COPY

RT Group, Inc.

Engineered from the Ground Up SM

December 30, 2016

Mr. Michael Piscitelli, AICP
Deputy Economic Development Administrator
City of New Haven
165 Church Street, 4R
New Haven, CT 06510

RE: 50% Plans and Construction Cost Estimate
Flood Protection Improvements - Vacant Lot North of Radiall
Mill River District Shoreline Analysis
City of New Haven, CT
CNH Project No. 15-195-21
RTG Project No. 15103.00

Dear Mike:

In accordance with Contract Amendment Request (CAR) No. 3, please find enclosed three (3) copies of the 50% Plans and Construction Cost Estimate for the Flood Protection Improvements at the Vacant Lot North of Radiall. As discussed in RTG's Memorandum to the City of New Haven (the City) (RTG, December 16, 2016), Elevated Development was ranked as the most appropriate Flood Protection Alternative for this site and was carried forward for the 50% design. Accordingly, the attached documents reflect the 50% design of a theoretical 4-story building with a footprint of about 20,000 square feet, as agreed to previously.

The 50% Construction Cost Estimate includes costs for construction as well as design, permitting, bidding, and construction phase services (e.g., submittal review, responding to RFI's, and construction observation) (Table 1). However, the cost estimate represents the increased development cost to provide flood protection only, and does not include the cost of the development itself (e.g., buildings, utilities, roads, parking, and site restoration have not been included and are by others).

The 50% estimate was prepared without the benefit of final plans and specifications. Accordingly, a 25% Scope & Budget Contingency has been included and the cost estimates should be considered "order of magnitude" level. Final costs are expected to vary from the estimates presented herein based on actual labor and material costs, competitive market conditions, final agreed to project scope, final implementation schedule, and other variable factors.

Sincerely,

David J. Arpin, P.E.
Project Manager

R:\Projects\15103.02 - Flood Resiliency Improvements\CORRES\Cover Letter - 50% Plans.docx

70 Romano Vineyard Way, Suite 134 North Kingstown, Rhode Island 02852 T 401 438 3100 F 401 294 9806 www.rtg-eng.com

Table 1
Budget-Level Cost Estimate
Flood Protection Improvements - Vacant Lot North of Radiall
50% Plans and Construction Cost Estimate
City of New Haven, CT

Item	Description	Unit of Payment	Estimated Quantity	Unit Price	Extended Total	Comments
1	**General Requirements**					
	Earth Material Submittals	LS	1	$2,500.00	$2,500.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Concrete Submittals	LS	1	$2,500.00	$2,500.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Steel Submittals	LS	1	$1,500.00	$1,500.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Electrical, Mechanical, and HVAC Submittals	LS	1	$0.00	$0.00	Assume part of overall Project Development Costs
	Safety Activity Plan	LS	1	$0.00	$0.00	Assume part of overall Project Development Costs
	Quality Control (QC) Plan	LS	1	$0.00	$0.00	Assume part of overall Project Development Costs
	Meetings	EA	8	$0.00	$0.00	Assume part of overall Project Development Costs
	Closeout Related Submittals	LS	1	$0.00	$0.00	Assume part of overall Project Development Costs
	Performance & Payment Bonds	LS	1	$40,288.45	$40,288.45	Assume at 2% of Flood Proofing Alternative Costs
	Record Drawings	LS	1	$10,000.00	$10,000.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
					$56,788.45	
	Calculate Bid Unit Cost	LS	1		$56,788.45	
2	**Mobilization**					
	Mobilization	LS	1	$50,000.00	$50,000.00	Estimator's Judgment, Related to Flood Proofing Alternative Only
					$50,000.00	
	Calculate Bid Unit Cost	LS	1		$50,000.00	
3	**Quality Control**					
	Grain Size through No. 200 Sieve	EA	2	$90.00	$180.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Moisture Density Relationship	EA	2	$200.00	$400.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Dry-Density and As-Placed Moisture Content	1/2 DAY	2	$300.00	$600.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Concrete Compressive Strength	EA	20	$100.00	$2,000.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
					$3,180.00	
	Calculate Bid Unit Cost	LS	1		$3,180.00	
4	**Erosion and Sedimentation Controls**					
	Silt Fence/Baled Hay Erosion Check	LF	500	$8.00	$4,000.00	Estimator's Judgment, Related to Flood Proofing Alternative Only
	Construction Entrance	EA	1	$15,000.00	$15,000.00	Estimator's Judgment, Related to Flood Proofing Alternative Only
					$19,000.00	
	Calculate Bid Unit Cost	LS	1		$19,000.00	
5	**Demolition, Clearing, and Removal**					
	Demolish and Remove Existing Structures	LS	1	$0.00	$0.00	Assume part of overall Project Development Costs
	Cut Down and Remove Vegetation	DAY	2	$0.00	$0.00	Assume part of overall Project Development Costs
	Grub Out and Remove Stumps	DAY	1	$0.00	$0.00	Assume part of overall Project Development Costs
	Strip and Stockpile Topsoil	CY	400	$0.00	$0.00	Assume part of overall Project Development Costs
	Trucking and Disposal Allowance	TRK	40	$0.00	$0.00	Assume part of overall Project Development Costs
					$0.00	
	Calculate Bid Unit Cost	LS	1		$0.00	
6	**Pile Supported Foundation**					
	Excavate for Pile Caps	CY	950	$10.00	$9,500.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Furnish Granular Fill Material for Leveling Pad	TON	250	$18.11	$4,527.50	Per Tilcon Connecticut x 1.15 Mark-up
	Place and Compact Granular Backfill Material	CY	140	$10.00	$1,400.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Furnish HP12x53 Piles (4 Piles/Cap x 66 Caps x 80-feet-long)	LF	21,120	$30.08	$635,289.60	Written Quote from Raymond Piling x 1.15 for Mark-Up
	Furnish Champion Splice	EA	264	$115.00	$30,360.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Install Champion Splice	EA	264	$300.00	$79,200.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Install H-Piles	LF	21,120	$50.00	$1,056,000.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Perform Static Pile Load Test	LS	1	$50,000.00	$50,000.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	PDA Testing on 10% of Production Piles	DAY	4	$2,300.00	$9,200.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	CAPWAPs	EA	26	$287.50	$7,475.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Form and Pour Pile Caps	CY	470	$0.00	$0.00	Assume part of overall Project Development Costs
	Form and Pour Main Columns at Caps to Support Building	CY	68	$0.00	$0.00	Assume part of overall Project Development Costs
	Form and Pour 1st Floor Beams and Structural Slab	CY	600	$0.00	$0.00	Assume part of overall Project Development Costs
					$1,882,952.10	
	Calculate Bid Unit Cost	LS	1		$1,882,952.10	

Table 1
Budget-Level Cost Estimate
Flood Protection Improvements - Vacant Lot North of Radiall
50% Plans and Construction Cost Estimate
City of New Haven, CT

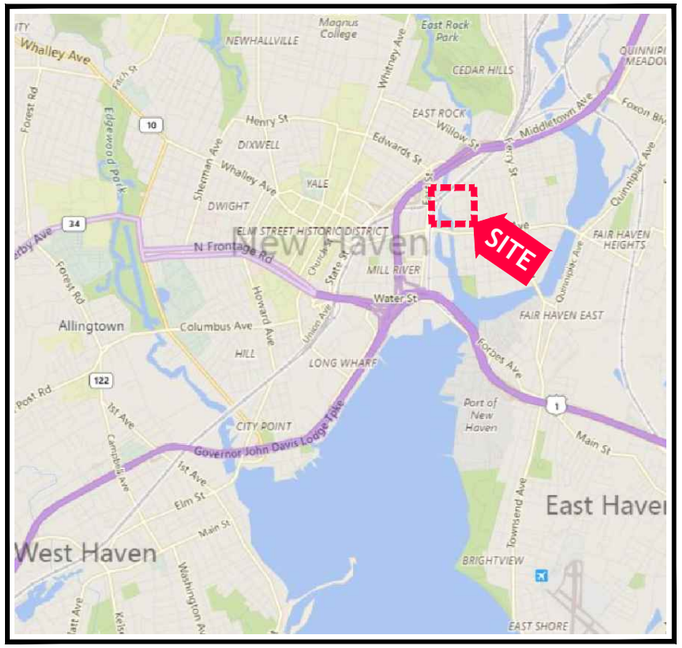
Item	Description	Unit of Payment	Estimated Quantity	Unit Price	Extended Total	Comments
7	**Riprap Scour Protection**					
	Excavate for Riprap Scour Protection	CY	192	$10.00	$1,920.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Prepare and Compact Subgrade	DAY	1	$3,500.00	$3,500.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Furnish and Install Geotextile Fabric	SF	3,100	$1.00	$3,100.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Furnish Riprap Bedding Stone	TON	95	$29.27	$2,780.65	Per Tilcon Connecticut x 1.15 Mark-up
	Install Riprap Bedding Stone	DAY	2	$3,500.00	$7,000.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Furnish Riprap	TON	155	$29.61	$4,589.55	Per Tilcon Connecticut x 1.15 Mark-up
	Install Riprap	DAY	2	$3,500.00	$7,000.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
					$29,890.20	
	Calculate Bid Unit Cost	LS	1		$29,890.20	
8	**Compensatory Floodplain Storage**					
	Excavate Floodplain Storage Basin	CY	90	$10.00	$900.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
	Grade and Shape Basin	DAY	1	$3,500.00	$3,500.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
					$4,400.00	
	Calculate Bid Unit Cost	LS	1		$4,400.00	
9	**Site Restoration**					
	Furnish Loam	CY	0	$20.00	$0.00	Assume part of overall Project Development Costs
	Place Loam	CY	0	$5.00	$0.00	Assume part of overall Project Development Costs
	Furnish and Install Seed	SF	0	$0.50	$0.00	Assume part of overall Project Development Costs
					$0.00	
	Calculate Bid Unit Cost	LS	1		$0.00	
10	**Demobilization and Clean-up**					
	Demobilization and Clean-up	LS	1	$25,000.00	$25,000.00	Estimator's Judgement, Related to Flood Proofing Alternative Only
					$25,000.00	
	Calculate Bid Unit Cost	LS	1		$25,000.00	
	SUBTOTAL				$2,071,210.75	Sum of Items 1-10
	Scope and Budget Contingencies				$517,802.69	Scope and Budget Contingencies @ 25%
	Supplemental Subsurface Investigation				$10,356.05	Supplemental Subsurface Investigation @ 0.50%
	Permitting				$20,712.11	Assume @ 1.0%
	Final Plans, Specifications, and Engineering				$103,560.54	Assume @ 5.0%
	Construction Phase Services				$124,272.64	Assume @ 6.0% (Full-Time Construction Observation Assumed)
	TOTAL ESTIMATE (2016 USD)				**$2,900,000.00**	Rounded to the Nearest $100,000.00
	Flood Proofing Cost Per SF of Building Footprint				**$145.00**	For a Hypothetical Building Footprint of 20,000 SF

FLOOD PROTECTION IMPROVEMENTS

MILL RIVER DISTRICT SHORELINE ANALYSIS

New Haven,Connecticut

MAP 181, BLOCK 772, LOT 5.01



SITE VICINITY MAP

INDEX OF DRAWINGS			
CATEGORY	SHEET	DRAWING	TITLE
GENERAL	1	G-01	TITLE, INDEX, LOCATION AND VICINITY MAPS
	2	G-02	LEGEND, ABBREVIATIONS, AND NOTES
CIVIL	3	C-01	EXISTING SITE PLAN
	4	C-02	PROPOSED SITE PLAN
	5	C-03	PROPOSED FOUNDATION PLAN
	6	C-04	PROPOSED FOUNDATION SECTION
DETAILS	7	D-01	MISCELLANEOUS DETAILS

SITE LOCATION MAP

DRAFT

50% SUBMISSION
NOT FOR CONSTRUCTION

THIS DRAWING IS HALF SIZE

File Location: R:\Projects\15103.02 - Flood Resiliency Improvements\DWG\Cover and Notes.dwg

RT Group, Inc.
Engineered from the Ground Up℠
458 Grand Avenue, Suite 213
New Haven, Connecticut 06513
T 203 823 9932 F 401 294 9806
DAM SAFETY · WATERFRONT · CONSTRUCTION ENGINEERING · GEOTECHNICAL
GEO-ENVIRONMENTAL · STRUCTURAL · CIVIL

DSGN	DJA
DR	TTA
CHK	DJA
APVD	JBR

No.	DATE	REVISIONS	BY	APVD

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 — 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

City of New Haven

FLOOD PROTECTION IMPROVEMENTS
MILL RIVER DISTRICT SHORELINE ANALYSIS
MAP 181, BLOCK 772, LOT 5.01
City of New Haven
New Haven,Connecticut

TITLE, INDEX, LOCATION AND VICINITY MAPS

SHEET	1 OF 7
DWG No.	G-01
DATE	DEC-2016
PROJ No.	15103.02

GENERAL NOTES:

1. THE SITE IS LOCATED IN NEW HAVEN, CONNECTICUT.
2. STANDARD SPECIFICATIONS, WHEN REFERENCED IN THESE DRAWINGS, SHALL MEAN THE CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION (MOST CURRENT EDITION). PARTS OF THE STANDARD SPECIFICATIONS THAT ARE SPECIFICALLY REFERENCED SHALL BECOME PART OF THESE DRAWINGS AS THOUGH STATED HEREIN IN FULL. IN CASE OF A DISCREPANCY BETWEEN THE STANDARD SPECIFICATIONS AND THE REQUIREMENTS STATED WITHIN THE DRAWINGS, THE REQUIREMENTS STATED WITHIN THE DRAWINGS SHALL PREVAIL.
3. THIS PROJECT IS MUNICIPALLY OWNED AND FUNDED. THEREFORE, SOME OF THE REFERENCES AND TERMINOLOGY OF THE STANDARD SPECIFICATIONS MAY SEEM OUT OF PLACE. THE OWNER IS THE CITY OF NEW HAVEN (THE CITY). THE ENGINEER FOR THIS PROJECT IS RT GROUP, INC. (RTG). THE CONNECTICUT DEPARTMENT OF TRANSPORTATION IS NOT A PARTY TO THIS PROJECT.
4. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY DURING THE PERFORMANCE OF THE WORK. SAFETY PROVISIONS SHALL COMPLY WITH OSHA AND OTHER APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS. THESE REQUIREMENTS SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.
5. THE UTILITY LOCATIONS SHOWN ON THESE DRAWINGS ARE CONSIDERED APPROXIMATE AND WERE OBTAINED FROM THE BEST AVAILABLE INFORMATION. THE ACTUAL LOCATION OF UTILITIES MAY VARY FROM THAT SHOWN AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATIONS OF ALL UTILITIES, GRADES, AND DIMENSIONS PRIOR TO STARTING WORK.
6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT CALL BEFORE YOU DIG (1-800-922-4455) AND THE CITY 3 BUSINESS DAYS BEFORE COMMENCING WITH ANY EXCAVATION/GRADING, IN ORDER THAT ALL AFFECTED UTILITY COMPANIES ARE NOTIFIED PRIOR TO STARTING WORK.
7. THE PROPERTY AND EASEMENT LINES SHOWN ON THESE DRAWINGS ARE CONSIDERED APPROXIMATE.
8. CONSTRUCTION LIMITS COINCIDE WITH PROPERTY LINE AND/OR EASEMENT LIMITS AS SHOWN ON THESE DRAWINGS.
9. WATER ELEVATIONS AT THE SITE ARE TIDAL AND ARE EXPECTED TO VARY.
10. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS IN THE FIELD BEFORE ORDERING ANY MATERIAL, COMMENCING ANY FABRICATION, OR PERFORMING ANY WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER, IN WRITING, OF ANY CONDITIONS OR DIMENSIONS WHICH VARY FROM THOSE SHOWN IN THE DRAWINGS AND INCORPORATE SUCH VARIATIONS IN THE CONSTRUCTION AS APPROVED BY THE ENGINEER.
11. THE PROPOSED WORK IS LOCATED WITHIN A FEMA ZONE VE FLOOD ZONE AND WILL BE INUNDATED DURING THE 100 YEAR FLOOD. THE 100 YEAR FLOOD ELEVATION IS ESTIMATED AT ABOUT 12 FEET NAVD 88 AS SHOWN ON THE NEW HAVEN COUNTY, CONNECTICUT FLOOD INSURANCE RATE MAP NUMBER 09009C0441J, PANEL 441 OF 635, DATED JULY 8, 2013 AND MAP NUMBER 09009C0442J, PANEL 442 OF 635, DATED JULY 8, 2013.

DESIGN BASIS ASSUMPTIONS:

1. IT IS ASSUMED THAT THE DESIGN BUILDING IS A 4-STORY OFFICE BUILDING WITH LOADING PER THE STATE OF CONNECTICUT BUILDING CODE SECTION 1607.1:
   - 1.1. DEAD LOAD-FLOOR =120 PSF (ASSUMES CONCRETE FLOORS)
   - 1.2. DEAD LOAD-ROOF =50 PSF (ASSUMES STEEL TRUSS)
   - 1.3. LIVE LOAD-FLOOR =80 PSF (ASSUMES OFFICE BUILDING)
   - 1.4. LIVE LOAD-ROOF =50 PSF
2. THE ESTIMATED VERTICAL LOADING PER PILE BASED ON THE ABOVE LOADING IS APPROXIMATELY 45 TONS (ALLOWABLE).
3. IT WAS ASSUMED THAT APPROXIMATELY 64 CY OF COMPENSATORY FLOOD STORAGE WOULD BE REQUIRED DUE TO THE PROPOSED CONSTRUCTION WITHIN THE FLOOD PLAIN. ACCORDINGLY, A MINIMUM OF 64 CY OF EXISTING SOIL IS PROPOSED TO BE REMOVED FROM THE SITE AS PART OF THE SITE GRADING SHOWN.
4. THE DESIGN FLOOD ELEVATION (DFE) FOR THE SITE IS EL. 15.0' AND INCLUDES THE BASE FLOOD ELEVATION (EL. 12.0'), THE ESTIMATED SEA LEVEL RISE (1.5'), AND FREEBOARD (1.0').

ENVIRONMENTAL PROTECTION:

THE CONTRACTOR SHALL BE RESPONSIBLE TO TAKE PREVENTATIVE MEASURES TO HELP MINIMIZE ANY ENVIRONMENTAL IMPACT. THESE MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

1. NO FUEL WILL BE STORED ON SITE. ALL FUEL WILL BE BROUGHT TO THE SITE AS REQUIRED.
2. ALL FUEL TRANSFER OPERATIONS ARE TO BE CONDUCTED IN AN EFFICIENT AND SAFE MANNER IN ACCORDANCE WITH THE CONTRACTOR'S OPERATIONS MANUAL.
3. ABSORBENT DIAPERS DESIGNED FOR USE WITH PETROLEUM PRODUCTS SHALL BE PLACED UNDER ALL MACHINERY DURING FUELING OPERATIONS.
4. ALL HYDRAULIC EQUIPMENT SHALL UTILIZE VEGETABLE BASED, NON-TOXIC, AND NON-POLLUTING HYDRAULIC FLUID.
5. EQUIPMENT SHALL BE PROPERLY MAINTAINED AND RECORDED IN WEEKLY LOGS INCLUDING THE REQUIREMENTS FOR AND ACTUAL MAINTENANCE COMPLETED.
6. A SPILL KIT AND/OR ABSORBENT MATERIALS AND 300 LINEAR (MIN) FEET OF USCG APPROVED OIL CONTAINMENT BOOM SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION OPERATIONS.

LAYOUT:

1. THE HORIZONTAL CONTROL DATUM FOR THIS PROJECT IS CONSIDERED SITE SPECIFIC BUT IS APPROXIMATELY ALIGNED WITH NAD 83 (I.E., STATE PLANE COORDINATE SYSTEM) .
2. THE VERTICAL CONTROL DATUM FOR THIS PROJECT IS NAVD 88.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL LAYOUT WORK FROM THE CONTROL MONUMENTATION PROVIDED AND IN ACCORDANCE WITH SECTION 01040, SITE CONDITIONS.

AVAILABLE SUBSURFACE INFORMATION:

1. GEOTECHNICAL INFORMATION, AS INCLUDED AND SHOWN IN THE CONTRACT DOCUMENTS, WAS OBTAINED FROM SOIL BORINGS COMPLETED BY NEW ENGLAND BORING CONTRACTORS, INC FOR RTG BETWEEN OCTOBER 25 AND 28, 2016.
2. IT IS INTENDED THAT SUBSURFACE INFORMATION, AS NOTED ABOVE, BE USED ONLY AS AN INDICATION OF POSSIBLE SUBSURFACE CONDITIONS, AND THAT UPON THE CONTRACTOR'S REVIEW, FURTHER SUBSURFACE EXPLORATIONS MAY BE WARRANTED. SUCH EXPLORATIONS SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE.
3. THE CONTRACTOR SHALL USE THE INFORMATION PROVIDED AT ITS OWN RISK AND SHALL COMPLETELY HOLD HARMLESS THE CITY AND RTG FROM ALL CONSEQUENCES AND/OR FAULT ARISING FROM ITS USE.

QUALITY CONTROL:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 01400, QUALITY CONTROL.

MOBILIZATION/DEMOBILIZATION:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02005, MOBILIZATION/DEMOBILIZATION.

DEMOLITION AND REMOVAL:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02050, DEMOLITION AND REMOVAL.

CLEARING, GRUBBING, AND STRIPPING:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02110, CLEARING, GRUBBING, AND STRIPPING.

EARTHWORK:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02200, EARTHWORK.

STOCKPILE MANAGEMENT:

1. THE CONTRACTOR SHALL MAINTAIN STOCKPILES AND THE AREAS AROUND THEM GRADED TO DRAIN AND TAKE ALL NECESSARY PRECAUTIONS TO MINIMIZE EROSION FROM THE STOCKPILES, INCLUDING BUT NOT LIMITED TO THE INSTALLATION OF HAY BALES OR SILT FENCE.
2. SOIL MATERIAL THAT MEETS THE SPECIFIED GRADATION REQUIREMENTS UNDER SECTION 02200, EARTHWORK AS DETERMINED IN ACCORDANCE WITH SECTION 01400, QUALITY CONTROL, MAY BE STOCKPILED ADJACENT TO THE WORK AREA FOR REUSE.
3. EXCESS MATERIAL, INCLUDING DEMOLITION DEBRIS, THAT DOES NOT MEET THE SPECIFIED GRADATION REQUIREMENTS AND/OR EXCAVATED MATERIAL IN EXCESS OF THAT REQUIRED FOR COMPLETING THIS PROJECT SHALL BE DISPOSED OF OFFSITE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS.

EROSION AND SEDIMENT CONTROL:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02270, EROSION AND SEDIMENT CONTROL.

SUPPORT PILES:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02301, SUPPORT PILES.

DEWATERING, CONTROL, AND DIVERSION OF WATER:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02400, DEWATERING, CONTROL, AND DIVERSION OF WATER.
2. WATER ELEVATIONS AT THE SITE ARE EXPECTED TO VARY. SUMPS AND PUMPS ARE EXPECTED TO BE ADEQUATE TO CONTROL INFLOWS AND/OR THE ACCUMULATION OF PONDED WATER DUE TO SURFACE WATER RUN OFF.
3. THE CONTRACTOR SHALL ROUTE ALL PUMPED WATER TO DEWATERING BASINS OR OTHER SUITABLE DEVICES (E.G., DEWATERING BAGS) PRIOR TO ALLOWING THE PUMPED WATER TO FLOW OVER LAND.

DYNAMIC PILE TESTING:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02457, DYNAMIC PILE TESTING.

BITUMINOUS PAVEMENT:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02512, BITUMINOUS PAVEMENT.

REINFORCING STEEL:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 03200, REINFORCING STEEL.

CONCRETE:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 03310, CONCRETE.

DRAFT

50% SUBMISSION
NOT FOR CONSTRUCTION

THIS DRAWING IS HALF SIZE

LEGEND:

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING WATERFRONT STRUCTURE
- EXISTING PROPERTY LINE
- EXISTING EDGE OF PAVEMENT
- EXISTING FENCE
- EXISTING EDGE OF VEGETATION
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SILT FENCE
- RIVER EXTENTS AT EL. 0 (NAVD 88)
- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- PROPOSED PAVEMENT
- PROPOSED RIPRAP
- APPROXIMATE GROUNDWATER
- LP EXISTING LIGHTPOLE
- PROPOSED PILE CAP
- RTG-SB-01 APPROXIMATE LOCATION OF SOIL BORING PERFORMED BY NEW ENGLAND BORING CONTRACTORS, INC. FOR RTG (OCTOBER 25 THROUGH 28, 2016)

	ABOVE MLW	NAVD 88
MHHW	7.09	3.49
MHW	6.75	3.15
NAVD '88	3.60	0.00
MSL	3.38	-0.22
MLW	0.00	-3.60
MLLW	-0.24	-3.84

VERTICAL DATUM CONVERSION DIAGRAM

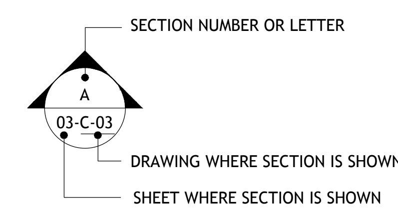
THE ABOVE TIDAL AND DATUM ELEVATION DATA WAS TAKEN FROM THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) DATABASE FOR THE FOLLOWING STATION:
STATION ID: *8467150*
LOCATION: BRIDGEPORT, CONNECTICUT
LATITUDE: *41°10.4' N*
LONGITUDE: *073°10.9' W*

ABBREVIATIONS

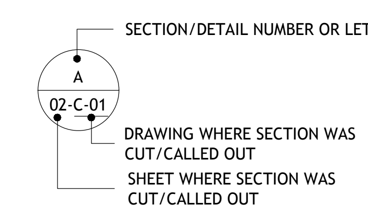
AC	ACRES
APPROX.	APPROXIMATE
BLDG.	BUILDING
BOT	BOTTOM
CIP	CAST-IN-PLACE
CONS. JT.	CONSTRUCTION JOINT
CONT. JT.	CONTRACTION JOINT
CONC.	CONCRETE
DFE	DESIGN FLOOD ELEVATION
DIA.	DIAMETER
EA	EACH
EPC	EPOXY COATED
EXP. JT.	EXPANSION JOINT
EL.	ELEVATION
E.O.P.	EDGE OF PAVEMENT
EXIST	EXISTING
FFE	FINISHED FLOOR ELEVATION
FT	FEET
F&I	FURNISH AND INSTALL
GALV.	GALVANIZED
HORIZ	HORIZONTAL
HYD	HYDRANT
ID	INSIDE DIAMETER
LF	LINEAR FEET
LOC	LIMITS OF CLEARING, GRUBBING & STRIPPING
LOD	LIMITS OF DISTURBANCE
MAX.	MAXIMUM
MIN.	MINIMUM
NAD 83	NORTH AMERICAN DATUM OF 1983
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
NGVD 29	NATIONAL GEODETIC VERTICAL DATUM OF 1929
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT TO SCALE
O.C.	ON CENTER
O.C.E.W.	ON CENTER EACH WAY
O.D.	OUTER DIAMETER
P	PROPERTY LINE
PI	POINT OF INTERSECTION
REQ'D	REQUIRED
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND REINSTALL
R&S	REMOVE AND STOCKPILE
TBD	TO BE DETERMINED
TEMP.	TEMPORARY
TYP.	TYPICAL
VERT	VERTICAL

RTG CONTROL POINT DATA

POINT NO.	NORTHING	EASTING	ELEVATION, NAVD 88	DESCRIPTION
▲ RTG-PK-10	674281.9336	956887.9937	7.9547	PK NAIL
▲ RTG-PK-11	674225.1188	956783.7304	6.8499	PK NAIL



SECTION / DETAIL



DETAIL AND SECTION DESIGNATION

RT Group, Inc.
Engineered from the Ground Up[SM]
458 Grand Avenue, Suite 213
New Haven, Connecticut 06513
T 203 823 9932 F 401 294 9806
DAM SAFETY · WATERFRONT · CONSTRUCTION ENGINEERING · GEOTECHNICAL GEO-ENVIRONMENTAL · STRUCTURAL · CIVIL

DSGN	DJA
DR	TTA
CHK	DJA
APVD	JBR

No.	DATE	REVISIONS	BY	APVD

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 — 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

City of New Haven

FLOOD PROTECTION IMPROVEMENTS
MILL RIVER DISTRICT SHORELINE ANALYSIS
MAP 181, BLOCK 772, LOT 5.01
City of New Haven
New Haven, Connecticut

LEGEND, ABBREVIATIONS, AND NOTES

SHEET	2 OF 7
DWG No.	G-02
DATE	DEC-2016
PROJ No.	15103.02

EXISTING SITE PLAN

SCALE: 1"=20'

Graphic Scale 1"=20'

20' 10' 0 20' 40' 60'

DRAFT

50% SUBMISSION NOT FOR CONSTRUCTION

THIS DRAWING IS HALF SIZE

File Location: R:\Projects\15103.02 - Flood Resiliency Improvements\DWG\FloodResiliencyPlans (WORKING).dwg

RT Group, Inc.
Engineered from the Ground Up℠
458 Grand Avenue, Suite 213
New Haven, Connecticut 06513
T 203 823 9932 F 401 294 9806
DAM SAFETY - WATERFRONT - CONSTRUCTION ENGINEERING - GEOTECHNICAL
GEO-ENVIRONMENTAL - STRUCTURAL - CIVIL

DSGN	DJA
DR	TTA
CHK	DJA
APVD	JBR

No.	DATE	REVISIONS	BY	APVD

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

City of New Haven

FLOOD PROTECTION IMPROVEMENTS
MILL RIVER DISTRICT SHORELINE ANALYSIS
MAP 181, BLOCK 772, LOT 5.01
City of New Haven
New Haven,Connecticut

EXISTING SITE PLAN

SHEET	3 OF 7
DWG No.	C-01
DATE	DEC-2016
PROJ No.	15103.02

PROPOSED SITE PLAN

SCALE: 1"=20'

Graphic Scale 1"=20'
20' 10' 0 20' 40' 60'

DRAFT

50% SUBMISSION NOT FOR CONSTRUCTION

THIS DRAWING IS HALF SIZE

File Location: R:\Projects\15103.02 - Flood Resiliency Improvements\DWG\FloodResiliencyPlans (WORKING).dwg

RT Group, Inc.
Engineered from the Ground Up℠
458 Grand Avenue, Suite 213
New Haven, Connecticut 06513
T 203 823 9932 F 401 294 9806
DAM SAFETY · WATERFRONT · CONSTRUCTION ENGINEERING · GEOTECHNICAL GEO-ENVIRONMENTAL · STRUCTURAL · CIVIL

DSGN	DJA
DR	TTA
CHK	DJA
APVD	JBR

No.	DATE	REVISIONS	BY	APVD

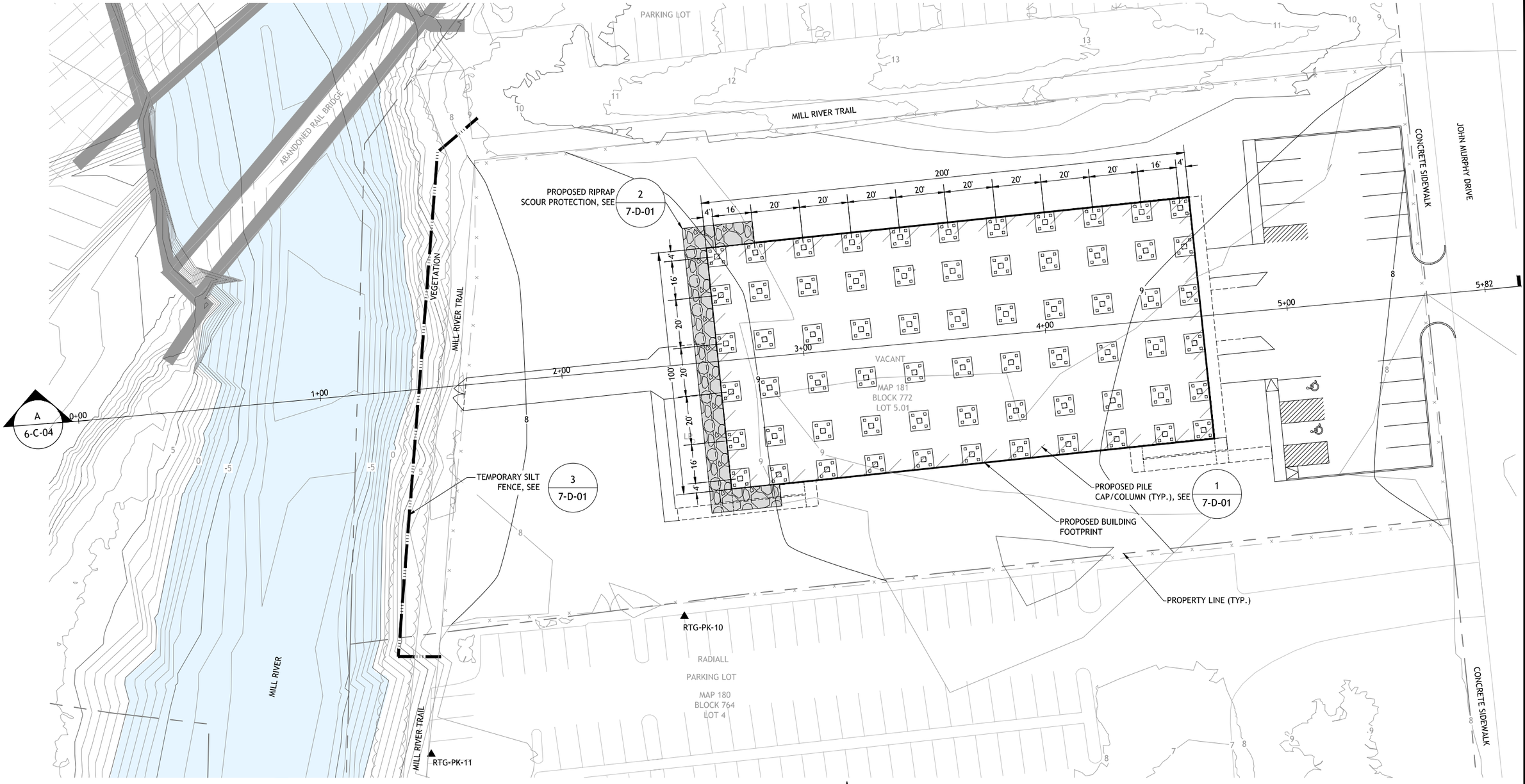
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

City of New Haven

FLOOD PROTECTION IMPROVEMENTS
MILL RIVER DISTRICT SHORELINE ANALYSIS
MAP 181, BLOCK 772, LOT 5.01
City of New Haven
New Haven,Connecticut

PROPOSED SITE PLAN

SHEET	4 OF 7
DWG No.	C-02
DATE	DEC-2016
PROJ No.	15103.02



PROPOSED FOUNDATION PLAN

SCALE: 1"=20'

Graphic Scale 1"=20'
20' 10' 0 20' 40' 60'

DRAFT

50% SUBMISSION NOT FOR CONSTRUCTION

THIS DRAWING IS HALF SIZE

File Location: R:\Projects\15103.02 - Flood Resiliency Improvements\DWG\Flood Resiliency Plans (WORKING).dwg

RT Group, Inc.
Engineered from the Ground Up℠
458 Grand Avenue, Suite 213
New Haven, Connecticut 06513
T 203 823 9932 F 401 294 9806
DAM SAFETY · WATERFRONT · CONSTRUCTION ENGINEERING · GEOTECHNICAL
GEO-ENVIRONMENTAL · STRUCTURAL · CIVIL

DSGN	DJA
DR	TTA
CHK	DJA
APVD	JBR

No.	DATE	REVISIONS	BY	APVD

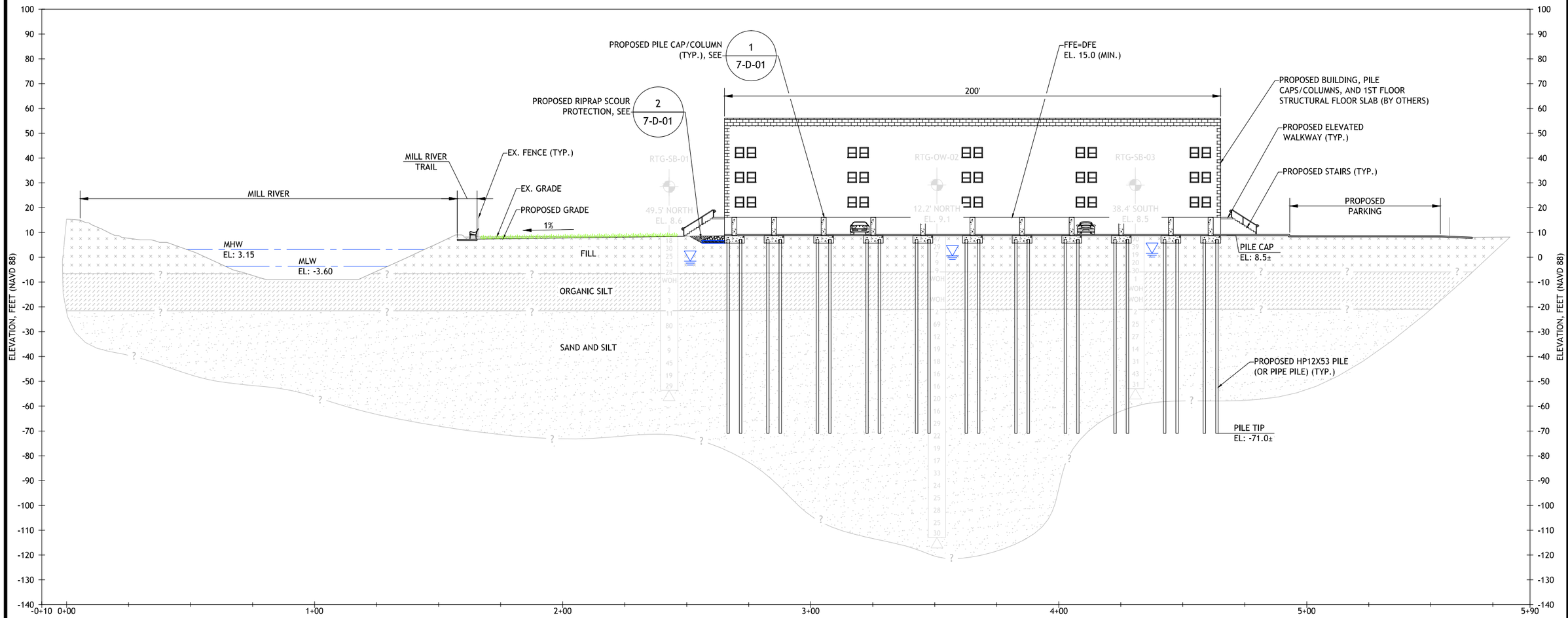
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

City of New Haven

FLOOD PROTECTION IMPROVEMENTS
MILL RIVER DISTRICT SHORELINE ANALYSIS
MAP 181, BLOCK 772, LOT 5.01
City of New Haven
New Haven,Connecticut

PROPOSED FOUNDATION PLAN

SHEET	5 OF 7
DWG No.	C-03
DATE	DEC-2016
PROJ No.	15103.02



LEGEND:

RTG-SB-01 — DENOTES APPROXIMATE LOCATION OF SOIL BORING PERFORMED BY NEW ENGLAND BORING CONTRACTORS, INC. FOR RTG (OCTOBER 25 THROUGH OCTOBER 28, 2016)

BOTTOM OF SOIL BORING

15 — STANDARD PENETRATION NUMBER ("N" VALUE)

APPROXIMATE GROUNDWATER

FILL

ORGANIC SILT

SAND AND SILT

THE ACTUAL HORIZONTAL AND VERTICAL LIMITS MAY VARY

Graphic Scale 1"=20'
20' 10' 0 20' 40' 60'

PROPOSED FOUNDATION SECTION

A / 05-C-03

SCALE: 1"=20'

NOTES:

1. SOIL BORING LOCATION AND ELEVATION DATA ARE AS SURVEYED BY RTG ON NOVEMBER 8, 2016.
2. THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN SOIL BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE SPECIFIC LOCATION AND ON THE DATES INDICATED. SOIL AND ROCK CONDITIONS, AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THE BORING LOCATIONS. ALSO THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THE SOIL BORING LOCATIONS.

DRAFT

50% SUBMISSION
NOT FOR CONSTRUCTION

THIS DRAWING IS HALF SIZE

File Location: R:\Projects\15103.02 - Flood Resiliency Improvements\DWG\Flood Resiliency Plans (WORKING).dwg

RT Group, Inc.
Engineered from the Ground Up℠
458 Grand Avenue, Suite 213
New Haven, Connecticut 06513
T 203 823 9932 F 401 294 9806
DAM SAFETY · WATERFRONT · CONSTRUCTION ENGINEERING · GEOTECHNICAL
GEO-ENVIRONMENTAL · STRUCTURAL · CIVIL

DSGN	DJA
DR	TTA
CHK	DJA
APVD	JBR

No.	DATE	REVISIONS	BY	APVD

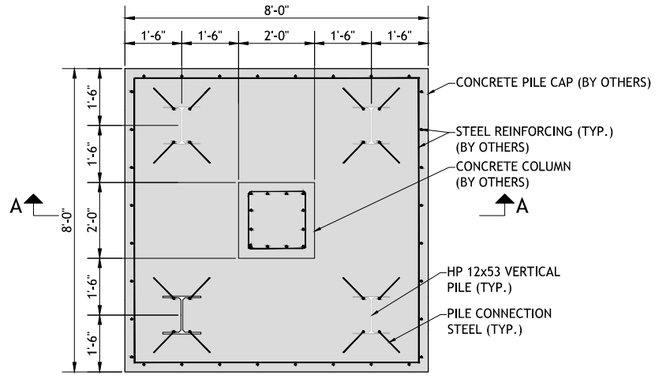
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 — 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

City of New Haven

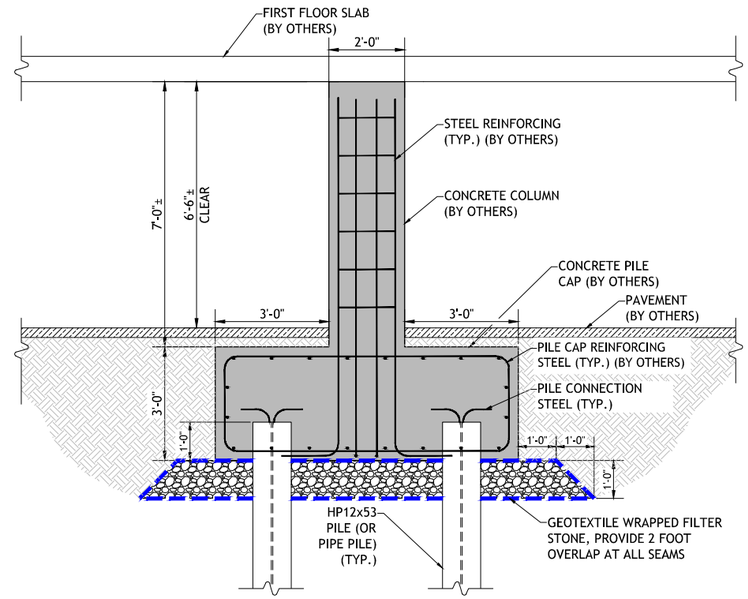
FLOOD PROTECTION IMPROVEMENTS
MILL RIVER DISTRICT SHORELINE ANALYSIS
MAP 181, BLOCK 772, LOT 5.01
City of New Haven
New Haven,Connecticut

PROPOSED FOUNDATION SECTION

SHEET	6 OF 7
DWG No.	C-04
DATE	DEC-2016
PROJ No.	15103.02



PLAN

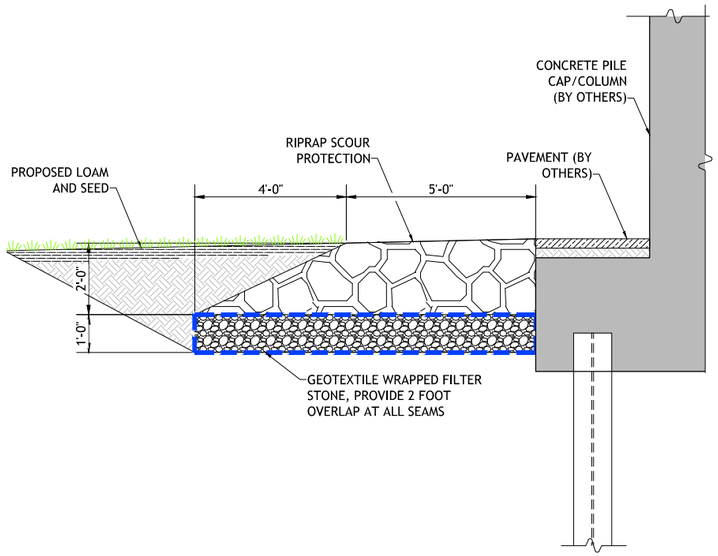


SECTION A-A

PILE CAP/COLUMN DETAIL

1 / 4-C-02

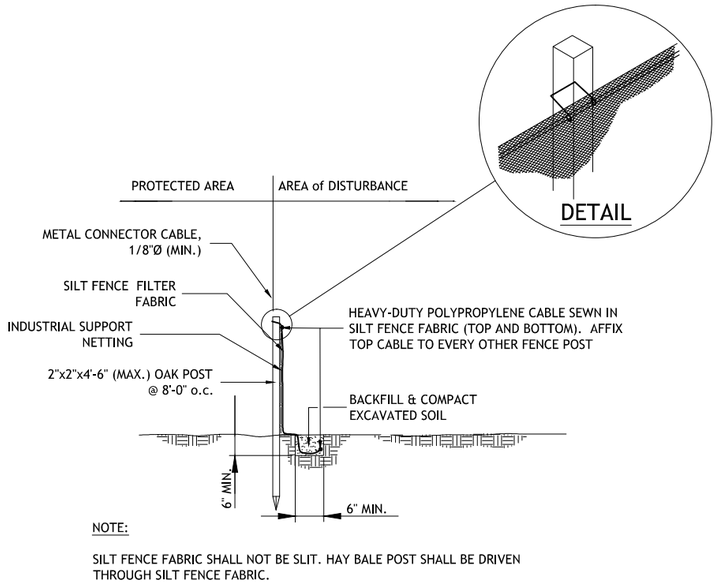
SCALE: 1/2"=1'-0"



RIPRAP SCOUR PROTECTION DETAIL

2 / 4-C-02

SCALE: 1/2"=1'-0"



NOTE:

SILT FENCE FABRIC SHALL NOT BE SLIT. HAY BALE POST SHALL BE DRIVEN THROUGH SILT FENCE FABRIC.

SILT FENCE DETAIL

3 / 5-C-03

SCALE: NTS

DRAFT

50% SUBMISSION NOT FOR CONSTRUCTION

THIS DRAWING IS HALF SIZE

File Location: R:\Projects\15103.02 - Flood Resiliency Improvements\DWGS\Flood Resiliency Plans (WORKING).dwg

RT Group, Inc.
Engineered from the Ground Up℠
458 Grand Avenue, Suite 213
New Haven, Connecticut 06513
T 203 823 9932 F 401 294 9806
DAM SAFETY · WATERFRONT · CONSTRUCTION ENGINEERING · GEOTECHNICAL
GEO-ENVIRONMENTAL · STRUCTURAL · CIVIL

DSGN	DJA
DR	TTA
CHK	DJA
APVD	JBR

No.	DATE	REVISIONS	BY	APVD

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

City of New Haven

FLOOD PROTECTION IMPROVEMENTS
MILL RIVER DISTRICT SHORELINE ANALYSIS
MAP 181, BLOCK 772, LOT 5.01
City of New Haven
New Haven,Connecticut

MISCELLANEOUS DETAILS

SHEET	7 OF 7
DWG No.	D-01
DATE	DEC-2016
PROJ No.	15103.02