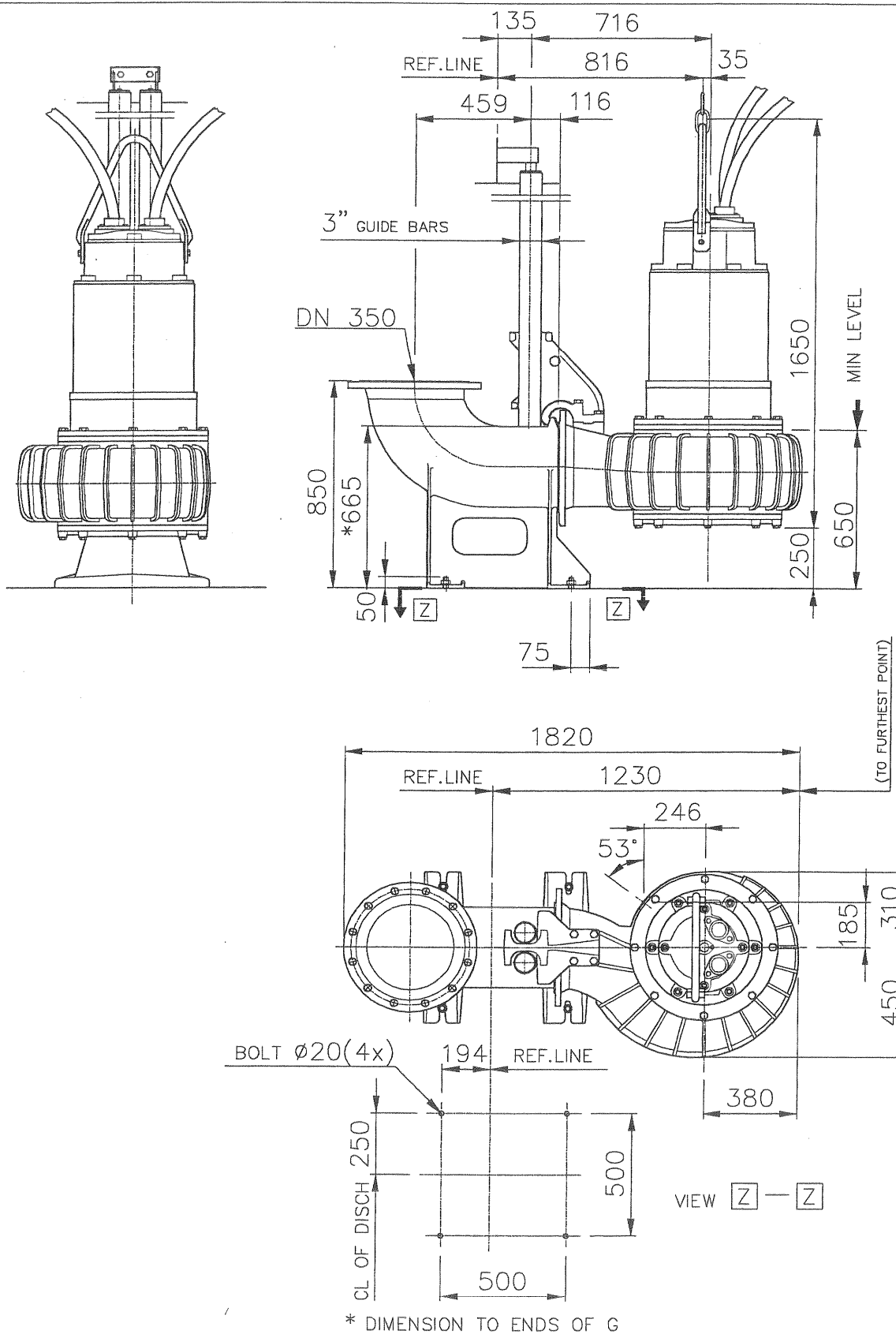
CONNECTION

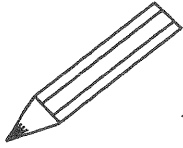
CP 3300.091/181



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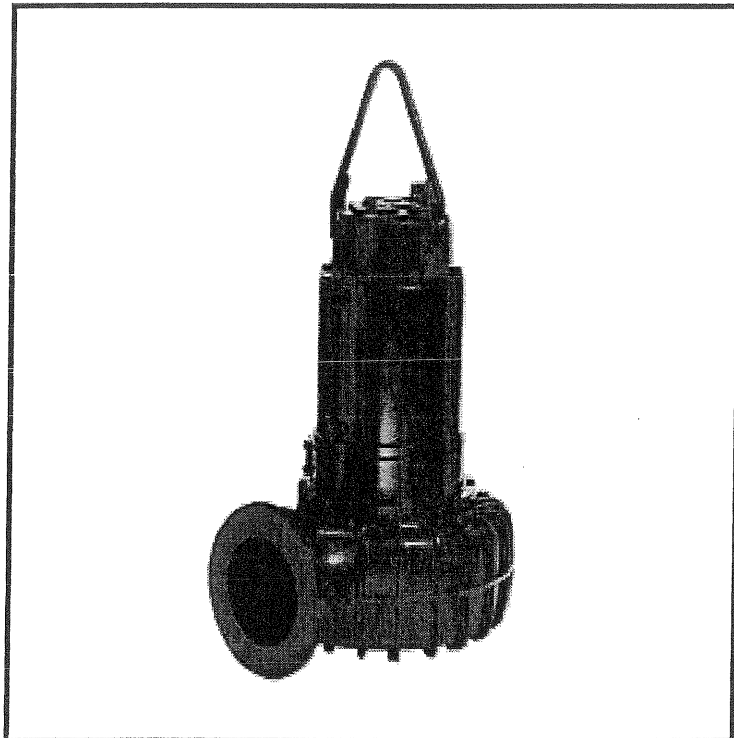
FLYGT



FLYGT SUBMERSIBLE PUMP

PARTS LIST CP 3300 LT

SERIAL NO 3300.091 0350005



**ITT FLYGT CORPORATION
35 NUTMEG DRIVE**

**TRUMBULL, CT 06611
USA
TELEPHONE NO: 203-3804700**

Flygt



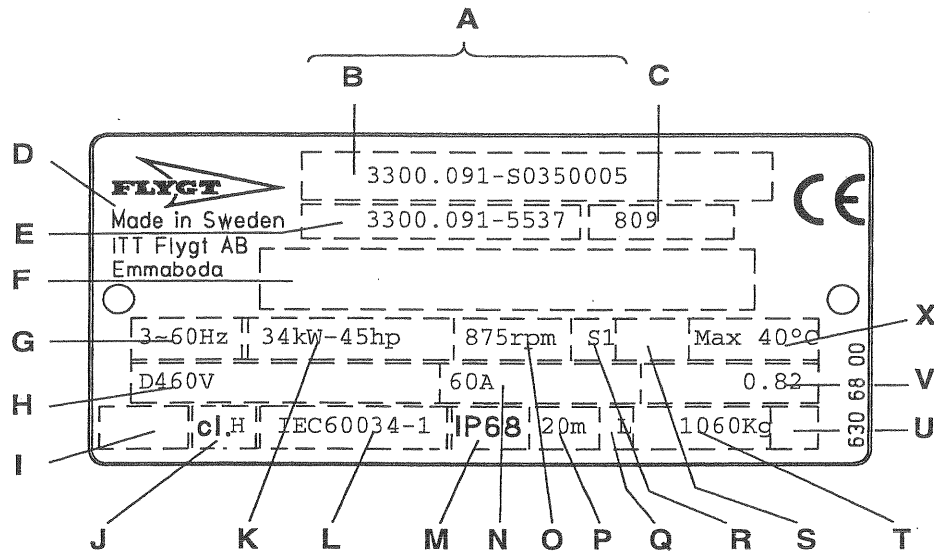
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DATAPLATE

FLYGT CP 3300 LT

DATE: 2003-09-30

SERIAL NO: 3300.091 0350005



Dataplate interpretation:

- | | |
|--|--|
| A Serial number | M Degree of protection |
| B Product code + Number | N Rated current |
| C Curv code / Propeller code | O Rated speed |
| D Country of origin | P Max. submergence |
| E Product number | Q Direction of rotation R=right, L=left |
| F Additional information | R Duty class |
| G Phase; Type of current; Frequency | S Duty factor |
| H Rated voltage | T Product weight |
| I Thermal protection | U Locked rotor code letter |
| J Thermal class | V Power factor |
| K Rated shaft power | X Max. ambient temperature |
| L International standard | |
- (1 kg = 2.2 pound, 1 Lit=0.26 US gallon, 1 l = 0,22 UK gallon)

Recommended spare parts:

See REC. column: **A** = Parts for inspection and maintenance
B = Parts for major overhaul

For service;

To ensure long operating life use Flygt Bearing Grease 90 20 61 (Cartridge).
 Lubrication kit 84 15 40 contains two 90 20 61 and one 84 15 30 (Grease gun).

The O-ring kit contains a full set of O-rings. Position no 800.

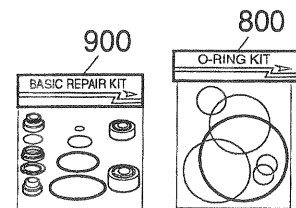
The Basic Repair kits contain both inner and outer Mechanical seals, bearings and a O-ring kit. Position no 900.

A complete set of tools can be ordered for repair and maintenance work, i.e. standard hand tools and special tools for seal change and hydraulic-end use.

Order:

This partlist can be used as an order form by marking out the number of parts in the Qty/Order column.

Please send or fax the form to your Flygt representative.



PARTS LIST

FLYGT CP 3300 LT

SERIAL NO 3300.091 0350005

Item no	Partno	Rec	Denomination	Qty/ord.
1	342 10 00		Lifting handle compl	1
2	84 34 07	B	Hexagon head screw M16X60-A2-70	2
3	342 20 00	B	Sleeve	2
5	342 21 00		Plain washer	2
6	83 38 94	B	Disc spring B-56X28,5X2-1	2
7	83 45 59		Cable tie 200X2,4 PA 6/6 -55+105	1
8	630 68 00		Data plate USE 6306801 AS SPARE PART	2
8	630 70 00		Certificate plate FM APPROVED	2
9	426 71 00		Connection plate	1
9	427 13 00		Marking tape	1
9	550 22 00		Connection plate (FLS)	1
9	550 24 00		Connection plate	1
10	82 20 88		Drive screw 4X5-A2-70	16
11	81 41 04	B	Hexagon head screw M8X20-A2-70	2
13	303 09 00	B	Earthing plate	2
23	94 21 10	B (s)	Motor cable SUBC 4AWG/3-2-1-GC 33-35	26.8 m
24	591 56 02		Motor cable entr.uni	1
24.1	82 00 34	B	Hex.socket hd screw M8X25-A2-70	4
24.4	590 64 00	B	Clamp	2
24.5	590 57 00		Entrance flange	1
26	82 00 69		Hex.socket hd screw M12X30-A2-70	2
28	82 41 01	AB	Plain washer 35,5X60X2-A2-70(33)-35	2
29	84 44 15	AB	Seal sleeve (33)-35 MM	1
32	319 03 06		Entrance cover	1
33	82 75 00	AB	O-ring 269,3X5,7 NBR	1
34	80 30 46		Parallel pin CP-H8-8X16-2346	1
35	82 01 05		Hex.socket hd screw M16X40-A2-70	4
37	391 30 02		Bearing housing	1
38	82 75 06	B	O-ring 359,3X5,7 NBR	1
39	80 30 46		Parallel pin CP-H8-8X16-2346	1
40	82 01 05		Hex.socket hd screw M16X40-A2-70	6
43	426 82 00		Con.term.board unit	1
44	82 74 81	B	O-ring 139,5X3,0 NBR	1
45	81 41 06		Hexagon head screw M8X25-A2-70	4
46	82 35 16		Plain washer 8-A2-A 140	4

Ordered by:

Company:.....Ref:.....Tel:.....Date:.....

PARTS LIST

Item no	Partno	Rec	Denomination	Qty/ord.
49	83 42 30	B	End sleeve 6.0MM2; L=10MM	9
49	83 42 34	B	End sleeve 25,0MM2; L=15MM	3
49	83 42 36	B	End sleeve 0.75MM2; L=6MM	2
49	83 42 39	B	End sleeve 16,0MM2; L=12MM	1
52	94 05 15	B	Insulating hose pvc	0.78 m
53	81 41 04		Hexagon head screw M8X20-A2-70	4
56	303 09 00	B	Earthing plate	4
57	441 41 00		Protective disc	1
58	391 32 00	B	Cover	1
59	82 59 21	B	Retaining ring SGA 72	1
59	82 59 21	B	Retaining ring SGA 72	1
60	393 03 00		Plain washer	1
61	84 53 75	B	Roller bearing ECP(75X160X37)	1
65	391 33 00		Bearing cover	1
66	391 31 00		Ring	1
67	82 73 30	B	Seal strip	1
68	81 41 32		Hexagon head screw M10X30-A2-70	4
69	531 43 01		Stator housing	1
70	82 01 05		Hex.socket hd screw M16X40-A2-70	4
79	427 40 38		Stator 35-24-8a	1
82	319 12 01		Outer casing	1
83	82 75 10	B	O-ring 439,3X5,7 NBR	1
84	82 78 88	B	O-ring 460,0X8,0-1 NBR	1
86	283 13 01		Slotted head screw	2
87	82 73 91		O-ring 22,2X3,0 NBR	2
89	279 76 01		Pipe	1
92	374 81 03		Plate	1
93	81 73 42		Slotted head screw M4X12-A4-70	2
101	504 78 11		Cable unit (FLS)	1
103	518 89 02		Leakage detect.unit (FLS)	1
105	503 45 02		Bearing housing	1
106	84 25 72	B	Seal ring	1
107	374 56 00	B	Retaining ring	2
108	82 44 26		Supporting washer 90X110X3,5	2
109	83 37 03	B	Ball bearing 3318 C3 GLAPP(90X190X73)	1
110	526 34 00		Bearing cover	1
111	82 75 02	B	O-ring 289,3X5,7 NBR	1
112	81 41 55		Hexagon head screw M12X30-A2-70	4
114	617 99 01	B	Mechanical seal WCCR/WCCR	1
114.7	82 81 94		O-ring	1
114.8	641 25 00		Spring housing unit	1

Ordered by:

Company:.....Ref:.....Tel:.....Date:.....

PARTS LIST

Item no	Partno	Rec	Denomination	Qty/ord.
117	374 57 00		Washer	1
118	319 19 00		End washer	1
119	81 73 86		Slotted head screw M8X12-A4-70	4
120	428 22 01	B	Inspection screw	2
122	82 73 90	AB	O-ring 19.2X3.0 NBR	6
126	411 16 01		Cover EN/FM/PTB	1
127	82 74 07	AB	O-ring 74.2X5.7 NBR	1
128	82 00 52		Hex.socket hd screw M10X30-A2-70	4
129	620 78 00		Oil housing	1
130	82 75 12	B	O-ring 479.3X5.7 NBR	2
132	646 59 00	B	Gasket compl.	1
133	81 41 34		Hexagon head screw M10X40-A2-70	5
134	319 20 00		Washer	1
135	306 73 00		Hexagon head screw	9
136	302 21 00		Compression spring	9
141	337 79 11	B	Mechanical seal WCCR/WCCR-TYPE S	1
141.1	82 81 54		O-ring	1
141.2	82 81 55		O-ring 89,1X5,7 FPM	1
141.6	669 75 72		Retaining ring	1
141.11	574 26 00		Seal ring	1
158	601 65 88	B	Impeller	1
159	440 44 00		Sleeve	1
162	341 86 00	B	Special washer	1
165	84 59 12		Locking assembly 55X85	1
169	82 13 97		Hex.socket hd screw 16X100-A4-70	1
179	82 75 12		O-ring 479.3X5.7 NBR	1
184	379 71 01	AB	Wear ring compl.	1
191	437 82 02	B	Suction cover	1
197	82 01 11		Hex.socket hd screw	16
198	81 41 55		Hexagon head screw M12X30-A2-70	2
200	319 34 22		Pump housing	1
201	82 27 28		Lock nut M10-A4-70	2
202	80 95 07		Stud 10X45-A2-70	2
203	433 56 00		Cover	1
204	502 53 00		Gasket	1
209	305 79 00		Guiding claw	1
210	84 34 37		Hexagon head screw M20X110-A2-70	2
214	84 34 30		Hexagon head screw M20X60-A2-70	2
229	667 40 01		Sticker	2
800	80 32 41		O-rings kit 3300.090,091,180,181	1
900	601 89 24		Basic repair kit 3300.090,091,180,181	1

Ordered by:

Company:.....Ref:.....Tel:.....Date:.....

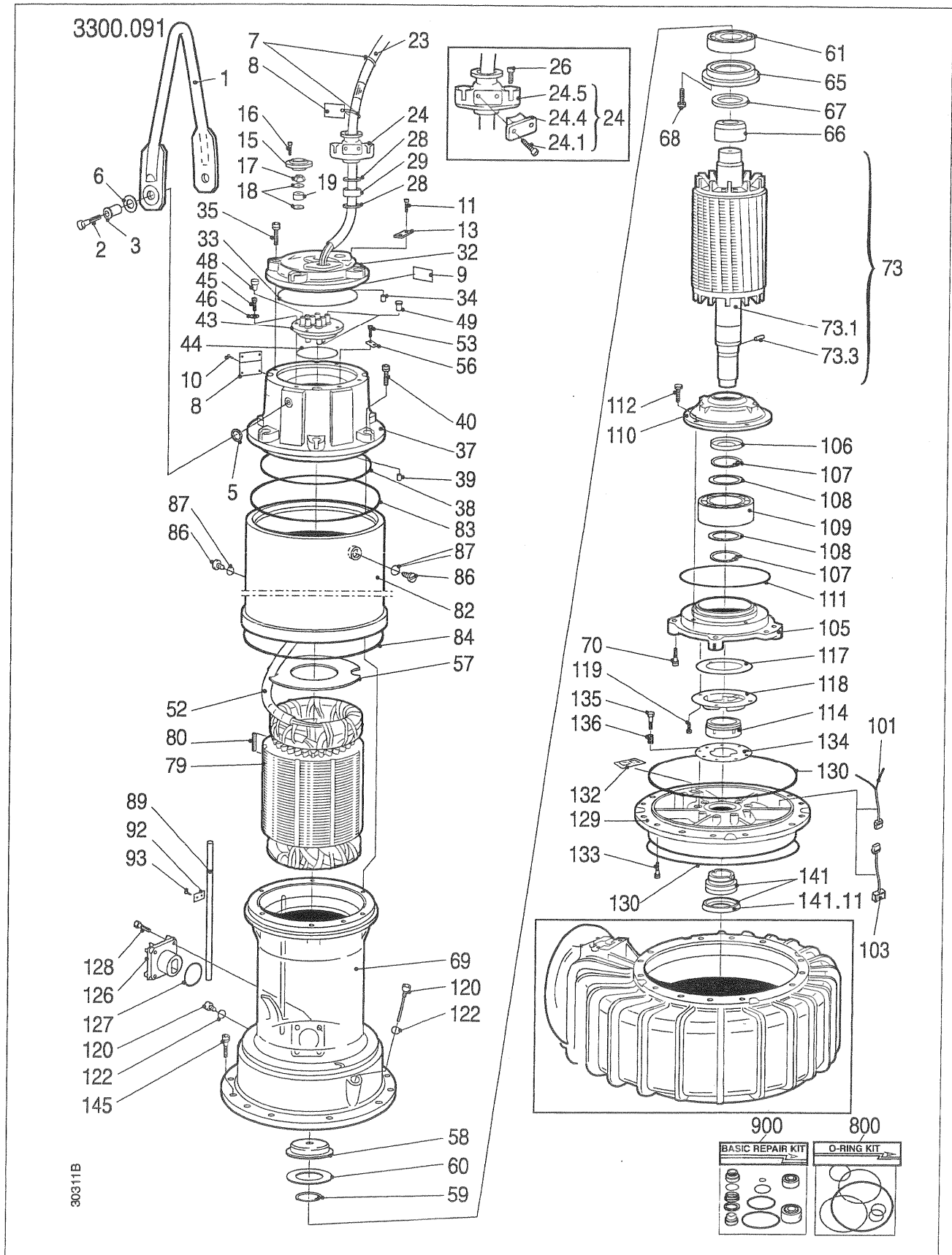
PARTS LIST

Item no	Partno	Rec	Denomination	Qty/ord.
	90 17 52		Paraffin oil	13 l
	90 20 54		Bearing grease ESSO UNIREX N3	0.16 kg
...
...
...
...

Ordered by:

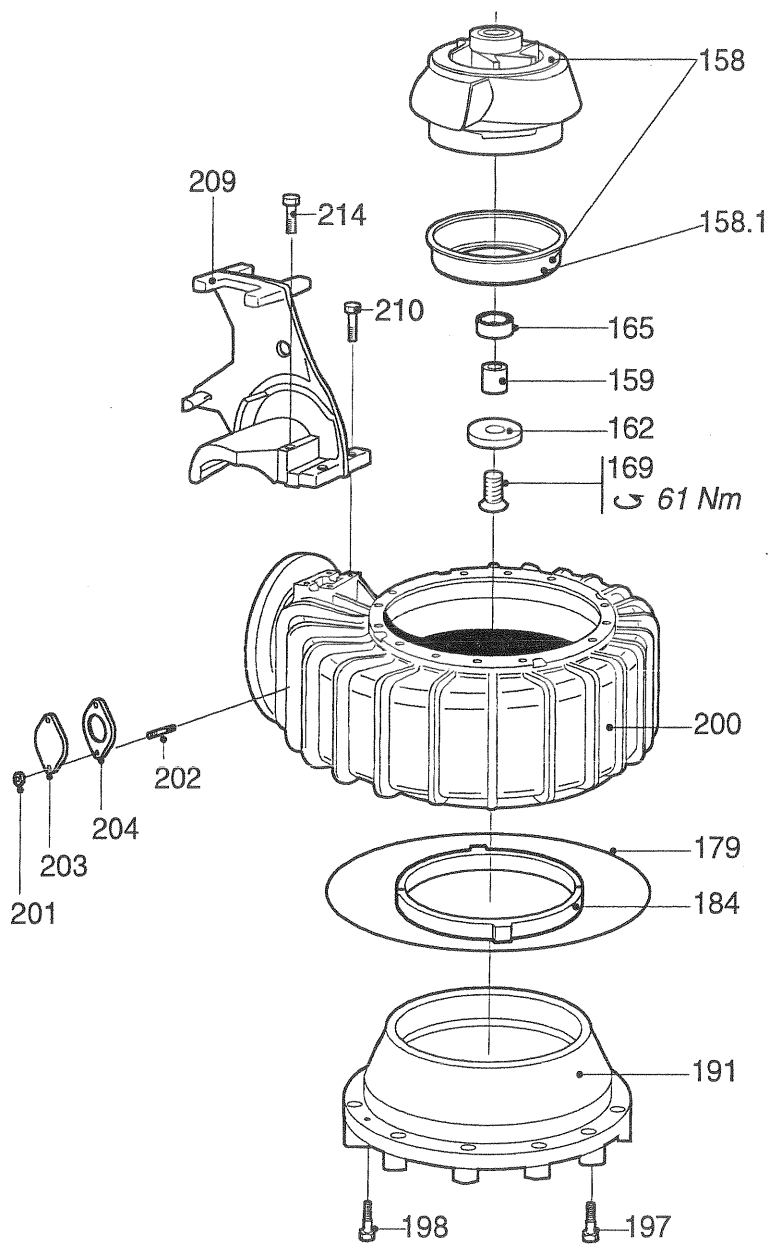
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EXPLODED VIEW



HYDRAULIC PARTS

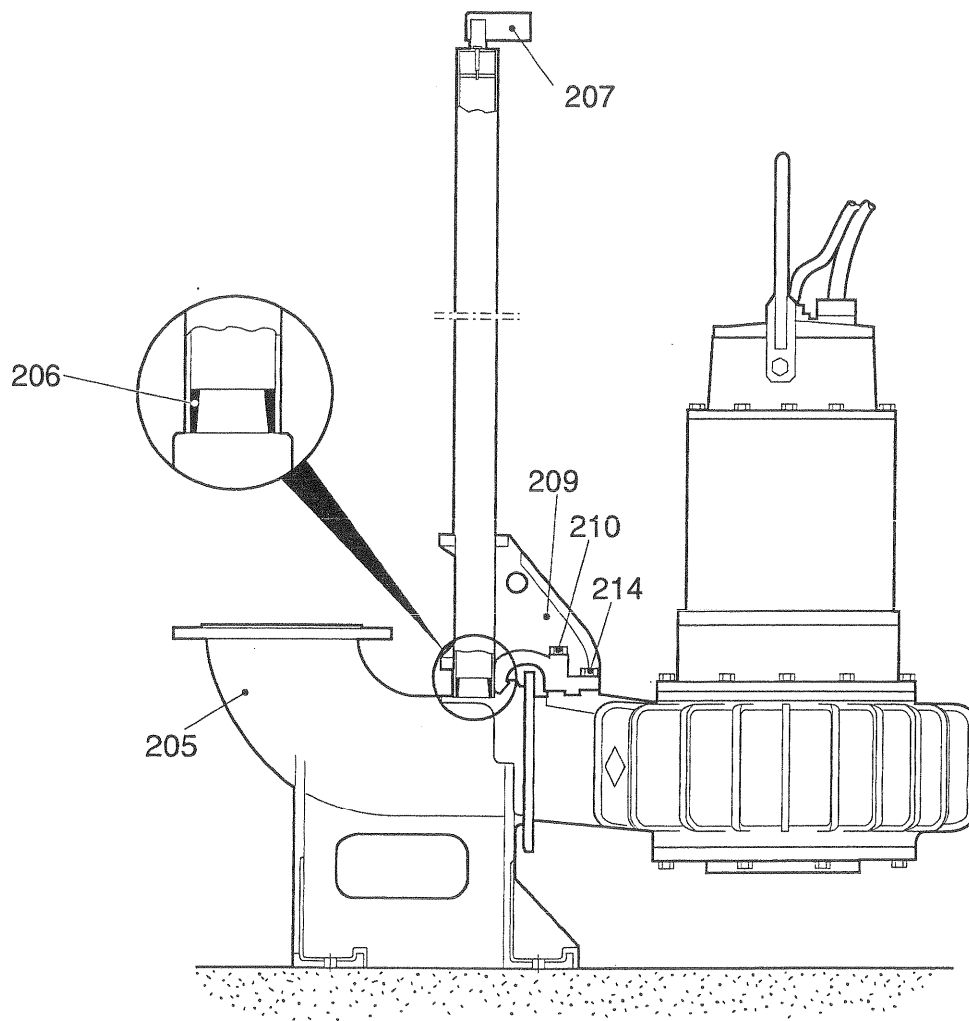
CP 3300 LT



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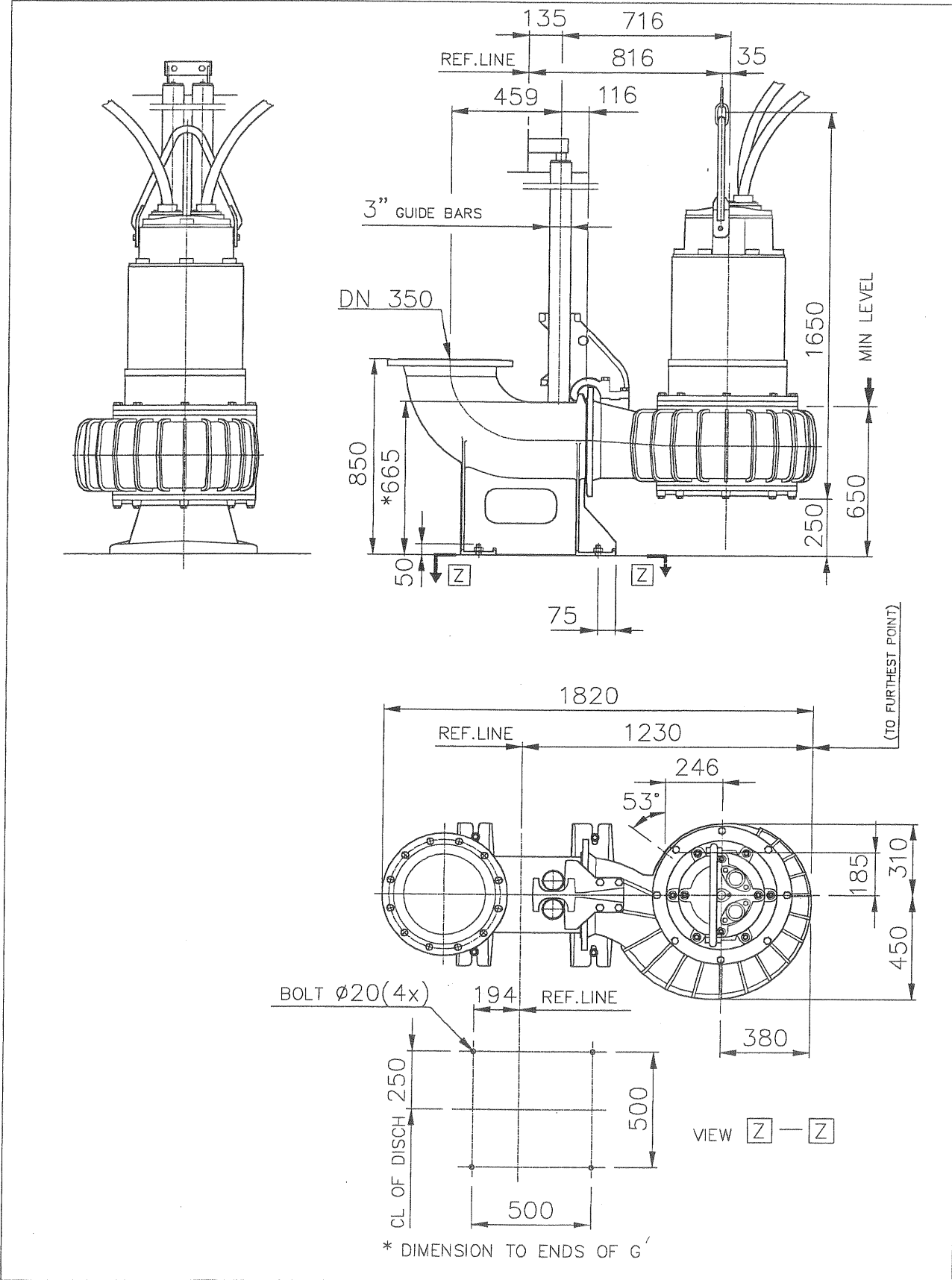
CONNECTION

CP 3300.091/181

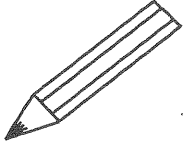


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* DIMENSION TO ENDS OF G'



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**Cambridge, MA
Sherman St. P/S
Control Panel**

**FLYGT MA
78-K Olympia Avenue
Woburn, MA 01801
Tel: (781) 935-6515
Fax: (781) 938-0364**

- A. Control Panel Specifications**
- B. Operation Instructions**
- C. Drawings**
- D. Component Specifications**

10/23/2003

Control Panel Specifications



FLYGT

An **ITT Industries** company

ENGINEERING SUBMITTALS

FILE

JOB NAME-	SHERMAN ST. P/S-CAMBRIDGE	
QUOTE NO.-	55148BB	Rev:
DATE-	10/22/2003	
CUSTOMER	FLYGT, MA-BRIAN McCARTHY	

ELECTRICAL SERVICE

VOLTAGE -	480V
PHASE -	3
WIRES -	4

CONTROL SYSTEM

TYPE OF CONTROL PANEL -	TRIPLEX
SENSING DEVICE -	FLOATS
NUMBER OF MOTORS -	3 (CP3300)
MOTOR H.P.-	45 (60 FLA)
ENCLOSURE:	
MATERIAL -	304 STAINLESS STEEL
NEMA RATING -	3R
SIZE -	74 X 72 X 24
MODIFICATIONS -	DEAD FRONT, DRIP SHIELD, VENTS AND LOUVERS
MOUNTING STYLE -	FREE STANDING NO GRATTING AVAILABLE

PRODUCTION REQUIREMENT

<input type="checkbox"/> APPROVAL WAIVED
<input type="checkbox"/> APPROVED AS SUBMITTED
<input type="checkbox"/> DRAWINGS APPROVED AS NOTED, "PROVIDE CLEAR AND PRECISE COMMENTS"

APPROVAL SIGNATURE: _____

UL approval check list

- make sure fuses are proper size
- label all fuses
- isolate neutral
- check the following components for ul approval:
 - flasher
 - alarm light
 - heater (hoffman or strip heater)
- all wire must be 90 deg at least
- make sure the phase monitor is fused
- must have an overload chart
- fill out the pump data sheet includes voltage, horse power, fls, and total fla
- ground fault protection on the secondary of the transformer when non ul components are in control circuit of panel
- attach a non ul component list sheet when needed
- mark all ground lugs with ground label
- mark terminal block with torque requirement label
- mark out 4, 4x if a hole is made in the enclosure
- intrinsically safe markings
 - install grounded barrier
 - mark terminal strip
- SEL on panels with Main or Main and Emergency
- Article 702 on panels with Main and Emergency
- SEL drawing 60, 100, 150, 200 other 250

UL NUMBER BE041274

PANEL SERIAL NUMBER 030795

ETL approval check list

make sure fuses are proper size

label all fuses

isolate neutral

check the following components for ETL approval:

flasher

alarm light

heater (hoffman or strip heater)

all wire must be 90 deg at least

make sure the phase monitor is fused

must have an overload chart

fill out the pump data sheet includes voltage, horse power, fls, and total fla

mark all ground lugs with ground label

mark terminal block with torque requirement label

mark out 4, 4x if a hole is made in the enclosure

intrinsically safe markings

install grounded barrier

mark terminal strip

SEL on panels with Main or Main and Emergency

Article 702 on panels with Main and Emergency

SEL drawing 60, 100, 150, 200 other 250

PANEL SERIAL NUMBER 03-0795

PANEL QUOTE NUMBER 55148 BB

Operation Instructions

OPERATIONS MANUAL

GENERAL:

This control system will operate three (3) submersible sewage pumps at 480 VAC, three phase, incoming commercial power and provides for automatic alternation of pumps to equalize run time.

The controls operate with five [5] intrinsically safe float regulators adjusted to predetermined levels within the wet well. An aluminum dead front with breaker knockouts is provided for safety and allows for check operation of system.

The system is designed to automatic restart in the event of a power failure. All thermal or pump moisture indications will be re-initiated as if the system was in normal operation.

The system is designed to operate three [3] pumps to equalize the run time on the pumps.

Three solid state reduced voltage starters with isolation and up-to-speed starters are installed to ramp the pumps up to speed and reduce the inrush current of the system. The starters will allow the system to operate as an across the line system in the event of a solid state starter failure. Up to speed contactors allow the system to operate as an across the line starter; however the inrush current is eliminated and the heat generated from the solid state starters is removed.

BREAKERS:

The circuit breakers are located in the upper right hand portion of the enclosure and include: main circuit breaker (MCB), pump motor breakers (MB), a control circuit breaker (CCB) and a circuit breaker for the solenoid valve actuator (CB2).

Incoming power 480 VAC, 3 phase, 4 wire from the local utility is applied to the main circuit breaker. Power is jumpered from the main circuit breaker to the lightning arrestor other circuit breakers and a 5 KVA mini power zone for development of the 120 VAC control power. MB1, MB2 and MB3 control power to pumps 1, 2 and 3 respectively. Valve control breaker controls the power to the remote valve control. The CCB controls 120 VAC power to the control circuits.

A phase monitor is provided to protect the pumps from single phasing, voltage unbalance or phase loss. Any of these condition will shut down the control circuit and must be corrected to allow the pumps to run.

STARTERS:

The starters are located in the lower right hand portion of the enclosure and contain the necessary control wiring to actuate the starter coils on demand from the controls. The starters contain a melting allow overload heater on each power leg rated at the full load amp draw of the pumps. Excessive amp draw by the pumps will open the overload relay contacts and shut down the pump. The manual reset handle located on the dead front must reset the overloads before the pumps will restart.

NOTE: If reset is required, the amp draw of the pump should be checked.

CONTROLS:

The controls consist of a 120 VAC intrinsically safe control system for safety reasons. The relays control sequencing and voltage application to the pump alternators (PAA), lights and alarm functions.

The output voltage of the intrinsically safe relays is applied to the float switches directly and consists of a DC voltage level. When the float switch tilts, the contact closure signals the ISR to turn on and feed a 120 VAC signal to the operating relay coils and the time delay relays.

OPERATING SEQUENCE

(a) Lead Pump Operation:

When the level in the wet well rises and tilts float regulator FR1, ISR1 relay is activated which in turn activates relay R1. Relay R1 acts as a backup relay to allow the system to continue to operate in case of the off float FR1 failure. R1 controls the off level and ISR1 sets the shut off level for the pumps.

As the level rises in the wet well, float regulator FR2 tilts. ISR2 is activated which supplies a voltage to R2 and through contacts 7-6, to the automatic alternator through the HOA switches for starting of the lead pump. The lead pump will operate until the off float switch opens. When the motor starter is activated, a run light is illuminated and the elapsed time starts recording signifying the motor is on. The lock in circuit to the off float switch is through relay R2 contact 3-1.

(b) Lag Pump Operation:

As level continues to rise, FR3 tilts, supplying voltage to ISR3, R3 and supplies voltage through the automatic alternator and the HOA switch to the motor starter. When voltage is applied to the motor starter, the run light and elapsed time meter are activated.

Both pumps will run until the OFF level is reached.

When FR1 opens, the alternator switches and will now allow pump 2 to start as the lead pump with the next rise and fall of the level in the wet well. Subsequent operation allows pump 3 to become the lead pump.

(c) Lag-Lag Pump Operation:

As level continues to rise, FR4 tilts, supplying voltage to ISR4, R4 and supplies voltage through the automatic alternator and the HOA switch to the motor starter. When voltage is applied to the motor starter, the run light and elapsed time meter are activated. Even though the level is at the level to call for the third pump, the third pump will not be allowed to start unless one of the other pumps stop or fail.

Both pumps will run until the OFF level is reached.

(d) Back Up System Operation:

In the even the off float FR1 fails, voltage will not be supplied to relay R1. When the level rises to FR2 level the voltage is now supplied through FR2, ISR2 and the normally closed contact 4-1 of R1 to ISR3. When ISR3 is activated, the lag pump will start and run until FR2 opens. The level lights will indicate the failure since PL3-Lag and RL will be illuminated and PL1-Off and PL2-Lead will be off.

(e) Alarm Operation:

If the influent rate exceeds the pumping capacity of two pumps, FR5 will tilt energizing ISR5 and R5. R5 contact 9-11, is sent out as dry contact alarm for high level.

The following conditions are sent out as dry contacts.

1. Pump 1 run IC1
2. Pump 2 run IC2
3. Pump 3 run IC3
4. High level R5 (9-11)
5. Pump 1 fail R18 (9-11)

6. Pump 2 fail R19 (9-11)
7. Pump 3 fail R20 (9-11)

(f) Alternator Operation:

The solid state automatic alternator operates on de-energization to prevent contact arcing and momentary starting of pumps. The alternator sequences with the OFF float regulator FR1.

To replace a pump, turn the defective pump motor breaker and the HOA switch off position. The pump may now be removed.

Pump Fail Operation:

When a pump is called, the call for relay (R7-Pump 1, R9-Pump 2, and R11-Pump 3) will call the solid state starter (SSS). The SSS will call for the isolation contactor (IC1, IC2, and IC3). The IC closed contact must open before the fail timer (TD1, TD2, and TD3) times out. If the IC does not energize before TD times out one of the pump fail relays will energize and latch back to a reset button. At the next level the next pump in the sequence will be called. TD1, TD2, and TD3 must be set between (50-100% or 30-60 seconds).

MINI-CAS II Operation:

Each pump is supplied with a moisture-thermal controller that will provide an indication of the motor status. In the event of a pump failure, a remote indication is supplied through relays R15, R16 or R17.

MAINTENANCE:

To assure watertight integrity, the hold-down "dogs" on the cabinet should be secure at all times. A mild protective spray, such as CRC 226, should be used bi-monthly on the outer door gasket.

All conduit openings should be sealed to preclude intrusion of gases from the wet well.

NORMAL CONDITIONS OF COMPONENTS:

1. Intrinsically safe relays - When the LED is on, power is applied to the unit.
2. Relays - The indicator lights illuminate when the relay is activated.

3. Alternator - The illuminated LED shows power is applied and which pump is scheduled to start on the next cycle.

MALFUNCTION INDICATION POSSIBLE CAUSES

1. Pump(s) will not run.
(hand position)
 - 1A. Loss of incoming power.
 - B. Motor breakers in off position.
 - C. HOA in off position.
 - D. CCB in off position.
 - E. MS OL's tripped.
 - F. Ground fault tripped.
 - G. Defective F1, F2.
 - H. Defective motor starter.
 - I. Motor over temp. TTS open
 - J. MINI-CAS FUS II dropped out.

2. Pump(s) will not run.
(auto position)
 - 2A. All of above.
 - B. Defective ISR2 or 3.
 - C. Defective FR2 or 3.
 - D. Defective CCT.
 - E. Defective R2, R3, or R4.

3. Alternator will not alternate.
 - 3A. Defective FR1.
 - B. Defective alternator
 - C. Defective ISR1.
 - D. Defective R1.

55148BB.48c

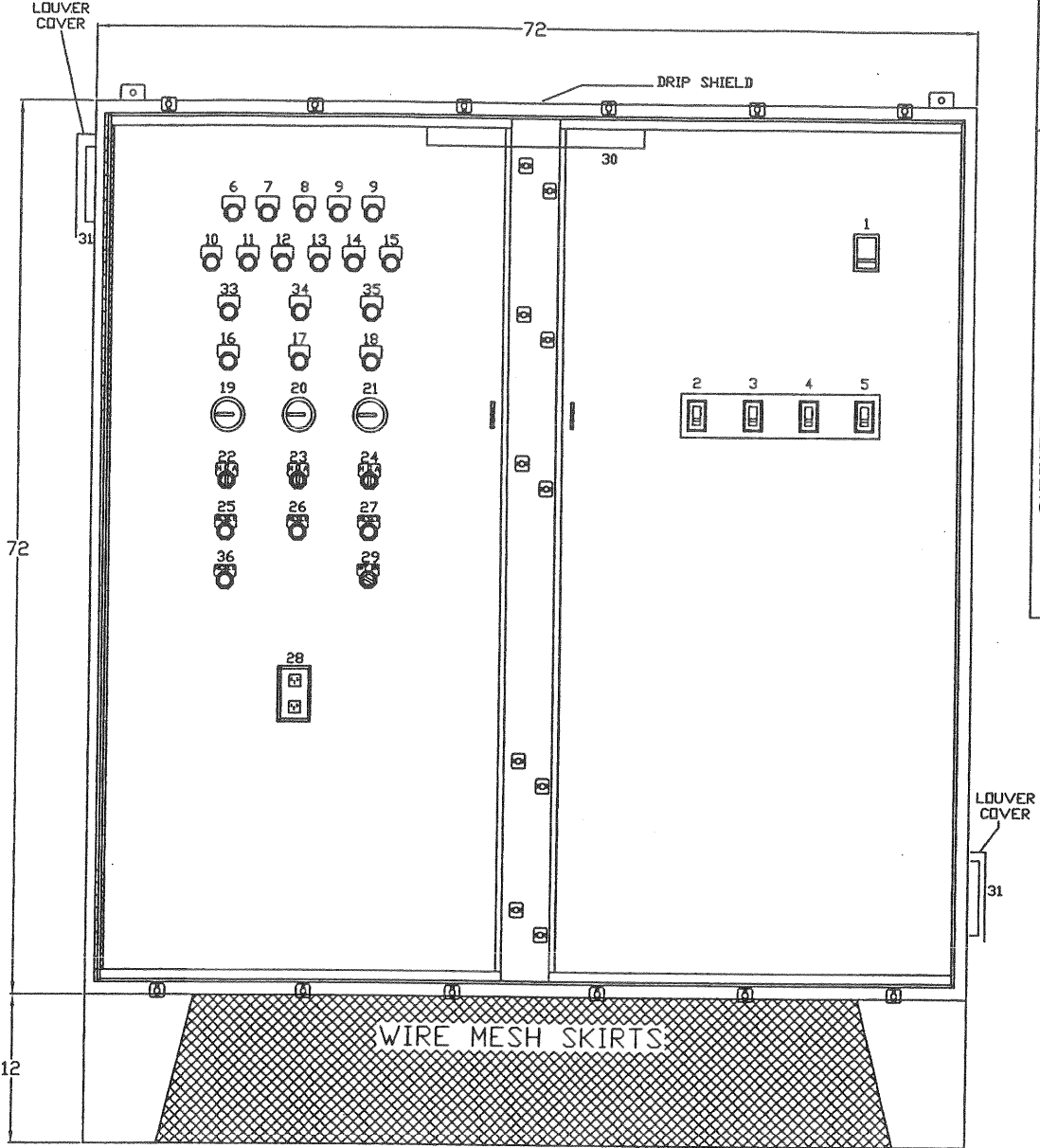
09/09/2003

Type of sort :All parameters

Code	Label	Value
	Identification	
	Reference ATS48	ATS48D75Y
	Supply voltage	208/690 V
	Starter rated current	75.0 A
	Rated continuous current	375.0 A
	Adjustments	
IN	Motor nominal current	<u>60.0 A</u>
ILT	Coefficient of current limit	400 %
ACC	Acceleration ramp time	15 s
TQ0	Initial torque on starting	20 %
STY	Choice of stop type	Freewheel stop
DEC	Deceleration ramp time	15 s
EDC	Freewheel thr'hld on braking	20 %
BRC	Int level of braking torque	50 %
EBA	Pseudo DC braking level	20 %
	Advanced Adjustments	
IN2	Motor 2 nominal current	65.0 A
IL2	Motor 2 current limit	400 %
AC2	Motor 2 Acceleration time	15 s
TQ2	Motor 2 starting torque	20 %
DE2	Motor 2 deceleration time	15 s
ED2	Freewheel level dec2	20 %
IPR	Motor preheat level	0 %
TPR	Time before preheat	5 min
CLP	Torque control	<u>Disabled</u>
LSC	Stator loss compensation	50 %
BST	Voltage boost level	Disabled
TLI	Torque limit	Disabled
TIG	Braking loop gain	40 %
TL2	Motor 2 Torque limit	Disabled
TI2	Motor 2 decel loop gain	40 %
DLT	Start in delta configuration	Disabled
SST	Test on low power motor	Disabled
CSC	Activate cascade function	Disabled
ULN	Supply voltage	460 V
FRC	Supply frequency	Auto detection
RPR	Reset kW or time	No action
	AO Configuration	
0_4	AO scaling	AO = 0-20 mA
ASC	Analogue output scaling AO	200 %
	I/O Assignments	
LI1	Assignment of Logic Input LI1	STOP
LI2	Assignment of Logic Input LI2	RUN
LI3	Logic Input LI3 assignment	force freewheel
LI4	Logic Input LI4 assignment	Forced local
LO1	Logic Output LO1 assignment	Mot therm alarm
LO2	Logic Output LO2 assignment	Motor powered
R1	Relay R1 assignment	<u>Isolating relay</u>
R2	Relay R2 assignment	Bypass

Code	Label	Value
R3	Relay R3 assignment	Motor powered
AO	Analogue output AO assign	Motor current
	Protection	
THP	Motor thermal protection	Class 10
PTC	Activate PTC protection	disabled
RTH	Reset thermal O/L value	No
OIL	I overcurrent threshold	disabled
LOC	Overcurrent level	80 %
TOL	Overcurrent time	10.0 s
ULL	Underload activation	disabled
LUL	Underload threshold	60 %
TUL	Underload time	60 s
PHL	Phase loss level	10 %
PHP	Phase Loss Activation	<i>Disabled</i>
PHR	Phase rotation protection	No protection
TBS	Time before starting	2 s
TLS	Start too long	Disabled
ARS	Automatic restart	Disabled
	Display module port	
TLP	Time-Out	5.0 s
ADD	Starter address	0
TBR	Baud rate	19200 baud
FOR	Communication protocol	8data,no,1Stop

Drawings



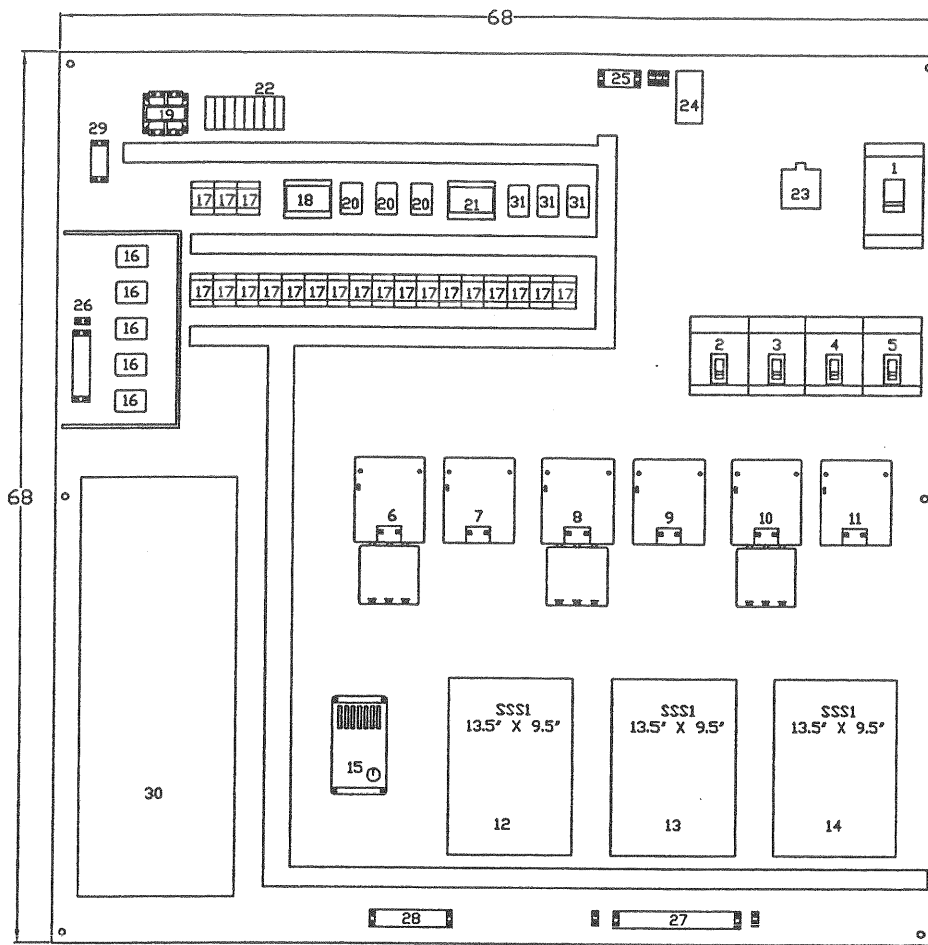
SHERMAN ST. P/S
CAMBRIDGE
QUOTE NO. DATE DRAWN BY REVISION
55148BB3/17/2003 JOHN

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ITT-FLYGT CORP.
TRUMBULL, CT 06611

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OUTER DOOR HAS BEEN REMOVED FOR CLARITY

- 1 - MCB MAIN CIRCUIT BREAKER
- 2 - MB1 MOTOR BREAKER 1
- 3 - MB2 MOTOR BREAKER 2
- 4 - MB3 MOTOR BREAKER 3
- 5 - VALVE CONTROL BREAKER
- 6 - PL1 OFF LEVEL
- 7 - PL2 LEAD LEVEL
- 8 - PL3 LAG LEVEL
- 9 - PL5 HIGH LEVEL
- 10 - PL6 OVERTEMP 1
- 11 - PL7 MOISTURE 1
- 12 - PL8 OVERTEMP 2
- 13 - PL9 MOISTURE 2
- 14 - PL10 OVERTEMP 3
- 15 - PL11 MOISTURE 3
- 16 - RL1 PUMP 1 RUN
- 17 - RL2 PUMP 2 RUN
- 18 - RL3 PUMP 3 RUN
- 19 - ETM1 ELAPSED TIME METER 1
- 20 - ETM2 ELAPSED TIME METER 2
- 21 - ETM3 ELAPSED TIME METER 3
- 22 - HOA1 HAND, OFF, AUTO 1 (PUMP 1)
- 23 - HOA2 HAND, OFF, AUTO 2 (PUMP 2)
- 24 - HOA3 HAND, OFF, AUTO 3 (PUMP 3)
- 25 - MINI CAS 1 RESET
- 26 - MINI CAS 2 RESET
- 27 - MINI CAS 3 RESET
- 28 - DR DUPLEX RECEPTACLE
- 29 - TROUBLE LIGHT SWITCH
- 30 - CABINET LIGHT
- 31 - LOUVERS AND VENTS
- 32 - PL4 STAND-BY LEVEL
- 33 - PL12 PUMP 1 FAIL
- 34 - PL13 PUMP 2 FAIL
- 35 - PL14 PUMP 3 FAIL
- 36 - PUMP FAIL RESET



LAYOUT MAY VARY

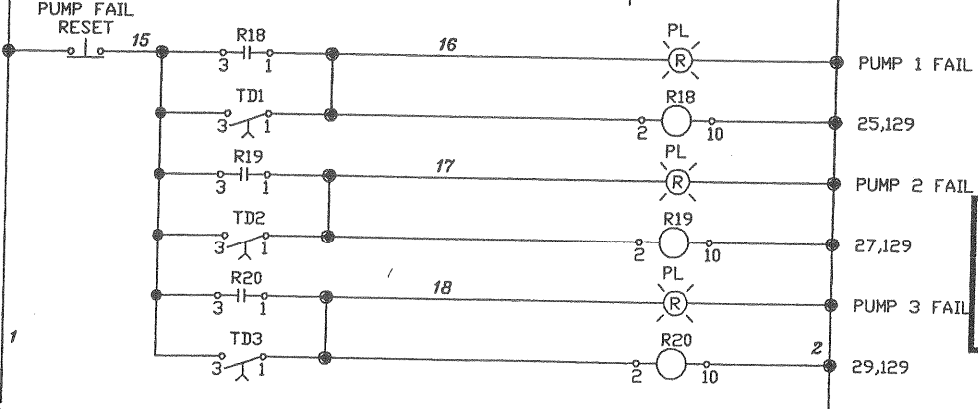
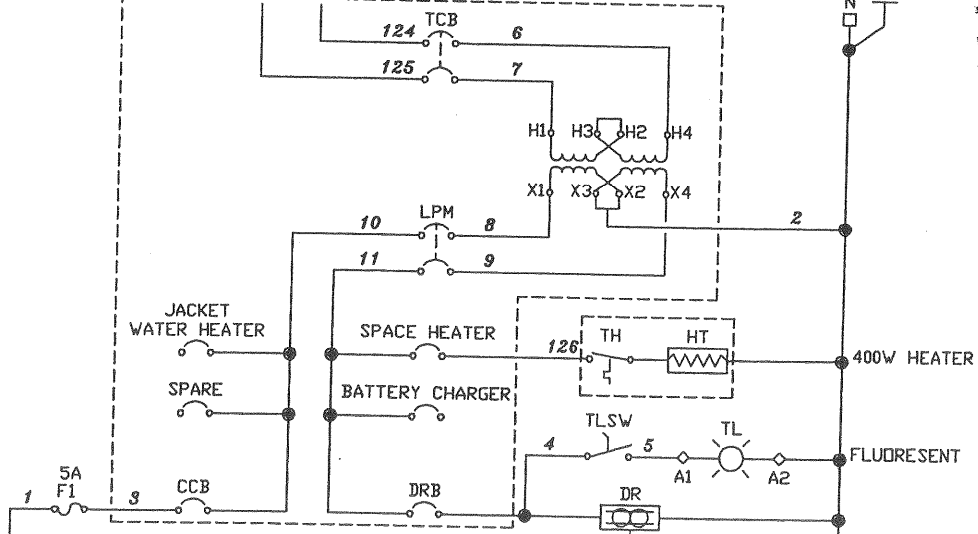
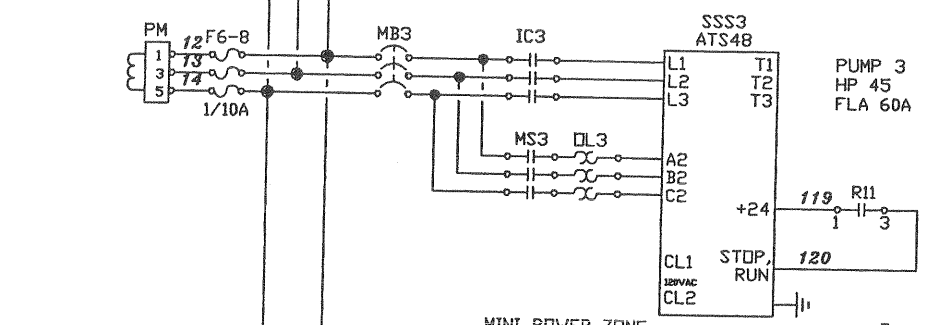
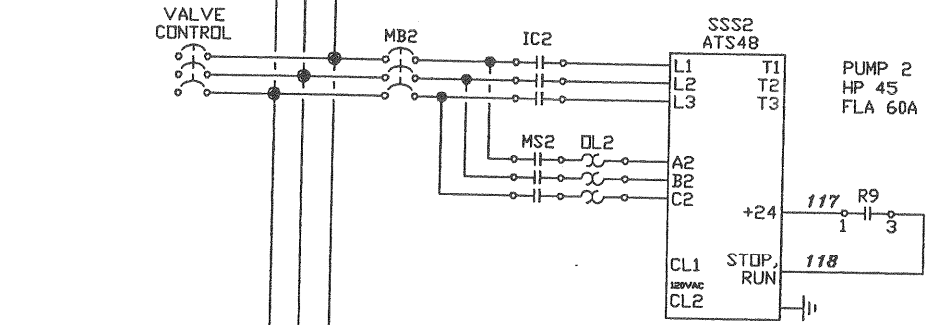
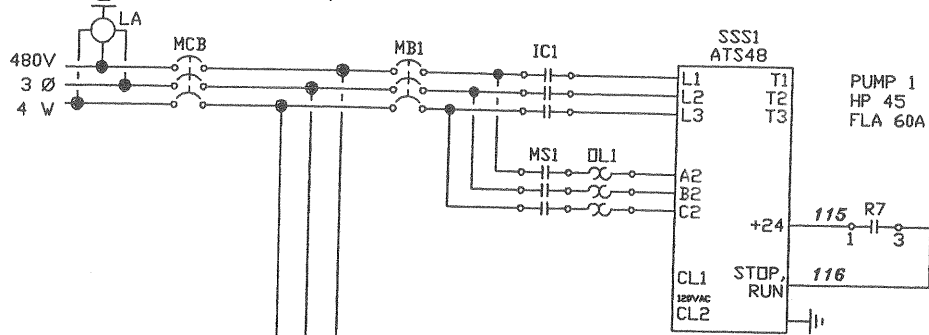
- 1 - MCB MAIN CIRCUIT BREAKER
- 2 - MB1 MOTOR BREAKER 1
- 3 - MB2 MOTOR BREAKER 2
- 4 - MB3 MOTOR BREAKER 3
- 5 - VALVE CONTROL BREAKER
- 6 - MS1 MOTOR STARTER 1
- 7 - IC1 ISOLATION CONTACTOR 1
- 8 - MS2 MOTOR STARTER 2
- 9 - IC2 ISOLATION CONTACTOR 2
- 10 - MS3 MOTOR STARTER 3
- 11 - IC3 ISOLATION CONTACTOR 3
- 12 - SSS1 SOLID STATE STARTER 1
- 13 - SSS2 SOLID STATE STARTER 2
- 14 - SSS3 SOLID STATE STARTER 3
- 15 - HT HEATER
- 16 - ISRI-5 INTRINSICALLY SAFE RELAYS 1-5
- 17 - RI-20 RELAYS 1-20
- 18 - ALT ALTERNATING RELAY
- 19 - CCT CONTROL CIRCUIT TRANSFORMER
- 20 - MCI-3 MINI CAS 1-3
- 21 - PM PHASE MONITOR
- 22 - FUSE BLOCK
- 23 - LA LIGHTNING ARRESTOR
- 24 - NEUTRAL BLOCK
- 25 - TSA TERMINAL STRIP A
- 26 - TSB TERMINAL STRIP B
- 27 - TSC TERMINAL STRIP C
- 28 - TSD TERMINAL STRIP D
- 29 - TSF TERMINAL STRIP F
- 30 - SKVA MINI POWER ZONE
- 31 - TDI-3 TIME DELAYS 1-3

SHERMAN ST. P/S
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QUOTE NO.	DATE	DRAWN BY	REVISION
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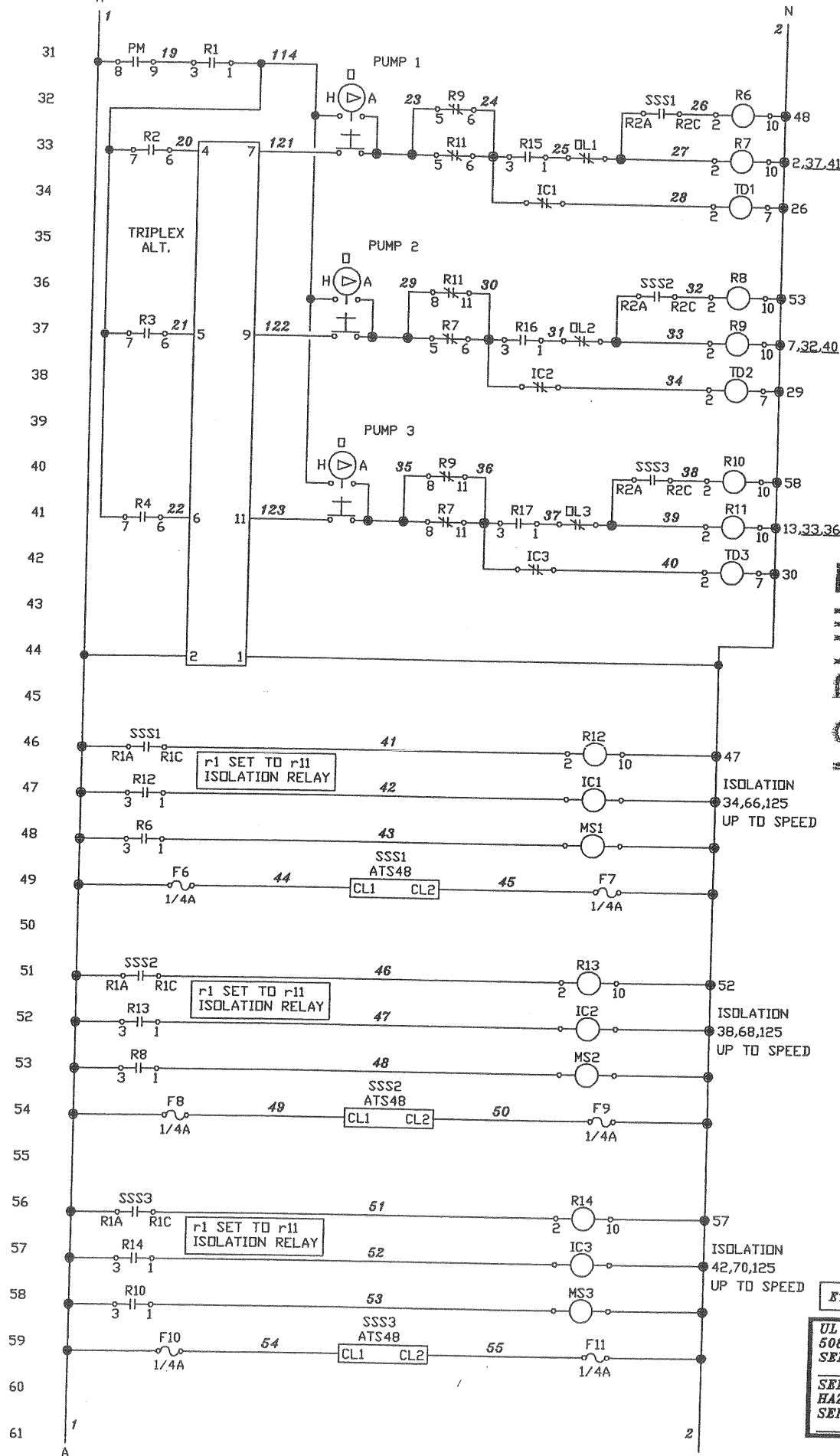
QUOTE NO.	DATE	DRAWN BY	REVISION
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ETL LISTED
UL LISTED
508 STANDARD
SERIAL NO.
SERVICE ENT
HAZ LOCATION
SERIAL NO.



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CAMBRIDGE

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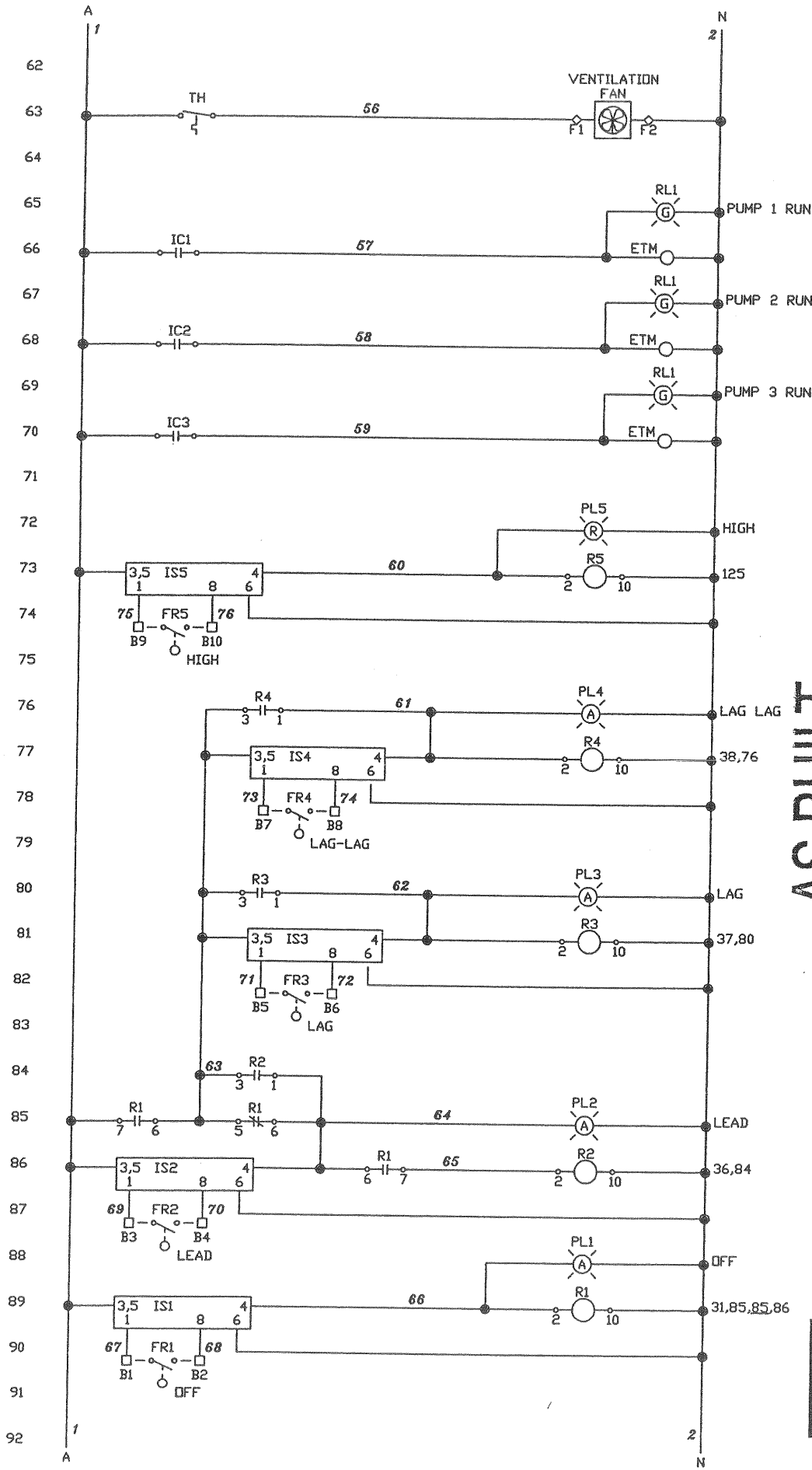
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SHERMAN ST. P/S	
CAMBRIDGE	
QUOTE NO.	DATE
55148BB	3/17/2003
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JOHN	

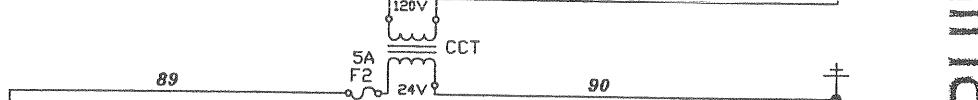
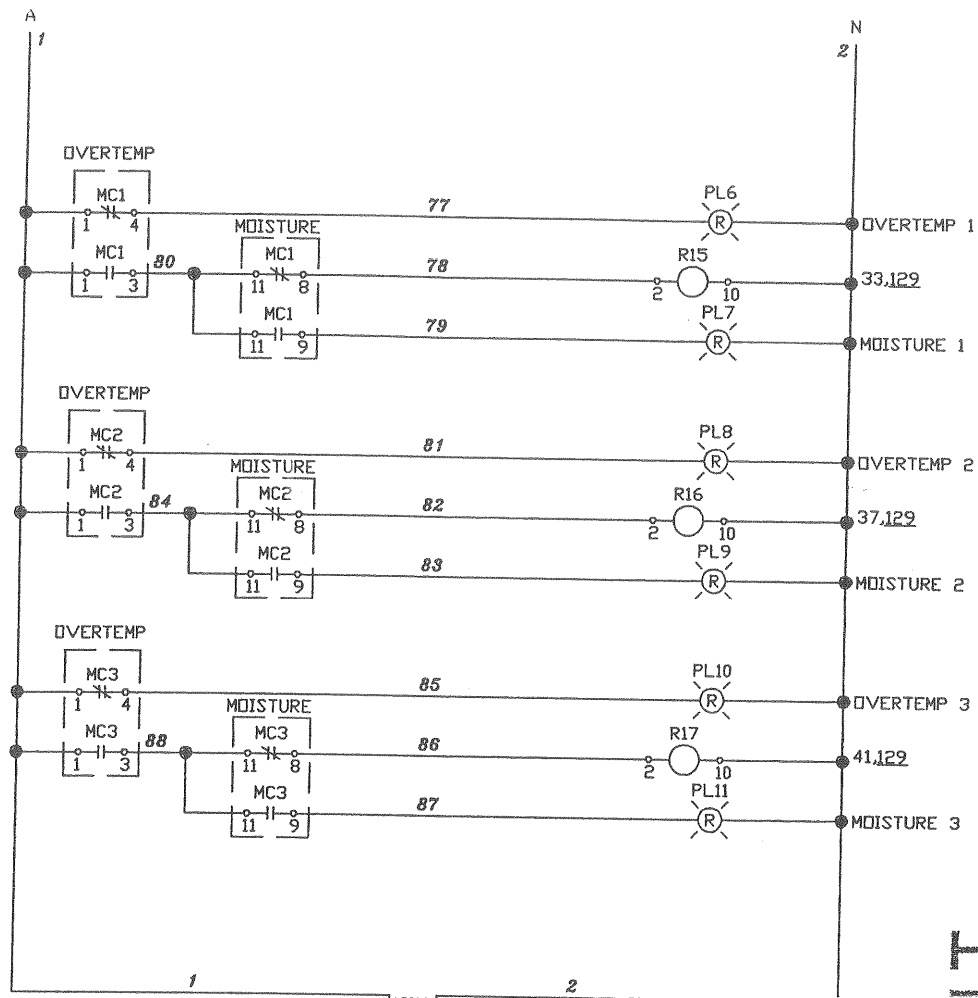
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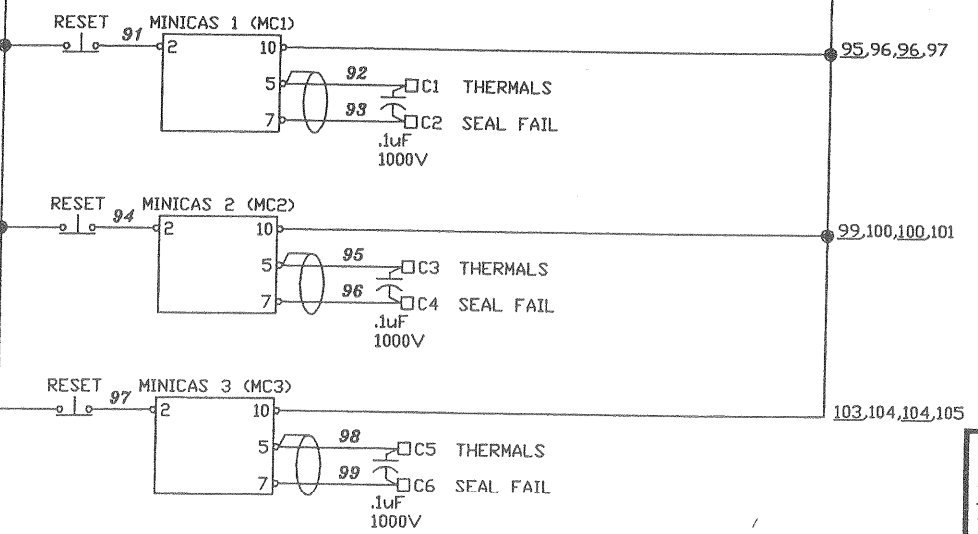
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SERIAL NO.

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When power is applied the overtemp contacts change state
The pump current loop 7mA<130mA pump sensors are good
less than 7mA overtemp contact re-close
greater than 30mA moisture contact closes



SHERMAN ST. P/S
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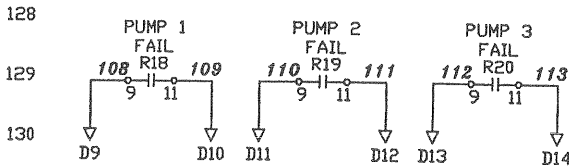
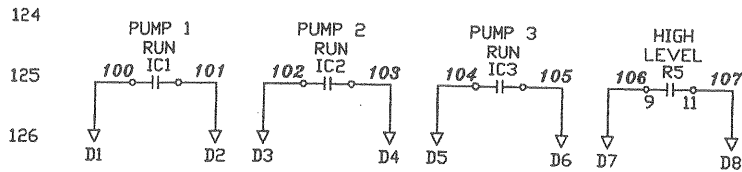
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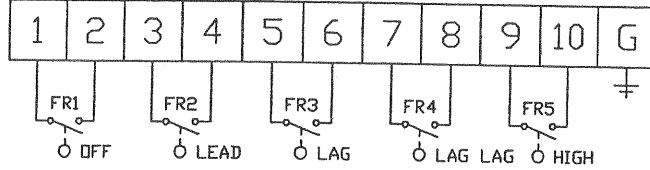
QUOTE NO. 55148BB3/17/2003
DATE 3/17/2003
DRAWN BY JOHN
REVISION



LAST WIRE #125

Intrinsically safe wiring terminals
"Install in accordance with Article 504 of the National Electrical Code."

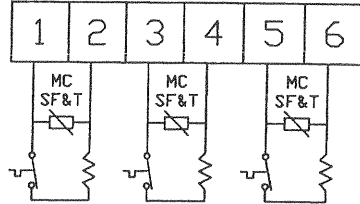
TERMINAL STRIP B (TS-B)



LOW VOLTAGE
DISCREET SIGNALS
SHOULD BE IN
SEPARATE CONDUIT

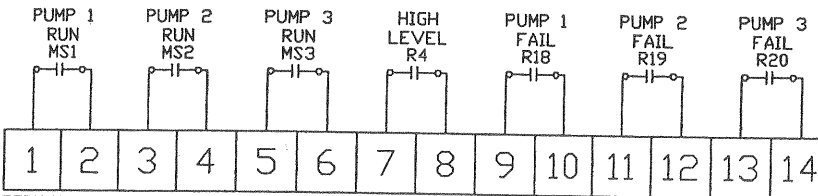
Nonintrinsically safe wiring terminals

TERMINAL STRIP C (TS-C)

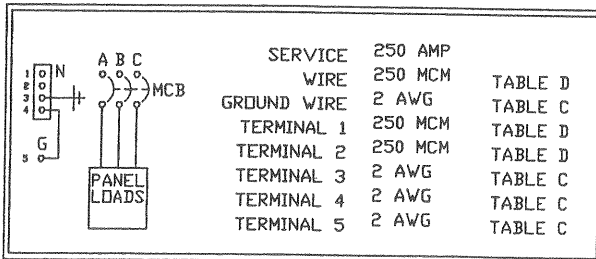


Black - Supply Voltage ungrounded
Red - AC control circuits
Blue - DC positive
Yellow - powered by other source
White or Gray - Grounded AC
White w/blue stripe - DC negative grounded
White w/yellow stripe - powered by other source, grounded

Dry contacts leaving panel powered by other source
REMOTE ALARMS



TERMINAL STRIP D (TS-D)



AS BUILT

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508 STANDARD
SERIAL NO.

SERVICE ENT
HAZ LOCATION
SERIAL NO.

CUSTOMER FLYGT, MA
JOB NAME SHERMAN, ST-CAMBRIDGE
VOLTAGE 480V PHASE 3 HZ 60
H.P. #1 45 #2 45 #3 45 #4 X
F.L.A. 60A 60A 60A X
TOTAL F.L.A. 160A
SERIAL # 03-0795 DATE: 09/09/2003

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TRUMBULL, CT 06611
ITT-FLYGT

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Component Specifications

FLYGTAn **ITT Industries** company**AS BUILT****BILL OF MATERIAL****BY: JOHN**

QUOTE NO.	55148BB	Date: 9/09/2003	Rev:
JOB NAME	SHERMAN ST. P/S-CAMBRIDGE	03-0795	
CUSTOMER	FLYGT, MA	Po# 166217	

QTY	LEGEND	DESCRIPTION	MFG.	PART #	Check Off
1		ENCLOSURE	HOFFMAN	A-74H7224SSLP	[✓]
1		SUB PANEL	HOFFMAN	A-72P72	[✓]
1	N	ISOLATED NEUTRAL BLOCK 335 A.	MARATHON	1431553	[✓]
2	G	GROUND BUSS (#4-2/0)	SQD	PK12GTA	[✓]
1	MCB	MAIN CIRCUIT BREAKER	SQD	KAL36250	[✓]
1		MULTI-LUG KITS (6-#14-#4)	SQD	PDC6KA4	[✓]
3	MB	MOTOR BREAKER	SQD	FAL36100-18M	[✓]
1		VALVE CONTROL CIRCUIT BREAKER	SQD	FAL34020	[✓]
1	TCB	TRANSFORMER BREAKER	SQD	FAL24020	[✓]
1	LPM	LIGHTING PANEL MAIN	SQD	QO230	[✓]
1	CCB	CONTROL BREAKER	SQD	QO120	[✓]
1	DRB	DUP RECEPTACLE BREAKER	SQD	QO120	[✓]
1	HCB	GEN. JACKET WATER HEATER	SQD	QO120	[✓]
1	LCB	BATTERY CHARGER CIRCUIT BREAKER	SQD	QO120	[✓]
1	CB	CIRCUIT BREAKER (SPARE)	SQD	QO120	[✓]
1	CPT	MINI POWER ZONE	SQD	7400-MPZ5S40F	[✓]
3	SSS	SOLID STATE STARTER	SQD	ATS48D75Y SN# 6W0324000371 SN# 6W0318000119 SN# 6W0324000315	[✓]
3	MS	MOTOR STARTER	SQT	LC1D6511G6	[✓]
3	IC	ISOLATION CONTACTOR	SQT	LC1D6511G6	[✓]
3	OL	OVERLOAD BLOCKES	SQT	LR3D3359	[✓]
3	MSA	ISOLATION AUX. CONTACT	SQT	LADN31	[✓]
1	CCT	CONTROL TRANSFORMER	SQD	9070-T75D23S12	[✓]
3	TS	TERMINAL STRIP	MARATHON	SERIES 200	[✓]
1	TS	TERMINAL STRIP	MARATHON	SERIES 300	[✓]
1	*DR	DUPLEX RECEPTACLE	PASS & SEY.	2091-I	[✓]
1		WALL PLATES	LEVITON	84401-40	[✓]
2	*F	FUSE	LITTELFUSE	BLF -5 /250V	[✓]
6	*F	FUSE (750VA) (TIME DELAY AC-DC)	LITTELFUSE	KLDR -1/4 /600V	[✓]
3	*F	FUSE (FAST ACT AC - DC)	LITTELFUSE	KLK-1/10 /600V	[✓]
0		FUSE HOLDER	LITTELFUSE	L60030M1PQ	[✓]
	HOA	HAND-OFF-AUTO SELECTOR	SQD	9001SKS43B	[✓]
3		(NO, NC) CONTACT	SQD	9001-KA1	[✓]
3	RL	RUN LIGHT	SQD	9001SKP1	[✓]
14	PL	PILOT LIGHT	SQD	9001SKP1	[✓]

3	ETM	ELAPSED TIME METER	REDINGTON	710-0016	[4]
4	P/B	PUSH BUTTON	SQD	9001-SKR1U	[4]
4		(NC) CONTACT	SQD	9001-KA3	[4]
20	R	CONTROL RELAY (120VAC)	POTTER B.	KRPA14AN-120	[4]
4		8 PIN SOCKET (ISR)	OMRON	PF083A	[4]
23		11 PIN SOCKET	IDEC	SR3P-05	[4]
3		8 PIN SOCKET	IDEC	SR2-06	[4]
2		12 PIN SOCKET	CUSTOM CONN	SD12	[4]
1	ALT	TRIPLEX ALTERNATOR	FLYGT	14-40 32 20	[4]
3	TD	TIME DELAY (120V 60 SECONDS)	FLYGT	14-40 31 91	[4]
5	ISR	INTRINSICALLY SAFE RELAY (120V)	FLYGT	14-40 32 22	[4]
1	PM	PHASE MONITOR (500V 12 PIN)	FLYGT	14-40 32 14	[4]
3	MC	MINI-CAS (ADD .1Uf 1000V CAPACITOR TO MINI-CAS PINS 5-7)	FLYGT	14-40 71 13	[4]
1	TH/HT	HEATER UNIT	HOFFMAN	D-AH4001B	[4]
1	TH	THERMOSTAT	HOFFMAN	ATEMNO	[4]
1	FAN	VENTILATION FAN	HOFFMAN	A-6AXFN	[4]
1		VENTILATION FILTER	HOFFMAN	A-FLT66	[4]
2		LOUVERS	HOFFMAN	AVK66SS6	[4]
2		LOUVER COVERS	STA-CON	8 X 8	[4]
1		TROUBLE LIGHT SWITCH	SQD	9001SKS11B	[4]
1		(NO) CONTACT	SQD	9001-KA2	[4]
1	* TL	TROUBLE LIGHT	CRESENT	CU15A	[4]
1	* LIGHT	PANEL LIGHT	G.E.	18"	[4]
1	LA	LIGHTNING ARRESTOR	SQD	6671 SDSA3650	[4]
1	VC	VAPOR CAPSULE	ZERUST	VCC-1	[4]

NOTES:

- * OR EQUAL
- + INDICATES LINE ITEM CHANGE
- SPECIAL ITEMS IN BOLD TYPE
- @ PROVIDED BY PUMP REP

AS BUILT

PACKING LIST

Quote#: 55148BB			Date: 9/09/2003		Rev:
SPARE PARTS					
QTY	LEGEND	DESCRIPTION	MFG	PART #	
1		LIGHT BULB	SYLVANIA	755	[4]
2	* F	FUSE	LITTELFUSE	BLF -5 /250V	[4]
6	* F	FUSE (750VA) (TIME DELAY AC-DC)	LITTELFUSE	KLDR -1/4 /600V	[4]
3	* F	FUSE (FAST ACT AC - DC)	LITTELFUSE	KLK-1/10 /600V	[4]

SHOP CHECK SHEET

AS BUILT

Quote#: 55148BB	Date: 9/09/2003	Rev:
-----------------	-----------------	------

P.O.#	166217	# PUMPS	3	Ship Date	9/09/2003
H.P.'s	45	VOLTAGE	480V	PHASE	3
FUS. #		DRIPSHIELD	YES	SERIAL #	03-0795
DEADFRONT	ALUM.	ENCLOSURE TYPE	3R	MATL.	304 STAINLESS

SPECIAL INSTRUCTIONS	Check OFF
----------------------	-----------

INTRINSICALLY SAFE DEVICES HAVE ALUMINUM BARRIER	[]
CORROSION INHIBITOR	[]

Wire Numbers - Type	[]
Legends and Legend Sheet	[]
Ground Lugs	[]
Overload Heater Chart (NA)	[]
Pump Data Sheet	[]
Drawings on Door	[]
Picture of Panel	[]

ETL LABEL	[]
UL Serial No. <u>BE041274</u>	[]
Service Entrance	[]
UL Hazardous Locations <u>BD395468</u>	[]

Spare Parts

In Panel See Packing List []

 In Separate Box See Packing List []

Wired by: subpanel N.F/B. door/deadfront J.W.

Tester J.M. *[Signature]*

Inspector J.W. *[Signature]*

Comments Solid state starter manuals are inside the enclosure.

APPENDIX F
EXAMPLE CRS WORK ORDER FORM



New Request

Category

Request ID

Type

Status

Item

Priority

Summary

Description



Location

Advanced

District

	Number	Suffix	Unit	GIS
Street Number	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Street Name	<input type="text"/>			<input type="text"/>
Cross Street	<input type="text"/>			<input type="text"/>
Point Of Interest	<input type="text"/>			<input type="text"/>

General

Notifications

Requester Information

Last Name	<input type="text"/>	Phone	<input type="text"/>
First Name	<input type="text"/>	Email Address	<input type="text"/>
Company	<input type="text"/>	Requester Type	<input type="text"/>
Street	<input type="text"/>	Reply	<input type="text"/>
City	<input type="text" value="Cambridge"/>	Request Source	<input type="text"/>
Postal Code	<input type="text"/>	Due Date	<input type="text"/>
Submitted By	<input type="text"/>	Requested On	<input type="text"/>

Support Information

Group	<input type="text"/>
Supervisor	<input type="text"/>
Assign To	<input type="text"/>
Asset	<input type="text"/>

Additional Information

Council Order	<input type="checkbox"/>
Additional Requesters	<input type="checkbox"/>

Save

Reports

Current User

Request Template

Print

Log Off

Close



Request Worksheet



Req No: REQ244187 **Location:** 236 Columbia St
Request: Repair Stormwater Main **Status:** Assigned
Description: Repair Stormwater Main

I checked a video of the storm drain on Columbia St. There are two connections in the approximate location of the sinkhole 19 feet from the manhole D01COM4785. One is a factory tap that is capped, the other appears to have been to be plugged and abandoned. I did not observe any other defects on the drain line.

I could not find a video of the sanitary line. However, Sewer Plan 6850 shows a service lateral at the same location as the sinkhole, 19 feet from the common manhole.

Work Log:

ASSIGNMENT:

Group: Public Works - Engineering **Submitter:** jwilcox **Submit Date:** 2/22/10
Person: **Priority:** Low **Scheduled:**

REQUESTER

Name: Wendy Robinson **Type:** City Employee
Address: **Reply Requested:**
City: Cambridge **Zip:**
Phone: 617-349-6958 **Email:** wrobinson@CambridgeMA.GOV

RESOLUTION NOTES:

Change Status To: _____ **Resolution Code:** _____
Requester Reply Type Made: _____ **Requester Reply Date:** _____

Description of Work Completed: _____

Approved By: **Approval Date:**
CRS Entry By: **Entry Date:**

APPENDIX G
CURRENT AND HISTORICAL BMPs NARRATIVE

CURRENT & HISTORICAL STORMWATER BEST MANAGEMENT PRACTICES (BMP) WITHIN THE CITY OF CAMBRIDGE

Four of the Nine Minimum Controls as set forth in the NPDES CSO Permit can be enhanced through incorporation of Best Management Practices (BMP) improvements. Over the past decade since the original NPDES CSO permit was issued, the City of Cambridge has implemented these BMP approaches throughout the City to reduce CSO overflows and provide water quality improvements during CSO activations. Specifically the four controls that can be enhanced using BMPs include the following:

- NMC #2: Maximization of Storage in the Collection System
- NMC #4: Maximization of Flow to the POTW
- NMC #6: Control of Solids and Floatable Materials in CSOs
- NMC #7: Pollution Prevention Programs to Reduce Contaminants in CSOs

This summary of current and historical BMPs within the City of Cambridge provides a brief overview of the types of Best Management Practices employed over the past decade and where these improvements have been constructed to provide benefit at specific CSO sites.

Solids Deposition and BMP Controls

The City of Cambridge sewer and drainage systems are greatly constrained from a conveyance perspective, primarily due to flat topography, impounded receiving water systems, and the consequent proclivity of significant solids deposition within the pipe systems themselves. This results in further reducing conveyance capacity, lowering service levels, and increasing the probability of wet weather combined sewer overflows. The deposition of sewage solids during dry weather in combined sewers has also been recognized as a major contributor to "first-flush" phenomena where deposited solids become re-suspended during storm events, resulting in higher contaminant loading during the initial hours of a rainfall event and combined sewer overflows. The following BMPs were designed and constructed in the City of Cambridge drainage, sewer, and combined sewer systems to provide capture of these solids or flushing to convey solids downstream to the treatment works and minimize the chance of these solids discharging to the Alewife Brook or Charles River during a CSO event.

BMP Catch Basins (Sumps and Hoods)

The most widely used method of sediment control throughout the City of Cambridge includes construction of BMP type catchbasins. In many instances, catchbasins were historically constructed with shallow sumps (or no sump) and consequently all particulate runoff was conveyed to the downstream combined sewer or drainage system, adding to the sedimentation issues experienced in flat areas of the City. As the City continues to improve its stormwater and sanitary sewer infrastructure, an effort has been made to add new BMP type catchbasins or to retrofit existing catchbasins to become BMP compliant wherever feasible. Typically this includes the construction of a 6-ft minimum sump (or a remote sump where necessary), as well as the removal of curb inlets and the construction of catchbasin hoods on the outlet to provide floatables controls. BMP catchbasins have been installed throughout the City and provide

sediment capture and reduction of CSO contamination (NMC #7). Of specific note, 57 new BMP catchbasins were installed during the Fresh Pond Parkway Sewer Separation Project within the CAM 004 catchment area, including replacement of 26 catch basins with minimal sump depth that were no longer functioning. Approximately 350 six-foot sumped catch basins have been constructed throughout the City since 1998.

Infiltration Basins

Recent projects such as the Prentiss Street Sewer Separation Project (CAM 011) and the CAM 400 Sewer Separation Project have incorporated infiltration basins to minimize discharge to the storm drain and combined sewer systems. These infiltration basins are offline structures, located downstream of a sump catchbasin, with a perforated sump surrounded by crushed stone bedding so that smaller storm events will simply discharge into the ground as opposed to being directed to the storm drain system. The upstream catchbasin sump is intended to capture any first flush sediment so that this material is not deposited in the infiltration basin where it could plug the perforated base and minimize effective recharge of stormwater back into the ground.

The benefit of these infiltration basins is a reduction of runoff into the stormwater or combined sewer systems, increasing system storage (NMC#2), and enhancing pollution prevention (including phosphorous control) via infiltration of contaminants back into the soil instead of discharging to local water bodies. Currently these basins are being installed within the CAM 400 catchment area (Whittemore Avenue) and along Prentiss St and portions of Oxford Street in Area 13, which discharges at the CAM 011 CSO structure.

Sanitary and Storm System Flushing

The City has also incorporated automatic sewer flushing systems in the CAM 004 system within the Alewife watershed and in the CAM 011 system in the Agassiz area within the Charles River watershed. Flushing of sewers either by manual or by automated means is generally used to reduce hydraulic restrictions, and infrequently, as a pollution prevention approach. The goal of sewer flushing is to induce an unsteady waveform by either rapidly adding external water or creating a "dam break" effect by the quick opening of a restraining gate. The aim is to re-suspend and transport deposited pollutants to the sewage treatment facility during dry weather and/or to displace solids deposited in the upper reaches of large collection systems closer to the system outlet. During wet weather events these accumulated loads may then be more quickly displaced to the treatment headworks before overflows occur, or be more efficiently captured by wet weather first flush storage facilities. Flushing has been shown to readily remove organic deposits, saturated water-logged floatable solids, and fine sand and grit, but is not very effective for removing heavy debris.

As part of the Contract 2B, Fresh Pond Parkway Project (1999 – 2001), passive automatic flushing systems were installed in the City of Cambridge's storm and sanitary sewer system tributary to the CAM 004 CSO, which ultimately discharges to the Alewife Brook. Grit and debris deposition has historically been a problem within the existing combined sewers, storm drains, and sanitary trunk sewers in this area due to its flat topography. This condition is

exacerbated by hydraulic constraints imposed on the system's outlet by the Alewife Brook (high backwater levels during wet weather conditions) and downstream sanitary siphons. Shown below in Figure 1 is a plan view of several of these sanitary and storm drain flushing vaults installed in the CAM 004 area.

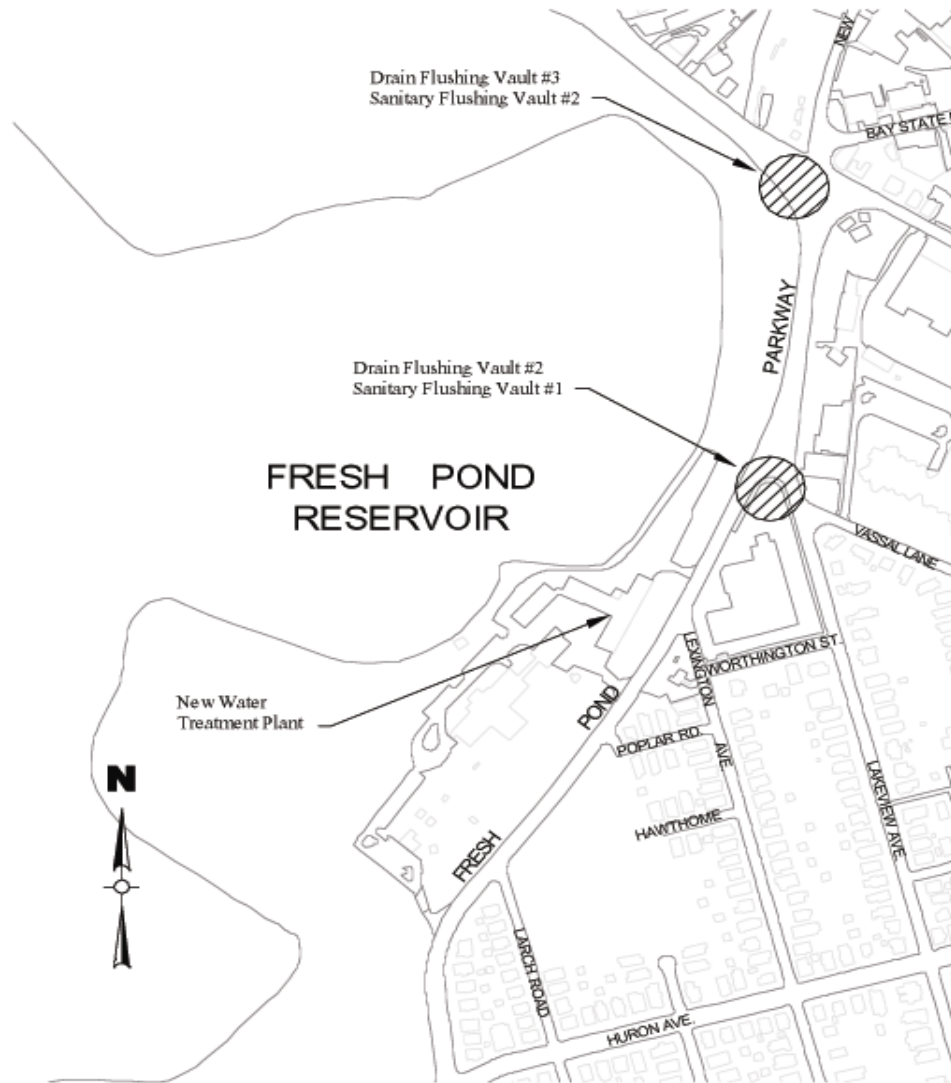


Figure 1 – Flushing Vault for the Fresh Pond Parkway Sewer Separation Project

Similarly, the combined sewer and sewer lines in the Carver/Crescent area of the CAM 011 collection system in the Charles River Watershed are constrained due to inadequate conveyance velocities and a propensity to collect sediments. These systems are flushed with stored stormwater so as to continuously move debris along to locations where it can be conveniently removed from the system. Figure 2 below shows a schematic design for one of

these flushing vaults installed within the Carver/Crescent area. These flushing systems have contributed to the goals of maximizing collection system storage (NMC#2), and maximizing flow to the treatment works (NMC #4), as well as providing CSO contaminant reductions during CSO events (NMC #7).

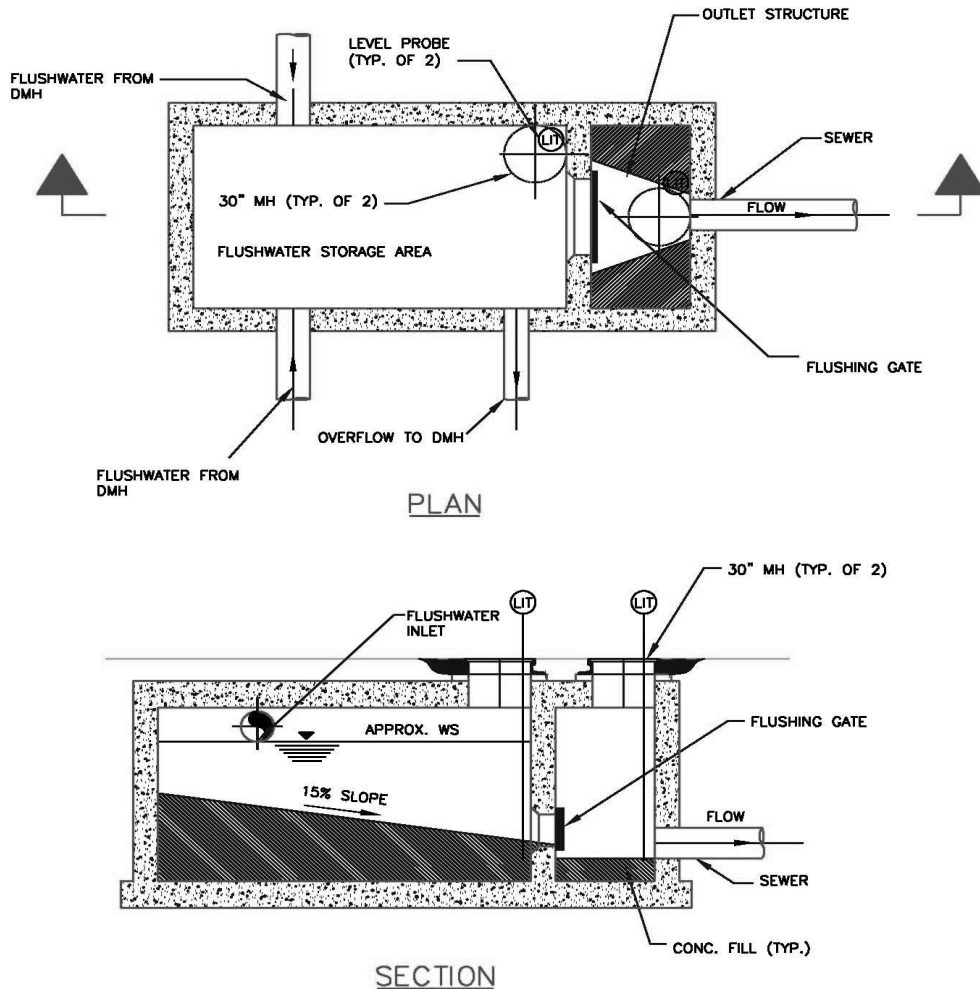


Figure 2 – Plan and Section of Typical Flush Vault

Grit Pits

Similar to BMP catchbasins, the City has also installed grit pits within many areas to provide additional solids capture. These BMPs help to maximize flow to the treatment works (NMC#4) and provide additional water quality benefits during CSO overflows (NMC#7). The pits are typically oversized manholes with 3-ft sumps installed in-line to the sewer or drain that allows for sediments and debris to deposit into the pit instead of being carried downstream. These systems provide the most benefit just upstream of flat areas where sediments typically settle out into the pipe and result in reduced flow capacity. In order for these systems to operate as intended, regular maintenance is scheduled where a vector truck removes debris via the access manhole. Grit pits have been constructed within the Cambridgeport area, (draining to the

Cottage Farm CSO facility) along Massachusetts Avenue, and within the CAM 017 area, providing CSO improvements to the CAM 017 CSO regulator structure. Additional grit pits have been planned for Area 13 and Harvard Square, both tributary to the CAM 011 CSO regulator. Figure 3 below shows design of a typical grit pit installed within the Cambridgeport area.

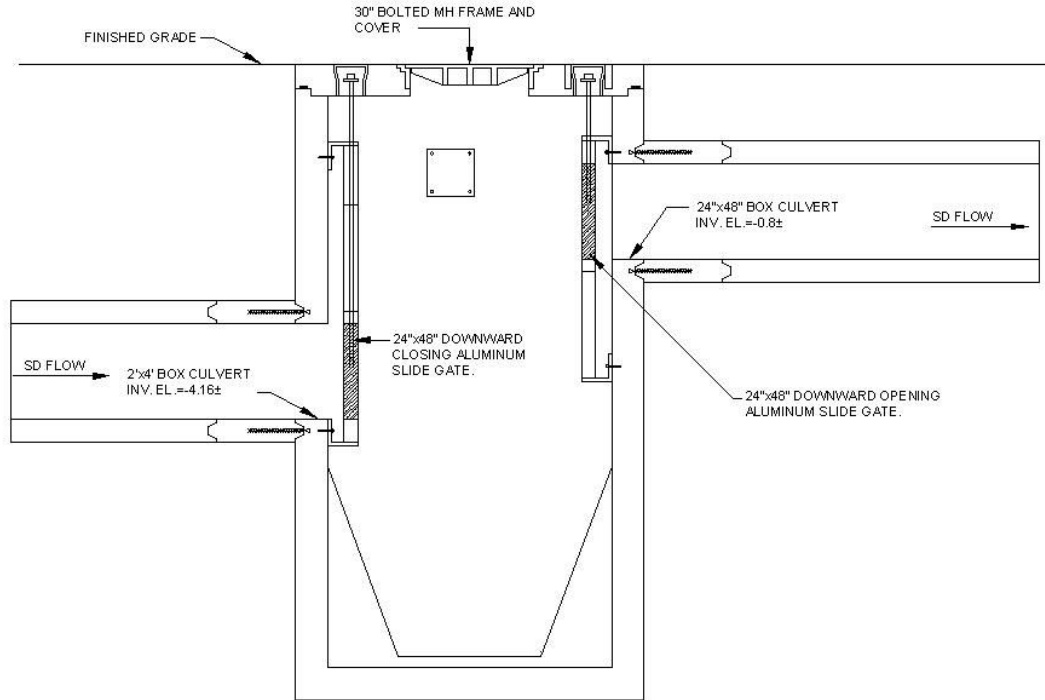


Figure 3 – Typical Grit Pit Design

Storage Tanks

Storage tanks have been installed throughout the City to contain wet weather flows during larger storm events, to prevent flooding, and reduce CSO activation frequency and overflow volume. Typically these systems involve an overflow weir to divert peak flows away from the collection system and into a tank (or series of tanks) that will contain excess flows and gradually release these flows back to the collection system following the storm event, either by gravity or discharge pumping.

Storage tanks have been installed within New Street (CAM 004), Bellis Circle (CAM 401A), Beacon Street, Scott St. / Holden St., and Crescent St. / Carver St. (CAM 011) areas of the City; providing a reduction in activations at the various CSOs and contributing to maximized system storage (NMC#2) and increased flow to the treatment plant (NMC#4). Figure 4 below shows the location of storage tanks constructed in the Crescent St. / Carver St. area (CAM 011).

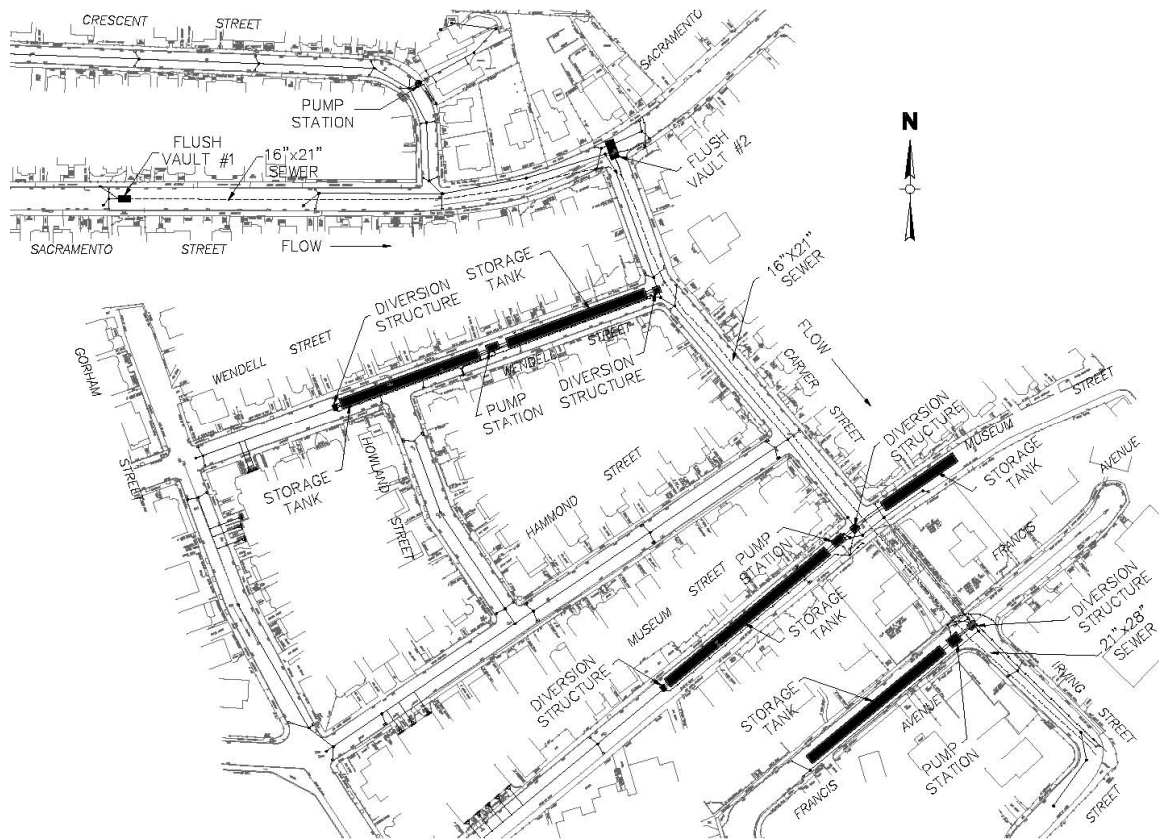


Figure 4 – Crescent / Carver Area Storage Tanks and Flush Vaults

Additional wet weather storage has also been provided using above ground storage at the Buckingham-Browne & Nichols (BBN) sports field (tributary to CAM 004), Danehy Park constructed wetland (CAM 401A), and the Agassiz sports fields (tributary to CAM 011) within the City of Cambridge. Similar to the storage tanks, these above ground systems help to maximize collection system storage and provide additional water quality benefits by allowing water to infiltrate into the soil as opposed to direct discharge into the stormwater collection system.

Private Storage and Infiltration Systems

The City has required all development, excluding single, double or triple occupancy homes, to incorporate stormwater storage or infiltration mitigation as part of their development proposals since 2000. This has typically taken the form of stormwater storage of that portion of an event in excess of the two (2) year preconstruction runoff hydrograph and the twenty five (25) year post construction runoff hydrograph. The policy also requires adherence to best management practices specific to water quality requirements. This requirement has helped reduce runoff amounts in the CAM 017 area, the Cottage Farm CSO area, the CAM 011 area, and the CAM 005 area in particular, and thus maximized system storage (NMC #2).

Floatables Control Baffles

As part of the MWRA Long Term Control Plan requirements, the City has incorporated floatable control mechanisms at various CSOs throughout the City. Floatables control has been implemented through floatable control baffles installed at several locations, including CAM 005, CAM 007, and CAM 017 CSO regulator structures. Floatables baffles within the CAM 001, CAM 002A, and CAM 401B structures are scheduled for construction during 2010. Typically these are designed to provide floatables control during infrequent activations up to the 2-year storm event, which is the standard MWRA threshold for floatables control. Since upstream catchments are sensitive to sewer surcharging/system flooding and potential CSO increases at other locations, the suitability of alternative geometric baffle configurations is analyzed under larger design event conditions (such as 10-year and 25-year events), to minimize the potential for the baffles to reduce upstream level of service. The benefit of this BMP control is the reduction of floatables discharge to local water bodies (NMC #6).

Floatables Control Brush Screen

An alternate means of floatables control is the installation of a floatables control brush screen which sits at the CSO overflow weir and allows flow to pass through to the overflow while keeping floatable material within the sanitary sewer pipe. Upon water levels receding in the combined sewer, this captured material is then washed downstream to the treatment works. Similar to the baffles, the brush screen provides water quality benefits in association with NMC #6. A 32-inch diameter brush screen has been installed at the CAM 401A regulator to serve this purpose.



Figure 5 – Floatables Control Brush Screen within CAM 401A Regulator

Bending Weirs

Bending weirs are used for diversion of flows during extreme wet weather events. Typically these devices serve as weirs within diversion structures to allow CSO overflow discharge; however, due to the unique bending nature of these weirs, they provide increased CSO control over traditional static weirs. As flow increases within the system, the bending weir will slowly begin to tip based upon the pressure exerted by flow in the combined system. At a set point

when the available collection system is fully utilized, the bending weir will begin to allow discharge to the CSO. The benefit of this BMP is that it provides better CSO overflow control and maximizes both system storage (NMC#2) and flow to the treatment plant (NMC#4). A bending weir has been installed to divert flow at the Broadway Storage Tanks near the Cambridge Main Library (Tributary to CAM 011) and a bending weir is currently being designed for the CAM 017 regulator structure to provide reductions in both CSO spill frequency and spill volume.

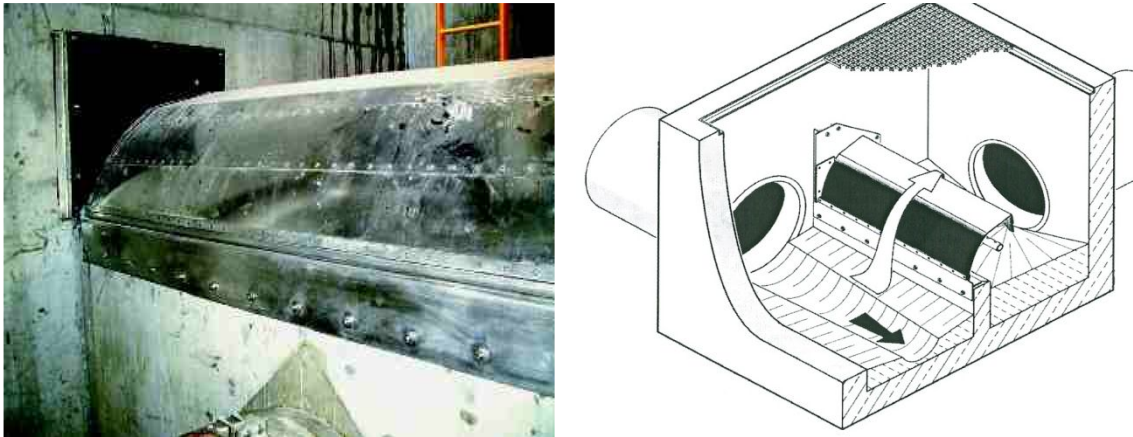


Figure 6 – Typical Bending Weir Configuration

Sewer Separation Program

Over the past decade, the City has engaged in a strategic sewer separation program. Through this program, numerous common manholes have been removed, new sewers and drains installed throughout the City, and an aggressive campaign of inflow removal has been pursued to remove inflow sources from the combined sewer system. New outfalls have been constructed at South Massachusetts Avenue (CAM 017 and Cottage Farm), Amesbury Street, Audrey Street, and Pearl Street (Cottage Farm). In addition, both Harvard University (CAM 011 and CAM 009) and MIT (CAM 017 and Cottage Farm) have undergone a program of disconnecting roof leaders from campus buildings (to the maximum extent practicable) from the combined sewer system and redirecting these discharges back into the ground. The long term benefit is that flow removed from the combined system and redirected back into the ground (or into a designated storm drain system) reduces peak flows within the combined system and thereby reduces the frequency and volume of CSO overflows by providing more system storage capacity (NMC#2). Sewer separation projects have also been constructed in the Harvard Square area leading to overflow reductions at the CAM 009 structure and the City is presently designing an infrastructure renewal project on Western Avenue that will incorporate sewer separation elements, assuming these improvements comply with the new MS4 permit presently under consideration.

Stormceptors

The Stormceptor (manufactured by Imbrium Systems Inc.) is a localized treatment unit that can be installed as part of the overall catchbasin system but provides additional water quality

treatment beyond a typical BMP catchbasin. These devices are ideally suited for small parking lots and other spill prone areas where sediment capture and oil removal can increase discharge water quality. The Stormceptor is designed to slow incoming stormwater to create a non-turbulent treatment environment, allowing free oils to rise and sediment to settle, removing a wide range of particle sizes as well as free oils, heavy metals, and nutrients that attach to fine sediments. Currently these have been installed within the Cambridgeport area of the City (tributary to CAM 017) and one Stormceptor unit has been designed for construction on Whittemore Ave under the current CAM 400 Sewer Separation Project, adjacent to the CAM 400 CSO regulator. This unit is proposed to be installed within a small parking lot to increase solids capture and improve downstream stormwater quality (NMC #7).

Swales

Given the historic layout of the City of Cambridge street system, opportunities for providing swale type retention storage within the city is limited. Nevertheless the city has provided for such within the CAM 004 system and has encouraged private development to examine such during the course of their stormwater management investigations when proposing projects in the city. With swale systems, stormwater is allowed to infiltrate back into the soil, providing additional water quality benefits (NMC #7), as well as flow retention and overall discharge reductions to maximize system capacity (NMC #2). To date, swales have been utilized within the Fresh Pond Parkway area (tributary to CAM 004) and additional swales are currently being evaluated as part of the City's upcoming sewer separation program within the Contract 8/9 Area of the City, also tributary to CAM 004.

Conclusions

As described above, the City has made extensive efforts over the past decade to maximize collection system capacity and storage, maximize flow to the treatment plant, and provide water quality improvements through floatables control, grit and sediment control, and sewer and drain system flushing. These BMP improvements continue to reduce the potential for contaminated discharge at CSO's during wet weather events, and provide additional flooding and CSO frequency reduction through improved system capacity.

APPENDIX H
SUMMARY OF CSO ABATEMENT PROJECTS & STATUS

City of Cambridge CSO Abatement Projects and Status, April 2010

CSO Outfall	Required Project Type Under 2 nd Stipulation	Receiving Water	Contract / Project Name	Completion Date or Proposed Completion Date	Notes
CAM001	Floatables Control	Alewife	Contract 4 - Floatables	October 2010	Baffles to be installed.
CAM002	Floatables control; interceptor relief	Alewife	Contract 4 - Floatables	October 2010	Baffles to be installed. Underflow enlarged.
CAM004	Sewer Separation	Alewife	2A/2B Fresh Pond Parkway	2001	CSO is now controlled by Drain Vault 5
CAM004	Sewer Separation	Alewife	Contract 8A/8B/9	December 2015	At completion, CSO at CAM004 will be eliminated
CAM004	Sewer Separation	Alewife	Contract 12- Stormwater Outfall	July 2012	Stormwater outfall and treatment wetland
CAM400	Sewer Separation / common manholes	Alewife	Contract 13	October 2010	CSO regulator to be eliminated; convert to stormwater outfall
CAM401A	Floatables Control	Alewife	Bellis Circle	2005	Installed brush screen
CAM401B	Floatables control; interceptor relief	Alewife	Contract 4- Floatables	October 2010	Baffles to be installed. Underflow enlarged.
CAM005	Hydraulic Relief	Charles	MWRA CAM005 Hydraulic Relief	2000	For full project description see: http://www.mwra.com/annual/csoar/2009/csoar2009.pdf
CAM007	Floatables Control	Charles	Contract 5	2009	Baffle installed
CAM009	Floatables Control	Charles	Contract 5	2009	Outfall temporarily plugged
CAM011	Floatables Control	Charles	Contract 5	2009	Outfall temporarily plugged
CAM017	Floatables Control	Charles	Contract 5	2009	Baffles were installed in 2009.

APPENDIX I
FATS, OIL AND GREASE PROGRAM INFORMATION

Food Facility Plan Reviews and F.O.G. Inspections

Date	Facility name	Facility Address	Comments	Plan Review	Inspection
4/1/2008	Shrimp Market	100 Cambridgeside Place	Need sewer connection fee	4/1/2008	
5/14/2008	Mulan Restaurant	228 Broadway	renovated	5/14/2008	5/14/2008
5/29/2008	Craigie on Main	853 Main Street	renovated former site of La Groceria	5/29/2008	
5/30/2008	Finagle a Bagle	11 First Street	new facility	5/30/2008	
7/15/2008	Third at Kendall		new hotel with restaurant	7/15/2008	
7/18/2008	Shire Café Reno's	700 Main Street	renovations to cafeteria	7/18/2008	
8/4/2008	MIT ATO	405 Memorial Drive	kitchen inspection		8/4/2008
8/19/2008	Shabu Square	1 Eliot St	renovated/new restaurant plan review	8/19/2008	
8/19/2008	Shabu Yu	57 JFK	renovated/new restaurant plan review	8/19/2008	
9/16/2008	Dunkin Donuts	517 Concord Ave	facility renovated	9/16/2008	
10/27/2008	Whole Foods	340 River Street	inspection new grease traps		10/27/2008
10/28/2008	99 Restaurant at Tria Hotel	220 Alewife Brook Parkway	restaurant closed	10/28/2008	
11/16/2008	Banjós	1972 Mass Ave	new facility formerly KFC	11/16/2008	11/16/2008
12/9/2008	Toscaninnis	Main Street	inspection new grease trap		12/9/2008
1/6/2009	La Molisana	500 Technology Square	Need sewer connection fee	1/6/2009	
1/26/2009	Chipolte	227 Alewife Brook Parkway	new facility	1/26/2009	
2/9/2009	Subway	36 JFK Street	ronovated formerly Boston Chowder	2/9/2009	

Food Facility Plan Reviews and F.O.G. Inspections

Facility name	Facility Address	Comments	Plan Review Date	Inspection Date
Tiger and Bear	3 Brattle St	new restaurant formerly Greenhouse	4/4/2009	
Trader Joes	211 Alewife Brook Parkway	New grocery store	5/21/2009	
Druid	1357 Cambridge St	Letter sent		8/26/2009
Whole Foods	200 Alewife Brook Parkway	FOG sampling 10/6/2009		9/2/2009
PF Changs	110 First Street	new facility	10/5/2009	10/2/2009
First Printer	15 Dunster St	new facility, formerly Herrell's	2/8/2010	11/5/2009
Japanese restaurant	231 Alewife Brook Parkway	new facility	2/5/2010	
East Coast Grill	Cambridge Street			8/24/2009
Bukowski	Cambridge Street			11/19/2009
Hotel Sonesta	40 Land Boulevard	FOG Sampling 11/9/2009		2/10/2010
Whole Foods	240 River Street	FOG Sampling 12/14/2009		
East by Northeast	Cambridge St		11/14/2009	11/14/2009
Harvard Faculty Club	20 Quincy Street	General plan received	1/20/2010	1/20/2010
Hotel Marlowe		FOG Sampling 12/14/2009		
Cambridgeside Galleria Mall	100 Land Boulevard	FOG Sampling 11/9/2009 and 12/14/2009		12/2/2009
Lord Hobo	92 Hampshire Street	new facility, formerly B Side Lounge General plan received		
West Cambridge VFW	688 Huron Ave	new facility		2/18/2010

Sewer Maintenance Route

Locations for jetting with biological additive

DN Manhole UP Manhole

Oak St at Cambridge St

S08SMH0096 S08SMH0098

Food Facilities contributing

1969 Coffeehouse
Druid
Inman Sq Market

further down Cambridge St

new Asian restaurant
Bukowski
Dixie BBQ
East Coast Grill
Christinas
All Star Sandwich (Inspected, plan reviewed)

Concord Lane

S61COM1205 S61COM1210

MacDonalds
Movie Theater
Whole Foods
Ma Magoos?

Mifflin Place

S41SMH1505 S41SMH1510

Harvest Restaurant

University Road

S43SMH0012 S43SMH0020

Charles Hotel restaurants

Sag in SS line causes grease to build up to

White Street

S71SMH6140 S71SMH6145

Anna's Taqueria

Eliot Street

S39SMH0215 S39SMH0220

Charlie's, IHOP, 16-18 Eliot Street

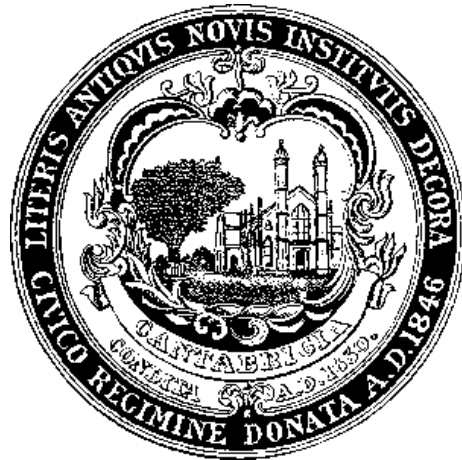
Sag in SS line causes grease to build up to

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Managing Food Wastes

November 2009
Cambridge License Commission
Mandatory Renewal Meeting



Purpose

- To highlight a serious problem
- To provide restaurant, hotel and food facility managers with information to improve food wastes management

Introduction

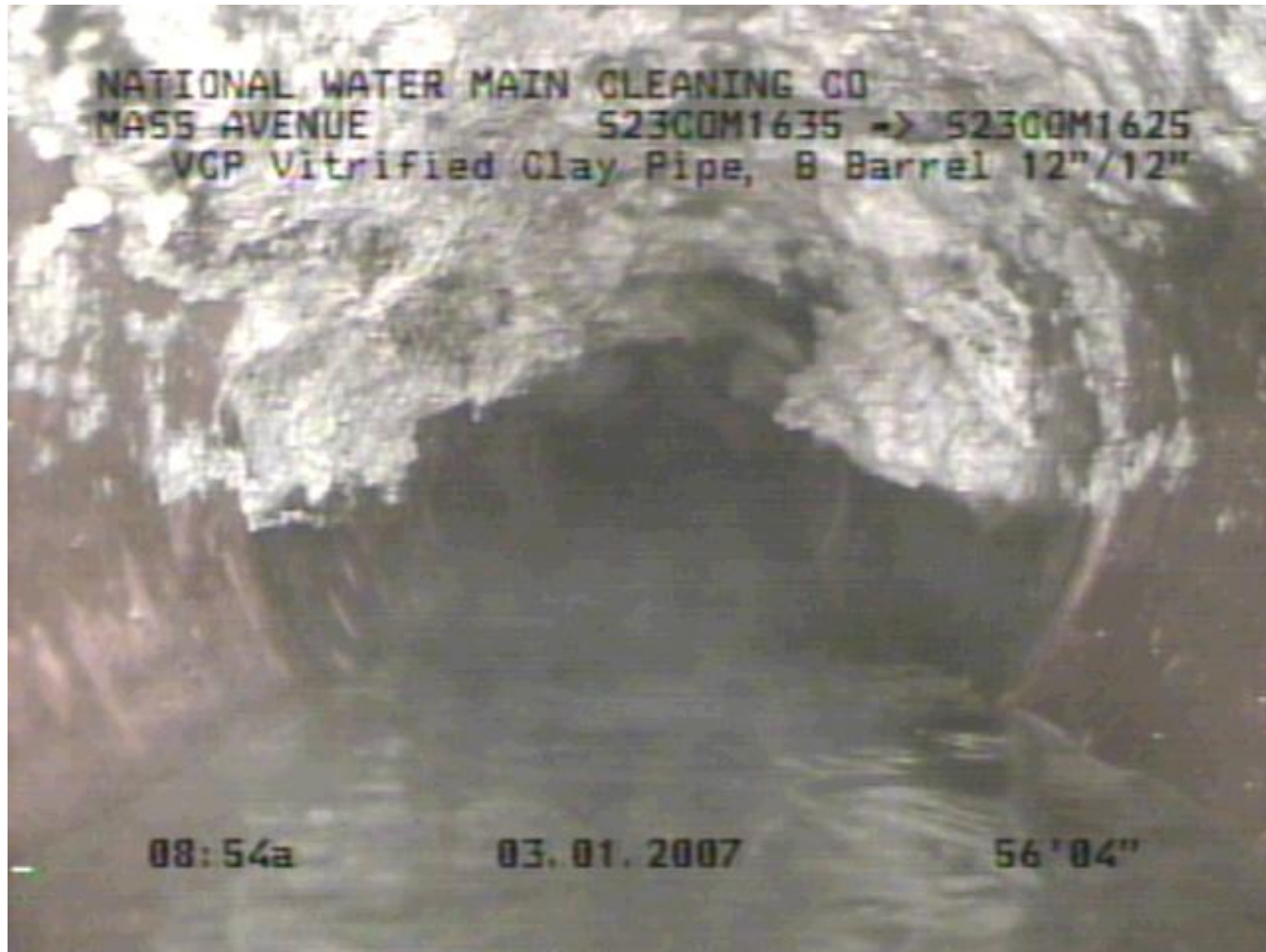
- What are food wastes
- Why are they a problem
- How food wastes enter the sewer
- New Sewer and Stormwater Regulations
- What restaurant, hotel and food facility managers can do

Food Wastes include:

- Cooked food and leftover portions
- Meats, fish, poultry, pasta, margarine, salad dressing
- Milk, cream, cakes, desserts, ice cream
- Raw trimmings
- Grease and oils

Why are food wastes a problem?

This is what a sewer pipe looks like when it is blocked with food wastes



This is the view inside a sewer pipe
without food wastes



Food waste blockages may also
fill up sewer manholes







This is the view inside a manhole without food wastes



Food wastes are also a problem if they enter catch basins and storm drains







Catch basins in
Cambridge
discharge to the
Charles River or
Alewife Brook



How food wastes enter the sewer system

Through garbage disposers



Through grease traps that are not cleaned often enough or are too small



Through
sinks or
drains that are
not connected
to grease
interceptors



Revised Ordinance and New
Regulations
passed in 2008

Wastewater and Stormwater Drainage
System
Ordinance, Number 13.13.16

Wastewater and Stormwater Drainage
Use Regulations

Ordinance Highlights

DPW has authority to promulgate regulations

DPW can require pretreatment of wastewater

DPW can charge food handling facilities
for costs to maintain blocked pipes

Regulations Highlights

DPW can require sampling of wastewater

Prohibited Discharges

Substances that may obstruct flow

Visible floatable oils, fats or greases

Wastewater containing more than 300 mg/l
Fats, Oils, or Grease (F.O.G.)

Penalties up to \$5000.00 per day

DPW has spent more than \$150,000.00 maintaining a single section of sewer pipe that is always blocked with food wastes



**What restaurant, hotel and
food facility managers can do**

Clean grease traps / interceptors regularly



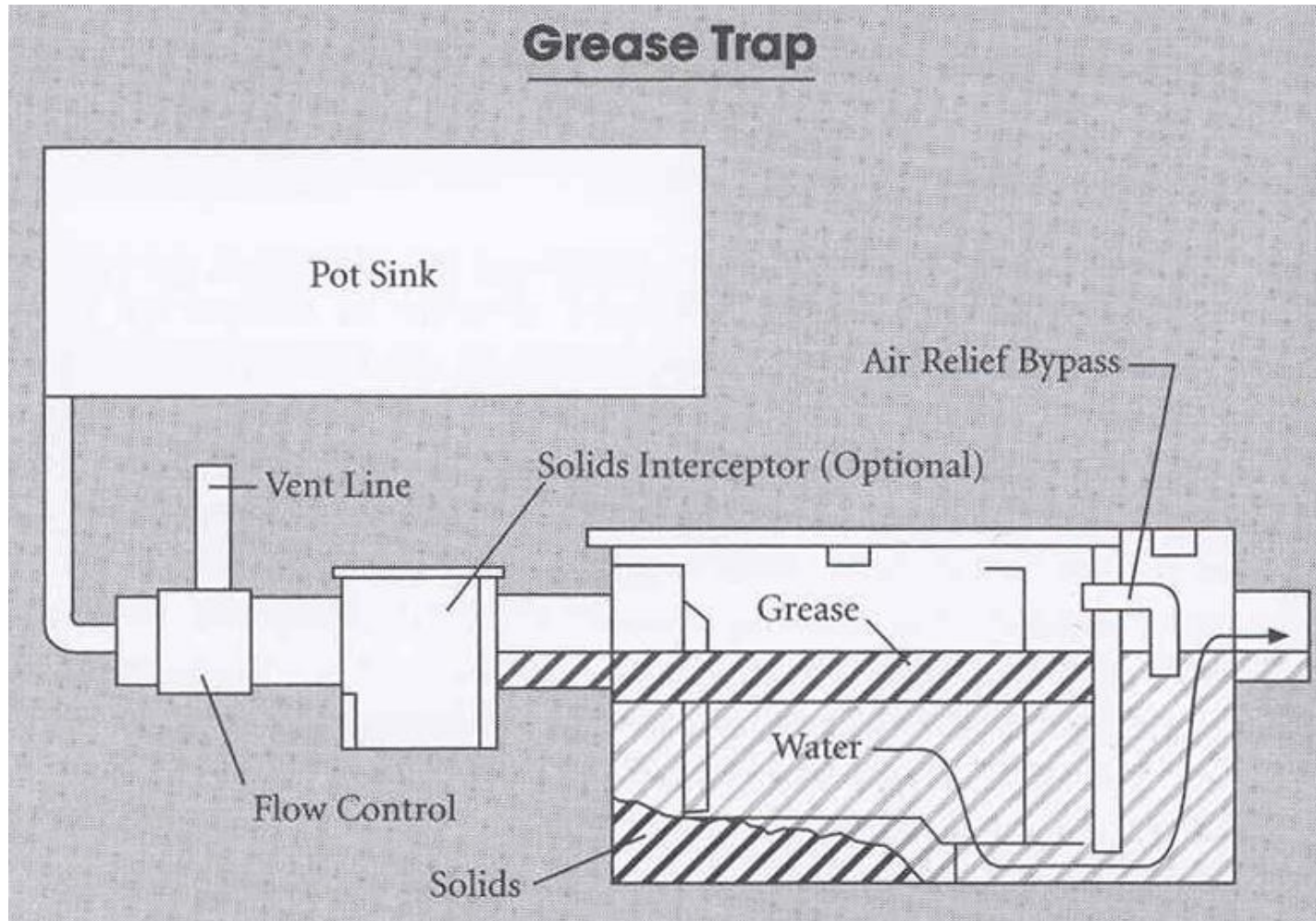


**Maintain logs of grease
interceptor cleaning and
service dates**

Make sure grease interceptors are sized properly

**Grease Interceptor sizing formula in State
Plumbing Code**

Clean grease trap before the thickness of the grease cake or oily liquid on top equals one quarter the depth of liquid in the trap



Make sure grease
interceptor is
plumbed correctly



Inlet end should have
air intake and
flow control



Make sure baffles are in place and can be lifted when grease interceptor is cleaned



Install grease traps on rinse sinks



Be sure containers for storing used oil do not leak or spill



Maintain records of used oil pick up dates



Store used oil containers away from catch basins





Example of shelter to protect oil containers

Ensure exhaust hoods are properly
maintained



Sign up for the DPW Composting Program



Compost that Stuff!

**Food waste recycling services
ARE COMING TO CAMBRIDGE!**

Brought to you through a grant from Mass DEP,
the City of Cambridge, and Save That Stuff, Inc.



www.savethatstuff.com

Consider installing a bacterial remedial system

Several have received approval from
Massachusetts Water Resources Authority MWRA

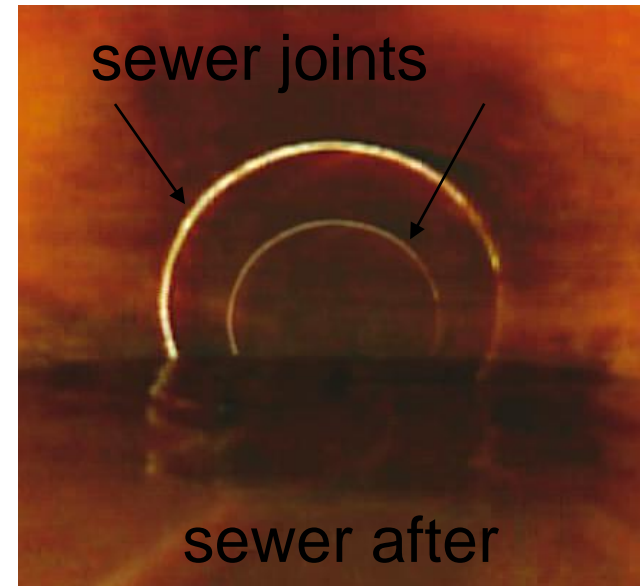
Biological Oil & Grease Treatment & Waste Water Treatment Optimization

Bacta-Pur

www.bactapur.com

New Bedford, MA

(508) 961-2892



Bacta-Pur® BACTIVATOR™

Physiological engineering optimizes performance.

models for all flow rates & applications



Train staff on proper procedures
for food wastes management

Photo of wash water emptied into street



A Public Service Announcement

Help Stop Flooding-Keep Our Catch Basins Clean

Did you know that one of the best ways to reduce flooding to streets and private property is to keep catch basins clean? Catch basins are the openings along the street that allow rainwater to flow into underground drainage systems and out to rivers. While the City works to keep these openings free from debris, the only way to ensure that the over 5,000 catch basins in Cambridge are always prepared for a rainstorm is for residents and business owners to help out.

Please check the catch basins near your property periodically to ensure that water can flow into the drain, unobstructed by ice, leaves, or other debris. Remember- only water should go down the drain. Help protect your streets, your neighbors' and your own property from flooding-help keep our catch basins clear.



Food wastes will not break down

They need to be kept out of the sewer system

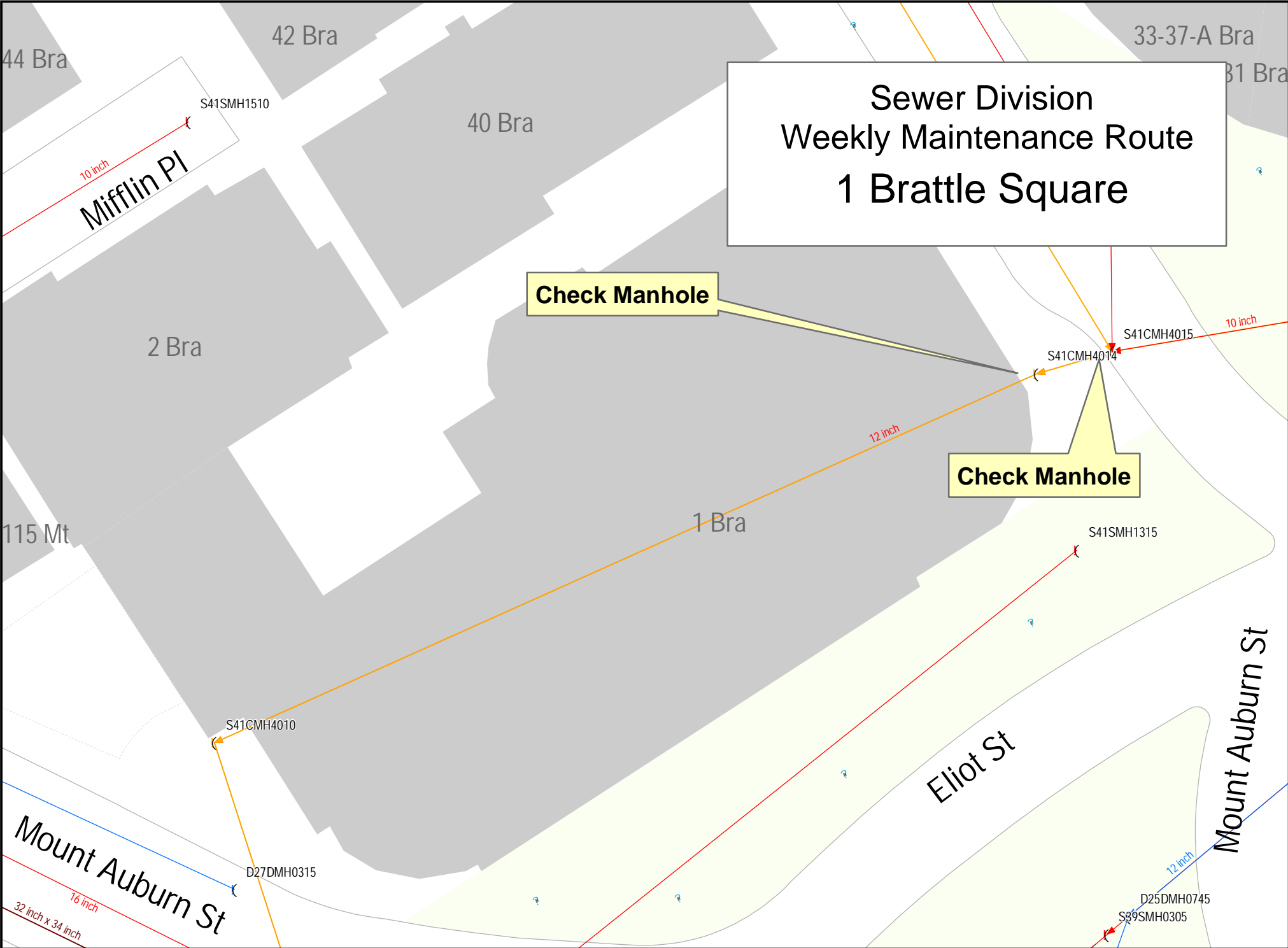
They need to be kept out of storm drains

DPW staff will try to answer any questions

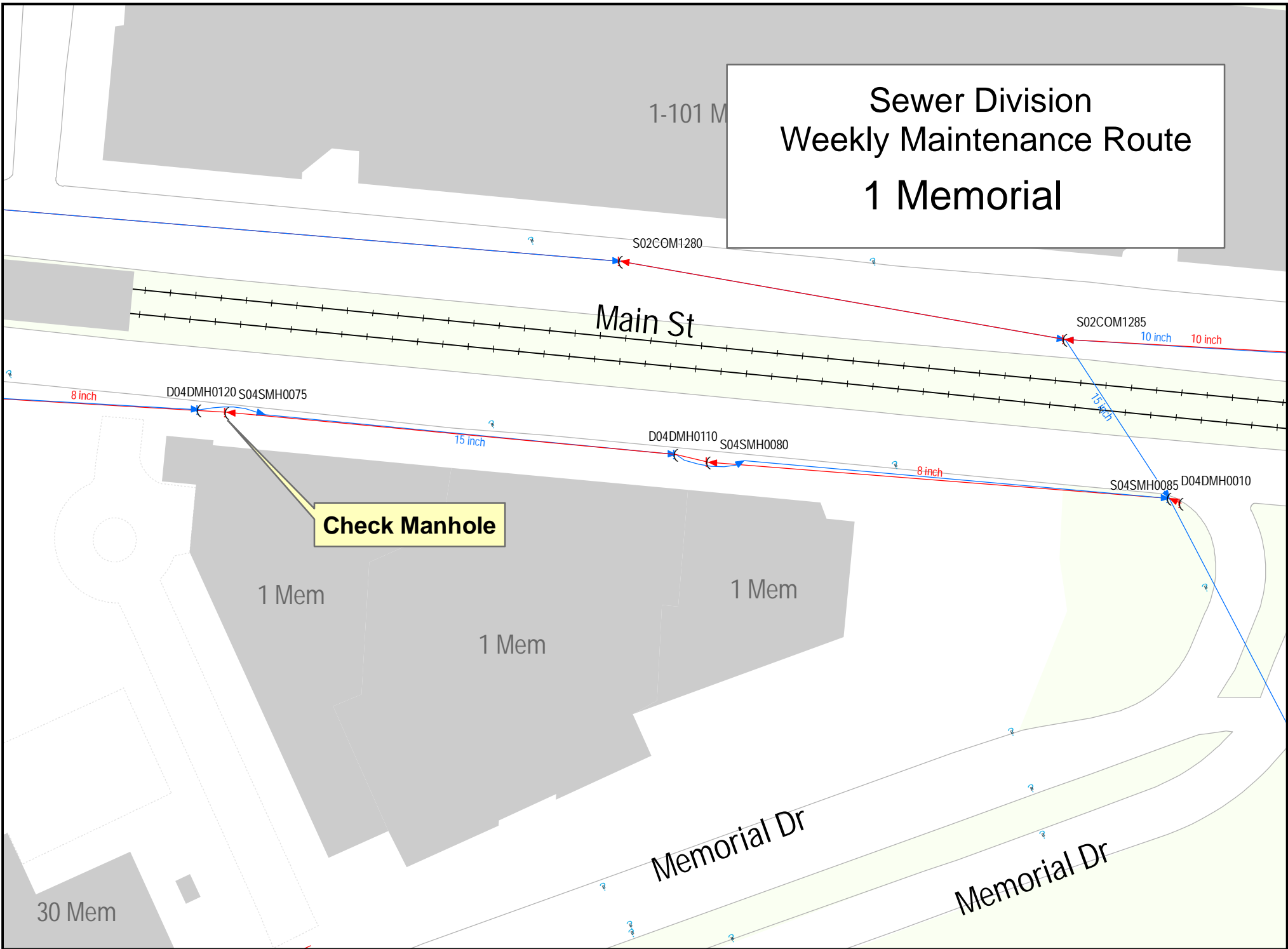
Thank you

APPENDIX J
SEWER MAINTENANCE ROUTE MAPS

Sewer Division Weekly Maintenance Route 1 Brattle Square



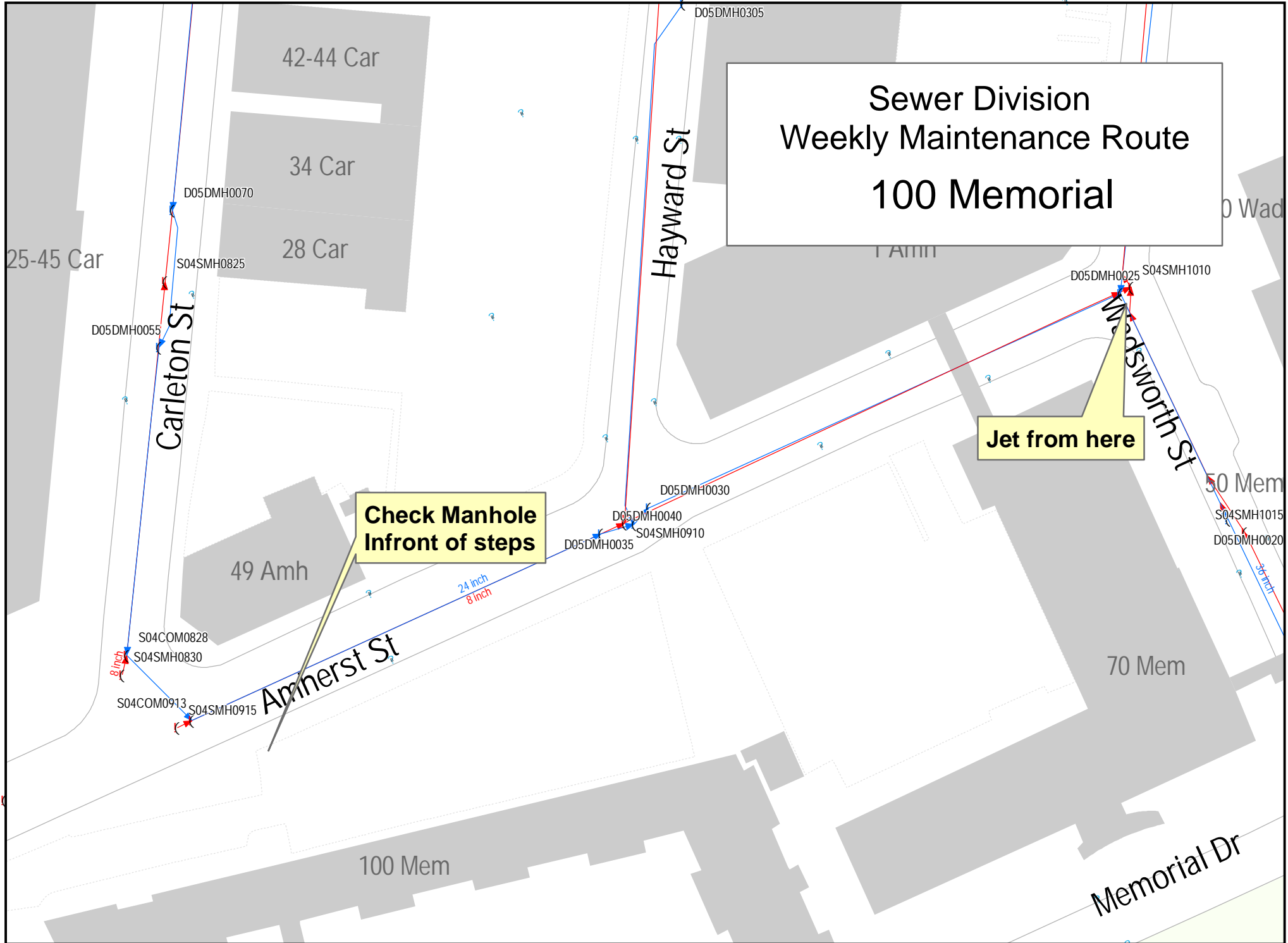
Sewer Division Weekly Maintenance Route 1 Memorial



Sewer Division Weekly Maintenance Route 100 Memorial

Jet from here

Check Manhole
Infront of steps



Carleton St

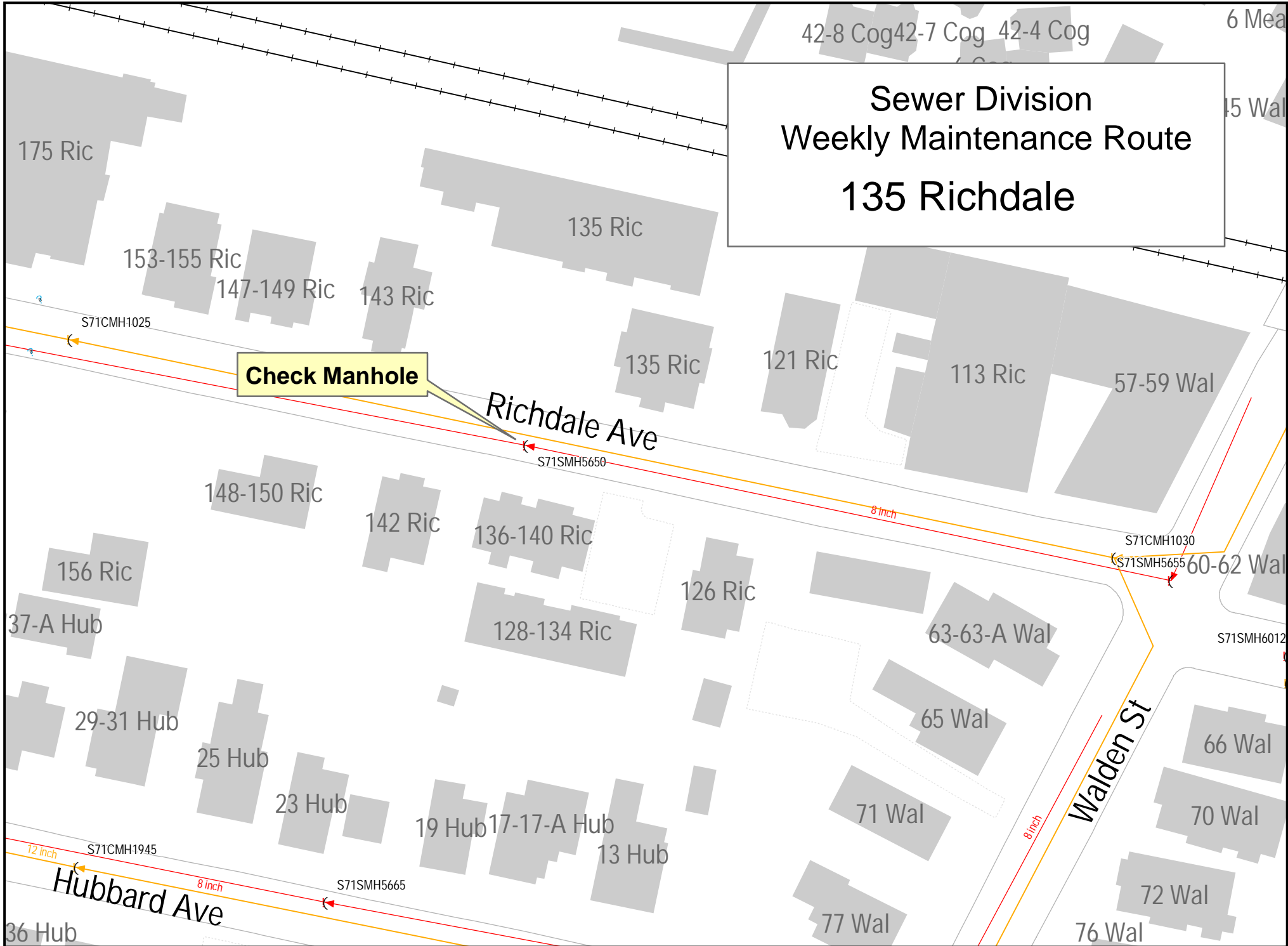
Hayward St

Wadsworth St

Amherst St

Memorial Dr

Sewer Division Weekly Maintenance Route 135 Richdale



Check Manhole

Richdale Ave

Hubbard Ave

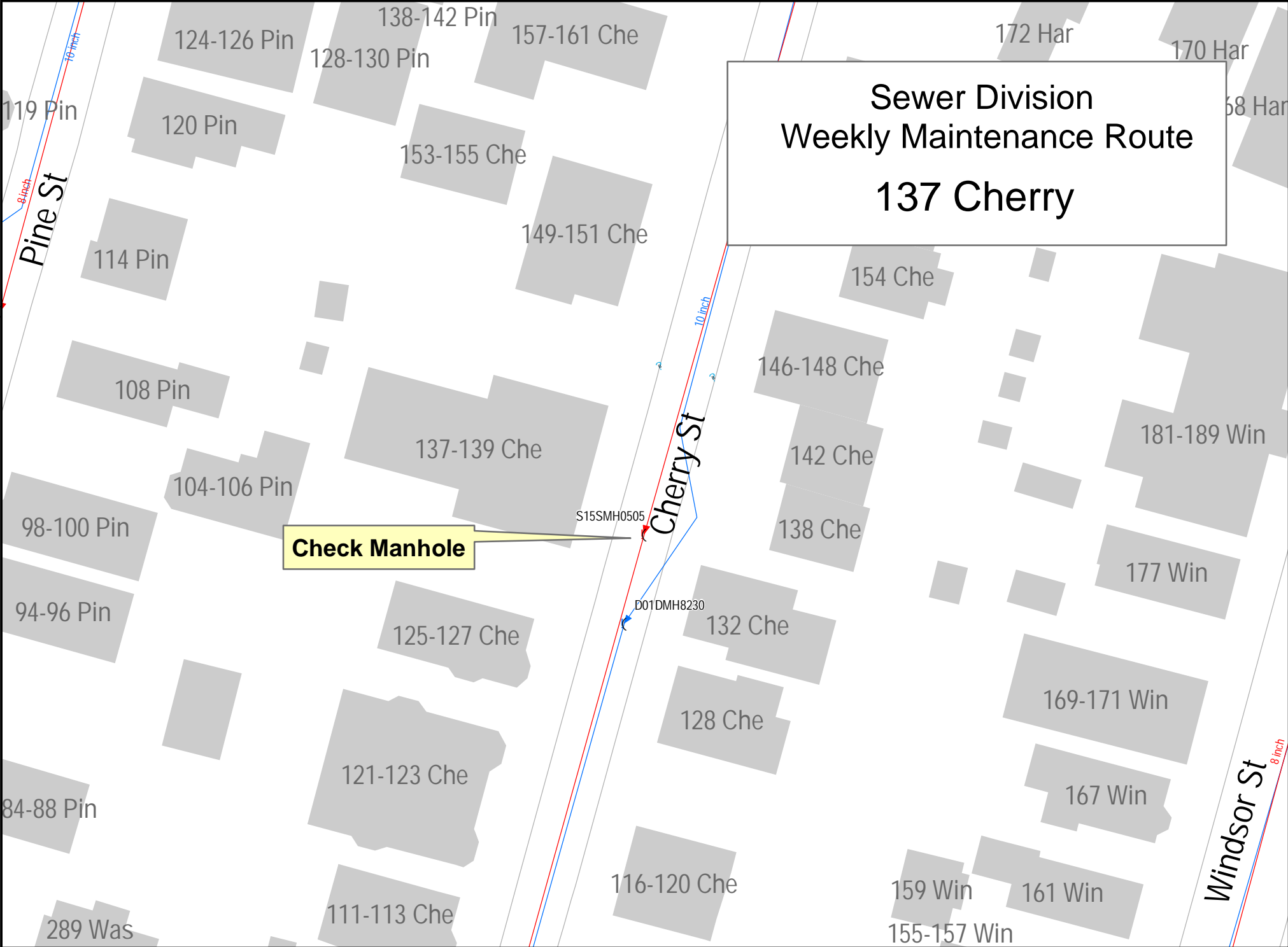
Walden St

Sewer Division
Weekly Maintenance Route
137 Cherry

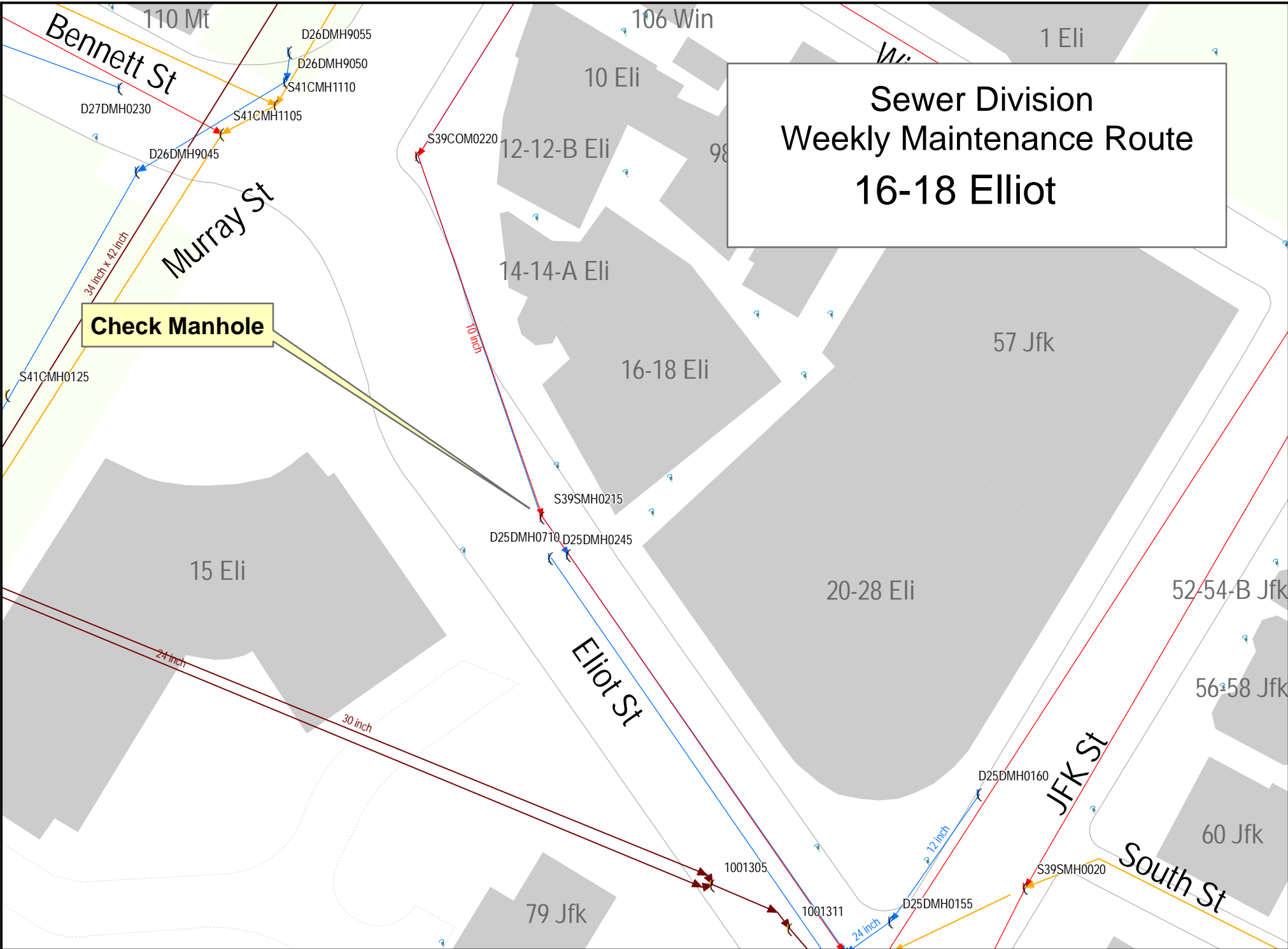
Check Manhole

S15SMH0505

D01DMH8230

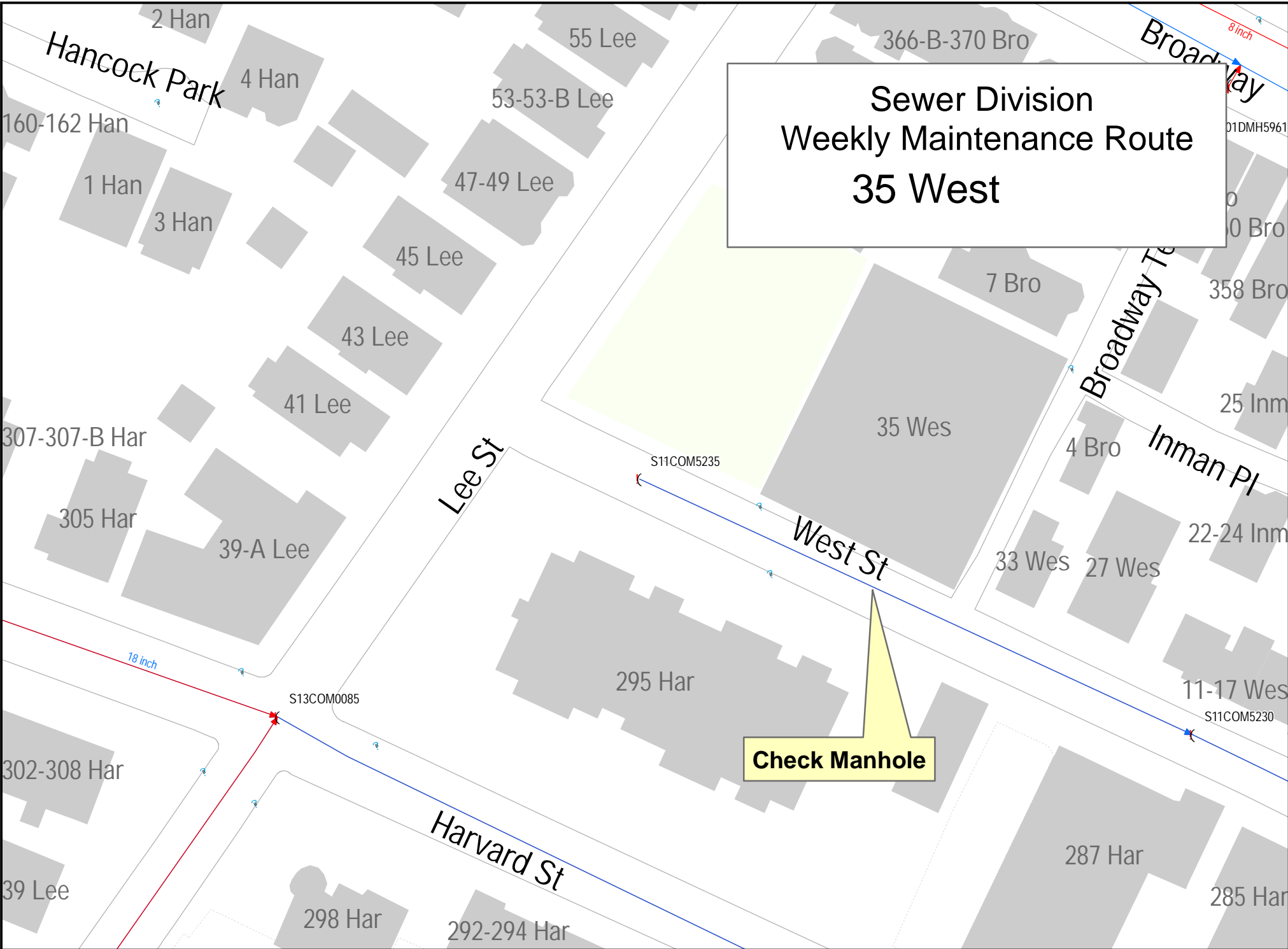


Sewer Division Weekly Maintenance Route 16-18 Elliot



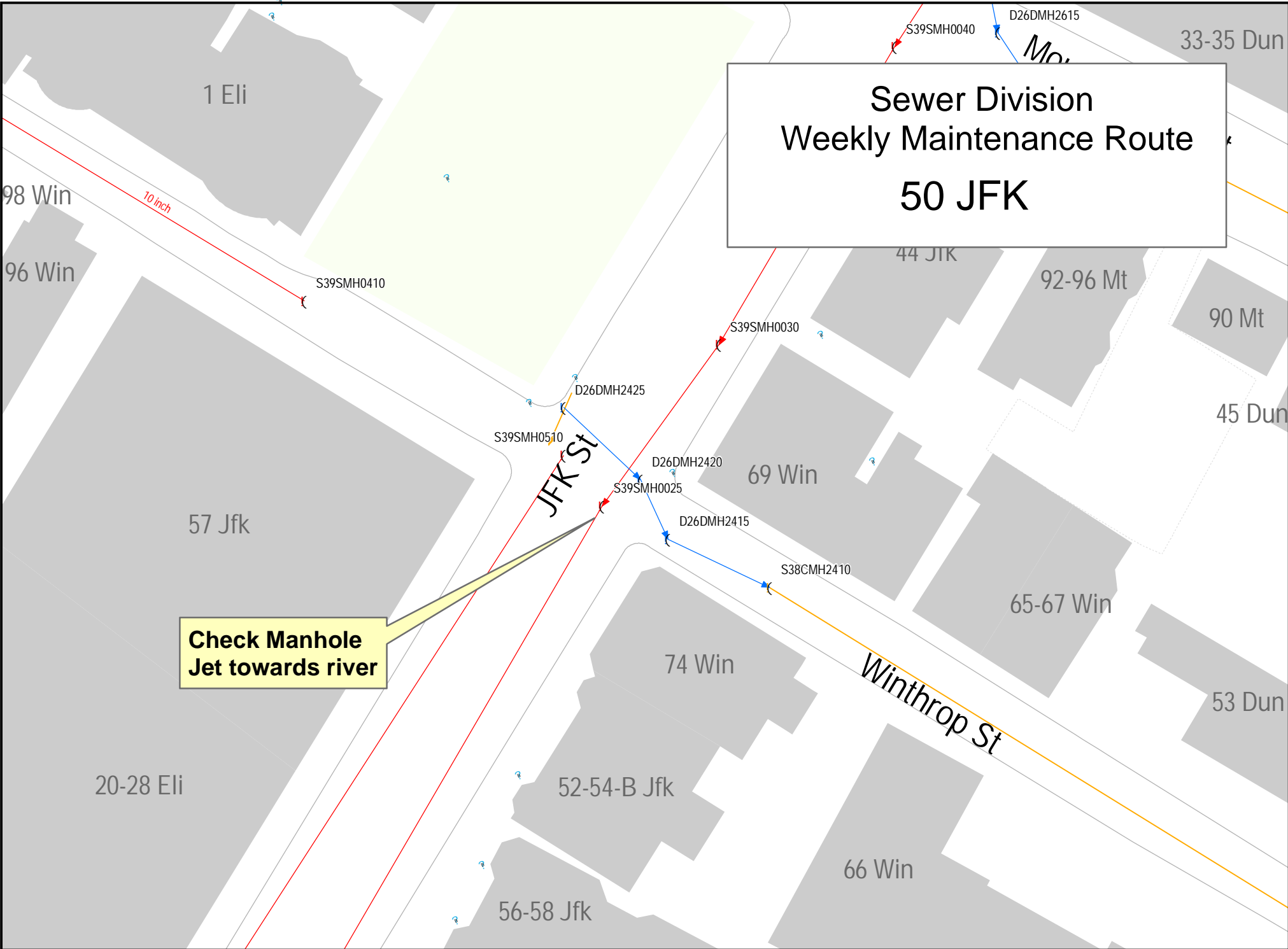
**Sewer Division
Weekly Maintenance Route
35 West**

Check Manhole



Sewer Division Weekly Maintenance Route 50 JFK

**Check Manhole
Jet towards river**



Sewer Division
Weekly Maintenance Route
55 Essex

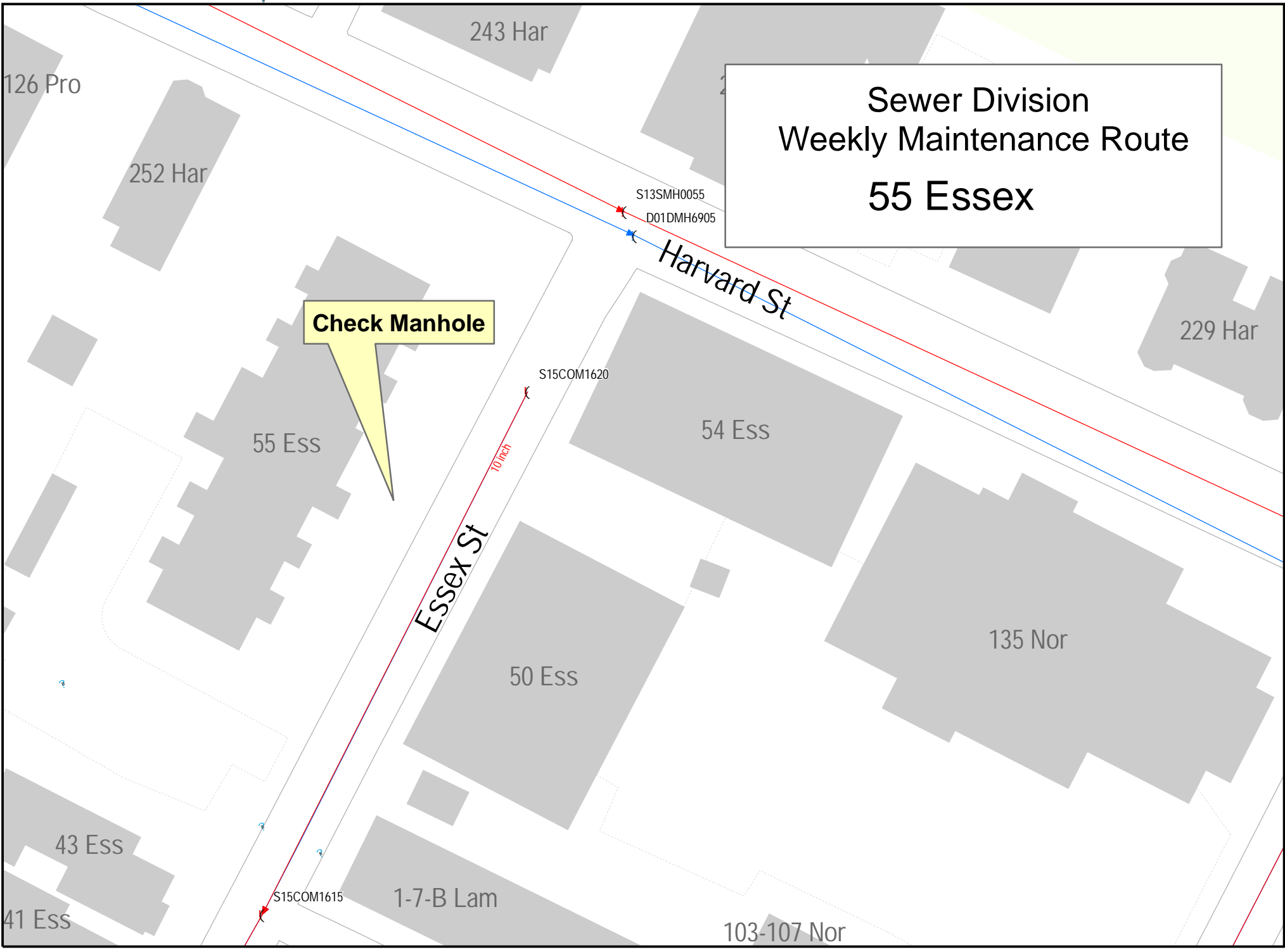
Check Manhole

S13SMH0055
D01DMH6905

S15COM1620

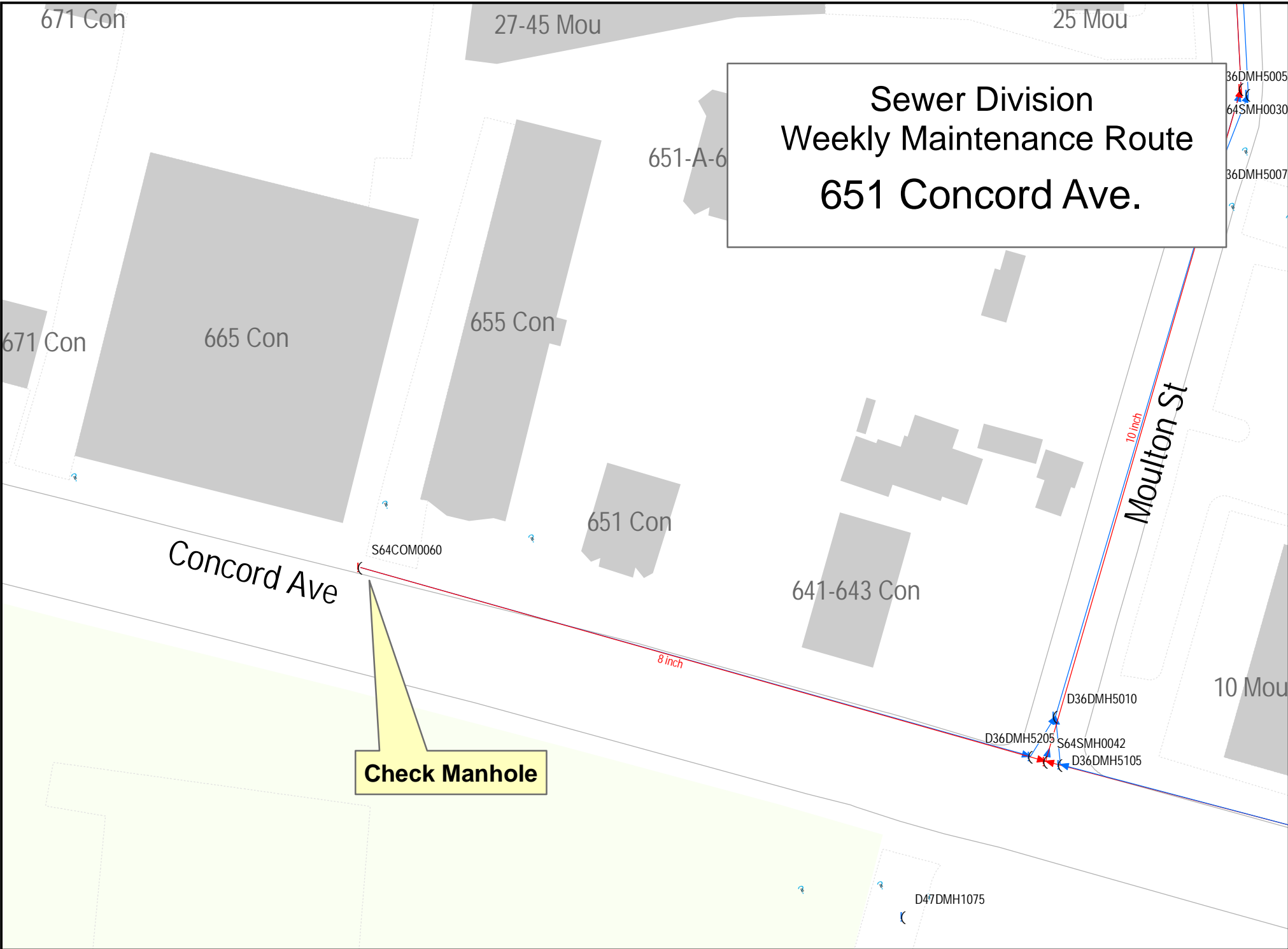
S15COM1615

10 Inch



**Sewer Division
Weekly Maintenance Route
651 Concord Ave.**

Check Manhole



Sewer Division
Weekly Maintenance Route
808 Memorial near River

River Street Bridge

Memorial Dr

Check Manhole

S31SMH0025

S31SMH0030

820 Mem

816 Mem

810-812 Mem

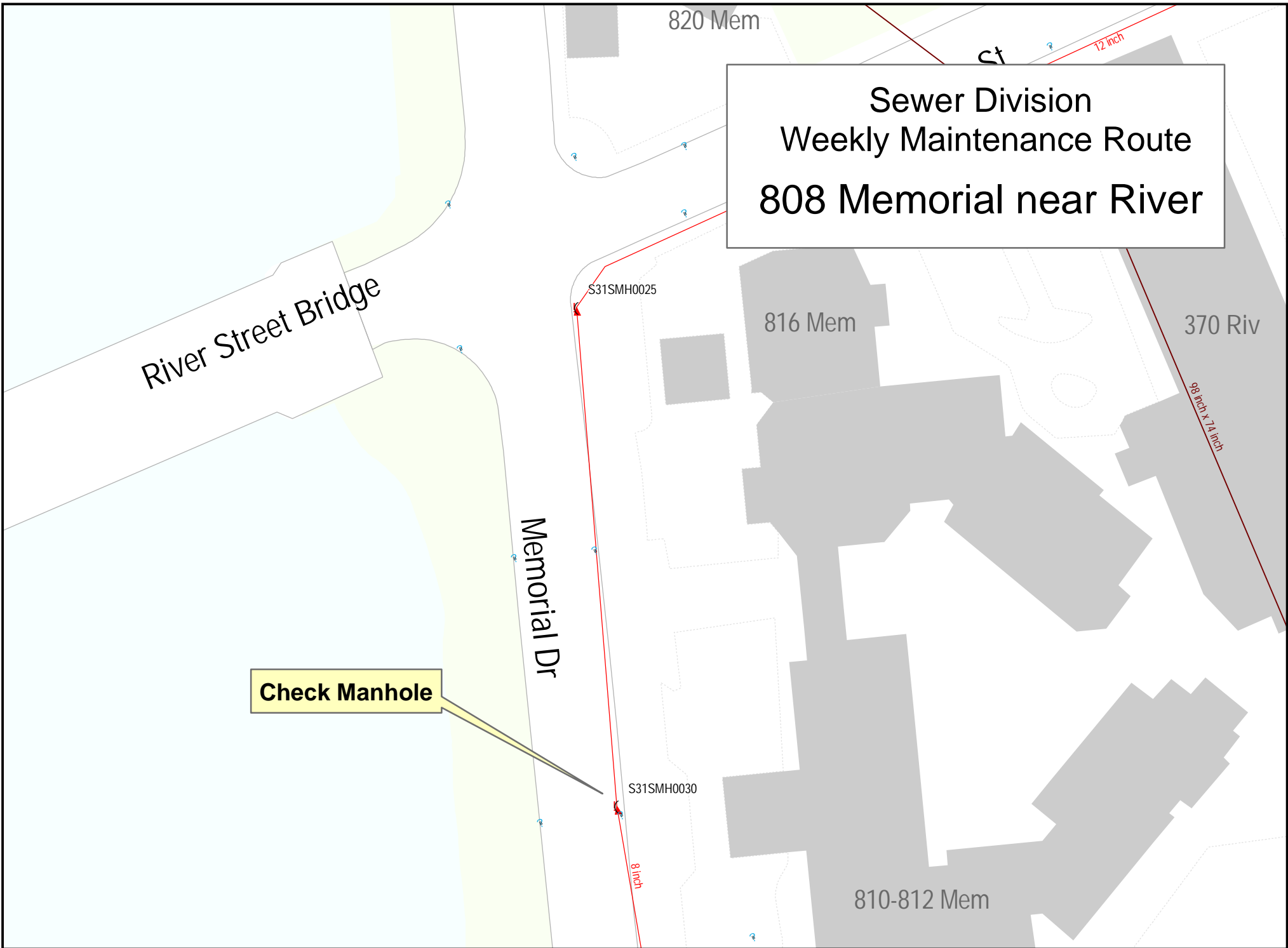
370 Riv

st

12 inch

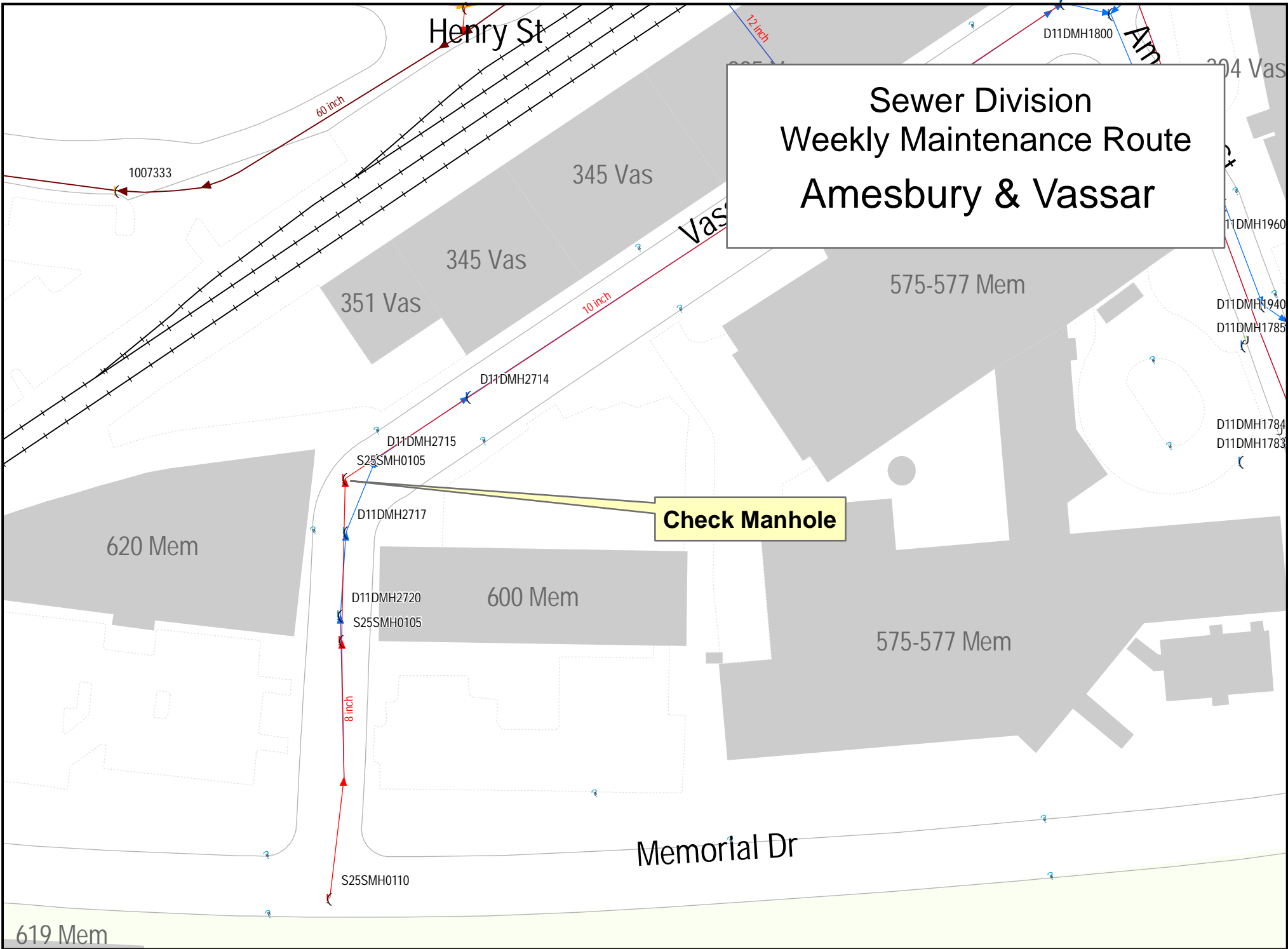
98 inch x 14 inch

8 inch



Sewer Division Weekly Maintenance Route Amesbury & Vassar

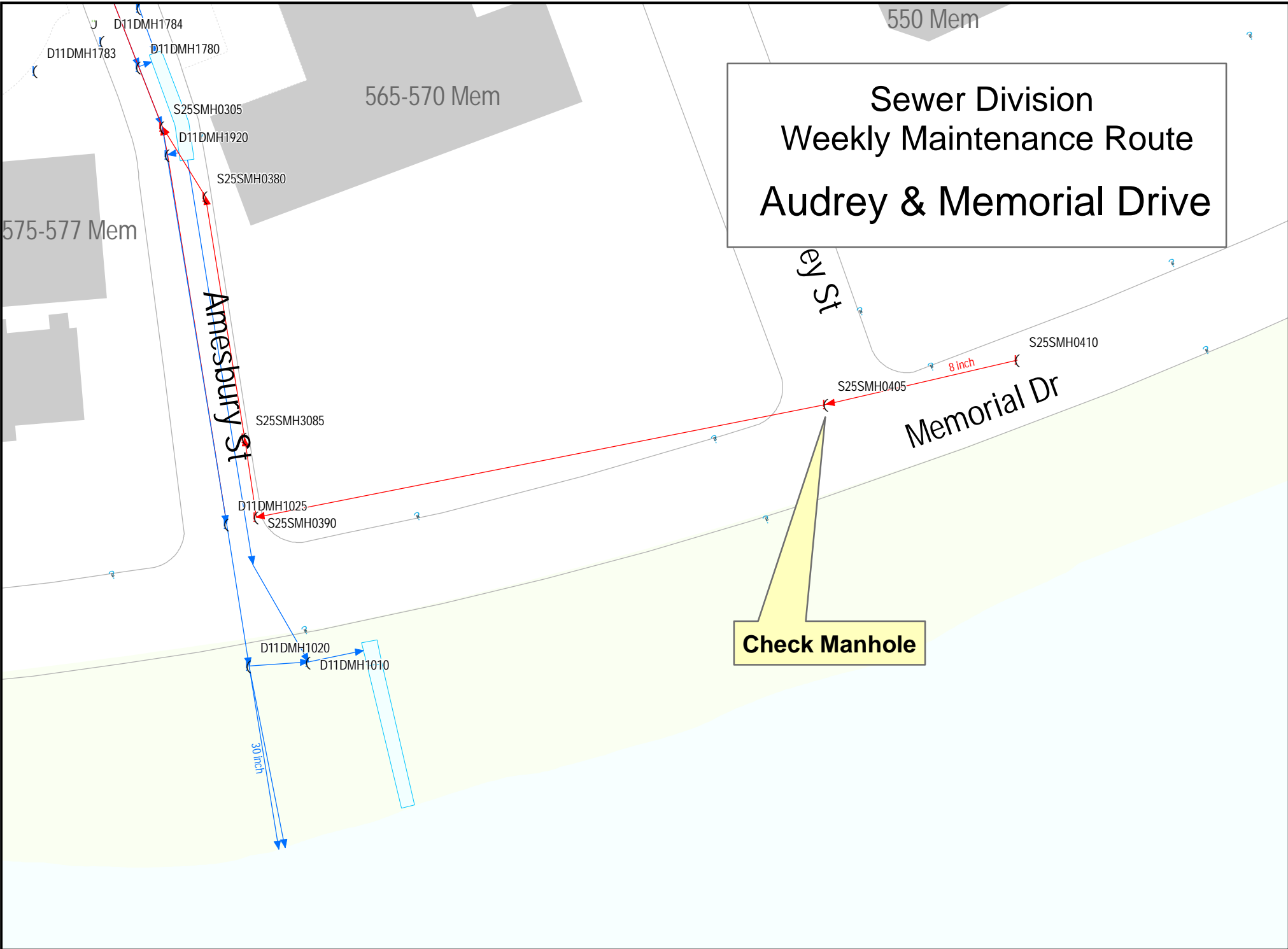
Check Manhole



**Sewer Division
Weekly Maintenance Route
Ashburton Place**

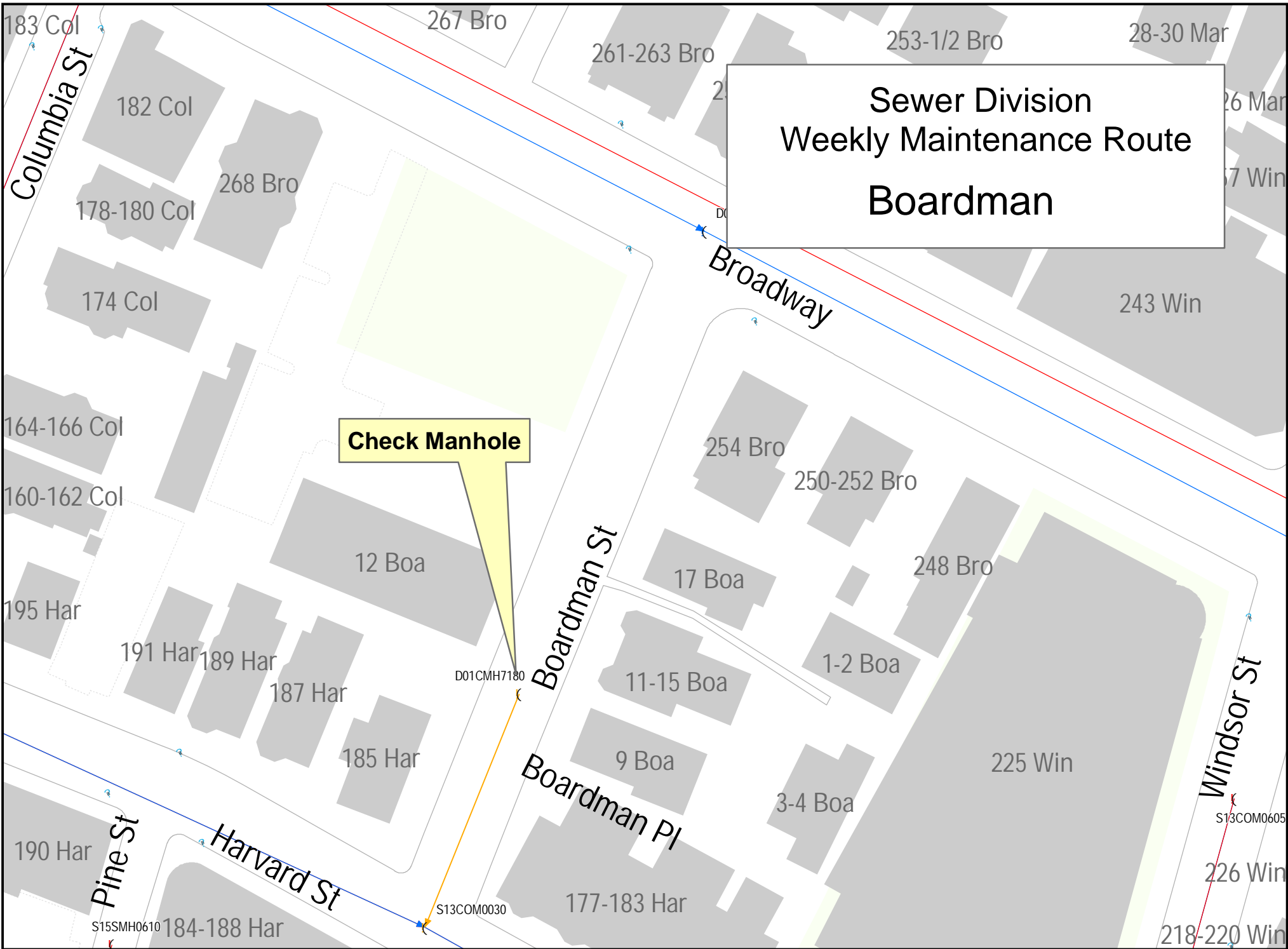


Sewer Division Weekly Maintenance Route Audrey & Memorial Drive



**Sewer Division
Weekly Maintenance Route
Boardman**

Check Manhole



8 Bre

9-11-A Bre

Sewer Division Weekly Maintenance Route Brewer & Chapman

987-989 Mem

Brewer St

S44SMH0020

Need to change cover to SS

D28DMH0120

1-3 Cha

D28DMH0115

12 inch

10 inch

8 Cha

Chapman Pl

Gerry St

D28DMH0705

D28DMH0410

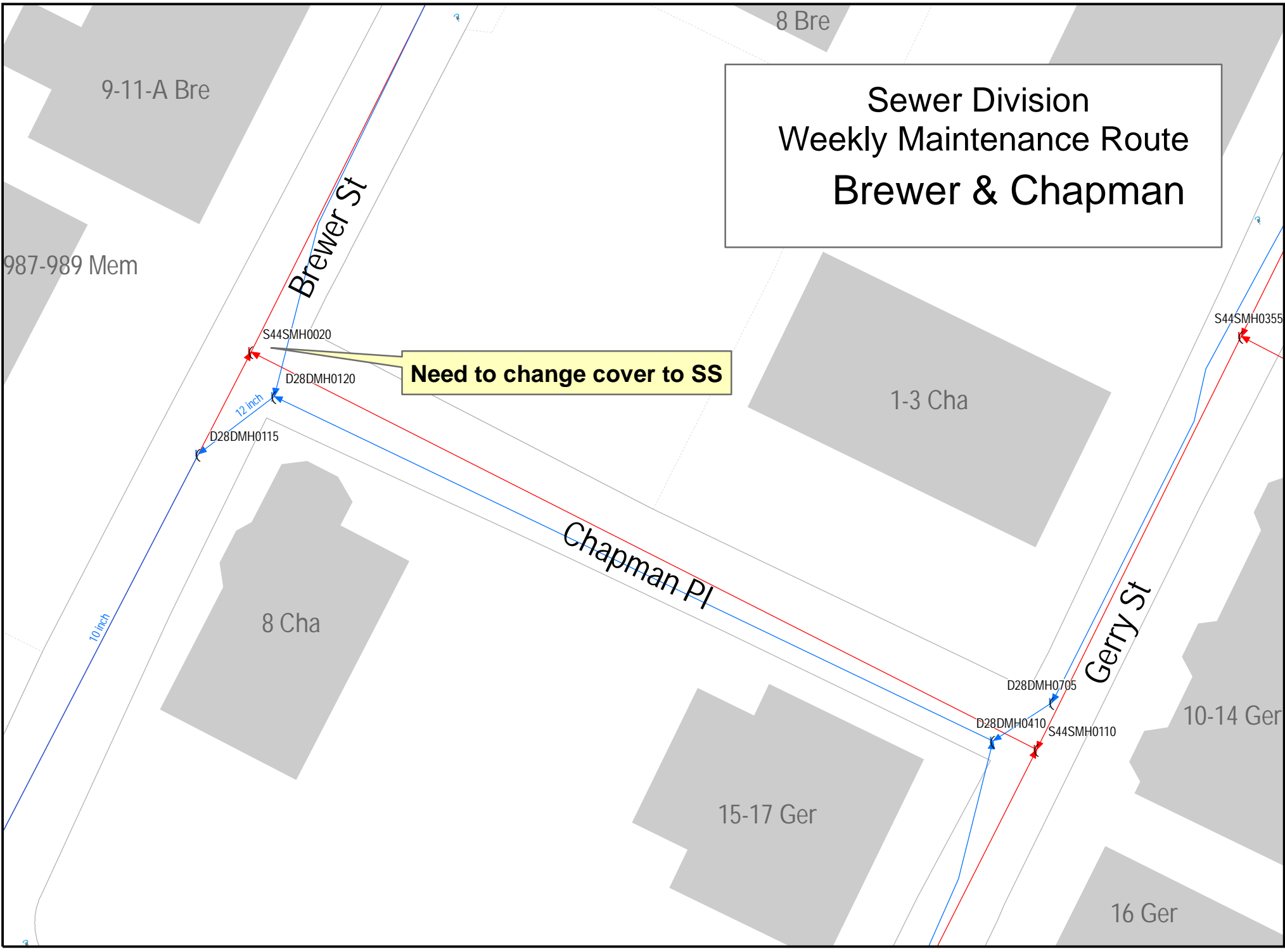
S44SMH0110

S44SMH0355

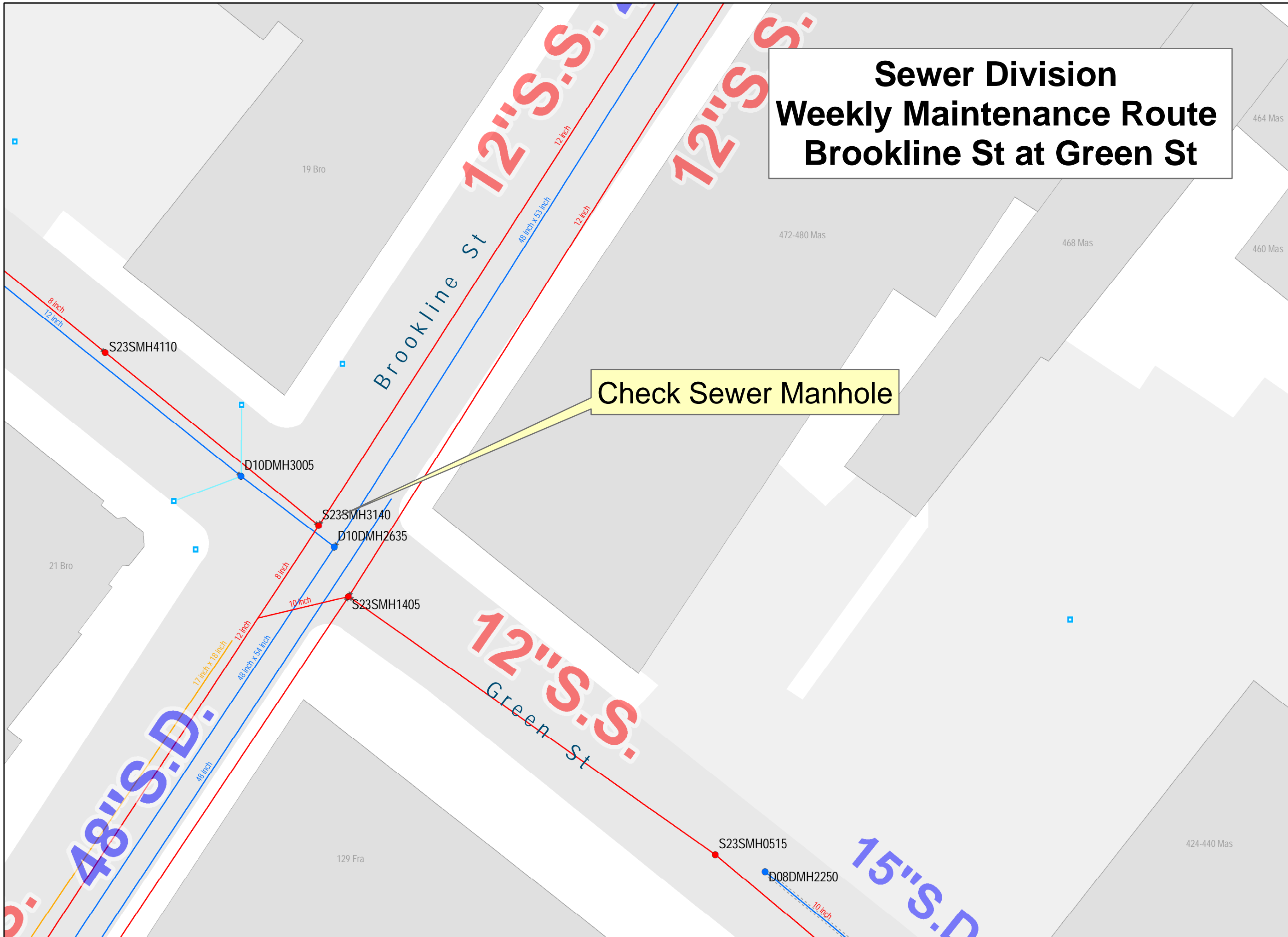
10-14 Ger

15-17 Ger

16 Ger



Sewer Division Weekly Maintenance Route Brookline St at Green St



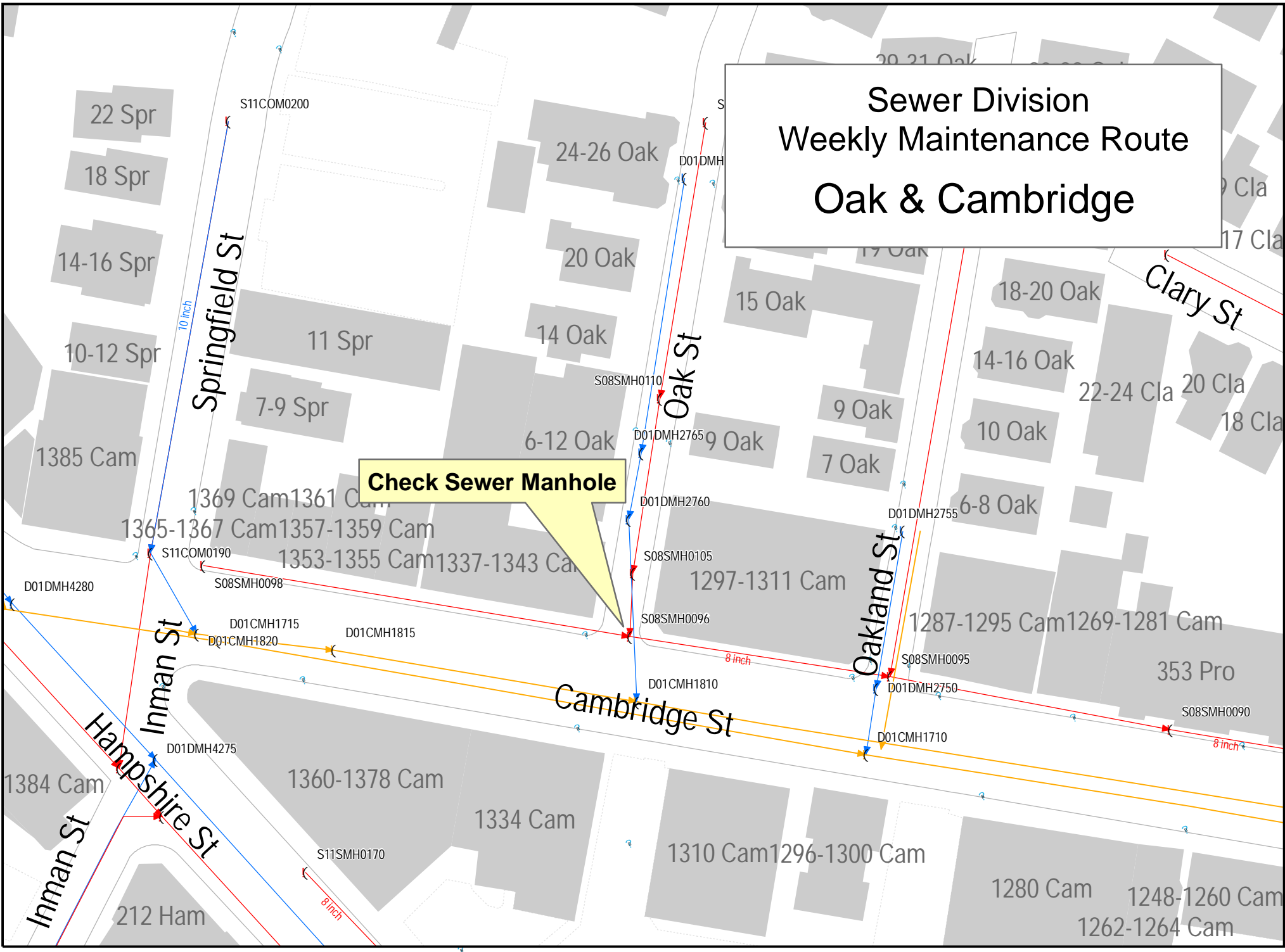
Check Sewer Manhole

- Storm Runoff
- Sanitary Sewer
- Combined
- Abandoned
- MWRA
- Force Mains
- Over / Under
- Trench Drain
- SS Service
- SD Service
- Abandoned
- Catchbasin
- Drywell
- Area Drain
- Drop Inlet
- Oil / Water Separator
- Abandoned
- Outfall
- C.S.O.
- Underground Structures
- Structures
- Pump Station
- Lift Station
- Storm Runoff Catchment Area
- City Line



Sewer Division Weekly Maintenance Route Oak & Cambridge

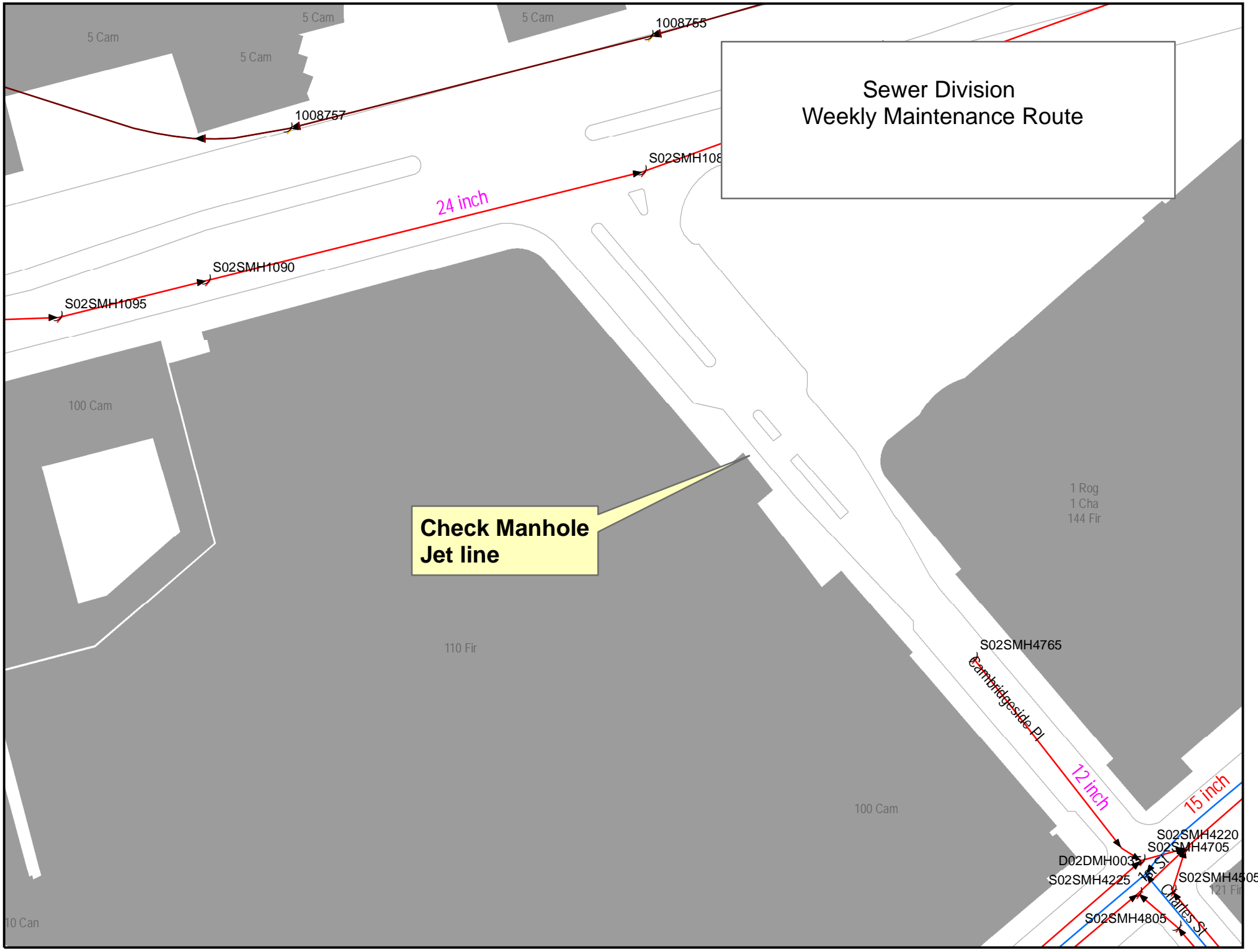
Check Sewer Manhole



Sewer Division Weekly Maintenance Route

24 inch

Check Manhole
Jet line



Sewer Division
Weekly Maintenance Route
Clarendon

30 Chu

44 Cla

40 Cla

S78CMH9500

Clarendon Ave

D41DMH9965

S78COM0210

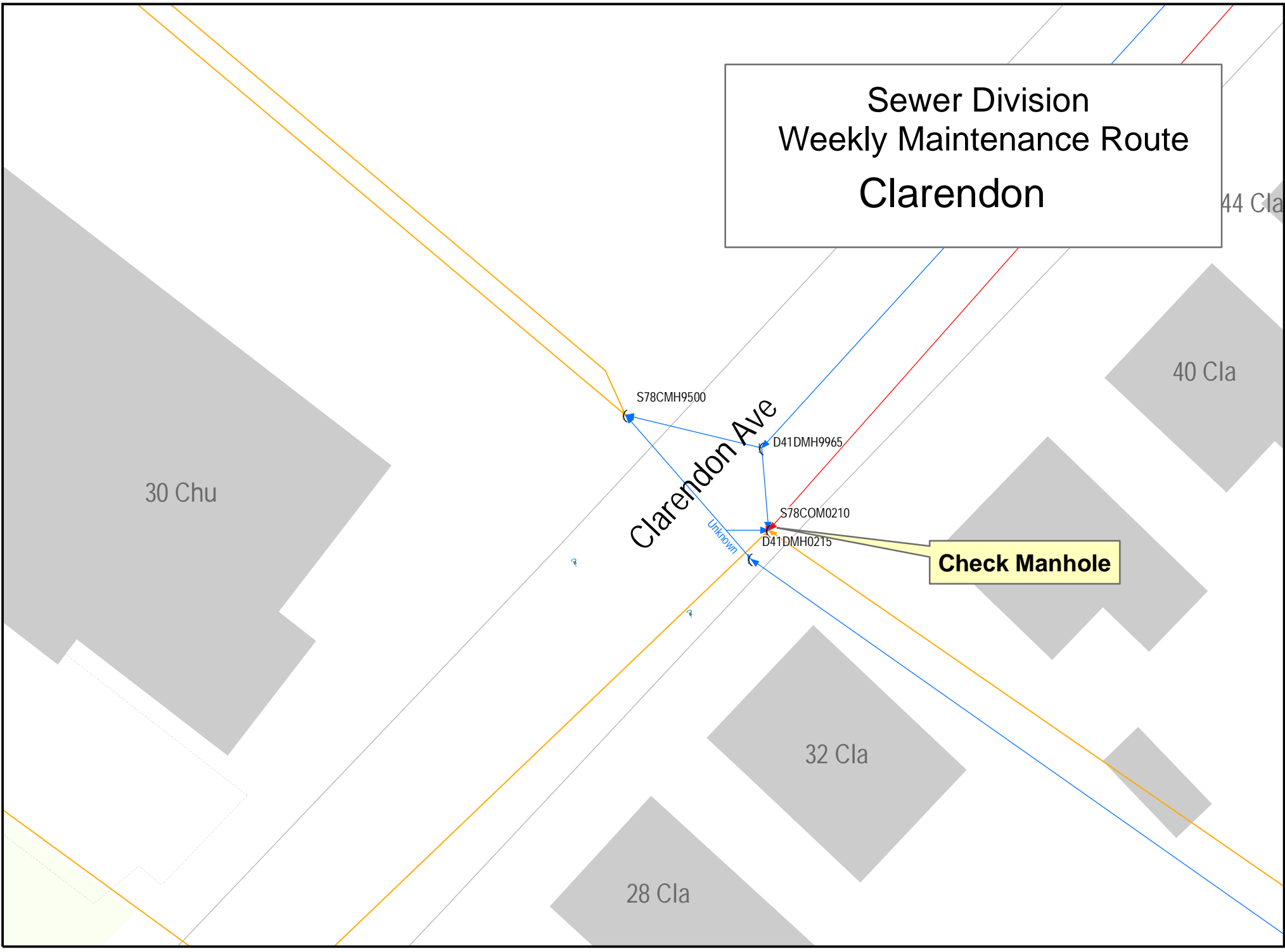
UNKNOWN

D41DMH0215

Check Manhole

32 Cla

28 Cla



Sewer Division Weekly Maintenance Route Creighton

2050 Mas

2044-2046 Mas

2028-2038 Mas

Check Manhole

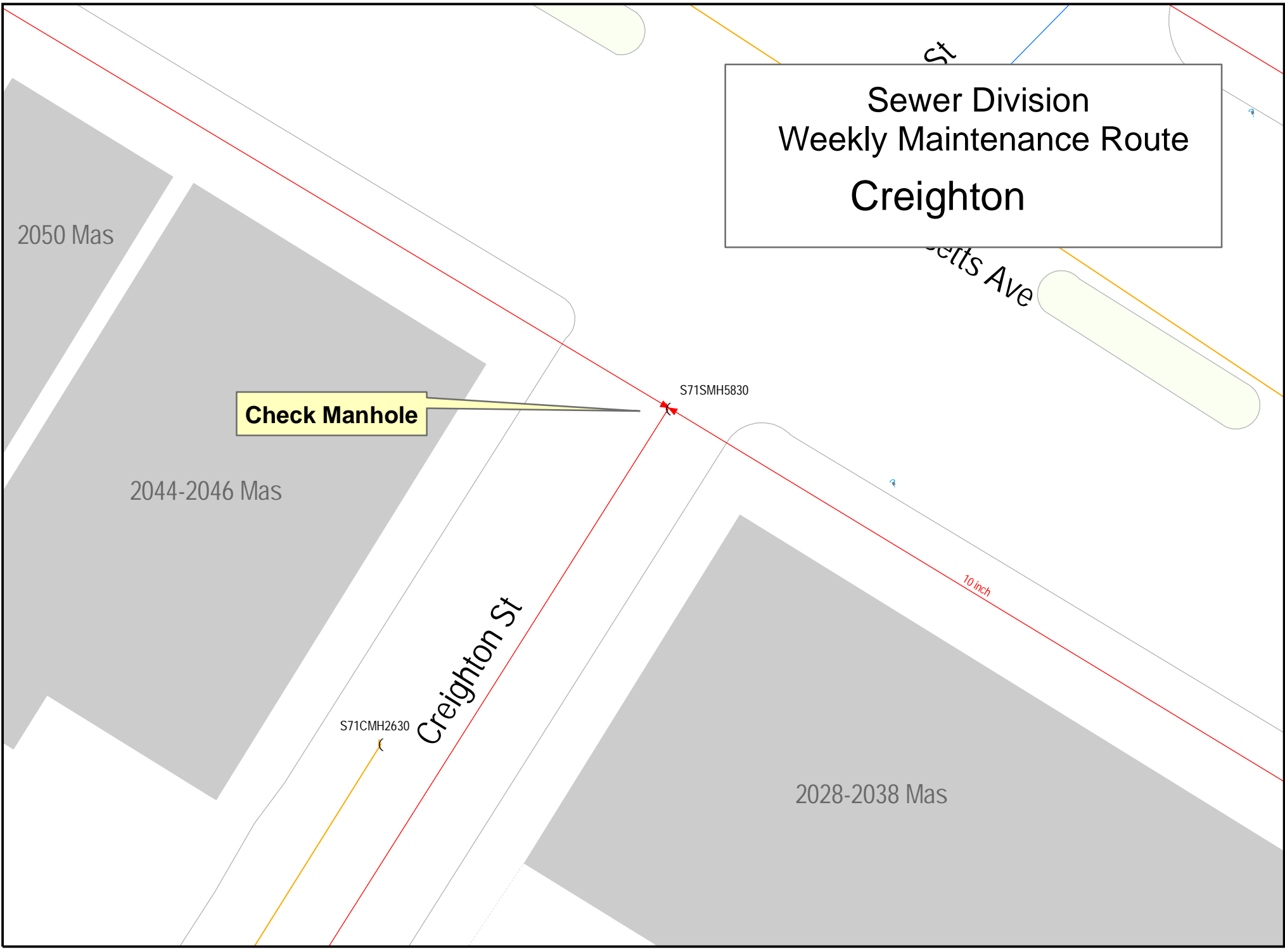
S71SMH5830

S71CMH2630

Creighton St

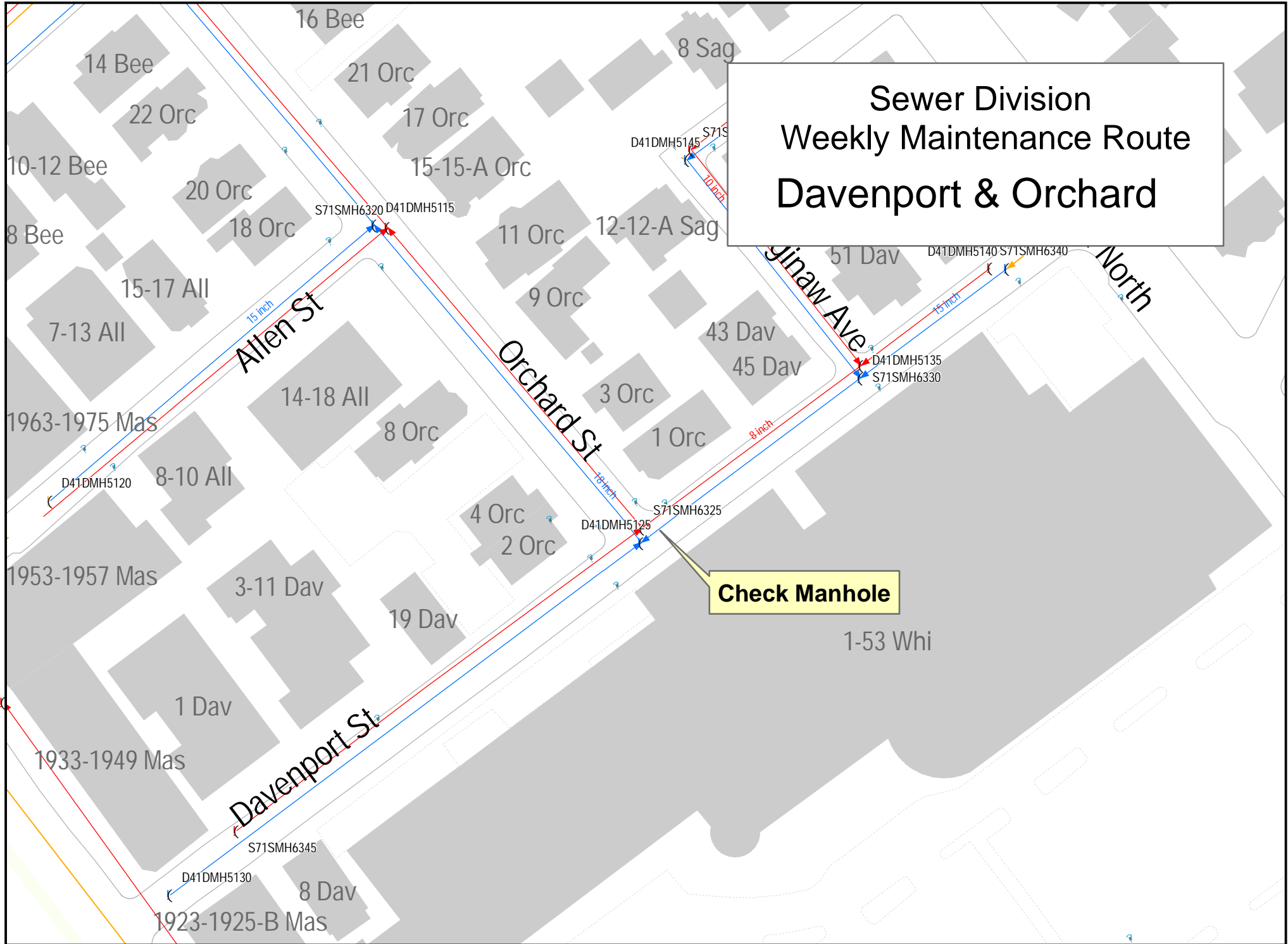
St
etts Ave

10 inch



Sewer Division Weekly Maintenance Route Davenport & Orchard

Check Manhole



Sewer Division Weekly Maintenance Route

Check Manhole

S71SMH2885

D41CMH2620

D41CMH2622

8 inch

12 inch

6 Alb

2368-2380 Mas

2375 Mas

2353 Mas

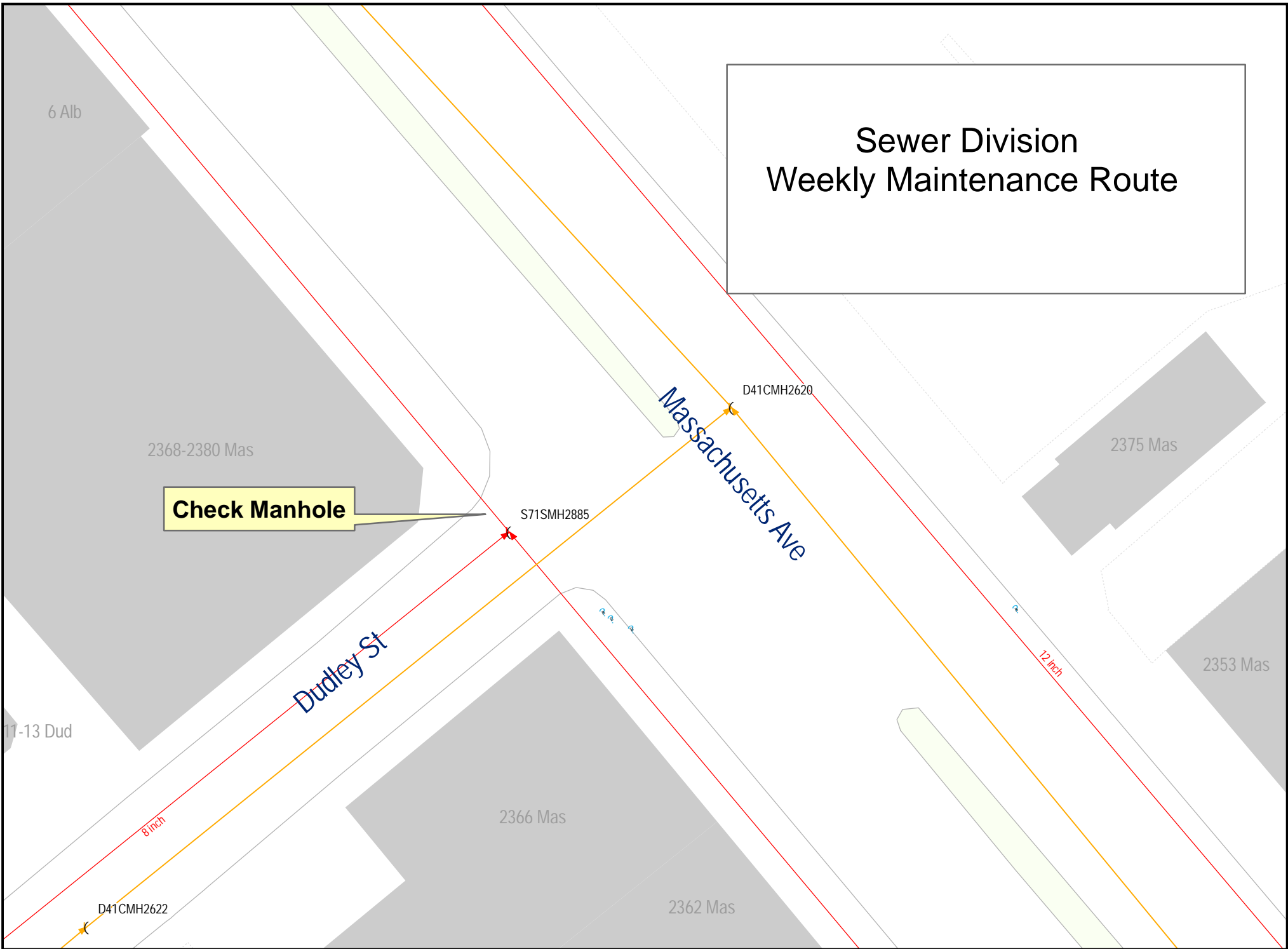
11-13 Dud

Dudley St

Massachusetts Ave

2366 Mas

2362 Mas



Sewer Division Weekly Maintenance Route Endicott

Check Manhole
You will see alot of flow

S22SMH0410
D10DMH0120
S22SMH0310

8 inch

410-R Mem

21SMH0820

Mem

350 Mem

D09DMH0005

Amforth St

S22COM0510

362 Mem

S22SMH0315
S22SMH0420
D10DMH0115

Endicott St

372 Mem

S22COM0610

400-403 Mem

405-407 Mem

Memorial Dr

Memorial Dr

410 Mem

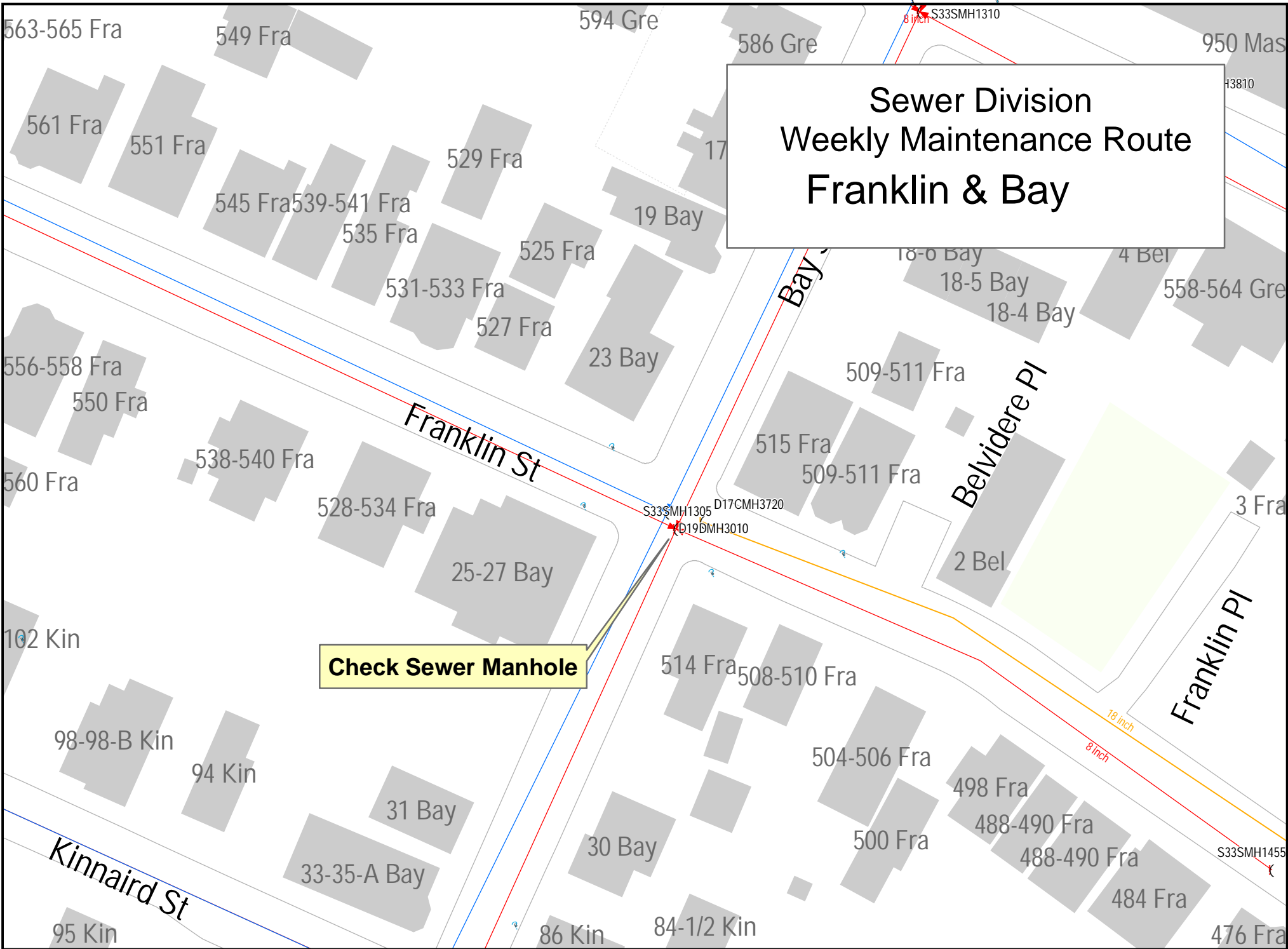
8 inch

428 Mem

409 Mem

Sewer Division Weekly Maintenance Route Franklin & Bay

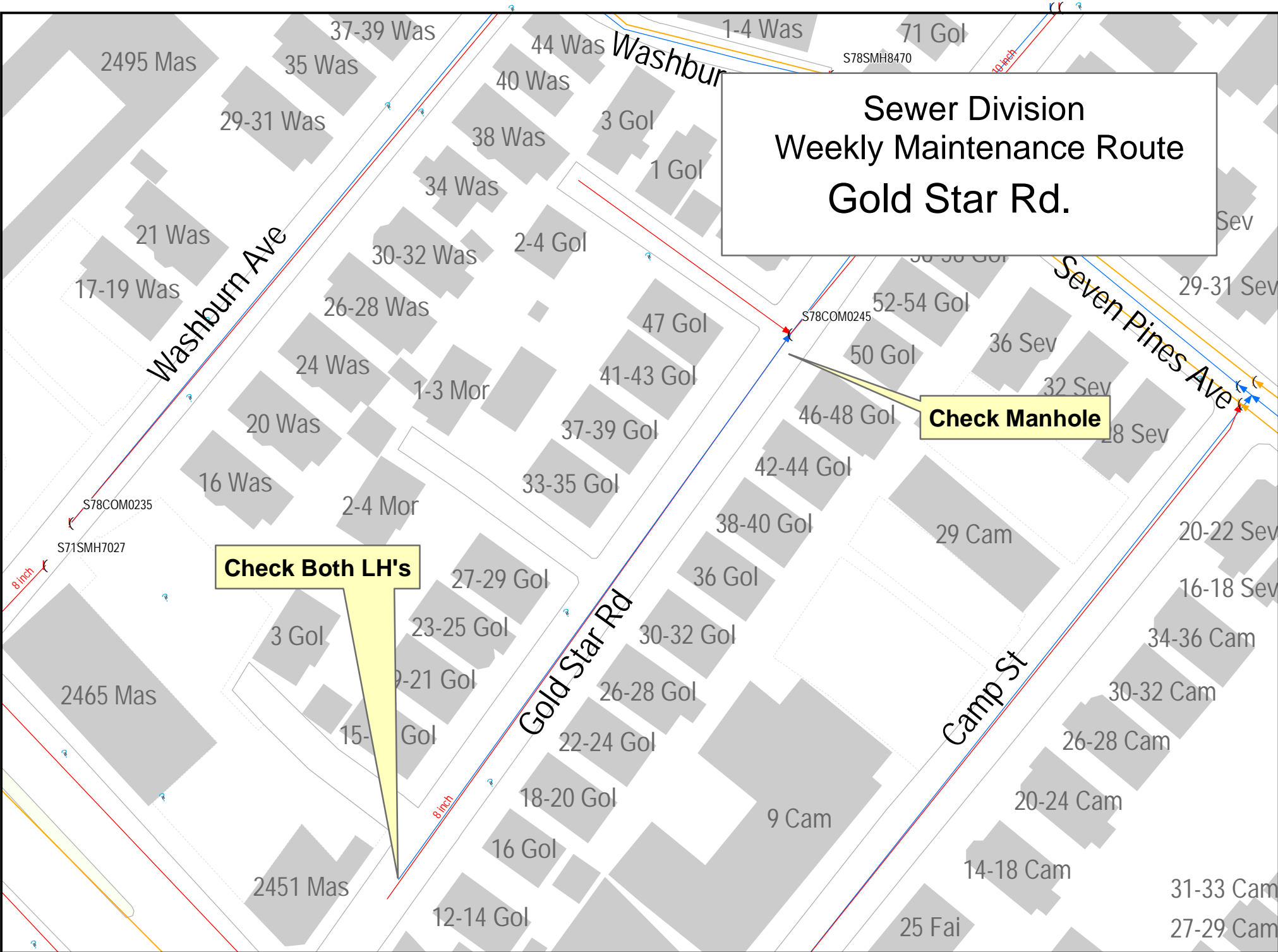
Check Sewer Manhole



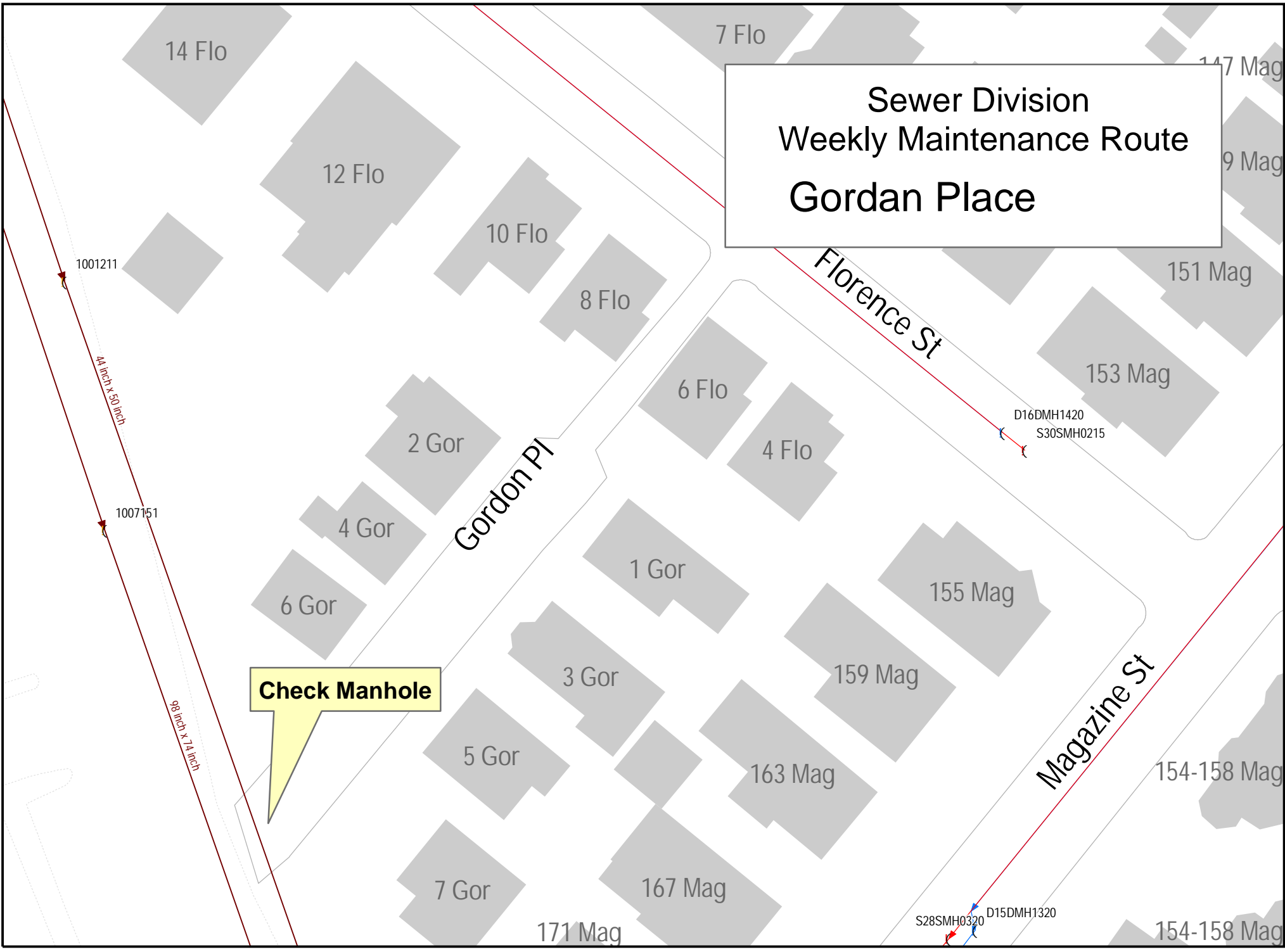
Sewer Division Weekly Maintenance Route Gold Star Rd.

Check Manhole

Check Both LH's



Sewer Division Weekly Maintenance Route Gordan Place



Check Manhole

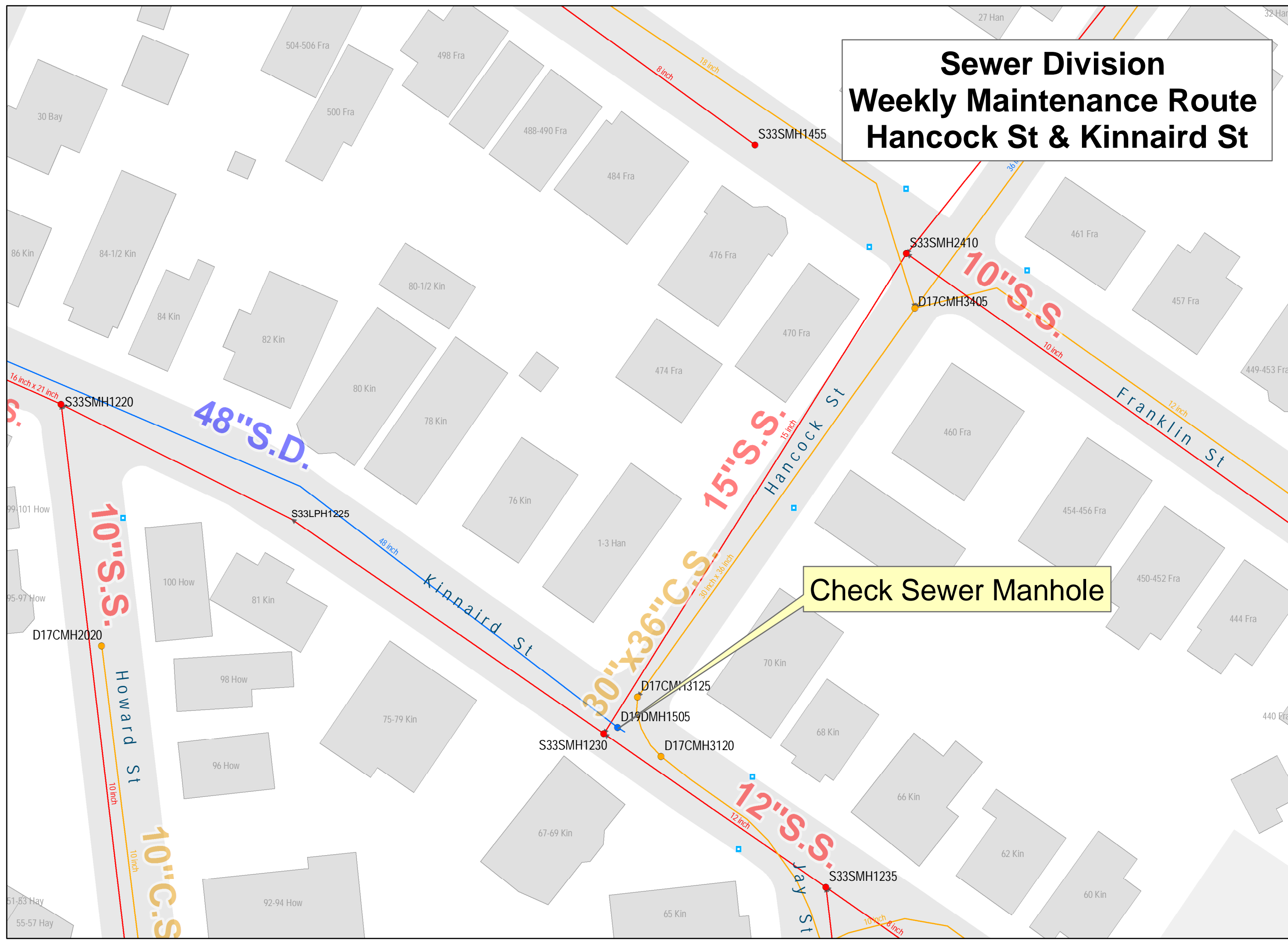
1001211

1007151

D16DMH1420
S30SMH0215

S28SMH0320
D15DMH1320

Sewer Division Weekly Maintenance Route Hancock St & Kinnaird St



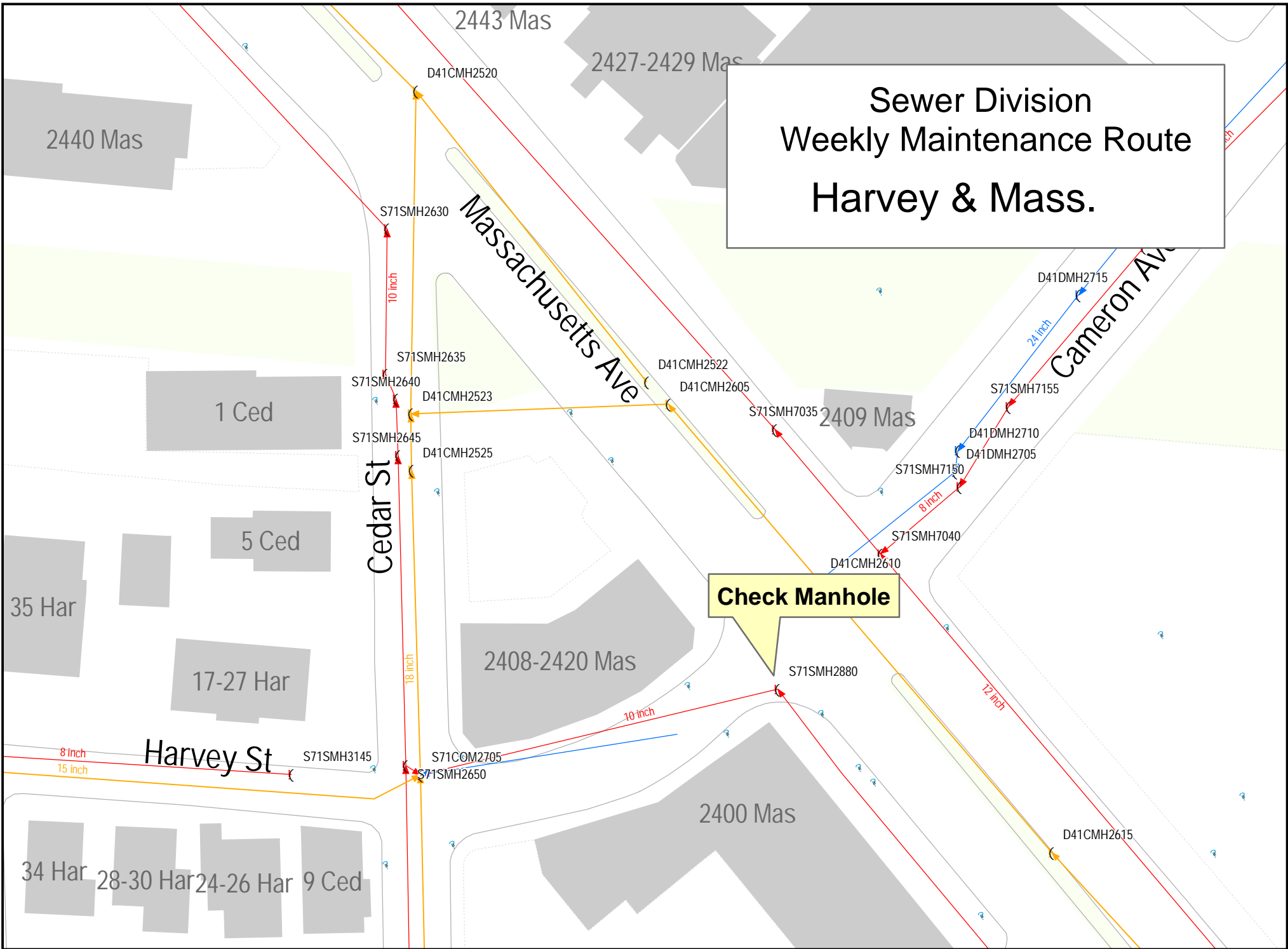
Check Sewer Manhole

- Storm Runoff
- Sanitary Sewer
- Combined
- Abandoned
- MWRA
- Force Mains
- Over / Under
- Trench Drain
- SS Service
- SD Service
- Abandoned
- Catchbasin
- Drywell
- Area Drain
- Drop Inlet
- Oil / Water Separator
- Abandoned
- Outfall
- C.S.O.
- Underground Structures
- Structures
- Pump Station
- Lift Station
- Storm Runoff Catchment Area
- City Line



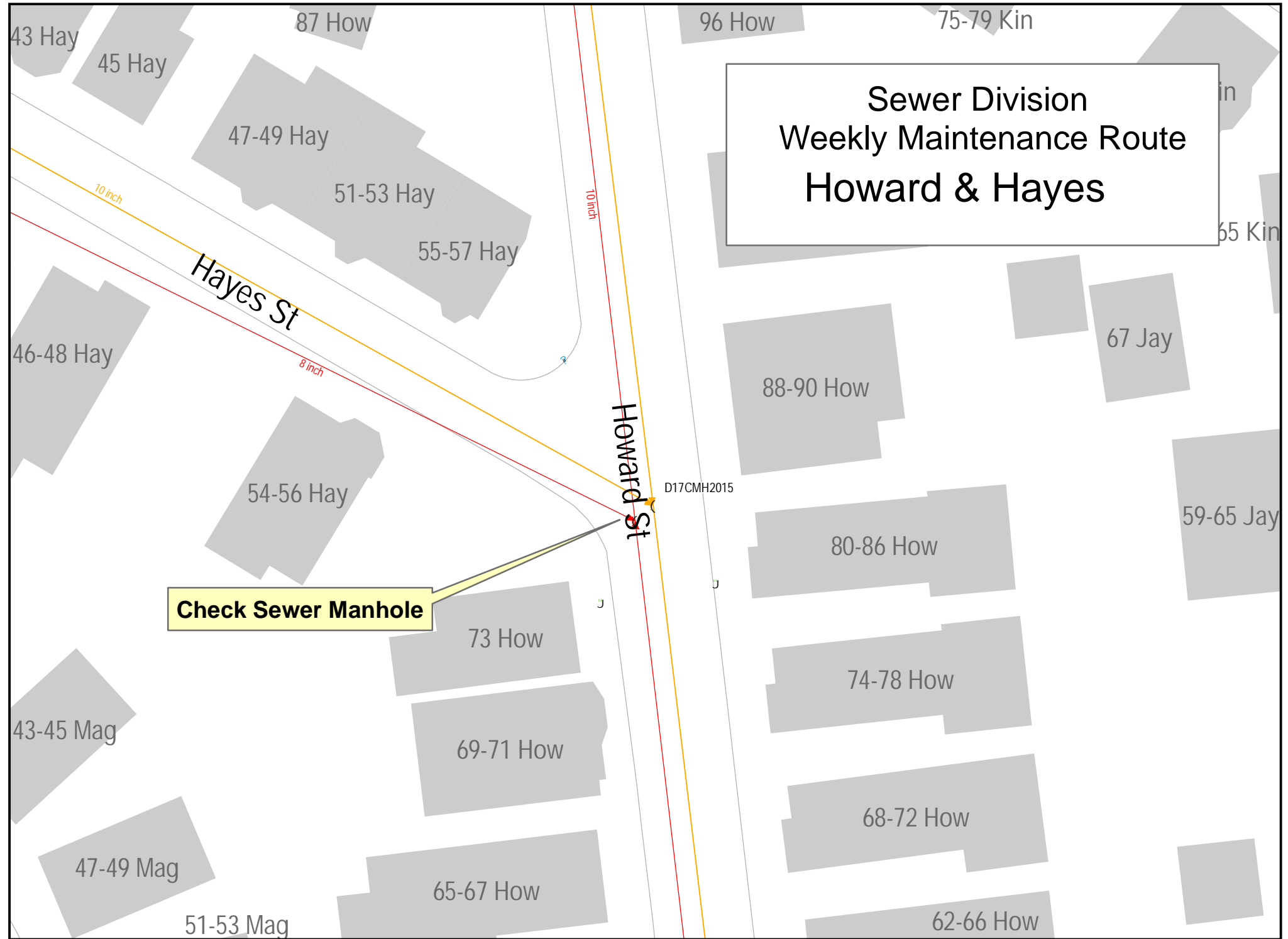
Sewer Division Weekly Maintenance Route Harvey & Mass.

Check Manhole



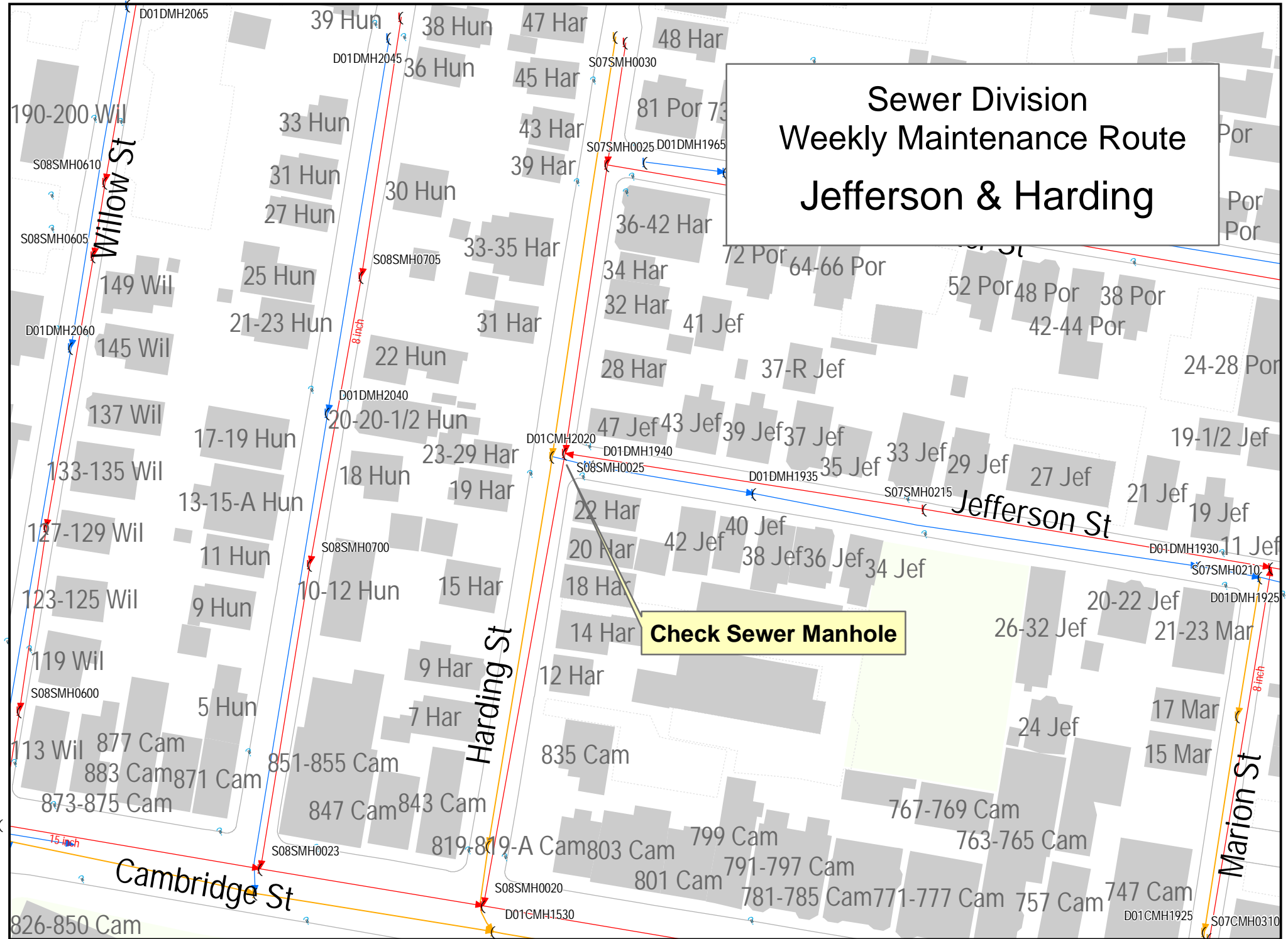
Sewer Division Weekly Maintenance Route Howard & Hayes

Check Sewer Manhole



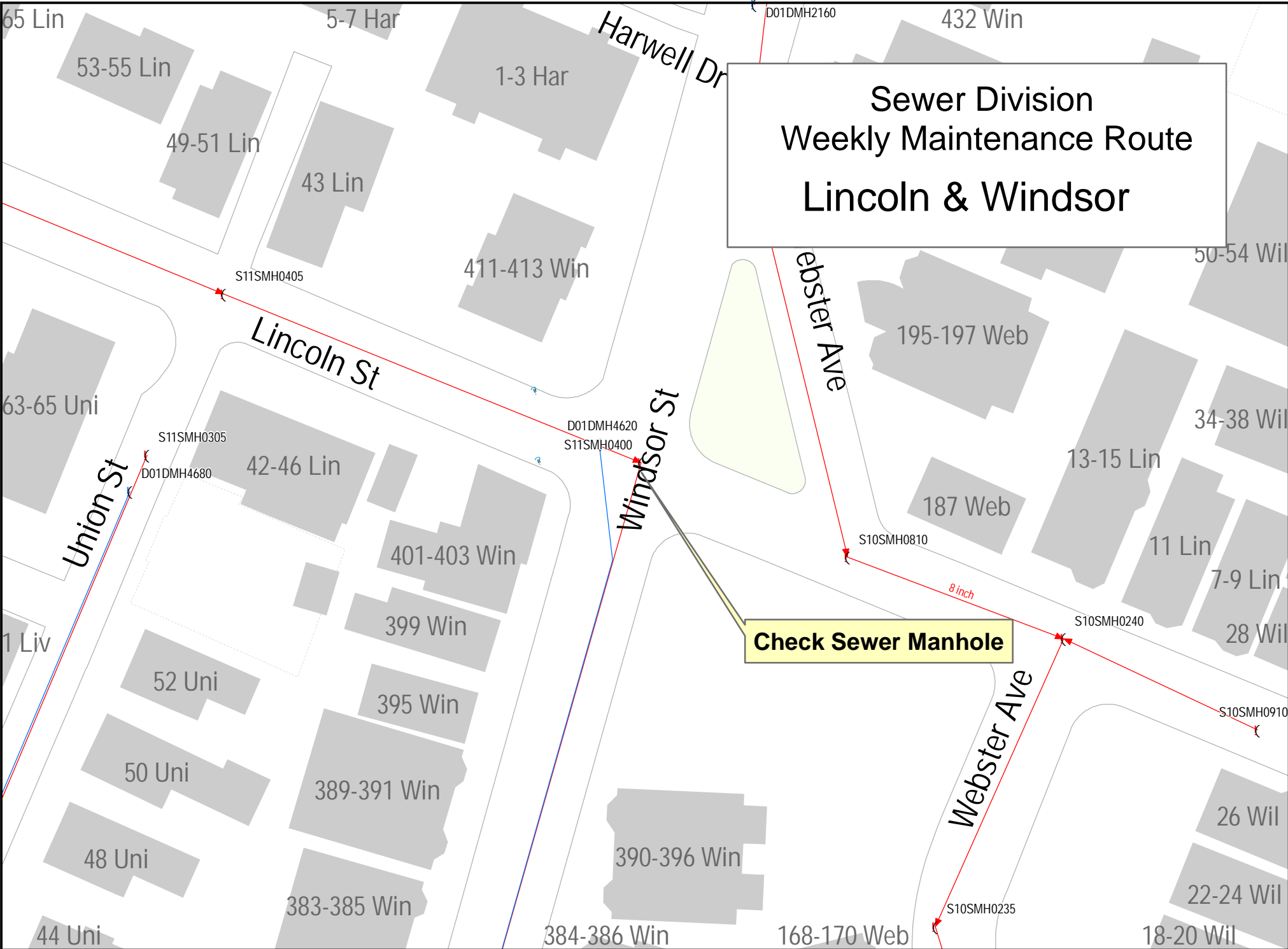
Sewer Division Weekly Maintenance Route Jefferson & Harding

Check Sewer Manhole



**Sewer Division
Weekly Maintenance Route
Lincoln & Windsor**

Check Sewer Manhole

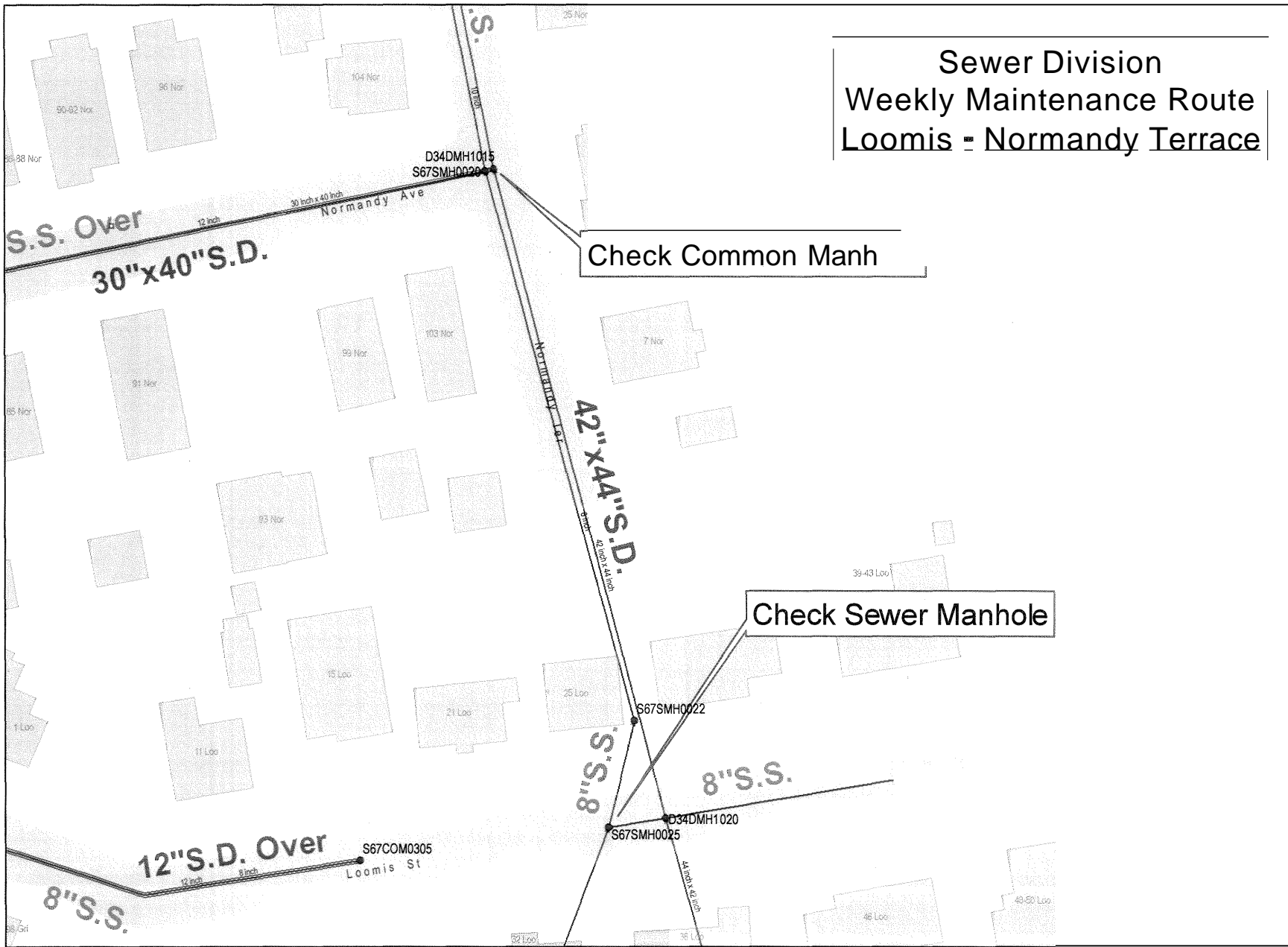


Sewer Division Weekly Maintenance Route Loomis - Normandy Terrace

CITY OF CAMBRIDGE
PUBLIC WORKS
SEWER DIVISION
SEWER & STORM DRAINS
2008 ATLAS

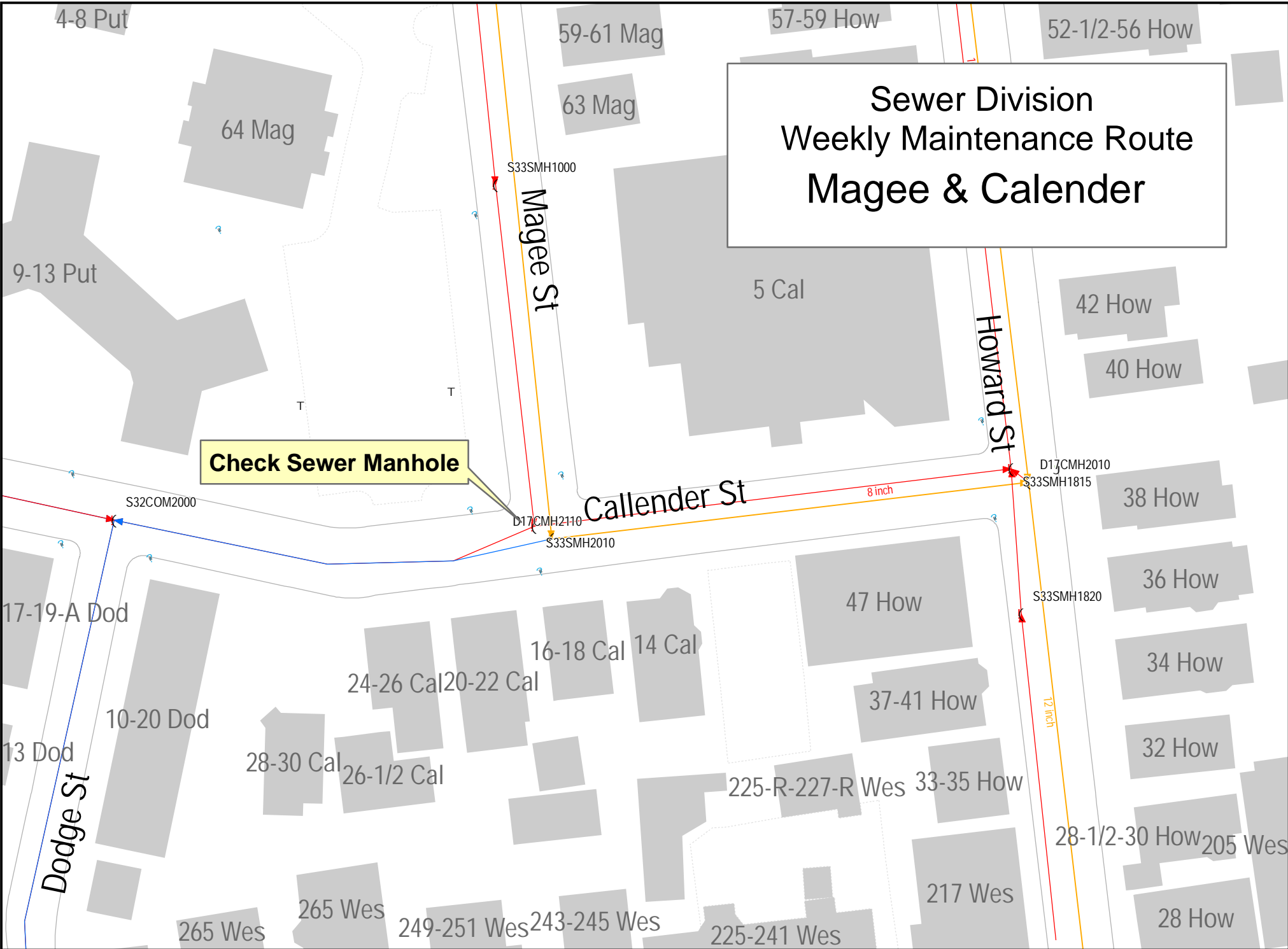


- ● Storm Runoff
- ● Sanitary Sewer
- ● Combined
- ○ Abandoned
- MWRA
- Force Mains
- = Over / Under Trench Drain
- SS Service
- SD Service
- Abandoned
- Catchbasin
- Drywell
- Area Drain
- Drop Inlet
- Oil / Water Separator
- Abandoned
- Outfall
- C.S.O.
- Underground Structures
- Pump Station
- Lift Station
- Storm Runoff Catchment Area
- City Line



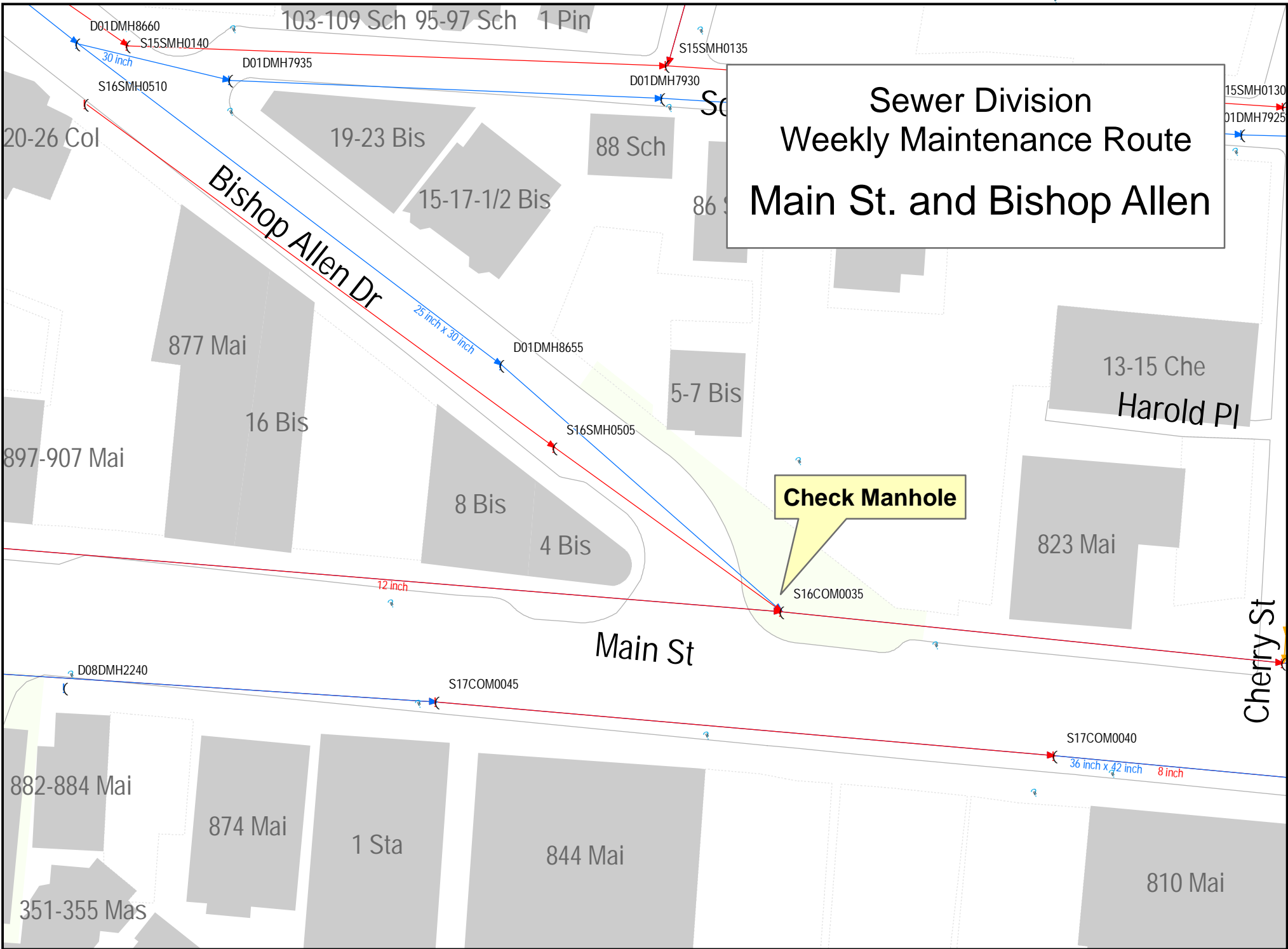
Sewer Division Weekly Maintenance Route Magee & Calender

Check Sewer Manhole

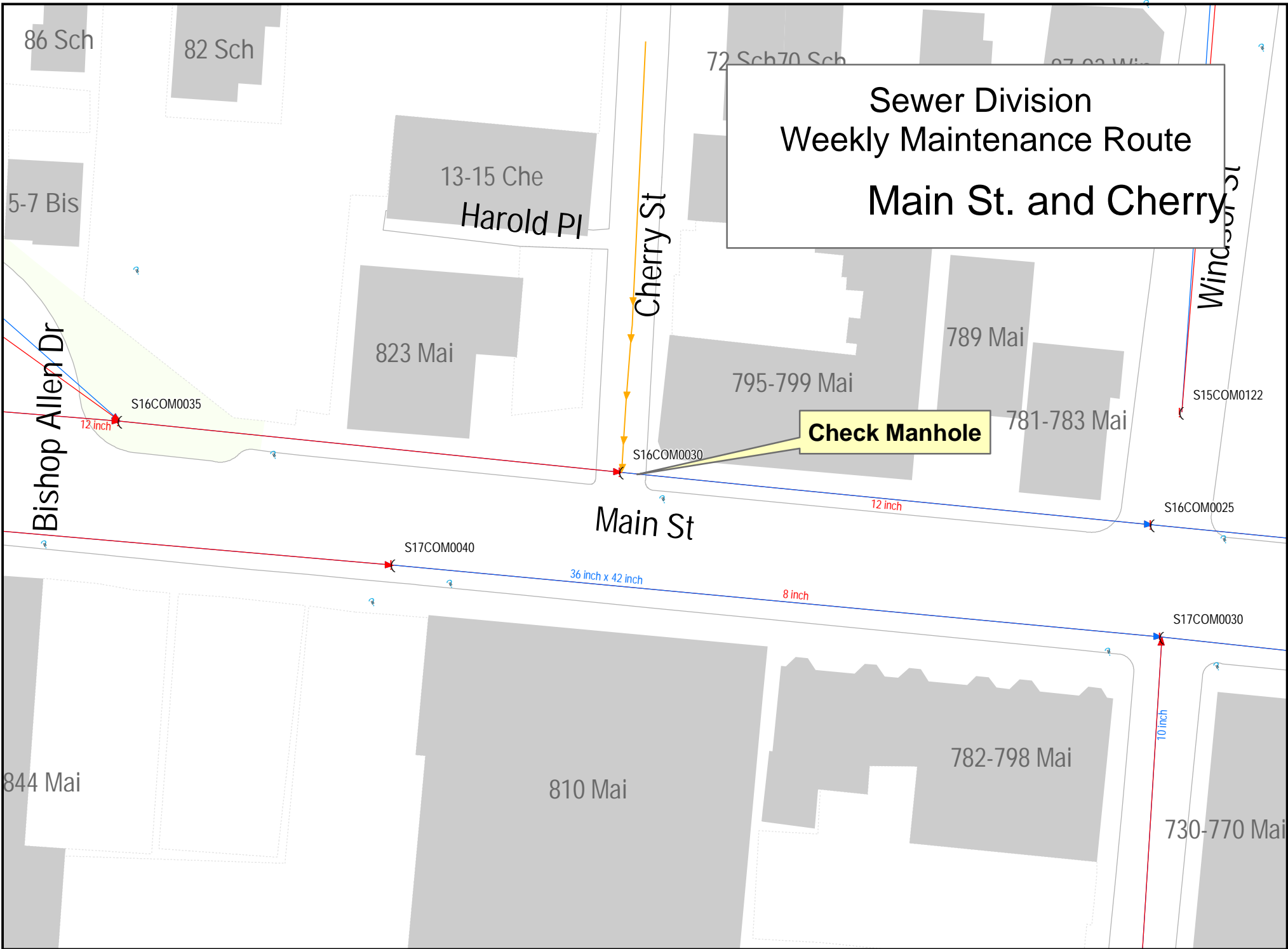


Sewer Division Weekly Maintenance Route Main St. and Bishop Allen

Check Manhole



Sewer Division Weekly Maintenance Route Main St. and Cherry



655-731 Mai

655-731 Mai

33-35 New

Sewer Division Weekly Maintenance Route Portland & Main

Tec

S16COM0015

S16COM0010

D01DMH3875

1001161

1001155

S05COM0010

10 inch

S17COM0010

Main St

D01DMH9105 S04COM0010

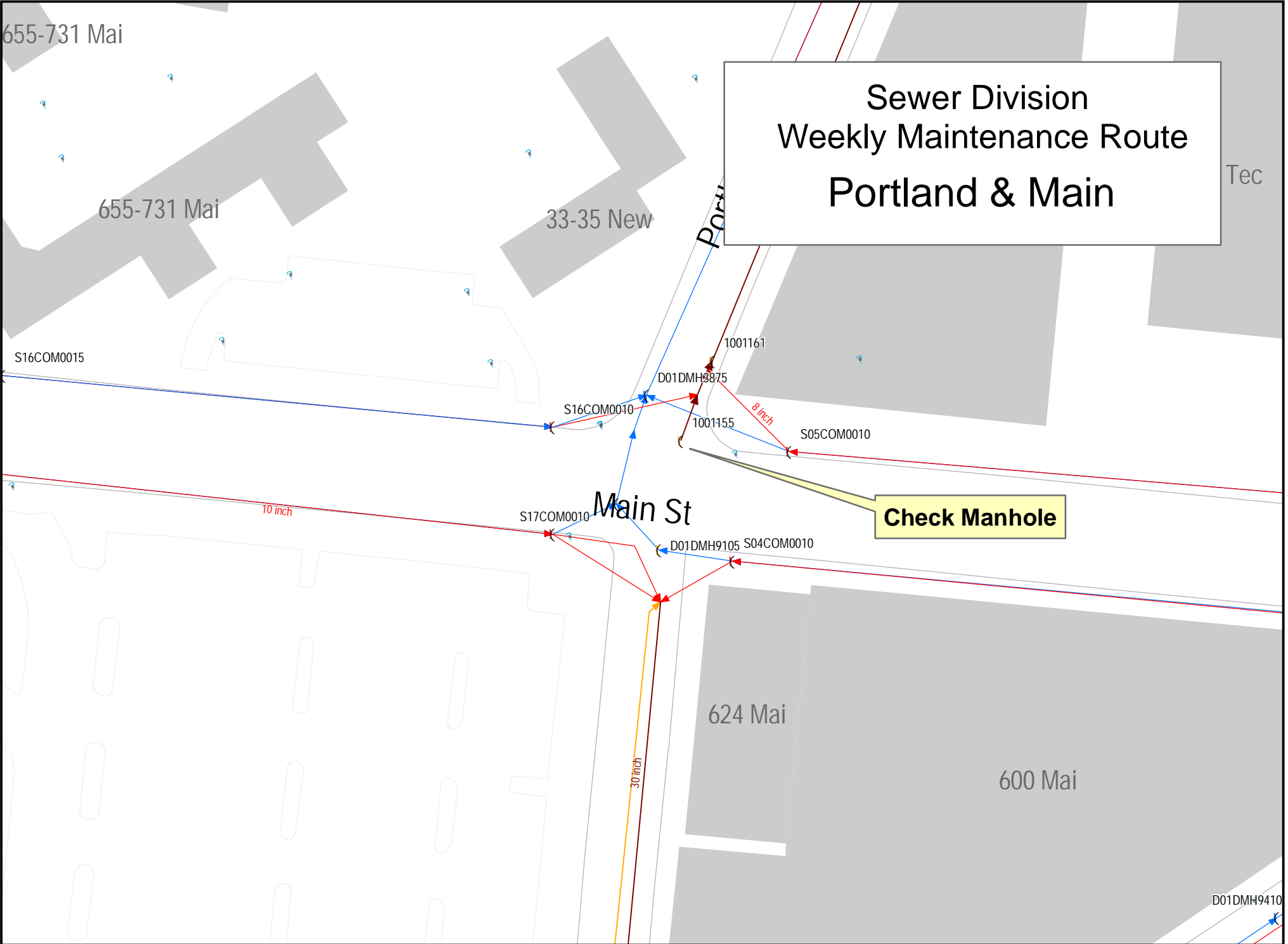
Check Manhole

624 Mai

600 Mai

30 inch

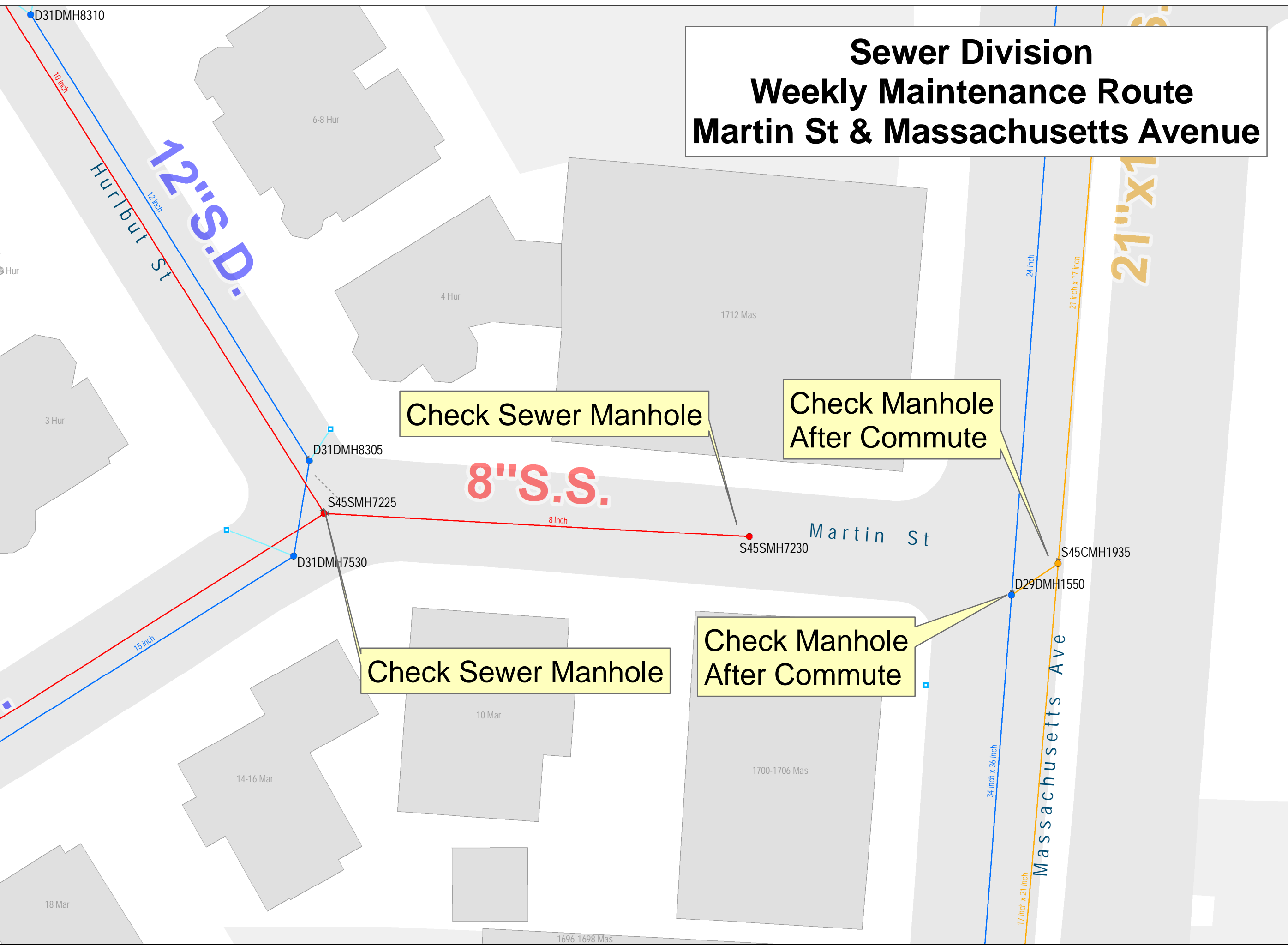
D01DMH9410



Sewer Division

Weekly Maintenance Route

Martin St & Massachusetts Avenue

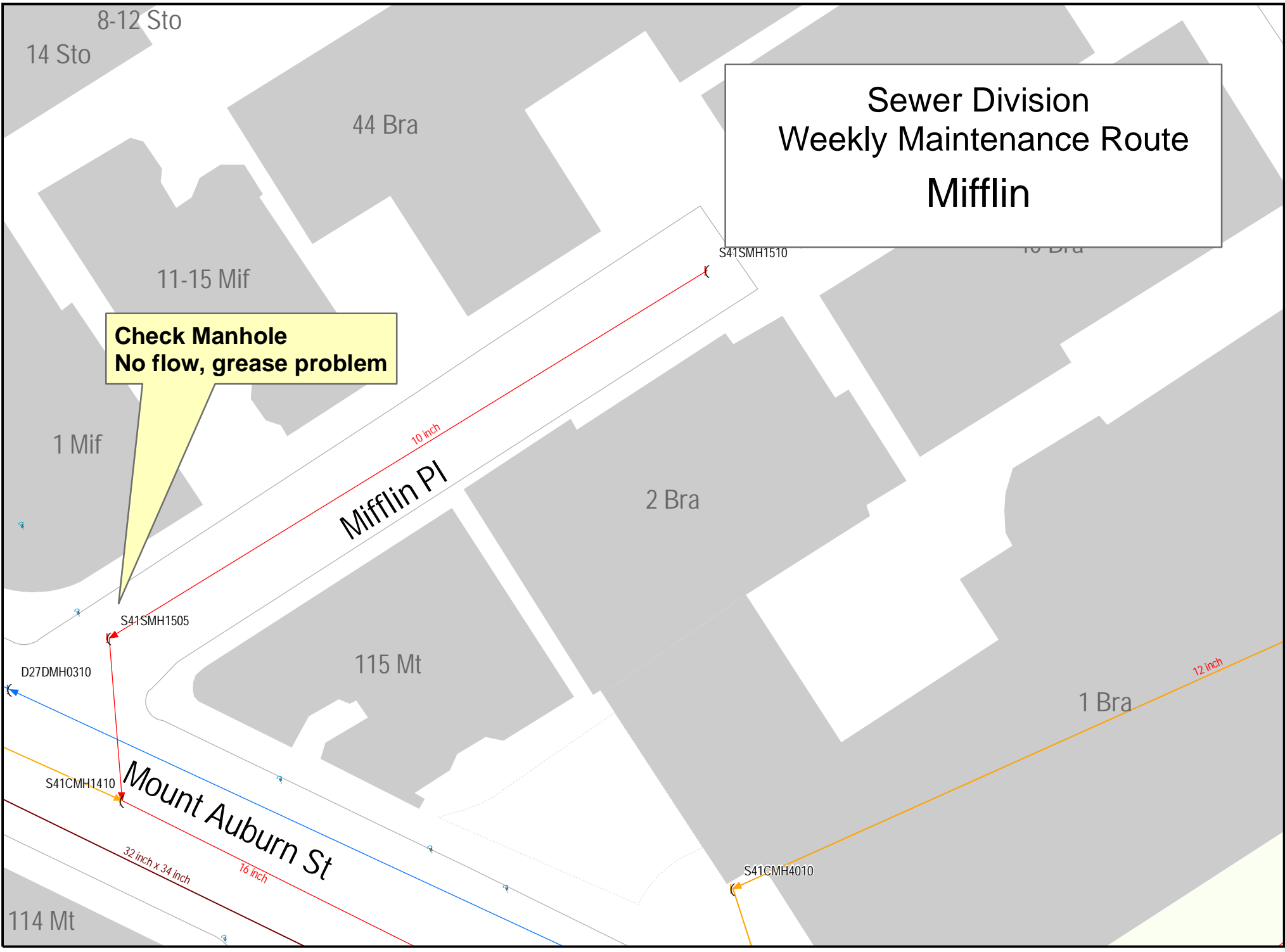


- Storm Runoff
- Sanitary Sewer
- Combined
- Abandoned
- MWRA
- Force Mains
- Over / Under
- Trench Drain
- SS Service
- SD Service
- Abandoned
- Catchbasin
- Drywell
- Area Drain
- Drop Inlet
- Oil / Water Separator
- Abandoned
- Outfall
- C.S.O.
- Underground Structures
- Structures
- Pump Station
- Lift Station
- Storm Runoff Catchment Area
- City Line



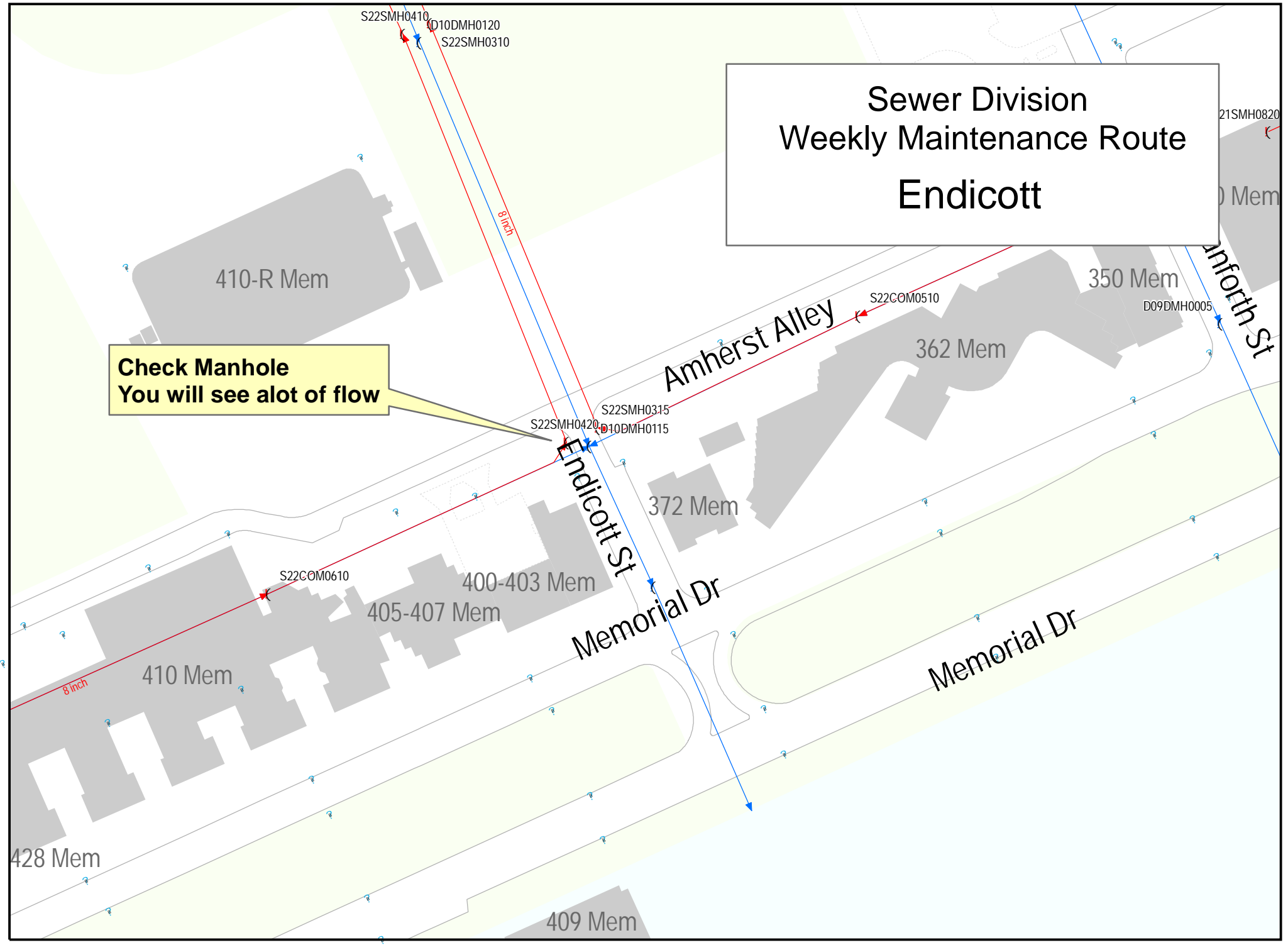
Sewer Division Weekly Maintenance Route Mifflin

**Check Manhole
No flow, grease problem**



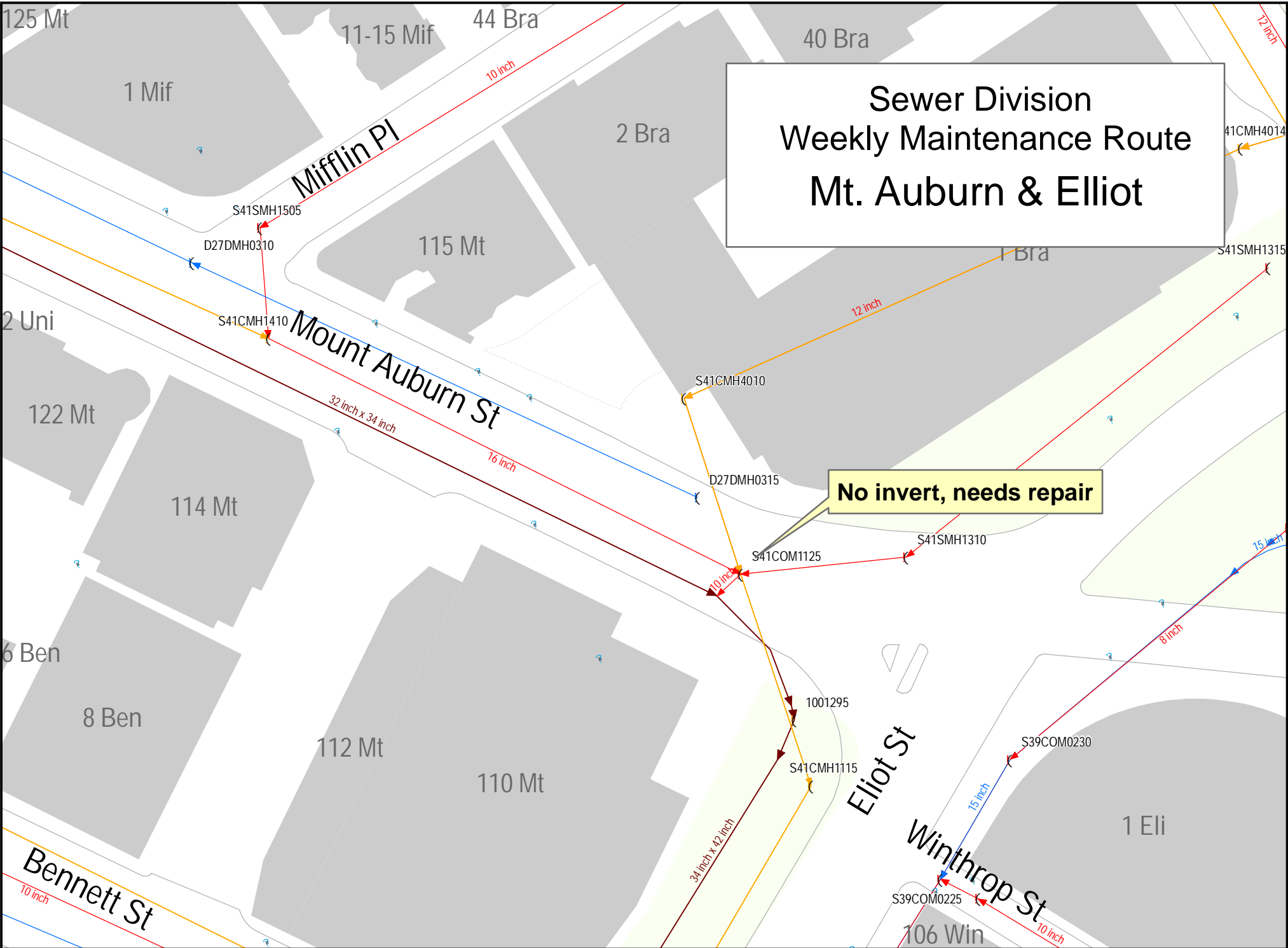
Sewer Division Weekly Maintenance Route Endicott

**Check Manhole
You will see alot of flow**




























Sewer Division Weekly Maintenance Route Mt. Auburn & Elliot

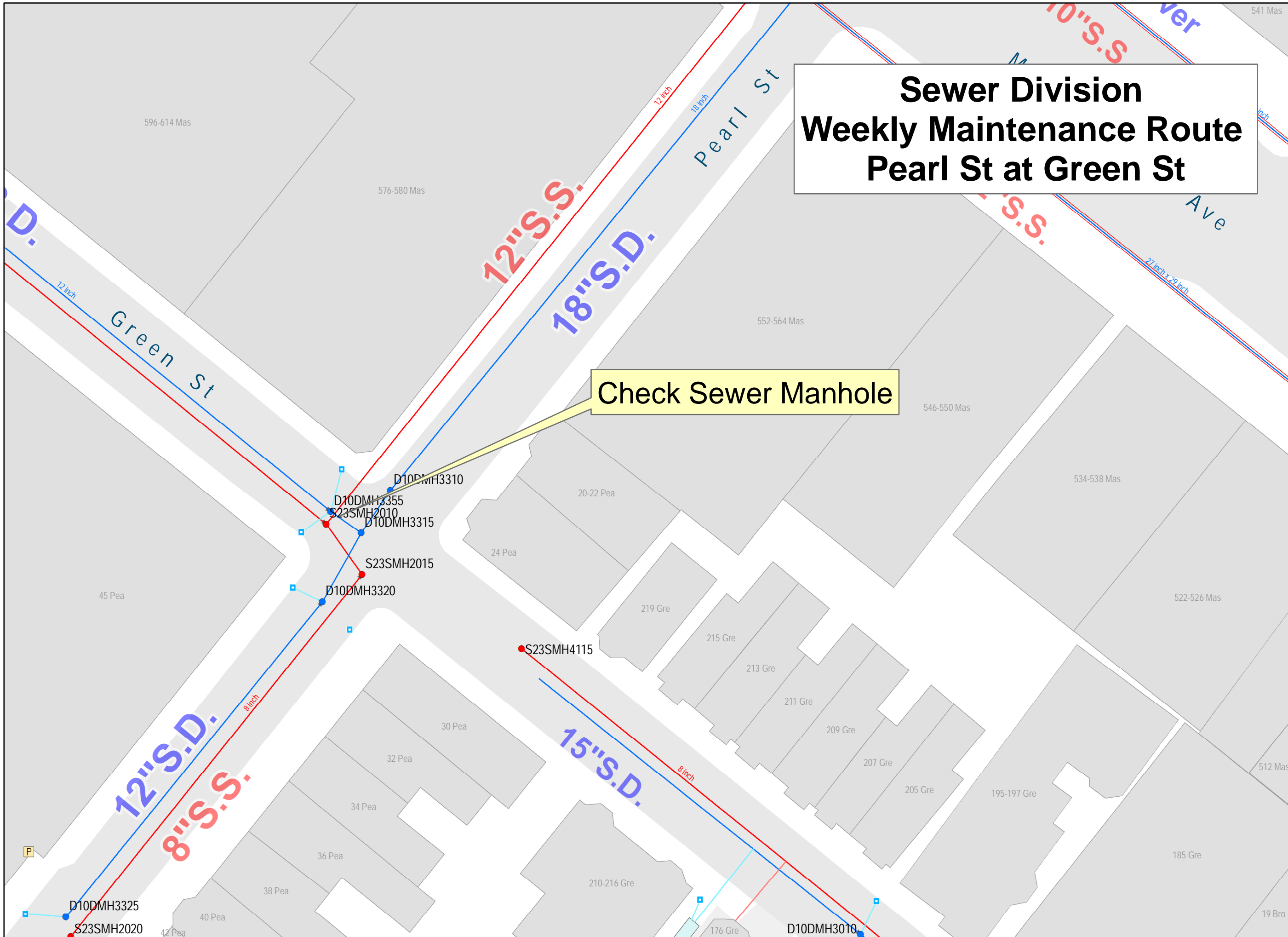
No invert, needs repair



Sewer Division Weekly Maintenance Route Pearl St at Green St

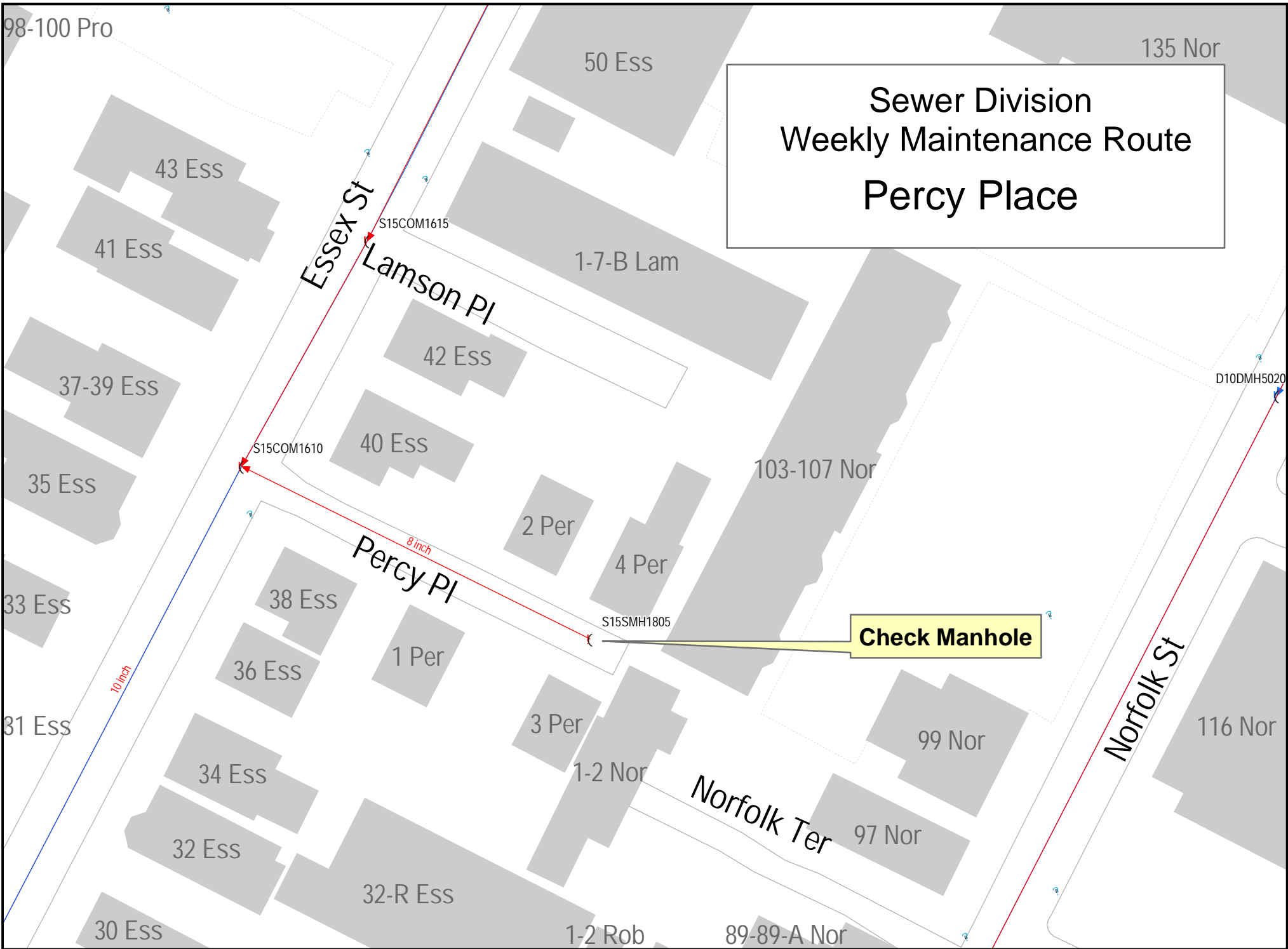
Check Sewer Manhole

-  Storm Runoff
-  Sanitary Sewer
-  Combined
-  Abandoned
-  MWRA
-  Force Mains
-  Over / Under
-  Trench Drain
-  SS Service
-  SD Service
-  Abandoned
-  Catchbasin
-  Drywell
-  Area Drain
-  Drop Inlet
-  Oil / Water Separator
-  Abandoned
-  Outfall
-  C.S.O.
-  Underground Structures
-  Structures
-  Pump Station
-  Lift Station
-  Storm Runoff Catchment Area
-  City Line



Sewer Division Weekly Maintenance Route Percy Place

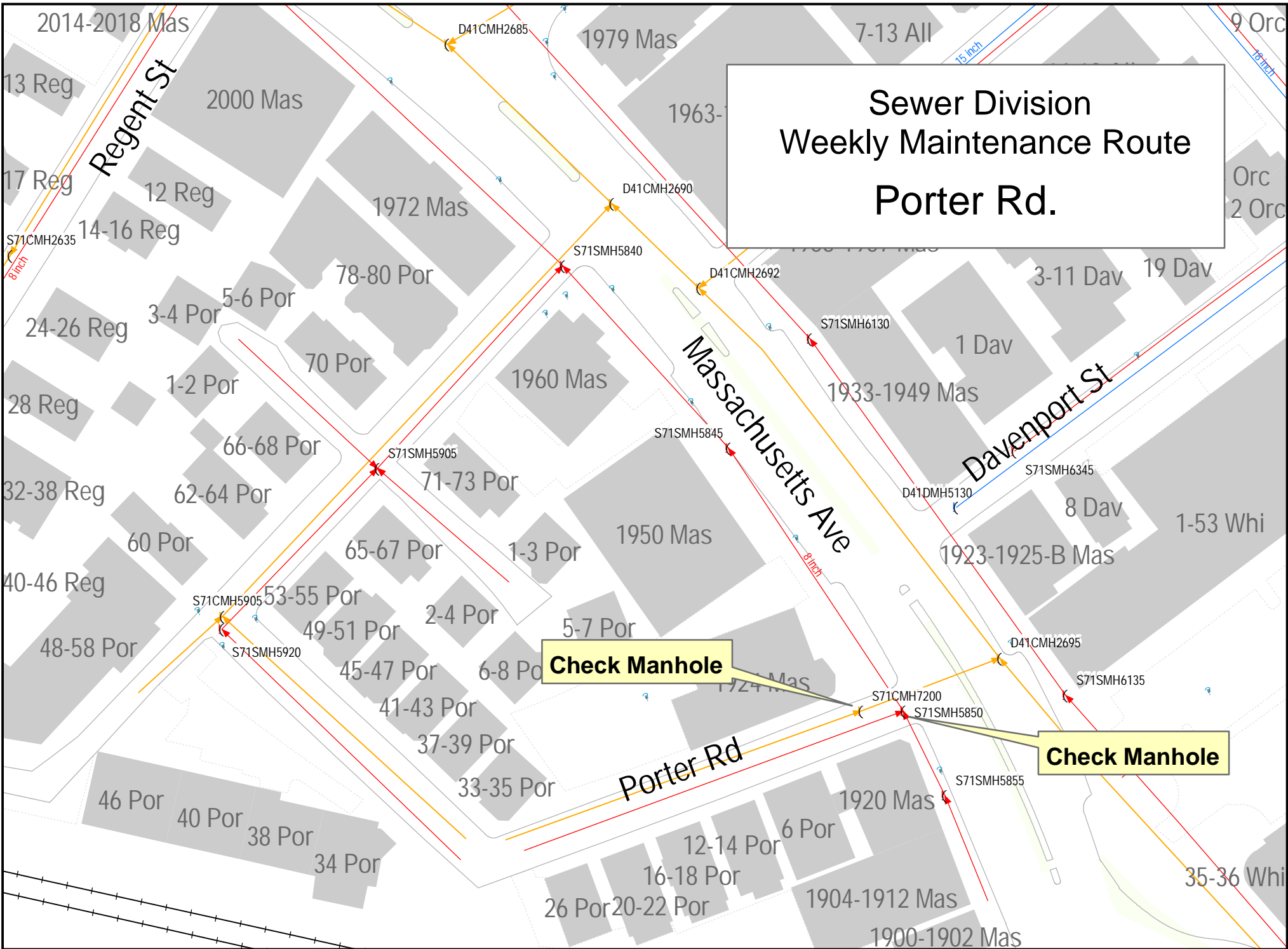
Check Manhole



Sewer Division Weekly Maintenance Route Porter Rd.

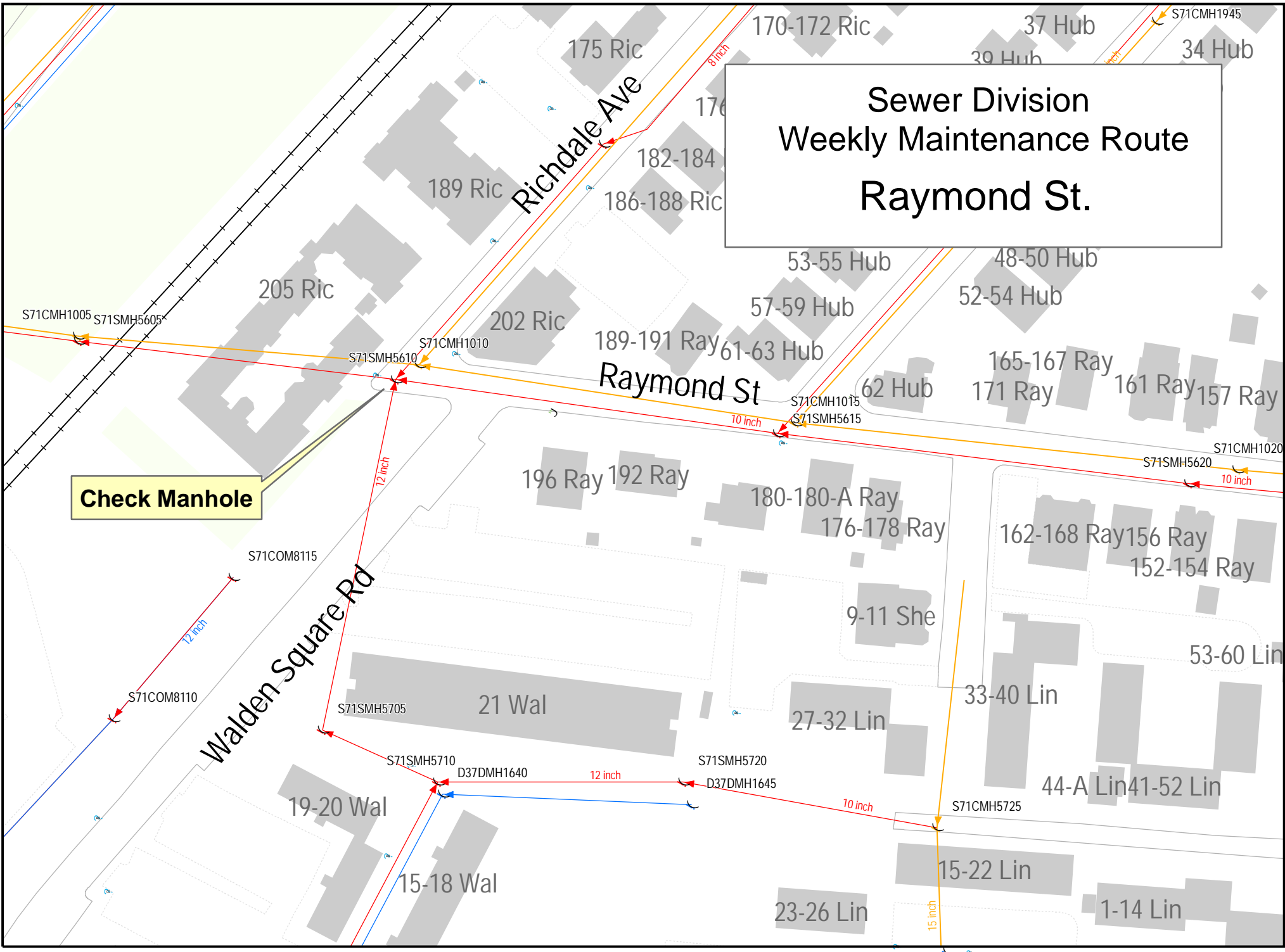
Check Manhole

Check Manhole



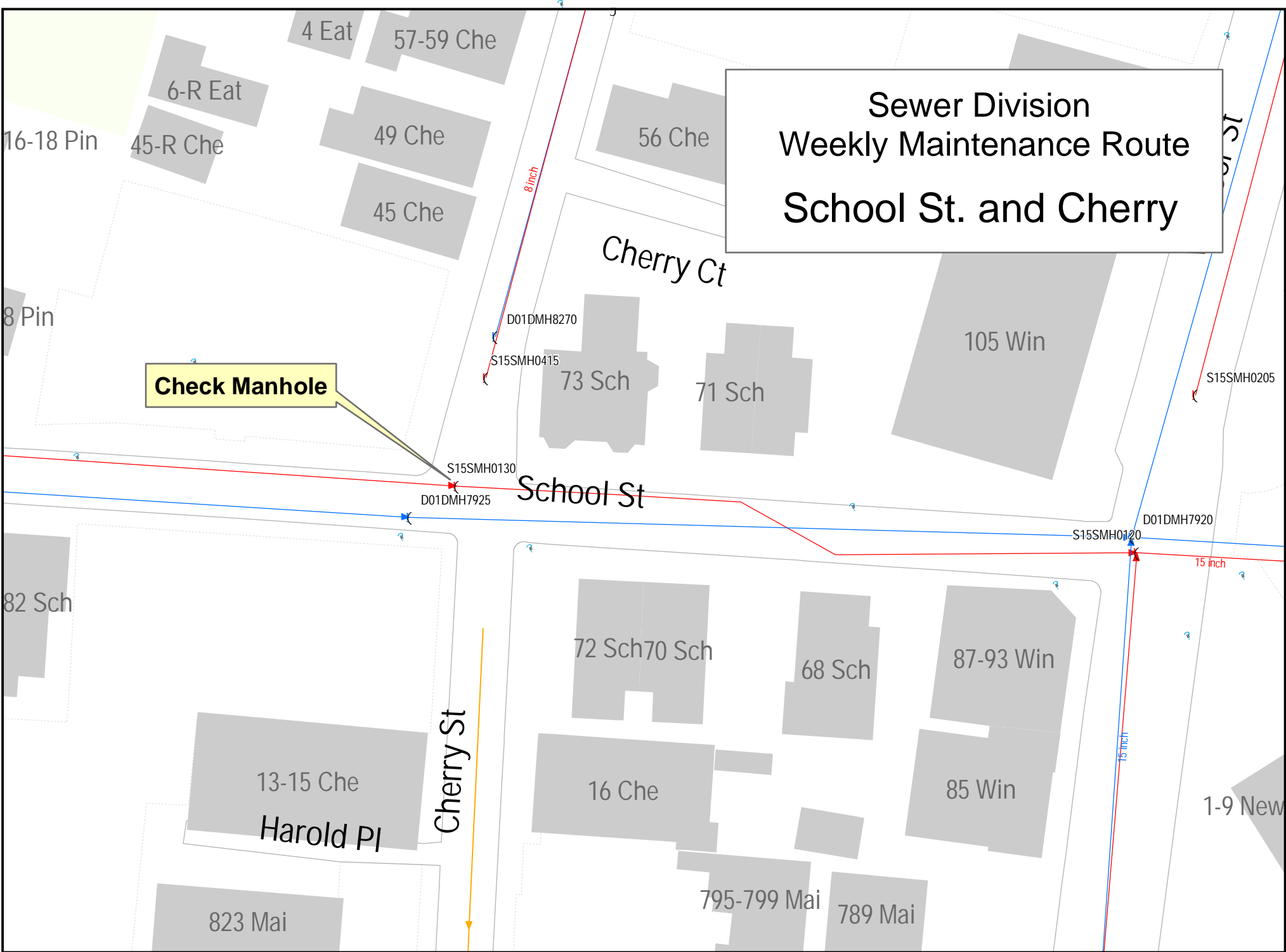
Sewer Division Weekly Maintenance Route Raymond St.

Check Manhole

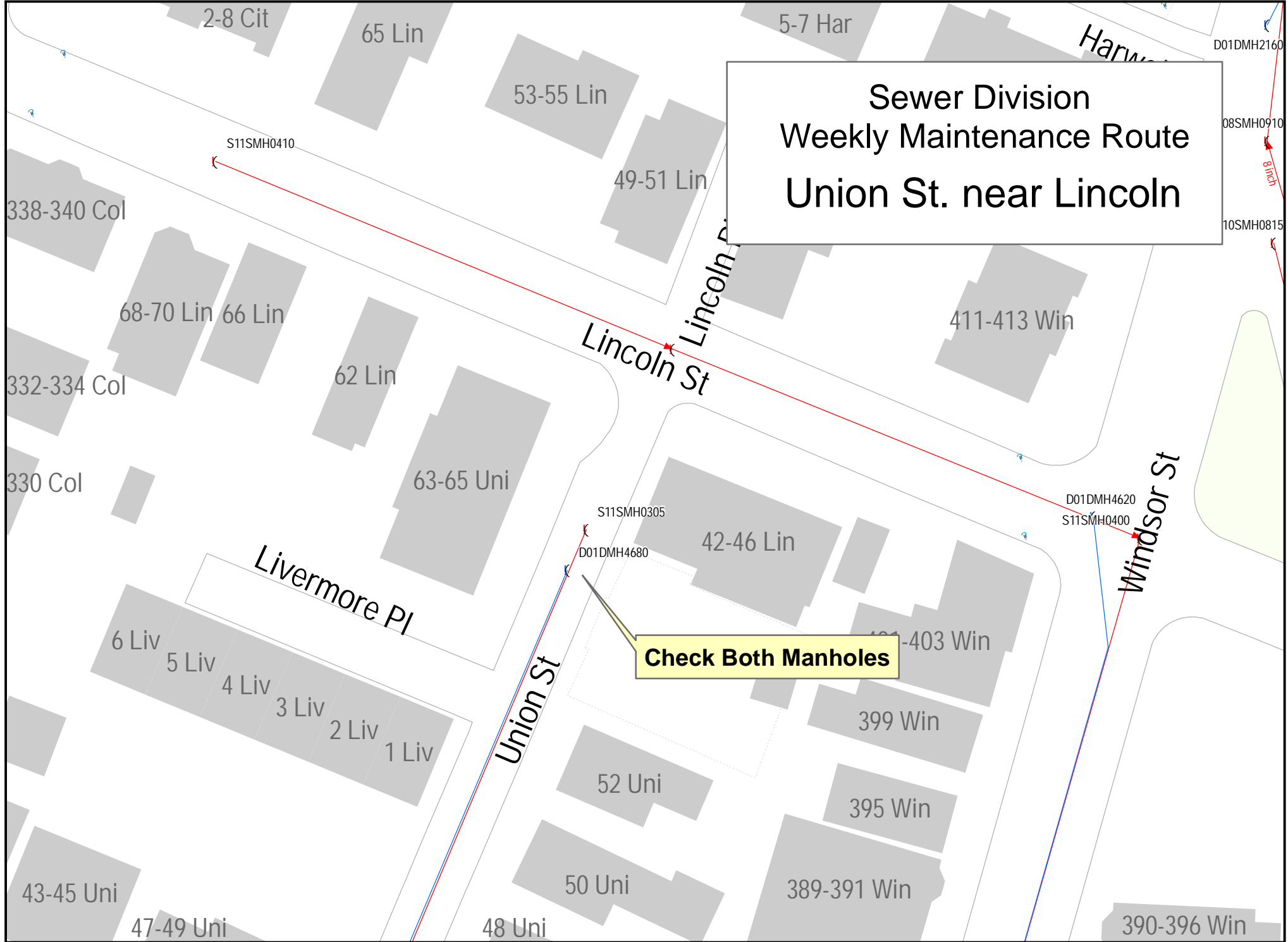


Sewer Division Weekly Maintenance Route School St. and Cherry

Check Manhole



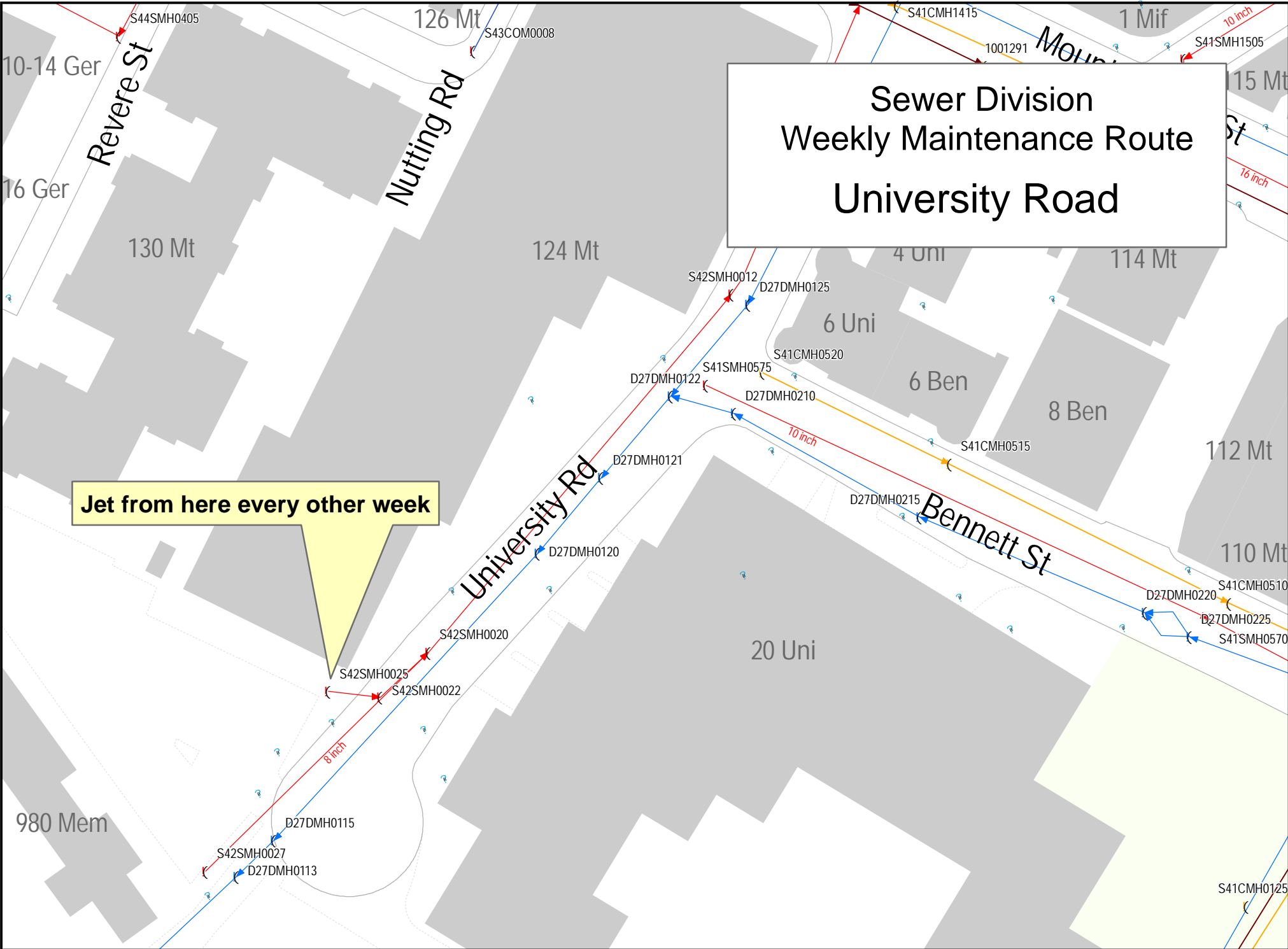
Sewer Division Weekly Maintenance Route Union St. near Lincoln



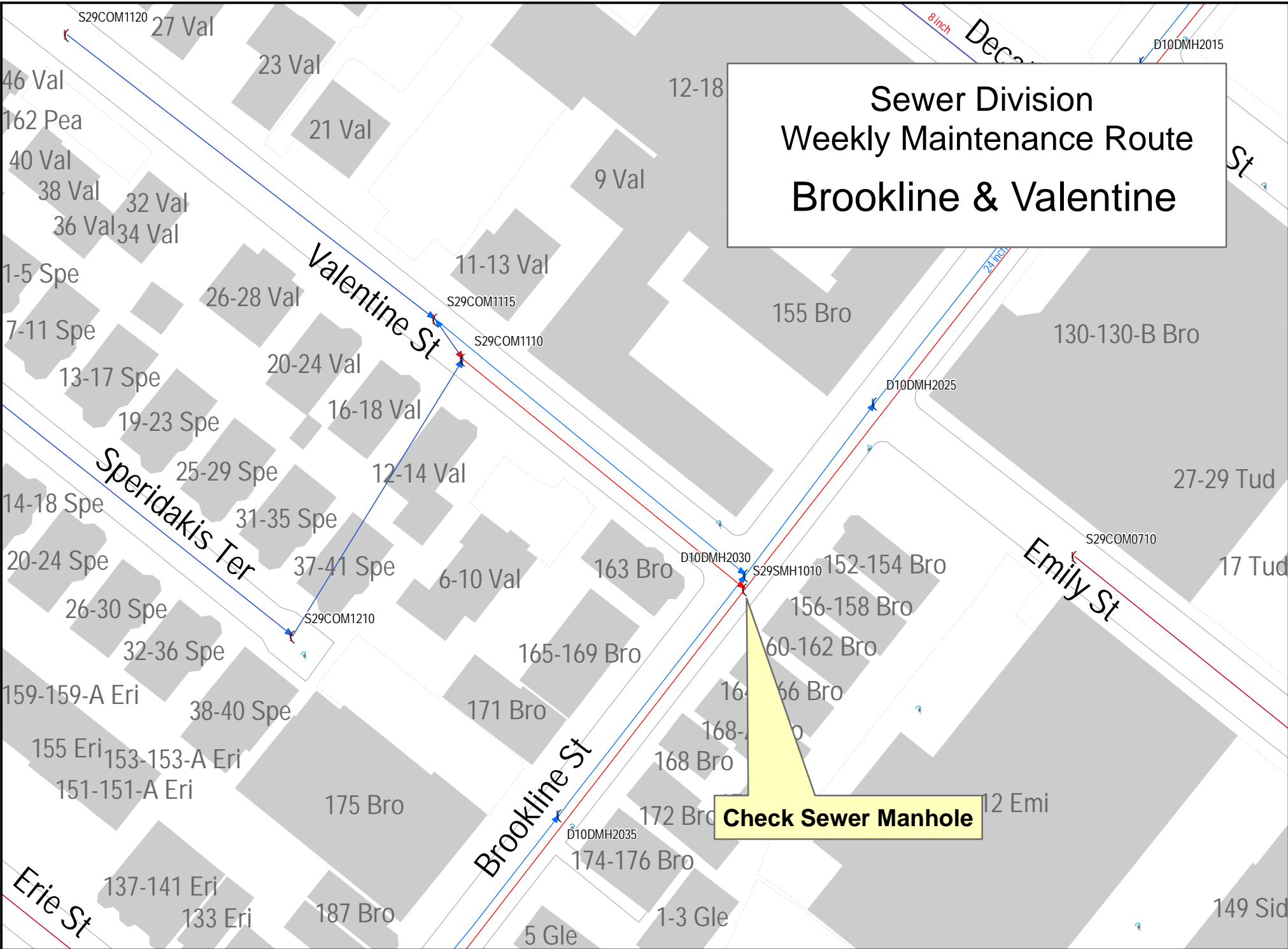
Check Both Manholes

Sewer Division Weekly Maintenance Route University Road

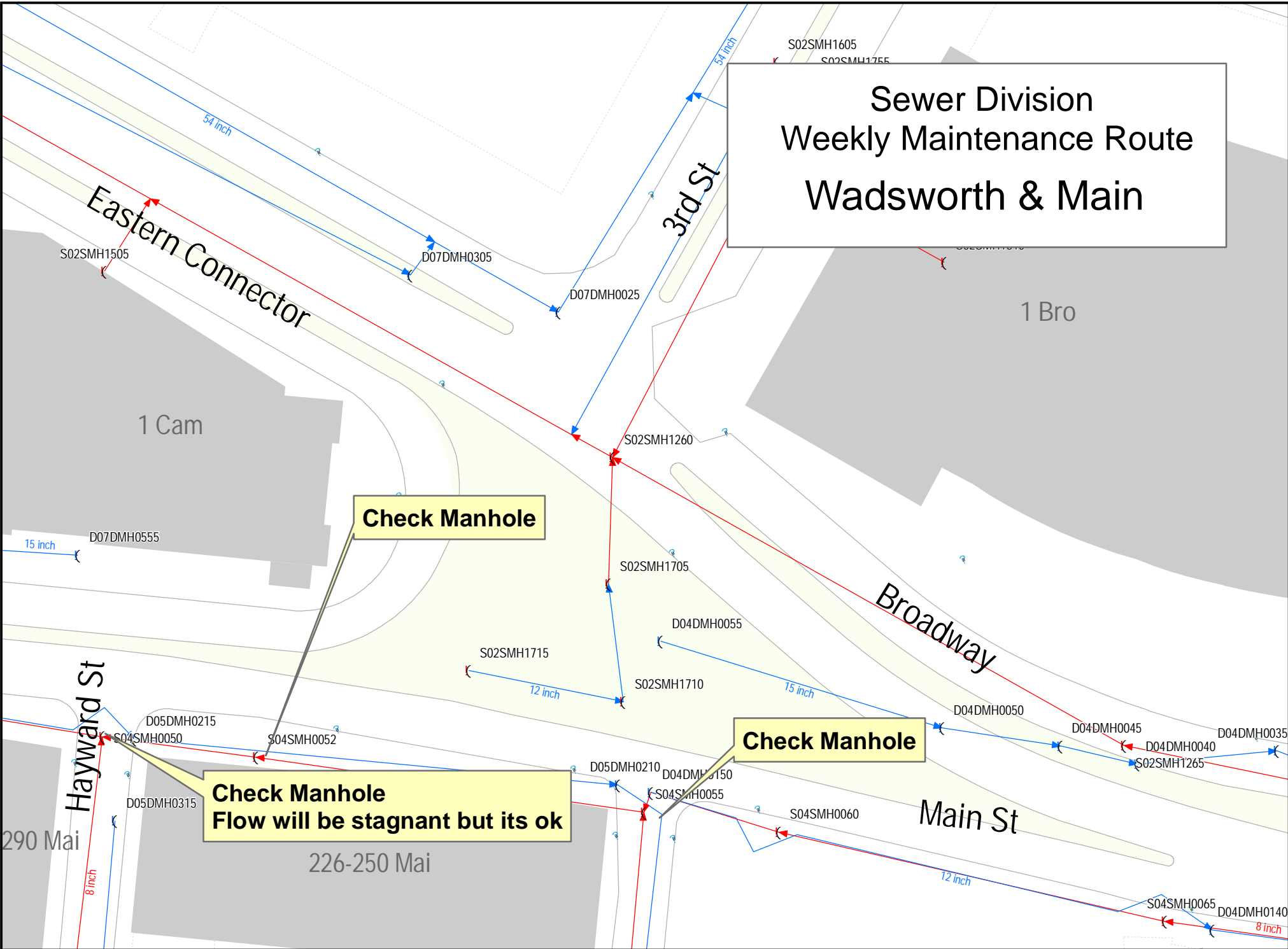
Jet from here every other week



Sewer Division Weekly Maintenance Route Brookline & Valentine



Sewer Division Weekly Maintenance Route Wadsworth & Main

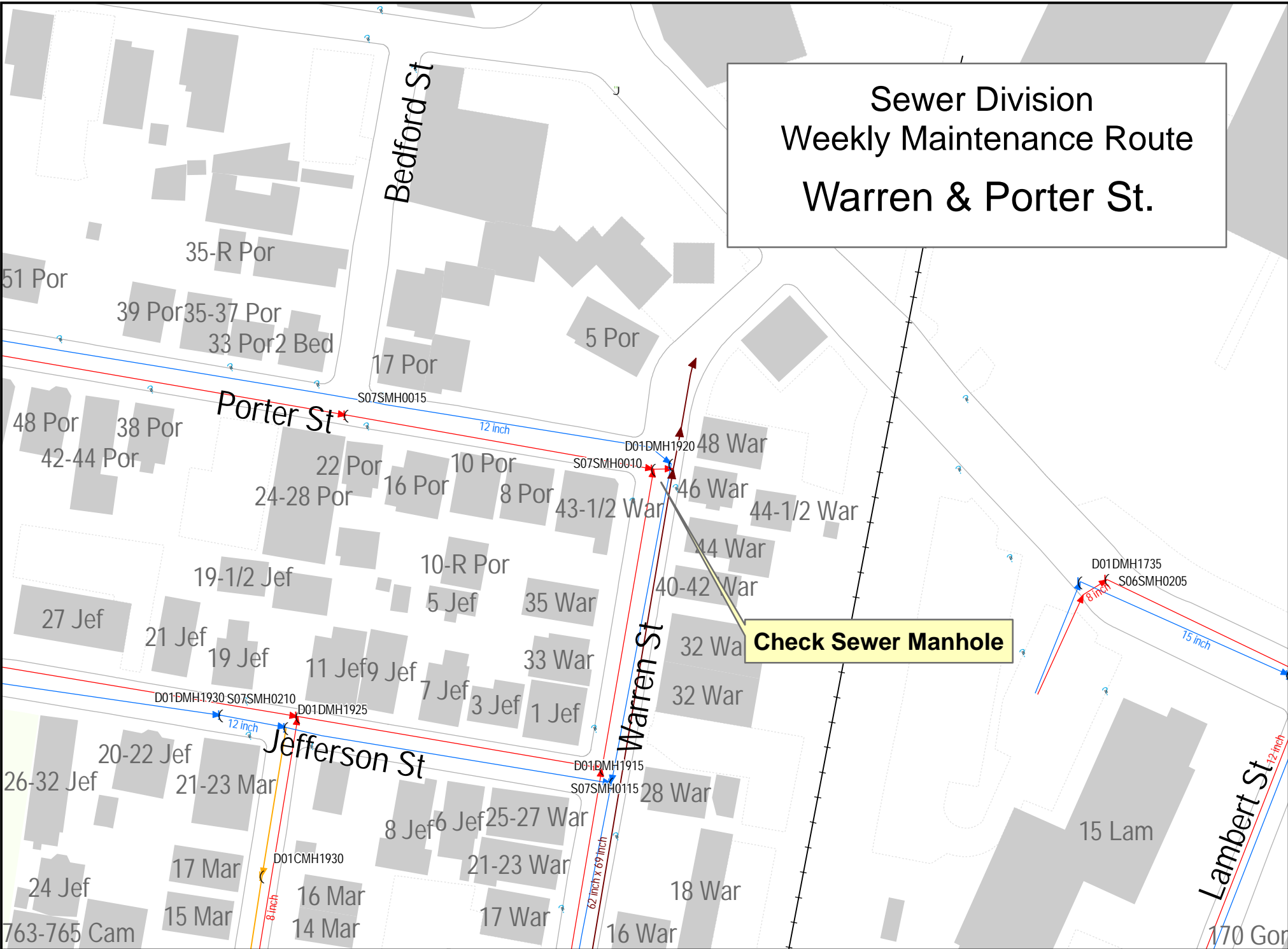


Check Manhole

**Check Manhole
Flow will be stagnant but its ok**

Check Manhole

Sewer Division Weekly Maintenance Route Warren & Porter St.



Check Sewer Manhole

Sewer Division
Weekly Maintenance Route
White Street

White St

Somerville Ave

35-36 Whi

1 Por

1899 Mas

815 Som

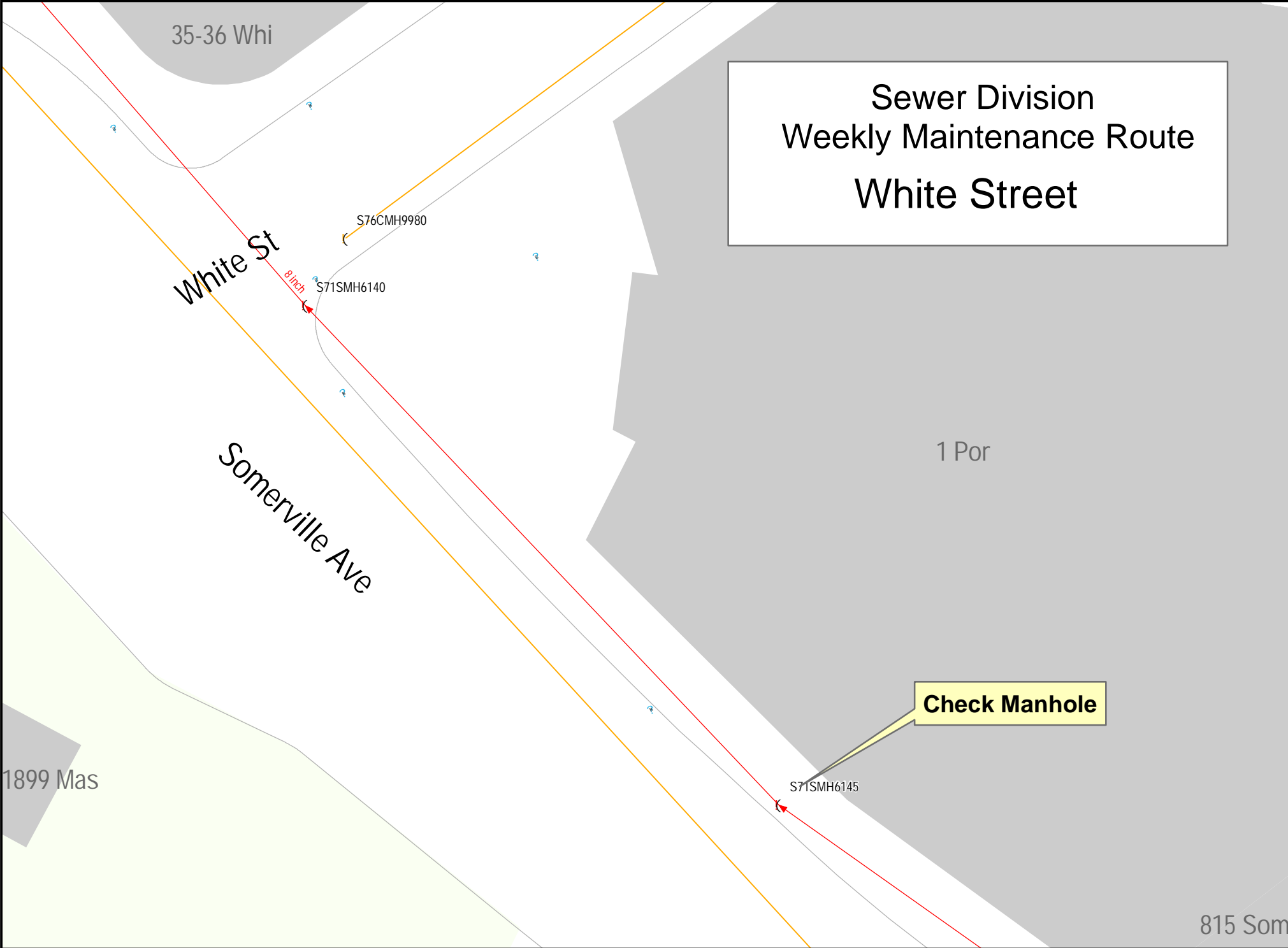
S76CMH9980

S71SMH6140

8 inch

Check Manhole

S71SMH6145



APPENDIX K
INTEGRATED PEST MANAGEMENT POLICY

1. No applications of pesticides (fungicide, herbicide or insecticide) will occur on at passive parks or tot lots as part of regular maintenance. Pesticides will not be applied on vegetation in passive parks or tot lots (except as described below) even in cases of infestation; turf in pesticide free parks that succumbs to an infestation will be removed and replaced.
2. An Integrated pest Management program will be introduced for management of athletic fields to minimize applications of herbicides and other maintenance practices will be modified to better achieve healthy and durable turf conditions. Pesticide applications on athletic fields will be done as needed only after other management options have been exhausted.
3. Fertilizers containing nutrients from at least 50% organic sources will be used on all facilities.
4. Non-selective herbicides, such as Roundup, will not be used on athletic areas (or on passive parks or tot lots, see item #1). There is one exception to this: the vent trench in Danehy Park must be treated with a non-selective herbicide several times per year in order to keep the area clear for venting as required under state Department of Environmental Protection landfill closure requirements. Access to this area is restricted, however, and detailed signage will be posted before and after these applications.
5. Use of insecticides will be limited to injection treatment of trees and to sever infestations by insects that could cause safety concerns, such as hornets' nests. In such cases of insect infestations, postings will be done before and after applications and treated areas will be roped off for 72 hours.
6. No permits for use of athletic fields will be issued for the first week of April, the first week of July, or the first weekend of September. On field areas, fertilizer with pre-emergent weed control (primarily for crabgrass) is to be applied in April. Fertilizer with broadleaf weed control may be applied in July, based on assessment of turf conditions. Fertilizer and lime, where needed, are to be applied in September (timed to avoid football practices). Access to these fields will be restricted by roping off the areas to avoid possible exposure of athletic users for 72 hours after application.

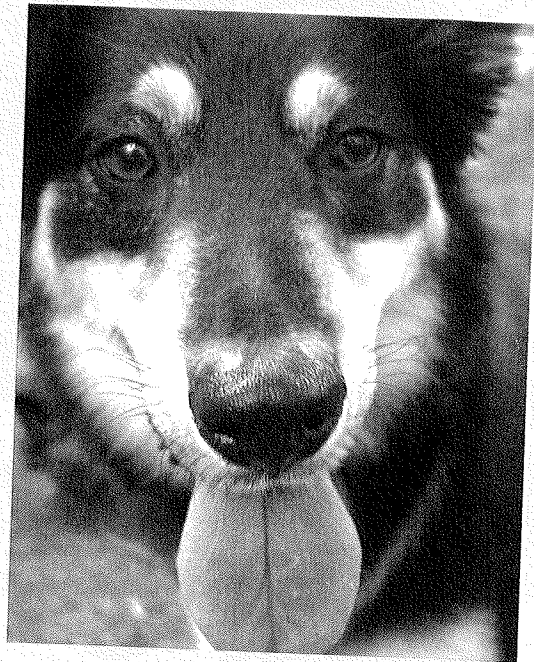
City of Cambridge Pesticide Policy

7. Signage to be posted before and after applications will include: date and time applied, what was applied and reason for applying it, applicator's name and affiliation, and pesticide license number, date when area will be accessible again, and who to contact with questions.
8. Installation of irrigation will be a priority for passive parks, where its use is feasible. This will contribute to turf quality for those areas on which herbicide use is prohibited
9. Department of Public works staff and contractors will be required to undergo training in IPM techniques. DPW contract specifications are being amended to reflect the new policy.
10. Soil samples will be taken from parks and athletic fields each Fall to determine lime needs for the years as well as fertilizer needs for the following year.
11. City contractors will be required to file a report with DPW each year listing all compounds applied and to supply copies of pesticide applicator licenses. These materials will be kept on file at DPW and made available to the public upon request.
12. Evaluation of park conditions will be undertaken after two years with an interim assessment completed in FY98, both of which will be provided to the City Council for consideration. A baseline assessment of a selection of representative parks is to be initiated in Spring 1997 and follow-up assessments will be done regularly.

It is significant to note that most of the above elements are already practiced at Danehy Park and the Fresh pond Reservation, which make up a very large proportion of the City's open space. This program will be expanded to include the remaining City-owned open space in Cambridge.

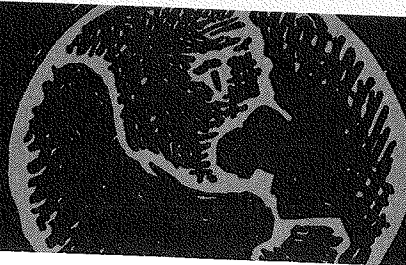
APPENDIX L
PUBLIC EDUCATION / OUTREACH MATERIALS

CAMBRIDGE
DEPARTMENT
OF PUBLIC
**'THE
WORKS**

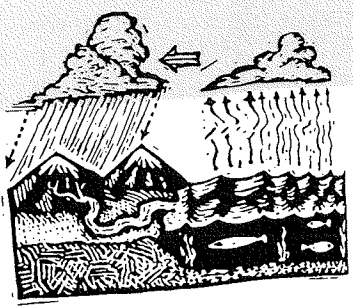


CAMBRIDGE
DEPARTMENT
OF PUBLIC
**'THE
WORKS**

147 Hampshire Street
Cambridge, MA 02139
617.349.4800 / TTY 617.349.4805
www.ci.cambridge.ma.us/~TheWorks



ANIMAL
WORKS



Water washing **over** the land can pick up an array of **contaminants** that can runoff to our local rivers either **directly** or through the stormwater drains. The Environmental Protection Agency has determined that pollution from this runoff **is** the largest cause of water quality problems in the U.S. Everyday personal actions you take can have a significant impact on water quality in **our** rivers.

As a pet owner **you** can help, simply by picking up **after** your pet. Being a responsible owner not only keeps the areas you walk **clean** for everyone, but also reduces contaminants in water runoff.



- For more information on services of the Animal Commission, call **617.349.4376** or visit www.ci.cambridge.ma.us/dept/animal.html
- For more information on how to keep Cambridge clean, contact the Department of Public Works at **617.349.4800** or visit www.ci.cambridge.ma.us/~TheWorks

Did You Know?

- Pet waste significantly contributes to pollutants (bacteria and organic matter) in the Charles River and Little River/Alewife Brook.
- Waste dumped or washed into catch basins (stormwater drains) is carried directly to rivers through the stormwater drain system. Even waste left in the street, far from a catch basin, can get washed into the drains during storms.
- Pet waste can carry viruses and bacteria that are extremely harmful to humans.
- Pet waste contains nitrogen and phosphorus nutrients that accelerate growth of damaging algae and aquatic weeds.
- In the City of Cambridge, it's illegal to leave pet waste in public areas, and even on private property you don't own or occupy.
- Pet waste is damaging to trees.

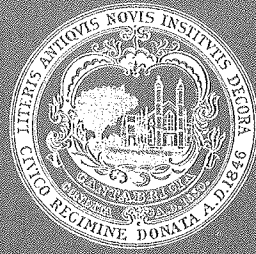
What You Can Do

- Always clean up after your pet and dispose of the waste in the trash, in a sealed or tied plastic bag, or in a toilet.
- Encourage your neighbors and other pet owners to be responsible; it's not hard, and it's part of the responsibility you have owning a pet.

What You Shouldn't Do

- Don't dispose of waste in a catch basin (stormwater drain). These systems go directly to local rivers.
- Don't use pet waste as a fertilizer. Bacteria in pet waste does far more harm than good.
- Don't add pet waste to a compost pile. The pile will never get hot enough to kill disease-causing organisms.

CAMBRIDGE
DEPARTMENT
OF PUBLIC
**THE
WORKS**



Dear Cambridge Business,

We are asking you to join us in a collaborative effort to keep our city as clean as possible. Without your cooperation, this would indeed be a difficult task.

Throughout the year, the Cambridge Department of Public Works (DPW) services all of the major squares, and empties all of the litter baskets in the City twice a day. Also, the DPW empties all of the public area recycling bins weekly.

In addition, we assign hand crews to assist local businesses in removing litter from the busiest areas of the city. Last year, we collected over **5,000 tons** of litter from our streets.

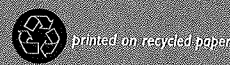
There are a number of ways local businesses can step up to the plate, and help to create a safer and more attractive Cambridge.

Please take a moment to review this brochure and learn how you can help join the effort to keep our city clean.

We thank you in advance.

Sincerely,

Lisa Peterson
Commissioner of Public Works



CAMBRIDGE
DEPARTMENT
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**THE
WORKS**

147 Hampshire Street
Cambridge, MA 02139
617.349.4800 / TTY 617.349.4805
www.cambridgema.gov/~TheWorks

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www.cambridgema.gov/~TheWorks



Keeping Cambridge Clean Requires a Team Effort

In partnership with the
Central Square Business Association, the
Harvard Square Business Association, the
Cambridge Combined Business Association,
and the Cambridge Chamber of Commerce



Help put a lid on litter.

Litter isn't just a problem for the City, but for your business. Litter-strewn storefronts and streets can drive potential customers away from our business districts – and from your business.

While the City does its part, local businesses are required by law to keep the areas abutting their property free of litter. *But it's not just the law; it's the right thing to do, for your business and your customers.*

On a larger community scale, litter can clog catch basins, cause flooding, or get washed into the Charles River or Alewife Brook. And that's everyone's problem.

Litter Baskets Are NOT For Commercial Trash:



Litter baskets are designed for casual disposal of litter by pedestrians.

It is illegal to dispose of commercial rubbish in litter baskets. When this happens, litter baskets immediately fill up causing overflow to spill onto the sidewalk.

Disposing Of Commercial Trash:

Rubbish that is put out too early is an eyesore, and can result in public health concerns.

It is illegal to put rubbish receptacles out prior to 3pm of the day before scheduled pickup, and receptacles must be removed by 6pm the day of pickup.

Posting/Flyering/Signage Regulations:

Posting fliers and other information on poles, walls, MBTA shelters, news racks or any public or private property without the owner's consent is prohibited in Cambridge.

City approval is required to place signs or display goods on sidewalks. To apply for a permit, call the City Clerk's Office at 617-349-4260.

What's Your Recycling Plan?

All Cambridge businesses are *required* to file a recycling plan with the DPW. Businesses have three recycling options:

1. Use the Recycling Drop-Off Center during open hours (Tues. & Thurs. 4 - 7:30pm, Sat. 9 - 4pm) for free (only businesses with 50 or fewer employees).
2. Receive recycling service through the City's curbside collection contractor at a subsidized rate.
3. Arrange recycling service with a private hauler.

■ *For more information on Commercial Recycling Regulations, call the Recycling Division at 617-349-4879*

How To Deal With Graffiti:

Report recent graffiti by calling the graffiti hotline at 617-349-6955. Contact the police (911) if you witness someone applying graffiti.

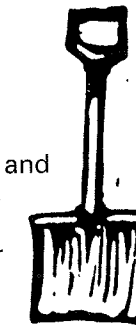
■ *Contact DPW at 617-349-4800 for a brochure on dealing with graffiti on or around your property.*

Snow And Ice Removal

Cambridge Businesses and Property Owners are required to:

- Remove snow from all sidewalks abutting their business or property within 12 hours after the snow stops falling in the day and before 1pm when it has fallen during the night.
- Clear ice off sidewalks or treat them with an ice-melting substance within six hours of the time the ice forms.
- Make openings in snow banks between streets and sidewalks at crosswalks, street corners and bus stops. The opening should be wide enough to enable persons with strollers or in a wheelchair to get onto sidewalks safely.
- Corner businesses are required to shovel the side street sidewalk and the sidewalk (including access ramps) in front of their property.

■ *Contact DPW at 617-349-4800 for a brochure on snow and ice removal*



What You Can Do:

- Clean the sidewalk and gutter adjoining your property on a daily basis.
- Provide proper disposal containers for cigarette butts immediately outside of businesses where customers, employees and others may smoke.
- Inform employees that litter baskets are strictly for pedestrian disposal of wrappers, cups, papers and small pieces of litter, *not* bags of trash.
- Use sealed rubbish receptacles, instead of plastic bags. Remove emptied receptacles after pickup.
- Refrain from posting and inform any contractors hired to distribute flyers that posting is prohibited.
- Obtain a permit prior to placing any obstruction on the sidewalk, including signs.
- Keep your Recycling Plan up to date, and inform employees of what materials must be recycled.
- Promptly remove snow and ice from the front of your property following a storm.
- Make sure catch basins are clear of snow and debris so they will work properly and control flooding.

■ *More information is available at the Public Works web site www.cambridge.ma.gov/~TheWorks*

What to Bring

Adhesives & Glues
Automobile Tires (up to 4 per household)
Engine Degreaser, Brake & Transmission Fluid
Fluorescent Light Bulbs (Straight & U-Shaped)
Hobby & Art Supplies
Household Cleaners & Spot Removers
Motor Oil
Non-Alkaline & Car Batteries
Paints (Oil-Based and Latex), Stains, Thinners, Strippers
Photo Chemicals & Chemistry Sets
Poisons, Insecticides, Pesticides & Weed Killers
Propane Cylinders (20 lbs or less only)
Solvents & Varnishes
Swimming Pool Chemicals
Waste Fuels (Kerosene, Gasoline & Antifreeze)
Wood Preservatives & Fiberglass Residue

What Not to Bring

We will not accept:

Alkaline Batteries (safe to throw in trash)
Ammunition, Fireworks & Explosives (call Fire Dept at 617.349.3300)
Asbestos (requires proper disposal)
Chlorine Bleach & Ammonia
Commercial/Industrial Waste
Compressed Gas Cylinders
Computers, televisions (CRTs) & other electrical appliances
Construction Debris
Empty Aerosol Cans (recycle curbside)
Fire Extinguishers
Infectious & Biological Waste
Prescription Medicines (discard medicine and recycle container)
Radioactive Waste
Smoke Detectors (safe to throw in trash)
Syringes

Other Waste Disposal Services

In addition to Household Hazardous Waste Days, Public Works also offers services related to the disposal of:

TVs/ Computer Monitors

Diagonal screen length 20" or less:

Free pickup on regular trash day. Limit one TV or monitor (with CPU, keyboard, and/or printer, totaling 40 pounds or less) per week.

Larger than 20":

Call 349-4800 to purchase sticker and schedule special Thursday pickup (\$20, \$15 for seniors).

Fluorescent bulbs, non-alkaline batteries, mercury-containing devices (e.g. thermometers)

Accepted at Drop-off Center,
147 Hampshire Street during open hours:
Tues/Thurs 4-7:30pm Sat 9am-4pm

Small Appliances:

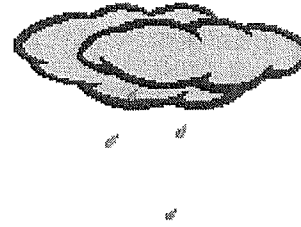
Accepted at Drop Off Center (hours listed above).

Motor Oil

Accepted at DPW, 147 Hampshire Street, during regular business hours, 8:30-5 M-F, or during Drop Center hours (listed above). Drain into container with tight lid. Follow the signs at DPW gate to the motor oil tank under shed. Ring the bell and wait for attendant.

Healthy Household Habits for Clean Water

Water washing over the land, whether from rain, snow melt, car washing or the watering of lawns and gardens picks up an array of contaminants including oils, metals and bacteria. These contaminants are deposited directly into local waterways overland or transported through catch basins. In Cambridge this runoff finds its way to the Charles River and to the Alewife Brook. The Environmental Protection Agency has determined that pollution from water runoff is the single largest cause of our nation's water quality problems. Everyday personal actions you take can have a significant impact on the quality of water in our local rivers.



By practicing healthy household habits, residents can keep common pollutants like pesticides, pet waste, and automotive fluids off the ground and out of our rivers. Adopt these healthy household habits and help protect the Charles River and the Alewife Brook. Remember to share these habits with your family and neighbors!

Lawn and Garden - Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute local waterways. In addition, yard clippings and leaves can wash into catch basins and contribute nutrients and organic matter in our rivers.

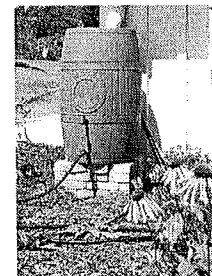
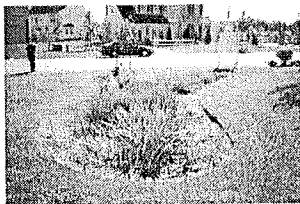
- Use pesticide and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Avoid applications if the forecast calls for rain. Purchase and use nontoxic and biodegradable products whenever possible.
- Select native plants and grasses that are drought and pest resistant. Native plants require less water, fertilizer and pesticides.
- Sweep up yard debris, rather than hosing down areas.
- Recycle yard waste including leaves, grass, plants, shrub prunings and twigs. Place in barrels with City stickers or in paper yard waste bags. Call Public Works at 617.349.4800 for yard waste stickers or for information about buying a rodent-proof compost bin for \$25.



- Don't over water your lawns and gardens. Water during the cool times of the day, and don't let water run off into the catch basins. Install a rain barrel or cistern to capture the rainwater from your roof for use in your yard.
- Before beginning an outdoor project, locate the nearest catch basin and protect them from debris and other materials.
- Cover piles of dirt and mulch being used in landscape projects to prevent these from being blown or washed into catch basins. Vegetate bare spots in your yard to prevent soil erosion.

Landscaping - Minimize the stormwater runoff from your property by simple changes in your landscape.

- Reduce the amount of paved area and increase the amount of vegetated areas or permeable areas in your yard. Redirect downspouts away from paved surfaces and onto vegetated areas to increase infiltration.
- Install Rain Barrels or Cisterns to collect rainwater from rooftops in mosquito proof containers. The water can be used later to water lawn or garden areas. Check with Cambridge DPW to see if they are sponsoring a Rain Barrel sales event.
- Install Rain Gardens and Grassy Swales to collect rainwater and allows it to soak into the ground.

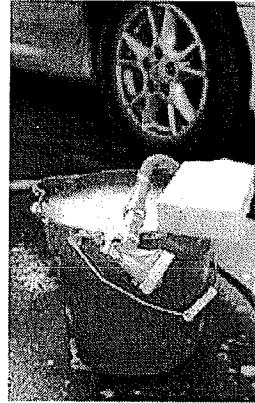


Pet Care - Pet waste can be a major source of bacteria and excess nutrients in local waters.

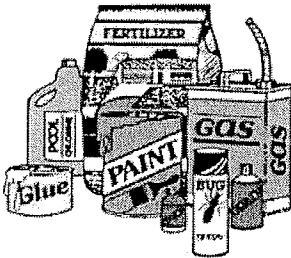
- Always clean up after your pet and dispose of the waste in the trash, in a sealed or tied plastic bag, or in a toilet.

Auto Care - Washing your car, degreasing auto parts and doing tune-ups at home can send detergent, oil and other contaminants to local waterways. Dumping automotive fluids into catch basins has the same results as dumping the materials directly into the Charles River and Alewife Brook.

- Use a commercial car wash or wash your car on a lawn or other unpaved surface to minimize the amount of dirty, soapy water flowing into catch basins.
- Check your car, motorcycle and other machinery and equipment for leaks and spills. Make repairs as soon as possible. Clean up spilled fluids with an absorbent material, and don't wash spills into nearby catch basins. Remember to properly dispose of the absorbent material.
- Recycle used oil and other automotive fluids. Don't dump them down the catch basin or dispose of them in your trash. Residents can bring used motor oil to Public Works during regular business hours and to the Recycling Drop-Off Center Tues/Thurs 4-7:30 and Sat 9-4pm.
- Reduce automobile use by carpooling, riding public transportation, riding your bike or walking. When it rains, air pollution turns into stormwater pollution.



Remember - Don't pour household products that contain chemicals on the ground, into catch basins or down the drain. Products such as insecticides, pesticides, oil-based paint, solvents, and used motor oil and other auto fluids must be properly disposed. The City of Cambridge sponsors several Household Hazardous Waste collection events each year.



Stormwater Hotline:

Report illegal dumping into catch basins or dirty looking discharges from outfalls to the DPW by calling (617) 349-4800 or (617) 349-4846, or by e-mail to: TheWorks@cambridgema.gov

For more information, see www.cambridgema.gov/TheWorks and <http://www.epa.gov/owow/nps/whatis.html>

Rain Gardens: Reuse Stormwater in Your Yard

Stormwater refers to rain and melted snow and ice. Stormwater runoff from your roof, driveway and other hard surfaces in your yard is typically directed towards the street and into the municipal storm drain system. This stormwater runoff, which has picked up harmful substances such as road salt, pet waste, heavy metals, pesticides, fertilizers and oils, ends up in local water bodies, where it can harm water quality and aquatic habitat. Meanwhile, water used for lawns and gardens is drawn from the local drinking water supply.

There are several ways that you can reduce runoff and better use stormwater in your yard while ensuring proper drainage. One relatively easy and attractive method is a rain garden. Find out how you can build a rain garden from the resources below.

Rain Garden resources:

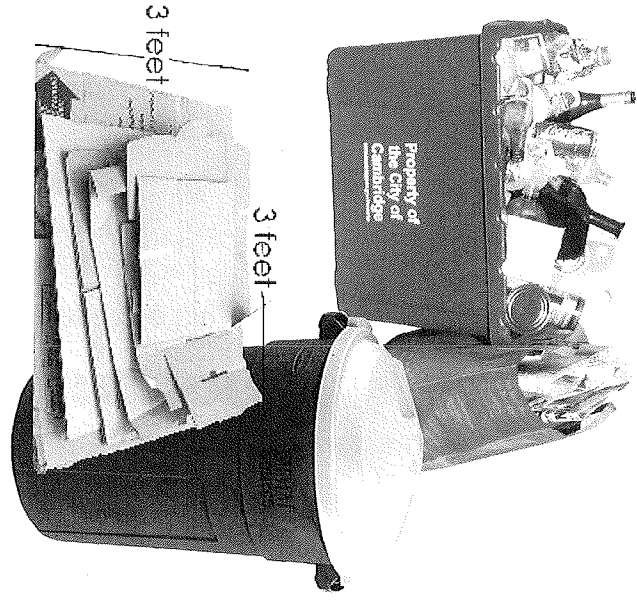
- [Rain Garden Fact Sheet](http://www.pwd.org/pdf/water_resources/conservation%20fact%20sheets/rain_garden.pdf), Portland ME Water District
http://www.pwd.org/pdf/water_resources/conservation%20fact%20sheets/rain_garden.pdf
- [How to Plant a Rain Garden](http://nricd.org/plantraingarden.htm), Northern Rhode Island Conservation District
<http://nricd.org/plantraingarden.htm>
- [Rain Gardens](http://www.appliedeco.com/RainGarden.cfm), Applied Ecological Services, Inc. <http://www.appliedeco.com/RainGarden.cfm>
- [Building a Rain Garden](http://www.mass.gov/dfwele/river/pdf/raingardenfactsheet.pdf), Massachusetts Riverways Program
<http://www.mass.gov/dfwele/river/pdf/raingardenfactsheet.pdf>
- [All About Rain Gardens](http://raingardennetwork.com/about.htm), Rain Garden Network <http://raingardennetwork.com/about.htm>
- [Rain Gardens - Using Spectacular Wetland Plantings to Reduce Runoff](http://www.bbq.org/gar2/topics/design/2004sp_raingardens1.html), Brooklyn Botanical Gardens http://www.bbq.org/gar2/topics/design/2004sp_raingardens1.html
- [Rain Gardens of West Michigan](http://www.raingardens.org/Index.php) <http://www.raingardens.org/Index.php>



For more information on Cambridge's Stormwater Management Program visit:
www.cambridgema.gov/TheWorks/stormwater/Index.html or contact Catherine Daly Woodbury at
Cambridge DPW at 617.349.4818

www.cambridgema.gov/recycle
617.349.4800 TTY 617.349.4005

DPW Business Hours:	Recycling Center Hours:
Mon 8:30am - 8pm	Tues 4pm - 7:30pm
Tues-Thurs 8:30am - 5pm	Thurs 4pm - 7:30pm
Fri 8:30am - Noon	Sat 9am - 4pm



Recycling and Trash Regulations for Residents

Updated Fall 2009

City of Cambridge
Department of Public Works
147 Hampshire Street

PRESORTED STANDARD
US POSTAGE PAID
CAMBRIDGE, MA
PERMIT 58646

147 Hampshire Street
Cambridge, MA 02139
617.349.4800
Info Line 617.349.4005
www.cambridgema.gov/recycle

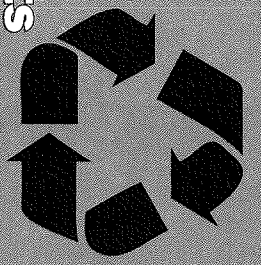


ECRWSS RESIDENTIAL CUSTOMERS CAMBRIDGE, MA

Available in: **español** **português** **kreyòl**

YES	NO
✓ Batteries: Vehicle & Non-alkaline	✗ Alkaline Batteries (OK in trash)
✓ Chemicals	✗ Ammunition, Fireworks, etc. (call 617.349.3300)
✓ Car Tires (4 per car)	✗ Asbestos (requires proper disposal)
✓ Fuels, Motor Oil & Antifreeze	✗ Bleach & Ammonia
✓ Fluorescent Bulbs (accepted at local hardware stores)	✗ Compressed Gas Cylinders
✓ Mercury Items (thermometers & thermostats)	✗ Computers / TVs
✓ Paints (oil & latex)	✗ Empty Aerosol Cans (recycle curbside)
✓ Propane Tanks (20 lbs or less)	✗ Fire Extinguishers
✗ *Underlined items accepted at Recycling Center	✗ Infectious, Biological or Radioactive Waste
	✗ Medicine (discard pills & recycle bottle)
	✗ Smoke Detectors
	✗ Syringes (for info call 617.665.3848)

Report illegal dumping into catch basins or dirty-looking discharges from outfalls to DPW.



Visit the recycling website!
Check out our A-Z "Get Rid of It Right" list, with details on how to recycle, donate or dispose of just about anything. Visit www.cambridgema.gov/recycle and click on Residents.

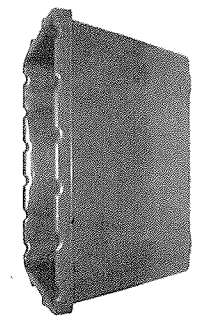
Exemptions:
If you have a disability that makes it difficult for you to recycle or set your trash out after 6pm, call the Commission for Persons with Disabilities at 617.349.4692 for an exemption application. Trash bags are not allowed the night before collection.



Printed on 100% post-consumer recycled paper with vegetable-based inks.

Curbside Recycling

Recycling Bins
Bins are only available to residential buildings with 9 units or less. 2 bins per household.



Pick up bins at DPW during business or Recycling Center hours.

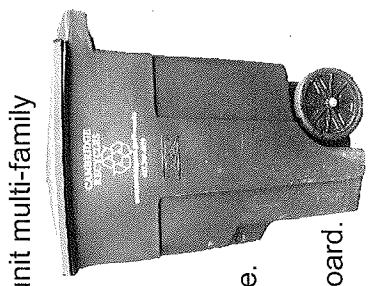
To request delivery, call or email bluebins@cambridgema.gov. Include address, phone, zip, number of bins needed, and whether you have broken bins.

Use a 32 Gallon Trash Can for Containers or Yard Waste



Residents can use any 32-gallon barrel for recycling glass, metal and plastic containers or yard waste. Face sticker to street when using barrel for recycling. Call DPW to request stickers.

Toters for 6+ Unit Buildings



Toters are available to 6+ unit multi-family residential buildings. These 96-gallon bins have wheels and lids. To request delivery, call or fill out the toter request form on our website. Toters are labeled for containers or papers/cardboard.

See INSIDE for curbside recycling and trash rules...

did you know about the City's...

Recycling Center

Located at 147 Hampshire Street near Inman Square, the Center is in the back right corner of the DPW yard.

Open Hours

Tuesday & Thursday 4pm-7:30pm
Saturday 9am-4pm

Proof of residency is required upon request. The DPW yard is closed to the public at all other times.

What to Bring

- Batteries (non-alkaline only)
- Books (hard and soft covers, binders OK)
- Cans & Bottles
- Cardboard & Paper
- Cell Phones
- Clothing (in a plastic bag)
- Flags
- Food Waste (no liquids or grease)
- Mercury Items (fluorescent bulbs, thermometers, thermostats)
- Metal Items (no sealed containers)
- Motor Oil
- Packaging Peanuts (no block Styrofoam)
- Plastic Bags (bubble wrap OK)
- Plastics, Large Items (laundry baskets, crates, etc.)
- Small Appliances & Electronics (no TVs, monitors, big appliances)
- Toner / Ink Cartridges

Finished compost is available to residents in small quantities April through October.

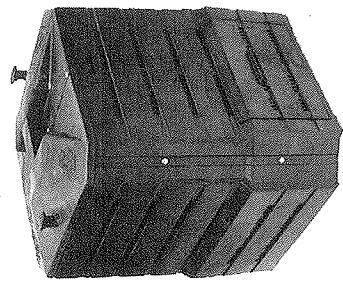
Compost Organic Waste

Composting is nature's way of recycling and is one of the best things you can do to reduce waste and protect the climate.

Turn food and yard waste back into soil for outdoor gardens or indoor plants. Visit our website for more information on each option.

1. Compost Outdoors

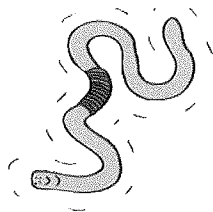
For only \$50, buy a rodent-resistant compost bin from DPW during business hours or when the Recycling Center is open.



Roughly 30" square, the bin holds over 11 cubic feet of material. Produce compost in 6-12 months!

2. Compost Indoors

Perfect for apartment dwellers, worm composting is easy with red worms. Use a plastic tub to recycle food scraps and make vermicompost.



3. Drop off Food Waste

Residents may bring food waste and food-soiled paper to the Recycling Center during open hours.



Collect scraps (vegetable & fruit peelings, coffee grounds, bread, etc.) in a paper bag or reusable container like a kitty litter bucket. Wrap meat and fish in newspaper to reduce odors.

Empty into the brown tofers on wheels. No yard waste, liquids, grease, pet/human waste, diapers, plastic, glass, metal or Styrofoam.

Recycling

Trash

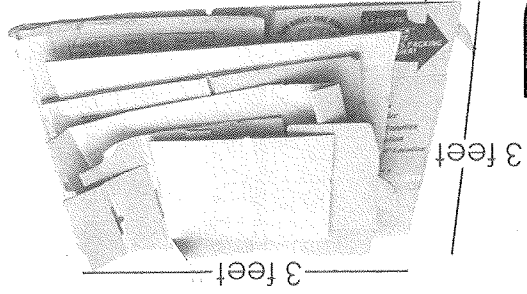
Recycling is mandatory in Cambridge, and easy! You can reduce your trash by at least 50% to help protect the environment and save the City money.

Trash, recycling and yard waste must be placed at the curb by 7am on collection day or after 6pm the night before.

During holiday weeks, collection is delayed one day.

Trash Preparation

1. Trash barrels / bags cannot exceed 50 gallons or 50 pounds.
2. No trash in boxes. Flatten and cut cardboard to 3 feet by 3 feet for recycling.
3. Trash must be in barrels with a tight lid when stored on private property and when set at the curb.
4. No trash in bags at the curb the night before collection. Only heavy duty bags accepted. No thin grocery or kitchen bags.



Cardboard must be flat and no larger than 3 feet by 3 feet.

File cleanup or lots of moving boxes?

Bring to the Recycling Center or call to borrow a "toter".



Place in a paper bag or separate bin. Staples, paper clips, spirals, windows on envelopes, and the plastic spout on cartons are OK.

- ✓ Cardboard
- ✓ Magazines & Newspapers
- ✓ Phone Books & Junk Mail
- ✓ Cereal Boxes, Paper Towel Rolls
- ✓ Milk / Juice Cartons
- ✓ Soft Cover Books (no hard covers)
- ✓ All Office Paper (no blueprints)
- ✓ Shredded Paper (in a stapled & labeled paper bag)
- × No Plastic Bags
- × No Pizza Boxes

Paper & Cardboard

Place rinsed containers loose in your bin. Keep containers separate from papers. Remove caps and lids. Do not pour grease or oil down any drain.

Bottles & Cans

- ✓ Aluminum (pie plates, trays & foil)
- ✓ Empty Aerosol Cans (no spray paint or oil cans)
- ✓ Glass Bottles & Jars (any color)
- ✓ Metal Cans (tin, steel & aluminum)
- ✓ Stiff Plastic Containers (must be marked #1-7, plant pots OK)

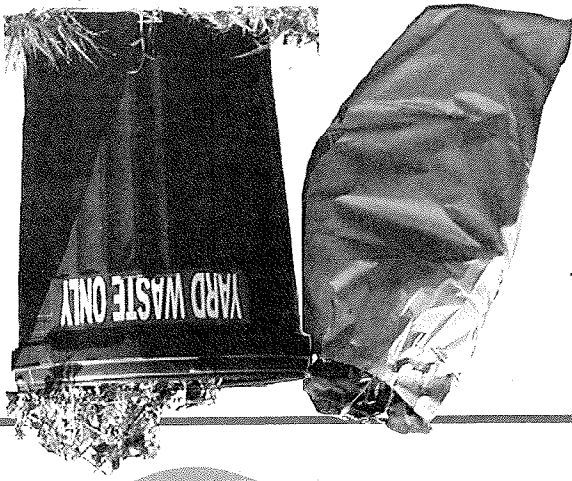


- × No Plastic Bags
- × No Styrofoam
- × No Liquids or Food Residue
- × No Dishes or Glasses
- × No Light Bulbs
- × No Windows
- × No Unmarked Plastics
- × No Clothes Hangers



Leaf & Yard Waste

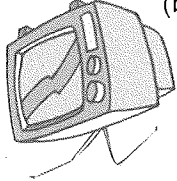
- ✓ Leaves, Grass & Plants
- ✓ Thin Shrub Prunings & Twigs (no more than 1 inch in diameter)
- ✓ Thick Limbs (3 feet in length) or 3 tied bundles, 3 ft x 3 ft)
- × No Plastic Bags
- × No Food
- × No Trash



Place loose in barrels with City stickers facing the street, or in paper leaf bags. Collection begins the 1st FULL week in April and ends the 2nd FULL week in December. Weather permitting, Christmas trees are generally collected for recycling for 2 weeks beginning the 1st FULL week after the holiday.

The City Will Pick Up

- **Electronics** (microwaves, stereos, box fans for recycling)
- **Computers & TVs** (20" or less diagonal length with hard drive, keyboard, mouse, and small printer or fax for recycling)
- **Furniture, Mattress & Boxspring** (or post at craigslist.org)
- **Toilet & Sink**
- **3 Tied Bundles Per Week:**
 - Carpet (3 ft x 3 ft)
 - Lumber / Tree Limbs (3 ft x 3 ft, no nails)



Call a Private Hauler

- **Construction & Demolition Debris** (including bathtubs, cabinets, pipes, sawdust, drywall, windows, etc. Contractors responsible for disposal. Donate materials in good condition: www.bostonbmc.org or www.bostonstore.org)
- **Property Cleanouts**
- **Automotive Parts**
- **Boilers & Furnaces**
- **Tree Stumps, Rocks, Soil, Dirt & Sand**

Fines for Violations

- × Trash is not prepared correctly
- × Large items do not have a sticker
- × Trash or recycling is set out too early
- × Empty containers or rejected items are not removed by 6 pm day of pickup
- × No recycling participation

Please call ahead.

*No charge for underlined items, but

- (over 20" diagonal length)
- TVs & Computer Monitors
- Water Coolers & Heaters
- Trash Compactors
- Stoves (gas & electric)
- Snow Blowers (remove gas)
- Refrigerators & Freezers (remove door per state law)
- Radiators
- Metal Filing Cabinets & Desks
- Lawnmowers (remove gas)
- Exercise Equipment & Bicycles
- Dishwashers
- Dehumidifiers
- Copiers & Printers (more than 40 lbs)
- Clothes Washers & Dryers
- Air Conditioners

Schedule pickup and purchase stickers in advance. \$20, \$15 for seniors. No commercial or industrial items.

Large Items



CAMBRIDGE
DEPARTMENT
OF PUBLIC
**THE
WORKS**



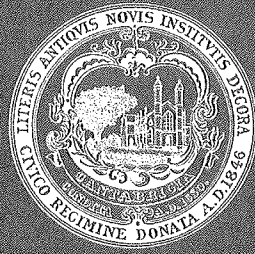
About Street Trees

Every year, the City of Cambridge adds around 300 trees to residential streets. Placement of the trees can provide many benefits to city residents:

- Trees lower street and sidewalk temperatures in summer months.
- Shade trees can reduce air conditioning costs and help cleanse the air of diesel and dust particles.
- Trees absorb carbon dioxide, which helps ease the negative effects of greenhouse gasses.
- Tree roots help hold stormwater in soil.
- Tree-lined streets encourage motorists to drive slower.
- Tree leaves and roots filter particles from stormwater, improving water quality.
- Trees significantly enhance property values.

The City Arborist oversees the health and maintenance of these trees throughout the year.

■ For more information on how to keep Cambridge green, call **617.349.4880**.



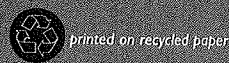
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www.ci.cambridge.ma.us/~TheWorks



Residential Street Tree Planting and Care

■ How the City's tree planting programs beautify, and how to care for your local trees...



CAMBRIDGE
DEPARTMENT
OF PUBLIC
**THE
WORKS**

147 Hampshire Street
Cambridge, MA 02139
617.349.4800 / TTY 617.349.4805
www.ci.cambridge.ma.us/~TheWorks



Tree Planting Programs

The City of Cambridge has a variety of programs available for residents interested in adding trees to public spaces around their buildings and homes.

Replacing Existing Trees

If a tree was removed from a well in front of your house, it can be replaced at no expense to you. Call **617.349.4051** and leave your name, address, and phone number. The City Arborist will contact you about a replacement.

Requesting a New Tree Planting

If you've never had a sidewalk tree in front of your house or building, you may be able to participate in the *Client Tree Program*. The cost for a new tree is \$140. Call **617.349.4051** and leave your name, address, ZIP code, and phone number. An application will be mailed to you.

Commemorative Tree Program

The *Commemorative Tree Program* is another option for people or organizations to honor a person, significant life event, or other idea. Your cost for a commemorative tree planting is \$200. For a brochure with more information on this program, call **617.349.4051**.

Plantings generally take place in spring, or in fall when necessary. All street trees depend on the help of residents for weeding and watering.

For new street trees, weekly watering and weeding is critical for their survival. Read further in this brochure for tips on caring for new and existing trees.



Tree Pruning Cycles

In 1999, the Department of Public Works launched an ambitious, wide-scale street tree pruning program, with a goal of visiting every tree once every four years.

Pruning helps create better looking, safer and healthier trees. It also reduces obstructions of street signs and lighting, and reduces the threat posed by dead limbs. The program also allows for a regular, systemized update of the city's tree database and a streamlining of removal and replacement.

By the end of 2002, nearly 80% of the city's 15,000 public trees will have been pruned. In coming years, the second cycle of pruning will begin, with year-by-year progress through all 13 city neighborhoods. In 2006, the second cycle will be complete.



How to Care For Trees

Caring for Street Trees

As noted, city trees depend greatly on residents for weeding and watering; newly planted trees especially so. Place a hose running at a slow trickle until the ground is well-soaked. "Tree Gators" can also work well: nylon and plastic bladders that can be attached to your tree and filled with water. Client Tree or Commemorative Tree Program participants can get a tree gator from the Department of Public Works. Call **617.349.4051**. Replacement trees are also eligible.

Caring for Private Property Trees

A decision to plant trees includes a commitment to care for and maintain them:

- Hire an ISA or Mass. certified arborist for care.
- Choose the best tree for your space, keeping in mind the mature size of the tree, aesthetic concerns, and landscaping needs.
- Water – don't overwater – during growth season
- Fertilizer isn't tree food; don't over-fertilize.
- Apply 3-4 inches of organic mulch/compost mix 6 inches away from the base. Extend the mix to the length of the branches, or as far as practical.
- *Don't* rent a chainsaw and ladder to prune or remove your large shade trees yourself.
- *Don't* hire inexperienced, non-licensed arborists.
- *Don't* plant large species trees in confined areas or too close to buildings. Remember, they grow!
- *Don't* over-mulch.

■ For a list of local arboricultural firms, call the City Arborist at **617.349.6433**. Leave your mailing address or fax number.

Protecting Water Quality from **URBAN RUNOFF**

Clean Water Is Everybody's Business

In urban and suburban areas, much of the land surface is covered by buildings and pavement, which do not allow rain and snowmelt to soak into the ground. Instead, most developed areas rely on storm drains to carry large amounts of runoff from roofs and paved areas to nearby waterways. The stormwater runoff carries pollutants such as oil, dirt, chemicals, and lawn fertilizers directly to streams and rivers, where they seriously harm water quality. To protect surface water quality and groundwater resources, development should be designed and built to minimize increases in runoff.

How Urbanized Areas Affect Water Quality Increased Runoff

The porous and varied terrain of natural landscapes like forests, wetlands, and grasslands traps rainwater and snowmelt and allows them to filter slowly into the ground. In contrast, impervious (nonporous) surfaces like roads, parking lots, and rooftops prevent rain and snowmelt from infiltrating, or soaking, into the ground. Most of the rainfall

The most recent National Water Quality Inventory reports that runoff from urbanized areas is the leading source of water quality impairments to surveyed estuaries and the third-largest source of impairments to surveyed lakes.

Did you know that because of impervious surfaces like pavement and rooftops, a typical city block generates more than 5 times more runoff than a woodland area of the same size?

and snowmelt remains above the surface, where it runs off rapidly in unnaturally large amounts.

Storm sewer systems concentrate runoff into smooth, straight conduits. This runoff gathers speed and erosional power as it travels underground. When this runoff leaves the storm drains and empties into a stream, its excessive volume and power blast out streambanks, damaging streamside vegetation and wiping out aquatic habitat. These increased storm flows carry sediment loads from construction sites and other denuded surfaces and eroded streambanks. They often carry higher water temperatures from streets, roof tops, and parking lots, which are harmful to the health and reproduction of aquatic life.

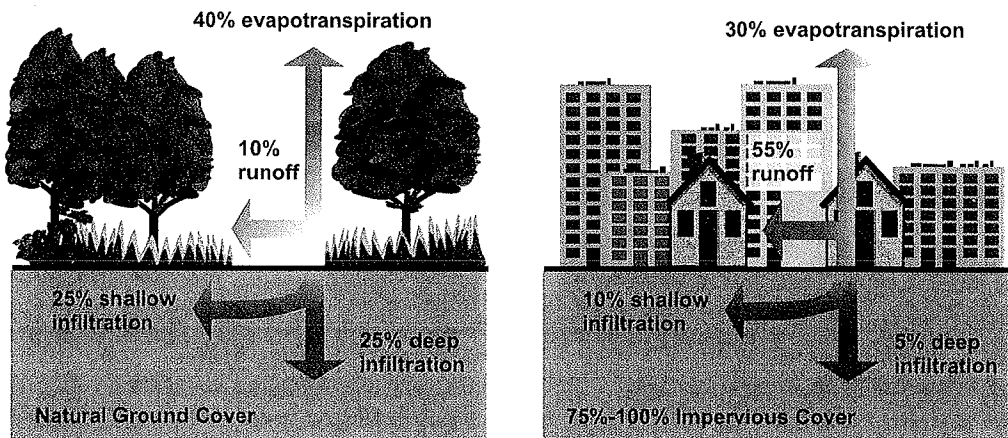
The loss of infiltration from urbanization may also cause profound groundwater changes. Although urbanization leads to great increases in flooding during and immediately after wet weather, in many instances it results in lower stream flows during dry weather. Many native fish and other aquatic life cannot survive when these conditions prevail.

Increased Pollutant Loads

Urbanization increases the variety and amount of pollutants carried into streams, rivers, and lakes. The pollutants include:

- Sediment
- Oil, grease, and toxic chemicals from motor vehicles
- Pesticides and nutrients from lawns and gardens
- Viruses, bacteria, and nutrients from pet waste and failing septic systems
- Road salts
- Heavy metals from roof shingles, motor vehicles, and other sources
- Thermal pollution from dark impervious surfaces such as streets and rooftops

These pollutants can harm fish and wildlife populations, kill native vegetation, foul drinking water supplies, and make recreational areas unsafe and unpleasant.



Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface runoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.

Managing Urban Runoff

What Homeowners Can Do

To decrease polluted runoff from paved surfaces, households can develop alternatives to areas traditionally covered by impervious surfaces. Porous pavement materials are available for driveways and sidewalks, and native vegetation and mulch can replace high maintenance grass lawns. Homeowners can use fertilizers sparingly and sweep driveways, sidewalks, and roads instead of using a hose. Instead of disposing of yard waste, they can use the materials to start a compost pile. And homeowners can learn to use Integrated Pest Management (IPM) to reduce dependence on harmful pesticides.

In addition, households can prevent polluted runoff by picking up after pets and using, storing, and disposing of chemicals properly. Drivers should check their cars for leaks and recycle their motor oil and antifreeze when these fluids are changed. Drivers can also avoid impacts from car wash runoff (e.g., detergents, grime, etc.) by using car wash facilities that do not generate runoff. Households served by septic systems should have them professionally inspected

and pumped every 3 to 5 years. They should also practice water conservation measures to extend the life of their septic systems.

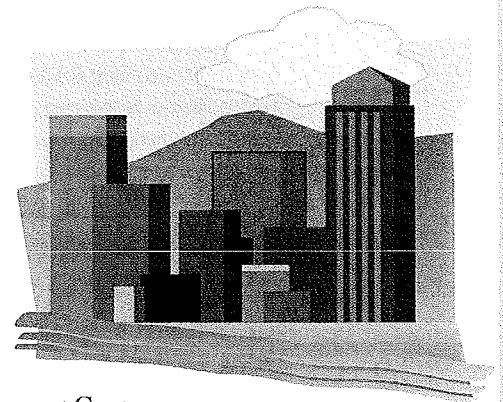
Controlling Impacts from New Development

Developers and city planners should attempt to control the volume of runoff from new development by using low impact development, structural controls, and pollution prevention strategies. Low impact development includes measures that conserve natural areas (particularly sensitive hydrologic areas like riparian buffers and infiltrable soils); reduce development impacts; and reduce site runoff rates by maximizing surface roughness, infiltration opportunities, and flow paths.

Controlling Impacts from Existing Development

Controlling runoff from existing urban areas is often more costly than controlling runoff from new developments. Economic efficiencies are often realized through approaches that target "hot spots" of runoff pollution or have multiple benefits, such as high-efficiency street sweeping (which addresses aesthetics, road safety,

and water quality). Urban planners and others responsible for managing urban and suburban areas can first identify and implement pollution prevention strategies and examine source control opportunities. They should seek out priority pollutant reduction opportunities, then protect natural areas that help control runoff, and finally begin ecological restoration and retrofit activities to clean up degraded water bodies. Local governments are encouraged to take lead roles in public education efforts through public signage, storm drain marking, pollution prevention outreach campaigns, and partnerships with citizen groups and businesses. Citizens can help prioritize the clean-up strategies, volunteer to become involved in restoration efforts, and mark storm drains with approved "don't dump" messages.



Related Publications

Turn Your Home into a Stormwater Pollution Solution!

www.epa.gov/nps

This web site links to an EPA homeowner's guide to healthy habits for clean water that provides tips for better vehicle and garage care, lawn and garden techniques, home improvement, pet care, and more.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas

www.epa.gov/owow/nps/urbanmm

This technical guidance and reference document is useful to local, state, and tribal managers in implementing management programs for polluted runoff. Contains information on the best available, economically achievable means of reducing pollution of surface waters and groundwater from urban areas.

Onsite Wastewater Treatment System Resources

www.epa.gov/owm/onsite

This web site contains the latest brochures and other resources from EPA for managing onsite wastewater treatment systems (OWTS) such as conventional septic systems and alternative decentralized systems. These resources provide basic information to help individual homeowners, as well as detailed, up-to-date technical guidance of interest to local and state health departments.

Low Impact Development Center

www.lowimpactdevelopment.org

This center provides information on protecting the environment and water resources through integrated site design techniques that are intended to replicate preexisting hydrologic site conditions.

Stormwater Manager's Resource Center (SMRC)

www.stormwatercenter.net

Created and maintained by the Center for Watershed Protection, this resource center is designed specifically for stormwater practitioners, local government officials, and others that need technical assistance on stormwater management issues.

Strategies: Community Responses to Runoff Pollution

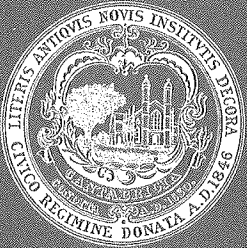
www.nrdc.org/water/pollution/storm/stoinx.asp

The Natural Resources Defense Council developed this interactive web document to explore some of the most effective strategies that communities are using around the nation to control urban runoff pollution. The document is also available in print form and as an interactive CD-ROM.

For More Information

U.S. Environmental Protection Agency
Nonpoint Source Control Branch (4503T)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

www.epa.gov/nps



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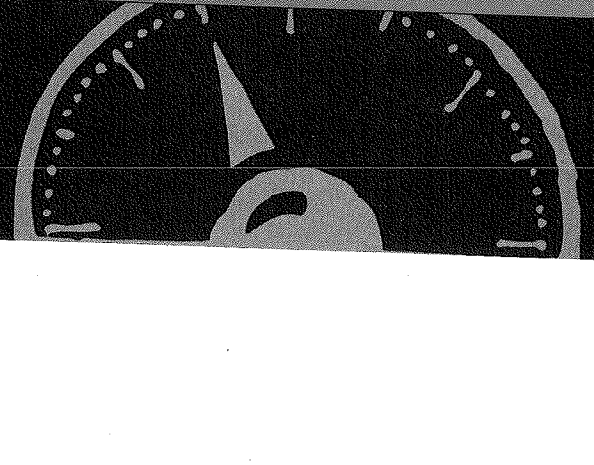



Vehicle Maintenance and Car Washing

Simple steps you take when caring for your car can do a lot to help the environment...

CAMBRIDGE
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147 Hampshire Street
Cambridge, MA 02138
617.349.4800 / TTY 617.349.4800
www.ci.cambridge.ma.us/~TheWorks



 printed on recycled paper



Water washing over the land, whether from rain, snow melt, car washing or the watering of lawns and gardens, picks up an array of contaminants including oils, metals, and bacteria. This runoff finds its way into the Charles River of the Little River/Alewife Brook either directly or through the stormwater drain system. The Environmental Protection Agency has determined that pollution from stormwater runoff is the single largest cause of our nation's water quality problems. Everyday personal actions you take can have a significant impact on the water quality in our rivers.

The City of Cambridge Department of Public Works sponsors Household Hazardous Waste Collection Days. Contact DPW at **617.349.4800** for the date of the next collection day. If you witness illegal dumping of waste materials into catch basins, call DPW immediately – and confidentially – at **617.349.4800**.



Did You Know?

- Many car care products contain toxic chemicals that can contaminate surface and groundwater resources.
- Motor oil, antifreeze, battery acid, gasoline, car waxes, degreasers, radiator flushes, and rust preventatives can all contribute to contamination, and pose direct threats to fish and other aquatic species.
- A single quart of motor oil can contaminate up to two million gallons of drinking water. A gallon of oil can create an eight acre oil slick.
- Contaminates in stormwater runoff can impact fishing and swimming conditions.
- Cars can pollute indirectly through emissions-borne metals and other pollutants.

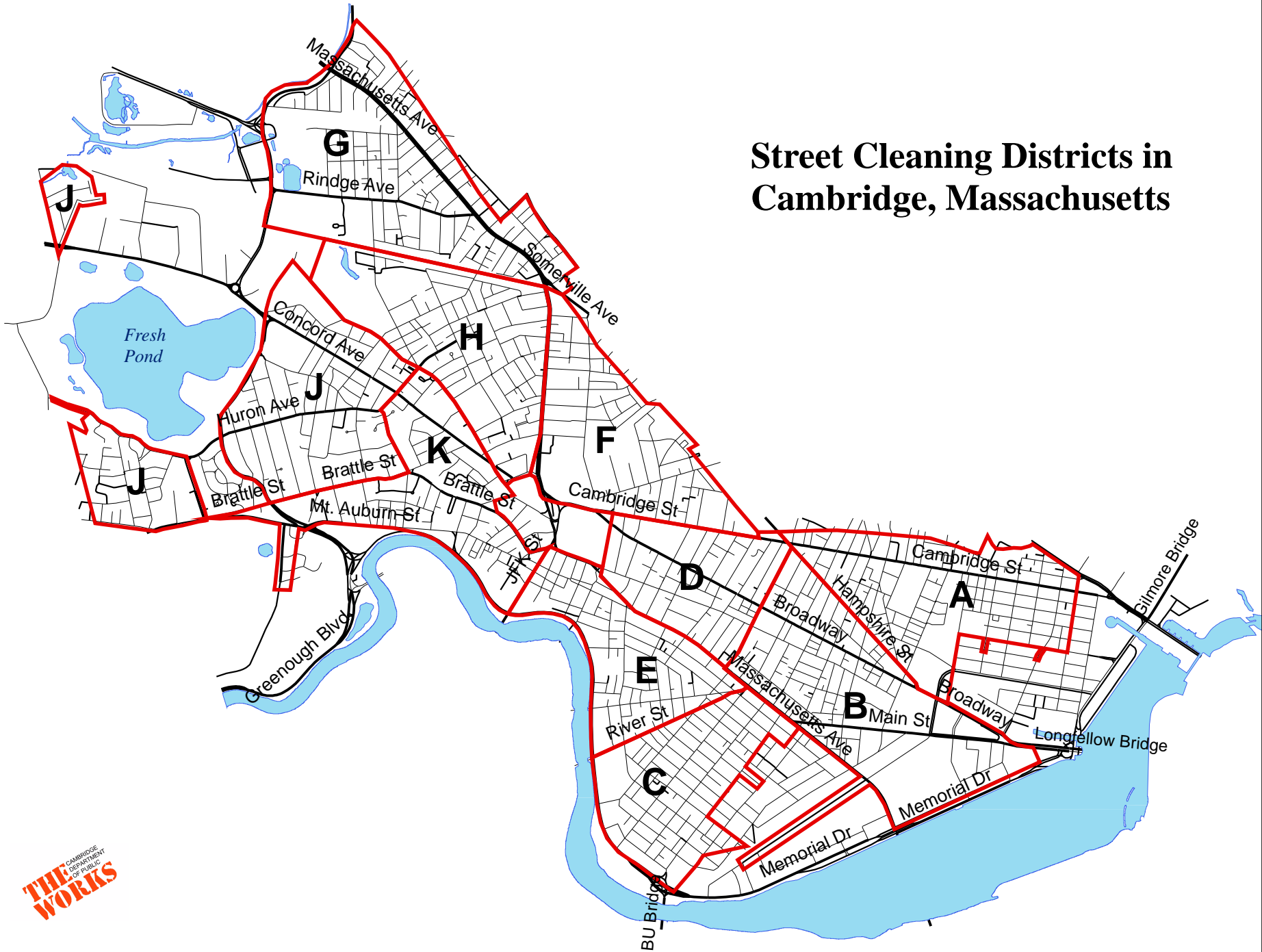
What You Can Do

- When changing fluids from your car, drain into a clean and unbreakable container, seal it and label it. Take the fluids to a hazardous waste collection site.
 - Never pour any chemicals or hazardous substances from cars down catch basin (stormwater drains), on the ground, or leave in driveways or parking lots.
 - Recycle used oil by returning it to the point of purchase with your receipt. The law (MGL Ch 21 S. 52A) requires retailers to accept it and recycle at no cost to you.
 - Quickly contain and clean up spills. Do not wash it away with a hose.
- Check your car regularly for leaks.
- Car pooling, public transportation, walking or using a bicycle for transportation helps reduce all kinds of car emissions-borne pollutants.
- Don't "top off" when fueling your car.
- Use a car wash to clean cars. They're connected to the sanitary sewer system, and often conserve water by recycling rinse water.
- If you wash your own car, use a shutoff nozzle on your hose, use detergent and water sparingly, use non-phosphate, biodegradable detergents, and wash on a pervious surface area that will absorb the water (such as grass) whenever possible.

■ For more information on used oil recycling, contact the DPW Recycling Program at **617.349.4800** or visit www.ci.cambridge.ma.us/~TheWorks

APPENDIX M
STREET SWEEPING SCHEDULE & MAP

Street Cleaning Districts in Cambridge, Massachusetts



2009 STREET SWEEPING SCHEDULE

DISTRICT	SIDE	DAY	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
A	ODD	1st Wed	1	6	3	1	5	2	7	4	2
A	EVEN	1st Thur	2	7	4	2	6	3	1	5	3
B	ODD	1st Mon	6	4	1	6	3	31-Aug	5	2	7
B	EVEN	1st Tues	7	5	2	7	4	1	6	3	1
C	ODD	1st Fri	3	1	5	30-Jun	7	4	2	6	4
C	EVEN	2nd Mon	13	11	8	13	10	14	30-Sep	9	14
D	ODD	2nd Tues	14	12	9	14	11	8	13	10	8
D	EVEN	2nd Wed	8	13	10	8	12	9	14	30-Oct	9
E	ODD	2nd Thur	9	14	11	9	13	10	8	12	10
E	EVEN	2nd Fri	10	8	12	10	14	11	9	13	11
F	ODD	3rd Mon	29-Apr	18	15	20	17	21	19	16	21
F	EVEN	3rd Tues	21	19	16	21	18	15	20	17	15
G	ODD	3rd Wed	15	20	17	15	19	16	21	18	16
G	EVEN	3rd Thur	16	21	18	16	20	17	15	19	17
H	ODD	3rd Fri	17	15	19	17	21	18	16	20	18
H	EVEN	4th Mon	27	29-May	22	27	24	28	26	23	28
J	ODD	4th Tues	28	26	23	28	25	22	27	24	22
J	EVEN	4th Wed	22	27	24	22	26	23	28	25	23
K	ODD	4th Thur	23	28	25	23	27	24	22	30-Nov	24
K	EVEN	4th Fri	24	22	26	24	28	25	23	27	None
HOLIDAY SCHEDULE		Will be posted & swept									
20-Apr		29-Apr									
25-May		29-May									
3-Jul		30-Jun									
7-Sep		31-Aug									
12-Oct		30-Sep									
11-Nov		30-Oct									
26-Nov		30-Nov									
25-Dec		None									

APPENDIX N
PUBLIC NOTIFICATION DOCUMENTATION

WARNING
WET WEATHER
SEWAGE DISCHARGE
CITY OF CAMBRIDGE
OUTFALL NO. CAM401A

WARNING
WET WEATHER
SEWAGE DISCHARGE
CITY OF CAMBRIDGE
OUTFALL NO. CAM004

WARNING
WET WEATHER
SEWAGE DISCHARGE
CITY OF CAMBRIDGE
OUTFALL NO. CAM005

WARNING
WET WEATHER
SEWAGE DISCHARGE
CITY OF CAMBRIDGE

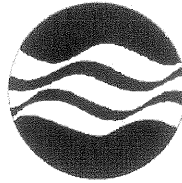




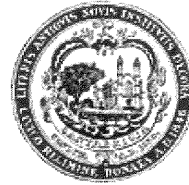
Informational Sign – John Wald Park



Massachusetts Water Resources Authority



Boston Water and Sewer Commission



City of Cambridge

PUBLIC NOTICE **April 2010**

Lower Charles River Basin Combined Sewer Overflows Update

This notice and enclosed map poster comply with Massachusetts Department of Environmental Protection (DEP) requirements to provide information about Combined Sewer Overflow (CSO) discharges, potential public health impacts, and the progress of CSO control measures being implemented to improve the water quality of the Lower Charles River Basin.

The water quality of the Lower Charles River Basin has greatly improved over the past two decades, but continues to be impaired at times due to bacteria and other pollutants from a number of sources, including cross connections between sanitary sewers and storm drains, urban stormwater runoff, and CSOs.

Portions of Boston, Cambridge and Brookline are served by combined stormwater and sanitary sewer systems common in older cities. During large rainfall events, the increased volume of stormwater together with the sanitary flow can exceed the capacities of the local and MWRA systems and contribute to combined sewer overflows to the Charles River Basin. These overflows relieve the sewer system to prevent system flooding and sewage backups into homes, businesses and streets.

As recently as the early 1980's, there were more than 20 active overflow locations (CSO outfalls) along the Charles River Basin or its tributaries. Most have been permanently closed through the CSO control efforts of Massachusetts Water Resources Authority (MWRA), Boston Water and Sewer Commission (BWSC), the City of Cambridge, and the Town of Brookline, and there are now nine outfalls that can release untreated CSO to the Charles River Basin during heavy rainfall. In addition, MWRA's Cottage Farm CSO Facility can release treated CSO to the basin at Outfall MWR201.

As part of the Boston Harbor Case (D. Mass. C.A. No. 85-0489-RGS), MWRA is undertaking certain corrective actions to reduce or eliminate CSO discharges to Boston Harbor, the Mystic, Charles and Neponset rivers, and Alewife Brook. MWRA, in conjunction with BWSC, the City of Cambridge and the Town of Brookline, is completing projects that are intended to significantly reduce CSO discharges to the Charles River in accordance with a long-term control plan that is approved by the U.S. Environmental Protection Agency and DEP and mandated by federal court order.

Work already completed by MWRA and the communities has greatly reduced CSO events and discharge volume to the Charles River. MWRA estimates that average annual CSO discharge volume to the river has been reduced by 98% since 1987, when MWRA accepted responsibility for developing and implementing the long-term control plan. More information about the long-term control plan can be found in MWRA's latest CSO Annual Progress Report, at <http://www.mwra.com/annual/csoar/2009/csoar2009.pdf>.

The enclosed map poster also provides more information on CSOs to the Lower Charles River Basin, as well as related website links and email and telephone contacts.



Massachusetts Water Resources Authority



City of Cambridge



City of Somerville

April 2008

JOINT PUBLIC NOTICE

Alewife Brook Combined Sewer Overflows Progress Update

This notice, required by the Massachusetts Department of Environmental Protection, is an annual update on the progress of Combined Sewer Overflow control measures to improve the water quality of Alewife Brook. Discharges to Alewife Brook originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control sources of pollution.

You are also receiving this notice if your property appears to lie in the extended floodplain of Alewife Brook.

The water quality of Alewife Brook is often impaired due to bacteria and other pollutants from a number of sources, including cross connections between sanitary sewers and storm drains, urban stormwater runoff and Combined Sewer Overflows. During both wet and dry weather, Alewife Brook generally fails to meet state bacteria standards for fishing and swimming.

Portions of Cambridge and Somerville are served by combined stormwater and sanitary sewer systems common in older cities. There are now eight Combined Sewer Overflow outfalls along Alewife Brook that release untreated discharges during moderate and heavy rainfall. These discharges relieve the sewer system, preventing sewage backups into homes, businesses and streets.

The Massachusetts Water Resources Authority (MWRA) in conjunction with the Cities of Cambridge and Somerville is implementing several projects that when completed will significantly reduce Combined Sewer Overflows into the Alewife Brook. These efforts are required by a federal court order issued to the MWRA for the Boston Harbor Clean-Up. MWRA, along with the affected Combined Sewer Overflow communities, is implementing 35 Combined Sewer Overflow control projects along Boston Harbor, the Mystic, Charles and Neponset Rivers, and Alewife Brook.

Work already completed by the MWRA, Cambridge and Somerville has noticeably reduced the number of Combined Sewer Overflow events and the total volume discharged to Alewife Brook. MWRA and Somerville also closed four Combined Sewer Overflow outfalls through these control efforts.

The next phase of Combined Sewer Overflow control work includes a stormwater outfall and treatment wetland associated with sewer separation work that is planned in the neighborhood east of Fresh Pond Reservation in Cambridge. Sewer separation in this area is expected to further reduce Combined Sewer Overflow discharges significantly and result in the closing of a major Cambridge Combined Sewer Overflow outfall. Design and construction of this project and the other Alewife Brook Combined Sewer Overflow projects have been delayed due to the filing of a citizens' appeal of MassDEP's Superseding Order of Conditions issued for the project pursuant to the Wetlands Protection Act. While MassDEP has

upheld its wetlands approval, the citizen petitioners have filed an appeal in Massachusetts Superior Court. Notwithstanding the delay due to the continuing appeals, MWRA and the City of Cambridge are developing a final work plan and schedule with the goal of resuming design and construction of the Alewife Brook Combined Sewer Overflow projects beginning in 2008.

For more information on Combined Sewer Overflows and the Combined Sewer Overflow abatement program, visit its website at www.mwra.com or visit the Cambridge and Somerville websites at www.cambridgema.gov/~TheWorks and www.ci.somerville.ma.us.

Updated information on water quality in the Alewife Brook watershed can be found at the Mystic River Watershed Association (MyRWA) website, www.mysticriver.org and at a “real time” site co-sponsored by the City of Somerville and MyRWA at www.mysticriveronline.org.

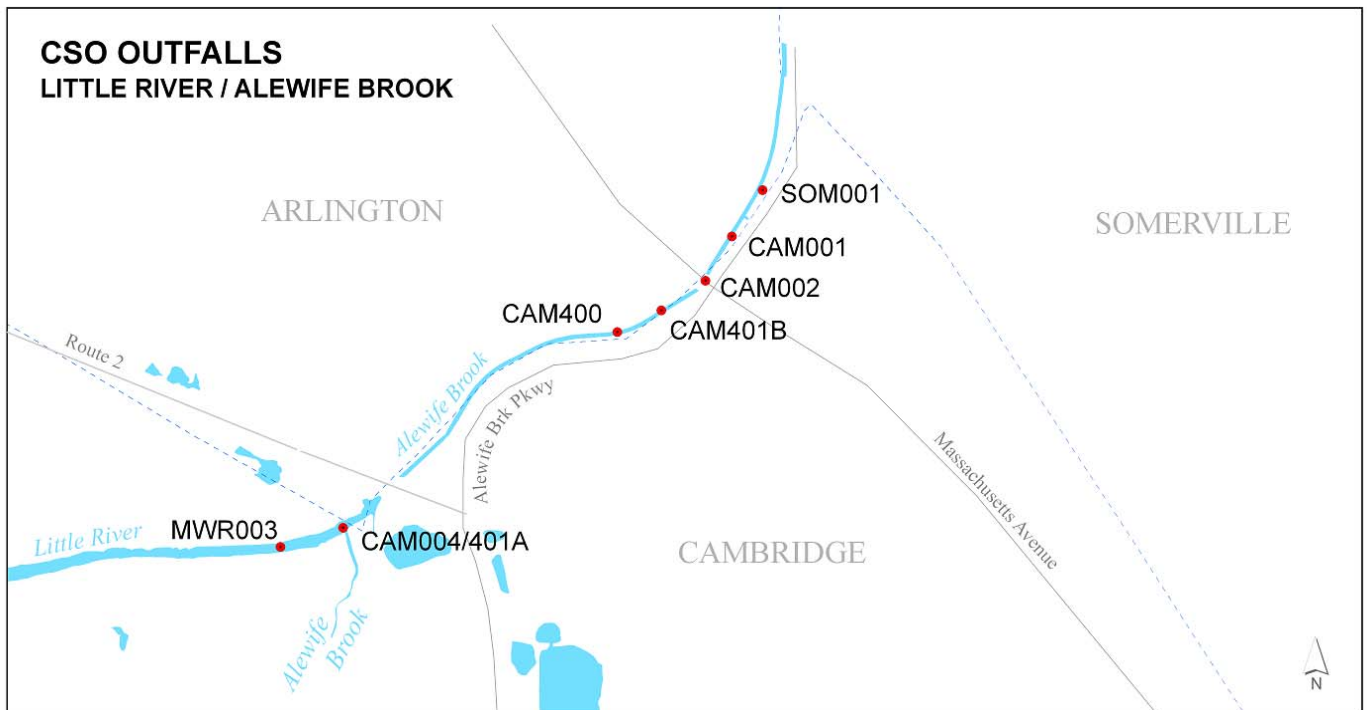
It is important to understand that floodwaters in all cases can present health risks, and proper precautions are necessary to minimize these risks during flooding events. Public health officials recommend avoiding contact with the Brook during rainstorms and for 48 hours afterwards, as there may be increased health risks due to bacteria or other pollutants. The Massachusetts Department of Environmental Protection has developed guidance for responding to flooding or sewer backups for homeowners, which can be found at <http://www.mass.gov/dep/water/laws/flooding.htm>.

Date: April 15, 2008
Contacts: Ria Convery, Communications Director, Massachusetts Water Resources Authority
(617) 788-1105 or ria.convery@mwra.state.ma.us

Owen O’Riordan, Assistant Commissioner of Engineering, City of Cambridge
(617) 349-4845 or ooriordan@cambridgema.gov

Charles E. O’Brien, P.E., Director of Engineering, City of Somerville
(617) 625-6600 ext. 5410 or cobrien@ci.somerville.ma.us

Little River/Alewife Brook Combined Sewer Overflow Outfalls



APPENDIX O
WASTEWATER & STORMWATER USE REGULATIONS;
LAND DISTURBANCE REGULATIONS AND ORDINANCE

**The City of Cambridge
Department of Public Works**

The City of Cambridge Commissioner of Public Works (“the Commissioner”) hereby adopts these Land Use Regulations pursuant to Cambridge Municipal Code Chapter 13.16 Wastewater and Stormwater Drainage System.

LAND DISTURBANCE REGULATIONS

**Article I
General Provisions And Definitions**

Section 1 – Reference to Regulations.

These regulations shall be referred to as the Land Disturbance Regulations.

Section 2 – Authority.

Under the authority granted by the Home Rule Amendment of the Massachusetts Constitution, the Home Rule statues and pursuant to the regulations of the federal Clean Water Act found at 40 CFR 122.34 and in furtherance of the goals set forth therein and pursuant to Cambridge Municipal Code, ch. 13.16, the City of Cambridge Commissioner of Public Works has established the following Regulations governing stormwater management standards for land disturbance including but not limited to disturbance from development and redevelopment projects.

Section 3 – Applicability and Purpose.

This Regulation shall apply to all activities that:

- (i) disturb one (1) or more acres of land,
- (ii) exceed fifty thousand (50,000) square feet of Gross Floor Area,
- (iii) have a project parcels(s) equal to or greater than one acre in size,
- (iv) include outdoor parking for ten (10) cars or more,
- (v) require a Special Permit from the Planning Board, or
- (vi) in the opinion of the City Engineer may result in an adverse impact of the municipal Sewer, Combined Sewer, Stormwater Drainage Systems or Water Resources..

The purpose of this Regulation is to reduce pollutants in any stormwater runoff from construction activities and to address post construction stormwater runoff from new development and redevelopment projects.

All federal, state and local permit requirements related to implementation of stormwater management facilities must be met by the owner prior to facility use.

Section 4 – Severability.

The provisions of these Regulations are severable. If any provision of these Regulations or any specific application to any person or circumstance, is held invalid, such invalidity shall not affect other provisions or applications which can be given effect in the absence of the invalid provision or application.

Section 5 – Required Applications and Permits.

- (a) Applications and permits required by these Regulations are in addition to applications and permits that may be required by other federal, state (including MWRA) and local laws or Regulations. The

following applications and permits are required by these Regulations and issued by the DPW as they apply:

- (i) Land Disturbance Permit
- (ii) NPDES General Permit for Discharges from Large and Small Construction Activities as issued by EPA, where applicable

Section 6 – Definitions

All terms used in these Land Disturbance Regulations shall be as defined in the City of Cambridge Wastewater and Stormwater Drainage Use Regulations unless otherwise defined herein:

Certified Professional In Erosion And Sediment Control (CPESC) shall mean a certified specialist in soil erosion and sediment control. This certification program, sponsored by the Soil and Water Conservation Society in cooperation with the American Society of Agronomy, provides the public with evidence of professional qualifications.

Construction and Waste Materials shall mean excess or discarded building or site materials, including but not limited to concrete truck washout, chemicals, litter and sanitary waste at a construction site that may adversely impact water quality.

Clearing shall mean any activity that removes the vegetative surface cover.

Development shall mean the modification of land to accommodate a new use or expansion of use, usually involving construction.

Erosion shall mean the wearing away of the land surface by natural or artificial forces such as wind, water, ice, gravity, or vehicle traffic and the subsequent detachment and transportation of soil particles.

Erosion And Sediment Control Plan shall mean a document containing narrative, drawings and details developed by a Massachusetts registered professional engineer (P.E.), a Certified Professional in Erosion and Sedimentation Control (CPESC) or a Massachusetts Registered landscape architect, which includes best management practices (BMPs), or equivalent measures designed to control surface runoff, erosion and sedimentation during pre-construction and construction related land disturbance activities.

Grading shall mean changing the level or shape of the ground surface.

Impervious Surface shall mean any material or structure on or above the ground that prevents water infiltrating the underlying soil.

Land Disturbance shall mean any action that causes a change in the position, location, or arrangement of soil, sand, rock, gravel of similar earth material.

Land Disturbance Permit is a permit required to conduct land disturbing activities.

Land Disturbing Activity shall mean any activity that causes a change in the position or location of soil, sand, rock, gravel, or similar earth material.

Massachusetts Stormwater Management Policy is the Policy issued by the Department of Environmental Protection, and as amended, that coordinates the requirements prescribed by state regulations promulgated under the authority of the Massachusetts Wetlands Protection Act G.L. c. 131 §. 40 and Massachusetts Clean Waters Act G.L. c. 21, §. 23-56. The Policy addresses stormwater impacts through implementation of performance standards to reduce or prevent pollutants from reaching water bodies and control the quantity of runoff from a site.

Redevelopment shall mean the development, rehabilitation, expansion, demolition or phased projects that disturb the ground surface or increase the impervious area on previously developed sites.

Sediment shall mean mineral or organic soil material that is transported by wind or water, from its origin to another location; the product of erosion processes.

Sedimentation shall mean the process or act of deposition of sediment.

Slope shall mean the incline of a ground surface expressed as a ratio of horizontal distance to vertical distance.

Soil shall mean any earth, sand, rock, gravel, or similar material.

Soil Stabilization shall mean the use, singly or in combination, of mechanical, structural, or vegetative methods, to prevent or retard erosion.

Water Resources shall mean lakes, ponds, streams, rivers, wetlands, and groundwater.

Article II Permits and Plan Review Procedures

Section 1 – Permits.

- (a) **Filing Application.** A Land Disturbance Permit is required when a project:
- (i) disturbs one (1) or more acres of land,
 - (ii) exceed fifty thousand (50,000) square feet of Gross Floor Area,
 - (iii) has project parcels(s) equal to or greater than one acre in size,
 - (iv) includes outdoor parking for ten (10) cars or more,
 - (v) requires a Special Permit from the Planning Board, or
 - (vi) in the opinion of the City Engineer the project may result in and adverse impact of the municipal Sewer, Combined Sewer, Stormwater Drainage Systems or Water Resources.

The site owner or his/her representative shall file with the DPW, two (2) copies (one paper and one electronic copy on CD) of a completed application package for a Land Disturbance Permit. Permit issuance is required prior to any land disturbing activity. While the applicant can be a representative, the permittee must be the owner of the site. The Land Disturbance Permit Application package shall include:

- (i) completed Application Form with original signatures of all owners;
 - (ii) the Stormwater Management Plan as specified in Article IV, Sections 1 and 2;
 - (iii) the Erosion and Sediment Control Plan as specified in Article V, Sections 1 and 2;
 - (iv) the Operation and Maintenance Plan as specified in Article VI, Section 1;
 - (v) the NPDES General Permit for Discharges from Large and Small Construction Activities, as applicable;
 - (vi) payment of the application and review fees.
- (b) **Entry.** Filing an application for a permit grants the DPW or its agent permission to enter the site to verify the information in the application and to inspect for compliance with the resulting permit

Section 2 – Plan Review Procedures.

- (a) **Process.** A written application for approval of the Stormwater Management Plan, Erosion and Sediment Control Plan, and Operation and Maintenance Plan shall be filed with the DPW. Plans that

meet the requirements specified in the City of Cambridge Wastewater and Stormwater Management Guidelines will be reviewed in accordance with the standards of Articles IV, V, and VI. The DPW shall approve, approve with conditions, or deny the Stormwater Management Plan, Erosion and Sediment Control Plan, and Operation and Maintenance Plan within sixty (60) days following the date the application for approval is filed.

- (b) **Duration.** Approval of the Stormwater Management Plan, Erosion and Sediment Control Plan, and Operation and Maintenance Plan submitted under the provisions of this Regulation shall expire one year after the date of approval unless land disturbing activities have commenced in accordance with said plans. However, if, not less than forty-five (45) days prior to the expiration of the approval, the applicant makes a written request to the DPW for an extension of time to commence the land disturbing activities setting forth the reasons for the requested extension, the DPW may grant one or more extension, each not to exceed one year, for good cause.
- (c) **Conditions.** Plans may be approved subject to adherence with reasonable and necessary conditions to assure compliance with this Regulation. Such conditions may, by way of example but not limitation, require the construction of structures, drainage facilities, storage basins and other facilities, require replacement of vegetation, establish required monitoring procedures, stage the work over time, require alteration of the site design to insure buffering, and require the conveyance to the City or other public entity of certain lands or interests therein as may be needed to comply with such conditions.
- (d) **Modifications.** The approved plans shall not be changed, modified, or altered without written authorization from the DPW. The applicant shall be required to make any plan modifications needed due to conflicts, omissions or changed conditions that arise in the field and adhere to the standards in Articles IV, V, and VI, subject to written authorization from the DPW. The applicant shall bear all costs to comply with this Section 2 and the City of Cambridge Wastewater and Stormwater Management Guidelines.
- (e) **Performance bond.** Prior to approval of the Stormwater Management Plan, Erosion and Sediment Control Plan, and Operation and Maintenance Plan, the applicant shall be required to post a surety bond, irrevocable letter of credit, cash, or other acceptable security. The form of the bond shall be approved by the City Solicitor, and be in an amount deemed sufficient by the DPW to ensure that the work will be completed in accordance with the Land Disturbance Permit. The bond shall guarantee completion and compliance with conditions within a specific time. The adequacy, conditions and acceptability of any bond shall be determined by the DPW. If the project is phased, the DPW may release part of the bond as each phase is completed and in compliance with the permit but the bond may not be fully released until the DPW has received the final inspection report and the applicant has obtained a Certificate of Occupancy, if applicable.
- (f) **Fee Structure.** An applicant shall pay to the DPW with each submission an Application Fee established by the DPW to cover expenses connected with the application review of the Land Disturbance Permit, a Technical Review Fee sufficient to cover professional review and an inspection fee sufficient to cover DPW costs in ensuring adherence to the applicant's permit conditions. The DPW may retain a registered professional engineer (P.E.) or other professional consultant to advise the DPW on any or all aspects of these plans at applicant's expense. Applicants must pay review fees before the permit shall issue.

Section 3 – Issuance of Land Disturbance Permit.

- (a) No permit shall be issued until the required Stormwater Management Plan, Erosion and Sediment Control Plan, and Operation and Maintenance Plan are approved the DPW.
- (b) As a condition of permit issuance, the applicant shall agree to allow or obtain the necessary authorizations to allow all inspections required by the City.

- (c) Where a bond, letter of credit or other guarantee is required, the permit shall not be issued until the bond or guarantee has been obtained by the Applicant and received and approved by the City.

Article III Non-Exclusivity, Exemptions, and Waivers

Section 1 – Non-Exclusivity.

In addition to permits required by these Land Disturbance Regulations, applicants shall be required to obtain all other permits or approvals required by applicable federal, state and local laws, rules, and regulations.

Section 2 – Exemptions.

The provisions of this Regulation do not apply to:

- (a) Emergency work to protect life, or property.
- (b) Transportation improvements which will not directly increase non-point source pollution or quantity of stormwater runoff once construction has been completed (e.g., pavement overlays).
- (c) Normal maintenance and improvement of land in agricultural use as defined by the Wetlands Protection Act regulation 310 CMR 10.04.

Section 3 – Waivers.

- (a) The DPW may waive strict compliance with any requirement of this Regulation, where:
 - (i) such action is allowed by applicable federal, state and local laws, rules and/or regulations,
 - (ii) is in the public interest, and
 - (iii) is not inconsistent with the purpose and intent of this Regulation.
- (b) Any applicant may submit a written request to the DPW to be granted such a waiver. Such a request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that strict compliance of this Regulation does not further the purposes or objectives of this Regulation.

Article IV Stormwater Management Standards

Section 1 – Stormwater Management Standards.

A Stormwater Management Plan shall meet the following requirements and standards (specific plan requirements and guidance are given in the City of Cambridge Wastewater and Stormwater Management Guidelines).

- (a) The quality of stormwater leaving the site after development shall be equivalent to or, to the extent practicable, better than the quality of stormwater leaving the site before development based on the following criteria:
 - (i) Water quality control facilities required for development shall be designed, installed and maintained in accordance with the City of Cambridge Wastewater and Stormwater Management Guidelines.
 - (ii) Land use activities of particular concern as pollution sources shall be required to implement additional pollution controls in accordance with the City of Cambridge

Wastewater and Stormwater Management Guidelines.

- (iii) Development in a watershed that drains to wetlands or Water Resource shall assure that water quality control facilities meet the requirements for pollutants of concern in accordance with the City of Cambridge Wastewater and Stormwater Management Guidelines and all applicable federal, state and local laws, rules and regulations.
 - (iv) No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or Water Resources.
- (b) The peak discharge rate of stormwater leaving the site after development shall be equal to or less than the peak discharge rate of stormwater leaving the site before development based on the following criteria:
- (i) Stormwater discharge leaving the site, during construction and after construction completion, does not have a negative impact on adjacent and abutting properties.
 - (ii) Stormwater discharge from a site, during construction and after construction completion, will be infiltrated, treated or stored in accordance with the quantity and quality control requirements specified in the City of Cambridge Wastewater and Stormwater Management Guidelines.

Article V

Erosion and Sediment Standards

Section 1 – Erosion and Sediment Standards.

An Erosion and Sediment Control Plan must meet the following objectives applicable to all land disturbance activities:

- (a) The objective of this Article is to minimize to the maximum extent practicable sediments or pollutants exiting the site, entering the public right-of-way or being deposited into any Water Resource or stormwater drainage system.
- (b) In order to meet the objectives set forth in Section 1 (a) above, the owner or applicant shall:
 - (i) Implement measures intended to keep soil on site or out of Water Resources, stormwater drainage systems or the public right-of-way as the first step in any development.
 - (ii) Remove any soil that enters the public right-of-way.
 - (iii) Protect stormwater inlets that are functioning during the course of the development by approved sediment control measures so that sediment-laden water cannot enter the inlets without first being properly treated.
 - (iv) Apply permanent or temporary soil stabilization to denuded development site areas in conformance with the City of Cambridge Wastewater and Stormwater Management Guidelines.
 - (v) Plant replacement vegetative cover in accordance with the City of Cambridge Wastewater and Stormwater Management Guidelines.
 - (vi) Secure or protect soil stockpiles throughout the project with temporary or permanent soil stabilization measures, protect all stockpiles on the site, and those transported from the site. All handling of soils shall be done in accordance with the City of Cambridge

Wastewater and Stormwater Management Guidelines and all applicable federal, state and local laws, rules and regulations.

- (vii) Post signage on the site of the permitted land disturbing activity that identifies the DPW 24-hour Hotline Number (617-349-4800).
- (viii) Sequence activities to minimize simultaneous areas of land disturbance.
- (ix) Maximize groundwater recharge as approved by DPW.
- (x) Properly manage on-site construction and waste materials.
- (xi) Site Dewatering: Water pumped from the site shall be treated by temporary sedimentation basins, grit chambers, sand filters, upflow chambers, hydro-cyclones, swirl concentrators or other appropriate controls. Water shall not be discharged in a manner that causes erosion or flooding of the site or receiving channels or a wetland. In the case where a SWIP is granted for construction site dewatering, the owner shall abide by the City of Cambridge Wastewater and Stormwater Drainage Use Regulations and all applicable federal, state and local laws, rules and regulations.
- (xii) Tracking: construct graveled roads, access drives and parking areas of sufficient width and length with sufficiently sized and maintained wash bays to prevent sediment from being tracked onto public or private roadways. Any sediment reaching a public or private road shall be removed by street cleaning (not flushing) before the end of each workday.

Section 2 – Additional Erosion and Sediment Requirements for Special Sites.

When the DPW determines that special site conditions may prevent compliance with Section 1, the DPW may require additional erosion, sediment and pollutant control measures as set forth in the City of Cambridge Wastewater and Stormwater Management Guidelines.

(a) Special site conditions may include, but are not limited to, the following:

- (i) Slopes before development that are greater than 10 percent (1 Vertical: 10 Horizontal).
- (ii) Land disturbance of a natural vegetative buffer within 50 feet of a wetland and or waterbody.
- (iii) The development site is located entirely or partially within a Flood Plain Overlay District.

(b) Required additional control measures may include but are not limited to:

- (i) Project timing is such that land disturbing activity will take place between October 1 and April 30.
- (ii) Requiring that a Massachusetts registered professional engineer (P.E.), other professional certified by the State of Massachusetts with experience or qualifications in preparing erosion and sediment control plans, a registered CPESC or Massachusetts registered Landscape Architect prepare or implement the Erosion and Sediment Control Plan.
- (iii) Prohibiting land disturbing activities between October 1 and April 30.
- (iv) Limiting the amount of denuded soil at any given time.
- (v) Requiring a bond, letter of credit or other guarantee.

Article VI Operation And Maintenance Standards

Section 1 – Maintenance and Repair.

The owner is responsible for maintenance and shall prepare and submit to the DPW for approval an Operation and Maintenance Plan for the stormwater management measures incorporated in the Land Disturbance Permit. The owner shall notify DPW of any changes in ownership or assignment of financial responsibility. Prior to any transfer of ownership of any property subject to an Operation and Maintenance Plan, the owner shall inform the prospective owner of the requirements of the existing Operation and Maintenance Plan, and of the requirement to file a new Operation and Maintenance Plan upon transfer of ownership. The new owner shall be required to submit an Operation and Maintenance Plan to the DPW for approval within 60 days of the transfer of ownership. Until the new plan is approved by the DPW, the new owner shall be bound by the provisions of the existing Operation and Maintenance Plan.

An Operation and Maintenance Plan must meet the following requirements (specific plan requirements and guidance are given in the City of Cambridge Wastewater and Stormwater Management Guidelines):

- (a) If the Operation and Maintenance Plan identifies a person other than the owner (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation satisfactory to DPW of such person's obligation or agreement to assume this responsibility.
- (b) Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project.
- (c) The Operation and Maintenance Plan shall include a schedule for preventative and corrective maintenance to maintain the function of the stormwater management measures, including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.
- (d) The person responsible for maintenance identified under Section 1 (a) above shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.
- (e) The person responsible for maintenance identified under Section 1 (a) above shall evaluate the effectiveness of the operation and maintenance plan at least once per year and shall note certification of its effectiveness in the log referred to in Section (d) above, or in the event that it is no longer effective, applicant shall provide certification to that effect to DPW with a proposed revised plan for DPW's review and approval.
- (f) The person responsible for maintenance identified under Section 1(a) above shall retain and make available, upon request by DPW, the operation and maintenance plan and the documentation required by Sections 1(d) and (e) above.
- (g) The provisions of any Operation and Maintenance Plan for a stormwater management facility that is dedicated to and accepted by the City for the City's ownership, operation or control shall terminate upon the City's acceptance of ownership, operation or control of said facility.

Nothing in this Section 1 shall preclude the DPW from requiring the posting of a performance or maintenance guarantee in accordance with the City of Cambridge Wastewater and Stormwater Management Guidelines.

Article VII Inspections and Plan Revisions

Section 1 – Inspections.

- (a) The DPW or its authorized representative may conduct inspections whenever it is necessary to enforce any provisions of this Regulation, to determine compliance with this Regulation.
- (b) When an inspection is occurring, the DPW or authorized representative shall first present proper credentials to the responsible party and request entry. If such entry is thereupon refused, the DPW shall have recourse to any remedy provided by law to obtain entry, including obtaining an administrative search warrant.

Section 2 – Permit-Related Inspections.

- (a) **Pre-Development Meeting.** Prior to starting clearing, excavation, construction, or land disturbing activity the applicant or designated agent, shall meet with the DPW to review the approved plans and their implementation. The applicant or designated agent shall inspect the project site and provide certification to the DPW of project completeness at the following stages:
 - (i) Initial Site Inspection: prior to approval of any plan.
 - (ii) The applicant or designated agent shall make inspections as hereinafter required and shall either approve that portion of the work completed or shall notify the owner if the work fails to comply with the Land Disturbance Permit. The Land Disturbance Permit and associated plans for grading, stripping, excavating, and filling work, as approved by DPW, shall be maintained at the site during the progress of the work. The owner shall notify the DPW at least two (2) working days before each of the following events; the applicant or designated agent shall be responsible to observe and assure the project progresses appropriately at the following events:
 - a. Erosion and sediment control measures are in place and stabilized;
 - b. Site Clearing has been substantially completed;
 - c. Rough Grading has been substantially completed;
 - d. Final Grading has been substantially completed;
 - e. Close of the Construction Season; and
 - f. Final Landscaping (permanent stabilization) and project final completion.
- (b) **Owner Inspections.** The owner or designated agent shall conduct and document inspections of all control measures no less than weekly or as specified in the Land Disturbance Permit, and prior to and following anticipated storm events. The purpose of such inspections will be to determine the overall effectiveness of the Erosion and Sediment Control Plan and the need for additional control measures. The owner or designated agent shall retain monthly reports in a format approved by the DPW which shall be made available to the DPW upon request.
- (c) **Bury Inspection:** The DPW shall be notified prior to backfilling of any underground drainage or storm water conveyance structures so that inspection, if deemed necessary by the DPW, can take place.
- (d) **Final Inspection.** After the storm water management system has been constructed and before the surety bond has been released, the applicant must submit a stamped record plan signed by a Massachusetts Registered Professional Engineer (P.E.) or Massachusetts Registered Land Surveyor

detailing the actual storm water management system as installed. The record plan will include a statement box on the plan certifying the site review was conducted in accordance with this Regulation and all items were constructed in accordance with the Land Disturbance Permit. The applicant or designated agent shall request a final inspection site meeting with the DPW. The DPW shall visit the site with the applicant or designated agent to confirm its "as-built" features. As-Built drawings of structural BMPs shall be submitted to the DPW. A final report as referenced in Article VIII shall be submitted to the DPW for review and approval prior to the issuance of Certificate of Occupancy, if applicable.

- (e) **Access Permission.** To the extent permitted by law, or if authorized by the owner or other party in control of the property, the DPW, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this Regulation and may make or cause to be made such examinations, surveys or sampling as the DPW deems reasonably necessary to determine compliance with the Land Disturbance Permit.

If the system is found to be inadequate by virtue of physical evidence of operational failure, it shall be corrected by the owner before the surety bond is released. If the owner fails to act the DPW may use the surety bond to complete the work.

Section 4 – Other Inspections.

Where the DPW has determined that special site conditions exist, the DPW may designate an inspector to monitor erosion, sediment and pollutant control at that site, or, if deemed necessary by the DPW, the DPW may hire a consultant to serve as the designated inspector, the cost of which shall be borne by the owner.

Section 5 – Refusal of Entry.

No person shall refuse entry or access to a permitted development project to any authorized representative of the DPW who provides proper credentials and requests entry for the purpose of conducting an inspection. In addition, no person shall obstruct, hamper or interfere with any such representative while in the process of carrying out his or her official duties.

Section 6 – Inspection Fees.

The owner or applicant shall be solely responsible for the costs associated with any revisions, including but not limited to, any additional or alternate methods, measures, performance criteria or controls. If the DPW deems it necessary to hire a consultant to assist with same, the cost of such consultant shall be borne by the owner.

Section 7 – Revisions to Plans.

- (a) During development, the DPW or the owner or applicant may request revisions to the Land Disturbance Permit. All revisions shall be reviewed and approved by the DPW.
- (b) The DPW may require revisions to the approved Stormwater Management Plan, Erosion and Sediment Control Plan or Operating and Maintenance Plan when:
- (i) It is determined that measures approved in the Stormwater Management Plan, Erosion, Sediment Control Plan or the Operation and Maintenance Plan do not meet the purposes set forth in Article IV, V or VI.;
 - (ii) An alternate method, measure or control fails to perform as claimed by the owner or applicant;
 - (iii) A change in project timing has occurred due to an adverse change in weather;
 - (iv) During development, relevant new information about soil, site, topography or water conditions is discovered;

- (v) Changes to the area or type of land disturbing activity or equipment used are proposed or implemented;
 - (vi) The project schedule has changed which results in development being conducted at a different time of year than originally accepted or approved; or
 - (vii) Additional or substitute construction or maintenance materials or chemicals will be used during development that require pollutant BMPs as set out in the City of Cambridge Wastewater and Stormwater Management Guidelines.
- (c) Revised plans shall show all actual and proposed changes made on the site, the new locations of the drainage patterns, and the effect that the revisions will have on the site. The new plans shall show how problems associated with the prior plan have been corrected, and indicate all new erosion, sediment and pollutant control measures. The DPW may require that the new plans be prepared by a Massachusetts registered professional engineer (P.E.), a Massachusetts registered landscape architect, or a CPESC, and that the revisions are stamped as such.
- (d) The owner or applicant shall be solely responsible for the costs associated with any revisions, including but not limited to, any additional or alternate methods, measures, performance criteria or controls or costs for any consultants that the DPW deems necessary to assist it with its review and approval of any such revisions.

Article VIII Project Completion

At completion of the project the owner shall submit a final report of all stormwater controls and treatment BMPs. The as-built drawings shall show all deviations from the approved plans, if any, and be certified by a Massachusetts registered professional engineer (P.E.) or a Massachusetts registered land surveyor. Detailed requirements pertaining to the final report and as-built drawings are set forth in the City of Cambridge Wastewater and Stormwater Management Guidelines.

Article IX Certificate of Occupancy

The DPW will issue a letter certifying completion upon receipt and approval of the final reports and/or upon otherwise determining that all work completed pursuant to the Land Disturbance Permit has been satisfactorily completed in conformance with this Regulation, which letter shall be submitted by the owner or applicant to the City of Cambridge Department of Inspectional Services prior to the issuance of a Certificate of Occupancy, if applicable.

Article X Compliance and Enforcement

Section 1 – Investigation and Notice of Violations.

If the DPW believes that a violation of this Regulation, a rule promulgated pursuant to this Regulation, or a Land Disturbance Permit issued hereunder may have occurred or exists, the City may investigate. If, after this investigation, the DPW determines that a violation has occurred or exists, the DPW shall issue written notice of a violation to the person or persons alleged to have caused or contributed to a violation of this Regulation, a rule promulgated pursuant to this Regulation, and/or a Land Disturbance Permit issued hereunder. A written notice of violation shall include a statement of facts upon which the violation is based.

Within fourteen (14) days of the issuance of a written notice of violation, the alleged violator shall submit

to the DPW a written response to the notice of violation and a plan for correcting the violation. Submission of this plan in no way relieves the alleged violator of liability for any previous violation not addressed by the plan or future violation(s).

Within fourteen (14) days of the receipt of a written response to a notice of violation, the DPW shall determine whether the response resolves and/or corrects the violation. If the DPW determines that the response resolves and/or corrects the violation, then the plan for correcting the violation shall be incorporated into a consent agreement pursuant to Section 2.

Section 2 – Consent Agreement.

A consent agreement may be entered into at any time by and between the DPW and the person or persons alleged to have caused or contributed to the violation. The consent agreement shall be mutually acceptable to both the DPW and the recipient(s) and shall reflect the recipient's agreement to assume responsibility for and correct violations of this Regulation, rules promulgated or permits issued pursuant to this Regulation.

The consent agreement shall contain a short statement of facts, describe the actions necessary to correct the non-compliance, contain a compliance schedule, and be signed by all parties. The agreement may contain a monetary assessment or other relief as agreed to by the parties for the non-compliance, including without limitation, amounts necessary to compensate the City for costs incurred investigating, administering and/or enforcing this Regulation or rules promulgated hereto.

Section 3 – Administrative Compliance Orders.

If the DPW determines that a violation of this Regulation, a rule promulgated or a permit issued pursuant to this Regulation has occurred or exists, the DPW may issue an administrative compliance order ("Administrative Order") pursuant to this Section 3.

Except as provided in Section 4, the DPW may issue an Administrative Order in the following circumstances:

- (a) the DPW determines that a person has violated a consent agreement entered into with the DPW; or
- (b) (i) the DPW determines that a person has violated or continues to violate this Regulation, a rule promulgated or permit issued pursuant to this Regulation, and (ii) the DPW has attempted to resolve the violation pursuant to Sections 1 and 2 but no voluntary consent agreement has been entered into.

The Administrative Order shall contain a statement of facts upon which the Administrative Order is based, a description of the actions that must be taken to correct the non-compliance, a compliance schedule, and other requirements as might be reasonably necessary to address the non-compliance. Administrative Orders also may contain administrative fines and penalties, and such other monetary relief for the non-compliance, including without limitation amounts necessary to compensate the City for costs incurred investigating, administering, and enforcing this Regulation or rules promulgated hereto.

Section 4 – Emergency Orders.

The DPW may issue an order without attempting to resolve a violation by using the enforcement procedures described in Section 1 and 2 if the City finds that a violation of this Regulation, a rule promulgated or permit issued pursuant to this Regulation, constitutes or causes, or will constitute or cause, a substantial injury to the public health, safety, welfare, or the environment, and it is prejudicial to the interests of the people of the City to delay action ("Emergency Order").

Emergency Orders issued pursuant to this Section 4 shall contain a statement of facts upon which the order is based, and notification to the person that it must immediately take action to discontinue, abate, correct, or otherwise address the imminent and substantial injury caused or likely to be caused by the non-compliance.

Within seven (7) days, the City shall provide the person an opportunity to be heard and to present any

proof that the non compliance does not or will not constitute imminent and substantial injury to the public health, safety, welfare or the environment.

Section 5 – Civil Penalties.

A person who violates any provision of this Regulation or rules promulgated hereunder, including without limitation any notice, order, stormwater construction approval, agreement, decision, or determination promulgated, issued, made, or entered by the DPW under this Regulation or rules promulgated hereunder, is responsible for a municipal civil infraction, subject to payment of a civil fine of not less than \$100 per day and not more than \$5,000 per day for each infraction, plus costs and other sanctions.

Section 6 – Separate Offenses.

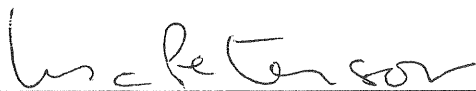
Each act of violation, and each day or portion of a day that a violation of this Regulation, rules or regulations promulgated pursuant to this Regulation, stormwater construction approval, order, notice, or determination issued, made or entered into under this Regulation is permitted to exist or occur, constitutes a separate offense and shall be punishable as provided by this Regulation.

Section 7 - Cost Recovery.

- (a) The DPW may recover all reasonable costs incurred by the City which are attributable to or associated with violations of these Regulations, including but not limited to the costs of administration, investigation, sampling and monitoring, legal and enforcement activities, damage to the City's sanitary or combined system or to the City's stormwater drainage systems, contracts and health studies, and any fines and penalties assessed to the City which result from a discharge not in compliance with these Regulations or rules adopted thereunder.
- (b) All such costs shall be documented by the City and shall be served upon the discharger by certified or registered mail, return receipt requested. Such documentation shall itemize the costs the DPW has determined are attributable to the violations.
- (c) Such costs are due and payable to the City upon the receipt of the letter documenting such costs. All such costs shall be paid to the City Treasurer. Nonpayment or dispute regarding the amount shall be referred for appropriate action to the City Solicitor. The City Solicitor may initiate appropriate action against the discharger to recover costs under this Article.
- (d) The DPW may terminate a discharge for nonpayment of costs after 30 days notice to the discharger.

Adopted:

Effective Date: March 31, 2008



Lisa Peterson
Commissioner

2008 MAR 31 P 6:57
OFFICE OF THE CITY CLERK
CAMBRIDGE, MASSACHUSETTS

ORDINANCE NUMBER 1313

Final Publication Number 3156. First Publication in the Chronicle on January 17, 2008.

City of Cambridge

In the Year Two Thousand and Eight

AN ORDINANCE

In amendment to the Ordinance entitled “Municipal Code of the City of Cambridge”

Be it ordained that Cambridge Municipal Code Chapter 13.16 is hereby amended as follows:

Chapter 13.16

WASTEWATER AND STORMWATER DRAINAGE SYSTEM

Sections:

- 13.16.010** **Definitions.**
- 13.16.020** **Wastewater System and Stormwater Drainage System connections—General regulations.**
- 13.16.030** **Wastewater System and Stormwater Drainage System— City Engineer’s duty.**
- 13.16.040** **Interference and obstruction during construction.**
- 13.16.050** **Discharges— Commissioner’s responsibility.**
- 13.16.060** **Inspectors—Powers and authority.**
- 13.16.070** **Assessments— Wastewater System prerequisite.**
- 13.16.080** **Annual Wastewater System use charge.**
- 13.16.090** **Property destruction.**
- 13.16.100** **Violation—Penalty.**

Section 13.16.010 Definitions.

Unless the context specifically indicates otherwise, the meaning of terms used in this chapter shall be as follows:

1. “Combined Sewer” shall mean a sewer designed to receive both wastewater and stormwater.
2. “Commissioner” means the Commissioner of Public Works of the City of Cambridge, or his or her designee.
3. “Land Disturbance” shall mean any action that causes a change in the position, location, or arrangement of soil, sand rock, gravel of similar earth material.
4. “Land Disturbance Activity” shall mean any activity that causes a change in the position or location of soil, sand, rock, gravel, or similar earth material.
5. “Owner” shall mean a person who alone or jointly or severally with others has the legal title to any premises or has care, charge or control of any premises as agent, executor, administrator, trustee, lessee or guardian of the estate of the holder of legal title.

6. "Person" shall mean any agency of the federal government, any agency or political subdivision of the Commonwealth, any State, public or private corporation or authority, individual, trust, firm, joint stock company, partnership, association, or other entity, or any group thereof, and any officer, employee, or agent of such person, and any group of persons.

7. "Private Combined Sewer" shall mean a combined sewer which is not owned by the City, DCR or the MWRA. Private combined sewers include, but are not limited to, building Drains (wastewater), building combined sewer laterals and manholes located on private property and not located within an easement held by the City or other public agencies. The owner of the private combined sewer is also responsible for the connection from a private sewer to the public wastewater system.

8. "Private Sewer" shall mean a sewer that is not owned by the City, DCR or the MWRA. Private sewers include, but are not limited to building Drains (wastewater), building sewer laterals and manholes located on private property and not located within an easement held by the City or other public agencies. The owner of the private sewer is also responsible for the connection from a private sewer to the public wastewater system.

9. "Private Stormwater Drain" shall mean a stormwater Drain that is not owned by the City or the DCR. Private Stormwater Drains include, but are not limited to, building Drains (stormwater), building stormwater Drain laterals, catch basins and manholes located on private property and not located within an easement held by the City and other public agencies. The owner of the private stormwater Drain is also responsible for the connection from a private stormwater Drain to the public stormwater system.

10. "Public Combined Sewer" shall mean a combined sewer that is owned by the City, DCR or the MWRA.

11. "Public Sewer" means a sewer which is owned by the City, DCR or the MWRA or any of their successors.

12. "Public Stormwater Drain" shall mean a stormwater Drain that is owned by the City or the DCR.

13. "Sanitary Sewer" means a sewer designed to carry sewage.

14. "Sewage" means the spent water of a community, which may be a combination of liquid and water-carried wastes from residences, commercial buildings, institutions and industrial facilities, together with leachate and construction site dewatering, and exclusive of groundwater, surface water, and/or stormwater.

15. "Sewer" means a pipe or conduit for carrying sewage.

16. Shall and May. Shall is mandatory; may is permissive.

17. "Stormwater" shall mean any water resulting from rainfall or other precipitation that runs off surfaces during or after a storm.

18. "Stormwater Drain" means a pipe or conduit that carries surface water, stormwater and groundwater or runoff and is exclusive of sewage.

19. "Stormwater Drainage System" means pipes, conduits, pumping stations and appurtenances, including tidegates, catch basins, and manholes used in the collection and transport of stormwater, groundwater and runoff.

20. "Wastewater" shall mean Sewage, together with any Groundwater, Stormwater and surface water that may be present.

21. "Wastewater System" shall mean totality of the devices, equipment or works used in transportation, pumping, storage, treatment, recycling, or reclamation of Wastewater or in the disposal of the effluent.

Section 13.16.020 Wastewater System and Stormwater Drainage System connections.

A. The Commissioner is hereby authorized to regulate Combined Sewers, Land Disturbance Activity, Private Combined Sewers, Private Sewers, Private Stormwater Drains, Public Combined Sewers, Public Sewers, and Public Stormwater Drains and any other equipment or installations of any

description now or in the future connected to the City's Wastewater System or Stormwater Drainage System. The Commissioner shall have authority to promulgate regulations and guidance documents regulating all activities in any way related to the uncovering, excavating over, blocking access to, making any connection with or opening into, altering, or disturbing, or in any way directly or indirectly using the City's Wastewater System or Stormwater Drainage System, and shall establish permit requirements for all such activities and take necessary and appropriate enforcement action to prohibit or remedy any such unpermitted activity.

B. No unauthorized Person or Owner shall uncover, excavate over, block access to, make any connection with or opening into, alter, or disturb, or in any way directly or indirectly use the City's Wastewater System or Stormwater Drainage System or appurtenance thereof without first obtaining a written permit from the Commissioner. Any person proposing a new discharge into the system or in any way changing the volume or character of any effluent that is to be or is being discharged into the City's Wastewater System or Stormwater Drainage System shall be required to notify the Commissioner at least forty-five days prior to the proposed change or connection, and shall be further required to obtain all required permits and to comply with all regulations and guidance documents promulgated by the Commissioner pursuant to the authority granted to the Commissioner by this ordinance and by any and all applicable federal, state and local laws, regulations and rules and shall be responsible for all fees and charges established by the Commissioner in said regulations..

C. All costs and expense incident to the installation and connection to the City's Wastewater System or Stormwater Drainage System and any costs for maintenance thereof shall be borne by the owner. The owner shall indemnify the City from any loss or damage that may directly or indirectly be occasioned by the installation of any connection to the City's Wastewater System or Stormwater Drainage System. Notwithstanding the foregoing, the City Manager may provide for connection to the mains of the City's Wastewater System and Stormwater Drainage System in the public way at the expense of the City when the need for a new connection stems from the City's commitments to sewer and storm drain separation and correction of improperly connected building sewer and storm drain lines as required by the United States Environmental Protection Agency, the Massachusetts Department of Environmental Protection, the Massachusetts Water Resources Authority, and the City of Cambridge DPW. The City Manager may limit the City's assumption of costs for correction of improperly connected building sewer or storm drain lines where the City Manager determines that the improper connection was made negligently, knowingly, or intentionally by the current or former owner of the property, their agents, or others acting on their behalf. (Ord. 1203, Amended, 06/01/1998)

Section 13.16.030 Wastewater System and Stormwater Drainage System--City Engineer's duties.

The City Engineer shall make and file in his or her office, accurate plans of the Wastewater System and the Stormwater Drainage System, showing all entrances thereto when made as provided in the regulations and guidance documents promulgated by the Commissioner pursuant to the authority granted to the Commissioner by this ordinance and by any and all applicable federal, state and local laws, regulations and rules.

Section 13.16.040 Interference and obstruction during construction.

Whenever any street is opened for the laying of pipes for water, gas or other purposes, or for any work of construction, such laying of pipes and work connected therewith, or such work of construction shall be so executed as not to obstruct, in any way, the course, capacity or construction of any part of the City's Wastewater System and Stormwater Drainage System, and whenever pipes for any purpose, or any work of construction, are found to exist at such a depth or in such location as to interfere with any existing part of the City's Wastewater System or Stormwater Drainage System, the person maintaining the same, shall, upon notice thereof, at once remove, change or alter such pipe or pipes or other works, in such a manner as the City Engineer may direct. If such person neglects to comply immediately with the terms of such

notification the City Engineer may make such removal, change or alteration, and the cost thereof shall be paid by such person; provided, that whenever any sewer is to be constructed, or any water pipe to be laid, in any street or way, the City Engineer and Chief Superintendent of Water Works shall consult with each other in regard to the location of any existing pipes. (Prior code § 17-49)

Section 13.16.050 Discharges--Commissioner's responsibilities.

A. The Commissioner shall promulgate regulations and guidance documents to control the use of the City's Wastewater System and Stormwater Drainage System throughout the City so as to require that no person shall, without prior authorization from the Commissioner, uncover, excavate over, block access to, make any connection with or opening into, alter, or disturb, or in any way directly or indirectly use the City's Wastewater System or Stormwater Drainage System, to prohibit any person from maliciously, willfully or negligently breaking, damaging, destroying, uncovering, defacing or tampering with any structure, appurtenance, or equipment which is part of the City's Wastewater System or Stormwater Drainage System. Said regulations promulgated by the Commissioner shall require that all activities by users of the City's Wastewater System and Stormwater Drainage System are accomplished in a manner that complies with all federal, state and local laws, regulations and rules in effect and as amended. If any waters or wastes are discharged, or are proposed to be discharged to the City's Wastewater System or Stormwater Drainage System, which waters contain substances or possess characteristics prohibited in the Commissioner's regulations and guidance documents or in any and all applicable federal, state or local law, regulation or rule, the Commissioner may:

1. Reject the wastes;
2. Require pretreatment to an acceptable condition for discharge to the City's Wastewater System or Stormwater Drainage System;
3. Require control over the quantities and rates of discharge;
4. Require payment to cover the added cost of handling and treating the wastes not covered by existing taxes or sewer charges, or
5. Take any other enforcement action or response provided in the Commissioner's regulations and guidance documents or pursue any other remedy provided by any applicable federal, state or local law, regulation or rule.

Section 13.16.060 Inspectors--Powers and authority.

A. The Commissioner or his or her designees bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation, measurement, sampling and testing in accordance with the provisions of this ordinance and the regulations and guidance documents promulgated by the Commissioner pursuant to the authority granted to the Commissioner by this ordinance and any and all applicable laws, regulations and rules.

B. The Commissioner or his or her designees bearing proper credentials and identification shall be permitted to enter all private properties through which the City holds a duly negotiated easement for the purposes of, but not limited to, inspection, observation, measurement, sampling, repair and maintenance of any portion of the sewage or stormwater works lying within such easement. All entry and subsequent work, if any, on such easement, shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved. (Ord. 1007 (part), 1984: prior code § 17-58)

Section 13.16.070 Assessments—Wastewater System prerequisite.

No owner of land or buildings or any portion of land or buildings shall be assessed for a Wastewater System benefit until said land or buildings can be drained into the Wastewater System and no such land or buildings or portion of such land or buildings shall be assessed more than once for the same sewer benefit. (Prior code § 17-50)

Section 13.16.080 Annual Wastewater System use charge.

There is established an annual charge for the use of the City's Wastewater System by any land or buildings in the City having one or more connection discharging into said Wastewater System.

A. The City Manager shall annually recommend to the City Council, a just and equitable Wastewater System service charge based on water supplied to, delivered to, and received by any land or buildings that drain to the Wastewater System, determined by metered water consumption and/or other applicable standards for computation of water supplied, delivered or received by said land or buildings. The charge shall take into account all appropriate Wastewater System related estimated revenues and available surpluses, and shall produce sufficient revenue to equal or exceed the annual appropriations proposed for Wastewater System operation, maintenance and debt service. The City Council shall adopt annually the Wastewater System service charge.

B. The quantity of water supplied by the City through a water meter in good working order shall be determined by the reading of such meter. The owner of land or buildings or any portion of land or buildings that drain to the Wastewater System receiving or using water supplied to, delivered to, or received by any source other than the City shall so notify the Commissioner in accordance with regulations promulgated by the Commissioner pursuant to the authority granted to the Commissioner by this ordinance and any and all applicable federal, state and local laws, regulations and rules. Where water is not supplied by the City, but derived or received by said land or buildings from another source, and/or water is used by said land or buildings in such a manner as to enter the Wastewater System of the City, such water shall be measured by one or more water meters in good working order installed and maintained on the land or buildings by the owner, at the expense of the owner, subject to inspection and approval by the Commissioner. The quantity of water so derived or received, or the quantity of water so used, or both, shall be determined by the readings of such meter or meters. Alternatively, at the discretion of the Commissioner, the quantity of all other water delivered to or received by land or buildings shall be established by the Commissioner by any reasonable and equitable method apt in the circumstances of the particular case to determine the quantity of water discharged by said land or buildings into the Wastewater System of the City.

C. An owner of land or buildings may apply to the Commissioner for an abatement of said Wastewater System charge if water so supplied, derived or received is used on said land or in said buildings in such a manner as not to enter the Wastewater System of the City. Determination of the charge established by this Section shall be adjusted to reflect the quantity so used deducted from the aggregate amount of water so supplied, derived or received during such period.

D. In no case shall the minimum annual charge for Wastewater System use under the provisions of this chapter be less than ten dollars.

E. The charges established by this Section shall be due and payable by the owner of record at such time or times and in such installments if any, as the Commissioner from time to time determines. The Commissioner shall in his or her order of assessment designate as the owner of a parcel assessed, the person who was liable to assessment therefor on the preceding January 1st.

F. A monthly interest charge of one and one-half percent shall be assessed on the balance of any sewer service use charge remaining unpaid after thirty days from the date of billing. Nonpayment upon such date shall furthermore be deemed to be delinquent and thereafter such delinquency shall constitute a lien upon the real estate for which such service is supplied. The City Treasurer-Collector is authorized and directed to file sworn statements showing such delinquencies in the office of the Recorder of Deeds of Middlesex County, and the filing of such statements shall be deemed notice of the lien of such charges for such services. (Ord. 1007 (part), 1984: prior code § 17-62)

Section 13.16.090 Property destruction prohibited.

In addition to all penalties and remedies available to the Commissioner pursuant to the regulations and guidance documents promulgated pursuant to the authority of this ordinance and provided in any other applicable federal, state or local law, regulation or rule, no unauthorized person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is a part of the City's Wastewater System or Stormwater Drainage System. Any person violating this provision shall be subject to immediate arrest under charge of disorderly conduct. (Ord. 1007 (part), 1984; prior code § 17-60)

Section 13.16.100 Violation--Penalty.

A. Any person found to be violating any of the provisions of the regulations and guidance documents promulgated by the Commissioner pursuant to the authority granted to the Commissioner by this ordinance and by any and all applicable federal, state or local laws, regulations or rules, shall be guilty of a misdemeanor, and on conviction thereof, shall be fined in the amount not exceeding \$5,000.00 dollars for each violation. Each day in which any such violation continues shall be deemed a separate offense.

B. Any person violating any of the provisions of the regulations and guidance documents promulgated by the Commissioner pursuant to the authority granted to the Commissioner by this ordinance and by any and all other applicable federal, state or local laws, rules or regulations shall become liable to the City for any expense, loss or damage occasioned the City by reason of such violation. (Ord. 1007 (part), 1984; prior code § 17-61)

In City Council January 28, 2008.

Passed to be ordained by a yea and nay vote:-

Yeas 9; Nays 0; Absent 0.

Attest:- D. Margaret Drury, City Clerk.

A true copy;

ATTEST:-

D. Margaret Drury
City Clerk

**The City of Cambridge
Department of Public Works**

The City of Cambridge Commissioner of Public Works (“the Commissioner”) hereby adopts these Wastewater and Stormwater Drainage Use Regulations pursuant to Cambridge Municipal Code Chapter 13.16 Wastewater and Stormwater Drainage System.

WASTEWATER AND STORMWATER DRAINAGE USE REGULATIONS

**ARTICLE I
General Provisions and Definitions**

Section 1 - Reference to Regulations. These Regulations may be referred to as the City of Cambridge Wastewater and Stormwater Drainage Use Regulations.

Section 2 - Authority. Under the authority of Chapter 436 (Section 6) of the 1977 Acts and Resolves of Massachusetts, M.G.L. c. 83, §§ 14-24, the general police powers of the City of Cambridge, the provisions of Cambridge Municipal Code Chapter 13.16 §13.16.020 and pursuant to the regulations of the federal Clean Water Act, 40 CFR 122.34, the City of Cambridge Commissioner of Public Works (“Commissioner”) has established the following Regulations governing the use of public and private Wastewater and Stormwater Drains in the City.

Section 3 - Purpose. These Regulations are intended to protect the public health, safety and welfare and the environment and to ensure proper and safe operation of the City’s Sanitary Sewers, Combined Sewers and Stormwater Drains by regulating the direct and indirect discharge of Waste, stormwater and pollutants to the City’s Wastewater and Stormwater Drainage systems. These Regulations are also intended to prohibit and remove illicit connections and unauthorized discharges to the City’s Stormwater Drainage system. This includes the legal authority to carry out all inspection, surveillance and monitoring procedures necessary to comply with this Regulation.

Section 4 - Severability. The provisions of these Regulations are severable. If any provision of these Regulations or any specific application to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications of these Regulations which can be given effect in the absence of the invalid provision or application.

Section 5 - Applicable Regulations. Every user of the City’s Wastewater or Stormwater Drainage systems shall be subject to these Regulations, as they apply, and to any charges, rates, fees, and assessments which are or may be established by the City. Every user of the City’s Wastewater or Stormwater Drainage systems shall also be subject to applicable federal, state, and local regulations. In instances where various regulations contain different requirements, the most stringent requirements shall apply.

Section 6 - Right to Amend Regulations. The City reserves the right to amend these Regulations in any manner and to establish additional limitations or requirements as are deemed necessary or appropriate.

Section 7 – Federal, State, and Local Regulations. No provision of these Regulations shall be deemed to contravene or render ineffective any valid federal, state or local regulation.

Section 8 – Stormwater and Wastewater Infrastructure Permit (SWIP).

- (a) In addition to any permits that may be required by applicable federal, state or local laws or regulations, a Stormwater and Wastewater Infrastructure Permit ("SWIP") is required by these Regulations and shall be issued by the DPW approving any work relating to the following Wastewater and Stormwater drain related activities as they apply:
- (i) Collection System Access
 - (ii) Termination and Verification (cutting and capping)
 - (iii) Stormwater Discharge
 - (iv) Wastewater Discharge
 - (v) FOG (Fats, Wax, Oils and Grease)
 - (vi) Excavation (in public ways)
 - (vii) Demolition
 - (viii) Temporary Construction Site Dewatering
 - (ix) Direct Connection Permit (to municipal Wastewater and/or Stormwater Drainage system)

[In addition to an SWIP, a Sewer Use Discharge Permit, when required by the Massachusetts Water Resources Authority (MWRA), shall be issued jointly with the MWRA and the DPW.]

- (b) No discharge or operation, which affects the Wastewater or Stormwater Drainage system, shall be authorized without the appropriate valid SWIP for the discharge or operation first being obtained.
- (c) The DPW may refuse to issue an SWIP for any Discharge which it believes can reasonably be expected to result in significant harm to health, safety, the environment, the City's Wastewater or Stormwater Drainage system, a tributary to the City's Wastewater or Stormwater Drainage system, or may pass through, interfere with, or otherwise be incompatible with the wastewater treatment process or sludge disposal.
- (d) The DPW shall enforce, pursuant to Article X of these Regulations and other applicable, federal, state or local laws and regulations, the terms and conditions of an SWIP issued under these Regulations.
- (e) The DPW may modify an SWIP as deemed necessary or appropriate or as required by federal, state or local laws or regulations.
- (f) A permittee may request reconsideration of the terms and conditions in an issuance, renewal, or modification of an SWIP issued by the DPW, and an applicant may request reconsideration of the denial of an SWIP by the DPW.

[With regard to Sewer Use Discharge Permits, which are issued jointly by the DPW and the MWRA, requests for reconsideration shall be subject to the requirements of these Regulations and to the requirements and procedures of the MWRA.]

- (g) An SWIP shall not be assigned or transferred without prior written approval of the DPW. After approval of an SWIP assignment or transfer, the permittee shall provide a copy of the SWIP to the assignee or transferee and to the DPW.
- (h) These Regulations shall not be construed to require the DPW to permit itself for activities done to carry out the DPW's responsibilities under any federal, state or local laws, regulations or

requirements. Requirements specific to permits required by these Regulations can be waived by the authority of the Commissioner of Public Works or his/her designee,

Section 9 – Definitions - Terms which are not defined herein shall be interpreted as defined in the most recent edition of *Glossary-Water and Wastewater Control Engineering*, published by the Water Pollution Control Federation (WPCF) [now called the Water Environment Federation (WEF)], Washington, D.C. Throughout these Regulations, shall means mandatory, and may means permissive. The following terms shall have the following meanings:

Aliquot shall mean a divisor or factor of a quantity, constituting a sample.

Backwater valve also referred to as a **back-flow valve, check valve or back-flow preventer** shall mean a device installed in a building Drain or a building stormwater Drain to prevent the discharge from the building, or flows originating outside the building, from flowing back into the building.

Bacteria treatment shall mean the introduction into the Wastewater system of microorganisms specifically bred to accelerate the natural decomposition of fats, oils and grease of animal or vegetable origin.

Below grade plumbing fixture shall mean any plumbing fixture located at an elevation below the elevation of the roadway adjacent to the property to which the City's Wastewater or Stormwater Drainage systems serving the fixture shall be considered to be liable to backflow.

Biochemical Oxygen Demand or BOD shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedures for five (5) days at (20) degrees centigrade, usually expressed as a concentration (e.g. mg/l).

Best Management Practices or BMP shall mean Stormwater Management techniques that reduce pollution from stormwater runoff.

Blowdown shall mean the minimum discharge of recirculated water from a heating or cooling system for the purpose of preventing the concentration of materials contained in the water from exceeding limits established by best engineering practice.

Building combined sewer lateral shall mean the pipe, which connects a building Drain carrying Waste to a combined sewer or other place of disposal. The building combined sewer lateral begins 10 feet outside the inner face of the building foundation wall and extends to and includes the connection to the City,, MWRA, DCR or private Wastewater systems.

Building Drain shall mean the lowest horizontal piping of a plumbing or Drainage system which extends from inside or outside the walls of a building to a point ending 10 feet (3.048 meters) outside the inner face of the building foundation wall. The building Drain conveying Waste from plumbing fixtures within the building shall discharge to a building sewer lateral or building combined sewer lateral, while the building Drain conveying stormwater and other Drainage shall discharge to a building stormwater Drain lateral.

Building sewer lateral, also referred to as a **house sanitary connection, or sanitary service**, shall mean the pipe which connects to a building Drain conveying Waste from plumbing fixtures within a building to a City sanitary or combined sewer, a private sanitary or combined sewer, an MWRA sewer (where allowed by MWRA), or other place of disposal. The building sewer lateral begins 10 feet outside the inner face of the building foundation wall and extends to and includes the connection to the City, MWRA, DCR or private wastewater systems.

Building stormwater Drain lateral shall mean the pipe, which connects a building Drain conveying stormwater to a stormwater Drain, combined sewer, or other place of disposal. The building stormwater Drain lateral begins 10 feet outside the inner face of the building foundation wall and extends to and

includes the connection to the City's stormwater Drain, combined sewer or private combined sewer or stormwater Drain.

Bypass shall mean an intentional or negligent diversion of a wastestream, by direct or indirect means.

Catch basin shall mean a structure used to collect runoff and divert it to the stormwater or combined collection system.

Chemical Oxygen Demand or COD shall mean the oxygen equivalent of the portion of the organic matter that is susceptible to oxidation by a chemical oxidant, expressed in milligrams per liter, as determined by a procedure described in the latest edition of *Standard Methods for the Examination of Water and Wastewater*.

City shall mean the City of Cambridge, Massachusetts.

City Engineer shall mean the City Engineer of the City of Cambridge or his/her designee.

Cleanout shall mean a device or structure designed to provide access to a building combined sewer lateral, building sewer lateral or building stormwater Drain lateral for the purpose of eliminating blockages and removing deposited or accumulated materials.

Collection system shall mean the pipes, conduits, pumping stations, and appurtenances involved in the collection and transport of Waste and stormwater.

Collection System Access shall mean the opening and/or entry of a person or equipment into the City's Wastewater or Stormwater Drainage systems and shall be authorized only pursuant to a validly issued SWIP under Section 8(a)(i) herein.

Combined sewer shall mean a sewer designed to receive both Waste and stormwater.

Combined Sewer Overflow (CSO) or Combined Sewer Outfall shall mean the portion of a pipe extending from a combined sewer regulator downstream to its outlet. This term is also used to mean the permitted discharge of combined sewage to a receiving water body.

Commissioner shall mean the Commissioner of the Department of Public Works.

Common manhole (CMH) shall mean a structure allowing access to both sanitary or combined sewer, and stormwater Drainage systems typically configured to allow sanitary sewer or combined sewer pipes and stormwater pipes to pass through the same structure where flows are separated by a horizontal plate or vertical wall.

Commonwealth shall mean the Commonwealth of Massachusetts.

Composite sample shall mean a combination of individual samples of Wastewater or stormwater taken at predetermined intervals to represent the integrated composition of the sample source.

Connection shall mean the point where a sewer, stormwater Drain or combined sewer is joined to another sewer or Drain.

Construction Site Dewatering shall mean any water that is directly or indirectly discharged to the City of Cambridge collection system from a construction site.

Conventional Pollutant shall mean as specified under the Clean Water Act, conventional pollutants including solids, coliform bacteria, high biochemical oxygen demand, pH, oil and grease.

Cooling water shall mean the water discharged from any system of condensation, air conditioning, cooling, refrigeration, or other system of heat transfer.

CPHD shall mean the Cambridge Public Health Department.

Cross connection shall mean any actual or potential physical connection or arrangement between a pipe conveying potable water from a public water system and any non-potable water supply, piping arrangement or equipment including, but not limited to, waste pipe, soil pipe, sewer, Drain or other unapproved sources.

Daily Maximum Limit shall mean the highest allowable concentration for any pollutant in a waste stream.

DCR shall mean the Massachusetts Department of Conservation and Recreation [formerly known as the Metropolitan District Commission (MDC)].

Decorative fountain shall mean an indoor or outdoor fountain that is designed and constructed for aesthetic purposes and is not intended for human contact recreation or for providing drinking water.

Demolition Permit shall mean any dismantling, intentional destruction or removal of structures, utilities, public or private right-of-way surfaces, or similar property

DEP shall mean the Massachusetts Department of Environmental Protection.

Dewatering Drainage shall mean groundwater or surface water, which is removed from a site and discharged beyond the limits of the site by means of gravity or pumping.

Direct Connection shall mean the new connection to the municipal Wastewater and Stormwater Drainage systems or modification, reconnection or repair of an existing connection to the municipal Wastewater and Stormwater Drainage systems.

Discharge shall mean flow from a canal, conduit, Sewer, Drain, Outfall, pump, stack, tank or treatment process, or any emission, intentional or unintentional, including but not limited to, flow resulting from spilling, leaking, seeping, pumping, pouring, emitting, emptying, depositing, dumping, releasing, injecting, escaping, leaching or infiltrating whether direct or indirect.

Downspout shall mean a pipe, which conveys Stormwater from the roof of a building into a Stormwater Drain or combined sewer or into or onto the ground. Also called a roof Drain or roof leader.

DPW shall mean the City of Cambridge Department of Public Works.

Drain shall mean a horizontal pipe that carries Waste, water or waterborne waste in a drainage system or a horizontal stormwater conveyance channel, whether natural or artificially constructed, enclosed or open.

Drainage Facility shall mean any system of artificially constructed Drains, including open channels, whether lined or unlined, and separate stormwater Drains used to convey stormwater, surface water or groundwater. A Drainage facility may also convey effluent discharged pursuant to an National Pollution Discharge Elimination System (NPDES) permit when such use is approved by the DPW.

Dry weather flow shall mean any flow in a stormwater or Wastewater system in dry weather conditions.

Dry well shall mean a pit or underground cavity installed to drain surface water and stormwater Drainage into underground strata.

Dwelling unit shall mean a house, condominium, fraternity, dormitory, apartment, mobile home or trailer, group of rooms or single room occupied or intended for occupancy as a separate living quarter.

Easement shall mean an acquired legal right for the specific use of land owned and maintained by others.

Effluent shall mean Waste or other liquid, irrespective of treatment, flowing out of a treatment facility or part thereof.

Enzyme shall mean a protein that acts as a catalyst to induce chemical changes in other substances, itself remaining apparently unchanged in the process.

EPA shall mean the United States Environmental Protection Agency.

EPA Site Dewatering Permit shall mean the written approval of EPA to Owners and/or operators of sites that discharge groundwater and/or stormwater from construction dewatering activities discharging to waters of the Commonwealth of Massachusetts. Owner's and/or operators will be required to submit a Notice Of Intent to EPA-New England to be covered by the appropriate general permit and will receive a written notification from EPA-New England of permit coverage and authorization to discharge under the general permit.

Excavation Permit shall mean the written approval to excavate or dig or make a hole or cavity in or under municipal property or interests. Approval will be granted by: the Superintendent of Streets for excavation in the Public Right of Way; the Commissioner for excavation within a municipal park; the City Engineer for excavation within a municipal easement; or their respective designees and shall be authorized only pursuant to a validly issued SWIP under Article I Section 8(a)(vi).

Excessive shall mean more than the limits established in these Regulations, directly or by reference, or more than limits determined by the DPW, the MWRA, or other federal, state or local agency to be acceptable.

Floatable oil shall mean oil, fat or grease of animal or vegetable origin, or petroleum derived oil or grease in a physical state such that it will separate by gravity from Waste by treatment in an approved pretreatment facility.

Floor Drain shall mean an intended Drainage point in an otherwise impervious floor, which serves as the point of entry into any subsurface Drainage, treatment, disposal, containment, or other plumbing system.

FOG (Fats, Wax, Oils, and Grease) shall mean the discharge from a food-handling establishment of fats, wax, oils, and grease into the City's wastewater system and shall be authorized only pursuant to a validly issued SWIP under Article I Section 8(a)(v). Food handling establishments shall include commercial/industrial establishments or other establishments as deemed appropriate by the DPW that include as part of their operations the handling, preparation and/or distribution of food.

Garage shall mean any building wherein one or more motor vehicles are serviced, kept or stored and shall include (without limitation) a public or private garage, carport, motor vehicle repair or paint shop, service station, lubritorium, car wash, gasoline station with grease pits or wash racks, or any building used for similar purposes.

Garbage shall mean the animal and vegetable wastes resulting from the domestic or commercial handling, storage, sale, preparation, cooking, or dispensing of food, excluding rubbish.

GPM shall mean gallons per minute.

Grab sample shall mean an individual aliquot collected over a period of time not exceeding 15 minutes.

Grease trap shall mean a receptacle designed to collect and retain or remove grease, oils and fatty substances from Waste normally resulting from the commercial/industrial handling, preparation,

processing, cooking or dispensing of food and related equipment. Also called a grease interceptor in the *Uniform State Plumbing Code, 248 CMR 2.00*.

Groundwater shall mean a supply of water under the earth's surface contained within or flowing through a geological formation.

Hazardous Waste shall mean a waste, or combination of wastes, that at the time of discharge:

- (a) Is identified as a hazardous waste by EPA pursuant to the *Resource Conservation and Recovery Act, 42 USC 6901, et seq.*, and is listed in *40 CFR Part 261*, as amended from time to time;
- (b) Has any of the hazardous waste characteristics identified by EPA in *40 CFR Part 261* as amended from time to time;
- (c) Has been identified by DEP as a hazardous waste pursuant to *M.G.L. c. 21C* and is listed in *310 CMR 30.000*; as amended from time to time; or
- (d) Has any of the hazardous waste characteristics identified by DEP in *310 CMR 30.000*, as amended from time to time.
- (e) A waste that would be a hazardous waste pursuant to the EPA or DEP criteria, but for the fact that it is discharged to the sanitary sewer or combined sewer system shall be, for purposes of this definition, a hazardous waste unless it is in Waste which is discharged to the sewer or combined sewer system pursuant to a permit issued under these Regulations and in compliance with the City's and the MWRA's discharge limits.

Illicit connection also called an **illegal connection** shall mean any connection to a stormwater Drain which allows an illicit discharge to a stormwater Drain and any connection which allows stormwater to discharge to a sanitary sewer regardless of whether said connection was previously allowed, permitted, or approved before the effective date of these Regulations.

Illicit discharge shall mean any direct or indirect discharge to the stormwater Drainage system that is not composed entirely of stormwater, except as exempted pursuant to Article V (C) Sections 5 and 6. The term does not include a discharge in compliance with an NPDES Storm Water Discharge Permit or a Surface Water Discharge Permit, or resulting from fire fighting activities. Illicit discharges include a surface or subsurface Drain or conveyance, which allows an illicit discharge into the stormwater Drainage system including sewage, process Waste, or wash water, and any connections from indoor Drains, sinks, or toilets.

Improperly Shredded Garbage shall mean wastes from the domestic and commercial preparation, cooking, and dispensing of food, and from the handling, storage and sale of produce, excluding rubbish and trash, which has particles greater than 1/2 inch or 1.27 centimeters in any dimension so as to prevent the particles from being carried freely under normal flow conditions in Municipal Wastewater system.

Individual Waste disposal system shall mean a privately owned septic tank, cesspool or similar self-contained receptacle or facility which collects, treats or otherwise disposes of Waste as defined under *310 CMR 15.000 (Title 5)*.

Industrial Waste shall mean the liquid wastes resulting from the processes employed in industrial, commercial, manufacturing, trade or business establishments as distinct from domestic wastes.

Infiltration shall mean groundwater, surface water or municipal water that enters or leaks into a sanitary or combined sewer through such means as a defective pipe, pipe joint, connection or manhole wall.

Inflow shall mean precipitation or surface runoff that enters a sanitary sewer through such means as downspouts and roof leaders, foundation Drains, yard Drains and area Drains, sump pumps, catch basins,

interconnections between storm Drains and sanitary sewers, and defective manhole covers and frames and common manholes.

Inspectional Services Department (ISD) shall mean the Inspectional Services Department of the City of Cambridge.

Interconnection shall mean a physical connection between a sanitary or combined sewer and stormwater Drain which allows the flows to intermix.

Lamphole refers to pipe connecting to the Wastewater system with a wye or tee connection which permits inspection and flushing of the Wastewater system to clear it of heavy obstructions.

Lateral shall mean a Building sewer lateral, a Building Combined sewer lateral or a Building Drain.

Leachate shall mean the water that collects contaminants as it percolates through wastes, pesticides or fertilizers, and may result in hazardous substances entering surface water, groundwater or soil.

Licensed Drain layer shall mean a person authorized in writing by the DPW to install, maintain and repair sanitary sewers, combined sewers, stormwater Drains, building sewer laterals, building combined sewer laterals and building stormwater Drain laterals within the City of Cambridge.

Main shall mean a sanitary sewer Drain, combined sewer Drain or stormwater Drain that collects and conveys flows from other sanitary sewer Drains, combined sewer Drains or stormwater Drains.

Manhole shall mean a structure allowing access to Wastewater and stormwater systems.

Minimum controls shall mean structures or activities which operators of regulated stormwater systems are required to implement under the Clean Water Act.

Municipal Separate Storm Sewer System (MS4s) or Municipal Storm Drain System shall mean the system of conveyances designed or used for collecting or conveying stormwater, including any road with a Drainage system, street, gutter, curb, inlet, piped stormwater Drain, pumping facility, retention or detention basin, natural or manmade or altered Drainage channel, reservoir, and other Drainage structure that together comprise the stormwater Drainage system owned or operated by the City.

MWRA shall mean the Massachusetts Water Resources Authority.

MWRA General Permit shall mean the Permit required and issued by the MWRA that authorizes certain facilities with low industrial flows and no or low levels of regulated pollutants in their industrial Waste to discharge industrial Waste to the MWRA's Wastewater system.

MWRA Group Permit shall mean the Permit required and issued by the MWRA that is applicable to a specific type or types of industrial and commercial processes or discharges.

National Categorical Pretreatment Standard shall mean the requirements under *40 CFR 403.6* and *40 CFR Chapter I, subchapter N*, specifying quantities or concentrations of pollutants or pollutant properties which may be discharged to a publicly-owned treatment works by new or existing sanitary or combined sewer users in specific industrial categories which are established as separate Regulations under the appropriate subpart of *40 CFR Chapter I, subchapter N*.

National Pollutant Discharge Elimination System (NPDES) Exclusion shall mean a written determination from EPA that a discharge does not require an NPDES permit.

National Pollutant Discharge Elimination System (NPDES) General Permit shall mean the permit issued by EPA that authorizes a class of discharges such as stormwater associated with industrial activity, non-contact cooling water, construction dewatering, and water treatment backwash.

National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Dewatering shall mean the written approval of EPA to Owners and/or operators of sites that discharge groundwater and/or stormwater from construction dewatering activities discharging to waters of the Commonwealth of Massachusetts. Owner's and/or operators will be required to submit a Notice of Intent (NOI) to EPA-New England to be covered by the appropriate general permit and will receive a written notification from EPA-New England of permit coverage and authorization to discharge under the general permit. Owners and operators may be granted authorization to discharge groundwater and stormwater generated wastewaters into waters of Massachusetts. Discharges authorized under this general permit must be treated in a settling basin or other treatment system designed to remove total suspended solids unless the DEP specifically waives that requirement for individual applicant. Construction dewatering activity under this permit is defined as pumped or drained discharges of groundwater and/or stormwater from excavations or other points of accumulation of association with a construction activity.

National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) shall mean the form completed and submitted to the EPA by a person seeking to include a discharge under an NPDES General Permit.

National Pollutant Discharge Elimination System (NPDES) Permit shall mean the permit required and issued by EPA to control point source discharges of pollutants to waters of the United States or separate stormwater Drain systems. It shall also mean the permit issued to the City by the EPA for its combined sewer and stormwater discharges.

National Pretreatment Standard or Pretreatment Standard shall mean the general prohibitions and specific prohibitions of *40 CFR 403.5 (a) and (b)*, of the *National Categorical Pretreatment Standards*.

Non-contact cooling water shall mean water used for cooling that does not come into direct contact with any raw material, intermediate product, waste product or finished product.

Non-contact industrial process water shall mean water used in an industrial or manufacturing process, or in the development, recovery, or processing of natural resources that does not come into direct contact with any raw material, intermediate product, waste product, or finished product.

Non-conventional pollutant shall mean any pollutant not defined as a conventional pollutant or a toxic pollutant.

Non point source pollution (NPS) shall mean pollution which occurs when water runs over land or through the ground and picks up natural and human-made pollutants, and discharges them in surface waters or introduces them into groundwater.

Non-stormwater discharge shall mean any waters discharged to the City's Wastewater or stormwater Drainage system which are not composed primarily of rainfall or other precipitation that runs off surfaces during or after a storm.

Oil/water separator shall mean a receptacle designed to separate petroleum-based oil and grease from water. Also called a trap or interceptor.

Outfall shall mean the point of discharge from a stormwater Drain or combined sewer overflow to a water body, wetland or land surface. Also called an outlet.

Owner shall mean a person who alone or jointly or severally with others has the legal title to any premises or has care, charge or control of any premises as agent, executor, administrator, trustee, lessee or guardian of the estate of the holder of legal title.

Particle separator shall mean a receptacle designed and installed to separate sand, grit and oil from water. Also called a solids separator/interceptor.

Person shall mean any agency of the federal government, any agency or political subdivision of the Commonwealth, any State, public or private corporation or authority, individual, trust, firm, joint stock company, partnership, association, or other entity, or any group thereof, and any officer, employee, or agent of such person, and any group of persons.

pH shall mean a measure of the acidity or alkalinity of a substance expressed as standard units, and calculated as the logarithm (base 10) of the reciprocal of the concentration of hydrogen ions expressed in grams per liter of solution.

Point source pollution shall mean pollution caused by any discernible, confined, and discrete conveyance to surface water or groundwater, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, vessel or other floating craft and container.

Pollutant shall mean any element, constituent, or property of Waste, or of agricultural, industrial, manufacturing, or commercial process waste, or leachate, or any other substance which causes the alteration of the chemical, physical, biological, or radiological integrity of water through its introduction therein.

Premises shall mean a parcel of real estate or portion thereof, including any improvements thereon, which is determined by the City to be a single user for purposes of receiving, using and paying for service.

Pretreatment shall mean the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in Waste to a less harmful state prior to or in lieu of discharging or otherwise introducing such pollutants into the Wastewater system. Pretreatment shall include the reduction or alteration of pollutants by physical, chemical or biological processes, process changes, or other means, except as prohibited by *40 CFR Part 403*. Dilution is not pretreatment.

Private combined sewer shall mean a combined sewer, which is not owned by the City, DCR or the MWRA. Private combined sewers include, but are not limited to, building Drains (Waste), building combined sewer laterals and manholes located on private property and not located within an easement held by the City or other public agencies. The owner of the private combined sewer is also responsible for the connection from a private combined sewer to the public Wastewater system.

Private sewer shall mean a sewer that is not owned by the City, DCR or the MWRA. Private sewers include, but are not limited to building Drains (Waste), building sewer laterals and manholes located on private property and not located within an easement held by the City or other public agencies. The owner of the private sewer is also responsible for the connection from a private sewer to the main of the public Wastewater system.

Private stormwater Drain shall mean a stormwater Drain that is not owned by the City or the DCR. Private stormwater Drains include, but are not limited to, building Drains (stormwater), building stormwater Drain laterals, catch basins and manholes located on private property and not located within an easement held by the City and other public agencies. The owner of the private stormwater Drain is also responsible for the connection from a private stormwater Drain to the main of the public stormwater system.

Public combined sewer shall mean a combined sewer that is owned by the City, DCR or the MWRA.

Public record shall mean a "public record" as defined by M.G.L. c. 4 section 7(26).

Public sewer shall mean a sewer, which is owned by the City, DCR or the MWRA.

Public stormwater Drain shall mean a stormwater Drain that is owned by the City or the DCR.

Public ways shall mean any and all portions of the streets and sidewalks in the city of Cambridge, which are open for use by the public.

Receiving waters shall mean any watercourse, river, pond, wetland, ditch, lake, aquifer, ocean or other body of surface water or groundwater that receives a discharge of Wastewater, stormwater or effluent.

Recreational spray or sprinkler pool or recreational fountain shall mean an outdoor spray or sprinkler pool, which is designed and constructed for the purpose of human contact recreation.

Regulator shall mean a device for regulating the diversion of flow in a combined sewer.

Requirements for Site Plans shall mean the document, which describes the information, which must be included in site plans submitted to the DPW. A Site Plan is required by the DPW for review and approval of a proposed connection, or reconstruction, repair or modification of an existing building sewer lateral, building combined sewer lateral, or building stormwater Drain lateral which connects to the City's wastewater or stormwater Drainage system.

Roof Drain or roof leader - See Downspout

Runoff shall mean that part of precipitation, snow melt, or irrigation water, which is not absorbed into the ground. Instead, it flows over the land into streams, other surface bearing water or Drainage structures.

Sanitary sewage shall mean liquid and water-carried human and domestic wastes from buildings, exclusive of ground, storm and surface water, industrial wastes, uncontaminated cooling water, and uncontaminated industrial process water.

Sanitary sewer shall mean a sewer designed to carry sewage.

Septage shall mean the wastes of primarily sanitary sewage origin or industrial wastes that are removed from a cesspool, septic tank, portable toilet, holding tank or similar receptacle.

Sewage shall mean the spent water of a community, which may be a combination of liquid and water-carried wastes from residences, commercial buildings, industrial facilities and institutions, together with leachate and construction site dewatering, and exclusive of groundwater, surface water, and/or stormwater.

Sewer shall mean a pipe or conduit that carries sewage.

Sewer extension shall mean the addition to a wastewater system of a sanitary or combined wastewater pipe, together with appurtenant works, which when connected to the wastewater system becomes the property of, and is operated and maintained by, the person owning the wastewater system.

Sewer Use Discharge Permit (industrial) shall mean the permit required and issued jointly by the City and the MWRA to a user for the discharge of industrial Waste to the City's or the MWRA's Wastewater system.

Site plan shall mean a plan of land indicating the general location and boundaries of the lot, major anticipated changes in natural features, existing and proposed buildings, pervious and impervious surfaces, existing and proposed curb cuts, infrastructure, topographic, intended changes and external utilities that will be utilized.

Sludge shall mean waste containing varying amounts of solids that is removed from water and Waste through treatment by physical, chemical or biological processes.

Slug shall mean: any discharge to the Wastewater system of a non-routine episodic nature, including but not limited to an accidental spill in a non-customary batch discharge.

- (a) that portion of a discharge which contains a pollutant that is prohibited by these Regulations or contains a concentration of a pollutant at least five times above the concentration limit for that pollutant provided in federal or state regulations.
- (b) a discharge from a large vat, vessel, or container into the Wastewater system in a manner that:
 - (i) harms or threatens to harm the Wastewater system, workers or receiving waters;
 - (ii) contains a pollutant in excess of the requirements of these Regulations;
 - (iii) causes a violation of any federal or state permit issued to the City; or
 - (iv) constitutes a discharge of a pollutant without an appropriate permit.

Solid Waste shall mean any unwanted or discarded solid material, consisting of putrescible or nonputrescible solid waste material.

Standard Methods shall mean the current edition of *Standard Methods for the Examination of Water and Wastewater*, as published by the American Public Health Association (APHA), American Water Works Association (AWWA) and the Water Environment Federation (WEF).

Stormwater shall mean any water resulting from rainfall or other precipitation that runs off surfaces during or after a storm.

Stormwater Discharge shall mean the discharge of stormwater to the City's stormwater drainage system and shall be authorized only pursuant to a validly issued SWIP under to Section 8(a)(iii).

Stormwater Drain shall mean a pipe or conduit that carries surface water, stormwater, groundwater or runoff and is exclusive of sewage.

Stormwater Drainage system shall mean pipes, conduits, open channels, pumping stations and appurtenances, including tidegates, catch basins, and manholes used in the collection and transport of Stormwater, Groundwater and runoff.

Stormwater Guidelines shall mean the City of Cambridge Stormwater Guidance Document, a guidance manual issued by the Commissioner pursuant to these Regulations, which is intended to assist in effectively implementing stormwater management, erosion and sediment controls, and operation and maintenance standards and also provides requirements for plan submittals.

Stormwater management shall mean regulatory, structural, administrative, managerial, maintenance, physical and chemical measures or devices designed to prevent the discharge of point and non point pollutants to Stormwater Drainage Systems. Also, regulates the rate and quantity of Stormwater Discharge from point and non point sources to receiving bodies of water. Non-structural measures and structural devices are often referred to as best management practices or BMPs.

Substantial rehabilitation shall mean 1) repairs, replacement, improvements (including major movable equipment) and additions, the cost of which exceeds 15% of the after rehabilitation value of the property; or 2) replacement of two or more major building components.

Surface water shall mean all water appearing on the earth's surface exposed to the atmosphere, such as rivers, lakes, streams, and oceans.

Suspended solids shall mean solids that either float on the surface or are in suspension in water, Waste or other liquids and are removable by laboratory filtering procedures as described in *Standard Methods*.

Termination and Verification shall mean the disconnection of Sewer, Combined Sewer or Stormwater Drainage System connections from a building to the City's Sanitary Sewers, Combined Sewers, or Stormwater Drainage Systems and shall be authorized only pursuant to a validly issued SWIP under Article I Section 8(a)(ii) herein

Toxic organics shall mean organics listed as toxic in federal or state laws or regulations.

Toxic pollutant shall mean any pollutant identified as such in federal or state laws or regulations.

Trade secret shall mean anything tangible, which constitutes, represents, evidences, or records a secret scientific, technical, merchandising, production, manufacturing, or management information, design, process, procedure, formula, invention, method, or improvement.

Treatment system or pretreatment system shall mean any and all devices, equipment, or works used in the pumping, storing, treating, recycling, and reclaiming of Sewage, Industrial Waste or Groundwater.

Upset shall mean an exceptional incident in which there is unintentional and temporary noncompliance with the Discharge standards of these Regulations, or any permit thereunder, due to factors beyond the reasonable control of the person responsible for the Discharge. An Upset does not include the following; noncompliance to the extent caused by operational error, an improperly or inadequately designed treatment facility, lack of preventive maintenance, or careless or improper operation.

User shall mean any person including other MS4s that discharge Waste or Stormwater directly or indirectly into the City's Sanitary Sewers, Combined Sewers or Stormwater Drain, or MWRA interceptors within the City.

Waste shall mean Wastewater and any and all other waste substances whether liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any production, manufacturing or processing operation.

Waste oil shall mean used and/or reprocessed, but not subsequently re-refined, oil that has served its original intended purpose. Waste oil includes, but is not limited to, used and/or reprocessed fuel oil, engine oil, gear oil, cutting oil, and transmission fluid and dielectric fluid. Waste oil does not include oils used in food preparation.

Wastewater shall mean the spent water of a community, which may be a combination of the liquid and water-carried Wastes from residences, commercial buildings, industrial facilities, and institutions, together with any Groundwater and Stormwater that may be present.

Wastewater Discharge (non-industrial) shall mean the non-industrial discharge of Waste to the City's Sewer system and shall be authorized only pursuant to a validly issued SWIP under Section 8(a)(iv) herein.

Wastewater system shall mean totality of the devices, equipment or works used in transportation, pumping, storage, treatment, recycling, or reclamation of Waste or in the disposal of the effluent.

Wastewater treatment process shall mean the physical, chemical and biological operations and processes, considered individually or in combination, that are applied at a Waste treatment plant to remove, reduce or alter the pollutant loading of Waste.

ARTICLE II
Use of Wastewater and Stormwater Drainage Systems

Section 1 - Public Wastewater and Stormwater Drainage Systems. The use of all Public Wastewater and Stormwater Drainage Systems in the City, except interceptors of the MWRA's Wastewater System, shall be controlled by the DPW. No person shall, without prior authorization from the DPW, uncover, excavate over, block access to, make any connection with or opening into, alter, or disturb the City's Wastewater or Stormwater Drainage Systems. No person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance, or equipment, which is part of the City's Wastewater or Stormwater Drainage Systems.

Section 2 - Private Wastewater and Private Stormwater Drainage Systems.

- (a) All Private Sewers, Private Combined Sewers, Private Stormwater Drains and appurtenant structures that connect to the City's Wastewater or Stormwater Drainage System shall be controlled as to Discharge by the DPW, but constructed, installed, maintained, repaired, and operated by their Owners, at the Owner's expense. All Private Sewers, Private Combined Sewers, and Private Stormwater Drains that connect to the City's Wastewater or Stormwater Drainage Systems shall be constructed, installed, maintained, repaired, and operated to the satisfaction of the DPW. Discharges from Combined or Sanitary Sewers that connect to the City's Wastewater System are also subject to MWRA regulation.
- (b) Repairs to Private Sewers, Private Combined Sewers, Private Stormwater Drains and appurtenant structures in the City, including repairs required to comply with these Regulations, shall be made by a licensed drain layer.

Section 3 - Permit to Enter City's Wastewater and Stormwater Drainage Systems. No person shall enter or install equipment into the City's Wastewater or Stormwater Drainage Systems without first obtaining from the DPW an SWIP for Collection System Access to enter City Wastewater and Stormwater Drainage Systems in accordance with Article I Section 8 (a)(i) of these Regulations.

Section 4 - Wastewater Connections. The City requires that Waste disposal facilities be connected to its Wastewater System whenever the lack of such connection would endanger public health, create a public nuisance, or impair water quality or the environment. Connection to the City's Wastewater System shall be subject to the availability of capacity in the system as determined by the DPW. Connections shall be made in compliance with all federal, state and local rules, regulations and specifications and at the Owner's expense.

Section 5 - Stormwater Drainage Connections. Connection to the City's Stormwater Drainage System shall be made when required by the DPW. Such connections shall be required whenever the DPW determines they are necessary to prevent the endangerment of the public health, the creation of a public nuisance, or the impairment of water quality or the environment, and in such other circumstances as the DPW reasonably deems appropriate. Connections to the City's Stormwater Drainage System shall be made in compliance with all federal, state and local rules, regulations and specifications and at the Owner's expense.

Section 6 - Special Facilities. When required by the DPW a User shall design, construct, install, operate and maintain special facilities, which will provide for the regulation and control of the rate, volume and characteristics of Waste discharged to the City's and MWRA's Wastewater System or Stormwater to the City's Stormwater Drainage Systems. The design of such special facilities shall be subject to the approval of the DPW. Such special facilities shall be designed, constructed operated and maintained at the Owner's expense. The DPW shall have the right to inspect such special facilities in accordance with Article V (A), Section 3 to ascertain compliance with these Regulations.

Section 7 - Ownership and Maintenance of Building Sewer Laterals, Building Combined Sewer Laterals, Building Drains and Building Stormwater Drain Laterals

- (a) Building Sewer Laterals, Building Combined Sewer Laterals, Building Drains and Building Stormwater Drain Laterals, whether located on public or private property are the responsibility of and shall be installed and maintained by the Owner of the premises served. In the case where more than one premise is connected to the same Building Sewer Lateral, Building Combined Sewer Lateral, Building Drain or Building Stormwater Drain Lateral, the Owners of the respective premises shall be jointly and severally responsible for the maintenance and repair of the Building Sewer Lateral, Building Combined Sewer Lateral, Building Drain or Building Stormwater Drain Lateral.
- (b) The Owner shall at all times keep such Laterals and Drains clean and in good repair in order not to cause excessive infiltration, exfiltration or inflow, depletion of Groundwater, damage to property, odor, or harm to the City's Wastewater and Stormwater Drainage Systems.
- (c) The Owner shall maintain, repair, modify or replace an existing Building Sewer Lateral, Combined Sewer Lateral, Building Drain or Building Stormwater Drain Lateral whenever it is determined by the DPW that such Wastewater or Stormwater Drainage Systems may endanger public health, create a public nuisance, result in public or private property damage, harm the City's Wastewater and Stormwater Drainage Systems, result in excessive infiltration, exfiltration or inflow or impair water quality or the environment and in such other circumstances as the DPW deems appropriate.
- (d) Building Sewer Laterals, Building Combined Sewer Laterals, Building Drains and Building Stormwater Drain Laterals shall be maintained, repaired, modified or replaced at the Owner's expense.

Article III
Building Sewer Laterals, Building Combined Sewer Laterals, Building Stormwater Drain Laterals, Connections and Appurtenances

Section 1 - Separate Building Sewer Laterals and Building Stormwater Drain Laterals. Separate and independent Building Sewer Laterals and Building Stormwater Drain Laterals shall be provided for all new or Substantially Rehabilitated buildings. Where one building stands behind another on an interior lot, and no private sewer or stormwater drain is available or can be constructed to the rear of the building through an adjoining alley, court, yard, or driveway, the Building Sewer Lateral, Building Combined Sewer Lateral or Building Stormwater Drain Lateral may be extended from the front building to the rear building provided that prior written approval and all necessary permits for the extension are obtained from the DPW, the Inspectional Services Department (ISD) and the Cambridge Public Health Department (CPHD).

Section 2 - Existing Building Sewer Laterals, Building Combined Sewer Laterals and Building Stormwater Drain Laterals. If the DPW approves, and the Owner obtains all necessary permits, including an SWIP if required pursuant to Article I, §8, existing Building Sewer Laterals, Building Combined Sewer Laterals and Building Stormwater Drain Laterals may be used to accommodate new Wastewater or stormwater. The costs of any examination and testing required by the DPW as a precondition to such approval shall be at the Owner's expense.

Section 3 - Gravity Discharge to Sewer, Combined Sewer and Stormwater Drains. All Building Sewer Laterals, Building Combined Sewer Laterals and Building Stormwater Drain Laterals shall discharge by gravity to the City sewer, combined sewer or stormwater drain. The Building Drain shall be brought to the building at an elevation below the basement floor. In all new or substantially rehabilitated buildings in which any Building Sewer Lateral, Building Combined Sewer Lateral or Building Stormwater Drain Lateral is too low to permit gravity discharge, wastewater, stormwater or Groundwater shall be lifted by an approved means and allowed to discharge by gravity (i.e., not under pressure) to the City sewer, combined sewer or stormwater drain if approved by the Commissioner or his/her representative and the Owner obtains all necessary permits and obtains an SWIP pursuant to Article I, §8.

Section 4 - Wastewater-Stormwater Separation.

- (a) The plumbing of any new or substantially rehabilitated building shall be so constructed as to keep all stormwater, surface water, groundwater, roof and surface runoff, subsurface drainage, uncontaminated cooling water, and non-contact industrial process water separate from sanitary sewage and industrial wastes, and from the Building Sewer Lateral.
- (b) The building drain conveying sewerage from plumbing fixtures within the building shall discharge to a building sewer lateral, while the building drain conveying stormwater and other drainage shall discharge to a building stormwater drain lateral.
- (c) Where separate Stormwater Drains and Sanitary Sewers are provided and where the DPW has determined that on-site retainage of stormwater is not possible, Building Stormwater Drain Laterals shall be connected to a Stormwater Drain. Connection of a Building Stormwater Drain Lateral to a Sanitary Sewer is prohibited.
- (d) Where separate Stormwater Drains and Sanitary Sewers are provided, Building Sewer Laterals shall be connected to a Sanitary Sewer. Connection of a Building Sewer Lateral to a Stormwater Drain is prohibited.
- (e) For existing properties where only a Combined Sewer has been provided by the City, and the DPW has determined that sewer separation and on-site retainage of stormwater is not feasible, the separate Building Stormwater Drain Lateral may be connected to the Building Sewer Lateral or Building Combined Sewer Lateral in a manner prescribed by the *Cambridge Wastewater and*

Stormwater Management Guidelines and the Building Sewer connection shall be made to such Combined Sewer.

- (f) The DPW shall require an Owner to eliminate a source of Infiltration or Inflow to the sanitary sewer system or the combined sewer system whenever the DPW determines that the source results in excessive Infiltration or Inflow.

Section 5 - Connections to Combined Sewer Overflows. In order to prevent the direct discharge of wastewater to receiving waters under dry weather conditions, a Building Sewer Lateral or Building Combined Sewer Lateral shall not be connected to a Combined Sewer Overflow.

Section 6 - Connections to Manholes. Building sewer connections for new or Substantially Rehabilitated buildings shall not be made directly to City-owned manholes unless expressly authorized by the issuance of an SWIP pursuant to Article I, §8.

Section 7 - Connections to Catch Basins. Private drains, including but not limited to, Building Stormwater Drain Laterals for new or existing buildings, and drains from irrigation systems shall not be connected directly to catch basins unless specifically authorized by the issuance of an SWIP pursuant to Article I, §8.

Section 8 - Connections from Individual Wastewater Disposal Systems. Connection of an individual wastewater disposal system, whether directly or indirectly to a City sanitary sewer, combined sewer, or stormwater drain is prohibited.

Section 9 - Dye Testing of Connections.

- (a) Prior to activating water service, every Building Sewer Lateral or Building Combined Sewer Lateral shall be dye tested by the DPW, or by the Owner or his/her designee in the presence of a DPW and/or ISD inspector, to establish that the Building Sewer Lateral or Building Combined Sewer Lateral is properly connected to the City's wastewater system. The DPW may conduct dye testing of an existing building's wastewater system to establish that it is properly connected to the City's wastewater system. The DPW may require the Owner forthwith to eliminate a connection from a Building Sewer Lateral or a Building Combined Sewer Lateral to a stormwater drain (also referred to as an illicit or illegal connection) at the Owner's expense.
- (b) Where separate sanitary sewers and stormwater drains exist, the DPW may also dye test, or require the Owner to dye test in the presence of a DPW inspector, a new or existing Building Stormwater Drain Lateral to establish that the Building Stormwater Drain Lateral is properly connected to the City's Stormwater Drainage System. The DPW may also require the Owner forthwith to eliminate a connection from a Building Stormwater Drain Lateral to a sanitary sewer at the Owner's expense.

Section 10 - Backwater Valves. All existing or new building drains from plumbing fixtures subject to backflow from a public sewer or combined sewer, or a private sewer or combined sewer connected to a public wastewater system which is subject to backflow, shall be required to have backwater valves installed at the Owner's expense. Any plumbing fixture located at an elevation below the surface elevation of the roadway containing the public wastewater system serving the fixture shall be considered to be subject to backflow. Backwater valves shall be installed in accordance with the *Uniform State Plumbing Code, 248 CMR, Section 2.09:(4)* and the DPW's *Requirements for Site Plans*.

Section 11 - Cleanouts. Where a new building is to be constructed which is set back three feet or more from the property line, the City has the authority to require the Owner to install a cleanout on the portion of the Building Sewer Lateral, Building Combined Sewer Lateral or Building Stormwater Drain Lateral on the Owner's property.

Section 12 - Floor Drains. Floor drains shall be connected to the Building Sewer Lateral or Building

Combined Sewer Lateral.

Section 13 – Oil/Water Separators for Garages.

An Owner of a building or business requiring an oil/water separator pursuant to these regulations shall be required to obtain a validly issued SWIP under Article I, §8 and an MWRA permit, which shall comply with the following:

- (a) Oil/water separators shall be required on sewers or combined sewers directly or indirectly tributary to the City's wastewater system from existing and new garages, services stations, enclosed parking areas, and other establishments capable of discharging petroleum-based oil or grease, flammable wastes, sand, or other harmful substances. Discharges from oil/water separators shall be directed to a sanitary or combined sewer and not to a stormwater drain.
- (b) The determination as to whether an oil/water separator is required rests with the DPW and the MWRA. The type, capacity, location and construction of all oil/water separators shall be approved by the DPW and MWRA, and shall be located so as to be readily accessible for maintenance and inspection. The DPW shall have the right to inspect such facilities in accordance with Article V (A), §3 of these Regulations.
- (c) Where oil/water separators are required, they shall be installed and maintained continuously to satisfactory and effective operation by and at the expense of the Owner or User. Both the Owner of the premises where an oil/water separator is required and the Owner or operator of the establishment or business conducted on the premises shall be jointly and severally responsible for installing an oil/water separator acceptable to the DPW, and for properly servicing and maintaining an oil/water separator.
- (d) The Owner or operator of the establishment or business conducted on the premises where the oil/water separator is located shall maintain a log describing the date and type of all services and maintenance performed in connection with the oil/water separator, the identity of the person who performed the service or maintenance, the amount of residue removed from the oil/water separator on each date, and the method of disposal of the residue. The log entries shall be maintained for six years and shall be made available for inspection and copying by the DPW. The schedule for service and maintenance of an oil/water separator shall be subject to approval by the DPW.
- (e) In addition to complying with these Regulations, oil/water separators shall conform to the regulations of the *State Uniform Plumbing Code, 248 CMR 2:00*, and all other applicable laws.

Section 14 - Particle Separators.

An Owner of a building or business requiring a particle separator pursuant to these regulations shall be required to obtain a validly issued SWIP under Article I, §8, which shall comply with the following:

- (a) Particle separators shall be required on all newly constructed stormwater drains which connect directly or indirectly to the City's stormwater drainage system, or which discharge to water resources, from existing and new outdoor parking or paved areas. Particle separators shall be required on existing stormwater drains from existing or expanded outdoor parking lots or paved areas whenever appropriate as determined by the DPW. Particle separators shall be designed, installed, and maintained in accordance with the *Cambridge Wastewater and Stormwater Management Guidelines*. The DPW shall have the right to inspect such facilities in accordance with Article V (A), §3 of these Regulations.
- (b) The Owner of the particle separator shall maintain a log describing the date and type of all service and maintenance performed in connection with the particle separator, the identity of the person who performed the service or maintenance, the amount of residue removed from the particle separator,

and the method of disposal of the residue. The log entries shall be maintained for six years and shall be made available for inspection and copying by the DPW. The schedule for service and maintenance of a particle separator shall be subject to approval by the DPW.

Section 15 - Grease Traps.

An Owner of a building or business requiring grease trap pursuant to these regulations shall be required to obtain a validly issued SWIP under Article I, §8, which shall comply with the following:

- (a) Grease traps shall be installed as specified by and maintained in accordance with the *State Uniform Plumbing Code* and the *Cambridge Wastewater and Stormwater Management Guidelines* so that the discharge concentration of fats, wax, oils or grease does not exceed 300 mg/l from the Building Sewer Lateral or Building Combined Sewer Lateral.
- (b) Waste removed from grease traps shall not be discharged into the wastewater system. The Owner shall be responsible for the proper disposal of such waste.
- (c) Chemical, biological, or physical means (including flushing with water) shall not be used to release fats, wax, oil or grease into the wastewater system, bypass the trap, or otherwise make the trap operate less effectively. With prior approval from the MWRA and the DPW a chemical or biological agent may be added to convert the fats, wax, oil and grease. The resulting discharge from the trap shall not cause or contribute to an obstruction or blockage in the wastewater system or otherwise violate these Regulations. Unless so converted, the fats, wax, oil and grease contents of a grease trap shall not be discharged to the wastewater system.

Section 16 – Fats, Wax, Oils and Grease (FOG) Sampling

An Owner of a building or business required to install a sampling port or sampling manhole pursuant to these regulations shall be required to obtain a validly issued SWIP under Article I, §8, which shall comply with the following:

- (a) DPW may require a food handling facility to install a sampling port or sampling manhole in accordance with the provisions of Article II, §6 in these Regulations. Where sampling ports are required, they must be installed on the discharge line from the facility before it connects to the City's sewer or combined sewer systems. Sampling ports must be installed in a safe and accessible location prominently identified and approved by DPW. No source of FOG from a facility may be introduced to the discharge line downstream from the sampling location. If a facility has more than one discharge line from the kitchen, sampling ports may be installed on each line if so required by DPW. If it is determined by DPW that there is insufficient space at a facility for a sampling port, or if the discharge line is inaccessible, DPW will conduct sampling at a downstream location to verify FOG discharge. If DPW finds that FOG levels downstream from two or more food handling facilities without sampling ports exceed the FOG limit, DPW shall have the authority to require any or every facility to implement and document the Best Management Practices as described in *Cambridge Wastewater and Stormwater Management Guidelines*
- (b) Sampling can be conducted by DPW at unannounced times. All sampling, testing and analysis will be performed in accordance with the provisions of Article V (A), §3 and §5 of these Regulations.
- (c) Compliance with the FOG limit specified in Article V (B), §2(t) of these Regulations will be assessed from samples taken at the sampling location. In the event of a violation, DPW may take any enforcement action authorized under Article VII in these Regulations.

Article IV Requirements for Design and Construction of Facilities

Section 1 - Design and Construction Standards. New building sewer laterals, building combined sewer laterals, building stormwater drain laterals, other private sewers, combined sewer, stormwater drains, grease traps, oil/water separators, particle separators, appurtenances, and other wastewater or stormwater facilities tributary to the City's wastewater and stormwater drainage systems shall be designed and constructed in conformance with current DPW standards and specifications. In the absence of such specifications, the materials and procedures set forth in *the American Society for Testing and Materials*, the *WEF Manual of Practice No. 9, Design and Construction of Urban Stormwater Management Systems and Gravity Sanitary Sewer Design and Construction*, *New England Interstate Water Pollution Control Commission Guides for the Design of Wastewater Treatment Works*, *Title V of the State Environmental Code* and the *Uniform State Plumbing Code, 248 CMR 2.00* or their amendments shall apply, subject to the prior written approval of DPW.

Section 2 - Application Required for SWIP for Building Sewer Lateral, Building Combined Sewer Lateral or Building Stormwater Drain Lateral Connection.

- (a) The Owner shall complete and submit to the DPW an SWIP application prior to the construction of a new building sewer lateral, building combined sewer lateral or building stormwater drain lateral, or reconstruction, repair, or modification of an existing building sewer lateral, building combined sewer lateral or building stormwater drain lateral which connects to a City sanitary sewer, combined sewer or stormwater drain, or to an MWRA interceptor within the City.
- (b) The application shall be supplemented by building site plans, which have been approved in advance by the City Engineer, or by such other permits, plans, specifications, and information as the DPW may require. Building site plans shall be prepared in accordance with the *DPW's requirements for site plans*. Applicable fees shall be paid at the time the SWIP application is filed at a rate determined annually by the DPW.
- (c) Construction, reconstruction, repair or modification of the building sewer lateral, building combined sewer lateral or building stormwater drain lateral shall not proceed until an SWIP has been obtained. A DPW inspector will be assigned to inspect construction, reconstruction, repair or modification of the building sewer lateral, building combined sewer lateral or building stormwater drain lateral and connection to a City sanitary sewer, combined sewer or stormwater drain.

Section 3 - Connection and Extension Permit Required. No person shall connect to a City sanitary or combined sewer or directly to an MWRA sewer or construct a sewer extension which ultimately connects to a City or to an MWRA sewer without the appropriate SWIP approved by the DPW, and, if applicable, a Sewer System Extension and Connection Permit from DEP in accordance with 314 CMR 7.

Section 4 - Direct Connection to MWRA Sewers. A Direct Master (Direct Connection) Permit application to the MWRA must be approved in advance by the DPW. Where a person seeks to make a direct connection to an MWRA sewer, the DPW shall require the person to supply such information as would enable the DPW to determine whether to approve the application. Within 10 days after receiving a Direct Connection Permit from the MWRA, the permittee shall provide a copy of the permit to the DPW.

Section 5 - Bonding Requirements. The DPW shall have the right to require that any person proposing to construct, repair or modify a building drain, building sewer lateral, building combined sewer lateral, building stormwater drain lateral, other private sewer, grease trap, oil trap, and other wastewater facility tributary to the City's wastewater and stormwater drainage systems post a bond in a form satisfactory to the City and in an amount and for a period of time that the DPW deems sufficient to guarantee construction quality and operating performance.

Section 6 - Licensed Drain Layer. All building sewer lateral, building combined sewer lateral and building stormwater drain lateral installation, repair or maintenance work shall be performed by a drain layer who possesses a valid Drain Layers License issued by the DPW. A drain layer's bond, using the City's standard bond form as then in effect, must be submitted to and approved by the DPW in advance of installation, repair or maintenance.

Section 7 - Violations to be Reported. All licensed drain layers are required to give a full written report to the DPW within 24 hours if, in the course of performing their work:

- (a) prohibited substances are found in a building drain, building sewer lateral, building combined sewer lateral or building stormwater drain lateral, or plumbing is found that would allow discharges of such substances to a building drain, building sewer lateral, building combined sewer lateral or building stormwater drain lateral;
- (b) interconnections or illicit connections are observed;
- (c) a defect or deterioration of the building drain, building sewer lateral, building combined sewer lateral or building stormwater drain lateral is observed; or
- (d) a defect or deterioration of the City's sanitary sewer, combined sewer or stormwater drain is observed.

Failure to provide such reports may lead to license suspension or in the case of repeated violations, to license revocation.

Section 8 - Right to Inspect During Construction. The DPW shall have the right to inspect all building drains, building sewer laterals, building combined sewer laterals, building stormwater drain laterals, and other private sewers, private stormwater drains, grease traps, oil traps, particle separators and other facilities, at any reasonable time while such construction is underway. The owner shall notify the DPW when such facility is installed and ready for final inspection and before the facility is connected to the City's wastewater and stormwater drainage systems. Connection to the City's wastewater and stormwater drainage systems shall be made in the presence of a DPW inspector. No facility shall be covered over until approval has been given by the DPW inspector.

Section 9 – Illicit Connections to the Stormwater Drain. Every newly constructed, replaced or extended building sewer lateral or building combined sewer lateral that discharges directly or indirectly to the City's stormwater drainage system shall be designed or constructed to disconnect from the City's stormwater drainage system and connect to the City's sanitary or combined sewer system as required by the DPW.

Section 10 – Inflow and Infiltration. Every newly constructed, replaced or extended building sewer lateral or combined sewer lateral that discharges directly or indirectly to the City's sanitary or combined sewer system shall be designed, constructed and maintained so as to minimize all Inflow and Infiltration into the City's sanitary or combined sewer system. The DPW may require an Owner to determine and eliminate the source of the Infiltration or Inflow to an existing Building Sewer Lateral or Building Combined Sewer Lateral at the Owner's expense.

Section 11 - Construction of Below-grade Plumbing. All plumbing fixtures located at an elevation below the adjacent roadway elevation which contains the City sanitary or combined sewer serving the proposed plumbing shall be considered to be subject to backflow and shall be equipped with a backwater valve in accordance with 248 CMR Section 2.09(4) of the Uniform State Plumbing Code, the DPW's requirements for site plans, and 780 CMR Section 10.15 (ii) of the State Building Code. The backwater valve shall be installed and maintained at the Owner's expense.

Section 12 – Distance from Water Services. Building sewer lateral, building combined sewer lateral and building stormwater drain lateral connections shall be laid at least 10 feet apart horizontally and 18

inches apart vertically from any new or existing water service connection in accordance with DEP regulations.

Section 13 - Fuel Dispensing Areas. Any area which is used to dispense fuel and is covered by a canopy or other type of roof or enclosure shall drain into an approved oil/water separator and then into a sanitary sewer, or if not available, a combined sewer. As an alternative, it is permissible to contain all runoff within the fuel dispensing area so that it is not drained off. The owner shall be responsible for the removal and disposal of any runoff, which is contained in such a manner. The fuel dispensing area shall be graded so as to prevent any runoff to surrounding areas, which drain into a stormwater drain. Runoff from canopies of gas stations and from fuel dispensing areas not in a building or covered by a canopy shall be drained according to the *Cambridge Wastewater and Stormwater Guidelines* or, in the absence of such guidelines, as prescribed by the City Engineer.

Section 14 - Stormwater Management. On-site retainage of stormwater and implementation of other stormwater management measures to control the rate, volume and characteristics of stormwater discharged to the City's combined sewer or stormwater drainage systems shall be required whenever appropriate, as determined by the DPW. Every person seeking to establish a new connection to the City's combined sewer or stormwater drainage system or to reconstruct, repair or modify an existing connection for a facility undergoing expansion or rehabilitation shall be required to obtain an SWIP and may be required to prepare and implement a stormwater management plan. Such a plan may include non-structural and structural measures to manage stormwater during and after construction of the new or expanded facility. The design and maintenance of such facilities shall be subject to the approval of the DPW in accordance with the *Cambridge Wastewater and Stormwater Guidelines* and shall meet all current state and federal regulations. The design, installation and maintenance of such facilities shall be at the facility Owner's expense. The DPW shall have the right to inspect such facilities in accordance with this article and Article V (A), §3 of these Regulations.

Section 15 - Decorative Fountains. New or substantially rehabilitated decorative fountains shall be equipped with a shut off mechanism and shall be designed and constructed so as to re-circulate water. Decorative fountains shall discharge to a stormwater drain.

Section 16 - Recreational Spray and Sprinkler Pools. New or substantially rehabilitated recreational spray and sprinkler pools, also known as recreational fountains, shall be equipped with a shut off mechanism and shall be designed and constructed so as to be nonrecirculating. Recreational spray and sprinkler pools shall discharge to a stormwater drain.

Section 17 - Termination of Service. Every person seeking to obtain a Demolition Permit from the City's Inspectional Services Department to demolish part or all of a structure shall submit a completed SWIP (Termination & Verification), which requires sign-off by DPW. Prior to demolition of any building, the Owner shall obtain a Termination and Verification Permit to cut and cap all building sewer laterals, building combined sewer laterals and building stormwater drain laterals at the connection to the sanitary or combined sewer or stormwater drain, and have the DPW inspect all building sewer laterals, building combined sewer laterals and building stormwater drain laterals to ensure that they are properly cut and capped prior to back-filling.

Section 18 - Expenses Borne by the Owner. All costs and expenses incident to the application for the design, construction, installation, connection, repair, and maintenance of a building sewer lateral, building combined sewer lateral, building stormwater drain lateral, other private sewers or stormwater drains, special facilities, particle separators, grease traps, oil traps, or other wastewater or stormwater drainage facilities shall be borne by the Owner. Notwithstanding the foregoing the City may, in its discretion, bear part or all of such costs and expenses pursuant to Cambridge Municipal Code §13.16.020(C). The Owner shall indemnify the City from, and shall reimburse the City for, any loss or damage directly or indirectly occasioned by the installation, use or operation of any building sewer lateral, building combined sewer lateral, building stormwater drain lateral, private sewer or stormwater drain, special facility, particle separator, grease trap, oil/water separator or other wastewater or stormwater facility.

Section 19 – Extension, Replacement or Relocation of Sanitary Sewer, Combined Sewer and Stormwater Drains. Any person may propose an extension, replacement or relocation of a City sanitary sewer, combined sewer or stormwater drain to serve a new or rehabilitated building. Every person who proposes to extend, replace or relocate a City sanitary sewer, combined sewer or stormwater drain shall prepare and submit for review and approval by the DPW a construction plan, and such other permits, plans, specifications, to include, if applicable, a Sewer System Extension and Connection Permit from DEP in accordance with 314 CMR 7 and any other information the DPW deems necessary to determine whether to approve the request. Extension, replacement or relocation of a City sanitary sewer, combined sewer or stormwater drain shall not commence without the DPW's prior written approval and the approval of any other state agency that governs the approval of sewer extensions. Every extension, replacement or relocation of a City sanitary sewer, combined sewer or stormwater drain shall be designed and constructed in accordance with the DPW's design requirements, specifications and standard details. Any tests, studies, investigations and inspections required for design and construction shall be conducted in accordance with the City's requirements. All expenses incurred pursuant to the extension, replacement or relocation of a City sanitary sewer, combined sewer or stormwater drain including but not limited to, application, engineering, legal permitting, construction and inspection costs shall be borne by the applicant. The Owner shall indemnify the City from, and shall reimburse the City for, any loss or damage directly or indirectly occasioned by the extension, replacement or relocation of a City sanitary sewer, combined sewer or stormwater drain including but not limited to, application, engineering, legal permitting, construction and inspection costs.

Section 20 - Bonding Requirements for Sanitary Sewer, Combined Sewer or Stormwater Drain Extensions. Before extending, replacing or relocating a public sanitary sewer, combined sewer or stormwater drain the contractor shall (a) be approved in writing by the City, and (b) post a performance bond with the DPW in an amount and form acceptable to the City.

Section 21 - Transfer Agreement. After constructing a DPW approved public sanitary sewer, combined sewer or stormwater drain extension, replacement or relocation, the Owner shall transfer ownership of the sanitary sewer, combined sewer or stormwater drains to the City through a Transfer Agreement in a form prescribed by the City. The Transfer Agreement shall be accompanied with as-built plans and easements if required for the extended, replaced or relocated sanitary sewer, combined sewer or stormwater drain and any other conditions or information required by the DPW. Until such time as the Transfer Agreement is signed by the City, the extended, replaced or relocated sanitary sewer, combined sewer or stormwater drain shall be considered to be privately owned by the applicant and shall be subject to the requirements pertaining to private sanitary sewers, combined sewers or stormwater drains contained in these Regulations.

Section 22- DPW Denial of Modification of Proposal. The DPW may deny a request to extend, replace or relocate a public sanitary sewer, combined sewer or stormwater drain, or the DPW determines that proposed construction is incompatible with the DPW's or MWRA's sanitary sewer, combined sewer or stormwater drainage systems, the DPW's design requirements, or these Regulations. The DPW may condition its approval of a request to extend, replace or relocated a public sanitary sewer, combined sewer or stormwater drain. Such conditions may include, but are not limited to, the requirement to install a pipe larger than the size required to serve the applicant.

Article V Discharge Requirements, Prohibitions and Restrictions

A. GENERAL REQUIREMENTS

Section 1 - Compliance with Discharge Limits. Every User who directly or indirectly discharges wastewater to the City's sanitary or combined system or stormwater to the City's stormwater drainage systems shall comply with the strictest of the following discharge limits applicable to the discharge: the National Pretreatment Standards, NPDES Permit conditions, state limits, MWRA, local or permit limits, limits contained in these Regulations, and limits in a permit or order issued under these Regulations. If a *National Categorical Pretreatment Standard* includes a limit in addition to a daily maximum limit (e.g., 30 day, monthly, weekly, four day, loading, or production-based limit), that limit must also be met.

Section 2 - Dilution Prohibited. No User shall achieve, or attempt to achieve, compliance with these Regulations by diluting a discharge instead of using proper pretreatment. The increased use of process water in place of proper treatment shall be considered dilution and is prohibited by these Regulations.

Section 3 - Inspection

- (a) The DPW may inspect the facilities of any User to the City's sanitary system, combined system, or stormwater drainage system to determine compliance with the requirements of these Regulations. The User shall allow the DPW to enter upon the premises of the User for the purposes of inspection, sampling, photographic documentation or record examination and copying. The DPW shall also have the right to install or to have installed on the User's property at the property owner's expense such devices as are necessary to conduct sampling, inspection, compliance monitoring and metering operations as referenced in this Article.
- (b) Conditions for entry:
 - (i) The DPW shall present appropriate credentials at the time of entry.
 - (ii) The purpose of the entry shall be for inspection, observation, measurement, sampling, testing, photographic documentation, or record examination and copying in accordance with the provisions of these Regulations.
 - (iii) Any entry shall be made at reasonable times during normal operating hours unless an emergency situation exists which endangers the public health, safety and welfare of the community as determined by the DPW, in which case the DPW may make an emergency entry and provide notice of entry to the discharger as soon as reasonably practicable.
- (c) If the DPW is refused access to any part of the premises from which stormwater or waste is discharged, and DPW believes that there may be a violation of these Regulations, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with these Regulations or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the DPW shall, with the assistance of the City Solicitor, seek any and all remedies available under federal, state and local laws or regulations, and the User and/or Owner of the premises shall be liable for all fines, fees, penalties, and all costs of enforcement, including but not limited to attorneys fees.

Section 4 - Monitoring Facility Requirements.

- (a) When required by the DPW, a User shall install and maintain at the Owner's expense suitable control or measuring devices, together with manholes, chambers, meters, sampling ports, and other appurtenances in its building sewer laterals, building combined sewer laterals or building stormwater

drain laterals, including those from pumps, to facilitate discharge observation, monitoring, sampling and measurement.

- (b) Such manholes, chambers or meters shall be safely accessible and shall be located and constructed in accordance with site plans approved by the DPW, shall be installed by and at the expense of the Owner, and shall be maintained by the Owner in good operating condition at all times.
- (c) All such meters and other measuring devices shall be approved by the DPW prior to installation and use. All such meters and measuring devices shall be calibrated by the Owner so as to ensure accurate measurement. The facilities shall be constructed in accordance with all applicable construction standards. Construction shall be completed in compliance with a time schedule established by the DPW.
- (d) The DPW requires permittees to keep and retain all records associated with meters, measuring devices and samplers. These records shall include data on volumes, water quality and maintenance.
- (e) All records from meters, measuring devices and samplers, whether required by DPW or not, shall be kept for at least six years and furnished to the DPW upon request. During construction and after installation, the DPW shall have the right to inspect the facilities in accordance with this Article.

Section 5 - Sampling and Analysis.

- (a) All measurements, tests and analyses of the characteristics of wastewater or stormwater required to conform to these Regulations shall be performed in accordance with the most recent edition of *Standard Methods for the Examination of Water and Wastewater*, unless otherwise authorized or required by the DPW, MWRA, EPA or DEP.
- (b) Sample analysis required by these Regulations, or any permit issued hereunder, shall be performed by an independent laboratory currently certified by the DEP for the parameters being analyzed. The use of a laboratory with provisional DEP certification is prohibited.
- (c) Samples analyzed shall be collected at locations designated by the DPW and by methods acceptable to, and at a frequency determined by, the DPW. The DPW will stipulate whether a composite or grab sample should be taken and whether composite samples will be time or flow weighted.
- (d) The DPW may require a permittee to submit a complete data package, including chain of custody records, raw data, and quality assurance/quality control related results, with a report required by the DPW. The DPW may require that discharge monitoring reports be submitted on paper copy, or by electronic means.

Section 6 - Compliance Measurement Location. All limitations imposed by these Regulations shall be applied at the end of the pretreatment process line, or at the end of the process line if there is not pretreatment. The Owner or User shall not introduce a Pollutant into a wastewater or stormwater stream after the compliance measurement location without prior approval of DPW.

Section 7- Notification of Changed Discharge. Every User who directly or indirectly discharges to the City's wastewater or stormwater drainage system shall notify the DPW in advance of (a) any substantial change in the volume or character of pollutants in the discharge; and (b) any change in the location of the discharge to a different sanitary sewer, combined sewer or stormwater drain connection.

Section 8 - Notification of Violations and Remediation Actions.

- (a) A notification of violation will be issued for discharges of otherwise permitted flows in quantities or of such size as to be capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the City's wastewater system.

- (b) Users shall notify the City Engineer immediately upon discharging wastewater or stormwater in violation of these Regulations or their permits, and of any Upset Slug load, or spill that may reasonably be expected to discharge to the wastewater or stormwater drainage systems.
- (c) Each notification shall be followed within 15 days of the date of occurrence by a detailed written statement addressed to the City Engineer describing the causes of the discharge and the remediation measures being taken to prevent a recurrence. Such notification will not relieve Users of liability for any expense, loss or damage to the City's wastewater or stormwater drainage systems, or for any fines imposed on the City due to such discharge.
- (d) In the case where a discharge to the wastewater system violates these Regulations or a permit, the User shall also notify the Director of the MWRA's Sewerage Division immediately. Such notification shall be followed by any additional actions required by the MWRA.
- (e) In the case were a discharge to the stormwater drainage system violates these Regulations or a permit, the User shall also notify DEP and EPA immediately. Such notification shall be followed by any additional actions required by the DEP or EPA.

Section 9 - Preventative Measures. Each User shall provide reasonable and appropriate protection from any discharge, including accidental discharges or potential to discharge in violation of these Regulations.

Section 10 - Confidentiality of Data and Documents.

All information and data regarding any User, whether obtained from reports, questionnaires, permit applications, permits, monitoring programs, or inspections shall be maintained in accordance with the Massachusetts Public Records Law.

B. DISCHARGE PROHIBITIONS AND RESTRICTIONS APPLICABLE TO THE WASTEWATER SYSTEM.

Section 1 - General Prohibitions. No persons shall discharge or cause or allow to be discharged into a City sanitary or combined sewer or into a sanitary or combined sewer tributary thereto, any substances, waters or wastes that the City and /or the MWRA through it's regulations has identified as likely, either singly or by interaction with other substances, to:

- (a) harm or interfere with any wastewater system, wastewater treatment facility, or wastewater treatment process.
- (b) pass through, interfere with or be otherwise incompatible with the wastewater treatment process or sludge disposal;
- (c) cause or result in blockage of flow;
- (d) cause a violation of federal or state law or any discharge permits issued to either the City, the State or the MWRA;
- (e) cause a violation of federal or state water quality standards or otherwise adversely affect the receiving waters;
- (f) endanger or threaten to endanger life, limb, health, or welfare of any person(s) or the public health, safety, welfare, or the environment, or property; or
- (g) constitute a nuisance.

Section 2 - Prohibited Wastes or Substances. No person shall discharge or cause or allow to be discharged directly or indirectly into a City sanitary or combined sewer or into a sanitary or combined sewer tributary thereto any prohibited wastes or substances as specified hereunder or as further specified by DEP, EPA or the MWRA such that the most restrictive requirement is applicable. The prohibited waste or substances include, but are not limited to the following:

- (a) Fuel oil, crude oil, lubricating oil, or any other oils or greases of hydrocarbon or petroleum origin in excess of 15 milligrams per liter.
- (b) Any wastewater discharge from any building or facility served by a private water supply without having first obtained a validly issued SWIP.
- (c) Swimming pool water unless there is no reasonable alternative as determined by the City and MWRA and upon written approval by the City and the MWRA.
- (d) Any liquid, solid, or gas including but not limited to, gasoline, kerosene, naphtha, benzene, toluene, xylene, ethers, alcohols, ketones, aldehydes, peroxides and methyl ethyl ketone, which by reason of its nature or quantity is or may be sufficient, either alone or by interaction with other substances, to create a fire or explosion hazard or to be otherwise injurious to the wastewater system, or to receiving waters, including:
 - (i) Wastewater with a closed cup flashpoint of less than 140 degrees Fahrenheit (F) or 60 degrees Celsius (C) using the test methods specified in *40 CFR 261.21*, and measured at the point of indirect discharge to the City's or the MWRA's sewerage system, or at such other place as the DPW or the MWRA determines; or
 - (ii) Any pollutant, which causes an exceedance of 10 percent of the lower explosive limit as measured by an explosimeter at the point of discharge to the sanitary or combined sewer or at any point within the sanitary or combined sewer.
- (e) Solids or viscous substances (such as, but not limited to, sand, mud, metal, glass, wood, paper, plastics, rags, improperly shredded garbage, rubber, latex, lime or other slurries, garbage, grease, animal guts or tissue, hides or fleshings, entrails bones, hair, feathers, ashes, cinders, stone or marble dust, straw, shavings, grass clippings, spent grains, spent hops, tar, asphalt residues, residues from refining or processing fuel or lubricating oil, grease, glass grinding or polishing wastes) in quantities or of such size as to be capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the City's wastewater system.
- (f) Any noxious or malodorous liquids, gases or solids, which either singly or by interaction with other wastes, are capable of creating a public nuisance or hazard to life, or of preventing safe entry into sewers for purposes of inspection, maintenance repair, sampling, or any similar activity which results in the presence of toxic gases, vapors, or fumes within the wastewater system in a quantity that may cause acute worker health and safety problems.
- (g) Any waters or wastes containing strong acid iron pickling wastes or concentrated plating solutions, whether neutralized or not.
- (h) Any slug.
- (i) Sludges or deposited solids resulting from an industrial or pretreatment process.
- (j) Substances causing noticeable discoloration or turbidity.
- (k) Liquids or vapors having a temperature higher than 150 degrees Fahrenheit (F) or 65 degrees Celsius (C), unless an alternative temperature limit is approved in writing by the DPW and the MWRA.

- (l) Any garbage containing particles larger than one-half inches (1.27 centimeters) in any dimension or particles, which will not be carried freely in the wastewater system.
- (m) Waters or wastes having pH lower than 5.5 or higher than 10.5, or having any other corrosive or injurious properties capable of causing damage or hazard to structures, equipment, people or the collection system. Excursions from these limits are permitted for facilities that continuously monitor pH, subject to limitations established by the MWRA in its *Sewer Use Regulations 360, CMR 10.000*.
- (n) Mercury, polychlorinated biphenyls (PCBs), phenanthrene or pesticides, including but not limited to, dieldrin, chlordane, 1,1,1-Trichloro-2,2- bis(p-chlorophenyl)-ethane (4-4 DDT), demeton, endosulfan I, endosulfan II, endrin, guthion, heptachlor, malathion, methoxychlor, mirex, parathion, acrolein, aldrin, TDE, DDE, Hexachlorocyclo-hexane, lindane, benzene-cis-hexachloride and benzene-trans-hexachloride (BHC), hexachlorocyclopentadiene and toxaphene.
- (o) Waters or wastes containing amounts of metal or other materials in excess of the following limits as contained in federal, state or MWRA regulations:

MATERIAL	DAILY AVERAGE LIMIT milligrams per liter (mg/l)
Acrolein	0.15
Antimony (total)	10.0
Arsenic III (total)	0.5
Benzene	0.3
Boron (total)	20.0
Cadmium (total)	0.1
Chlorinated Naphthalenes	0.8
Chromium (VI) (Hexavalent)	0.5
Chromium (total)	1.0
Copper (total)	1.0
Cyanide (total)	0.5
Fluoranthene	1.5
Formaldehyde	9.0
Hexachlorobutadiene	0.0
Lead (total)	0.2
Nickel (total)	1.0
Phenol	5.0
Phenolic Compounds - the following hydroxy derivatives of benzene:	
2-chlorophenol;	
2,4-dichlorophenol;	
2,4-dimethylphenol;	
4,6-dinitro-o-cresol;	
2,4-dinitrophenol;	
2-nitrophenol;	
4-nitrophenol;	
p-chloro-m-cresol; and	
2,4,6-trichlorophenol	0.5
Selenium (total)	5.0
Silver (total)	2.0
Toxic Organic - each Toxic Organic not limited elsewhere	
in these Regulations	1.0
Toxic Organics (total)	5.0
Trichloroethylene	0.07
Vinyl Chloride	0.02
Vinylidene Chloride	0.3
Zinc (total)	1.0

- (p) Waters or wastes containing amounts of toxic or objectionable metals and nonmetals in excess of limits contained in federal, state or MWRA regulations or in a Sewer Use Discharge Permit.
- (q) Radioactive wastes or isotopes of such half-life or concentrations as may exceed limits established by federal, state or MWRA regulations.
- (r) Total suspended solids or dissolved solids of a type or concentration, which would inhibit flow in the collection system.
- (s) Materials that exert a biochemical oxygen demand in excess of 400 milligrams per liter or a chemical oxygen demand in excess of 1,000 milligrams per liter or chlorine demand in excess of limits established by the MWRA.
- (t) Waters or wastes containing fats, wax, oil and grease, in excess of 300 mg/l (based on the materials recovered in the applicable EPA approved procedure, unless otherwise authorized or required by the City and EPA), or containing any substance which may solidify or become viscous at temperatures between 32°F (0°C) and 180°F (82°C). Waters or wastes containing such substances, excluding normal household waste, shall exclude all visible floatable oils, fats and greases. The use of chemical, biological or physical means to bypass or release fats, waxes, oils or greases into the sewer is prohibited. If a person is unable to comply with the 300 mg/l requirement after treatment, the DPW may increase the limit on a case by case basis if the MWRA and DPW are satisfied that such increase will not contribute to nuisance conditions or an adverse impact on the wastewater system, receiving waters, or the MWRA's Wastewater Residuals program. The DPW may apply a monetary charge to any such increase in the limit to recover the costs it reasonably expects to incur as a result of the increase.
- (u) Any substances containing pathogenic organisms in such quantities as determined by local, state or federal law as hazardous to the public health or the environment, including but not limited to any "Infectious or Physically Dangerous Medical or Biological Waste" as defined and identified by the Massachusetts Department of Public Health in its regulations entitled "Storage and Disposal of Infectious or Physically Dangerous Medical Waste or Biological Waste, State Sanitary Code, Chapter VIII," at *105 CMR 480.010*, and whose disposal via the municipal wastewater system or via a septic system is prohibited by *105 CMR 480.200*.
- (v) Any hazardous waste, or any wastewater which results from the treatment of hazardous waste, and is discharged to the City's wastewater system by dedicated pipe, truck, rail, or by other method.
- (w) Waste or wastewater discharged through a bypass, unless such discharge through the bypass was approved in writing in advance by the DPW and the MWRA, or the discharge through the bypass is allowed by *40 CFR 403.17* and the person using the bypass has provided the required notices to the DPW and the MWRA in a timely manner.
- (x) Any filter backwash not specifically authorized to be discharged by a permit issued to the discharger by the DPW or the MWRA, any filter backwash that is not treated to meet the limits and prohibitions established by the DPW or the MWRA, or any filter backwash, which causes or contributes to a violation of these Regulations.
- (y) Any trucked or hauled pollutants.
- (z) Any water or wastewater, not otherwise governed by these Regulations, containing pollutants at levels which may adversely affect the MWRA's and the City's ability to process or dispose of its wastewater residuals in an environmentally sound and economic manner in accordance with applicable state and federal requirements.

Section 3 - Prohibited Discharges into Sanitary Sewers.

- (a) No person shall directly or indirectly discharge or cause or allow any stormwater to be discharged into any City sanitary sewer or any sanitary sewer tributary thereto.
- (b) No person shall discharge or cause or allow to be discharged directly or indirectly into a City sanitary sewer or into a sanitary sewer tributary thereto any groundwater, dewatering drainage, subsurface drainage, accumulated surface water, non-contact cooling water, non-contact industrial process waters, uncontaminated contact cooling water, uncontaminated industrial process water, or waters associated with the excavation of a foundation or trench, hydrological testing, groundwater treatment/remediation, removal or installation of an underground storage tank or dewatering of a manhole, except as provided in Section 4 (b) below.

Section 4 - Prohibited Discharges into Combined Sewers. No person shall discharge or cause or allow to be discharged directly or indirectly into a City combined sewer or into a combined sewer tributary thereto any of the following:

- (a) Groundwater, dewatering drainage, subsurface drainage, accumulated surface water, non-contact cooling water, non-contact industrial process waters, uncontaminated contact cooling water, uncontaminated industrial process water, or waters associated with the excavation of a foundation or trench, hydrological testing, groundwater treatment/remediation, removal or installation of an underground storage tank or dewatering of a manhole.
- (b) Discharges otherwise prohibited by subsection (a) above may be permitted, when the discharger has taken all reasonable efforts to eliminate and minimize the flow, and there is no reasonable access to a stormwater drain, surface water, or another disposal alternative, and the amount to be discharged will not have an actual or potential adverse impact on the combined sewer system or the quality of receiving water, or the City's ability to meet its obligations under any law, regulation, permit, or order, and the discharger has obtained a validly issued SWIP, subject to the following conditions:
 - (1) A discharger shall obtain a Sewer Use Discharge Permit (which is issued jointly by the DPW and the MWRA) if applicable.
 - (2) The SWIP and/or Sewer Use Discharge Permit may stipulate special conditions and terms as deemed necessary or appropriate by the DPW and/or the MWRA.
 - (3) The SWIP and/or Sewer Use Discharge Permit shall be denied if the DPW determines that the discharge, whether singly or in combination with others, is or may cause or contribute to a water quality problem, or may cause or contribute to a violation of the City's NPDES Permit.
 - (4) In the case of construction site dewatering, the duration of the SWIP and/or Sewer Use Discharge Permit shall not exceed the time period necessary to keep the site dewatered during construction.
 - (5) A permittee may apply to the DPW and the MWRA for an extension of an SWIP or a Sewer Use Discharge Permit for construction site dewatering. Such application shall be submitted a minimum of fourteen (14) days prior to the expiration of the existing permit.

C. DISCHARGE PROHIBITIONS AND RESTRICTIONS APPLICABLE TO THE STORMWATER DRAINAGE SYSTEM.

Section 1 - Prohibited Discharges into Stormwater Drains. No person shall directly or indirectly discharge or cause or allow to be discharged any Illicit Discharge or any other waters not composed entirely of stormwater into a building stormwater drain, lateral connection to a City stormwater drain or to a City stormwater drain except as provided in Sections 5 and 6 below.

Section 2 - Prohibited Connections to Stormwater Drains. The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited.

Section 3 – Wastewater System Connections. Any wastewater system which is or has been connected to the stormwater drainage system, or which is or has been connected to the stormwater drainage system as a result of a false application, misrepresentation, or non-disclosure on a construction permit, or which was connected to the stormwater drainage system by way of obtaining a wastewater system connection and plumbing permits through any means which circumvented the limitations created by this Article, shall be disconnected, from the stormwater drainage system by the Owner or by the City at the Owner's expense.

Section 4 – Flow Obstructions Prohibited.

- (a) No person shall place any dam or other flow restricting structure or device in any drainage facility or watercourse without first having obtained an SWIP (Collection System Access) approval from the DPW.
- (b) No person shall place or deposit into any outfall, drainage facility, stormwater drain or watercourse within the City any garbage, yard waste, soil, rock or similar material, or any other substance which obstructs flow in the stormwater drainage system or damages the system or interferes with the proper operation of the system or which constitutes a nuisance or a hazard to the public. In the event that such an obstruction occurs, the DPW may cause such obstruction to be removed or cause such damage to be repaired and to recover applicable costs pursuant to the provisions of Article VII of these Regulations.

Section 5 - Authorized Discharges to Stormwater Drains. Discharges to stormwater drains which are authorized by these Regulations are as follows:

- (a) Discharges composed entirely of stormwater.
- (b) Discharges for which the owner has obtained both an SWIP from the DPW and an NPDES Permit, coverage under an NPDES General Permit, or an NPDES Permit Exclusion from the EPA.
- (c) Discharges from the following sources:
 - (i) water line flushing,
 - (ii) landscape irrigation,
 - (iii) diverted stream flows,
 - (iv) rising ground waters,
 - (v) uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)),
 - (vi) uncontaminated pumped ground water,
 - (vii) discharge from potable water sources,
 - (viii) foundation drains,
 - (ix) air conditioning condensation,
 - (x) irrigation water, springs,
 - (xi) water from crawl space pumps,
 - (xii) footing drains,

- (xiii) lawn watering,
- (xiv) individual resident car wash waters,
- (xv) flows from riparian habitats and wetlands,
- (xvi) dechlorinated swimming pool discharges
- (xvii) street wash water by methods approved by the City,
- (xviii) residential building wash waters, without detergents, and
- (xix) discharges or flows from emergency fire fighting activities.

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Section 6 – Stormwater Discharges.

- (a) With the exception of discharges authorized under Section 5 above, no person shall cause or allow any non-stormwater discharges to the City's stormwater drainage system without having first obtained an SWIP from the DPW. Discharges to stormwater drains that require an SWIP include, but are not limited to, dewatering drainage, subsurface drainage, non-contact cooling water, non-contact industrial process waters, uncontaminated cooling water, uncontaminated industrial process water, or water associated with the excavation of a foundation or trench, hydrological testing, groundwater treatment/remediation, removal or installation of an underground storage tank, foundation drains, crawl space pumps, footing drains or utility access chamber discharges. The decision to issue an SWIP rests entirely with the DPW. Such discharges shall comply with all other applicable requirements.
- (b) Persons seeking to discharge stormwater pursuant to an SWIP shall also obtain an NPDES Permit, coverage under an NPDES General Permit or an NPDES Exclusion for the discharge, where applicable, a copy of which shall be provided to the DPW.
- (c) The SWIP issued to the user may stipulate special conditions and terms as deemed necessary or appropriate by the DPW.
- (d) An SWIP shall be denied, revoked, suspended or reissued if the DPW determines that the discharge, whether singly or in combination with others, is or may cause or contribute to a water quality problem, or may cause or contribute to a violation of the City's NPDES Permit.
- (e) In the case of construction site dewatering, the duration of the permit shall not exceed the time period necessary to keep a site dewatered during construction. A permittee may apply to the DPW for an extension of an SWIP for construction site dewatering if so approved by the appropriate state or federal agency. Such application shall be submitted to the DPW a minimum of fourteen 14 days prior to the expiration of the existing permit.

Section 7 - NPDES Notice of Intent and Permit. Every person who is required to be covered under an NPDES Permit for a Stormwater Discharge associated with Industrial Activity or for construction purposes shall submit to the City Engineer a copy of the completed Notice of Intent or individual application as submitted to EPA, and the information identified in items (a) through (h) below, as applicable:

- (a) Address of the building (or premises) where the discharge will take place and the name and address of the building (or premises) owner;
- (b) Name of a contact person, title and phone number;
- (c) A site plan or sketch which shows the location of the connection of the building stormwater drain or the point(s) of discharge to the City's stormwater drainage system, including the street name, size of the stormwater drain to which the stormwater will discharge and the outfall to which the discharge will

be conveyed and discharged;

- (d) Standard Industrial Code (SIC Code) of the facility;
- (e) A description of the product or services provided by the facility;
- (f) A description of the nature of the discharge;
- (g) Existing NPDES permit, if any;
- (h) Facility's City water service account number.

D. OTHER DISCHARGE PROHIBITIONS AND RESTRICTIONS.

Section 1 - Dumping to Catch Basins. No person shall directly or indirectly dump, discharge or cause or allow to be discharged into any catch basin, any solid waste, construction debris, paint or painting product, antifreeze, hazardous waste, oil, gasoline, grease and all other automotive and petroleum products, solvents and degreasers, drain cleaners, commercial and household cleaners, soap, detergent, cleaning or wash waters ammonia, food and food waste, fats, wax, oil and grease, grass or yard waste, leaves, animal feces, dirt, sand, gravel or other pollutant. Any person determined by the City to be responsible for the direct or indirect discharge of any of the above substances to a catch basin may be responsible for all clean-up costs and for paying any penalties assessed by the City or other federal state or local agencies.

Section 2 - Disposal of Septage Prohibited. No person shall discharge or cause or allow to be discharged any septage into a City sanitary sewer, combined sewer, or stormwater drain or into any sewer or stormwater drain tributary thereto.

Section 3 - Notification of Spills

Notwithstanding other requirements of federal, state or local laws, rules or regulations, as soon as a person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of or suspects a release of materials at that facility or operation resulting in or which may result in discharge of pollutants to the City's sanitary sewer, combined sewer, or stormwater drainage system or waters of the Commonwealth, the person shall take all necessary steps to ensure containment, and cleanup of the release. In the event of a release of oil or hazardous waste to the City's sanitary sewer, combined sewer, or stormwater drainage system, the person shall immediately notify the City's fire, police, and public works departments. In the event of a release of a non-hazardous pollutant to the city's sanitary sewer, combined sewer, or stormwater drainage system, the reporting person shall notify the DPW within twenty-four (24) hours. The reporting person shall provide to the DPW written confirmation of all telephone, facsimile or in-person notifications within three business days thereafter. If the discharge of prohibited materials is from a commercial or industrial facility, the facility owner or operator of the facility shall retain on-site a written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained in accordance with the Massachusetts Public Records Law.

Article VI Industrial Discharge and Pretreatment Requirements.

A. INDUSTRIAL DISCHARGE, MWRA GROUP PERMIT, MWRA GENERAL PERMIT AND TEMPORARY CONSTRUCTION SITE DEWATERING PERMIT REQUIREMENTS.

Section 1 - Compliance with MWRA Regulations. The intent of this Article is to comply with the MWRA regulations governing dischargers of industrial wastes. This Article shall accordingly be construed to conform with such MWRA regulations as they now exist or may be amended.

Section 2 - Prohibited Discharges. No industrial user shall discharge or cause or allowed to be discharged into any City sanitary or combined sewer or into any sanitary or combined sewer tributary thereto any prohibited or restricted wastes identified in Article V (B).

Section 3 - Discharge Permits.

- (a) No user shall discharge industrial wastes, directly or indirectly, into the City's or MWRA's wastewater system without first obtaining an SWIP, and a Sewer Use Discharge Permit, or an MWRA Group Permit, or MWRA General Permit authorizing the discharge or unless such discharge is exempted by these Regulations. The determination as to whether a discharge constitutes an industrial discharge and that coverage under an SWIP and Sewer Use Discharge Permit, MWRA Group Permit, or MWRA General Permit is required rests with the DPW and the MWRA. Every user proposing a new or modified discharge of industrial wastes shall obtain the required permit(s) and shall file the required permit applications with the DPW prior to constructing a building sewer lateral or building combined sewer lateral to convey such wastes, or if a building sewer lateral or building combined sewer lateral already exists, prior to discharging to the City or MWRA wastewater systems. .
- (b) A permittee shall provide at least 30 days advance written notification to the DPW and the MWRA before taking any action which may substantially change the volume or nature of its discharge, including a substantial change in the volume or character of pollutants in its discharge, from any compliance measurement locations, or from any wastewater connection. Such actions may include, but are not limited to, the following:
 - (i) substantial expansion or contraction of the facility for which the discharge originates;
 - (ii) substantial increase or decrease in production;
 - (iii) modification of any process;
 - (iv) alteration of the pretreatment system or the operation of the pretreatment system; or
 - (v) discharge from a different or relocated wastewater connection.
- (c) The MWRA and DPW will review the information provided in the written notification of modification and will inform the permittee if the proposed change requires submission of a new permit application. The permittee shall file a new permit application if required by the DPW and/or the MWRA, and obtain a modified permit before taking the action described in the notice. If a new permit is not required, the permittee may take the action described in the notice, provided that the action does not violate these Regulations or the terms of any permit.
- (d) If an industrial user discharges types, amounts or rates of pollutants in violation of these Regulations or its permit, the DPW may revoke its permit in accordance with Article VII, Section 5

of these Regulations. If changes in the industrial process have improved the characteristics and/or volume of its discharge, an industrial user may apply to the DPW and the MWRA for modification of its discharge permit.

- (e) A permit shall not be assigned or transferred without prior written approval of the DPW and the MWRA. After approval of a permit assignment or transfer, the permittee shall provide a copy of the permit to the assignee or transferee.

Section 4 - Compliance With Discharge Permit. No user shall directly or indirectly discharge any industrial waste into the City's wastewater system unless such discharge complies with an SWIP and a Sewer Use Discharge Permit or an MWRA Group Permit, or an MWRA General Permit issued to the discharger, and complies with these Regulations.

Section 5 - Obligation to Comply With Regulations. The issuance of an SWIP and/or a Sewer Use Discharge Permit, an MWRA Group Permit, or MWRA General Permit shall not relieve the permittee of its obligation to comply with the *Massachusetts Clean Waters Act, M.G.L., c. 21, sections 26 through 53*, and with the requirements contained in these Regulations, and all other applicable federal, state and local laws and regulations.

Section 6 - Significant Industrial Users. In addition to the requirements of these Regulations, any person operating a facility in Cambridge that is a significant industrial user as defined in *40 CFR 403.3* shall comply with the applicable requirements of *40 CFR Part 403*, including the reporting requirements of *40 CFR 403.12* and any *National Categorical Pretreatment Standard* applicable to the facility, and all other applicable federal, state and local laws and regulations.

Section 7 - Sewer Use Discharge Permit Application and Issuance.

- (a) Every User required to obtain a Sewer Use Discharge Permit shall complete and file with both the DPW and the MWRA a permit application form, which may be obtained from the MWRA.
- (b) The DPW and the MWRA shall evaluate the adequacy of data furnished in the application and may require the applicant to provide additional data within a specified time. If the applicant fails to supply the requested information, the DPW and/or the MWRA may deny the Sewer Use Discharge Permit. After receipt of adequate data, the DPW and the MWRA may issue a Sewer Use Discharge Permit. The Sewer Use Discharge Permit is effective only when authorized in writing by both the DPW and the MWRA.
- (c) The DPW and the MWRA may stipulate special conditions and terms, as authorized by law, upon which a Sewer Use Discharge Permit is issued, including but not limited to the following:
 - (i) Limits on rate, time and characteristics of discharge and requirements for flow regulation, equalization and retention.
 - (ii) Installation of inspection, flow measurement and sampling facilities, and provision for access to such facilities for inspection and/or sampling related to the permit terms and conditions.
 - (iii) Specifications for monitoring programs, which may include flow measurement, sampling, physical, chemical and biological tests, data recording, and reporting schedules.
 - (iv) Pretreatment requirements and implementation schedules, including schedules for reporting progress towards meeting such requirements.
 - (v) Periodic submission of discharge reports and retention and submission of hazardous waste manifests.
 - (vi) Special service charges or fees.

- (vii) Provision for the operation of wastewater pretreatment facilities by persons licensed according to State law, including the *Rules and Regulations for Certification of Operators of Wastewater Treatment Facilities, 257 CMR 2.00*.
 - (viii) Other provisions deemed appropriate by the DPW or the MWRA to ensure compliance with these Regulations, and with applicable requirements of State or Federal laws.
- (d) The DPW or the MWRA may change the conditions of a Sewer Use Discharge Permit from time to time as circumstances (including federal or state laws, rules or regulations) may require.

Section 8 - MWRA Group Permit Application. The Owner of a facility required to be covered under an MWRA Group Permit shall complete and file with the MWRA an application or Notice of Intent to Discharge, on a form available from the MWRA. A copy of the application or the Notice of Intent shall be provided to the DPW. The Owner shall not commence discharging until it is issued a Group Permit by the MWRA, and a copy of the Group Permit is filed with DPW.

Section 9 - MWRA General Permit Application. The Owner of a facility required to be covered under an MWRA General Permit shall complete and file with the MWRA an application or Notice of Intent to Discharge, on a form available from the MWRA. A copy of the application or the Notice of Intent shall be provided to the DPW. The Owner shall not commence discharging until it receives written notice from MWRA that the facility is covered under a General Permit, and a copy of the General Permit is filed with DPW.

Section 10 – Temporary Construction Site Dewatering Permit Application. The Owner of a facility required to be covered under an SWIP for temporary construction site dewatering shall complete and file with the MWRA or EPA an application or Notice of Intent (NOI) to Discharge, on a form available from the MWRA or EPA in accordance with their requirements. A completed SWIP for temporary construction site dewatering and a copy of the approved MWRA Construction Site Dewatering Permit or EPA's NPDES General Permit for Construction Dewatering shall be provided to the DPW. The Owner shall not commence discharging until it is issued an SWIP for temporary construction site dewatering. If a discharge is conveyed to a wastewater system the discharge shall be metered and the sewer charge will be applied by the DPW and is the responsibility of the permittee.

Section 11 - Notification to Employees. Users shall inform their employees of the existence of these Regulations, and if applicable, of the permittee's SWIP, and/or Sewer Use Discharge Permit, MWRA Group Permit, or MWRA General Permit. At least one copy of these Regulations and the permit(s) shall be permanently and conspicuously posted by each such User. Such User shall also permanently post a notice identifying the employee who has been designated as the individual responsible for compliance with, and who should be notified of, any violation of these Regulations or permit. Every such User shall provide copies of the above-referenced permits to each employee working in its pretreatment operations.

B. PRETREATMENT REQUIREMENTS.

Section 1 - Pretreatment Requirements. Every User who directly or indirectly discharges wastewater to the City or the MWRA wastewater system shall provide the pretreatment necessary to ensure that the discharge complies with these Regulations. All pretreatment equipment shall be properly installed and maintained in satisfactory and effective operation at the Owner's expense.

Section 2 - Compliance with the Pretreatment Standards. Every User whose operation within Cambridge is subject to a *National Categorical Pretreatment Standard* shall obtain a Sewer Use Discharge Permit for this operation.

Section 3 - Pretreatment Regulations. All industrial Users and dischargers of industrial wastes shall comply with federal, state, and local laws, rules and regulations pertaining to industrial pretreatment as

they now exist or may be amended in the future.

Section 4 - Pretreatment Facilities.

- (a) Prior to construction or installation of any pretreatment facilities required by any applicable industrial pretreatment federal, state and local laws, rules and regulations, detailed plans and operating procedures, along with a proposed implementation schedule, shall be submitted to the DPW and the MWRA for review. The review of such plans and operating procedures will in no way relieve such User from the responsibility of modifying the pretreatment facility as may be necessary to produce an effluent acceptable to the DPW and the MWRA under the provisions of their respective regulations and the requirements of federal, state or local agencies.
- (b) An approved implementation schedule will be incorporated in the Sewer Use Discharge Permit. Any subsequent proposed changes in a pretreatment facility or method of operation shall be reported to and approved by the DPW and the MWRA before modification of such a facility.
- (c) Pretreatment facilities shall be continuously maintained in satisfactory and effective operation. All costs associated with pretreatment facility planning, design, construction, operation and maintenance shall be borne by the Owner or User. The DPW shall have the right to inspect such facilities in accordance with Article V, Section 3 of these Regulations.

Section 5 - Pretreatment Operator's License. The individual(s) responsible for operating a pretreatment system that discharges directly or indirectly to the DPW's wastewater system shall possess the proper operator's license(s) as required by law, including the *Rules and Regulations for Certification of Operators of Wastewater Treatment Facilities, 257 CMR 2.00*.

Article VII Violations, Penalties and Enforcement

Section 1 - Violations.

Any person who fails to comply with the requirements of these Regulations or the terms and conditions of any permit issued thereunder or the requirements of any federal, state or local laws, rules or regulations governing use of the City's wastewater and stormwater drainage system shall be subject to enforcement actions by the DPW.

- (a) Each day a violation occurs or continues shall be considered a separate violation.
- (b) For violations of discharge limits, each parameter that exceeds a discharge limit shall be considered a separate violation except as provided elsewhere in these Regulations adopted hereunder.

Section 2 - Administrative Orders.

The DPW may issue the following administrative orders at any time it deems such action appropriate to address violations of or to secure timely and effective compliance with these Regulations or the terms and conditions of any permit issued thereunder or the requirements of any federal, state or local laws, rules or regulations governing use of the City's wastewater and stormwater drainage system, whether or not any previous notifications of violation have been provided to the User.

- (a) Cease and Desist Order. The DPW may issue an order to cease and desist a violation or an action or inaction which threatens a violation and to direct the user to comply forthwith or to take such appropriate remedial or preventive action as may be needed to properly address the violation or threatened violation, including halting operations and terminating the discharge.
- (b) Compliance Order. The DPW may issue an order requiring a User to provide within a specified period of time, such treatment, pretreatment or discharge control facilities or related appurtenances as are necessary to correct a violation or to prevent a threatened violation. A compliance order may also direct that a User provide improved operation and maintenance of existing discharge facilities, conduct additional self-monitoring or submit appropriate reports or operation and maintenance logs.
- (c) Show Cause Order. The DPW may issue an order to show cause why a proposed enforcement action should not be taken. Notice shall be served on the User specifying the time and place for a meeting, the proposed enforcement action and the reasons for such action, and a request that the User show cause why the proposed enforcement action should not be taken. Whether or not a duly notified User appears as noticed, additional enforcement action may be initiated.
- (d) Consent Order. The DPW may enter into consent orders, assurances of voluntary compliance, or other similar documents establishing an agreement with a User. Such orders shall include specific actions to be taken by the User and specific time frames to correct a violation or to remove the threat of a violation. Consent orders are allowed when:
 - (i) User agrees to return to compliance promptly, and remedy any adverse impacts of noncompliance within a reasonable period of time; and
 - (ii) Noncompliance has not caused actual harm to public health, safety or welfare, or the environment, or otherwise presented a significant threat; and
 - (iii) Noncompliance does not involve criminal conduct; and
 - (iv) User demonstrates a good faith intention to maintain future compliance with all applicable environmental requirements; and

- (v) Where applicable, User agrees to investigate pollution prevention, source reduction and resource conservation opportunities, and implement them, as established to be feasible by the User and agreed to by DPW.

Section 3 – Emergency Action.

When a User has failed to take action within the time established in an administrative notice or order to eliminate an imminent threat to humans or to the environment or to the effective operation of the City's collection system, the DPW may take such action as deemed necessary, including work by City personnel to eliminate the threat or to mitigate the impact on the City's collection system or the environment. The DPW shall attempt to notify the User of the intended action, but if unable to do so within a reasonable period of time, shall proceed with the action.

Section 4 - Penalties.

- (a) Criminal Penalty Any person who shall continue any violation beyond the time limit provided for, shall be guilty of a misdemeanor, and on conviction thereof, shall be fined in the amount not exceeding five thousand dollars (\$5,000.00) for each violation. Each day in which any such violation continues shall be deemed a separate offense. Failure to pay a civil penalty within 30 days following a final determination regarding the violation is grounds for termination of the Owner's discharge as outlined in Section 5.
- (b) Civil Penalty Authorized enforcement personnel may issue citations, pursuant to G.L., c. 40, § 21D, for violations of these provisions assessing fines of up to five thousand dollars (\$5,000.00) for each day such violation is committed or permitted to continue.
- (c) Injunction. As an additional remedy a violation of these Regulations may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction.

Section 5 - Termination or Prevention of a Discharge.

- (a) Notwithstanding any other provision of these Regulations, the DPW may terminate or prevent a discharge into the City's sanitary or combined system or to the City's stormwater drainage systems if:
 - (i) the discharge or threatened discharge presents or may present an endangerment to human health or the environment, or threatens to interfere with the operation of the City's collection system; or
 - (ii) a permit was obtained by misrepresentation of any material fact or lack of full disclosure; or
 - (iii) the discharger violates any requirement of these Regulations or the terms and conditions of any permit issued thereunder or the requirements of any federal, state or local laws, rules or regulations governing use of the City's wastewater and stormwater drainage system; or
 - (iv) Such action is directed by a court of competent jurisdiction.
- (b) Notice of termination or prevention of discharge or permit revocation shall be provided to the discharger or posted on the subject property prior to terminating or preventing discharge.
 - (i) In situations that do not represent an imminent danger to human health or the environment or an imminent threat of interference to the City's sanitary or combined system or to the City's stormwater drainage systems, the notice shall be in writing, shall contain the reasons for the termination or prevention of discharge, the effective date, duration and the name, address and telephone number of a City contact, shall be signed by the Commissioner of Public Works, and shall be received at the business address of the discharger no fewer than 30 days prior to the effective date.

- (ii) In situations where there is an imminent endangerment to human health or the environment or imminent threat of interference with the operations of the City's sanitary or combined system or to the City's stormwater drainage systems, the DPW may immediately terminate an existing discharge or prevent a new discharge from commencing after providing informal notice to the discharger or after posting such notice on the subject property. Informal notice may be verbal or written and shall include the effective date and time and a brief description of the reason. Within 3 working days following the informal notice, a written formal notice containing the reasons for the termination or prevention of discharge, the effective date, duration and the name, address and telephone number of the City contact, signed by the Commissioner of Public Works, and shall be provided to the discharger.
- (c) The DPW shall reinstate discharge privileges upon clear and convincing proof by the discharger of the elimination of the noncomplying discharge or conditions creating the threat of endangerment or interference as set forth in these Regulations.

Section 6 – Cost Recovery

- (a) The DPW may recover all reasonable costs incurred by the City which are attributable to or associated with violations of these Regulations, including but not limited to the costs of administration, investigation, sampling and monitoring, legal and enforcement activities, damage to the City's sanitary or combined system or to the City's stormwater drainage systems, contracts and health studies, and any fines and penalties assessed to the City which result from a discharge not in compliance with these Regulations or rules adopted thereunder.
- (b) All such costs shall be documented by the City and shall be served upon the discharger by certified or registered mail, return receipt requested. Such documentation shall itemize the costs the DPW has determined are attributable to the violations.
- (c) Such costs are due and payable to the City upon the receipt of the letter documenting such costs. All such costs shall be paid to the City Treasurer. Nonpayment or dispute regarding the amount shall be referred for appropriate action to the City Solicitor. The City Solicitor may initiate appropriate action against the discharger to recover costs under this Article.
- (d) The DPW may terminate a discharge for nonpayment of costs after 30 days notice to the discharger.

Adopted:

Effective Date: March 31, 2008



Lisa Peterson
Commissioner

2008 MAR 31 P 6:51
OFFICE OF THE CITY CLERK
CAMBRIDGE, MASSACHUSETTS