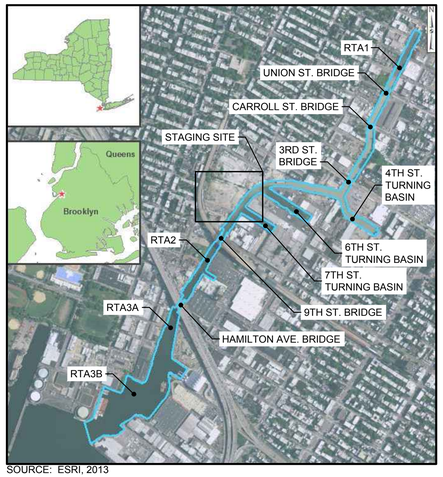
REMEDIATION TARGET AREA (RTA) 1 DESIGN

GOWANUS CANAL SUPERFUND SITE

BROOKLYN, NEW YORK

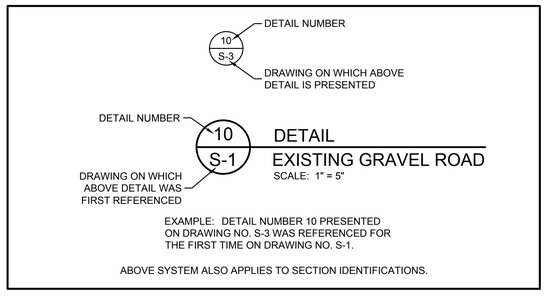
100% DESIGN PACKAGE

FEBRUARY 2020



SOURCE: ESRI, 2013

VICINITY MAP
NOT TO SCALE



DETAIL IDENTIFICATION LEGEND

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SOURCE: MICROSOFT CORPORATION BING MAPS 2016

LOCATION MAP
SCALE: 1" = 500'

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1. DESIGN DRAWINGS FOR BRIDGES AND BULKHEAD SUPPORTS WILL BE PROVIDED BY OTHERS AS PART OF A SEPARATE DESIGN PACKAGE.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

PREPARED FOR:

Gowanus Canal Remedial Design Group

PREPARED BY:

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144
TELEPHONE: 678.202.9510

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: COVER SHEET

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR001
REVIEWED BY:	RSH	DRAWING NO.:	G-1
APPROVED BY:	JFB		OF 4

NOT ISSUED FOR CONSTRUCTION

X:\DL_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR001

IDENTIFICATION NO. (DREDGING NOTE 8)	NYCDEP SHORELINE SURVEY ID (DREDGING NOTE 8)	PERMIT TYPE	NEW YORK EAST FIPS ZONE 3101		IDENTIFIED IN KSS 2019 SURVEY	PIPE SIZE (DREDGING NOTE 5)	PIPE MATERIAL	OUTFALL INVERT ELEVATION (NAVD88)	IS THE OUTFALL SUBMERGED?
			NORTH	EAST					
GC-CF-E-001 (DREDGING NOTE 16)	RH-038	COMBINED SEWER OVERFLOW (CSO); STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) PERMITTED (NY0027073)	673294.8	634313.0	YES	16" [KSS, 2019] (DREDGING NOTE 15)	REINFORCED CONCRETE	-1.81 (DREDGING NOTE 15)	TIDAL TRANSITION ZONE
GC-CF-E-002 (DREDGING NOTE 16)			673290.4	634310.9	YES		REINFORCED CONCRETE	-1.91 (DREDGING NOTE 15)	TIDAL TRANSITION ZONE
GC-CF-E-003 (DREDGING NOTE 16)			673286.2	634308.9	YES		REINFORCED CONCRETE	-1.91 (DREDGING NOTE 15)	TIDAL TRANSITION ZONE
GC-CF-E-004 (DREDGING NOTE 16)			673282.3	634307.0	YES		REINFORCED CONCRETE	-1.94 (DREDGING NOTE 15)	TIDAL TRANSITION ZONE
GC-CF-E-005 (DREDGING NOTE 16)			673278.3	634305.0	YES		REINFORCED CONCRETE	-1.88 (DREDGING NOTE 15)	TIDAL TRANSITION ZONE
GC-CF-E-006 (DREDGING NOTE 16)			673274.3	634303.1	YES		REINFORCED CONCRETE	-2.00 (DREDGING NOTE 15)	TIDAL TRANSITION ZONE
GC-CF-E-007	-	UNKNOWN	673263.5	634296.7	YES	5" [KSS, 2019]	-	2.13	ABOVE WATER
GC-CF-E-008	-	UNKNOWN	673261.4	634295.5	YES	9" [KSS, 2019]	-	4.22	ABOVE WATER
GC-CF-E-009	RH-835	UNKNOWN	673193.5	634258.4	YES	12" [KSS, 2019]	-	0.91	TIDAL TRANSITION ZONE
GC-CF-E-009A	-	UNKNOWN	673185.3	634250.9	NO	-	-	-	SUBMERGED
GC-CF-E-010	RH-512	UNKNOWN	672904.6	634107.6	YES	10" - COLLAPSED [KSS, 2019]	-	-0.15	TIDAL TRANSITION ZONE
GC-CF-E-015	RH-460	UNKNOWN	672367.9	633849.1	YES	12" [KSS, 2019]	CLAY	3.86	ABOVE WATER
GC-CF-E-016 (DREDGING NOTES 14 AND 16)	OH-005	CSO; SPDES PERMITTED (NY0026166)	672325.0	633845.9	YES	48" (Qty = 2) [KSS, 2019] (DREDGING NOTE 15)	BRICK	0 (DREDGING NOTE 15)	TIDAL TRANSITION ZONE
GC-CF-E-025	OH-510	UNKNOWN	671616.6	633568.4	YES	20" [KSS, 2019]	METAL	2.30	ABOVE WATER
GC-CF-E-030	RH-512	UNKNOWN	672840.9	634079.2	YES	10" [KSS, 2019]	-	0.78	TIDAL TRANSITION ZONE
GC-CF-E-031	RH-460	UNKNOWN	672848.6	634082.9	YES	6" [KSS, 2019]	-	3.99 (DREDGING NOTE 13)	ABOVE WATER
GC-CF-E-032	-	(DREDGING NOTE 7)	671653.3	633588.7	YES	20" [KSS, 2019]	STEEL	3.33	ABOVE WATER
GC-CF-N-001	-	UNKNOWN	673674.4	634390.4	YES	14" [KSS, 2019]	-	2.46	ABOVE WATER
GC-CF-N-001A	-	UNKNOWN	673665.1	634404.1	NO	8" [CH2MHILL, 2011]	CONCRETE	-	TIDAL TRANSITION ZONE
GC-CF-N-001B	-	UNKNOWN	673665.5	634403.2	NO	10" OD [CH2MHILL, 2011]	CAST IRON	-	TIDAL TRANSITION ZONE
GC-CF-N-002 (DREDGING NOTE 16)	RH-034	CSO; SPDES PERMITTED (NY0027073)	673659.7	634419.5	YES	10'x10' [KSS, 2019] (DREDGING NOTE 15)	-	3.46 (DREDGING NOTES 9 AND 15)	ABOVE WATER
GC-CF-N-003 (DREDGING NOTE 16)			673653.9	634430.4	YES			3.42 (DREDGING NOTES 9 AND 15)	
GC-CF-N-004 (DREDGING NOTE 16)			673648.4	634441.4	YES			3.51 (DREDGING NOTES 9 AND 15)	
GC-CF-N-005 (DREDGING NOTE 16)			673642.7	634452.5	YES			3.52 (DREDGING NOTES 9 AND 15)	
GC-CF-W-001	-	UNKNOWN	673638.1	634373.9	YES	12" [KSS, 2019]; 12" [CH2MHILL, 2011]	CCP	1.73	TIDAL TRANSITION ZONE
GC-CF-W-002 (DREDGING NOTE 16)	RH-039	UNKNOWN	673558.2	634332.7	YES	33"x26" [KSS, 2019]; ~ 2' [CH2MHILL, 2011] (DREDGING NOTE 15)	-	-3.13 (DREDGING NOTE 15)	SUBMERGED
GC-CF-W-002A	-	UNKNOWN	673560.2	634333.7	YES	12" [KSS, 2019]	-	-3.46	SUBMERGED
GC-CF-W-003	-	UNKNOWN	673500.4	634303.1	YES	8" [KSS, 2019]	-	0.55	TIDAL TRANSITION ZONE
GC-CF-W-004	-	UNKNOWN	673411.7	634258.3	YES	6" [KSS, 2019]	-	2.52	ABOVE WATER
GC-CF-W-005	-	UNKNOWN	673378.0	634241.2	YES	6" [KSS, 2019]	-	3.26	ABOVE WATER
GC-CF-W-006 (DREDGING NOTE 6)	-	UNKNOWN	673340.3	634220.6	YES	12" [KSS, 2019]	METAL	-0.18	TIDAL TRANSITION ZONE
GC-CF-W-007	-	UNKNOWN	673075.9	634091.5	YES	6" [KSS, 2019]	-	0.32	TIDAL TRANSITION ZONE
GC-CF-W-008	-	UNKNOWN	673034.9	634069.1	YES	6" [KSS, 2019]	-	2.10	ABOVE WATER
GC-CF-W-009	-	UNKNOWN	672796.0	633944.2	YES	4" [KSS, 2019]	-	6.15	ABOVE WATER
GC-CF-W-010	-	UNKNOWN	672774.1	633931.6	YES	4" [KSS, 2019]	-	10.18	ABOVE WATER
GC-CF-W-011	-	UNKNOWN	672767.3	633928.5	YES	4" [KSS, 2019]	-	10.31	ABOVE WATER
GC-CF-W-012	-	UNKNOWN	672495.8	633794.1	YES	4" [KSS, 2019]	PVC	3.54	ABOVE WATER
GC-CF-W-013	-	UNKNOWN	672487.7	633789.7	YES	4" [KSS, 2019]	PVC	3.66	ABOVE WATER
GC-CF-W-014	-	UNKNOWN	672476.4	633783.7	YES	4" [KSS, 2019]	PVC	3.78	ABOVE WATER
GC-CF-W-015	-	UNKNOWN	672454.8	633772.4	YES	4" [KSS, 2019]	PVC	3.84	ABOVE WATER
GC-CF-W-012A	-	UNKNOWN	672513.3	633802.3	NO	-	-	-	TIDAL TRANSITION ZONE
GC-CF-W-014A	-	UNKNOWN	672468.1	633780.5	NO	-	-	-	ABOVE WATER
GC-CF-W-015A	-	UNKNOWN	672448.7	633777.3	NO	-	-	-	TIDAL TRANSITION ZONE
GC-CF-W-016	-	UNKNOWN	672423.3	633757.6	YES	12" [KSS, 2019]	STEEL	4.94	ABOVE WATER
GC-CF-W-017	-	UNKNOWN	672429.2	633757.1	YES	8" [KSS, 2019]	CLAY	3.14	ABOVE WATER
GC-CF-W-018	-	UNKNOWN	672330.2	633755.5	NO	~8" [CH2MHILL, 2011]	STEEL/METAL	-	TIDAL TRANSITION ZONE
GC-CF-W-019	-	UNKNOWN	672257.3	633758.2	NO	~4" [CH2MHILL, 2011]	STEEL/METAL	-	TIDAL TRANSITION ZONE
GC-CF-W-040	-	UNKNOWN	673541.0	634328.7	NO	~1" [CH2MHILL, 2011]	PVC/PLASTIC	-	ABOVE WATER
GC-CF-W-041	-	UNKNOWN	672434.0	633770.7	NO	N/A	UNKNOWN	-	TIDAL TRANSITION ZONE
GC-CF-W-045	-	UNKNOWN	671976.0	633671.8	NO	~4" [CH2MHILL, 2011]	STEEL/METAL	-	TIDAL TRANSITION ZONE
GC-CF-W-046	-	UNKNOWN	671950.3	633659.3	NO	~8" [CH2MHILL, 2011]	STEEL/METAL	-	TIDAL TRANSITION ZONE
GC-CF-W-046A	-	UNKNOWN	671940.9	633649.9	NO	-	-	-	TIDAL TRANSITION ZONE
GC-CF-W-097	-	UNKNOWN	671811.4	633579.4	NO	-	-	-	TIDAL TRANSITION ZONE
GC-CF-W-098	-	UNKNOWN	672228.9	633751.6	NO	-	-	-	TIDAL TRANSITION ZONE
GC-CF-W-042	-	UNKNOWN	672340.3	633756.5	NO	~4" [CH2MHILL, 2011]	TERRA COTTA	-	TIDAL TRANSITION ZONE
GC-CF-W-043	-	UNKNOWN	672190.7	633749.6	NO	~4" [CH2MHILL, 2011]	STEEL/METAL	-	TIDAL TRANSITION ZONE
GC-OF-091	-	UNKNOWN	671894.8	633743.9	YES	12" [KSS, 2019]	-	3.11	ABOVE WATER
GC-OF-092	-	UNKNOWN	671901.0	633748.3	YES	12" [KSS, 2019]	-	3.22	ABOVE WATER
GC-OF-095	-	UNKNOWN	672315.9	633768.4	NO	-	-	-	-
GC-OF-097	-	UNKNOWN	672242.4	633756.8	NO	-	-	-	-
GC-OF-098	-	UNKNOWN	672193.8	633749.7	NO	-	-	-	TIDAL TRANSITION ZONE
GC-OF-099 (DREDGING NOTES 10 AND 16)	-	UNKNOWN	672115.4	633724.2	YES	30" [KSS, 2019] (DREDGING NOTE 15)	METAL	2.04 (DREDGING NOTE 15)	ABOVE WATER
GC-OF-101	-	UNKNOWN	671975.3	633680.0	NO	-	-	-	-
GC-OF-110 (DREDGING NOTE 16)	RH-036	CSO; SPDES PERMITTED (NY0027073)	672591.0	633941.7	NO	18" DIAMETER [NYCDEP, 2007] (DREDGING NOTE 15)	-	-	SUBMERGED
GC-OF-111	-	UNKNOWN	672716.6	634011.0	NO	1" [GEI, 2009]	STEEL	-	-
GC-OF-112	-	UNKNOWN	672772.9	633937.7	NO	-	-	-	ABOVE WATER
GC-OF-116 (DREDGING NOTE 11)	-	UNKNOWN	672749.5	633920.2	YES	6" [KSS, 2019].	-	4.98	ABOVE WATER
GC-OF-117 (DREDGING NOTE 11)	-	UNKNOWN	672749.4	633920.1	YES	6" [KSS, 2019].	-	4.02	ABOVE WATER
GC-OF-118 (DREDGING NOTE 11)	-	UNKNOWN	-	-	-	-	-	-	-
GC-OF-128	-	UNKNOWN	672909.0	634009.5	NO	-	-	-	-
GC-OF-129 (DREDGING NOTE 16)	RH-037	CSO; SPDES PERMITTED (NY0027073)	673060.6	634177.2	NO	18" DIAMETER [NYCDEP, 2007] (DREDGING NOTE 15)	-	-	SUBMERGED
GC-OF-140 (DREDGING NOTE 16)	RH-033	CSO; SPDES PERMITTED (NY0027073)	673514.8	634415.8	NO	38"W x 44"H [NYCDEP, 2007] (DREDGING NOTE 15)	-	-	SUBMERGED
GC-OF-194	-	UNKNOWN	673673.4	634390.0	YES	8" [KSS, 2019]	-	1.23	TIDAL TRANSITION ZONE
GC-OF-195	-	UNKNOWN	673670.1	634389.2	YES	9" (OD) [KSS, 2019]	GATED METAL	0.96	TIDAL TRANSITION ZONE
GC-OF-197	-	UNKNOWN	673656.5	634385.1	NO	8" [GEI, 2009]	STEEL	-	SUBMERGED
GC-RTA1-001 (DREDGING NOTE 12)	-	UNKNOWN	672264.6	633848.6	YES	6" [KSS, 2019]	-	4.23	ABOVE WATER
GC-RTA1-002 (DREDGING NOTE 12)	-	UNKNOWN	671818.6	633695.6	YES	10" [KSS, 2019]	-	2.80	ABOVE WATER
GC-RTA1-003 (DREDGING NOTE 12)	-	UNKNOWN	671737.5	633642.8	YES	8" [KSS, 2019]	-	-0.03	TIDAL TRANSITION ZONE
GC-RTA1-004 (DREDGING NOTE 12)	-	UNKNOWN	671792.5	633567.2	YES	6" [KSS, 2019]	PVC	3.92	ABOVE WATER
GC-RTA1-005 (DREDGING NOTE 12)	-	UNKNOWN	671760.2	633548.1	YES	6" [KSS, 2019]	PVC	2.00	ABOVE WATER

1 / G-2 TABLE
OUTFALL DATA
(GENERAL NOTE 3, DREDGING NOTES 6 THROUGH 13)

GENERAL NOTES:

1. ELEVATIONS (EL.) ARE IN FEET (FT) BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). THE GRID COORDINATE SYSTEM CORRESPONDS TO NEW YORK STATE PLANE, EAST ZONE (3101). HORIZONTAL REFERENCE DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83).
2. THE BATHYMETRIC SURFACE IN REMEDIAL TARGET AREA (RTA) 1 WAS CREATED BY MERGING THE BATHYMETRY DATA OBTAINED FROM HYDROGRAPHIC SURVEYS CONDUCTED BY: (I) ROGERS SURVEYING, PLLC (ROGERS) ON 29 MAY 2019 NEAR THE HEAD OF THE CANAL (APPROXIMATELY 300 FT FROM THE HEAD OF THE CANAL), AND (II) OCEAN SURVEYS, INC. (OSI) FROM 13 TO 18 OCTOBER 2014 FOR THE REMAINDER OF RTA1. B&B ENGINEERS & GEOLOGISTS OF NEW YORK, P.C. (B&B) RECEIVED THE SOUNDING XYZ BATHYMETRIC DATA FROM OSI IN NOVEMBER 2014 AND FROM ROGERS IN JUNE 2019, BOTH WERE USED TO CREATE A DIGITAL TERRAIN MODEL IN AUTOCAD CIVIL 3D TO REPRESENT THE BATHYMETRIC SURFACE. BATHYMETRIC ELEVATIONS FOR THE COMPLETED TURNING BASIN (TB) 4 PILOT STUDY AREA WERE BASED ON FINAL CAP SURFACES AS PART OF PROGRESS SURVEY 59 BY SEVENSON ENVIRONMENTAL SERVICES INC. DATED 15 NOVEMBER 2018.
3. BULKHEAD ALIGNMENTS, OUTFALL LOCATIONS, AND EXISTING TOPOGRAPHY ALONGSIDE PROPERTIES NEAR THE HEAD OF THE CANAL WERE OBTAINED FROM A TOPOGRAPHIC SURVEY PERFORMED BY KENNON SURVEYING SERVICES, INC. (KSS) AND DATED 15 JULY 2019.
4. SUBSURFACE STRATIGRAPHY DATA IN THE CANAL FOR THE BOTTOM OF SOFT SEDIMENT (OR TOP OF NATIVE ALLUVIAL SEDIMENT) AND BOTTOM OF NATIVE ALLUVIAL (OR TOP OF GLACIAL DEPOSITS) WERE ESTABLISHED FROM CONE PENETROMETER TESTING (CPT) LOGS AND SEDIMENT CORES COLLECTED BY B&B IN 2015, 2017, AND 2018 DURING PRE-DESIGN (PD) INVESTIGATIONS (PD-7, PD-8, AND PD-18) AND 2017 SUPPLEMENTAL INVESTIGATIONS IN TB4 (CPT LOGS), BORINGS FROM THE NATIONAL GRID FULTON REMEDIAL DESIGN REPORT (GZA, 2016), AND HISTORICAL SEDIMENT LOGS IN RTA3 FROM PREVIOUS INVESTIGATIONS COMPLETED BY GEI (2009), EPA (2011), AND CH2M (2015). THE SUBSURFACE INFORMATION IS AVAILABLE UPON REQUEST.
5. TIDAL EPOCHS WERE BASED ON THE TIDAL EPOCH FROM 1983 TO 2001 AT THE BATTERY STATION (NO. 8518750) MAINTAINED BY THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA). MEAN LOW WATER (MLW) IS -2.57 FT AND MEAN HIGH WATER (MHW) IS 1.96 FT NAVD88.
6. PROPERTY BOUNDARY DATA ALONG THE CANAL WAS OBTAINED FROM THE NEW YORK CITY DEPARTMENT OF CITY PLANNING (NYCDCP) [AUGUST - NOVEMBER 2014].
7. ADDRESSES AND BLOCK AND LOT NUMBERS WERE GENERALLY OBTAINED FROM THE NEW YORK CITY TAX LOT DIGITAL MAP AS ACCESSED ON 1 JULY 2015 (OR LATER) AND/OR DIRECT DISCUSSIONS WITH THE PROPERTY OWNER, TENANT, AND/OR REPRESENTATIVE.
8. THE NAVIGATIONAL ELEVATION IN RTA1 WAS SELECTED TO BE -8.77 FT (I.E., 6 FT DEPTH AT MEAN LOWER LOW WATER). THIS ELEVATION WILL BE ADEQUATE TO PROVIDE "SUFFICIENT DEPTH TO OPERATE THE FLUSHING TUNNEL" AND ALLOW FOR VESSEL NAVIGATION FOR THE PURPOSES OF PERFORMING "CAP MONITORING AND MAINTENANCE, AS WELL AS SEWER SYSTEM AND FLUSHING TUNNEL MAINTENANCE AND BRIDGE AND BULKHEAD REPAIRS" IN ACCORDANCE WITH THE RECORD OF DECISION (ENVIRONMENTAL PROTECTION AGENCY [EPA], 2013). THE SELECTED NAVIGATIONAL ELEVATION OF -8.77 FT IS AN INCREASE IN THE DEPTH OF WATER BY 1 FOOT RELATIVE TO THE ELEVATION SELECTED AS PART OF THE BASIS OF DESIGN REPORT (B&B, 2016).
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SAFETY OF WORK AREAS AND LIMITING PUBLIC ACCESS INTO WORK AREAS. WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS AND WITH ENVIRONMENTAL HEALTH AND SAFETY/TRAINING REQUIREMENTS IN ACCORDANCE WITH THE APPROVED HEALTH AND SAFETY PLAN AND SECTION 01 35 29 OF THE SPECIFICATIONS.
10. THE CONTRACTOR SHALL HAVE AN APPROVED SET OF CONSTRUCTION DRAWINGS AND SPECIFICATIONS, A COPY OF THE CONTRACTOR'S HEALTH AND SAFETY PLAN (HASP), AND A COPY OF THE SEDIMENT & EROSION CONTROL PLAN ON THE JOB SITE AT ALL TIMES.
11. THE CONTRACTOR SHALL CONTACT NEW YORK 811 (I.E., CALL BEFORE YOU DIG) 2 TO 10 WORKING DAYS (EXCLUDING HOLIDAYS AND WEEKENDS) PRIOR TO THE START OF CONSTRUCTION TO VERIFY THE LOCATION OF ANY POTENTIAL UTILITIES IN THE PUBLIC RIGHT OF WAY. CONTRACTOR IS RESPONSIBLE FOR LOCATING UNDERGROUND UTILITIES WITHIN EXCAVATION AREAS WITHIN THE PROPERTY LIMITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE OR DISRUPTION OF UTILITY SERVICE DURING CONSTRUCTION. DO NOT MODIFY OR REMOVE ANY EXISTING UTILITIES WITHOUT THE PERMISSION OF THE UTILITY OWNER.
12. WORKING HOUR RESTRICTIONS ARE PROVIDED IN SECTION 01 57 19 OF THE SPECIFICATIONS.
13. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A LOCAL NOTICE TO MARINERS OF THE UNITED STATES COAST GUARD TWO WEEKS PRIOR TO THE COMMENCEMENT OF MARINE CONSTRUCTION ACTIVITIES INVOLVING VESSEL ACTIVITY IN THE CANAL, INCLUDING, BUT NOT LIMITED TO, DREDGING, CAPPING, AND BULKHEAD SHORING. REQUIREMENTS FOR SUBMITTING THE LOCAL NOTICE TO MARINERS ARE LISTED IN SECTION 01 41 00 OF THE SPECIFICATIONS.
14. THE CONTRACTOR SHALL VERIFY WORK IN FIELD AND SHALL SATISFY THEMSELVES AS TO THE ACCURACY BETWEEN WORK SET FORTH IN THESE CONSTRUCTION DRAWINGS AND THE WORK REQUIRED IN THE FIELD. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCING LAND DISTURBANCE AND DREDGING ACTIVITIES.
15. WATER LEVELS AND WATER QUALITY IN THE CANAL ARE AFFECTED BY COMBINED SEWER OVERFLOWS (CSOS). THE CONTRACTOR SHALL BE PREPARED TO ENCOUNTER OCCASIONAL PERIODS OF HIGHER FLOWS.

DREDGING NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR ASCERTAINING THAT THEIR TUGS, BARGES, AUXILIARY WATERCRAFT, AND OTHER VESSELS HAVE ADEQUATE DRAFT AND CLEARANCE. VESSELS SHOULD NOT BE ALLOWED TO RUN AGROUND AND SHOULD BE SELECTED WITH A GOAL OF MINIMIZING THE GENERATION OF TURBIDITY WHERE POSSIBLE. VESSELS SHALL HAVE NECESSARY REGISTRATIONS, BE IN PROPER WORKING CONDITION AND ROUTINELY INSPECTED.
2. BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" IN JUNE 2019 PROVIDE: (I) THE ELEVATION THAT MAY BE DREDGED IN THE IMMEDIATE VICINITY OF THE BRIDGE FOUNDATIONS/SUPPORTS; AND (II) THE LATERAL SETBACK/OFFSET FROM EACH BRIDGE FOUNDATION THAT WOULD BE REQUIRED (IF ANY) PRIOR TO DREDGING.
3. THE BRIDGE OPENING WIDTHS (FOR VESSEL TRAFFIC) AND VERTICAL BRIDGE CLEARANCES AT THE HAMILTON AVENUE (AVE.), 9TH STREET (ST.), 3RD ST., CARROLL ST. AND UNION ST. BRIDGES ARE PROVIDED IN THE NOTES FOR DRAWING G-3.
4. WATER QUALITY IN THE CANAL WILL BE MONITORED BY OTHERS PRIOR TO AND DURING DREDGING OPERATIONS. IF AN EXCEEDANCE OF THE THRESHOLD CRITERIA FOR TURBIDITY IS OBSERVED DURING WORK IN THE CANAL, THE CONTRACTOR SHALL IMPLEMENT WATER QUALITY CONTROLS IN ACCORDANCE WITH SECTIONS 02 60 16 AND 01 57 19.
5. PIPE OUTFALL INFORMATION (INCLUDING PIPE SIZE, MATERIAL AND INVERT ELEVATION) WAS OBTAINED FROM THE KSS TOPOGRAPHIC SURVEY IN JULY 2019. THE OUTFALL INFORMATION WAS FURTHER SUPPLEMENTED BY CSO DATA OBTAINED FROM REPORTS COMPLETED BY NYCDEP (2007); GEI (2009); CH2MHILL (2011); NYSDEC (2017) AND OUTFALL ANALYSIS COMPLETED BY NYCDEP (2020).
   (I) (NYCDEP, 2007) - NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION, BUREAU OF ENGINEERING DESIGN AND CONSTRUCTION. GOWANUS CANAL WATERBODY/WATERSHED FACILITY PLAN REPORT. SEPTEMBER 2007.
   (II) (GEI, 2009) - GEI CONSULTANTS, INC. REMEDIAL INVESTIGATION TECHNICAL REPORT, GOWANUS CANAL, BROOKLYN, NEW YORK. PREPARED FOR NATIONAL GRID, DECEMBER 2009.
   (III) (CH2MHILL, 2011) - CH2MHILL, GRB ENVIRONMENTAL SERVICES INC. APPENDIX G - SURVEY OF OUTFALL FEATURES TO THE GOWANUS CANAL, GOWANUS CANAL REMEDIAL INVESTIGATION REPORT. PREPARED FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY, JANUARY 2011.
   (IV) (NYSDEC, 2017) - NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION. OUTFALL PERMIT INFORMATION OBTAINED FROM STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) DATABASE. DOWNLOADED ON 23 MAY 2017.
   (v) (NYCDEP, 2020) - INFORMATION BASED ON OUTFALL DATABASE ANALYSIS COMPLETED BY NYCDEP AND PROVIDED VIA ELECTRONIC EMAIL ON 20 FEBRUARY 2020.
6. AS PER TABLE G.1 (LIST OF PIPE OUTFALLS ALONG THE GOWANUS CANAL) OF "APPENDIX G - SURVEY OF OUTFALL FEATURES TO THE GOWANUS CANAL" (CH2MHILL, 2011), OUTFALL GC-OF-139 IS A DUPLICATE OF GC-CF-W-006 AND HAS BEEN REMOVED FROM THE PIPE OUTFALL SUMMARY TABLE.
7. AS PER THE NYSDEC DATABASE DOWNLOADED ON 19 APRIL 2019, THE OUTFALLS AT PROPERTY 175 THIRD ST. (BLOCK - 972, LOT - 1) ARE PERMITTED UNDER NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) NO EXPOSURE FACILITY MULTI SECTOR GENERAL PERMIT (MSGP) ID NYR00F468. HOWEVER, IT IS UNKNOWN WHICH OUTFALLS AT THE PROPERTY ARE COVERED UNDER THE PERMIT.
8. THE "IDENTIFICATION NO." CORRESPONDS TO ID NAMES FROM THE CH2MHILL REMEDIAL INVESTIGATION REPORT (2011). THE NYCDEP SHORELINE SURVEY ID'S ARE FROM THE NYCDEP WATERBODY/WATERSHED FACILITY PLAN REPORT (2007). FOR OUTFALLS WITH BOTH CH2MHILL AND NYCDEP IDS, THE NYCDEP ID IS PRESENTED ON THE DRAWINGS.
9. KSS (2019) SURVEY MEASURED THE CROWN ELEVATION OF THE FOUR BOX CULVERTS COMPRISING CSO RH-034 (AVERAGE CROWN ELEVATION OF APPROXIMATELY 3.5 FT). THE FOUR BOX CULVERTS FOR CSO RH-034 WERE IDENTIFIED TO HAVE A DIMENSION OF 10 FT (SPAN) X 10 FT (RISE). THE INVERT ELEVATION OF THE BOX CULVERTS (APPROXIMATELY AN AVERAGE INVERT ELEVATION OF -6.5 FT) WAS ESTIMATED BY SUBTRACTING 10 FT FROM THE CROWN ELEVATION TO ACCOUNT FOR THE CULVERT RISE.
10. OUTFALL GC-OF-099, LOCATED ALONG 1ST ST. (WEST SIDE) PROPERTY, PROJECTS OUT FROM A SECONDARY BULKHEAD WALL BEHIND THE MAIN SHEET PILE BULKHEAD. FROM GOOGLE STREET VIEW, THE TOP OF THE SHEET PILE BULKHEAD AT THE CANAL WAS OBSERVED TO ONLY EXTEND A FEW VERTICAL FEET FROM THE WATER SURFACE.
11. THREE OUTFALLS (GC-OF-116, -117, AND -118) WERE IDENTIFIED BY GEI (2009) TO HAVE THE SAME COORDINATES, HOWEVER, GEI (2009) DID NOT PROVIDE DETAILS RELATED TO THE SIZE AND MATERIAL OF THE OUTFALLS. KSS (2019) SURVEY WAS ABLE TO VERIFY THE PRESENCE OF TWO OF THE THREE OUTFALLS AND PROVIDE SIZE AND MATERIAL INFORMATION. AS THE GEI (2009) SURVEY DID NOT HAVE DETAILS TO DISTINGUISH BETWEEN THE THREE OUTFALLS, IT WAS ASSUMED THE TWO OUTFALLS IDENTIFIED IN KSS (2019) SURVEY WERE GC-OF-116 AND -117.
12. FIVE ADDITIONAL OUTFALLS WERE SHOWN ON KSS (2019) SURVEY THAT WERE NOT LOCATED IN PREVIOUS REPORTS (NYCDEP, 2007; GEI, 2009; AND CH2MHILL 2011). THE FIVE NEW OUTFALLS WERE PROVIDED UNIQUE IDENTIFICATION NUMBERS STARTING WITH GC-RTA1-001, AND ENDING AT GC-RTA1-005.
13. CROWN ELEVATION FOR OUTFALL GC-CF-E-031 WAS PROVIDED AS 3.99 FT IN KSS (2019) SURVEY. GIVEN THAT THE OUTFALL WAS IDENTIFIED AS A 6-INCH (IN.) DIAMETER (DIA) PIPE, THE INVERT ELEVATION OF THE OUTFALL WILL BE APPROXIMATELY AT 3.5 FT.
14. NYCDEP'S (2020) OUTFALL ANALYSIS IDENTIFIED AN OUTFALL ALONG CARROLL ST. BRIDGE (EAST SIDE) AND ADJACENT TO EXISTING OUTFALL GC-CF-E-016 (NYCDEP ID: OH-005) THAT IS LINKED TO THE PHASE 1 OF CARROLL GARDEN HIGH LEVEL STORM SEWER (HLSS). HOWEVER, THE OUTFALL HAS NOT BEEN IDENTIFIED IN EARLIER SURVEYS AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION. THIS OUTFALL HAS NOT BEEN INCLUDED ON THE DRAWINGS PENDING VERIFICATION.
15. NYCDEP'S (2020) OUTFALL ANALYSIS SHOWS DIFFERENT OR ADDITIONAL INFORMATION (I.E. PIPE SIZE, SHAPE AND INVERT ELEVATIONS) FOR OUTFALLS GC-CF-E-001 TO GC-CF-E-006 (NYCDEP ID: RH-038); GC-CF-E-016 (NYCDEP ID: OH-005); GC-CF-N-002 TO GC-CF-N-005 (NYCDEP ID: RH-034); GC-CF-W-002 (NYCDEP ID: RH-039); GC-OF-099; GC-OF-110 (NYCDEP ID: RH-036); GC-OF-129 (RH-037); AND GC-OF-140 (RH-033) AS COMPARED TO DATA CONSOLIDATED FROM EARLIER SURVEYS INCLUDING KSS (2019) SURVEY. INFORMATION FROM NYCDEP'S OUTFALL ANALYSIS WILL BE PROVIDED UPON REQUEST.
16. NYCDEP'S (2020) OUTFALL ANALYSIS RECOMMENDS UPSIZING THEIR EXISTING PIPE SIZES FOR OUTFALLS GC-CF-E-001 TO GC-CF-E-006 (NYCDEP ID: RH-038); GC-CF-E-016 (NYCDEP ID: OH-005); GC-CF-N-002 TO GC-CF-N-005 (NYCDEP ID: RH-034); GC-CF-W-002 (NYCDEP ID: RH-039); GC-OF-099; GC-OF-110 (NYCDEP ID: RH-036); GC-OF-129 (RH-037); GC-OF-140 (RH-033); AND THE OUTFALL ASSOCIATED WITH CARROLL GARDEN HLSS. THIS INFORMATION WILL BE REVIEWED WITH THE CONTRACTOR PRIOR TO MOBILIZATION TO THE FIELD.

CULTURAL RESOURCES EVALUATION NOTES:

1. THE CONTRACTOR SHALL MONITOR AND MANAGE DEBRIS IN ACCORDANCE WITH THE CULTURAL RESOURCES MONITORING PLAN PREPARED BY ARCHAEOLOGY HISTORICAL RESOURCE SERVICES (AHRS).
2. THE LEVEL 2 MONITORING AREA SHOWN ON DRAWINGS DR-6 THROUGH DR-13 WAS PROVIDED BY AHRS IN AUGUST 2016 AND REPRESENTS AREAS WHERE KNOWN OR SUSPECTED CULTURAL RESOURCES ARE LOCATED NEARBY. THE CONTRACTOR SHALL BE AWARE AND COMPLY WITH ANY REQUIREMENTS FOR THE LEVEL 2 AREAS IN THE CULTURAL RESOURCES MONITORING PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE REQUIREMENTS LISTED IN THE CULTURAL RESOURCES MONITORING PLAN AND COORDINATING CONSTRUCTION ACTIVITIES WITH THESE REQUIREMENTS. NO SEPARATE PAYMENT OR SCHEDULE ALLOWANCE WILL BE MADE FOR COORDINATING CONSTRUCTION WORK AND CULTURAL RESOURCE ACTIVITIES.
3. RTA1 WAS REPORTEDLY LAST DREDGED IN 1975. DUE TO THE RECENT AGE OF NEAR SURFACE SEDIMENTS, THE LEVEL 2 CATEGORY DOES NOT APPLY TO THE FULL DEPTH OF SEDIMENT. THE DEPTH OF SEDIMENT CATEGORIZED AS LEVEL 2 WILL BE ESTABLISHED IN CONJUNCTION WITH THE CULTURAL RESOURCE ARCHAEOLOGIST.

STAGING AND SUPPORT SITE NOTES:

1. STAGING SITE DRAWINGS DEPICT CONDITIONS AS OF 19 SEPTEMBER 2019. TOPOGRAPHY IS BASED ON A LAND SURVEY SUBMITTED BY SEVENSON ENVIRONMENTAL ON 26 FEBRUARY 2019.
2. STORAGE LOCATION OF SHEETPILE AND ARTICULATED CONCRETE BLOCK MATS ON STAGING SITE ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS CONDUCTED BY PERSONNEL FROM B&B ON 5 JULY 2019.
3. GRADING NEAR THE END OF HUNTINGTON ST. ARE BASED ON A SURVEY CONDUCTED BY ROGERS SURVEYING, PLLC ON 27 MARCH 2017. EXISTING FEATURE NEAR THE END OF HUNTINGTON ST. ARE BASED ON FIELD OBSERVATIONS BY PERSONNEL FROM B&B ON 5 JULY 2019.
4. ELECTRICAL INFORMATION ON THE STAGING SITE WAS OBTAINED FROM THE FIGURE "AS-BUILT SITE PLAN" AND ASSOCIATED AUTOCAD FILE COMPLETED BY ENVIROTRAC ENVIRONMENTAL SERVICES AND SIGNED 6 MARCH 2017. CURRENT ELECTRICAL SERVICE IS RESERVED FOR OTHERS. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ELECTRICAL POWER FOR THEIR OPERATIONS.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR STAFFING GUARD BOOTHS IN ACCORDANCE WITH SECTION 31 10 00 OF THE SPECIFICATIONS.
6. DURING RTA1 CONSTRUCTION, REMEDIATION WORK IS LIKELY TO BE PERFORMED BY OTHERS SIMULTANEOUSLY ON THE UPLAND SITE ADJACENT TO THE STAGING SITE. THE ADJACENT UPLAND SITE IS DELINEATED ON THE DESIGN DRAWINGS AS "LIMITS OF WORK BY OTHERS." THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING ACCESS AND ENSURING WORKPLACE SAFETY ON THE STAGING SITE OUTSIDE THE LIMITS OF WORK BY OTHERS.
7. OCCASIONALLY IT COULD BE NECESSARY FOR THE UPLAND REMEDIATION CONTRACTOR TO TRANSIT THROUGH THE STAGING SITE TO DELIVER EQUIPMENT OR SUPPLIES TO THE UPLAND REMEDIATION AREA. WITHOUT IMPACTING COST OR SCHEDULE, THE CONTRACTOR IS TO COOPERATE AND COORDINATE WITH THE UPLAND REMEDIATION CONTRACTOR TO ALLOW EQUIPMENT AND SUPPLIES TO TRANSIT THROUGH THE STAGING SITE. THE UPLAND REMEDIATION CONTRACTOR SHALL NOTIFY THE CONTRACTOR A MINIMUM OF 24 HOURS IN ADVANCE OF THEIR ACCESS NEEDS TO ALLOW INCORPORATION INTO THE CONTRACTOR'S PLAN FOR THE DAY. THE UPLAND CONTRACTOR SHALL COMPLY WITH THE HEALTH AND SAFETY REQUIREMENTS OF THE CONTRACTOR. THE CONTRACTOR RETAINS THE RIGHT TO STOP WORK TO ENSURE SAFETY. IF THE CONTRACTOR DETERMINES THAT ACCESS CANNOT BE PROVIDED TO THE UPLAND REMEDIATION CONTRACTOR WITHOUT IMPACTING COST, SCHEDULE, OR SAFETY, THE CONTRACTOR SHALL VERBALLY NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY AND AWAIT DIRECTION BEFORE ALLOWING ACCESS TO THE UPLAND REMEDIATION CONTRACTOR.

SEDIMENT AND EROSION CONTROL (S&EC) PLAN:

1. PROPERTY DESCRIPTION - THE PROPERTY (BLOCK 471 LOT 200) CONSISTS OF APPROXIMATELY 3.8 ACRES (AC) LOCATED ALONG THE GOWANUS CANAL IN BROOKLYN, NEW YORK.
2. THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH FENCING, STAKES, RIBBONS, CAUTION TAPE, OR OTHER APPROPRIATE MEANS PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE ACTIVITY (LIMITS OF DISTURBANCE) SHALL BE DEMARCATED FOR THE DURATION OF THE CONSTRUCTION ACTIVITY. NO LAND DISTURBANCE SHALL OCCUR OUTSIDE THE APPROVED LIMITS INDICATED ON THE APPROVED CONSTRUCTION DRAWINGS.
3. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF ANY OTHER CONSTRUCTION ACTIVITIES (E.G., SITE GRADING, CLEARING, MOVING STOCKPILES, ETC.).
4. INTERNAL HAUL ROADS SHALL BE MAINTAINED AS TO PREVENT EROSION AND CONTROL SEDIMENT FROM LEAVING THE SITE.
5. THE CONTRACTOR SHALL PREVENT TRACKING OR FLOW OF SEDIMENT ONTO ROADWAYS.
6. EXISTING BMPS (E.G., CONSTRUCTION ENTRANCES) SHALL BE INSPECTED PRIOR TO EARTH DISTURBING ACTIVITIES TO ENSURE CONSTRUCTION IN ACCORDANCE WITH THE SPECIFICATIONS. BMPS THAT DO NOT MEET THE REQUIREMENTS SHALL BE REPLACED OR MODIFIED TO COMPLY WITH THE SPECIFICATIONS.
7. FIBER ROLLS, SILT FENCE OR SIMILAR SHALL BE PLACED ON SLOPES, AS NEEDED IN ACCORDANCE WITH REQUIREMENTS IN SECTION 01 57 13.
8. LAYDOWN AND STOCKPILE AREAS SHALL HAVE SEDIMENT AND EROSION CONTROLS INSTALLED AS NEEDED IN ACCORDANCE WITH REQUIREMENTS IN SECTION 01 57 13.
9. THERE WILL BE NO MATERIAL/EQUIPMENT STORAGE IN AREAS OTHER THAN THE CONSTRUCTION FOOTPRINT AND STORAGE AREAS SHOWN IN CONSTRUCTION DRAWINGS.
10. INSTALLATION, MAINTENANCE, AND REMOVAL OF EROSION AND SEDIMENT CONTROL SHALL BE THE CONTRACTOR'S RESPONSIBILITY. EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL ALL DISTURBED SOIL WITHIN THE CONSTRUCTION AREA HAS BEEN TEMPORARILY OR PERMANENTLY STABILIZED AND THE WORK IS COMPLETE AND ACCEPTED BY THE OWNER'S REPRESENTATIVE.
11. SITE INSPECTIONS SHALL BE CONDUCTED AT LEAST ONCE EVERY 7 CALENDAR DAYS FOLLOWING INSTALLATION OF ALL EROSION AND SEDIMENT CONTROLS. SITE INSPECTIONS SHALL BE CONDUCTED BY A QUALIFIED INSPECTOR, DEFINED IN PART VIII OF THE NYSDEC STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) GENERAL PERMIT AS A PERSON THAT IS KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICES OF EROSION AND SEDIMENT CONTROL, SUCH AS A LICENSED PROFESSIONAL ENGINEER OR CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC).
12. INSPECT SEDIMENT AND EROSION CONTROL PRACTICES AND POLLUTION PREVENTION MEASURES DAILY TO ENSURE THEY ARE BEING MAINTAINED IN EFFECTIVE OPERATING CONDITION. DAILY INSPECTIONS SHALL BE CONDUCTED BY A TRAINED CONTRACTOR, DEFINED IN PART VIII OF THE NYSDEC SPDES GENERAL PERMIT AS AN EMPLOYEE FROM THE CONTRACTING (CONSTRUCTION) COMPANY THAT HAS RECEIVED FOUR HOURS OF DEPARTMENT ENDORSED TRAINING IN PROPER EROSION AND SEDIMENT CONTROL PRINCIPLES FROM A SOIL AND WATER CONSERVATION DISTRICT, OR OTHER DEPARTMENT ENDORSED ENTITY. THE QUALIFIED INSPECTOR (DESCRIBED IN NOTE 11) MAY ALSO CONDUCT DAILY INSPECTIONS, PROVIDED THEY HAVE RECEIVED THE SAME FOUR HOUR TRAINING DESCRIBED HEREIN.
13. IF STRUCTURAL OR MAINTENANCE PROBLEMS ARE IDENTIFIED DURING SITE INSPECTIONS, THE CONTRACTOR SHALL BEGIN IMPLEMENTING CORRECTIVE ACTIONS WITHIN ONE BUSINESS DAY AND SHALL COMPLETE THE CORRECTIVE ACTIONS WITHIN SEVEN (7) CALENDAR DAYS OF THE INSPECTION.
14. A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE SITE WILL BE PROVIDED TO THE CONTRACTOR.

SEWER LINE NOTES:

1. LOCATION OF TRANSITIONS FROM THE ORIGINAL 72 IN. BRICK SEWER CIRCA 1892-1908 TO 1939 SEWER ARE APPROXIMATE.
2. LEVEL 1 RESTRICTION AREAS: THE ORIGINAL 72 IN. BOND-LORRAINE BRICK SEWER SECTIONS (CIRCA 1892-1908) REPRESENT LEVEL 1 RESTRICTION AREAS. DO NOT PARK TRUCKS (LOADED OR OTHERWISE), MACHINES, OR PERSONAL VEHICLES AT ANY TIME DURING CONSTRUCTION WITHIN 25 FT OF SEWER CENTERLINE WITHIN THE LEVEL 1 RESTRICTION AREAS.
3. LEVEL 2 RESTRICTION AREA: THE 1939 RECONSTRUCTED 72 IN. CONCRETE CULVERT SECTION OF THE BOND-LORRAINE SEWER REPRESENTS THE LEVEL 2 RESTRICTION AREA. DO NOT STOCKPILE CONSTRUCTION MATERIALS WITHIN 10 FT OF THE SEWER CENTER LINE IN THE LEVEL 2 RESTRICTION AREA.
4. EXCAVATION AND COMPACTION OVER SEWER AND SEWER RIGHT OF WAY (ROW) IS NOT WITHIN THIS PROJECT SCOPE OF WORK. IF SCOPE CHANGES TO INCLUDE THESE ACTIVITIES, APPROVAL BY THE OWNER'S REPRESENTATIVE WILL BE REQUIRED.

PROTECTION NOTES:

1. MAINTAIN AND/OR INSTALL CONCRETE BLOCKS/STRUCTURAL TRAFFIC BARRIERS TO PROTECT AND SUPPORT MONITORING WELLS, RECOVERY WELLS, STORAGE BOXES AND RELATED EQUIPMENT THROUGHOUT ALL PHASES OF CONSTRUCTION.
2. STORAGE BOXES CONTAIN DRUMS OF MATERIAL PURGED FROM RECOVERY WELLS ONSITE. SHOULD THE CONTRACTOR REQUIRE TEMPORARY RELOCATION OF THE STORAGE BOXES THE OWNER'S REPRESENTATIVE SHALL ARRANGE FOR THE EXISTING WELL MONITORING CONTRACTOR TO PUMP AND DRAIN DRUMS WITHIN THE STORAGE BOXES PRIOR TO TEMPORARY RELOCATION. THE DRUMS SHALL BE REMOVED AND RELOCATED INDEPENDENTLY FROM THE STORAGE BOXES. DRUMS SHALL BE PLACED DIRECTLY ON THE GROUND IN AN AREA APPROVED BY OWNER'S REPRESENTATIVE. STORAGE BOXES SHALL BE RELOCATED AND PLACED IN THE SAME AREA AS THE DRUMS. AT THE CONCLUSION OF THE WORK, DRUMS AND STORAGE BOXES SHALL BE RETURNED TO THEIR ORIGINAL LOCATIONS ON THE ASPHALT PAD IN THE SAME MANNER IN WHICH THEY WERE ORIGINALLY MOVED (MOVED INDEPENDENTLY FROM ONE ANOTHER). DRUMS SHALL BE GROUNDED FOR DISSIPATION OF ELECTROSTATIC DISCHARGE AS SHOWN ON THE CONSTRUCTION DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR DAMAGES TO THE STORAGE BOXES OR DRUMS. THE DURATION THAT DRUMS AND STORAGE BOXES ARE TEMPORARILY RELOCATED SHOULD BE KEPT TO A MINIMUM.
3. PROTECT BOND-LORRAINE SEWER THROUGHOUT ALL PHASES OF CONSTRUCTION. REFER TO LEVEL 1 AND LEVEL 2 RESTRICTION AREAS FOR DETAILS.
4. PROTECT ALL EXISTING TREES OUTSIDE THE CONSTRUCTION AREA THAT BORDER THE SITE. MAINTAIN ALL EXISTING TREE PROTECTION BARRIERS.
5. PROTECT EXISTING WATER SERVICE AND FIRE HYDRANTS.
6. PROTECT EXISTING UTILITIES WITHIN AND ADJACENT TO THE CONSTRUCTION AREA.
7. PROTECT EXISTING SEDIMENT AND EROSION CONTROLS UNLESS OTHERWISE NOTED.
8. REPLACE/REPAIR IN KIND FEATURES TO BE PROTECTED WHICH BECOME DAMAGED.
9. EXISTING PERIMETER FENCE MAY BE UTILIZED AS PERIMETER CONSTRUCTION FENCE PENDING OWNER'S REPRESENTATIVE APPROVAL. PROTECT AND MAINTAIN EXISTING PERIMETER FENCE AND PERIMETER CONSTRUCTION FENCE.
10. PROTECT THE FOUNDATION WALL IN AREAS SHOWN ON THE DRAWINGS. THE FOUNDATION WALL DIMENSIONS AND CONSTRUCTION ARE UNKNOWN.
11. CONTRACTOR IS TO MAINTAIN AND PROTECT ELECTRICAL SERIVCE IN ACCORDANCE WITH SECTION 01 51 00.

LIMITED WORK AREA NOTES:

1. DO NOT STOCKPILE SOIL, PARK EQUIPMENT, OR OTHERWISE SURCHARGE THE AREA WITHIN 25 FEET OF THE GOWANUS CANAL BULKHEAD LINE.
2. IF THE CONTRACTOR DECIDES TO PLACE A MATERIAL HANDLER IN THE LIMITED WORK AREA TO OFFLOAD DEBRIS ONTO THE ASPHALT PAD, A STABILITY ANALYSIS MUST BE COMPLETED IN ACCORDANCE WITH SECTION 02 51 19.
3. LIMIT WORK WITHIN THE BOND-LORRAINE STREET SEWER AS DESCRIBED IN LEVEL 1 AND LEVEL 2 RESTRICTIONS DESCRIBED IN THE SEWER LINE NOTES.

ABBREVIATIONS

AC	ACRES
ACB	ARTICULATED CONCRETE BLOCK
AHRS	ARCHAEOLOGY HISTORICAL RESOURCE SERVICES
AVE.	AVENUE
B&B	B&B ENGINEERS & GEOLOGISTS OF NEW YORK, P.C.
BMP	BEST MANAGEMENT PRACTICES
CPESC	CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL
CPT	CONE PENETROMETER TESTING
CQC	CONSTRUCTION QUALITY CONTROL
CRM	CULTURAL RESOURCES MONITORING
CSO	COMBINED SEWER OVERFLOW
CY	CUBIC YARDS
DIA	DIAMETER
E	EAST
EL.	ELEVATION
EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
FT	FEET
GAC	GRANULAR ACTIVATED CARBON
GPI	GREENMAN-PEDERSON, INC.
HASP	HEALTH AND SAFETY PLAN
HLSS	HIGH LEVEL STORM SEWER
IN.	INCH
ISS	IN SITU STABILIZATION/SOLIDIFICATION
KSS	KENNON SURVEYING SERVICES, INC.
MAX	MAXIMUM
MLW	MEAN LOW WATER
MHW	MEAN HIGH WATER
MI	MILES
MIN	MINIMUM
MSGP	MULTI SECTOR GENERAL PERMIT
NAD83	NORTH AMERICAN DATUM OF 1983
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
NOAA	NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NTS	NOT TO SCALE
NYCDCP	NEW YORK CITY DEPARTMENT OF CITY PLANNING
NYCDEP	NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
NYCDOT	NEW YORK CITY DEPARTMENT OF TRANSPORATION
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
OC	OLEOPHILIC CLAY
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSI	OCEAN SURVEY, INC.
PD	PRE-DESIGN
PDM	PROCESSED DREDGED MATERIAL
PSI	POUNDS PER SQUARE INCH
PL	PLACE
ROW	RIGHT OF WAY
RTA	REMEDIAL TARGET AREA
S&EC	SEDIMENT AND EROSION CONTROL
SF	SQUARE FEET
SPDES	STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM
ST.	STREET
STA.	STATION
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
TYP	TYPICAL
TB	TURNING BASIN
W	WEST

NOT ISSUED FOR CONSTRUCTION

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REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: GENERAL NOTES, ABBREVIATIONS, AND OUTFALL DATA TABLE

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR002
REVIEWED BY:	RSH	DRAWING NO.:	G-2 OF 4
APPROVED BY:	JFB		

X:\09_CADD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR002

BRIDGE OVERHEAD CLEARANCES AT BRIDGE CENTERLINE [1]			
BRIDGE	CALCULATED TOP OF BRIDGE OPENING [2]	APPROXIMATE OVERHEAD CLEARANCE (FT)	
	ELEVATION FT-NAVD88	AT MLW	AT MHW
HAMILTON AVE. [3]	-	-	-
9TH STREET	8.5	11.1	6.6
3RD STREET [4]	9.3	10.4	5.9
CARROLL STREET [10]	4.6	7.1	2.6
UNION STREET [11]	9.9	12.5	8.0

2 / G-3 TABLE
BRIDGE OVERHEAD CLEARANCES

BRIDGE OPENING WIDTHS (APPROXIMATE)	
BRIDGE	WIDTH (FT) [6]
HAMILTON AVE. [7]	46.8 [7]
9TH STREET [7]	59.9 [7]
3RD STREET [7]	42.0 [7]
CARROLL STREET [12]	36.0 [7]
UNION STREET [12]	42.9 [7]

3 / G-3 TABLE
BRIDGE OPENING WIDTHS

LEGEND

- BARGE ACCESS FROM GOWANUS BAY TO STAGING SITE AND RTA1
- CANAL BOUNDARY
- FLUSHING TUNNEL

NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR INSPECTING BRIDGE OPENINGS AND EVALUATING CLEARANCES FOR THEIR PROPOSED MEANS AND METHODS OF CONSTRUCTION.
2. THE ELEVATION OF THE TOP OF EACH BRIDGE OPENING WAS BASED ON THE AVERAGE OF TWO FIELD MEASUREMENTS CONDUCTED BY B&B ON 2 OCTOBER 2014 FOR THE 3RD ST. BRIDGE AND ONE MEASUREMENT CONDUCTED ON 10 MARCH 2015 FOR THE 9TH ST. BRIDGE. THESE ELEVATIONS ARE CONSIDERED APPROXIMATE AND WERE CALCULATED RELATIVE TO ESTIMATED TIDAL ELEVATIONS.
3. MEASUREMENTS OF OVERHEAD CLEARANCE AT THE HAMILTON AVE. BRIDGE HAVE NOT BEEN PERFORMED; HOWEVER, VISUAL OBSERVATIONS AND THE 1984 USCG REPORT INDICATE THE HAMILTON AVE. BRIDGE WILL HAVE THE GREATEST OVERHEAD CLEARANCE OF THE FIVE BRIDGES THAT SPAN THE CANAL.
4. THE CURVATURE OF THE UNION ST. BRIDGE FURTHER REDUCE OVERHEAD CLEARANCE OUTSIDE OF THE BRIDGE CENTERLINE. NEAR THE BRIDGE ABUTMENTS, OERHEAD CLEARANCE IS REDUCED BY APPROXIMATELY 9 FT WHICH IS NOT PRESENTED ON THIS TABLE. THE 3RD ST. BRIDGE IS ALSO CURVED, HOWEVER, BETWEEN THE CABLES LOCATED ON THE SOUTHERN END OF THE BRIDGE, THE VERTICAL CLEARANCE IS GOVERNED BY THE PRESENCE OF LIGHTS WHICH ARE ESTIMATED TO DECREASE OVERHEAD CLEARANCE BY APPROXIMATELY 1.5 FT. THIS ESTIMATE WAS BASED ON GEOSYTNEC FIELD MEASUREMENTS AND COMPLETED ON 2 OCTOBER 2014 AND IS ACCOUNT FOR WITHIN THE TABLE. BETWEEN THE CABLES AND ABUTMENTS, THE CURVATURE OF THE BRIDGE LIMITS CLEARANCE, HOWEVER, IT IS PRESUMED THIS AREA WOULD NOT BE NAVIGABLE TO BARGES AND SCOWS WHEN THE 3RD ST. BRIDGE IS CLOSED.
5. LIGHTS BENEATH THE 3RD ST. BRIDGE ARE ESTIMATED TO DECREASE THE OVERHEAD CLEARANCE BY APPROXIMATELY 1.5 FT BASED ON B&B FIELD MEASUREMENTS FROM 2 OCTOBER 2014. THIS REDUCTION IS NOT ACCOUNTED FOR IN THE TABLE.
6. THE BRIDGE OPENING WIDTHS PROVIDED ARE PRESENTED ASSUMING THE BRIDGES ARE OPEN. WHEN THE BRIDGES ARE CLOSED, THE OPENING WIDTHS MAY BE NARROWER (E.G., THE OPENING WIDTH OF THE 3RD ST. BRIDGE WHEN CLOSED IS APPROXIMATELY 24.0 FT DUE TO THE PRESENCE OF CABLES).
7. MULTIPLE OPENING MEASUREMENTS WERE COMPLETED BY OSI (2014) AT THE HAMILTON AVE., 9TH ST., AND 3RD ST. BRIDGES, WHICH WAS CONSIDERED THE WIDTH BETWEEN BRIDGE FENDERS. FOR THE PURPOSES OF THE EVALUATION PRESENTED HEREIN, THE SMALLEST MEASUREMENT FOR EACH BRIDGE OPENING WAS SELECTED.
8. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A MINIMUM OF TWO HOURS OF ADVANCED NOTIFICATION TO NYCDOT PRIOR TO THE 9TH ST., 3RD ST., CARROLL ST., AND UNION ST. BRIDGES BEING OPENED. THE FOLLOWING NUMBER MAY BE USED TO CONTACT NYCDOT [(212) 839-3740]. THE NYCDOT BRIDGE OPERATOR CAN ALSO BE REACHED ON MARINE RADIO CHANNEL 13. THE HAMILTON AVE. BRIDGE DOES NOT REQUIRE ADVANCED NOTIFICATION.
9. ON HOT DAYS (E.G., TEMPERATURES ABOVE APPROXIMATELY 90 DEGREES), THE 9TH ST. BRIDGE MAY NOT BE OPERATIONAL. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING NYCDOT TO DETERMINE ANY OTHER RESTRICTIONS THAT MAY EXIST.
10. THE OVERHEAD CLEARANCE AT THE CARROLL ST. BRIDGE WAS OBTAINED FROM BRIDGE DRAWINGS.
11. THE OVERHEAD CLEARANCE AT THE UNION ST. BRIDGE, WHILE CLOSED, IS UNKNOWN AT THIS TIME, BUT WILL BE REQUIRED TO BE OPENED TO ALLOW FOR VESSELS TO PASS.
12. THE OPENING WIDTH AT THE UNION ST. BRIDGE WAS FOUND TO BE 42.9 FT BASED ON THE TOPOGRAPHIC SURVEY PERFORMED (2019) BY KSS. THE OPENING WIDTH AT THE CARROLL ST. BRIDGE WAS FOUND TO BE 36 FT BASED ON THE FOLLOWING DOCUMENTS: (I) THE UNITED STATES COAST GUARD "BRIDGE OVER NAVIGABLE WATERS REPORT" (1984); (II) A HISTORICAL DRAWING (HISTORICBRIDGES.ORG, 2015); AND (III) MEASUREMENTS BASED ON AN NYCDOT DRAWING; AND THE TOPOGRAPHIC SURVEY PERFORMED IN 2019 BY KSS.
13. BRIDGE OPENING WIDTHS AND VERTICAL BRIDGE CLEARANCES ARE SUMMARIZED IN THE DOCUMENT "RESTRICTIONS TO NAVIGATION EVALUATION" (B&B, 2020), WHICH WILL BE PROVIDED TO THE CONTRACTOR UPON REQUEST.
14. EXISTING BATHYMETRY PLANS AND DEBRIS PLANS FOR STA. 0+00 TO 8+00, 8+00 TO 16+00, AND 16+00 TO 24+00 ARE PRESENTED ON DRAWINGS DR-1 TO DR-3 AND DR-6 TO DR-8, RESPECTIVELY.

N

0 300' 600'
SCALE IN FEET

NOT ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: GENERAL SITE PLAN

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

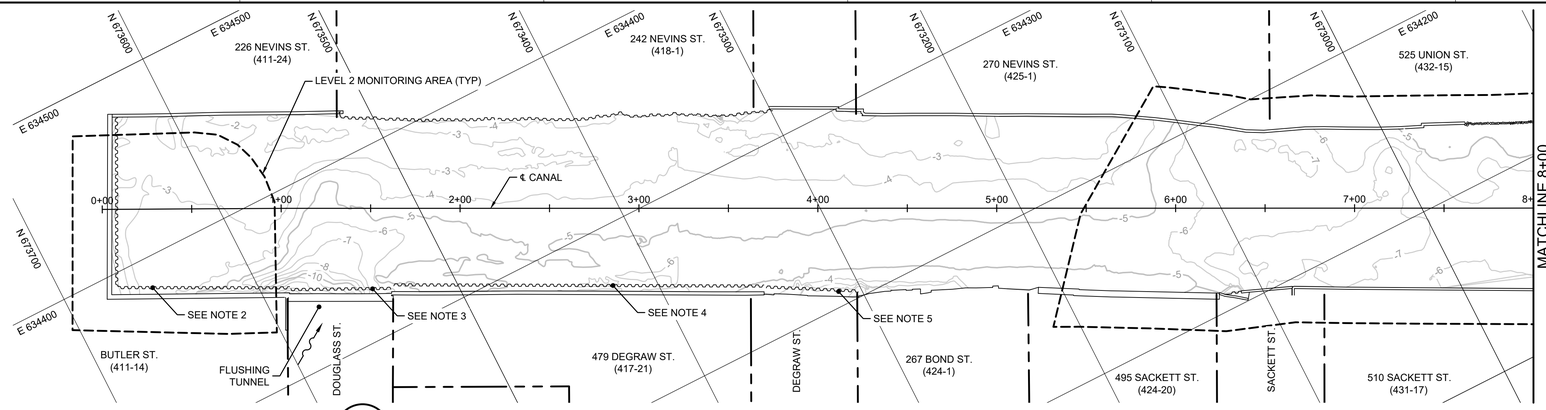
SIGNATURE

DATE

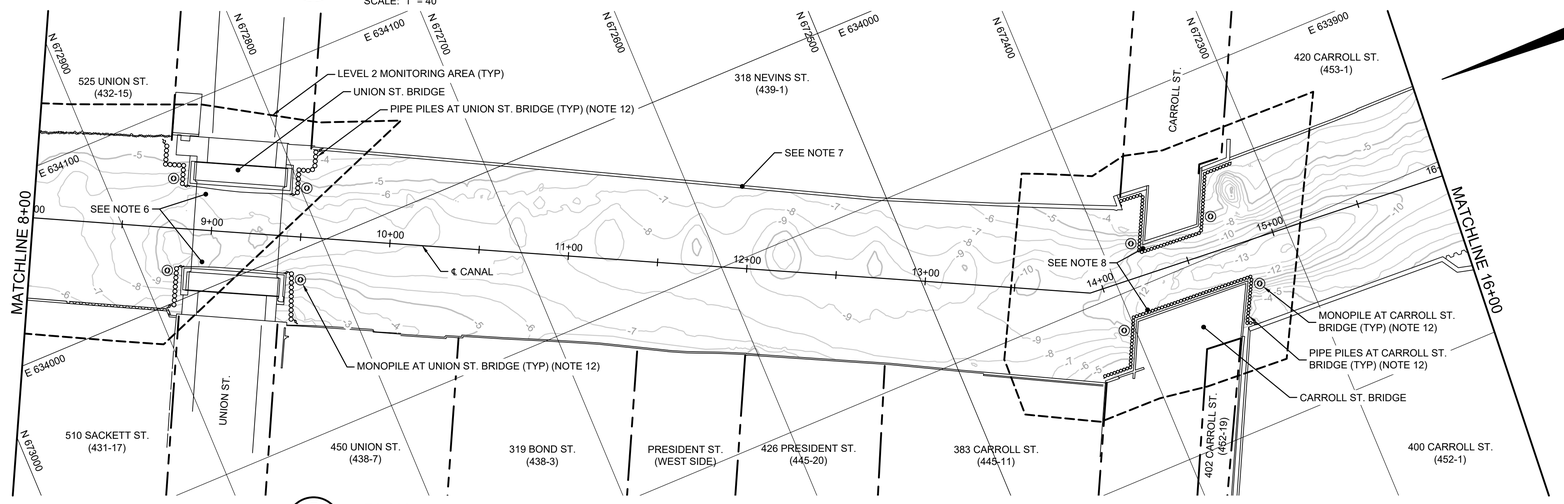
ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	JAS	FILE:	HPH106A-DR040
REVIEWED BY:	RSH	DRAWING NO.:	G-3 OF 4
APPROVED BY:	JFB		

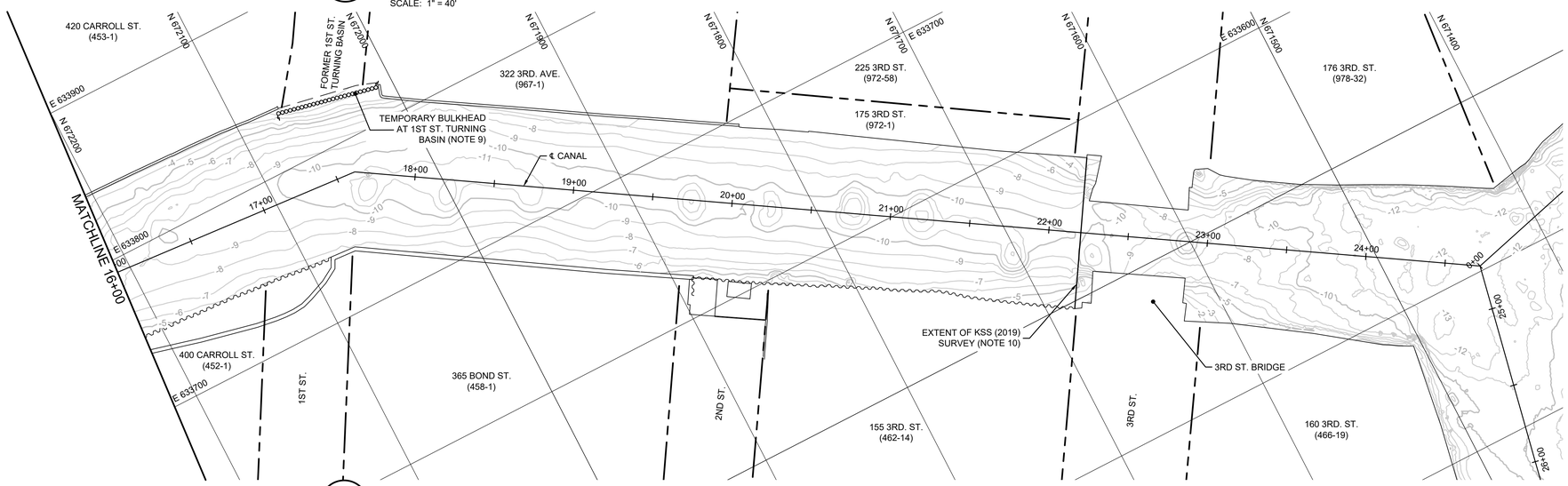
X:\05_CAD\DR\EDGING DES\GW\RTA1\DRAWINGS\HPH106A-DR040



4 / G-4 PLAN
BULKHEAD SUPPORT INFORMATION (STA 0+00 TO 8+00)
SCALE: 1" = 40'



5 / G-4 PLAN
BULKHEAD SUPPORT INFORMATION (STA 8+00 TO 16+00)
SCALE: 1" = 40'



6 / G-4 PLAN
BULKHEAD SUPPORT INFORMATION (STA 16+00 TO 24+00)
SCALE: 1" = 40'

LEGEND

- BATHYMETRY ELEVATION (1-FT) (-10)
- PROPERTY LINE
- CANAL STATIONING (4+00)
- LEVEL 2 MONITORING AREA (NOTE 11)
- BULKHEAD SUPPORT
- BLOCK AND LOT (417-21)
- FLUSHING TUNNEL

NOTES:

1. BULKHEAD SUPPORT IS REQUIRED ALONG RTA1 PRIOR TO THE START OF DREDGING. THIS DRAWING IDENTIFIES THE PROPERTIES WHERE BULKHEAD SUPPORT IS TO BE CONSTRUCTED BY A GROUP OF RESPONDENTS PER AN APRIL 4, 2019 ADMINISTRATIVE ORDER ISSUED BY EPA. NOTES 2 TO 9 PROVIDE INFORMATION ON SPECIFIC PROPERTIES.
2. AS DIRECTED IN A JULY 6, 2017 EMAIL, THE RD GROUP IS RESPONSIBLE FOR THE DESIGN OF THE BULKHEAD SUPPORT AT THE BUTLER ST. PROPERTY. APTIM, AS A SUBCONTRACTOR TO CASHMAN DREDGING, IS THE ENGINEER OF RECORD FOR THE DESIGN. THE DESIGN IS INCLUDED AS AN ATTACHMENT TO THE RTA1 DESIGN REPORT.
3. AS DIRECTED IN A JULY 6, 2017 EMAIL, THE RD GROUP IS RESPONSIBLE FOR THE DESIGN OF THE BULKHEAD SUPPORT AT THE DOUGLASS ST. END PROPERTY. APTIM, AS A SUBCONTRACTOR TO CASHMAN DREDGING, IS THE ENGINEER OF RECORD FOR THE DESIGN. THE DESIGN IS INCLUDED AS AN ATTACHMENT TO THE RTA1 DESIGN REPORT.
4. AS DIRECTED IN A JULY 6, 2017 EMAIL, THE RD GROUP IS RESPONSIBLE FOR THE DESIGN OF THE BULKHEAD SUPPORT AT 479 DEGRAW ST. HOWEVER, SINCE THAT TIME, THE PROPERTY OWNER HAS ELECTED TO DESIGN AND CONSTRUCT THE BULKHEAD SUPPORT.
5. AS DIRECTED IN A JULY 6, 2017 EMAIL, THE RD GROUP IS RESPONSIBLE FOR THE DESIGN OF THE BULKHEAD SUPPORT AT THE DEGRAW ST. END (WEST) PROPERTY. APTIM, AS A SUBCONTRACTOR TO CASHMAN DREDGING, IS THE ENGINEER OF RECORD FOR THE DESIGN. THE DESIGN IS INCLUDED AS AN ATTACHMENT TO THE RTA1 DESIGN REPORT.
6. AS DIRECTED IN A JULY 6, 2017 EMAIL, THE RD GROUP IS RESPONSIBLE FOR THE DESIGN OF THE BULKHEAD SUPPORT AT THE UNION ST. BRIDGE. GREENMAN-PEDERSEN, INC. (GPI) IS THE ENGINEER OF RECORD FOR THE DESIGN. THE DESIGN IS INCLUDED AS AN ATTACHMENT TO THE RTA1 DESIGN REPORT.
7. AS DIRECTED IN A JULY 6, 2017 EMAIL, THE RD GROUP IS RESPONSIBLE FOR THE DESIGN OF THE BULKHEAD SUPPORT AT 318 NEVIN ST. ENGINEERING ANALYSIS CONDUCTED BY APTIM, AS A SUBCONTRACTOR TO CASHMAN DREDGING, INDICATE THAT CONSTRUCTION OF BULKHEAD SUPPORT IS NOT REQUIRED AT THIS PROPERTY. THIS PROPERTY IS NOT INCLUDED IN THE APRIL 4, 2019 ADMINISTRATIVE ORDER.
8. AS DIRECTED IN A JULY 6, 2017 EMAIL, THE RD GROUP IS RESPONSIBLE FOR THE DESIGN OF THE BULKHEAD SUPPORT AT THE CARROLL ST. BRIDGE. GREENMAN-PEDERSEN, INC. (GPI) IS THE ENGINEER OF RECORD FOR THE DESIGN. THE DESIGN IS INCLUDED AS AN ATTACHMENT TO THE RTA1 DESIGN REPORT.
9. PER A MAY 28, 2014 ORDER, NYC IS RESPONSIBLE FOR THE DESIGN OF THE EXCAVATION OF THE FORMER 1ST TURNING BASIN, WHICH REQUIRES IN PART THE INSTALLATION OF A TEMPORARY BULKHEAD AT THE INTERSECTION OF THE FORMER 1ST ST. TURNING BASIN AND THE GOWANUS CANAL. THE TEMPORARY BULKHEAD WAS DESIGNED BY MUESER RUTLEDGE CONSULTING ENGINEERS (MRCE) UNDER SUBCONTRACT TO AKRF, INC. THE DESIGN IS INCLUDED AS AN ATTACHMENT TO THE RTA1 DESIGN REPORT.
10. THE KSS TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) SURVEY ARE TO BE FIELD VERIFIED.
11. LEVEL 2 ARCHAEOLOGICAL MONITORING, INCLUDING DETERMINING THE HORIZONTAL AND VERTICAL LIMITS OF SEDIMENT CATEGORIZED AS LEVEL 2 SHALL BE CONDUCTED AS DESCRIBED UNDER CULTURAL RESOURCES EVALUATION NOTES ON DRAWING G-2.
12. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).

FOR INFORMATION ONLY
REFER TO INDIVIDUAL BULKHEAD SUPPORT DESIGNS FOR CONSTRUCTION REQUIREMENTS

0 40' 80'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	-	-
C	11.20.17	RTA1 65% REMEDIAL DESIGN	-	-
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: BULKHEAD SUPPORT INFORMATION

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

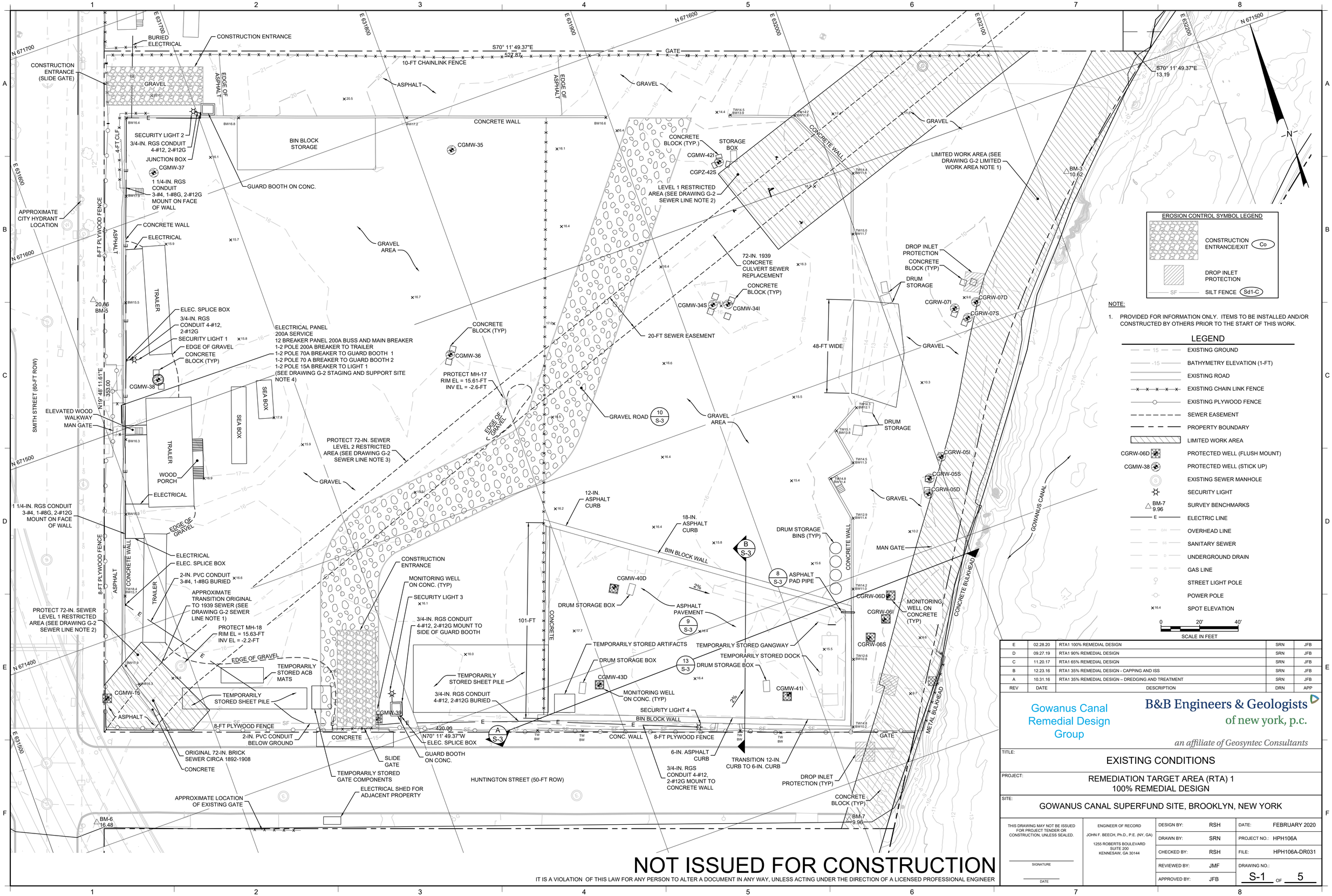
DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR068
REVIEWED BY:	JAS	DRAWING NO.:	G-4 OF 4
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR068



EROSION CONTROL SYMBOL LEGEND

CONSTRUCTION ENTRANCE/EXIT (Co)

DROP INLET PROTECTION

SF SILT FENCE (Sd1-C)

NOTE:

1. PROVIDED FOR INFORMATION ONLY. ITEMS TO BE INSTALLED AND/OR CONSTRUCTED BY OTHERS PRIOR TO THE START OF THIS WORK.

LEGEND

- EXISTING GROUND
- BATHYMETRY ELEVATION (1-FT)
- EXISTING ROAD
- EXISTING CHAIN LINK FENCE
- EXISTING PLYWOOD FENCE
- SEWER EASEMENT
- PROPERTY BOUNDARY
- LIMITED WORK AREA
- CGRW-06D PROTECTED WELL (FLUSH MOUNT)
- CGMW-38 PROTECTED WELL (STICK UP)
- EXISTING SEWER MANHOLE
- SECURITY LIGHT
- BM-7 9.96 SURVEY BENCHMARKS
- E ELECTRIC LINE
- OH OVERHEAD LINE
- SS SANITARY SEWER
- D UNDERGROUND DRAIN
- G GAS LINE
- STREET LIGHT POLE
- POWER POLE
- 16.4 SPOT ELEVATION

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
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A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: EXISTING CONDITIONS

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	RSH	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	RSH	FILE:	HPH106A-DR031
REVIEWED BY:	JMF	DRAWING NO.:	S-1 OF 5
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

X:\05_CAD\DRED\ENG DESIGN\RTA1\DRAWINGS\HPH106A-DR031

PARCEL 471-200 PROPERTY BOUNDARY

30 FT

CONSTRUCTION ENTRANCE (SLIDE GATE)

SECURITY LIGHT 2

3/4-IN. RGS CONDUIT 4-#12, 2-#12G

JUNCTION BOX

GUARD BOOTH ON CONC.

CGMW-37

1 1/4-IN. RGS CONDUIT 3-#4, 1-#8G, 2-#12G MOUNT ON FACE OF WALL

ELECTRICAL

ADMINISTRATIVE AREA FOR TRAILERS AND PARKING (NOTE 11)

GRAVEL ROAD

STAGING SITE (NOTE 1)

EXISTING PLYWOOD FENCE

20.86 BM-5

40'

ELEC. SPLICE BOX

3/4-IN. RGS CONDUIT 4-#12, 2-#12G

SECURITY LIGHT 1

ELECTRICAL PANEL
200A SERVICE
12 BREAKER PANEL 200A BUSS AND MAIN BREAKER
1-2 POLE 200A BREAKER TO TRAILER
1-2 POLE 70A BREAKER TO GUARD BOOTH 1
1-2 POLE 70 A BREAKER TO GUARD BOOTH 2
1-2 POLE 15A BREAKER TO LIGHT 1
(SEE DRAWING G-2 STAGING AND SUPPORT SITE NOTE 4)

CGMW-38

N19° 48' 11.61"E 358.00

SMITH STREET

PROTECT 72-IN. SEWER LEVEL 2 RESTRICTED AREA (SEE DRAWING G-2 SEWER LINE NOTE 3)

ELECTRICAL

1 1/4-IN. RGS CONDUIT 3-#4, 1-#8G, 2-#12G MOUNT ON FACE OF WALL

ELECTRICAL

ELEC. SPLICE BOX

2-IN. PVC CONDUIT 3-#4, 1-#8G BURIED

PROTECT 72-IN. SEWER LEVEL 1 RESTRICTED AREA (SEE DRAWING G-2 SEWER LINE NOTE 2)

PROTECT MH-18
RIM EL = 15.63 FT
INV EL = -2.2 FT

STAGING SITE (NOTE 1)

CONSTRUCTION ENTRANCE (SLIDE GATE)

CGMW-15

2-IN. PVC CONDUIT BELOW GROUND

ORIGINAL 72-IN. BRICK SEWER CIRCA 1892-1908 (SEE DRAWING G-2 SEWER LINE NOTE 1)

BM-6
16.48

APPROXIMATE LOCATION OF EXISTING GATE

CGMW-35 (PVC) 12 S-3

11 S-3 GRADING NEAR 1-FT HIGH WALL (NOTE 7)

CGMW-36 (PVC) 12 S-3

PROTECT MH-17
RIM EL = 15.61 FT
INV EL = -2.6 FT

SILT FENCE (TYP) 18 S-5

CONSTRUCTION ENTRANCE 19 S-5

RAMP

MONITORING WELL ON CONC.(TYP.)

SECURITY LIGHT 3

3/4-IN. RGS CONDUIT 4-#12, 2-#12G MOUNT TO SIDE OF GUARD BOOTH

ELEC. SPLICE BOX

CGMW-39

420.00
N10° 11' 49.37"W

A S-3

GUARD BOOTH ON CONCRETE

3/4-IN. RGS CONDUIT 4-#12, 2-#12G BURIED

HUNTINGTON STREET (50-FT ROW) (NOTE 2)

LIMITS OF WORK (TYP)

CONTRACTOR TO INSTALL 24 FT SWINGING GATE AND FENCE (NOTE 2)

LIMITS OF WORK BY OTHERS (NOTES 6 AND 8)

STORAGE BOX

CGMW-42I (PVC)

CGPZ-42S (PVC)

LIMITS OF WORK BY OTHERS (NOTES 6, 8, AND 12)

LEVEL 1 RESTRICTED AREA (SEE DRAWING G-2 SEWER LINE NOTE 2)

CGMW-34S (PVC)

CGMW-34I (PVC)

CGRW-07I (STEEL)

CGRW-07D (STEEL)

CGRW-07S (STEEL)

EASTERN RAMP

LOCATION WHERE SCOWS MAY BE MOORED

BM-3
10.62

(STEEL) CGRW-05I

(STEEL) CGRW-05S

(STEEL) CGRW-05D

GOWANUS CANAL

CGMW-40D

CGMW-43D

CGMW-41I

CGRW-06D

CGRW-06I

CGRW-06S

ASPHALT PAD (NOTE 3)

TREATED WATER AND STORMWATER DISCHARGE LOCATION (NOTE 3)

SECURITY LIGHT 4

TREATED WATER AND STORMWATER DISCHARGE LOCATION (NOTE 3)

FIBER ROLL (TYP) 16 S-5

SILT FENCE (TYP.) 18 S-5

17 S-5 STRAW BALE DIKE

LIMITED WORK AREA ADJACENT TO CANAL (NOTE 10)

BM-7
9.96

0 20' 40'
SCALE IN FEET

NOTES:

1. CONTRACTOR SHALL PROPOSE A LAYOUT IN ACCORDANCE WITH SPECIFICATION SECTIONS 01 57 13, 31 10 00, 31 23 00, AND 01 57 19.
2. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A PERMIT FOR THE TEMPORARY CLOSURE OF HUNTINGTON ST. AS OUTLINED IN SPECIFICATION SECTION 01 41 00.
3. ANY WATER TREATED ON-SITE SHALL BE DISCHARGED TO EITHER OF THE STORMWATER GRATES, LOCATED ON OR NEAR HUNTINGTON STREET, IN ACCORDANCE WITH SECTION 44 08 40. STORMWATER FROM THE ASPHALT PAD SHALL BE MANAGED IN ACCORDANCE WITH SECTION 02 51 19. A DETAIL OF THE PIPING ON THE ASPHALT PAD IS PROVIDED AS DETAIL 5 ON SHEET S-3.
4. ALL WELLS ON-SITE SHALL BE PROTECTED FROM DAMAGE.
5. DREDGED SEDIMENT, WASTE, AND DEBRIS SHALL BE MANAGED IN ACCORDANCE WITH SECTION 02 51 19.
6. REMEDIATION WORK IS LIKELY TO BE PERFORMED BY OTHERS SIMULTANEOUSLY ON THE UPLAND SITE ADJACENT TO THE STAGING SITE. OCCASIONALLY, IT COULD BE NECESSARY FOR THE UPLAND REMEDIATION CONTRACTOR TO TRANSIT THROUGH THE STAGING SITE TO DELIVER EQUIPMENT OR SUPPLIES TO THE UPLAND REMEDIATION AREA. ADDITIONAL DETAILS REGARDING THIS ARE PROVIDED WITHIN THE GENERAL NOTES ON SHEET G-2 AS STAGING AND SUPPORT SITE NOTES 6 AND 7.
7. THE WIDTH OF THE GRAVEL ROAD SHALL BE WIDENED TO ALLOW FOR A LARGER TURNING RADIUS NEAR THE 15 FT LONG, 1 FT HIGH CONCRETE WALL. A DETAIL REGARDING THE GRADING IS PROVIDED AS DETAIL 7 ON SHEET S-3.
8. THE CONTRACTOR MAY WORK INSIDE THE AREA DELINEATED AS LIMITS OF WORK BY OTHERS AFTER UPLAND REMEDIATION BEGINS, CONTINGENT ON APPROVAL FROM THE OWNER'S REPRESENTATIVE.
9. DETAILS REGARDING THE INSTALLATION OF DOCK FACILITIES IS PROVIDED IN SECTION 31 10 00.
10. A DESCRIPTION OF THE LIMITED WORK AREA ADJACENT TO THE CANAL IS PROVIDED IN THE LIMITED WORK AREA NOTES ON DRAWING G-2.
11. ADMINISTRATIVE AREA FOR TRAILERS AND PARKING IS RESERVED FOR OTHERS AND IS NOT FOR CONTRACTOR USE.
12. PROVIDED FOR INFORMATION ONLY. ITEMS TO BE INSTALLED AND/OR CONSTRUCTED BY OTHERS PRIOR TO THE START OF THIS WORK.

EROSION CONTROL SYMBOL LEGEND

CONSTRUCTION ENTRANCE/EXIT (Co)
INLET PROTECTION
SF SILT FENCE (Sd1-C)
FIBER ROLL
STRAW BALE DIKE

LEGEND

- EXISTING GROUND ELEVATION
- BATHYMETRY ELEVATION (1-FT)
- EXISTING ROAD
- EXISTING CHAIN LINK FENCE
- EXISTING PLYWOOD FENCE
- SEWER EASEMENT
- PROPERTY BOUNDARY
- LIMITED WORK AREA
- GRAVEL ROAD
- LIMITS OF WORK
- CGRW-06D EXISTING FLUSH MOUNT WELL (NOTE 4)
- CGMW-38 EXISTING PROTECTED WELL (STICK UP) (NOTE 4)
- EXISTING SEWER MANHOLE
- SECURITY LIGHT
- TRAFFIC DIRECTION
- E ELECTRIC LINE
- OVERHEAD LINE
- SANITARY SEWER
- UNDERGROUND DRAIN
- GAS LINE
- STREET LIGHT POLE
- POWER POLE

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
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Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: STAGING SITE PLAN

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	RSH	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	RSH	FILE:	HPH106A-DR034
REVIEWED BY:	JMF	DRAWING NO.:	S-2 OF 5
APPROVED BY:	JFB		

7 S-2 PLAN
STAGING SITE
SCALE: 1" = 20'

NOT ISSUED FOR CONSTRUCTION

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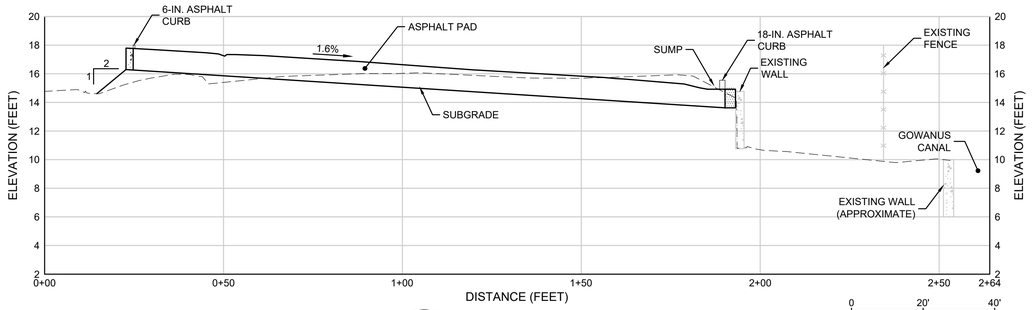
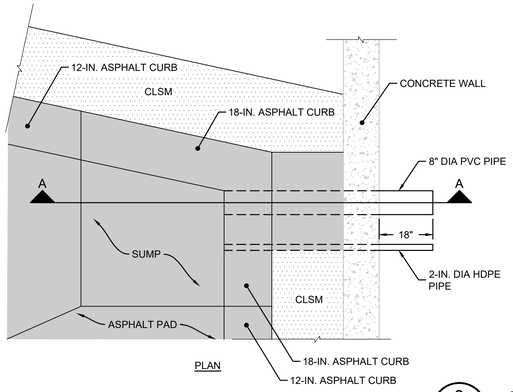
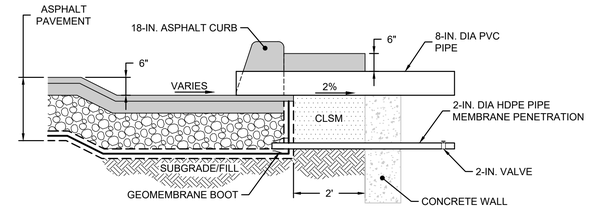
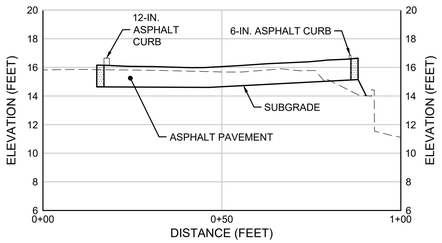


A S-1 SECTION
EXISTING ASPHALT PAD WEST-EAST
(NOTE 2)
SCALE: 1" = 20' (HORIZONTAL); 1" = 5' (VERTICAL)

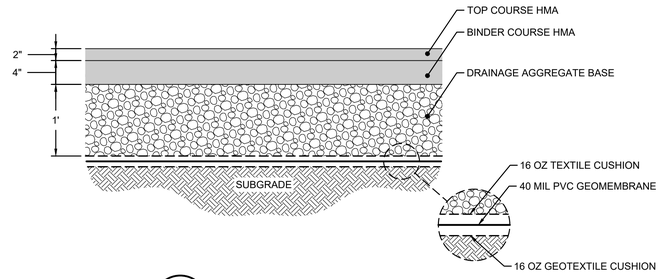




8 S-1 DETAIL
EXISTING ASPHALT PAD PIPE
(NOTE 2)
SCALE: 1" = 2'

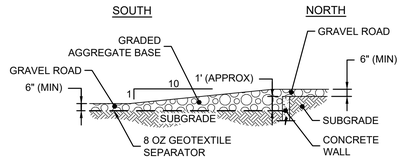


B S-1 SECTION
EXISTING ASPHALT PAD NORTH-SOUTH
(NOTE 2)
SCALE: 1" = 20' (HORIZONTAL); 1" = 5' (VERTICAL)

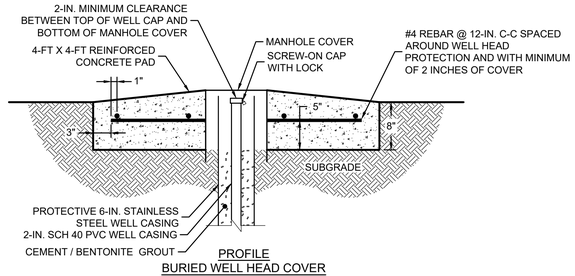


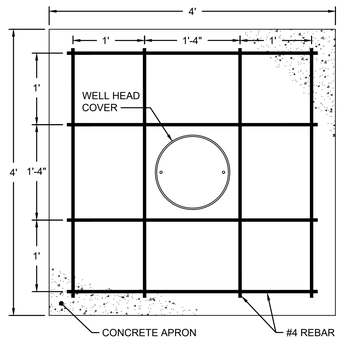
9 S-1 DETAIL
EXISTING ASPHALT PAD
(NOTE 2)
SCALE: 1" = 1'

10 S-1 DETAIL
EXISTING GRAVEL ROAD
(NOTE 9)
SCALE: 1" = 5'

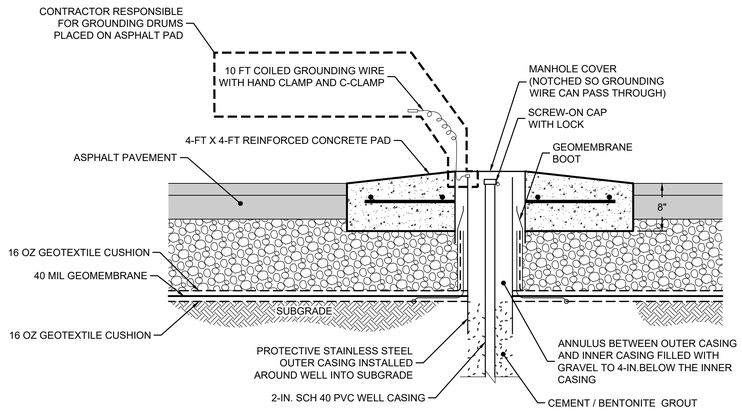


11 S-2 DETAIL
GRADING NEAR 1-FT HIGH WALL
(NOTE 9)
SCALE: 1" = 5'





12 S-2 DETAIL
CONVERSION OF PVC WELL TO FLUSH MOUNT
(NOTES 3 TO 7)
SCALE: NTS



NOTES:

1. INSPECT GROUNDING WIRES FOR CORROSION OR DAMAGE. THE CONTRACTOR SHALL REPLACE DAMAGED GROUNDING WIRE(S) (GRAINGER MFG. MODEL # RAC10-C OR OTHER APPROVED BY THE OWNER'S REPRESENTATIVE).
2. THE GROUNDING WIRE SHALL BE ELECTRICALLY BONDED TO THE STAINLESS STEEL OUTER CASING. THE OTHER END OF THE GROUNDING WIRE SHALL PASS THROUGH THE NOTCH IN THE MANHOLE COVER AND SHALL BE ELECTRICALLY BONDED IN SERIES OR IN PARALLEL TO EACH DRUM INSIDE THE DRUM STORAGE BOX.

13 S-1 DETAIL
EXISTING GROUNDING SYSTEM FOR DRUMS PLACED ON ASPHALT PAD
(NOTES 2 & 8)
SCALE: NTS

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.
2. THE ASPHALT PAD AND ASSOCIATED PIPING, CURBS, AND GROUNDING SYSTEM WERE PREVIOUSLY INSTALLED AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.
3. FOR EXISTING PVC STICKUP WELLS CONVERTED TO FLUSH MOUNT, STAINLESS STEEL OUTER CASING SHALL BE INSTALLED INTO THE SUBGRADE. A MANHOLE COVER WILL ADDITIONALLY BE INSTALLED AROUND THE OUTER CASING AS DESCRIBED IN NOTE 4.
4. A MANHOLE COVER (CNI MFG # 112MWCL-1 OR OTHER APPROVED BY THE OWNER'S REPRESENTATIVE) WILL BE INSTALLED TO PROTECT THE WELL HEAD.
5. CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI AND MIX TO BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO USE.
6. REINFORCING BARS SHALL BE OF GRADE 60 OR GREATER.
7. CONCRETE SHALL BE SLIGHTLY SLOPED SO THAT DRAINAGE WILL FLOW AWAY FROM THE PROTECTIVE CASING AND OFF THE CONCRETE PAD.
8. DRUMS PLACED ON THE ASPHALT PAD SHALL BE GROUNDED TO THE PREVIOUSLY CONSTRUCTED GROUNDING SYSTEM.
9. THE WIDTH OF THE GRAVEL ROAD SHALL BE WIDENED TO ALLOW FOR A LARGER TURNING RADIUS NEAR THE 15 FT LONG, 1 FT HIGH CONCRETE WALL.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: STAGING SITE SECTIONS AND DETAILS

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	RSH	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	RSH	FILE:	HPH106A-DR020
REVIEWED BY:	JMF	DRAWING NO.:	S-3 OF 5
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

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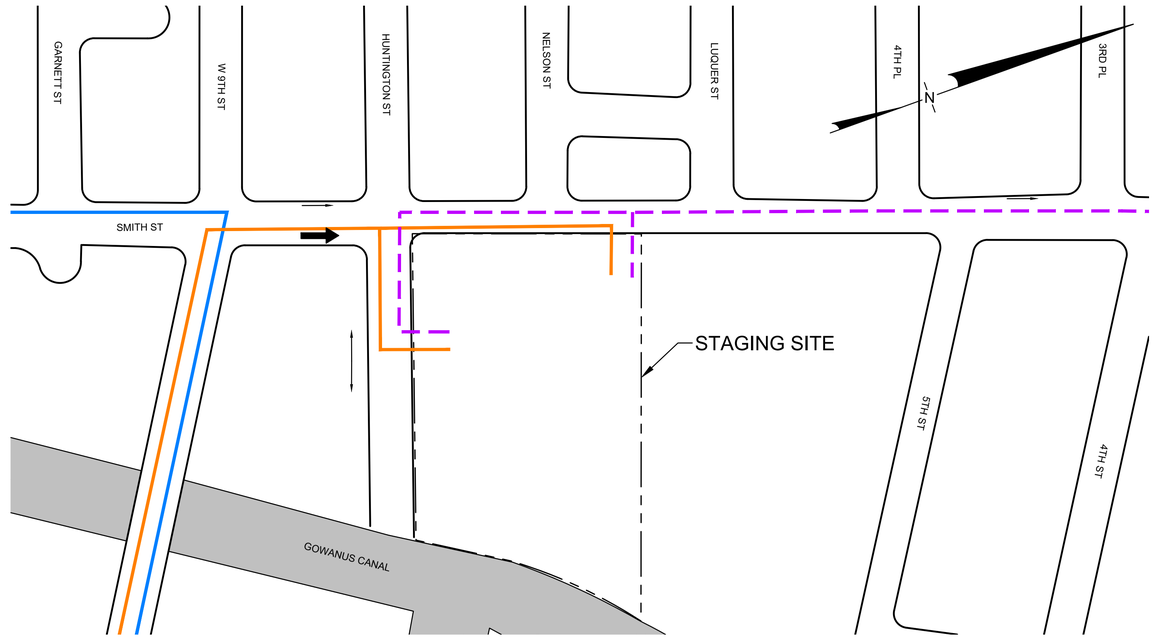
14 / S-4 PLAN
OVERALL TRAFFIC ROUTE
SCALE: 1" = 250'

0 250' 500'
SCALE IN FEET



15 / S-4 PLAN
TRAFFIC MANAGEMENT - SMITH ST
SCALE: 1" = 100'

0 100' 200'
SCALE IN FEET

DIRECTIONS ENTERING THE SITE AT HUNTINGTON STREET:

1.	HEAD NORTHEAST ON I-278	
2.	TAKE EXIT 23 FOR 38TH ST	0.1 MI
3.	MERGE ONTO 38TH ST	184 FT
4.	TURN LEFT AT 4TH AVE	1.5 MI
5.	TURN LEFT AT 9TH ST	0.6 MI
6.	TURN RIGHT ONTO SMITH ST	0.1 MI
7.	RIGHT TURN ONTO HUNTINGTON ST	100 FT
8.	TURN LEFT INTO SITE	

DIRECTIONS EXITING THE SITE AT HUNTINGTON STREET:

1.	RIGHT OUT OF SITE ON HUNTINGTON ST	
2.	TURN RIGHT ONTO SMITH ST	0.25 MI
3.	TURN RIGHT AT 3RD ST	0.6 MI
4.	TURN RIGHT AT 4TH AVE	0.7 MI
5.	TURN RIGHT AT PROSPECT AVE	0.2 MI
6.	TURN LEFT TO MERGE ONTO I-278 W	

TRUCK ROUTE LEGEND

- STAGING SITE
- DIRECTION OF TRAFFIC
- EXITING SITE TRUCK ROUTE
- ENTERING TRUCK ROUTE
- DESIGNATED LOCAL TRUCK ROUTE
- DIRECTION OF TRUCK ROUTE TRAFFIC

TRUCK ROUTE NOTES:

1. ROADWAY BASE MAP SOURCE: GOOGLE EARTH 2015.
2. TRUCKS TRANSPORTING CONSTRUCTION EQUIPMENT OR MATERIALS (SOIL, WATER, PIPE, CEMENT, ETC.) TO OR FROM THE SITE MUST USE SPECIFIC ROUTES AND BE IN COMPLIANCE WITH NEW YORK CITY TRAFFIC RULES. TRUCKS MAY ONLY USE NON-DESIGNATED STREETS FOR THE PURPOSE OF ARRIVING OR DEPARTING THE DESTINATION AND MUST USE DESIGNATED LOCAL TRUCK ROUTES TO THE GREATEST EXTENT POSSIBLE.
3. TRUCKS AND EQUIPMENT CANNOT QUEUE IN LOCAL STREETS. QUEUE INSIDE PROJECT LIMITS OR APPROVED OFFSITE STAGING AREA.
4. CONTRACTOR MUST INSPECT TRUCK ROUTES DAILY FOR SPILLAGE, DUST, OR OTHER SITE RELATED IMPACTS. ANY IMPACTS MUST BE RETURNED TO ORIGINAL CONDITION DAILY TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL MAINTAIN CONSTRUCTION ENTRANCES AND ADDRESS ANY IMPACTS IN ACCORDANCE WITH SECTION 01 57 13 OF THE SPECIFICATIONS.
5. CONTINUOUS TRAFFIC FLOW ON SMITH STREET OUTSIDE STAGING SITE AREA MUST BE MAINTAINED.
6. PERFORM MAINTENANCE AND PROTECTION OF TRAFFIC IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITION, AND TO THE SATISFACTION OF NEW YORK CITY.
7. CONTRACTOR TO CHOOSE APPROPRIATE ACCESS AND EGRESS POINTS TO ACCOMMODATE PHASING OF CONSTRUCTION ACTIVITIES.

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C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: TRAFFIC PLAN

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	RSH	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	RSH	FILE:	HPH106A-DR042
REVIEWED BY:	JMF	DRAWING NO.:	S-4 OF 5
APPROVED BY:	JFB		

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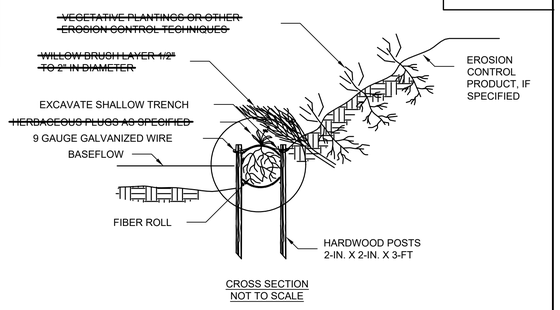
X:\GI_CAD\DESIGN\DESIGN\RTA1\DRAWINGS\HPH106A.DR042

SYMBOL



CROSS SECTION
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

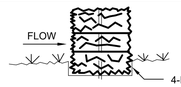
1. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW BASEFLOW OR A 4-IN. TRENCH ON SLOPE CONTOURS.
2. PLACE THE ROLL IN THE TRENCH AND ANCHOR WITH 2-IN. x 2-IN. POSTS PLACED ON BOTH SIDES OF THE ROLL AND SPACED LATERALLY ON 2 FT TO 4 FT CENTERS. TRIM THE TOP OF THE POSTS EVEN WITH THE EDGE OF THE ROLL, IF NECESSARY.
3. NOTCH THE POSTS AND TIE TOGETHER, ACROSS THE ROLL, WITH 9 GAUGE GALVANIZED WIRE OR 1/8-IN. DIAMETER BRAIDED NYLON ROPE.
4. PLACE SOIL EXCAVATED FROM THE TRENCH BEHIND THE ROLL AND HAND TAMP. ~~PLANT WITH SUITABLE HERBACEOUS OR WOODY VEGETATION AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS. VEGETATION SHALL BE PLACED IMMEDIATELY ADJACENT TO THE ROLL TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION, IF SPECIFIED, SHALL BE PLANTED INTO THE FIBER ROLL.~~

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

FIBER ROLL

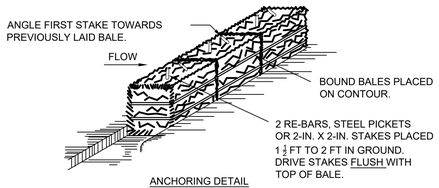
16 / S-2 DETAIL
FIBER ROLL
(NOTE 2)
SCALE: NTS
SOURCE: NYSDE

SYMBOL



BEDDING DETAIL
NOT TO SCALE

DRAINAGE AREA NO MORE THAN 1/4 AC PER 100 FT OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%.



ANCHORING DETAIL
NOT TO SCALE

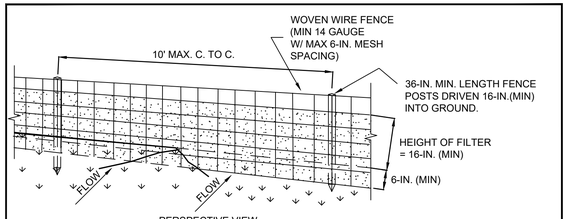
CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) IN. , AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

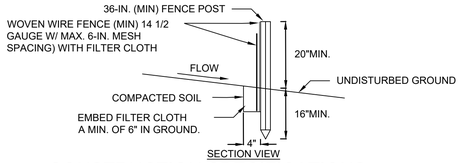
ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

STRAW BALE DIKE

17 / S-2 DETAIL
STRAW BALE DIKE
SCALE: NTS
SOURCE: NYSDE



PERSPECTIVE VIEW



SECTION VIEW

CONSTRUCTION SPECIFICATIONS

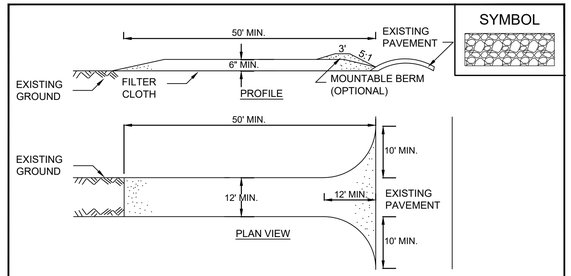
1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24-IN. AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6-IN. MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX IN. AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

SILT FENCE

18 / S-2 DETAIL
SILT FENCE
SCALE: NTS
SOURCE: NYSDE

SYMBOL



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 IN. STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FT (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) IN.
4. WIDTH - TWELVE (12) FT MIN. , BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

STABILIZED CONSTRUCTION ENTRANCE

19 / S-2 DETAIL
CONSTRUCTION ENTRANCE
SCALE: NTS
SOURCE: NYSDE

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
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A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: STORMWATER AND EROSION CONTROL DETAILS

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

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SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	RSH	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	RSH	FILE:	HPH106A-DR046
REVIEWED BY:	JMF	DRAWING NO.:	S-5 OF 5
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

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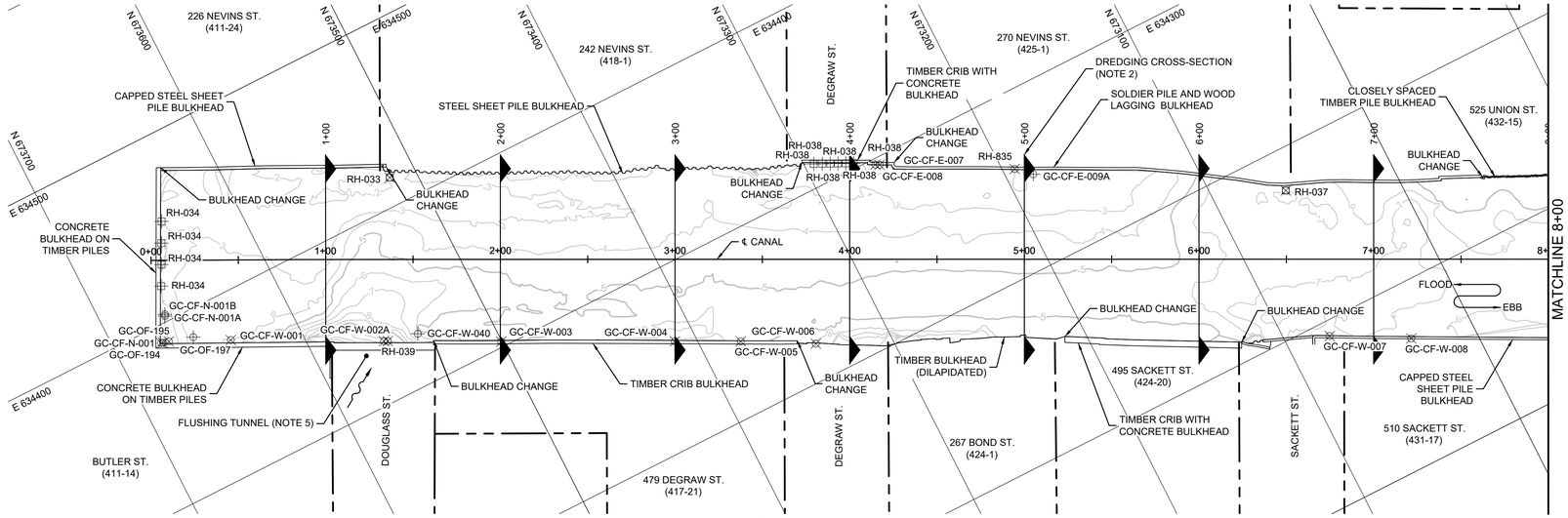


20
G-3

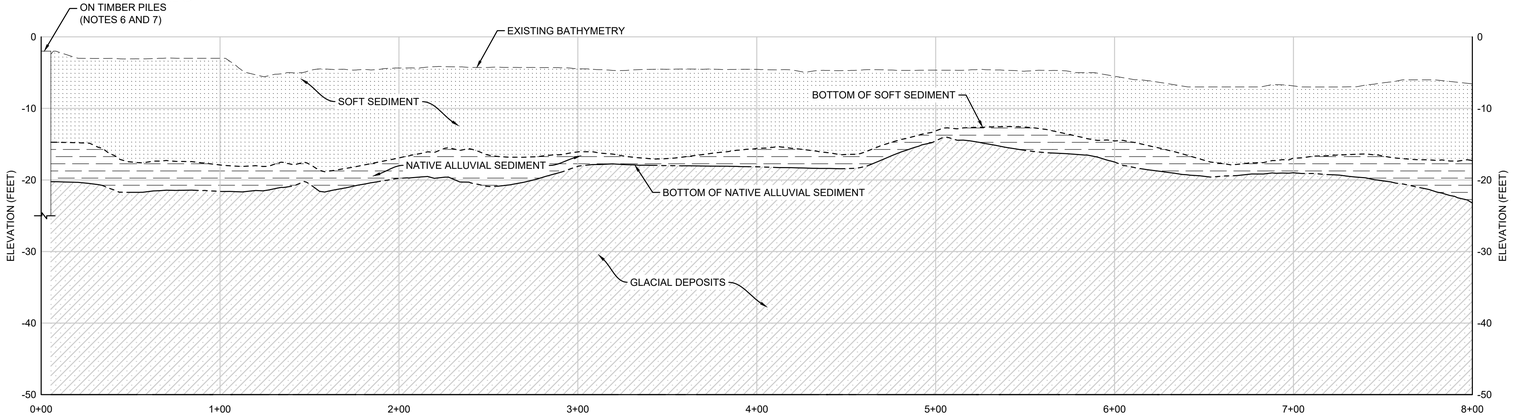
PLAN

EXISTING BATHYMETRY (STA. 0+00 TO 8+00)

SCALE: 1" = 40'

0 40' 80'

SCALE IN FEET



DISTANCE (FEET)

21
DR-1

PROFILE

EXISTING BATHYMETRY (STA. 0+00 TO 8+00)

SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

0 40' 80'

SCALE IN FEET (HORIZONTAL)

0 10' 20'

SCALE IN FEET (VERTICAL)

LEGEND

- -5 — BATHYMETRY ELEVATION (1-FT)
- PROPERTY LINE
- EXISTING BATHYMETRY
- BOTTOM OF SOFT SEDIMENT
- BOTTOM OF NATIVE ALLUVIAL SEDIMENT
- 5+00 — CANAL STATIONING
- SOFT SEDIMENT
- NATIVE ALLUVIAL SEDIMENT
- GLACIAL DEPOSITS
- OUTFALL - KSS, 2019 SURVEY (NOTE 4)
- OUTFALL - PREVIOUS SURVEYS (NOTE 4)
- CSO - KSS, 2019 SURVEY (NOTE 4)
- CSO - PREVIOUS SURVEYS (NOTE 4)
- (417-21) — BLOCK AND LOT
- FLUSHING TUNNEL

NOTES:

1. DEBRIS IN RTA1 IS PRESENTED ON DRAWINGS DR-6 TO DR-8.
2. DREDGE CROSS-SECTIONS ARE PRESENTED ON DRAWINGS DR-15 AND DR-16.
3. CONTRACTOR IS RESPONSIBLE FOR DOCUMENTING AND VERIFYING THE LOCATION AND DESCRIPTION OF OUTFALLS. ONLY RTA1 OUTFALLS ARE PRESENTED ON THE DRAWING. OUTFALL DATA (INCLUDING PIPE SIZE, MATERIAL AND INVERT ELEVATION) IS PROVIDED AS TABLE 1 ON DRAWING G-2 AND DESCRIBED WITHIN THE ASSOCIATED DREDGING NOTES.
4. THE BULKHEAD TYPE FOR EACH PROPERTY IS PRIMARILY BASED ON THE RESULTS OF A TOPOGRAPHIC SURVEY CONDUCTED IN RTA1 BY KENNON SURVEYING SERVICES INC. (KSS) AND DATED 15 JULY 2019.
5. THE FLUSHING TUNNEL OPERATED BY NYC HAS FIVE RECTANGULAR OPENINGS WITH DIMENSIONS OF APPROXIMATELY 12.5 FT (HIGH) X 8 FT (WIDE) AND DISCHARGES WATER FROM THE EAST RIVER AT THE HEAD OF THE CANAL.
6. THE HORIZONTAL LIMITS OF THE BULKHEAD SHOWN ON THIS DRAWING ARE FOR ILLUSTRATION PURPOSES ONLY.
7. THE TOP OF BULKHEAD ELEVATIONS ARE SHOWN AS APPROXIMATE. TOPOGRAPHIC SURVEY INFORMATION SHOWING TOP OF WALL ELEVATIONS WAS OBTAINED BY KSS IN JULY 2019 AND THIS DATA IS AVAILABLE UPON REQUEST.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: EXISTING BATHYMETRY PLAN (STA. 0+00 TO 8+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR005
REVIEWED BY:	JAS	DRAWING NO.:	DR-1 OF 18
APPROVED BY:	JFB		

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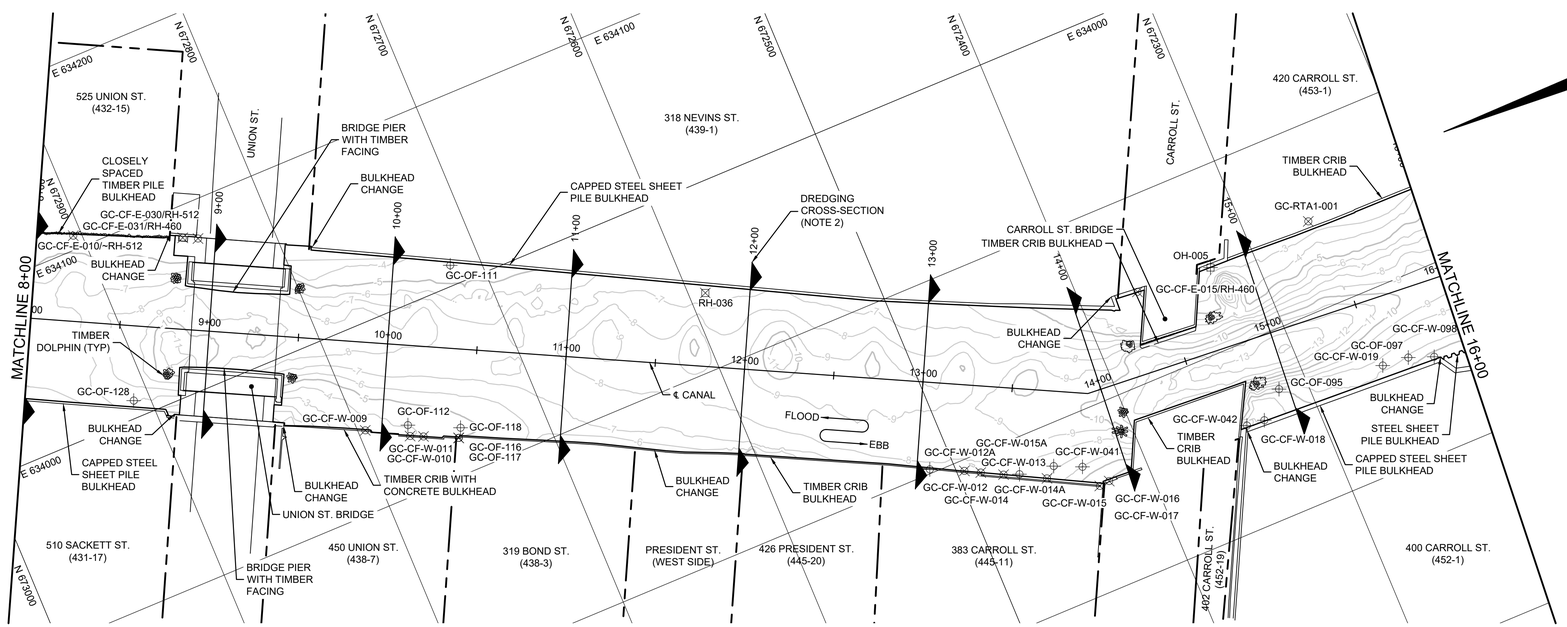
X:\RI_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR005

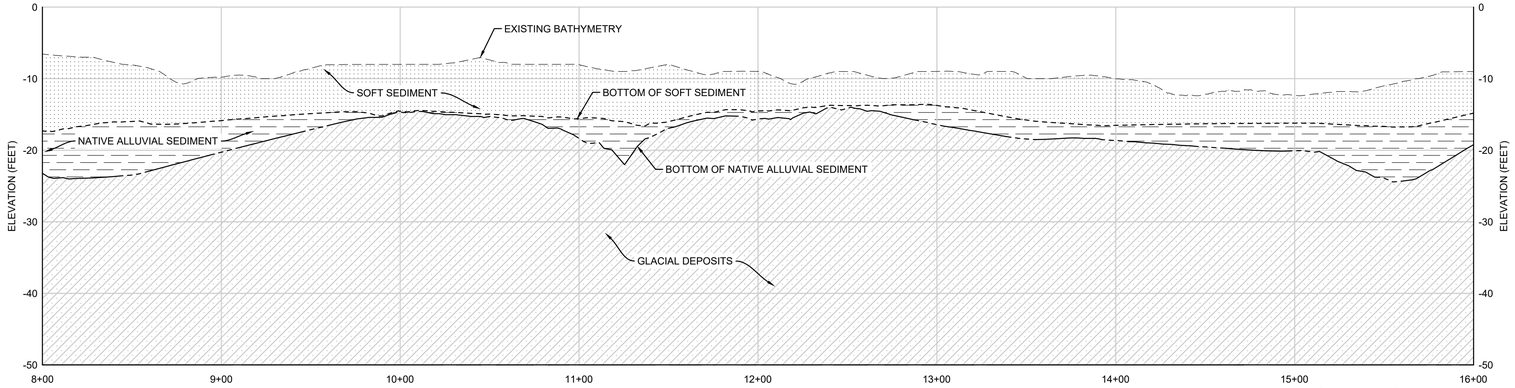


22 / G-3

PLAN

EXISTING BATHYMETRY (STA. 8+00 TO 16+00)

SCALE: 1" = 40'



23 / DR-2

PROFILE

EXISTING BATHYMETRY (STA. 8+00 TO 16+00)

SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

LEGEND

-5	BATHYMETRY ELEVATION (1-FT)
	PROPERTY LINE
	EXISTING BATHYMETRY
	BOTTOM OF SOFT SEDIMENT
	BOTTOM OF NATIVE ALLUVIAL SEDIMENT
10+00	CANAL STATIONING
	SOFT SEDIMENT
	NATIVE ALLUVIAL SEDIMENT
	GLACIAL DEPOSITS
	OUTFALL - KSS, 2019 SURVEY (NOTE 4)
	OUTFALL - PREVIOUS SURVEYS (NOTE 4)
	CSO - KSS, 2019 SURVEY (NOTE 4)
	CSO - PREVIOUS SURVEYS (NOTE 4)
(417-21)	BLOCK AND LOT

NOTES:

1. DEBRIS IN RTA1 IS PRESENTED ON DRAWINGS DR-6 TO DR-8.
2. DREDGE CROSS-SECTIONS ARE PRESENTED ON DRAWINGS DR-15 AND DR-16.
3. CONTRACTOR IS RESPONSIBLE FOR DOCUMENTING AND VERIFYING THE LOCATION AND DESCRIPTION OF OUTFALLS. ONLY RTA1 OUTFALLS DATA ARE PRESENTED ON THE DRAWING. OUTFALL DATA (INCLUDING PIPE SIZE, MATERIAL AND INVERT ELEVATION) IS PROVIDED AS TABLE 1 ON DRAWING G-2 AND DESCRIBED WITHIN THE ASSOCIATED NOTES.
4. THE BULKHEAD TYPE FOR EACH PROPERTY IS PRIMARILY BASED ON THE RESULTS OF A TOPOGRAPHIC SURVEY CONDUCTED IN RTA1 BY KENNON SURVEYING SERVICES INC. (KSS) AND DATED 15 JULY 2019.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: EXISTING BATHYMETRY PLAN (STA. 8+00 TO 16+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR006
REVIEWED BY:	JAS	DRAWING NO.:	DR-2 OF 18
APPROVED BY:	JFB		

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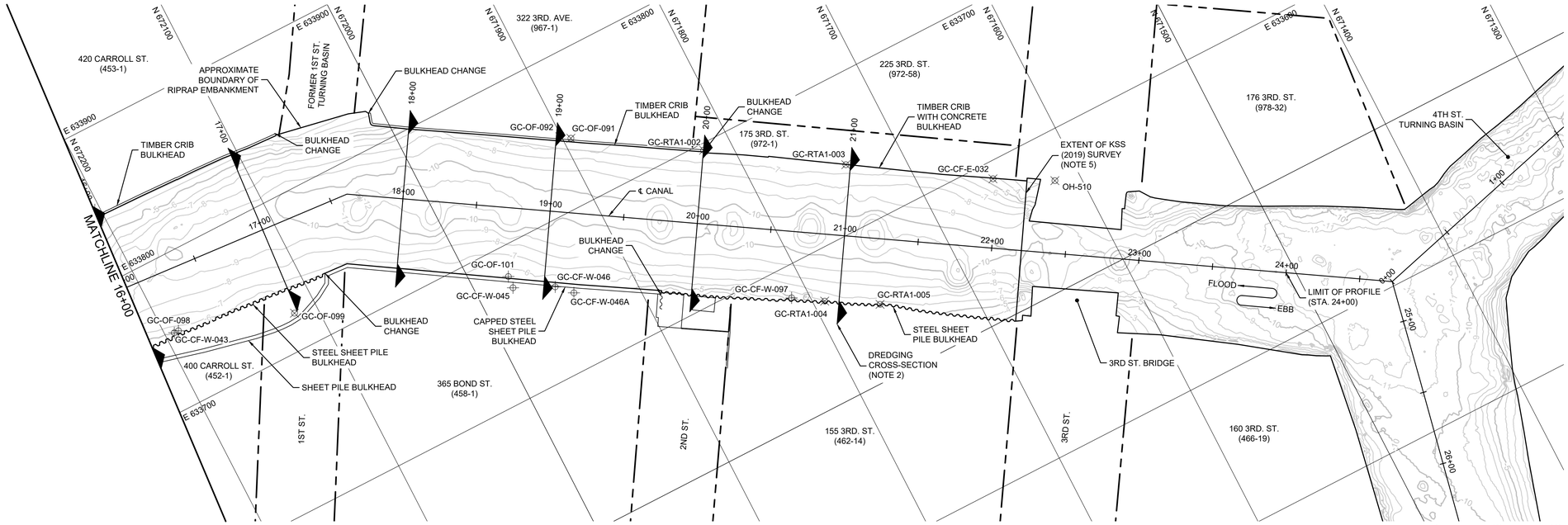
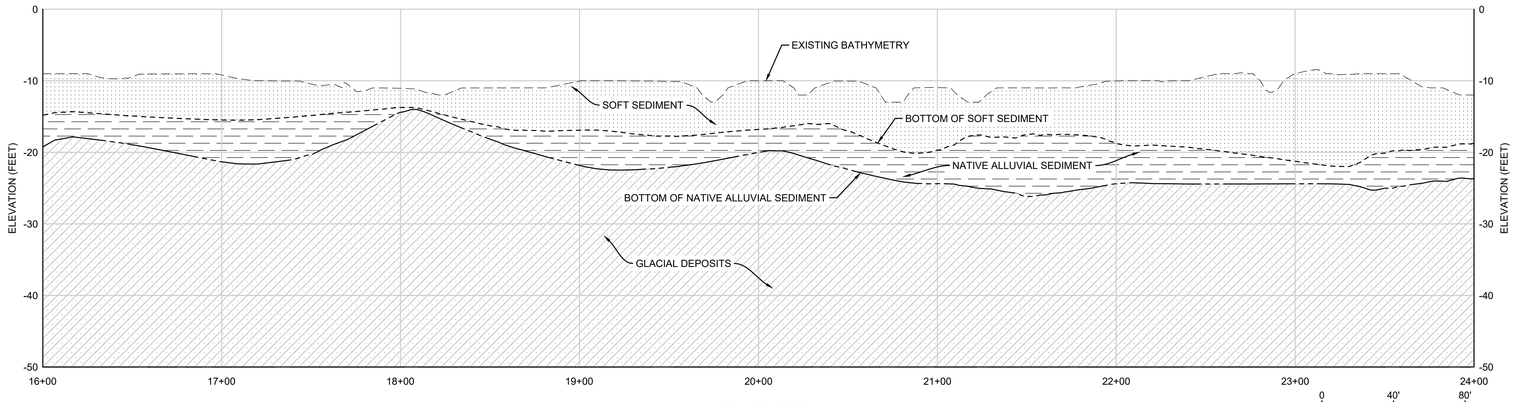
X:\EN_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR006



24 / G-3 PLAN

EXISTING BATHYMETRY (STA. 16+00 TO 24+00)

SCALE: 1" = 40'



25 / DR-3 PROFILE

EXISTING BATHYMETRY (STA. 16+00 TO 24+00)

SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

LEGEND

- BATHYMETRY ELEVATION (1-FT)
- PROPERTY LINE
- EXISTING BATHYMETRY
- BOTTOM OF SOFT SEDIMENT
- BOTTOM OF NATIVE ALLUVIAL SEDIMENT
- 20+00 CANAL STATIONING
- SOFT SEDIMENT
- NATIVE ALLUVIAL SEDIMENT
- GLACIAL DEPOSITS
- OUTFALL - KSS, 2019 SURVEY (NOTE 4)
- OUTFALL - PREVIOUS SURVEYS (NOTE 4)
- CSO - KSS, 2019 SURVEY (NOTE 4)
- CSO - PREVIOUS SURVEYS (NOTE 4)
- (417-21) BLOCK AND LOT

NOTES:

1. DEBRIS IN RTA1 IS PRESENTED ON DRAWINGS DR-6 TO DR-8.
2. DREDGE CROSS-SECTIONS ARE PRESENTED ON DRAWINGS DR-15 AND DR-16.
3. CONTRACTOR IS RESPONSIBLE FOR DOCUMENTING AND VERIFYING THE LOCATION AND DESCRIPTION OF OUTFALLS. ONLY RTA1 OUTFALLS DATA ARE PRESENTED ON THE DRAWING. OUTFALL DATA (INCLUDING PIPE SIZE, MATERIAL AND INVERT ELEVATION) IS PROVIDED AS TABLE 1 ON DRAWING G-2 AND DESCRIBED WITHIN THE ASSOCIATED NOTES.
4. THE BULKHEAD TYPE FOR EACH PROPERTY IS PRIMARILY BASED ON THE RESULTS OF A TOPOGRAPHIC SURVEY CONDUCTED IN RTA1 BY KENNON SURVEYING SERVICES INC. (KSS) AND DATED 15 JULY 2019.
5. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: EXISTING BATHYMETRY PLAN (STA. 16+00 TO 24+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR007
REVIEWED BY:	JAS	DRAWING NO.:	DR-3 OF 18
APPROVED BY:	JFB		

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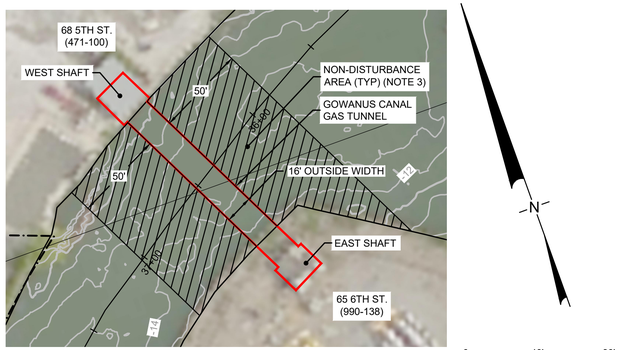
X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR007

26 / G-3 PLAN
EXISTING BATHYMETRY - RTA2
SCALE: 1" = 100'



27 / DR-4 DETAIL
GAS TUNNEL
SCALE: 1" = 40'

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR ASCERTAINING THAT THE EXISTING BATHYMETRY PROVIDES ADEQUATE DRAFT FOR THEIR WATERCRAFT AND VESSELS.
2. THE LOCATION AND SIZE OF THE GOWANUS CANAL GAS TUNNEL WAS BASED ON REVIEWING A COMBINATION OF: (I) 50% REMEDIAL DESIGN DRAWINGS FOR THE FORMER CITIZENS GAS WORKS MGP SITE (SHEET 4, REV A) DATED 3 JUNE 2011 PREPARED BY GEI CONSULTANTS FOR NATIONAL GRID; (II) AERIAL IMAGERY FROM MICROSOFT CORPORATION BING MAPS (2016) WHICH PRESENTS THE ACCESS SHAFTS TO THE TUNNEL; (III) "PROPOSED PIPE TUNNEL UNDER GOWANUS CANAL" DRAWINGS COMPLETED BY THE BROOKLYN UNION GAS CO. (NOW NATIONAL GRID) ON 9 JUNE 1923; AND (IV) GOWANUS CANAL GAS TUNNEL INSPECTION REPORT PREPARED BY LIRO ENGINEERS FOR NATIONAL GRID IN NOVEMBER 2013.
3. ACTIVITIES THAT COULD POTENTIALLY DAMAGE THE GAS TUNNEL WITHIN THE NON-DISTURBANCE AREA OR THAT WOULD DIRECTLY CONTACT THE TOP OF TB4 PILOT STUDY CAP SHALL BE PROHIBITED (E.G., SPUDS FOR BARGES SHALL NOT BE USED, PILINGS SHALL NOT BE INSTALLED).
4. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.

LEGEND

-10	BATHYMETRY ELEVATION (2-FT)
	CANAL BOUNDARY
30+00	CANAL STATIONING
	GAS TUNNEL
	STAGING SITE
	NON-DISTURBANCE AREA
(471-100)	BLOCK AND LOT

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: EXISTING BATHYMETRY PLAN - RTA2

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR050
REVIEWED BY:	JAS	DRAWING NO.:	DR-4 OF 18
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

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28
G-3

PLAN
EXISTING BATHYMETRY - RTA3
SCALE: 1" = 100'

0 100' 200'
SCALE IN FEET

LEGEND

-10 BATHYMETRY ELEVATION (2-FT)

CANAL BOUNDARY

60+00 CANAL STATIONING

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR ASCERTAINING THAT THE EXISTING BATHYMETRY PROVIDES ADEQUATE DRAFT FOR THEIR WATERCRAFT AND VESSELS.
2. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: EXISTING BATHYMETRY PLAN - RTA3

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

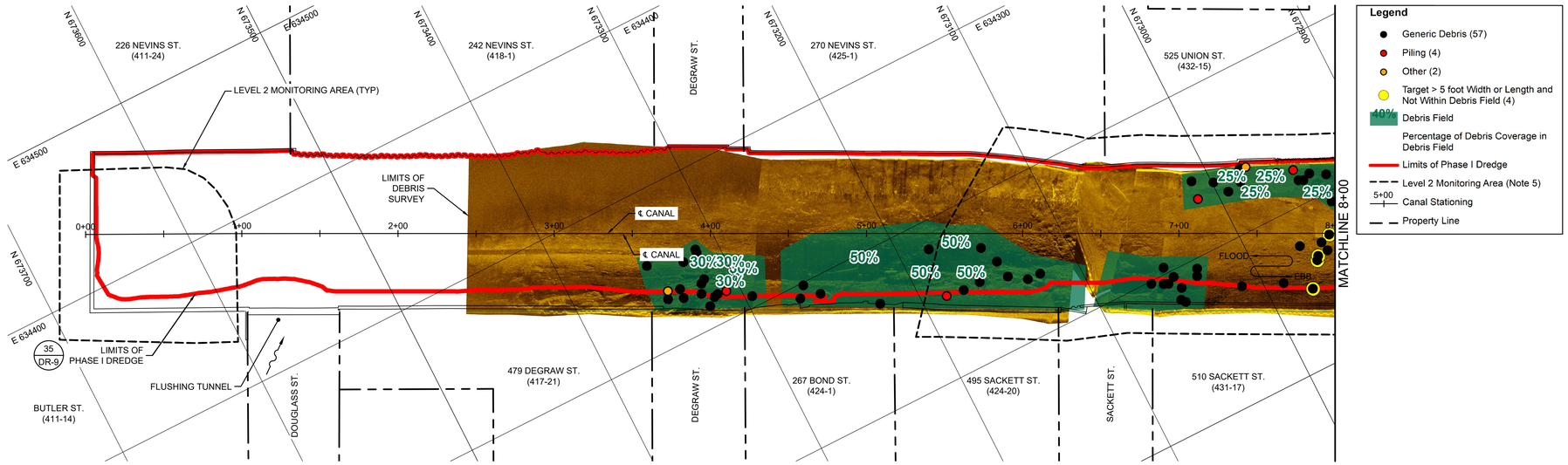
DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR051
REVIEWED BY:	JAS	DRAWING NO.:	DR-5 OF 18
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

X:\06_CAD\DR\DESIGN\ DES\GW\RTA1\DRAWINGS\HPH106A\DR051



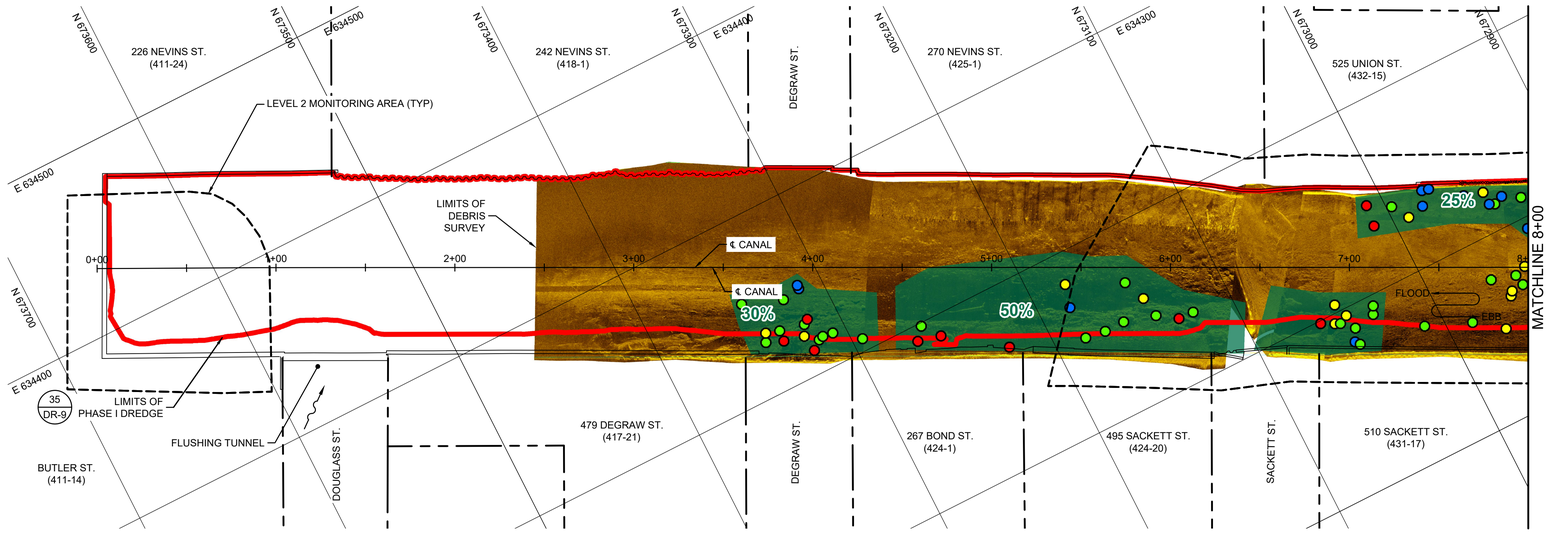
Legend

- Generic Debris (57)
- Piling (4)
- Other (2)
- Target > 5 foot Width or Length and Not Within Debris Field (4)
- Debris Field
- Percentage of Debris Coverage in Debris Field
- Limits of Phase I Dredge
- Level 2 Monitoring Area (Note 5)
- 5+00 Canal Stationing
- Property Line

29 / G-3 PLAN

OBSERVED DEBRIS BY CATEGORY (STA. 0+00 TO 8+00)

SCALE: 1" = 40'



Legend

Target Size (Maximum of Length or Width)

- Less than 2 Feet (11)
- 2 to 5 Feet (29)
- 5 to 10 Feet (13)
- Greater than 10 Feet (10)
- Debris Field
- 40% Percentage of debris coverage in Debris Field
- Limits of Phase I Dredge
- Level 2 Monitoring Area (Note 5)
- 5+00 Canal Stationing
- Property Line

30 / DR-6 PLAN

OBSERVED DEBRIS BY SIZE (STA. 0+00 TO 8+00)

SCALE: 1" = 40'

NOTES:

1. THE DEBRIS DATA PRESENTED ON THIS DRAWING WAS COLLECTED BY SEAVISION UNDERWATER SOLUTIONS, INC. IN JANUARY 2015 UTILIZING SIDESCAN SONAR. THE IDENTIFIED DEBRIS IS LOCATED NEAR THE BATHYMETRIC SURFACE. SIDESCAN SONAR CANNOT IDENTIFY BURIED DEBRIS; HOWEVER, GIVEN THE VOLUME OF DEBRIS DETECTED NEAR THE BATHYMETRIC SURFACE WITHIN THE CANAL, LARGE BURIED DEBRIS WILL LIKELY BE ENCOUNTERED AND NEED TO BE REMOVED DURING DREDGING OPERATIONS.
2. DEBRIS FIELDS ARE DEFINED BY SEAVISION AS LARGE SWATHS OF CANAL BOTTOM THAT ARE FILLED WITH DEBRIS TARGETS, SOME OF WHICH ARE NOTICEABLE IN THE IMAGERY BUT NOT PRACTICAL TO TARGET INDIVIDUALLY DUE TO THE SHEER VOLUME OF TARGETS.
3. (#) INDICATES THE NUMBER OF INSTANCES OF A GIVEN TARGET SIZE.
4. THE SIDESCAN SONAR SURVEY IS AVAILABLE ELECTRONICALLY UPON REQUEST.
5. LEVEL 2 ARCHAEOLOGICAL MONITORING, INCLUDING DETERMINING THE HORIZONTAL AND VERTICAL LIMITS OF SEDIMENT CATEGORIZED AS LEVEL 2 SHALL BE CONDUCTED AS DESCRIBED UNDER CULTURAL RESOURCES EVALUATION NOTES ON DRAWING G-2.

0 40' 80'

SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: EXISTING DEBRIS PLAN (STA. 0+00 TO 8+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR008
REVIEWED BY:	JAS	DRAWING NO.:	DR-6 OF 18
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

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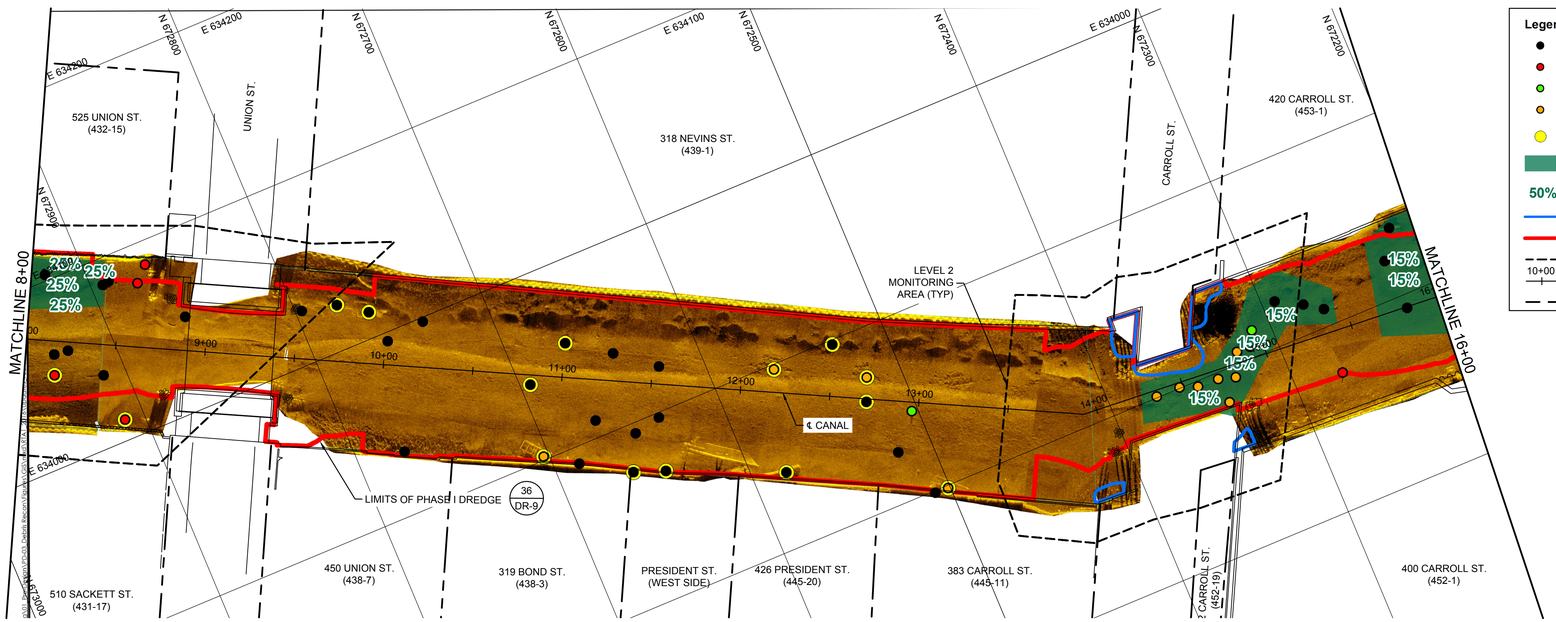


31
G-3

PLAN

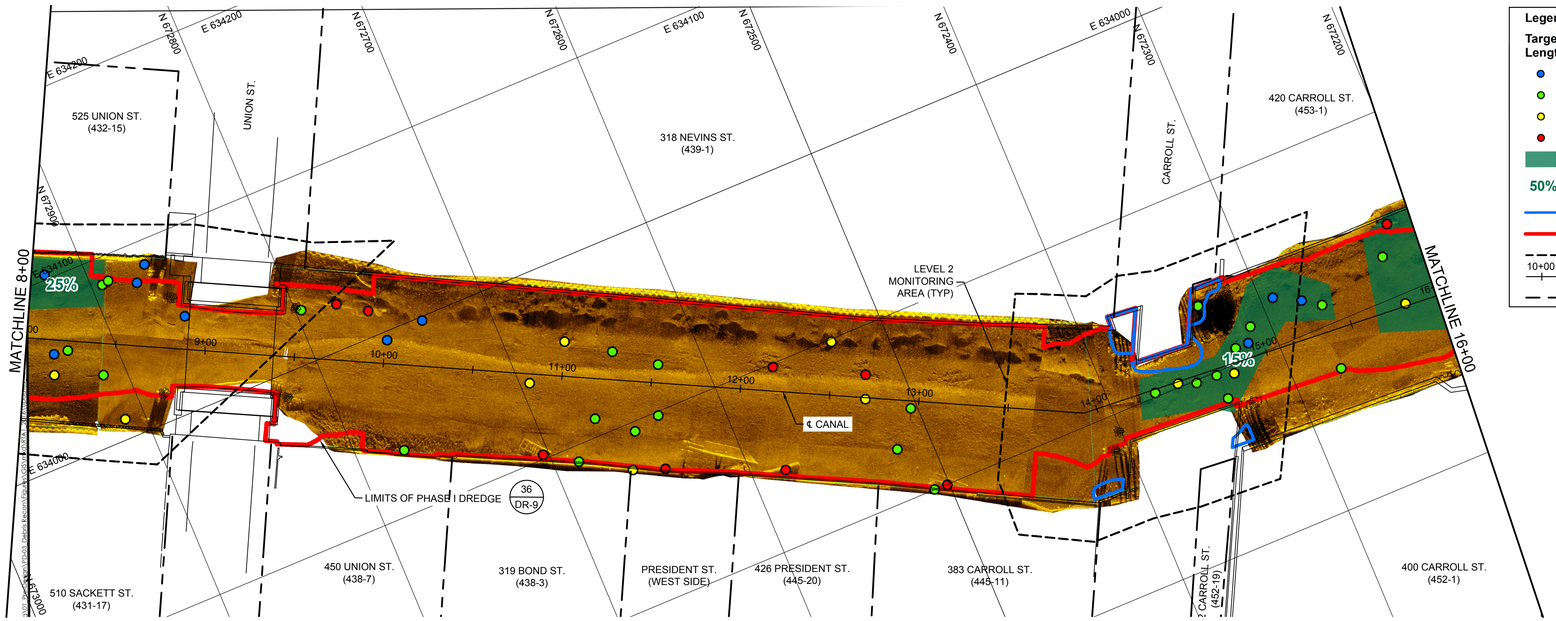
OBSERVED DEBRIS BY CATEGORY (STA. 8+00 TO 16+00)

SCALE: 1" = 40'

Legend

- Generic Debris (36)
- Piling (5)
- Tire (2)
- Other (11)
- Target > 5 foot Width or Length and Not Within Debris Field (15)
- Debris Field
- 50% Percentage of Debris Coverage in Debris Field
- GPI Dredge Area Limits (Note 6)
- Limits of Phase I Dredge
- Level 2 Monitoring Area (Note 5)
- 10+00 Canal Stationing
- Property Line

N



32
DR-7

PLAN

OBSERVED DEBRIS BY SIZE (STA. 8+00 TO 16+00)

SCALE: 1" = 40'

Legend

Target Size (Maximum of Length or Width)

- Less than 2 Feet (10)
- 2 to 5 Feet (25)
- 5 to 10 Feet (10)
- Greater than 10 Feet (9)
- Debris Field
- 50% Percentage of debris coverage in Debris Field
- GPI Dredge Area Limits (Note 6)
- Limits of Phase I Dredge
- Level 2 Monitoring Area (Note 5)
- 10+00 Canal Stationing
- Property Line

NOTES:

1. THE DEBRIS DATA PRESENTED ON THIS DRAWING WAS COLLECTED BY SEAVISION UNDERWATER SOLUTIONS, INC. IN JANUARY 2015 UTILIZING SIDESCAN SONAR. THE IDENTIFIED DEBRIS IS LOCATED NEAR THE BATHYMETRIC SURFACE. SIDESCAN SONAR CANNOT IDENTIFY BURIED DEBRIS; HOWEVER, GIVEN THE VOLUME OF DEBRIS DETECTED NEAR THE BATHYMETRIC SURFACE WITHIN THE CANAL, LARGE BURIED DEBRIS WILL LIKELY BE ENCOUNTERED AND NEED TO BE REMOVED DURING DREDGING OPERATIONS.
2. DEBRIS FIELDS ARE DEFINED BY SEAVISION AS LARGE SWATHS OF CANAL BOTTOM THAT ARE FILLED WITH DEBRIS TARGETS, SOME OF WHICH ARE NOTICEABLE IN THE IMAGERY BUT NOT PRACTICAL TO TARGET INDIVIDUALLY DUE TO THE SHEER VOLUME OF TARGETS.
3. (#) INDICATES THE NUMBER OF INSTANCES OF A GIVEN TARGET SIZE.
4. THE SIDESCAN SONAR SURVEY IS AVAILABLE ELECTRONICALLY UPON REQUEST.
5. LEVEL 2 ARCHAEOLOGICAL MONITORING, INCLUDING DETERMINING THE HORIZONTAL AND VERTICAL LIMITS OF SEDIMENT CATEGORIZED AS LEVEL 2 SHALL BE CONDUCTED AS DESCRIBED UNDER CULTURAL RESOURCES EVALUATION NOTES ON DRAWING G-2.
6. ADDITIONAL DREDGING WITHIN THE VICINITY OF THE CARROLL ST. BRIDGE BULKHEADS SHALL BE PERFORMED AS PART OF THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019). THE GPI DREDGE AREAS SHOWN ON THIS DRAWING ARE FOR ILLUSTRATION PURPOSES ONLY. REFER TO THE DETAIL TITLED PHASE I DREDGE NEAR CARROLL ST. BRIDGE SHOWN ON DRAWING DR-18 FOR CLARITY.

0 40' 80'

SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: EXISTING DEBRIS PLAN (STA. 8+00 TO 16+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR009
REVIEWED BY:	JAS	DRAWING NO.:	DR-7 OF 18
APPROVED BY:	JFB		

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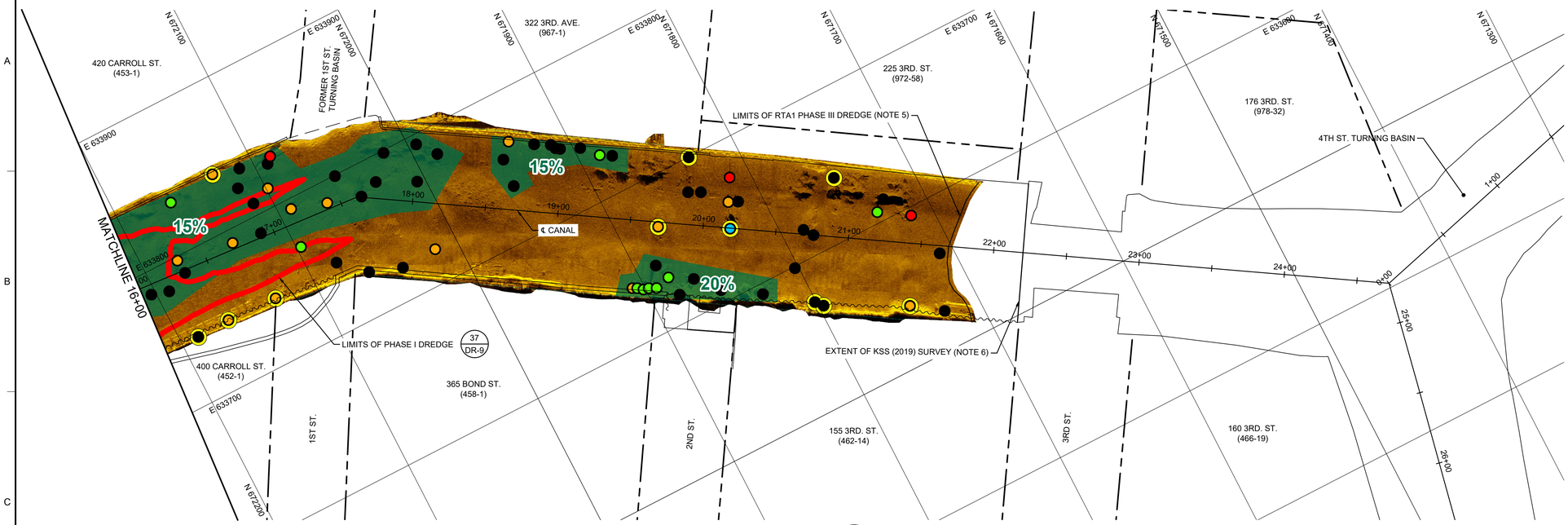
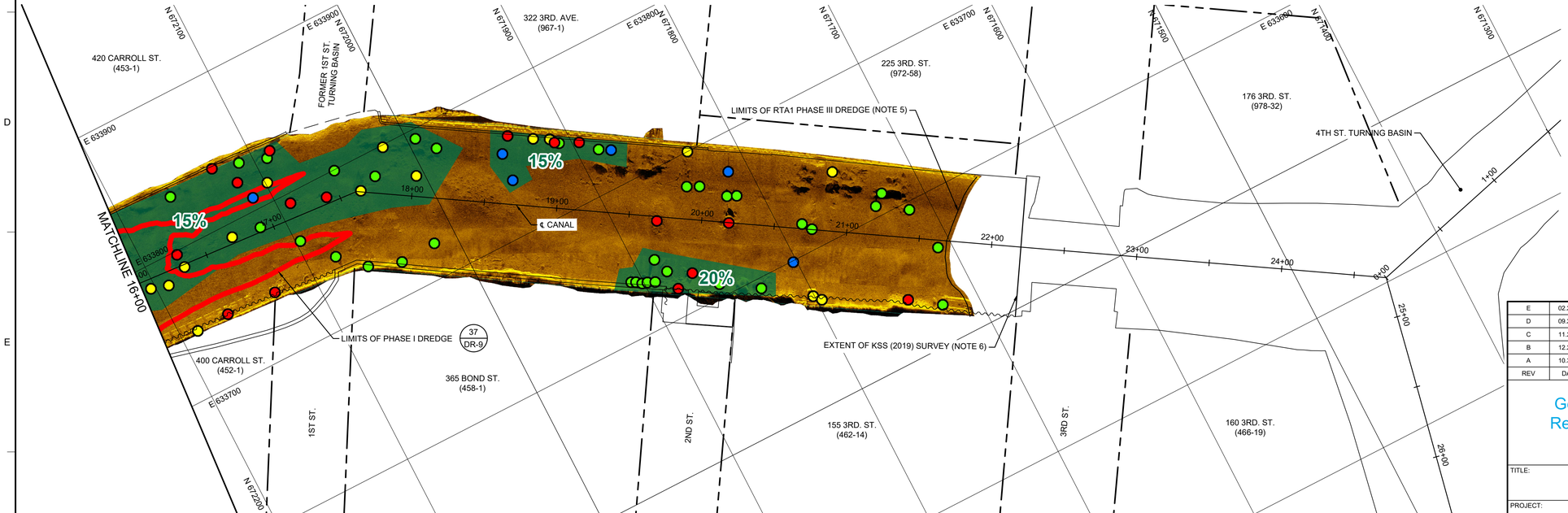
X:\06_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR009



33
G-3

PLAN
OBSERVED DEBRIS BY CATEGORY
(STA. 16+00 TO 24+00)
SCALE: 1" = 40'



34
DR-8

PLAN
OBSERVED DEBRIS BY SIZE
(STA. 16+00 TO 24+00)
SCALE: 1" = 40'

Legend

- Generic Debris
- Piling
- Tire
- Wreck
- Other
- Target > 5 foot Width or Length and Not Within Debris Field (11)
- Debris Field
- 50% Percentage of debris coverage in Debris Field
- Limits of Phase I Dredge
- 20+00 Canal Stationing
- Property Line

Legend

Target Size (Maximum of Length or Width)

- Less than 2 Feet (6)
- 2 to 5 Feet (35)
- 5 to 10 Feet (15)
- Greater than 10 Feet (16)
- Debris Field
- 50% Percentage of debris coverage in Debris Field
- Limits of Phase I Dredge
- 20+00 Canal Stationing
- Property Line

N

0 40' 80'
SCALE IN FEET

NOTES:

1. THE DEBRIS DATA PRESENTED ON THIS DRAWING WAS COLLECTED BY SEAVISION UNDERWATER SOLUTIONS, INC. IN JANUARY 2015 UTILIZING SIDESCAN SONAR. THE IDENTIFIED DEBRIS IS LOCATED NEAR THE BATHYMETRIC SURFACE. SIDESCAN SONAR CANNOT IDENTIFY BURIED DEBRIS; HOWEVER, GIVEN THE VOLUME OF DEBRIS DETECTED NEAR THE BATHYMETRIC SURFACE WITHIN THE CANAL, LARGE BURIED DEBRIS WILL LIKELY BE ENCOUNTERED AND NEED TO BE REMOVED DURING DREDGING OPERATIONS.
2. DEBRIS FIELDS ARE DEFINED BY SEAVISION AS LARGE SWATHS OF CANAL BOTTOM THAT ARE FILLED WITH DEBRIS TARGETS, SOME OF WHICH ARE NOTICEABLE IN THE IMAGERY BUT NOT PRACTICAL TO TARGET INDIVIDUALLY DUE TO THE SHEER VOLUME OF TARGETS.
3. (#) INDICATES THE NUMBER OF INSTANCES OF A GIVEN TARGET SIZE.
4. THE SIDESCAN SONAR SURVEY IS AVAILABLE ELECTRONICALLY UPON REQUEST.
5. DEBRIS LOCATED OUTSIDE THE LIMITS OF THE RTA1 DREDGING WILL BE REMOVED AS PART OF A FUTURE, SEPARATE REMEDIATION.
6. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.

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B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: EXISTING DEBRIS PLAN (STA. 16+00 TO 24+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

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SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
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REVIEWED BY:	JAS	DRAWING NO.:	DR-8 OF 18
APPROVED BY:	JFB		

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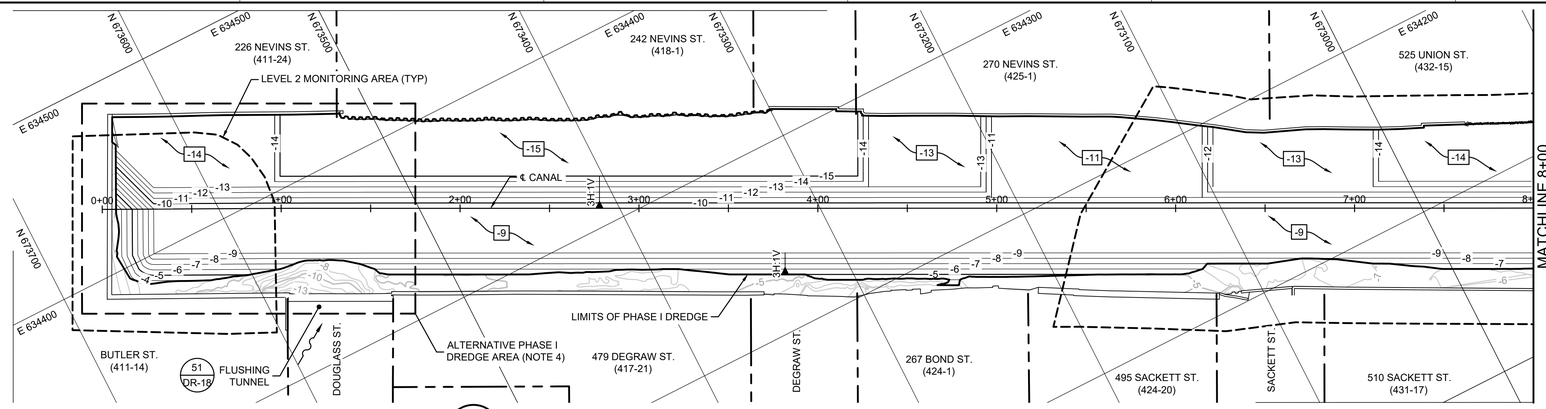
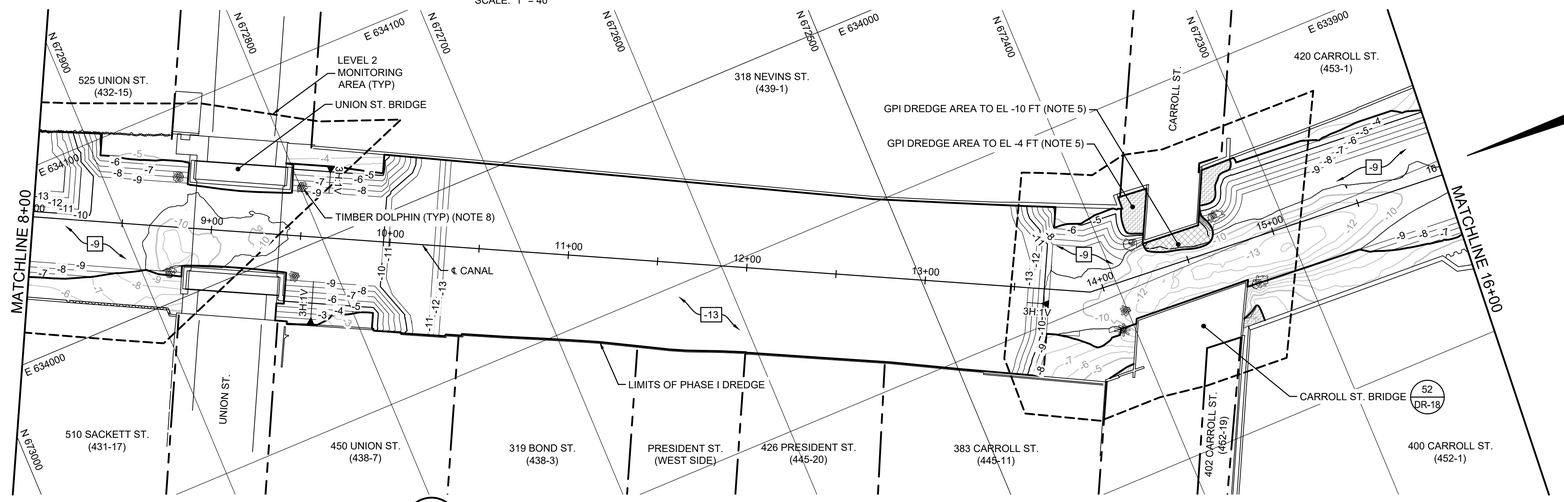
X:\EN_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR010



35 DR-6 PLAN

PHASE I DREDGE (STA. 0+00 TO 8+00)

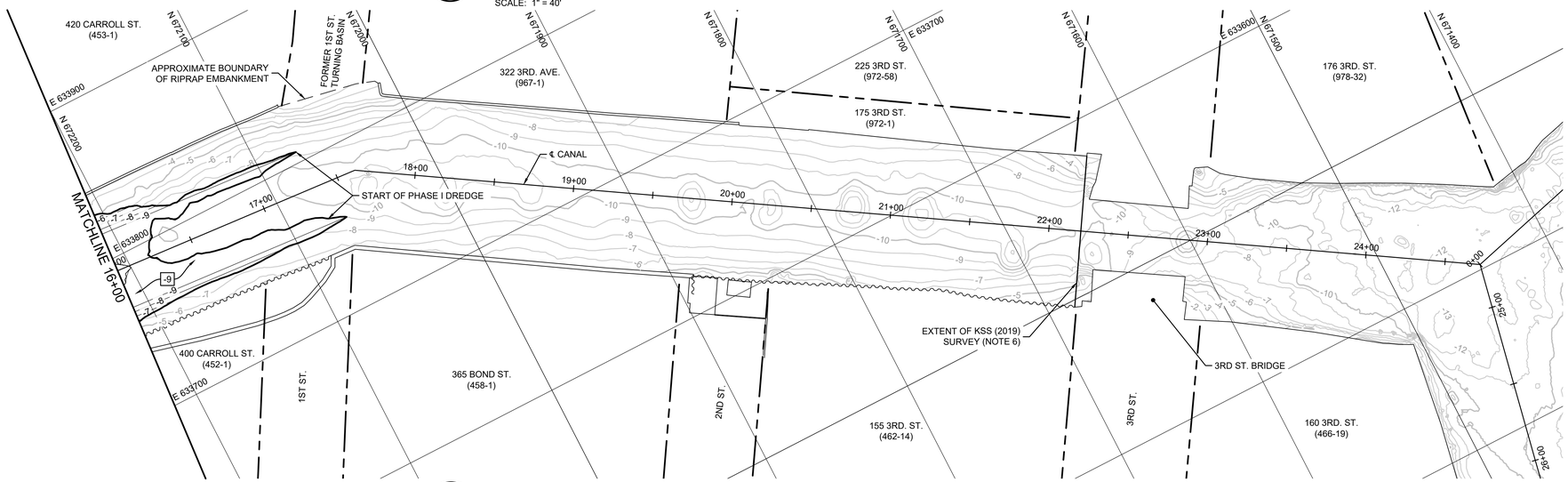
SCALE: 1" = 40'



36 DR-7 PLAN

PHASE I DREDGE (STA. 8+00 TO 16+00)

SCALE: 1" = 40'



37 DR-8 PLAN

PHASE I DREDGE (STA. 16+00 TO 24+00)

SCALE: 1" = 40'

LEGEND

- -10 — BATHYMETRY ELEVATION (1-FT)
- -5 — PHASE I DREDGE ELEVATION
- LIMITS OF PHASE I DREDGE
- PROPERTY LINE
- 5+00 — CANAL STATIONING
- LEVEL 2 MONITORING AREA (NOTE 7)
- ALTERNATIVE PHASE I DREDGE AREA (NOTE 4)
- -9 — PHASE I DREDGING ELEVATION
- GPI DREDGE AREA TO ELEVATION -4 FT (NOTE 5)
- GPI DREDGE AREA TO ELEVATION -10 FT (NOTE 5)
- (417-21) — BLOCK AND LOT
- FLUSHING TUNNEL

NOTES:

1. PHASE I DREDGE SLOPES ARE TO BE 3H:1V.
2. MONITORING OF BULKHEAD STABILITY WHILE DREDGING IS OUTLINED IN SECTIONS 02 22 00 AND 35 20 23.13.
3. PHASE I DREDGING WILL NOT BE CONSIDERED COMPLETE UNTIL CLEARANCE IS SHOWN ON THE CONTRACTOR'S AFTER DREDGE SURVEY AS OUTLINED IN SECTION 35 20 23.13 OR AS APPROVED BY THE OWNER'S REPRESENTATIVE.
4. PHASE I DREDGING LIMITS AND DEPTHS AT THE HEAD OF THE CANAL NEAR CSO RH-034 AND FLUSHING TUNNEL MAY BE MODIFIED TO FACILITATE BULKHEAD CONSTRUCTION UPON SUBMITTAL AND APPROVAL OF A CONTRACTOR WORK PLAN FOR ADDITIONAL DREDGING IN THESE AREAS.
5. ADDITIONAL DREDGING WITHIN THE VICINITY OF THE CARROLL ST. BRIDGE BULKHEADS SHALL BE PERFORMED AS PART OF THE BRIDGE SUPPORT PLANS COMPLETED BY GPI AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).
6. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.
7. LEVEL 2 ARCHAEOLOGICAL MONITORING, INCLUDING DETERMINING THE HORIZONTAL AND VERTICAL LIMITS OF SEDIMENT CATEGORIZED AS LEVEL 2 SHALL BE CONDUCTED AS DESCRIBED UNDER CULTURAL RESOURCES EVALUATION NOTES ON DRAWING G-2.
8. THE CONTRACTOR CAN ADJUST THE PHASE I DREDGING SURFACE NEAR TIMBER DOLPHINS AND BRIDGES TO AVOID DAMAGE TO STRUCTURES. TIMBER DOLPHINS SHALL BE REMOVED IN ACCORDANCE WITH THE BRIDGE SUPPORT DRAWINGS COMPLETED BY GPI AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).
9. THE PURPOSE OF PHASE I DREDGE FROM JUST BELOW THE UNION ST. BRIDGE TO THE HEAD OF THE CANAL IS TO PROVIDE ACCESS TO INSTALL BULKHEADS AT SELECT PROPERTIES ON THE WESTERN SIDE OF THE CANAL.
10. THE PHASE I DREDGE SURFACE BETWEEN CARROLL ST. AND UNION ST. BRIDGES CAN ONLY BE IMPLEMENTED IF BULKHEAD WORK HAS BEEN COMPLETED ON THE WESTERN SIDE OF THE CANAL. IN THE EVENT BULKHEAD WORK HAS NOT BEEN COMPLETED THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE AND WAIT FOR FURTHER INSTRUCTION.
11. THE OVERALL PURPOSE OF THE PHASE I DREDGE IS TO FACILITATE THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT THAT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).

0 40' 80'

SCALE IN FEET

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A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: PHASE I DREDGING PLAN

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

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SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR053
REVIEWED BY:	JAS	DRAWING NO.:	DR-9 OF 18
APPROVED BY:	JFB		

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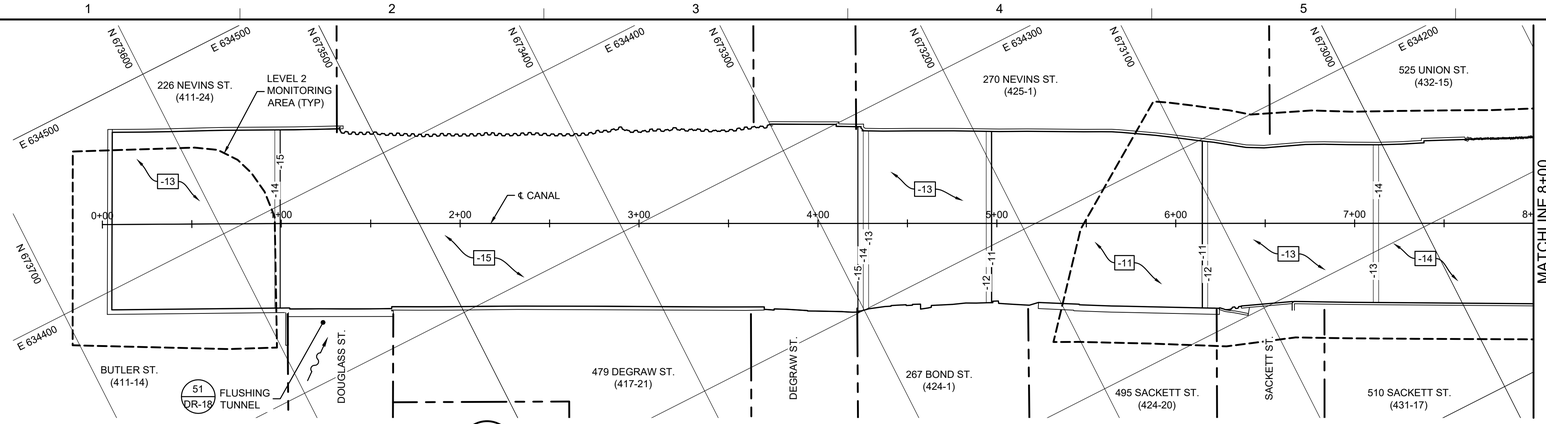
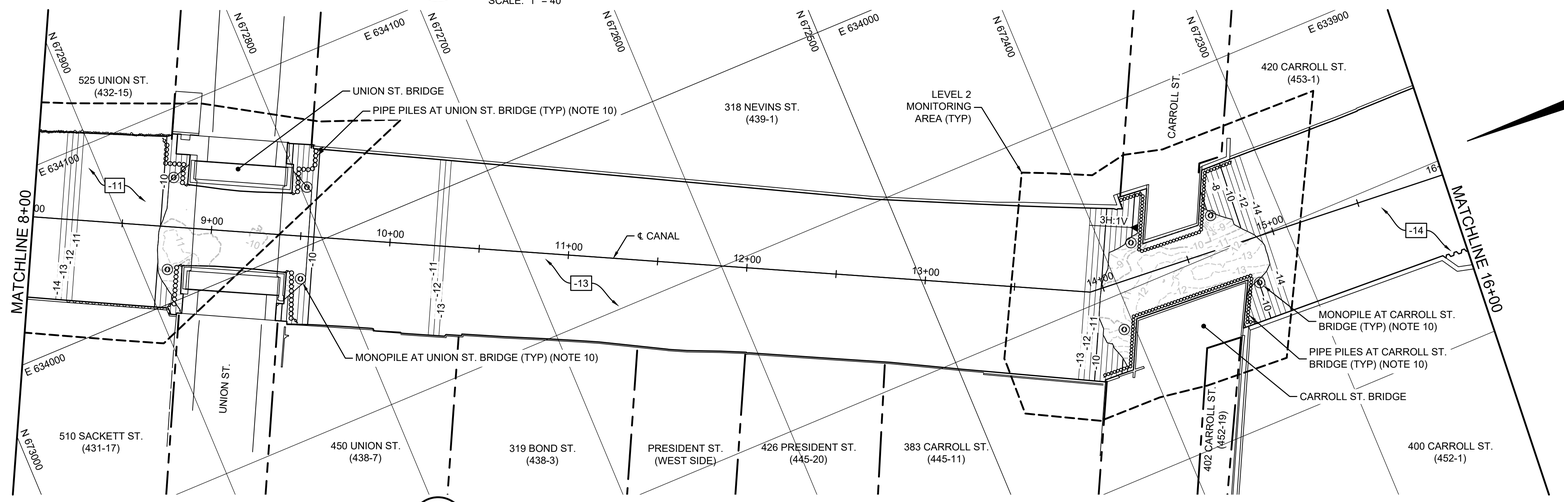
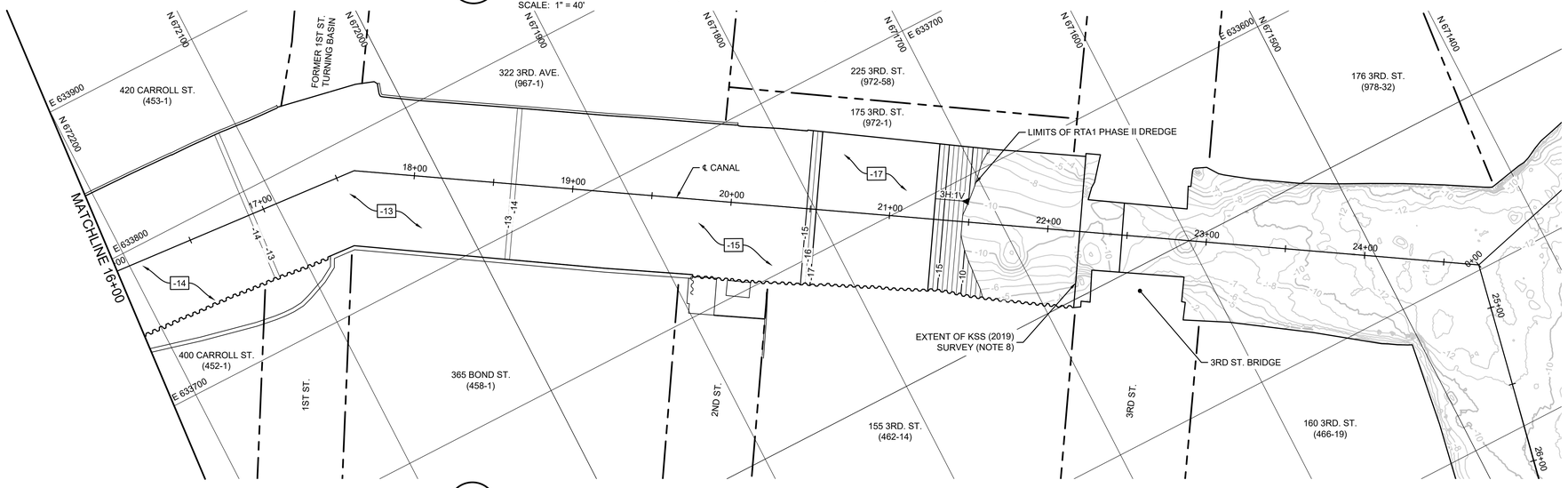
X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR053



38 DR-10 PLAN
PHASE II DREDGING (STA 0+00 TO 8+00)
SCALE: 1" = 40'



39 DR-10 PLAN
PHASE II DREDGING (STA 8+00 TO 16+00)
SCALE: 1" = 40'



40 DR-10 PLAN
PHASE II DREDGING (STA 16+00 TO 24+00)
SCALE: 1" = 40'

LEGEND

- -10 — BATHYMETRY ELEVATION (1-FT)
- -10 — PHASE I DREDGE ELEVATION
- -10 — PHASE II DREDGE ELEVATION
- PROPERTY LINE
- 5+00 — CANAL STATIONING
- LEVEL 2 MONITORING AREA (NOTE 9)
- -15 — PHASE II DREDGING ELEVATION
- (417-21) — BLOCK AND LOT
- FLUSHING TUNNEL

NOTES:

1. THE DREDGING PLAN SHOWS THE TARGET GRADE ELEVATIONS AND THE LIMITS OF DREDGING FOR PHASE II.
2. PHASE II DREDGE SLOPES ARE TO BE 3H:1V.
3. PRIOR TO PHASE II, THE CONTRACTOR SHALL FIRST DREDGE THE ENTIRE PHASE I DREDGE AS SHOWN IN DRAWING DR-9 AND COMPLETE BULKHEAD RELATED WORK OUTLINED IN SECTION 31 41 00.
4. PHASE II DREDGING IS TO BE COMPLETED IN MAXIMUM 4 FT LIFTS, AS DETAILED IN SECTION 35 20 23.13.
5. MONITORING OF BULKHEAD STABILITY WHILE DREDGING IS OUTLINED IN SECTIONS 02 22 00 AND 35 20 23.13.
6. DURING PHASE II, NO DREDGING SHALL BE COMPLETED WITHIN 25 FT FROM OR UNDER THE UNION ST. AND CARROLL ST. BRDIGES.
7. PHASE II DREDGING WILL NOT BE CONSIDERED COMPLETE UNTIL CLEARANCE IS SHOWN ON BOTH THE CONTRACTOR'S AND THIRD-PARTY SURVEYOR'S AFTER DREDGE SURVEY AS OUTLINED IN SECTION 35 20 23.13.
8. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.
9. LEVEL 2 ARCHAEOLOGICAL MONITORING, INCLUDING DETERMINING THE HORIZONTAL AND VERTICAL LIMITS OF SEDIMENT CATEGORIZED AS LEVEL 2 SHALL BE CONDUCTED AS DESCRIBED UNDER CULTURAL RESOURCES EVALUATION NOTES ON DRAWING G-2.
10. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).
11. THE BULKHEADS LIMITS SHOWN ARE THE EXISTING BULKHEAD LOCATIONS. DREDGING WILL BE CONDUCTED UPTO THE BRIDGE SUPPORT AND BULKHEAD SUPPORT INSTALLED BY THE CONTRACTOR AS SHOWN IN THE GPI (2019) DRAWINGS. DREDGING WILL ALSO BE CONDUCTED UPTO ANY NEW BULKHEADS INSTALLED BY THE PROPERTY OWNERS.
12. THE DREDGE SURFACE BETWEEN 3RD ST. AND CARROLL ST. BRIDGES CAN ONLY BE IMPLEMENTED IF BULKHEAD WORK HAS BEEN COMPLETED ON THE EASTERN SIDE OF THE CANAL. IN THE EVENT BULKHEAD WORK HAS NOT BEEN COMPLETED, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE AND WAIT FOR FURTHER INSTRUCTION.

0 40' 80'
SCALE IN FEET

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E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
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A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: PHASE II DREDGING PLAN

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

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SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
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REVIEWED BY:	JAS	DRAWING NO.:	DR-10 OF 18
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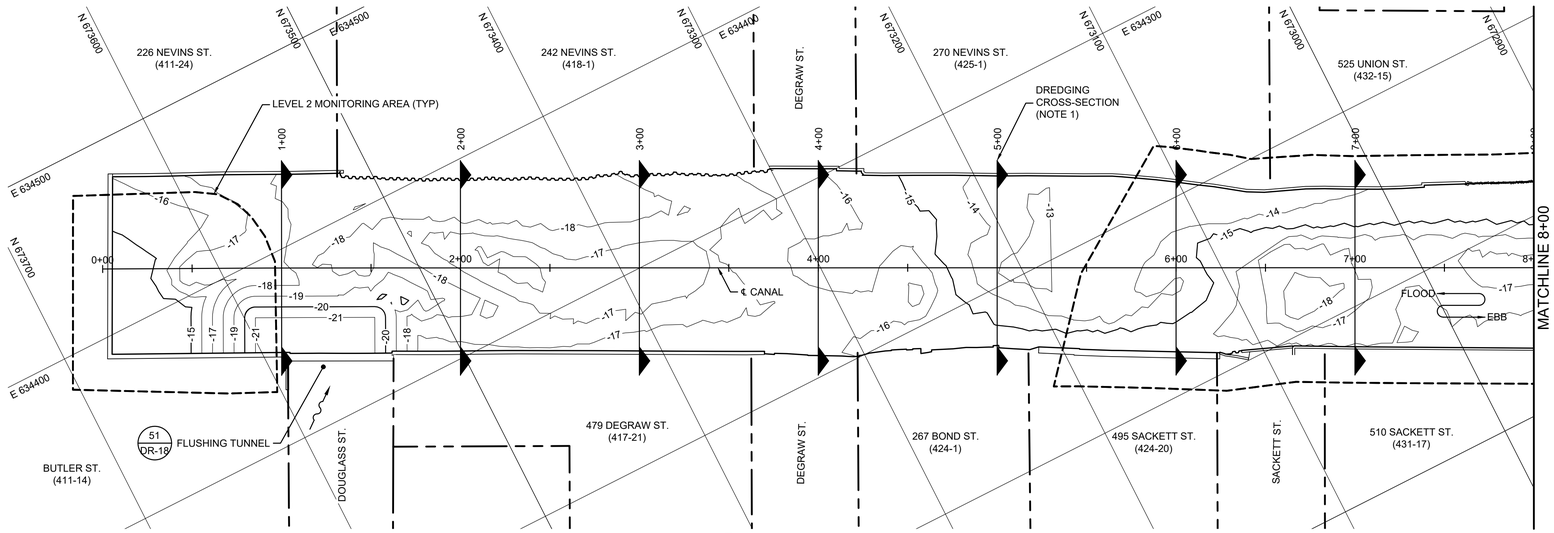


41 / DR-11 PLAN

PHASE III DREDGING (STA. 0+00 TO 8+00)

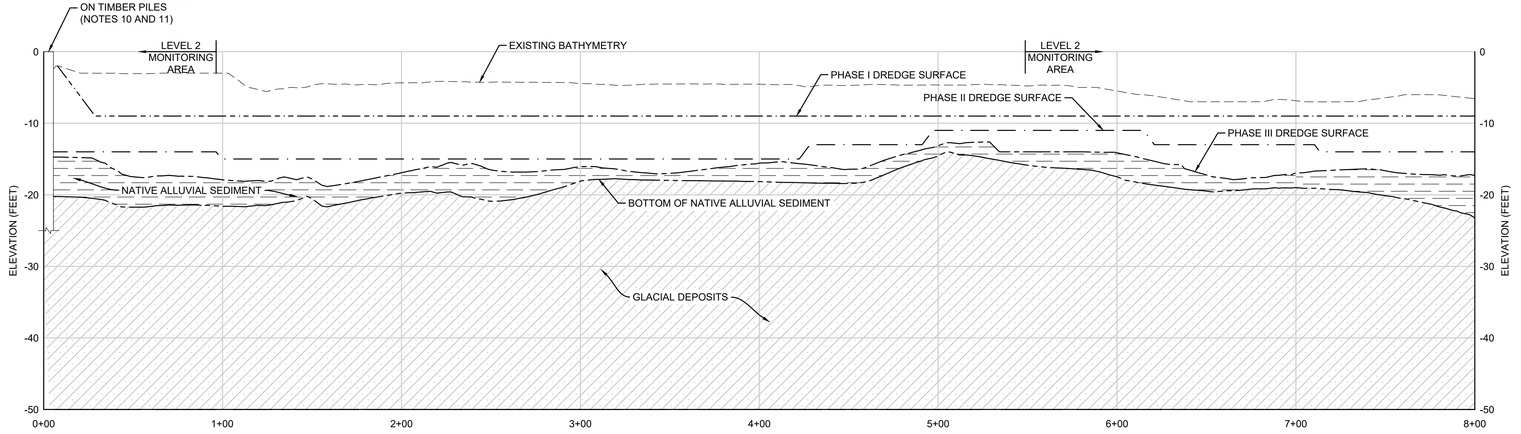
SCALE: 1" = 40'

0 40' 80'

SCALE IN FEET

LEGEND

- -17 — PHASE III DREDGE ELEVATION
- PROPERTY LINE
- 5+00 — CANAL STATIONING
- EXISTING BATHYMETRY
- BOTTOM OF SOFT SEDIMENT
- BOTTOM OF NATIVE ALLUVIAL SEDIMENT
- PHASE I DREDGE SURFACE
- PHASE II DREDGE SURFACE
- PHASE III DREDGE SURFACE
- LEVEL 2 MONITORING AREA (NOTE 12)
- SOFT SEDIMENT
- NATIVE ALLUVIAL SEDIMENT
- GLACIAL DEPOSITS
- (417-21) BLOCK AND LOT
- FLUSHING TUNNEL



DISTANCE (FEET)

42 / DR-11 PROFILE

PHASE III DREDGING (STA. 0+00 TO 8+00)

SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

0 40' 80'

SCALE IN FEET (HORIZONTAL)

0 10' 20'

SCALE IN FEET (VERTICAL)

NOTES:

1. DREDGE CROSS SECTIONS ARE PRESENTED ON DRAWINGS DR-15 AND DR-16.
2. THE DREDGING PLAN SHOWS THE TARGET GRADE ELEVATIONS AND THE LIMITS OF DREDGING FOR PHASE III.
3. PHASE III DREDGE SLOPES AT THE FLUSHING TUNNEL ARE TO BE 6H:1V.
4. PRIOR TO PHASE III, THE CONTRACTOR SHALL FIRST DREDGE THE ENTIRE PHASE I DREDGE, COMPLETE BULKHEAD RELATED WORK, DREDGE PHASE II, AND COMPLETE IN-SITU STABILIZATION.
5. PHASE III DREDGING IS TO BE COMPLETED IN MAXIMUM 4 FT LIFTS, AS DETAILED IN SECTION 35 20 23.13.
6. MONITORING OF BULKHEAD STABILITY WHILE DREDGING IS OUTLINED IN SECTIONS 02 22 00 AND 35 20 23.13.
7. THE CONTRACTOR SHALL USE SLOTTED EXCAVATION AS OUTLINED IN SECTION 35 20 23.13.
8. AN OVERDREDGE ALLOWANCE, AS OUTLINED IN SECTION 35 20 23.13, WILL BE GIVEN TO THE CONTRACTOR. ANY SEDIMENT REMOVED BELOW THE OVERDREDGE ALLOWANCE WILL BE REMOVED AND DISPOSED AT THE EXPENSE OF THE CONTRACTOR.
9. PHASE III DREDGING WILL NOT BE CONSIDERED COMPLETE UNTIL CLEARANCE IS SHOWN ON BOTH THE CONTRACTOR'S AND THIRD-PARTY SURVEYOR'S AFTER DREDGE SURVEY AS OUTLINED IN SECTION 35 20 23.13.
10. THE HORIZONTAL LIMITS OF THE BULKHEAD SHOWN ON THIS DRAWING ARE FOR ILLUSTRATION PURPOSES ONLY.
11. THE TOP OF BULKHEAD ELEVATIONS ARE SHOWN AS APPROXIMATE. TOPOGRAPHIC SURVEY INFORMATION SHOWING TOP OF WALL ELEVATIONS WAS OBTAINED BY KSS IN JULY 2019 AND THIS DATA IS AVAILABLE UPON REQUEST.
12. LEVEL 2 ARCHAEOLOGICAL MONITORING, INCLUDING DETERMINING THE HORIZONTAL AND VERTICAL LIMITS OF SEDIMENT CATEGORIZED AS LEVEL 2 SHALL BE CONDUCTED AS DESCRIBED UNDER CULTURAL RESOURCES EVALUATION NOTES ON DRAWING G-2

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Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: PHASE III DREDGING PLAN (STA. 0+00 TO 8+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

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KENNESAW, GA 30144

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DRAWN BY:	SRN	PROJECT NO.:	HPH106A
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REVIEWED BY:	JAS	DRAWING NO.:	DR-11 OF 18
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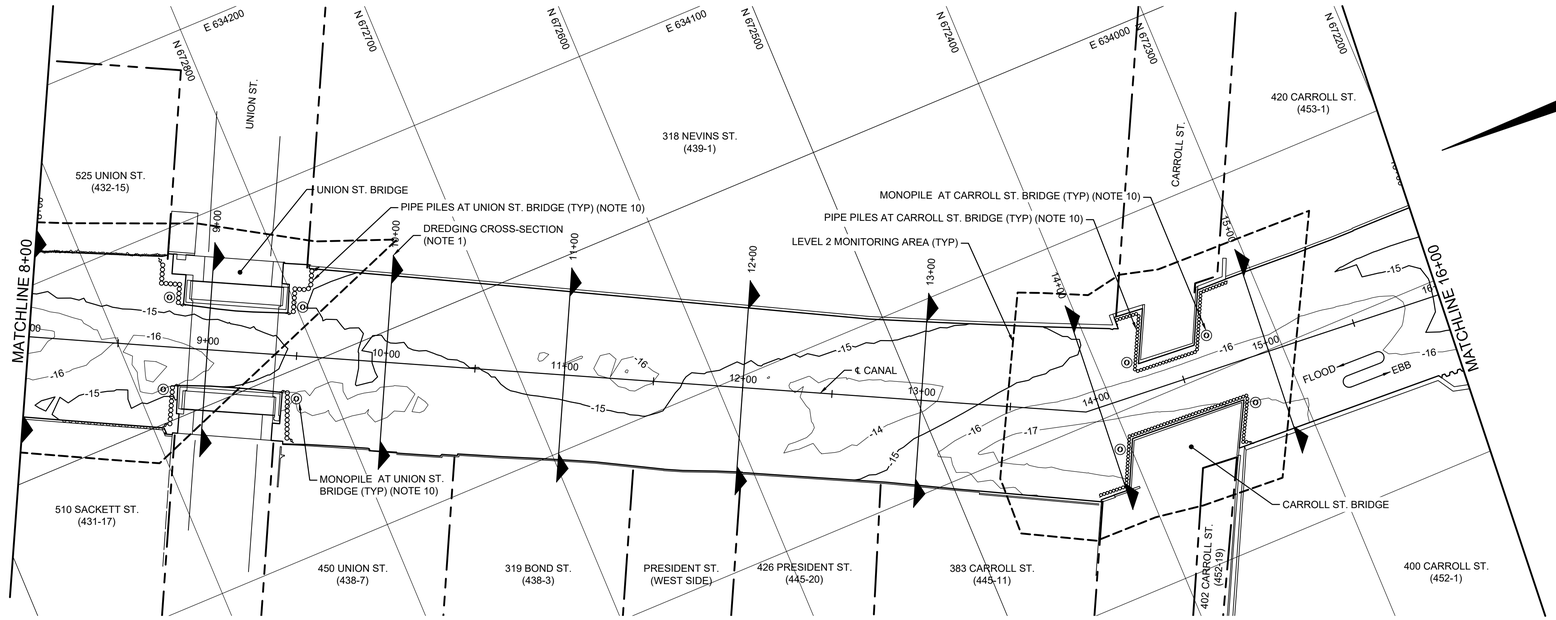
X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR036



43 / DR-12

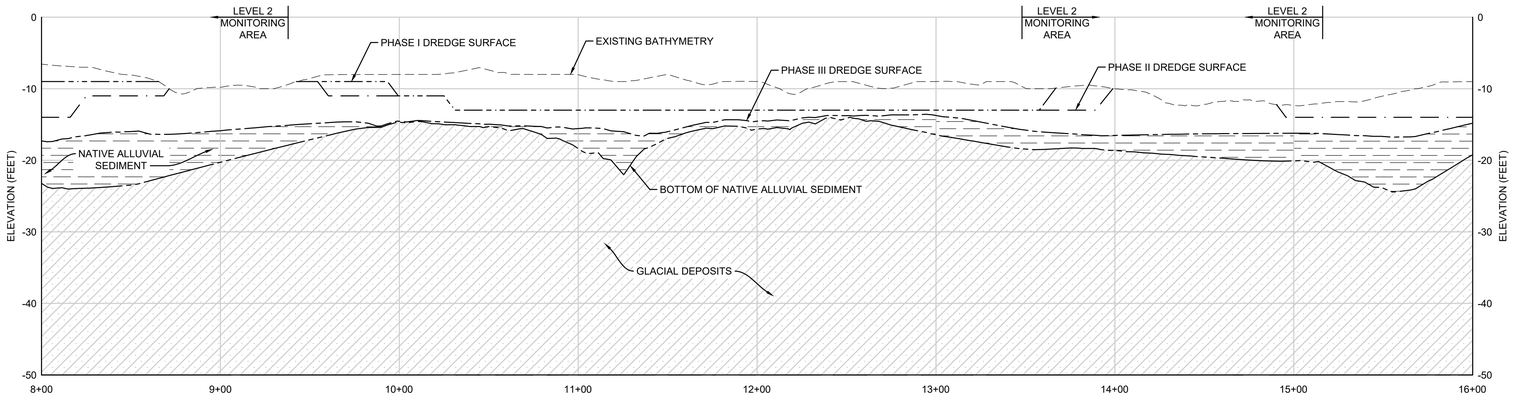
PLAN

PHASE III DREDGING (STA. 8+00 TO 16+00)

SCALE: 1" = 40'

LEGEND

-16	PHASE III DREDGE ELEVATION
	PROPERTY LINE
10+00	CANAL STATIONING
	EXISTING BATHYMETRY
	BOTTOM OF SOFT SEDIMENT
	BOTTOM OF NATIVE ALLUVIAL SEDIMENT
	PHASE I DREDGE SURFACE
	PHASE II DREDGE SURFACE
	PHASE III DREDGE SURFACE
	LEVEL 2 MONITORING AREA (NOTE 9)
	SOFT SEDIMENT
	NATIVE ALLUVIAL SEDIMENT
	GLACIAL DEPOSITS
(417-21)	BLOCK AND LOT



44 / DR-12

PROFILE

PHASE III DREDGING (STA. 8+00 TO 16+00)

SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

0 40' 80'
SCALE IN FEET (HORIZONTAL)

0 10' 20'
SCALE IN FEET (VERTICAL)

NOTES:

1. DREDGE CROSS SECTIONS ARE PRESENTED ON DRAWINGS DR-15 AND DR-16.
2. THE DREDGING PLAN SHOWS THE TARGET GRADE ELEVATIONS AND THE LIMITS OF DREDGING FOR PHASE III.
3. PRIOR TO PHASE III, THE CONTRACTOR SHALL FIRST DREDGE THE ENTIRE PHASE I DREDGE, COMPLETE BULKHEAD RELATED WORK, DREDGE PHASE II, AND COMPLETE IN-SITU STABILIZATION.
4. PHASE III DREDGING IS TO BE COMPLETED IN MAXIMUM 4 FT LIFTS, AS DETAILED IN SECTION 35 20 23.13.
5. MONITORING OF BULKHEAD STABILITY WHILE DREDGING IS OUTLINED IN SECTIONS 02 22 00 AND 35 20 23.13.
6. THE CONTRACTOR SHALL USE SLOTTED EXCAVATION AS OUTLINED IN SECTION 35 20 23.13.
7. AN OVERDREDGE ALLOWANCE, AS OUTLINED IN SECTION 35 20 23.13, WILL BE GIVEN TO THE CONTRACTOR. ANY SEDIMENT REMOVED BELOW THE OVERDREDGE ALLOWANCE WILL BE REMOVED AND DISPOSED AT THE EXPENSE OF THE CONTRACTOR.
8. PHASE III DREDGING WILL NOT BE CONSIDERED COMPLETE UNTIL CLEARANCE IS SHOWN ON BOTH THE CONTRACTOR'S AND THIRD-PARTY SURVEYOR'S AFTER DREDGE SURVEY AS OUTLINED IN SECTION 35 20 23.13.
9. LEVEL 2 ARCHAEOLOGICAL MONITORING, INCLUDING DETERMINING THE HORIZONTAL AND VERTICAL LIMITS OF SEDIMENT CATEGORIZED AS LEVEL 2 SHALL BE CONDUCTED AS DESCRIBED UNDER CULTURAL RESOURCES EVALUATION NOTES ON DRAWING G-2.
10. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: PHASE III DREDGING PLAN (STA. 8+00 TO 16+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR037
REVIEWED BY:	JAS	DRAWING NO.:	DR-12 OF 18
APPROVED BY:	JFB		

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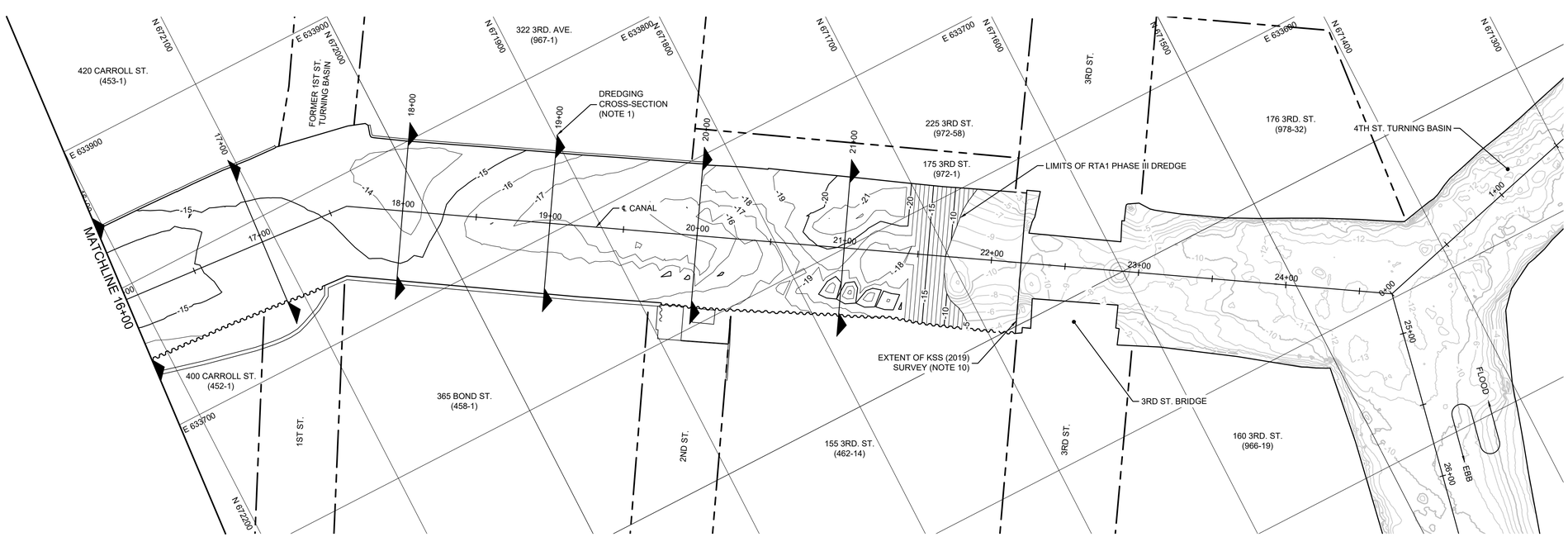
IT IS A VIOLATION OF THIS LAW FOR ANY PERSON TO ALTER A DOCUMENT IN ANY WAY, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER

X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A\DR037

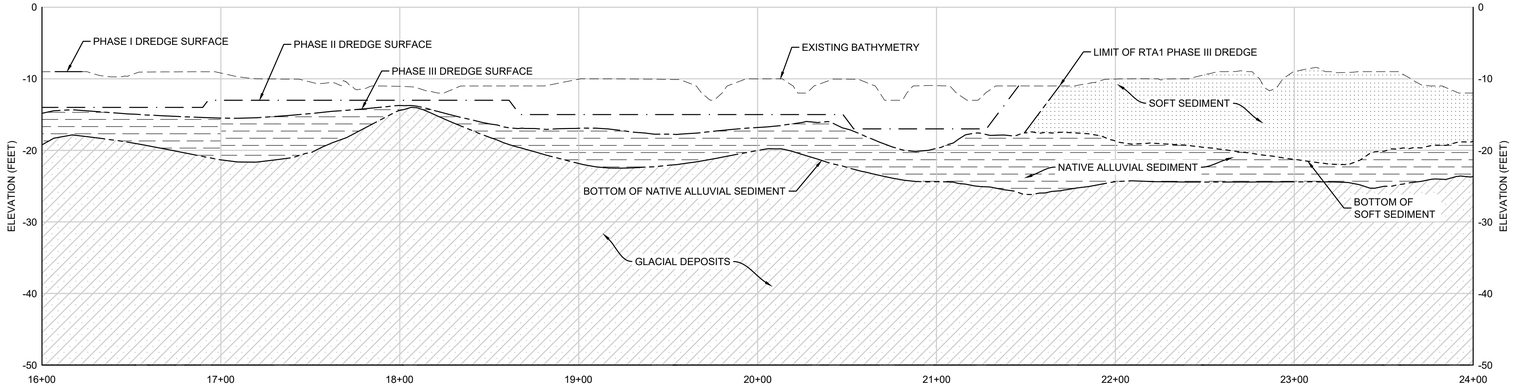


45 DR-13

PLAN
PHASE III DREDGING (STA. 16+00 TO 24+00)
SCALE: 1" = 40'

LEGEND

-10	EXISTING BATHYMETRY (1-FT)
-10	PHASE III DREDGE ELEVATION
	PROPERTY LINE
20+00	CANAL STATIONING
	EXISTING BATHYMETRY
	BOTTOM OF SOFT SEDIMENT
	BOTTOM OF NATIVE ALLUVIAL SEDIMENT
	PHASE I DREDGE SURFACE
	PHASE II DREDGE SURFACE
	PHASE III DREDGE SURFACE
	SOFT SEDIMENT
	NATIVE ALLUVIAL SEDIMENT
	GLACIAL DEPOSITS
(417-21)	BLOCK AND LOT



46 DR-13

DISTANCE (FEET)

PROFILE
PHASE III DREDGING (STA. 16+00 TO 24+00)
SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

0 40' 80'
SCALE IN FEET (HORIZONTAL)

0 10' 20'
SCALE IN FEET (VERTICAL)

NOTES:

1. DREDGE CROSS SECTIONS ARE PRESENTED ON DRAWINGS DR-15 AND DR-16.
2. THE DREDGING PLAN SHOWS THE TARGET GRADE ELEVATIONS AND THE LIMITS OF DREDGING FOR PHASE III.
3. PHASE III DREDGE SLOPES AT THE LIMITS OF RTA1 DREDGING ARE TO BE 3H:1V.
4. PRIOR TO PHASE III DREDGE, THE CONTRACTOR SHALL FIRST DREDGE THE ENTIRE PHASE I DREDGE, COMPLETE BULKHEAD RELATED WORK, DREDGE PHASE II, AND COMPLETE IN-SITU STABILIZATION.
5. PHASE III DREDGING IS TO BE COMPLETED IN MAXIMUM 4 FT LIFTS, AS DETAILED IN SECTION 35 20 23.13.
6. MONITORING OF BULKHEAD STABILITY WHILE DREDGING IS OUTLINED IN SECTIONS 02 22 00 AND 35 20 23.13.
7. THE CONTRACTOR SHALL USE SLOTTED EXCAVATION AS OUTLINED IN SECTION 35 20 23.13.
8. AN OVERDREDGE ALLOWANCE, AS OUTLINED IN SECTION 35 20 23.13, WILL BE GIVEN TO THE CONTRACTOR. ANY SEDIMENT REMOVED BELOW THE OVERDREDGE ALLOWANCE WILL BE REMOVED AND DISPOSED AT THE EXPENSE OF THE CONTRACTOR.
9. PHASE III DREDGING WILL NOT BE CONSIDERED COMPLETE UNTIL CLEARANCE IS SHOWN ON BOTH THE CONTRACTOR'S AND THIRD-PARTY SURVEYOR'S AFTER DREDGE SURVEY AS OUTLINED IN SECTION 35 20 23.13.
10. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: PHASE III DREDGING PLAN (STA. 16+00 TO 24+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR038
REVIEWED BY:	JAS	DRAWING NO.:	DR-13 OF 18
APPROVED BY:	JFB		

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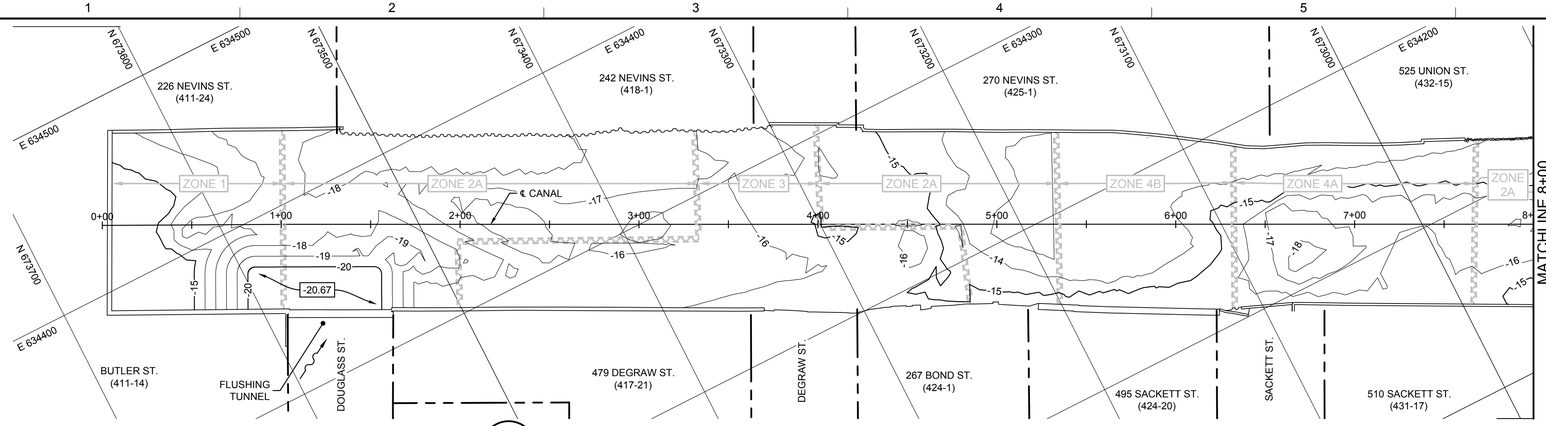
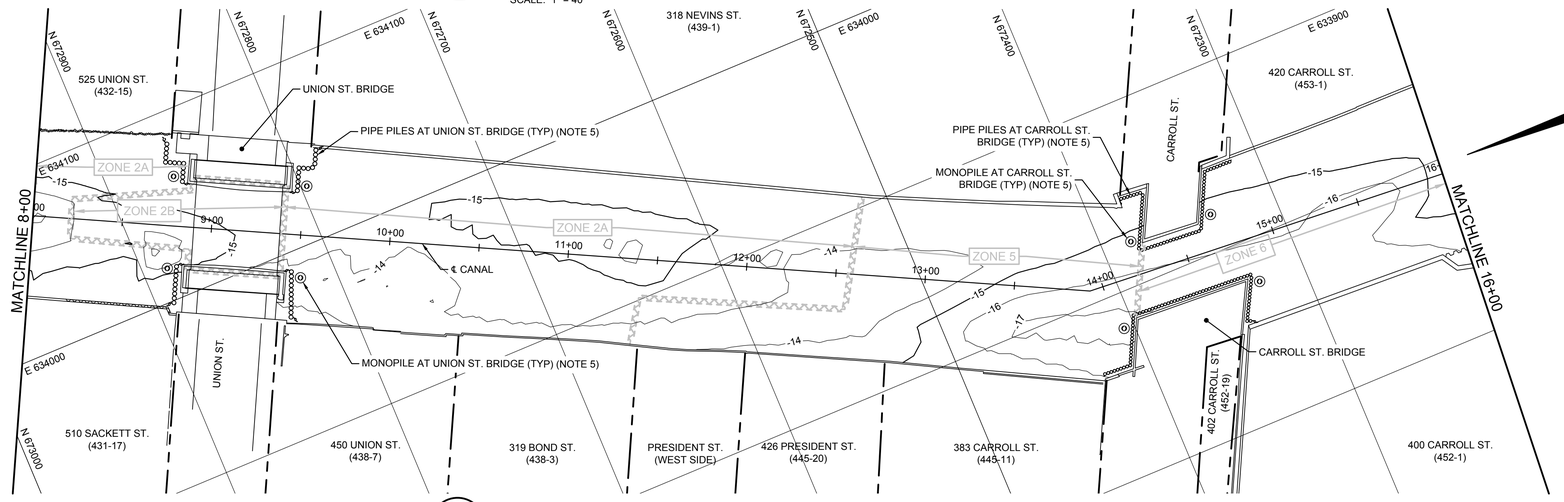
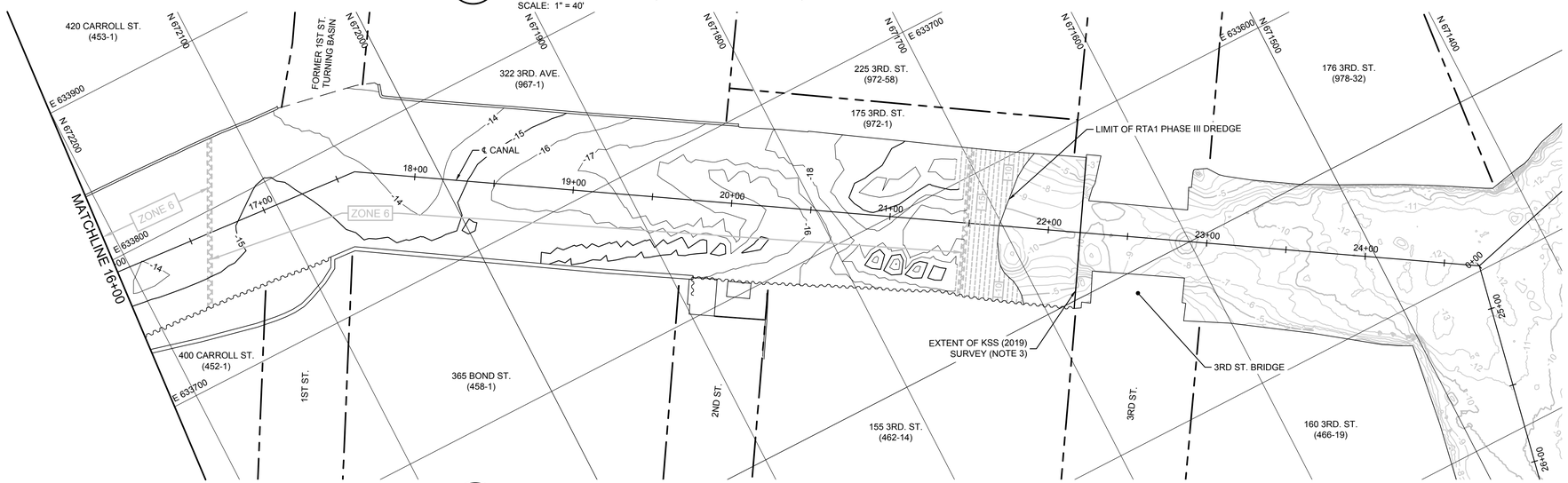
X:\06_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR038



47 DR-14 PLAN
LEVELING LAYER (STA 0+00 TO 8+00)
SCALE: 1" = 40'



48 DR-14 PLAN
LEVELING LAYER (STA 8+00 TO 16+00)
SCALE: 1" = 40'



49 DR-14 PLAN
LEVELING LAYER (STA 16+00 TO 24+00)
SCALE: 1" = 40'

LEGEND

- BATHYMETRY ELEVATION (1-FT)
- PHASE III DREDGE ELEVATION (1-FT)
- TOP OF LEVELING LAYER (1-FT) (NOTE 1)
- PROPERTY LINE
- CANAL STATIONING
- CAP TREATMENT ZONE BOUNDARY
- CAP TREATMENT LAYER ZONES IN RTA1 ZONES
- BLOCK AND LOT
- FLUSHING TUNNEL

NOTES:

1. THE PROPOSED TOP ELEVATIONS OF LEVELING LAYER ARE APPROXIMATE AND WILL VARY BASED ON THE DEPTH OF THE UNDERLYING PHASE III DREDGE SURFACE ACHIEVED IN THE FIELD.
2. THE ENGINEERED LEVELING LAYER WITH A TYPICAL THICKNESS OF 8 IN. AND A MINIMUM AND MAXIMUM THICKNESS OF 6 IN. AND 10 IN., RESPECTIVELY SHALL BE PLACED IN ZONES 2B AND 3. THE SAND LEVELING LAYER WITH A TYPICAL THICKNESS OF 4 IN. AND A MINIMUM AND MAXIMUM THICKNESS OF 3 IN. AND 6 IN., RESPECTIVELY SHALL BE PLACED IN THE REMAINING ZONES WITHIN RTA1 (I.E. ZONES 1, 2A, 4A, 4B, 5, 6 AND 7). SPECIFICATIONS FOR THE LEVELING LAYER ARE PROVIDED IN SECTION 35 20 23.13.
3. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.
4. THE TIE-IN SLOPE AT TRANSITION BOUNDARIES OF DIFFERENT LEVELING LAYER THICKNESSES WILL BE A MAXIMUM OF 4H:1V. THE ANGLE OF REPOSE OF MATERIAL MAY RESULT IN FLATTER SLOPES, WHICH IS ACCEPTABLE. THE SIDE SLOPES OF THE LEVELING LAYER SURFACE AT THE FLUSHING TUNNEL WILL BE AT 6H:1V.
5. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).

0 40' 80'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: LEVELING LAYER

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR061
REVIEWED BY:	JAS	DRAWING NO.:	DR-14 OF 18
APPROVED BY:	JFB		

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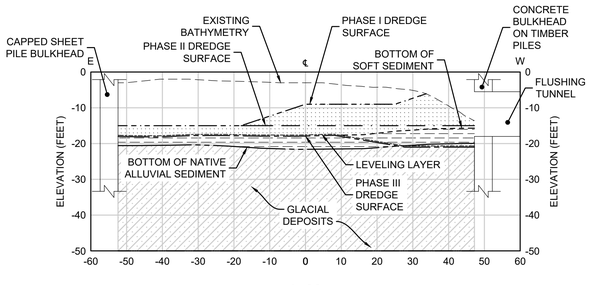
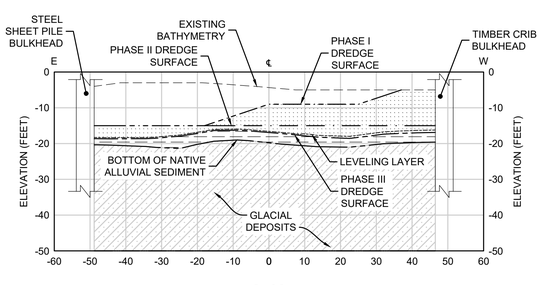
X:\05_CAD\DR\DESIGN\HPH\TA1\DRAWINGS\HPH106A.DR061



1+00
(GOWANUS CANAL)
SCALE: 1"=20'



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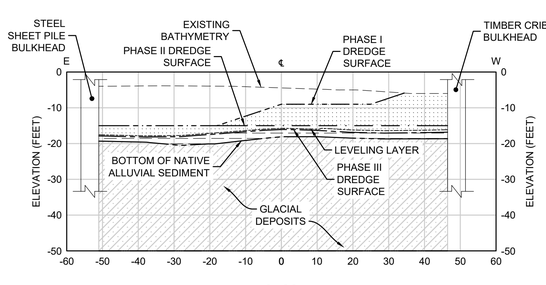

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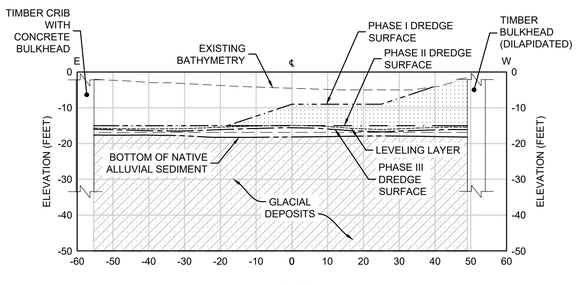

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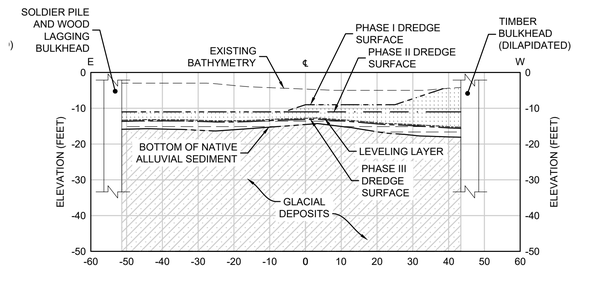

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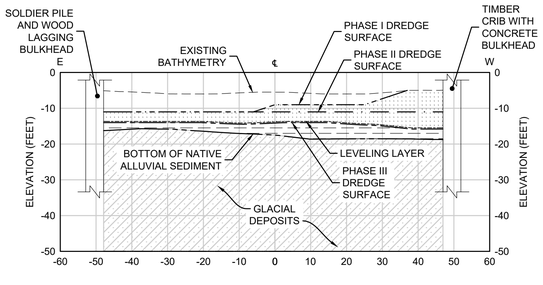

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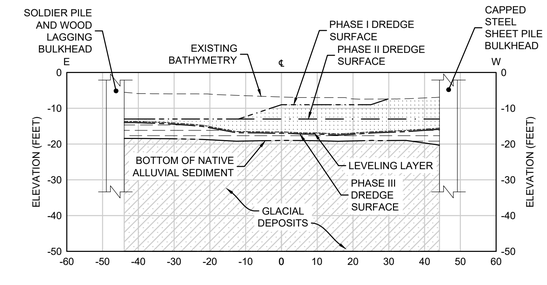
(GOWANUS CANAL)
SCALE: 1"=20'



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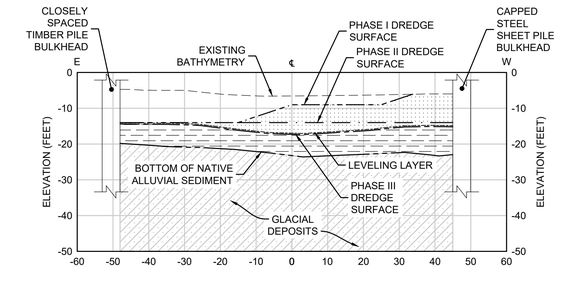

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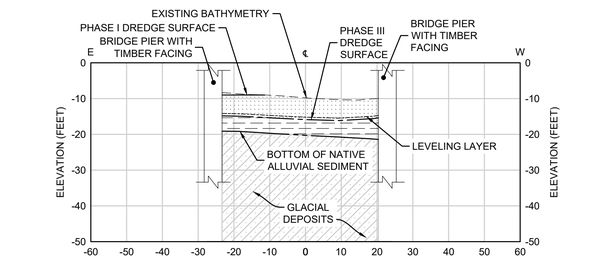
(GOWANUS CANAL)
SCALE: 1"=20'



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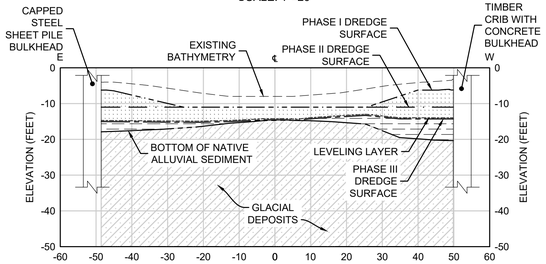

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(GOWANUS CANAL)
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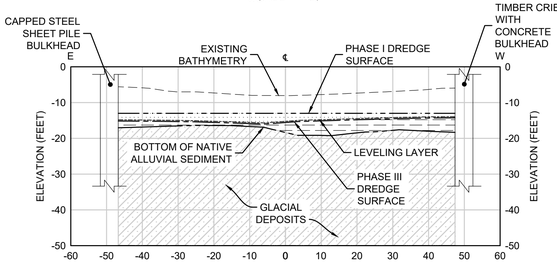

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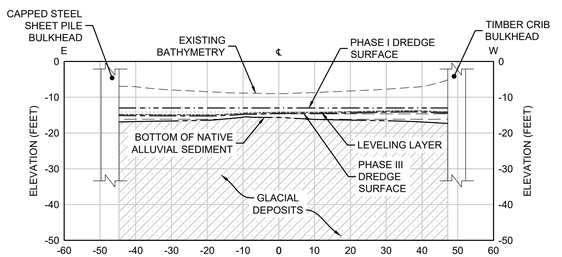

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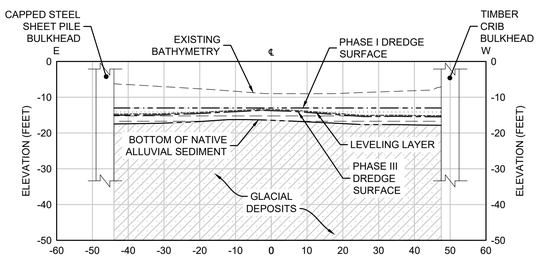


13+00
(GOWANUS CANAL)
SCALE: 1"=20'

LEGEND

- EXISTING BATHYMETRY
- BOTTOM OF SOFT SEDIMENT
- BOTTOM OF NATIVE ALLUVIAL SEDIMENT
- PHASE I DREDGE SURFACE
- PHASE II DREDGE SURFACE
- PHASE III DREDGE SURFACE
- LEVELING LAYER
- SOFT SEDIMENT
- NATIVE ALLUVIAL SEDIMENT
- GLACIAL DEPOSITS

NOTES:

1. THE LOCATION OF CROSS-SECTIONS ARE PRESENTED ON DRAWINGS DR-1 THROUGH DR-3.
2. THE BULKHEAD TYPE FOR EACH PROPERTY IS PRIMARILY BASED ON THE RESULTS OF A TOPOGRAPHIC SURVEY CONDUCTED IN RTA1 BY KENNON SURVEYING SERVICES INC. (KSS) AND DATED 15 JULY 2019.
3. THE HORIZONTAL LIMITS OF THE BULKHEAD ARE SHOWN ON THE PLAN VIEWS OF DRAWINGS DR-1 THROUGH DR-3. THE HORIZONTAL LIMITS SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY.
4. THE TOP OF BULKHEAD SHOWN IS APPROXIMATE. TOPOGRAPHIC SURVEY INFORMATION SHOWING TOP OF WALL ELEVATIONS WAS OBTAINED BY KSS IN JULY 2019 AND THIS DATA IS AVAILABLE UPON REQUEST.
5. THE DEPTHS OF BULKHEADS ARE AVAILABLE IN SELECT AREAS. THE BOTTOM ELEVATION OF THE BULKHEAD AT STATIONS 2+00 AND 3+00 ON 479 DEGRAW ST. WERE ESTIMATED BASED ON GEOTECHNICAL BORING "B-417_21-0007" COMPLETED AS PART OF PRE-DESIGN 5 INVESTIGATIONS IN 2015. THE BOTTOM ELEVATION OF THE BULKHEAD AT STATIONS 7+00 AND 8+00 ON 525 UNION ST. WERE ESTIMATED BASED ON GEOTECHNICAL BORING "B-432_15-0015 COMPLETED AS PART OF PRE-DESIGN 5 INVESTIGATIONS IN 2015. THE BOTTOM ELEVATION OF THE BULKHEAD AT STATIONS 10+00 THROUGH 14+00 ON 318 NEVINS ST. WERE ESTIMATED BASED ON GEOTECHNICAL BORING "B-439_1-0026" COMPLETED AS PART OF PRE-DESIGN 5 INVESTIGATIONS IN 2016. THE BOTTOM ELEVATION OF THE BULKHEAD AT STATION 10+00 450 UNION ST. WAS ESTIMATED IN THE PRE-DESIGN 5 INVESTIGATIONS IN 2016.

0 20' 40'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: DREDGING CROSS-SECTIONS (1 OF 2)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

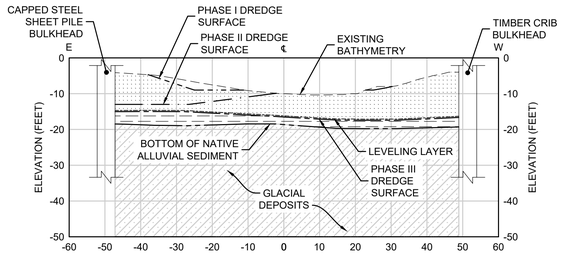
DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

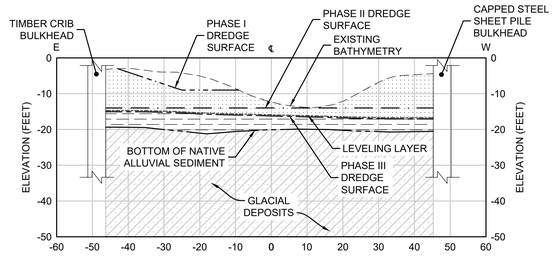
DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR039
REVIEWED BY:	JAS	DRAWING NO.:	DR-15 OF 18
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

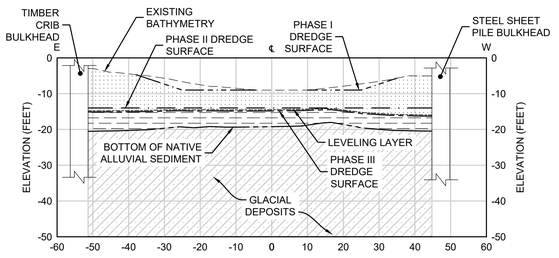
X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR039



14+00
(GOWANUS CANAL)
SCALE: 1"=20'



15+00
(GOWANUS CANAL)
SCALE: 1"=20'



16+00
(GOWANUS CANAL)
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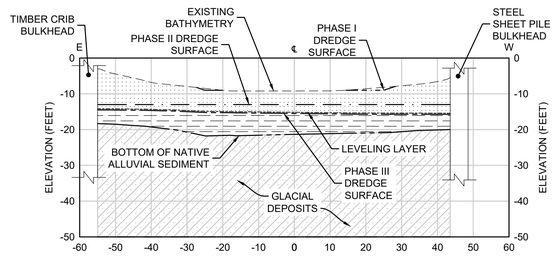

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(GOWANUS CANAL)
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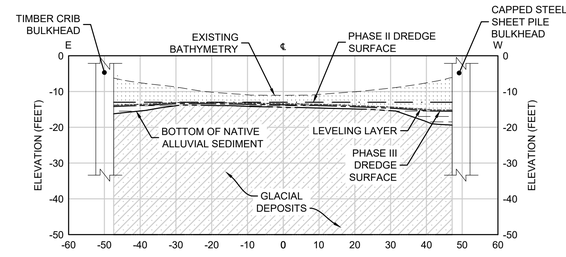

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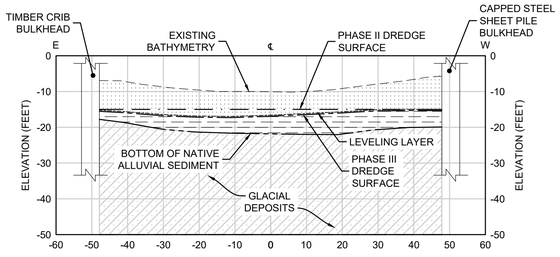

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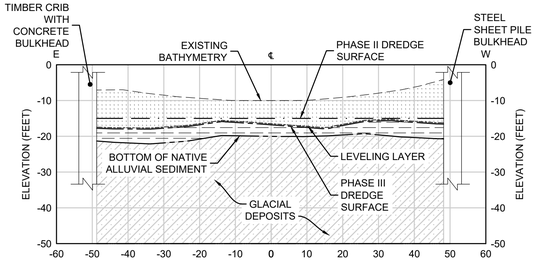
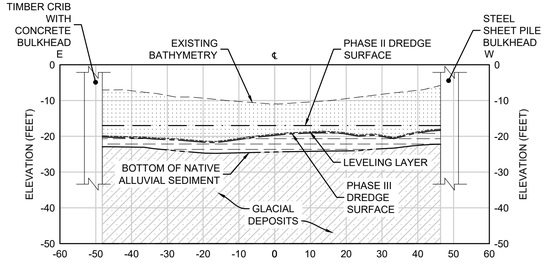
(GOWANUS CANAL)
SCALE: 1"=20'



20+00
(GOWANUS CANAL)
SCALE: 1"=20'



21+00
(GOWANUS CANAL)
SCALE: 1"=20'

NOTES:

1. THE LOCATION OF CROSS-SECTIONS ARE PRESENTED ON DRAWINGS DR-1 THROUGH DR-3.
2. THE BULKHEAD TYPE FOR EACH PROPERTY IS PRIMARILY BASED ON THE RESULTS OF A TOPOGRAPHIC SURVEY CONDUCTED IN RTA1 BY KENNON SURVEYING SERVICES INC. (KSS) AND DATED 15 JULY 2019.
3. THE HORIZONTAL LIMITS OF THE BULKHEAD ARE SHOWN ON THE PLAN VIEWS OF DRAWINGS DR-1 THROUGH DR-3. THE HORIZONTAL LIMITS SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY.
4. THE TOP OF BULKHEAD SHOWN IS APPROXIMATE. TOPOGRAPHIC SURVEY INFORMATION SHOWING TOP OF WALL ELEVATIONS WAS OBTAINED BY KSS IN JULY 2019 AND THIS DATA IS AVAILABLE UPON REQUEST.
5. THE DEPTHS OF BULKHEADS ARE AVAILABLE IN SELECT AREAS. THE BOTTOM ELEVATION OF THE BULKHEAD AT STATIONS 2+00 AND 3+00 ON 479 DEGRAW ST. WERE ESTIMATED BASED ON GEOTECHNICAL BORING "B-417_21-0007" COMPLETED AS PART OF PRE-DESIGN 5 INVESTIGATIONS IN 2015. THE BOTTOM ELEVATION OF THE BULKHEAD AT STATIONS 7+00 AND 8+00 ON 525 UNION ST. WERE ESTIMATED BASED ON GEOTECHNICAL BORING "B-432_15-0015 COMPLETED AS PART OF PRE-DESIGN 5 INVESTIGATIONS IN 2015. THE BOTTOM ELEVATION OF THE BULKHEAD AT STATIONS 10+00 THROUGH 14+00 ON 318 NEVINS ST. WERE ESTIMATED BASED ON GEOTECHNICAL BORING "B-439_1-0026" COMPLETED AS PART OF PRE-DESIGN 5 INVESTIGATIONS IN 2016. THE BOTTOM ELEVATION OF THE BULKHEAD AT STATION 10+00 450 UNION ST. WAS ESTIMATED IN THE PRE-DESIGN 5 INVESTIGATIONS IN 2016.

0 20' 40'
SCALE IN FEET

LEGEND

- EXISTING BATHYMETRY
- BOTTOM OF SOFT SEDIMENT
- BOTTOM OF NATIVE ALLUVIAL SEDIMENT
- PHASE I DREDGE SURFACE
- PHASE II DREDGE SURFACE
- PHASE III DREDGE SURFACE
- LEVELING LAYER
- SOFT SEDIMENT
- NATIVE ALLUVIAL SEDIMENT
- GLACIAL DEPOSITS

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: DREDGING CROSS-SECTIONS (2 OF 2)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR054
REVIEWED BY:	JAS	DRAWING NO.:	DR-16 OF 18
APPROVED BY:	JFB		

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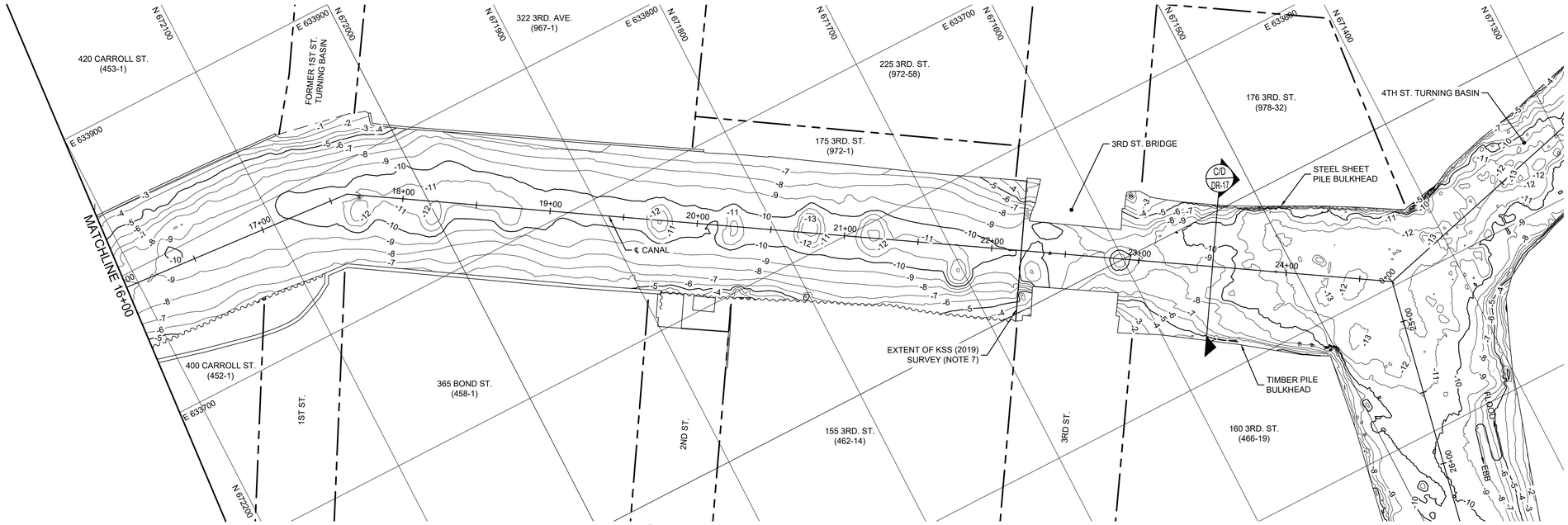
X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR054



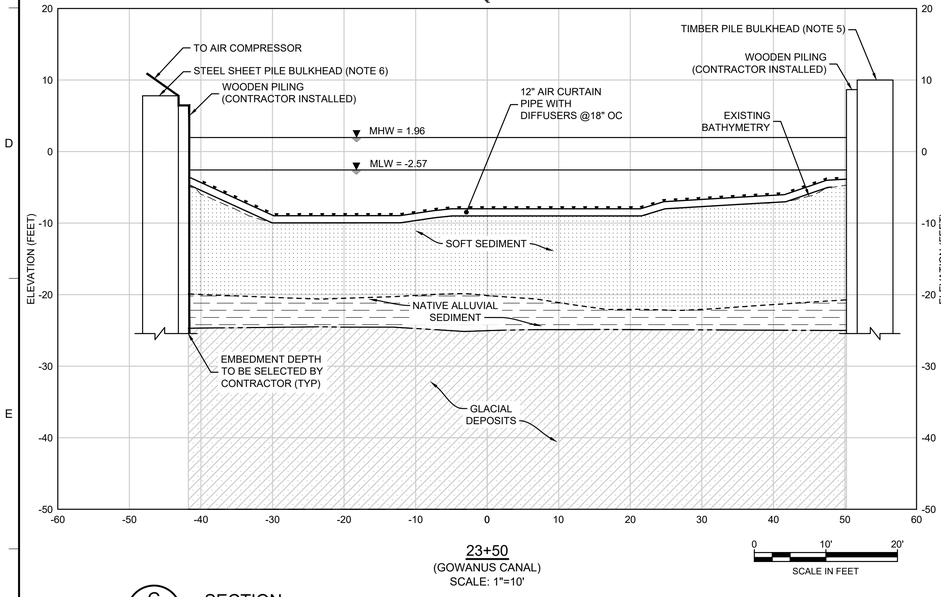
50
DR-17

PLAN
INSTALLATION LOCATION FOR SEDIMENT RESUSPENSION CONTROL MEASURES
SCALE: 1" = 40'

N

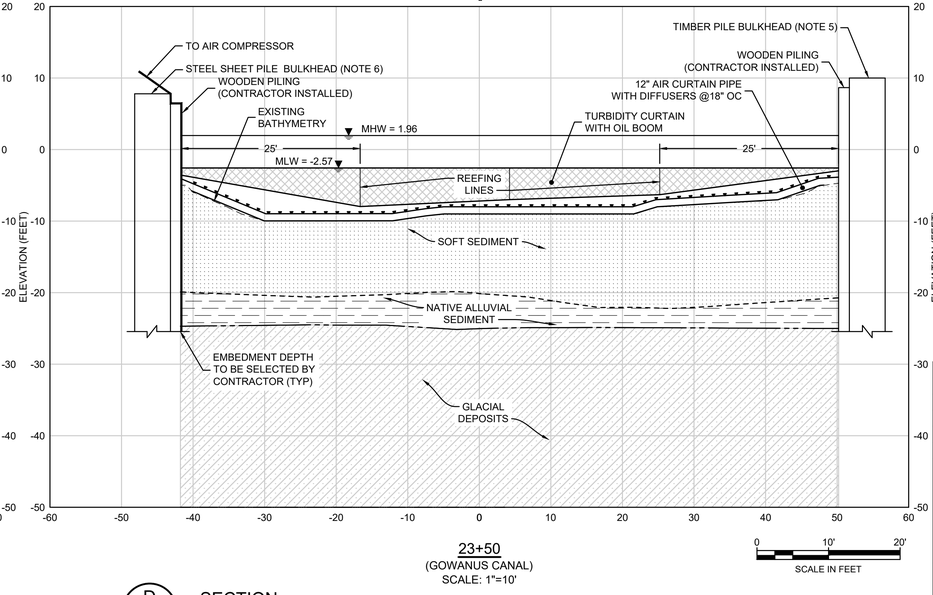
LEGEND

-10	BATHYMETRY ELEVATION (1-FT)
	PROPERTY LINE
	WATER LEVEL
	12" AIR CURTIAN PIPE WITH DIFFUSERS
	REEFING LINE
	EXISTING BATHYMETRY
	BOTTOM OF SOFT SEDIMENT
	BOTTOM OF NATIVE ALLUVIAL SEDIMENT
20+00	CANAL STATIONING
	SOFT SEDIMENT
	NATIVE ALLUVIAL SEDIMENT
	GLACIAL DEPOSITS
	TURBIDITY CURTAIN
(417-21)	BLOCK AND LOT



C
DR-17

SECTION
DAYTIME OPERATIONS - SEDIMENT RESUSPENSION CONTROL MEASURES
SCALE: 1" = 10'



D
DR-17

SECTION
AFTER WORK HOURS - SEDIMENT RESUSPENSION CONTROL MEASURES
SCALE: 1" = 10'

NOTES:

1. PRIOR TO DREDGING ACTIVITIES, THE CONTRACTOR SHALL INSTALL RESUSPENSION CONTROL MEASURES, AS PRESENTED IN SECTION 02 60 16.
2. THE CONTRACTOR IS TO INSTALL PILINGS ADJACENT TO THE BULKHEADS TO SERVE AS AN ANCHOR POINT FOR THE AIR AND TURBIDITY CURTAINS, AS DETAILED IN SECTION 02 60 16. GAPS BETWEEN THE INSTALLED PILING AND EXISTING BULKHEAD SHOULD BE SEALED TO PREVENT SHORT-CIRCUITING.
3. THE AIR CURTAIN, TURBIDITY CURTAIN, AND OIL BOOM SHALL BE OPERATED IN ACCORDANCE WITH SECTION 02 60 16.
4. THE CONTRACTOR MUST EITHER PLACE ALL EQUIPMENT NEEDED FOR THE AIR CURTAIN (I.E. AIR COMPRESSOR, ETC.) ON A BARGE WITHIN THE CANAL OR OBTAIN ACCESS AGREEMENTS, IN ACCORDANCE WITH SECTION 02 60 16 FROM ADJACENT PROPERTY OWNERS TO PLACE EQUIPMENT ON LAND.
5. THE TOP ELEVATION OF THE 160 3RD ST. BULKHEAD IS UNKNOWN.
6. THE TOP ELEVATION OF THE 176 3RD ST. BULKHEAD WAS OBTAINED FROM A SURVEY CONDUCTED BY ROGERS SURVEYING, PLLC IN FEBRUARY 2017.
7. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE:
SEDIMENT AND FLOATABLE CONTAINMENT

PROJECT:
REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE:
GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR041
REVIEWED BY:	JAS	DRAWING NO.:	DR-17 OF 18
APPROVED BY:	JFB		

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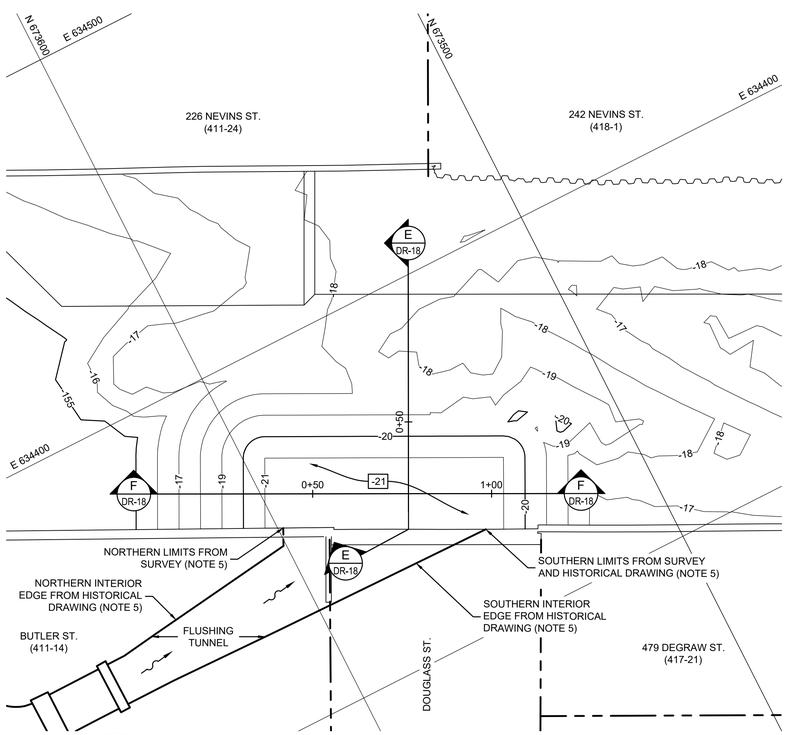
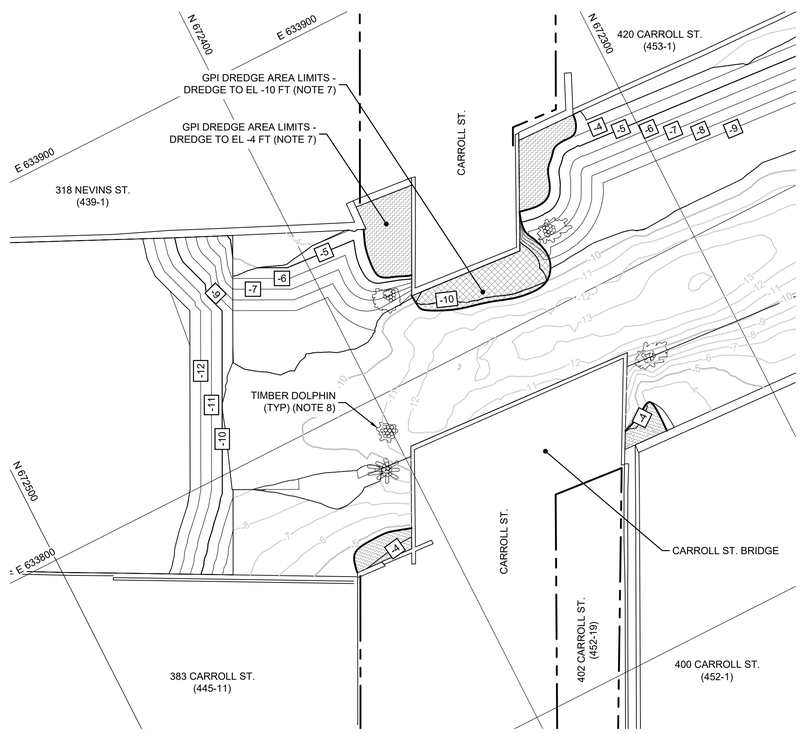
X:\06_CAD\DR\DESIGN\S DESIGN\RTA1\DRAWINGS\HPH106A\DR041



51 / DR-9 PLAN
PHASE III DREDGING NEAR FLUSHING TUNNEL
SCALE: 1" = 20'

0 20' 40'
SCALE IN FEET



52 / DR-9 DETAIL
PHASE I DREDGE NEAR CARROLL ST. BRIDGE
SCALE: 1" = 20'

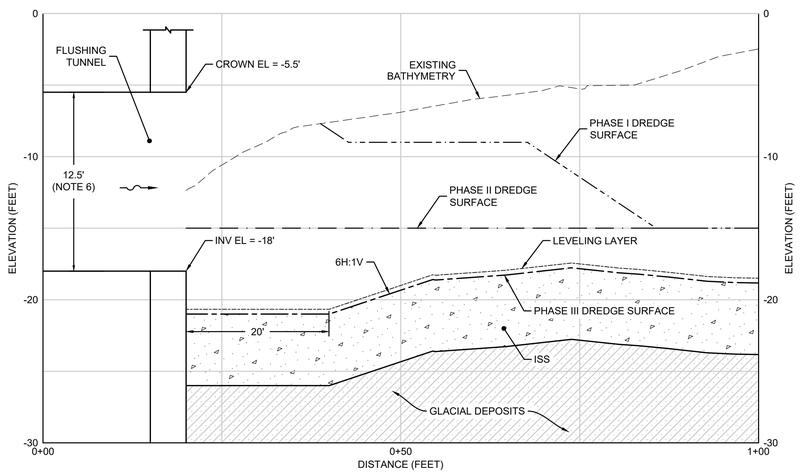
0 20' 40'
SCALE IN FEET

LEGEND

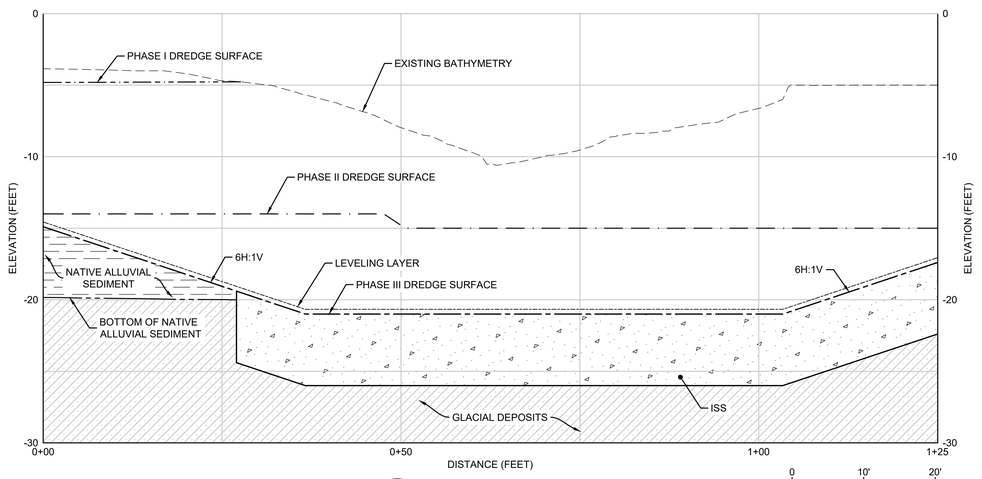
- BATHYMETRY ELEVATION (1-FT)
- PHASE I DREDGE ELEVATION
- PHASE III DREDGE ELEVATION (FT)
- PROPERTY LINE
- EXISTING BATHYMETRY
- BOTTOM OF NATIVE ALLUVIAL SEDIMENT
- PHASE I DREDGE SURFACE
- PHASE II DREDGE SURFACE
- PHASE III DREDGE SURFACE
- LEVELING LAYER
- DREDGE TO ELEVATION -4.0 FT (NOTE 7)
- DREDGE TO ELEVATION -10.0 FT (NOTE 7)
- NATIVE ALLUVIAL SEDIMENT
- GLACIAL DEPOSITS
- ISS
- PHASE III DREDGE ELEVATION
- PROPERTY BLOCK AND LOT
- FLUSHING TUNNEL

NOTES:

1. TOPOGRAPHIC ELEVATIONS AND BULKHEAD INFORMATION (I.E., ALIGNMENTS AND TOP OF WALL ELEVATIONS) WERE OBTAINED FROM A TOPOGRAPHIC SURVEY COMPLETED BY KSS AND DATED 15 JULY 2019.
2. THE BATHYMETRIC SURFACE IN RTA1 WAS CREATED BY MERGING THE BATHYMETRY DATA OBTAINED FROM HYDROGRAPHIC SURVEYS CONDUCTED BY: (I) ROGERS SURVEYING, PLLC ON 29 MAY 2019 NEAR THE HEAD OF THE CANAL (APPROXIMATELY 300 FT FROM THE HEAD OF THE CANAL), AND (II) OSI FROM 13 TO 18 OCTOBER 2014 FOR THE REMAINDER OF RTA1.
3. ELEVATIONS ARE IN FT BASED ON NAVD88. THE GRID COORDINATE SYSTEM CORRESPONDS TO NEW YORK STATE PLAN, EAST ZONE (3101). HORIZONTAL REFERENCE DATUM IS NAD83.
4. SUBSURFACE STRATIGRAPHY DATA AT THE HEAD OF THE CANAL FOR BOTTOM OF SOFT SEDIMENT (OR TOP OF NATIVE ALLUVIAL) AND BOTTOM OF NATIVE ALLUVIAL (OR TOP OF GLACIAL DEPOSITS) WAS ESTABLISHED FROM CPT LOGS AND SEDIMENT CORES COLLECTED BY B&B IN 2015, 2017 AND 2018 DURING PRE-DESIGN INVESTIGATIONS (PD-7, PD-8 AND PD-18).
5. THE LIMITS OF THE FLUSHING TUNNEL WERE VERIFIED FROM HYDROGRAPHIC SURVEYING PERFORMED BY ROGERS SURVEYING PLLC ON 29 MAY 2019 ("SURVEY"). A HISTORICAL PLAN DRAWING TITLED "TUNNEL FOR THE IMPROVEMENT OF THE SANITARY CONDITION OF GOWANUS CANAL" DATED 11 OCTOBER 1905 ("HISTORICAL DRAWING") WAS OVERLAID ONTO THE FLUSHING TUNNEL DETAIL BY ALIGNING THE NORTHERN DOUGLASS ST. PROPERTY BOUNDARY AND THE BOUNDARY OF THE CANAL (I.E., BULKHEAD ALONG THE CANAL). THE SOUTHERN LIMITS OF WHERE THE FLUSHING TUNNEL DISCHARGES INTO THE CANAL AND SOUTHERN INTERIOR EDGE OF THE FLUSHING TUNNEL FROM THE SURVEY MATCHED THE HISTORICAL DRAWING. FROM THE SURVEY, THE NORTHERN LIMITS OF WHERE THE FLUSHING TUNNEL DISCHARGES INTO THE CANAL EXTENDED AN ADDITIONAL 6 TO 7 FT NORTH OF THE LIMITS PRESENTED ON THE HISTORICAL DRAWING. THE NORTHERN LIMITS OF WHERE THE FLUSHING TUNNEL DISCHARGES INTO THE CANAL IS PRESENTED BASED ON THE SURVEY. THE NORTHERN INTERIOR EDGE OF THE FLUSHING TUNNEL COULD NOT BE VERIFIED FROM THE SURVEY AND IS BASED ON HISTORICAL DRAWING.
6. COMMUNICATIONS WITH NYCDEP ON 16 MAY 2019 AND JULY 17 2019 STATED THE DIAMETER OF THE FLUSHING TUNNEL IS 12 FT AND INVERT IS -19.34 FT BROOKLYN DATUM (APPROX. = -18 FT-NAVD88). THIS IS SIMILAR TO THE HISTORICAL DRAWING WHICH INDICATES THE INVERT AT THE DISCHARGE POINT INTO THE CANAL IS AT -19 FT BROOKLYN DATUM (APPROX. = -17.6 FT-NAVD88) AND HEIGHT OF THE FLUSHING TUNNEL IS 12.5 FT. FOR THE PURPOSES OF FLUSHING TUNNEL DETAILS ON THIS DRAWING, THE INVERT IS PRESENTED AT -18 FT-NAVD88 AND HEIGHT OF 12.5 FT, HOWEVER, THESE SHALL BE VERIFIED IN THE FIELD.
7. DREDGING WITHIN THE VICINITY OF THE CARROLL ST. BRIDGE BULKHEADS SHALL BE PERFORMED AS PART OF THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI). AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).
8. THE CONTRACTOR CAN ADJUST THE PHASE I DREDGE SURFACE NEAR TIMBER DOLPHINS AND BRIDGES TO AVOID DAMAGE TO STRUCTURES. TIMBER DOLPHINS SHALL BE REMOVED IN ACCORDANCE WITH THE BRIDGE SUPPORT DRAWINGS COMPLETED BY GPI AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).



E / DR-18 SECTION
FLUSHING TUNNEL
SCALE: 1" = 10' (HORIZONTAL); 1" = 5' (VERTICAL)



F / DR-18 SECTION
FLUSHING TUNNEL
SCALE: 1" = 10' (HORIZONTAL); 1" = 5' (VERTICAL)

0 10' 20'
SCALE IN FEET (HORIZONTAL)

0 5' 10'
SCALE IN FEET (VERTICAL)

NOT ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	-	-
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: DREDGING DETAILS

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

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SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR067
REVIEWED BY:	JAS	DRAWING NO.:	DR-18 OF 18
APPROVED BY:	JFB		

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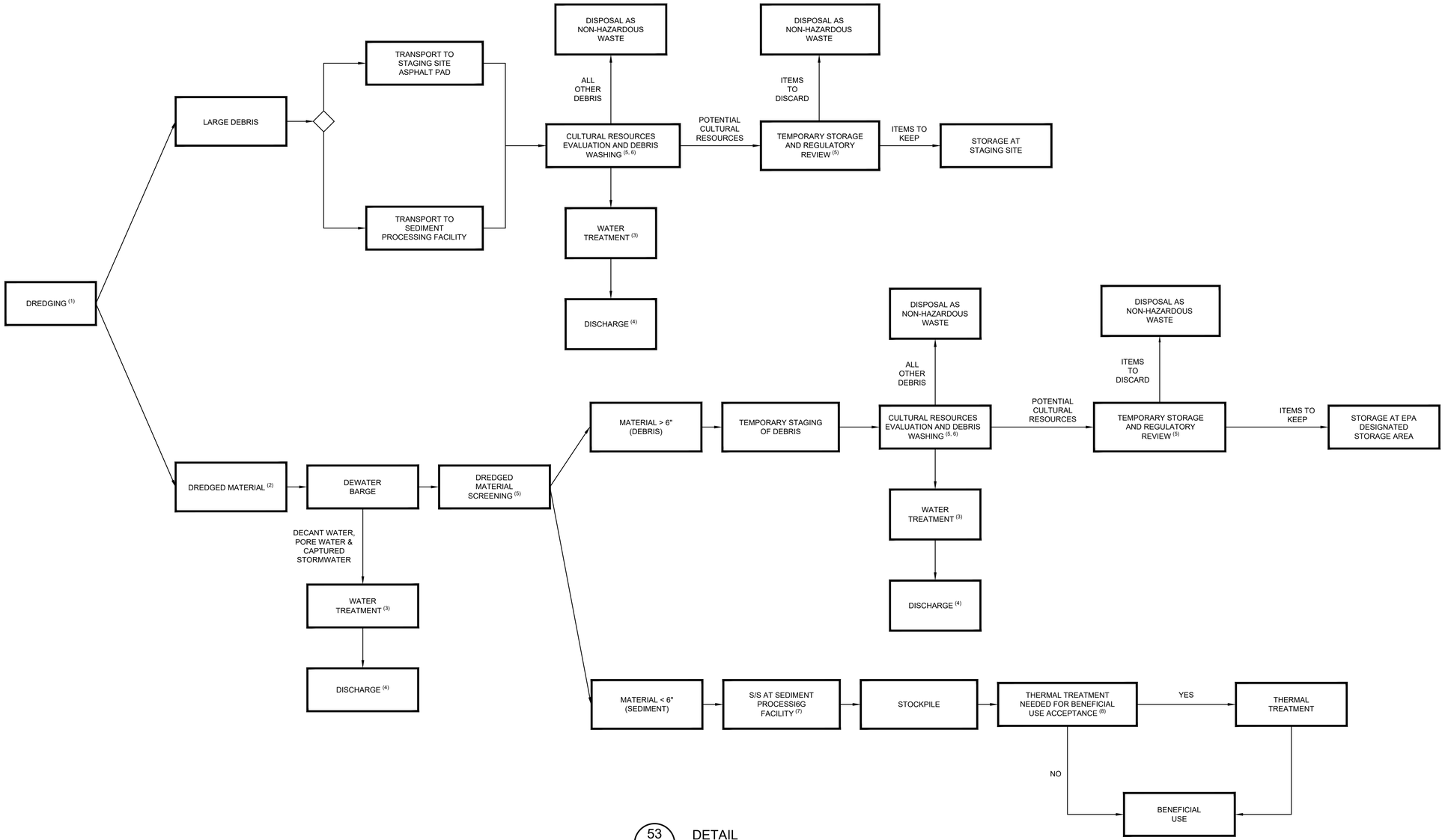

LEGEND

◇ DECISION POINT

53 / ST-1 DETAIL

DREDGED MATERIAL PROCESS FLOW DIAGRAM

SCALE: NTS

NOTES:

1. BEST MANAGEMENT PRACTICES (BMP) ENGINEERING CONTROLS (E.G. SILT CURTAINS, AIR CURTAINS AND/OR SECONDARY CONTAINMENT) SHALL BE USED DURING DREDGING PHASES.
2. DREDGED MATERIAL REQUIRING THERMAL TREATMENT SHALL BE SEGREGATED AND HANDLED SEPARATELY FROM OTHER DREDGED MATERIAL.
3. ALTERNATIVE WATER TREATMENT APPROACHES SUCH AS OFF-SITE TREATMENT AT A LICENSED DISPOSAL FACILITY ARE ALLOWED DURING PHASE I DREDGING AS INDICATED IN SPECIFICATION SECTION 44 08 40.
4. EFFLUENT FROM THE DREDGE WATER TREATMENT SYSTEM MUST BE IN COMPLIANCE WITH DISCHARGE PERMIT REQUIREMENTS. HALT DISCHARGE TO THE CANAL (AND IF NECESSARY, DREDGING ACTIVITIES), UNTIL THE CAUSE OF EXCEEDANCE IS IDENTIFIED AND CORRECTED.
5. ARCHAEOLOGICAL MONITORING SHALL BE CONDUCTED AS DESCRIBED UNDER CULTURAL RESOURCES EVALUATION NOTES ON DRAWING G-2.
6. DEBRIS WASHING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 02 51 19 AND SECTION 35 20 23.13.
7. S/S = SOLIDIFICATION/STABILIZATION.
8. INFORMATION REGARDING SUITABILITY FOR THERMAL TREATMENT IS PROVIDED IN SECTION 02 51 19.

NOT ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
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A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: DREDGED MATERIAL PROCESS FLOW DIAGRAM

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

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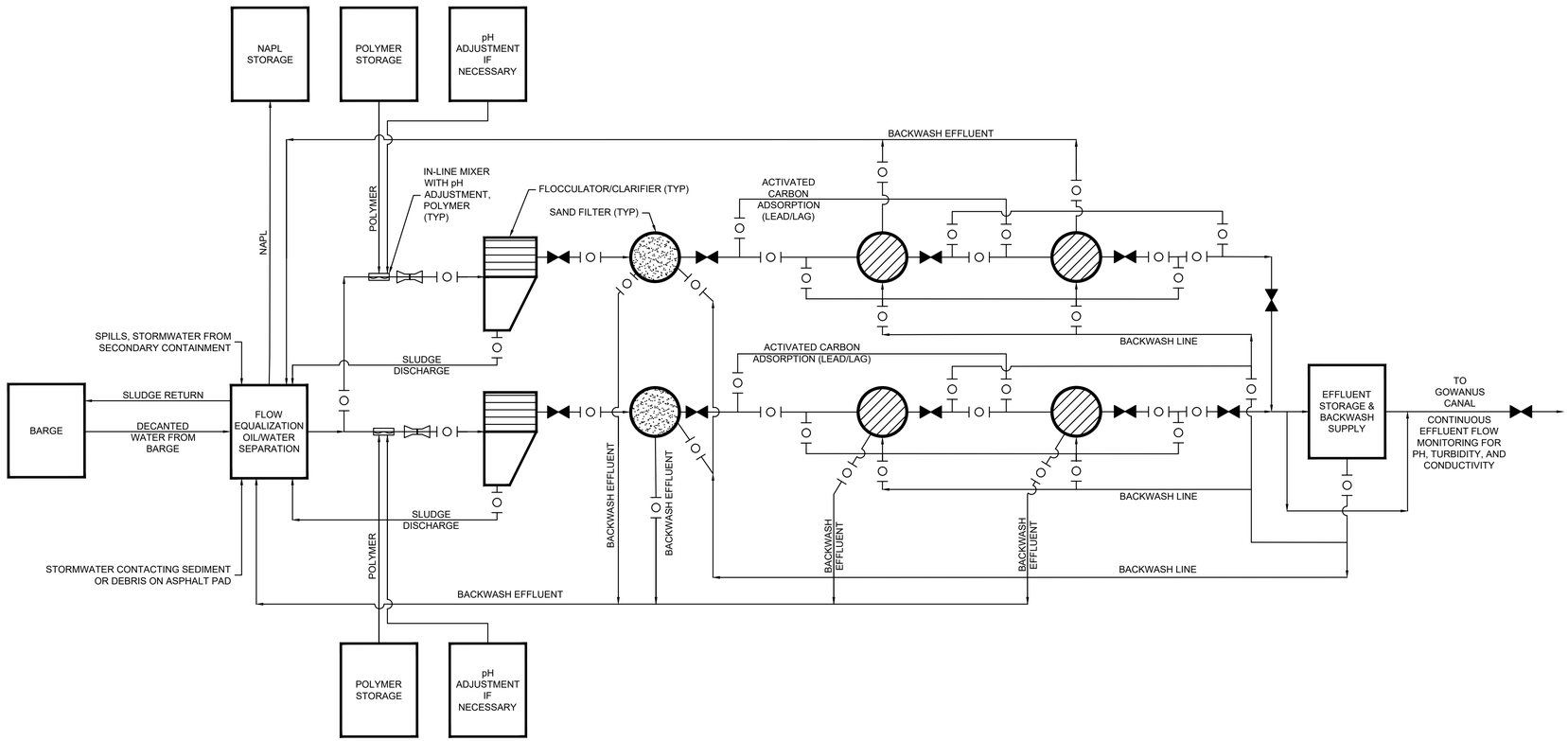
SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	RSH	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	RSH	FILE:	HPH106A-DR019
REVIEWED BY:	JMF	DRAWING NO.:	ST-1 OF 1
APPROVED BY:	JFB		

X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR019



LEGEND

- BALL VALVE
- PIPING / FLOW DIRECTION
- FLOW METER
- IN-LINE MIXER
- SAMPLING VALVE
- FLOCCULATOR/CLARIFIER
- SAND FILTER
- ACTIVATED CARBON FILTER

NOTES:

1. DURING PHASE I DREDGING, REDUNDANT TREATMENT TRAINS ARE NOT REQUIRED. THE CONTRACTOR MAY ELECT TO USE ALTERNATIVE WATER TREATMENT PROCESSES (I.E., OFFSITE TREATMENT AT A LICENSED DISPOSAL FACILITY) DURING PHASE I DREDGING IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN SPECIFICATION 44 08 40.
2. THE DRAWINGS AND SPECIFICATIONS DESCRIBE THE MINIMUM DESIGN CRITERIA AND WATER TREATMENT UNIT OPERATIONS TO BE PROVIDED. THE CONTRACTOR SHALL PROVIDE THE PROCESSES NECESSARY TO MEET EFFLUENT STANDARDS LISTED IN SECTION 44 08 40 BASED ON THE EQUIPMENT, PRODUCTION RATES, AND DREDGING MEANS AND METHODS TO BE USED.

54
WT-1
DETAIL
WATER TREATMENT PROCESS FLOW DIAGRAM
SCALE: NTS

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: WATER TREATMENT PROCESS FLOW DIAGRAM

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

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SIGNATURE

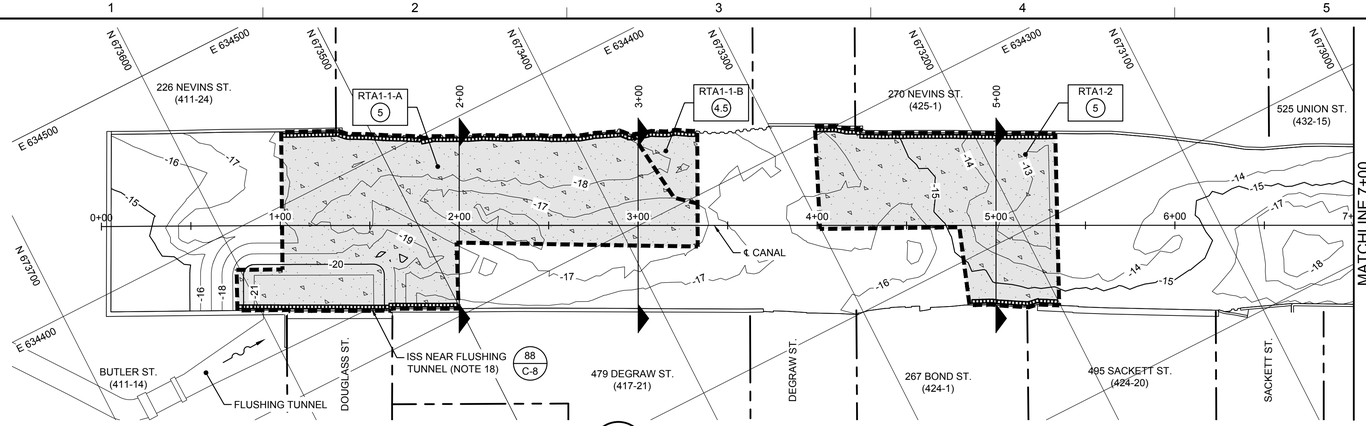
DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

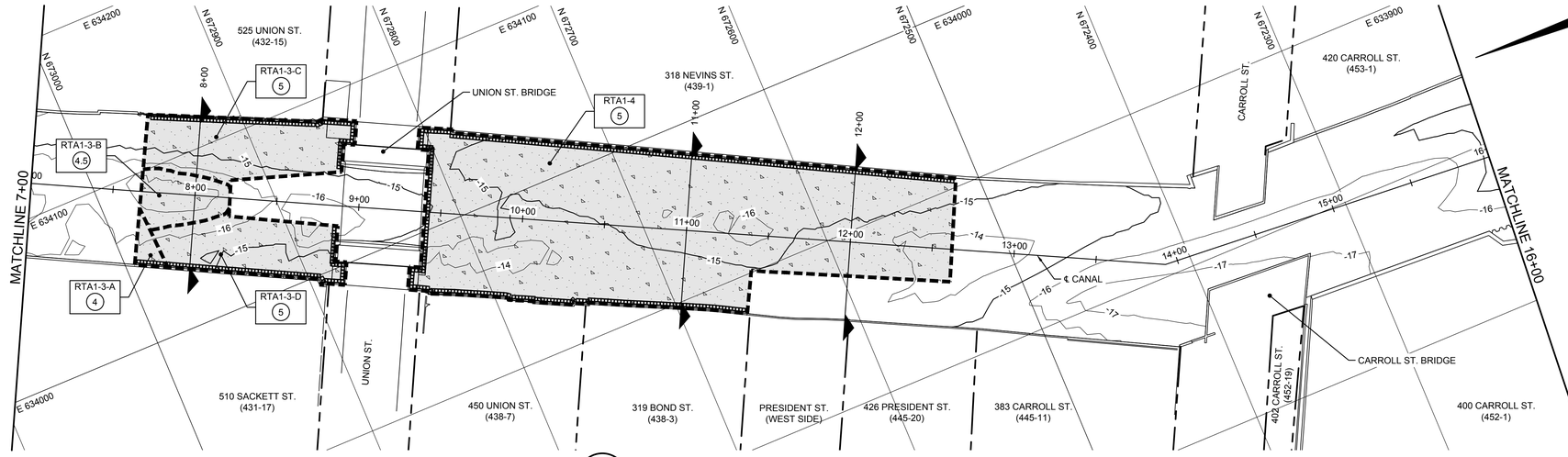
DESIGN BY:	RSH	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	RSH	FILE:	HPH106A-DR022
REVIEWED BY:	JMF	DRAWING NO.:	WT-1 OF 1
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

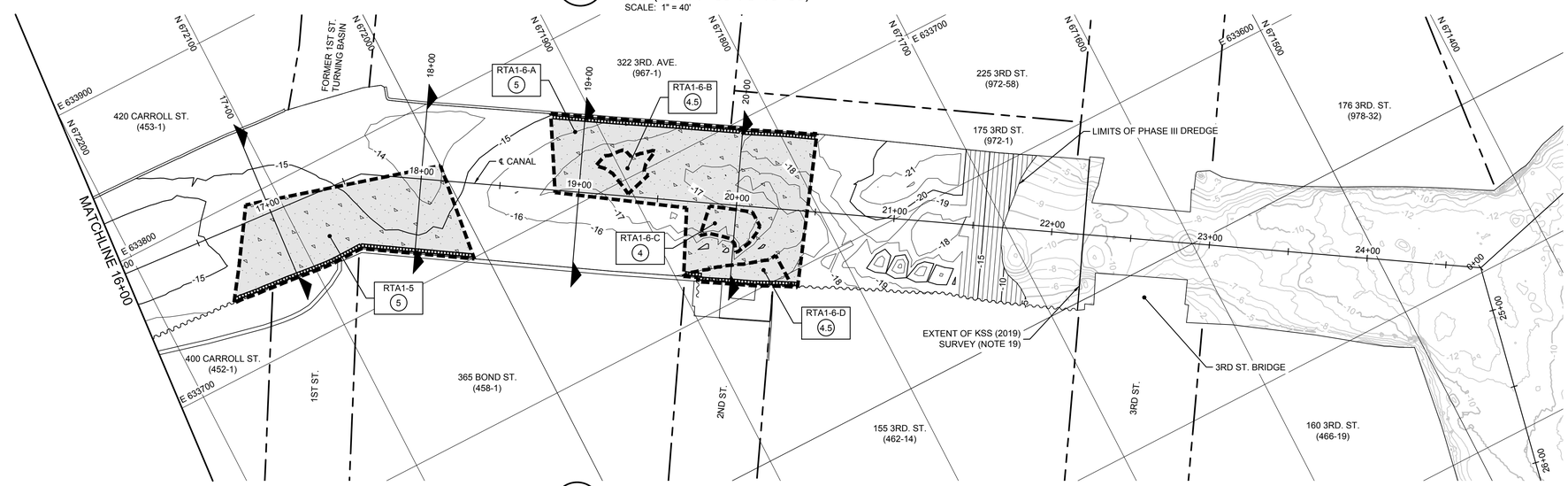
X:\EN_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR022



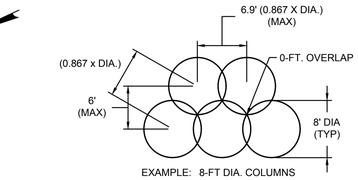
55 ISS-1 PLAN
ISS (STA. 0+00 TO 7+00)
SCALE: 1" = 40'



56 ISS-1 PLAN
ISS (STA. 7+00 TO 16+00)
SCALE: 1" = 40'



57 ISS-1 PLAN
ISS (STA. 16+00 TO 24+00)
SCALE: 1" = 40'



NOTE:

1. CONTRACTOR SHALL LAYOUT COLUMNS SUCH THAT THERE IS A 0-FT. OVERLAP (NEAT LINE) WHERE THREE COLUMNS INTERSECT AS SHOWN ON THE ABOVE DETAIL.

58 ISS-1 DETAIL
EXAMPLE ISS COLUMN LAYOUT
SCALE: 1" = 10'

LEGEND

- -10 — BATHYMETRY ELEVATION (1-FT)
- -15 — PHASE III DREDGE SURFACE (NOTES 3 AND 10)
- PROPERTY LINE
- ISS AREAS WITHIN 2-FT OF BULKHEADS, SENSITIVE STRUCTURES, AND AREAS IN, AROUND, AND BENEATH BRIDGES AND THEIR APPROACHES
- 5+00 — CANAL STATIONING
- ISS AREAS
- RTA1-1-A / 5 — THICKNESS OF ISS (FT.)
- (417-21) — BLOCK AND LOT
- FLUSHING TUNNEL

NOTES:

1. THE PROFILES AND CROSS-SECTIONS OF ISS AREAS ARE PRESENTED ON DRAWINGS ISS-2 AND ISS-3, RESPECTIVELY.
2. ISS SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 03 11 00.
3. ISS IS TO BE INSTALLED AFTER PHASE II DREDGING AND PRIOR TO PHASE III DREDGING (REFER TO DRAWINGS DR-11 THROUGH DR-13 FOR PHASE III DREDGING ELEVATIONS). TOP OF ISS TREATMENT ELEVATIONS ARE PRESENTED (TOP OF ISS TREATMENT = PHASE III DREDGE ELEVATIONS).
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A PROPOSED ISS COLUMN LAYOUT FOR THE ISS AREAS SHOWN ON THE DRAWING. THE CONTRACTOR SHALL PROVIDE SEQUENCING AND PROPOSED EQUIPMENT FOR ISS TREATMENT AREAS NEAR SENSITIVE STRUCTURES INCLUDING BULKHEADS, UNION STREET BRIDGE AND FLUSHING TUNNEL. PROVIDE A COMPLETE LAYOUT FOR THE ISS TREATMENT AREAS INCLUDING X, Y COORDINATES, AND TOP AND BOTTOM ELEVATIONS FOR EACH ISS COLUMN.
5. ADJACENT ISS COLUMNS SHALL HAVE A MINIMUM VERTICAL OVERLAP OF 3 FT. ALL ISS COLUMNS SHALL HAVE A MINIMUM THICKNESS OF 3 FT. THERE SHALL BE NO UNTREATED ZONES WITHIN THE ISS AREA AND BETWEEN THE ISS COLUMNS.
6. THE CONTRACTOR SHALL EXPLORE ALL ISS AREAS UPTO THE TOP OF NATIVE ALLUVIAL SEDIMENT INTERFACE WITH A SUPPORT EXCAVATOR IMMEDIATELY PRIOR TO ISS COLUMN CONSTRUCTION TO CHECK FOR OBSTRUCTIONS. IN THE EVENT OBSTRUCTIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THEM TO THE EXTENT PRACTICAL TO FACILITATE ISS CONSTRUCTION.
7. ISS USING LARGE DIAMETER AUGERING (DIAMETER GREATER THAN 2 FT) METHODS SHALL NOT OCCUR WITHIN 2 FT OF SENSITIVE STRUCTURES INCLUDING BULKHEADS, AREAS IN, AROUND, AND BENEATH UNION STREET BRIDGE AND APPROACHES, AND THE FLUSHING TUNNEL. EXCAVATOR MOUNTED MIXING METHODS ARE ACCEPTABLE.
8. THE CONTRACTOR SHALL PERFORM ISS STARTUP/DEMONSTRATION EVALUATION IN SELECTED AREAS PRIOR TO FULL-SCALE ISS CONSTRUCTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AN ISS MIX DESIGN THAT MEETS THE PERFORMANCE REQUIREMENTS.
10. THE BOTTOM OF ISS TREATMENT SHALL BE DETERMINED PER ISS COLUMN BASED ON THE PHASE III DREDGE ELEVATION AS THE TOP OF ISS TREATMENT AND THE ISS THICKNESS AS SHOWN ON THE DRAWINGS.
11. ISS SWELL SHALL BE MINIMIZED TO THE EXTENT PRACTICAL. ISS SWELL SHALL BE REMOVED BY THE CONTRACTOR AS SPECIFIED IN SECTION 35 20 23.13. ISS SWELL IMPACTING THE NAVIGATIONAL ELEVATION SHOWN ON THE DRAWINGS MUST BE REMOVED AFTER ISS IS COMPLETE IN EACH ISS AREA.
12. THE CONTRACTOR SHALL CONVEY GROUT FROM THE BATCH PLANT TO THE ISS AREAS. THE CONTRACTOR SHALL PREVENT LEAKS OR SPILLAGE OF ISS GROUT DURING CONVEYANCETHE LOCATION OF THE BATCH PLANT AND ISS LAYDOWN AREA SHALL BE SELECTED AS PART OF THE CONTRACTOR'S ISS WORK PLAN.
13. ISS TREATMENT INSIDE OF THE PROPOSED PIPE PILE BULKHEAD AND EXISTING BULKHEAD SURROUNDING THE UNION STREET BRIDGE WILL NOT BE PERFORMED. ISS SHALL ONLY BE PERFORMED UP TO THE CANAL SIDE OF THESE BULKHEADS.
14. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE STABILITY OF EXISTING CRITICAL STRUCTURES THAT INCLUDE BUT ARE NOT LIMITED TO THE FLUSHING TUNNEL, BULKHEADS, AND UNION STREET BRIDGE AND ABUTMENTS.
15. ISS SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACTOR'S ISS WORK PLAN INCLUDING STABILITY CALCS, MONITORING OF BULKHEADS, AND REQUIRED LAYOUT.
16. THE CONTRACTOR SHALL SUBMIT, AS PART OF THE ISS WORK PLAN, A CONSTRUCTION SEQUENCE THAT INTEGRATES DRIVING SHEETS, DREDGING, CUTTING SHEETS AND IMPLEMENTING ISS IN FRONT OF THE FLUSHING TUNNEL NEAR DOUGLAS STREET. ADDITIONAL REMOVAL OF ISS SWELL MAY BE REQUIRED ADJACENT TO THE FLUSHING TUNNEL.
17. ISS NEAR UNION STREET BRIDGE SHALL BE IMPLEMENTED SUCH THAT IT DOES NOT IMPEDE OPERATION OF THE BRIDGE.
18. DETAIL FOR ISS IMPLEMENTATION NEAR THE FLUSHING TUNNEL IS SHOWN ON DRAWING C-8.
19. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.
20. THE BULKHEADS LIMITS SHOWN ARE THE EXISTING BULKHEAD LOCATIONS. ISS WILL BE CONDUCTED UPTO THE BRIDGE SUPPORT AND BULKHEAD SUPPORT INSTALLED BY THE CONTRACTOR AS SHOWN IN THE GPI (2019) DRAWINGS TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL". ISS WILL ALSO BE CONDUCTED UPTO ANY NEW BULKHEADS INSTALLED BY THE PROPERTY OWNERS.

0 40' 80'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: ISS PLAN

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

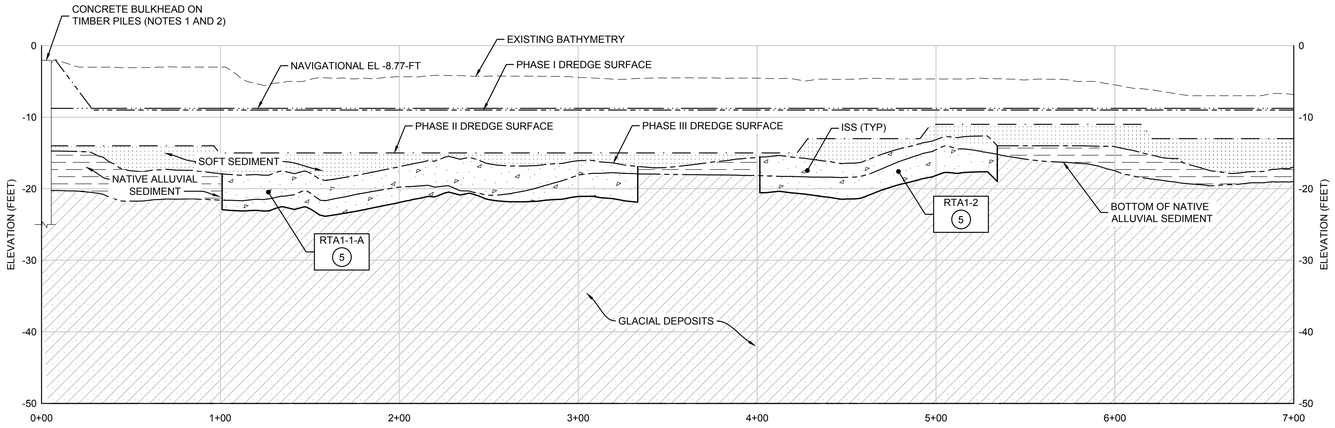
DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

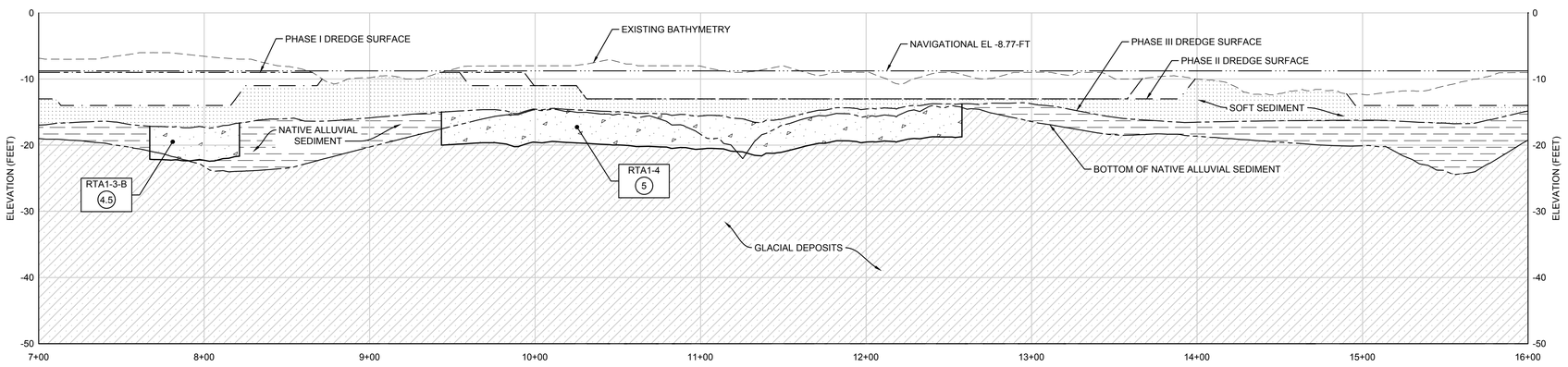
DESIGN BY:	JAC	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	JAC	FILE:	HPH106A-DR023
REVIEWED BY:	CAR	DRAWING NO.:	ISS-1 OF 3
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

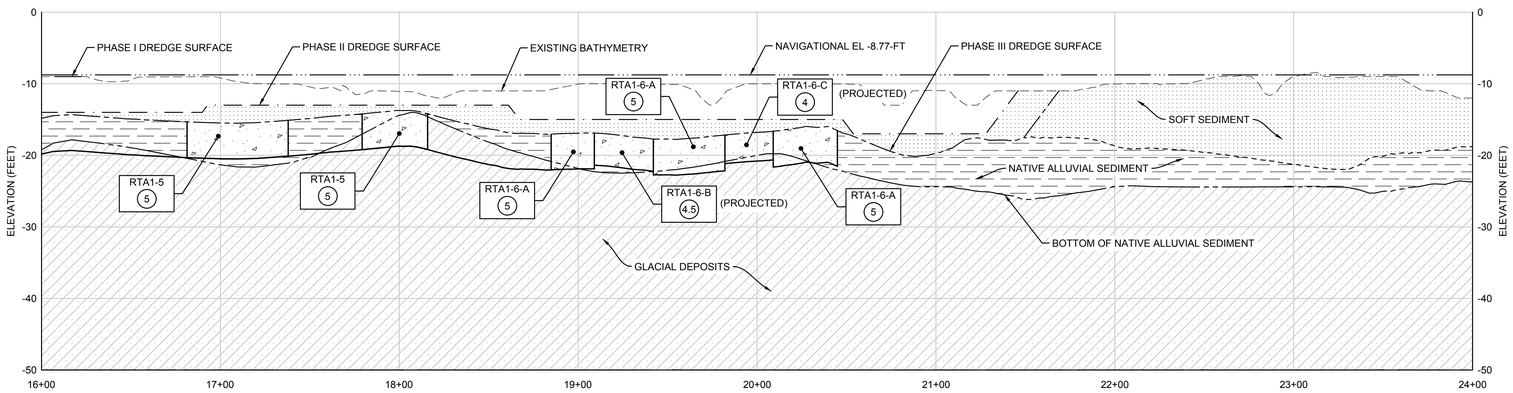
X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR023



59 ISS-2 **PROFILE**
ISS (STA. 0+00 TO 7+00)
SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)



60 ISS-2 **PROFILE**
ISS (STA. 7+00 TO 16+00)
SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)



61 ISS-2 **PROFILE**
ISS (STA. 16+00 TO 24+00)
SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

LEGEND

- NAVIGATIONAL ELEVATION
- EXISTING BATHYMETRY
- BOTTOM OF SOFT SEDIMENT
- BOTTOM OF NATIVE ALLUVIAL SEDIMENT
- PHASE I DREDGE SURFACE PROFILE
- PHASE II DREDGE SURFACE PROFILE
- PHASE III DREDGE SURFACE PROFILE
- ISS AREAS
- SOFT SEDIMENT
- NATIVE ALLUVIAL SEDIMENT
- GLACIAL DEPOSITS
- ISS
- RTA1-1-A 5 — THICKNESS OF ISS (FT)

NOTES:

1. THE HORIZONTAL LIMITS OF THE BULKHEAD SHOWN ON THIS DRAWING ARE FOR ILLUSTRATION PURPOSES ONLY.
2. THE TOP OF BULKHEAD ELEVATIONS ARE SHOWN AS APPROXIMATE. TOPOGRAPHIC SURVEY INFORMATION SHOWING TOP OF WALL ELEVATIONS WAS OBTAINED BY KSS IN JULY 2019 AND THIS DATA IS AVAILABLE UPON REQUEST.
3. ISS SWELL SHALL BE MINIMIZED TO THE EXTENT PRACTICAL AS SPECIFIED IN SECTION 03 11 00. ISS SWELL SHALL BE REMOVED BY THE CONTRACTOR AS SPECIFIED IN SECTION 35 20 23.13. ISS SWELL REMAINING ABOVE THE NAVIGATIONAL ELEVATION SHOWN ON THE DRAWINGS MUST BE REMOVED IMMEDIATELY AFTER ISS IS COMPLETE IN EACH ISS AREA.
4. ADJACENT ISS COLUMNS SHALL HAVE A MINIMUM VERTICAL OVERLAP OF 3 FT. ALL ISS COLUMNS SHALL HAVE A MINIMUM THICKNESS OF 3 FT. THERE SHALL BE NO UNTREATED ZONES WITHIN THE ISS AREA AND BETWEEN THE ISS COLUMNS.

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D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: ISS PROFILES

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

SCALE IN FEET (HORIZONTAL): 0, 40', 80'

SCALE IN FEET (VERTICAL): 0, 10', 20'

NOT ISSUED FOR CONSTRUCTION

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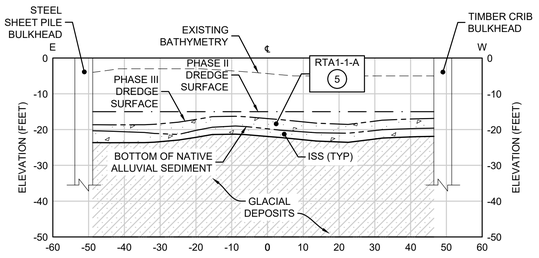
SIGNATURE

DATE

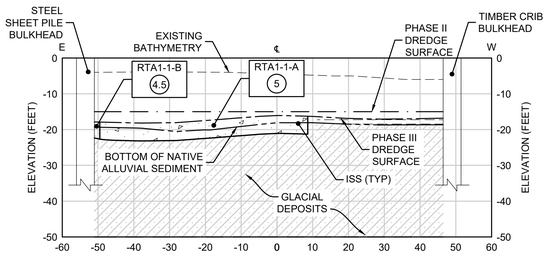
ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BLVD., SUITE 200
KENNESAW, GA 30144

DESIGN BY:	JAC	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	JAC	FILE:	HPH106A-DR024
REVIEWED BY:	CAR	DRAWING NO.:	ISS-2 OF 3
APPROVED BY:	JFB		

X:\09_CAD\DWG\DNG DESIGN\RTA1\DRAWINGS\HPH106A-DR024



2+00
(GOWANUS CANAL)
SCALE: 1"=20'



3+00
(GOWANUS CANAL)
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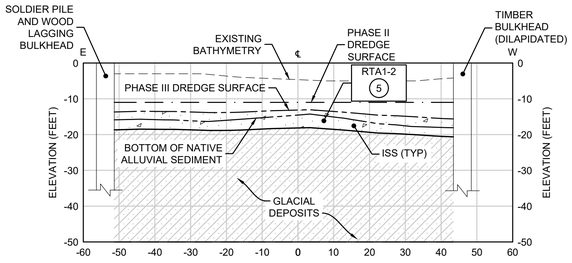
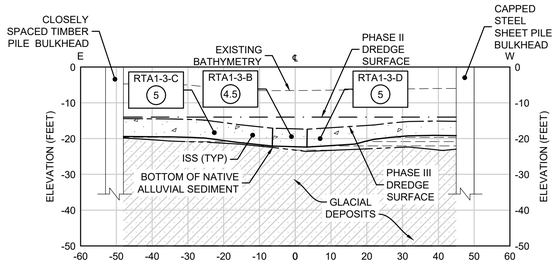
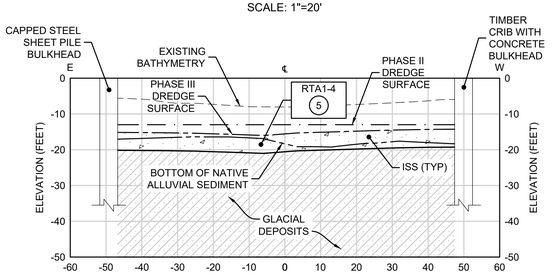


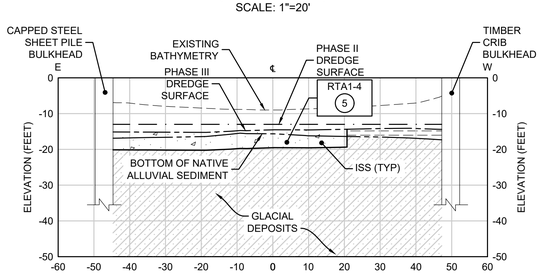
5+00
(GOWANUS CANAL)
SCALE: 1"=20'



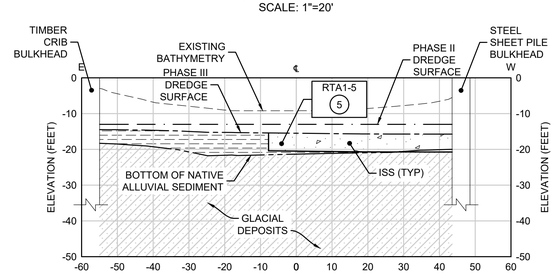
8+00
(GOWANUS CANAL)
SCALE: 1"=20'



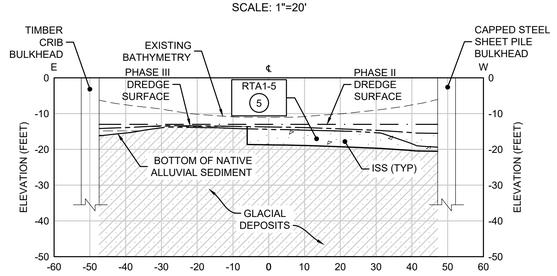
11+00
(GOWANUS CANAL)
SCALE: 1"=20'



12+00
(GOWANUS CANAL)
SCALE: 1"=20'



17+00
(GOWANUS CANAL)
SCALE: 1"=20'



18+00
(GOWANUS CANAL)
SCALE: 1"=20'

19+00
(GOWANUS CANAL)
SCALE: 1"=20'

20+00
(GOWANUS CANAL)
SCALE: 1"=20'

LEGEND

- EXISTING BATHYMETRY
- BOTTOM OF SOFT SEDIMENT
- BOTTOM OF NATIVE ALLUVIAL SEDIMENT
- PHASE II DREDGE SURFACE
- PHASE III DREDGE SURFACE
- ISS AREAS
- SOFT SEDIMENT
- NATIVE ALLUVIAL SEDIMENT
- GLACIAL DEPOSITS
- ISS
- RTA1-1-A (5) — ISS THICKNESS (FT.)

NOTES:

1. THE LOCATION OF CROSS-SECTIONS ARE PRESENTED ON DRAWING ISS-1.
2. ADJACENT ISS COLUMNS SHALL HAVE A MINIMUM VERTICAL OVERLAP OF 3 FT. ALL ISS COLUMNS SHALL HAVE A MINIMUM THICKNESS OF 3 FT. THERE SHALL BE NO UNTREATED ZONES WITHIN THE ISS AREA AND BETWEEN THE ISS COLUMNS.

0 20' 40'
SCALE IN FEET

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E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
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C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: ISS CROSS-SECTIONS

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

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ENGINEER OF RECORD
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KENNESAW, GA 30144

DESIGN BY:	JAC	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	JAC	FILE:	HPH106A-DR025
REVIEWED BY:	CAR	DRAWING NO.:	ISS-3 OF 3
APPROVED BY:	JFB		

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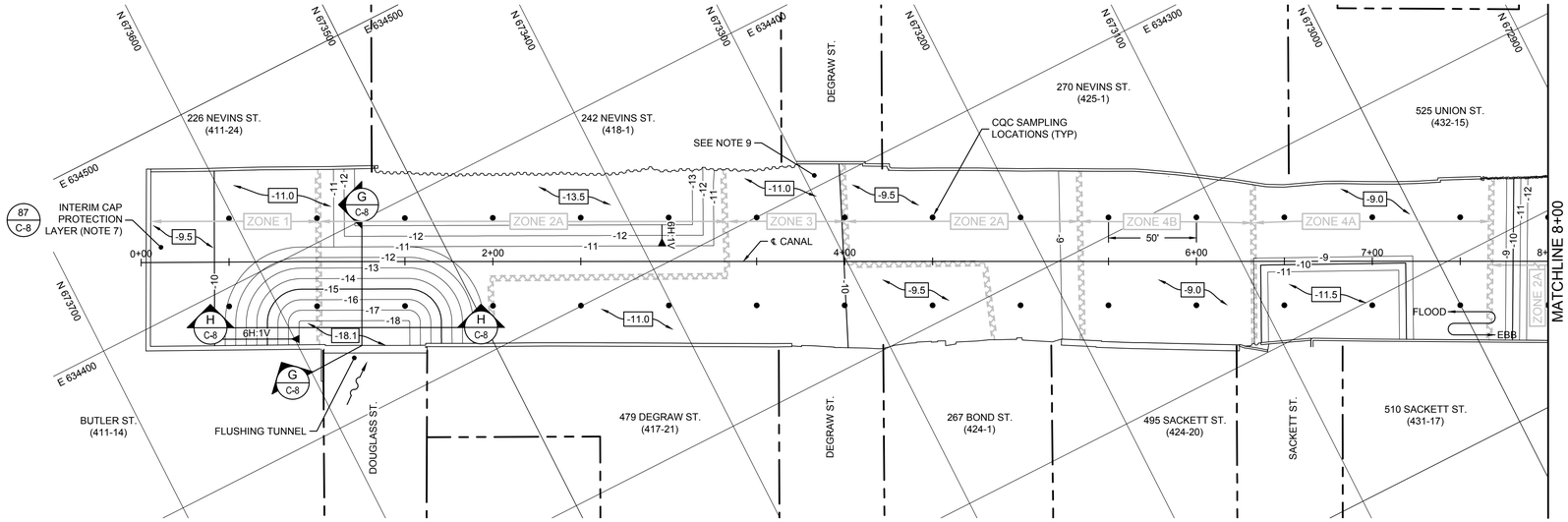
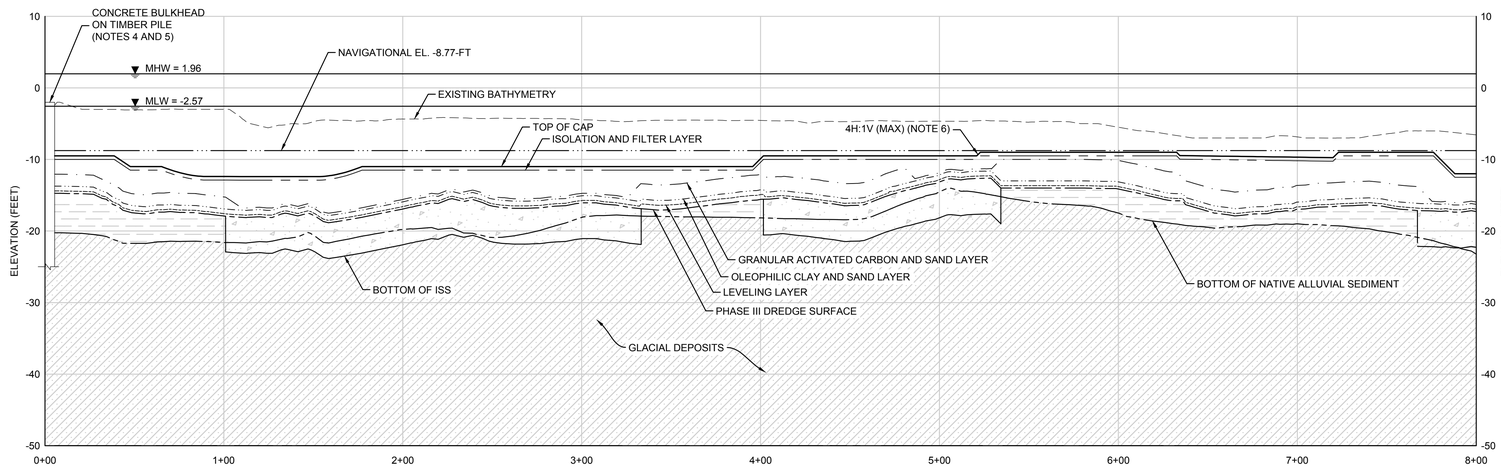


62
C-1

PLAN
TOP OF CAP (STA. 0+00 TO 8+00)
SCALE: 1" = 40'

0 40' 80'
SCALE IN FEET



63
C-1

PROFILE
TOP OF CAP (STA. 0+00 TO 8+00)
SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

0 40' 80'
SCALE IN FEET (HORIZONTAL)

0 10' 20'
SCALE IN FEET (VERTICAL)

LEGEND

-10	TOP OF CAP ELEVATION (NOTE 1)
	PROPERTY LINE
	WATER LEVEL
	NAVIGATIONAL ELEVATION
	EXISTING BATHYMETRY
	BOTTOM OF SOFT SEDIMENT
	BOTTOM OF NATIVE ALLUVIAL SEDIMENT
	PHASE III DREDGE SURFACE
	LEVELING LAYER
	OLEOPHILIC CLAY AND SAND LAYER
	GRANULAR ACTIVATED CARBON AND SAND LAYER
	ISOLATION AND FILTER LAYER
	TOP OF CAP
5+00	CANAL STATIONING
	CAP TREATMENT ZONE BOUNDARY
	NATIVE ALLUVIAL SEDIMENT
	GLACIAL DEPOSITS
	ISS AREAS
-11.0	CAPPING ELEVATION
(417-21)	BLOCK AND LOT
	CQC SAMPLING LOCATIONS (NOTE 2)
	FLUSHING TUNNEL
ZONE 1	CAP TREATMENT LAYER ZONES IN RTA1

NOTES:

1. CAP ELEVATIONS PRESENTED ON THE DRAWING REPRESENT THE TOP OF CAP SURFACE AND ARE APPROXIMATE. THE CAP ELEVATIONS WERE OBTAINED BY BUILDING UP TO THE TOP OF ARMOR LAYER AND VARY WITHIN RTA1 BASED ON THE VARYING THICKNESSES OF THE UNDERLYING CAP TREATMENT LAYERS AND LEVELING LAYER. CAP CONSTRUCTION IS DESCRIBED IN THE RTA1 CAP AND CONSTRUCTION SEQUENCE DETAIL ON DRAWING C-7.
2. FOLLOWING FULL SCALE INSTALLATION OF EACH TREATMENT LAYER, IN-SITU CATCH PAN SAMPLES FOR CONSTRUCTION QUALITY CONTROL (CQC) SHALL BE COLLECTED IN ACCORDANCE WITH THE SPECIFICATION FOR CAP CONSTRUCTION TREATMENT LAYER - SECTION 35 43 00. CQC SAMPLE LOCATIONS SHOWN ON THIS DRAWING ARE EXAMPLES AND DO NOT REFLECT EXACT LOCATIONS THAT WILL BE CHOSEN IN THE FIELD.
3. AMENDMENTS AND MIXING RATIOS FOR THE CAP LAYERS DIFFER WITHIN RTA1. REFER TO THE CAP CONSTRUCTION SPECIFICATIONS (TREATMENT LAYER - SECTION 35 43 00 AND, ISOLATION AND ARMOR LAYER - SECTION 35 43 29) FOR INFORMATION ON AMENDMENTS AND MIXING RATIOS. DETAILS FOR THE CAP ARE PRESENTED ON DRAWINGS C-7, C-8 AND C-9.
4. THE HORIZONTAL LIMITS OF THE BULKHEAD SHOWN ON THIS DRAWING ARE FOR ILLUSTRATION PURPOSES ONLY.
5. THE TOP OF BULKHEAD ELEVATIONS ARE SHOWN AS APPROXIMATE. TOPOGRAPHIC SURVEY INFORMATION SHOWING TOP OF WALL ELEVATIONS WAS OBTAINED BY KSS IN JULY 2019 AND THIS DATA IS AVAILABLE UPON REQUEST.
6. THE TIE-IN SLOPE BETWEEN THE TOP OF CAP SURFACE AT DIFFERENT ELEVATIONS WILL BE A MAXIMUM OF 4H:1V. THE ANGLE OF REPOSE OF MATERIAL MAY RESULT IN FLATTER SLOPES, WHICH IS ACCEPTABLE. THE SIDE SLOPES OF THE TOP OF CAP SURFACE AT THE FLUSHING TUNNEL AND THE ADJACENT AREA OPPOSITE 242 NEVINS ST. (418-1) WILL BE AT 6H:1V AS SHOWN ON THIS DRAWING.
7. AS A TEMPORARY PROTECTIVE MEASURE BETWEEN THE TIME OF CAP TREATMENT LAYER PLACEMENT AND MOBILIZATION OF EQUIPMENT FOR THE PLACEMENT OF ACB MATS, AN INTERIM CAP PROTECTION LAYER (APPROX. 35 FT IN LENGTH FROM THE HEAD OF THE CANAL) MAY BE PLACED ABOVE THE CAP TREATMENT LAYERS FOR EROSION PROTECTION AGAINST FLOWS FROM CSO RH-034. PRIOR TO PLACING THE ACB MATS FOR BUILDING THE TOP OF CAP SURFACE, THE PERMANENT 6 IN. THICK ISOLATION AND FILTER LAYER WILL BE PLACED ABOVE THE INTERIM CAP PROTECTION LAYER TO MATCH THE ISOLATION LAYER SHELF ELEVATION AT THE HEAD OF THE CANAL AS SHOWN ON DRAWING C-6 AND DESCRIBED IN SECTION 35 43 29.
8. THE BULKHEAD LIMITS SHOWN ARE THE EXISTING BULKHEAD LOCATIONS. CAPPING WILL BE CONDUCTED UPTO THE BRIDGE SUPPORT AND BULKHEAD SUPPORT INSTALLED BY THE CONTRACTOR, AND ANY NEW BULKHEADS INSTALLED BY PROPERTY OWNERS.
9. THE TOP OF CAP SURFACE NEAR DEGRAW ST. (EAST SIDE) MAY NEED TO BE MODIFIED TO ACCOUNT FOR NYC'S PROPOSED UPSIZING OF CSO RH-038 AT THAT LOCATION.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: CAPPING PLAN (STA. 0+00 TO 8+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR028
REVIEWED BY:	JAS	DRAWING NO.:	C-1 OF 9
APPROVED BY:	JFB		

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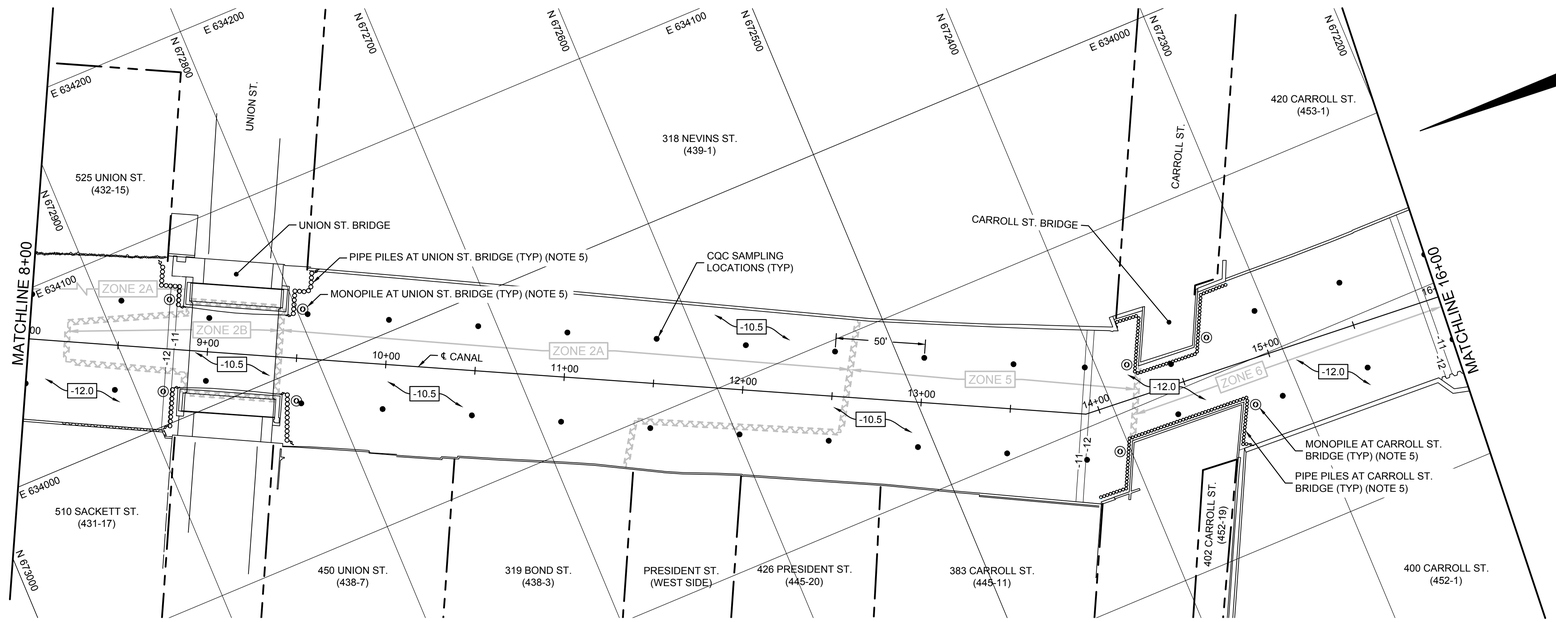
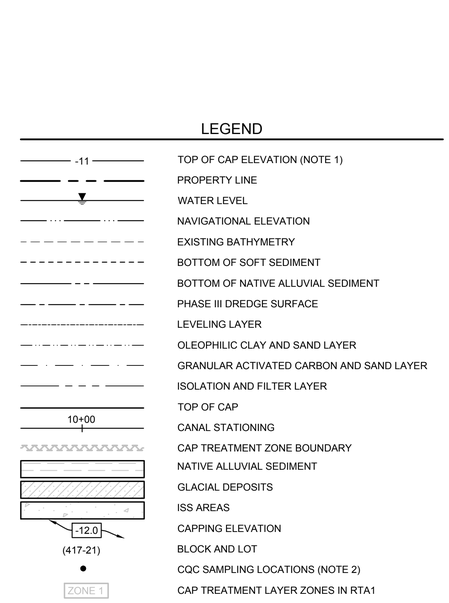
X:\09_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR028

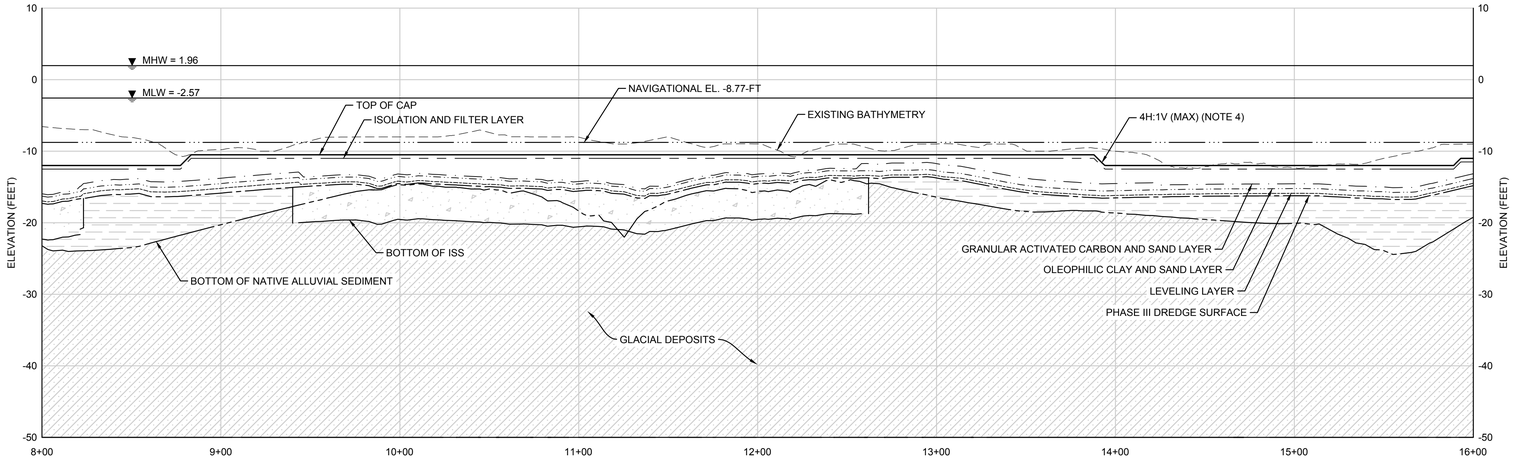


64
C-2

PLAN
TOP OF CAP (STA. 8+00 TO 16+00)

SCALE: 1" = 40'





65
C-2

PROFILE
TOP OF CAP (STA. 8+00 TO 16+00)

SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

0 40' 80'
SCALE IN FEET (HORIZONTAL)

0 10' 20'
SCALE IN FEET (VERTICAL)

NOTES:

1. CAP ELEVATIONS PRESENTED ON THE DRAWING REPRESENT THE TOP OF CAP SURFACE AND ARE APPROXIMATE. THE CAP ELEVATIONS WERE OBTAINED BY BUILDING UP TO THE TOP OF ARMOR LAYER AND VARY WITHIN RTA1 BASED ON THE VARYING THICKNESSES OF THE UNDERLYING CAP TREATMENT LAYERS AND LEVELING LAYER. CAP CONSTRUCTION IS DESCRIBED IN THE RTA1 CAP AND CONSTRUCTION SEQUENCE DETAIL ON DRAWING C-7.
2. FOLLOWING FULL SCALE INSTALLATION OF EACH TREATMENT LAYER, IN-SITU CATCH PAN SAMPLES FOR CONSTRUCTION QUALITY CONTROL (CQC) SHALL BE COLLECTED IN ACCORDANCE WITH THE SPECIFICATION FOR CAP CONSTRUCTION TREATMENT LAYER - SECTION 35 43 00. CQC SAMPLE LOCATIONS SHOWN ON THIS DRAWING ARE EXAMPLES AND DO NOT REFLECT EXACT LOCATIONS THAT WILL BE CHOSEN IN THE FIELD.
3. AMENDMENTS AND MIXING RATIOS FOR THE CAP LAYERS DIFFER WITHIN RTA1. REFER TO THE CAP CONSTRUCTION SPECIFICATIONS (TREATMENT LAYER - SECTION 35 43 00 AND, ISOLATION AND ARMOR LAYER - SECTION 35 43 29) FOR INFORMATION ON AMENDMENTS AND MIXING RATIOS. DETAILS FOR THE CAP ARE PRESENTED ON DRAWINGS C-7, C-8 AND C-9.
4. THE TIE-IN SLOPE BETWEEN THE TOP OF CAP SURFACE AT DIFFERENT ELEVATIONS WILL BE A MAXIMUM OF 4H:1V. THE ANGLE OF REPOSE OF MATERIAL MAY RESULT IN FLATTER SLOPES, WHICH IS ACCEPTABLE.
5. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).
6. THE BULKHEAD LIMITS SHOWN ARE THE EXISTING BULKHEAD LOCATIONS. CAPPING WILL BE CONDUCTED UPTO THE BRIDGE SUPPORT AND BULKHEAD SUPPORT INSTALLED BY THE CONTRACTOR, AND ANY NEW BULKHEADS INSTALLED BY PROPERTY OWNERS.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: CAPPING PLAN (STA. 8+00 TO 16+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

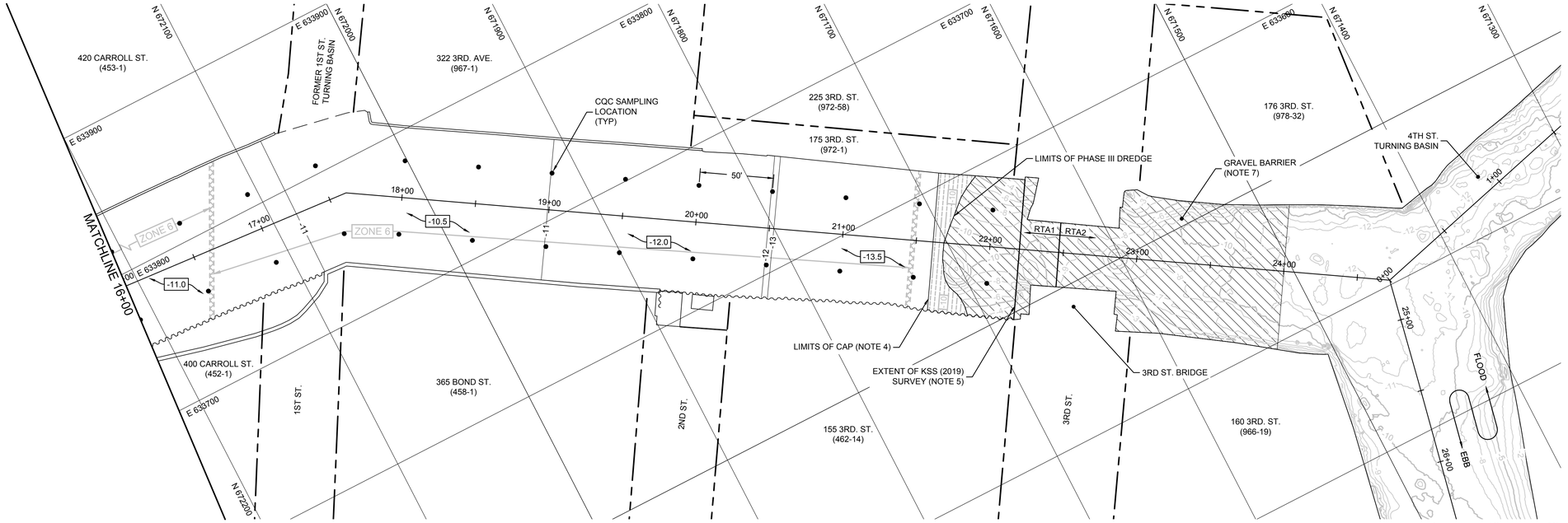
DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR029
REVIEWED BY:	JAS	DRAWING NO.:	C-2 OF 9
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

X:\GL_CAD\DERDESIGN\DESIGN\RTA1\DRAWINGS\HPH106A.DR029



66
C-3

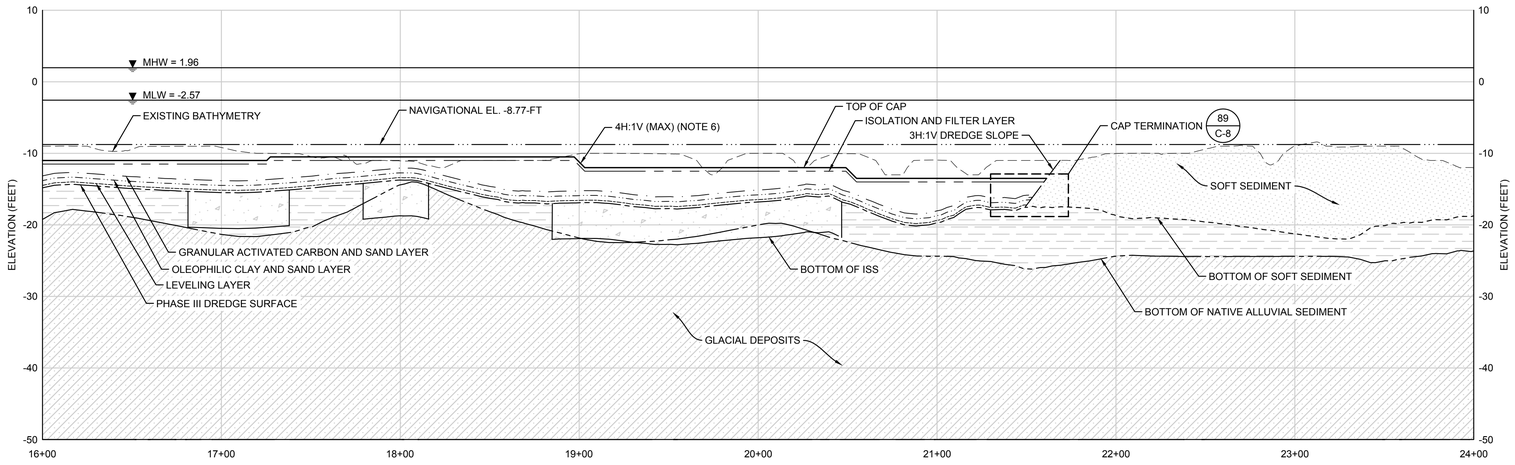
PLAN
TOP OF CAP (STA. 16+00 TO 24+00)

SCALE: 1" = 40'

0 40' 80'
SCALE IN FEET

LEGEND

-10	BATHYMETRY ELEVATION (1-FT)
-10	PHASE III DREDGE ELEVATION (1-FT)
-11	TOP OF CAP ELEVATION (NOTE 1)
	PROPERTY LINE
	WATER LEVEL
	NAVIGATIONAL ELEVATION
	EXISTING BATHYMETRY
	BOTTOM OF SOFT SEDIMENT
	BOTTOM OF NATIVE ALLUVIAL SEDIMENT
	PHASE III DREDGE SURFACE
	LEVELING LAYER
	OLEOPHILIC CLAY AND SAND LAYER
	GRANULAR ACTIVATED CARBON AND SAND LAYER
	ISOLATION AND FILTER LAYER
	TOP OF CAP
20+00	CANAL STATIONING
	CAP TREATMENT ZONE BOUNDARY
	SOFT SEDIMENT
	NATIVE ALLUVIAL SEDIMENT
	GLACIAL DEPOSITS
	ISS AREAS
	GRAVEL BARRIER
-11.0	CAPPING ELEVATION
(417-21)	BLOCK AND LOT
	CQC SAMPLING LOCATIONS (NOTE 2)
ZONE 1	CAP TREATMENT LAYER ZONES IN RTA1



DISTANCE (FEET)

67
C-3

PROFILE
TOP OF CAP (STA. 16+00 TO 24+00)

SCALE: 1" = 40' (HORIZONTAL); 1" = 10' (VERTICAL)

0 40' 80'
SCALE IN FEET (HORIZONTAL)

0 10' 20'
SCALE IN FEET (VERTICAL)

NOTES:

1. CAP ELEVATIONS PRESENTED ON THE DRAWING REPRESENT THE TOP OF CAP SURFACE AND ARE APPROXIMATE. THE CAP ELEVATIONS WERE OBTAINED BY BUILDING UP TO THE TOP OF ARMOR LAYER AND VARY WITHIN RTA1 BASED ON THE VARYING THICKNESSES OF THE UNDERLYING CAP TREATMENT LAYERS AND LEVELING LAYER. CAP CONSTRUCTION IS DESCRIBED IN THE RTA1 CAP AND CONSTRUCTION SEQUENCE DETAIL ON DRAWING C-7.
2. FOLLOWING FULL SCALE INSTALLATION OF EACH TREATMENT LAYER, IN-SITU CATCH PAN SAMPLES FOR CONSTRUCTION QUALITY CONTROL (CQC) SHALL BE COLLECTED IN ACCORDANCE WITH THE SPECIFICATION FOR CAP CONSTRUCTION TREATMENT LAYER - SECTION 35 43 00. CQC SAMPLE LOCATIONS SHOWN ON THIS DRAWING ARE EXAMPLES AND DO NOT REFLECT EXACT LOCATIONS THAT WILL BE CHOSEN IN THE FIELD.
3. AMENDMENTS AND MIXING RATIOS FOR THE CAP LAYERS DIFFER WITHIN RTA1. REFER TO THE CAP CONSTRUCTION SPECIFICATIONS (TREATMENT LAYER - SECTION 35 43 00 AND, ISOLATION AND ARMOR LAYER - SECTION 35 43 29) FOR INFORMATION ON AMENDMENTS AND MIXING RATIOS. DETAILS FOR THE CAP ARE PRESENTED ON DRAWINGS C-7, C-8 AND C-9.
4. CAP LAYERS WILL BE EXTENDED TO THE SOUTHERN LIMIT OF THE CAP (I.E., TOE OF THE DREDGE SLOPE). ON THE DREDGE SLOPE, THE CAP WILL BE CONSTRUCTED IN ACCORDANCE WITH THE CAP TERMINATION DETAIL PRESENTED ON DRAWING C-8.
5. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.
6. THE TIE-IN SLOPE BETWEEN THE TOP OF CAP SURFACE AT DIFFERENT ELEVATIONS WILL BE A MAXIMUM OF 4H:1V. THE ANGLE OF REPOSE OF MATERIAL MAY RESULT IN FLATTER SLOPES, WHICH IS ACCEPTABLE.
7. DURING ARMOR LAYER PLACEMENT IN RTA1, A 4 IN. THICK GRAVEL LAYER SHALL BE PLACED EXTENDING FROM THE LIMITS OF PHASE III DREDGE IN RTA1 UP TO STA 24+00 IN RTA2. THE GRAVEL LAYER WILL SERVE AS A BARRIER AND LIMIT RECONTAMINATION OF RTA1 FROM THE SOFT SEDIMENT IN RTA2. THE GRAVEL BARRIER IS SHOWN AS A HATCH PATTERN ON THIS DRAWING AND SPECIFICATIONS FOR THE GRAVEL ARE OUTLINED IN THE ISOLATION AND FILTER LAYER - SECTION 35 43 29.
8. THE BULKHEAD LIMITS SHOWN ARE THE EXISTING BULKHEAD LOCATIONS. CAPPING WILL BE CONDUCTED UPTO THE BRIDGE SUPPORT AND BULKHEAD SUPPORT INSTALLED BY THE CONTRACTOR, AND ANY NEW BULKHEADS INSTALLED BY PROPERTY OWNERS.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: CAPPING PLAN (STA. 16+00 TO 24+00)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR030
REVIEWED BY:	JAS	DRAWING NO.:	C-3 OF 9
APPROVED BY:	JFB		

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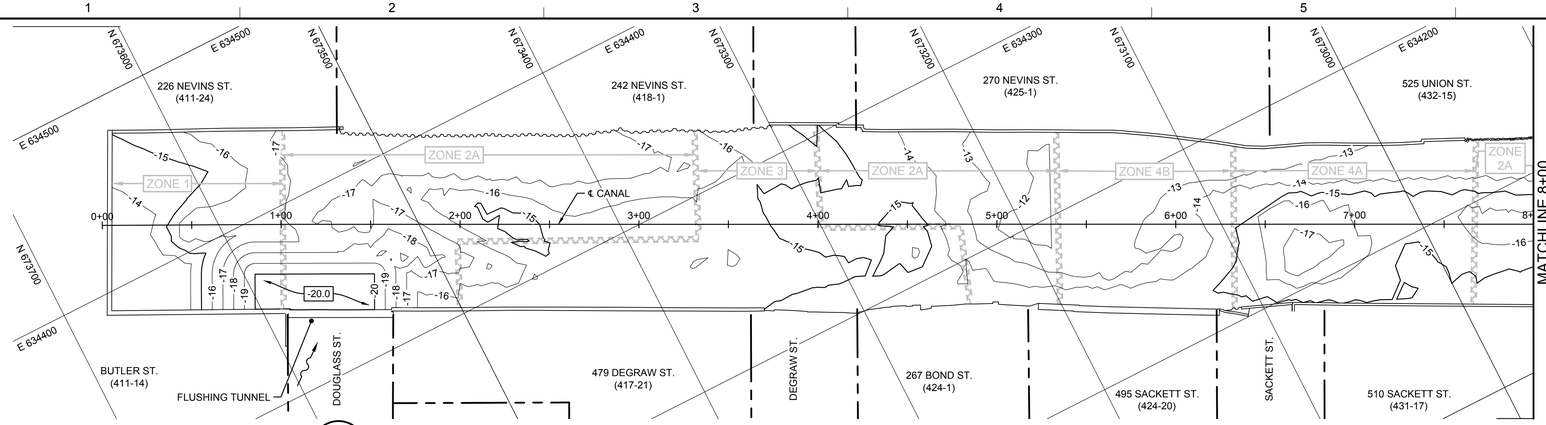
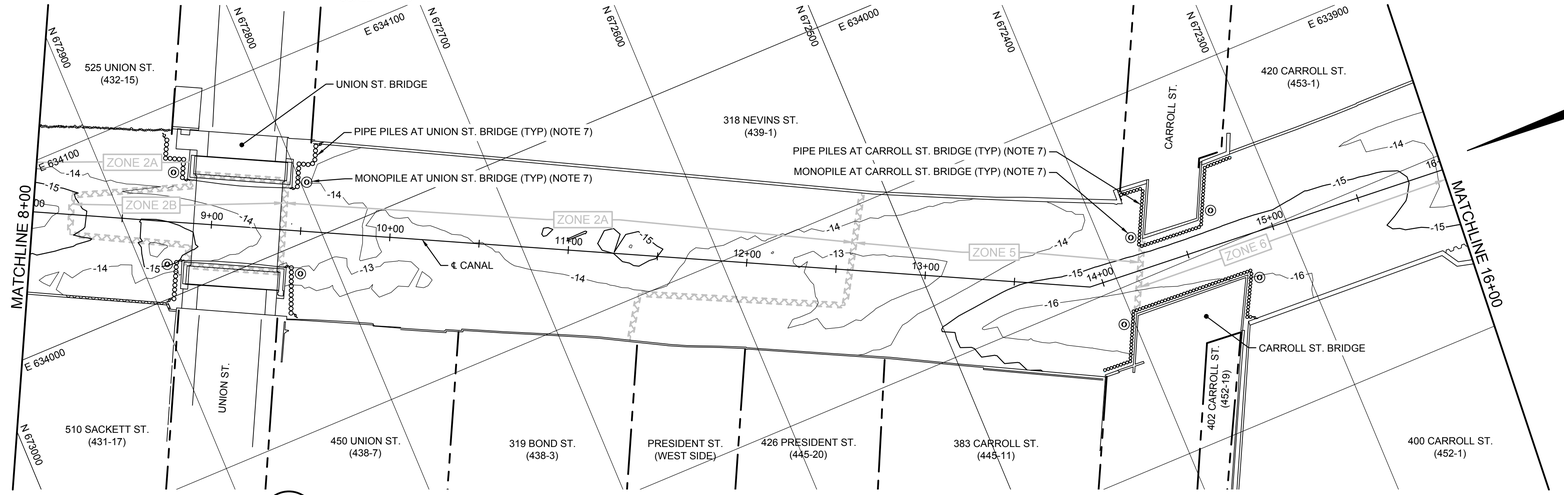
X:\06_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A-DR030



68 / C-4 PLAN

OLEOPHILIC CLAY AND SAND LAYER (STA 0+00 TO 8+00)

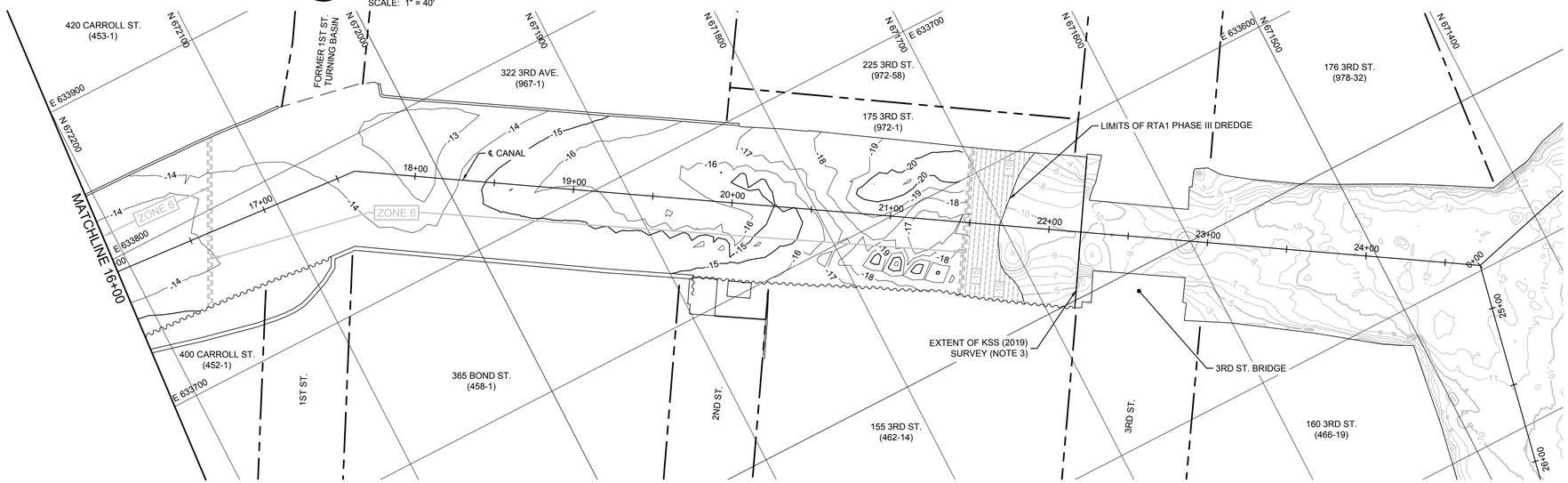
SCALE: 1" = 40'



69 / C-4 PLAN

OLEOPHILIC CLAY AND SAND LAYER (STA 8+00 TO 16+00)

SCALE: 1" = 40'



70 / C-4 PLAN

OLEOPHILIC CLAY AND SAND LAYER (STA 16+00 TO 24+00)

SCALE: 1" = 40'

LEGEND

- -10 — BATHYMETRY ELEVATION (1-FT)
- -10 — PHASE III DREDGE ELEVATION (1-FT)
- -10 — TOP OF OLEOPHILIC CLAY AND SAND LAYER (1-FT) (NOTE 1)
- PROPERTY LINE
- 5+00 — CANAL STATIONING
- CAP TREATMENT ZONE BOUNDARY
- 79 / C-7 ZONE 1 — CAP TREATMENT LAYER ZONES IN RTA1
- (417-21) — BLOCK AND LOT
- FLUSHING TUNNEL

NOTES:

1. THE PROPOSED TOP ELEVATIONS OF OLEOPHILIC CLAY (OC) LAYER ARE APPROXIMATE AND WILL VARY BASED ON THE DEPTH OF THE UNDERLYING PHASE III DREDGE SURFACE, AND LEVELING LAYER THICKNESS ACHIEVED IN THE FIELD.
2. THE MINIMUM THICKNESS AND MIX RATIOS FOR THE OC + SAND LAYER ARE PROVIDED IN THE SPECIFICATION FOR CAP CONSTRUCTION TREATMENT LAYER - SECTION 35 43 00.
3. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.
4. THE BULKHEAD LIMITS SHOWN ARE THE EXISTING BULKHEAD LOCATIONS. CAPPING WILL BE CONDUCTED UPTO THE BRIDGE SUPPORT AND BULKHEAD SUPPORT INSTALLED BY THE CONTRACTOR, AND ANY NEW BULKHEADS INSTALLED BY PROPERTY OWNERS.
5. THE TIE-IN SLOPE AT TRANSITION BOUNDARIES FOR THE CAP TREATMENT LAYER MATERIAL WILL BE A MAXIMUM OF 4H:1V. THE ANGLE OF REPOSE OF MATERIAL MAY RESULT IN FLATTER SLOPES, WHICH IS ACCEPTABLE. THE SIDE SLOPES OF THE CAP TREATMENT LAYER AT THE FLUSHING TUNNEL WILL BE AT 6H:1V.
6. AS A TEMPORARY PROTECTIVE MEASURE BETWEEN THE TIME OF CAP TREATMENT LAYER PLACEMENT AND MOBILIZATION OF EQUIPMENT FOR THE PLACEMENT OF ACB MATS, AN INTERIM CAP PROTECTION LAYER (APPROX. 35 FT IN LENGTH FROM THE HEAD OF THE CANAL) MAY BE PLACED ABOVE THE CAP TREATMENT LAYERS FOR EROSION PROTECTION AGAINST FLOWS FROM CSO RH-034. PRIOR TO PLACING THE ACB MATS FOR BUILDING THE TOP OF CAP SURFACE, THE PERMANENT 6 IN. THICK ISOLATION AND FILTER LAYER WILL BE PLACED ABOVE THE INTERIM CAP PROTECTION LAYER TO MATCH THE ISOLATION LAYER SHELF ELEVATION AT THE HEAD OF THE CANAL AS SHOWN ON DRAWING C-6 AND DESCRIBED IN SECTION 35 43 29.
7. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).

0 40' 80'

SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: OLEOPHILIC CLAY AND SAND LAYER

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

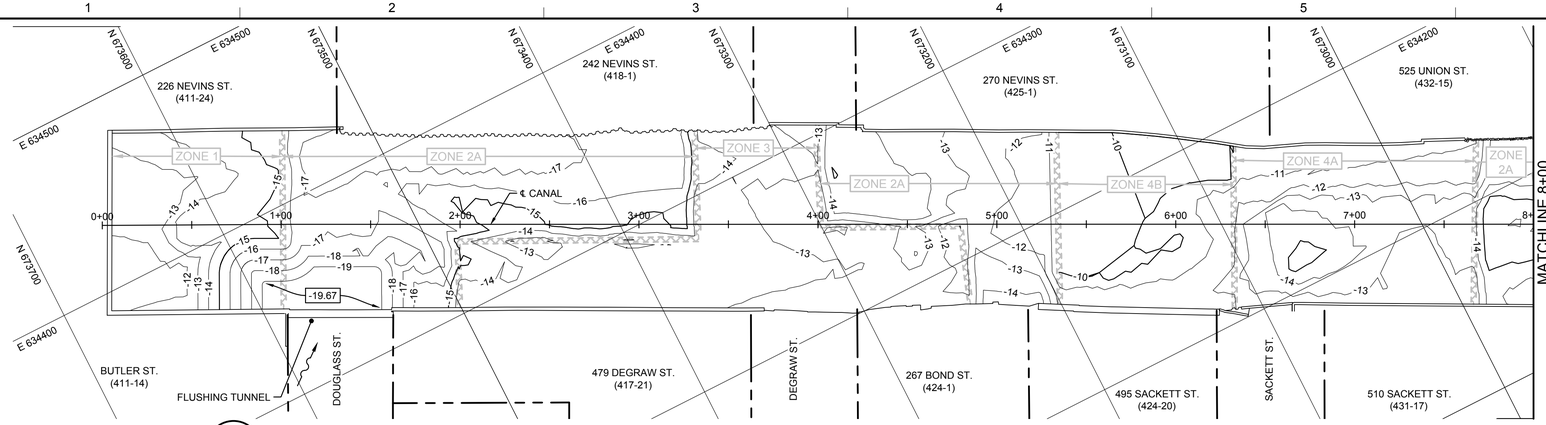
DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR062
REVIEWED BY:	JAS	DRAWING NO.:	C-4 OF 9
APPROVED BY:	JFB		

NOT ISSUED FOR CONSTRUCTION

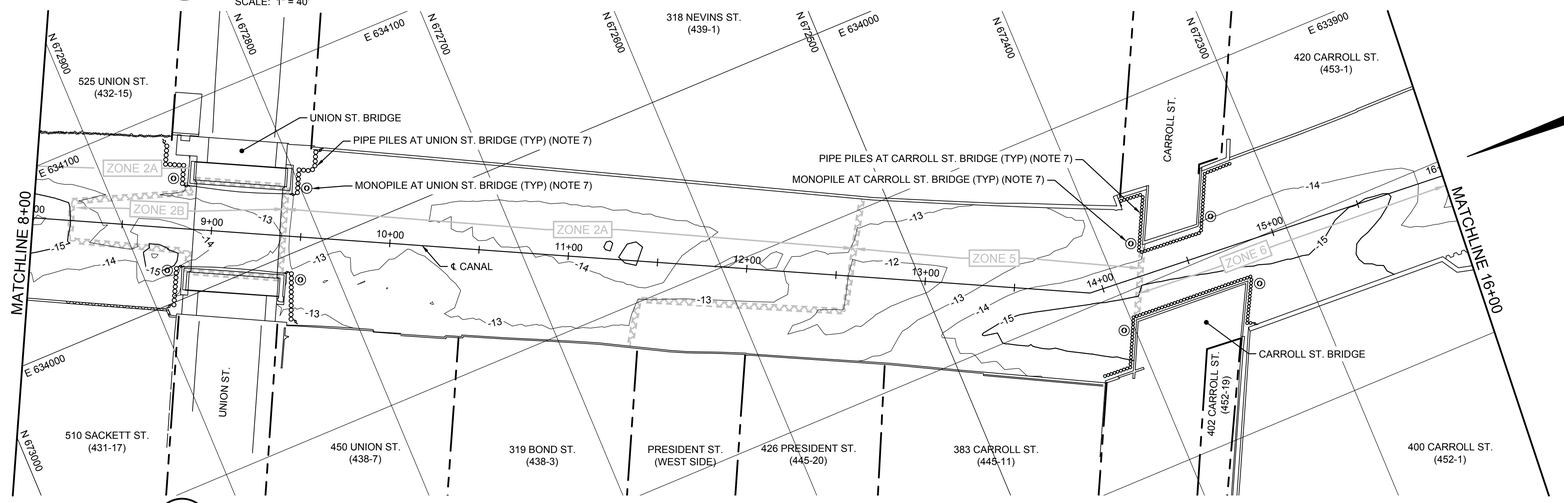
X:\GL_CAD\DREDGING DESIGN\RTA1\DRAWINGS\HPH106A.DR062



71 / C-5 PLAN

GRANULAR ACTIVATED CARBON AND SAND LAYER (STA 0+00 TO 8+00)

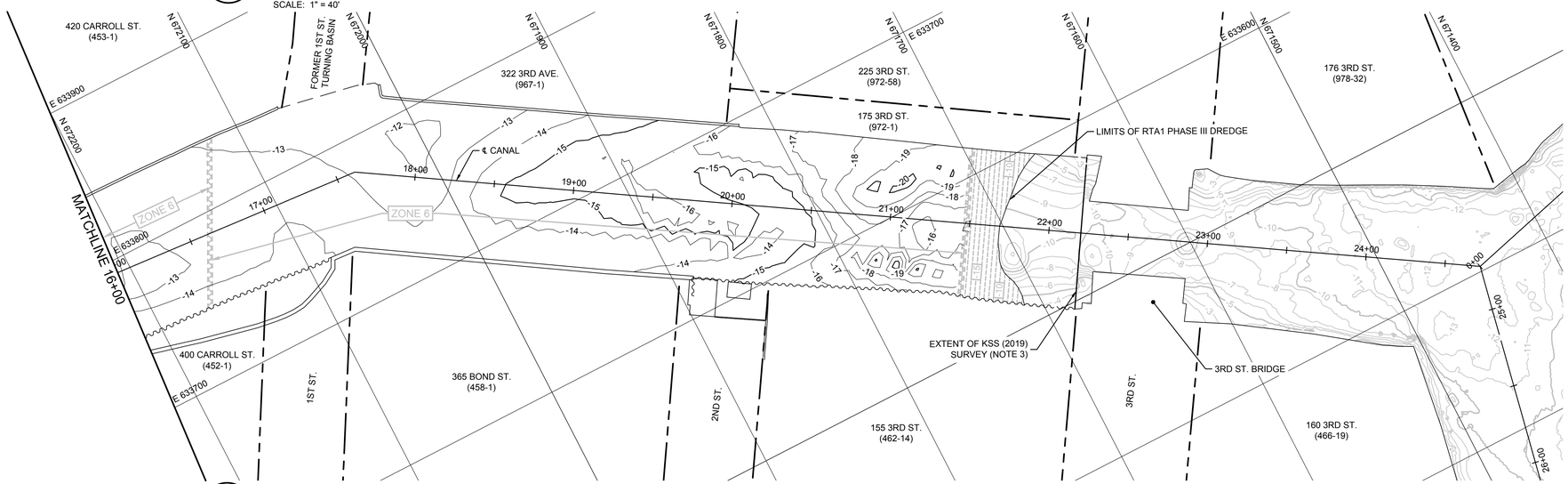
SCALE: 1" = 40'



72 / C-5 PLAN

GRANULAR ACTIVATED CARBON AND SAND LAYER (STA 8+00 TO 16+00)

SCALE: 1" = 40'



73 / C-5 PLAN

GRANULAR ACTIVATED CARBON AND SAND LAYER (STA 16+00 TO 24+00)

SCALE: 1" = 40'

LEGEND

- -10 — BATHYMETRY ELEVATION (1-FT)
- -10 — PHASE III DREDGE ELEVATION (1-FT)
- -15 — TOP OF GRANULAR ACTIVATED CARBON AND SAND LAYER (1-FT) (NOTE 1)
- PROPERTY LINE
- 5+00 — CANAL STATIONING
- CAP TREATMENT ZONE BOUNDARY (NOTE 2)
- 79 / C-7 ZONE 1 — CAP TREATMENT LAYER ZONES IN RTA1
- (417-21) — BLOCK AND LOT
- FLUSHING TUNNEL

NOTES:

1. THE PROPOSED TOP ELEVATIONS OF GRANULAR ACTIVATED CARBON (GAC) LAYER ARE APPROXIMATE AND WILL VARY BASED ON THE DEPTH OF THE UNDERLYING PHASE III DREDGE SURFACE, AND THICKNESSES OF LEVELING AND OC + SAND LAYERS ACHIEVED IN THE FIELD.
2. THERE ARE SIX ZONES WITH VARYING THICKNESSES AND/OR DOSAGES OF GAC + SAND LAYER IN RTA1. THESE ZONES ARE SUMMARIZED IN THE LEVELING AND CAP TREATMENT LAYER THICKNESS TABLE ON DRAWING C-7. MIX RATIOS FOR THE GAC + SAND LAYER ARE PROVIDED IN THE SPECIFICATION FOR CAP CONSTRUCTION TREATMENT LAYER - SECTION 35 43 00.
3. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.
4. THE BULKHEAD LIMITS SHOWN ARE THE EXISTING BULKHEAD LOCATIONS. CAPPING WILL BE CONDUCTED UPTO THE BRIDGE SUPPORT AND BULKHEAD SUPPORT INSTALLED BY THE CONTRACTOR, AND ANY NEW BULKHEADS INSTALLED BY PROPERTY OWNERS.
5. THE TIE-IN SLOPE AT TRANSITION BOUNDARIES FOR THE CAP TREATMENT LAYER MATERIAL WILL BE A MAXIMUM OF 4H:1V. THE ANGLE OF REPOSE OF MATERIAL MAY RESULT IN FLATTER SLOPES, WHICH IS ACCEPTABLE. THE SIDE SLOPES OF THE CAP TREATMENT LAYER AT THE FLUSHING TUNNEL WILL BE AT 6H:1V.
6. AS A TEMPORARY PROTECTIVE MEASURE BETWEEN THE TIME OF CAP TREATMENT LAYER PLACEMENT AND MOBILIZATION OF EQUIPMENT FOR THE PLACEMENT OF ACB MATS, AN INTERIM CAP PROTECTION LAYER (APPROX. 35 FT IN LENGTH FROM THE HEAD OF THE CANAL) MAY BE PLACED ABOVE THE CAP TREATMENT LAYERS FOR EROSION PROTECTION AGAINST FLOWS FROM CSO RH-034. PRIOR TO PLACING THE ACB MATS FOR BUILDING THE TOP OF CAP SURFACE, THE PERMANENT 6 IN. THICK ISOLATION AND FILTER LAYER WILL BE PLACED ABOVE THE INTERIM CAP PROTECTION LAYER TO MATCH THE ISOLATION LAYER SHELF ELEVATION AT THE HEAD OF THE CANAL AS SHOWN ON DRAWING C-6 AND DESCRIBED IN SECTION 35 43 29.
7. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).

0 40' 80'

SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.

an affiliate of Geosyntec Consultants

TITLE: GRANULAR ACTIVATED CARBON AND SAND LAYER

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
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KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR063
REVIEWED BY:	JAS	DRAWING NO.:	C-5
APPROVED BY:	JFB		OF 9

NOT ISSUED FOR CONSTRUCTION

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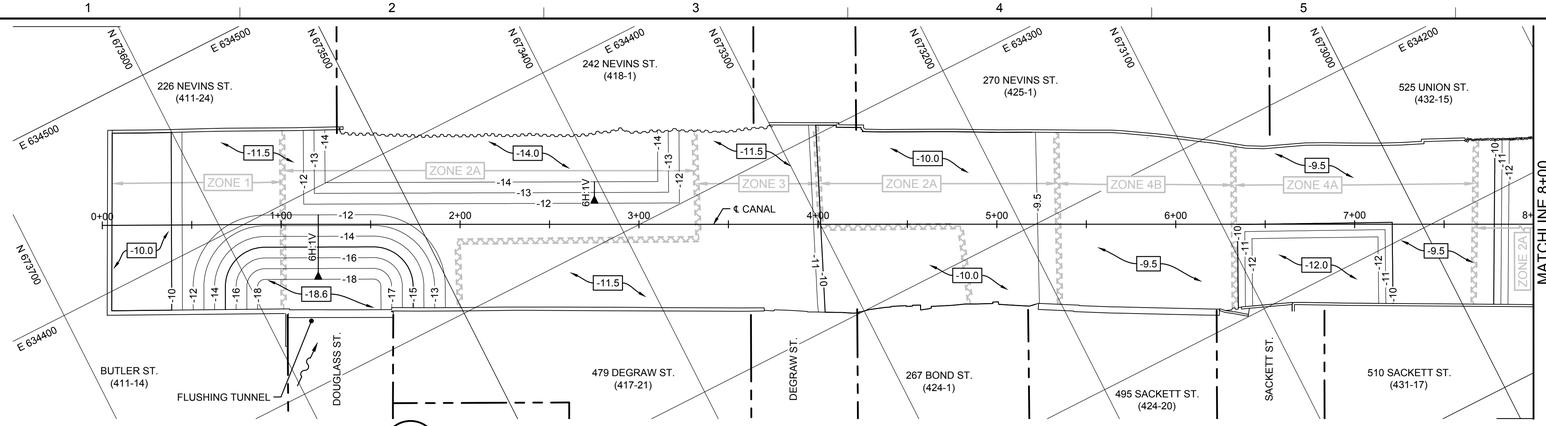
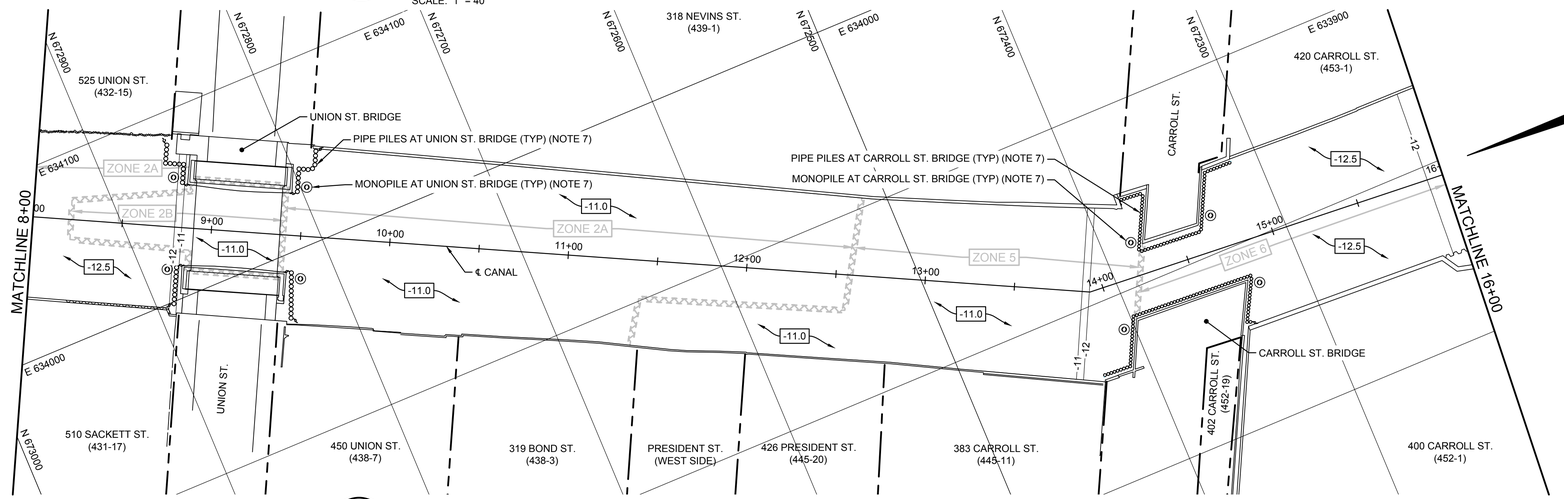
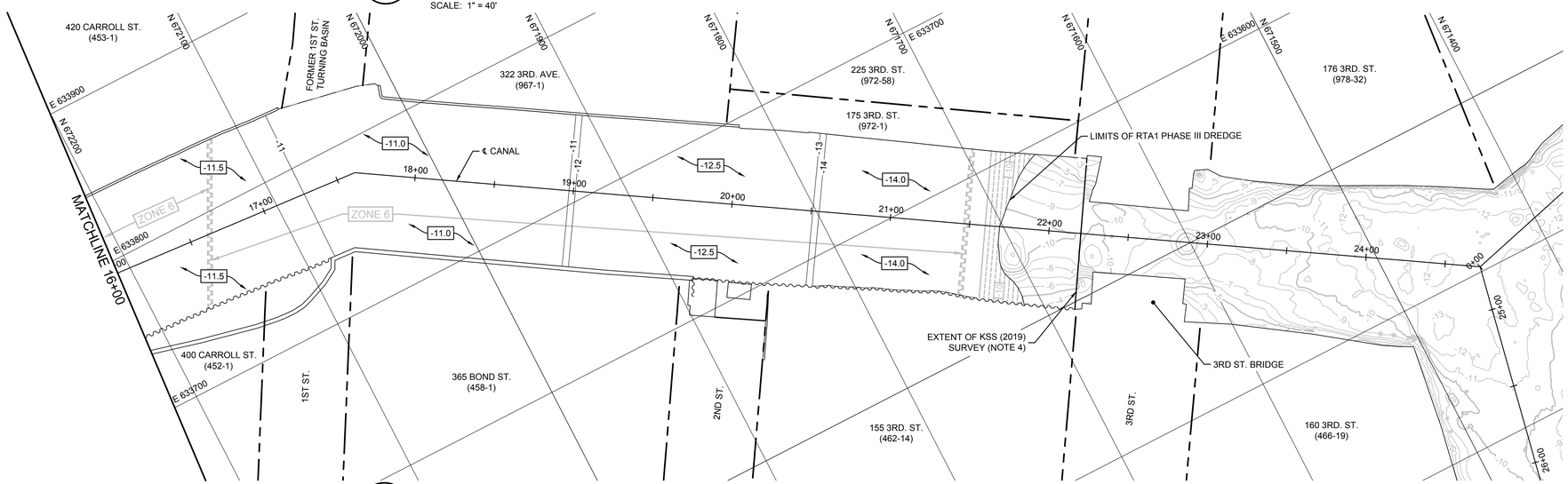


74 C-6 PLAN
ISOLATION AND FILTER LAYER (STA 0+00 TO 8+00)
SCALE: 1" = 40'



75 C-6 PLAN
ISOLATION AND FILTER LAYER (STA 8+00 TO 16+00)
SCALE: 1" = 40'



76 C-6 PLAN
ISOLATION AND FILTER LAYER (STA 16+00 TO 24+00)
SCALE: 1" = 40'

LEGEND

- -10 — BATHYMETRY ELEVATION (1-FT)
- -10 — PHASE III DREDGE ELEVATION (1-FT)
- -10 — TOP OF ISOLATION AND FILTER LAYER (NOTE 1)
- PROPERTY LINE
- 5+00 — CANAL STATIONING
- -11.0 — ISOLATION AND FILTER LAYER ELEVATION
- CAP TREATMENT ZONE BOUNDARY
- ZONE 1 — CAP TREATMENT LAYER ZONES IN RTA1
- (417-21) — BLOCK AND LOT
- FLUSHING TUNNEL

NOTES:

1. THE PROPOSED TOP ELEVATIONS OF ISOLATION AND FILTER LAYER SHELVES ARE APPROXIMATE AND WILL VARY BASED ON THE DEPTH OF THE UNDERLYING PHASE III DREDGE SURFACE, AND THICKNESSES OF LEVELING AND CAP TREATMENT LAYERS ACHIEVED IN THE FIELD.
2. THE THICKNESS OF ISOLATION AND FILTER LAYER WILL VARY WITHIN RTA1 (I.E. THICKER IN SOME AREAS) TO ACCOUNT FOR THE UNEVEN SURFACE OF THE UNDERLYING CAP TREATMENT LAYER AND TO HELP CREATE SHELVES OF UNIFORM ELEVATION FOR THE PLACEMENT OF ARMOR LAYER ON A RELATIVELY FLAT SURFACE. VERTICAL TOLERANCES ARE OUTLINED IN THE SPECIFICATION FOR ISOLATION AND ARMOR LAYER - SECTION 35 43 29. ANY MATERIAL PLACED BY THE CONTRACTOR OVER AND ABOVE THE MAXIMUM VERTICAL TOLERANCE SHALL BE CONSIDERED EXCESSIVE AND NOT PAID FOR BY THE OWNER.
3. THE TIE-IN SLOPE BETWEEN THE ISOLATION AND FILTER LAYER SHELVES AT DIFFERENT ELEVATIONS WILL BE A MAXIMUM OF 4H:1V. THE ANGLE OF REPOSE OF MATERIAL MAY RESULT IN FLATTER SLOPES, WHICH IS ACCEPTABLE. THE SIDE SLOPES OF THE ISOLATION AND FILTER LAYER AT THE FLUSHING TUNNEL AND THE ADJACENT AREA OPPOSITE 242 NEVINS ST. (418-1) WILL BE AT 6H:1V AS SHOWN ON THIS DRAWING.
4. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.
5. THE BULKHEAD LIMITS SHOWN ARE THE EXISTING BULKHEAD LOCATIONS. CAPPING WILL BE CONDUCTED UPTO THE BRIDGE SUPPORT AND BULKHEAD SUPPORT INSTALLED BY THE CONTRACTOR, AND ANY NEW BULKHEADS INSTALLED BY PROPERTY OWNERS.
6. AS A TEMPORARY PROTECTIVE MEASURE BETWEEN THE TIME OF CAP TREATMENT LAYER PLACEMENT AND MOBILIZATION OF EQUIPMENT FOR THE PLACEMENT OF ACB MATS, AN INTERIM CAP PROTECTION LAYER (APPROX. 35 FT IN LENGTH FROM THE HEAD OF THE CANAL) MAY BE PLACED ABOVE THE CAP TREATMENT LAYERS FOR EROSION PROTECTION AGAINST FLOWS FROM CSO RH-034. PRIOR TO PLACING THE ACB MATS FOR BUILDING THE TOP OF CAP SURFACE, THE PERMANENT 6 IN. THICK ISOLATION AND FILTER LAYER WILL BE PLACED ABOVE THE INTERIM CAP PROTECTION LAYER TO MATCH THE ISOLATION LAYER SHELF ELEVATION AT THE HEAD OF THE CANAL AS SHOWN ON THIS DRAWING AND DESCRIBED IN SECTION 35 43 29.
7. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).

0 40' 80'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	-	-
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	-	-

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: ISOLATION AND FILTER LAYER

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR065
REVIEWED BY:	JAS	DRAWING NO.:	C-6 OF 9
APPROVED BY:	JFB		

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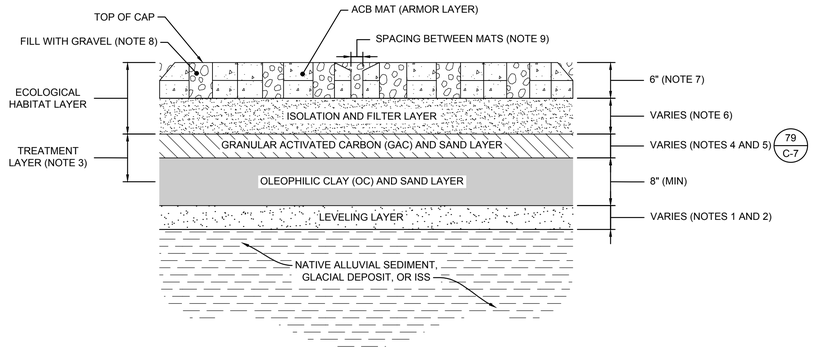


CONSTRUCTION SEQUENCE NOTES:

I. THE CONTRACTOR SHALL SUBMIT AN AS-BUILT SURVEY OF THE PHASE III DREDGE SURFACE TO THE OWNER'S REPRESENTATIVE FOR APPROVAL. THE DREDGE REQUIREMENT SPECIFICATIONS ARE DETAILED IN SECTION 35 20 23.13.

II. THE CONTRACTOR SHALL INSTALL A LEVELING LAYER IN ACCORDANCE WITH THE SPECIFICATIONS DETAILED IN SECTION 35 20 23.13. THE CONTRACTOR SHALL SUBMIT AN AS-BUILT SURVEY OF THE TOP OF LEVELING LAYER TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.

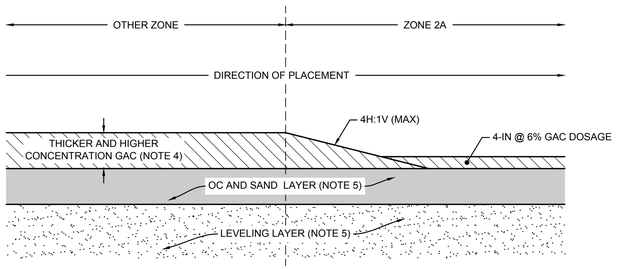
III. THE CONTRACTOR SHALL INSTALL AN OLEOPHILIC CLAY (OC) + SAND LAYER IN ACCORDANCE WITH THE SPECIFICATIONS DETAILED IN SECTION 35 43 00. THE CONTRACTOR SHALL SUBMIT AN AS-BUILT SURVEY OF THE TOP OF OC + SAND LAYER TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.

IV. THE CONTRACTOR SHALL INSTALL A GRANULAR ACTIVATED CARBON (GAC) + SAND LAYER IN ACCORDANCE WITH THE SPECIFICATIONS DETAILED IN SECTION 35 43 00. THE CONTRACTOR SHALL SUBMIT AN AS-BUILT SURVEY OF THE TOP OF GAC + SAND LAYER TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.

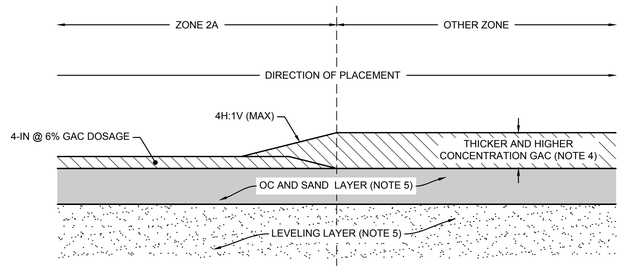
V. THE CONTRACTOR SHALL INSTALL AN ISOLATION AND FILTER LAYER IN ACCORDANCE WITH THE SPECIFICATIONS DETAILED IN SECTION 35 43 29. THE CONTRACTOR SHALL SUBMIT AN AS-BUILT SURVEY OF THE TOP OF ISOLATION AND FILTER LAYER TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.

VI. THE CONTRACTOR SHALL WORK WITH THE ACB MAT MANUFACTURER TO DESIGN AN ACB MAT LAYOUT PLAN SPECIFIC TO RTA1 THAT MEETS THE REQUIREMENTS OF SPECIFICATIONS DETAILED IN SECTION 35 43 29 AND IS IN ACCORDANCE WITH THE REPRESENTATIVE ACB MAT LAYOUT SHOWN ON DRAWING C-9. THE CONTRACTOR SHALL PROVIDE THE ACB MAT LAYOUT PLAN IN RTA1 FOR OWNER'S APPROVAL BEFORE ORDERING THE MATS.

77 / C-7 DETAIL
RTA1 CAP AND CONSTRUCTION SEQUENCE
SCALE: 1" = 1'



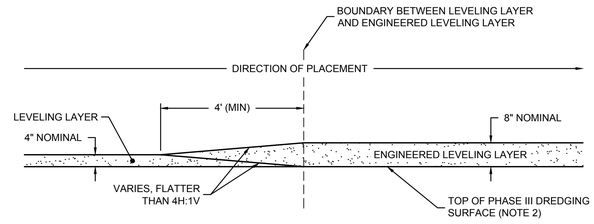
78 / C-7 DETAIL
GAC TRANSITION TYPE I
SCALE: 1" = 2'



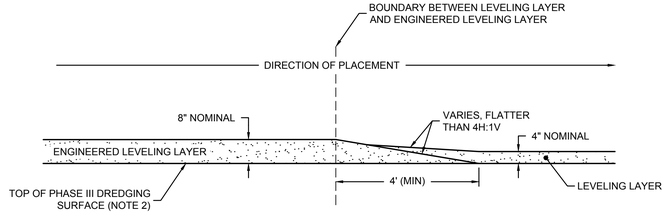
81 / C-7 DETAIL
GAC TRANSITION TYPE II
SCALE: 1" = 2'

CAP LAYER	MINIMUM THICKNESS (IN.) BY ZONE							
	1	2A	2B	3	4A	4B	5	6
LEVELING	4	4	8	8	4	4	4	4
OLEOPHILIC CLAY AND SAND	8	8	8	8	8	8	8	8
GRANULAR ACTIVATED CARBON AND SAND (DOSAGE)	20 (40%)	4 (6%)	9 (12%)	26 (40%)	28 (40%)	36 (50%)	12 (40%)	8 (12%)

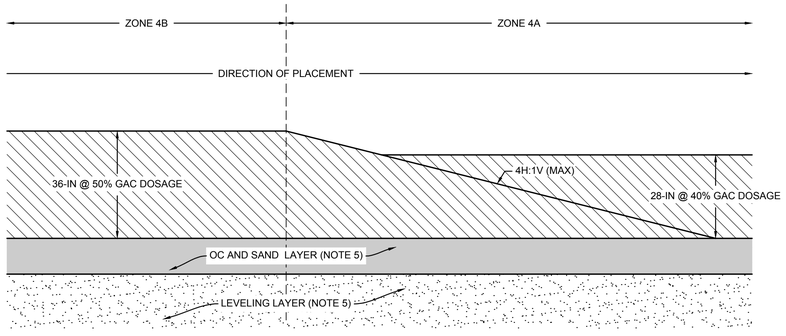
79 / DR-14 TABLE
LEVELING AND CAP TREATMENT LAYER THICKNESS



80 / C-7 DETAIL
LEVELING LAYER TRANSITION TYPE I
SCALE: 1" = 2'



82 / C-7 DETAIL
LEVELING LAYER TRANSITION TYPE II
SCALE: 1" = 2'



83 / C-7 DETAIL
GAC TRANSITION TYPE III
SCALE: 1" = 1'

NOTES:

1. AN ENGINEERED LEVELING LAYER WITH A TYPICAL THICKNESS OF 8 IN. AND A MINIMUM AND MAXIMUM THICKNESS OF 6 IN. AND 10 IN., RESPECTIVELY SHALL BE PLACED IN ZONES 2B AND 3 OF RTA1. A SAND LEVELING LAYER WITH A TYPICAL THICKNESS OF 4 IN. AND A MINIMUM AND MAXIMUM THICKNESS OF 3 IN. AND 6 IN., RESPECTIVELY SHALL BE PLACED IN THE REMAINING ZONES WITHIN RTA1 (I.E. ZONES 1, 2A, 4A, 4B, 5, AND 6). SPECIFICATIONS FOR THE LEVELING LAYER ARE PROVIDED IN SECTION 35 20 23.13.
2. LEVELING LAYER SHALL BE PLACED ATOP THE PHASE III DREDGE SURFACE. TWO LEVELING LAYER TRANSITION DETAILS ARE PRESENTED ON THIS DRAWING. THE TOP OF PHASE III DREDGE SURFACE IS SHOWN AS A FLAT SURFACE ON THE LEVELING LAYER TRANSITION DETAILS FOR CLARITY.
3. THE CAP WILL HAVE A TREATMENT LAYER CONSISTING OF OC + SAND LAYER OVERLAIN BY GAC + SAND LAYER. AMENDMENTS AND MIXING RATIOS FOR THE CAP TREATMENT LAYER DIFFER WITHIN RTA1 AND ARE SPECIFIED IN SECTION 35 43 00.
4. THERE ARE SIX ZONES WITH VARYING THICKNESSES AND DOSAGES OF GAC + SAND LAYER IN RTA1. THESE ZONES ARE SUMMARIZED IN THE LEVELING AND CAP TREATMENT LAYER THICKNESS TABLE ON THIS DRAWING.
5. GAC + SAND LAYER SHALL BE PLACED ATOP THE OC + SAND AND LEVELING LAYERS. THREE GAC TRANSITION DETAILS ARE PRESENTED ON THIS DRAWING. THE TOP OF OC + SAND AND LEVELING LAYERS ARE SHOWN AS A FLAT SURFACE ON THE GAC TRANSITION DETAILS FOR CLARITY.
6. THE THICKNESS OF ISOLATION AND FILTER LAYER WILL VARY WITHIN RTA1 TO ACCOUNT FOR THE UNEVEN SURFACE OF THE UNDERLYING CAP TREATMENT LAYER AND TO HELP CREATE SHELVES OF UNIFORM ELEVATION FOR THE PLACEMENT OF ARMOR LAYER ON A RELATIVELY FLAT SURFACE. THE ISOLATION AND FILTER LAYER COMBINED WITH THE GRAVEL PLACED WITHIN THE VOIDS OF AND ATOP THE ACB MATS WILL SERVE AS THE ECOLOGICAL HABITAT LAYER FOR PROMOTING BENTHIC RECOLONIZATION.
7. THE ARMOR LAYER WILL CONSIST OF 6 IN. THICK ACB MATS DESIGNED TO WITHSTAND PROPELLER WASH FORCES OF VESSELS ENTERING RTA1 FOR CAP MAINTENANCE AND MONITORING. GRAVEL WILL BE PLACED WITHIN THE VOIDS OF AND ATOP THE ACB MATS SUCH THAT APPROXIMATELY 2 IN. OF EXCESS GRAVEL SITS ABOVE THE ACB MATS. CLOSED ACB MATS SHALL BE INSTALLED AT CRITICAL LOCATIONS SUCH AS THE HEAD OF THE CANAL AND NEAR BRDIGE OPENINGS WHERE LARGER HYDRODYNAMIC FORCES ARE ANTICIPATED. ACB MAT PLACEMENT WITHIN RTA1 IS SHOWN ON DRAWING C-9.
8. THE TWO IN. OF EXCESS GRAVEL PLACED ATOP ACB MATS ARE NOT SHOWN FOR CLARITY.
9. THE TYPICAL SPACING BETWEEN ACB MATS IS OUTLINED IN THE SPECIFICATION FOR ISOLATION AND ARMOR LAYER - SECTION 35 43 29.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: CAP DETAILS (1 OF 3)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR033
REVIEWED BY:	JAS	DRAWING NO.:	C-7 OF 9
APPROVED BY:	JFB		

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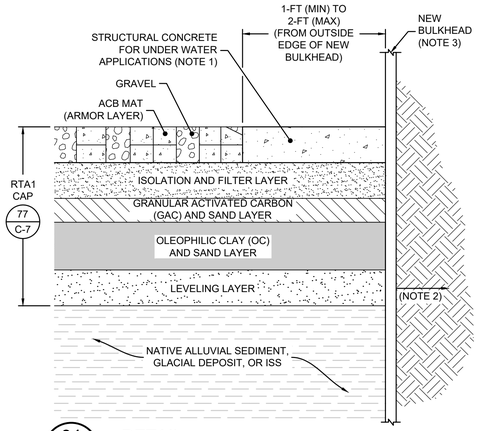
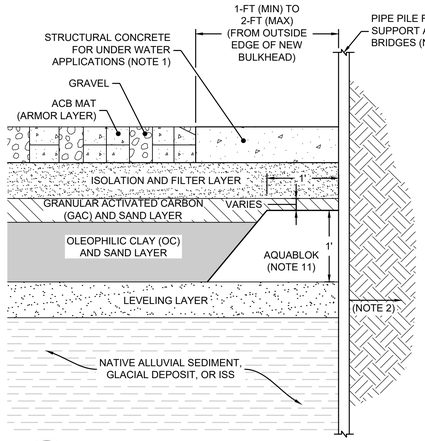
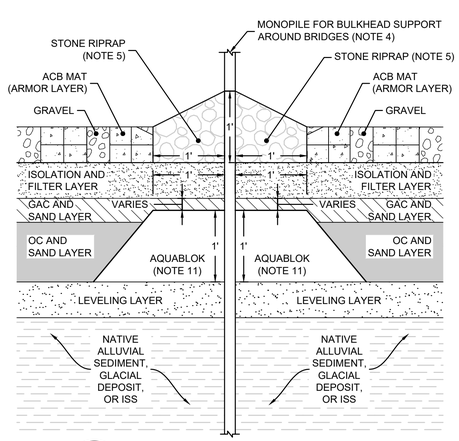


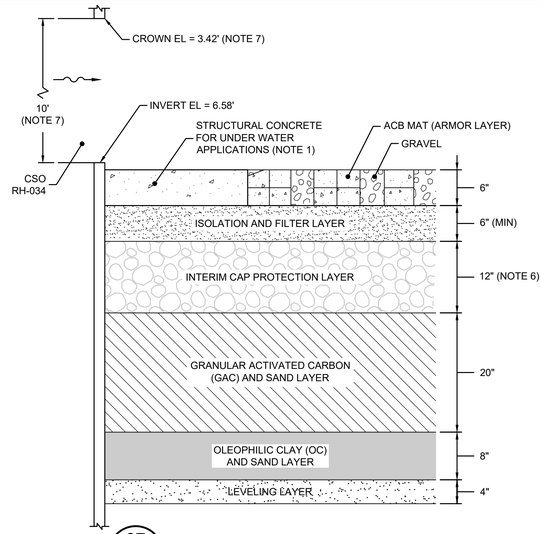
84 C-8 DETAIL
STRUCTURAL CONCRETE ALONG BULKHEAD EDGES
SCALE: 1" = 1'



85 C-8 DETAIL
CAP SCHEMATIC AND AQUABLOK INSTALLATION ALONG PIPE PILES
SCALE: 1" = 1'



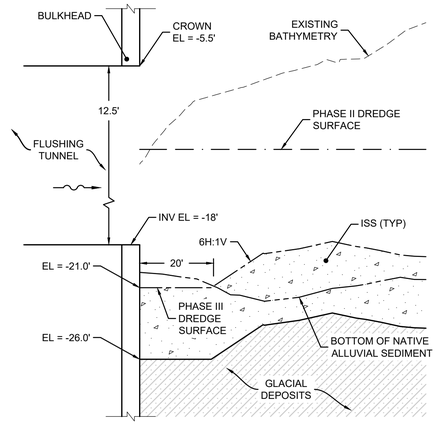
86 C-8 DETAIL
CAP SCHEMATIC AND AQUABLOK INSTALLATION ALONG MONOPILES
SCALE: 1" = 1'



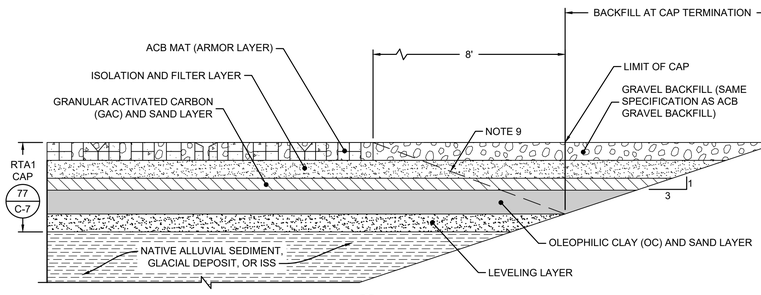
87 C-1 DETAIL
INTERIM CAP PROTECTION LAYER AT THE HEAD OF CANAL
SCALE: 1" = 1'

LEGEND

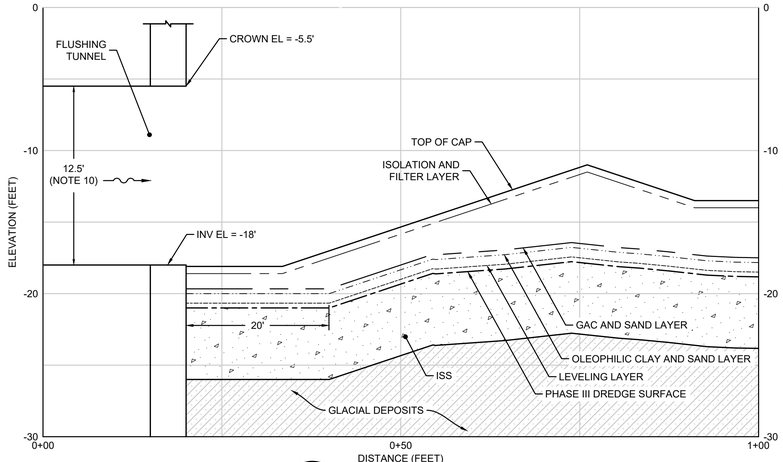
- EXISTING BATHYMETRY
- BOTTOM OF NATIVE ALLUVIAL SEDIMENT
- PHASE II DREDGE SURFACE
- PHASE III DREDGE SURFACE
- LEVELING LAYER
- OLEPHILIC CLAY AND SAND LAYER
- GRANULAR ACTIVATED CARBON AND SAND LAYER
- ISOLATION AND FILTER LAYER
- TOP OF CAP
- NATIVE ALLUVIAL SEDIMENT
- GLACIAL DEPOSITS
- ISS



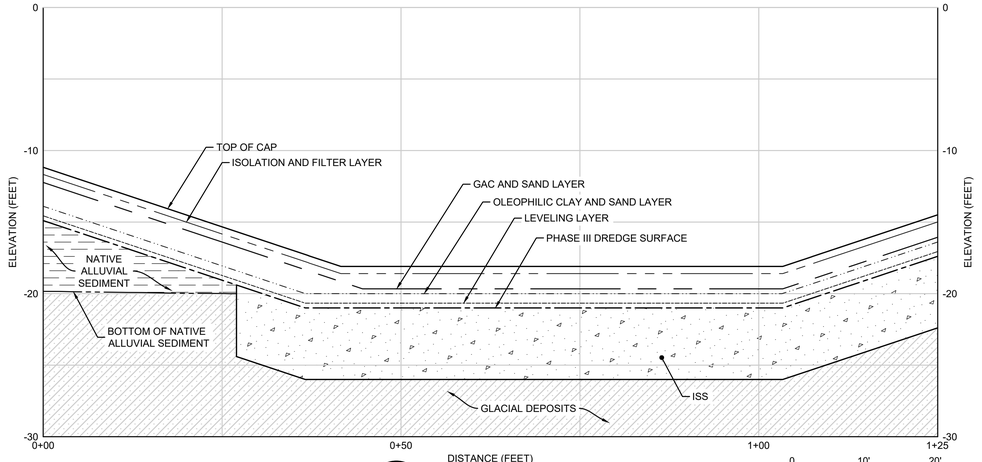
88 ISS-1 DETAIL
ISS NEAR FLUSHING TUNNEL
(NOTE 8)
SCALE: 1" = 20'



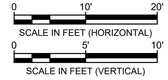
89 C-3 DETAIL
CAP TERMINATION
SCALE: 1" = 2'



G C-1 SECTION
CAP AT FLUSHING TUNNEL
SCALE: 1" = 10' (HORIZONTAL); 1" = 5' (VERTICAL)



H C-1 SECTION
CAP AT FLUSHING TUNNEL
SCALE: 1" = 10' (HORIZONTAL); 1" = 5' (VERTICAL)



NOTES:

1. STRUCTURAL CONCRETE PLACED UNDER WATER SHALL BE FLUSH WITH THE TOP OF ACB MATS AND HAVE A THICKNESS OF 6 IN. PLUS OR MINUS 2 IN.
2. THE DETAIL OF BULKHEAD SUPPORT PROVIDED ON THIS DRAWING IS APPROXIMATE. SEVERAL DIFFERENT BULKHEAD TYPES ARE PRESENT ALONG THE CANAL AND THE DETAIL IS PRESENTED AS AN EXAMPLE OF WHERE THE STRUCTURAL CONCRETE SHALL BE PLACED RELATIVE TO THE CAP AND OUTSIDE EDGE OF THE BULKHEAD.
3. DESIGN AND INSTALLATION OF NEW BULKHEAD SUPPORTS IN FRONT OF EXISTING BULKHEADS WILL BE PROVIDED BY OTHERS AS PART OF A SEPARATE DESIGN PACKAGE.
4. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).
5. THE SIZE OF STONE RIPRAP USED FOR ANCHORING AROUND THE MONOPILE INSTALLATION AT THE UNION AND CARROLL ST. BRIDGES SHALL BE THE SAME AS THE STONE SIZE USED FOR THE INTERIM CAP PROTECTION LAYER AND IS OUTLINED IN THE SPECIFICATION FOR ISOLATION AND ARMOR LAYER - SECTION 35 43 29.
6. AS A TEMPORARY PROTECTIVE MEASURE BETWEEN THE TIME OF CAP TREATMENT LAYER PLACEMENT AND MOBILIZATION OF EQUIPMENT FOR THE PLACEMENT OF ACB MATS, AN INTERIM CAP PROTECTION LAYER (40 FT IN LENGTH FROM THE HEAD OF THE CANAL) MAY BE PLACED ABOVE THE CAP TREATMENT LAYERS FOR EROSION PROTECTION AGAINST FLOWS FROM CSO RH-034. THE STONE SIZE, THICKNESS AND MAXIMUM VERTICAL TOLERANCES FOR THE INTERIM CAP PROTECTION LAYER ARE OUTLINED IN THE SPECIFICATION FOR ISOLATION AND ARMOR LAYER - SECTION 35 43 29. PRIOR TO PLACEMENT OF THE ACB MATS, THE PERMANENT 6 IN. THICK ISOLATION AND FILTER LAYER SHALL BE PLACED ABOVE THE INTERIM CAP PROTECTION LAYER IN ACCORDANCE WITH THE ELEVATION OF TOP OF ISOLATION LAYER SHELF AT THE HEAD OF THE CANAL, AS SHOWN ON DRAWING C-6 AND SECTION 35 43 29.
7. THE CROWN ELEVATION AND SIZE OF CULVERT OPENING FOR CSO RH-034 WAS DETERMINED FROM THE RESULTS OF A TOPOGRAPHIC SURVEY CONDUCTED IN RTA1 BY KENNON SURVEYING SERVICES INC. (KSS) AND DATED 15 JULY 2019.
8. RTA1 CAP ABOVE ISS IS NOT SHOWN ON THE DETAIL FOR CLARITY.
9. DREDGING AS PART OF FUTURE, SEPARATE REMEDIATION SOUTH OF THE 3RD ST. BRIDGE WILL START AT THE INTERFACE BETWEEN THE GRAVEL BACKFILL AND ACB MATS.
10. COMMUNICATIONS WITH NYCDEP ON 16 MAY 2019 AND JULY 17 2019 STATED THE DIAMETER OF THE FLUSHING TUNNEL IS 12 FT AND INVERT IS -19.34 FT BROOKLYN DATUM (APPROX. = -18 FT-NAVD88). THIS IS SIMILAR TO THE HISTORICAL DRAWING WHICH INDICATES THE INVERT AT THE DISCHARGE POINT INTO THE CANAL IS AT -19 FT BROOKLYN DATUM (APPROX. = -17.6 FT-NAVD88) AND HEIGHT OF THE FLUSHING TUNNEL IS 12.5 FT. FOR THE PURPOSES OF FLUSHING TUNNEL DETAILS ON THIS DRAWING, THE INVERT IS PRESENTED AT -18 FT-NAVD88 AND HEIGHT OF 12.5 FT, HOWEVER, THESE SHALL BE VERIFIED IN THE FIELD.
11. AQUABLOK WILL BE PLACED ABOVE THE LEVELING LAYER AND EXTEND 1 FT LATERALLY FROM THE EDGE OF PIPE PILES OR MONOPILES INSTALLED AROUND THE UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT. THE SIDE SLOPE WHILE PLACING AQUABLOK WILL BE A MAXIMUM OF 4H:1V.

REV	DATE	DESCRIPTION	DRN	APP
E	02.28.20	RTA1 100% REMEDIAL DESIGN	SRN	JFB
D	09.27.19	RTA1 90% REMEDIAL DESIGN	SRN	JFB
C	11.20.17	RTA1 65% REMEDIAL DESIGN	SRN	JFB
B	12.23.16	RTA1 35% REMEDIAL DESIGN - CAPPING AND ISS	SRN	JFB
A	10.31.16	RTA1 35% REMEDIAL DESIGN – DREDGING AND TREATMENT	SRN	JFB

Gowanus Canal Remedial Design Group

B&B Engineers & Geologists of new york, p.c.
an affiliate of Geosyntec Consultants

TITLE: CAP DETAILS (2 OF 3)

PROJECT: REMEDIATION TARGET AREA (RTA) 1
100% REMEDIAL DESIGN

SITE: GOWANUS CANAL SUPERFUND SITE, BROOKLYN, NEW YORK

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

ENGINEER OF RECORD
JOHN F. BEECH, Ph.D., P.E. (NY, GA)
1255 ROBERTS BOULEVARD
SUITE 200
KENNESAW, GA 30144

DESIGN BY:	SS	DATE:	FEBRUARY 2020
DRAWN BY:	SRN	PROJECT NO.:	HPH106A
CHECKED BY:	SS	FILE:	HPH106A-DR066
REVIEWED BY:	JAS	DRAWING NO.:	C-8 OF 9
APPROVED BY:	JFB		

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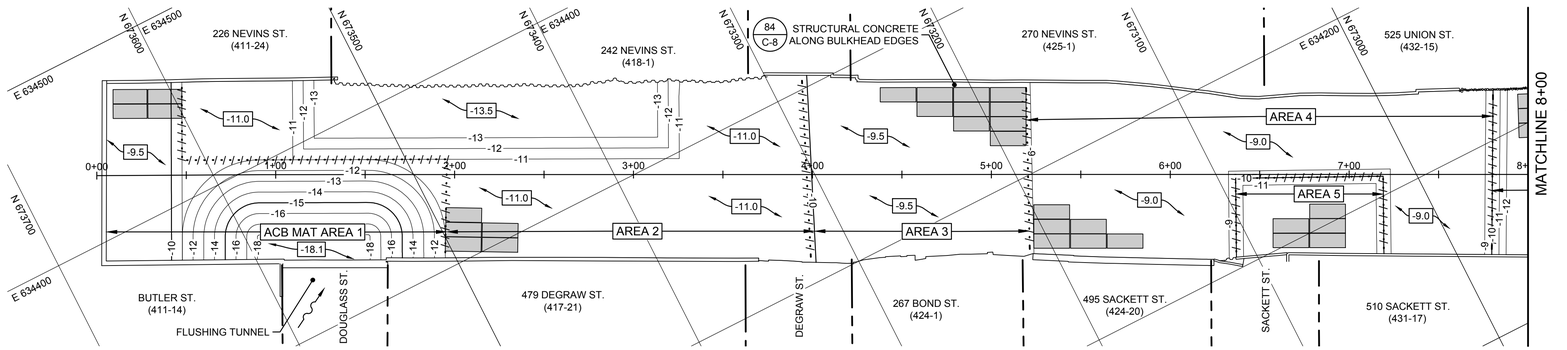
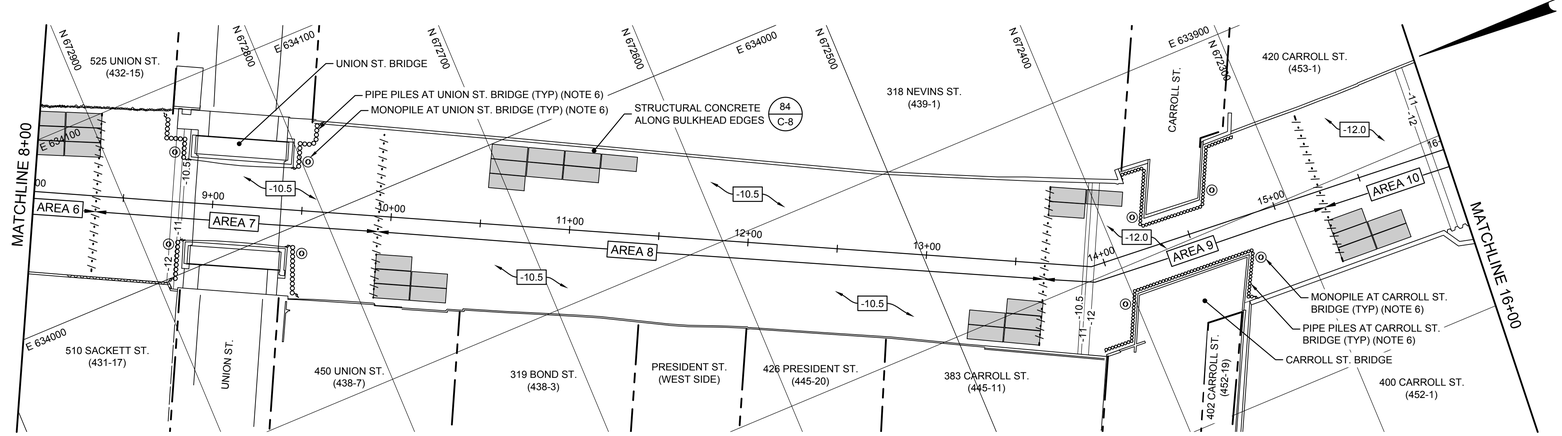
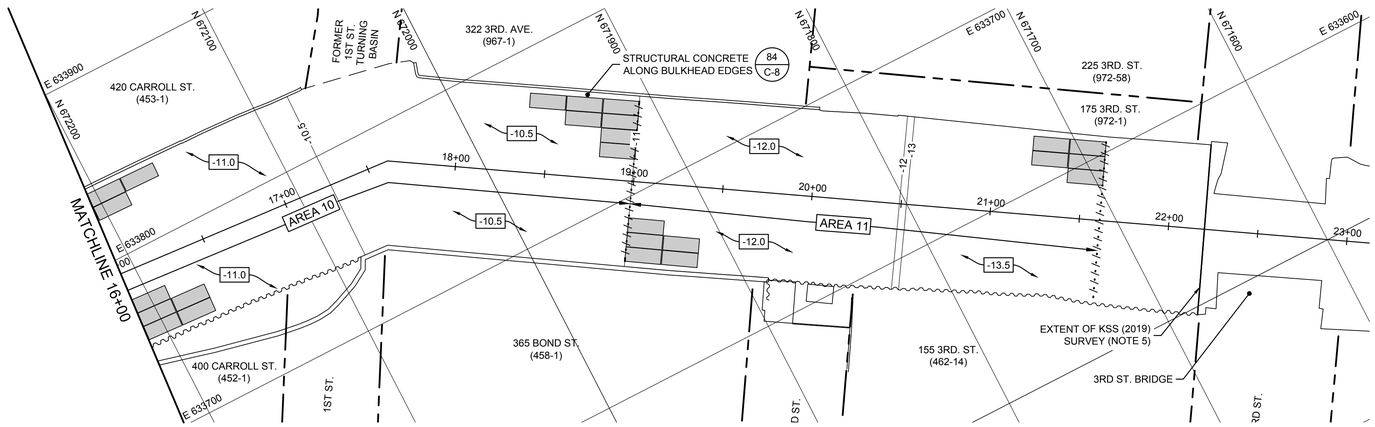


90 C-9 PLAN
ACB MAT LAYOUT (STA 0+00 TO 8+00)
SCALE: 1" = 40'

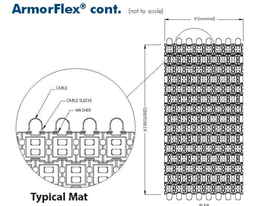


91 C-9 PLAN
ACB MAT LAYOUT (STA 8+00 TO 16+00)
SCALE: 1" = 40'



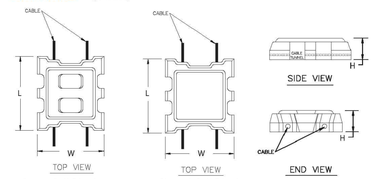
92 C-9 PLAN
ACB MAT LAYOUT (STA 16+00 TO 24+00)
SCALE: 1" = 40'

ArmorFlex® cont. (not to scale)



Typical Mat

ArmorFlex® (not to scale)



Open Cell Block | Closed Cell Block

ArmorFlex Unit Specification

Concrete Block Class	Open/Closed Cell	Nom. Dimensions (in.) L	W	H	Gross Area/ (sq. ft.)	Min. Block Weight lbs	lbs/sq. ft.	Open Area %
30S	Open	13	11.6	4.75	0.98	33	35	20
50S	Open	13	11.6	6	0.98	42	50	20
40	Open	17.4	15.5	4.75	1.77	59	40	20
50	Open	17.4	15.5	6	1.77	76	50	20
70	Open	17.4	15.5	8.5	1.77	108	70	20
40L	Open	17.4	23.6	4.75	2.58	97	40	20
50L	Open	17.4	23.6	6	2.58	116	50	20
70L	Open	17.4	23.6	8.5	2.58	174	70	20
45S	Closed	13	11.6	4.75	0.98	39	45	10
55S	Closed	13	11.6	6	0.98	50	55	10
45	Closed	17.4	15.5	4.75	1.77	71	45	10
55	Closed	17.4	15.5	6	1.77	91	55	10
80	Closed	17.4	15.5	8.5	1.77	136	85	10
45L	Closed	17.4	23.6	4.75	2.58	109	45	10
55L	Closed	17.4	23.6	6	2.58	138	55	10
85L	Closed	17.4	23.6	8.5	2.58	207	85	10
High Velocity Application Block Classes								
40-T	Open	17.4	15.5	4.75	1.77	58	40	20
50-T	Open	17.4	15.5	6.00	1.77	75	50	20
70-T	Open	17.4	15.5	8.50	1.77	109	70	20

93 C-9 DETAIL
ACB MAT
(NOTE 2)
SCALE: NTS

RTA1 ACB MAT AREAS	RECOMMENDED ACB CLASS TYPE (NOTE 2)	THICKNESS OF RECOMMENDED ACB (IN.)	CELL CONFIGURATION
1	55L	6	CLOSED
2	50	6	OPEN
3	50L	6	OPEN
4	55L	6	CLOSED
5	50	6	OPEN
6	50	6	OPEN
7	55	6	CLOSED
8	50	6	OPEN
9	55	6	CLOSED
10	50	6	OPEN
11	50	6	OPEN

94 C-9 TABLE
ACB MAT AREAS

NOTES:

1. THE ACB MAT LAYOUT WAS SUBDIVIDED INTO ELEVEN AREAS BASED ON VARIABLE TOP OF CAP ELEVATIONS IN RTA1. CLOSED ACB MATS SHALL BE INSTALLED AT CRITICAL LOCATIONS SUCH AS THE HEAD OF THE CANAL AND NEAR BRIDGE OPENINGS WHERE LARGER HYDRODYNAMIC FORCES ARE ANTICIPATED. THE RECOMMENDED ACB CLASS TYPE, THICKNESS AND CELL CONFIGURATION FOR EACH AREA IS SUMMARIZED IN THE ACB MAT AREAS TABLE ON THIS DRAWING. THE DIVISION OF RTA1 INTO ELEVEN ACB MAT AREAS IS ONLY FOR THE PURPOSES OF ACB MAT PLACEMENT AND IS DIFFERENT FROM THE CAP TREATMENT ZONES OUTLINED IN THE LEVELING AND CAP TREATMENT LAYER THICKNESS TABLE ON DRAWING C-7.
2. THE ACBS HIGHLIGHTED WITHIN THE ACB MAT DETAIL ON THIS DRAWING (I.E. 50, 50L, 55, AND 55L) ARE EXAMPLES OF CONTECH'S ARMORFLEX CONCRETE BLOCK CLASSES THAT WOULD MEET THE TECHNICAL SPECIFICATIONS. ALTERNATIVE ACB CLASS TYPES FROM OTHER MANUFACTURERS THAT ARE ENGINEERED EQUIVALENT AND MEET THE CAP SPECIFICATION FOR ISOLATION AND ARMOR LAYER - SECTION 35 43 29 MAY BE USED.
3. THE ACB MATS SHOWN IN PLAN VIEW ON THIS DRAWING ARE FOR REPRESENTATION PURPOSES ONLY. THE CONTRACTOR SHALL WORK WITH THE ACB MAT MANUFACTURER TO DESIGN AN ACB MAT LAYOUT PLAN SPECIFIC TO RTA1 THAT MEETS THE CAP SPECIFICATION FOR ISOLATION AND ARMOR LAYER - SECTION 35 43 29 AND ACB MAT LAYOUT SHOWN ON THIS DRAWING. THE CONTRACTOR SHALL PROVIDE THE ACB MAT LAYOUT PLAN IN RTA1 FOR OWNER'S APPROVAL BEFORE ORDERING THE MATS.
4. PRIOR TO ORDERING THE ACB MATS, THE CONTRACTOR SHALL VERIFY THE LOCATION OF BULKHEADS IN RTA1 TO ACCOUNT FOR THE INSTALLATION OF NEW BULKHEAD SUPPORTS IN FRONT OF THE EXISTING BULKHEADS.
5. THE KSS (2019) TOPOGRAPHIC SURVEY EXTENDED TO THE VICINITY OF THE 3RD ST. BRIDGE AS SHOWN ON THIS DRAWING. THE APPROXIMATE LIMITS OF THE CANAL BOUNDARY BEYOND THE KSS (2019) TOPOGRAPHIC SURVEY ARE TO BE FIELD VERIFIED.
6. THE DESIGN AND INSTALLATION OF PIPE PILES AND MONOPILES AROUND UNION AND CARROLL ST. BRIDGES FOR BULKHEAD STABILITY SUPPORT SHALL BE PERFORMED IN ACCORDANCE WITH THE BRIDGE SUPPORT PLANS COMPLETED BY GREENMAN-PEDERSON, INC. (GPI) AND TITLED "FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL" (JUNE 2019).

0 40' 80'
SCALE IN FEET

LEGEND

- -11 — TOP OF CAP ELEVATION
- PROPERTY LINE
- 5+00 — CANAL STATIONING
- ACB MAT AREA BOUNDARIES (NOTE 1)
- TYPICAL ACB MAT (NOTE 3)
- -11.0 — CAPPING ELEVATION
- FLUSHING TUNNEL

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CHECKED BY:	SS	FILE:	HPH106A-DR060
REVIEWED BY:	JAS	DRAWING NO.:	C-9 OF 9
APPROVED BY:	JFB		

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