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31 March 2022
File No. 128868-010

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP RGP Coordinator
5 Post Office Square, Suite 100 (OEP06-01)
Boston, Massachusetts 02109-3912

Attention: Shauna Little

Subject: NPDES RGP NOI Application
Permanent Groundwater Remediation Discharge
Boston Children's Hospital – Hale Family Building
Boston, Massachusetts

Ladies and Gentlemen:

Haley & Aldrich, Inc. (Haley & Aldrich) has prepared this submission to facilitate permanent off-site discharge of groundwater remediation effluent from the Boston Children's Hospital (BCH) Hale Family Building on the BCH campus located at 300 Longwood Avenue in Boston, Massachusetts. A Project Locus is provided as Figure 1. On behalf of the Owner and Operator, The Children's Hospital Corporation, and in accordance with the 2017 National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) in Massachusetts, MAG910000, Haley & Aldrich submits this Notice of Intent (NOI) and the applicable documentation as required by the U.S. Environmental Protection Agency (EPA) for discharge of groundwater remediation effluent under the NPDES RGP. As defined in Table 1 of the NPDES RGP, the Activity Category is II (Non-Petroleum-Related Site Remediation). A copy of the completed NOI form is enclosed as Appendix A.

PREVIOUS NPDES RGP FOR TEMPORARY CONSTRUCTION DEWATERING DISCHARGE

On 15 July 2017, Haley & Aldrich submitted a NPDES RGP NOI for temporary construction dewatering activities in support of construction of the BCH Hale Family Building. The EPA subsequently issued NPDES RGP Authorization No. MAG910718 to the project on 25 July 2017. Temporary construction dewatering activities began at the site on 7 March 2018 and continued until 16 December 2021 when construction of the building and the permanent groundwater treatment system were completed. Subsequently, Haley & Aldrich submitted a Notice of Termination (NOT) to the EPA on 24 January 2022 to close out NPDES RGP Authorization No. MAG910718.

NEW NPDES RGP FOR PERMANENT GROUNDWATER REMEDIATION DISCHARGE

Discharge from the permanent groundwater treatment system, which collects effluent from the building underslab drainage (USD) system, is pumped to the building stormwater system prior to off-site discharge to the Boston Water and Sewer Commission (BWSC) storm drain system. The effluent is a remedial wastewater, managed under Post-Temporary Solution Status Reports to be submitted to the Massachusetts Department of Environmental Protection (MassDEP) under Release Tracking Number (RTN) 3-12332 under the Massachusetts Contingency Plan (MCP) by Harvard Medical School, the responsible party for RTN 3-12332, which is further discussed herein. The effluent from the permanent groundwater treatment system will also be managed under the subject NPDES RGP under Activity Category II (Non-Petroleum-Related Site Remediation).

EXISTING BUILDING CONDITIONS

The Hale Family Building is located on a portion of the BCH campus in the vicinity of Shattuck Street and Meadow Lane. General site grades are estimated at about El. 40[1]. The building is bordered by several other BCH campus buildings including the Bader building to the west, the Farley/Pavilion building to the west and north, and the former I.C. Smith Library to the north. Shattuck Street borders the site to the south, beyond which is the Brigham and Women's Hospital (BWH) Connors Center building; Meadow Lane borders the site to the east, beyond which are two Harvard Medical School buildings: the Laboratory for Human Reproduction and Reproductive Biology (LHRRB) and Seeley G. Mudd buildings.

CONSTRUCTION ACTIVITIES

Construction for the Hale Family Building began in February 2017 with site preparation activities. The former Wolbach building, which previously occupied a portion of the site, was demolished in June 2017. Site preparation activities were completed in late 2017. Installation of the perimeter concrete diaphragm wall (slurry wall), to provide groundwater cut-off and temporary excavation support as well as serve as the permanent foundation wall, began in November 2017 and was completed in April 2018. General excavation inside the slurry wall and construction of the interior foundations, sub-slab portions of the USD system, sub-slab portions of the vapor mitigation system, and lowest level floor slab were completed in 2019. Building interior fit-out and commissioning have been on-going, and the Certificate of Occupancy was issued on 10 January 2022.

The building includes a four-level below-grade clinical and hospital support space occupying an area of approximately 34,500 square feet (sf) that required excavation to depths of approximately 65 to 75 ft below ground surface (bgs). The building's below-grade footprint encompasses most of the site. The remainder of the site is occupied by connections between the new building and the existing adjacent buildings or landscaped with various hardscape (i.e., pavement or stone) features.

[1] Elevations reported herein are in feet and reference the Boston City Base (BCB) Datum.

SITE HISTORY

The subject site was undeveloped until the Wolbach building, previously known as the Thomas Morgan Rotch, Jr. Memorial Hospital for Infants, was built in the early 1900s and later was part of the Harvard Medical School until it was acquired by BCH in the mid-1970s. The building had been used for BCH administrative offices since the acquisition. The Wolbach building was historically depicted on Sanborn Maps at 55 Van Dyke (now Shattuck) Street with a tunnel connecting the building to the Harvard Medical School campus and to the power plant west of the BCH campus. As mentioned previously, the Wolbach building was demolished as part of construction activities in June 2017. A separate two-story infant hospital with a basement, platform walkways, and connecting tunnels occupied a portion of the site from approximately 1919 to the 1950s. Connecting tunnels still existed beneath the site until they were demolished during site preparation activities. No other above grade structures existed at the site. The site area included the Prouty Garden, which was opened in 1956, replacing the area formerly occupied by the infant hospital. No significant changes were noted for the Wolbach building or Prouty Garden on Sanborn maps or aerial photographs through 2008.

ENVIRONMENTAL CONDITIONS AND REGULATORY BACKGROUND

The site is located within the boundaries of the off-property portion of the Mission Hill Ledge Site (Ledge Site), identified under RTN 3-12332 and associated with a historic release of Tetrachloroethene (PCE) and resulting breakdown products Trichloroethene (TCE) and cis-1,2-Dichloroethene (cis-1,2-DCE). Harvard Medical School is the party responsible for the release. The Children's Hospital Corporation is undertaking response actions under RTN 3-33889, assigned to the site for PCE and TCE in groundwater above RCGW-2 Reportable Concentrations, as a "Downgradient Property Owner" under Release Abatement Measure (RAM) Plans submitted to MassDEP on 23 February 2017 and 1 July 2019. RAM Status Reports have been filed with MassDEP every six months since filing of the initial RAM Plan in 2017. On 2 November 2020, a Downgradient Property Status (DPS) Opinion was submitted to document that the site is within the off-property limits of the Ledge Site. Currently, the off-property portion of the Ledge Site is in Temporary Solution.

CONTINUED REGULATORY COMPLIANCE

The Children's Hospital Corporation will continue to conduct post-construction sampling and reporting under the new NPDES RGP for permanent discharge and share details of the treatment system and post-construction monitoring results with Harvard Medical School so that the existing Temporary Solution can be revised to include new information from the subject site. On-going activities associated with operation of the permanent groundwater treatment system will be conducted as a Post-Temporary Solution Response Action under RTN 3-12332 (Ledge Site). Operation, Maintenance and Monitoring (OM&M) of the system will be conducted by The Children's Hospital Corporation, and documentation of OM&M activities will be provided to Harvard Medical School as the responsible party who will submit monitoring results in Post-Temporary Solution Status Reports for RTN 3-12332. The existing RAM Plan will be closed once the Revised Temporary Solution is submitted.

SUMMARY OF HISTORIC SAMPLING FOR PREVIOUS NPDES RGP FOR TEMPORARY CONSTRUCTION DEWATERING

A total of nine (9) groundwater samples were collected at the site between June 2015 and April 2017. The samples were submitted to Alpha Analytical (Alpha) of Westborough, Massachusetts to support the NPDES RGP NOI for temporary construction dewatering. The groundwater samples were submitted for chemical analysis of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), total metals (including antimony, arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, silver and zinc), hexavalent and trivalent chromium, Ammonia, polychlorinated biphenyls (PCBs), pH, Hardness, Total Suspended Solids (TSS), Total Phenols, Total Chloride, Total Residual Chlorine (TRC) and Total Cyanide. Measurements of temperature were obtained in the field on the sampling dates indicated above. Refer to Table III for a summary of the previous groundwater analytical data. The results indicated concentrations of Carbon tetrachloride, TCE and PCE above NPDES RGP Effluent Limitations.

Additionally, a sample of the Muddy River (the receiving water) was collected on 26 May 2017, upstream of the discharge location at outfall DO 045, and analyzed for the following parameters: pH, Hardness, Ammonia, total metals (including antimony, arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, silver and zinc), and hexavalent and trivalent chromium. Measurements of temperature were obtained in the field on the sampling date indicated above. A summary of the results of the Muddy River sample is included as Table II. It is our understanding that since the receiving water is a freshwater body, salinity does not need to be analyzed for either the source water or receiving water. Results were used to calculate the site Water Quality Based Effluent Limitations (WQBELs).

UPDATE TO COMPLIANCE MONITORING PARAMETERS AND FREQUENCY

As mentioned previously, temporary construction dewatering activities were conducted during the period from 7 March 2018 to 16 December 2021. The results are included as Table I. During this time, compliance monitoring of the influent and effluent of the dewatering treatment system was conducted in accordance with NPDES RGP Authorization No. MAG910718. The USD system of the building was completed on 31 May 2019, and groundwater collected in the system was routed through the temporary construction dewatering treatment system. The influent compliance monitoring data collected during the period from June 2019 through December 2021 (a 2.5-year period) is most representative of the groundwater treated by the permanent groundwater treatment system. Therefore, the maximum concentrations detected in the influent compliance monitoring data collected during this period were used to calculate the WQBELs.

Note that the most recent results for the influent and effluent NPDES RGP compliance samples collected on 28 February 2022 indicate that all parameters for the effluent sample were within Effluent Limitations with the exception of TSS at 37 mg/L, above the Effluent Limitation of 30 mg/L. Upon receipt of the results, the bag filters for the groundwater treatment system were replaced. Post corrective measure samples of the influent and effluent will be collected to confirm the effluent has returned to compliance with the NPDES RGP.

Several parameters that were monitored during temporary construction dewatering in accordance with the NPDES RGP were not detected during the 2.5-year period from June 2019 to December 2021. These include 1,4-Dioxane, Carbon tetrachloride, 1,1-Dichloroethane, Methyl-tert-butyl ether, Chloroform, Chloromethane, Trichlorofluoromethane, Methylene chloride and Group I polycyclic aromatic hydrocarbons (PAHs). It is the opinion of Haley & Aldrich that continued monitoring for these parameters in the influent and effluent of the permanent groundwater treatment system is not necessary. The subject facility requests that the EPA approve the removal of these parameters from the compliance monitoring requirements for the new NPDES RGP.

Given the extensive monthly compliance monitoring data collected for the site under NPDES RGP Authorization No. MAG910718 and the generally favorable results for the monitoring, the subject facility requests that the EPA approve a reduction to the required compliance monitoring frequency from monthly to quarterly for the new NPDES RGP.

EFFLUENT LIMITATIONS AND DILUTION FACTOR DETERMINATION

The compliance monitoring data and receiving water data described above were input into the EPA-suggested WQBEL Calculation spreadsheet to calculate the Effluent Limitations for the site. As requested by EPA, the Microsoft Excel spreadsheet for the WQBEL calculations will be submitted to the EPA via email for their review upon submission of the subject NOI. Copies of the "EnterData" and "FreshwaterResults" tabs from the Microsoft Excel file are included in Appendix B.

The Seven Day Ten Year (7Q10) low flow of the Muddy River at the outfall location was determined to be 1.08 cubic feet per second (cfs), corresponding to 0.70 million gallons per day (MGD), using the U.S. Geological Survey (USGS) StreamStats program and confirmed by MassDEP. We have also confirmed with MassDEP that the dilution factor for the project is 25.3. The StreamStats Report, dilution factor calculations and confirmation from MassDEP are included in Appendix B.

PERMANENT GROUNDWATER REMEDIATION DISCHARGE

Groundwater collected in the building USD system is routed to a sump that directs the water to the permanent groundwater treatment system which includes a series of bag filters to remove suspended solids and undissolved contaminants including metals, followed by granular activated carbon (GAC) vessels to remove dissolved contaminants including PCE, TCE and cis-1,2-DCE to within the Effluent Limitations established by the NPDES RGP. Total flow is measured with a flow meter/totalizer. The system is designed for a maximum flow rate of 20 gallons per minute (gpm); average flow rates of about 10 gpm are anticipated. Details of the permanent groundwater treatment system submitted by the contractors responsible for installation of the system are included in Appendix C for reference. A schematic process flow diagram of the groundwater treatment system is included as Figure 2.

Following treatment, the effluent from the groundwater treatment system is pumped to the building stormwater system prior to off-site discharge to the BWSC storm drain system. The proposed discharge route travels northeast along Meadow Lane to Longwood Avenue, continues to the northeast along Blackfan Street, and reaches the Muddy River where the effluent discharges to outfall DO 045. The

proposed discharge route is shown on Figures 3A through 3C. Additionally, Site Plan #17350 drawings approved by BWSC on 2 March 2018 are included in Appendix D for reference.

DETERMINATION OF ENDANGERED SPECIES ACT ELIGIBILITY REQUIREMENTS

In accordance with the Endangered Species Act (ESA) guidelines outlined in Appendix I of the 2017 NPDES RGP, a preliminary determination for the action area associated with this facility was established using the U.S. Fish and Wildlife Service (FWS) Information, Planning, and Conservation (IPaC) online system; a copy of the determination is attached in Appendix E. Based on the results of the determination, the facility and action area are considered to meet FWS Criterion A as no listed species or critical habitat have been established to be present within the action area. One candidate species, the Monarch Butterfly, was listed within the area, but no critical habitats have been established. Additionally, a MassDEP Phase 1 Site Assessment Map is included in Appendix E which confirms that no critical habitats are present at the subject site.

DOCUMENTATION OF NATIONAL HISTORIC PRESERVATION ACT ELIGIBILITY REQUIREMENTS

Based on a review of the resources provided by the U.S. National Register of Historic Places and a review of the Massachusetts Cultural Resource Information System (MACRIS), no historic properties have been established to be present at the site, and discharges and discharge-related activities are not considered to have the potential to affect historic properties. The discharge is considered to meet Criterion A. The Wolbach building (55 Shattuck Street), which previously occupied a portion of the site until it was demolished in June 2017, is referred to as BOS.7683 in Massachusetts Historical Commission (MHC) records. Documentation, including correspondence with the MHC, is included in Appendix F.

OWNER AND OPERATOR INFORMATION

Contact:
The Children's Hospital Corporation
300 Longwood Avenue
Boston, Massachusetts 02115
Attn: Jeremy Thomsen
Title: Building Engineering

Authorized Signatory:
The Children's Hospital Corporation
300 Longwood Avenue
Boston, Massachusetts 02115
Attn: Lisa Hogarty
Title: Senior Vice President Real Estate
Planning and Development

ATTACHMENTS

A plot of the concentrations of the primary site contaminants of concern, PCE, TCE and cis-1,2-DCE, in construction dewatering influent over time is included as Figure 4. The completed "Suggested Format for the Remediation General Permit Notice of Intent (NOI)" form is enclosed in Appendix A. Appendix B includes tabs from the WQBEL calculation spreadsheet and dilution factor calculations and documentation. Appendix C includes details of the permanent groundwater treatment system. Appendix D includes Site Plan #17350 drawings approved by BWSC on 2 March 2018. Appendices E and F include the ESA documentation and National Register of Historic Places and MHC documentation,

respectively. A Best Management Practices Plan (BMPP), which outlines the proposed discharge operations covered under the NPDES RGP, will be available at the site and is included in Appendix G. Laboratory data reports for all sampling conducted at the site are available upon request.

CLOSING

Thank you for considering this NPDES RGP NOI application. Please feel free to contact the undersigned should you require additional information or have questions.

Sincerely yours,
HALEY & ALDRICH, INC.

Jonathan M. Thibault, P.E. (CO)
Senior Technical Specialist

Keith E. Johnson, P.E. (RI), LSP
Technical Expert

Attachments:

Table I – Summary of NPDES RGP Compliance Monitoring Results
Table II – Summary of Receiving Water (Muddy River) Quality Data
Table III – Summary of Groundwater Quality Data
Figure 1 – Project Locus
Figure 2 – Schematic Process Flow Diagram – Groundwater Treatment System
Figure 3A – Discharge Route (Figure 1 of 3)
Figure 3B – Discharge Route (Figure 2 of 3)
Figure 3C – Discharge Route (Figure 3 of 3)
Figure 4 – PCE, TCE and cis-1,2-DCE Concentrations in Dewatering Influent Over Time
Appendix A – Remediation General Permit Notice of Intent
Appendix B – Effluent Limitations and Dilution Factor Calculations and Documentation
Appendix C – Permanent Groundwater Treatment System Details
Appendix D – Site Plan #17350 Drawings Approved by BWSC on 2 March 2018
Appendix E – Endangered Species Act Documentation
Appendix F – National Register of Historic Places and Massachusetts Historical Commission Documentation
Appendix G – Best Management Practices Plan

c: The Children's Hospital Corporation; Attn: Lisa Hogarty, Robert Sullivan, Mary Kaitlin O'Connor, Steven Smith, Jeremy Thomsen
Goulston & Storrs; William Seuch

TABLE I
SUMMARY OF NPDES RGP COMPLIANCE MONITORING RESULTS
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			DAY 1				WEEK 1		WEEK 2		DAY 1 (NOTE 2)		WEEK 1	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2018_0307	EFFLUENT_2018_0307	INFLUENT_2018_0308	EFFLUENT_2018_0308	INFLUENT_2018_3_09	EFFLUENT_2018_3_09	INFLUENT_2018_3-16	EFFLUENT_2018_3-16	INFLUENT_2018_0719	EFFLUENT_2018_0719	INFLUENT_2018_0724	EFFLUENT_2018_0724
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	3/7/2018	3/7/2018	3/8/2018	3/8/2018	3/9/2018	3/9/2018	3/16/2018	3/16/2018	7/19/2018	7/19/2018	7/24/2018	7/24/2018
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L1807867-01	L1807867-02	L1807981-01	L1807981-02	L1808191-01	L1808191-02	L1809073-01 L1809073-01-REV	L1809073-02	L1827664-01	L1827664-02	L1828369-01	L1828369-02
Volatile Organic Compounds (ug/L)														
1,1-Dichloroethane	2,000	70	-	-	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (3)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	-	-	64	79	75	80	370	550	ND (10)	ND (10)	ND (10)	12
Carbon tetrachloride	2	4.4	-	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2)	1.1	ND (1)	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	-	-	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (3)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	-	-	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (10)	ND (5)	ND (5)	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	-	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2)	1.1	ND (1)	ND (1)	ND (1)
Methyl Tert Butyl Ether	5,000	70	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (4)	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	-	-	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (12)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	50	5	-	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2)	**6.8**	2.4	3.8	ND (1.5)
Trichloroethene	5	5	-	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2)	1.1	ND (1)	ND (1)	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	-	-	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (10)	ND (5)	ND (5)	ND (5)	ND (5)
Benzene	1,000	5	-	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	40,000	NA	-	-	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	1.7	ND (3)	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	5,000	NA	-	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	NA	NA	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)
o-Xylene	NA	NA	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (4)	ND (1)	ND (1)	ND (1)	ND (1)
Xylene (total)	3,000	NA	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (4)	ND (1)	ND (1)	ND (1)	ND (1)
Total BTEX	NA	100	-	-	ND	ND	ND	ND	1.7	ND	ND	ND	ND	ND
Total Volatile Organic Compounds	NA	NA	-	-	64	79	75	80	371.7	550	10.1	2.4	3.8	12
Volatile Organic Compounds by SIM (ug/L)														
1,4-Dioxane	6,000	200	-	-	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (12)	ND (50)	ND (50)	ND (50)	ND (50)
Semi-Volatile Organic Compounds by SIM (ug/L)														
Benzo(a)anthracene	1,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.16	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.14	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.22	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Chrysene	70	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.21	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.11	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	ND	ND			ND	ND	ND	ND	ND	0.84	ND	ND
Acenaphthene	6,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.33	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Anthracene	30	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.1	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	0.12	0.12	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.12	0.7	ND (0.1)	ND (0.1)
Fluorene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.19	ND (0.1)	ND (0.1)
Naphthalene	700	20	0.14	0.18	-	-	0.1	0.31	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.11
Phenanthrene	10,000	NA	0.14	0.13	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.45	ND (0.1)	ND (0.1)
Pyrene	20	NA	0.12	0.12	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.56	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	0.52	0.55			0.1	0.31	ND	ND	0.12	2.33	ND	0.11
Total Semi-Volatile Organic Compounds by SIM	NA	NA	0.52	0.55	-	-	0.1	0.31	ND	ND	0.12	3.17	ND	0.11
Metals (ug/L)														
Antimony, Total	8,000	206	ND (4)	ND (4)	-	-	7.63	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
Arsenic, Total	900	104	5.47	5.92	-	-	19.83	6.85	5.71	4.07	9.34	3.61	1	1.64
Cadmium, Total	4	10.2	ND (0.2)	ND (0.2)	-	-	9.05	0.21	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chromium, Total	300	323	34.96	35.51	-	-	33.48	42.48	90.4	77.6	14.96	2.65	ND (1)	1.6
Chromium III (Trivalent), Total	600	323	ND (10)	ND (10)	-	-	ND (10)	ND (10)	19	11	15	ND (10)	ND (10)	ND (10)
Chromium VI (Hexavalent), Total	300	323	28	28	-	-	34	36	71	67	ND (10)	ND (10)	ND (10)	ND (10)
Copper, Total	100,000	242	24.85	27.13	-	-	**3,894**	21.46	16.84	12.07	17.57	2.63	1.35	2.02
Iron, Total	NA	5,000	810	984	-	-	**11,800**	2,640	2,480	772	**13,300**	820	530	669
Lead, Total	10	160	2.26	2.93	-	-	**1,206**	3.67	4.5	1.77	8.11	ND (1)	ND (1)	ND (1)
Mercury, Total	20	0.739	ND (0.2)	ND (0.2)	-	-	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	ND (2)	2.03	-	-	61.4	3.74	4.97	2.39	11.54	ND (2)	ND (2)	ND (2)
Selenium, Total	100	235.8	22.86	23.84	-	-	ND (5)	26.29	38.86	39.14	15.33	10.24	ND (5)	5.68
Silver, Total	7	35.1	ND (0.4)	ND (0.4)	-	-	0.5	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)
Zinc, Total	900	420	11.19	14.56	-	-	**4,571**	20.53	51.77	19.56	33.79	ND (10)	ND (10)	13.03
General Chemistry														
Ammonia, Total (mg/L)	NA	Monitor Only	0.466	0.464	-	-	0.696	0.603	0.282	0.294	ND (0.075)	0.148	ND (0.075)	ND (0.075)
Chloride, Total (ug/L)	NA	Monitor Only	116,000	120,000	-	-	128,000	128,000	150,000	142,000	489,000	443,000	501,000	477,000
Cyanide, Total (mg/L)	0.03	178	ND (0.005)	ND (0.005)	-	-	ND (0.005)	ND (0.005)	0.007	0.006	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	19	26	-	-	**100**	**66**	**100**	28	**250**	23	**31**	20
pH (SU)	NA	6.5 to 8.3	**11**	**11.1**	-	-	**11.6**	**11.6**	**11.3**	**11.4**	7.4	7.5	7.4	7.8

ABBREVIATIONS AND NOTES:
NA: Not applicable
- : Not analyzed
ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
ug/L: Micrograms per liter
mg/L: Milligrams per liter
SU: Standard units

1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
2. Discharge under the NPDES RGP did not occur during the period 3/17/2018 to 7/18/2018, an interruption lasting greater than 90 days. As a result, the sampling sequence restarted upon the restart of discharging.
3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
4. Temporary construction dewatering effluent discharge was terminated on 12/16/2021 when the permanent configuration of the groundwater treatment system was completed on 12/17/2021. A Notice of Termination (NOT) was issued for the NPDES RGP on 1/24/2022, and the EPA provided notice on 1/28/2022 that a Notice of Intent (NOI) application for a new NPDES RGP would need to be submitted to cover the discharge from the permanent groundwater treatment system. As a result, monthly compliance samples were not collected in December 2021 and January 2022 (Months 41 and 42) and resumed in February 2022 (Month 43) until such time that the new NPDES RGP is issued to cover the permanent discharge.

TABLE I
SUMMARY OF NPDES RGP COMPLIANCE MONITORING RESULTS
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			WEEK 2		WEEK 3		WEEK 4		POST CORRECTIVE MEASURE		POST CORRECTIVE MEASURE		MONTH 2	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2018_0802	EFFLUENT_2018_0802	INFLUENT_2018_0810	EFFLUENT_2018_0810	INFLUENT_2018_0816	EFFLUENT_2018_0816	INFLUENT_2018_0828	EFFLUENT_2018_0828	INFLUENT_2018_0904	EFFLUENT_2018_0904	INFLUENT_2018_0921	EFFLUENT_2018_0921
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	8/2/2018	8/2/2018	8/10/2018	8/10/2018	8/16/2018	8/16/2018	8/28/2018	8/28/2018	9/4/2018	9/4/2018	9/21/2018	9/21/2018
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L1829959-01	L1829959-02	L1831306-01	L1831306-02	L1832168-01	L1832168-02	L1833890-01	L1833890-02	L1834742-01	L1834742-02	L1837820-01	L1837820-02
Volatile Organic Compounds (ug/L)														
1,1-Dichloroethane	2,000	70	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	-	-	-	-	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	ND (10)	19	24	21	13	13	-	-	-	-	ND (10)	ND (10)
Carbon tetrachloride	2	4.4	1.2	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	2.1	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	-	-	-	-	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	1.2	ND (1)
Methyl Tert Butyl Ether	5,000	70	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Tetrachloroethene	50	5	4.9	ND (1.5)	3.3	ND (1)	1.6	1.7	-	-	-	-	**12**	**6.2**
Trichloroethene	5	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	-	-	-	-	ND (5)	ND (5)
Benzene	1,000	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Toluene	40,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Ethylbenzene	5,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
m,p-Xylenes	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	-	-	-	-	ND (2)	ND (2)
o-Xylene	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Xylene (total)	3,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Total BTEX	NA	100	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND
Total Volatile Organic Compounds	NA	NA	8.2	19	27.3	21	14.6	14.7	-	-	-	-	13.2	6.2
Volatile Organic Compounds by SIM (ug/L)														
1,4-Dioxane	6,000	200	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	ND (50)	ND (50)
Semi-Volatile Organic Compounds by SIM (ug/L)														
Benzo(a)anthracene	1,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	ND (0.1)	ND (0.1)	ND (0.1)	0.11	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Chrysene	70	NA	ND (0.1)	ND (0.1)	ND (0.1)	0.11	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	ND	ND	ND	0.22	ND	ND	-	-	-	-	ND	ND
Acenaphthene	6,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Anthracene	30	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	ND (0.1)	ND (0.1)	ND (0.1)	0.26	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Fluorene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Naphthalene	700	20	ND (0.1)	ND (0.1)	0.16	ND (0.1)	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Phenanthrene	10,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	0.22	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Pyrene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	0.22	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	ND	ND	0.16	0.7	ND	ND	-	-	-	-	ND	ND
Total Semi-Volatile Organic Compounds by SIM	NA	NA	ND	ND	0.16	0.92	ND	ND	-	-	-	-	ND	ND
Metals (ug/L)														
Antimony, Total	8,000	206	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	-	-	-	-	ND (4)	ND (4)
Arsenic, Total	900	104	4.23	ND (1)	6.44	2.03	1.33	16.45	-	-	-	-	7.33	ND (1)
Cadmium, Total	4	10.2	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	0.53	-	-	-	-	ND (0.2)	ND (0.2)
Chromium, Total	300	323	11.07	ND (1)	11.95	1.54	2.59	101.2	-	-	-	-	22.51	ND (1)
Chromium III (Trivalent), Total	600	323	11	ND (10)	12	ND (10)	ND (10)	101	-	-	-	-	22	ND (10)
Chromium VI (Hexavalent), Total	300	323	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)
Copper, Total	100,000	242	11.1	1.96	15.12	2.41	3.74	111.8	-	-	-	-	28.69	ND (1)
Iron, Total	NA	5,000	**8,000**	250	**11,200**	652	2,070	**83,800**	**105,000**	1,700	-	-	**22,600**	147
Lead, Total	10	160	4.23	ND (1)	5.19	ND (1)	1.06	54.85	-	-	-	-	11.77	ND (1)
Mercury, Total	20	0.739	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	-	-	-	-	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	9.8	ND (2)	11.01	ND (2)	2.75	83.92	-	-	-	-	18.27	2.2
Selenium, Total	100	235.8	12.52	10.83	15.03	14.4	5.6	9.58	-	-	-	-	ND (5)	ND (5)
Silver, Total	7	35.1	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	-	-	-	-	ND (0.4)	ND (0.4)
Zinc, Total	900	420	28.64	16.91	29.7	10.87	ND (10)	210.7	-	-	-	-	47.04	ND (10)
General Chemistry														
Ammonia, Total (mg/L)	NA	Monitor Only	0.122	0.101	ND (0.075)	ND (0.075)	0.126	ND (0.15)	-	-	-	-	ND (0.075)	ND (0.075)
Chloride, Total (ug/L)	NA	Monitor Only	558,000	575,000	608,000	632,000	444,000	561,000	-	-	-	-	745,000	786,000
Cyanide, Total (mg/L)	0.03	178	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	-	-	-	-	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	**160**	8.6	**260**	22	**52**	**2,600**	**4,900**	**50**	**60**	9.8	**470**	ND (5)
pH (SU)	NA	6.5 to 8.3	7.4	7.8	**8.4**	8.1	7.6	7.8	-	-	-	-	7.9	7.9

ABBREVIATIONS AND NOTES:
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- : Not analyzed
ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
ug/L: Micrograms per liter
mg/L: Milligrams per liter
SU: Standard units

1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
2. Discharge under the NPDES RGP did not occur during the period 3/17/2018 to 7/18/2018, an interruption lasting greater than 90 days. As a result, the sampling sequence restarted upon the restart of discharging.
3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
4. Temporary construction dewatering effluent discharge was terminated on 12/16/2021 when the permanent configuration of the groundwater treatment system was completed on 12/17/2021. A Notice of Termination (NOT) was issued for the NPDES RGP on 1/24/2022, and the EPA provided notice on 1/28/2022 that a Notice of Intent (NOI) application for a new NPDES RGP would need to be submitted to cover the discharge from the permanent groundwater treatment system. As a result, monthly compliance samples were not collected in December 2021 and January 2022 (Months 41 and 42) and resumed in February 2022 (Month 43) until such time that the new NPDES RGP is issued to cover the permanent discharge.

TABLE I
SUMMARY OF NPDES RGP COMPLIANCE MONITORING RESULTS
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			POST CORRECTIVE MEASURE		POST CORRECTIVE MEASURE		MONTH 3		POST CORRECTIVE MEASURE		POST CORRECTIVE MEASURE		MONTH 4	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2018_1003	EFFLUENT_2018_1003	INFLUENT_2018_1009	EFFLUENT_2018_1009	INFLUENT_2018_1025	EFFLUENT_2018_1025	INFLUENT_2018_1108	EFFLUENT_2018_1108	INFLUENT_2018_1115	EFFLUENT_2018_1115	INFLUENT_2018_1126	EFFLUENT_2018_1126
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	10/3/2018	10/3/2018	10/9/2018	10/9/2018	10/25/2018	10/25/2018	11/8/2018	11/8/2018	11/15/2018	11/15/2018	11/26/2018	11/26/2018
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L1839943-01	L1839943-02	L1840708-01	L1840708-02	L1843611-01	L1843611-02	L1845811-01	L1845811-02	L1847054-01	L1847054-02	L1848107-01	L1848107-02
Volatile Organic Compounds (ug/L)														
1,1-Dichloroethane	2,000	70	-	-	-	-	ND (1.5)	ND (1.5)	-	-	-	-	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	-	-	-	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)
Carbon tetrachloride	2	4.4	-	-	-	-	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	-	-	-	-	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	-	-	-	-	ND (5)	ND (5)	-	-	-	-	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	-	-	-	-	1.9	ND (1)	-	-	-	-	2.1	ND (1)
Methyl Tert Butyl Ether	5,000	70	-	-	-	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	-	-	-	-	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Tetrachloroethene	50	5	**13**	**14**	**10**	ND (1)	**17**	ND (1)	-	-	-	-	**24**	ND (1)
Trichloroethene	5	5	-	-	-	-	1.5	ND (1)	-	-	-	-	2	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	-	-	-	-	ND (5)	ND (5)	-	-	-	-	ND (5)	ND (5)
Benzene	1,000	5	-	-	-	-	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Toluene	40,000	NA	-	-	-	-	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Ethylbenzene	5,000	NA	-	-	-	-	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
m,p-Xylenes	NA	NA	-	-	-	-	ND (2)	ND (2)	-	-	-	-	ND (2)	ND (2)
o-Xylene	NA	NA	-	-	-	-	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Xylene (total)	3,000	NA	-	-	-	-	ND (1)	ND (1)	-	-	-	-	ND (1)	ND (1)
Total BTEX	NA	100	-	-	-	-	ND	ND	-	-	-	-	ND	ND
Total Volatile Organic Compounds	NA	NA	-	-	-	-	20.4	ND	-	-	-	-	28.1	ND
Volatile Organic Compounds by SIM (ug/L)														
1,4-Dioxane	6,000	200	-	-	-	-	ND (50)	ND (50)	-	-	-	-	ND (50)	ND (50)
Semi-Volatile Organic Compounds by SIM (ug/L)														
Benzo(a)anthracene	1,000	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Chrysene	70	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	-	-	-	-	ND	ND	-	-	-	-	ND	ND
Acenaphthene	6,000	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Anthracene	30	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Fluorene	40	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Naphthalene	700	20	-	-	-	-	0.19	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Phenanthrene	10,000	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Pyrene	20	NA	-	-	-	-	ND (0.1)	ND (0.1)	-	-	-	-	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	-	-	-	-	0.19	ND	-	-	-	-	ND	ND
Total Semi-Volatile Organic Compounds by SIM	NA	NA	-	-	-	-	0.19	ND	-	-	-	-	ND	ND
Metals (ug/L)														
Antimony, Total	8,000	206	-	-	-	-	ND (4)	ND (4)	-	-	-	-	ND (4)	ND (4)
Arsenic, Total	900	104	-	-	-	-	ND (1)	ND (1)	-	-	-	-	2.5	1.11
Cadmium, Total	4	10.2	-	-	-	-	ND (0.2)	ND (0.2)	-	-	-	-	ND (0.2)	ND (0.2)
Chromium, Total	300	323	-	-	-	-	16.56	10.03	-	-	-	-	4.95	ND (1)
Chromium III (Trivalent), Total	600	323	-	-	-	-	ND (10)	10	-	-	-	-	ND (10)	ND (10)
Chromium VI (Hexavalent), Total	300	323	-	-	-	-	16	ND (10)	-	-	-	-	ND (10)	ND (10)
Copper, Total	100,000	242	-	-	-	-	5.42	2.28	-	-	-	-	8.64	ND (1)
Iron, Total	NA	5,000	-	-	-	-	401	313	-	-	-	-	4,430	591
Lead, Total	10	160	-	-	-	-	ND (1)	ND (1)	-	-	-	-	3.72	ND (1)
Mercury, Total	20	0.739	-	-	-	-	ND (0.2)	ND (0.2)	-	-	-	-	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	-	-	-	-	ND (2)	ND (2)	-	-	-	-	4.29	ND (2)
Selenium, Total	100	235.8	-	-	-	-	ND (5)	ND (5)	-	-	-	-	ND (5)	ND (5)
Silver, Total	7	35.1	-	-	-	-	ND (0.4)	ND (0.4)	-	-	-	-	ND (0.4)	ND (0.4)
Zinc, Total	900	420	-	-	-	-	ND (10)	ND (10)	-	-	-	-	14.96	ND (10)
General Chemistry														
Ammonia, Total (mg/L)	NA	Monitor Only	-	-	-	-	0.106	ND (0.075)	-	-	-	-	0.157	ND (0.075)
Chloride, Total (ug/L)	NA	Monitor Only	-	-	-	-	510,000	598,000	-	-	-	-	542,000	557,000
Cyanide, Total (mg/L)	0.03	178	-	-	-	-	0.01	ND (0.005)	-	-	-	-	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	-	-	-	-	**110**	ND (5)	-	-	-	-	**310**	ND (5)
pH (SU)	NA	6.5 to 8.3	-	-	-	-	**11.7**	**5.2**	**11.9**	**5.3**	**8.7**	**6.0**	7.9	6.9

ABBREVIATIONS AND NOTES:
NA: Not applicable
- : Not analyzed
ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
ug/L: Micrograms per liter
mg/L: Milligrams per liter
SU: Standard units

1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
2. Discharge under the NPDES RGP did not occur during the period 3/17/2018 to 7/18/2018, an interruption lasting greater than 90 days. As a result, the sampling sequence restarted upon the restart of discharging.
3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
4. Temporary construction dewatering effluent discharge was terminated on 12/16/2021 when the permanent configuration of the groundwater treatment system was completed on 12/17/2021. A Notice of Termination (NOT) was issued for the NPDES RGP on 1/24/2022, and the EPA provided notice on 1/28/2022 that a Notice of Intent (NOI) application for a new NPDES RGP would need to be submitted to cover the discharge from the permanent groundwater treatment system. As a result, monthly compliance samples were not collected in December 2021 and January 2022 (Months 41 and 42) and resumed in February 2022 (Month 43) until such time that the new NPDES RGP is issued to cover the permanent discharge.

TABLE I
SUMMARY OF NPDES RGP COMPLIANCE MONITORING RESULTS
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			MONTH 5		POST CORRECTIVE MEASURE		MONTH 6		MONTH 7		POST CORRECTIVE MEASURE		MONTH 8	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2018_1220	EFFLUENT_2018_1220	INFLUENT_2019_0116	EFFLUENT_2019_0116	INFLUENT_2019_0123	EFFLUENT_2019_0123	INFLUENT_2019_0222	EFFLUENT_2019_0222	INFLUENT_2019_0313	EFFLUENT_2019_0313	INFLUENT_2019_0326	EFFLUENT_2019_0326
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	12/20/2018	12/20/2018	1/16/2019	1/16/2019	1/23/2019	1/23/2019	2/22/2019	2/22/2019	3/13/2019	3/13/2019	3/26/2019	3/26/2019
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L1852615-01	L1852615-02	L1902121-01	L1902121-02	L1902875-01	L1902875-02	L1907075-01	L1907075-02	L1909860-01	L1909860-02	L1911912-01	L1911912-02
Volatile Organic Compounds (ug/L)														
1,1-Dichloroethane	2,000	70	ND (1.5)	ND (1.5)	-	-	ND (1.5)	ND (1.5)	ND (3.8)	ND (1.5)	-	-	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	ND (10)	ND (10)	-	-	ND (10)	ND (10)	1,500	ND (10)	-	-	12	ND (10)
Carbon tetrachloride	2	4.4	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (2.5)	ND (1)	-	-	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	1.7	ND (1)	-	-	ND (1)	ND (1)	ND (2.5)	ND (1)	-	-	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	ND (5)	ND (5)	-	-	ND (5)	ND (5)	ND (12)	ND (5)	-	-	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	1.8	ND (1)	-	-	2	ND (1)	ND (2.5)	ND (1)	-	-	2.6	ND (1)
Methyl Tert Butyl Ether	5,000	70	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (25)	ND (10)	-	-	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (2.5)	ND (1)	-	-	ND (1)	ND (1)
Tetrachloroethene	50	5	**16**	ND (1)	-	-	**10**	ND (1)	**12**	ND (1)	-	-	**20**	ND (1)
Trichloroethene	5	5	1.4	ND (1)	-	-	1.5	ND (1)	ND (2.5)	ND (1)	-	-	1.6	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	ND (5)	ND (5)	-	-	ND (5)	ND (5)	ND (12)	ND (5)	-	-	ND (5)	ND (5)
Benzene	1,000	5	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (2.5)	ND (1)	-	-	ND (1)	ND (1)
Toluene	40,000	NA	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (2.5)	ND (1)	-	-	ND (1)	ND (1)
Ethylbenzene	5,000	NA	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (2.5)	ND (1)	-	-	ND (1)	ND (1)
m,p-Xylenes	NA	NA	ND (2)	ND (2)	-	-	ND (2)	ND (2)	ND (5)	ND (2)	-	-	ND (2)	ND (2)
o-Xylene	NA	NA	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (2.5)	ND (1)	-	-	ND (1)	ND (1)
Xylene (total)	3,000	NA	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (2.5)	ND (1)	-	-	ND (1)	ND (1)
Total BTEX	NA	100	ND	ND	-	-	ND	ND	ND	ND	-	-	ND	ND
Total Volatile Organic Compounds	NA	NA	20.9	ND	-	-	13.5	ND	1,512	ND	-	-	36.2	ND
Volatile Organic Compounds by SIM (ug/L)														
1,4-Dioxane	6,000	200	ND (50)	ND (50)	-	-	ND (50)	ND (50)	ND (120)	ND (50)	-	-	ND (50)	ND (50)
Semi-Volatile Organic Compounds by SIM (ug/L)														
Benzo(a)anthracene	1,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Chrysene	70	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	ND	ND	-	-	ND	ND	ND	ND	-	-	ND	ND
Acenaphthene	6,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Anthracene	30	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Fluorene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Naphthalene	700	20	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Phenanthrene	10,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Pyrene	20	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	ND	ND	-	-	ND	ND	ND	ND	-	-	ND	ND
Total Semi-Volatile Organic Compounds by SIM	NA	NA	ND	ND	-	-	ND	ND	ND	ND	-	-	ND	ND
Metals (ug/L)														
Antimony, Total	8,000	206	ND (4)	ND (4)	-	-	ND (4)	ND (4)	ND (4)	ND (4)	-	-	ND (4)	ND (4)
Arsenic, Total	900	104	ND (1)	ND (1)	-	-	ND (1)	ND (1)	4.15	1.56	-	-	1.68	1.05
Cadmium, Total	4	10.2	ND (0.2)	ND (0.2)	-	-	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	-	-	ND (0.2)	ND (0.2)
Chromium, Total	300	323	33.02	13.3	-	-	5.04	2	11.1	2.1	-	-	8.17	1.76
Chromium III (Trivalent), Total	600	323	ND (10)	13	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10)
Chromium VI (Hexavalent), Total	300	323	102	ND (10)	-	-	ND (10)	ND (10)	12	ND (10)	-	-	ND (10)	ND (10)
Copper, Total	100,000	242	2.14	ND (1)	-	-	3.73	ND (1)	1.76	1.19	-	-	4.01	1.18
Iron, Total	NA	5,000	629	**8,490**	867	**5,980**	213	3,850	161	**11,600**	69	ND (50)	202	ND (50)
Lead, Total	10	160	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	-	-	1.02	ND (1)
Mercury, Total	20	0.739	ND (0.2)	ND (0.2)	-	-	0.23	0.32	ND (0.2)	ND (0.2)	-	-	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	ND (2)	ND (2)	-	-	ND (2)	ND (2)	ND (2)	2.09	-	-	ND (2)	ND (2)
Selenium, Total	100	235.8	ND (5)	ND (5)	-	-	ND (5)	ND (5)	ND (5)	ND (5)	-	-	ND (5)	ND (5)
Silver, Total	7	35.1	ND (0.4)	ND (0.4)	-	-	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	-	-	ND (0.4)	ND (0.4)
Zinc, Total	900	420	ND (10)	ND (10)	-	-	113.2	18.6	ND (10)	44.8	-	-	ND (10)	ND (10)
General Chemistry														
Ammonia, Total (mg/L)	NA	Monitor Only	0.153	0.152	-	-	0.244	0.367	ND (0.075)	0.538	-	-	0.124	ND (0.075)
Chloride, Total (ug/L)	NA	Monitor Only	602,000	607,000	-	-	636,000	638,000	595,000	639,000	-	-	562,000	578,000
Cyanide, Total (mg/L)	0.03	178	ND (0.005)	ND (0.005)	-	-	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	-	-	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	**600**	**370**	**260**	**160**	28	7.6	13	21	-	-	17	ND (5)
pH (SU)	NA	6.5 to 8.3	**11.7**	7.1	-	-	**8.8**	7.4	**8.7**	7.0	-	-	**8.4**	7.8

ABBREVIATIONS AND NOTES:
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ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
ug/L: Micrograms per liter
mg/L: Milligrams per liter
SU: Standard units

1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
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3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
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BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			MONTH 9		MONTH 10		MONTH 11		MONTH 12		MONTH 13		MONTH 14	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2019_0419	EFFLUENT_2019_0419	INFLUENT_2019_0521	EFFLUENT_2019_0521	INFLUENT_2019_0624	EFFLUENT_2019_0624	INFLUENT_2019_0724	EFFLUENT_2019_0724	INFLUENT_2019_0823	EFFLUENT_2019_0823	INFLUENT_2019_0923	EFFLUENT_2019_0923
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	4/19/2019	4/19/2019	5/21/2019	5/21/2019	6/24/2019	6/24/2019	7/24/2019	7/24/2019	8/23/2019	8/23/2019	9/23/2019	9/23/2019
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L1916201-01	L1916201-02	L1921290-01	L1921290-02	L1927511-01	L1927511-02	L1932879-01	L1932879-02	L1938510-01	L1938510-02	L1943864-01	L1943864-02
Volatile Organic Compounds (ug/L)														
1,1-Dichloroethane	2,000	70	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	10	ND (10)	27	ND (10)	ND (10)	ND (10)	10	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	2	4.4	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	3.9	ND (1)	3.3	ND (1)	3.1	ND (1)	ND (1)	ND (1)	2.7	ND (1)	6.4	ND (1)
Methyl Tert Butyl Ether	5,000	70	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	50	5	**34**	ND (1)	**21**	ND (1)	**24**	ND (1)	**7.6**	ND (1)	**18**	ND (1)	**18**	ND (1)
Trichloroethene	5	5	3	ND (1)	2	ND (1)	2.4	ND (1)	ND (1)	ND (1)	2.3	ND (1)	**7**	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Benzene	1,000	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	40,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	5,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
o-Xylene	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Xylene (total)	3,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Total BTEX	NA	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Volatile Organic Compounds	NA	NA	50.9	ND	53.3	ND	29.5	ND	17.6	ND	23	ND	31.4	ND
Volatile Organic Compounds by SIM (ug/L)														
1,4-Dioxane	6,000	200	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Semi-Volatile Organic Compounds by SIM (ug/L)														
Benzo(a)anthracene	1,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Chrysene	70	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	6,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Anthracene	30	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluorene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Naphthalene	700	20	0.57	0.46	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	1.5	0.64	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Phenanthrene	10,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Pyrene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	0.57	0.46	ND	ND	ND	ND	1.5	0.64	ND	ND	ND	ND
Total Semi-Volatile Organic Compounds by SIM	NA	NA	0.57	0.46	ND	ND	ND	ND	1.5	0.64	ND	ND	ND	ND
Metals (ug/L)														
Antimony, Total	8,000	206	ND (4)	ND (4)	ND (4)	ND (4)	ND (8)	ND (8)	ND (8)	ND (8)	ND (8)	ND (8)	ND (4)	ND (4)
Arsenic, Total	900	104	1.74	1.95	1.01	1.06	ND (2)	ND (2)	3.52	ND (2)	ND (2)	ND (2)	ND (1)	1.13
Cadmium, Total	4	10.2	0.22	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	0.33	0.34
Chromium, Total	300	323	5.66	3.37	ND (1)	ND (1)	ND (2)	ND (2)	4.2	2.13	ND (2)	ND (2)	ND (1)	1.15
Chromium III (Trivalent), Total	600	323	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chromium VI (Hexavalent), Total	300	323	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Copper, Total	100,000	242	1.64	ND (1)	2.31	3.11	3.16	ND (2)	5.46	ND (2)	ND (2)	ND (2)	3.24	1.34
Iron, Total	NA	5,000	113	ND (50)	50	ND (50)	59	ND (50)	225	ND (100)	ND (100)	ND (100)	81	567
Lead, Total	10	160	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)
Mercury, Total	20	0.739	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (2)	ND (2)
Selenium, Total	100	235.8	ND (5)	ND (5)	ND (5)	ND (5)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (5)	ND (5)
Silver, Total	7	35.1	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.4)	ND (0.4)
Zinc, Total	900	420	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)	ND (20)	52.36	ND (20)	44.84	ND (20)	50.72	29.54
General Chemistry														
Ammonia, Total (mg/L)	NA	Monitor Only	0.169	0.249	ND (0.075)	0.162	0.204	1.18	0.172	0.305	0.099	0.106	ND (0.075)	0.614
Chloride, Total (ug/L)	NA	Monitor Only	632,000	654,000	605,000	607,000	531,000	594,000	137,000	205,000	667,000	672,000	551,000	552,000
Cyanide, Total (mg/L)	0.03	178	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	ND (5)	ND (5)	ND (5)	ND (5)	29	ND (5)	13	ND (5)	ND (5)	ND (5)	5.5	8.6
pH (SU)	NA	6.5 to 8.3	7.7	7.7	7.5	7.4	8.1	7.4	7.7	7.7	7.7	7.7	7.7	7.4

ABBREVIATIONS AND NOTES:
NA: Not applicable
- : Not analyzed
ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
ug/L: Micrograms per liter
mg/L: Milligrams per liter
SU: Standard units

1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
2. Discharge under the NPDES RGP did not occur during the period 3/17/2018 to 7/18/2018, an interruption lasting greater than 90 days. As a result, the sampling sequence restarted upon the restart of discharging.
3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
4. Temporary construction dewatering effluent discharge was terminated on 12/16/2021 when the permanent configuration of the groundwater treatment system was completed on 12/17/2021. A Notice of Termination (NOT) was issued for the NPDES RGP on 1/24/2022, and the EPA provided notice on 1/28/2022 that a Notice of Intent (NOI) application for a new NPDES RGP would need to be submitted to cover the discharge from the permanent groundwater treatment system. As a result, monthly compliance samples were not collected in December 2021 and January 2022 (Months 41 and 42) and resumed in February 2022 (Month 43) until such time that the new NPDES RGP is issued to cover the permanent discharge.

TABLE I
SUMMARY OF NPDES RGP COMPLIANCE MONITORING RESULTS
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			MONTH 15		MONTH 16		MONTH 17		MONTH 18		MONTH 19		MONTH 22 (NOTE 3)	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2019_1024	EFFLUENT_2019_1024	INFLUENT_2019_1121	EFFLUENT_2019_1121	INFLUENT_2019_1219	EFFLUENT_2019_1219	INFLUENT_2020_0127	EFFLUENT_2020_0127	INFLUENT_2020_0225	EFFLUENT_2020_0225	INFLUENT_2020_0529	EFFLUENT_2020_0529
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	10/24/2019	10/24/2019	11/21/2019	11/21/2019	12/19/2019	12/19/2019	1/27/2020	1/27/2020	2/25/2020	2/25/2020	5/29/2020	5/29/2020
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L1950302-01	L1950302-02	L1956135-01	L1956135-02	L1960997-01	L1960997-02	L2003759-01	L2003759-02	L2008360-01	L2008360-02	L2022148-01	L2022148-02
Volatile Organic Compounds (ug/L)														
1,1-Dichloroethane	2,000	70	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	2	4.4	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	3.7	ND (1)	1.4	ND (1)	2.1	ND (1)	2.6	ND (1)	4.3	ND (1)	4.2	ND (1)
Methyl Tert Butyl Ether	5,000	70	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	50	5	**12**	ND (1)	**6.4**	ND (1)	**7.1**	ND (1)	**15**	ND (1)	**18**	ND (1)	**26**	ND (1)
Trichloroethene	5	5	**5.9**	ND (1)	1.8	ND (1)	4	ND (1)	**5**	ND (1)	**8.4**	ND (1)	**5**	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Benzene	1,000	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	40,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	2.2	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	5,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
o-Xylene	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Xylene (total)	3,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Total BTEX	NA	100	ND	ND	ND	ND	2.2	ND	ND	ND	ND	ND	ND	ND
Total Volatile Organic Compounds	NA	NA	21.6	ND	9.6	ND	15.4	ND	22.6	ND	30.7	ND	35.2	ND
Volatile Organic Compounds by SIM (ug/L)														
1,4-Dioxane	6,000	200	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Semi-Volatile Organic Compounds by SIM (ug/L)														
Benzo(a)anthracene	1,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Chrysene	70	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	6,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Anthracene	30	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluorene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Naphthalene	700	20	ND (0.1)	ND (0.1)	2	0.32	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Phenanthrene	10,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Pyrene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	ND	ND	2	0.32	ND	ND	ND	ND	ND	ND	ND	ND
Total Semi-Volatile Organic Compounds by SIM	NA	NA	ND	ND	2	0.32	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ug/L)														
Antimony, Total	8,000	206	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
Arsenic, Total	900	104	1.57	1.19	2.4	1.22	ND (1)	1.2	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Cadmium, Total	4	10.2	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	0.26	ND (0.2)
Chromium, Total	300	323	ND (1)	ND (1)	12.26	1.06	ND (1)	1.81	ND (1)	ND (1)	ND (1)	ND (1)	1.66	ND (1)
Chromium III (Trivalent), Total	600	323	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chromium VI (Hexavalent), Total	300	323	ND (10)	ND (10)	11	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Copper, Total	100,000	242	1.64	ND (1)	7.01	2.93	11.26	2.79	2.65	ND (1)	4.02	ND (1)	4.54	ND (1)
Iron, Total	NA	5,000	76	ND (50)	664	1,720	151	218	125	ND (50)	105	ND (50)	667	ND (50)
Lead, Total	10	160	ND (1)	ND (1)	1.08	ND (1)	1.29	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Mercury, Total	20	0.739	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	ND (2)	ND (2)	2.74	2.6	3.43	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	2.1	ND (2)
Selenium, Total	100	235.8	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Silver, Total	7	35.1	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)
Zinc, Total	900	420	14.32	12.05	153	34.16	21.78	22.04	58.67	40.49	82.56	58.45	64.38	45.86
General Chemistry														
Ammonia, Total (mg/L)	NA	Monitor Only	0.283	0.217	0.954	2.54	0.246	0.984	0.299	0.167	0.076	ND (0.075)	ND (0.075)	0.08
Chloride, Total (ug/L)	NA	Monitor Only	640,000	658,000	562,000	500,000	374,000	365,000	664,000	666,000	693,000	699,000	700,000	705,000
Cyanide, Total (mg/L)	0.03	178	0.012	ND (0.005)	0.007	0.026	0.012	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	ND (5)	ND (5)	22	7.6	ND (6.5)	7.3	8.1	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
pH (SU)	NA	6.5 to 8.3	7.4	7.3	8.1	7.4	7.7	7.9	7.5	7.3	7.6	7.5	7.2	7.3

ABBREVIATIONS AND NOTES:
NA: Not applicable
- : Not analyzed
ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
ug/L: Micrograms per liter
mg/L: Milligrams per liter
SU: Standard units

1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
2. Discharge under the NPDES RGP did not occur during the period 3/17/2018 to 7/18/2018, an interruption lasting greater than 90 days. As a result, the sampling sequence restarted upon the restart of discharging.
3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
4. Temporary construction dewatering effluent discharge was terminated on 12/16/2021 when the permanent configuration of the groundwater treatment system was completed on 12/17/2021. A Notice of Termination (NOT) was issued for the NPDES RGP on 1/24/2022, and the EPA provided notice on 1/28/2022 that a Notice of Intent (NOI) application for a new NPDES RGP would need to be submitted to cover the discharge from the permanent groundwater treatment system. As a result, monthly compliance samples were not collected in December 2021 and January 2022 (Months 41 and 42) and resumed in February 2022 (Month 43) until such time that the new NPDES RGP is issued to cover the permanent discharge.

TABLE I
SUMMARY OF NPDES RGP COMPLIANCE MONITORING RESULTS
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			MONTH 23		MONTH 24		MONTH 25		MONTH 26		MONTH 27		MONTH 28	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2020_0626	EFFLUENT_2020_0626	INFLUENT_2020_0731	EFFLUENT_2020_0731	INFLUENT_2020_0828	EFFLUENT_2020_0828	INFLUENT_2020_0928	EFFLUENT_2020_0928	INFLUENT_2020_1027	EFFLUENT_2020_1027	INFLUENT_2020_1123	EFFLUENT_2020_1123
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	6/26/2020	6/26/2020	7/31/2020	7/31/2020	8/28/2020	8/28/2020	9/28/2020	9/28/2020	10/27/2020	10/27/2020	11/23/2020	11/23/2020
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L2027095-01	L2027095-02	480-173219-1	480-173219-2	L2035443-01	L2035443-02	L2040967-01	L2040967-02	L2046656-01	L2046656-02	L2052216-01	L2052216-02
Volatile Organic Compounds (ug/L)														
1,1-Dichloroethane	2,000	70	ND (1.5)	ND (1.5)	ND (1)	ND (1)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	ND (10)	ND (10)	ND (6)	ND (6)	ND (10)	ND (10)	39	29	ND (10)	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	2	4.4	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	ND (5)	ND (5)	ND (1)	ND (1)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	5.2	1.2	6.9	ND (1)	4.7	ND (1)	4.5	ND (1)	4.4	ND (1)	4.1	ND (1)
Methyl Tert Butyl Ether	5,000	70	ND (10)	ND (10)	ND (1)	ND (1)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	50	5	**28**	1.8	**26**	ND (1)	**24**	ND (1)	**26**	ND (1)	**25**	ND (1)	**21**	ND (1)
Trichloroethene	5	5	**9.4**	ND (1)	**10**	ND (1)	**7.3**	ND (1)	**6.5**	ND (1)	**5.9**	ND (1)	4.2	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	ND (5)	ND (5)	ND (1)	ND (1)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Benzene	1,000	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	40,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	1	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	5,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	NA	NA	ND (2)	ND (2)	ND (1)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
o-Xylene	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Xylene (total)	3,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Total BTEX	NA	100	ND	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	ND
Total Volatile Organic Compounds	NA	NA	42.6	3	42.9	ND	36	ND	76	30	35.3	ND	29.3	ND
Volatile Organic Compounds by SIM (ug/L)														
1,4-Dioxane	6,000	200	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Semi-Volatile Organic Compounds by SIM (ug/L)														
Benzo(a)anthracene	1,000	NA	ND (0.1)	ND (0.1)	ND (4.9)	ND (4.9)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	ND (0.1)	ND (0.1)	ND (4.9)	ND (4.9)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	ND (0.1)	ND (0.1)	ND (4.9)	ND (4.9)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	ND (0.1)	ND (0.1)	ND (4.9)	ND (4.9)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Chrysene	70	NA	ND (0.1)	ND (0.1)	ND (4.9)	ND (4.9)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	ND (0.1)	ND (0.1)	ND (4.9)	ND (4.9)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	ND (0.1)	ND (0.1)	ND (4.9)	ND (4.9)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	6,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Anthracene	30	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluorene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Naphthalene	700	20	ND (0.1)	ND (0.1)	ND (4.9)	ND (4.9)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Phenanthrene	10,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Pyrene	20	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Semi-Volatile Organic Compounds by SIM	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ug/L)														
Antimony, Total	8,000	206	ND (4)	ND (4)	ND (20)	ND (20)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
Arsenic, Total	900	104	1.9	ND (1)	ND (15)	ND (15)	ND (1)	ND (1)	ND (1)	ND (1)	1.45	ND (1)	1.04	ND (1)
Cadmium, Total	4	10.2	0.69	0.2	ND (2)	ND (2)	0.24	ND (0.2)	0.26	0.3	0.68	ND (0.2)	0.51	0.24
Chromium, Total	300	323	45.12	ND (1)	ND (4)	ND (4)	11.63	ND (1)	ND (1)	ND (1)	9.22	ND (1)	38.65	ND (1)
Chromium III (Trivalent), Total	600	323	45	ND (10)	ND (10)	ND (10)	11	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	38	ND (10)
Chromium VI (Hexavalent), Total	300	323	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Copper, Total	100,000	242	13.56	ND (1)	ND (10)	ND (10)	12.61	1.19	44.89	5.23	30.74	1.38	19.15	ND (2)
Iron, Total	NA	5,000	2,270	ND (50)	230	ND (50)	559	ND (50)	1,440	211	2,600	ND (50)	1,740	ND (50)
Lead, Total	10	160	3.77	ND (1)	ND (10)	ND (10)	ND (1)	ND (1)	ND (1)	ND (1)	4.44	ND (1)	3.08	ND (1)
Mercury, Total	20	0.739	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	10.81	ND (2)	ND (10)	ND (10)	5.29	ND (2)	29.75	ND (2)	29.28	2.24	16.3	2.08
Selenium, Total	100	235.8	ND (5)	ND (5)	ND (25)	ND (25)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Silver, Total	7	35.1	ND (0.4)	ND (0.4)	ND (6)	ND (6)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)
Zinc, Total	900	420	119.7	23.58	21	21	32.77	18.43	95.75	52.8	119.7	22.42	126.4	25.8
General Chemistry														
Ammonia, Total (mg/L)	NA	Monitor Only	0.082	0.109	ND (0.2)	ND (0.2)	ND (0.075)	ND (0.075)	0.159	0.195	0.13	ND (0.075)	ND (0.075)	ND (0.075)
Chloride, Total (ug/L)	NA	Monitor Only	702,000	702,000	720,000	730,000	749,000	772,000	729,000	725,000	719,000	719,000	706,000	723,000
Cyanide, Total (mg/L)	0.03	178	ND (0.005)	ND (0.005)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	ND (5)	ND (5)	ND (4)	ND (4)	9.3	ND (5)	**52**	ND (5)	**36**	ND (5)	**35**	ND (5)
pH (SU)	NA	6.5 to 8.3	7.2	7.1	7.6	7.6	7.4	7.3	7.5	7.3	7.2	7.3	7.3	6.6

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- : Not analyzed
ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
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1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
2. Discharge under the NPDES RGP did not occur during the period 3/17/2018 to 7/18/2018, an interruption lasting greater than 90 days. As a result, the sampling sequence restarted upon the restart of discharging.
3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
4. Temporary construction dewatering effluent discharge was terminated on 12/16/2021 when the permanent configuration of the groundwater treatment system was completed on 12/17/2021. A Notice of Termination (NOT) was issued for the NPDES RGP on 1/24/2022, and the EPA provided notice on 1/28/2022 that a Notice of Intent (NOI) application for a new NPDES RGP would need to be submitted to cover the discharge from the permanent groundwater treatment system. As a result, monthly compliance samples were not collected in December 2021 and January 2022 (Months 41 and 42) and resumed in February 2022 (Month 43) until such time that the new NPDES RGP is issued to cover the permanent discharge.

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BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			MONTH 29		MONTH 30		MONTH 31		MONTH 32		MONTH 33		MONTH 34	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2020_1221	EFFLUENT_2020_1221	INFLUENT_2021_0122	EFFLUENT_2021_0122	INFLUENT_2021_0223	EFFLUENT_2021_0223	INFLUENT_2021_0322	EFFLUENT_2021_0322	INFLUENT_2021_0423	EFFLUENT_2021_0423	INFLUENT_2021_0524	EFFLUENT_2021_0524
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	12/21/2020	12/21/2020	1/22/2021	1/22/2021	2/23/2021	2/23/2021	3/22/2021	3/22/2021	4/23/2021	4/23/2021	5/24/2021	5/24/2021
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L2057057-01	L2057057-02	L2103694-01	L2103694-02	L2108825-01	L2108825-02	L2114281-01	L2114281-02	L2121066-01	L2121066-02	L2127528-01	L2127528-02
Volatile Organic Compounds (ug/L)														
1,1-Dichloroethane	2,000	70	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	12	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	2	4.4	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	4.7	ND (1)	4.8	ND (1)	4.5	ND (1)	5.1	ND (1)	4.8	1.2	4	2.4
Methyl Tert Butyl Ether	5,000	70	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	50	5	**24**	ND (1)	**25**	ND (1)	**26**	ND (1)	**25**	ND (1)	**19**	ND (1)	**34**	3.9
Trichloroethene	5	5	4.4	ND (1)	4.5	ND (1)	4	ND (1)	4.6	ND (1)	3.9	ND (1)	4.9	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Benzene	1,000	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	40,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	5,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
o-Xylene	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Xylene (total)	3,000	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Total BTEX	NA	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Volatile Organic Compounds	NA	NA	33.1	ND	34.3	ND	34.5	ND	46.7	ND	27.7	1.2	42.9	6.3
Volatile Organic Compounds by SIM (ug/L)														
1,4-Dioxane	6,000	200	ND (50)	ND (50)	ND (50)	ND (50)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Semi-Volatile Organic Compounds by SIM (ug/L)														
Benzo(a)anthracene	1,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Chrysene	70	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	6,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Anthracene	30	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluorene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Naphthalene	700	20	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Phenanthrene	10,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Pyrene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Semi-Volatile Organic Compounds by SIM	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ug/L)														
Antimony, Total	8,000	206	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
Arsenic, Total	900	104	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Cadmium, Total	4	10.2	0.2	ND (0.2)	0.25	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chromium, Total	300	323	ND (1)	ND (1)	6.6	ND (1)	161.4	ND (1)	16.8	ND (1)	**1,417**	3.21	24.21	ND (1)
Chromium III (Trivalent), Total	600	323	ND (10)	ND (10)	ND (10)	ND (10)	161	ND (10)	16	ND (10)	**1,420**	ND (10)	24	ND (10)
Chromium VI (Hexavalent), Total	300	323	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Copper, Total	100,000	242	8.8	1.2	47.21	1.23	23.19	1.18	12	ND (1)	11.76	ND (1)	7.01	ND (1)
Iron, Total	NA	5,000	99	ND (50)	266	ND (50)	772	ND (50)	154	ND (50)	2,150	ND (50)	170	ND (50)
Lead, Total	10	160	ND (1)	ND (1)	1.01	ND (1)	1.02	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Mercury, Total	20	0.739	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	6.64	ND (2)	10.45	ND (2)	13.21	ND (2)	9.64	ND (2)	70.89	2.3	6.66	ND (2)
Selenium, Total	100	235.8	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Silver, Total	7	35.1	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)
Zinc, Total	900	420	53.4	36.57	41.08	18.02	32.71	11.08	33.6	22.07	45.78	30.51	18.81	ND (10)
General Chemistry														
Ammonia, Total (mg/L)	NA	Monitor Only	ND (0.075)	ND (0.075)	0.138	ND (0.075)	0.134	0.124	ND (0.075)	ND (0.075)	ND (0.075)	0.08	ND (0.075)	ND (0.075)
Chloride, Total (ug/L)	NA	Monitor Only	287,000	728,000	739,000	727,000	811,000	797,000	688,000	734,000	752,000	743,000	781,000	820,000
Cyanide, Total (mg/L)	0.03	178	ND (0.005)	ND (0.005)	0.01	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	ND (5)	ND (5)	7.6	ND (5)	7	ND (5)	ND (5)	ND (5)	11	ND (5)	ND (5)	ND (5)
pH (SU)	NA	6.5 to 8.3	7.3	7.3	7.3	7.3	7.5	7.4	7.4	7.3	7.3	7.2	7.3	7.3

ABBREVIATIONS AND NOTES:
NA: Not applicable
- : Not analyzed
ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
ug/L: Micrograms per liter
mg/L: Milligrams per liter
SU: Standard units

1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
2. Discharge under the NPDES RGP did not occur during the period 3/17/2018 to 7/18/2018, an interruption lasting greater than 90 days. As a result, the sampling sequence restarted upon the restart of discharging.
3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
4. Temporary construction dewatering effluent discharge was terminated on 12/16/2021 when the permanent configuration of the groundwater treatment system was completed on 12/17/2021. A Notice of Termination (NOT) was issued for the NPDES RGP on 1/24/2022, and the EPA provided notice on 1/28/2022 that a Notice of Intent (NOI) application for a new NPDES RGP would need to be submitted to cover the discharge from the permanent groundwater treatment system. As a result, monthly compliance samples were not collected in December 2021 and January 2022 (Months 41 and 42) and resumed in February 2022 (Month 43) until such time that the new NPDES RGP is issued to cover the permanent discharge.

TABLE I
SUMMARY OF NPDES RGP COMPLIANCE MONITORING RESULTS
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			MONTH 35		POST CORRECTIVE MEASURE		MONTH 36		MONTH 37		MONTH 38		MONTH 39	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2021_0624	EFFLUENT_2021_0624	INFLUENT_2021_0715	EFFLUENT_2021_0715	INFLUENT_2021_0723	EFFLUENT_2021_0723	INFLUENT_2021_0824	EFFLUENT_2021_0824	INFLUENT_2021_0924	EFFLUENT_2021_0924	INFLUENT_2021_1022	EFFLUENT_2021_1022
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	6/24/2021	6/24/2021	7/15/2021	7/15/2021	7/23/2021	7/23/2021	8/24/2021	8/24/2021	9/24/2021	9/24/2021	10/22/2021	10/22/2021
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L2134468-01	L2134468-02	L2138161-01	L2138161-02	L2139850-01	L2139850-02	L2145479-01	L2145479-02	L2152141-01	L2152141-02	L2158155-01	L2158155-02
Volatile Organic Compounds (ug/L)														
1,1-Dichloroethane	2,000	70	ND (1.5)	ND (1.5)	-	-	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	2	4.4	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	ND (5)	ND (5)	-	-	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	4.5	4	1.8	ND (1)	3.8	ND (1)	3	ND (1)	3.2	ND (1)	2.8	ND (1)
Methyl Tert Butyl Ether	5,000	70	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	50	5	**24**	**6.5**	**11**	ND (1)	**23**	ND (1)	**15**	ND (1)	**17**	ND (1)	**12**	ND (1)
Trichloroethene	5	5	4	1.3	1.6	ND (1)	3.3	ND (1)	2.8	ND (1)	3.5	ND (1)	2.4	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	ND (5)	ND (5)	-	-	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Benzene	1,000	5	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	40,000	NA	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	5,000	NA	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	NA	NA	ND (2)	ND (2)	-	-	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
o-Xylene	NA	NA	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Xylene (total)	3,000	NA	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Total BTEX	NA	100	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Total Volatile Organic Compounds	NA	NA	32.5	11.8	14.4	ND	30.1	ND	20.8	ND	23.7	ND	17.2	ND
Volatile Organic Compounds by SIM (ug/L)														
1,4-Dioxane	6,000	200	ND (5)	ND (5)	-	-	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Semi-Volatile Organic Compounds by SIM (ug/L)														
Benzo(a)anthracene	1,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Chrysene	70	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	6,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Anthracene	30	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluorene	40	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Naphthalene	700	20	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Phenanthrene	10,000	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Pyrene	20	NA	ND (0.1)	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Total Semi-Volatile Organic Compounds by SIM	NA	NA	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ug/L)														
Antimony, Total	8,000	206	ND (4)	ND (4)	-	-	ND (4)	ND (4)	ND (4)	ND (4)	ND (40)	ND (40)	ND (4)	ND (4)
Arsenic, Total	900	104	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (10)	ND (10)	ND (1)	ND (1)
Cadmium, Total	4	10.2	ND (0.2)	ND (0.2)	-	-	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (2)	ND (2)	ND (0.2)	ND (0.2)
Chromium, Total	300	323	60.55	ND (1)	-	-	57.46	ND (1)	ND (1)	ND (1)	ND (10)	ND (10)	ND (1)	ND (1)
Chromium III (Trivalent), Total	600	323	60	ND (10)	-	-	57	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chromium VI (Hexavalent), Total	300	323	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Copper, Total	100,000	242	4.85	1.54	-	-	2.04	1.51	2.67	1.93	ND (10)	ND (10)	2.55	1.06
Iron, Total	NA	5,000	261	ND (50)	-	-	236	ND (50)	53	ND (50)	223	ND (50)	71	ND (50)
Lead, Total	10	160	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (10)	ND (10)	ND (1)	ND (1)
Mercury, Total	20	0.739	ND (0.2)	ND (0.2)	-	-	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	17.33	ND (2)	-	-	34.66	ND (2)	ND (2)	ND (2)	ND (20)	ND (20)	2.03	ND (2)
Selenium, Total	100	235.8	ND (5)	ND (5)	-	-	ND (5)	ND (5)	ND (5)	ND (5)	ND (50)	ND (50)	ND (5)	ND (5)
Silver, Total	7	35.1	ND (0.4)	ND (0.4)	-	-	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (4)	ND (4)	ND (0.4)	ND (0.4)
Zinc, Total	900	420	20.1	15.15	-	-	17.99	19.21	23.96	20.77	ND (100)	ND (100)	22.27	15.48
General Chemistry														
Ammonia, Total (mg/L)	NA	Monitor Only	0.084	ND (0.075)	-	-	ND (0.075)	ND (0.075)	0.113	ND (0.075)	0.103	ND (0.075)	0.115	0.084
Chloride, Total (ug/L)	NA	Monitor Only	804,000	786,000	-	-	751,000	756,000	780,000	777,000	763,000	775,000	766,000	760,000
Cyanide, Total (mg/L)	0.03	178	ND (0.005)	ND (0.005)	-	-	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	5.5	ND (5)	-	-	ND (5)	ND (5)	ND (5)	ND (5)	7	ND (5)	ND (5)	ND (5)
pH (SU)	NA	6.5 to 8.3	7.4	7.4	-	-	7.2	7.4	7.2	7.3	7.4	7.4	7.4	7.4

ABBREVIATIONS AND NOTES:
NA: Not applicable
- : Not analyzed
ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
ug/L: Micrograms per liter
mg/L: Milligrams per liter
SU: Standard units

1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
2. Discharge under the NPDES RGP did not occur during the period 3/17/2018 to 7/18/2018, an interruption lasting greater than 90 days. As a result, the sampling sequence restarted upon the restart of discharging.
3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
4. Temporary construction dewatering effluent discharge was terminated on 12/16/2021 when the permanent configuration of the groundwater treatment system was completed on 12/17/2021. A Notice of Termination (NOT) was issued for the NPDES RGP on 1/24/2022, and the EPA provided notice on 1/28/2022 that a Notice of Intent (NOI) application for a new NPDES RGP would need to be submitted to cover the discharge from the permanent groundwater treatment system. As a result, monthly compliance samples were not collected in December 2021 and January 2022 (Months 41 and 42) and resumed in February 2022 (Month 43) until such time that the new NPDES RGP is issued to cover the permanent discharge.

TABLE I
SUMMARY OF NPDES RGP COMPLIANCE MONITORING RESULTS
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS
FILE NO. 128868-010

PERMIT NO.: MAG910718
OPERATOR: SUFFOLK CONSTRUCTION COMPANY, INC.
65 ALLERTON STREET, BOSTON, MASSACHUSETTS
OPERATOR CONTACT INFO: JASON SEABURG, JSEABURG@SUFFOLK.COM, 617-807-0175 (CELL)
RECEIVING WATER: MUDDY RIVER (FRESHWATER)
OUTFALL NUMBER: OUTFALL 001 TO CITY OF BOSTON DO 045

			MONTH 40		MONTH 43 (NOTE 4)	
Location Name	2014	2017	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
Sample Name	MCP RCGW-2	NPDES RGP	INFLUENT_2021_1129	EFFLUENT_2021_1129	INFLUENT_20220228	EFFLUENT_20220228
Sample Date	REPORTABLE	EFFLUENT LIMITATIONS	11/29/2021	11/29/2021	2/28/2022	2/28/2022
Lab Sample ID	CONCENTRATIONS	PERMIT NO. MAG910718	L2165346-01	L2165346-02	L2210481-01	L2210481-02
Volatile Organic Compounds (ug/L)						
1,1-Dichloroethane	2,000	70	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)
Acetone	50,000	7,970	ND (10)	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	2	4.4	ND (1)	ND (1)	ND (1)	ND (1)
Chloroform (Trichloromethane)	50	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane (Methyl Chloride)	10,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)
cis-1,2-Dichloroethene	20	70	3.6	ND (1)	4.1	ND (1)
Methyl Tert Butyl Ether	5,000	70	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	2,000	Monitor Only	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	50	5	**21**	ND (1)	**29**	ND (1)
Trichloroethene	5	5	3.8	ND (1)	4	ND (1)
Trichlorofluoromethane (CFC-11)	100,000	Monitor Only	ND (5)	ND (5)	ND (5)	ND (5)
Benzene	1,000	5	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	40,000	NA	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	5,000	NA	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)
o-Xylene	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)
Xylene (total)	3,000	NA	ND (1)	ND (1)	ND (1)	ND (1)
Total BTEX	NA	100	ND	ND	ND	ND
Total Volatile Organic Compounds	NA	NA	28.4	ND	37.1	ND
Volatile Organic Compounds by SIM (ug/L)						
1,4-Dioxane	6,000	200	ND (5)	ND (5)	ND (5)	ND (5)
Semi-Volatile Organic Compounds by SIM (ug/L)						
Benzo(a)anthracene	1,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(a)pyrene	500	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(b)fluoranthene	400	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(k)fluoranthene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Chrysene	70	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Dibenz(a,h)anthracene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Indeno(1,2,3-cd)pyrene	100	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group I Polycyclic Aromatic Hydrocarbons	NA	Monitor Only	ND	ND	ND	ND
Acenaphthene	6,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Acenaphthylene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Anthracene	30	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Benzo(g,h,i)perylene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluoranthene	200	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Fluorene	40	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Naphthalene	700	20	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Phenanthrene	10,000	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Pyrene	20	NA	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	ND	ND	ND	ND
Total Semi-Volatile Organic Compounds by SIM	NA	NA	ND	ND	ND	ND
Metals (ug/L)						
Antimony, Total	8,000	206	ND (4)	ND (4)	ND (4)	ND (4)
Arsenic, Total	900	104	ND (1)	ND (1)	ND (1)	ND (1)
Cadmium, Total	4	10.2	ND (0.2)	0.23	ND (0.2)	ND (0.2)
Chromium, Total	300	323	ND (1)	ND (1)	ND (1)	ND (1)
Chromium III (Trivalent), Total	600	323	ND (10)	ND (10)	ND (10)	ND (10)
Chromium VI (Hexavalent), Total	300	323	ND (10)	ND (10)	ND (10)	ND (10)
Copper, Total	100,000	242	2.23	3.65	1.08	1.77
Iron, Total	NA	5,000	ND (50)	ND (50)	ND (50)	ND (50)
Lead, Total	10	160	ND (1)	ND (1)	ND (1)	ND (1)
Mercury, Total	20	0.739	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Nickel, Total	200	1,450	ND (2)	ND (2)	ND (2)	ND (2)
Selenium, Total	100	235.8	ND (5)	ND (5)	ND (5)	ND (5)
Silver, Total	7	35.1	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)
Zinc, Total	900	420	76.3	27.12	22.2	20.9
General Chemistry						
Ammonia, Total (mg/L)	NA	Monitor Only	ND (0.075)	ND (0.075)	ND (0.075)	ND (0.075)
Chloride, Total (ug/L)	NA	Monitor Only	817,000	801,000	728,000	822,000
Cyanide, Total (mg/L)	0.03	178	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Total Suspended Solids (TSS) (mg/L)	NA	30	ND (5)	ND (5)	ND (5)	**37**
pH (SU)	NA	6.5 to 8.3	7.5	7.5	7	7.1

ABBREVIATIONS AND NOTES:
NA: Not applicable
- : Not analyzed
ND (0.1): Not detected; number in parentheses is the laboratory reporting limit
ug/L: Micrograms per liter
mg/L: Milligrams per liter
SU: Standard units

1. **Bold** values indicate an exceedance of the applicable NPDES RGP Effluent Limitation.
2. Discharge under the NPDES RGP did not occur during the period 3/17/2018 to 7/18/2018, an interruption lasting greater than 90 days. As a result, the sampling sequence restarted upon the restart of discharging.
3. As a result of the COVID-19 pandemic and associated suspension of construction operations and in accordance with EPA guidance, monthly compliance samples were not collected in March and April 2020 (Months 20 and 21).
4. Temporary construction dewatering effluent discharge was terminated on 12/16/2021 when the permanent configuration of the groundwater treatment system was completed on 12/17/2021. A Notice of Termination (NOT) was issued for the NPDES RGP on 1/24/2022, and the EPA provided notice on 1/28/2022 that a Notice of Intent (NOI) application for a new NPDES RGP would need to be submitted to cover the discharge from the permanent groundwater treatment system. As a result, monthly compliance samples were not collected in December 2021 and January 2022 (Months 41 and 42) and resumed in February 2022 (Month 43) until such time that the new NPDES RGP is issued to cover the permanent discharge.

TABLE II
SUMMARY OF RECEIVING WATER (MUDDY RIVER) QUALITY DATA
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS
FILE NO. 128868-010

Location Name	MUDDY RIVER OUTFALL DO 045
Sample Name	MUDDY RIVER_05262017
Sample Date	5/26/2017
Lab Sample ID	L1717570-01
Sample Type	Surface Water
Metals (ug/L)	
Antimony, Total	ND (4)
Arsenic, Total	1.46
Cadmium, Total	ND (0.2)
Chromium, Total	1.94
Chromium III (Trivalent), Total	ND (10)
Chromium VI (Hexavalent), Total	ND (10)
Copper, Total	13.85
Iron, Total	1090
Lead, Total	12.36
Mercury, Total	ND (0.2)
Nickel, Total	ND (2)
Selenium, Total	ND (5)
Silver, Total	ND (1)
Zinc, Total	34.3
General Chemistry	
Ammonia, Total (ug/L)	161
Hardness, Total (ug/L)	40900
pH (SU)	7.4
Temperature (°C) (Note 2)	12.2

ABBREVIATIONS AND NOTES:
ug/L: Micrograms per liter
ND (2.5): Not detected, number in parentheses is the laboratory reporting limit
SU: Standard units

1. Sample collected upstream of the proposed discharge location at outfall DO 045.
2. Temperature measured in the field on the sampling date indicated.

TABLE III
SUMMARY OF GROUNDWATER QUALITY DATA
BOSTON CHILDREN'S HOSPITAL CLINICAL BUILDING (BCCB)
BOSTON, MASSACHUSETTS
FILE NO. 128868-006

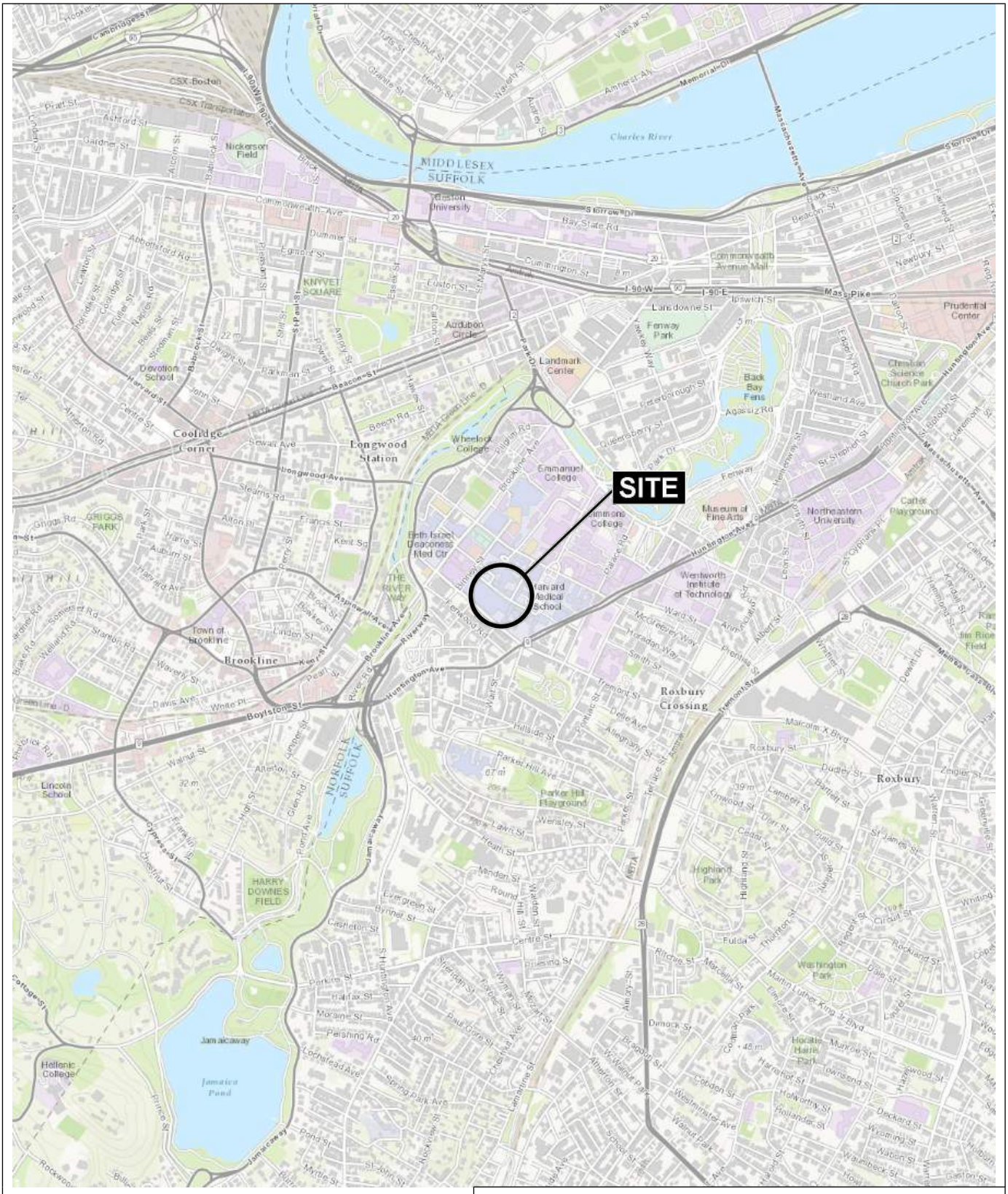
Location Name **Sample Name** **Sample Date** **Lab Sample ID** **Well Screen Interval (ft, BCB)** **Groundwater Elevation (ft, BCB)[4]** **Sample Type**	2014 MCP RCGW-2 Reportable Concentrations	NPDES RGP Effluent Limitations	Units	B115(D) B115D_04182017 4/18/2017 L1712207-01 -29.5 to -39.5 9.99 Groundwater	B115(S) B115S_04192017 4/19/2017 L1712403-01 1.5 to -8.5 9.72 Groundwater	B5 HA15-B5 6/30/2015 L1514957-01 -31 to -41 8.30 Groundwater	B5 B5(OW) 5/20/2016 L1615398-04 -31 to -41 9.25 Groundwater	B102(D) B102(D) 5/24/2016 L1615699-01 -36 to -46 8.11 Groundwater	B114(S) B114(S) 5/20/2016 L1615398-01 -14 to -19 10.16 Groundwater	B114(D) B114(D) 5/20/2016 L1615398-02 -38 to -48 9.37 Groundwater	B115(S) B115(S) 5/20/2016 L1615398-03 1.5 to -8.5 9.45 Groundwater	B115(D) B115(D) 5/24/2016 L1615699-02 -29.5 to -39.5 9.64 Groundwater
A. Inorganics												
Ammonia	NA	Report	ug/L	224	-	-	-	-	-	-	-	-
Chloride	NA	Report	ug/L	566000	-	436000	-	-	-	-	-	-
Total Residual Chlorine	NA	62	ug/L	ND(20)	-	ND(20)	-	-	-	-	-	-
Total Suspended Solids	NA	30000	ug/L	16000	-	27000	-	-	-	-	-	-
Antimony, Total	8000	206	ug/L	1.41 J	-	5.3	-	-	-	-	-	-
Arsenic, Total	900	104	ug/L	1.83	-	1.4	-	-	-	-	-	-
Cadmium, Total	4	10.2	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Chromium, Total	300	323	ug/L	7.01	-	31.9	-	-	-	-	-	-
Chromium, Hexavalent	300	323	ug/L	ND(10)	-	30	-	-	-	-	-	-
Copper, Total	100000	242	ug/L	3.55	-	2.5	-	-	-	-	-	-
Iron, Total	NA	5000	ug/L	102	-	120	-	-	-	-	-	-
Lead, Total	10	160	ug/L	0.55	-	ND(0.5)	-	-	-	-	-	-
Mercury, Total	20	0.739	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Nickel, Total	200	1450	ug/L	1.48 J	-	2.4	-	-	-	-	-	-
Selenium, Total	100	235.8	ug/L	ND(5)	-	ND(5)	-	-	-	-	-	-
Silver, Total	7	35.1	ug/L	ND(0.4)	-	ND(0.4)	-	-	-	-	-	-
Zinc, Total	900	420	ug/L	4.62 J	-	ND(10)	-	-	-	-	-	-
Cyanide, Total	30	178000	ug/L	2 J	-	ND(5)	-	-	-	-	-	-
Total Hardness	NA	NA	ug/L	589000	-	-	-	-	-	-	-	-
pH[5]	NA	6.5 to 8.3	SU	8.39	6.64	8.01	9.04	7.17	6.75	7.85	6.73	8.20
Temperature[5]	NA	28.33	°C	18.2	19.4	20.3	19.9	18.9	19.9	19.4	20.8	19.3
B. Non-Halogenated Volatile Organic Compounds												
Benzene	1000	5	ug/L	ND(0.5)	0.7	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
Toluene	40000	NA	ug/L	ND(0.75)	ND(0.75)	ND(0.75)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Ethylbenzene	5000	NA	ug/L	ND(0.5)	0.27 J	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
o-xylene	3000	NA	ug/L	ND(1)	0.5 J	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
p/m-Xylene	3000	NA	ug/L	ND(1)	0.92 J	ND(1)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Total BTEX	NA	100	ug/L	ND	2.39	ND	ND	ND	ND	ND	ND	ND
1,4-Dioxane	6000	200	ug/L	ND(3)	4.5	ND(3)	**ND(250)**	**ND(250)**	**ND(250)**	**ND(250)**	**ND(250)**	**ND(250)**
Acetone	50000	7970	ug/L	ND(5)	ND(5)	10	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Phenol	2000	1080	ug/L	ND(5)	-	ND(5)	-	-	-	-	-	-
C. Halogenated Volatile Organic Compounds												
Carbon tetrachloride	2	4.4	ug/L	ND(0.5)	**7**	ND(0.5)	ND(1)	ND(1)	1.3	ND(1)	**15**	ND(1)
1,2-Dichlorobenzene	2000	600	ug/L	ND(2.5)	ND(2.5)	ND(2.5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,3-Dichlorobenzene	6000	320	ug/L	ND(2.5)	ND(2.5)	ND(2.5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,4-Dichlorobenzene	60	5	ug/L	ND(2.5)	ND(2.5)	ND(2.5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Total Dichlorobenzene	NA	NA	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	2000	70	ug/L	ND(0.75)	0.3 J	ND(0.75)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,2-Dichloroethane	5	5	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,1-Dichloroethene	80	3.2	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,2-Dibromoethane	2	0.05	ug/L	ND(0.01)	-	ND(0.01)	**ND(2)**	**ND(2)**	**ND(2)**	**ND(2)**	**ND(2)**	**ND(2)**
Methylene chloride	2000	4.6	ug/L	ND(3)	ND(3)	ND(3)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
1,1,1-Trichloroethane	4000	200	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,1,2-Trichloroethane	900	5	ug/L	ND(0.75)	ND(0.75)	ND(0.75)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Trichloroethene	5	5	ug/L	1.5	3.6	2	4.4	**6.9**	3.3	**9.4**	2	**5.1**
Tetrachloroethene	50	5	ug/L	**5.6**	**43**	3.1	**27**	**55**	**28**	**39**	**24**	**31**
cis-1,2-Dichloroethene	20	70	ug/L	3	5.2	8	8.3	13	4.3	9.7	2.2	8.6
Vinyl chloride	2	2	ug/L	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)

TABLE III
SUMMARY OF GROUNDWATER QUALITY DATA
BOSTON CHILDREN'S HOSPITAL CLINICAL BUILDING (BCCB)
BOSTON, MASSACHUSETTS
FILE NO. 128868-006

Location Name **Sample Name** **Sample Date** **Lab Sample ID** **Well Screen Interval (ft, BCB)** **Groundwater Elevation (ft, BCB)[4]** **Sample Type**	2014 MCP RCGW-2 Reportable Concentrations	NPDES RGP Effluent Limitations	Units	B115(D) B115D_04182017 4/18/2017 L1712207-01 -29.5 to -39.5 9.99 Groundwater	B115(S) B115S_04192017 4/19/2017 L1712403-01 1.5 to -8.5 9.72 Groundwater	B5 HA15-B5 6/30/2015 L1514957-01 -31 to -41 8.30 Groundwater	B5 B5(OW) 5/20/2016 L1615398-04 -31 to -41 9.25 Groundwater	B102(D) B102(D) 5/24/2016 L1615699-01 -36 to -46 8.11 Groundwater	B114(S) B114(S) 5/20/2016 L1615398-01 -14 to -19 10.16 Groundwater	B114(D) B114(D) 5/20/2016 L1615398-02 -38 to -48 9.37 Groundwater	B115(S) B115(S) 5/20/2016 L1615398-03 1.5 to -8.5 9.45 Groundwater	B115(D) B115(D) 5/24/2016 L1615699-02 -29.5 to -39.5 9.64 Groundwater
D. Non-Halogenated Semi-Volatile Organic Compounds												
Butyl benzyl phthalate	10000	NA	ug/L	ND(5)	-	ND(5)	-	-	-	-	-	-
Di-n-butylphthalate	5000	NA	ug/L	ND(5)	-	ND(5)	-	-	-	-	-	-
Di-n-octylphthalate	100000	NA	ug/L	ND(5)	-	ND(5)	-	-	-	-	-	-
Diethyl phthalate	9000	NA	ug/L	ND(5)	-	ND(5)	-	-	-	-	-	-
Dimethyl phthalate	50000	NA	ug/L	ND(5)	-	ND(5)	-	-	-	-	-	-
Bis(2-ethylhexyl)phthalate	50000	101	ug/L	ND(3)	-	ND(3)	-	-	-	-	-	-
Total Phthalates	NA	190	ug/L	ND	-	ND	-	-	-	-	-	-
Benzo(a)anthracene	1000	1	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Benzo(a)pyrene	500	1	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Benzo(b)fluoranthene	400	1	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Benzo(k)fluoranthene	100	1	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Chrysene	70	1	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Dibenzo(a,h)anthracene	40	1	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	100	1	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Total Group I Polycyclic Aromatic Hydrocarbons	NA	1	ug/L	ND	-	ND	-	-	-	-	-	-
Acenaphthene	10000	NA	ug/L	ND(0.1)	-	ND(0.2)	-	-	-	-	-	-
Acenaphthylene	40	NA	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Anthracene	30	NA	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Benzo(ghi)perylene	20	NA	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Fluoranthene	200	NA	ug/L	ND(0.2)	-	0.2	-	-	-	-	-	-
Fluorene	40	NA	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Naphthalene	700	20	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Phenanthrene	10000	NA	ug/L	ND(0.2)	-	0.4	-	-	-	-	-	-
Pyrene	20	NA	ug/L	ND(0.2)	-	ND(0.2)	-	-	-	-	-	-
Total Group II Polycyclic Aromatic Hydrocarbons	NA	100	ug/L	ND	-	0.6	-	-	-	-	-	-
E. Halogenated Semi-Volatile Organic Compounds												
Aroclor 1016	5	NA	ug/L	ND(0.287)	-	ND(0.25)	-	-	-	-	-	-
Aroclor 1221	5	NA	ug/L	ND(0.287)	-	ND(0.25)	-	-	-	-	-	-
Aroclor 1232	5	NA	ug/L	ND(0.287)	-	ND(0.25)	-	-	-	-	-	-
Aroclor 1242	5	NA	ug/L	ND(0.287)	-	ND(0.25)	-	-	-	-	-	-
Aroclor 1248	5	NA	ug/L	ND(0.287)	-	ND(0.25)	-	-	-	-	-	-
Aroclor 1254	5	NA	ug/L	ND(0.287)	-	ND(0.25)	-	-	-	-	-	-
Aroclor 1260	5	NA	ug/L	ND(0.23)	-	ND(0.2)	-	-	-	-	-	-
Total Polychlorinated Biphenyls	NA	0.000064	ug/L	ND	-	ND	-	-	-	-	-	-
Pentachlorophenol	200	1	ug/L	ND(0.8)	-	ND(0.8)	-	-	-	-	-	-
F. Fuels Parameters												
Total Petroleum Hydrocarbons	5000	5000	ug/L	**ND(5200)**	-	ND(4000)	-	-	-	-	-	-
Ethanol	NA	Report	ug/L	ND(250)	ND(250)	-	-	-	-	-	-	-
Methyl tert butyl ether	5000	70	ug/L	0.77 J	0.41 J	ND(1)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Tert-Butyl Alcohol	NA	120	ug/L	ND(10)	ND(10)	ND(10)	-	-	-	-	-	-
Tertiary-Amyl Methyl Ether	NA	90	ug/L	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Other Volatile Organic Compounds												
Chloroform	50	NA	ug/L	0.23 J	2.1	1.1	ND(1)	ND(1)	1.8	1.1	3.9	ND(1)
Chloromethane	10000	NA	ug/L	0.45 J	ND(2.5)	ND(2.5)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Naphthalene	700	20	ug/L	0.52 J	ND(2.5)	ND(2.5)	ND(2)	ND(2)	ND(2)	ND(2)	3	ND(2)
Trichlorofluoromethane	100000	NA	ug/L	ND(2.5)	6.8	ND(2.5)	ND(2)	ND(2)	3	ND(2)	10	ND(2)

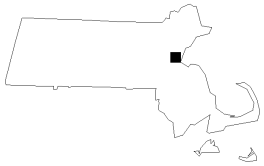
ABBREVIATIONS AND NOTES:
-: Not Analyzed
BCB: Boston City Base Datum
MCP: 310 CMR 40.0000 Massachusetts Contingency Plan effective 25 April 2014; revisions 23 May 2014
NA: Not Applicable
ug/L: micrograms per liter
ND (2.5): Not detected, number in parentheses is the laboratory reporting limit
J: Estimated value. The Target analyte concentration is below the quantitation limit (RL) but above the Method Detection Limit (MDL)
or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

1. This table shows Volatile and Semi-Volatile Organic Compounds detected in at least one sample and/or listed in Table 2 of the NPDES RGP.
For a complete list of analytes see the laboratory data reports.
2. Samples B115D_04182017 and B115S_04192017 were analyzed for Volatile and Semi-Volatile Organic Compounds using multiple analytical methods.
The result from the method with the highest detection or the lowest quantitation limit (RL) is shown in this table. For a complete list of analytes and
analyses see the laboratory data reports.
3. **Bold** values indicate an exceedance of NPDES RGP Effluent Limitations. **Bold ND** values indicate the laboratory reporting limit exceeds the
NPDES RGP Effluent Limitations.
4. Groundwater elevations measured in the field on the sampling dates indicated.
5. pH and temperature measured in the field on the sampling dates indicated.



MAP SOURCE: ESRI

SITE COORDINATES: 42°20'10"N, 71°6'21"W



HALEY ALDRICH

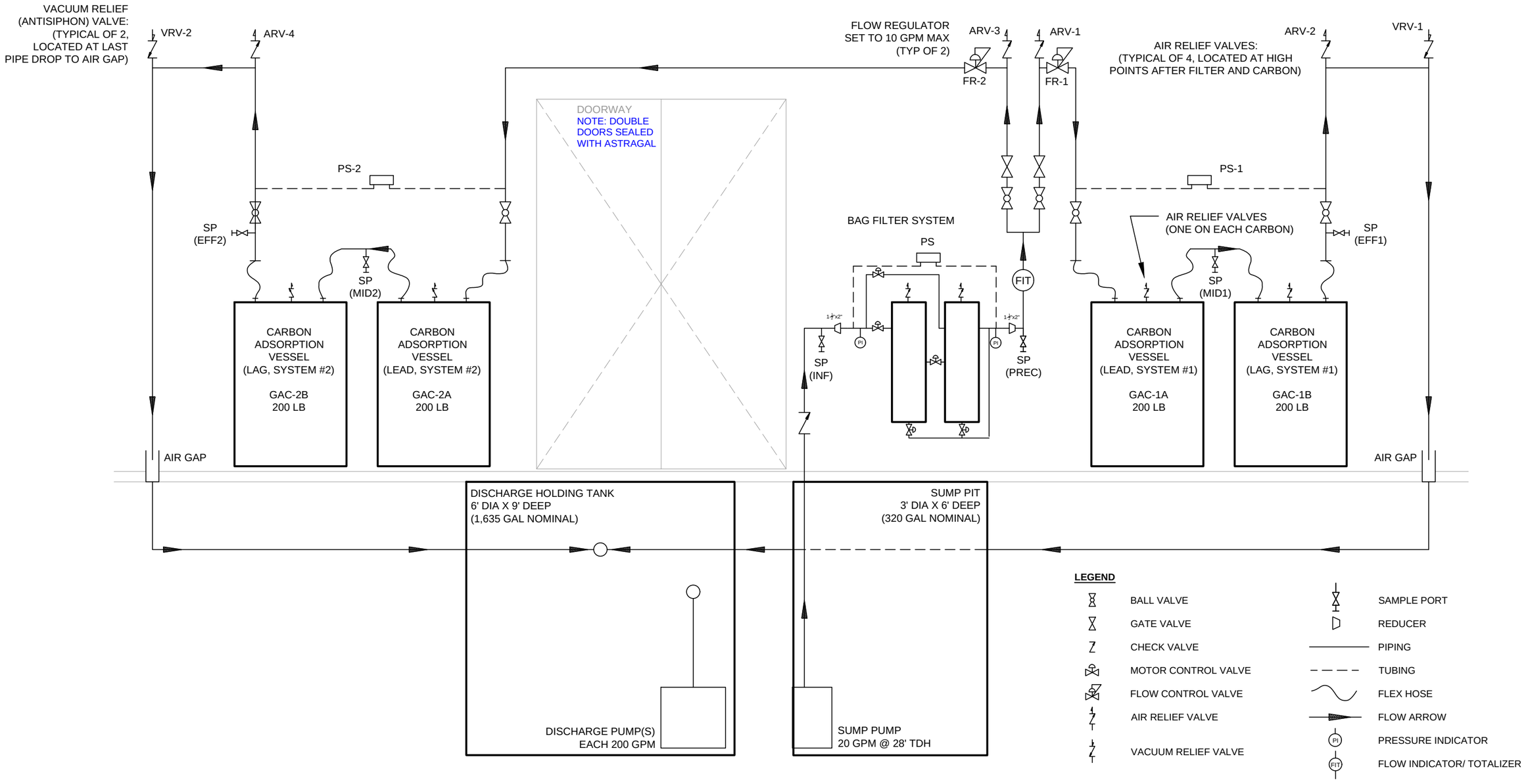
HALE FAMILY BUILDING
BOSTON CHILDREN'S HOSPITAL
BOSTON, MASSACHUSETTS

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
MARCH 2022

FIGURE 1

35520-400_1_LOCUS.PDF



FUNCTIONAL DESCRIPTION

WATER COLLECTED IN THE SUB-SLAB DRAINAGE SYSTEM COLLECTS IN THE SUMP PIT, WHERE IT IS PUMPED AT UP TO 20 GPM TO THE TREATMENT SYSTEM. IN THE TREATMENT SYSTEM, IT IS FILTERED THROUGH A FULLY AUTOMATED DUPLEX BAG FILTER SYSTEM. WATER WILL THEN PASS TO ONE OR MORE CARBON ADSORPTION SYSTEMS. FLOW CONTROL VALVES LIMIT FLOW TO EITHER SYSTEM TO 10 GPM. WATER PASSES THROUGH TWO (2) 200-LB CARBON VESSELS BEFORE FLOWING TO A DISCHARGE HOLDING TANK TO TRANSFER TO THE OUTFALL.

OPERATIONS

1. BAG FILTERS SHOULD OPERATE UNTIL ALARM INDICATES FILTER NEEDS TO BE CHANGED.
2. CARBON VESSELS SHOULD OPERATE UNTIL THE CARBON MID SAMPLE DETECTS ANY OF PCE, TCE OR CIS-1,2-DCE AT CONCENTRATIONS ABOVE LABORATORY REPORTING LIMITS.
3. WHEN CHANGED, LAG CARBON VESSEL SHOULD BECOME THE LEAD VESSEL, AND NEW VESSEL PLACED AS LAG.
4. CARBON VESSELS MAXIMUM FLOW IS 10 GPM, AND MAXIMUM PRESSURE IS 10 PSI.

CONTROLS

SUMP PUMP: LOW LEVEL, HIGH LEVEL AND HIGH-HIGH LEVEL FLOAT SWITCHES.
BAG FILTER SYSTEM: LOCAL CONTROL PANEL WITH ACTIVE FILTER AUTOMATION AND PRESSURE SWITCH (SETTABLE FROM 0 - 25 PSID). INITIAL SETTING SHOULD BE 5 PSID.
TREATMENT ROOM: WATER SENSOR ON FLOOR (TWO FOR REDUNDANCY), POWER FAILURE.
DISCHARGE PUMP: LOW LEVEL, HIGH LEVEL AND HIGH-HIGH LEVEL FLOAT SWITCHES.

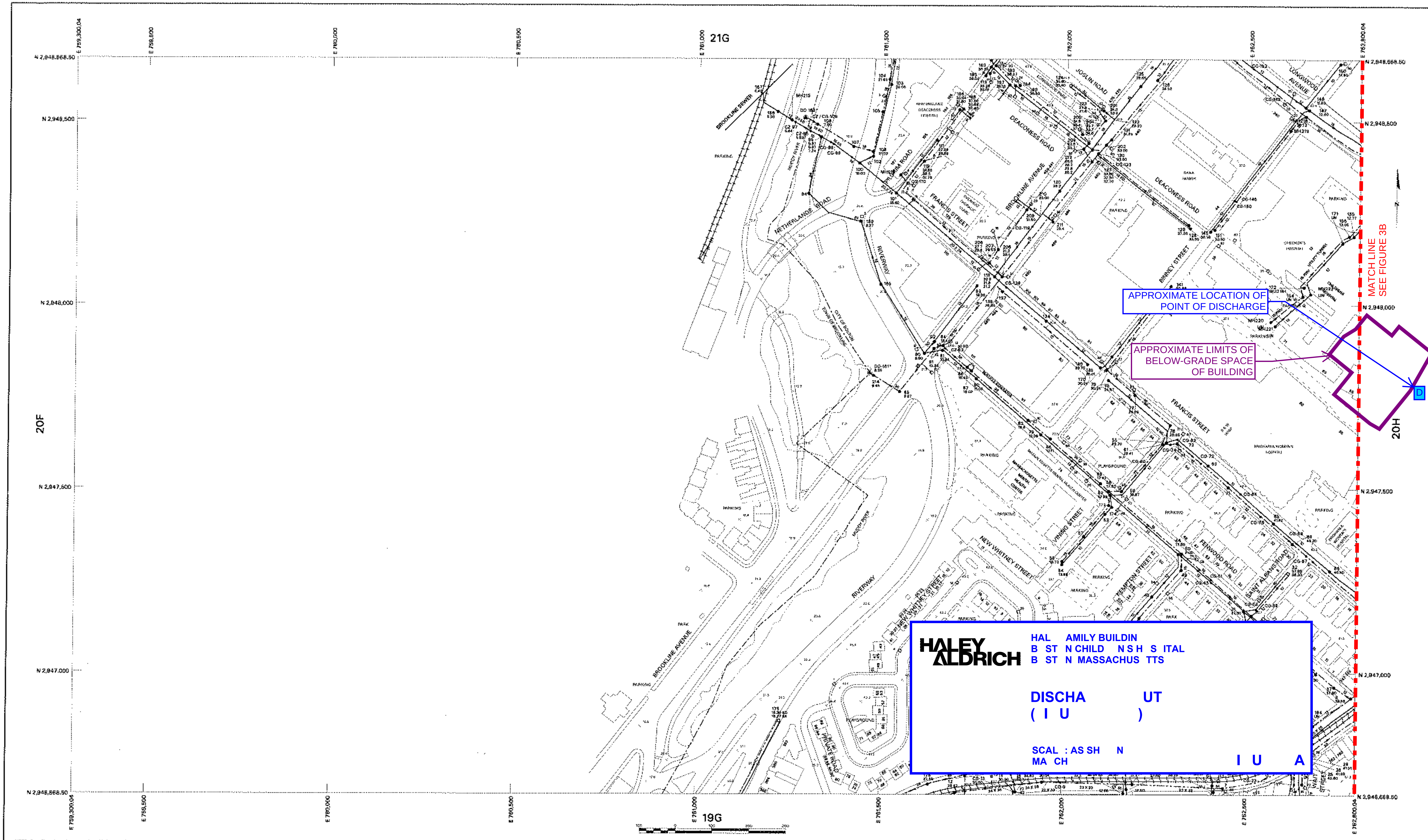
HALEY ALDRICH

HALE FAMILY BUILDING
BOSTON CHILDREN'S HOSPITAL
BOSTON, MASSACHUSETTS

SCHEMATIC PROCESS FLOW DIAGRAM - GROUNDWATER TREATMENT SYSTEM

SCALE: NONE
JANUARY 2020 - UPDATED DECEMBER 2020

FIGURE 2



NOTE: Spot Elevations shown are plotted in Boston City Base

500 FOOT GRID BASED ON MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NAD 83

DATE OF PHOTOGRAPHY - MARCH 30, APRIL 1 & 17, 1995
VERTICAL DATUM BASED ON THE BOSTON CITY BASE

THE LANDBASE ON THIS MAP WAS COMPILED TO MEET THE ASPRS STANDARD FOR CLASS 1 MAP ACCURACY

Date Produced
December 27, 1999

BOSTON WATER AND SEWER COMMISSION

SEWER SYSTEM MAP

JAMAICA PLAIN
FENWAY/KENMORE

SHEET NO.
20G

MATCH LINE
SEE FIGURE 3C

MATCH LINE
SEE FIGURE 3A

APPROXIMATE ROUTE OF DISCHARGE TO OUTFALL

APPROXIMATE LOCATION OF POINT OF DISCHARGE

APPROXIMATE LIMITS OF BELOW-GRADE SPACE OF BUILDING

HALEY ALDRICH

HAL AMILY BUILDIN
B ST N CHILD N S H S ITAL
B ST N MASSACHUS TTS

DISCHA UT
(I U)

SCAL : AS SH N
MA CH I U B

NOTE: Boot Elevations shown are plotted in Boston City Base

500 FOOT GRID BASED ON MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NAD 83

DATE OF PHOTOGRAPHY - MARCH 30, APRIL 1 & 17, 1995
VERTICAL DATUM BASED ON THE BOSTON CITY BASE

THE LANDBASE ON THIS MAP WAS COMPILED TO MEET THE ASPRS STANDARD FOR CLASS 1 MAP ACCURACY

Date Produced
February 15, 2000

BOSTON WATER AND SEWER COMMISSION

SEWER SYSTEM MAP

FENWAY/KENMORE

SHEET NO. 20H

APPROXIMATE ROUTE OF DISCHARGE TO OUTFALL

MUDDY RIVER OUTFALL DO 045

MATCH LINE
SEE FIGURE 3B

HALEY ALDRICH

HAL AMILY BUILDIN
B ST N CHILD N S H S ITAL
B ST N MASSACHUS TTS

DISCHA UT
(I U)

SCAL : AS SH N
MA CH I U C

NOTE: Spot Elevations shown are plotted in Boston City Base

500 FOOT GRID BASED ON MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NAD 83

DATE OF PHOTOGRAPHY - MARCH 30, APRIL 1 & 17, 1995
VERTICAL DATUM BASED ON THE BOSTON CITY BASE

THE LANDBASE ON THIS MAP WAS COMPILED TO MEET THE ASPRS STANDARD FOR CLASS 1 MAP ACCURACY

Date Produced
December 28, 1999

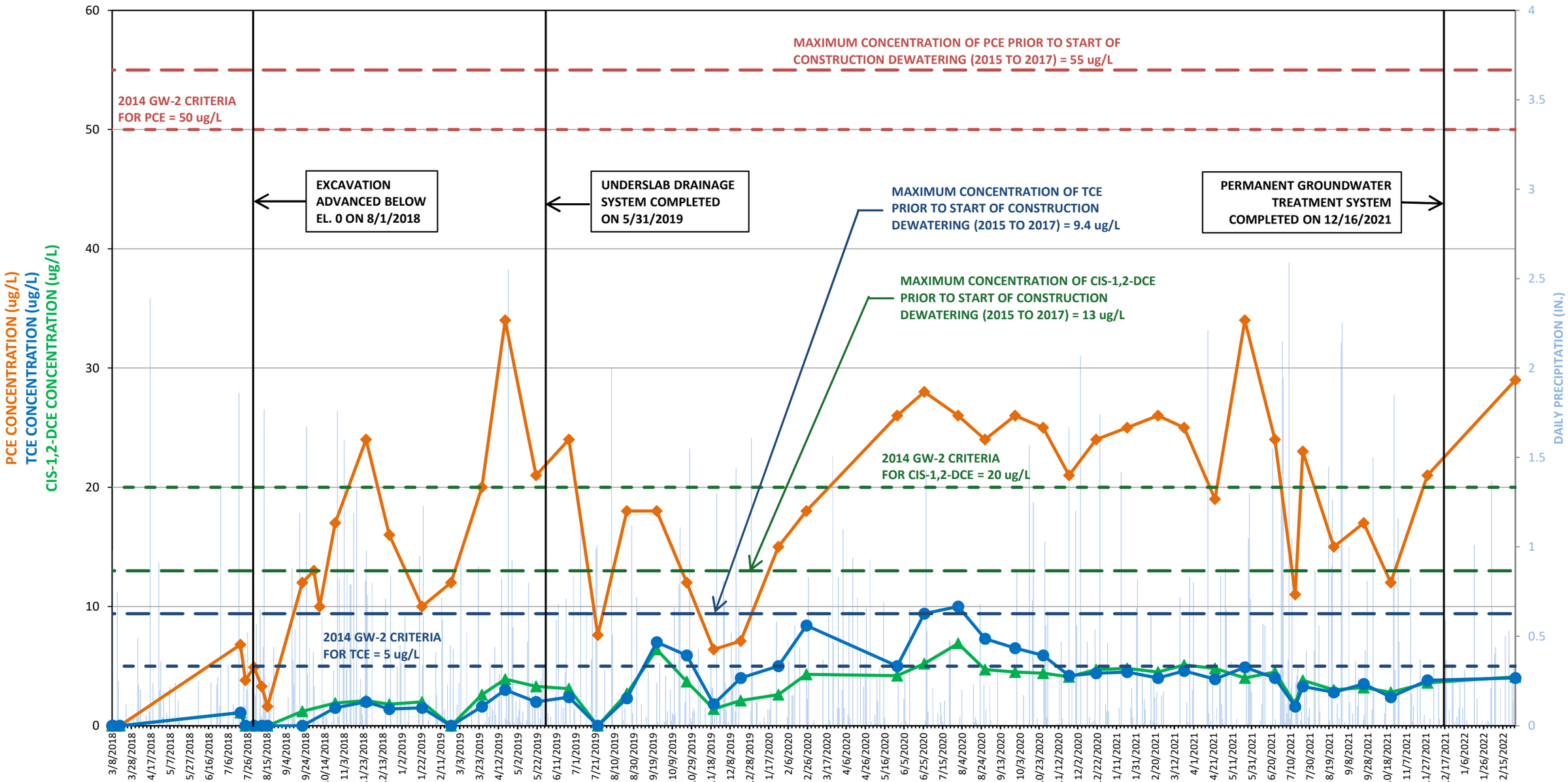
BOSTON WATER AND SEWER COMMISSION

SEWER SYSTEM MAP

FENWAY/KENMORE

SHEET NO.
21H

PCE, TCE AND CIS-1,2-DCE CONCENTRATIONS IN CONSTRUCTION DEWATERING INFLUENT OVER TIME



Note:
1. Daily precipitation data obtained from USGS gage 01104683 located near Netherlands Road bridge over Muddy River in Brookline, Massachusetts.

APPENDIX A

Remediation General Permit Notice of Intent

II. Suggested Format for the Remediation General Permit Notice of Intent (NOI)

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
Boston Children's Hospital - Hale Family Building</td><td colspan="3">Site address:
Street: 300 Longwood Avenue</td></tr>
<tr><td>City: Boston</td><td>State: MA</td><td>Zip: 02115</td></tr>
<tr><td rowspan="4">2. Site owner
The Children's Hospital Corporation

Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Jeremy Thomsen</td></tr>
<tr><td colspan="2">Telephone: 617-355-8979</td><td>Email: Jeremy.Thomsen@childrens.harv</td></tr>
<tr><td colspan="3">Mailing address:
Street: 300 Longwood Avenue</td></tr>
<tr><td>City: Boston</td><td>State: MA</td><td>Zip: 02115</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner</td><td colspan="3">Contact Person:</td></tr>
<tr><td colspan="2">Telephone:</td><td>Email:</td></tr>
<tr><td colspan="3">Mailing address:
Street:</td></tr>
<tr><td>City:</td><td>State:</td><td>Zip:</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:
NPDES RGP Authorization No. MAG910718 for temporary construction dewatering (terminated)

NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP
☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:</td><td colspan="3">5. Other regulatory program(s) that apply to the site (check all that apply):
■ MA Chapter 21e; list RTN(s): 3-33889, 3-12332
☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:
☐ CERCLA
☐ UIC Program
☐ POTW Pretreatment
☐ CWA Section 404</td></tr>
</table>

B. Receiving water information:

1. Name of receiving water(s):	Waterbody identification of receiving water(s):	Classification of receiving water(s):
Muddy River	MA72-11	Class B, Warm Water Fishery

Receiving water is (check any that apply): ☐ Outstanding Resource Water ☐ Ocean Sanctuary ☐ territorial sea ☐ Wild and Scenic River

2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): ■ Yes ☐ No

Are sensitive receptors present near the site? (check one): ☐ Yes ■ No
If yes, specify:

3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. Category 5 Waters Requiring a TMDL per MA 2018/2020 Integrated List of Waters, E. Coli (TMDL No. 32383, Pathogens in Charles River Watershed)

4. Indicate the seven day-ten-year low flow (7Q10) of the receiving water determined in accordance with the instructions in Appendix V for sites located in Massachusetts and Appendix VI for sites located in New Hampshire.	1.08 cfs (0.70 MGD)
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	25.3

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ■ Yes ☐ No
If yes, indicate date confirmation received: 3/24/2022

7. Has the operator attached a summary of receiving water sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No

C. Source water information:

1. Source water(s) is (check any that apply):

■ Contaminated groundwater Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No	☐ Contaminated surface water Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ☐ Yes ☐ No	☐ The receiving water ☐ A surface water other than the receiving water; if so, indicate waterbody:	☐ Potable water; if so, indicate municipality or origin: ☐ Other; if so, specify:

2. Source water contaminants: Trichloroethene, Tetrachloroethene, Total Suspended Solids, Chromium III exceeding NPDES RGP Effluent Limitations	
a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): ☐ Yes ■ No If yes, indicate the contaminant(s) and the maximum concentration present in accordance with the instructions in Appendix VIII.	b. For a source water that is a surface water other than the receiving water, potable water or other, indicate any contaminants present at the maximum concentration in accordance with the instructions in Appendix VIII? (check one): ☐ Yes ☐ No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ☐ Yes ■ No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): ■ Existing discharge ☐ New discharge ☐ New source	
Outfall(s): Outfall DO 045 to the Muddy River	Outfall location(s): (Latitude, Longitude) (42.34010, -71.09948)
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Storm drain system operated by Boston Water and Sewer Commission (BWSC) ☐ A private storm sewer system ■ A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): ■ Yes ☐ No Has the operator has received permission from the owner to use such system for discharges? (check one): ■ Yes ☐ No, if so, explain, with an estimated timeframe for obtaining permission: BWSC approval obtained on 3/2/2018 (refer to attached BWSC approved Site Plan #17350 drawings) Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ■ No	
Provide the expected start and end dates of discharge(s) (month/year): Start 12/2021 (corresponding to completion of permanent groundwater treatment system) Indicate if the discharge is expected to occur over a duration of: ☐ less than 12 months ■ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ■ Yes ☐ No	

<table>
<tr><td>2. Activity Category: (check all that apply)</td><td colspan="2">3. Contamination Type Category: (check all that apply)</td></tr>
<tr><td rowspan="4">☐ I – Petroleum-Related Site Remediation
■ II – Non-Petroleum-Related Site Remediation
☐ III – Contaminated Site Dewatering
☐ IV – Dewatering of Pipelines and Tanks
☐ V – Aquifer Pump Testing
☐ VI – Well Development/Rehabilitation
☐ VII – Collection Structure Dewatering/Remediation
☐ VIII – Dredge-Related Dewatering</td><td colspan="2">a. If Activity Category I or II: (check all that apply)

■ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
■ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ F. Fuels Parameters</td></tr>
<tr><td colspan="2">b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</td></tr>
<tr><td>☐ G. Sites with Known Contamination</td><td>☐ H. Sites with Unknown Contamination</td></tr>
<tr><td>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)

☐ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ F. Fuels Parameters</td><td>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</td></tr>
</table>

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✓	29	SM 4500	75	954	-	Report mg/L	---
Chloride		✓	29	300.0	12500	817000	-	Report µg/l	---
Total Residual Chlorine	✓		2	SM 4500	20	ND	-	0.2 mg/L	
Total Suspended Solids		✓	29	2540D	5000	52000	-	30 mg/L	---
Antimony	✓		29	200	4	ND	-	206 µg/L	
Arsenic		✓	29	200	1	3.52	-	104 µg/L	
Cadmium		✓	29	200	0.2	0.69	-	10.2 µg/L	
Chromium III		✓	29	200	10	1420	-	323 µg/L	
Chromium VI		✓	29	7196A	10	11	-	323 µg/L	
Copper		✓	29	200	1	47.21	-	242 µg/L	6.2 µg/L
Iron		✓	29	200	50	2600	-	5,000 µg/L	1,000 µg/L
Lead		✓	29	200	0.5	4.44	-	160 µg/L	1.75 µg/L
Mercury	✓		29	245	0.2	ND	-	0.739 µg/L	
Nickel		✓	29	200	2	70.89	-	1,450 µg/L	
Selenium	✓		29	200	5	ND	-	235.8 µg/L	
Silver	✓		29	200	0.4	ND	-	35.1 µg/L	
Zinc		✓	29	200	10	153	-	420 µg/L	
Cyanide		✓	29	4500 CN	5	0.012	-	178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX		✓	29	624.1	1	2.2	-	100 µg/L	---
Benzene	✓		29	624.1	1	ND	-	5.0 µg/L	---
1,4 Dioxane	✓		29	624.1 SIM	5	ND	-	200 µg/L	---
Acetone		✓	29	624.1	5	39	-	7.97 mg/L	---
Phenol	✓		2	420	5	ND	-	1,080 µg/L	

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride	✓		29	624.1	1	ND	-	4.4 µg/L	
1,2 Dichlorobenzene	✓		9	624.1	1	ND	-	600 µg/L	---
1,3 Dichlorobenzene	✓		9	624.1	1	ND	-	320 µg/L	---
1,4 Dichlorobenzene	✓		9	624.1	1	ND	-	5.0 µg/L	---
Total dichlorobenzene	✓		9	624.1	1	ND	-	763 µg/L in NH	---
1,1 Dichloroethane	✓		29	624.1	1.5	ND	-	70 µg/L	---
1,2 Dichloroethane	✓		9	624.1	0.5	ND	-	5.0 µg/L	---
1,1 Dichloroethylene	✓		9	624.1	0.5	ND	-	3.2 µg/L	---
Ethylene Dibromide	✓		8	504.1	0.01	ND	-	0.05 µg/L	---
Methylene Chloride	✓		29	624.1	1	ND	-	4.6 µg/L	---
1,1,1 Trichloroethane	✓		9	624.1	0.5	ND	-	200 µg/L	---
1,1,2 Trichloroethane	✓		9	624.1	0.75	ND	-	5.0 µg/L	---
Trichloroethylene		✓	30	624.1	1	10	-	5.0 µg/L	---
Tetrachloroethylene		✓	30	624.1	1	34	-	5.0 µg/L	
cis-1,2 Dichloroethylene		✓	30	624.1	1	6.9	-	70 µg/L	---
Vinyl Chloride	✓		9	624.1	1	ND	-	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✓		2	625.1	3	ND	-	190 µg/L	
Diethylhexyl phthalate	✓		2	625.1	3	ND	-	101 µg/L	
Total Group I PAHs	✓		29	625.1 SIM	0.1	ND	-	1.0 µg/L	---
Benzo(a)anthracene	✓		29	625.1 SIM	0.1	ND	-	As Total PAHs	
Benzo(a)pyrene	✓		29	625.1 SIM	0.1	ND	-		
Benzo(b)fluoranthene	✓		29	625.1 SIM	0.1	ND	-		
Benzo(k)fluoranthene	✓		29	625.1 SIM	0.1	ND	-		
Chrysene	✓		29	625.1 SIM	0.1	ND	-		
Dibenzo(a,h)anthracene	✓		29	625.1 SIM	0.1	ND	-		
Indeno(1,2,3-cd)pyrene	✓		29	625.1 SIM	0.1	ND	-		

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs		✔	28	625.1 SIM	0.1	2	-	100 µg/L	---
Naphthalene		✔	29	625.1 SIM	0.1	2	-	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✔		2	608	0.2	ND	-	0.000064 µg/L	---
Pentachlorophenol	✔		2	625.1 SIM	0.8	ND	-	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✔		2	1664A	4000	ND	-	5.0 mg/L	---
Ethanol	✔		2	8260	250	ND	-	Report mg/L	---
Methyl-tert-Butyl Ether	✔		29	624.1	10	ND	-	70 µg/L	
tert-Butyl Alcohol	✔		3	624.1	10	ND	-	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		9	624.1	2	ND	-	90 µg/L in MA 140 µg/L in NH	---
Other (i.e., pH, temperature, hardness, salinity, LC_{50}, additional pollutants present); if so, specify:									
pH (SU)		✔	29	4500	NA	8.1	-		
Temperature (°C)		✔	9	FIELD	NA	20.8	-		
Hardness		✔	1	200	660	589000	-		
Chloroform	✔		29	624.1	1	ND	-		
Chloromethane	✔		29	624.1	5	ND	-		
Trichlorofluoromethane	✔		29	624.1	5	ND	-		
							-		

E. Treatment system information

1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply)

☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ■ Granulated Activated Carbon ("GAC")/Liquid Phase Carbon Adsorption
☐ Ion Exchange ☐ Precipitation/Coagulation/Flocculation ■ Separation/Filtration ☐ Other; if so, specify:

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.
Prior to discharge, groundwater collected in the underslab drainage system and directed to the sump will be routed through a series of bag filters and granular activated carbon (GAC) vessels. Refer to Figure 2 attached to the subject NPDES RGP NOI for the schematic process flow diagram for the permanent groundwater treatment system.

Identify each major treatment component (check any that apply):
☐ Fractionation tanks☐ Equalization tank ☐ Oil/water separator ☐ Mechanical filter ■ Media filter
☐ Chemical feed tank ☐ Air stripping unit ■ Bag filter ☐ Other; if so, specify:

Indicate if either of the following will occur (check any that apply):
☐ Chlorination ☐ De-chlorination

3. Provide the **design flow capacity** in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: Bag filters Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	20 GPM
Provide the proposed maximum effluent flow in gpm.	20 GPM
Provide the average effluent flow in gpm.	10 GPM
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	NA

4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): ■ Yes ☐ No

F. Chemical and additive information

1. Indicate the type(s) of chemical or additive that will be applied to effluent prior to discharge or that may otherwise be present in the discharge(s): (check all that apply)

☐ Algaecides/biocides ☐ Antifoams ☐ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ☐ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ☐ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:

2. Provide the following information for each chemical/additive, using attachments, if necessary:

a. Product name, chemical formula, and manufacturer of the chemical/additive;
b. Purpose or use of the chemical/additive or remedial agent;
c. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each chemical/additive;
d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive;
e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks; and
f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).

3. Has the operator attached an explanation which demonstrates that the addition of such chemicals/additives may be authorized under this general permit in accordance with the instructions in F, above? (check one): ☐ Yes ■ No; if no, has the operator attached data that demonstrates each of the 126 priority pollutants in CWA Section 307(a) and 40 CFR Part 423.15(j)(1) are non-detect in discharges with the addition of the proposed chemical/additive? (check one): ☐ Yes ■ No

G. Endangered Species Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

■ **FWS Criterion A**: No endangered or threatened species or critical habitat are in proximity to the discharges or related activities or come in contact with the "action area".

☐ **FWS Criterion B**: Formal or informal consultation with the FWS under section 7 of the ESA resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by FWS on a finding that the discharges and related activities are "not likely to adversely affect" listed species or critical habitat (informal consultation). Has the operator completed consultation with FWS? (check one): ☐ Yes ☐ No; if no, is consultation underway? (check one): ☐ Yes ☐ No

☐ **FWS Criterion C**: Using the best scientific and commercial data available, the effect of the discharges and related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the operator and affirmed by EPA, that the discharges and related activities will have "no effect" on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the FWS. This determination was made by: (check one) ☐ the operator ☐ EPA ☐ Other; if so, specify:

☐ **NMFS Criterion**: A determination made by EPA is affirmed by the operator that the discharges and related activities will have "no effect" or are "not likely to adversely affect" any federally threatened or endangered listed species or critical habitat under the jurisdiction of NMFS and will not result in any take of listed species. Has the operator previously completed consultation with NMFS? (check one): ☐ Yes ☐ No

2. Has the operator attached supporting documentation of ESA eligibility in accordance with the instructions in Appendix I, and G, above? (check one): ■ Yes ☐ No

Does the supporting documentation include any written concurrence or finding provided by the Services? (check one): ☐ Yes ■ No; if yes, attach.

H. National Historic Preservation Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

■ **Criterion A**: No historic properties are present. The discharges and discharge-related activities (e.g., BMPs) do not have the potential to cause effects on historic properties.

☐ **Criterion B**: Historic properties are present. Discharges and discharge related activities do not have the potential to cause effects on historic properties.

☐ **Criterion C**: Historic properties are present. The discharges and discharge-related activities have the potential to have an effect or will have an adverse effect on historic properties.

2. Has the operator attached supporting documentation of NHPA eligibility in accordance with the instructions in H, above? (check one): ■ Yes ☐ No

Does the supporting documentation include any written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (TPHO), or other tribal representative that outlines measures the operator will carry out to mitigate or prevent any adverse effects on historic properties? (check one): ■ Yes ☐ No

I. Supplemental information

Describe any supplemental information being provided with the NOI. Include attachments if required or otherwise necessary.

Refer to attached Haley & Aldrich, Inc. letter

Has the operator attached data, including any laboratory case narrative and chain of custody used to support the application? (check one): ■ Yes ☐ No

Has the operator attached the certification requirement for the Best Management Practices Plan (BMPP)? (check one): ■ Yes ☐ No

J. Certification requirement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

BMPP certification statement:	A BMPP meeting the requirements of this general permit has been developed and will be implemented and available for review at the site.
Notification provided to the appropriate State, including a copy of this NOI, if required.	Check one: Yes ☐ No ■
Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐
Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐ NA ☐
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.	Check one: Yes ■ No ☐ NA ☐
Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	Check one: Yes ☐ No ☐ NA ■
Signature: DocuSigned by: Lisa Hogarty D2F2A8B0199E4D4...	Date: 3/30/2022
Print Name and Title: Lisa Hogarty, Senior Vice President Real Estate Planning and Development	

*on behalf of The Children's Hospital Corporation and not individually

APPENDIX B

Effluent Limitations and Dilution Factor Calculations and Documentation

Enter number values in green boxes below

Enter values in the units specified

↓

0.7	Q_R = Enter upstream flow in **MGD**
0.0288	Q_P = Enter discharge flow in **MGD**
0	Downstream 7Q10

Enter a dilution factor, if other than zero

↓

25.3

Enter values in the units specified

↓

589	C_d = Enter influent hardness in **mg/L** $CaCO_3$
40.9	C_s = Enter receiving water hardness in **mg/L** $CaCO_3$

Enter **receiving water** concentrations in the units specified

↓

7.4	pH in **Standard Units**
12.2	Temperature in **°C**
0.161	Ammonia in **mg/L**
40.9	Hardness in **mg/L** $CaCO_3$
0	Salinity in **ppt**
0	Antimony in **µg/L**
1.46	Arsenic in **µg/L**
0	Cadmium in **µg/L**
1.94	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
13.85	Copper in **µg/L**
1090	Iron in **µg/L**
12.36	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
34.3	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

↓

0	TRC in **µg/L**
0.954	Ammonia in **mg/L**
0	Antimony in **µg/L**
3.52	Arsenic in **µg/L**
0.69	Cadmium in **µg/L**
1420	Chromium III in **µg/L**
11	Chromium VI in **µg/L**
47.21	Copper in **µg/L**
2600	Iron in **µg/L**
4.44	Lead in **µg/L**
0	Mercury in **µg/L**
70.89	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
153	Zinc in **µg/L**
0.012	Cyanide in **µg/L**
0	Phenol in **µg/L**
0	Carbon Tetrachloride in **µg/L**
34	Tetrachloroethylene in **µg/L**
0	Total Phthalates in **µg/L**
0	Diethylhexylphthalate in **µg/L**
0	Benzo(a)anthracene in **µg/L**
0	Benzo(a)pyrene in **µg/L**
0	Benzo(b)fluoranthene in **µg/L**
0	Benzo(k)fluoranthene in **µg/L**
0	Chrysene in **µg/L**
0	Dibenzo(a,h)anthracene in **µg/L**
0	Indeno(1,2,3-cd)pyrene in **µg/L**
0	Methyl-tert butyl ether in **µg/L**

Notes:

Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approved
Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry
Discharge flow is equal to the design flow or 1 MGD, whichever is less
Only if approved by State as the entry for Q_R; leave 0 if no entry

Saltwater (estuarine and marine): only if approved by the State
Leave 0 if no entry

Freshwater only

pH, temperature, and ammonia required for all discharges
Hardness required for freshwater
Salinity required for saltwater (estuarine and marine)
Metals required for all discharges if present and if dilution factor is > 1
Enter 0 if non-detect or testing not required

if >1 sample, enter maximum
if >10 samples, may enter 95th percentile
Enter 0 if non-detect or testing not required

Dilution Factor	25.3					
A. Inorganics	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
Ammonia	**Report**	mg/L	---			
Chloride	**Report**	µg/L	---			
Total Residual Chlorine	**0.2**	mg/L	278	µg/L	---	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	16196	µg/L		
Arsenic	**104**	µg/L	218	µg/L		
Cadmium	**10.2**	µg/L	0.1912	µg/L		
Chromium III	**323**	µg/L	1438.0	µg/L		
Chromium VI	**323**	µg/L	289.4	µg/L		
Copper	242	µg/L	**6.2**	µg/L		
Iron	5000	µg/L	**1000**	µg/L		
Lead	160	µg/L	**1.75**	µg/L		
Mercury	**0.739**	µg/L	22.92	µg/L		
Nickel	**1450**	µg/L	887.6	µg/L		
Selenium	**235.8**	µg/L	126.5	µg/L		
Silver	**35.1**	µg/L	42.7	µg/L		
Zinc	**420**	µg/L	1204.0	µg/L		
Cyanide	**178**	mg/L	131.6	µg/L	---	µg/L
B. Non-Halogenated VOCs						
Total BTEX	**100**	µg/L	---			
Benzene	**5.0**	µg/L	---			
1,4 Dioxane	**200**	µg/L	---			
Acetone	**7970**	µg/L	---			
Phenol	**1,080**	µg/L	7592	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**	µg/L	40.5	µg/L		
1,2 Dichlorobenzene	**600**	µg/L	---			
1,3 Dichlorobenzene	**320**	µg/L	---			
1,4 Dichlorobenzene	**5.0**	µg/L	---			
Total dichlorobenzene	**---**	µg/L	---			
1,1 Dichloroethane	**70**	µg/L	---			
1,2 Dichloroethane	**5.0**	µg/L	---			
1,1 Dichloroethylene	**3.2**	µg/L	---			
Ethylene Dibromide	**0.05**	µg/L	---			
Methylene Chloride	**4.6**	µg/L	---			
1,1,1 Trichloroethane	**200**	µg/L	---			
1,1,2 Trichloroethane	**5.0**	µg/L	---			
Trichloroethylene	**5.0**	µg/L	---			
Tetrachloroethylene	**5.0**	µg/L	83.5	µg/L		
cis-1,2 Dichloroethylene	**70**	µg/L	---			
Vinyl Chloride	**2.0**	µg/L	---			
D. Non-Halogenated SVOCs						
Total Phthalates	**190**	µg/L	---	µg/L		
Diethylhexyl phthalate	**101**	µg/L	55.7	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	**1.0**	µg/L	0.0962	µg/L	---	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.0962	µg/L	---	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.0962	µg/L	---	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.0962	µg/L	---	µg/L
Chrysene	**1.0**	µg/L	0.0962	µg/L	---	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0962	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.0962	µg/L	---	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---			
Naphthalene	**20**	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---		0.5	µg/L
Pentachlorophenol	**1.0**	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	**5.0**	mg/L	---			
Ethanol	**Report**	mg/L	---			
Methyl-tert-Butyl Ether	**70**	µg/L	506	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

HALEY & ALDRICH, INC.		**CALCULATIONS**	FILE NO.	0128868-010	
			SHEET	1 of 1	
CLIENT	The Children's Hospital Corporation		DATE	19-Mar-22	
PROJECT	Boston Children's Hospital - Hale Family Building		COMPUTED BY	JMT	
SUBJECT	Dilution Factor Calculations				

PURPOSE: Calculate Dilution Factor (DF) for project based on 7 Day 10 Year (7Q10) Low Flow values.

APPROACH: Calculate DF based on EPA formula $(Q_S + Q_D)/Q_D$, where Q_S is 7Q10 in million gallons per day (MGD) and Q_D is discharge flow in MGD.

ASSUMPTIONS:
1. 7Q10 is 1.08 cfs (from StreamStats)
2. A conversion of 7.48 is used to convert cubic feet to gallons
3. A design discharge flow rate of 20 gpm is assumed

CALCULATIONS:

7Q10 Low Flow Value (Q_S)

$$Q_S = \frac{1.08\ ft^3}{sec} \times \frac{7.48\ gallons}{ft^3} \times \frac{86{,}400\ sec}{day} \times \frac{1\ MG}{1{,}000{,}000\ gallons}$$

Q_S = 0.70 MGD

Discharge Flow Rate (Q_D)

$$Q_D = \frac{20\ gallons}{min} \times \frac{1{,}440\ min}{day} \times \frac{1\ MG}{1{,}000{,}000\ gallons}$$

Q_D = 0.0288 MGD

Dilution Factor (DF)

$$DF = \frac{Q_S + Q_D}{QD} = \frac{0.70\ MGD + 0.0288\ MGD}{0.0288\ MGD} = 25.3$$

CONCLUSION: The dilution factor for this project is calculated to be 25.3 based on the provided 7Q10 low flow value and discharge flow rate.

Thibault, Jonathan M.

From: Ruan, Xiaodan (DEP) <xiaodan.ruan@state.ma.us>
Sent: Thursday, March 24, 2022 5:13 PM
To: Thibault, Jonathan M.
Cc: Coniaris, Catherine (DEP)
Subject: RE: Boston Children's Hospital - Hale Family Building - 7Q10 and Dilution Factor for NPDES RGP NOI

Hi Jonathan,

I can confirm that the 7Q10 flow of 1.08 cfs for the Muddy River and the dilution factor of 25.3 for the proposed discharge with a design flow of 20 gpm from the project site at Boston Children's Hospital – Hale Family Building in Boston were correct.

Here is water quality information to assist you with filling out the NOI:

> Waterbody and ID: Muddy River (MA72-11) within Charles River Watershed
> Classification: B (CSO)
> Outstanding Resource Water?: No
> State's most recent Integrated List is located here: https://www.mass.gov/doc/final-massachusetts-integrated-list-of-waters-for-the-clean-water-act-20182020-reporting-cycle/download, search for "MA 72-11" to see the causes of impairments.
> TMDLs: There are two approved TMDLs (pathogens and phosphorus) for this segment.

If this is not a *current* MCP site, then in addition to submitting the NOI to EPA, you need to apply with MassDEP and submit a $500 fee (unless fee exempt, e.g., municipality). For MassDEP's application, please use ePLACE, an online application submittal process where you will set up a user ID and be able to submit NOIs for various projects as well as pay by credit card. The instructions are located on this page: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent. Technical assistant information is available on the front page of the ePLACE application webpage.

Please let me know if you have any questions.

Thanks,
Xiaodan

Xiaodan Ruan
Environmental Engineer
Massachusetts Department of Environmental Protection
One Winter Street, Boston, MA 02108
(857)-256-4172
xiaodan.ruan@mass.gov

From: Thibault, Jonathan M. <JThibault@haleyaldrich.com>
Sent: Monday, March 21, 2022 3:57 PM
To: Coniaris, Catherine (DEP) <Catherine.Coniaris@mass.gov>; Ruan, Xiaodan (DEP) <xiaodan.ruan@mass.gov>
Subject: Boston Children's Hospital - Hale Family Building - 7Q10 and Dilution Factor for NPDES RGP NOI

Hi Cathy and Xiaodan,

As required in Appendix V of the 2017 NPDES RGP, I have attached to this email our StreamStats report detailing the 7 D ay 10 Year (7Q10) low flow value for our project (listed below) along with the dilution factor calculations for your review and confirmation.

Project:
Boston Children's Hospital – Hale Family Building
Boston, Massachusetts

Discharge:
Muddy River via stormwater system outfall DO 045. See attached discharge route.
Design System Flow: 20 gallons per minute (0.0288 MGD)
7 Day 10 Year Low Flow value (from attached StreamStats Report) = 1.08 cfs (0.70 MGD)

Dilution Factor (from attached calculations) = 25.3

Can you please confirm if these values are appropriate for use for our project?

Thank you,

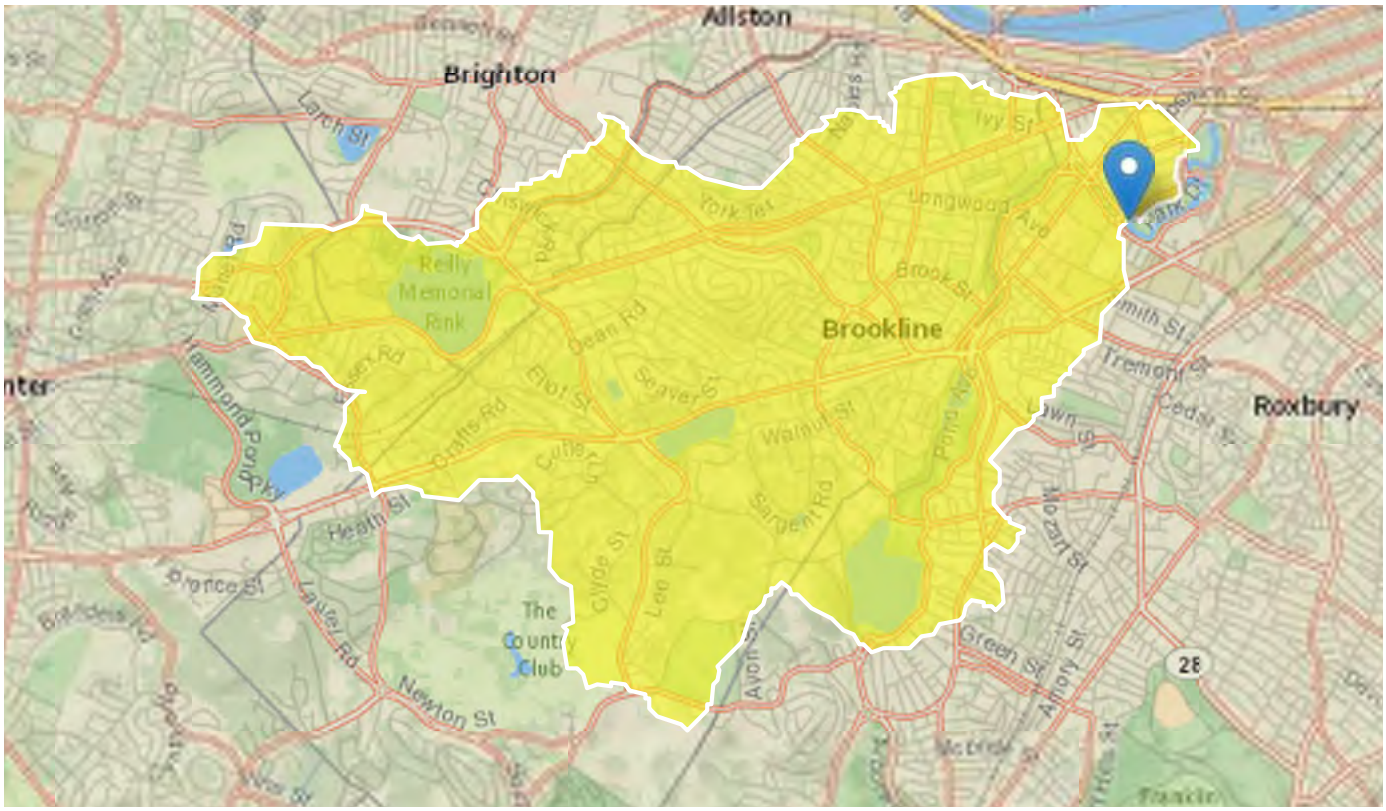
Jonathan M. Thibault, P.E. (CO)
Senior Technical Specialist

Haley & Aldrich, Inc.
Office: (720) 616-4404
Mobile: (617) 680-2293

www.haleyaldrich.com

StreamStats Report

Region ID: MA
Workspace ID: MA20220319193437928000
Clicked Point (Latitude, Longitude): 42.34010, -71.09948
Time: 2022-03-19 13:34:58 -0600



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	6.55	square miles
BSLDEM250	Mean basin slope computed from 1:250K DEM	3.028	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.77	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless

Low-Flow Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	6.55	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	3.028	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.77	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

Low-Flow Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SE	ASEp
7 Day 2 Year Low Flow	1.74	ft^3/s	0.331	8.8	49.5	49.5
7 Day 10 Year Low Flow	1.08	ft^3/s	0.167	6.5	70.8	70.8

Low-Flow Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

Application Version: 4.7.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.1.2

APPENDIX C

Permanent Groundwater Treatment System Details

SUBMITTAL NUMBER/TITLE: 221130-34.3 – Groundwater Filtration System (GFS-1) – Product Data, Rev. 3
SPECIFICATION SECTION: 221130 – Plumbing Drainage and Venting Systems
DATE OF SUBMITTAL: 18 May 2020
DATE RECEIVED BY H&A: 18 May 2020
DATE OF H&A REVIEW: 1 September 2020

☒ "REVIEWED." Fabrication, manufacture, installation or construction may proceed providing the Work is in compliance with the Contract Documents.

☐ "REVIEWED AS NOTED." Fabrication, manufacture, installation or construction may proceed providing the Work is in compliance with the Engineer's notations and comments, and the Contract Documents. See Engineer's notations and comments below.

☐ "REVIEWED AS NOTED, ADDITIONAL INFORMATION REQUIRED." Fabrication, manufacture, installation or construction may proceed on Noted Work providing the Work is in compliance with the Engineer's notations and comments, and the Contract Documents. No Work shall be fabricated, manufactured, installed or constructed on Work for which additional information or resubmission is indicated. The Contractor shall make a new submittal to the Engineer. See Engineer notations and comments below.

☐ "REVISE AND RESUBMIT." No Work shall be fabricated, manufactured, installed or constructed. The Contractor shall make a new submittal to the Engineer.

Engineer's review is only for general concept with the understanding that it is the Contractor's submission of his proposed design, and method to construct the work as specified and in conformance with the Contract Documents. Engineer's review is based on Contractor's representation that he has checked and approved this submittal and has verified dimensions, quantities, field conditions, relation to existing work, coordination of work to be installed later, and coordination with information in previously approved submittals. Approval by the Engineer does not authorize, or relieve the Contractor of responsibility for deviations from drawings, specifications, supplementary documents furnished by the Architect/Engineer. The Contractor is responsible for the accuracy of all information in the submittal, for details of fabrication and installation, for the safe construction of the work, and for compliance with all requirements of the Contract Documents.

HALEY & ALDRICH, INC. REVIEWED BY Jonathan M. Thibault DATE 1 September 2020

ENGINEER COMMENTS ON SUBMITTAL:

No additional comments or exceptions taken.

Submittal #22 11 30-34.3
22 11 30 - Plumbing Drainage and Venting Systems

Suffolk Construction Company, Inc.
65 Allerton Street
Boston, Massachusetts 02119
Phone: (617) 445-3500
Fax: (617) 541-2128

Project: 217031 - Hale Family Clinical Building
55 Shattuck Street
Boston, Massachusetts 02115

Groundwater Filtration System (GFS-1) - Product Data

REVISION:	3	**SUBMITTAL MANAGER:**	Meghan McWade **(Suffolk Construction)**
STATUS:	Open	**DATE CREATED:**	05/18/2020
ISSUE DATE:	06/1/2020	**SPEC SECTION:**	22 11 30 - Plumbing Drainage and Venting Systems
RESPONSIBLE CONTRACTOR:	American Plumbing & Heating (NORWELL)	**RECEIVED FROM:**	Peter Bent
RECEIVED DATE:	05/18/2020	**SUBMIT BY:**	05/18/2020
FINAL DUE DATE:	06/1/2020	**LOCATION:**	BCCB
SUB JOB:		**COST CODE:**	
LEAD TIME:	112 day(s)	**TYPE:**	Product Data
APPROVERS:	Meghan McWade **(Suffolk Construction)**, Shepley CA Admin Bulfinch **(Shepley Bulfinch)**, Kevin Horne **(Suffolk Construction)**, Meghan McWade **(Suffolk Construction)**		

BALL IN COURT:
Meghan McWade **(Suffolk Construction)**

DISTRIBUTION:
Jason Lansberry **(Suffolk Construction)** , Ed Tobin **(Suffolk Construction)** , David Lee **(R.W. Sullivan Engineering (BOSTON))** , Steve Smith **(Boston Children's Hospital)** , Shepley CA Admin Bulfinch **(Shepley Bulfinch)** , Robert Moroney **(Suffolk Construction)** , Kevin Malenchini **(Suffolk Construction)** , Todd Sampson **(R.W. Sullivan Engineering (BOSTON))** , Griffin Pharr **(Suffolk Construction)** , John Sanderson **(Bard, Rao + Athanas Consulting Enigneers)** , Robb Connor **(Shepley Bulfinch)** , Rachel Wein **(Shepley Bulfinch)** , Sabrina Torchia **(Suffolk Construction)** , Jane Galli **(Shepley Bulfinch)** , Rob Morsi **(Suffolk Construction)** , CA Admin **(Bard, Rao + Athanas Consulting Enigneers)** , Jason Seaburg **(Suffolk Construction)** , Craig Allhusen **(Boston Children's Hospital)** , Kyle Reilly **(Suffolk Construction)** , Kevin Horne **(Suffolk Construction)** , George Player **(Suffolk Construction)** , Michael Gailey **(Shepley Bulfinch)** , Kurt Victor **(Suffolk Construction)** , Tom Susko **(Shepley Bulfinch)** , Larry Malloy **(Suffolk Construction)** , Tyler Moriarty **(Shepley Bulfinch)** , Paul Capuzzo **(Boston Children's Hospital)** , David Parenteau **(Suffolk Construction)** , TJ Flatley **(Suffolk Construction)** , Jim Chambers **(Shepley Bulfinch)** , Lee Vanzler **(Haley & Aldrich, Inc. (BOSTON))**

DESCRIPTION:
Please see attached for Submittal # 22 11 30-34.3 - Groundwater Filtration System - Product Data

Thank you

ATTACHMENTS:

SUBMITTAL WORKFLOW

NAME	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
Peter Bent	5/18/2020	5/18/2020	Submitted	221130-34.2 - Groundwater Filtration System (GFS-1) R3.pdf	
Meghan McWade	5/18/2020		Pending		
Shepley CA Admin Bulfinch	6/1/2020		Pending		
Kevin Horne	6/1/2020		Pending		
Meghan McWade	6/1/2020		Pending		

Suffolk

Submittal #22 11 30-34.3
22 11 30 - Plumbing Drainage and Venting Systems

SUFFOLK CONSTRUCTION CO. INC REVIEWED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

THE SUBCONTRACTOR/VENDOR IS RESPONSIBLE FOR ALL DIMENSIONS, CORRECT FIT AND COORDINATION OF ALL ITEMS TO BE FURNISHED AND INSTALLED

BY:	DATE:
MMcWade	5/18/2020

JOB #:	JOB NAME:
217031	BCCB

SUBMITTAL #: **221130-34.3**

SPEC/DRWG REF:

REVIEWED FOR CONSTRUCTIBILITY

BY	DATE	COPIES TO

American Plumbing & Heating Corp.
1000 Cordwainer Drive
Norwell, MA 02061
Ph : (781) 347-9200

Submittal

Job: 7329-C-P
Boston Children's Clinical Bld
300 Longwood Ave
Boston, MA

Spec Section No: 220000
Submittal No: 11
Revision No: 3
Sent Date: 5/18/2020

Spec Section Title:

Submittal Title: GFS-1 Groundwater Filtration System

Contractor:
American Plumbing & Heating Corp.
James P. Bent

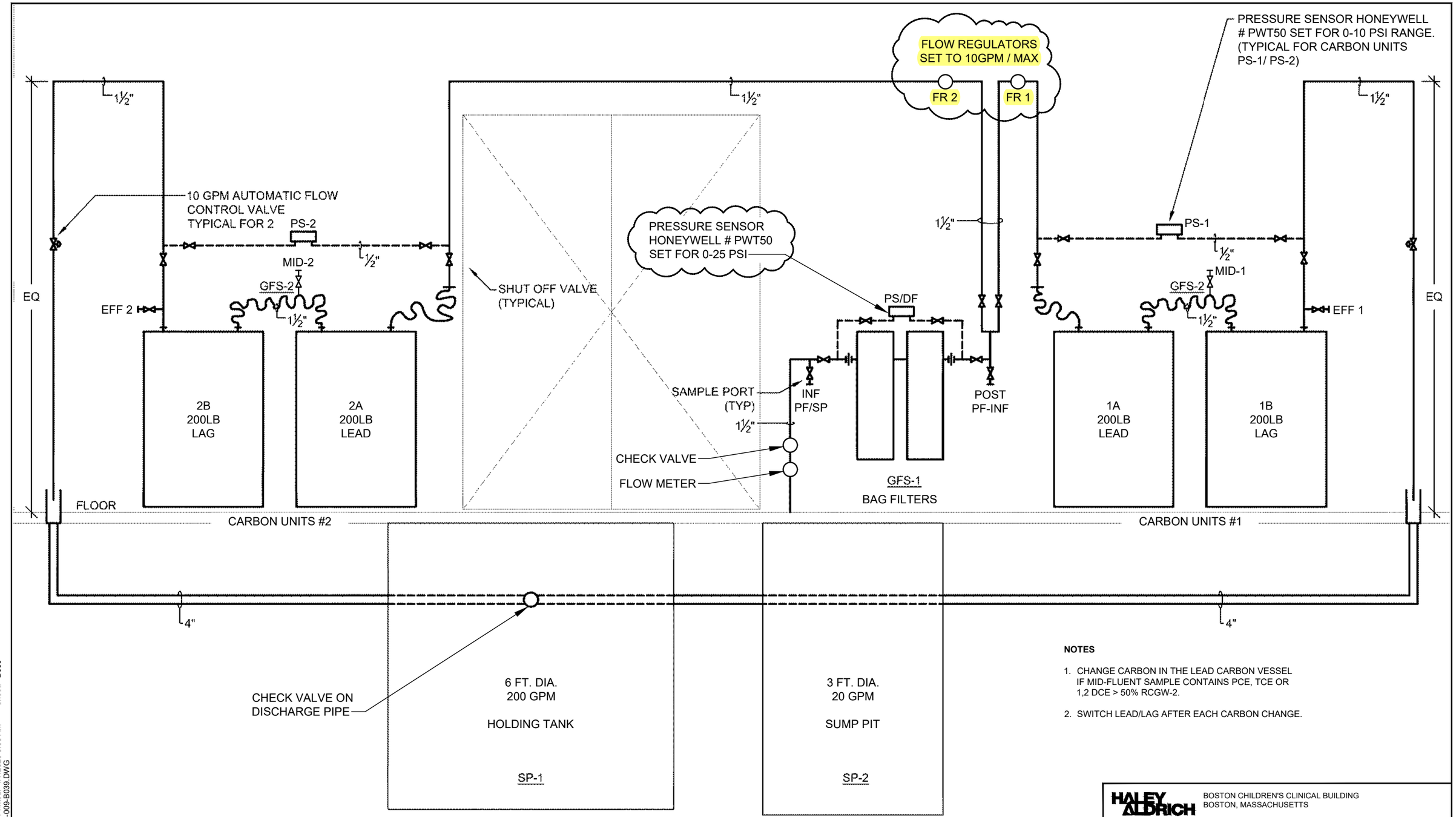
Contractor's Stamp

Other:
Suffolk Construction Co. Inc.
Griffin Pharr

Architect's Stamp

Engineer's Stamp

GROUNDWATER FILTRATION SYSTEM
FLOW REGULATORS FR1/FR2



NOTES

1. CHANGE CARBON IN THE LEAD CARBON VESSEL IF MID-FLUENT SAMPLE CONTAINS PCE, TCE OR 1,2 DCE > 50% RCGW-2.
2. SWITCH LEAD/LAG AFTER EACH CARBON CHANGE.

NOTE

1. DETAIL TAKEN FROM A DRAWING TITLED "PLUMBING DETAILS, SHEET 9, P010" BULLETIN 16, PREPARED BY RW SULLIVAN, DATED 1 MAY 2018.

GROUNDWATER FILTRATION DETAIL

NOT TO SCALE

HALEY ALDRICH

BOSTON CHILDREN'S CLINICAL BUILDING
BOSTON, MASSACHUSETTS

SCHEMATIC PROCESS FLOW
SUB-SLAB DRAINAGE SYSTEM
TREATMENT UNIT

SCALE: NONE
JANUARY 2020

FIGURE 2

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Sheet: B039

Hays Fluid Controls
114 Eason Road, PO Box 580, Dallas, NC 28034-0580
Phone: (800) 354-4297 • **Fax:** (704) 922-9595
Email: info@haysfluidcontrols.com

Item # 2524, Model 2524 Mesurflo® Y-Ball Automatic Balancing Valve ~~(3/4 in., 1 in., 1-1/4 in. &~~ 1-1/2 in.)

Model 2524 Mesurflo® Y-Ball Automatic Balancing Valve (3/4 in., 1 in., 1-1/4 in. &1-1/2 in.)

Standard Features:
- FNPT, FSWT and MNPT Outlet / Inlet Connections
- Changeable GPM Flow Cartridges
- Differential Operating Pressure:

2-80 PSID 0.5-5.00 GPM
3-80 PSID 5.50-17.0 GPM
5-80 PSID 18.0-25.0 GPM

- ± 10% Accuracy
- Operating Temperature Range 32ºF to 225ºF
- 1/4" Pressure / Temperature Ports
- Short or Lever Handle
- Right or Left Hand Porting
- Inlet and Outlet Port Options
- Valves Labeled with Model No., Size &Flow Rate
- Dryseal Pipe Threads
- Valve Body Suitable for 600 PSIG

· SPECIFICATIONS · MATERIAL SPECIFICATIONS

SPECIFICATIONS

Name	Mesurflo®
Size	1 in 1-1/2 in ~~1-1/4 in~~ 3/4 in
Flow Rate	10 GPM 0.50 to 25.0 gpm
Type	Y-Ball Automatic Balancing Valve
Valve Style	Y-Ball
Inlet Connections	FNPT FSWT MNPT
Outlet Connections	FNPT ~~FSWT~~ MNPT
Differential Operating Pressure	2-80 psid 0.50 to 5.00 gpm 3-80 psid 5.50 to 17.0 gpm 5-80 psid 18.0 to 25.0 gpm

Accuracy	± 10 %
Operating Temperature Range	32 to 225 ºF
Specification No.	ABV-SPEC-2524-003
Dimension A	6.9 in 175 mm
Dimension B	3.3 in 84 mm
Dimension C	2.6 in 66 mm
Dimension D	4 in 102 mm
Dimension E	1.6 in 41 mm
Dimension F	2.7 in 69 mm
Dimension G	2.5 in 64 mm
Options	Extended Handles Extended Pressure/Temperature Ports Manual Air Vent (Placed in Top Port) Plugged (Ports Machined w/1/4" Plug) Pressure Taps Stainless Steel Tag-Chain Upon Request

MATERIAL SPECIFICATIONS

Valve Body	Brass
Union End	Brass
Ball	Chrome Plated Brass
Pressure / Temperature Ports	Brass
O-Rings	EPDM
Ball Seat	PTFE
Stem Material	Brass
End Cap	Brass
Diaphragm	EPDM
Ball Valve End Fitting	Brass

Short Handle	Zinc Plated Steel
Coupling Nut	Brass
Orifice	Polyphenylsulfone
Orifice Holder	Brass

Page 3 of 3

SUBMITTAL NUMBER/TITLE: 221130-34.2 – Groundwater Filtration System (GFS-1) – Product Data, Rev. 2
SPECIFICATION SECTION: 221130 – Plumbing Drainage and Venting Systems
DATE OF SUBMITTAL: 25 March 2020
DATE RECEIVED BY H&A: 25 March 2020
DATE OF H&A REVIEW: 3 April 2020

☐ "REVIEWED." Fabrication, manufacture, installation or construction may proceed providing the Work is in compliance with the Contract Documents.

☒ "REVIEWED AS NOTED." Fabrication, manufacture, installation or construction may proceed providing the Work is in compliance with the Engineer's notations and comments, and the Contract Documents. See Engineer's notations and comments below.

☐ "REVIEWED AS ON REQUIRED." Fabrication, manufacture, installation or co k providing the Work is in compliance with the Engineer's nota t Documents. No Work shall be fabricated, manufactured, i hich additional information or resubmission is indicated. The to the Engineer. See Engineer notations and comments below

☐ "REVISE AND R d, manufactured, installed or constructed. The Contractor shall

	APPROVED FOR CONFORMANCE TO THE DESIGN CONCEPT AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION DOCUMENTS.
✔	**APPROVED EXCEPT AS NOTED,** RESUBMISSION NOT REQUIRED.
	APPROVED EXCEPT AS NOTED, RESUBMIT FOR RECORD.
	REVIEWED, REFERENCE CONSULTANT STAMP FOR ACTION REQUIRED.
	REVISE AND RESUBMIT.
	REJECTED.
	FILE COPY, INFORMATIONAL SUBMITTAL FOR RECORD PURPOSES.

BY Tyler Moriarty DATE 4/8/2020

SHEPLEY BULFINCH

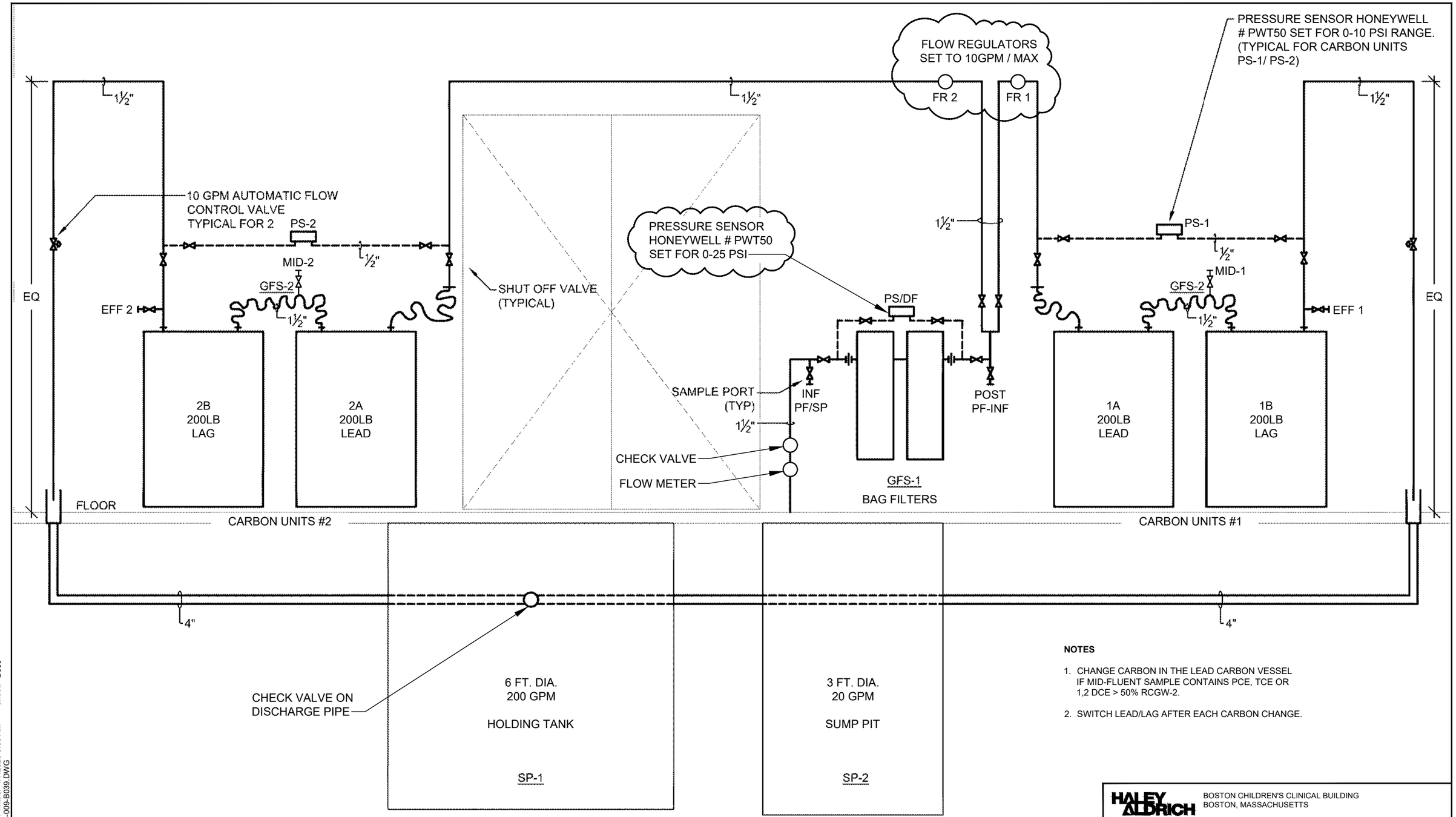
Engineer's review is only for general concept with the understanding that it is the Contractor's submission of his proposed design, and method to construct the work as specified and in conformance with the Contract Documents. Engineer's review is based on Contractor's representation that he has checked and approved this submittal and has verified dimensions, quantities, field conditions, relation to existing work, coordination of work to be installed later, and coordination with information in previously approved submittals. Approval by the Engineer does not authorize, or relieve the Contractor of responsibility for deviations from drawings, specifications, supplementary documents furnished by the Architect/Engineer. The Contractor is responsible for the accuracy of all information in the submittal, for details of fabrication and installation, for the safe construction of the work, and for compliance with all requirements of the Contract Documents.

HALEY & ALDRICH, INC. REVIEWED BY _____ DATE 3 April 2020

ENGINEER COMMENTS ON SUBMITTAL:

We have reviewed the subject submittal relative to the requirements outlined in specification Section 027100 – Permanent Groundwater Treatment and Bulletin No. 15 – Groundwater Treatment, including the memorandum titled "BCCB – Groundwater Treatment System, Updated Conceptual Design – Appendix J", dated 11 May 2018 and drawing "GT-1 Underslab Drainage and Vapor Mitigation System Plan". We provide the following comments:

1. See attached for an updated version of Detail 1 from Bulletin 16 drawing "P010 Plumbing Details Sheet 9", prepared by R.W. Sullivan and dated 1 May 2018, marked up to include additional detail on the designations of system components and locations of sampling ports and check valves. Additionally, the locations of the flow regulators have been moved to before rather than after the carbon filters. Please review and provide comment.



NOTES

1. CHANGE CARBON IN THE LEAD CARBON VESSEL IF MID-FLUENT SAMPLE CONTAINS PCE, TCE OR 1,2 DCE > 50% RCGW-2.
2. SWITCH LEAD/LAG AFTER EACH CARBON CHANGE.

NOTE

1. DETAIL TAKEN FROM A DRAWING TITLED "PLUMBING DETAILS, SHEET 9, P010" BULLETIN 16, PREPARED BY RW SULLIVAN, DATED 1 MAY 2018.

GROUNDWATER FILTRATION DETAIL

NOT TO SCALE

HALEY ALDRICH

BOSTON CHILDREN'S CLINICAL BUILDING
BOSTON, MASSACHUSETTS

SCHEMATIC PROCESS FLOW
SUB-SLAB DRAINAGE SYSTEM
TREATMENT UNIT

SCALE: NONE
JANUARY 2020

FIGURE 2

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Sheet: B039

R.W.Sullivan Engineering
MEP/FP Engineering . Code . Commissioning

Submittal Transmittal

R.W. Sullivan, Inc. | 529 Main Street, Suite 203 Boston MA 02129-1107 United States

PROJECT:	BCH BCCB 150063	DATE SENT:	4/6/2020
SUBJECT:	04785.000 - Submittal Forwarded - 221130-34.2 - Groundwater Filtration System (GFS-1) - Product... - Submittal:221130-34.2:cWBYj	SUBMITTAL ID:	150063-00-127R2
TYPE:	Submittal	TRANSMITTAL ID:	00705
PURPOSE:	No Exceptions Taken	VIA:	Email

SPEC SECTION:

FROM

NAME	COMPANY	EMAIL	PHONE
Maria Conti	R.W. Sullivan, Inc.	mc@rwsullivan.com	617-523-8227

TO

NAME	COMPANY	EMAIL	PHONE
BCCB-CA		BCCB-CA@shepleybulfinch.com	

CONTENTS

QUANTITY: 1 DATED: 3/25/2020 NUMBER:

DESCRIPTION:
Transmittal_Submittal - 221130-34.2 (Forwarded).pdf

ACTION:
REMARKS:

- [x] NO EXCEPTION TAKEN
- [ ] ACCEPTED AS NOTED
- [ ] REJECTED
- [ ] SUBMIT SPECIFIED ITEM
- [ ] REVISE-NO RESUBMISSION REQUIRED
- [ ] REVISE & RESUBMIT
- [ ] RETURNED WITHOUT ACTION
- [ ] REVIEWED

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general comformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: continuing and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating their work with that of all other trades, and performing their work in a safe and satisfactory manner.

ROBERT W. SULLIVAN, INC.
Consulting Engineers
By: JM Date: 4-6-20

COPIES:

Jeffrey Martell (R.W. Sullivan, Inc.)
David Lee (R.W. Sullivan, Inc.)

SUBMITTAL VI

Project:	BCH BCCB	**RWS#:**	150063
Submittal:	Plb Groundwater filtration	**Submittal #:**	150063-00-127R2
Sub-Contractor:	American Plumbing	**Architect:**	Shepley Bulfinch
Reviewer:	David Lee	**Architect/GC#:**	221130-34.2
Date:	2020-04-06	**Spec Section:**	221130

Plumbing	See Comments Below
HVAC	Not Applicable
Electrical	Not Applicable
Fire Protection	Not Applicable

IT M	STATUS	VI C MM NTS
FILT-GRND-SK-B3-01		
Groundwater filtration	NET	

NET = NO EXCEPTION TAKEN
AAN = ACCEPTED AS NOTED
REJ = REJECTED
SSI = SUBMIT SPECIFIED ITEM

RNR = REVISE NO RESUBMISSION
R&R = REVISE AND RESUBMIT
RWA = RETURNED WITHOUT ACTION
Reviewed = Review for conformance with the concept of the project

All comments must be addressed in writing by the Contractor.

Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the requirements of the drawings and specifications. This check is only for review of the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming, correlating and coordination of all quantities and dimensions; selecting fabrication processes and techniques of construction (means and methods); coordination of his work with that of all of the other trades; and performing his work in compliance with all pertinent codes in a safe manner.

K:\2015\150063-00\5_CA\Submittals\Plumbing\150063-00-127R2-221130-34-2 groundwater filtration\150063-00-127R2-221130-34-2 groundwater filtration.docx

The Schrafft Center . 529 Main Street, Suite 203 Boston, MA 02129-1107 617 523 8227 (p) 617.523.8016 (f) . www.rwsullivan.com

Suffolk

Submittal #22 11 30-34.2
22 11 30 - Plumbing Drainage and Venting Systems

Suffolk Construction Company, Inc.
65 Allerton Street
Boston, Massachusetts 02119
Phone: (617) 445-3500
Fax: (617) 541-2128

Project: 217031 - Hale Family Clinical Building
55 Shattuck Street
Boston, Massachusetts 02115

Groundwater Filtration System (GFS-1) - Product Data

SPEC SECTION:	22 11 30 - Plumbing Drainage and Venting Systems	**SUBMITTAL MANAGER:**	Meghan McWade **(Suffolk Construction)**
STATUS:	Open	**DATE CREATED:**	03/22/2019
ISSUE DATE:	04/8/2020	**REVISION:**	2
RESPONSIBLE CONTRACTOR:	American Plumbing & Heating (NORWELL)	**RECEIVED FROM:**	Peter Bent
RECEIVED DATE:	03/25/2020	**SUBMIT BY:**	03/25/2020
FINAL DUE DATE:	04/18/2019	**LOCATION:**	BCCB
SUB JOB:		**COST CODE:**	
		TYPE:	Product Data
APPROVERS:	Meghan McWade **(Suffolk Construction)**, Shepley CA Admin Bulfinch **(Shepley Bulfinch)**, Kevin Horne **(Suffolk Construction)**, Meghan McWade **(Suffolk Construction)**		

BALL IN COURT:
Meghan McWade **(Suffolk Construction)**

DISTRIBUTION:
Jason Lansberry **(Suffolk Construction)** , Ed Tobin **(Suffolk Construction)** , David Lee **(R.W. Sullivan Engineering (BOSTON))** , Steve Smith **(Boston Children's Hospital)** , Shepley CA Admin Bulfinch **(Shepley Bulfinch)** , Robert Moroney **(Suffolk Construction)** , Kevin Malenchini **(Suffolk Construction)** , Todd Sampson **(R.W. Sullivan Engineering (BOSTON))** , Griffin Pharr **(Suffolk Construction)** , John Sanderson **(Bard, Rao + Athanas Consulting Enigneers)** , Robb Connor **(Shepley Bulfinch)** , Rachel Wein **(Shepley Bulfinch)** , Sabrina Torchia **(Suffolk Construction)** , Jane Galli **(Shepley Bulfinch)** , Rob Morsi **(Suffolk Construction)** , CA Admin **(Bard, Rao + Athanas Consulting Enigneers)** , Jason Seaburg **(Suffolk Construction)** , Craig Allhusen **(Boston Children's Hospital)** , Kyle Reilly **(Suffolk Construction)** , Kevin Horne **(Suffolk Construction)** , George Player **(Suffolk Construction)** , Michael Gailey **(Shepley Bulfinch)** , Kurt Victor **(Suffolk Construction)** , Tom Susko **(Shepley Bulfinch)** , Larry Malloy **(Suffolk Construction)** , Angela Beck **(Suffolk Construction)** , Tyler Moriarty **(Shepley Bulfinch)** , Paul Capuzzo **(Boston Children's Hospital)** , David Parenteau **(Suffolk Construction)** , TJ Flatley **(Suffolk Construction)** , Jim Chambers **(Shepley Bulfinch)** , Lee Vanzler **(Haley & Aldrich, Inc. (BOSTON))**

DESCRIPTION:
Please see attached for Submittal # 22 11 30-34.2 - Groundwater Filtration System - Product Data

Thank you

ATTACHMENTS:

SUBMITTAL WORKFLOW

NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
Peter Bent	Submitter		4/4/2019	3/25/2020	Submitted	221130-34.1 - Groundwater Filtration System (GFS-1) R2.pdf	
Meghan McWade	Approver	3/25/2020	3/25/2020		Pending		
Shepley CA Admin Bulfinch	Approver		4/8/2020		Pending		
Kevin Horne	Approver		4/18/2019		Pending		
Meghan McWade	Approver		4/18/2019		Pending		

Submittal #22 11 30-34.2
22 11 30 - Plumbing Drainage and Venting Systems

SUFFOLK CONSTRUCTION CO. INC
REVIEWED IN ACCORDANCE WITH
THE CONTRACT DOCUMENTS.

THE SUBCONTRACTOR/VENDOR IS
RESPONSIBLE FOR ALL
DIMENSIONS, CORRECT FIT AND
COORDINATION OF ALL ITEMS
TO BE FURNISHED AND INSTALLED

BY: MMcWade	DATE: 3/25/20
JOB #: 217031	JOB NAME: BCCB
SUBMITTAL #: 221130-34.2	
SPEC/DRWG REF:	
REVIEWED FOR CONSTRUCTIBILITY	

BY DATE COPIES TO

American Plumbing & Heating Corp.
1000 Cordwainer Drive
Norwell, MA 02061
Ph : (781) 347-9200

Submittal

Job: 7329-C-P
Boston Children's Clinical Bld
300 Longwood Ave
Boston, MA

Spec Section No: 220000
Submittal No: 11
Revision No: 2
Sent Date: 3/2/2020

Spec Section Title:

Submittal Title: GFS-1 Groundwater Filtration System R2

Contractor:
American Plumbing & Heating Corp.
James P. Bent

Contractor's Stamp

Other:
Suffolk Construction Co. Inc.
Griffin Pharr

Architect's Stamp

Engineer's Stamp

GROUNDWATER FILTRATION SYSTEM RESUBMITTAL (GFS-1)
BCH ID: FILT-GRND-SK-B3-01

FOR REFERENCE ONLY - PRIOR SUBMITTION COMMENTS

SUBMITTAL NUMBER/TITLE: 221130-34.1 – Groundwater Filtration System (GFS-1) – Product Data, Rev. 1
SPECIFICATION SECTION: 221130 – Plumbing Drainage and Venting Systems
DATE OF SUBMITTAL: 15 February 2019
DATE RECEIVED BY H&A: 19 February 2019
DATE OF H&A REVIEW: 14 March 2019

☐ "REVIEWED." Fabrication, manufacture, installation or construction may proceed providing the Work is in compliance with the Contract Documents.

☐ "REVIEWED AS NOTED." Fabrication, manufacture, installation or construction may proceed providing the Work is in compliance with the Engineer's notations and comments, and the Contract Documents. See Engineer's notations and comments below.

☐ "REVIEWED AS NOTED, ADDITIONAL INFORMATION REQUIRED." Fabrication, manufacture, installation or construction may proceed on Noted Work providing the Work is in compliance with the Engineer's notations and comments, and the Contract Documents. No Work shall be fabricated, manufactured, installed or constructed on Work for which additional information or resubmission is indicated. The Contractor shall make a new submittal to the Engineer. See Engineer notations and comments below.

☒ "REVISE AND RESUBMIT." No Work shall be fabricated, manufactured, installed or constructed. The Contractor shall make a new submittal to the Engineer.

Engineer's review is only for general concept with the understanding that it is the Contractor's submission of his proposed design, and method to construct the work as specified and in conformance with the Contract Documents. Engineer's review is based on Contractor's representation that he has checked and approved this submittal and has verified dimensions, quantities, field conditions, relation to existing work, coordination of work to be installed later, and coordination with information in previously approved submittals. Approval by the Engineer does not authorize, or relieve the Contractor of responsibility for deviations from drawings, specifications, supplementary documents furnished by the Architect/Engineer. The Contractor is responsible for the accuracy of all information in the submittal, for details of fabrication and installation, for the safe construction of the work, and for compliance with all requirements of the Contract Documents.

HALEY & ALDRICH, INC. REVIEWED BY _____ DATE 14 March 2019

ENGINEER COMMENTS ON SUBMITTAL:

We have reviewed the subject submittal relative to the requirements outlined in specification Section 027100 – Permanent Groundwater Treatment and Bulletin No. 15 – Groundwater Treatment, including the memorandum titled "BCCB – Groundwater Treatment System, Updated Conceptual Design – Appendix J", dated 11 May 2018 and drawing "GT-1 Underslab Drainage and Vapor Mitigation System Plan". We provide the following comments:

1. Per Specification 027100 Section 1.6, please provide shop drawings which include a complete description of the procedures to be followed for installing and operating the treatment system.
   1a: No action required
2. We recommend using 316 stainless steel for all wetted components of the system, where applicable and feasible (e.g. bag filter baskets).
   2a: APH to review if 316 stainless is an option and if there is added cost
   APH: 316 SS is not an option on filter housings. Please note that sump pumps are not SS.
3. Please provide cut sheets and information related to other system components including piping, valves (including automatic flow control and shut off valves), flex hose, instruments, sample ports and control equipment (including control diagram and description of controls).
   3a: RW Sullivan to reach out to manufacturer and assist in obtaining documents
   Determined was not possible.
4. The block flow diagram provided on page 5 of 101 of the submittal indicates the system contains two (2) sets of two (2) GAC units (for a total of four units). We acknowledge and take no exception to the
   4a: H&A stated based off flow meter reading, currently averaging 13 lbs/ min flow rate which includes rainfall. SCCI to confirm flow rate with Flett/ Recon. Depending on flow rate, RW Sullivan to review if possible to reduce GAC units
   Determined was not possible.

FOR REFERENCE ONLY - PRIOR SUBMITTION COMMENTS & APH RESPONSE

inclusion of four (4) GAC units under the assumed flow rate of 20 gpm through the system. Please note that if the flow rate were reduced to 10 gpm, only two (2) GAC units might be considered.

5. We note that a check valve should be provided to prevent backflow from the discharge piping to the discharge holding tank.
   5a: APH to provide APH: Confirmed
6. We note that the dimensions of the filter vessels are different on pages 7 and 8 of 101 of the submittal; please confirm the size of the filter vessel system proposed.
   6a: APH to provide on resubmittal APH: Dimensions on page 8 are correct for filter housing. Please disregard dimensions on page 7.
7. Regarding the question on page 13 of 101 of the submittal, we recommend KHE 327P2SSL, 93% efficiency at 8 µm and 96% efficiency at 18 µm.
   7a: APH to provide on resubmittal APH: KHE 327P2SSL will be be provided.
8. Page 18 of 101 of the submittal indicates the filter vessel system is automated and requires compressed air to operate. We note that as indicated in the memorandum noted above, it was not our intention for the filter vessel system to be automated. Additionally, we recommend that the filter vessel system allow both filters to run at the same time, maximizing the time between filter changes. We note that this would require that both filters be changed at once, requiring the system to be shut down during filter changes.
   8a: Filter vessel system to remain as automated
9. We note that per the memorandum noted above, pressure sensors should be capable of measuring an absolute pressure range of 0 to 30 psi; the submitted pressure sensors measure a differential pressure range of 0 to 10 psi (refer to page 54 of 101 of the submittal). We recommend that a system of pressure sensors be incorporated into the system that can measure absolute pressure (up to 30 psi) as well as differential pressure across system components.
   9a: System to remain as specified per spec with pressure sensors measuring a differential pressure range of 0 to 10 psi
10. We note that per the memorandum noted above, level sensors should be ultrasonic (non-contact). The level sensors provided on pages 75 and 100 of 101 of the submittal are contact level sensors.
    10a: Level sensors to be ultrasonic. SCCI to submit RFI; RW Sullivan to provide revised specification APH: Submitted under seperate cover.
11. Page 92 of 101 of the submittal indicates the ejector sump pumps will pump 20 gpm at 13 psi. We recommend using a sump pump that will pump 20 gpm at a minimum of 20 psi through a fully loaded bag filter.
    11a: System to remain as specified per spec with ejector sump pumps pumping 20 gpm at 13 psi.

\\haleyaldrich.com\share\bos_common\128868 - BCCB\006 - Engineering Support\Submittals\Section 221130 - Plumbing Drainage and Venting Systems\221130-34.1 GFS-1 R1\221130-34.1 - Groundwater Filtration System (GFS-1) - Product Data-HAI Response.docx

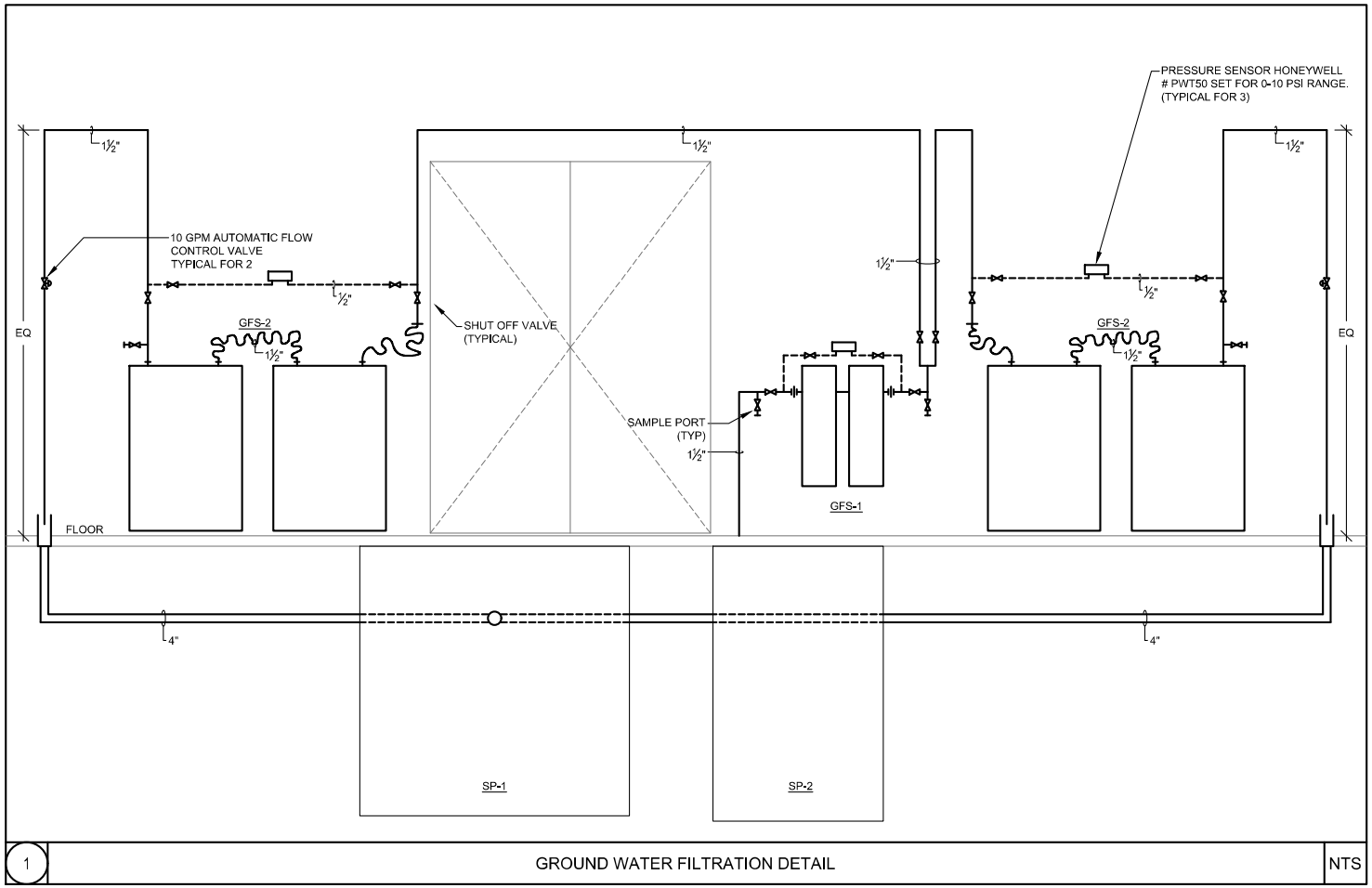
	APPROVED FOR CONFORMANCE TO THE DESIGN CONCEPT AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION DOCUMENTS.
	APPROVED EXCEPT AS NOTED, RESUBMISSION NOT REQUIRED.
	APPROVED EXCEPT AS NOTED, RESUBMIT FOR RECORD.
	REVIEWED, REFERENCE CONSULTANT STAMP FOR ACTION REQUIRED.
✔	**REVISE AND RESUBMIT.**
	REJECTED.
	FILE COPY, INFORMATIONAL SUBMITTAL FOR RECORD PURPOSES.

BY Michael Gailey DATE 3/15/2019

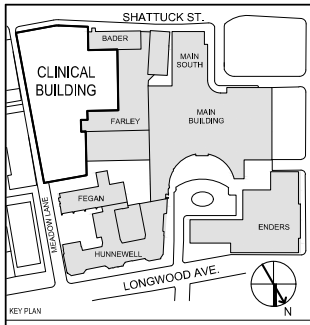
SHEPLEY BULFINCH

GROUND WATER FILTRATION SYSTEM
KNIGHT CORP.
GFS-1

BCH Identification #:
FILT-GRND-SK-B3-01



NO	DATE	DESCRIPTION



BOSTON CHILDREN'S CLINICAL BUILDING
55 SHATTUCK STREET
BOSTON, MA 02115
PROJECT

PLUMBING DETAILS SHEET 9
DRAWING TITLE

NONE
SCALE

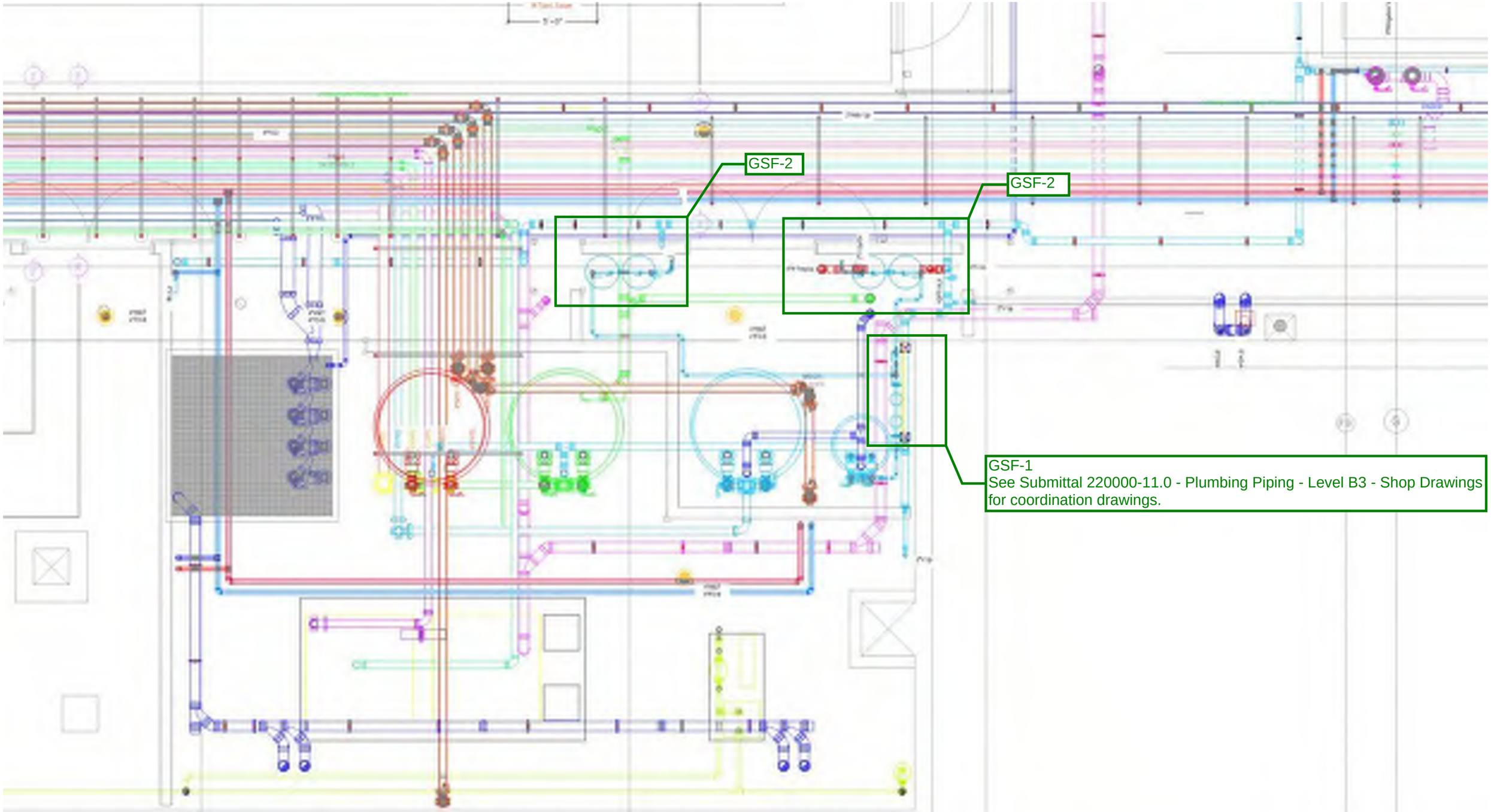
05/01/2018
ISSUE DATE

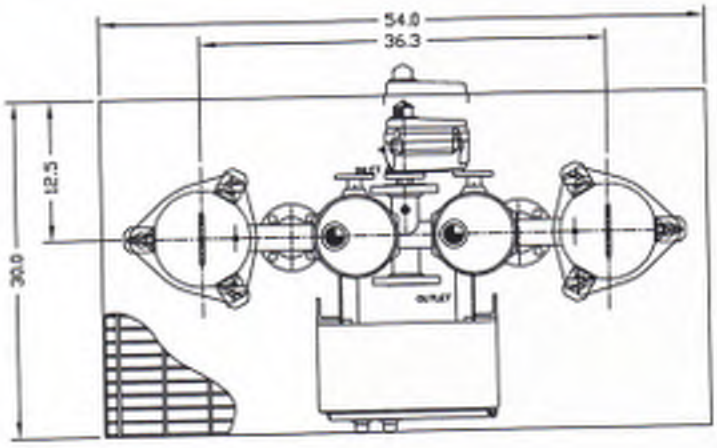
4785
JOB NUMBER

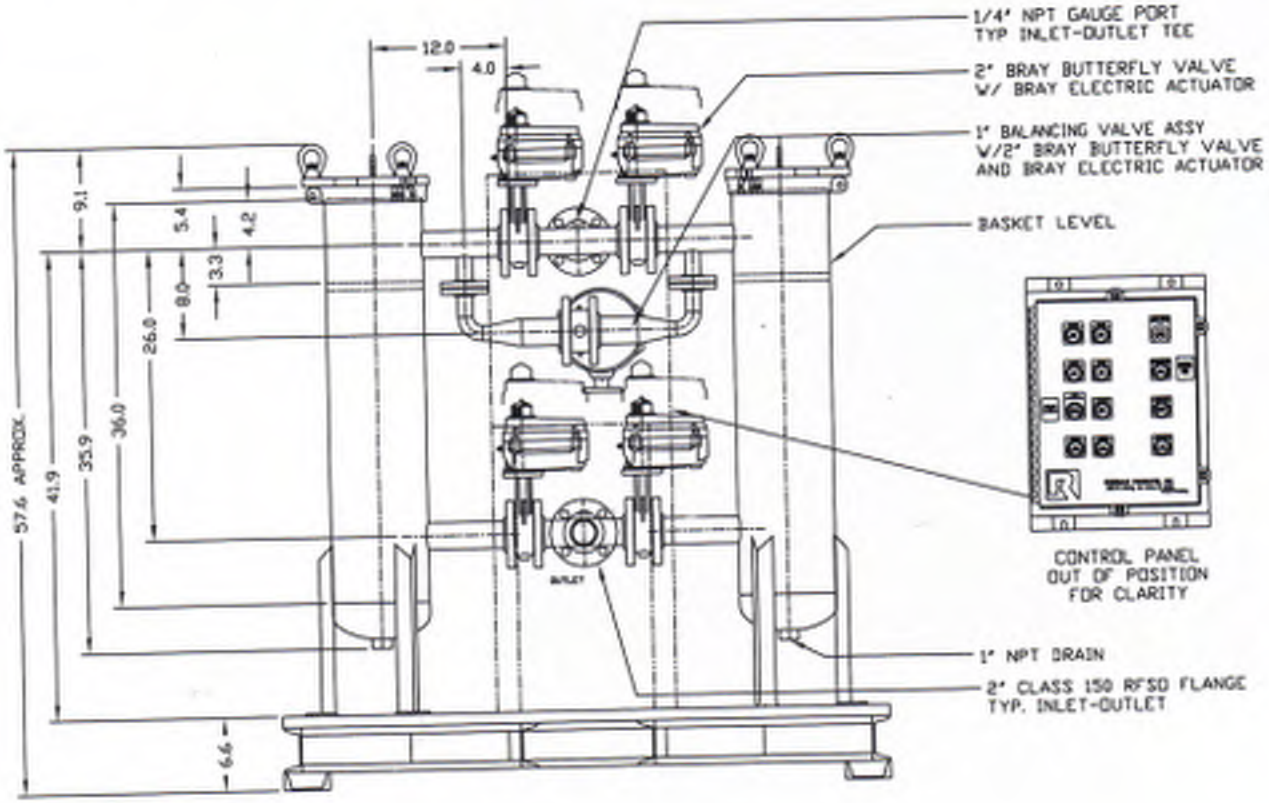
BULLETIN 16
SUBMISSION

P010
DRAWING NUMBER

THE ORIGINAL OF THIS DRAWING IS 36" X 48". IF THIS COPY IS ANY OTHER SIZE, IT HAS EITHER BEEN REDUCED OR ENLARGED. TAKE APPROPRIATE PRECAUTIONS ACCORDINGLY.


GSF-2
GSF-2
GSF-1
See Submittal 220000-11.0 - Plumbing Piping - Level B3 - Shop Drawings for coordination drawings.





NOTES:

1. CONSTRUCTION
   ALL WELDED CONSTRUCTION.
2. MATERIALS OF CONSTRUCTION
   ALL WETTED PARTS TO BE 316 STAINLESS STEEL
   ALL WELDED ATTACHMENTS TO BE 300 SERIES S.S.
   CLOSURE ASSEMBLIES TO BE SWING BOLT TYPE
3. DESIGN PRESSURE
   150 PSIG
4. DESIGN TEMPERATURE
   400°F
5. FILTER BAG BASKET
   304 STAINLESS STEEL
   4.4 ft2 AREA EACH BASKET
   9/64" DIA. HOLES ON 3/16" ST. CL'S (51% OPEN)
6. FILTER BAG
   (ORDER SEPARATELY)
7. O-RING MATERIAL
   BUNA
   Viton

LET.	REVISION	BY	DATE

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

MATERIAL

KNIGHT CORPORATION

ITEM NO.

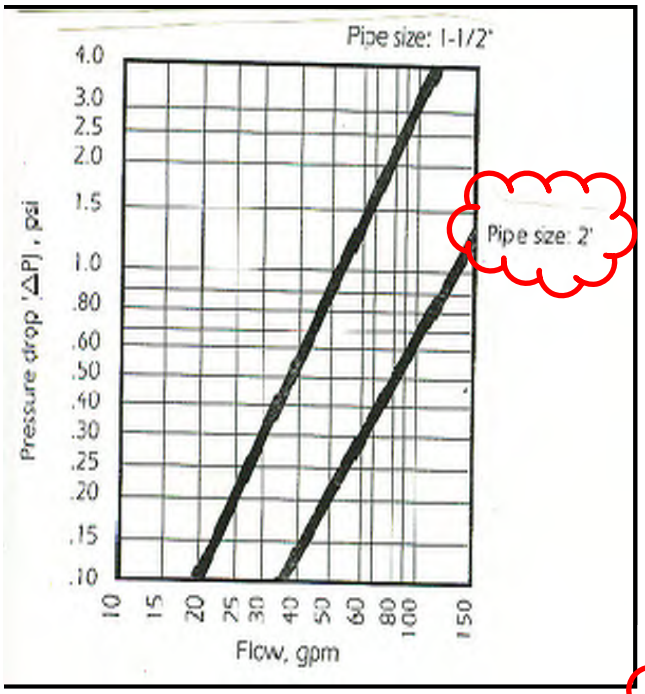
SHEET 1 of 2

DRAWING NO. C27655.10

REV.

Knight Housings - Series

~~SK15: USES SIZE 1 BAG~~, : USES SIZE 2 BAG



FEATURES:

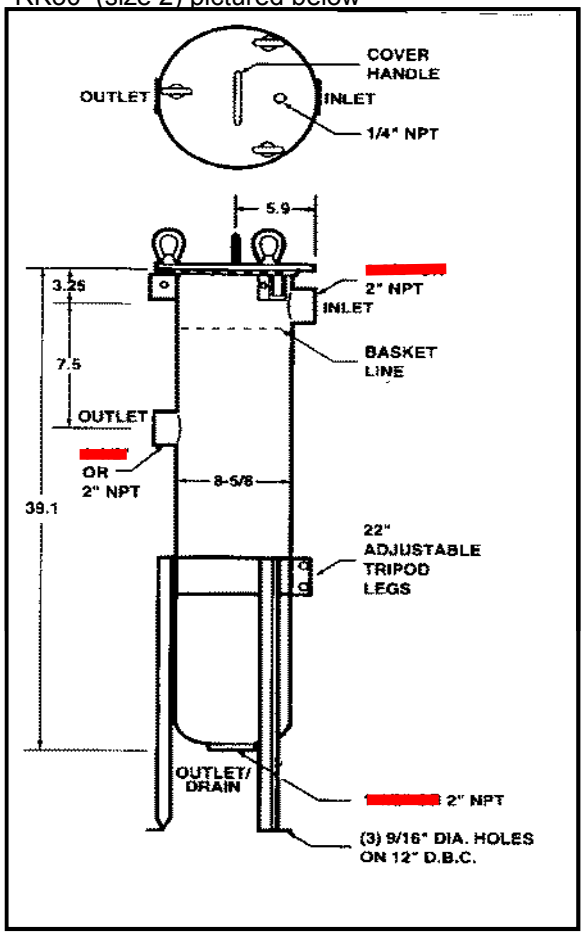
NEW!

- LARGE DIRT-HOLDING CAPACITY
- RATED TO 150 PSI
- FOR FLOW RATES UP TO 100 GPM*
- 1/4" NPT VENT CONNECTION
- UNISTYLE DESIGN (SIDE AND BOTTOM OUTLETS)
- COVER IS SEALED WITH O-RING
- ELECTROPOLISHED
- FOR SIZE ~~1 OR~~ 2 FILTER BAGS
- ADJUSTABLE LEG ASSEMBLY INCLUDED
- HEAVY-DUTY BASKET, OVER 50% OPEN AREA
- CARBON STEEL OR 304 STAINLESS STEEL

Filter Selection Surface Area is:
~~Size 1 Bag: 2.0 square feet~~
Size 2 Bag: 4.4 square feet

**Based on housing only. Fluid viscosity, filter bag used, and expected dirt loading should be considered when sizing a filter.*

RK30 (size 2) pictured below



HOW TO ORDER SK15 AND SK30 FILTER HOUSINGS

MODEL	CONNECTION SIZE	OUTLET STYLE	PRESSURE RATING	HOUSING MATERIAL	COVER SEAL	BASKET TYPE
~~SK15~~ ~~Fits size 1 filter bag~~	~~1-1/2" NPT~~	UNISTYLE ( )	150	~~CARBON STEEL (C)~~	~~BUNA (B)~~	FILTER BAG BASKET (B)
					~~EPR (E)~~RR	
Fits size 2 filter bag	2" NPT			304 STAINLESS STEEL (S)	VITON (V)	

52


Knight Corporation
The Finest Stock & Custom Liquid Bag Filters
Since 1972

Customer Satisfaction Is Our Top Priority

Knight Corporation, founded over 25 years ago, still holds to our founding principle that customer satisfaction must be our top priority. Over the years we have improved our manufacturing processes and expanded our technical expertise to keep pace with the changing needs and demands of our customers. Our technical service staff is the most knowledgeable in the industry. They continue to search for new media and filtering techniques which will increase your efficiency and lower your filtration costs.

Our vast experience has also taught us that prompt service is crucial in the filtration industry. We are very proud of the reputation that we have earned over the years for excellent service and the highest quality products. We answer all inquiries immediately and give our customers the support that they need in record time.

We offer the shortest lead time for delivery in the industry. Our normal shipping time is 5 days or less, with overnight delivery available.

Cost-Effective Solutions To All Your Liquid Filtering Needs

Knight filter bags offer high solids collection capacity with low pressure drop, which means longer operating cycles and lower operating costs. Our filter bags are economical. The per bag cost is low and one bag is equivalent to several cartridges, greatly reducing the space needed for inventory. Our filter bags are also easier and less costly to dispose of than other kinds of filters, and are completely combustible, allowing for total incineration.

From providing you with the finest quality stock filter bags, to helping you find solutions to your most demanding needs, there is no liquid filtration problem that we can not help you solve. In fact, we welcome the opportunity to work with you on your most demanding requirements. Give us a call or send us a sample of your present bag or media swatch. One of our technical service engineers will promptly get back to you with the most cost-effective solution to your specific need. Whether one of our stock bags will fill your need or a custom bag is required, you can be assured of prompt delivery and the highest quality product at the best possible cost.

Quality Assurance

The goal of every Knight employee is to provide our customers with the highest quality, from the inspection of the raw materials to the final inspection of the finished product. No product leaves our location until it has been checked and approved to meet our customers exact specification, as well as, our high standards of quality. When you want it right the first time...every time, you want a Knight filter bag. Our years of field experience, technical expertise and thorough knowledge of the liquid filtration industry enable us to produce the finest filter bags in the marketplace.

Nationwide Distributor Network To Solve On-Site Problems

Having a problem? Help is only a phone call away. Knight Corporation has a network of distributors strategically located across the country. When you need someone on-site, one of our highly qualified distributors will visit your location to assist you with the problem. Before you know it, you will be up and running with as little down-time as possible.

Custom Filter Bags To Your Specifications

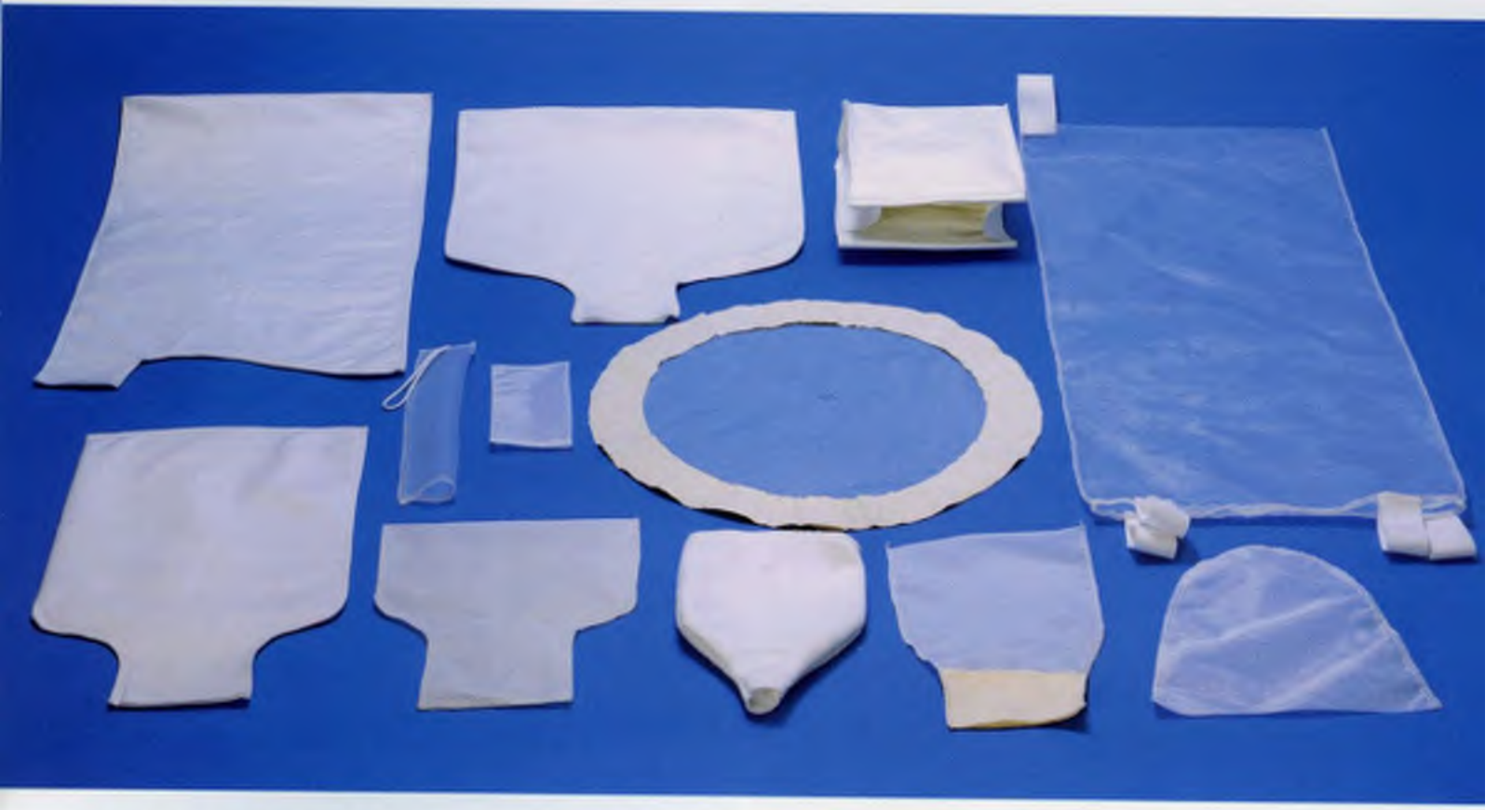
If you have a unique filtering problem, Knight can customize a filter bag to meet your exact specifications. Over the years we have provided customers worldwide with innovative solutions to their most difficult filtering problems. We can manufacture any filter bag, including bags with covers, extended length bags, special shaped bags and multiple layered bags. Our custom bags range in all sizes to accommodate your needs, from 3 inch diameter and 5 inches long to 25 inch diameter and over 25 feet long. Knight provides over a million custom bags per year.

Custom bags are available in Felt, Nomex, Nylon, Polyester, Anode, Cotton, Polypropylene and Teflon in a wide range of micron ratings. Special materials can be provided upon request.

Prompt Quotations

Send us the specifications for the bag you need or a sample of the bag you are currently using. We will get back to you quickly with our recommendations and a highly competitive quotation. Upon your approval of our price, we will provide you with a sample bag to enable you to evaluate the bag's effectiveness for your application.

Once you have approved the proposed bag, Knight Corporation will generate your order to the highest standard of quality and ship in less than a week.



Knight Filter Bags Are Ideal For Filtering:

- Adhesives
- Aerosol Products
- Automotive Fluids
- Chemicals
- Cleaning Fluids
- Coil Coatings
- Cooling Towers
- Cutting Fluids
- Dyestuffs
- Fabric Coatings
- Foods & Beverages
- Industrial Coatings
- Lacquers
- Liquid Detergents
- Metal Particles
- Paints
- Paper Coatings
- Petroleum Products
- Pharmaceuticals
- Pigments
- Plastisoils
- Plating Solutions
- Polymer Solutions
- Printing Inks
- Process Water
- Resins
- Vegetable Oils
- Water

Stock Liquid Filter Bags Available For All Make Filter Vessels

Quickest Delivery of Stock Filter Bags in the Industry.

We designed our stock filter bags to increase the efficiency of all make filter vessels. They are fabricated to fit all standard size filter vessels currently used in the filtration industry. The filter bag sizes that we carry in stock are P1, P2, P3, P4, P5, P6, P7, P8, P9, P12, PC1, PC2, C1, C2 and RP bags. Our stock bags handle flow rates from 1 up to 10,000 gpm and are available in most materials.

Carbon steel rings are standard, however plastic tops or stainless steel rings can be supplied upon request. Other options available on our stock bags include plastic rings, lifting handles, covers, and glazing.

We also offer stock tie-on bags, which are perfect for all gravity applications. They are available in a wide range of materials and micron ratings. Drawstrings on stock bags are available upon request.

Some of the companies currently using our stock or custom products include: Dow Corning, Sherwin Williams, Chrysler, ATO Findley, BASF, Merck, Sharpe and Dohme, Union Carbide, IBM, Dupont, Strohs and Ocean Spray.

Knight stock liquid filter bags are shipped within 1 week.

Bag volume, bag dimensions, surface area and cross reference for all filter bags used in Knight filter housings.

Bag Size Number (See Table 1)	3	4	1	2
Surface Area Per Bag - (ft^2)	0.5	1.0	2.0	4.4
Volume Per Bag - (gal)	.37	.67	2.1	4.6
Bag Diameter - inch/cm	4/10.2	4/10.2	7/17.8	7/17.8
Bag Length - inch/cm	9/22.9	15/38.1	16.5/41.9	32/81.3
Knight Corp. Filter Housing Numbers	PK-6	GK-12	CK-1[illegible]	RK-30

High Efficiency Liquid Filter Bags

It is with great pride that we announce the development of two new and advanced filter line series to meet your high efficiency needs... the Knight High Efficiency (KHE) 300 and 500 series. Knight Corporation has a long history of providing industry with the highest quality liquid filter bags for high efficiency applications. Since 1988, we have continued to expand our expertise and improve our manufacturing techniques on high efficiency filters to keep pace with changing needs and demands of the filtration industry.

The new KHE 300 and 500 series have further improved the performance of the original Knight all microfiber design by adding special media which increases filter life and efficiency. With the aid of independent testing, Knight Corporation has

KHE 327P2SSL will be provided

dirt holding capacity and exact particle retention. Since fewer filters are required, inventory and disposal costs are reduced. All filters come standard with lift handles for simple and fast removal. Dirt is contained inside the filter bag which promotes easy disposal, less risk of fluid contamination during change out and minimal operator exposure. Both KHE series have a cover to prevent any fiber migration and have no exposed seams. They are silicone free and made from 100% polypropylene media which is ideal for oil absorption and easy disposal by incineration.

The 300 series is available in ten different sizes and four style tops to fit most bag filter vessels. The 500 series has up to ten layers of media, including six layers of prefilter media that are individually sealed and inserted into the filter for structural strength and maximum use.

Independent Testing Results

The following charts reflect the results of tests performed by an independent test laboratory on a number 2 filter in a RK 30 vessel. Counts were taken on an automatic particle counter.

300 SERIES PART NUMBER	EFFICIENCY (A) 93%	EFFICIENCY (A) 96%	MAX (B) FLOW GPM
KHE 323P2SSL	1 µm	2 µm	75
KHE 327P2SSL	8 µm	18 µm	75

500 SERIES PART NUMBER	EFFICIENCY (A) 96%	EFFICIENCY (A) 99%	MAX (B) FLOW GPM
KHE 523P2SSL	1 µm	2 µm	50
KHE 525P2SSL	3 µm	5 µm	50
KHE 527P2SSL	8 µm	18 µm	50
KHE 529P2SSL	18 µm	25 µm	50

(A) Efficiency represents the initial efficiency on a clean element challenged on a single pass through a water base slurry of PTI fine test dust at 3 GPM. Efficiencies are derived by counting the ratio of upstream versus downstream particles. µm = micron.

(B) Flow data based on gallons per minute (GPM) for 1 pound (PSID) of pressure across a clean filter.

	300 SERIES	500 SERIES
Max Dirt Grams of Dust (C)	1,200	2,042
Max Total Filter Layers	5	10
Max Sq. Ft. Surface Area	23	43
Quantity Per Large Box	20	10
Max Temperature	200° F	200° F
Pure Polypropylene Media	Yes	Yes
Felt & Microfiber Sections	Yes	Yes
Easy Lift Handles	Yes	Yes
Silicone Free	Yes	Yes
No Exposed Sewn Seams	Yes	Yes
Oil Absorption & Removal	Yes	Yes
Batch operations	Yes	Yes
Continuous Operations	Yes	Yes

(C) Dirt load conducted until vessel pressure reached 40 pound (PSID).

Knight Corporation believes laboratory generated performance data is a useful tool for comparing different micron ratings and as a guide for establishing a recommendation in a filtering application. However, this data should not be construed as a guarantee or warranty by Knight Corporation, either expressed or implied, of a specific performance from use of our product. Due to variations in fluid viscosity, temperature, velocity, pressure and contaminant size, shape and texture, Knight Corporation cannot guarantee that field results will equal test results.

We Stock A Wide Range Of Plastic Tops And Media

Knight Corporation offers several types of plastic tops. Our Sure-Seal™ is a plastic top designed with a plastic handle for easy removal of the filter bag from the vessel. Our Sure-Seal™ is ideal for use in the P1, P2, P3 and P4 sized vessels, as well as, all other similar sized filter vessels, even if the vessel had been designed for a ring bag or a plastic topped bag. The Sure-Seal™ is a standard item and can ship in a week or less, the same time frame as all of our filter bags.

Knight Corporation also offers plastic, carbon, and stainless steel adapter heads. These adapter heads provide a simple, low cost solution to numerous filtration problems. Available with different NPT fittings, the adapter head screws on to the end of a pipe and a filter bag secures to the head. This system is an excellent alternative for filtering low pressure, low gpm flow rate applications.

We stock a wide range of roll materials and goods in order to meet the ever changing demands of our industry.

TYPES	KINDS	
• Felt	• Nylon	• Teflon
• Monofilament	• Polyester	• Cotton
• Multifilament	• Polypropylene	• Cheese Cloth
	• Nomex	

Any of our stock material rolls can be cut to any given length and size in either roll or sheet form.

All our stock materials are available in a wide range of micron ratings. Please refer to the "How To Order" section to determine the proper rating for your specific application. If you need further assistance, contact Knight Corporation.

Precision Crafted Filter/Strainer Vessels

Knight filter/strainer vessels are built to the highest standard of performance and are available in all the standard models and sizes currently used in the filtration industry. They can be used with a basket strainer, for particle retention down to 74 microns, or with a filter bag for particle retention down to 1 micron. The covers on all models can be easily removed without tools enabling the basket or filter to be cleaned or replaced quickly and easily.

Knight Vessel Features

- Precision crafted, and sturdy construction of carbon steel, 304 stainless steel or 316 stainless steel.
- Hydrostatically tested to 1 1/2 times their working pressure.
- Permanently piped.
- Low pressure drop operation.
- Covers are 5/8" thick with an O-ring seal to minimize bypassing of unfiltered liquid.
- Adjustable height legs.
- Large area, heavy duty stainless steel baskets in a wide selection of styles and sizes.
- ASME code stamp is available for 150 to 300 psi.

Knight Vessel Options

- Larger multiple basket (from 2 to 23) vessels are available, which can handle flow rates from 400 to 3,500 gpm.
- Most models are available as a duplex system, where two units are piped together with valves to permit continuous use of either unit while servicing the other.
- Expandable vessels, which offer the flexibility of either low or high flow rate applications.
- Liquid displacers, which promote minimal product loss and easy cleaning, are available for most models.
- Special options include: filter hold-down devices, sanitary construction, outlet connection choices, higher pressure ratings, extra length legs and heat jacketing.

Please contact Knight Corporation or your local distributor for a computerized solution to your specific need and a recommendation on the vessel size and model.

Knight Corporation

P.O. Box 332
Ardmore, PA 19003-0332
Phone: 610-853-2161
Fax: 610-853-1080

10885 Fallstone Road
Houston, TX 77099-3411
Phone: 281-933-5363
Fax: 281-933-8111

Visit our web site: knightcorp.com

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Knight Corporation

MODEL RK30 AUTO
DUPLEX ELECTRIC
CONTROLLER
PNEUMATIC OPERATION
150 PSIG RATED FILTER UNIT

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Installation Instructions
Complete the following steps.

Step 1. Complete the Duplex Vessel Installation procedures as described in Section II.

Step 2. Air pressure is required to operate the air valves of the system. Air pressure of 60 PSI minimum will be adequate. Knight recommends a regulator and filter be installed to assure trouble free operation of the air valves. Connect the plant air line to the fitting located on the Numatics air valve assembly located behind the control box. Control Panel power 110/120V is required. Knight has provided a general purpose non- locking receptacle plug for system power. Connect receptacle plug to customer supplied power source.

I. General Description

A. Introduction

Knight Corp produces a basic two-filter unit with an electric/pneumatic control system that can automatically switch from one filter to the other when the pressure drop across the on-line filter gets too high. When a filter is off line, it is isolated from the fluid, and can be worked on to replace bags or perform other maintenance.

Thus the unit provides continuous service as long as maintenance personnel service each filter as soon as it comes off line, and get it ready to go back on line when the other filter pressure drop gets too high.

The system provides a differential pressure switch connected into the fluid inlet and outlet lines to monitor the pressure drop. The system puts one filter on line until it shows the highest permissible pressure drop, then switches the flow over to the second filter and isolates the first filter from the fluid.

Each time the pressure drop sensor calls for a switchover, it should also send an electric alarm signal to the customer's remote annunciator system, warning that one of the filters has gotten dirty and needs maintenance. These remote warning signals stay on until an operator comes to the site and manually resets the controls. This turns the warning signal off.

B. Description of the Fluid Circuits

Each filter has a 2-way fluid inlet valve and a 2-way fluid outlet valve. The parts list calls these valves "transfer valves". They are Bray butterfly valves actuated by Bray pneumatic actuators.
These actuators are double air operated no spring actuators which have to be driven in both directions by air pressure.

It is a characteristic of this combination of hardware that the butterfly is always balanced to pressure reactions, and it takes a certain amount of torque to turn the butterfly shaft. The operator also has built-in friction and resistance to movement. So air pressure is needed to move the butterfly in either direction. The hardware combination is therefore analogous to a double air pilot operated 2-way liquid valve, detented in both positions.

The system also provides a Watts ball valve, provided with a Bray actuator, but this actuator is fitted with a return spring, and only has one air connection. The combination is air operated to open, spring return to close. The total combination therefore is a single pilot spring return normally closed 2-way liquid valve. This valve is called a "cross-connect valve".

The incoming liquid enters the branch outlet of a large pipe tee. From the run ports of this tee the liquid goes through the two filter inlet valves, then into the inlet ports of the filters.

The outlet ports of the filters connect to the (2) outlet valves, which in turn connect to the run ports of an

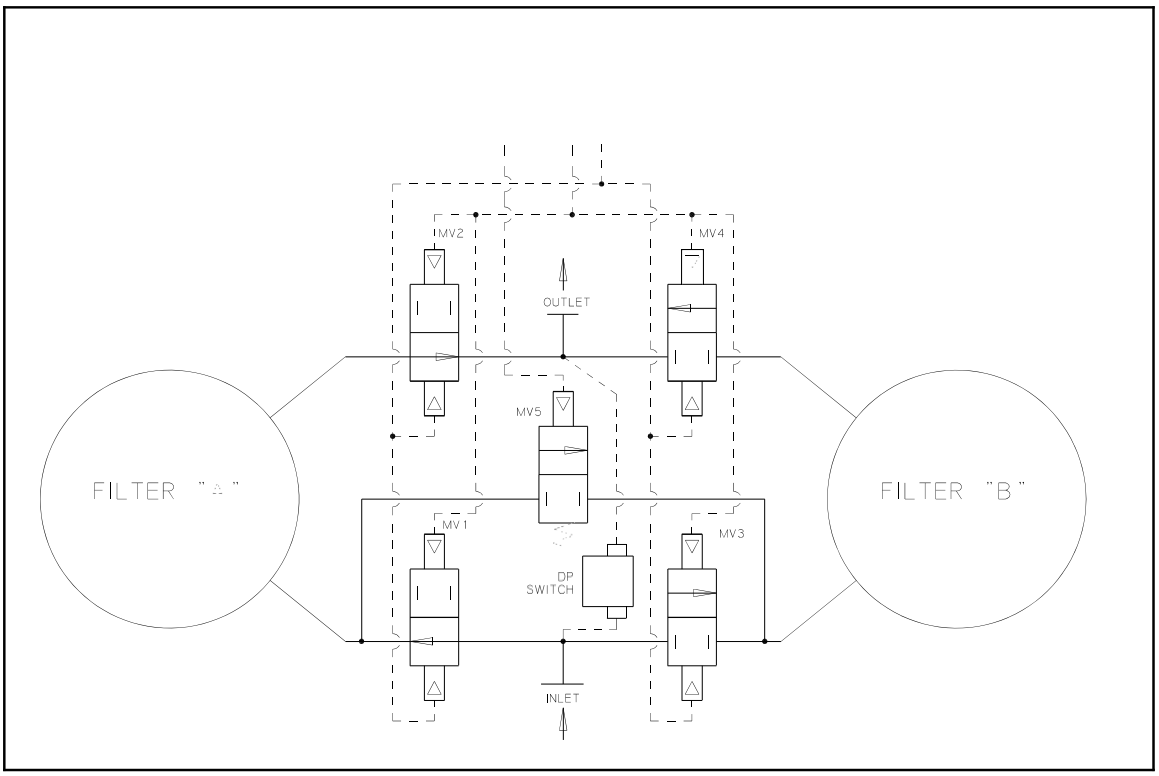
outlet tee. The branch outlet port of this tee is the main outlet port of the system.

A smaller liquid line taps into each filter inlet line between the inlet valve and the filter inlet port. The cross-connect valve is mounted in this cross-over line.

C. How the Fluid Circuits Work

To direct fluid through Filter A, the controls open inlet valve MV1 and outlet valve MV2, and close inlet valve MV3 and outlet valve MV4. The cross-connect valve MV5 is also closed. Liquid flows through Filter A, while Filter B is isolated from the fluid.

To direct fluid through Filter B, the controls close inlet valve MV1 and outlet valve MV2, and open inlet valve MV3 and outlet valve MV4. The cross-connect valve MV5 is also closed. Liquid flows through Filter B, while Filter A is isolated from the fluid.



The purpose of the cross-over valve is to bring the off-line filter up to liquid line pressure before opening the off-line filter's liquid valves. This prevents liquid hammer and hydraulic shock to the filter bags. There is also an automatic air vent on the cover of each filter housing that allows air to be automatically purged from each filter.

Note that the inlet valve and the outlet valve for each filter always open together and close together. It is important also to note that when the Filter A liquid valves are open, the Filter B liquid valves are closed and vice versa. Thus, one filter or the other is always on line passing liquid.

The cross-connect valve is only opened during the pressure equalization period at the beginning of a switchover.

II. Installation of Duplex Filter System

A. Installation

Please remove all shipping and crating materials carefully. Be sure to remove the plugs from the inlet and outlet openings. Dispose of all crating materials safely.

After positioning the Model RK30 Auto-Duplex Filter in its proper location, secure the filter support legs. This will provide a fixed location during your filtering process.

The inlet-outlet connections are centrally located in the system envelope. ANSI flanges are the standard connections, these connections have a branch tee style configuration. This is illustrated on page 20 of this manual.

The Model RK30 Auto-Duplex Filter is now ready for connection to the system. The inlet service line should be connected to the inlet side of the system. It is very important to identify which is the inlet side of the Model RK30 Auto-Duplex Filter System. The inlet is located above the outlet connection.

Another way to double check the identification of the inlet side of the system is by the location of the pressure balancing valve. The function of the valve is to fill the next filter and equalize the pressure difference before switching filters to limit surges within your piping system. This valve is always located on the inlet side of the system. Knight provides a timer delay inside the Control Panel allowing you to adjust the filling rate. Use your experience and flow rate data to calculate the desired delay required.

There are two float vents on the cover of your Model RK30 Auto-Duplex Filter unit. These float vents are for automatic pressure relief for your application.

There are (2) NPT drains, (1) each, located on the bottom of each housing. These ports allow complete drainage of the filter housings.

Some installations require electrical grounding of all equipment, be sure to provide adequate grounding where necessary.

After completing installation be sure to double check connections for integrity. Your Model RK30 Auto- Duplex Filter unit has been factory pressure tested leak free, therefore, any seepage problems usually occur from improper installation connections.

You are now ready to install the filter baskets and bags. Remove cover by loosening clamp assemblies sufficiently to allow them to swing free. Loosen the last clamp assembly sufficiently to allow the cover to swing free. Swing cover away from housing to gain access to strainer baskets and/or filter bags.

If your application requires a basket seal, insert the basket seal into the collar groove.

The next step is to install the filter bag baskets, making sure the basket flange is firmly seated on top of the basket collar. Insert filter bag into the bag basket making sure the filter bag ring is firmly seated inside the basket. For best results, be sure filter bag is fully extended to the bottom of the basket.

Before replacing cover assembly, inspect cover seal gasket (replace as necessary). Close cover and alternately tighten the closure assemblies evenly to ensure a leak proof seal between cover and housing body. The recommended torque value for 5/8"-11 closure assemblies is 150$^{\text{foot-lbs}}$.

Your Knight Model RK30 Auto-Duplex Filter unit is now ready for operation!

B. Operation

The Duplex system features continuous filtering capabilities. When it is determined that the operating filter vessel is dirty and needs cleaning the flow of fluid is diverted to the opposite filter vessel. This should be done slowly to ensure that the filter bag will not be displaced.

Filter System Start-Up Procedure:

Prior to turning on the flow to the inlet service, please make the following checks:

1. Check inside filter unit to be sure filter bags are in housing and do not require cleaning or replacement. If necessary install clean filter baskets and bags. The main liquid supply is OFF. MAIN POWER PULL ON/PUSH OFF palm button is OFF. All visual indicators are off.

2. Operator pulls the main power palm button control.

    a. Electric power turns ON. MAIN POWER PULL ON/PUSH OFF indicator turns red.

3. Operator must decide which filter housing to place on line.

    a. Depress momentarily the correct FILTER START button.

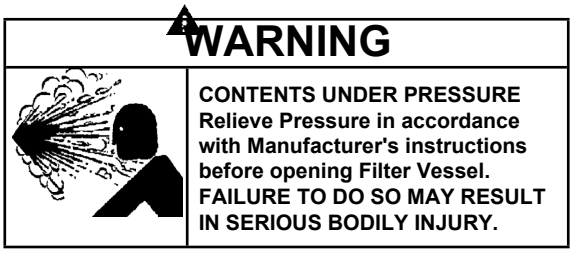
    b. The correct FILTER ON LINE indicator turns green, tells the operator one filter's liquid valves are open and ready to receive liquid, and the other filter's liquid valves are closed.

4. Check that filter unit covers are securely fastened to housings and actuator pointers are positioned so that fluid flow is restricted to a single housing. This can be determined by the orientation of the pointer located on the top of each pneumatic actuator valve. When the pointer is in line with the piping of the housing, the valve is open and fluid can flowing through that filter housing. If the pointer is perpendicular to the piping, the valve is closed and fluid is restricted through filter housing. Once you have determined which filter housing is operational you are now ready to open the flow to the inlet service line. Slowly open the inlet service line approximately 25% of normal operational flow (open slowly as not to displace filter bag inside the housing). After filter unit is pressurized and trapped air is vented, slowly open outlet service line valve until completely open. Complete opening of inlet service line until desired flow rate is reached. The system is on line. (Experience shows that as the liquid flow builds up through the system, it does NOT build up enough pressure drop to energize the pressure drop sensor.)

Once the desired service flow has been established, the filter will operate efficiently until dirty. A Differential Pressure Switch is provided with this Model RK30 Auto-Duplex System. This sensor has been pre-set to approximately 15 PSI (Knight recommends changing filter bags at 15 PSI maximum differential pressure). Operating the filter unit with a high differential may cause filter bags to rupture and cause damage to filter system or downstream equipment. Should a different pressure be required, remove the face plate from the Allen-Bradley Differential Pressure Switch, and use an appropriate tool to adjust the piston following the arrow indicator provided.

When it becomes necessary to clean or replace filter media during continuous operating conditions, follow the procedure outlined below:

1. Divert fluid flow to clean filter vessel.
2. Relieve the pressure from the filter unit.



3. Drain housing sufficiently to access filter basket.
4. Remove cover by loosening closure assemblies sufficiently to allow them to swing free. Swing cover away from housing to gain access to strainer baskets and/or filter bags.
5. Remove filter basket and clean thoroughly, remove the filter bag and dispose of properly.
6. Remove debris and sludge from inside of bag/basket sealing surface and O-ring groove

to avoid interference with cover seal or flow of fluid being filtered.

7. Install clean filter basket and filter bag. Be sure filter bag is seated inside the basket retainer plate.
8. Inspect cover gasket for cuts or other signs of failure and make sure it is properly seated.
9. Swing cover back into position, and alternately tighten closure assemblies evenly to ensure a leak proof seal between cover and housing body. The recommended torque value for the 5/8"-11 closure assemblies is $150^{\text{foot-lbs}}$.

Your Knight Model RK30 Auto-Duplex Filter is now ready for operation. Refer to filter system start-up procedure.

III. How the System Works

The purpose of this system is to provide continuous filtration, in spite of the filters getting clogged and needing cleaning or changing bags. The general idea is that one of the two filters will be on line at all times, allowing maintenance to change bags or perform service on one filter while the other filter is doing the filtering. The design of this system assumes that during startup liquid pressure will be OFF.

A. Typical Automatic Switchover Sequence (for reference only):

Assume for this explanation that the system has been actuated and reset, Filter B is on line, and the system is about to switch over to Filter A.

1. The pressure drop sensor senses that the pressure drop is too high, tells the controls "Pressure drop is too high".

2. Cross-connect valve opens, admits liquid under pressure from the Filter B inlet pipe to the inlet port of Filter A. Since filter A liquid valves are closed, Filter A quickly builds up to the liquid line pressure. Start cross-connect timer. Stop reading pressure drop sensor.

3. When enough time has elapsed the timer times out. Simultaneously, controls command Filter B liquid valves to close, and Filter A liquid valves to open. Controls also command cross-connect valve to close.

4. As the Filter B liquid valves start to close, the Filter A liquid valves start to open, and the opening of the Filter A valves proceeds at about the same rate as the closing of the Filter B valves. Thus, there is no interruption of liquid flow during the switch over from Filter B to Filter A.

5. Eventually the Filter B liquid valves get fully closed, and the Filter A liquid valves get fully open. The switch over is complete. Filter A is on line.

6. The controls start reading the condition of the pressure drop sensor again.

Case 1 - Initial Start-up Sequence:

Initial condition:

Main liquid supply is OFF. MAIN POWER PULL ON/PUSH OFF palm button is OFF. All visual indicators are off.

1. Operator pulls the main power palm button control.

    a. Electric power turns ON. MAIN POWER PULL ON/PUSH OFF indicator turns red.

2. Operator must decide which filter housing to place on line.

    a. Depress momentarily the correct FILTER START button.

    b. The correct FILTER ON LINE indicator turns green, tells the operator one filter's liquid valves are open and ready to receive liquid, and the other filter's liquid valves are closed.

3. If the operator is satisfied with the choice of filter on line, he may now open the external liquid valves, and allow the liquid to start flowing through the system. The system is on line. (Experience shows that as the liquid flow builds up through the system, it does NOT build up enough pressure drop to energize the pressure drop sensor.)

4. If the operator is NOT satisfied with the choice of filter on line, he may delay turning on the liquid, and may switch filters by depressing the ARM SWITCHOVER button and holding for 5 seconds, until the CROSS-CONNECT OPEN VALVE indicator light turns amber.

    a. The controls perform a normal switch-over sequence as detailed in Case 3.

5. When the switchover is complete, the FILTER ON LINE indicator for the new filter will turn green, indicating that the controls have commanded the power valves for the selected filter to open. The operator may then turn on the liquid flow, and the system is on line.

6. Operator pushes ARM SWITCHOVER button.

    a. SWITCHOVER ARMED indicator will turn blue, indicating that the differential pressure drop switch is ready for pressure drop through the system.

    (If operator has to disarm the SWITCHOVER ARMED feature, he can do so by momentarily depressing the CANCEL ALARMS/SWITCHOVER button. SWITCHOVER ARMED indicator turns off.)

Case 2 - Normal Shut-down:

Initial Conditions:

Liquid flow is normal. Electric power is ON. MAIN POWER PULL ON/PUSH OFF indicator is red. One filter is on line, and its FILTER ON LINE indicator is green. SWITCHOVER ARMED indicator light may be either to blue if ARMED or off if UNARMED.

1. Operator closes external liquid valves, turns off the flow of liquid.

2. Operator pushes MAIN POWER PULL ON/PUSH OFF.

    a. Electrical power turns off. All indicators turn off.

    b. Pneumatic actuators and liquid inlet and outlet valves will stay in current position. System is shut down.

Case 3 - Normal Switchover:

Initial Conditions:

Electrical power is ON. MAIN POWER PULL ON/PUSH OFF indicator is red.

ARM SWITCHOVER push button is armed. SWITCHOVER ARMED indicator is blue. Controls are reading the condition of the pressure drop sensor. Pressure drop sensor is telling the controls "Pressure drop is OK".

One filter is on line. (Let us say that Filter B is on line). FILTER B ON LINE indicator is green. Filter A is off line, but ready to go on line. FILTER A ON LINE indicator is off. FILTER A DIRTY indicator and FILTER B DIRTY indicator are off. FILTER A IS DIRTY and FILTER B IS DIRTY remote alarm signals are OFF. CROSS-CONNECT VALVE OPEN indicator is off.

1. Filter B begins to clog. Pressure drop rises. Pressure drop sensor actuates, tells controls "Pressure drop is too high".

    a. Differential pressure switch trips, produces an output. FILTER B DIRTY indicator turns red. FILTER B DIRTY tells remote annunciator that Filter B is dirty.

    b. Controls stop reading pressure drop sensor.

    c. SWITCHOVER ARMED indicator turns off.

    d. Open cross-connect valve. CROSS-CONNECT VALVE OPEN indicator turns amber. Liquid starts to pressurize Filter A housing.

    e. Start cross-connect timer.

2. When set time has elapsed to pressurize Filter A to inlet line pressure, cross-connect timer times out.

    a. Controls tell cross-connect valve to close. CROSS-CONNECT VALVE OPEN indicator turns off.

    b. Controls tell Filter B inlet and outlet valves to close. FILTER B ON LINE indicator turns off.

    c. Controls tell Filter A inlet and outlet valves to open. FILTER A ON LINE indicator turns green.

3. Cross-connect valve closes. Filter B liquid valves close. Filter A liquid valves open. As the liquid flow switches from dirty Filter B to clean Filter A, flow returns to normal, and the pressure

drop across the system returns to normal. Pressure drop sensor resets, tells controls "Pressure drop is OK". System will not switchover until ARM SWITCHOVER button is depressed and indicator light is blue.

Switchover to Filter A is complete.

(CAUTION- Relieve pressure in filter vessel and drain before servicing!!!)

4. Operator opens filter B and installs new bags, closes housing ready to go back on line.

5. Operator depresses CANCEL ALARMS/SWITCHOVER button and holds for 5 seconds.

   a. FILTER B DIRTY indicator turns off, FILTER B IS DIRTY remote alarm signal turns OFF.

6. Operator pushes ARM SWITCHOVER button.

   a. SWITCHOVER ARMED indicator will turn blue, indicating that the differential pressure drop switch is ready for pressure drop through the system.

   (If operator has to disarm the SWITCHOVER ARMED feature, he can do so by momentarily depressing the CANCEL ALARMS/SWITCHOVER button. SWITCHOVER ARMED indicator turns off.)

System is back on line, with Filter A on line, Filter B ready to go online when a switchover occurs, and the SWITCHOVER ARMED circuit ready to go into action when called upon to do so.

7. Filter A begins to clog. Pressure drop rises. Pressure drop sensor actuates, tells controls "Pressure drop is too high".

   a. Differential pressure switch trips, produces an output. FILTER A DIRTY indicator turns red. FILTER A DIRTY tells remote annunciator that Filter A is dirty.

   b. Controls stop reading pressure drop sensor.

   c. SWITCHOVER ARMED indicator turns off.

   d. Open cross-connect valve. CROSS-CONNECT VALVE OPEN indicator turns amber. Liquid starts to pressurize Filter A housing.

   e. Start cross-connect timer.

8. When enough time has elapsed to pressurize Filter B to inlet line pressure, cross-connect timer times out.

a. Controls tell cross-connect valve to close. CROSS-CONNECT VALVE OPEN turns off.

b. Controls tell Filter A inlet and outlet valves to close. FILTER A ON LINE indicator turns off.

c. Controls tell Filter B inlet and outlet valves to open. FILTER B ON LINE indicator turns green.

9. Cross-connect valve closes. Filter A liquid valves close. Filter B liquid valves open. As the liquid flow switches from dirty Filter A to clean Filter B, flow returns to normal, and the pressure drop across the system returns to normal. Pressure drop sensor resets, tells controls "Pressure drop is OK". System will not switchover until ARM SWITCHOVER button is depressed and indicator light is blue.

Switchover to Filter B is complete.

(CAUTION- Relieve pressure in filter vessel and drain before servicing!!!)

10. Operator opens filter A and installs new bags, closes housing ready to go back on line.

11. Operator depresses CANCEL ALARMS/SWITCHOVER button and holds for 5 seconds.

a. FILTER B DIRTY indicator turns off, FILTER B IS DIRTY remote alarm signal turns OFF.

12. Operator pushes ARM SWITCHOVER button.

a. SWITCHOVER ARMED indicator will turn blue, indicating that the differential pressure drop switch is ready for pressure drop through the system.

(If operator has to disarm the SWITCHOVER ARMED feature, he can do so by momentarily depressing the CANCEL ALARMS/SWITCHOVER button. SWITCHOVER ARMED indicator turns off.)

System is back on line, with Filter B on line, Filter A ready to go online when a switchover occurs, and the SWITCHOVER ARMED circuit ready to go into action when called upon to do so.

End of one complete switchover cycle.

Case 4 - Normal Switchover Occurs but Operators DO NOT Service the Off Line Filter:

Suppose the operator puts the system on line, with (let us say) Filter B on line and Filter A waiting, ready to go on line.

Filter B will eventually clog, and a normal switchover will occur. The system will take Filter B off line and will put Filter A on line as outlined in Case 3 above. The FILTER B IS DIRTY remote alarm output will turn ON and the FILTER B DIRTY indicator will turn red. The system is on Filter A.

Now, suppose that maintenance DOES NOT respond to the FILTER B IS DIRTY alarm, and DOES NOT service Filter B. Eventually filter A will also get clogged.

What happens NOW?

When the pressure drop sensor tells the controls "Pressure drop is too high":

a. FILTER A DIRTY indicator will turn red.

b. FILTER A IS DIRTY remote alarm output will turn ON.

c. Filter A will stay on line and the FILTER A ON LINE indicator will stay green.

When an operator finally does come to the site, he will see:

a. FILTER A DIRTY indicator is red.

b. FILTER B DIRTY indicator is red.

c. FILTER A ON LINE indicator is green.

d. FILTER B ON LINE indicator is off.

The operator thereby knows that BOTH filters are dirty, and that filter B got dirty first, and filter A got dirty second. He also knows that Filter B is the one that is isolated, and that Filter A is running on borrowed time, because he does not know HOW LONG filter A has been on line since switchover, and could be nearly completely plugged.

Operator now has a choice as to which filter he will service first. He knows that Filter B switched over

when the pressure drop sensor first sensed too high a pressure drop. He also knows that Filter A turned on its FILTER DIRTY warning alarm when it reached the same condition, but it has continued to run, and is clearly more clogged than Filter B. So he may decide to service Filter A first, knowing that Filter B is probably less clogged than filter A.

Servicing Filter A first:

1. Operator momentarily depresses the ARM SWITCHOVER button and holds for 5 seconds, until the CROSS-CONNECT OPEN VALVE indicator light turns amber.

    a. The system will perform a normal switchover. The FILTER A ON LINE indicator will turn off, then the FILTER B ON LINE indicator will turn green.

2. When FILTER B ON LINE indicator turns green, operator knows that Filter A is isolated, and he can now open it up and service it.

    (CAUTION- Relieve pressure in filter vessel and drain before servicing!!!)

3. Operator opens Filter A housing and changes bags, closes housing up.

4. Operator now momentarily depresses ARM SWITCHOVER button and holds for 5 seconds, until the CROSS-CONNECT OPEN VALVE indicator light turns amber.

    a. System performs a normal switchover from Filter B to Filter A. FILTER B ON LINE indicator turns off. FILTER A ON LINE indicator turns green.

    (CAUTION- Relieve pressure in filter vessel and drain before servicing!!!)

5. Operator now opens filter B housing and services Filter B.

6. When Filter B has been serviced, and housing closed up, operator can leave the system on Filter A or switch back to Filter B, as he chooses.

7. When he has the correct filter on line, operator depresses CANCEL ALARMS/SWITCHOVER button and holds for 5 seconds.

    a. The FILTER DIRTY indicators turn off.

    b. The FILTER IS DIRTY remote electric alarms reset.

8. Operator pushes the ARM SWITCHOVER button, and the system is back on line ready to run normally. SWITCHOVER ARMED indicator will turn blue, indicating that the differential pressure drop switch is ready for pressure drop through the system.

Servicing Filter B First:

(CAUTION- Relieve pressure in filter vessel and drain before servicing!!!)

If the operator decides to leave Filter A on line and service Filter B first, he does NOT switch filters. He simply opens the Filter B housing and changes bags, then closes Filter B housing up, and then switches over to Filter A and changes bags in Filter A.

When both filters have been serviced, he cancels the alarms, pushes the ARM SWITCHOVER button and the system is back in operation.

Case 5 - Operator Must Operate on One Filter Only:

If the unusual situation arises where one filter is completely out of service, and all filtering must be done by the other filter, with the consequent interruption of service while the filter is down for bag change, it can be accomplished as follows:

1. Perform the startup sequence as outlined in Case 1, but select the filter you want by momentarily depressing its FILTER START button and performing a normal switchover before turning on the liquid supply.

2. DO NOT DEPRESS THE ARM SWITCHOVER PUSH BUTTON.

   (If operator has to disarm the SWITCHOVER ARMED feature, he can do so by momentarily depressing the CANCEL ALARMS/SWITCHOVER button. SWITCHOVER ARMED indicator turns off.)

3. The system will run until the pressure drop sensor tells the controls "Pressure drop is too high". Then it will turn the FILTER DIRTY indicator red, and will turn on the FILTER IS DIRTY remote alarm signal, but it WILL NOT perform a switchover. It will keep the selected filter on line, even though the pressure drop goes higher and higher as the bags clog completely.

4. When maintenance comes to service the filter, they must turn OFF the liquid supply to the unit.

5. Operator pushes MAIN POWER PULL ON/PUSH OFF.

a. Electrical power turns off. All indicators turn off.

b. Pneumatic actuators and liquid inlet and outlet valves will stay in current position. System is shut down.

(CAUTION- Relieve pressure in filter vessel and drain before servicing!!!)

6. When you have closed up the active filter, the operator pulls the main power palm button control.

a. Electric power turns ON. MAIN POWER PULL ON/PUSH OFF indicator turns red.

7. Depress momentarily the correct FILTER START button.

a. The operator must now look at the pneumatic actuator indicators to determine which filter is open and ready to receive liquid. The indicator is a black plastic knob located on the top of the actuator. When the indicator is in line with the piping of the filter, the butterfly valve is "OPEN". If the indicator is perpendicular with the piping of the filter the butterfly valve is "CLOSED".

b. Once the operator decides which filter has its liquid valves open, they must depress the FILTER START button to the corresponding filter which has its liquid valves "OPEN". FILTER ON LINE indicator turns green, tells the operator which filter has its liquid valves open and is ready to receive liquid. This will always be the filter that was on line when last the system was shut down.

c. The operator may now open the system liquid valves, and allow the liquid to start flowing through the system. The system is on line. (Experience shows that as the liquid flow builds up through the system, it does NOT build up enough pressure drop to energize the pressure drop sensor.)

d. DO NOT DEPRESS THE ARM SWITCHOVER PUSH BUTTON.

(If operator has to disarm the SWITCHOVER ARMED feature, he can do so by momentarily depressing the CANCEL ALARMS/SWITCHOVER button. SWITCHOVER ARMED indicator turns off.)

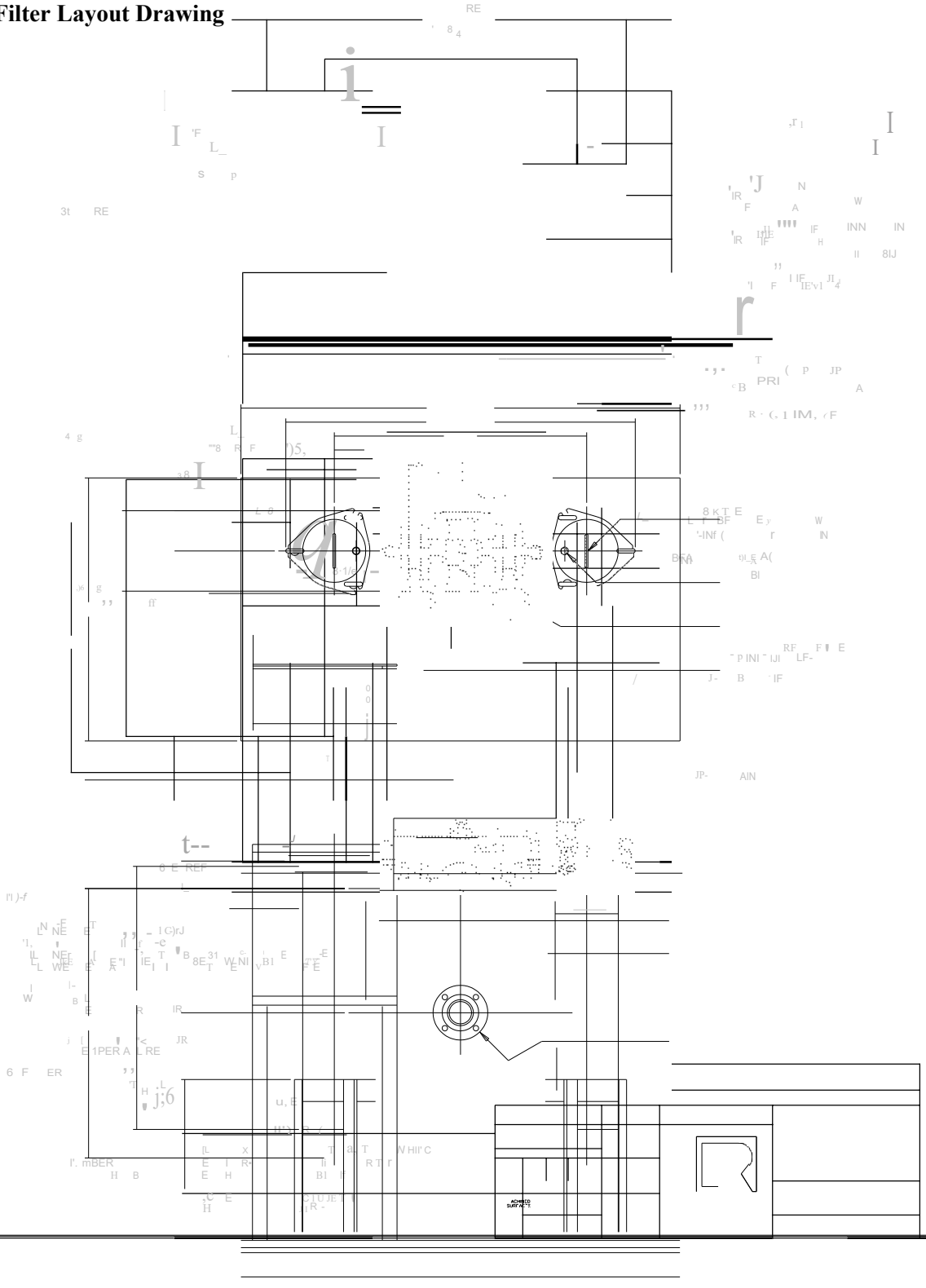
IV. Spare Parts for Automatic Duplex

Your Knight Multi-Bag Duplex Filter unit will give you many years of reliable service provided periodic inspections are made of various components and replacement of worn parts are made promptly. The following is meant to be a recommended spare parts list.

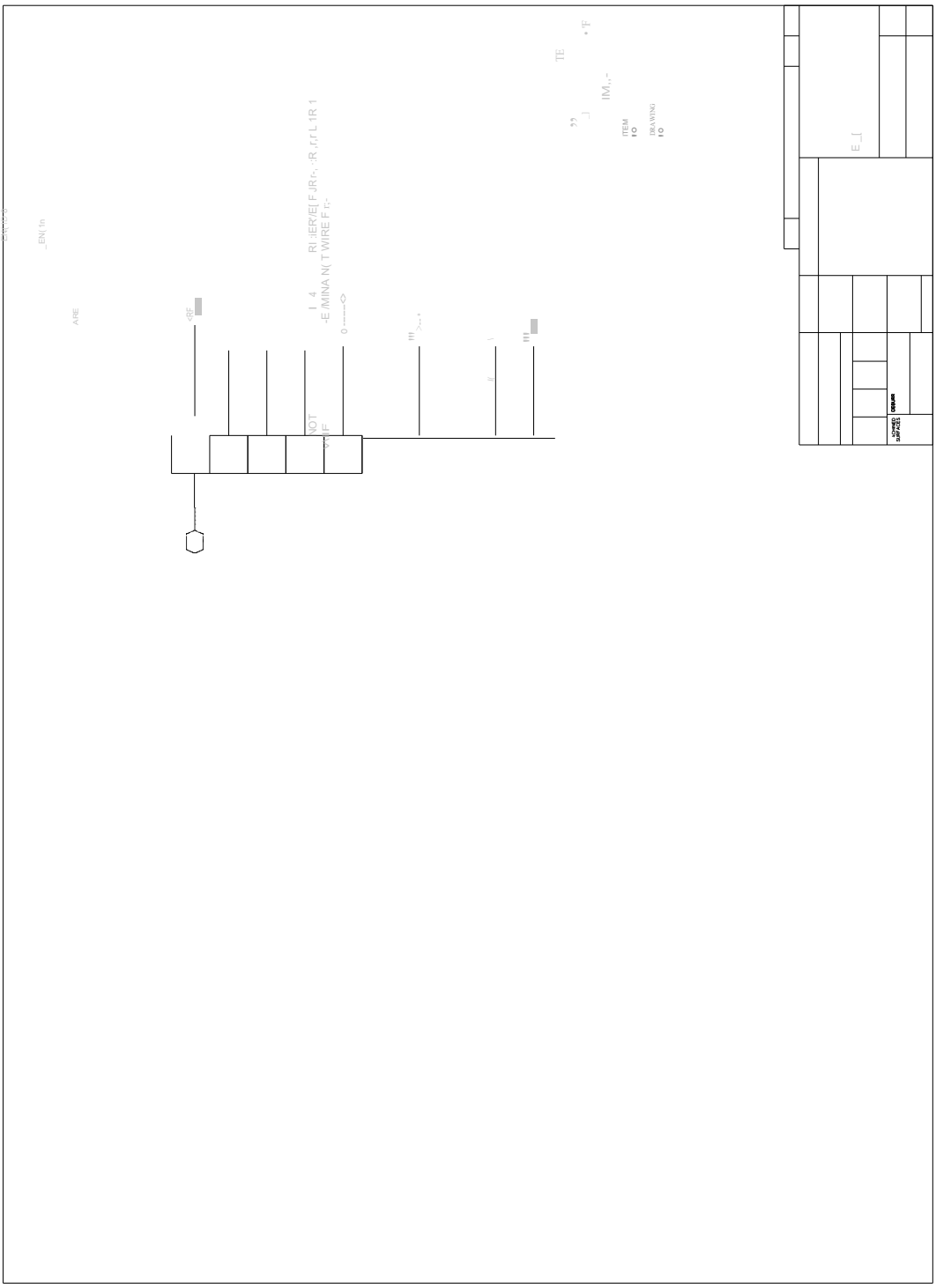
(The following drawings and Spare Parts List is representative of a typical Automatic Duplex filter system. The part numbers are descriptive of the components required for your specific system.)

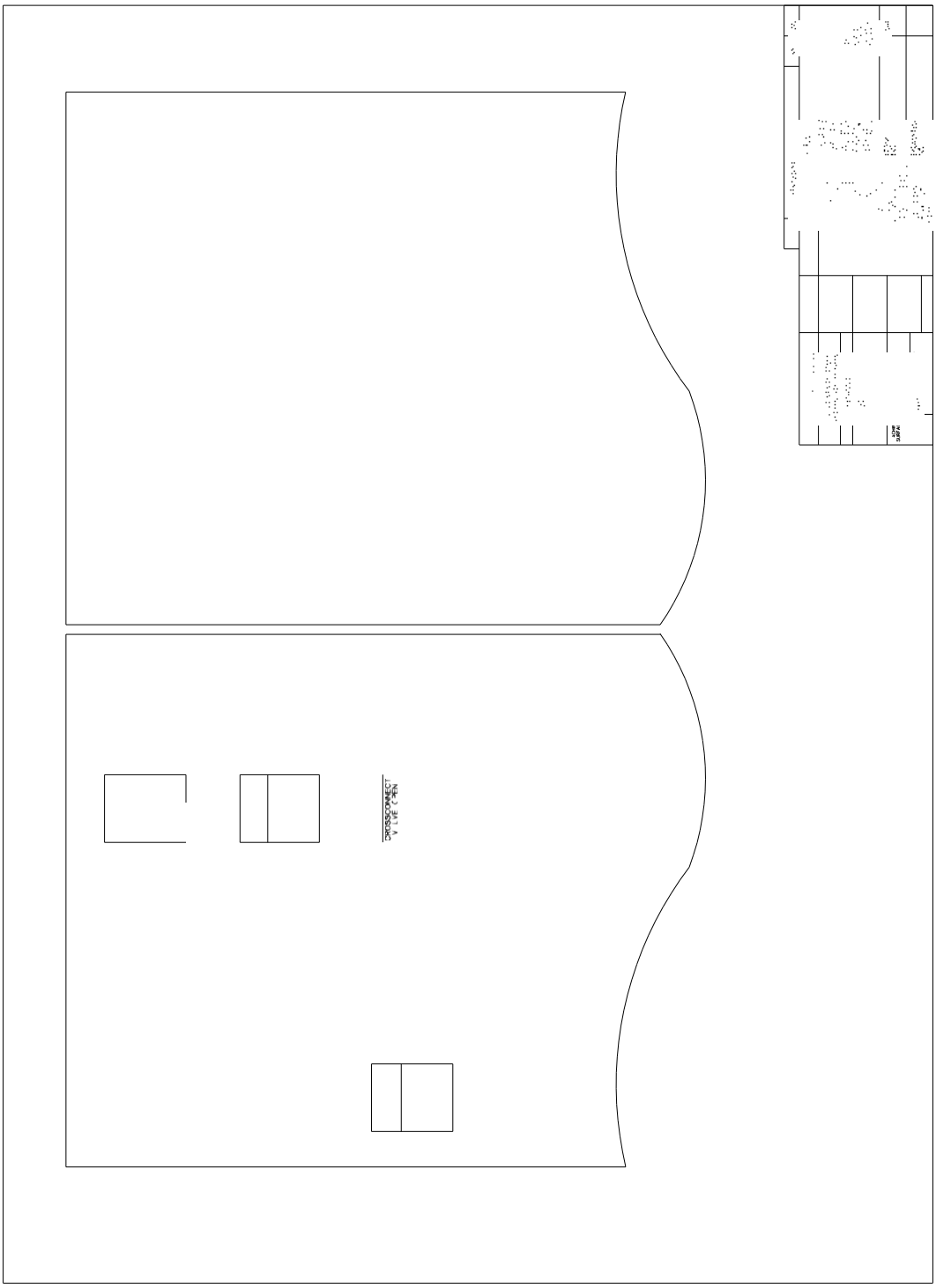
SPARE PARTS LIST			
Item	Description	Part No.	Time-Frame
1	Cross-Connect (3/4" Watts Ball Valve w/Bray Single Acting/Fail Close Actuator) Series 91/83 Actuator	3/4BVLV	as needed
2	Transfer Valve (3" Bray Butterfly Valve, Double Acting Actuator) Series 30 Valve, Series 91/83 Actuator	3BVLV	as needed
3	Allen Bradley "386T-D4542J", Differential Pressure Switch	5-5217	as needed
4	Numatics Solenoid Assembly 120 VAC	5-1043	as needed
5	Cover Seal (Buna)	8150CG-B	as needed
6	Basket Seal (Buna)	8BG-B	as needed
7	Rodend	8RENI	as needed
8	Eyenut	8ENNI	as needed
9	Clevis Pin Assembly	8CPNI	as needed
10	Filter Bag	per order	as needed
11	Filter Basket	0-730-B/PB 9/64 304	as needed

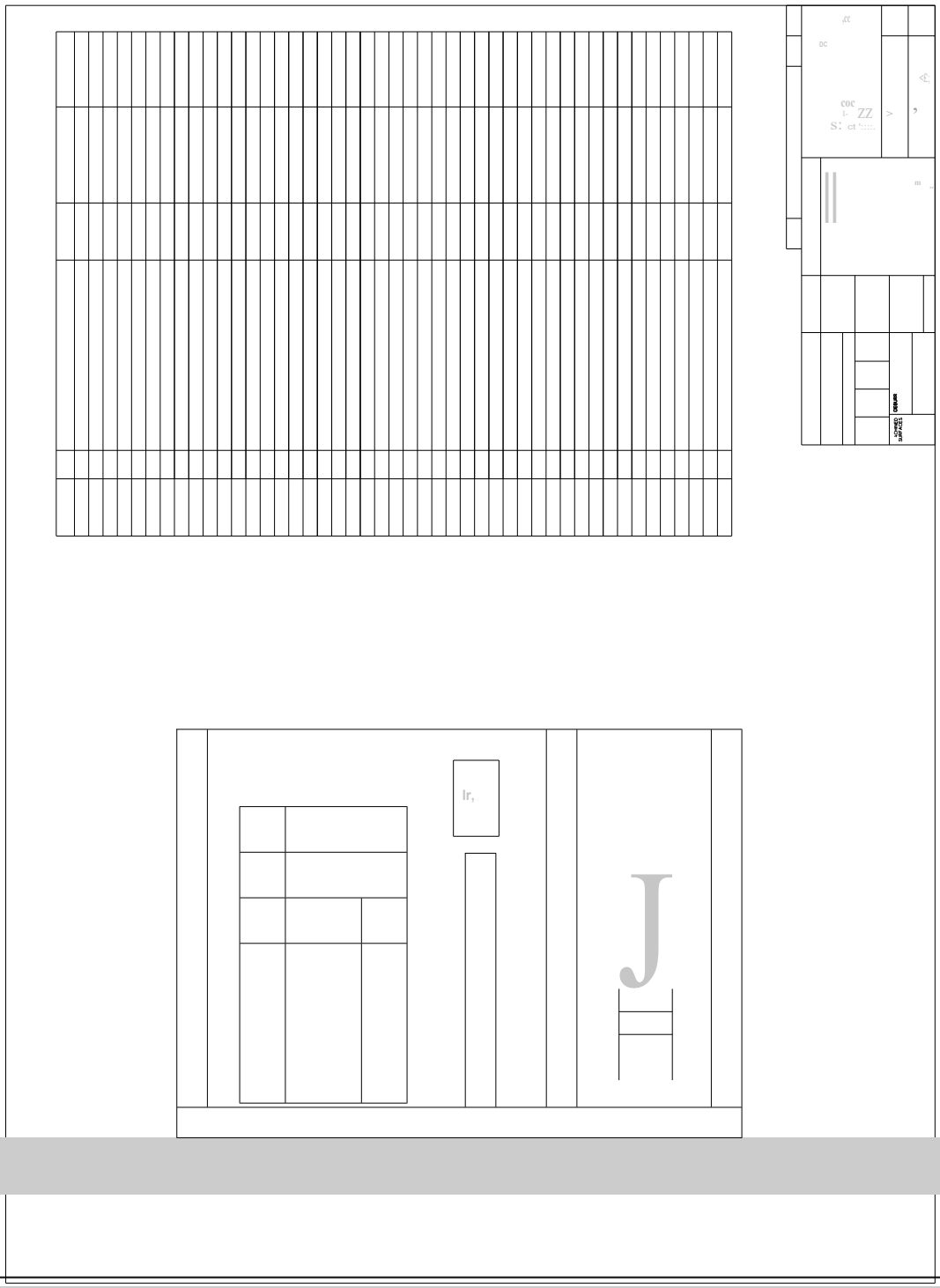
V. Filter Layout Drawing



VI. Control Box Electrical Drawings




DISCONNECT
LINE 2 OPEN



GROUND WATER FILTRATION SYSTEM
CARBTROL
GFS-2

SUBMITTAL NUMBER/TITLE: 221130-35.0 – Groundwater Filtration System (GFS-2) – Product Data
SPECIFICATION SECTION: 221130 – Plumbing Drainage and Venting Systems
DATE OF SUBMITTAL: 29 October 2018
DATE RECEIVED BY H&A: 2 November 2018
DATE OF H&A REVIEW: 21 November 2018

☐ "REVIEWED." Fabrication, manufacture, installation or construction may proceed providing the Work is in compliance with the Contract Documents.

☐ "REVIEWED AS NOTED." Fabrication, manufacture, installation or construction may proceed providing the Work is in compliance with the Engineer's notations and comments, and the Contract Documents. See Engineer's notations and comments below.

☒ "REVIEWED AS NOTED, ADDITIONAL INFORMATION REQUIRED." Fabrication, manufacture, installation or construction may proceed on Noted Work providing the Work is in compliance with the Engineer's notations and comments, and the Contract Documents. No Work shall be fabricated, manufactured, installed or constructed on Work for which additional information or resubmission is indicated. The Contractor shall make a new submittal to the Engineer. See Engineer notations and comments below.

☐ "REVISE AND RESUBMIT." No Work shall be fabricated, manufactured, installed or constructed. The Contractor shall make a new submittal to the Engineer.

Engineer's review is only for general concept with the understanding that it is the Contractor's submission of his proposed design, and method to construct the work as specified and in conformance with the Contract Documents. Engineer's review is based on Contractor's representation that he has checked and approved this submittal and has verified dimensions, quantities, field conditions, relation to existing work, coordination of work to be installed later, and coordination with information in previously approved submittals. Approval by the Engineer does not authorize, or relieve the Contractor of responsibility for deviations from drawings, specifications, supplementary documents furnished by the Architect/Engineer. The Contractor is responsible for the accuracy of all information in the submittal, for details of fabrication and installation, for the safe construction of the work, and for compliance with all requirements of the Contract Documents.

HALEY & ALDRICH, INC. REVIEWED BY _____ DATE 21 November 2018

ENGINEER COMMENTS ON SUBMITTAL:

We have reviewed the subject submittal relative to the requirements outlined in specification Section 027100 – Permanent Groundwater Treatment and Bulletin No. 15 – Groundwater Treatment, including the memorandum titled "BCCB – Groundwater Treatment System, Updated Conceptual Design – Appendix J", dated 11 May 2018 and drawing "GT-1 Underslab Drainage and Vapor Mitigation System Plan".

We take no exception to the use of the submitted granular activated carbon (GAC) units and pressure sensors. We note that per the contract documents noted above, the groundwater treatment system shall also include storage/holding tanks, pumps, bag filters, level sensors and sampling ports. Please provide cut sheets and information related to these other system components. Also, per Specification 027100 Section 1.6, please provide shop drawings which include a complete description of the procedures to be followed for installing and operating the treatment system.

G:\128868 - BCCB\006 - Engineering Support\Submittals\Section 221130 - Plumbing Drainage and Venting Systems\221130-35.0 GFS\221130-35.0 - Groundwater Filtration System (GFS-2) - Product Data-HAI Response.docx

R.W.Sullivan Engineering
MEP/FP Engineering . Code . Commissioning

Submittal Transmittal

R.W. Sullivan, Inc. | 529 Main Street, Suite 203 Boston MA 02129-1107 United States

PROJECT:	BCH BCCB 150063	DATE SENT:	11/6/2018
SUBJECT:	04785.000 - Submittal Forwarded - 221130-35.0 - Groundwater Filtration System (GFS-2) - Produ... - Submittal:221130-35.0 :cWBYj	SUBMITTAL ID:	150063-00-125R0
TYPE:	Submittal	TRANSMITTAL ID:	00454
PURPOSE:	Accepted as Noted	VIA:	Email
SPEC SECTION:	150063-00		

FROM

NAME	COMPANY	EMAIL	PHONE
Todd Sampson	R.W. Sullivan, Inc.	tas@rwsullivan.com	617-523-8227

TO

NAME	COMPANY	EMAIL	PHONE
Rachel DeSanto	Shepley Bulfinch Richardson and Abbott	RDeSanto@shepleybulfinch.com	

CONTENTS

QUANTITY: 1 DATED: 10/30/2018 NUMBER:

DESCRIPTION:
Transmittal_Submittal - 221130-35.0 (Forwarded)181030_Gr.zip

ACTION:
REMARKS:

QUANTITY: 1 DATED: 10/30/2018 NUMBER:

DESCRIPTION:
Transmittal_S

ACTION:
REMARKS:

	APPROVED FOR CONFORMANCE TO THE DESIGN CONCEPT AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION DOCUMENTS.
✔	**APPROVED EXCEPT AS NOTED,** RESUBMISSION NOT REQUIRED.
	APPROVED EXCEPT AS NOTED, RESUBMIT FOR RECORD.
	REVIEWED, REFERENCE CONSULTANT STAMP FOR ACTION REQUIRED.
	REVISE AND RESUBMIT.
	REJECTED.
	FILE COPY, INFORMATIONAL SUBMITTAL FOR RECORD PURPOSES.

BY Michael Gailey DATE 11/27/2018

SHEPLEY BULFINCH

- ✔ NO EXCEPTION TAKEN
- ✔ ACCEPTED AS NOTED
- ☐ REJECTED
- ☐ SUBMIT SPECIFIED ITEM
- ☐ REVISE-NO RESUBMISSION REQUIRED
- ☐ REVISE & RESUBMIT
- ☐ RETURNED WITHOUT ACTION
- ☐ REVIEWED

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general comformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: continuing and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating their work with that of all other trades, and performing their work in a safe and satisfactory manner.

ROBERT W. SULLIVAN, INC.
Consulting Engineers
By: DSL Date: 11-6-18

SUBMITTAL VI

Project:	BCH BCCB	**RWS#:**	150063
Submittal:	Groundwater Filtration System (GFS-2)	**Submittal #:**	150063-00-125R0
Sub-Contractor:	American Plumbing	**Architect:**	Shepley Bulfinch
Reviewer:	David Lee	**Architect/GC#:**	221130-35.0
Date:	2018-11-06	**Spec Section:**	221130

Plumbing	See Comments Below
HVAC	Not Applicable
Electrical	Not Applicable
Fire Protection	Not Applicable

IT M	STATUS	VI C MM NTS
FILT-GRND-SK-B3-02A FILT-GRND-SK-B3-02B		
Carbtrol Water Purification Canister 200 Pound Activated Carbon L-1	AAN	Provide Two Canisters for each system
Honeywell PWT Series Wet/Wet Differential Pressure Sensor Model # PWT50 Pressure Range: 0-10 psid	NET	

NET = NO EXCEPTION TAKEN
AAN = ACCEPTED AS NOTED
REJ = REJECTED
SSI = SUBMIT SPECIFIED ITEM

RNR = REVISE NO RESUBMISSION
R&R = REVISE AND RESUBMIT
RWA = RETURNED WITHOUT ACTION
Reviewed = Review for conformance with the concept of the project

All comments must be addressed in writing by the Contractor.

Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the requirements of the drawings and specifications. This check is only for review of the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming, correlating and coordination of all quantities and dimensions; selecting fabrication processes and techniques of construction (means and methods); coordination of his work with that of all of the other trades; and performing his work in compliance with all pertinent codes in a safe manner.

K:\2015\150063-00\5_CA\Submittals\Plumbing\150063-00-125R0-221130-35-0-Groundwater Filtration system\150063-00-125R0-221130-35-0-Groundwater Filtration system.docx

SHEPLEY BULFINCH

Submittal Transmittal

To:

R.W. Sullivan Engineering
Todd Sampson
529 Main St #203
Boston MA 02129
United States

R.W. Sullivan Engineering
David Lee
The Schrafft Center
529 Main Street, Suite 203
Boston, MA 02129-1107
United States of America

Robert W. Sullivan Engineering
Jennifer Shepherd
The Schrafft Center
529 Main Street, Suite 203
Boston, MA 02129

Subject: Groundwater Filtration System (GFS-2) - Product Data

Date: 10/30/2018

Due Back:

Project No.: 04785.000

Qty	No.	Date	Action	Description
1		10/30/2018		221130-35.0 - Groundwater Filtration System (GFS-2) - Product Data.pdf

Remarks:

Hale Family Clinical Building

More details: View online | View PDF

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Kyle Reilly requires action from you on this subm

Project:	Hale Family Clinical Building
Spec Section:	22 11 30 - Plumbing Drainage and Venting Systems
Submittal #:	22 11 30-35.0
Title:	Groundwater Filtration System (GFS-2) - Product Data
Type:	Product Data
Responsible Contractor:	American Plumbing & Heating (NORWELL)
Received From:	Peter Bent
Ball In Court:	Shepley CA Admin Bulfinch
Submitter:	Bent, Peter (American Plumbing & Heating (NORWEL
Approvers:	Reilly, Kyle (Suffolk Construction Company Inc.) Bulfinch , Shepley CA Admin (Shepley Bulfinch) Reilly, Kyle (Suffolk Construction Company Inc.)
Distribution:	Allhusen, Craig (Boston Children's Hospital) Bulfinch , Shepley CA Admin (Shepley Bulfinch) CA ADMIN, BR+A (Bard, Rao + Athanas Consulting E LLC (BOSTON)) Capuzzo, Paul (Boston Children's Hospital) Chambers, Jim (Shepley Bulfinch) Connor, Robb (Shepley Bulfinch) Flatley, TJ (Suffolk Construction Company Inc.) Gailey, Michael (Shepley Bulfinch) Galli, Jane (Shepley Bulfinch) Hill, Sabrina (Suffolk Construction Company Inc.) Horne, Kevin (Suffolk Construction Company Inc.) Kelley, Daniel (Shepley Bulfinch)

	Lansberry, Jason (Suffolk Construction Company Inc.) Lee, David (R.W. Sullivan Engineering (BOSTON)) Malenchini, Kevin (Suffolk Construction Company Inc. Malloy, Larry (Suffolk Construction Company Inc.) Moriarty, Tyler (Shepley Bulfinch) Moroney, Robert (Suffolk Construction Company Inc.) Morsi, Rob (Suffolk Construction Company Inc.) Paquette, Jonathan (Suffolk Construction Company In Parenteau, David (Suffolk Construction Company Inc.) Pharr, Griffin (Suffolk Construction Company Inc.) Player, George (Suffolk Construction Company Inc.) Reilly, Kyle (Suffolk Construction Company Inc.) Sampson, Todd (R.W. Sullivan Engineering (BOSTON Sanderson, John (Bard, Rao + Athanas Consulting En LLC (BOSTON)) Seaburg, Jason (Suffolk Construction Company Inc.) Smith, Steve (Boston Children's Hospital) Susko, Tom (Shepley Bulfinch) Tafone, Angela (Suffolk Construction Company Inc.) Terra-Salomão, Mark (Shepley Bulfinch) Tobin, Ed (Suffolk Construction Company Inc.) Victor, Kurt (Suffolk Construction Company Inc.) Wein, Rachel (Shepley Bulfinch)
Final Due Date:	11/12/18
Description:	Please see attached Submittal # 22 11 30-35.0 - Grou Filtration System (GFS-2) - Product Data Thank you
Attachments:	None
Design Team Review Time:	14 day(s)
Internal Review Time:	14 day(s)
Submitter:	Bent, Peter (American Plumbing & Heating (NORWEL
Date:	Sent: Returned: 10/29/18
Response:	Submitted
Attachments:	GFS-2 Ground Water Filtration System Filter.pdf
Comments:	None
Approver:	Reilly, Kyle (Suffolk Construction Company Inc.)
Date:	Sent: 10/29/18 Returned: 10/29/18
Response:	Approved

Attachments:	221130-35.0 - Groundwater Filtration System (GFS-2) Data.pdf
Comments:	Submitted for Approval
Approver:	Bulfinch , Shepley CA Admin (Shepley Bulfinch)
Date:	Sent: Returned:
Response:	Pending
Attachments:	None
Comments:	None
Approver:	Reilly, Kyle (Suffolk Construction Company Inc.)
Date:	Sent: Returned:
Response:	Pending
Attachments:	None
Comments:	None

Copies: Michael Gailey
Rachel Wein

By: _____
bccb-ca@shepleybulfinch.com

Submittal #22 11 30-35.0
22 11 30 - Plumbing Drainage and Venting Systems

Suffolk Construction Company, Inc.
65 Allerton Street
Boston, Massachusetts 02119
Phone: (617) 445-3500
Fax: (617) 541-2128

Project: 217031 - Hale Family Clinical Building
55 Shattuck Street
Boston, Massachusetts 02115

Groundwater Filtration System (GFS-2) - Product Data

SPEC SECTION:	22 11 30 - Plumbing Drainage and Venting Systems	**SUBMITTAL MANAGER:**	Kyle Reilly **(Suffolk Construction Company Inc.)**
STATUS:	Open	**DATE CREATED:**	10/22/2018
ISSUE DATE:		**REVISION:**	0
RESPONSIBLE CONTRACTOR:	American Plumbing & Heating (NORWELL)	**RECEIVED FROM:**	Peter Bent
RECEIVED DATE:		**SUBMIT BY:**	11/8/2018
FINAL DUE DATE:	11/12/2018	**LOCATION:**	BCCB
SUB JOB:		**COST CODE:**	
APPROVERS:	Kyle Reilly **(Suffolk Construction Company Inc.)**, Shepley CA Admin Bulfinch **(Shepley Bulfinch)**, Kyle Reilly **(Suffolk Construction Company Inc.)**		

BALL IN COURT:
Kyle Reilly **(Suffolk Construction Company Inc.)**

DISTRIBUTION:
Shepley CA Admin Bulfinch **(Shepley Bulfinch)** , Todd Sampson **(R.W. Sullivan Engineering (BOSTON))** , David Lee **(R.W. Sullivan Engineering (BOSTON))** , Michael Gailey **(Shepley Bulfinch)** , Ed Tobin **(Suffolk Construction Company Inc.)** , Jim Chambers **(Shepley Bulfinch)** , Craig Allhusen **(Boston Children's Hospital)** , Steve Smith **(Boston Children's Hospital)** , David Parenteau **(Suffolk Construction Company Inc.)** , Jason Seaburg **(Suffolk Construction Company Inc.)** , Jason Lansberry **(Suffolk Construction Company Inc.)** , Robb Connor **(Shepley Bulfinch)** , Jane Galli **(Shepley Bulfinch)** , Sabrina Hill **(Suffolk Construction Company Inc.)** , Kevin Malenchini **(Suffolk Construction Company Inc.)** , TJ Flatley **(Suffolk Construction Company Inc.)** , Griffin Pharr **(Suffolk Construction Company Inc.)** , Larry Malloy **(Suffolk Construction Company Inc.)** , Rob Morsi **(Suffolk Construction Company Inc.)** , Jonathan Paquette **(Suffolk Construction Company Inc.)** , George Player **(Suffolk Construction Company Inc.)** , Angela Tafone **(Suffolk Construction Company Inc.)** , Kurt Victor **(Suffolk Construction Company Inc.)** , John Sanderson **(Bard, Rao + Athanas Consulting Enigneers)** , Tyler Moriarty **(Shepley Bulfinch)** , Paul Capuzzo **(Boston Children's Hospital)** , Tom Susko **(Shepley Bulfinch)** , Robert Moroney **(Suffolk Construction Company Inc.)** , Kevin Horne **(Suffolk Construction Company Inc.)** , Rachel Wein **(Shepley Bulfinch)** , BR+A CA ADMIN **(Bard, Rao + Athanas Consulting Enigneers)** , Kyle Reilly **(Suffolk Construction Company Inc.)** , Daniel Kelley **(Shepley Bulfinch)** , Mark Terra-Salomão **(Shepley Bulfinch)**

DESCRIPTION:
Please see attached Submittal # 22 11 30-35.0 - Groundwater Filtration System (GFS-2) - Product Data

Thank you

ATTACHMENTS:

SUBMITTAL WORKFLOW

NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
Peter Bent	Submitter		11/8/2018	10/29/2018	Submitted	GFS-2 Ground Water Filtration System Filter.pdf	
Kyle Reilly	Approver	10/29/2018	10/29/2018		Pending		
Shepley CA Admin Bulfinch	Approver		11/12/2018		Pending		
Kyle Reilly	Approver		11/12/2018		Pending		

Submittal #22 11 30-35.0
22 11 30 - Plumbing Drainage and Venting Systems

BY	DATE	COPIES TO

American Plumbing & Heating Corp.
1000 Cordwainer Drive
Norwell, MA 02061
Ph : (781) 347-9200

Submittal

Job: 7329-C-P
Boston Children's Clinical Bld
300 Longwood Ave
Boston, MA

Spec Section No: 220000
Submittal No: 13
Revision No: 0
Sent Date: 10/29/2018

Spec Section Title:

Submittal Title: GFS-2 Ground Water Filatration System

Contractor:
American Plumbing & Heating Corp.
James P. Bent

Contractor's Stamp

Other:
Suffolk Construction Co. Inc.
Jonathan Paquette

Architect's Stamp

SUFFOLK CONSTRUCTION CO. INC REVIEWED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

THE SUBCONTRACTOR/VENDOR IS RESPONSIBLE FOR ALL DIMENSIONS, CORRECT FIT AND COORDINATION OF ALL ITEMS TO BE FURNISHED AND INSTALLED

BY:	DATE:
KR	10/29/2018
JOB #:	JOB NAME:
217031	BCH - BCCB

SUBMITTAL #: 22 11 30-35.0

SPEC/DRWG REF:

REVIEWED FOR CONSTRUCTIBILITY

Engineer's Stamp

GFS-2 GROUNDWATER FILTRATION SYSTEM

BCH Identification Number:
FILT-GRND-SK-B3-02A
FILT-GRND-SK-B3-02B

CARBTROL®

WATER PURIFICATION CANISTER 200 POUND ACTIVATED CARBON

L-1 ✓

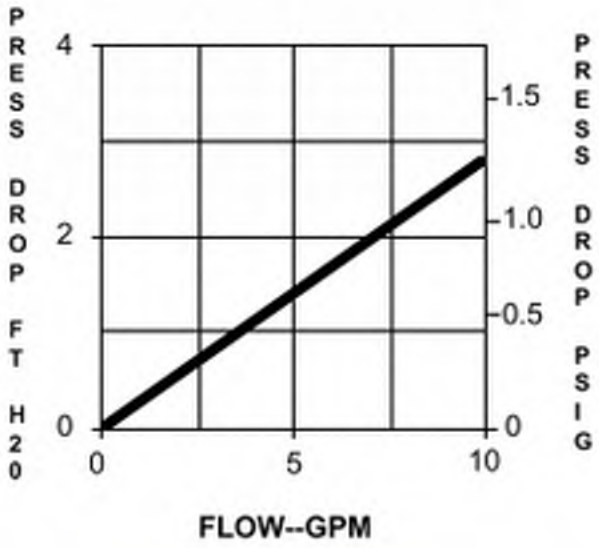
The CARBTROL L-1 (liquid) Canister handles up to 10 gpm.

FEATURES

- 200 pounds of high activity carbon.
- Large 1 1/4" internal piping. Low pressure drop allows operation of three canisters in series.
- Standard FPT couplings for easy installation - saves time and money.
- Special "no leak" lid gasket.
- Heavy duty steel drums. Acceptable for transport of hazardous spent carbon.
- Piping design eliminates channeling.

SPECIFICATIONS

DRUM:	24" Ø x 34" high, mild steel, epoxy phenolic internal coating with polyethylene liner. ✓
CARBON:	200 lbs.
SHIPPING WEIGHT:	250 lbs.
INLET:	1 1/4" FPT, steel
OUTLET:	1 1/4" FPT, steel
INTERNAL PIPING:	1 1/4" PVC
DRAIN:	3/4" bung
PRESSURE DROP:	1.25 psi @ 10 gpm ✓
MAX. OPERATING PRESSURE:	10 psi

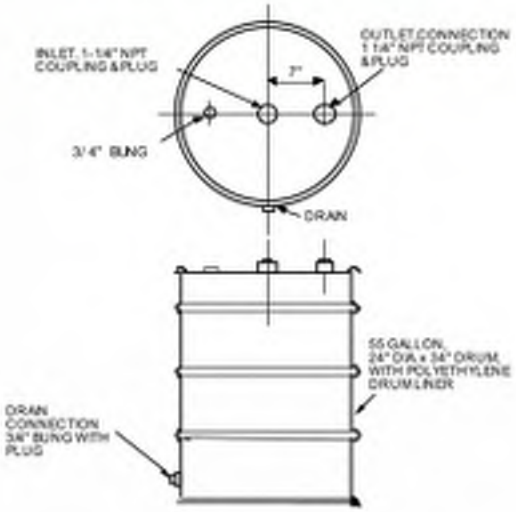


AT-100/#2

CARBTROL® CORPORATION
955 Connecticut Ave., Suite 5202
Bridgeport, CT 06607
800-242-1150
Fax: 203-337-4347
www.carbtrol.com
info@carbtrol.com

WATER PURIFICATION CANISTER
200 POUND ACTIVATED CARBON

L-1



OPTIONS

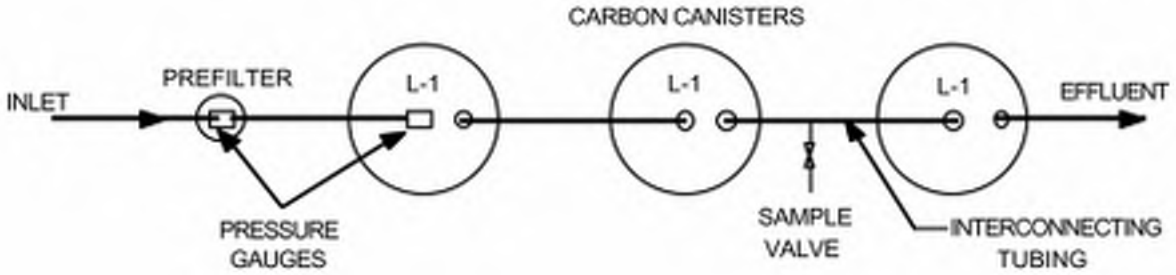
Interconnecting Piping Kit

Flexible 1 1/4" diameter PVC tubing with hose clamps. Includes inlet pressure gauge and intermediate sample valve.

Pre-filter for Suspended Solids Removal

Pre-filter consisting of a basket filter piped and mounted on support frame. Filter is of carbon steel construction.

ARRANGEMENT (3) L-1 Canisters in series for 10 gpm flow (Contact time @ 10 gpm - 15 minutes)

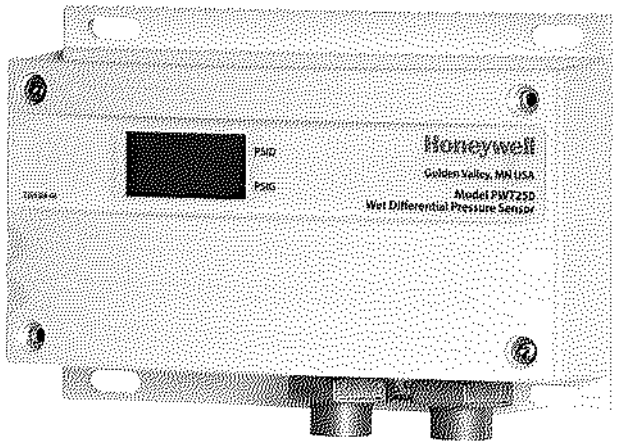


TYPICAL INSTALLATION

Honeywell

PWT Series Wet/Wet Differential Pressure Sensors

SPECIFICATION DATA



APPLICATION

The PWT Series wet/wet differential pressure sensors provide reliable, accurate measurement and control of proper applications, including the monitor and control of pump differential pressure, chiller/boiler differential pressure drop, and CW/HW system differential pressure. The PWT Series is ideal for measuring pressure across pumps, filters, heat exchangers, compressors and other non-corrosive wet media applications.

FEATURES

- **The PWT Pressure Sensors incorporate microprocessor profiled sensors for exceptional accuracy and reliability.**
- **Field-selectable 4-20 mA, 0-5 Vdc, or 0-10 Vdc output.**
- **Jumper-selectable slow or fast response time.**
- **Switch-selectable pressure ranges (See Table 2).**
- **The jumper-selectable output switch for normal (4-20 mA) or reverse (20-4mA) operation provides application flexibility.**
- **Rugged, die-cast enclosure provides NEMA 4 sealing.**
- **Jumper-selectable port swap feature.**
- **All models offer both push button and digital input to zero the output. A microprocessor algorithm prevents accidental zero adjustment during normal operation.**
- **Used with the PWT-BV bypass valve manifold.**

Table 1. PWT Sensor Models.

Model	Pressure Range	Bypass Valve Assembly
PWT50	0-5, 0-10, 0-25, 0-50 psid	No
PWT100	0-10, 0-20, 0-50, 0-100 psid	No
PWT250	0-25, 0-50, 0-125, 0-250 psid	No

SPECIFICATIONS

Models: See Table 1.

Dimensions: See Fig. 1.

Media Compatibility: 17-4 PH stainless steel

Supply Voltage: 12 to 30 VDC, 24 VAC nom.

Maximum Current Draw DC: 125 mA; AC: 280 mA

Proof Pressure: 2x max. F.S. range

Burst Pressure: 5x max. F.S. range

Accuracy at 25°C*:
Ranges A, B, C: ±1% F.S.**
Range D: ±2% F.S.**

Table 2. Range Selection Guide (PSI).

Model	A	B	C	D
PWT50	50	25	10	5
PWT100	100	50	20	10
PWT250	250	125	50	25

Surge Dampening: Electronic; 5-second averaging

IMPORTANT

Select operational range according to maximum gauge pressure, NOT differential pressure. Example: High gauge pressure =90 psig, select 100 psig model.

Temperature Compensated Range
0° to 50°C (32° to 122°F);
TC Zero <1.5% of product F.S. per sensor;
TC Span <1.5% of product F.S. per sensor

Sensor Operating Range: -20° to 85°C (-4° to 185°F)

Long Term Stability: ±0.25%

Zero Adjust: Push button auto-zero and digital input (2-position terminal block)

Operating Environment: -10° to 55°C (14° to 131°F); 10-90% RH noncondensing

Fittings: 1/8 in. NPT female, stainless steel 17-4 PH

* Accuracy combines linearity, hysteresis, and repeatability.
** F.S. is defined as full span of selected range in bidirectional mode.

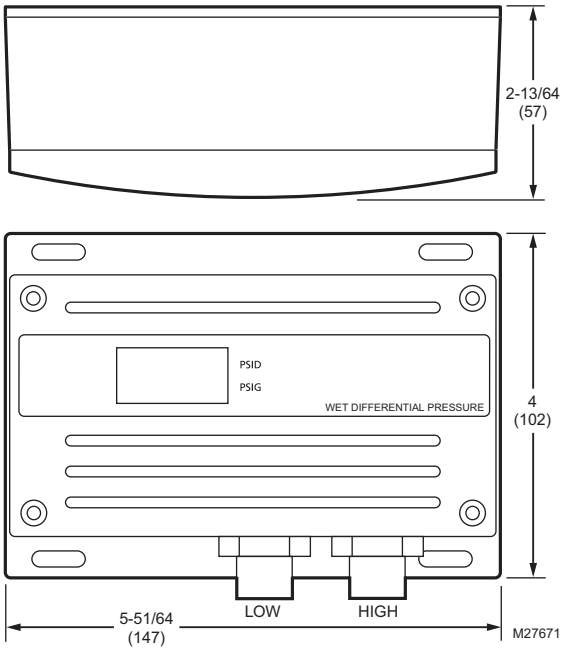


Fig. 1. Dimensions in in. (mm).

OPERATION

Blink Settings

Table 3. Blink Codes.

LED Color	Status
Solid Green	Normal operation.
Flashing Green	Low > High; use port swap jumper or bidirectional mode.
Solid Red	Differential pressure is too high; select a higher pressure range.
Flashing Red	Gauge pressure over sensor range; reduce line pressure or replace with a higher range device.

Auto-Zero: Press and hold the Zero button for 2 seconds or provide contact closure on the auxiliary 'Remote Zero' terminal to reset the output to zero pressure. To protect the device from accidental zeroing, this feature is only enabled when the detected pressure is within 5% of factory calibration.

Automation and Control Solutions
Honeywell International Inc.
1985 Douglas Drive North
Golden Valley, MN 55422
customer.honeywell.com

Honeywell

63-1327—04 M.S. Rev. 07-14
Printed in United States

GROUND WATER FILTRATION SYSTEM
DUPLEX SUMP PUMP
SP-1

R.W.Sullivan Engineering
MEP/FP Engineering . Code . Commissioning

Submittal Transmittal

R.W. Sullivan, Inc. | 529 Main Street, Suite 203 Boston MA 02129-1107 United States

PROJECT:	BCH BCCB 150063	DATE SENT:	9/11/2018
SUBJECT:	04785.000 - Submittal Forwarded - 221130-11.1 - Duplex Sump Pumps (SP-1) - Product Data - BCH... - Submittal:221130-11.1 :cWBYj	SUBMITTAL ID:	150063-00-010R1
TYPE:	Submittal	TRANSMITTAL ID:	00416
PURPOSE:	Accepted as Noted	VIA:	Email
SPEC SECTION:	150063-00		

FROM

NAME	COMPANY	EMAIL	PHONE
David Lee	R.W. Sullivan, Inc.	dsl@rwsullivan.com	617-523-8227

TO

NAME	COMPANY	EMAIL	PHONE
BCCB-CA		BCCB-CA@shepleybulfinch.com	

Shepley Bulfinch comments: (9/11/2018)
- Approved as Noted - Refer to RWS comments within.

	APPROVED FOR CONFORMANCE TO THE DESIGN CONCEPT AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION DOCUMENTS.
✔	**APPROVED EXCEPT AS NOTED,** RESUBMISSION NOT REQUIRED.
	APPROVED EXCEPT AS NOTED, RESUBMIT FOR RECORD.
	REVIEWED, REFERENCE CONSULTANT STAMP FOR ACTION REQUIRED.
	REVISE AND RESUBMIT.
	REJECTED.
	FILE COPY, INFORMATIONAL SUBMITTAL FOR RECORD PURPOSES.

BY Jane Galli DATE 9/13/2018

SHEPLEY BULFINCH

☑ NO EXCEPTION TAKEN	☐ REVISE-NO RESUBMISSION REQUIRED
☑ ACCEPTED AS NOTED	☐ REVISE & RESUBMIT
☐ REJECTED	☐ RETURNED WITHOUT ACTION
☐ SUBMIT SPECIFIED ITEM	☐ REVIEWED

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general comformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: continuing and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating their work with that of all other trades, and performing their work in a safe and satisfactory manner.

ROBERT W. SULLIVAN, INC.
Consulting Engineers
By: DSL Date: 9-11-18

SUBMITTAL VI

ro ect:	BCH BCCB	**S :**	150063
Submittal:	Duple Sump Pumps (SP-1)	**Submittal :**	150063-00-010R1
Sub Contractor:	Suffolk Construction	**Architect:**	Shepley Bulfinch
eviewer:	Dave Lee	**Architect/ C :**	221130-11.1
Date:	2018-09-11	**S ec Section:**	221130

IT M	STATUS	VI C MM NTS
Duple Sewage Ejectors (SP-1)	**AAN**	Basin must be 9 -6 to allow for 6 of sand below for leveling. Provide (2) transformers as specified. **rovide vent connection** **rovide Inlet connection**
Control anel	**N T**	

N T N C TI N TA N
AAN ACC T D AS N T D
CT D
SSI SUBMIT S CI I D IT M

N VIS N SUBMISSI N
VIS AND SUBMIT
A TU N D ITH UT ACTI N

All comments must be addressed in writing by the Contractor.

Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the re uirements of the drawings and specifications. This check is only for review of the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming, correlating and coordination of all uantities and dimensions; selecting fabrication processes and techni ues of construction (means and methods); coordination of his work with that of all of the other trades; and performing his work in compliance with all pertinent codes in a safe manner.

K: 2015 150063-00 5 CA Submittals Plumbing 150063-00-010R1-221130-11-1-duple sump pumps SP-1 150063-00-010R1-221130-11-1-duple sump pumps SP-1.doc

SHEPLEY BULFINCH

Submittal Transmittal

To:

R.W. Sullivan Engineering
Todd Sampson
529 Main St #203
Boston MA 02129
United States

R.W. Sullivan Engineering
David Lee
The Schrafft Center
529 Main Street, Suite 203
Boston, MA 02129-1107
United States of America

Robert W. Sullivan Engineering
Jennifer Shepherd
The Schrafft Center
529 Main Street, Suite 203
Boston, MA 02129

Subject: Duplex Sump Pumps (SP-1) - Product Data

Date: 9/6/2018

Due Back:

Project No.: 04785.000

Qty	No.	Date	Action	Description
1		9/6/2018		221130-11.1 - Duplex Sump Pumps (SP-1) - Product Data.pdf

Remarks:

Hale Family Clinical Building

More details: View online | View PDF

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Jonathan Paquette requires action from you on t submittal.

Project:	Hale Family Clinical Building
Spec Section:	22 11 30 - Plumbing Drainage and Venting Systems
Submittal #:	22 11 30-11.1
Title:	Duplex Sump Pumps (SP-1) - Product Data
Type:	Product Data
Responsible Contractor:	American Plumbing & Heating (NORWELL)
Received From:	Andrew Collins
Ball In Court:	Shepley CA Admin Bulfinch
Submitter:	Collins, Andrew (American Plumbing & Heating (NOR'
Approvers:	Reilly, Kyle (Suffolk Construction Company Inc.) Bulfinch , Shepley CA Admin (Shepley Bulfinch) Reilly, Kyle (Suffolk Construction Company Inc.)
Distribution:	Allhusen, Craig (Boston Children's Hospital) Capuzzo, Paul (Boston Children's Hospital) Chambers, Jim (Shepley Bulfinch) Connor, Robb (Shepley Bulfinch) Corcoran, Meagan (Suffolk Construction Company Inc Dath, Abigail (Bard, Rao + Athanas Consulting Enigne (BOSTON)) Finneral, Mark (Shepley Bulfinch) Gailey, Michael (Shepley Bulfinch) Galli, Jane (Shepley Bulfinch) Hill, Sabrina (Suffolk Construction Company Inc.)

	Horne, Kevin (Suffolk Construction Company Inc.) Lansberry, Jason (Suffolk Construction Company Inc.) Lee, David (R.W. Sullivan Engineering (BOSTON)) Malenchini, Kevin (Suffolk Construction Company Inc. Malloy, Larry (Suffolk Construction Company Inc.) Mertoguno, Albertus (Shepley Bulfinch) Morsi, Rob (Suffolk Construction Company Inc.) O'Connor, Gina (Bard, Rao + Athanas Consulting Enig LLC (BOSTON)) Paquette, Jonathan (Suffolk Construction Company In Parenteau, David (Suffolk Construction Company Inc.) Pharr, Griffin (Suffolk Construction Company Inc.) Player, George (Suffolk Construction Company Inc.) Riley, Bill (Shepley Bulfinch) Sampson, Todd (R.W. Sullivan Engineering (BOSTON Sanderson, John (Bard, Rao + Athanas Consulting En LLC (BOSTON)) Seaburg, Jason (Suffolk Construction Company Inc.) Smith, Steve (Boston Children's Hospital) Susko, Tom (Shepley Bulfinch) Tafone, Angela (Suffolk Construction Company Inc.) Tobin, Ed (Suffolk Construction Company Inc.) Victor, Kurt (Suffolk Construction Company Inc.) Wein, Rachel (Shepley Bulfinch) Yong, Anne (Shepley Bulfinch)
Final Due Date:	09/21/18
Description:	Please see enclosed Submittal #221130-11.1 - Duplex Pumps (SP-1) - Product Data. This equipment is being resubmitted with an upd rol panel to comply with the project specifications. Thank you.
Attachments:	None
Design Team Review Time:	14 day(s)
Internal Review Time:	14 day(s)
Submitter:	Collins, Andrew (American Plumbing & Heating (NOR
Date:	Sent: Returned: 09/06/18
Response:	Submitted
Attachments:	221130 - 2.6 Duplex Sump Pump (SP-1) UPDATED.p
Comments:	None
Approver:	Reilly, Kyle (Suffolk Construction Company Inc.)

Date:	Sent: 09/06/18 Returned: 09/06/18
Response:	Approved
Attachments:	221130-11.1 - Duplex Sump Pumps (SP-1) - Product I
Comments:	Submitted for Approval
Approver:	Bulfinch , Shepley CA Admin (Shepley Bulfinch)
Date:	Sent: Returned:
Response:	Pending
Attachments:	None
Comments:	None
Approver:	Reilly, Kyle (Suffolk Construction Company Inc.)
Date:	Sent: Returned:
Response:	Pending
Attachments:	None
Comments:	None

Copies: Michael Gailey
Rachel Wein

By: _____
bccb-ca@shepleybulfinch.com

Submittal #22 11 30-11.1
22 11 30 - Plumbing Drainage and Venting Systems

Suffolk Construction Company, Inc.
65 Allerton Street
Boston, Massachusetts 02119
Phone: (617) 445-3500
Fax: (617) 541-2128

Project: 217031 - Hale Family Clinical Building
55 Shattuck Street
Boston, Massachusetts 02115

Duplex Sump Pumps (SP-1) - Product Data

SPEC SECTION:	22 11 30 - Plumbing Drainage and Venting Systems	**SUBMITTAL MANAGER:**	Jonathan Paquette **(Suffolk Construction Company Inc.)**
STATUS:	Open	**DATE CREATED:**	09/6/2018
ISSUE DATE:	09/6/2018	**REVISION:**	1
RESPONSIBLE CONTRACTOR:	American Plumbing & Heating (NORWELL)	**RECEIVED FROM:**	Andrew Collins
RECEIVED DATE:		**SUBMIT BY:**	10/25/2017
FINAL DUE DATE:	09/21/2018	**LOCATION:**	BCCB
SUB JOB:		**COST CODE:**	
APPROVERS:	Kyle Reilly **(Suffolk Construction Company Inc.)**, Kyle Reilly **(Suffolk Construction Company Inc.)**, Shepley CA Admin Bulfinch **(Shepley Bulfinch)**		

BALL IN COURT:
Kyle Reilly **(Suffolk Construction Company Inc.)**

DISTRIBUTION:
Todd Sampson **(R.W. Sullivan Engineering (BOSTON))** , David Lee **(R.W. Sullivan Engineering (BOSTON))** , Michael Gailey **(Shepley Bulfinch)** , Ed Tobin **(Suffolk Construction Company Inc.)** , Jim Chambers **(Shepley Bulfinch)** , Craig Allhusen **(Boston Children's Hospital)** , Steve Smith **(Boston Children's Hospital)** , David Parenteau **(Suffolk Construction Company Inc.)** , Meagan Corcoran **(Suffolk Construction Company Inc.)** , Jason Seaburg **(Suffolk Construction Company Inc.)** , Jason Lansberry **(Suffolk Construction Company Inc.)** , Robb Connor **(Shepley Bulfinch)** , Jane Galli **(Shepley Bulfinch)** , Sabrina Hill **(Suffolk Construction Company Inc.)** , Kevin Malenchini **(Suffolk Construction Company Inc.)** , Gina O'Connor **(Bard, Rao + Athanas Consulting Enigneers)** , Abigail Dath **(Bard, Rao + Athanas Consulting Enigneers)** , Griffin Pharr **(Suffolk Construction Company Inc.)** , Larry Malloy **(Suffolk Construction Company Inc.)** , Rob Morsi **(Suffolk Construction Company Inc.)** , Jonathan Paquette **(Suffolk Construction Company Inc.)** , George Player **(Suffolk Construction Company Inc.)** , Angela Tafone **(Suffolk Construction Company Inc.)** , Kurt Victor **(Suffolk Construction Company Inc.)** , John Sanderson **(Bard, Rao + Athanas Consulting Enigneers)** , Mark Finneral **(Shepley Bulfinch)** , Paul Capuzzo **(Boston Children's Hospital)** , Tom Susko **(Shepley Bulfinch)** , Albertus Mertoguno **(Shepley Bulfinch)** , Anne Yong **(Shepley Bulfinch)** , Bill Riley **(Shepley Bulfinch)** , Kevin Horne **(Suffolk Construction Company Inc.)** , Rachel Wein **(Shepley Bulfinch)**

DESCRIPTION:
Please see enclosed Submittal #221130-11.1 - Duplex Sump Pumps (SP-1) - Product
Data. This equipment is being resubmitted with an updated control panel to comply with the project specifications.

Thank you.

ATTACHMENTS:

SUBMITTAL WORKFLOW

NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
Andrew Collins	Submitter		9/6/2018	9/6/2018	Submitted	221130 - 2.6 Duplex Sump Pump (SP-1) UPDATED.pdf	
Kyle Reilly	Approver	9/6/2018	9/7/2018		Pending		
Shepley CA Admin Bulfinch	Approver		9/21/2018		Pending		
Kyle Reilly	Approver		9/21/2018		Pending		

Submittal #22 11 30-11.1
22 11 30 - Plumbing Drainage and Venting Systems

BY	DATE	COPIES TO

American Plumbing & Heating Corp.
1000 Cordwainer Drive
Norwell, MA 02061
Ph : (781) 347-9200

Submittal

Job: 7329-C-P
Boston Children's Clinical Bld
300 Longwood Ave
Boston, MA

Spec Section No: 221130
Submittal No: 16
Revision No: 0
Sent Date: 8/9/2018

Spec Section Title:

Submittal Title: Duplex Sump Pump (SP-1) UPDATED

Contractor:
American Plumbing & Heating Corp.
James P. Bent

Contractor's Stamp

Suffolk Construction Co. Inc.
Kyle Reilly

Architect's Stamp

SUFFOLK CONSTRUCTION CO. INC REVIEWED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

THE SUBCONTRACTOR/VENDOR IS RESPONSIBLE FOR ALL DIMENSIONS, CORRECT FIT AND COORDINATION OF ALL ITEMS TO BE FURNISHED AND INSTALLED

BY:	DATE:
KR	09/06/2018
JOB #:	JOB NAME:
217031	BCH - BCCB

SUBMITTAL #:
22 11 30-11.1

SPEC/DRWG REF:

REVIEWED FOR CONSTRUCTIBILITY

Engineer's Stamp

Duplex Sump Pump (SP-1)

221130 – 2.6

1/5/2018

DATA SHEET

GUSTAVO PRESTON COMPANY
23 INDUSTRIAL AVE
CHELMSFORD, MA 01824
978-250-3333

CENTRIFUGAL PUMPS
SUBMERSIBLE & VERTICAL
SEWAGE & SUMP PUMPS
CONTROLS & PANELS

1/5/2018

JOB:	Boston Childrens Clinical Bldg Boston MA
ENGINEER:	RW Sullivan - David Lee
CONTRACTOR:	American Plumbing
REFERENCE:	SP-1 SUMP 1
ITEM:	SP-1 2519 Sump (Sump-SK-B3-01)
MODEL:	2519 SERIES 2500
PUMP:	WEIL DUPLEX 2519 SUBMERSIBLE SEWAGE WITH 35' POWER CABLE 4"DISCHARGE
CAPACITY/HEAD:	200 GPM @ 70 FEET TDH
MOTOR:	10 HP, 480 VOLTS, 3 PHASE, 1750 RPM
CONTROLS:	4 - FLOAT SWITCHES SUSPENDED FROM COVER 1 - 8101E NEMA 4 DDDF DUPLEX CONTROL PANEL TO INCLUDE THE FOLLOWING: 2 - COMB. MANUAL DISCONNECT & MOTOR CIRCUIT PROTECTOR 2 - MAGNETIC STARTERS 2 - SELECTOR SWITCHES 2 - PILOT LIGHTS 1 - AUTOMATIC ALTERNATOR 2 - CONTROL CIRCUIT TRANSFORMER 1 - ALARM BELL W/SILENCER, 120V 1 - NUMBERED AND WIRED TERMINAL STRIP 1 - SET(S) OF ISOLATED CONTACTS FOR REMOTE ALARM
BASIN:	72 DIA X 114" (9'-6") DEEP FIBERGLASS BASIN WITH INLET HUB AND ANCHOR FLANGE
COVER:	78" ROUND GASTIGHT STEEL COVER WITH ALL NECESSARY OPENINGS
REMOVAL SYSTEM:	2613-4 CI WITH SS LIFTING CABLES
SYSTEM NOTES:	Quoted as per MEP Fit-out Bid Set Specification Section 221130 Part 2.5, Schedule P012 Bulletin 008 & Drawing P003 (Infrastructure) dated 9-1-17. EXCEPTIONS TAKEN: * ALL FLOAT AND POWER WIRING TO BE DONE BY THE SITE LICENSED ELECTRICAL CONTRACTOR - PRICING NOT INCLUDED ** Exception to 8167 Control panel specified - quoted 8101E control panel to provide two independant control circuits as required by specification, as well as provide motor warranty in support of moisture sensors and temperature limiters per Sean Farrell reccomendation. * MUST VERIFY INLET HUB SIZE____ * MUST VERIFY VENT SIZE___ * Pricing Subject to Signed Submittals.

WEIL 4-Inch Submersible Wastewater Pump 2519

Heavy duty pump for commercial and industrial applications.
Pump clear water, gray water, effluent and wastewater with solids up to 3-inch diameter.

Disch. Size	4 Inch
Disch. Type	ANSI
Solids Max.	3 Inch
Mounting Style	2613 Removal

Pump
- Case - Cast Iron
- Impeller - Cast Iron
- Stainless Steel Hardware

Motor
- **Double Seal - Tandem**
  - Upper - Carbon against Ceramic
  - Lower - Silicon Carbide against Silicon Carbide
- **Air-Filled Hermetically Sealed**
- **Shaft - Stainless Steel Series 300**
- Motor Shell - Cast Iron
- Insulation - Class F
- Ball Bearings - 2 - Double Sealed
- Power Cable Length - ~~25 ft~~ 35 ft
- Three-phase motor
  - ~~1150 and~~ 1750 RPM
  - 60 Hz, ~~208-230 or~~ 460 volts

Options
- Bronze Impeller
- UL Explosion Proof Motor
- Moisture Sensor and Temperature Limiter
- Additional Power Cable Lengths
- Stainless Steel Lifting Cable

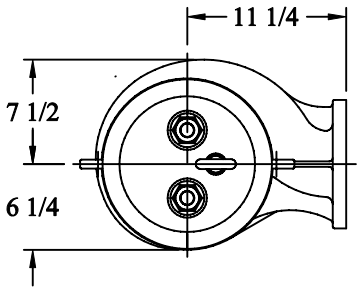
Flow - To prevent solids from settling out

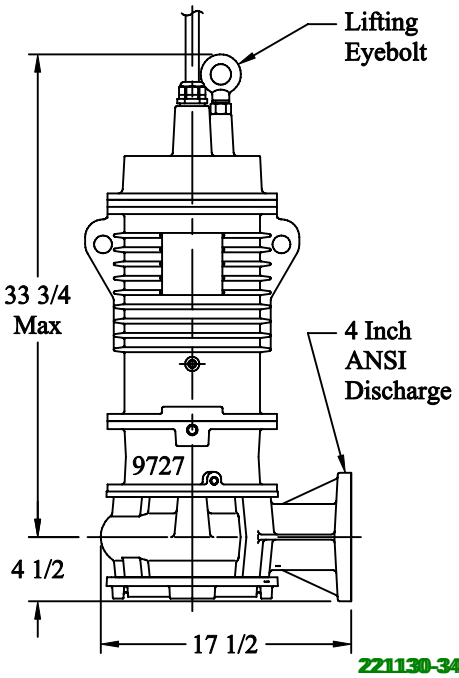
Discharge Pipe Size Dia Inches	Minimum Flow GPM
3	50
4	90
6	200

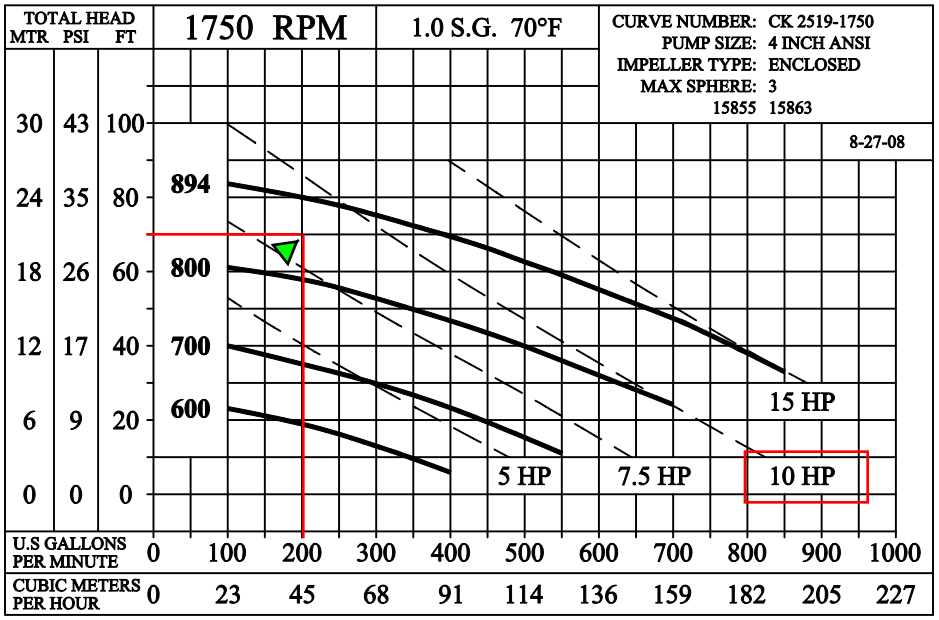
Capacities - Wet Wells

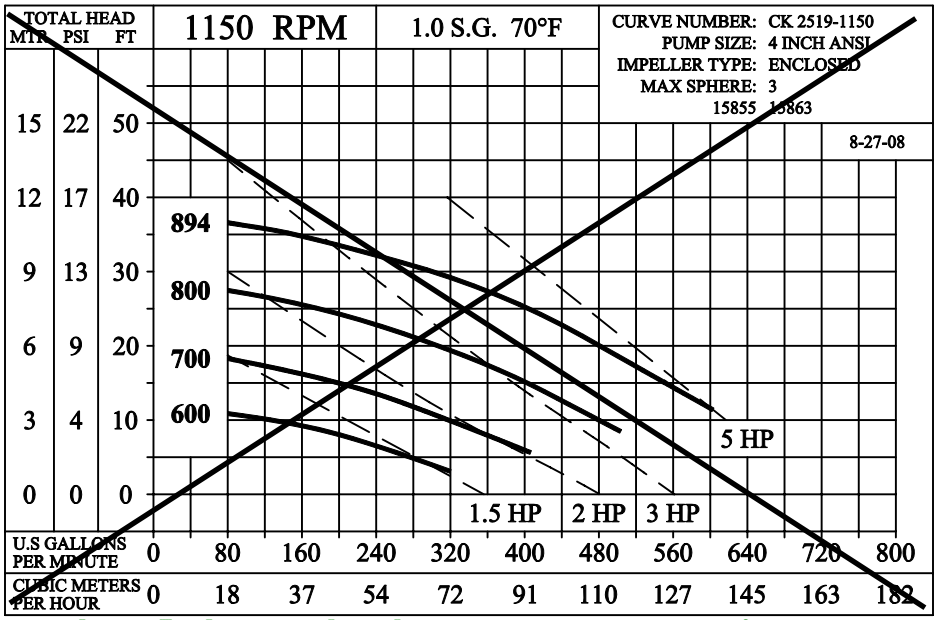
Dia or Side Inches	Gallons per Foot of Depth	
	Round	Square
48	94	120
60	147	187
72	212	269

Good wet well design
Maximum 10 starts per hour.
Minimum run time - 1 1/2 minutes.



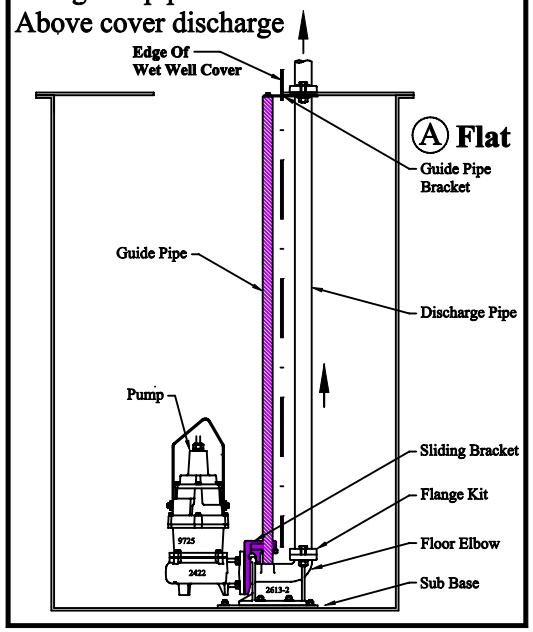




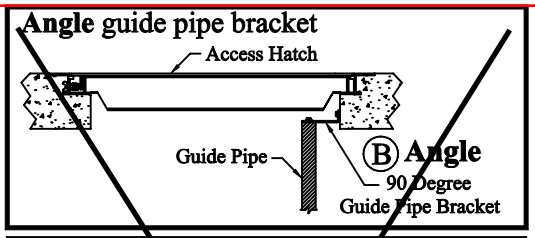


WEIL 4 Inch Removal System 2613-4

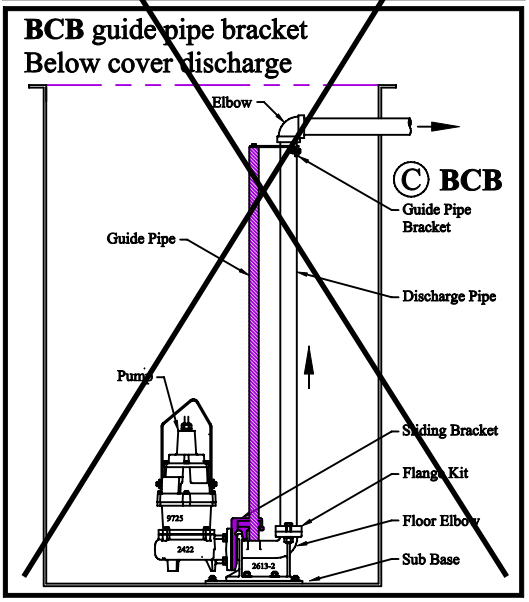
Flat guide pipe bracket
Above cover discharge



Angle guide pipe bracket



BCB guide pipe bracket
Below cover discharge



System Includes:

- Discharge Floor Elbow - one
- Sliding Bracket - one
  - Iron ~~or Bronze for use with Explosion Proof Motor~~
- Guide Pipe Bracket - one
  - Ⓐ - Flat (cover mount) - bolts to wet well cover or
  - Ⓑ - Angle 90° (side mount) - bolts to vertical side wall or
  - Ⓒ - BCB Bracket - Duplex or Simplex mounts to discharge pipe(s) - see pg 2 diagrams

Not Included:

- Discharge Pipe, Guide Pipe - 2 inch schedule 40 & Flange Kit

Options:

- Discharge Flange Kit for Floor Elbow
- Intermediate Guide Pipe Bracket
- Sub Base for Floor Elbow
- Level Control Lifting Assembly for BCB Duplex Bracket

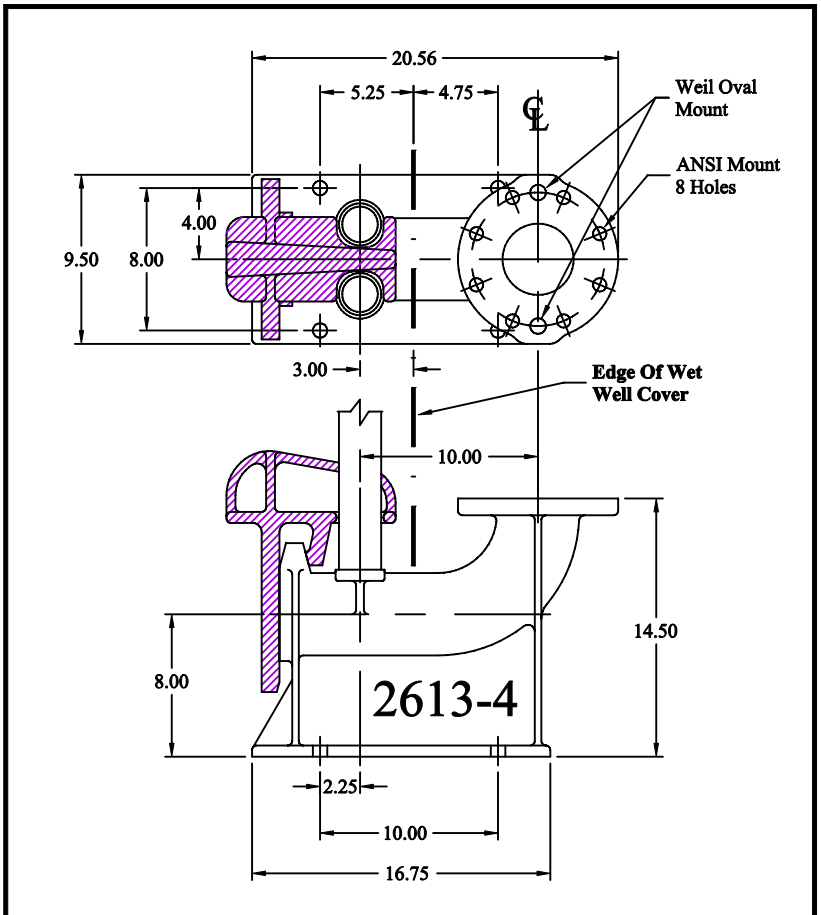
Removal System:

DUPLEX ~~Simplex~~

Order Number	Sliding Bracket	Guide Pipe Bracket	Mount Type	Wt Lbs
2613K1023	Iron	Flat	Cover	138
~~2613K5011~~	~~Iron~~	~~Angle~~	~~Side~~	~~138~~
2613K2023	Bronze	Flat	Cover	138
2613K6034	Bronze	Angle	Side	138
2613K3023	Iron	BCB	Pipe	138
2613K4023	Bronze	BCB	Pipe	138

Duplex - BCB System

Order Number	Sliding Bracket	Guide Pipe Bracket	Mount Type	Wt Lbs
2613K7023	Iron	BCB	Pipe	276
2613K7033	Bronze	BCB	Pipe	276



Discharge Flange Kit - For Floor Elbow

Includes - Flange, Gasket and Hardware
Weil = 2 bolt oval configuration

Order Number	Pipe Type	Flange Type
2613K204	Plain End	Weil
~~2613K104~~	~~Threaded~~	~~Weil~~
2613K106	Threaded	ANSI

Intermediate Guide Pipe Bracket:

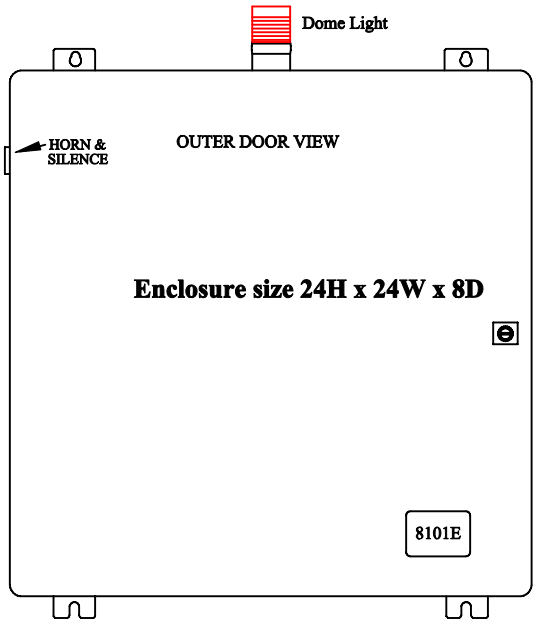
205.666.001	Intermediate Guide Pipe Bracket

WEIL Duplex Alternating Pump Control Panel 8101E

Duplex

Two Independent Control Circuits
Type 4 Double Door Dead Front Enclosure

- The 8101E Duplex panel has complete electrical separation of the control circuits for both pumps. It is a specification grade panel that utilizes single-pole level controls.
- Each pump has an independent control circuit power supply. Each pump control circuit also serves as backup for the other pump control circuit.
- Panel can be operated at 50 or 60 Hertz power.
- Type 4 enclosure for indoor or outdoor use. Provides protection against falling rain, splashing water or hose directed water; undamaged by the formation of ice on the enclosure.
- Exceeds Type 1, 3R and 12 requirements.
- Select level controls
  - 8213 Lever
  - 8220 Pressure Diaphragm
  - 8230 Tethered Float
- Requires one 8213 lever or four 8220 or 8230 level switches - three switches for level control and one switch for the high water.



Panel Includes

- U/L Listed Label
- LED Lights, hour meter, switches, and test buttons are on inner door.
- One lockable panel disconnect; through-the-door with door interlock on inner door. The mechanical interlock prevents the door from being opened when the disconnect is in the ON position. Lock is not provided.
- Padlocking hasp - on outer door, padlock not included.
- Two Industrial duty contactors.
- Two lockable pump disconnects, on motor overload protectors. Lock is not provided.
- Electric Alternator has a 3 position selector switch; that locks the pumps in Auto, Pump 1-2 or Pump 2-1 sequencing.
- Two Overloads - one per pump. Ambient compensated bimetallic (Class 10) motor overload circuit protector. Instantaneous magnetic trip for short circuit protection. Single-phase short circuit protection for three-phase motors. Field adjustable within the amp range.
- Two Control transformers with fused primary and fused secondary on all three-phase and single-phase 208 and 230-volt. Single-phase 115-volt has two fused control circuits.
- Pump run switches - one per pump. Three position TOA (test-off-automatic) with spring return to off from test.
- Green light indicates power to pump motor. One light per pump.
- White light indicates control power on. One light per control circuit.
- Red overload light indicates motor overload condition and pump is off. Light remains on and pump remains off until rest. One light per pump.
- Hour meters; non resetting meters indicates total pump run time.
- General Alarm Fault and Pump Run Status isolated contacts.
- High Water Alarm System Type 4X. Hold finger over hole of horn for 1-2 seconds and remove to silence horn (95 dB).
  - Red HWA light and alarm test button on inner door.
  - Two isolated contacts for remote monitoring and/or to use as a connection to a phone dialer.
- Alarm LED Dome Light - Lexan, red flashing on top of enclosure. Light indicates a general fault condition; overload, high water, moisture sensor or over temp condition. Light remains on until condition is corrected.
- Control Terminal board, numbered and wired.
- Layout and schematic CAD diagrams are provided. Installer connections at terminal board are clearly marked.

Motor Protrector Amp Range	Order Number			Approx. Weight Lbs.
	Single-Phase 115 Volts	Single-phase 208 or 230 Volts	Three-Phase 208, 230,460 Volts	
1.0 - 1.6	8101E-L-016	8101E-D-016	8101E-T-016	86
1.6 - 2.5	8101E-L-025	8101E-D-025	8101E-T-025	86
2.5 - 4.0	8101E-L-040	8101E-D-040	8101E-T-040	86
4.0 - 6.3	8101E-L-063	8101E-D-063	8101E-T-063	86
6.3 - 10.0	8101E-L-100	8101E-D-100	8101E-T-100	86
10.0 - 16.0	8101E-L-160	8101E-D-160	8101E-T-160	86
16.0 - 20.0	8101E-L-200	8101E-D-200	8101E-T-200	88
20.0 - 25.0	8101E-L-250	8101E-D-250	8101E-T-250	88
*25.0 - 32.0	8101E-L-320	8101E-D-320	8101E-T-320	101
*32.0 - 40.0	8101E-L-400	8101E-D-400	8101E-T-400	101
*40.0 - 50.0	8101E-L-500	8101E-D-500	8101E-T-500	116

*Includes 2nd disconnect and larger enclosure

Options:

8100K7079 Type 4X 304 Stainless Steel outer enclosure

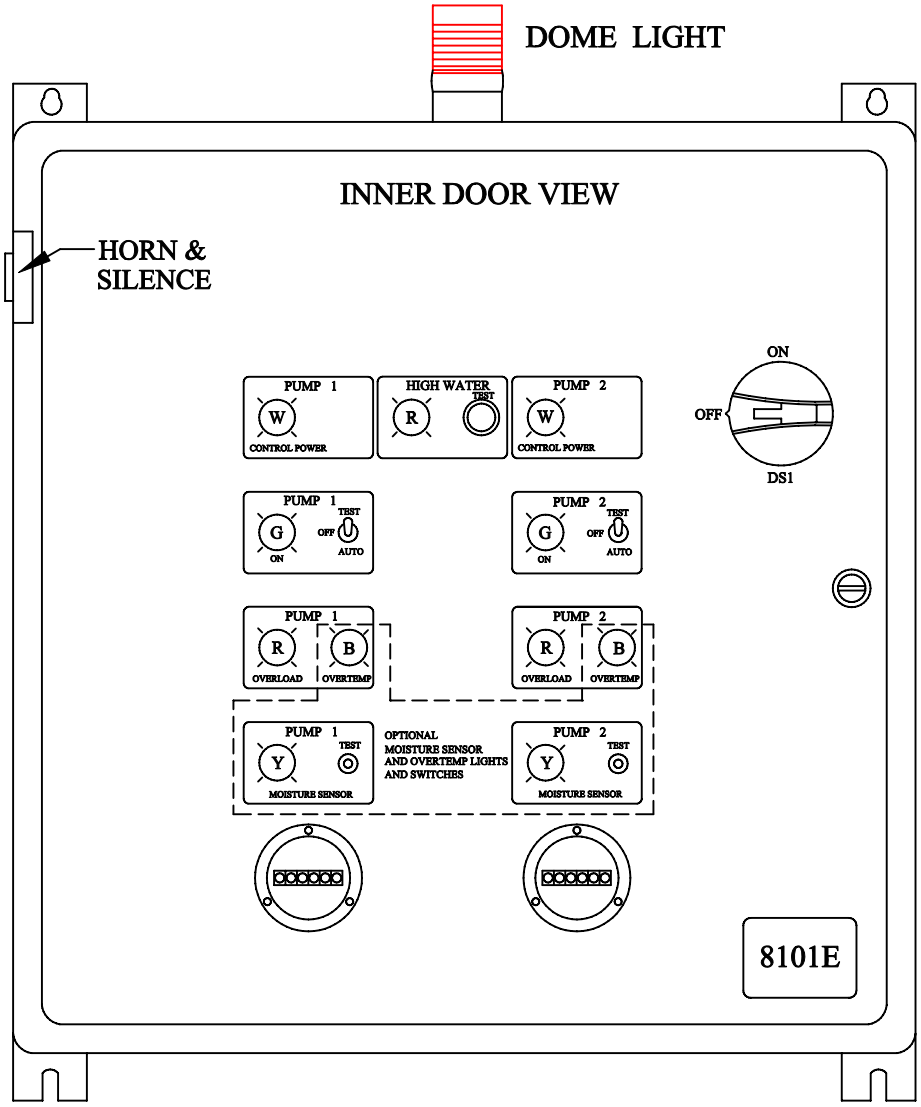
8100K7222D Option is for a duplex set of pumps with standard Non-Explosion-Proof Motors (9712 & 9725).
- Moisture sensor relay and test buttons only. Two yellow lights indicate moisture in the pump motor.

8100K7224D Option is for a duplex set of pumps with standard Non-Explosion-Proof Motors (9706, 9709, & 9727).
- Moisture sensor relay and test button. Two yellow lights indicate moisture in the pump motor.
- Temperature limiter circuit shuts down pump motor when motor temperature is sensed. The temperature limiter circuit automatically resets when the motor temperature falls to a normal temperature operating range. Two Blue lights indicates motor over temperature.

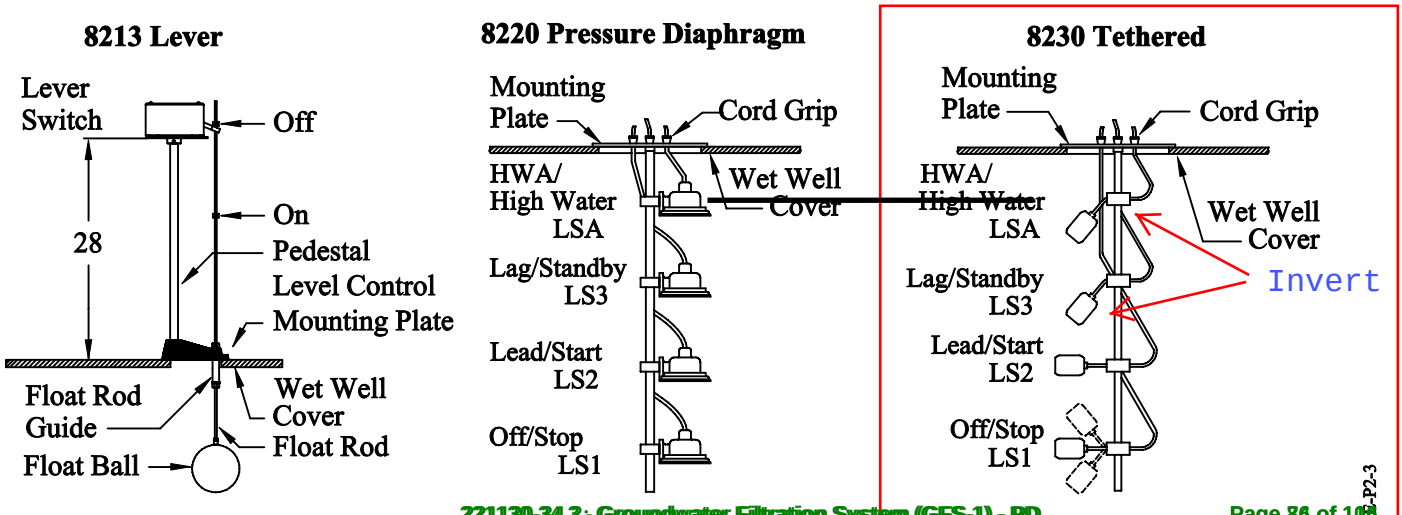
How to Order: Specify the Order Number, System Phase and Voltage, Pump Motor HP and any options.

F.O.B. Cedarburg (Milwaukee), Wisconsin

Submittal # 221130-11.0 BCH ID #: PUMP-SUMP-SK-B3-01



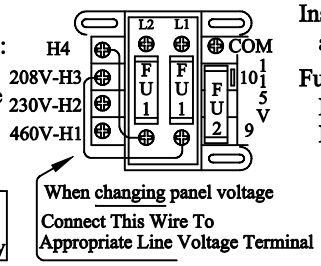
Use any of the three level controls with duplex control panel.



WEIL WI 4/17/2017 7:20 AM H8101E-T11 Schematic 3-Phase .dwg

PANEL NAME PLATE INCLUDES:
- -System Voltage
- -Motor Amp Range
- -MAX Panel Amps
- -Phase & HZ
- -Enclosure Type

Control Transformer Is Connected For Proper Line Voltage At Factory



Installer to Supply Branch Circuit Protection in accordance with NEC and local codes.

Fuses (LP-J or Equivalent) For Branch Circuit Protection 1.25 X Full load amps of both motors, Plus 2 Amps for C.P..

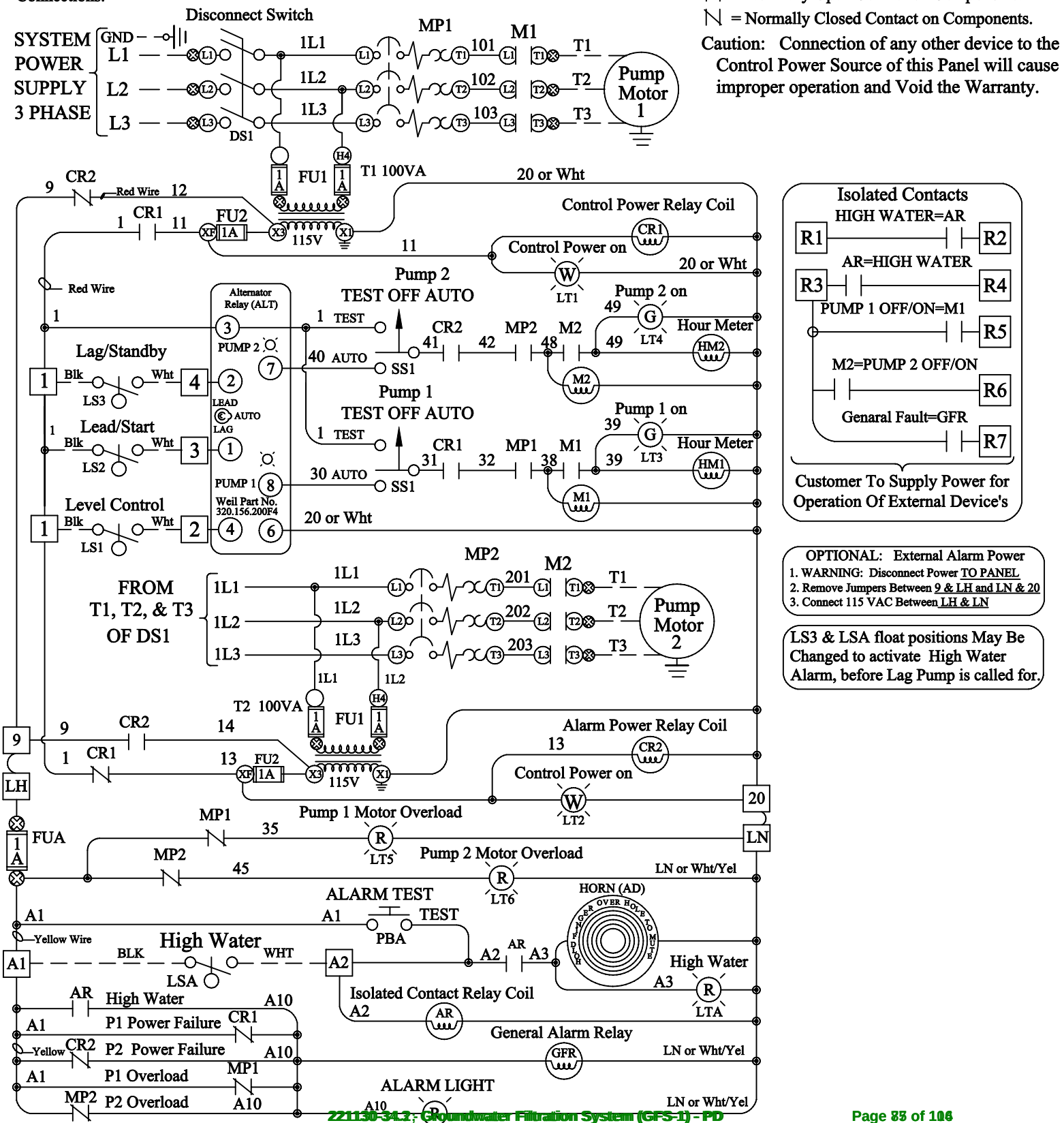
Wires are Individually Numbered.
M1 & M2 = Motor Contactors
MP1 & MP2 = Motor Circuit Protectors
SS1 & SS2 = Spring Return Test To Off
SS3 = Spring Return Test and Silence To Auto

Pump should rotate in the direction of the Arrow on the pump case. Change rotation of the pump at the control panel. Interchange wires:
T1 And T2 On M1 For Pump 1.
T1 And T2 On M2 For Pump 2.

= Component Coil
= Numbers on Terminal Blocks (TB1 or TB2).
= Numbers on Components.
= Normally Open Contact on Components.
= Normally Closed Contact on Components.

Caution: Connection of any other device to the Control Power Source of this Panel will cause improper operation and Void the Warranty.

Dotted lines (— — — —) represent Field Connections.



OPTIONAL: External Alarm Power
1. WARNING: Disconnect Power TO PANEL
2. Remove Jumpers Between 9 & LH and LN & 20
3. Connect 115 VAC Between LH & LN

LS3 & LSA float positions May Be Changed to activate High Water Alarm, before Lag Pump is called for.

WEIL

Round Wet Well Cover

Submersible 2613 Removal System Pumps

Includes

- Level control opening and plate for pressure diaphragm or tethered float switches.
  Plate has:
  - Coupling for level control pipe
  - Four cable holes for level controls
- Motor cable opening and plate for motor cables.
  Plate has:
  - Two pump power cable holes with cord grips
  - Two pump sensor cable holes with cord grips, if required.

CONFIRM

- Vent kit. Blank, 2, 3, or 4 inch.
- Hinged access door with handle and padlock hasp
- Upper guide rail bracket mounting holes
- Flange kits for above cover discharge pipes or blanking plates for below cover discharge openings.

Not Included

- Mounting hardware for perimeter of cover
- Level control pipe

Cover Selection

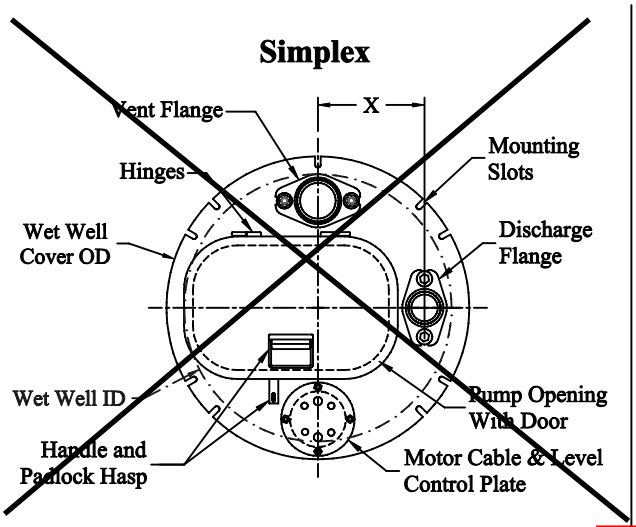
1. Determine the wet well size.
2. Identify pump system.
3. Identify level controls

Discharge Pipe Size:	2	3	4	6
(H) - Ctr/Ctr:	9	11	13	16

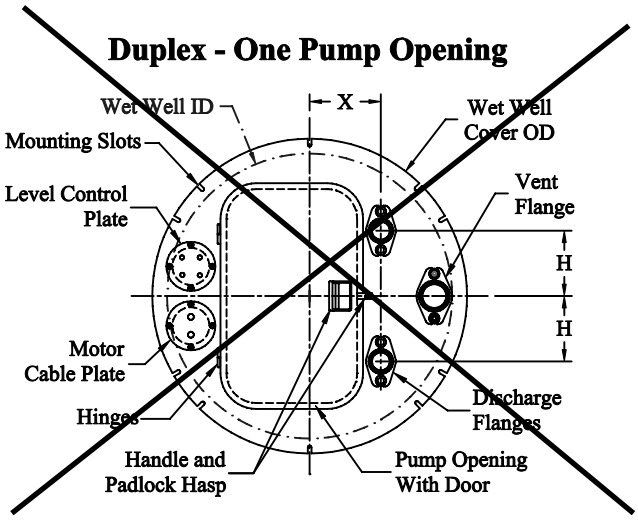
Spacing is for standard piping center to center inches

- Discharge spacing matches the 2613 Sub-Bases & the 2616 Isolation Valves
- Locations of vent, level control plate, and motor cable plate will vary.

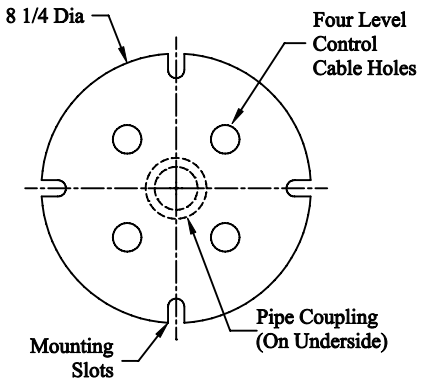
Simplex



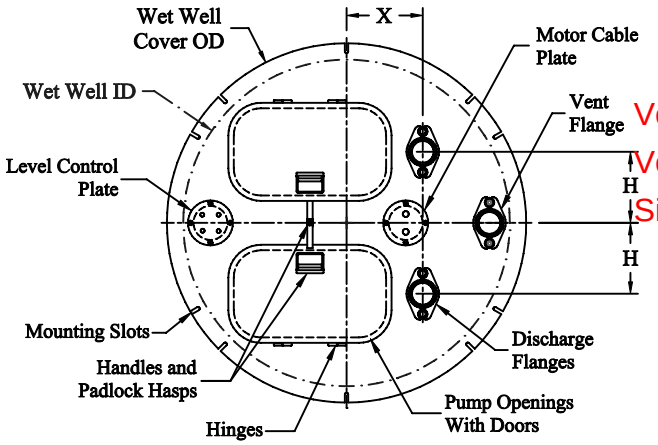
Duplex - One Pump Opening



Level Control Plate



Duplex - Two Pump Openings



Simplex

	Order Number	Wet Well Size	Cover Size	Disch Size	Matl Thick	Mtg. Holes	Bolt Circle	Dim X	Dim H	Pump Size	Opening Quanity	Weight Lbs	Drawing Number
A	8804K5002	24	28	2	0.375	(10) 5/8	26	9	--	12 x 18	1	80	D10998
	8804K5006	30	34	2	0.375	(10) 5/8	32.5	9	--	12 x 18	1	121	D10430
	8804K5021	30	34	3	0.375	(10) 5/8	32.5	11	--	14 x 22	1	123	D11000
	8804K5010	36	40	2	0.375	(10) 5/8	38.5	4	--	12 x 18	1	148	D10999
	8804K5025	36	40	3	0.375	(10) 5/8	38.5	10	--	14 x 22	1	150	D10997

For larger cover sizes use a **Duplex** cover and blank off one discharge

Duplex

	Order Number	Wet Well Size	Cover Size	Disch Size	Matl Thick	Mtg. Holes	Bolt Circle	Dim X	Dim H	Pump Size	Opening Quanity	Weight Lbs	Drawing Number
A	**8804K1326S**	36	40	2	0.375	(10) 5/8	38.5	11	9	18 x 30	1	148	D11084
	8804K1328	42	46	2	0.375	(10) 5/8	44	11	9	18 x 30	1	184	D10785
	8804K1330	42	46	3	0.375	(10) 5/8	44	12	11	22 x 36	1	196	D10711
	8804K1332S	48	53	2	0.375	(10) 5/8	51	11	9	18 x 30	1	256	D10786
	8804K1333S	48	53	3	0.375	(10) 5/8	51	12	11	22 x 36	1	264	D10712
B	8804K1334	48	53	4	0.375	(10) 5/8	51	14	13	16 x 23	2	272	D11089
	8804K2105	54	60	3	0.500	(10) 5/8	57	12	11	22 x 36	1	456	D10713
	8804K2005	54	60	4	0.500	(10) 5/8	57	14	13	16 x 28	2	477	D10722
	8804K2317	60	66	2	0.500	(10) 5/8	63	11	9	18 x 30	1	512	D11086
	8804K2111	60	66	3	0.500	(10) 5/8	63	12	11	22 x 36	1	528	D10705
	8804K1365	60	66	4	0.500	(10) 5/8	63	19	13	23 x 33	2	548	D11093
	8804K2321	72	78	2	0.500	(12) 3/4	75	11	9	18 x 30	1	708	D12292
	~~8804K1346~~	~~72~~	~~78~~	~~3~~	~~0.500~~	~~(12) 3/4~~	~~75~~	~~12~~	~~11~~	~~22 x 36~~	~~1~~	~~719~~	~~D11088~~
	8804K1367	72	78	4	0.500	(12) 3/4	75	19	13	23 x 33	2	726	D11783
	~~8804K1353~~	~~72~~	~~78~~	~~6~~	~~0.500~~	~~(12) 3/4~~	~~75~~	~~15~~	~~16~~	~~23 x 33~~	~~2~~	~~734~~	~~D10775~~

All dimensions are in **Inches**
S = Stocked Cover - Ships in 1 week (No Options)
A = level control holes drilled & tapped
B = For 7 inch case pumps only: 2517, 2523, 2535, 2534.

Note - Contact factory for pricing and avialability on:

- anti-slip (checkered steel)
- stainless steel (specify grade)
- extra openings
- non-standard sizes

Options

Order Number	Description
8800K7006	T-lock with handles with Key - per door
8800K7007	Flush Mounted Handles - per door
8800K7009	Below Cover Discharge

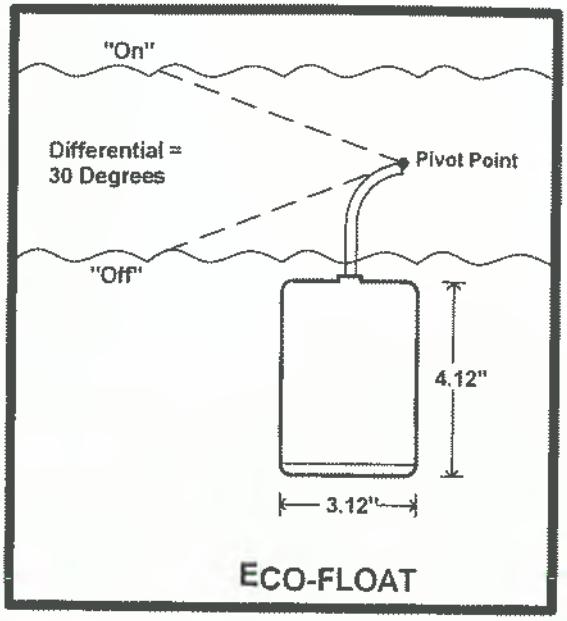
Option No.	Description	Wet Well Size - Inches							
		24	30	36	42	48	54	60	72
8800K7001	Galvanizing	A	A	A	A	A	A	A	A
8800K7003	Epoxy Paint	A	A	A	A	A	A	A	A
~~8800K7008~~	~~Gastight Sealent~~	A	A	A	A	----	----	----	----
8800K7008A	Gastight Sealent	----	----	----	----	A	A	A	A

A = Available

anchor scientific inc.
Box 378, Long Lake, MN 55356
952-473-7115 • FAX 952-473-6002 • www.anchorscientific.com

eco·float

Form 2600-A



Eco-Float

Description

The Eco-Float, (G style), is a mercury-free level switch for controlling liquid levels in a variety of applications. A snap action switch is activated by a ball rolling back and forth within a switching tube. The entire assembly is enclosed in a plastic float housing. There is a minimum differential between 'on' and 'off' of approximately 3.5 inches. Greater differentials can be achieved when the pipe mounted, (GP), or externally weighted, (GSE), versions are used. Various cable lengths, mounting styles, and circuit configurations are available and in stock.

Features

- Mercury Free
- Variety of Mounting Styles
- Variety of Circuit Configurations
- Replaces Mercury Float and Diaphragm Switches
- Differential Between 'On' and 'Off'

Applications

The Eco-Float can be used in a variety of liquid level monitoring applications, including lift stations, sumps, sewage ejectors, septic tanks, vaults, and tanks. Eco-Floats are ruggedly constructed of corrosion resistant material, which enable them to be used in a variety of different liquids. Some applications are subject to additional requirements described in the National Electric Code.

Specifications

Cable....18-2 or 18-3 SJOW 90° C. 41 x #34 copper .29D- 18-2; .31D- 18-3
Housing & Clamp.....Polypropylene 3" x 4.25"
Electrical Rating.....Standard 7A@ 120Vac; 3A @ 230Vac Std.
Eco-Float Gold Rating - .1A@ 120Vac (use with in intrinsically safe circuits; and very low energy circuits)
Temp Limit.....60° C. (water)

Ordering Information:

Specify

Model Series **G**

Mounting Style
SE Suspended, External weight
SI Suspended, Internal weight
P Pipe mounted

Cable Length **10, 15, 20, 30, 40, 50, 60** Ft.
Custom lengths available.

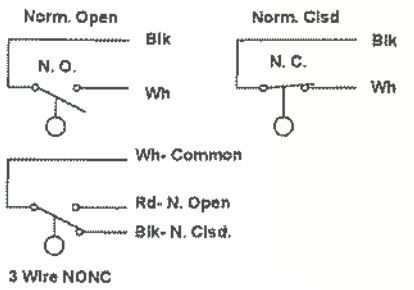
*Circuit configurations
NO Normally open (SPST)
NC Normally closed (SPST)
NONC Normally open/closed (DPST)

*For intrinsically safe applications use **NONC-Gold.**

Example:

GSI20NO

Eco-Float Suspended, Internally weighted, 20 ft. of cable, Normally open contacts.



FIBERGLASS BASIN DATA

fiberbasin inc.
620 S. ELMWOOD, AURORA, IL 60506
630/801-9770 FAX 801-9771
MAIL TO: PO BOX 1870 AURORA, IL 6050

F-4731
JUNE, 1996

TYPE OF SERVICE (✓)	
▶ SEWAGE OR SUMP (STANDARD)	☐ CONDENSATE (SPECIFY MAX. TEMP. ____°F)

DATA ON BASIN OPENINGS							
REQ'D INLET LOCATIONS REFER TO FIGURE 9 (TOP VIEW)	A						
"L" DISTANCE TO CENTER OF INLET	FIELD MEASURED						
TYPE INLET REQ'D REFER TO FIGURE NO.							
INLET PIPE SIZE							

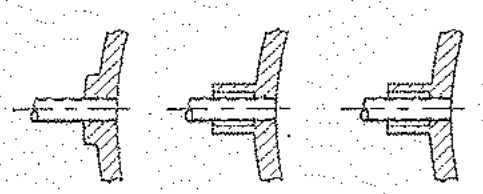


Fig. 1 THREADED INLET | Fig. 2 HUBBED & THREADED INLET | Fig. 3 HUBBED INLET (STD)

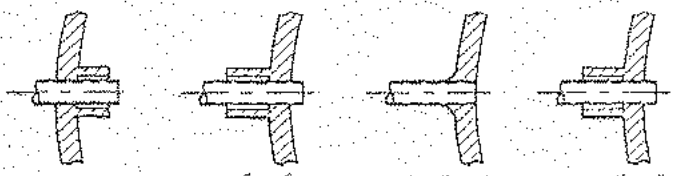
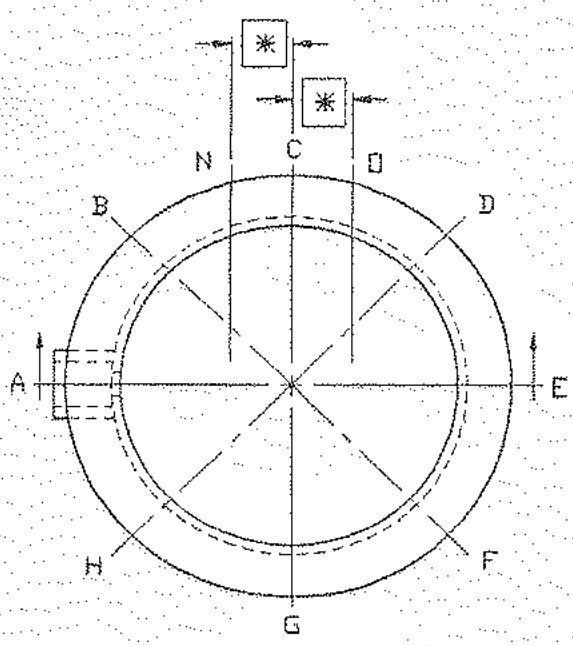


Fig. 4 HUBBED INLET (INSIDE) | Fig. 5 PARALLEL PUMP DISCHARGE RUNS-"N" & "O" LOCATIONS (SEE NOTE 3) | Fig. 6 FRP "NO HUB" INLET | Fig. 7 "PASS THROUGH" HUBBED INLET



TOP VIEW

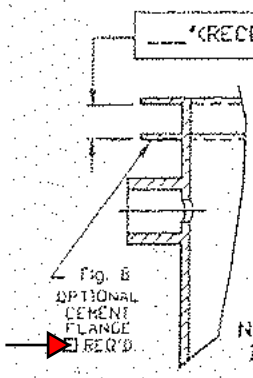
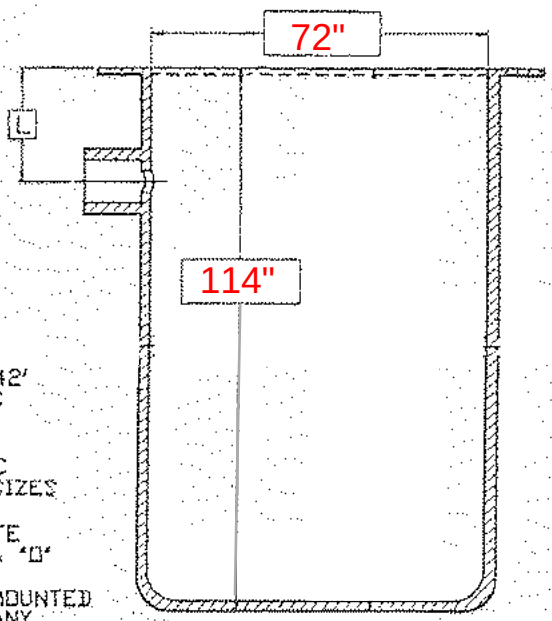


Fig. 8 OPTIONAL CEMENT FLANGE (IF REQ'D)

HUBBED INLET DIMS				
PIPE SIZE	3	4	6	8
"L" MIN.	7	7 1/2	9	10
INSIDE DIA.				



SECTION A-E
Fig. 9

NOTES:
1. AVAILABLE DIAMETERS: 18", 24", 30", 36", 42" 48", 60", 72", & 96". FOR OTHER DIAMETERS CONSULT FACTORY.
2. BASINS ARE CONSTRUCTED IN ONE SECTION UNLESS OTHERWISE SPECIFIED. IF SPECIFIC LENGTHS OF SECTIONS ARE REQ'D, ENTER SIZES IN BLANKS IN FIG. 9, SECTION A-E.
3. WHEN FIG. 5 ARRANGEMENT IS REQ'D, LOCATE ALL OTHER OPENINGS IN RELATION TO "N" & "O" LOCATIONS.
4. ALL ABOVE INLETS ARE FRP MATERIAL & MOUNTED AT OUR PLANT. CONTACT FIBERBASIN FOR ANY FRP "KIT TYPE" REQUIREMENTS.

Verify Inlet Hub Size_____

GROUND WATER FILTRATION SYSTEM
DUPLEX SUMP PUMP
(SP-2)

Submittal #22 11 30-37.1
22 11 30 - Plumbing Drainage and Venting Systems

Suffolk Construction Company, Inc.
65 Allerton Street
Boston, Massachusetts 02119
Phone: (617) 445-3500
Fax: (617) 541-2128

Project: 217031 - Hale Family Clinical Building
53 Binney Street
Boston, Massachusetts 02115

Duplex Sump Pump SP-2

SPEC SECTION:	22 11 30 - Plumbing Drainage and Venting Systems	**SUBMITTAL MANAGER:**	Kyle Reilly **(Suffolk Construction Company Inc.)**
STATUS:	Open	**DATE CREATED:**	03/26/2018
ISSUE DATE:	03/26/2018	**REVISION:**	1
RESPONSIBLE CONTRACTOR:	American Plumbing & Heating (NORWELL)	**RECEIVED FROM:**	Andrew Collins
RECEIVED DATE:		**SUBMIT BY:**	04/9/2018
FINAL DUE DATE:	04/11/2018	**LOCATION:**	BCCB
TYPE:	Product Data	**COST CODE:**	
APPROVERS:	Kyle Reilly **(Suffolk Construction Company Inc.)**, Shepley CA Admin Bulfinch **(Shepley Bulfinch)**, Kyle Reilly **(Suffolk Construction Company Inc.)**		

BALL IN COURT:
Kyle Reilly **(Suffolk Construction Company Inc.)**

DISTRIBUTION:
Shepley CA Admin Bulfinch **(Shepley Bulfinch)** , Todd Sampson **(R.W. Sullivan Engineering (BOSTON))** , David Lee **(R.W. Sullivan Engineering (BOSTON))** , Michael Gailey **(Shepley Bulfinch)** , Edward Tobin **(Suffolk Construction Company Inc.)** , Jim Chambers **(Shepley Bulfinch)** , Craig Allhusen **(Boston Children's Hospital)** , Steve Smith **(Boston Children's Hospital)** , David Parenteau **(Suffolk Construction Company Inc.)** , Meagan Corcoran **(Suffolk Construction Company Inc.)** , Jason Seaburg **(Suffolk Construction Company Inc.)** , Jason Lansberry **(Suffolk Construction Company Inc.)** , Robb Connor **(Shepley Bulfinch)** , Jane Galli **(Shepley Bulfinch)** , Sabrina Hill **(Suffolk Construction Company Inc.)** , Kevin Malenchini **(Suffolk Construction Company Inc.)** , Griffin Pharr **(Suffolk Construction Company Inc.)** , Larry Malloy **(Suffolk Construction Company Inc.)** , Rob Morsi **(Suffolk Construction Company Inc.)** , Jonathan Paquette **(Suffolk Construction Company Inc.)** , George Player **(Suffolk Construction Company Inc.)** , Angela Tafone **(Suffolk Construction Company Inc.)** , Kurt Victor **(Suffolk Construction Company Inc.)** , John Sanderson **(Bard, Rao + Athanas Consulting Enigneers)** , Mark Finneral **(Shepley Bulfinch)** , Paul Capuzzo **(Boston Children's Hospital)** , Tom Susko **(Shepley Bulfinch)** , Albertus Mertoguno **(Shepley Bulfinch)** , Anne Yong **(Shepley Bulfinch)** , Bill Riley **(Shepley Bulfinch)** , Kevin Horne **(Suffolk Construction Company Inc.)** , Rachel Wein **(Shepley Bulfinch)** , BR+A CA ADMIN **(Bard, Rao + Athanas Consulting Enigneers)**

DESCRIPTION:

ATTACHMENTS:

SUBMITTAL WORKFLOW

NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
Andrew Collins	Submitter		4/9/2018	3/27/2018	Submitted	221130 - 2.7 Duplex Sump Pump (SP-2) RR.pdf	
Kyle Reilly	Approver	3/27/2018	3/28/2018	3/28/2018	Approved	221130-37.1 - Duplex Sump Pump (SP-2).pdf	
Shepley CA Admin Bulfinch	Approver	3/28/2018	4/11/2018	4/17/2018	Approved As Noted	221130-37-1-Duplex Sump pump SP-2_AAN_response.pdf	**Approved as noted**
Kyle Reilly	Approver	4/17/2018	4/11/2018		Pending		

Submittal #22 11 30-37.1
22 11 30 - Plumbing Drainage and Venting Systems

BY	DATE	COPIES TO

R.W.Sullivan Engineering
MEP/FP Engineering . Code . Commissioning

Submittal Transmittal

R.W. Sullivan, Inc. | 529 Main Street, Suite 203 Boston MA 02129-1107 United States

PROJECT:	BCH BCCB 150063	DATE SENT:	4/12/2018
SUBJECT:	04785.000 - Submittal Forwarded - 221130-37.1 - Duplex Sump Pump SP-2 - BCH BCCB - Submittal:221130-37.1 :cWBYj	SUBMITTAL ID:	150063-00-019R1
TYPE:	Submittal	TRANSMITTAL ID:	00196
PURPOSE:	Accepted as Noted	VIA:	Email
SPEC SECTION:	150063-00		

FROM

NAME	COMPANY	EMAIL	PHONE
David Lee	R.W. Sullivan, Inc.	dsl@rwsullivan.com	617-523-8227

TO

NAME	COMPANY	EMAIL	PHONE
BCCB-CA		BCCB-CA@shepleybulfinch.com	

APPROVED FOR CONFORMANCE TO THE DESIGN CONCEPT AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTIANED IN THE CONSTRUCTION DOCUMENTS.

X APPROVED, EXCEPT AS NOTED. RESUBMISSION NOT REQUIRED.

APPROVED, EXCEPT AS NOTED. RESUBMIT FOR RECORD.

REVIEWED. REFERENCE CONSULTANT STAMP FOR ACTION REQUIRED.

REVISE AND RESUBMIT.

REJECTED.

FILE COPY. INFORMATIONAL SUBMITTAL FOR RECORD PURPOSES.

BY: Michael Gailey DATE: 4/17/2018

SHEPLEY BULFINCH

☑ NO EXCEPTION TAKEN
☑ ACCEPTED AS NOTED
☐ REJECTED
☐ SUBMIT SPECIFIED ITEM
☐ REVISE-NO RESUBMISSION REQUIRED
☐ REVISE & RESUBMIT
☐ RETURNED WITHOUT ACTION
☐ REVIEWED

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general comformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: continuing and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating their work with that of all other trades, and performing their work in a safe and satisfactory manner.

ROBERT W. SULLIVAN, INC.
Consulting Engineers
By: DSL Date: 4-12-18

SUBMITTAL VI

ro ect:	BCH BCCH	**S :**	150063
Submittal:	Duple sump pump SP-2	**Submittal :**	150063-00-019R1
Sub Contractor:	Suffolk Construction	**Architect:**	Shepley Bulfinch
eviewer:	David Lee	**Architect/ C :**	221130-2.7.0
Date:	2018-03-28	**S ec Section:**	221130

Plumbing	See Comments Below
HVAC	Not Applicable
Electrical	Not Applicable
Fire Protection	Not Applicable

IT M	STATUS	VI C MM NTS
~~WEIL 1622 Sump Pump~~	~~R R~~	~~Specified/Submitted pump is too large based on latest GeoTech filtration system re uirements. Provide Weil 1607 duple submersible pumps rated for 20gpm at 28 Ft TDH.~~
I L Sum um	AAN	Vent size shall be 2 . Inlet size shall be 4
2 Removal System 2613K1021	NET	
Pump Control Panel 8101E	NET	
Float System 8230 Tetherd	NET	
Round Wet Well Cover 8804K1326	NET	

N T N C TI N TA N
AAN ACC T D AS N T D
CT D
SSI SUBMIT S CI I D IT M

N VIS N SUBMISSI N
VIS AND SUBMIT
A TU N D ITH UT ACTI N
eviewed eview for conformance with the conce t of the ro ect

All comments must be addressed in writing by the Contractor.

Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the re uirements of the drawings and specifications. This check is only for review of the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming, correlating and coordination of all uantities and dimensions; selecting fabrication processes and techni ues of construction (means and methods); coordination of his work with that of all of the other trades; and performing his work in compliance with all pertinent codes in a safe manner.

K: 2015 150063-00 5 CA Submittals Plumbing 150063-00-019R1-221130-37-1-Duple Sump pump SP-2\150063-00-019R1-221130-37-1-Duplex Sump pump SP-2.docx

Submittal Transmittal

To:

R.W. Sullivan Engineering
Todd Sampson
529 Main St #203
Boston MA 02129
United States

R.W. Sullivan Engineering
David Lee
The Schrafft Center
529 Main Street, Suite 203
Boston, MA 02129-1107
United States of America

Robert W. Sullivan Engineering
Jennifer Shepherd
The Schrafft Center
529 Main Street, Suite 203
Boston, MA 02129

Subject: Duplex Sump Pump SP-2

Date: 3/28/2018

Due Back:

Project No.: 04785.000

Qty	No.	Date	Action	Description
1		3/28/2018		221130-37.1 - Duplex Sump Pump (SP-2) (1).pdf

Remarks:

BCH - BCCB

More details: View online | View PDF

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Please click on the "View Online" link in this Email to reply to this Submittal in Proc

Need help responding to this Submittal? Learn how in under a minute by watching this short training video.

Kyle Reilly requires action from you on this subm

Project:	BCH - BCCB
Spec Section:	22 11 30 - Plumbing Drainage and Venting Systems
Submittal #:	22 11 30-37.1
Title:	Duplex Sump Pump SP-2
Type:	Product Data
Responsible Contractor:	American Plumbing & Heating (NORWELL)
Received From:	Andrew Collins
Ball In Court:	Shepley CA Admin Bulfinch
Submitter:	Collins, Andrew (American Plumbing & Heating (NOR'
Approvers:	Reilly, Kyle (Suffolk Construction Company Inc.) Bulfinch , Shepley CA Admin (Shepley Bulfinch) Reilly, Kyle (Suffolk Construction Company Inc.)
Distribution:	Allhusen, Craig (Boston Children's Hospital) Bulfinch , Shepley CA Admin (Shepley Bulfinch) CA ADMIN, BR+A (Bard, Rao + Athanas Consulting E LLC (BOSTON)) Capuzzo, Paul (Boston Children's Hospital) Chambers, Jim (Shepley Bulfinch) Connor, Robb (Shepley Bulfinch) Corcoran, Meagan (Suffolk Construction Company Inc Finneral, Mark (Shepley Bulfinch) Gailey, Michael (Shepley Bulfinch) Galli, Jane (Shepley Bulfinch) Hill, Sabrina (Suffolk Construction Company Inc.) Horne, Kevin (Suffolk Construction Company Inc.)

	Lansberry, Jason (Suffolk Construction Company Inc.) Lee, David (R.W. Sullivan Engineering (BOSTON)) Malenchini, Kevin (Suffolk Construction Company Inc. Malloy, Larry (Suffolk Construction Company Inc.) Mertoguno, Albertus (Shepley Bulfinch) Morsi, Rob (Suffolk Construction Company Inc.) Paquette, Jonathan (Suffolk Construction Company In Parenteau, David (Suffolk Construction Company Inc.) Pharr, Griffin (Suffolk Construction Company Inc.) Player, George (Suffolk Construction Company Inc.) Riley, Bill (Shepley Bulfinch) Sampson, Todd (R.W. Sullivan Engineering (BOSTON Sanderson, John (Bard, Rao + Athanas Consulting En LLC (BOSTON)) Seaburg, Jason (Suffolk Construction Company Inc.) Smith, Steve (Boston Children's Hospital) Susko, Tom (Shepley Bulfinch) Tafone, Angela (Suffolk Construction Company Inc.) Tobin, Edward (Suffolk Construction Company Inc.) Victor, Kurt (Suffolk Construction Company Inc.) Wein, Rachel (Shepley Bulfinch) Yong, Anne (Shepley Bulfinch)
Final Due Date:	04/11/18
Attachments:	None
Design Team Review Time:	14 day(s)
Internal Review Time:	7 day(s)
Submitter:	Collins, Andrew (American Plumbing & Heating (NOR'
Date:	Sent: Returned: 03/27/18
Response:	Submitted
Attachments:	221130 - 2.7 Duplex Sump Pump (SP-2) RR.pdf
Comments:	None
Approver:	Reilly, Kyle (Suffolk Construction Company Inc.)
Date:	Sent: 03/27/18 Returned: 03/28/18
Response:	Approved
Attachments:	221130-37.1 - Duplex Sump Pump (SP-2).pdf
Comments:	None
Approver:	Bulfinch , Shepley CA Admin (Shepley Bulfinch)

Date:	**Sent:** **Returned:**
Response:	**Pending**
Attachments:	**None**
Comments:	**None**
Approver:	**Reilly, Kyle (Suffolk Construction Company Inc.)**
Date:	**Sent:** **Returned:**
Response:	**Pending**
Attachments:	**None**
Comments:	**None**

Copies: Michael Gailey
Rachel Wein

By: _____
bccb-ca@shepleybulfinch.com

Submittal #22 11 30-37.1
22 11 30 - Plumbing Drainage and Venting Systems

Suffolk Construction Company, Inc.
65 Allerton Street
Boston, Massachusetts 02119
Phone: (617) 445-3500
Fax: (617) 541-2128

Project: 217031 - BCH - BCCB
300 Longwood Ave
Boston, Massachusetts 02115

Duplex Sump Pump SP-2

SPEC SECTION:	22 11 30 - Plumbing Drainage and Venting Systems	**SUBMITTAL MANAGER:**	Kyle Reilly **(Suffolk Construction Company Inc.)**
STATUS:	Open	**DATE CREATED:**	03/26/2018
ISSUE DATE:	03/26/2018	**REVISION:**	1
RESPONSIBLE CONTRACTOR:	American Plumbing & Heating (NORWELL)	**RECEIVED FROM:**	Andrew Collins
RECEIVED DATE:		**SUBMIT BY:**	04/9/2018
FINAL DUE DATE:	04/11/2018	**LOCATION:**	BCCB
TYPE:	Product Data	**COST CODE:**	
APPROVERS:	Shepley CA Admin Bulfinch **(Shepley Bulfinch)**, Kyle Reilly **(Suffolk Construction Company Inc.)**, Kyle Reilly **(Suffolk Construction Company Inc.)**		

BALL IN COURT:
Kyle Reilly **(Suffolk Construction Company Inc.)**

DISTRIBUTION:
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DESCRIPTION:

ATTACHMENTS:

SUBMITTAL WORKFLOW

NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
Andrew Collins	Submitter		4/9/2018	3/27/2018	Submitted	221130 - 2.7 Duplex Sump Pump (SP-2) RR.pdf	
Kyle Reilly	Approver	3/27/2018	3/28/2018		Pending		
Shepley CA Admin Bulfinch	Approver		4/11/2018		Pending		
Kyle Reilly	Approver		4/11/2018		Pending		

BY **DATE** **COPIES TO**

American Plumbing & Heating Corp.
1000 Cordwainer Drive
Norwell, MA 02061
Ph : (781) 347-9200

Submittal

Job: 7329-C-P
Boston Children's Clinical Bld
300 Longwood Ave
Boston, MA

Spec Section No: 221130
Submittal No: 1
Revision No: 0
Sent Date: 1/25/2018

Spec Section Title:

Submittal Title: 2.7 - Duplex Sump Pump (SP-2)

Contractor:
American Plumbing & Heating Corp.
James P. Bent

Contractor's Stamp

Other:
Suffolk Construction Co. Inc.
Jonathan Paquette

Architect's Stamp

SUFFOLK CONSTRUCTION CO. INC REVIEWED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

THE SUBCONTRACTOR/VENDOR IS RESPONSIBLE FOR ALL DIMENSIONS, CORRECT FIT AND COORDINATION OF ALL ITEMS TO BE FURNISHED AND INSTALLED

BY:	DATE:
KR	03/28/2018
JOB #:	JOB NAME:
217031	BCH - BCCB

SUBMITTAL #: 22 11 30-37.1

SPEC/DRWG REF:

REVIEWED FOR CONSTRUCTIBILITY

Engineer's Stamp

Duplex Sump Pump
SP-2

221130 - 2.7

RE-SUBMITTAL
For

Boston Children's Clinical Bldg.
Boston, MA

SP-2 Weil Sump Pumps Model 1607

Please provide inlet size for basin _____
Please provide vent size for cover _____

March 12, 2018

Approved for Production: _____ Date: _____

Signature: _____
Print Name: _____

Gustavo Preston Company
23 Industrial Ave.
Chelmsford, MA 01824
978-250-3333

WEIL PUMP COMPANY

GUSTAVO PRESTON COMPANY
23 INDUSTRIAL AVE
CHELMSFORD, MA 01824
978-250-3333

CENTRIFUGAL PUMPS
SUBMERSIBLE & VERTICAL
SEWAGE & SUMP PUMPS
CONTROLS & PANELS

DATA SHEET

3/12/2018

JOB: Boston Childrens Clinical Bldg
Boston MA

ENGINEER: RW Sullivan - David Lee

CONTRACTOR: American Plumbing

REFERENCE: SP-2 SUMP 2

ITEM: SP-2 1607 Sump (Sump-SK-B3-02)

MODEL: 1607 SERIES 1600

SCCI Note:
BCH ID #:
PUMP-SUMP-SK-B3-02

PUMP: WEIL DUPLEX 1607
SUBMERSIBLE SUMP WITH 35' POWER CORD 2"DISCHARGE

CAPACITY/HEAD: 20 GPM @ 28 FEET TDH

MOTOR: 0.75 HP, 480 VOLTS, 3 PHASE, 1750 RPM

CONTROLS: 4 - FLOAT SWITCHES SUSPENDED FROM COVER

1 - 8101E NEMA 4 DDDF DUPLEX CONTROL PANEL TO INCLUDE THE FOLLOWING:

2 - COMB. MANUAL DISCONNECT & MOTOR CIRCUIT PROTECTOR
2 - MAGNETIC STARTERS
2 - SELECTOR SWITCHES
2 - PILOT LIGHTS
1 - AUTOMATIC ALTERNATOR
2 - CONTROL CIRCUIT TRANSFORMER
1 - ALARM BELL W/SILENCER, 120V
1 - NUMBERED AND WIRED TERMINAL STRIP
1 - SET(S) OF ISOLATED CONTACTS FOR REMOTE ALARM

BASIN: 36" DIA X 114" (9'-6") DEEP FIBERGLASS BASIN WITH INLET HUB AND ANCHOR FLANGE

COVER: 40" ROUND STEEL COVER WITH ALL NECESSARY OPENINGS AND 4" VENT

REMOVAL SYSTEM: 2613-2 CI WITH SS LIFTING CABLES

SYSTEM NOTES: Quoted as per MEP Fit-out Bid Set Specification Section 221130 Part 2.5, Schedule P012 Bulletin 008 & Drawing P003 (Infrastructure) dated 9-1-17.
EXCEPTIONS TAKEN: * ALL FLOAT AND POWER WIRING TO BE DONE BY THE SITE LICENSED ELECTRICAL CONTRACTOR - PRICING NOT INCLUDED
* Pricing Subject to Signed Submittals.
* MUST VERIFY INLET HUB SIZE____
* MUST VERIFY VENT SIZE___
** Exception to 8167 Control panel specified - quoted 8101E control panel to provide two independant control circuits as required by specification, per Sean Farrell reccomendation.

WEIL 2-Inch Submersible Wastewater Pump

Heavy duty pump for commercial and industrial applications.
Pump clear water and gray water with solids up to 1/2-inch diameter.

Disch. Size	2 Inch
Disch. Type	ANSI
Solids Max.	1/2 Inch
Mounting Style	2613 Removal

Pump

Case - Cast Iron
Impeller - Cast Iron
Stainless Steel Hardware
Strainer - 304 Stainless Steel

Motor

Double Seal - Tandem
- Upper - Carbon against Ceramic
- Lower - Silicon Carbide against Silicon Carbide

Air-Filled Hermetically Sealed
Shaft - Stainless Steel Series 300
Motor Shell - Cast Iron
Insulation - Class F
Ball Bearings - 2 - Double Sealed
Power Cable Length - ~~25 ft~~ 35 Ft

Three-phase motor
- ~~1150 and~~ 1750 RPM
- 60 Hz, ~~208-230~~ or 460 volts

Single-phase capacitor start motor
- 1150 and 1750 RPM
- 60 Hz, 115 or 208-230 volts
- Automatic reset thermal and overload protection

Options

Bronze Impeller
UL Explosion Proof Motor
Moisture Sensor and Temperature Limiter
Additional Power Cable Lengths
Stainless Steel Lifting Cable

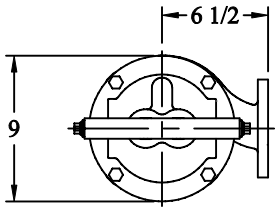
Flow - To prevent solids from settling out

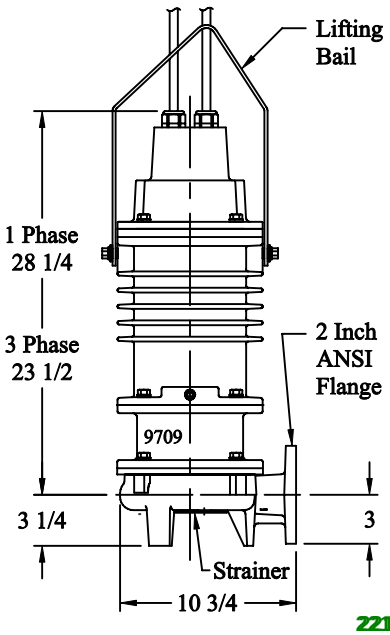
Discharge Pipe Size Dia Inches	Minimum Flow GPM
1 1/2	15
2	25
3	50

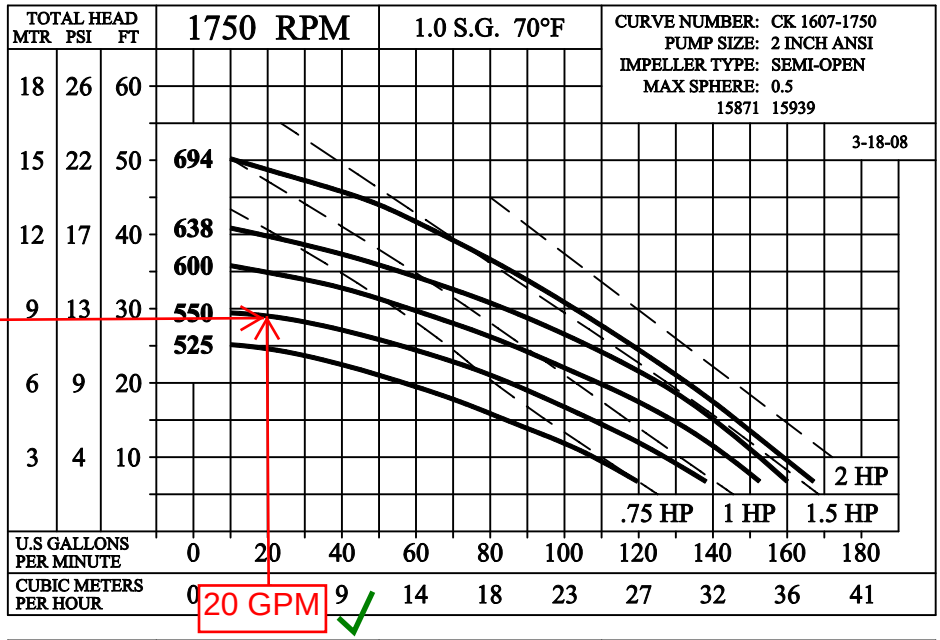
Capacities - Wet Wells

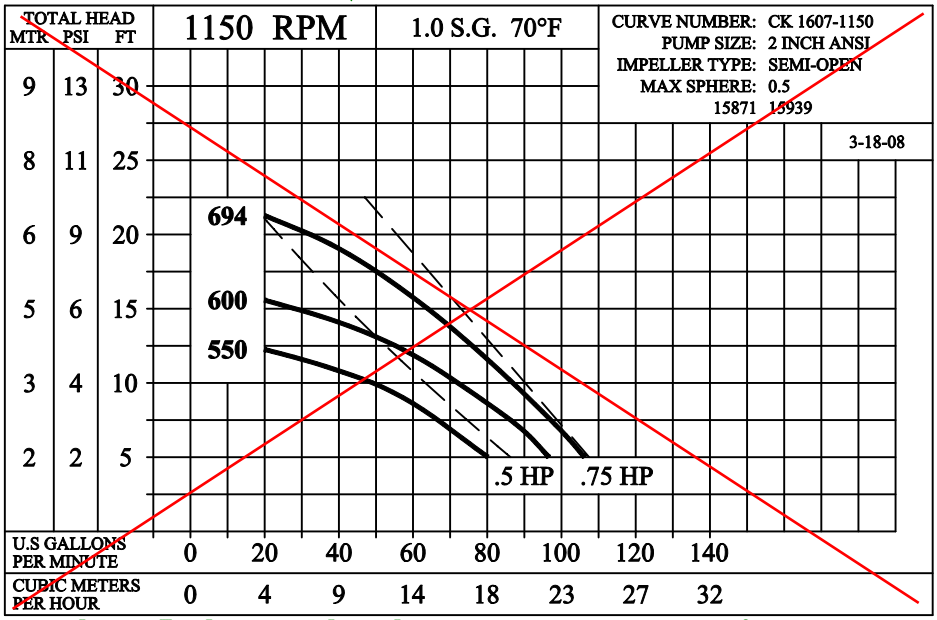
Dia or Side Inches	Gallons per Foot of Depth	
	Round	Square
24	24	30
30	37	47
36	53	67
48	94	120
60	147	187
72	212	269

Good wet well design
Maximum 10 starts per hour.
Minimum run time - 1 1/2 minutes.





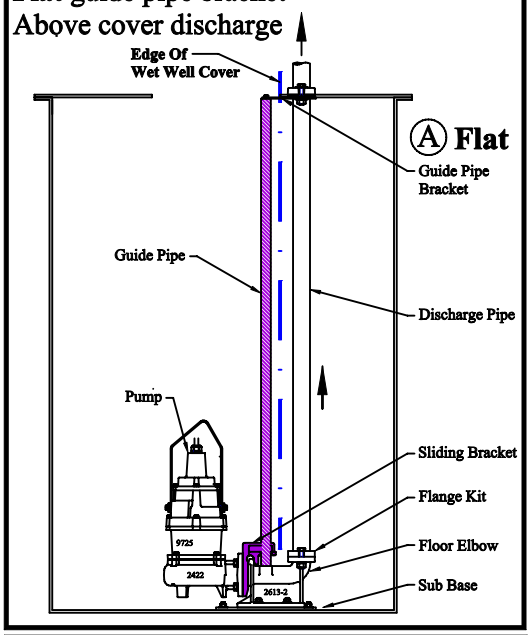




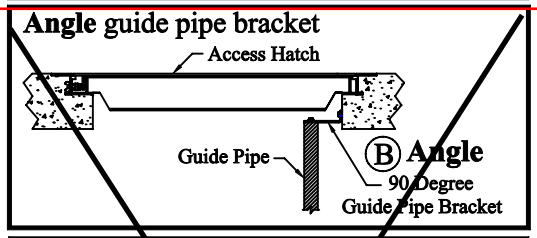
WEIL 2 Inch Removal System ✓2613-2

March 23, 2017

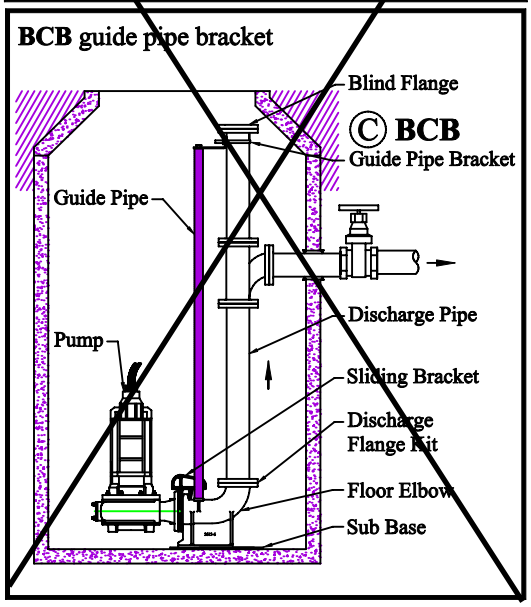
Flat guide pipe bracket
Above cover discharge



Angle guide pipe bracket



BCB guide pipe bracket



System Includes:

- Discharge Floor Elbow - one
- Sliding Bracket - one
  - Iron or
  - Bronze for use with Explosion Proof Motors
    - 316 Stainless Steel
- Guide Pipe Bracket - one
  - Ⓐ- Flat (cover mount) - bolts to wet well cover or
  - Ⓑ- Angle 90° (side mount) bolts to vertical side wall or
  - Ⓒ- BCB Bracket - mounts to discharge pipe

Not Included:

- Discharge Pipe - (2 inch schedule 40), Guide Pipe - (1 inch schedule 40)

Options:

- Discharge Flange Kit for Floor Elbow
- Intermediate Guide Pipe Bracket
- Sub Base for Floor Elbow
- Level Control Lifting Assembly for BCB Duplex Bracket

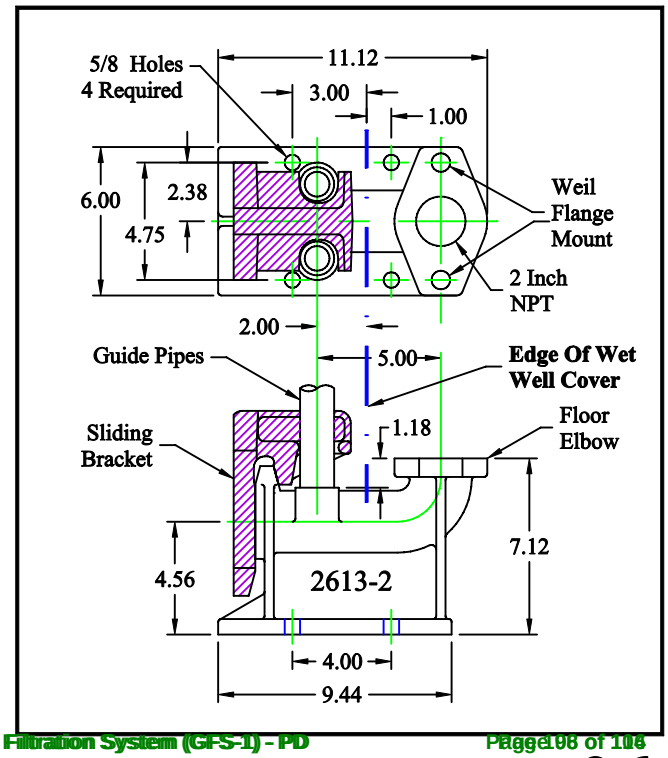
Removal System:

DUPLEX ~~Simplex~~

Order Number	Floor Elbow	Sliding Bracket	Guide Pipe Bracket	Mount Type	Weight Lbs.
2613K1021	Iron	Iron	Flat	Cover	42
2613K2021	Iron	Bronze	Flat	Cover	42
2613K9102	316 SS	316 SS	Flat	Cover	42
2613K5013	Iron	Iron	Angle	Side	42
2613K6032	Iron	Bronze	Angle	Side	42
2613K9122	316 SS	316 SS	Angle	Side	42
2613K3021	Iron	Iron	BCB	Pipe	42
2613K4021	Iron	Bronze	BCB	Pipe	42
2613K9132	316 SS	316 SS	BCB	Pipe	42

Duplex - BCB System

Order Number	Floor Elbow	Sliding Bracket	Guide Pipe Bracket	Mount Type	Weight Lbs.
2613K7021	Iron	Iron	Pipe	BCB	84
2613K7031	Iron	Bronze	Pipe	BCB	84
2613K9722	316 SS	316 SS	Pipe	BCB	84



Discharge Flange Kit - For Floor Elbow

Includes - Flange, Gasket and Hardware
Weil = 2 bolt oval configuration

Order Number	Material	Pipe Type	Flange Type
2613K102	Cast Iron	Threaded	Weil
2613K202	Cast Iron	Plain End	Weil
2613K942	316 SS	Plain End	Weil

Intermediate Guide Pipe Bracket:

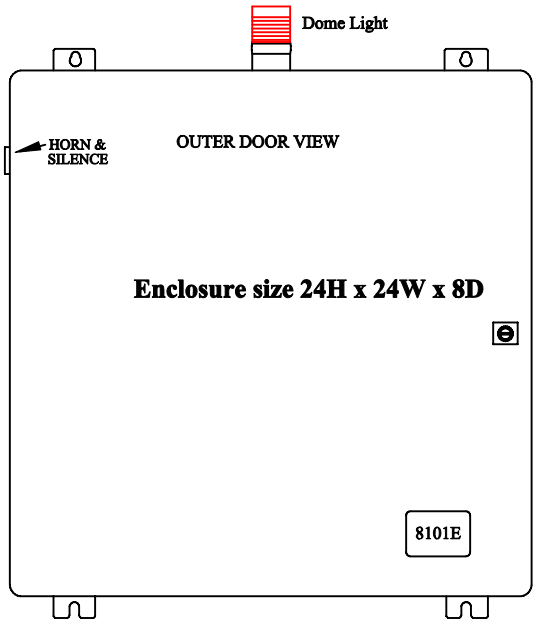
205.666.002	Intermediate Guide Pipe Bracket

WEIL Duplex Alternating Pump Control Panel 8101E

Two Independent Control Circuits
Type 4 Double Door Dead Front Enclosure

Duplex ✓

- The 8101E Duplex panel has complete electrical separation of the control circuits for both pumps. It is a specification grade panel that utilizes single-pole level controls.
- Each pump has an independent control circuit power supply. Each pump control circuit also serves as backup for the other pump control circuit.
- Panel can be operated at 50 or 60 Hertz power.
- Type 4 enclosure for indoor or outdoor use. Provides protection against falling rain, splashing water or hose directed water; undamaged by the formation of ice on the enclosure.
- Exceeds Type 1, 3R and 12 requirements.
- Select level controls
  - 8213 Lever
  - 8220 Pressure Diaphragm
  - 8230 Tethered Float
- Requires one 8213 lever or four 8220 or 8230 level switches - three switches for level control and one switch for the high water.



Panel Includes

- U/L Listed Label
- LED Lights, hour meter, switches, and test buttons are on inner door.
- One lockable panel disconnect; through-the-door with door interlock on inner door. The mechanical interlock prevents the door from being opened when the disconnect is in the ON position. Lock is not provided.
- Padlocking hasp - on outer door, padlock not included.
- Two Industrial duty contactors.
- Two lockable pump disconnects, on motor overload protectors. Lock is not provided.
- Electric Alternator has a 3 position selector switch; that locks the pumps in Auto, Pump 1-2 or Pump 2-1 sequencing.
- Two Overloads - one per pump. Ambient compensated bimetallic (Class 10) motor overload circuit protector. Instantaneous magnetic trip for short circuit protection. Single-phase short circuit protection for three-phase motors. Field adjustable within the amp range.
- Two Control transformers with fused primary and fused secondary on all three-phase and single-phase 208 and 230-volt. Single-phase 115-volt has two fused control circuits.
- Pump run switches - one per pump. Three position TOA (test-off-automatic) with spring return to off from test.
- Green light indicates power to pump motor. One light per pump.
- White light indicates control power on. One light per control circuit.
- Red overload light indicates motor overload condition and pump is off. Light remains on and pump remains off until rest. One light per pump.
- Hour meters; non resetting meters indicates total pump run time.
- General Alarm Fault and Pump Run Status isolated contacts.
- High Water Alarm System Type 4X. Hold finger over hole of horn for 1-2 seconds and remove to silence horn (95 dB).
  - Red HWA light and alarm test button on inner door.
  - Two isolated contacts for remote monitoring and/or to use as a connection to a phone dialer.
- Alarm LED Dome Light - Lexan, red flashing on top of enclosure. Light indicates a general fault condition; overload, high water, moisture sensor or over temp condition. Light remains on until condition is corrected.
- Control Terminal board, numbered and wired.
- Layout and schematic CAD diagrams are provided. Installer connections at terminal board are clearly marked.

Motor Protrector Amp Range	Order Number			Approx. Weight Lbs.
	Single-Phase 115 Volts	Single-phase 208 or 230 Volts	Three-Phase 208, 230,460 Volts	
1.0 - 1.6	8101E-L-016	8101E-D-016	8101E-T-016	86
1.6 - 2.5	8101E-L-025	8101E-D-025	8101E-T-025	86
2.5 - 4.0	8101E-L-040	8101E-D-040	8101E-T-040	86
4.0 - 6.3	8101E-L-063	8101E-D-063	8101E-T-063	86
6.3 - 10.0	8101E-L-100	8101E-D-100	8101E-T-100	86
10.0 - 16.0	8101E-L-160	8101E-D-160	8101E-T-160	86
16.0 - 20.0	8101E-L-200	8101E-D-200	8101E-T-200	88
20.0 - 25.0	8101E-L-250	8101E-D-250	8101E-T-250	88
*25.0 - 32.0	8101E-L-320	8101E-D-320	8101E-T-320	101
*32.0 - 40.0	8101E-L-400	8101E-D-400	8101E-T-400	101
*40.0 - 50.0	8101E-L-500	8101E-D-500	8101E-T-500	116

*Includes 2nd disconnect and larger enclosure

Options:

8100K7079 Type 4X 304 Stainless Steel outer enclosure

8100K7222D Option is for a duplex set of pumps with standard Non-Explosion-Proof Motors (9712 & 9725).
- Moisture sensor relay and test buttons only. Two yellow lights indicate moisture in the pump motor.

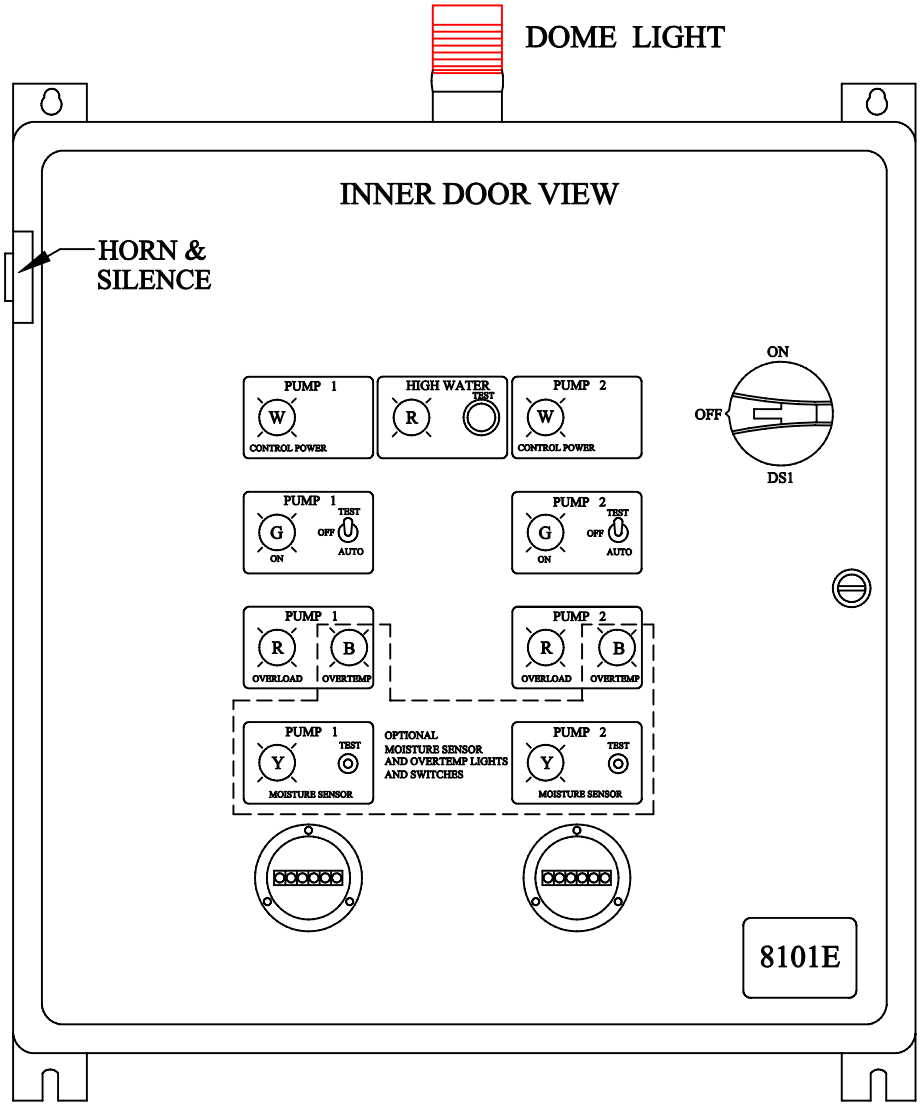
8100K7224D Option is for a duplex set of pumps with standard Non-Explosion-Proof Motors (9706, 9709, & 9727).
- Moisture sensor relay and test button. Two yellow lights indicate moisture in the pump motor.
- Temperature limiter circuit shuts down pump motor when motor temperature is sensed. The temperature limiter circuit automatically resets when the motor temperature falls to a normal temperature operating range. Two Blue lights indicates motor over temperature.

How to Order: Specify the Order Number, System Phase and Voltage, Pump Motor HP and any options.
F.O.B. Cedarburg (Milwaukee), Wisconsin

WEIL Duplex Alternating Pump Control Panel 8101E

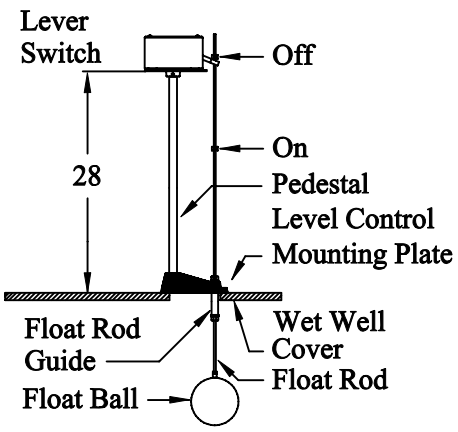
Two Independant Control Circuits
Type 4 Double Door Dead Front Enclosure

Duplex ✓

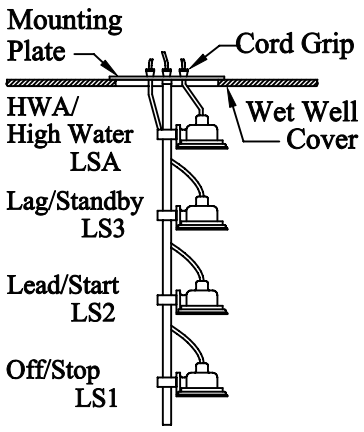


Use any of the three level controls with duplex control panel.

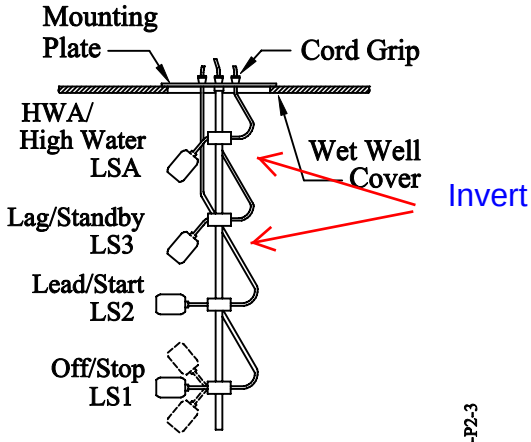
8213 Lever



8220 Pressure Diaphragm

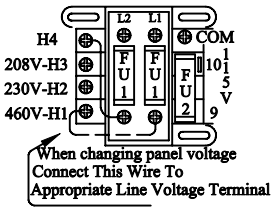


8230 Tethered



PANEL NAME PLATE INCLUDES:
- -System Voltage
- -Motor Amp Range
- -MAX Panel Amps
- -Phase & HZ
- -Enclosure Type

Control Transformer Is Connected For Proper Line Voltage At Factory



Installer to Supply Branch Circuit Protection in accordance with NEC and local codes.

Fuses (LP-J or Equivalent) For Branch Circuit Protection 1.25 X Full load amps of both motors, Plus 2 Amps for C.P..

Dotted lines (- - - - - - - -) represent Field Connections.

Wire Colors: Black = Power Green = Ground
Red = Control White = Common (Neutral)
Yellow = Alarm Circuit

SS1 & SS2 = Spring Return Test To Off

SS3 = Spring Return Test and Silence To Auto

= Component Coil

= Numbers on Terminal Blocks (TB1 or TB2).

= Numbers on Components.

= Normally Open Contact on Components.

= Normally Closed Contact on Components.

Caution: Connection of any other device to the Control Power Source of this Panel will cause improper operation and Void the Warranty.

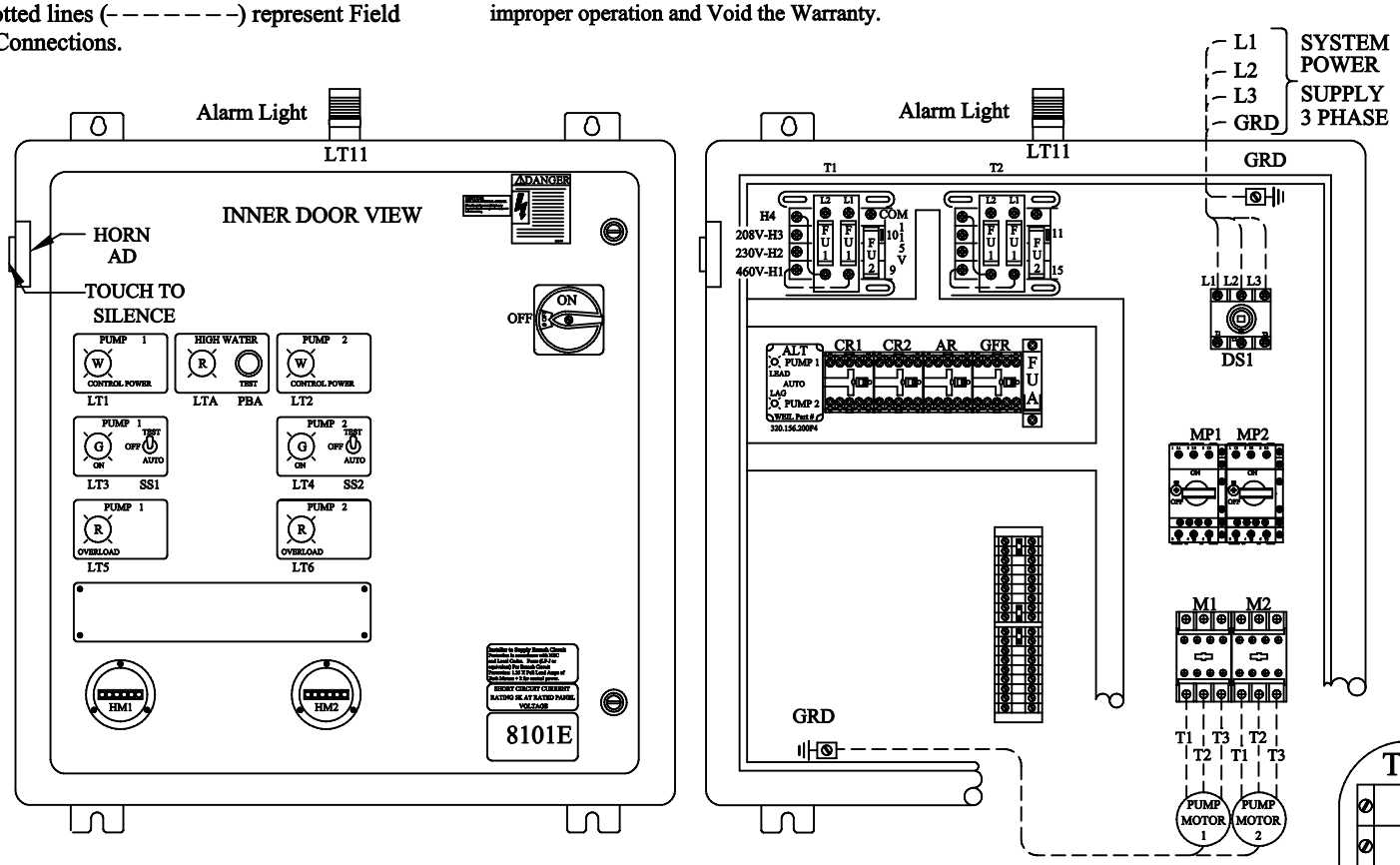
Pump should rotate in the direction of the Arrow on the pump case. Change rotation of the pump at the control panel. Interchange wires:
T1 And T2 On M1 For Pump 1.
T1 And T2 On M2 For Pump 2.

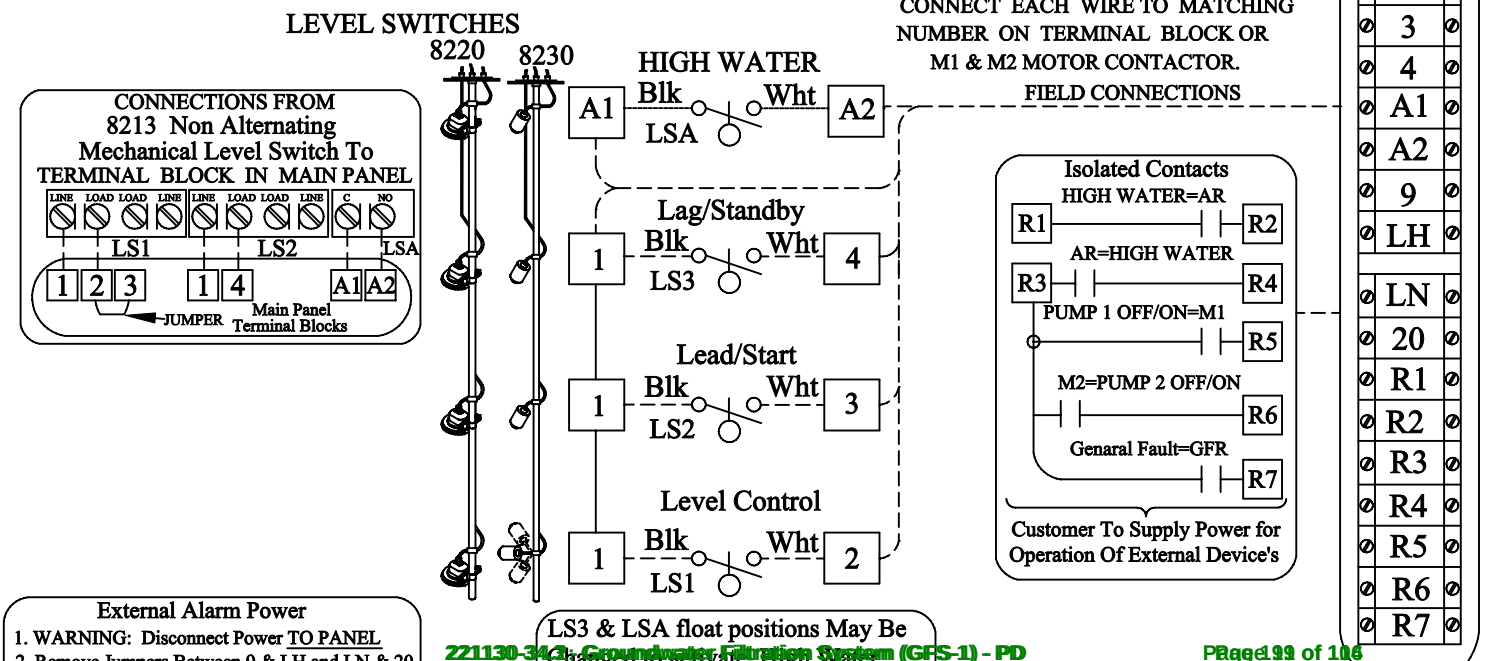
Wires are Individually Numbered.

M1 & M2 = Motor Contactors

MP1 & MP2 = Motor Circuit Protectors

Caution: Connection of any other device to the Control Power Source of this Panel will cause improper operation and Void the Warranty.





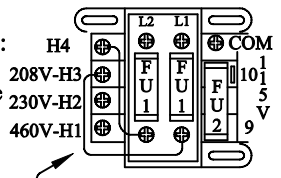
External Alarm Power
1. WARNING: Disconnect Power TO PANEL
2. Remove Jumpers Between 9 & LH and LN & 20
3. Connect 115 VAC Between LH & LN

LS3 & LSA float positions May Be Changed to activate High Water Alarm, before Lag Pump is called for.

GND 6/24/2015

PANEL NAME PLATE INCLUDES:
- -System Voltage
- -Motor Amp Range
- -MAX Panel Amps
- -Phase & HZ
- -Enclosure Type

Control Transformer Is Connected For Proper Line Voltage At Factory



When changing panel voltage Connect This Wire To Appropriate Line Voltage Terminal

Installer to Supply Branch Circuit Protection in accordance with NEC and local codes.

Fuses (LP-J or Equivalent) For Branch Circuit Protection 1.25 X Full load amps of both motors, Plus 2 Amps for C.P..

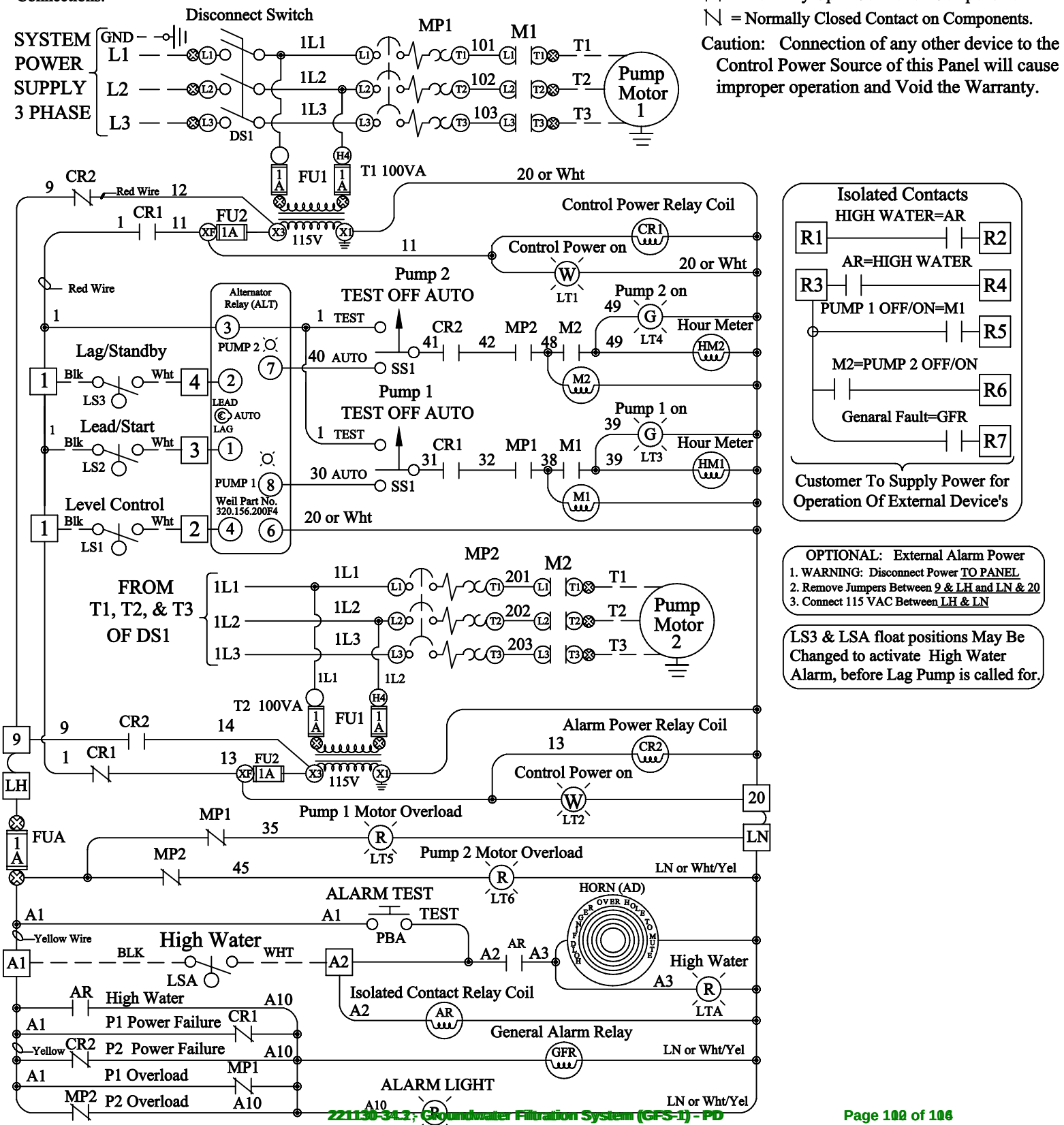
Wires are Individually Numbered.
M1 & M2 = Motor Contactors
MP1 & MP2 = Motor Circuit Protectors
SS1 & SS2 = Spring Return Test To Off
SS3 = Spring Return Test and Silence To Auto

Pump should rotate in the direction of the Arrow on the pump case. Change rotation of the pump at the control panel. Interchange wires:
T1 And T2 On M1 For Pump 1.
T1 And T2 On M2 For Pump 2.

= Component Coil
= Numbers on Terminal Blocks (TB1 or TB2).
= Numbers on Components.
= Normally Open Contact on Components.
= Normally Closed Contact on Components.

Caution: Connection of any other device to the Control Power Source of this Panel will cause improper operation and Void the Warranty.

Dotted lines (— — — —) represent Field Connections.



OPTIONAL: External Alarm Power
1. WARNING: Disconnect Power TO PANEL
2. Remove Jumpers Between 9 & LH and LN & 20
3. Connect 115 VAC Between LH & LN

LS3 & LSA float positions May Be Changed to activate High Water Alarm, before Lag Pump is called for.

WEIL

Round Wet Well Cover

Submersible 2613 Removal System Pumps

8804

Includes

- Level control opening and plate for pressure diaphragm or tethered float switches.
  Plate has:
  - Coupling for level control pipe
  - Four cable holes for level controls
- Motor cable opening and plate for motor cables.
  Plate has:
  - Two pump power cable holes with cord grips
  - Two pump sensor cable holes with cord grips, if required.

CONFIRM

- Vent kit. Blank, 2, 3, or 4 inch.
- Hinged access door with handle and padlock hasp
- Upper guide rail bracket mounting holes
- Flange kits for above cover discharge pipes or blanking plates for below cover discharge openings.

Not Included

- Mounting hardware for perimeter of cover
- Level control pipe

Cover Selection

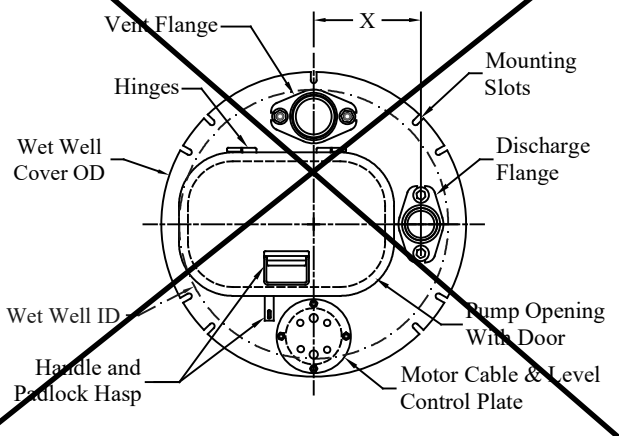
1. Determine the wet well size.
2. Identify pump system.
3. Identify level controls

Discharge Pipe Size:	2	3	4	6
(H) - Ctr/Ctr:	9	11	13	16

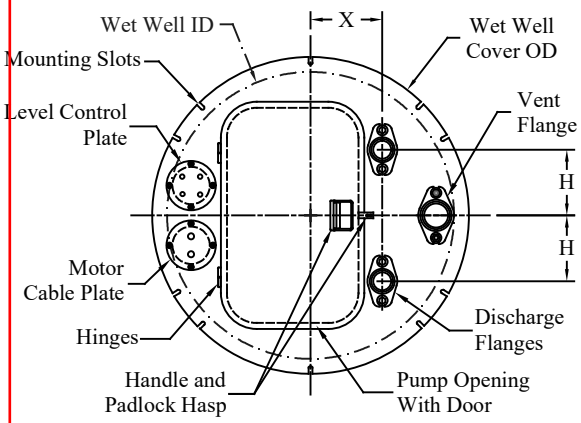
Spacing is for standard piping center to center inches

- Discharge spacing matches the 2613 Sub-Bases & the 2616 Isolation Valves
- Locations of vent, level control plate, and motor cable plate will vary.

Simplex

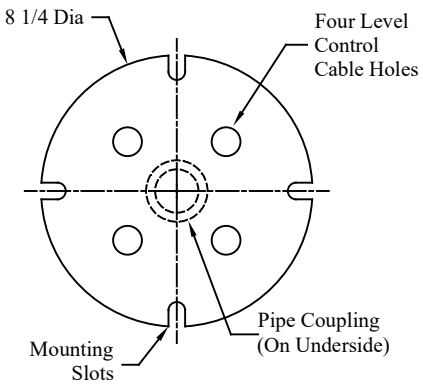


Duplex - One Pump Opening

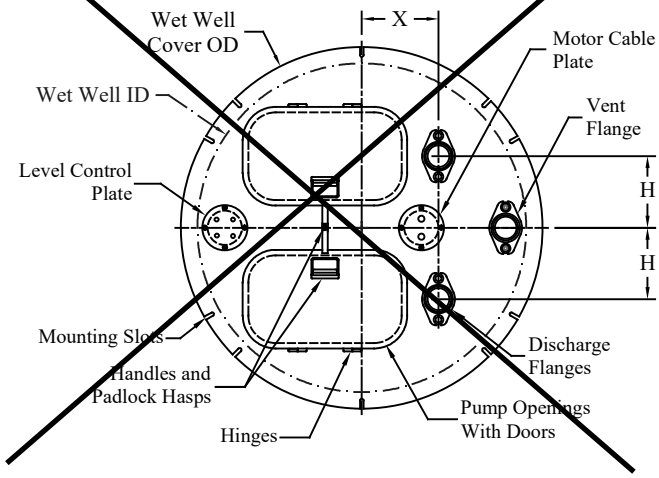


VERIFY VENT SIZE_____

Level Control Plate



Duplex - Two Pump Openings



Simplex

	Order Number	Wet Well Size	Cover Size	Disch Size	Matl Thick	Mtg. Holes	Bolt Circle	Dim X	Dim H	Pump Size	Opening Quanity	Weight Lbs	Drawing Number
A	8804K5002	24	28	2	0.375	(10) 5/8	26	9	--	12 x 18	1	80	D10998
	8804K5006	30	34	2	0.375	(10) 5/8	32.5	9	--	12 x 18	1	121	D10430
	8804K5021	30	34	3	0.375	(10) 5/8	32.5	11	--	14 x 22	1	123	D11000
	8804K5010	36	40	2	0.375	(10) 5/8	38.5	4	--	12 x 18	1	148	D10999
	8804K5025	36	40	3	0.375	(10) 5/8	38.5	10	--	14 x 22	1	150	D10997

For larger cover sizes use a **Duplex** cover and blank off one discharge

Duplex

	Order Number	Wet Well Size	Cover Size	Disch Size	Matl Thick	Mtg. Holes	Bolt Circle	Dim X	Dim H	Pump Size	Opening Quanity	Weight Lbs	Drawing Number
A	8804K1326	36	40	2	0.375	(10) 5/8	38.5	11	9	18 x 30	1	148	D11084
	8804K1328	42	46	2	0.375	(10) 5/8	44	11	9	18 x 30	1	184	D10785
	8804K1330	42	46	3	0.375	(10) 5/8	44	12	11	22 x 36	1	196	D10711
	8804K1332	48	53	2	0.375	(10) 5/8	51	11	9	18 x 30	1	256	D10786
	8804K1333	48	53	3	0.375	(10) 5/8	51	12	11	22 x 36	1	264	D10712
B	8804K1334	48	53	4	0.375	(10) 5/8	51	14	13	16 x 23	2	272	D11089
	8804K2105	54	60	3	0.500	(10) 5/8	57	12	11	22 x 36	1	456	D10713
	8804K2005	54	60	4	0.500	(10) 5/8	57	14	13	16 x 28	2	477	D10722
	8804K2317	60	66	2	0.500	(10) 5/8	63	11	9	18 x 30	1	512	D11086
	8804K2111	60	66	3	0.500	(10) 5/8	63	12	11	22 x 36	1	528	D10705
	8804K1365	60	66	4	0.500	(10) 5/8	63	19	13	23 x 33	2	548	D11093
	8804K2321	72	78	2	0.500	(12) 3/4	75	11	9	18 x 30	1	708	D12292
	8804K1346	72	78	3	0.500	(12) 3/4	75	12	11	22 x 36	1	719	D11088
	8804K1367	72	78	4	0.500	(12) 3/4	75	19	13	23 x 33	2	726	D11783
	8804K1353	72	78	6	0.500	(12) 3/4	75	15	16	23 x 33	2	734	D10775

All dimensions are in **Inches**
A = level control holes drilled & tapped
B = For 7 inch case pumps only: 2517, 2523, 2535, 2534.

Note - Contact factory for pricing and avialability on:

- anti-slip (checkered steel)
- stainless steel (specify grade)
- extra openings
- non-standard sizes

Options

Order Number	Description
8800K7006	T-lock with handles with Key - per door
8800K7007	Flush Mounted Handles - per door
8800K7009	Below Cover Discharge

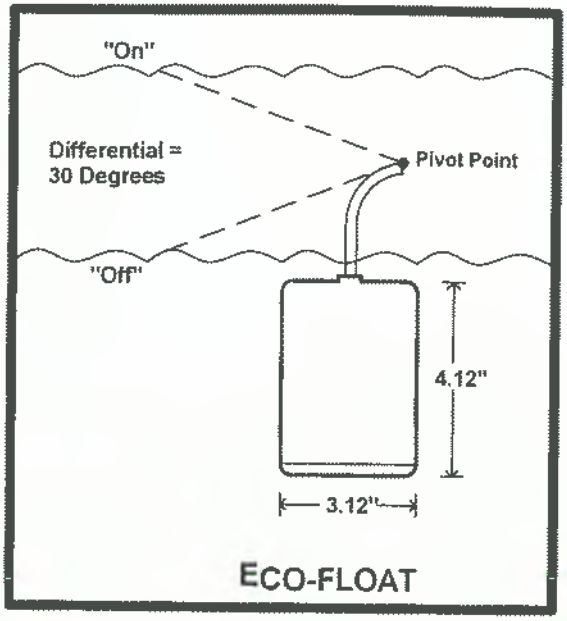
Option No.	Description	Wet Well Size - Inches							
		24	30	36	42	48	54	60	72
8800K7001	Galvanizing	A	A	A	A	A	A	A	A
8800K7003	Epoxy Paint	A	A	A	A	A	A	A	A
8800K7008	Gastight Sealent	A	A	A	A	----	----	----	----
8800K7008A	Gastight Sealent	----	----	----	----	A	A	A	A

A = Available

anchor scientific inc.
Box 378, Long Lake, MN 55356
952-473-7115 • FAX 952-473-6002 • www.anchorscientific.com

eco·float

Form 2600-A



Eco-Float

Description

The Eco-Float, (G style), is a mercury-free level switch for controlling liquid levels in a variety of applications. A snap action switch is activated by a ball rolling back and forth within a switching tube. The entire assembly is enclosed in a plastic float housing. There is a minimum differential between 'on' and 'off' of approximately 3.5 inches. Greater differentials can be achieved when the pipe mounted, (GP), or externally weighted, (GSE), versions are used. Various cable lengths, mounting styles, and circuit configurations are available and in stock.

Features

- Mercury Free
- Variety of Mounting Styles
- Variety of Circuit Configurations
- Replaces Mercury Float and Diaphragm Switches
- Differential Between 'On' and 'Off'

Applications

The Eco-Float can be used in a variety of liquid level monitoring applications, including lift stations, sumps, sewage ejectors, septic tanks, vaults, and tanks. Eco-Floats are ruggedly constructed of corrosion resistant material, which enable them to be used in a variety of different liquids. Some applications are subject to additional requirements described in the National Electric Code.

Specifications

Cable....18-2 or 18-3 SJOW 90° C. 41 x #34 copper .29D- 18-2; .31D- 18-3
Housing & Clamp.....Polypropylene 3" x 4.25"
Electrical Rating.....Standard 7A@ 120Vac; 3A @ 230Vac Std.
Eco-Float Gold Rating - .1A@ 120Vac (use with in intrinsically safe circuits; and very low energy circuits)
Temp Limit.....60° C. (water)

Ordering Information:

Specify

Model Series **G**

Mounting Style
SE Suspended, External weight
SI Suspended, Internal weight
P Pipe mounted

Cable Length **10, 15, 20, 30, 40, 50, 60** Ft.
Custom lengths available.

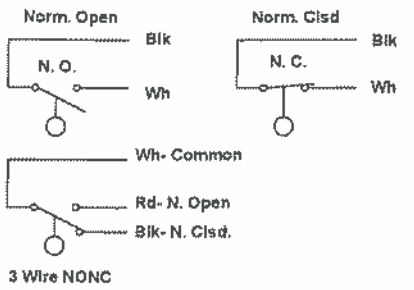
*Circuit configurations
NO Normally open (SPST)
NC Normally closed (SPST)
NONC Normally open/closed (DPST)

*For intrinsically safe applications use **NONC-Gold.**

Example:

GSI20NO

Eco-Float Suspended, Internally weighted, 20 ft. of cable, Normally open contacts.



FIBERGLASS BASIN DATA

fiberbasin inc.
620 S. ELMWOOD, AURORA, IL 60506
630/801-9770 FAX 801-9771
MAIL TO: PO BOX 1870 AURORA, IL 6050

F-4731
JUNE, 1996

TYPE OF SERVICE (✓)	
▶ ☐ SEWAGE OR SUMP (STANDARD)	☐ CONDENSATE (SPECIFY MAX. TEMP. ____°F)

DATA ON BASIN OPENINGS							
REQ'D INLET LOCATIONS REFER TO FIGURE 9 (TOP VIEW)	A						
"L" DISTANCE TO CENTER OF INLET	FIELD MEASURED						
TYPE INLET REQ'D REFER TO FIGURE NO.							
INLET PIPE SIZE							

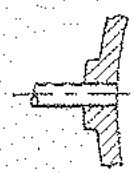


Fig. 1 THREADED INLET

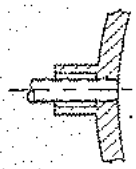


Fig. 2 HUBBED & THREADED INLET

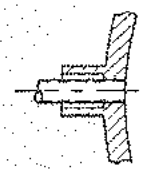


Fig. 3 HUBBED INLET (STD)

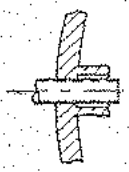


Fig. 4 HUBBED INLET (INSIDE)

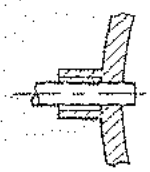


Fig. 5 PARALLEL PUMP DISCHARGE RUNS-"N" & "O" LOCATIONS (SEE NOTE 3)

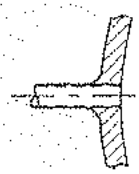


Fig. 6 FRP "NO HUB" INLET

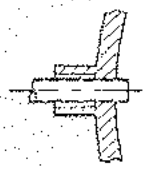
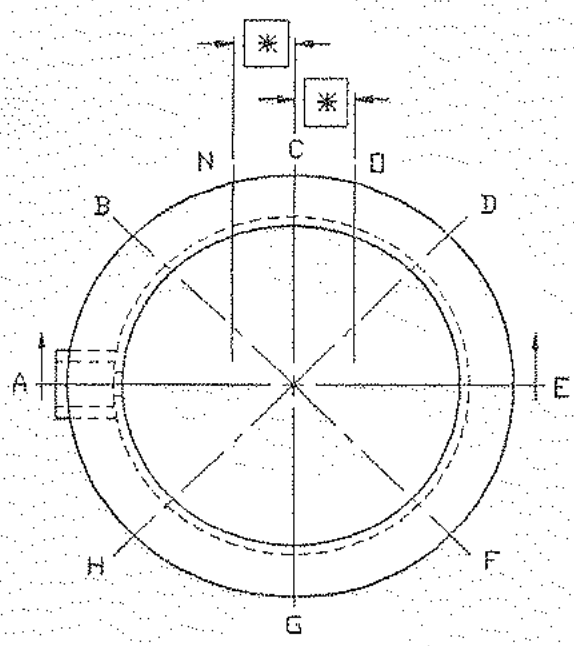
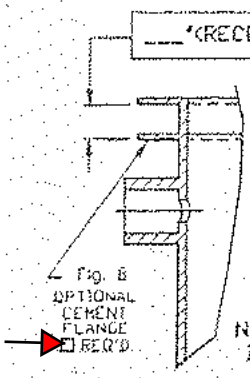


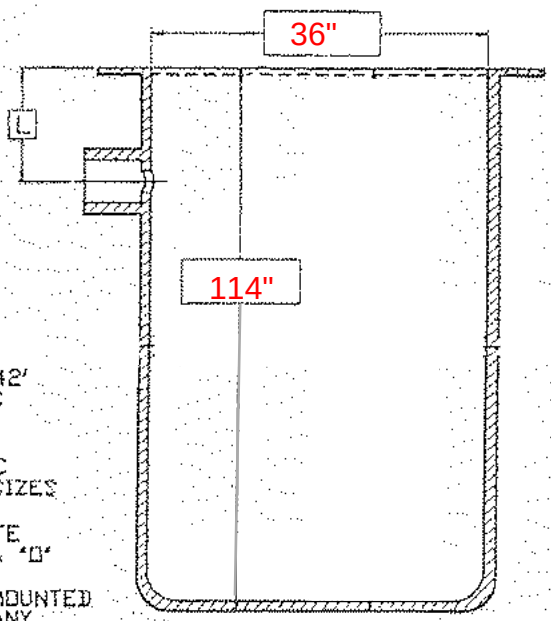
Fig. 7 "PASS THROUGH" HUBBED INLET



TOP VIEW



HUBBED INLET DIMS				
PIPE SIZE	3	4	6	8
"L" MIN.	7	7 1/2	9	10
INSIDE DIA.				



SECTION A-E
Fig. 9

NOTES:
1. AVAILABLE DIAMETERS: 18", 24", 30", 36", 42" 48", 60", 72", & 96". FOR OTHER DIAMETERS CONSULT FACTORY.
2. BASINS ARE CONSTRUCTED IN ONE SECTION UNLESS OTHERWISE SPECIFIED. IF SPECIFIC LENGTHS OF SECTIONS ARE REQ'D, ENTER SIZES IN BLANKS IN FIG. 9, SECTION A-E.
3. WHEN FIG. 5 ARRANGEMENT IS REQ'D, LOCATE ALL OTHER OPENINGS IN RELATION TO "N" & "O" LOCATIONS.
4. ALL ABOVE INLETS ARE FRP MATERIAL & MOUNTED AT OUR PLANT. CONTACT FIBERBASIN FOR ANY FRP "KIT TYPE" REQUIREMENTS.

Verify Inlet Hub Size_____

APPENDIX D

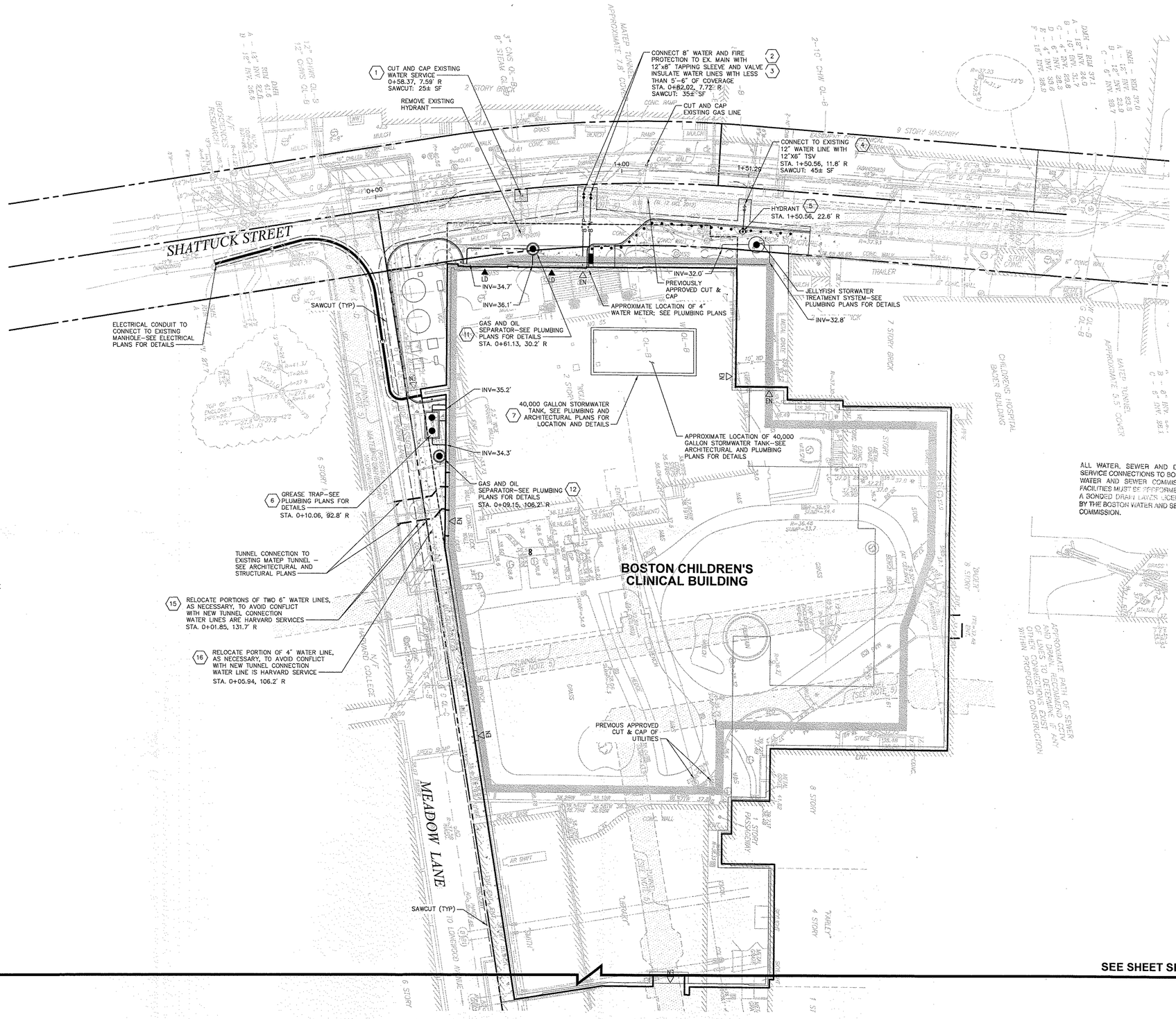
Site Plan #17350 Drawings Approved by BWSC on 2 March 2018

BWSC INSPECTIONS

1. CUT & CAP EXISTING WATER SERVICE, ±25 SF	
DATE:	
INSPECTOR:	
FEE:	
2. 8" FIRE PROTECTION CONNECTION, ±35 SF	
DATE:	
INSPECTOR:	
FEE:	
3. 8" DOMESTIC WATER CONNECTION, ±35 SF	
DATE:	
INSPECTOR:	
FEE:	
4. HYDRANT CONNECTION, ±45 SF	
DATE:	
INSPECTOR:	
FEE:	
5. HYDRANT	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
6. GREASE TRAP	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
7. STORMWATER TANK	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
8. 8" WATER CONNECTION, ±75 SF AT LONGWOOD AVENUE	
DATE:	
INSPECTOR:	
FEE:	
9. 18" DRAIN CONNECTION, ±45 SF AT LONGWOOD AVENUE	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
10. 15" SEWER CONNECTION, ±140 SF AT LONGWOOD AVENUE	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
11. GAS/OIL SEPARATOR	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
12. GAS/OIL SEPARATOR	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
13. 8" FIRE PROTECTION CONNECTION, ±75 SF AT LONGWOOD AVENUE	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
14. REMOVE AND REPLACE PORTION OF EXISTING 12" WATER MAIN, ±50 SF AT LONGWOOD AVENUE	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
15. TWO (2) – 6" WATER LINE RELOCATION	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
16. 4" WATER LINE RELOCATION	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
17. 4:1 I/I	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	
18. CONTRACTOR TO PROVIDE AS-BUILTS	
DATE:	
INSPECTOR:	
DYE TEST:	
FEE:	

(#) DATE:
INSPECTOR:

* THE CONTRACTOR IS RESPONSIBLE TO ARRANGE FOR THE REQUIRED DYE TESTS AND INSPECTIONS BY BWSC PERSONNEL.



SEE SHEET SP-2

SEE SHEET SP-2

vhb.com
vhb
99 High Street
Boston, MA 02110
617.728.7777

Boston Children's Clinical Building
55 Shattuck Street
Boston, MA 02115

New Water Account:
55 Shattuck Street - 142064000
Land Use Code: Exempt

Ward: 04 Parcel: 01883000

BOSTON WATER AND SEWER COMMISSION
Reviewed and approved as to proposed connection(s) to existing Water and Sewer facilities as shown, for Issue of Building Permit Only. Additional Permits must be obtained from BWSC prior to Connection to BWSC facilities. The Plans are valid for a period of one (1) year from date of approval.
JOHN P. SULLIVAN, JR. P.E. 3/4/18
Chief Engineer

BOSTON WATER & SEWER COMMISSION
Cross Connection
Approval: Date: 3-2-18
Discharge Enforcement
Approval: Date:

Reserved for Boston Water & Sewer Commission Use Only

Owner: Boston Children's Hospital
300 Longwood Avenue
Boston, MA 02115
Contact: Daniel Baxter
(617) 355-4703

Boston Children's Clinical Building

55 Shattuck Street
Boston, Massachusetts 02115

No.	Revision	Date	Appvd.

Designed by Checked by

Issued for Date

BWSC Site Plan Approval February 20, 2018

Not Approved for Construction

BWSC Site Plan
Site Plan #17350

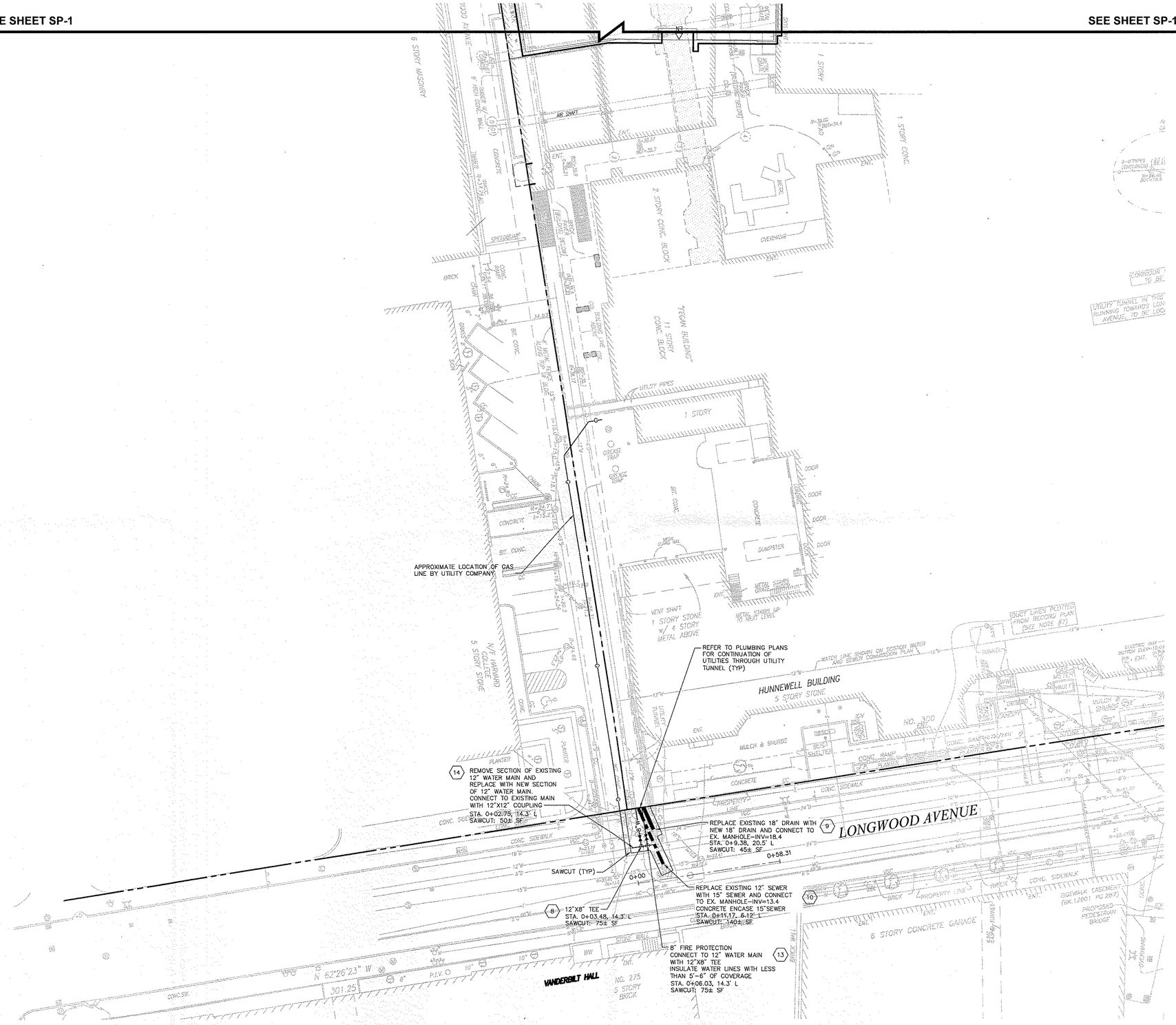
Drawing Number
SP-1
Sheet 1 of 4

COMMONWEALTH OF MASSACHUSETTS
LISA CHOW
CIVIL
No. 50431
REGISTERED PROFESSIONAL ENGINEER

Project Number
09497.02

SEE SHEET SP-1

SEE SHEET SP-1



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BWSC Site Plan
Site Plan #17350

COMMONWEALTH OF MASSACHUSETTS
LISA CHOW
CIVIL
No. 50431
REGISTERED PROFESSIONAL ENGINEER

Drawing Number

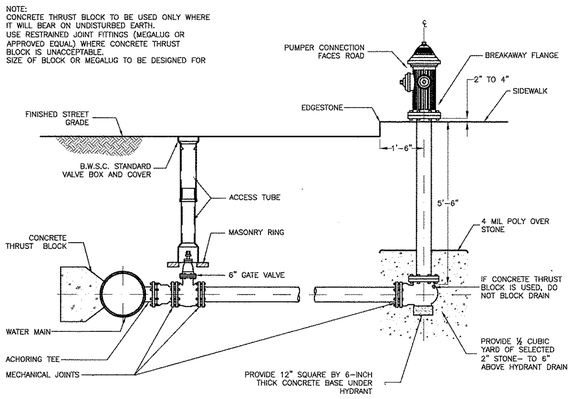
SP-2

Sheet 2 of 4

Project Number
09497.02

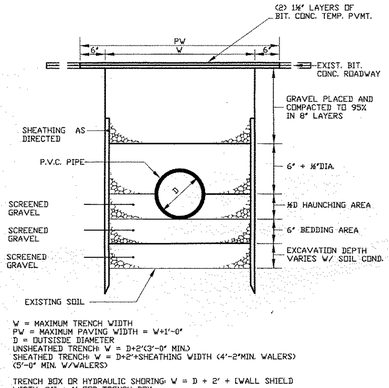
NOTES:

1. BASE PLAN–THE PROPERTY LINES, TOPOGRAPHY (BOSTON CITY BASE) AND PHYSICAL FEATURES SHOWN WERE DETERMINED BY AN ACTUAL FIELD SURVEY CONDUCTED BY FELDMAN LAND SURVEYORS.
2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVES. THE CONTRACTOR SHALL VERIFY AND/OR DETERMINE THE EXACT LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE OWNER SHALL BE NOTIFIED, IN WRITING, OF ANY DISCREPANCIES OR INTERFERENCES WITH THE PROPOSED WORK BEFORE CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY "DIG–SAFE" (1–800–344–7233) AT LEAST 72 HOURS BEFORE EXCAVATING.
3. FINAL DESIGN OF UTILITIES WITHIN THE BUILDING, INCLUDING OIL TRAPS AND GREASE TRAPS, TO BE SHOWN ON THE PLUMBING DRAWINGS.
4. ALL DI PIPE TO BE CEMENT LINED, CLASS 56 ZINC COATED FOR ALL PIPE DIAMETERS 4 INCHES TO 16 INCHES. ALL FITTINGS SHALL BE RESTRAINED BY MECHANICAL MEANS OR BY CONCRETE THRUST BLOCK, WITH PARTICULAR INSTALLATION DETAILS BASED ON ACTUAL FIELD CONDITIONS. ALL THRUST RESTRAINTS SHALL BE IN ACCORDANCE WITH BWSC STANDARD DETAIL A–01E–F.
5. THE LOCATION OF EXISTING SANITARY SEWER, DRAIN LINES, AND WATER PIPES ARE TO BE DETERMINED AT ALL CROSSINGS. THE WATER LINE SHOULD BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER/DRAIN IS AT LEAST 18" BELOW THE UNDERSIDE OF THE WATER LINE. WHEN THE ELEVATION OF THE WATER CANNOT BE VARIED TO MEET THIS REQUIREMENT, THE SEWER/DRAIN SHOULD BE ENCASED IN FLOWABLE FILL (LEAN CONCRETE, 100 PSI) FOR 10' ON EITHER SIDE OF THE CROSSING. IF THE PROPOSED WATER LINE IS IN DIRECT CONFLICT WITH AN EXISTING SEWER/DRAIN PIPE, THE WATER LINE SHALL BE INSTALLED ABOVE THE SEWER/DRAIN WITH 18" MINIMUM SEPARATION FOR A DISTANCE OF 10' ON EACH SIDE OF THE SEWER/DRAIN. ONE FULL PIPE LENGTH OF THE WATER LINE SHOULD BE CENTERED OVER THE SEWER/DRAIN SO THAT JOINTS WILL BE AS FAR FROM THE SEWER/DRAIN AS POSSIBLE. ALL PROPOSED WATER LINES THAT ARE LESS THAN 5'–6" BELOW FINISHED GRADE SHALL BE INSULATED.
6. ALL DRAIN SERVICE PIPE TO BE CLASS IV REINFORCED CONCRETE PIPE (RCP) UNLESS OTHERWISE NOTED.
7. ALL SEWER SERVICE PIPE TO BE MADE WITH PVC ASTM D3034 WITH A STANDARD DIMENSION RATIO OF 35.
8. ALL TAPPING SLEEVES AND VALVES ARE TO BE MUELLER H–615 OR APPROVED EQUAL.
9. CONTRACTOR MUST MEET OR EXCEED THE BWSC'S STANDARD REQUIREMENTS FOR ALL SEWER, STORM DRAIN, AND WATER WORK.
10. BUILDING CONNECTIONS SHALL BE BEDDED IN 3/4" MINIMUM CRUSHED STONE TO AT LEAST HALF THE PIPE DIAMETER.
11. CONTRACTOR SHALL USE EXISTING WYE BRANCHES FOR PROPOSED SEWER AND DRAIN CONNECTIONS, WHERE POSSIBLE.
12. EXISTING SEWER AND DRAIN SERVICES TO BE ABANDONED SHALL BE PLUGGED AT THE EXISTING WYE FITTINGS, AS DIRECTED BY THE BWSC.
13. THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE BWSC AN "AS–BUILT" PLAN IN AUTOCAD, PREPARED AND CERTIFIED BY A REGISTERED LAND SURVEYOR, REFLECTING ALL AS–BUILT CONDITIONS. SUCH PLANS SHALL ALSO BE STAMPED AND SIGNED BY A MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER. THESE AS–BUILT PLANS SHALL BE SUBMITTED WITHIN 15 DAYS OF THE COMPLETION OF CONSTRUCTION TO THE BWSC MAPPING AND INVENTORY COORDINATOR PRIOR TO THE WATER BEING TURNED ON.
14. CONTRACTOR TO INSTALL "DO NOT DUMP–DRAINS TO CHARLES RIVER" PLAQUES ADJACENT TO ALL NEW CATCH BASINS BEING INSTALLED FOR THIS PROJECT. PLAQUES AVAILABLE FROM THE BWSC ENGINEERING SERVICES DIVISION.
15. ABANDONMENT OF EXISTING SEWER AND DRAIN SERVICES MUST BE CUT AND CAPPED OFF AT THE MAIN IN THE STREET. ALL WORK MUST BE PERFORMED BY A BOSTON LICENSED PLUMBER.
16. THE CONTRACTOR SHALL NOTIFY BOSTON WATER OPERATIONS (617–443–9524) A MINIMUM OF 48 HOURS BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THEIR WATER SYSTEM SO THAT THE WATER MAIN CAN BE SHUT OFF.
17. WHERE WATER SERVICES AND SEWER SERVICES CROSS WITHIN 18 INCHES THE WATER MAIN SHALL BE ENCASED IN CONCRETE FOR A DISTANCE OF 10 FT. IF SERVICES RUN PARALLEL TO EACH OTHER AT A DISTANCE CLOSER THAN 10 FT THE WATER MAIN SHALL ALSO BE ENCASED IN CONCRETE.
18. THE TOTAL AREA OF WORK IN THE PUBLIC WAY FOR UTILITY RELATED WORK IS 385± SF.
19. CONTRACTOR TO REQUEST ROUGH CONSTRUCTION WAIVER FROM THE ISD PRIOR TO FILING FOR A GENERAL SERVICE APPLICATION.
20. THE CONTRACTOR SHALL PURCHASE A NEW HYDRANT FROM THE BOSTON WATER AND SEWER COMMISSION IF REQUIRED. ONLY PRIVATE HYDRANTS REQUIRE A FEE. PUBLIC HYDRANTS ARE PROVIDED FREE OF CHARGE. THE CONTRACTOR SHALL PURCHASE THE HYDRANT FROM THE COMMISSION WHEN PULLING THE GENERAL SERVICE APPLICATION (GSA).
21. WATER METERS GREATER THAN 2" WILL BE EITHER NEPTUNE OR ELSTER–AMCO COMPOUND METER. THE METER MUST BE PURCHASED BY THE CONTRACTOR. A METER TRANSMITTER UNIT (MTU) SHALL BE SUPPLIED BY THE COMMISSION AT THE OWNERS EXPENSE. A FEE OF $325/MTU WILL BE PAID TO THE COMMISSION WHEN FILING THE GSA.
22. CONTRACTOR TO NOTE THAT WATER WORK WILL LIKELY REQUIRE SHUTDOWN NOTIFICATIONS AND POTENTIAL TEMPORARY BYPASS SERVICES. CONTRACTOR IS RESPONSIBLE FOR THIS WORK.



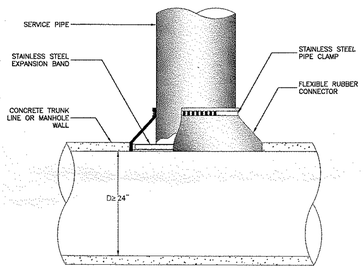
BWSC - Typical Hydrant Connection for High or Low Service Line 10/25/99

N.T.S. A–07



BWSC - Trench Detail for RCP or DICL Pipe 1/31/99

N.T.S. B–08

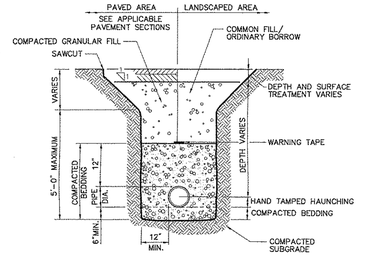


NOTES:

1. OPENING IN CONCRETE WALL SHALL BE CORED USING HIGH SPEED DIAMOND DRILL.
2. ALL METAL FIXTURES SHALL BE OF STAINLESS STEEL.
3. SERVICE LINE SHALL BE FLUSH WITH THE INSIDE OF THE CONCRETE PIPE OR WALL.
4. IF TRUNK LINE DIAMETER IS LESS THAN 24" THEN A SADDLE TYPE CONNECTION WILL BE USED.

BWSC - Typical Field (Boot) Connection 1/3/05

N.T.S. Source: VHB B–05

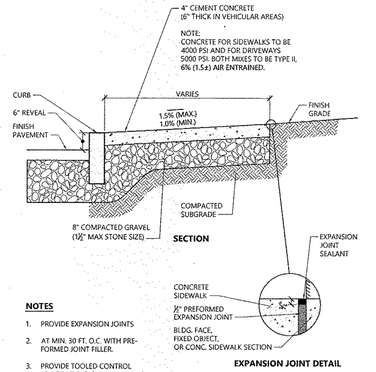


Notes:

1. WHERE UTILITY TRENCHES ARE CONSTRUCTED THROUGH DETENTION BASIN BERMS OR OTHER SUCH SPECIAL SECTIONS, PLACE TRENCH BACKFILL WITH MATERIALS SIMILAR TO THE SPECIAL SECTION REQUIREMENTS.
2. USE METALLIC TRACING/WARNING TAPE OVER ALL PIPES.

Utility Trench 8/11

N.T.S. Source: VHB LD_300

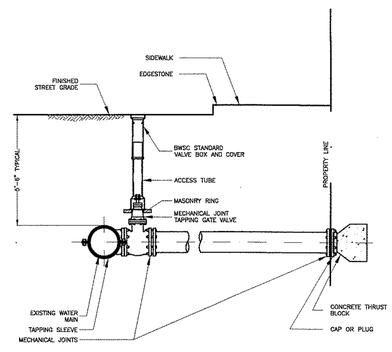


NOTES

1. PROVIDE EXPANSION JOINTS
2. AT MIN. 30 FT. O.C. WITH PRE-FORMED JOINT FILLER.
3. PROVIDE TOOLED CONTROL JOINTS AT 6' O.C.
4. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.

Concrete Sidewalk 1/16

N.T.S. Source: VHB LD_420



BWSC - Typical Water Pipe Connection with Tapping Sleeve and Gate Valve 8/30/99

N.T.S. A–33

vhb.com

vhb

99 High Street
Boston, MA 02110
617.728.7777

Boston Children's Clinical Building
55 Shattuck Street
Boston, MA 02115

New Water Account:
55 Shattuck Street - 142064000
Land Use Code: Exempt

Ward: 04 Parcel: 01883000

Reserved for Boston Water & Sewer Commission Use Only

Owner: Boston Children's Hospital
300 Longwood Avenue
Boston, MA 02115
Contact: Daniel Baxter
(617) 355-4703

Boston Children's Clinical Building

55 Shattuck Street
Boston, Massachusetts 02115

No.	Revision	Date	Appvd

Designed by Checked by

Issued for Date

BWSC Site Plan Approval February 20, 2018

Not Approved for Construction

BWSC Site Plan
Site Plan #17350

COMMONWEALTH OF MASSACHUSETTS
USA
CHOW
CIVIL
No. 50431
REGISTERED PROFESSIONAL ENGINEER

Drawing Number

SP-3

Sheet of

3 4

Project Number

09497.02

OVERALL SITE DRAINAGE CALCULATIONS

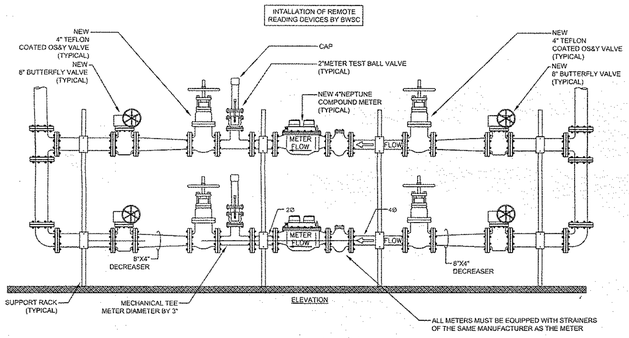
PURPOSE
PROVIDE VOLUME REQUIRED TO MITIGATE 1" OF STORMWATER SURFACE RUNOFF OVER TOTAL SITE IMPERVIOUS AREAS.

CALCULATIONS

1. TOTAL SITE IMPERVIOUS AREA = 56,747 SF

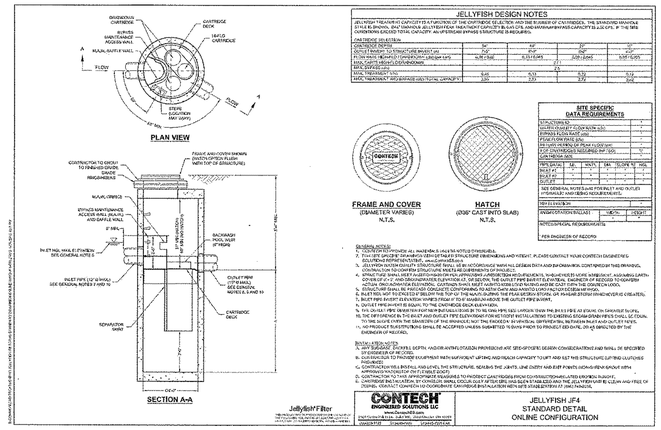
REQUIRED RECHARGE = 1" OVER IMPERVIOUS AREAS
REQUIRED RECHARGE = 1/12 FT x 56,747 SF = 4729.0 CF
REQUIRED RECHARGE = 4729.0 CF x 7.48 GAL/CF = 35,372 GAL

RECHARGE VOLUME PROVIDED: 40,000 GAL RAINWATER STORAGE TANK INSIDE THE BUILDING



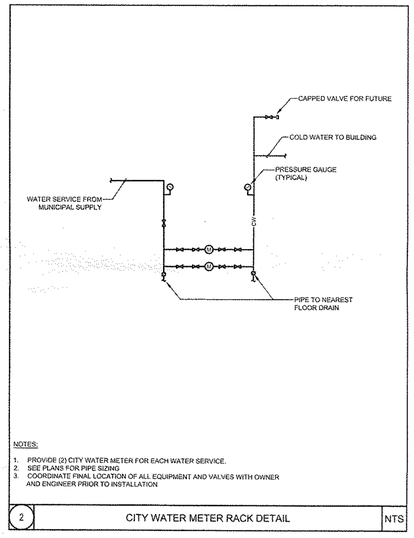
Water Meter Detail

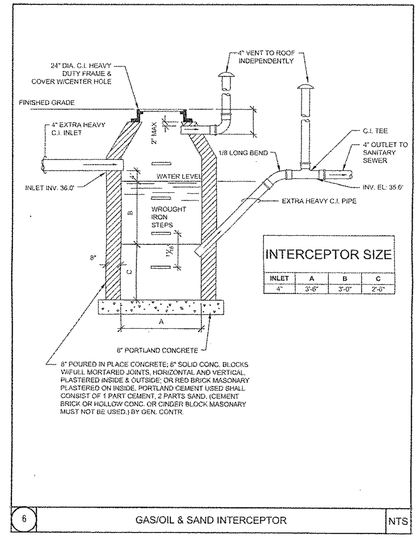
N.T.S. Source: RW Sullivan

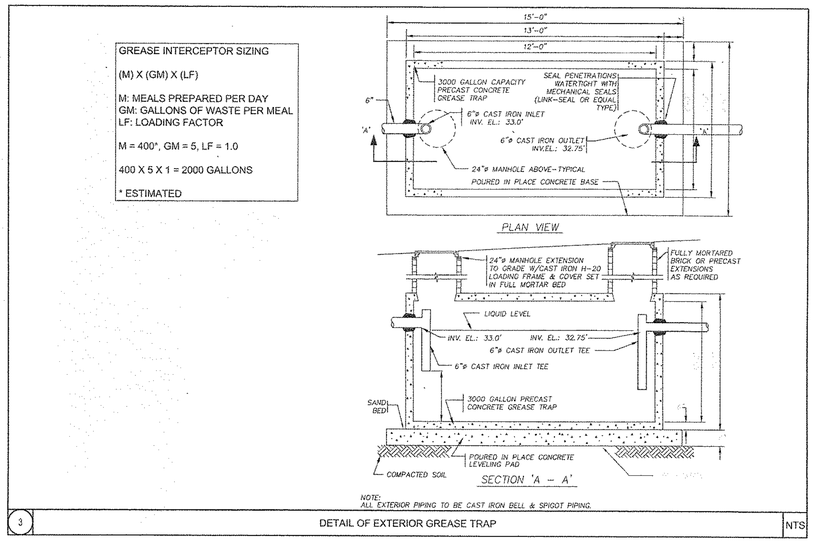


Contech Jellyfish JF4

N.T.S. Source: Contech







vhb.com
vhb
99 High Street
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Contact: Daniel Baxter
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Boston Children's Clinical Building

55 Shattuck Street
Boston, Massachusetts 02115

No.	Revision	Date	Apprvd.

Designed by | Checked by

Issued for | Date

BWSC Site Plan Approval February 20, 2018

Not Approved for Construction

BWSC Site Plan
Site Plan #17350

LISA CHOW CIVIL No. 50431 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

Drawing Number
SP-4

Sheet of
4 4

Project Number
09497.02

APPENDIX E

Endangered Species Act Documentation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: March 19, 2022
Project Code: 2022-0021781
Project Name: Boston Children's Hospital Clinical Building (BCCB) Site

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/newengland/endangeredspecies/project-review/index.html

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/birds/policies-and-regulations.php

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Project Code: 2022-0021781
Event Code: None
Project Name: Boston Children's Hospital Clinical Building (BCCB) Site
Project Type: Mixed-Use Construction
Project Description: Current site development plans include a new Clinical Building with a below-grade footprint area of approximately 34,500 square feet (sf) and four below-grade levels. Excavation to construct the below-grade space will proceed to depths of about 65 to 75 ft below existing site grades, corresponding to approximately 35 to 45 ft below site groundwater levels. Dewatering is necessary to control groundwater, seepage, precipitation, and surface water runoff and construction-generated water to enable below-grade construction activities in-the-dry. Construction activities are underway; dewatering is anticipated to begin around May 2017 and will likely continue through approximately May 2019. Temporary construction dewatering will be conducted a NPDES RGP; this request for an official species list is to support the NPDES RGP NOI application.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.33634754593064,-71.10535227631351,14z

Counties: Suffolk County, Massachusetts

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency:	Haley & Aldrich, Inc.
Name:	Jonathan Thibault
Address:	465 Medford Street
Address Line 2:	Suite 2200
City:	Boston
State:	MA
Zip:	02129
Email	jthibault@haleyaldrich.com
Phone:	6176802293

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: March 19, 2022
Project Code: 2022-0021780
Project Name: Boston Children's Hospital Clinical Building (BCCB) Discharge Location

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

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https://www.fws.gov/birds/policies-and-regulations.php

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Project Code: 2022-0021780
Event Code: None
Project Name: Boston Children's Hospital Clinical Building (BCCB) Discharge Location
Project Type: Mixed-Use Construction
Project Description: Current site development plans include a new Clinical Building with a below-grade footprint area of approximately 34,500 square feet (sf) and four below-grade levels. Excavation to construct the below-grade space will proceed to depths of about 65 to 75 ft below existing site grades, corresponding to approximately 35 to 45 ft below site groundwater levels. Dewatering is necessary to control groundwater, seepage, precipitation, and surface water runoff and construction-generated water to enable below-grade construction activities in-the-dry. Construction activities are underway; dewatering is anticipated to begin around May 2017 and will likely continue through approximately May 2019. Temporary construction dewatering will be conducted a NPDES RGP; this request for an official species list is to support the NPDES RGP NOI application.

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Endangered Species Act Species

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Insects

NAME	STATUS
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Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency:	Haley & Aldrich, Inc.
Name:	Jonathan Thibault
Address:	465 Medford Street
Address Line 2:	Suite 2200
City:	Boston
State:	MA
Zip:	02129
Email	jthibault@haleyaldrich.com
Phone:	6176802293

MassDEP - Bureau of Waste Site Cleanup

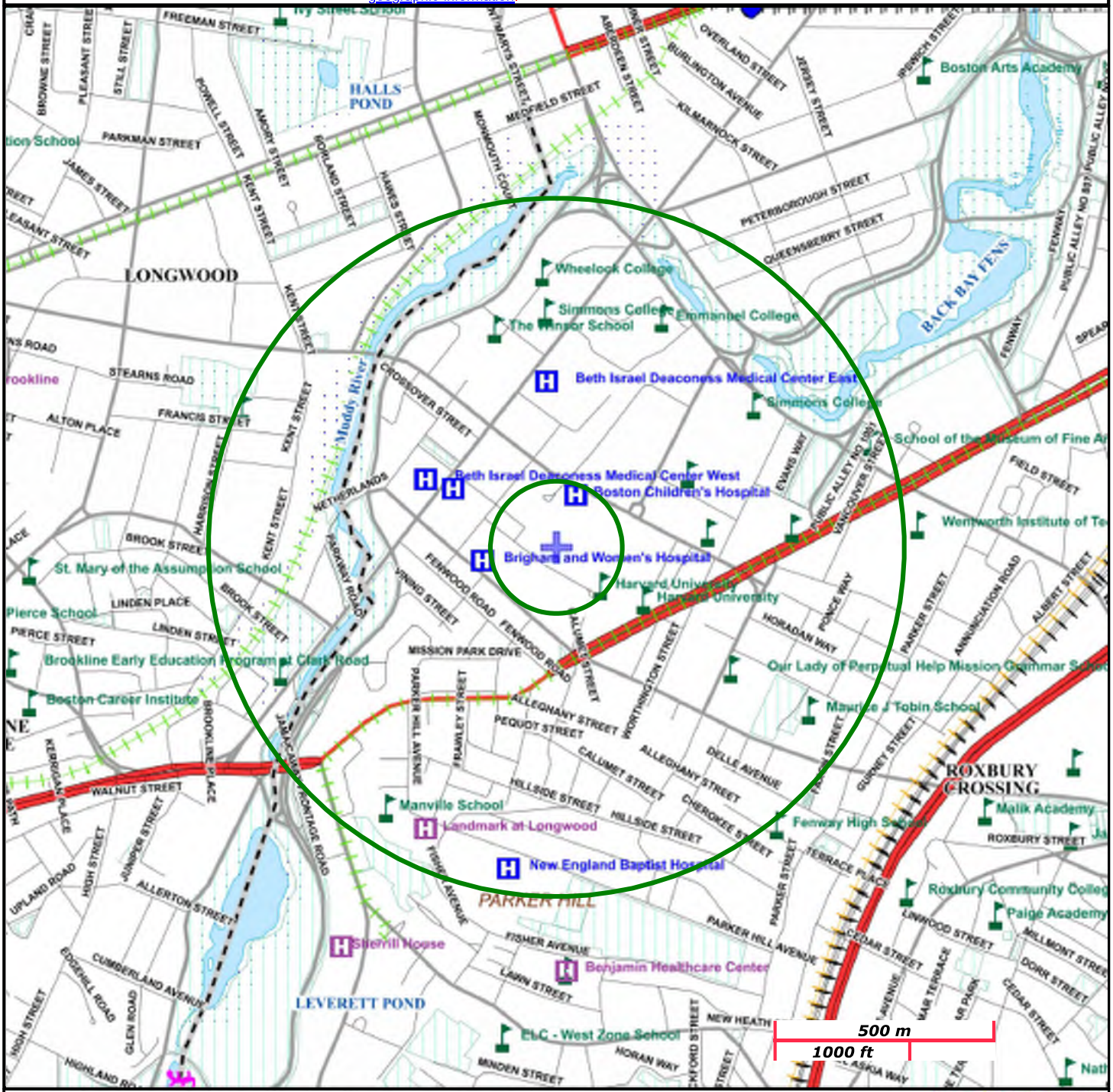
Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:
BOSTON CHILDREN'S HOSPITAL - HALE FAMILY BUILDING
300 LONGWOOD AVENUE BOSTON, MA
3-000033889

NAD83 UTM Meters:
4689273mN , 326552mE (Zone: 19)
March 19, 2022

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



APPENDIX F

National Register of Historic Places and
Massachusetts Historical Commission Documentation

TBag S.
BCCB File

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

May 22, 2015

Douglas Kelleher
Epsilon Associates
3 Clock Tower Pl., #250
Maynard, MA 01754

RE: Children's Hospital 2012 IMP, Children's Clinical Building (CCB), Combined Heat & Power (CHP) Plant (300 Longwood Ave), Parking Garage Addition, & New Construction at 819 Beacon Street, Boston (Fenway), MA; MHC# RC.53231; EEA# 14964

Dear Mr. Kelleher:

Thank you for your letter dated April 22, 2015 and received at this office on April 24, 2015, concerning the proposed project referenced above. Staff of the Massachusetts Historical Commission (MHC) have reviewed the draft Memorandum of Agreement (MOA) and have the following comments.

In Stipulation I Photographic Documentation, please delete the words "the MHC" in the first sentence. The MHC does not wish to receive a copy of the photodocumentation.

In Stipulation II, Preservation Plan, please include "A copy of the final Preservation Plan shall be submitted to the MHC for MHC's files."

In Stipulation V, Longwood Medical and Academic Area Architectural Survey, please include "Completed new MHC Inventory Forms shall be submitted to the MHC in draft form for MHC's review and comment. Final original MHC Inventory forms shall be submitted to the MHC in archivally stable and digital format, consistent with the MHC's Survey Guidelines."

The MHC has not received any comments from the consulting parties regarding the draft MOA.

Please circulate the revised final MOA with the requested changes described above to the signatories for their signature and submit the original to the MHC for final signature.

These comments are offered to assist in compliance with M.G.L. Chapter 9, sections 26-27C (950 CMR 71.00) and MEPA (301 CMR 11).

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

xc: Charles Weinstein, Boston Children's Hospital
Steve Chilton, MassDevelopment
Rosanne Foley, Boston Landmarks Commission
Greg Galer, Boston Preservation Alliance
Marilyn Sticklor, Goulston & Storrs

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

Massachusetts Cultural Resource Information System

MACRIS

MAC IS Search esults

Search Date: 3/19/2022

Search Criteria: Town(s): Boston; Place: Fenway - Longwood; Street Name: Shattuck,Longwood;

Inv No	ro erty Name	Street	Town	Year	Designations
BOS.7357	Massachusetts School of Art	364 Brookline Ave	Boston	1929	NRIND;
BOS.7359	Boston Fire Engine House 3	411 Brookline Ave	Boston	1873	
BOS.17876	Brigham, Peter Bent Hospital - Surgical Building	5-75 Francis St	Boston	C 1915	
BOS.9291	Longwood Avenue Bridge	Longwood Ave	Boston	C 1897	NRDIS; LL;
BOS.17855	Longwood Spa - Sparr's Drug Store	158 Longwood Ave	Boston	1911	
BOS.7504	Carlton Building	160 Longwood Ave	Boston	1892	
BOS.7505	Westcourt Apartment Building	164 Longwood Ave	Boston	1900	
BOS.7514	Massachusetts College of Pharmacy - White, George Robert Building	179 Longwood Ave	Boston	1917	
BOS.7506	Angell Memorial Animal Hospital	180-184 Longwood Ave	Boston	1915	
BOS.7507	Harvard University Dental School	188 Longwood Ave	Boston	1908	
BOS.7511	Harvard Medical School - Building D - Bacteriology and Pathology Building	210 Longwood Ave	Boston	1906	
BOS.7509	Harvard Medical School - Building B - Anatomy and Histology Building	220 Longwood Ave	Boston	1906	
BOS.7515	Boston Lying-in Hospital	221 Longwood Ave	Boston	1922	
BOS.7510	Harvard Medical School - Building C - Physiological Chemistry and Physiology Building	240 Longwood Ave	Boston	1906	
BOS.7512	Harvard Medical School - Building E - Pharmacology and Hygiene Building	260 Longwood Ave	Boston	1906	
BOS.18224	Boston Children's Hospital - Patient and Family Parking Garage	283 Longwood Ave	Boston	1995	
BOS.18216	Boston Children's Hospital - Bader Building	300 Longwood Ave	Boston	1930	
BOS.18221	Boston Children's Hospital - Children's Hospital Library	300 Longwood Ave	Boston	1994	
BOS.18215	Boston Children's Hospital - Farley Building	300 Longwood Ave	Boston	1956	
BOS.18214	Boston Children's Hospital - Fegan Building	300 Longwood Ave	Boston	1966	
BOS.7513	Boston Children's Hospital - Hunnewell Building	300 Longwood Ave	Boston	1912	
BOS.18213	Boston Children's Hospital - Ida C. Smith Ward	300 Longwood Ave	Boston	1930	
BOS.18225	Boston Children's Hospital - Radiology and Surgery E pansion Pavilion	300 Longwood Ave	Boston	1974	
BOS.17830	Longwood Medical Building	319 Longwood Ave	Boston	1929	
BOS.18219	Boston Children's Hospital - John F. Enders Pediatric Research Laboratories	320-332 Longwood Ave	Boston	1970	
BOS.18217	Boston Children's Hospital - 333 Longwood Avenue	333 Longwood Ave	Boston	1984	
BOS.17831	Temple Israel	477 Longwood Ave	Boston	1928	
BOS.17854	Harvard Medical School - Countway, Francis A. Library of Medicine	10 Shattuck St	Boston	1963	
BOS.17880	Brigham, Peter Bent Hospital - Clinical Building	20 Shattuck St	Boston	1913	
BOS.17879	Brigham, Peter Bent Hospital - Out-Door Department	20 Shattuck St	Boston	1913	
BOS.17881	Brigham, Peter Bent Hospital - Pearl Memorial Geriatric Unit	20 Shattuck St	Boston	1956	
BOS.7508	Harvard Medical School - Building A - Administrative Building	25 Shattuck St	Boston	1906	
BOS.17852	Harvard Medical School - Laboratory of Human Reproduction and Reproductive Biology	45 Shattuck St	Boston	1969	
BOS.7683	Boston Children's Hospital - Wolbach Building	55 Shattuck St	Boston	1914	

Massachusetts Cultural Resource Information System
Scanned Record Cover Page

Inventory No:	BOS.7683
Historic Name:	Boston Children's Hospital - Wolbach Building
Common Name:	Rotch, Thomas M. Jr. Memorial Hospital for Infants
Address:	55 Shattuck St
City/Town:	Boston
Village/Neighborhood:	Fenway - Longwood; Fenway;
Local No:	548;
Year Constructed:	1914
Architectural Style(s):	Classical Revival;
Architect(s):	Norcross Brothers; Shepley, Rutan and Coolidge;
Use(s):	Administration Office; Classroom; Hospital; Library;
Significance:	Architecture; Education; Health Medicine; Social History;
Area(s):	BOS.AFC
Designation(s):	
Building Materials:	Wall: Bronze; Copper; Marble; Stone, Cut; Foundation: Concrete Unspecified;
Demolished	Yes

7683 KK

BOSTON LANDMARKS COMMISSION Building Information Form Form No. 548 Area Fenway

ADDRESS 55 SHATTUCK COR. NEAR BLACKFAN ST.
Thomas Morgan Rotch, Jr.
NAME present Memorial Hospital for Infants original

MAP No. 21N-8E SUB AREA FENWAY-LONGWOOD

DATE 1910 BUILDING PERMIT source

SHEPLEY, RUTAN
TECT & COOLIDGE BLDG. PERMIT source

ER NORCROSS BROS. BLDG. PERMIT source

HARVARD UNIVERSITY
original present

GRAPHS FW 6 3/4, 3/5-83

TYPE (residential) single double row 2-fam. 3-deck ten apt.
(non-residential) HOSPITAL

NO. OF STORIES (1st to cornice) 2 plus BASEMENT

ROOF FLAT cupola dormers

MATERIALS (Frame) clapboards shingles stucco asphalt asbestos alum/vinyl
(Other) brick (stone MARBLE) concrete iron/steel/alum.

BRIEF DESCRIPTION CLASSICAL REVIVAL BUILDING OF 2 STORIES, HAVING 11-BAY FRONT FACADE DOMINATED BY DOUBLE-STORY TETRASTYLE IONIC PORTICO ATOP BROAD FLIGHT OF STEPS. PILASTERS ARE LOCATED AT EITHER SIDE OF ENTRY BAY, WHICH IS FURTHER DEFINED BY MOLDINGS & CORNICE. DOUBLE DOORS HAVE GRILLE ABOVE. PEDIMENT IS ADORNED BY GRIFFINS FLANKING AN URN, IN TURN FLANKED BY FOLIATE MOTIFS. WINDOWS ARE 1/1 DOUBLE-HUNG SASH, PAIRED BELOW TRANSOMS. SIDE FACADES*
EXTERIOR ALTERATION (minor) moderate drastic

CONDITION (good) fair poor LOT AREA 16,300 sq. feet
LOCATED IN DENSELY DEVELOPED MEDICAL COMPLEX.

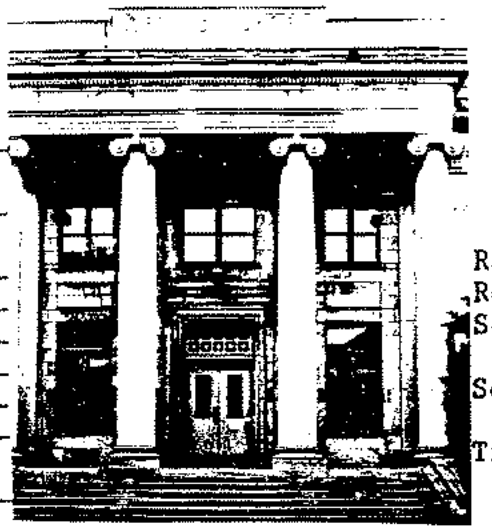
NOTEWORTHY SITE CHARACTERISTICS LAMPPOSTS LOCATED ATOP LOW BANISTER NEAR BASE OF STEPS. SMALL GRASSY AREA WITH SMALL TREES & LOW HEDGEROW FOUND EITHER SIDE OF STEPS.

SIGNIFICANCE (~~cont'd~~ on reverse)

* ARE 7 BAYS IN WIDTH, WITH CENTRAL CLASSICALLY EMBELLISHED ENTRY. DOOR ON ~~EAST~~ WEST SIDE IS TO BASEMENT; THAT ON ~~WEST~~ EAST CONTAINS COPPER GRILLE EFFECT WITH ANTHEMION MOTIFS.

(Map)

III. CK. 5/84



Moved; date if known _____

Themes (check as many

Aboriginal	___	Recreation	___
Agricultural	___	Religion	___
Architectural	✓	Science/ invention	___
The Arts	___	Social/ humanitarian	✓
Commerce	___	Transportation	___
Communication	___		
Community/ development	___		
Medicine	✓		

Significance (include explanation of themes checked above)

ARCHITECTURALLY DISTINGUISHED EXAMPLE OF CLASSICAL REVIVAL INSTITUTIONAL DESIGN BY BOSTON'S PROMINENT FIRM OF SHEPLEY, RUTAN, AND COOLIDGE, WHO WERE RESPONSIBLE ALSO FOR THE SIMILARLY STYLED HARVARD MEDICAL SCHOOL (SEE FORM). IT WAS BUILT FOR THE THOMAS MORGAN ROTCH, JR. MEMORIAL HOSPITAL FOR INFANTS, WHICH WAS INCORPORATED IN 1881 AS THE WEST-END NURSERY AND INFANTS' HOSPITAL. THE INSTITUTION WAS FOUNDED IN RESPONSE TO THE NEEDS OF THE POOR IN CROWDED TENEMENT HOUSING, WITH THE INTENT OF PROVIDING MEDICAL CARE TO INFANTS AND EDUCATING MOTHERS IN INFANT CARE AND ARTIFICIAL FEEDING. IN EARLY YEARS THE NURSERY AND HOSPITAL WERE ON BLOSSOM ST. (#33, #37).
THE NAME WAS CHANGED IN 1903 TO THE THOMAS MORGAN ROTCH, JR. MEMORIAL HOSPITAL FOR INFANTS. THOMAS M. ROTCH, M.D., WAS AN EARLY DIRECTOR OF THE INSTITUTION AND MEMBER OF THE CORPORATION; IN 1910 HE WAS MEDICAL DIRECTOR.

LAND AT THE SHATTUCK ST. (THEN, VAN DYKE ST.) SITE WAS PURCHASED FROM HARVARD UNIVERSITY IN 1904. GROUND WAS BROKEN FOR THE NEW BUILDING IN 1910, BUT IT WAS 1914 WHEN THE HOSPITAL MOVED INTO THE STRUCTURE. PLANS FOR THE BUILDING INCLUDED A RESEARCH LAB, MODEL LAUNDRY, STERILIZING MILK LABORATORY, WARDS, MODEL NURSERY (FOR TEACHING), MILK MODIFYING ROOM, AND LIBRARY (WHICH WAS TO BE OPEN TO THE PUBLIC); LECTURE & OPERATING ROOMS. IN 1924 THE HOSPITAL HAD JOINED *

Preservation Consideration (accessibility, re-use possibilities, capacity for public use and enjoyment, protection, utilities, context)

RECOMMENDED FOR NATIONAL REGISTER ~~DESIGNATION~~ LISTING

* WITH CHILDREN'S HOSPITAL IN ITS BUILDING AT 300 LONGWOOD.
55 SHATTUCK WAS SUBSEQUENTLY TAKEN OVER BY HARVARD UNIVERSITY'S SCHOOL OF PUBLIC HEALTH.

THE ARCHITECTURAL FIRM OF SHEPLEY, RUTAN, AND COOLIDGE WAS ALSO RESPONSIBLE FOR OTHER BUILDINGS IN THE FENWAY AREA. SEE FORMS FOR: YMCA (312-320 HUNTINGTON AVE), HARVARD MEDICAL SCHOOL (230-240 LONGWOOD AVE), AND CHILDREN'S HOSPITAL (300 LONGWOOD AVE)

Bibliography and/or references (such as local histories, deeds, assessor's records, early maps, etc.)

BOSTON BUILDING PERMITS, (DECEMBER 12, 1910)

BOSTON DIRECTORIES.

INFANTS' HOSPITAL. ANNUAL REPORTS.

LOWELL, ABBOTT LAWRENCE, & OTHERS. ADDRESSES WHICH WERE DELIVERED AT A MEETING HELD IN BEHALF OF THE NEW BUILDING FOR THE INFANTS' HOSPITAL, BOSTON, MAY 24, 1911.

55 SHATTUCK F/K 548 BOS.7683

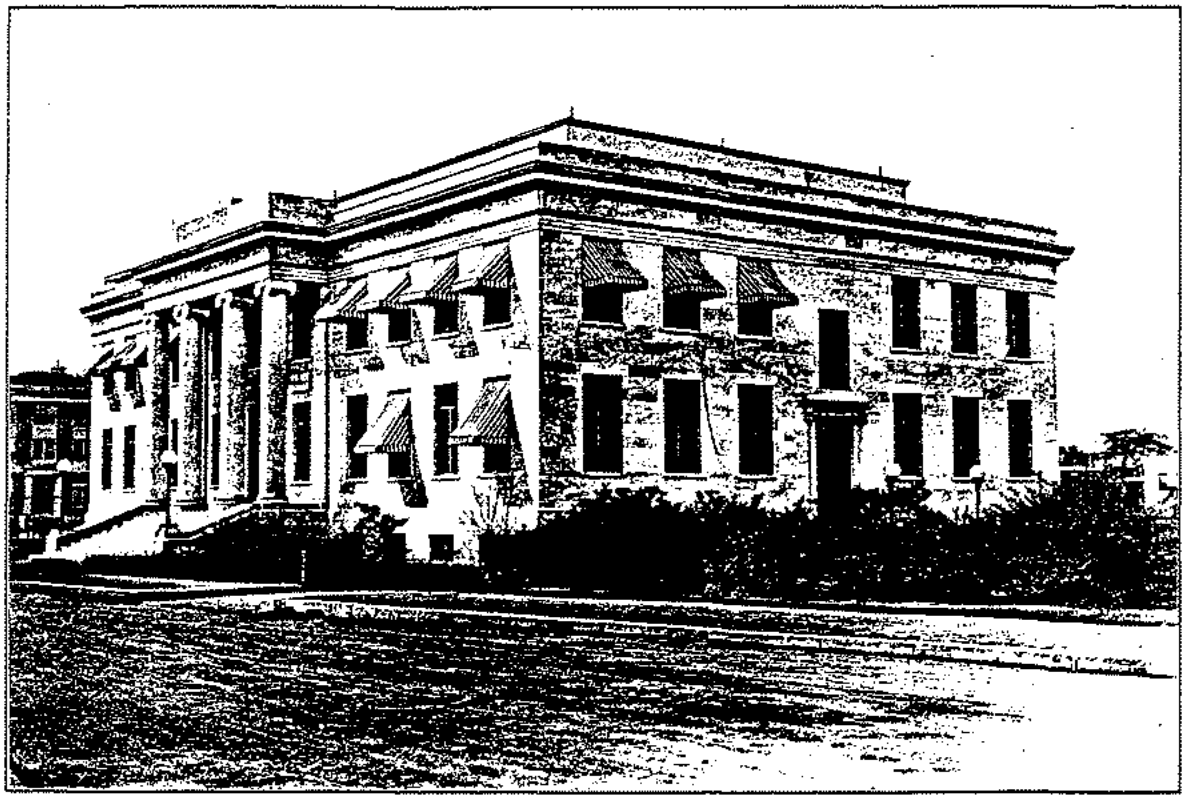
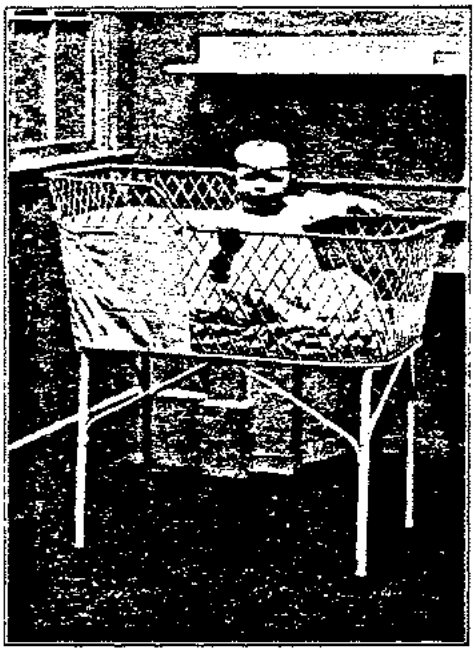


Photo by E. F. Turkington. INFANTS' HOSPITAL, ROTCH MEMORIAL BUILDING.

SPNEA.
(file: Roxbury. Longwood: Children's Hospital (Photo Mechanical Repros)

55 SHATTUCK

F/K 548



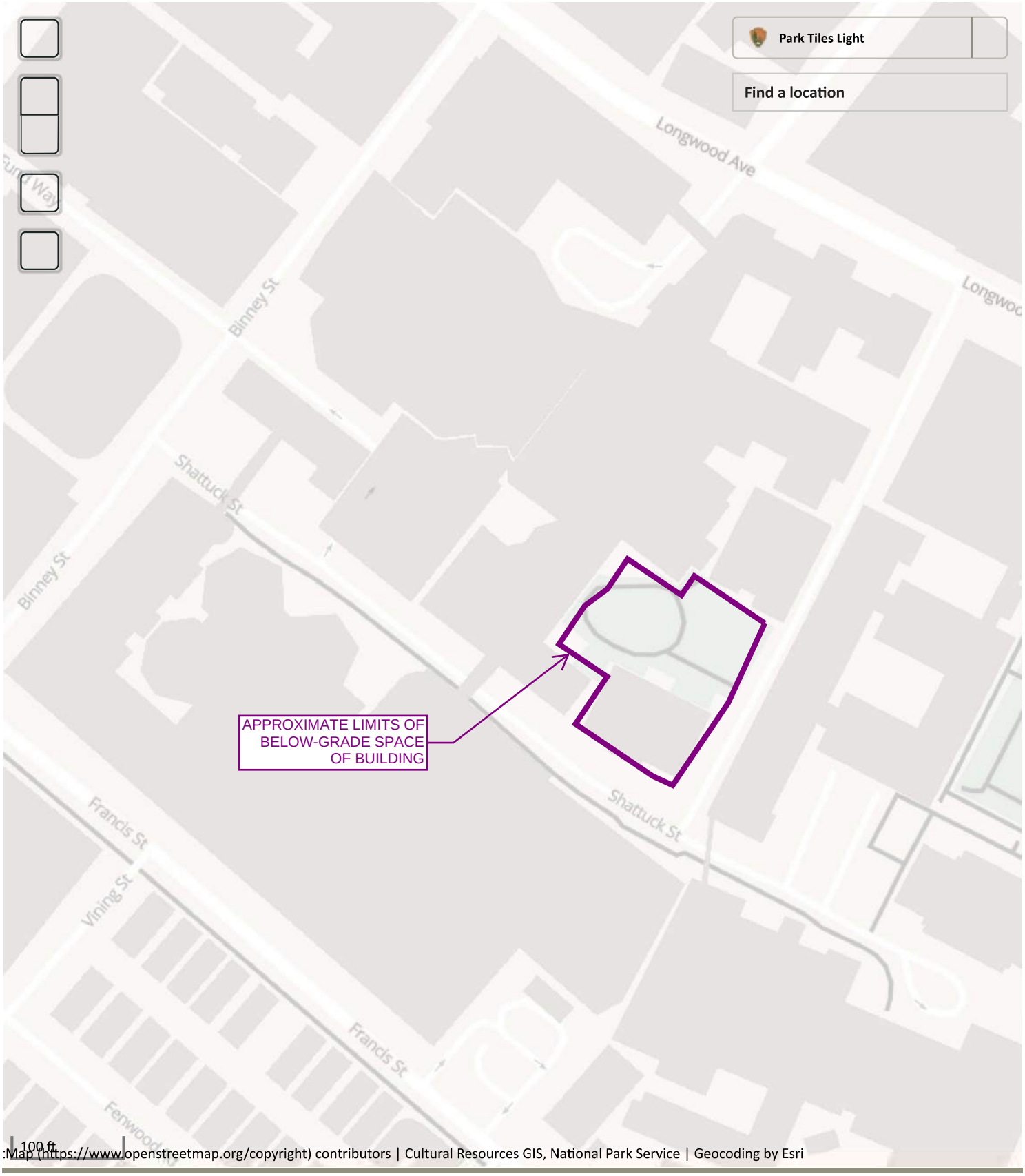
FROM: INFANTS' HOSPITAL,
28th ANNUAL REPORT
JANUARY 1910- JANUARY 1911

FROM: INFANTS' HOSPITAL
26th ANNUAL REPORT.
JANUARY 1908- 1909.

National Register of Histori...

National Park Service
U.S. Department of the Interior

Public, non-restricted data depicting National Register spatial data proce...



APPENDIX G

Best Management Practices Plan

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
REMEDIATION GENERAL PERMIT
BOSTON CHILDREN'S HOSPITAL – HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS

BEST MANAGEMENT PRACTICES PLAN

A Notice of Intent (NOI) application package for a Remediation General Permit (RGP) under the National Pollutant Discharge Elimination System (NPDES) has been submitted to the U.S. Environmental Protection Agency (EPA) to facilitate permanent off-site discharge of groundwater remediation effluent from permanent groundwater treatment system at the Boston Children's Hospital Hale Family Building on the BCH campus located at 300 Longwood Avenue in Boston, Massachusetts.

In accordance with NPDES RGP MAG910000, Section 2.5, a Best Management Practices Plan (BMPP) must be developed, implemented, and maintained for the discharges covered under this general permit. The BMPP provides a plan for compliance with the terms of the permit and documents the implementation of control measures, including best management practices (BMPs), to meet the following non-numeric technology-based effluent limitations:

- Minimize the potential for violations of the terms of this general permit, taking corrective actions, when necessary;
- Minimize the number and quantity of pollutants and/or the toxicity generated, discharged, or potentially discharged at the site;
- Minimize discharges of pollutants from the remediation activities; and
- Use pollution control technologies when necessary to meet the effluent limitations and requirements in this general permit.

This BMPP, along with the project-specific documents referenced below, will be available at the site during discharge activities. The BMPs discussed below will be conducted in accordance with the NPDES RGP MAG910000 obtained for the site. Please refer to the NOI application package submitted for this site, to the general NPDES RGP MAG910000 permit, and to the site-specific project documents for information regarding specific details of the BMPs to be conducted and followed.

Site-specific documents related to the site include the following:

- NPDES RGP NOI Application;
- Massachusetts Department of Environmental Protection (MassDEP) Release Abatement Measure (RAM) Plan;
- Stormwater Pollution Prevention Plan (SWPPP); and
- Health & Safety Plan.

The above-referenced project-specific documents included with this BMPP provide the following required information and considerations:

- Name and location of the site;
- System schematics, drawings or maps, including up to date site plans with a detailed outfall diagram;
- Identification and contact information for the operator(s); and
- Identification of potential sources of pollution.

Description of the specific control measures, including BMPs, the operator will take to reduce the pollutants associated with the following:

- Influent and effluent;
- Storage and handling areas;
- Site runoff;
- On-site transfer;
- Loading or unloading operations;
- Spillage or leaks;
- Sludge and waste disposal; and
- Drainage from material storage and handling areas.

Groundwater Treatment and Management

Groundwater collected in the building underslab drainage (USD) system is routed to a sump that directs the water to the permanent groundwater treatment system which includes a series of bag filters to remove suspended solids and undissolved contaminants including metals, followed by granular activated carbon (GAC) vessels to remove dissolved contaminants including tetrachloroethene (PCE), trichloroethene (TCE) and cis-1,2-Dichloroethene (cis-1,2-DCE) to within the Effluent Limitations established by the NPDES RGP. Total flow is measured with a flow meter/totalizer. The system is designed for a maximum flow rate of 20 gallons per minute (gpm); average flow rates of about 10 gpm are anticipated. Details of the permanent groundwater treatment system submitted by the contractors responsible for installation of the system and a schematic process flow diagram of the groundwater treatment system are included in the NOI.

Following treatment, the effluent from the groundwater treatment system is pumped to the building stormwater system prior to off-site discharge to the BWSC storm drain system. The proposed discharge route travels northeast along Meadow Lane to Longwood Avenue, continues to the northeast along Blackfan Street, and reaches the Muddy River where the effluent discharges to outfall DO 045. Plans of the proposed discharge route are included in the NOI.

Discharge Monitoring and Compliance

Regular sampling and testing of the untreated influent and of the treated effluent will be conducted as required by the NPDES RGP. This includes sampling and chemical testing required within the first month of discharging, and the monthly and/or quarterly testing to be conducted through the end of the scheduled discharge. A review of sample results will be conducted no more than 72 hours from receipt of the results.

Monitoring will include checking the condition of the treatment system, assessing the need for treatment system adjustments based on monitoring data, observing and recording flow rates and discharge quantities, and verifying the flow path of the discharged effluent. Monitoring will also include taking corrective actions to minimize the potential for general permit violations, when necessary.

The flow will be monitored by checking and documenting the flow through the flow meter to be installed on the system. Flow will be maintained below the "system design flow" by regularly monitoring flow and adjusting as needed.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
REMEDIATION GENERAL PERMIT
BOSTON CHILDREN'S HOSPITAL – HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS

Monthly and/or quarterly monitoring reports will be compiled and maintained at the site. Documentation regarding implementation of control measures, including BMPs, will be included in these reports.

BEST MANAGEMENT PRACTICES

The following BMPs will be considered and conducted as part of discharge activities at the subject site, in accordance with NPDES RGP requirements.

Effluent Flow BMPs include:

- Flow control measures which mitigate discharge(s) in exceedance of the design flow of the discharge (i.e., the maximum flow through the component with the lowest limiting capacity); and
- Documentation of the method(s) for measuring effluent flow.

Preventative Maintenance BMPs include:

- Documenting procedures and protocols so that all control measures, including all treatment system components and related appurtenances used to achieve the limitations in this general permit, remain in effective operating condition and do not result in leaks, spills, and other releases of pollutants;
- Maintaining a maintenance schedule for all treatment system components and related appurtenances used to meet the limitations of this general permit; and
- Records of the completion of regular maintenance activities will be maintained.

Site Management BMPs include:

- Implementing control measures that facilitate the proper management of solid and hazardous waste and prevent solids, sludge, or other pollutants removed in the course of treatment or control of water and wastewaters from entering Waters of the United States;
- Utilizing run-on and runoff management practices which divert, infiltrate, reuse, contain, or otherwise reduce extraneous uncontaminated waters and minimize the extent to which such uncontaminated waters commingle with remediation activity discharges; and
- Utilizing water quality control measures such that the discharges covered by this general permit do not adversely affect existing water quality by preventing any erosion, stream scouring, or sedimentation, and/or any direct or indirect discharge which contributes additional pollutants.

Pollutant Minimization BMPs include:

- Identifying and assessing the type and quantity of pollutants, including their potential to impact receiving water quality;
- Implementing water quality control measures that do not consider dilution as a form of treatment, or as a means to achieve the limitations and requirements in this general permit; and
- Selecting, designing, installing and properly operating and maintaining pollution control technologies necessary to meet the limitations and requirements in this general permit.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
REMEDIATION GENERAL PERMIT
BOSTON CHILDREN'S HOSPITAL – HALE FAMILY BUILDING
BOSTON, MASSACHUSETTS

Administrative Controls BMPs include:

- Documenting site security procedures appropriate for the treatment and other systems related to the NPDES RGP discharge(s); and
- Documenting employee training conducted at least annually (or once, for discharges lasting less than one year) for site personnel who have direct or indirect responsibility for compliance with this general permit.

Procedures for Initiating Corrective Actions and Completing within a Reasonable Timeframe include:

- Evaluation and revision (i.e., repair, modification, or replacement), if necessary, of any control measure used at the site if the control measure is identified as missing, installed incorrectly, or ineffective in discharge meeting the applicable water quality standards and/or effluent limitations and requirements in this general permit. The following actions will be conducted upon discovery of a violation of a permit limitation or requirement, at a minimum:
    - The discharge will stop immediately, unless the operator is otherwise instructed by the EPA and/or the appropriate State;
    - The operator will immediately take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution is achieved;
    - Notification will be provided to the EPA and to the appropriate State via telephone, e-mail or other verbal or written means within 24 hours; and
    - The cause of the permit violation will be identified, and corrective action will be initiated within 72 hours, if necessary, prior to resuming discharge when a treatment system is not in use, unless otherwise instructed by the EPA and/or the appropriate State.
- A schedule for and record of routine inspections conducted at least monthly by site personnel who have direct knowledge of the remediation activity at the site, the control measure(s) in use at the site, and the ability to assess the effectiveness of any control measure(s) in use at the site to meet the limitations and requirements of this general permit. Routine inspections will:
    - Assess the influent, effluent, treatment system, and remediation activity areas;
    - Identify any uncontrolled leaks, spills or discharges; and
    - Conduct visual inspection for indicators of pollution.

Quality Assurance/Quality Control (QA/QC) BMPs include:

- A description of applicable monitoring requirements;
- A map and/or treatment system diagram indicating the location of each monitoring point with a geographic identifier (i.e., latitude and longitude coordinates);
- Specifications for the number of samples, type of sample containers, type of preservation, holding times, type and number of quality assurance field samples (i.e., matrix spiked and duplicate samples and sample blanks), sample preparation requirements (e.g., sampling equipment calibration, clean sampling procedures), and sample storage and shipping methods, including EPA QA/QC and chain-of-custody procedures;
- Name(s), address(es), and telephone number(s) of the laboratories used by the operator;
- Specifications for analytical methods, analytical detection and quantitation limits for each required parameter, and laboratory data delivery and documentation requirements;
- A schedule for review of sample results, which will be reviewed by the operator no more than 72 hours from receipt of the results; and
- A description of data validation and data reporting processes.

Site Materials Management BMPs include:

- Good housekeeping practices and/or control measures that maintain areas that are potential sources of pollutants.
- Material compatibility practices and/or control measures that will facilitate safe handling, use and storage of materials used in the treatment process.
- For any chemical and/or additive used or stored at a site, operators will document:
    - Product name, chemical formula, and manufacturer of the chemical or additive;
    - Purpose or use of the chemical or additive;
    - Safety Data Sheet (SDS) and Chemical Abstracts Service (CAS) Registry number for each chemical or additive;
    - The frequency (e.g., hourly, daily), duration (e.g., hours, days), magnitude (i.e., frequency as maximum and average concentration), and method of application for the chemical or additive;
    - Any material compatibility risks for storage of the chemical or additive;
    - If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 for aquatic organism(s)); and
    - A description of the material management control measures employed (e.g., inventory, containment devices, protected storage building(s) and/or cabinet(s)) and any measures taken for material compatibility.
- Spill prevention practices and spill control measures, including other handling and collection methods, when necessary (e.g., containment devices), that will reduce spills and leaks from the treatment system and the release of chemical and/or additives in use at a site. The following actions will be conducted upon detection of a leak, spill, or other release containing a hazardous substance or oil:
    - The discharge will stop immediately;
    - Notification will be provided to the EPA within 24 hours;
    - The source of the leak, spill or other release will be identified and corrective action will be taken, if necessary, prior to resuming discharge, unless instructed otherwise by the EPA and/or the appropriate State; and
    - When a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs, the operator will document a description of the release, the circumstances leading to the release, the date of the release, a description of any corrective actions taken and the date such corrective actions are completed.
- Spent bag filters and GAC vessels will be placed in drums and manifested for off-site disposal to an appropriate receiving facility.

CERTIFICATION

The operator will certify the Best Management Practices as follows:

- On or before January 15th each calendar year, or upon Notice of Termination (NOT) if a discharge lasts less than one year, the operator will prepare a statement certifying that the

requirements of the BMPP were met for the previous calendar year, or for the duration of discharge if a discharge lasts less than a full calendar year;

- Each certification shall state whether the operation and maintenance activities were conducted, results recorded, and records maintained, and will indicate whether the discharges are in compliance with the requirements of the BMPP and meet the effluent limitations included in this general permit;
- The required certification statements will be maintained with a complete, up to date BMPP on site or at the location of the principal operator identified in the NOI and made available for inspection by the EPA or the State;
- Any amendments to the BMPP resulting from any change which occurred at the site that increases the generation of pollutants, or the release or potential release of pollutants to the receiving water, or changes the operation and maintenance procedures covered by the BMPP will be explained in the certification for the reporting period in which the change(s) occurred; and
- Each certification will be signed in accordance with 40 CFR §122.22.