

July 13, 2023

Kristin L. Duclos, Wetlands Specialist
NHDES Wetlands Bureau
29 Hazen Drive
Concord, NH 03302-0095

**RE: NHDES Request for More Information Response
Standard Dredge and Fill Wetlands Permit Application
NHDES File Number: 2022-00429
Subject Property: Market Street Marine Terminal, Portsmouth, Tax Map #119, Lot #5**

The following response is in regard to your email dated June 30, 2023 requesting additional information to address the NHDES Request for More Information dated June 1, 2022, for the project referenced above. Please see below for responses to each item requested.

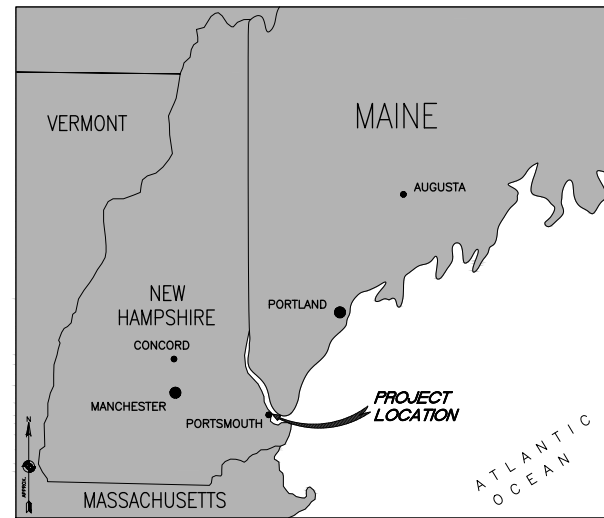
RFMI Item	Outstanding Item
3d.	<p>The response and plans indicate that the proposed work within the tidal buffer zone will be taking place within 14.5 feet of the shared property line with Portsmouth Tax Map/Lot 121-1. If this is the case, then written authorization for impacts within 20 feet will be required from the owner of the abutting parcel per Env-Wt 304.04(a).</p> <p><u>Response:</u> The proposed grading within the tidal buffer zone has been redesigned and will now be more than 20 feet from the abutting railroad parcel (Map/Lot 121-1). Written authorization from the property owner is no longer required.</p> <p>The revised grading will result in a reduction in the impacts shown at Impact Location E on the Wetland Impact Plan (from 47,490 SF to 46,840 SF). Total impacts within the developed tidal buffer zone will now be 51,070 SF.</p>
4b.	<p>Please revise the plans to show the proposed bathymetry within the dredge area in the overhead view.</p> <p><u>Response:</u> Proposed bathymetry has been added to the attached plans (Sheets 7, 8, and 9).</p>
13., 16.	<p>A sediment Sampling and Analysis Plan was submitted with the response, but the results of this analysis wasn't provided. Please provide the results of the Sediment Analysis and indicate whether any sources of contamination were</p>

	<p>identified in the dredge area. If contamination was identified, please address how the contaminated soils and dredge spoils will be addressed as a part of the dredge and disposal plans.</p> <p>Response: The results of the grain size analysis can be accessed here: PDF PDA - Market Street Marine Terminal - Grain Size Analysis.pdf. The Army Corps and EPA completed their review of the grain size analysis on July 13, 2023, and determined that the material is suitable for ocean disposal with no further testing required. A chemical analysis of dredged sediments will not need to be completed.</p>
15.	<p>Draft Dredge & Blasting Plans</p> <ul style="list-style-type: none"> • Draft specifications for dredging and blasting were provided as part of the RFMI response. Please confirm that Final Specifications for the dredge and blasting plans will be provided to NHDES for review and approval prior to the initiation of construction. <p>Response: Final specifications are attached.</p> <p>Turbidity Control and Monitoring Plan</p> <ul style="list-style-type: none"> • The Turbidity and Monitoring Control Plan appears to require a defined mixing zone for the in-water work related to the dredge work and piling installation. Please provide documentation of coordination with the NHDES Watershed Management Bureau Water Quality Planning Section, James Tilley (james.tilley@des.nh.gov) and Judy Houston (judith.e.houston@des.nh.gov) for review and approval of the defined mixing zone. <p>Response: The Turbidity Monitoring and Control plan has been provided to the Watershed Management Bureau to designate a mixing zone for construction related releases and discharges of turbidity.</p>
23.	<p>The NHB Datacheck Report provided was redacted. Please provide a complete, unredacted version of the Datacheck Report. (NHB23-0281)</p> <p>Response: The full NHB Datacheck Report is attached. However, it should be noted that Page 1 of the NHB DataCheck Results Letter states that “maps and NHB record pages are confidential and should be redacted from public documents.” Since the DES permit application file is available to the public, the map and record pages were redacted from the NHB DataCheck report that was included in the application package.</p>

PEASE DEVELOPMENT AUTHORITY

Division of Ports and Harbors Portsmouth, New Hampshire

MARKET STREET MARINE TERMINAL FUNCTIONAL REPLACEMENT BARGE DOCK ENVIRONMENTAL IMPACT PLANS

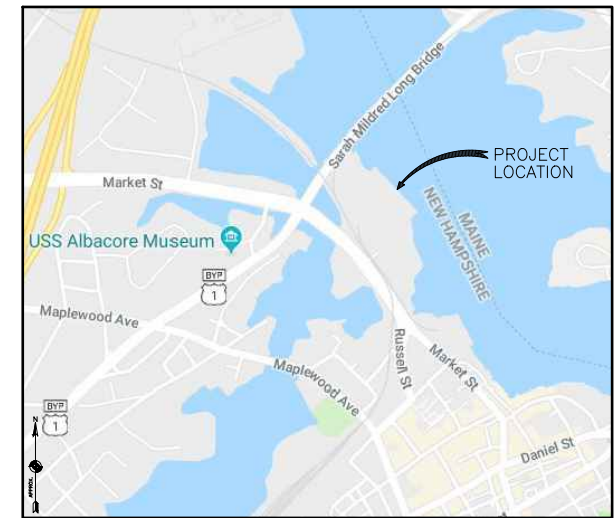


VICINITY MAP
N.T.S.

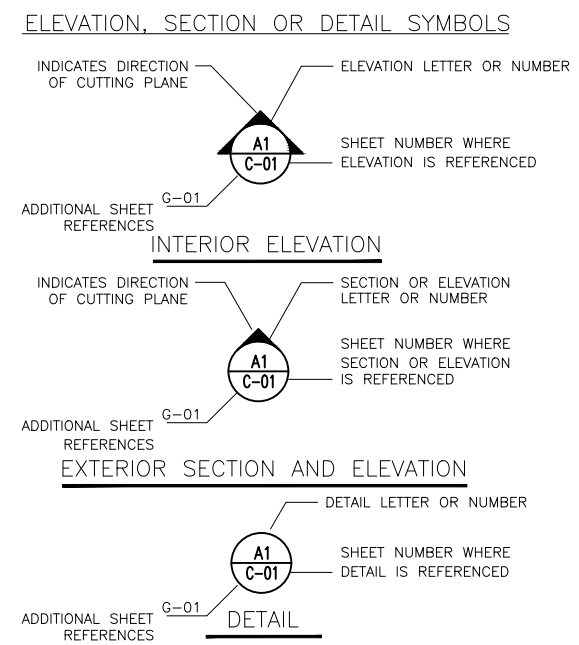
JULY 2023

LIST OF DRAWINGS

NUMBER	NAME	TITLE
<u>GENERAL</u>		
1	G-001	TITLE SHEET
2	G-002	GENERAL NOTES
3	G-003	SITE PHOTOS - 01
4	G-004	SITE PHOTOS - 02
5	G-005	SITE PHOTOS - 03
6	G-101	EXISTING CONDITIONS PLAN
7	G-102	PROJECT OVERVIEW PLAN
<u>CIVIL</u>		
8	C-101	WETLAND IMPACT PLAN
9	C-102	SHORELAND IMPACT PLAN
10	C-103	GENERAL SECTIONS
11	C-104	DREDGING PLAN
12	C-105	DREDGE SECTIONS
13	C-106	RIPRAP PLAN
14	C-107	RIPRAP SECTIONS
<u>STRUCTURAL</u>		
15	S-101	PILE PLAN
16	S-102	PILE SECTION AND DETAILS
17	S-103	FRAMING PLAN
18	S-104	FLOATING DOCK PLAN AND DETAILS



LOCATION MAP
N.T.S.



603.786.1870
inquiry@appledoremarine.com
Appledore Marine Engineering, LLC
600 State St, Suite E
Portsmouth New Hampshire 03801
SUBMITTED BY: [Signature]

PEASE DEVELOPMENT AUTHORITY
DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH
MARKET STREET MARINE TERMINAL
FUNCTIONAL REPLACEMENT BARGE DOCK

PROJECT No.: 5213
CAD DWG FILE: 5213_permit_01_G-001.dwg
DESIGNED BY: SND
DRAWN BY: KMV
CHECKED BY: NJE
SCALE: AS SHOWN

G-001
SHEET 1 OF 18

REVISION	DATE	DESCRIPTION	BY

GENERAL NOTES:

1. THE DRAWINGS AND SPECIFICATIONS FORM A PART OF THE CONTRACT DOCUMENTS. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IN THE EVENT OF A CONFLICT BETWEEN THE SPECIFICATIONS AND THE DRAWINGS, THE SPECIFICATIONS SHALL TAKE PRECEDENCE. A COPY OF THE DRAWINGS AND SPECIFICATIONS MUST BE KEPT ONSITE AT ALL TIMES DURING THE PROJECT.
2. COORDINATE ALL WORK WITH FACILITY PERSONNEL AND PORT OPERATIONS ON A DAILY BASIS. THE CONSTRUCTION WORK SHALL NOT INTERFERE WITH ONGOING OPERATIONS. SCHEDULE AND COORDINATE ALL WORK, INCLUDING ALLOWABLE WORK WINDOWS, WITH THE OWNER. MAINTAIN THE WORK SITE TO THE SATISFACTION OF THE OWNER.
3. COORDINATE MATERIAL STORAGE AND LAYDOWN AREAS WITH THE OWNER.
4. COORDINATE ALL BARGE ACCESS AND MOORING LOCATIONS WITH THE OWNER.
5. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SAFETY. DETERMINE CONSTRUCTION PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE FACILITIES AND THEIR COMPONENTS DURING ALL PHASES OF CONSTRUCTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIEDOWNS. SUCH MATERIAL SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE OWNER'S PROPERTY AFTER COMPLETION OF THE PROJECT. ALL PROPOSED STAGING AREAS SHALL BE COORDINATED WITH THE OWNER BEFORE STARTING WORK. TEMPORARY CONSTRUCTION STAGING/STORAGE AREA SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION UPON COMPLETION OF THE PROJECT.
6. DIMENSIONS AND DETAILS OF THE EXISTING CONSTRUCTION ARE FROM LIMITED ARCHIVE DRAWINGS AND FIELD INVESTIGATIONS. CHECK AND VERIFY ALL DIMENSIONS AND DETAILS OF THE EXISTING CONSTRUCTION PRIOR TO COMMENCING CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER BEFORE ORDERING MATERIALS AND PROCEEDING WITH THE AFFECTED PART OF THE WORK.
7. EXISTING CONDITIONS DRAWINGS ARE INTENDED TO PROVIDE GENERAL OVERVIEW OF STRUCTURES BUT DO NOT INCLUDE ALL APPURTENANCES AND CONDITIONS.
8. METHODS OF DEMOLITION, CONSTRUCTION, AND ERECTION ARE THE CONTRACTOR'S RESPONSIBILITY UNLESS OTHERWISE SPECIFIED.
9. PREVENT ANY DISTURBANCE OR DAMAGE TO EXISTING STRUCTURES.
10. CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE DONE TO EXISTING STRUCTURES AND VESSELS AS A RESULT OF PERFORMING THE WORK.
11. AT THE END OF EACH WORKING DAY, THE CONSTRUCTION SITE MUST BE LEFT IN A NEAT AND CLEAN CONDITION.
12. COMPLY WITH ALL APPLICABLE O.S.H.A REGULATIONS AND SAFETY REQUIREMENTS.
13. REPORT SPILLS AND LEAKS OR OIL OR OTHER HAZARDOUS SUBSTANCES (IE OIL, ANTIFREEZE, CHEMICALS, ETC.) OCCURRING DURING THE PERFORMANCE OF THIS CONTRACT IMMEDIATELY UPON DISCOVERY, REGARDLESS OF THE QUANTITY.
14. THE OWNER WILL CHARGE TO THE CONTRACTOR ANY ADDITIONAL COSTS OF INSPECTION OR TESTING WHEN PRIOR REJECTION MAKES REINSPECTION OR RETESTING NECESSARY.

REFERENCES AND STANDARDS:

1. AMERICAN CONCRETE INSTITUTE (ACI) BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, 2019 (ACI 318-19)
2. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, 16TH EDITION, 2022 (AISC-16)
3. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES, 2022 (ASCE 7-22)
4. ASCE SEISMIC DESIGN OF PIERS & WHARVES, 2014 (ASCE 61-14)
5. DEPARTMENT OF DEFENSE UNIFIED FACILITIES CRITERIA (UFC) DESIGN: PIERS AND WHARVES, 2017 (UFC 4-152-01)

DESIGN CRITERIA:

THE NORTH AND SOUTH WHARF EXTENSIONS HAVE BEEN DESIGNED AND ANALYZED FOR THE FOLLOWING LOADS:

DEAD LOAD: ACTUAL WEIGHT OF THE STRUCTURE

LIVE LOAD:

1. VEHICLE AND EQUIPMENT
 - a. 1,000 PSF UNIFORM LIVE LOAD
 - b. 250 TON CRAWLER CRANE (MAX PICK 55 TONS)
2. DESIGN VESSEL
 - a. 750 FOOT LOA
 - b. 35 FOOT DRAFT
 - c. 63,000 TON DISPLACEMENT
3. MOORING FITTINGS
 - a. 100 TON BOLLARD
 - b. 42" CLEAT (25 TON)

UTILITIES NOTES:

1. THE EXACT SIZE & LOCATION OF ALL EXISTING UTILITIES IMPACTED BY THE WORK SHALL BE FIELD VERIFIED PRIOR TO START OF CONSTRUCTION. NOTIFY "DIG SAFE" (1-888-344-7233) AT LEAST 14 CALENDAR DAYS PRIOR TO COMMENCEMENT OF GROUND PENETRATING ACTIVITY.
2. TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE OWNER AT THE CONTRACTOR'S EXPENSE. NOTIFY THE OWNER A MINIMUM OF 5 DAYS IN ADVANCE OF ANY OUTAGES.

ENVIRONMENTAL CONTROL NOTES:


1. THIS PROJECT REQUIRES THE IMPLEMENTATION OF A BEST MANAGEMENT PRACTICES PLAN (BMP) DURING ALL CONSTRUCTION WORK TO PREVENT/MINIMIZE ENVIRONMENTAL IMPACTS DURING THE CONSTRUCTION ACTIVITY.
2. ENVIRONMENTAL CONTROLS MUST CONFORM TO ALL STATE, LOCAL, AND FEDERAL REGULATIONS AND PERMITS. ENVIRONMENTAL CONTROLS SHALL INCLUDE BUT NOT BE LIMITED TO MEASURES TO CONTROL TURBIDITY, PH, AND DUST.
3. A COPY OF ALL PERMITS MUST BE POSTED ON SITE DURING CONSTRUCTION IN A PROMINENT LOCATION VISIBLE TO INSPECTING PERSONNEL.
4. USE NETS, TARPS, WORK PLATFORMS, OR OTHER APPROVED EQUIVALENT MEANS TO PREVENT DEBRIS FROM FALLING INTO THE RIVER. REMOVE DEBRIS THAT HAS FALLEN INTO THE RIVER. THE OWNER MAY CONDUCT UNDERWATER INSPECTIONS TO ENSURE THAT ALL DEMOLITION AND CONSTRUCTION DEBRIS HAS BEEN REMOVED PRIOR TO DEMOBILIZING.
5. STORAGE, FUELING AND LUBRICATION OF EQUIPMENT AND MOTOR VEHICLES MUST BE CONDUCTED IN A MANNER THAT AFFORDS THE MAXIMUM PROTECTION AGAINST SPILL AND EVAPORATION. FUEL, LUBRICANTS AND OIL MUST BE MANAGED AND STORED IN ACCORDANCE WITH ALL FEDERAL, STATE, REGIONAL, AND LOCAL LAWS AND REGULATIONS. THERE SHALL BE NO STORAGE OF FUEL ON THE PROJECT SITE. FUEL MUST BE BROUGHT TO THE PROJECT SITE AS NEEDED. EQUIPMENT OPERATION, ACTIVITIES, OR PROCESSES PERFORMED BY THE CONTRACTOR SHALL BE IN ACCORDANCE WITH ALL FEDERAL AND STATE AIR EMISSION AND PERFORMANCE LAWS AND STANDARDS.
6. ALL PILE DRIVING MUST OCCUR DURING DAYLIGHT HOURS AND MUST FOLLOW ALL RESTRICTIONS REQUIRED BY THE APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS. PILE DRIVING IS NOT PERMITTED FROM APRIL 1 THROUGH JUNE 30.
7. DREDGING MUST OCCUR BETWEEN NOVEMBER 15 AND MARCH 15.

SURVEY CONTROL NOTES:

1. MAINTAIN ADEQUATE SURVEY CONTROL AT ALL TIMES TO ESTABLISH AND MAINTAIN ALL LINES AND ELEVATIONS.
2. HORIZONTAL DATUM BASED ON NAD 1983, NEW HAMPSHIRE STATE PLANE (CONUS) ZONE-NH 2800.
3. ELEVATIONS ARE IN FEET BASED ON MEAN LOWER LOW WATER (MLLW) PROJECT DATUM. TIDAL ELEVATIONS ARE BASED ON THE 1983-2001 TIDAL EPOCH AND NOAA TIDE STATION 8419870 SEAVEY ISLAND, MAINE.
4. TOPOGRAPHIC SURVEY PERFORMED BY DOUCET SURVEY. IN MAY AND JULY 2018 USING VARIOUS SURVEY METHODS. FEATURES SHOWN CAN ONLY BE CONSIDERED INDICATIVE OF CONDITIONS EXISTING AT THAT TIME.
5. HYDROGRAPHIC SURVEY PERFORMED BY STEELE ASSOCIATES IN DECEMBER 2022 USING VARIOUS SURVEY METHODS. FEATURES SHOWN CAN ONLY BE CONSIDERED INDICATIVE OF CONDITIONS EXISTING AT THAT TIME.

ABBREVIATIONS

APPROX	APPROXIMATE
DIA, Ø	DIAMETER
℄	BASELINE
EA	EACH
EL	ELEVATION IN FEET
EQ	EQUAL(LY)
HOTL	HIGHEST OBSERVABLE TIDE LINE
IN	INCH(S)
MHW	MEAN HIGH WATER
MHHW	MEAN HIGHER HIGH WATER
MIN	MINIMUM
MLLW	MEAN LOWER LOW WATER
MLW	MEAN LOW WATER
NAVD88	NATIONAL VERTICAL DATUM 1988
NTS	NOT TO SCALE
OC	ON CENTER
PSF	POUNDS PER SQUARE FOOT
SQ	SQUARE
SSP	STEEL SHEET PILE
TYP	TYPICAL

BY	-	-	-	-	-	-	-
DESCRIPTION	-	-	-	-	-	-	-
REVISIONS	-	-	-	-	-	-	-
DATE	-	-	-	-	-	-	-
REVISION	-	-	-	-	-	-	-
 Appledore Marine Engineering, LLC 600 State St, Suite E Portsmouth New Hampshire 03801 603.786.1970 inquiry@appledoremarine.com							
SUBMITTED BY: _____ DATE: _____ TITLE: _____ (SIGNED) _____							
(SEAL) _____							
PEASE DEVELOPMENT AUTHORITY DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH MARKET STREET MARINE TERMINAL PORTSMOUTH, NH FUNCTIONAL REPLACEMENT BARGE DOCK GENERAL NOTES							
PROJECT No.: 5213							
CAD DWG FILE: S213_permit_01_5-001.dwg							
DESIGNED BY: SNID							
DRAWN BY: KMV							
CHECKED BY: NJE							
SCALE: AS SHOWN							
G-002							
SHEET 2 OF 18							

1

2

3

4

5

D

C

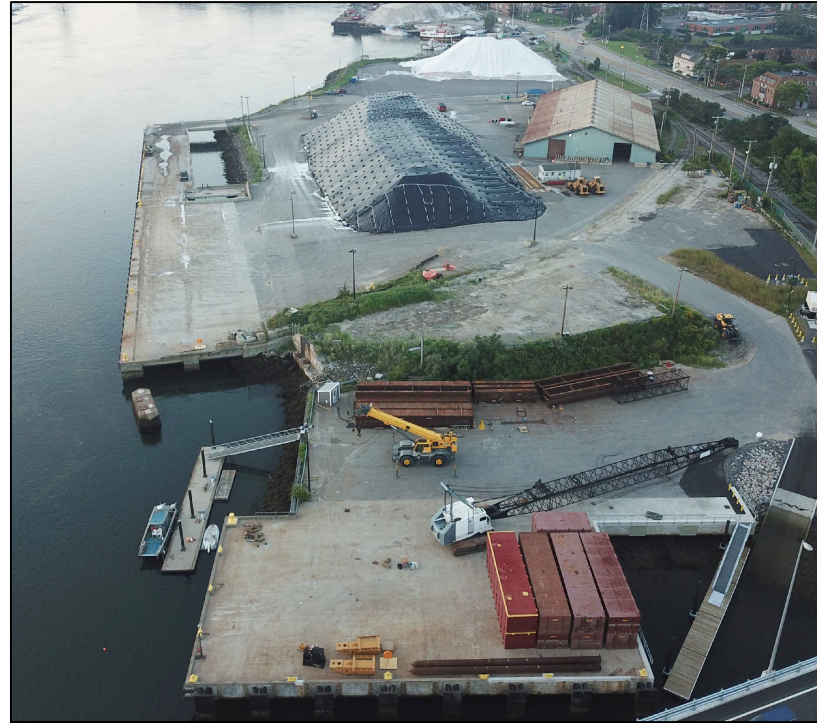
B

A



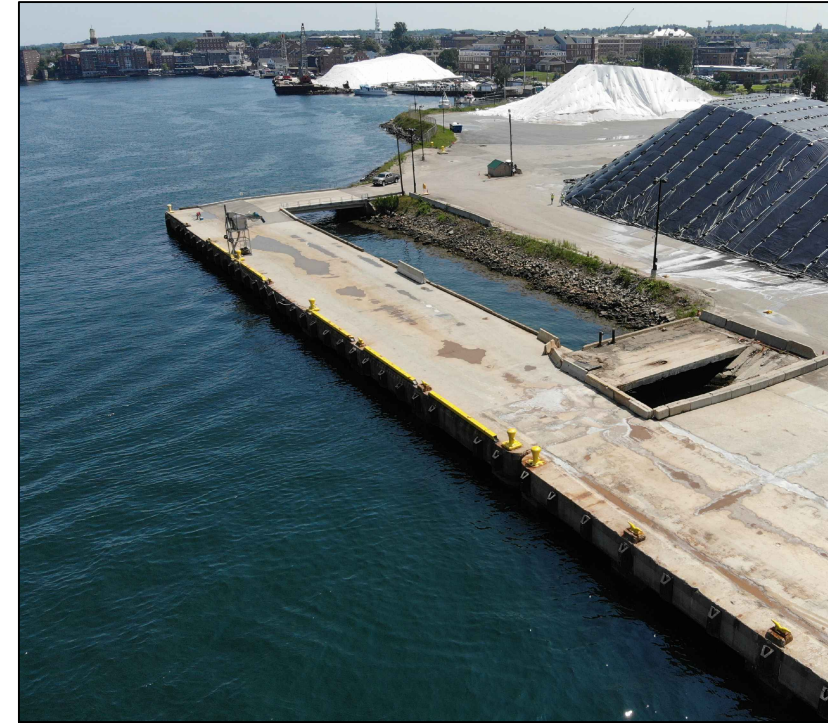
OVERALL SITE
LOOKING SOUTH

C1



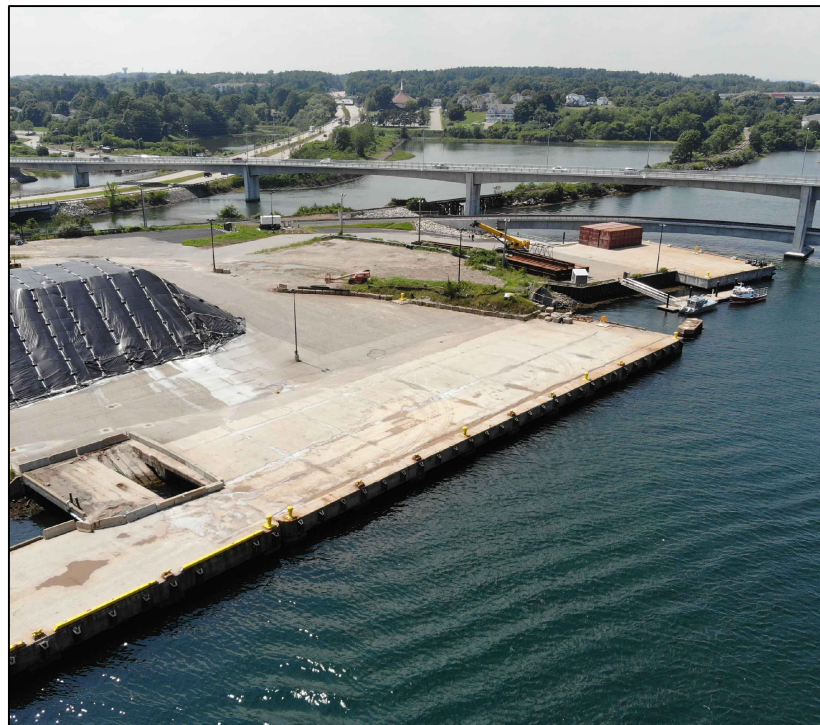
OVERALL SITE
LOOKING SOUTHEAST

C3



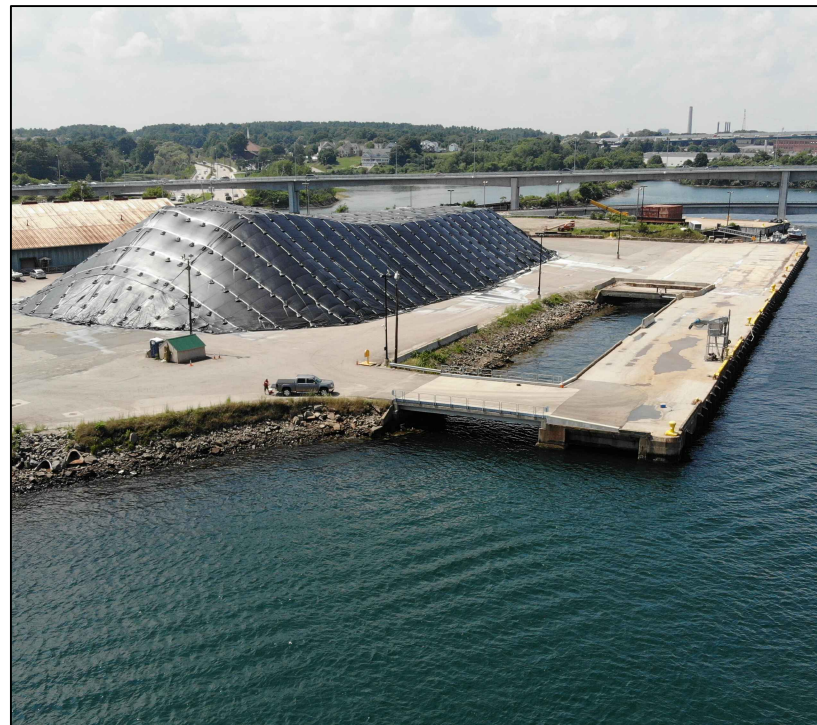
MAIN WHARF (1964 VINTAGE)
LOOKING SOUTHEAST

C4



MAIN WHARF (1977 VINTAGE)
LOOKING WEST

A1



SOUTH WHARF EXTENSION LOCATION
LOOKING WEST

A3



NORTH WHARF EXTENSION LOCATION
LOOKING SOUTH

A4

REVISION	DATE	DESCRIPTION	BY

603.766.1870
inquiry@applecoremarine.com
Applecore Marine Engineering, LLC
600 State St., Suite E
Portsmouth New Hampshire 03801
SUBMITTED BY: _____ TITLE: _____ DATE: _____

PEASE DEVELOPMENT AUTHORITY
DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH
MARKET STREET MARINE TERMINAL
FUNCTIONAL REPLACEMENT BARGE DOCK
SITE PHOTOS - 01

PROJECT No.: 5213
CAD DWG FILE: 5213_permit_02_5-003.dwg
DESIGNED BY: SMD
DRAWN BY: KMV
CHECKED BY: NJE
SCALE: AS SHOWN

G-003
SHEET 3 OF 18

1

2

3

4

5

D

C

B

A



NORTH WHARF EXTENSION LOCATION
LOOKING SOUTHWEST (C1)



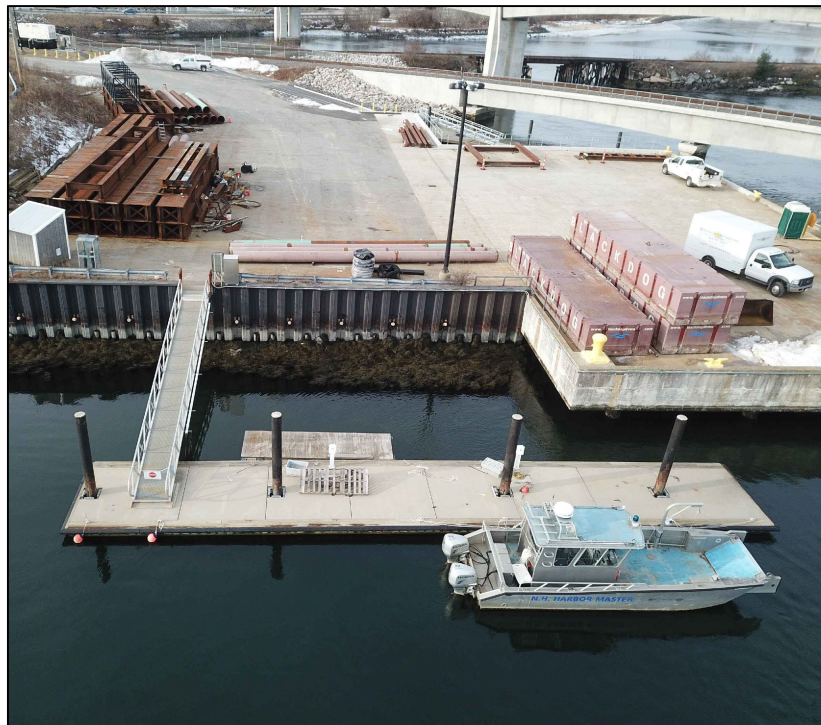
BRIDGE PIER 14
LOOKING SOUTHWEST (C3)



BRIDGE ABUTMENT 13
LOOKING SOUTHWEST (C4)



BARGE WHARF BULKHEAD
LOOKING WEST (A1)



FLOATING DOCK
LOOKING SOUTHWEST (A3)



FLOATING DOCK - NEW LOCATION
LOOKING SOUTHWEST (A4)

1

2

3

4

5

REVISION	DATE	DESCRIPTION	BY

603.786.1870
inquiry@applecoremarine.com
Applecore Marine Engineering, LLC
600 State St., Suite E
Portsmouth New Hampshire 03801
SUBMITTED BY: _____ DATE: _____

PEASE DEVELOPMENT AUTHORITY
DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH
MARKET STREET MARINE TERMINAL
FUNCTIONAL REPLACEMENT BARGE DOCK
SITE PHOTOS - 02

PROJECT No.: 5213
CAD DWG FILE: 5213_permit_02_G-003.dwg
DESIGNED BY: SMD
DRAWN BY: KMV
CHECKED BY: NJE
SCALE: AS SHOWN

G-004
SHEET 4 OF 18



MAIN WHARF - END SECTION
LOOKING NORTHWEST

C1



MAIN WHARF - SOUTH ACCESS BRIDGE
LOOKING SOUTHWEST

C3



MAIN WHARF - BRIDGE ABUTMENT
LOOKING WEST

C4



SOUTH WHARF EXTENSION REVETMENT
LOOKING WEST

A1



MAIN WHARF - FENDER SYSTEM
LOOKING SOUTHWEST

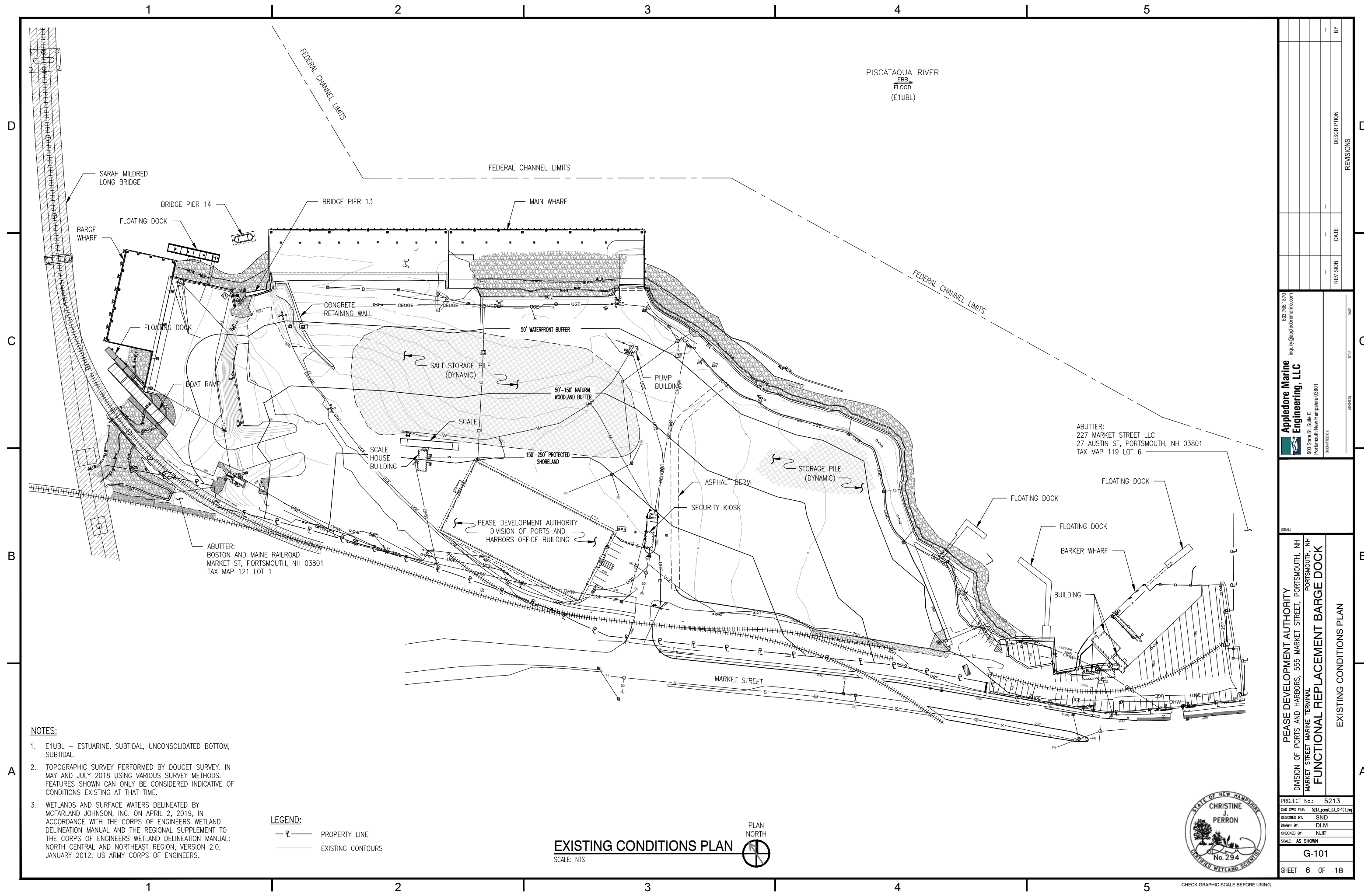
A3



BARGE WHARF - FENDER SYSTEM
LOOKING SOUTH

A4

<p>603.766.1870 inquiry@appliedmarine.com</p> <p>Applied Marine Engineering, LLC 600 State St., Suite E Portsmouth New Hampshire 03801</p> <p>SUBMITTED BY: _____ DATE: _____</p>		<p>REVISION</p> <p>DATE</p> <p>DESCRIPTION</p> <p>BY</p>	
<p>PEASE DEVELOPMENT AUTHORITY DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH MARKET STREET MARINE TERMINAL FUNCTIONAL REPLACEMENT BARGE DOCK</p> <p>SITE PHOTOS - 03</p>		<p>PROJECT No.: 5213 CAD DWG FILE: 5213_permit_02_5-003.dwg DESIGNED BY: SIND DRAWN BY: KMV CHECKED BY: SIND SCALE: AS SHOWN</p> <p>G-005</p> <p>SHEET 5 OF 18</p>	



NOTES:

1. E1UBL - ESTUARINE, SUBTIDAL, UNCONSOLIDATED BOTTOM, SUBTIDAL.
2. TOPOGRAPHIC SURVEY PERFORMED BY DOUCET SURVEY, IN MAY AND JULY 2018 USING VARIOUS SURVEY METHODS. FEATURES SHOWN CAN ONLY BE CONSIDERED INDICATIVE OF CONDITIONS EXISTING AT THAT TIME.
3. WETLANDS AND SURFACE WATERS DELINEATED BY MCFARLAND JOHNSON, INC. ON APRIL 2, 2019, IN ACCORDANCE WITH THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012, US ARMY CORPS OF ENGINEERS.

LEGEND:

- P - PROPERTY LINE
- - - - - EXISTING CONTOURS

EXISTING CONDITIONS PLAN

SCALE: NTS



ABUTTER:
227 MARKET STREET LLC
27 AUSTIN ST, PORTSMOUTH, NH 03801
TAX MAP 119 LOT 6

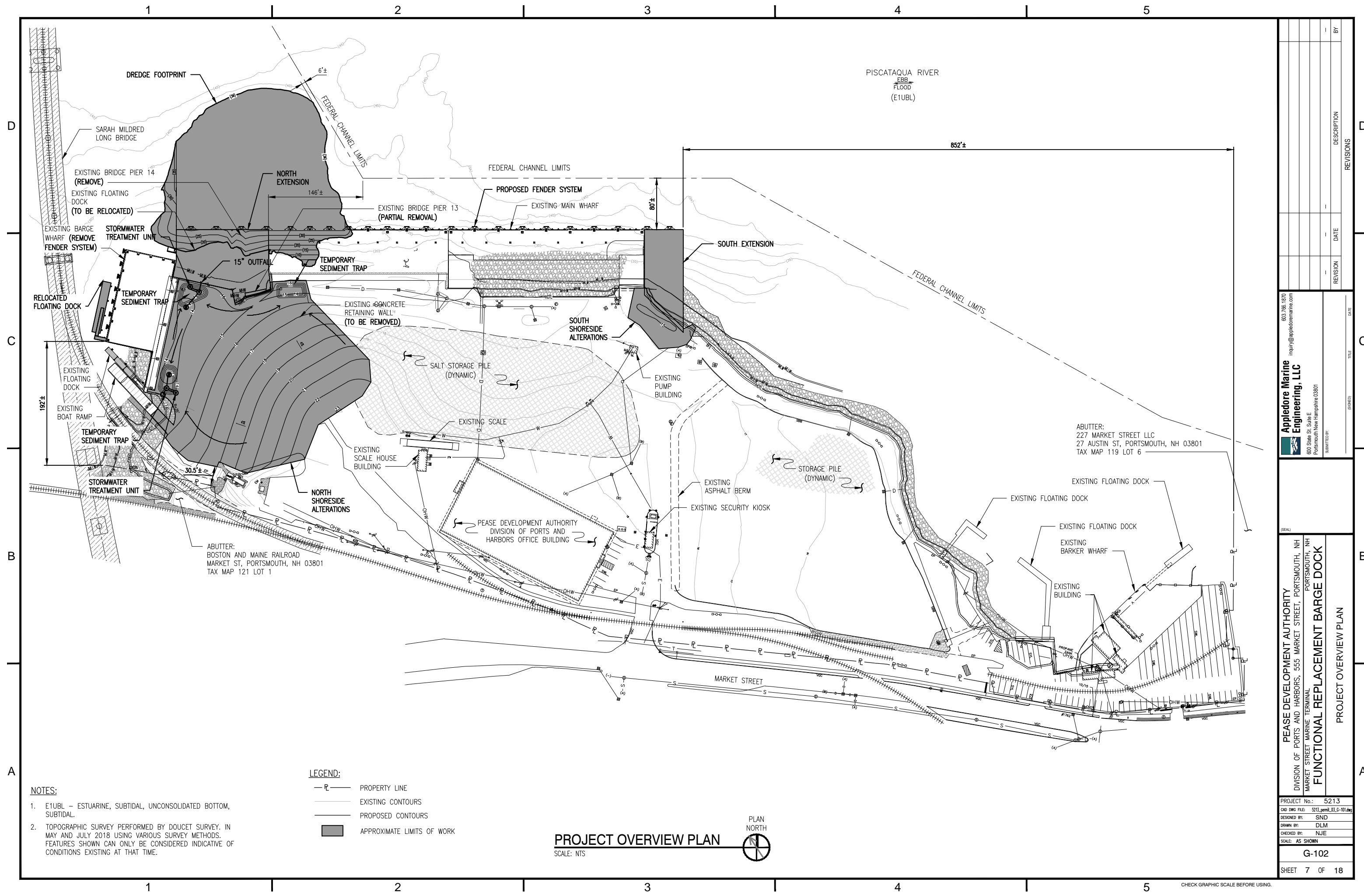
ABUTTER:
BOSTON AND MAINE RAILROAD
MARKET ST, PORTSMOUTH, NH 03801
TAX MAP 121 LOT 1

REVISION	DATE	DESCRIPTION	BY

603.766.1870
inquiry@appliedmarine.com
Applied Marine Engineering, LLC
600 State St, Suite E
Portsmouth New Hampshire 03801
SUBMITTED BY: [] DATE: []

PEASE DEVELOPMENT AUTHORITY
DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH
MARKET STREET MARINE TERMINAL
FUNCTIONAL REPLACEMENT BARGE DOCK
EXISTING CONDITIONS PLAN

PROJECT No.: 5213
CAD DWG FILE: S213_permit_03_G-101.dwg
DESIGNED BY: SND
DRAWN BY: DLM
CHECKED BY: NJE
SCALE: AS SHOWN



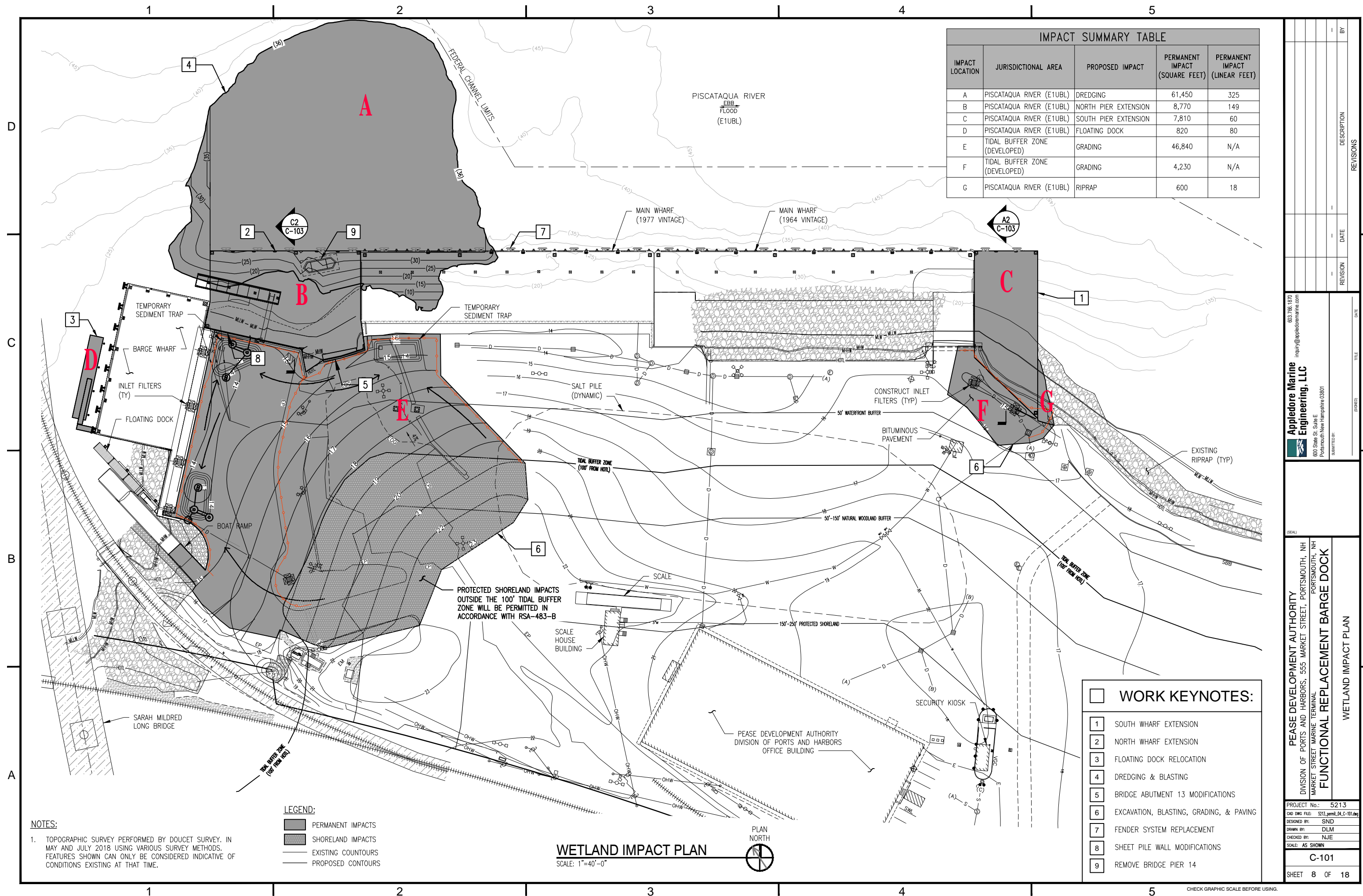
- NOTES:**
1. E1UBL - ESTUARINE, SUBTIDAL, UNCONSOLIDATED BOTTOM, SUBTIDAL.
 2. TOPOGRAPHIC SURVEY PERFORMED BY DOUCET SURVEY. IN MAY AND JULY 2018 USING VARIOUS SURVEY METHODS. FEATURES SHOWN CAN ONLY BE CONSIDERED INDICATIVE OF CONDITIONS EXISTING AT THAT TIME.

- LEGEND:**
- P - PROPERTY LINE
 - - - - - EXISTING CONTOURS
 - - - - - PROPOSED CONTOURS
 - - APPROXIMATE LIMITS OF WORK

PROJECT OVERVIEW PLAN
SCALE: NTS



<p>603.766.1970 inquiry@applepiemarine.com</p> <p>Applepiemarine Engineering, LLC 800 State St, Suite E Portsmouth New Hampshire 03801</p> <p>DATE: _____ DRAWN BY: _____ CHECKED BY: _____ SCALE: AS SHOWN</p>	<p>ABUTTER: 227 MARKET STREET LLC 27 AUSTIN ST, PORTSMOUTH, NH 03801 TAX MAP 119 LOT 6</p> <p>PROJECT No.: 5213 CAD DWG FILE: 5213.dwg DESIGNED BY: SND DRAWN BY: DLM CHECKED BY: NJE SCALE: AS SHOWN</p> <p>PROJECT OVERVIEW PLAN</p> <p>SHEET 7 OF 18</p>
<p>PEASE DEVELOPMENT AUTHORITY DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH MARKET STREET MARINE TERMINAL FUNCTIONAL REPLACEMENT BARGE DOCK</p>	<p>PROJECT OVERVIEW PLAN</p>
<p>PEASE DEVELOPMENT AUTHORITY DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH MARKET STREET MARINE TERMINAL FUNCTIONAL REPLACEMENT BARGE DOCK</p>	<p>PROJECT OVERVIEW PLAN</p>



IMPACT SUMMARY TABLE				
IMPACT LOCATION	JURISDICTIONAL AREA	PROPOSED IMPACT	PERMANENT IMPACT (SQUARE FEET)	PERMANENT IMPACT (LINEAR FEET)
A	PISCATAQUA RIVER (E1UBL)	DREDGING	61,450	325
B	PISCATAQUA RIVER (E1UBL)	NORTH PIER EXTENSION	8,770	149
C	PISCATAQUA RIVER (E1UBL)	SOUTH PIER EXTENSION	7,810	60
D	PISCATAQUA RIVER (E1UBL)	FLOATING DOCK	820	80
E	TIDAL BUFFER ZONE (DEVELOPED)	GRADING	46,840	N/A
F	TIDAL BUFFER ZONE (DEVELOPED)	GRADING	4,230	N/A
G	PISCATAQUA RIVER (E1UBL)	RIPRAP	600	18

NOTES:
 1. TOPOGRAPHIC SURVEY PERFORMED BY DOUCET SURVEY, IN MAY AND JULY 2018 USING VARIOUS SURVEY METHODS. FEATURES SHOWN CAN ONLY BE CONSIDERED INDICATIVE OF CONDITIONS EXISTING AT THAT TIME.

LEGEND:
 [Solid Grey] PERMANENT IMPACTS
 [Hatched Grey] SHORELAND IMPACTS
 [Dashed Line] EXISTING CONTOURS
 [Solid Line] PROPOSED CONTOURS

WETLAND IMPACT PLAN
 SCALE: 1"=40'-0"
 PLAN NORTH

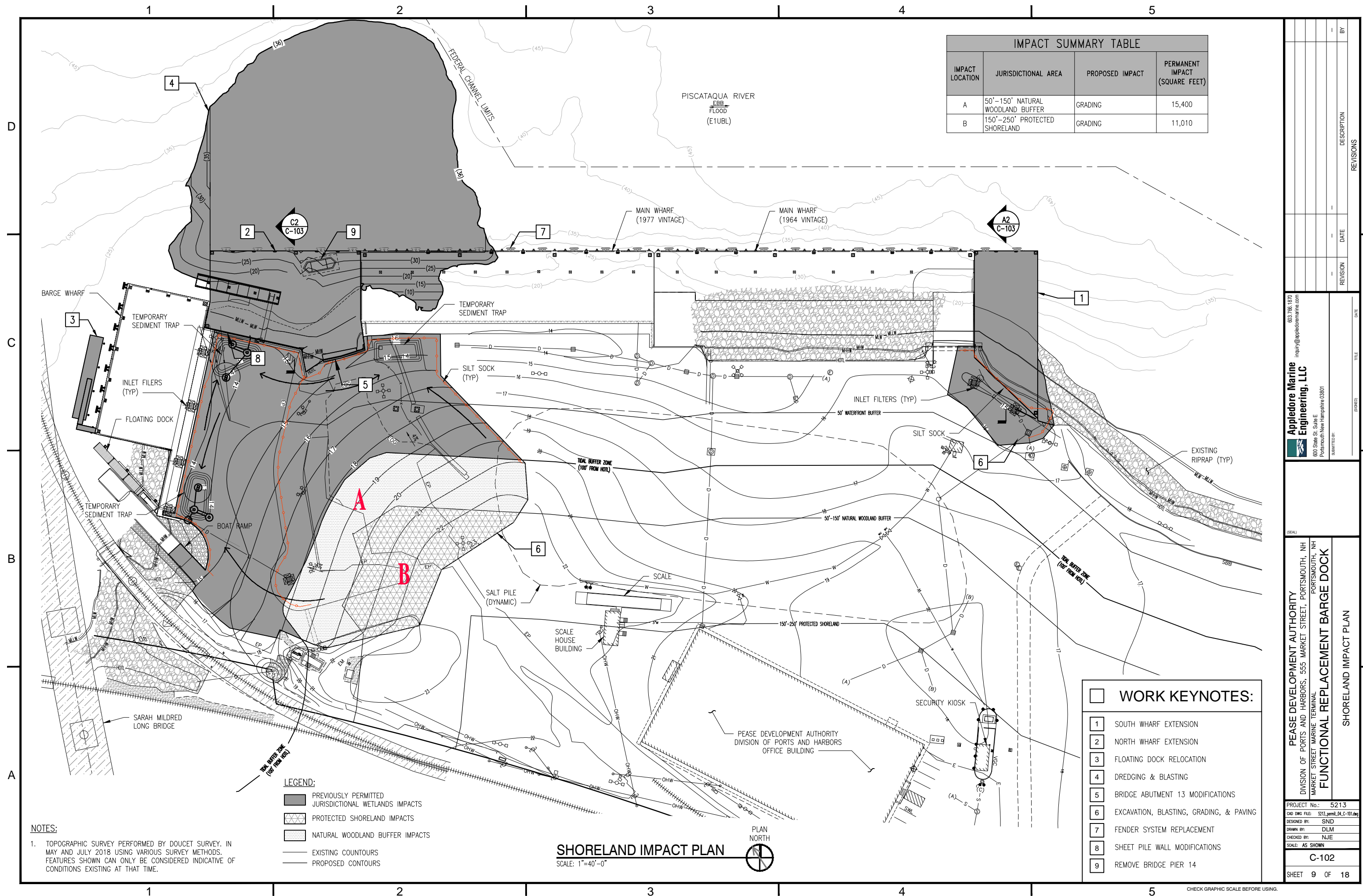
- WORK KEYNOTES:**
- 1 SOUTH WHARF EXTENSION
 - 2 NORTH WHARF EXTENSION
 - 3 FLOATING DOCK RELOCATION
 - 4 DREDGING & BLASTING
 - 5 BRIDGE ABUTMENT 13 MODIFICATIONS
 - 6 EXCAVATION, BLASTING, GRADING, & PAVING
 - 7 FENDER SYSTEM REPLACEMENT
 - 8 SHEET PILE WALL MODIFICATIONS
 - 9 REMOVE BRIDGE PIER 14

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 (DATE)

PEASE DEVELOPMENT AUTHORITY
 DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH
 MARKET STREET MARINE TERMINAL
FUNCTIONAL REPLACEMENT BARGE DOCK
 WETLAND IMPACT PLAN

PROJECT No.: 5213
 CAD DWG FILE: S213_pemil_04_C-101.dwg
 DESIGNED BY: SND
 DRAWN BY: DLM
 CHECKED BY: NJE
 SCALE: AS SHOWN
C-101
 SHEET 8 OF 18

REVISION	DATE	DESCRIPTION	BY



IMPACT SUMMARY TABLE			
IMPACT LOCATION	JURISDICTIONAL AREA	PROPOSED IMPACT	PERMANENT IMPACT (SQUARE FEET)
A	50'-150' NATURAL WOODLAND BUFFER	GRADING	15,400
B	150'-250' PROTECTED SHORELAND	GRADING	11,010

NOTES:
 1. TOPOGRAPHIC SURVEY PERFORMED BY DOUCET SURVEY, IN MAY AND JULY 2018 USING VARIOUS SURVEY METHODS. FEATURES SHOWN CAN ONLY BE CONSIDERED INDICATIVE OF CONDITIONS EXISTING AT THAT TIME.

LEGEND:
 [Solid Grey] PREVIOUSLY PERMITTED JURISDICTIONAL WETLANDS IMPACTS
 [Cross-hatched] PROTECTED SHORELAND IMPACTS
 [Dotted] NATURAL WOODLAND BUFFER IMPACTS
 [Thin Line] EXISTING CONTOURS
 [Thick Line] PROPOSED CONTOURS

SHORELAND IMPACT PLAN
 SCALE: 1"=40'-0"
 PLAN NORTH

- WORK KEYNOTES:**
- 1 SOUTH WHARF EXTENSION
 - 2 NORTH WHARF EXTENSION
 - 3 FLOATING DOCK RELOCATION
 - 4 DREDGING & BLASTING
 - 5 BRIDGE ABUTMENT 13 MODIFICATIONS
 - 6 EXCAVATION, BLASTING, GRADING, & PAVING
 - 7 FENDER SYSTEM REPLACEMENT
 - 8 SHEET PILE WALL MODIFICATIONS
 - 9 REMOVE BRIDGE PIER 14

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 MARKET STREET MARINE TERMINAL
FUNCTIONAL REPLACEMENT BARGE DOCK
 SHORELAND IMPACT PLAN

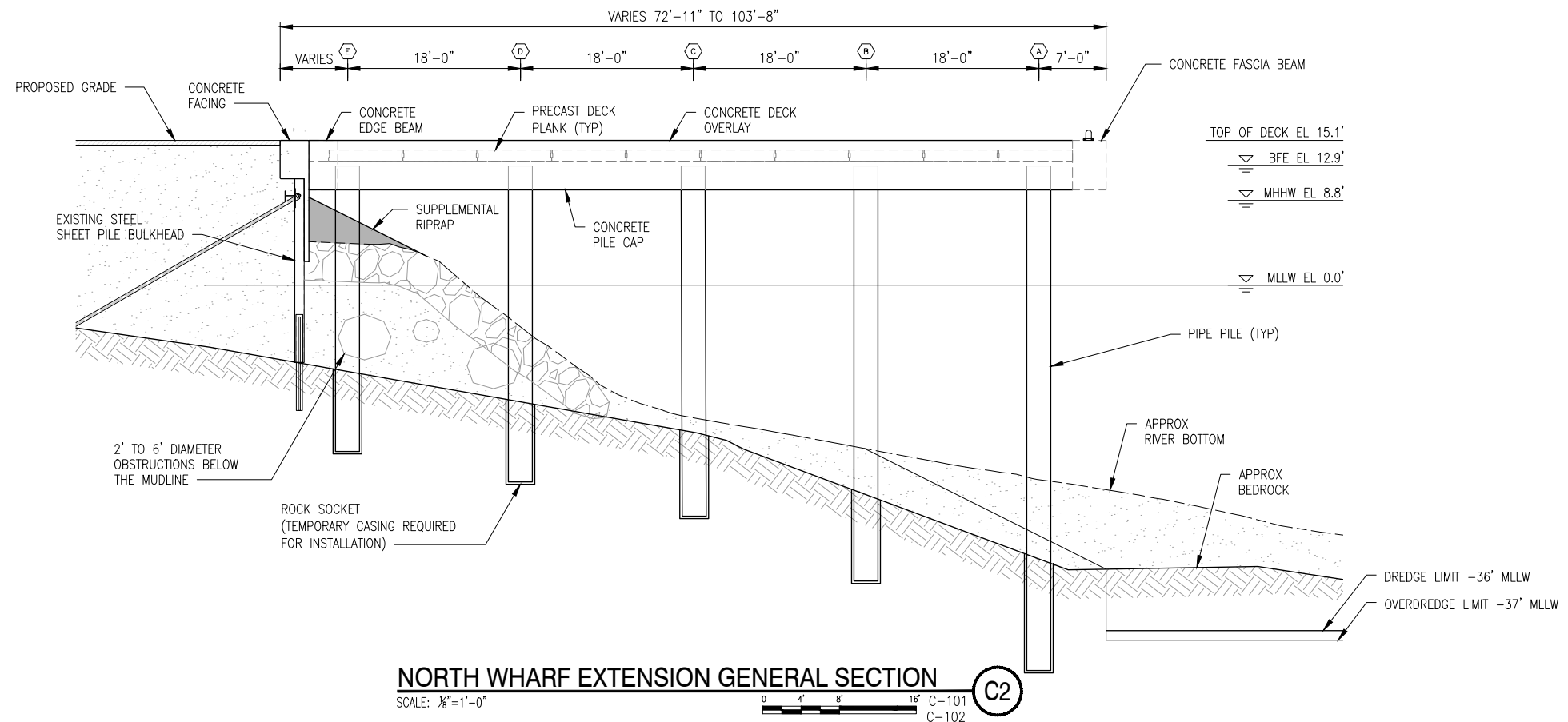
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 DESIGNED BY: SND
 DRAWN BY: DLM
 CHECKED BY: NJE
 SCALE: AS SHOWN
C-102
 SHEET 9 OF 18

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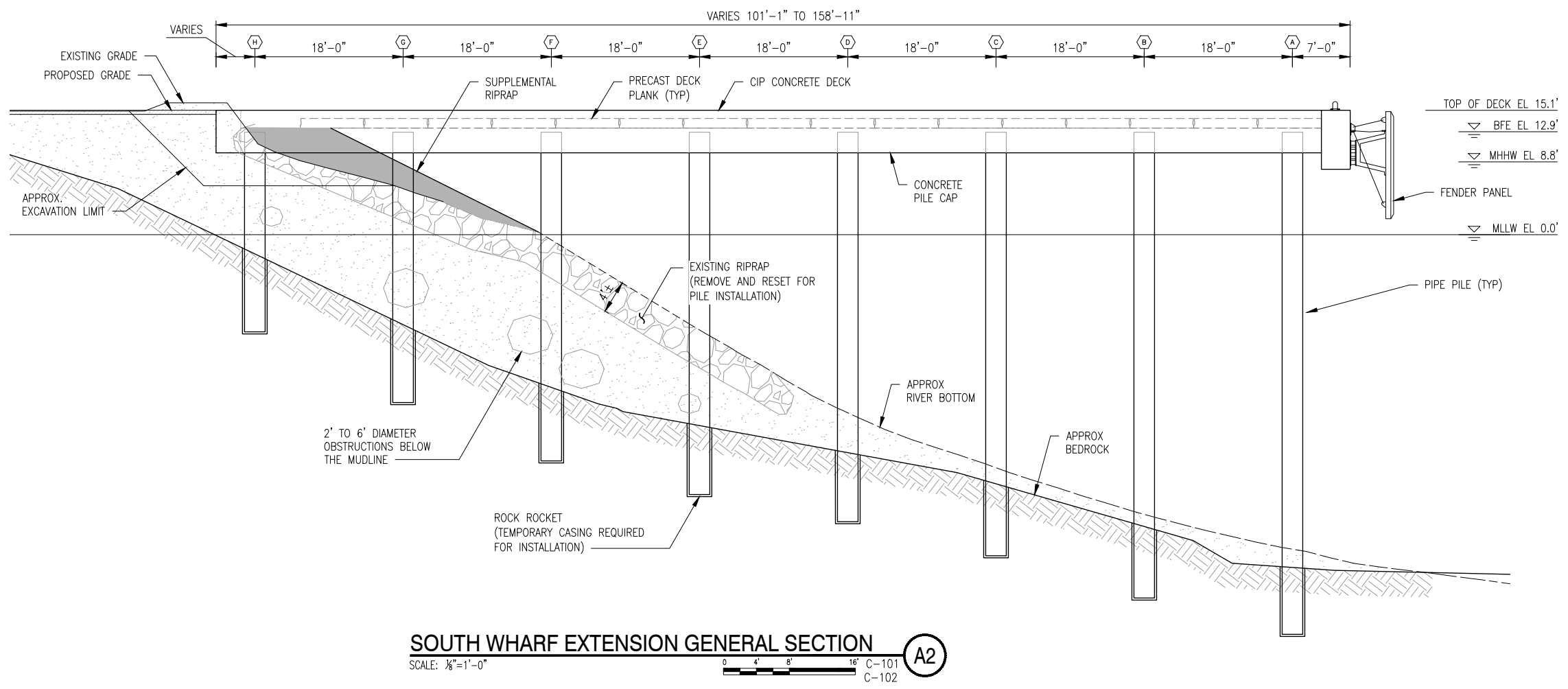
ELEVATION REFERENCE TABLE

REFERENCE	MLLW
DECK ELEVATION	15.10
BASE FLOOD ELEVATION (BFE)	12.86
HIGHEST OBSERVED TIDE (02/07/1978)	12.52
HIGHEST ASTRONOMICAL TIDE (HAT) (06/15/1995)	10.52
MEAN HIGHER HIGH WATER (MHHW)	8.84
MEAN HIGH WATER (MHW)	8.43
NORTH AMERICAN VERTICAL DATUM (NAVD88)	4.62
MEAN SEA LEVEL (MSL)	4.43
MEAN TIDE LEVEL (MTL)	4.38
NATIONAL GEODETIC VERTICAL DATUM (NGVD29)	3.86
MEAN LOW WATER (MLW)	0.32
MEAN LOWER LOW WATER (MLLW)	0.00
LOWEST ASTRONOMICAL TIDE (LAT)	-1.67
LOWEST OBSERVED WATER LEVEL (11/30/1955)	-3.35

THE LOCAL TIDAL DATUM INFORMATION AND THE RELATIONSHIP BETWEEN LOCAL TIDE AND NAVD88 IS BASED ON DATA PUBLISHED BY THE U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SERVICE FOR STATION "SEAVEY ISLAND, PORTSMOUTH HARBOR", STATION ID: 8419870, TIDAL EPOCH 1983-2001.



NORTH WHARF EXTENSION GENERAL SECTION C2
SCALE: 1/8"=1'-0"



SOUTH WHARF EXTENSION GENERAL SECTION A2
SCALE: 1/8"=1'-0"

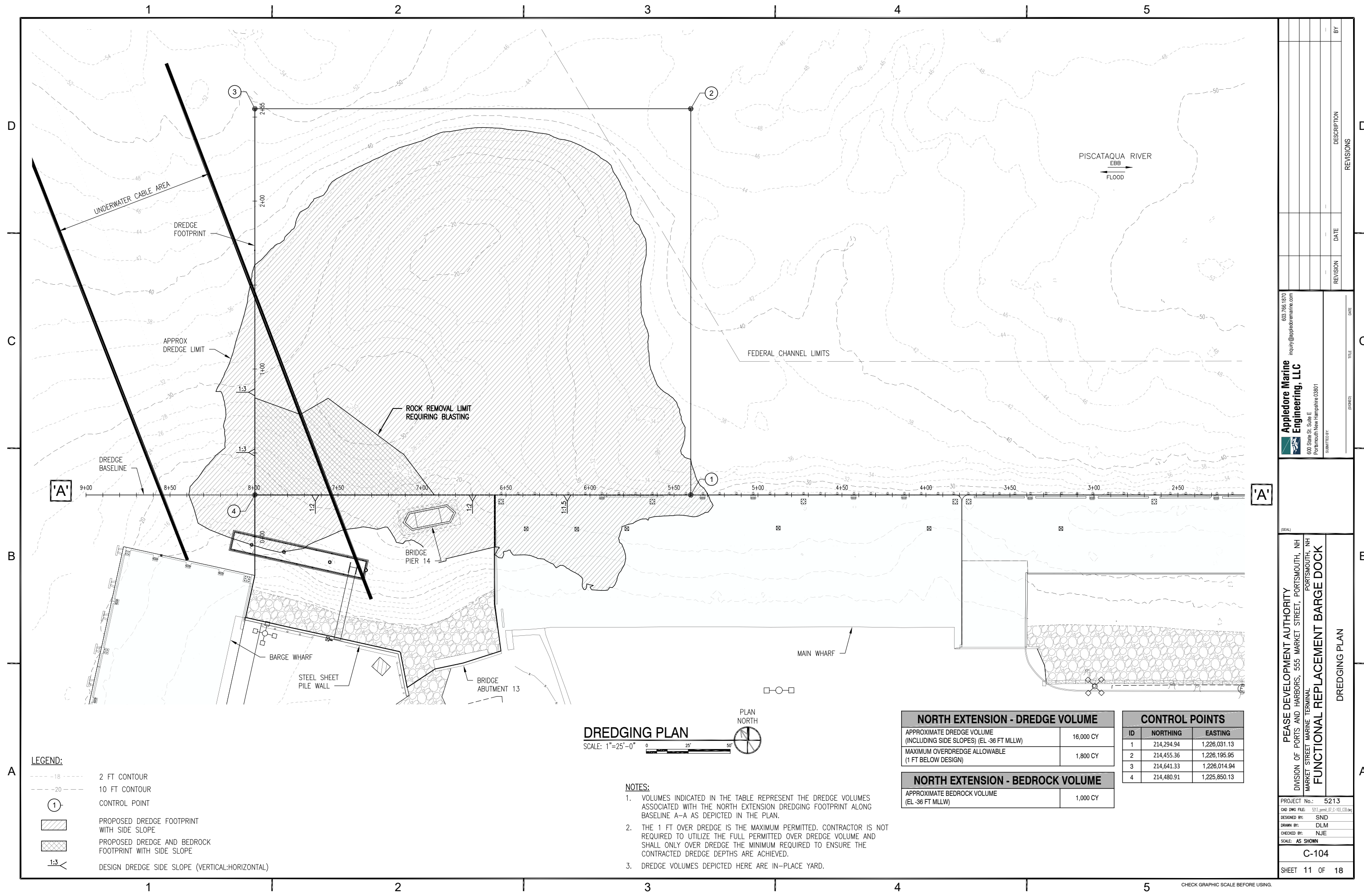
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PEASE DEVELOPMENT AUTHORITY
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FUNCTIONAL REPLACEMENT BARGE DOCK

GENERAL SECTIONS

PROJECT No.:	5213
CAD DWG FILE:	S213_permit_06_S-101.dwg
DESIGNED BY:	SND
DRAWN BY:	KMV
CHECKED BY:	NJE
SCALE:	AS SHOWN



UNDERWATER CABLE AREA

DREDGE FOOTPRINT

APPROX DREDGE LIMIT

DREDGE BASELINE

ROCK REMOVAL LIMIT REQUIRING BLASTING

BRIDGE PIER 14

BARGE WHARF

STEEL SHEET PILE WALL

BRIDGE ABUTMENT 13

FEDERAL CHANNEL LIMITS

PISCATAQUA RIVER
EBB
FLOOD

MAIN WHARF

DREDGING PLAN

SCALE: 1"=25'-0"



LEGEND:

	2 FT CONTOUR
	10 FT CONTOUR
	CONTROL POINT
	PROPOSED DREDGE FOOTPRINT WITH SIDE SLOPE
	PROPOSED DREDGE AND BEDROCK FOOTPRINT WITH SIDE SLOPE
	DESIGN DREDGE SIDE SLOPE (VERTICAL:HORIZONTAL)

- NOTES:**
- VOLUMES INDICATED IN THE TABLE REPRESENT THE DREDGE VOLUMES ASSOCIATED WITH THE NORTH EXTENSION DREDGING FOOTPRINT ALONG BASELINE A-A AS DEPICTED IN THE PLAN.
 - THE 1 FT OVER DREDGE IS THE MAXIMUM PERMITTED. CONTRACTOR IS NOT REQUIRED TO UTILIZE THE FULL PERMITTED OVER DREDGE VOLUME AND SHALL ONLY OVER DREDGE THE MINIMUM REQUIRED TO ENSURE THE CONTRACTED DREDGE DEPTHS ARE ACHIEVED.
 - DREDGE VOLUMES DEPICTED HERE ARE IN-PLACE YARD.

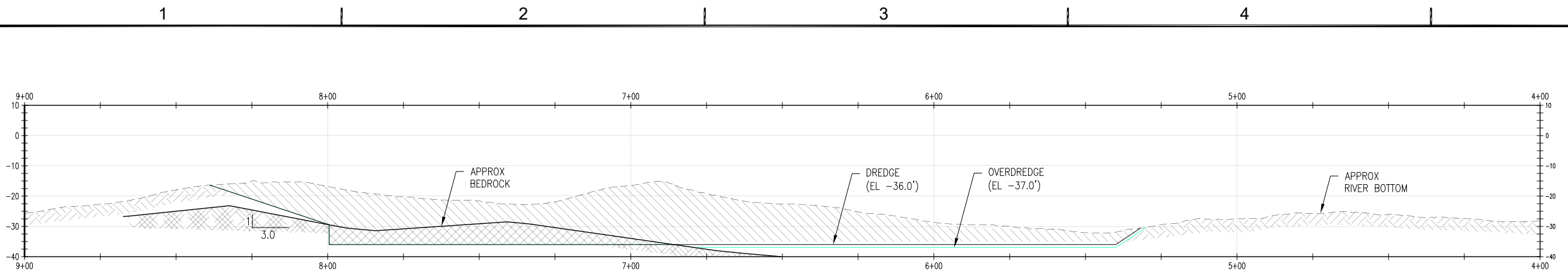
NORTH EXTENSION - DREDGE VOLUME	
APPROXIMATE DREDGE VOLUME (INCLUDING SIDE SLOPES) (EL -36 FT MLLW)	16,000 CY
MAXIMUM OVERDREDGE ALLOWABLE (1 FT BELOW DESIGN)	1,800 CY

NORTH EXTENSION - BEDROCK VOLUME	
APPROXIMATE BEDROCK VOLUME (EL -36 FT MLLW)	1,000 CY

CONTROL POINTS		
ID	NORTHING	EASTING
1	214,294.94	1,226,031.13
2	214,455.36	1,226,195.95
3	214,641.33	1,226,014.94
4	214,480.91	1,225,850.13

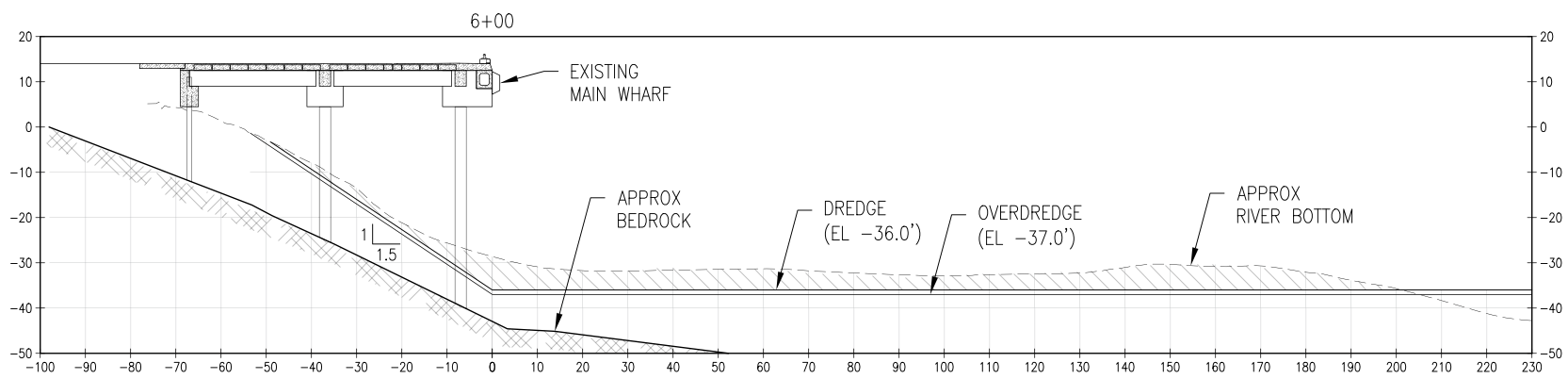
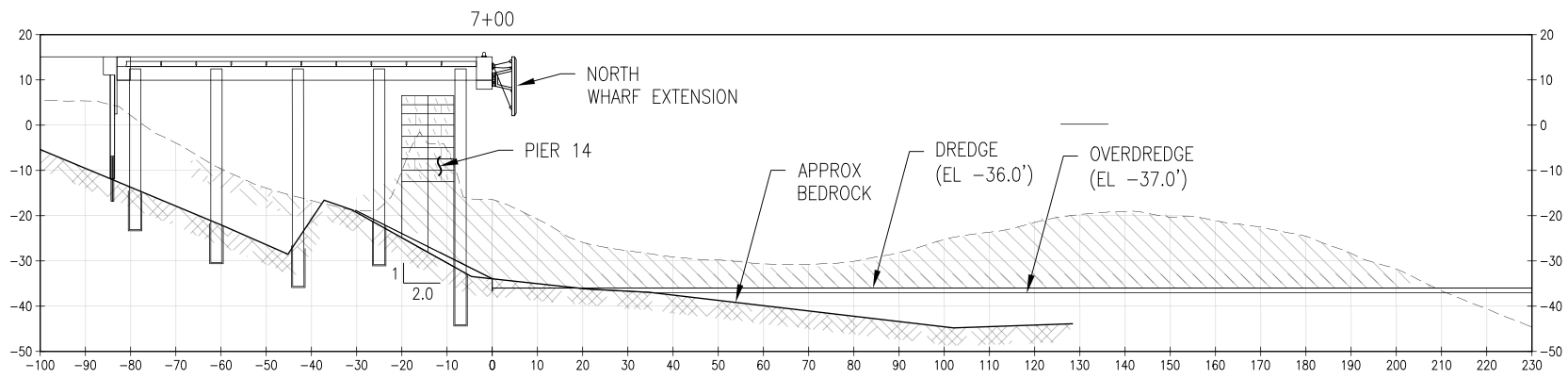
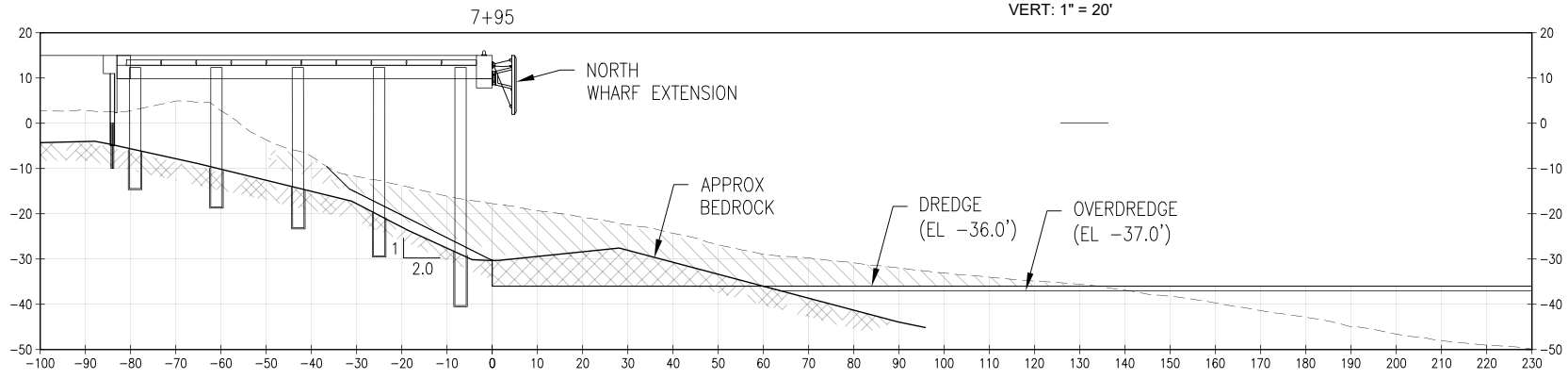
<p>Appledore Marine Engineering, LLC 600 State St, Suite E Portsmouth New Hampshire 03801</p>		603.786.1970 inquiry@appledoremarine.com
PROJECT No.: 5213 CAD DWG FILE: 5213_pmd_01_C-103_010.dwg DESIGNED BY: SND DRAWN BY: DLN CHECKED BY: NJE SCALE: AS SHOWN	SUBMITTED BY: _____ DATE: _____ (REVISED) _____ TITLE: _____ REVISION DATE DESCRIPTION BY	

<p>PEASE DEVELOPMENT AUTHORITY DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH MARKET STREET MARINE TERMINAL FUNCTIONAL REPLACEMENT BARGE DOCK</p>	<p>DREDGING PLAN</p>
<p>SHEET 11 OF 18</p>	



DREDGING PROFILE A-A

HORIZ: 1" = 20'
VERT: 1" = 20'



DREDGING SECTIONS A-A

HORIZ: 1" = 20'
VERT: 1" = 20'

- LEGEND:**
- DREDGE REMOVAL
 - BEDROCK REMOVAL
 - APPROXIMATE MUDLINE
 - APPROXIMATE BEDROCK

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Portsmouth New Hampshire 03801

SUBMITTED BY: _____
DATE: _____

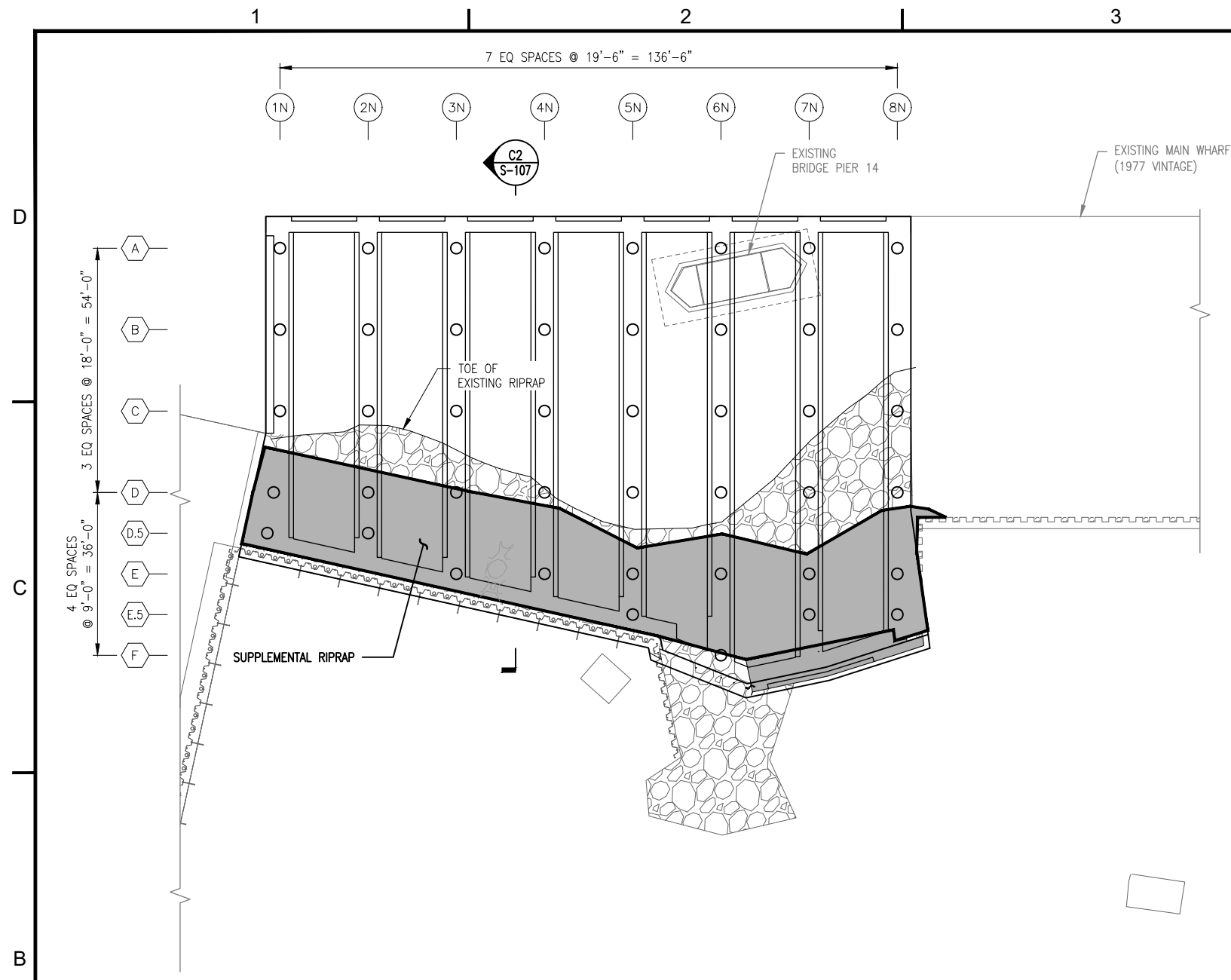
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CAD DWG FILE: 5213_pem_01_C-105_010.dwg

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MARKET STREET MARINE TERMINAL
FUNCTIONAL REPLACEMENT BARGE DOCK

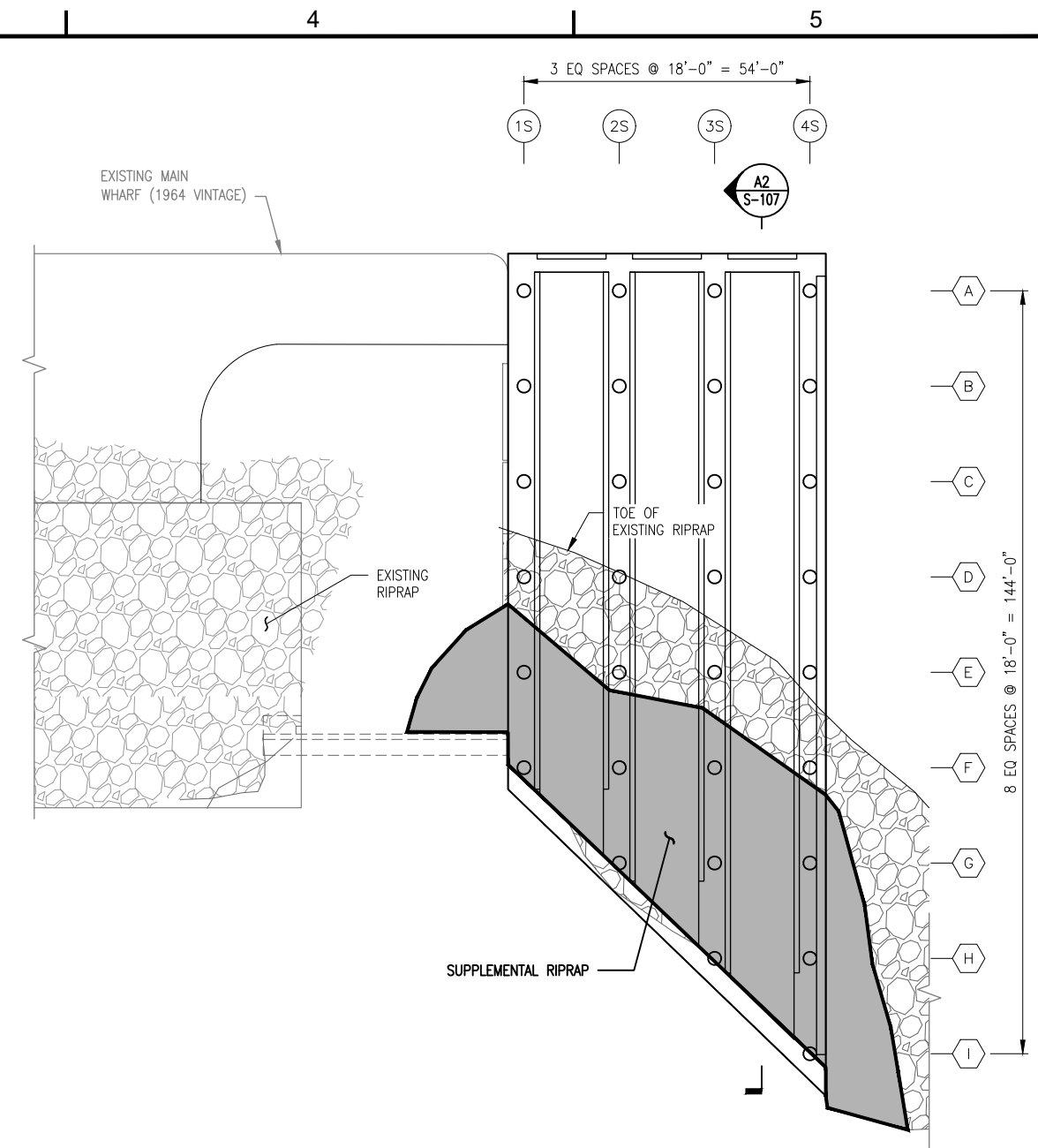
DREDGE SECTIONS

DESIGNED BY: SND
DRAWN BY: DLM
CHECKED BY: NJE
SCALE: AS SHOWN

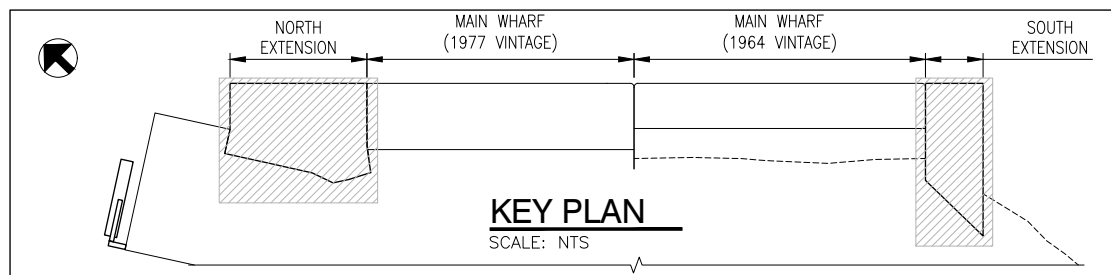
C-105
SHEET 12 OF 18



NORTH WHARF EXTENSION RIPRAP PLAN
 SCALE: 1/16"=1'-0"
 PLAN NORTH



SOUTH WHARF EXTENSION RIPRAP PLAN
 SCALE: 1/16"=1'-0"
 PLAN NORTH



KEY PLAN
 SCALE: NTS

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PROJECT No.: 5213 CAD DWG FILE: S213_permit_06_S-101.dwg DESIGNED BY: SND DRAWN BY: MDM CHECKED BY: NJE SCALE: AS SHOWN		SHEET 13 OF 18	

CHECK GRAPHIC SCALE BEFORE USING.

1

2

3

4

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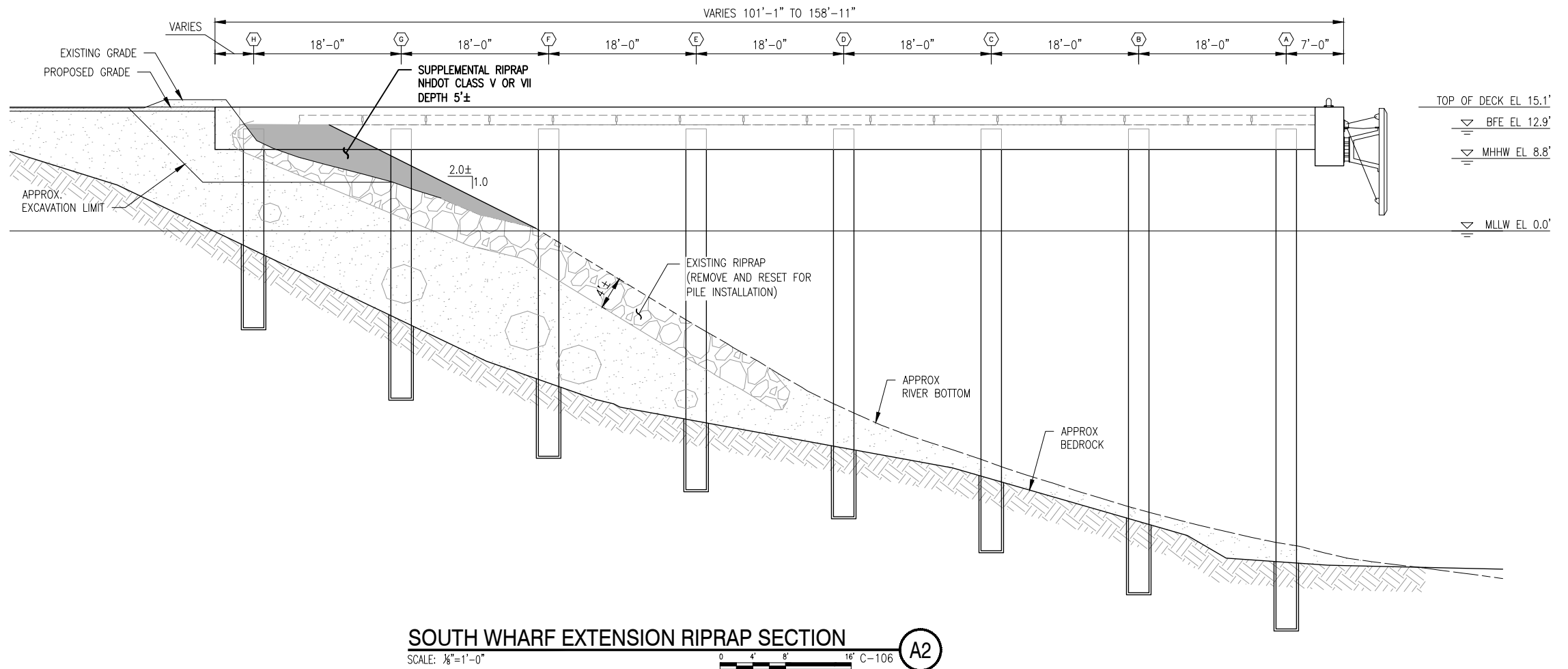
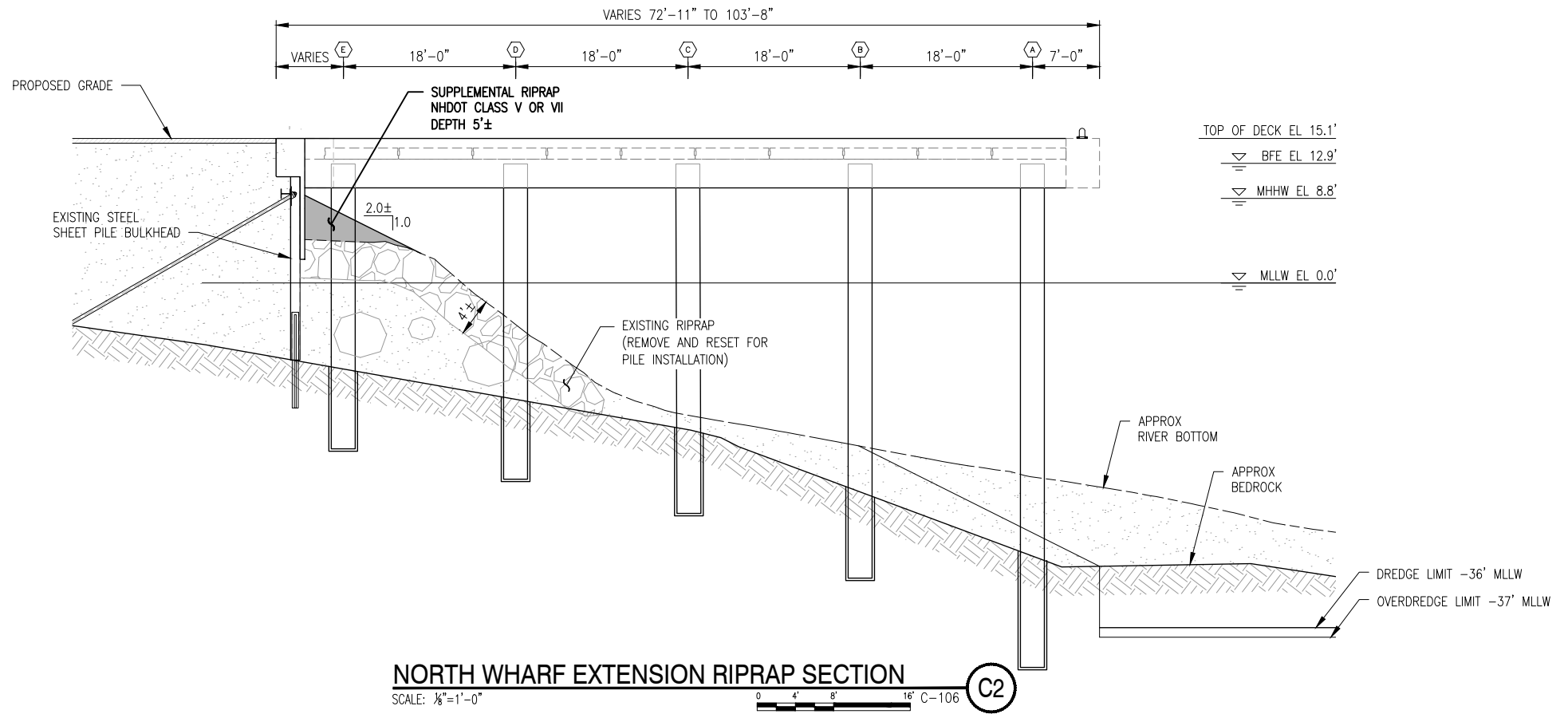
D

C

B

A

RIPRAP SUMMARY TABLE						
RIPRAP CLASSES AND SIZES			PERCENT DISTRIBUTION OF PARTICLE SIZE BY VOLUME (CF)			
NHDOT CLASS	NOMINAL SIZE (IN)	MAXIMUM SIZE (IN.)	<15%	15%-85%	>85%	MAXIMUM
V	18	36	1.3	3.5	8.5	22
VII	24	48	3	8	19	53



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 Portsmouth New Hampshire 03801

DATE: _____
 TITLE: _____
 DRAWN: _____
 SUBMITTED BY: _____

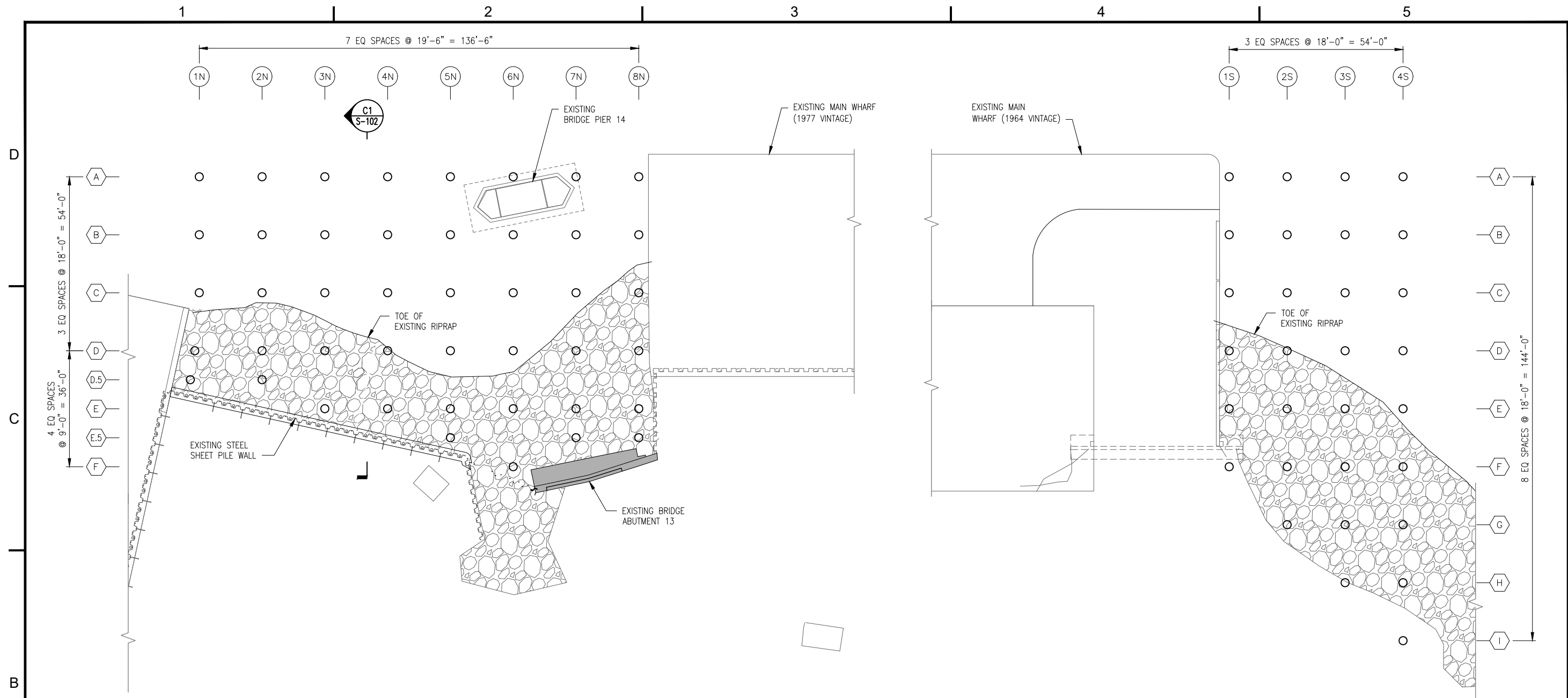
PEASE DEVELOPMENT AUTHORITY
 DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH
 MARKET STREET MARINE TERMINAL

FUNCTIONAL REPLACEMENT BARGE DOCK

RIPRAP SECTIONS

PROJECT No.:	5213
CAD DWG FILE:	S213_permit_06_S-101.dwg
DESIGNED BY:	SND
DRAWN BY:	KMV
CHECKED BY:	NJE
SCALE:	AS SHOWN

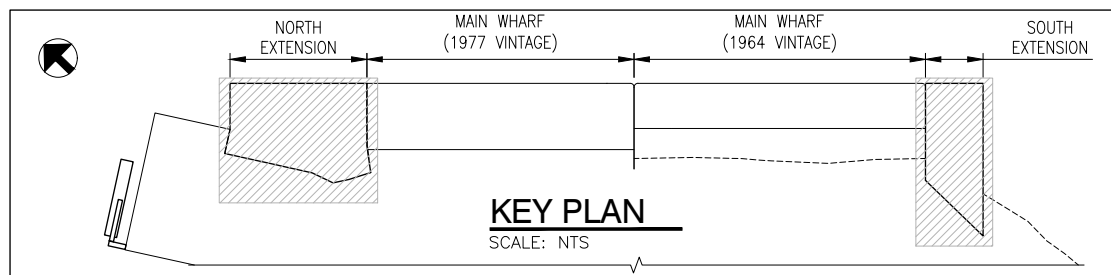
C-107
 SHEET 14 OF 18



NORTH WHARF EXTENSION PILE PLAN
 SCALE: 1/16" = 1'-0"
 PLAN NORTH

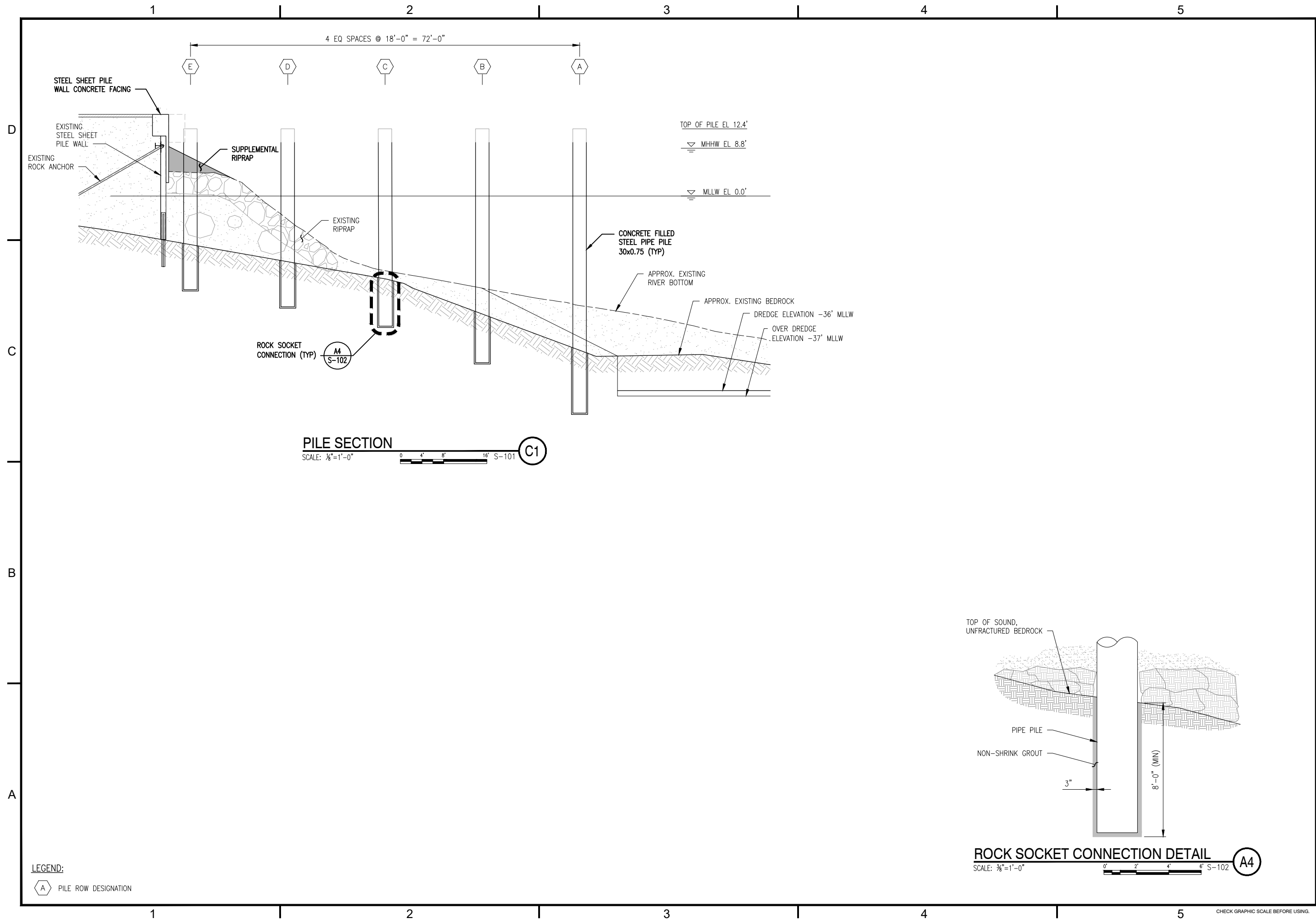
SOUTH WHARF EXTENSION PILE PLAN
 SCALE: 1/16" = 1'-0"
 PLAN NORTH

- LEGEND:**
- ① PILE BENT DESIGNATION
 - Ⓐ PILE ROW DESIGNATION
 - CONCRETE FILLED 30" DIA STEEL PIPE PILE

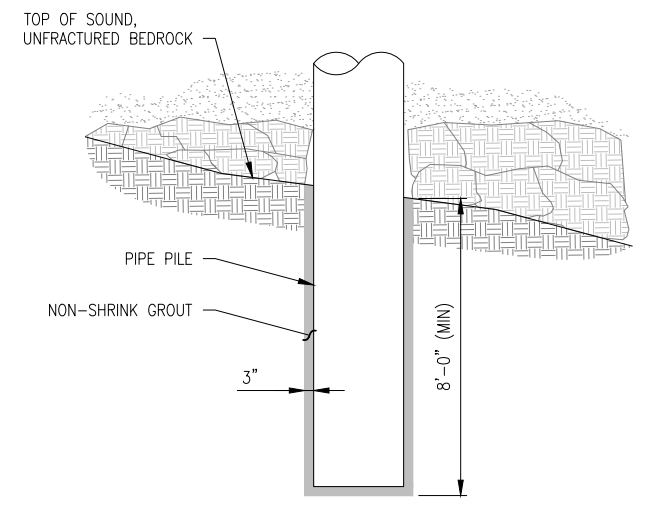


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REVISION	DATE	DESCRIPTION	BY						
<p>PEASE DEVELOPMENT AUTHORITY DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH MARKET STREET MARINE TERMINAL FUNCTIONAL REPLACEMENT BARGE DOCK</p>									
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<p>S-101</p>									
<p>SHEET 15 OF 18</p>									

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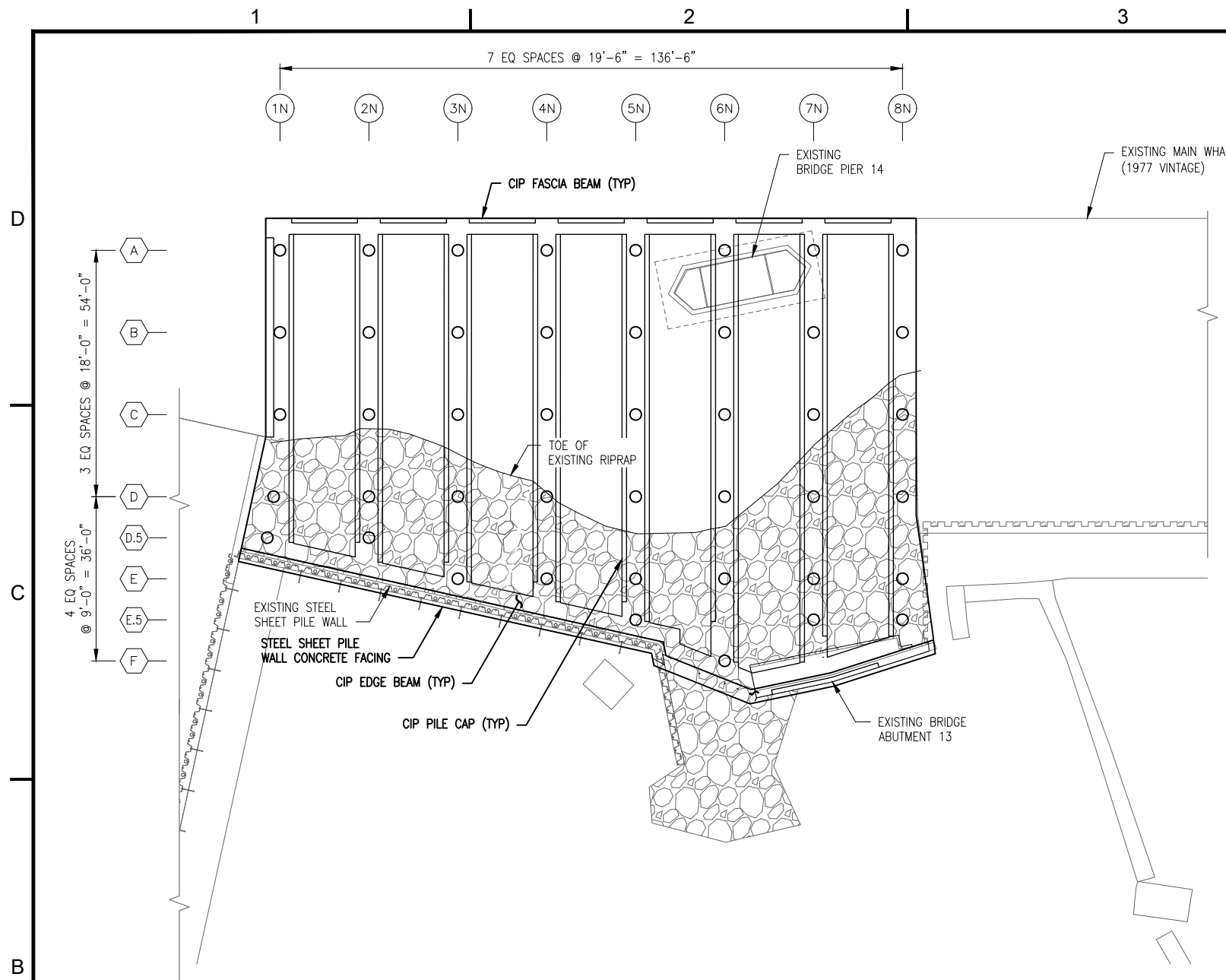
PILE SECTION
SCALE: 3/8"=1'-0" C1



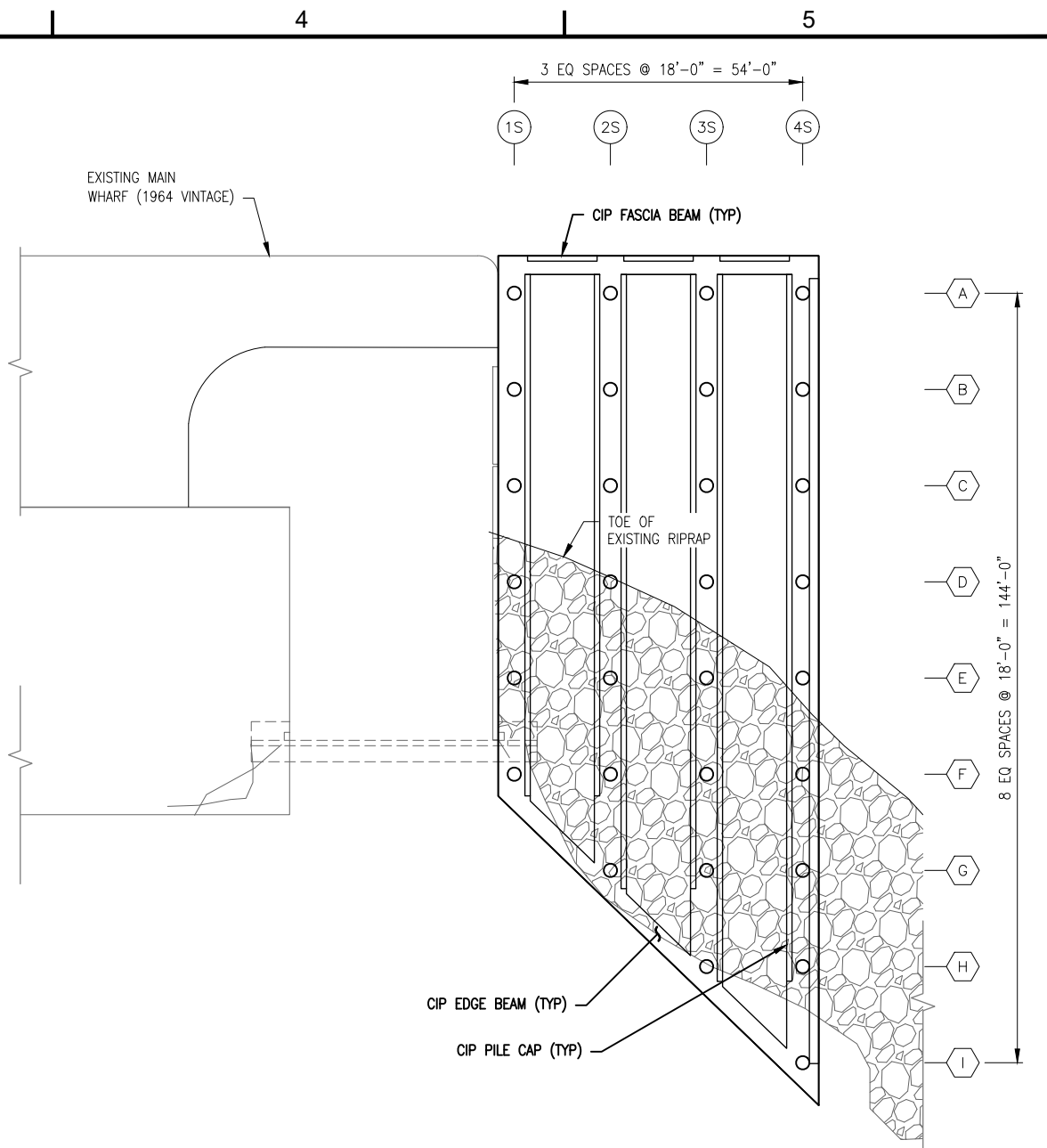
ROCK SOCKET CONNECTION DETAIL
SCALE: 3/8"=1'-0" A4

LEGEND:
A PILE ROW DESIGNATION

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FUNCTIONAL REPLACEMENT BARGE DOCK					
PILE SECTION AND DETAILS					
PROJECT No.: 5213					
CAD DWG FILE: S113_permit_06_S-101.dwg					
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DRAWN BY: MDM					
CHECKED BY: NJE					
SCALE: AS SHOWN					
S-102					
SHEET 16 OF 18					

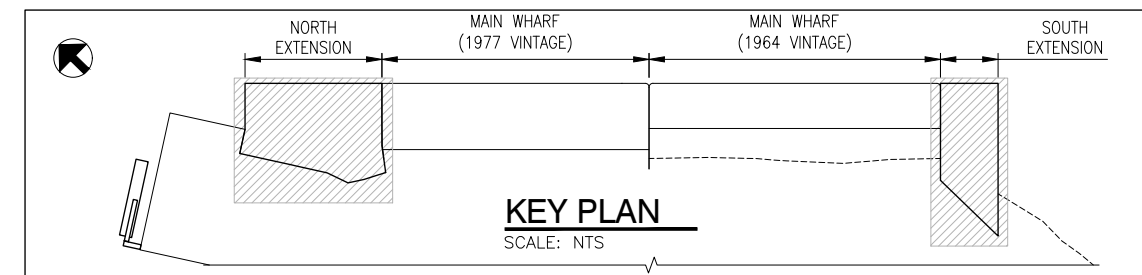


NORTH WHARF EXTENSION FRAMING PLAN
 SCALE: 1/16"=1'-0"
 PLAN NORTH



SOUTH WHARF EXTENSION FRAMING PLAN
 SCALE: 1/16"=1'-0"
 PLAN NORTH

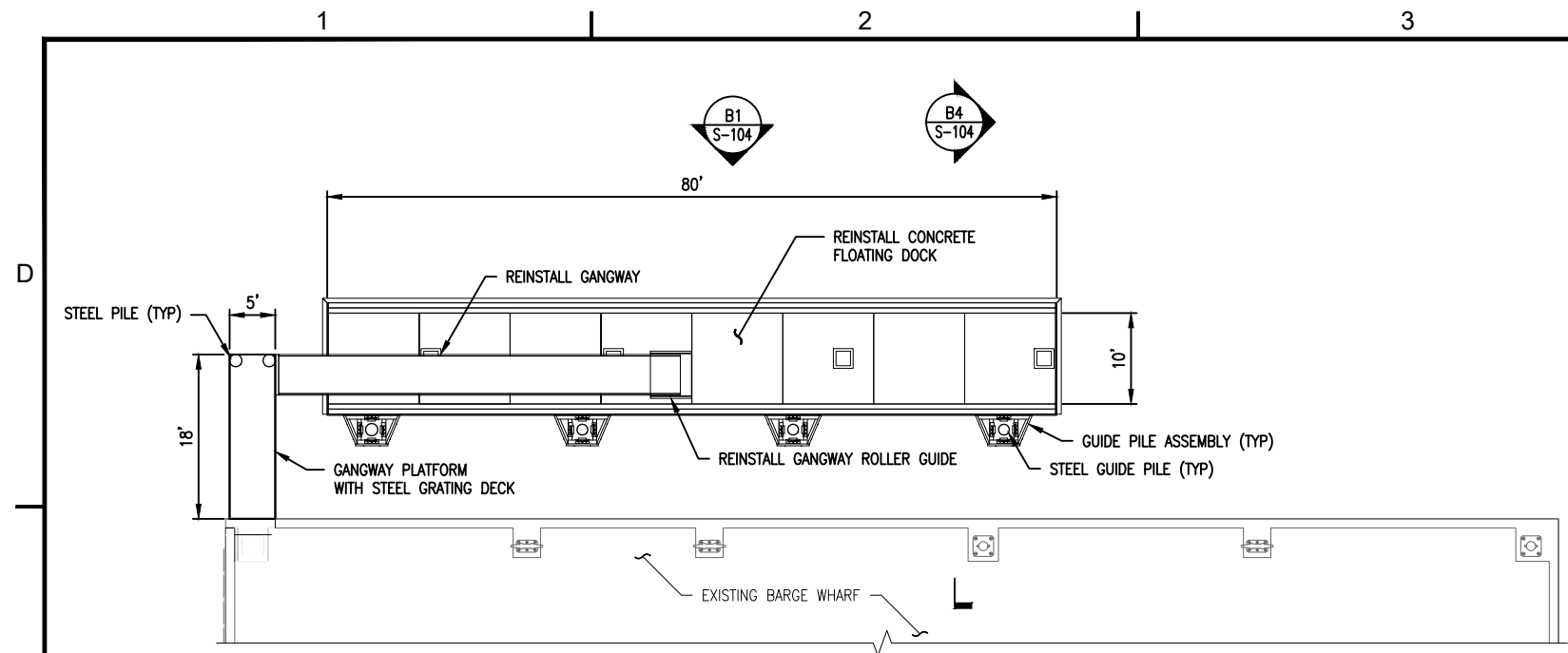
- LEGEND:**
- ① PILE BENT DESIGNATION
 - Ⓐ PILE ROW DESIGNATION
 - CONCRETE-FILLED STEEL PIPE PILE



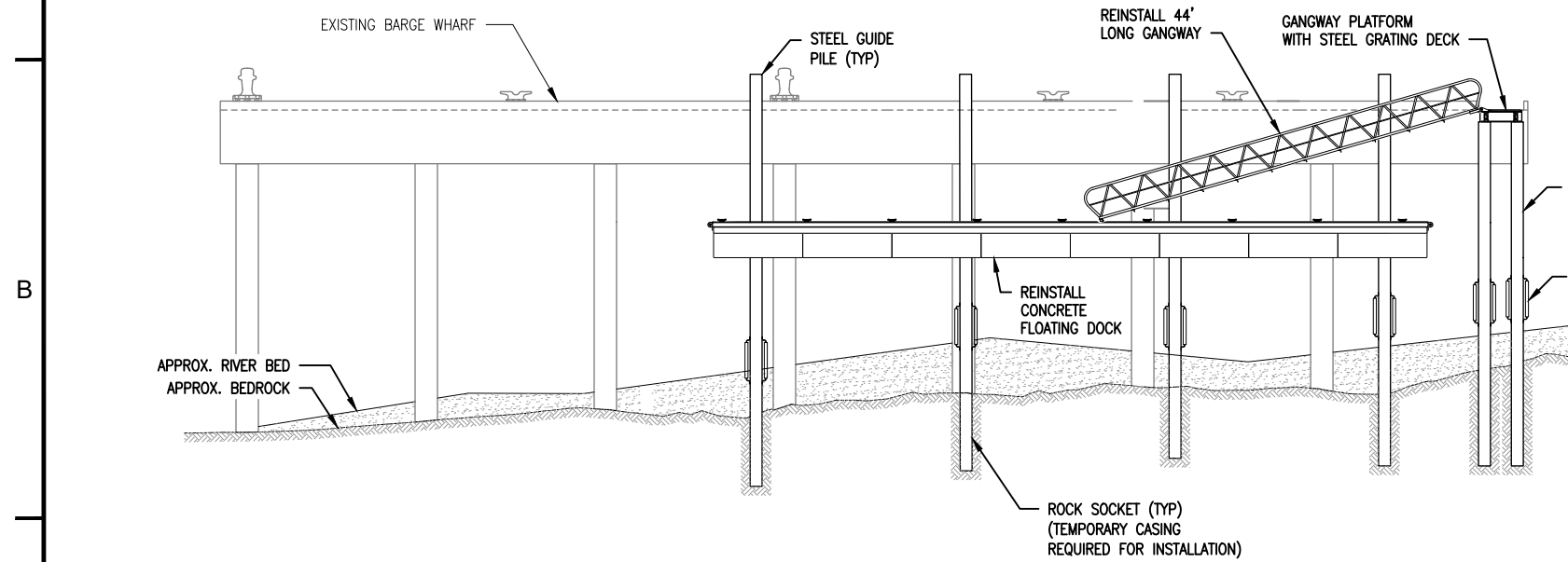
KEY PLAN
 SCALE: NTS

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<p>PEASE DEVELOPMENT AUTHORITY DIVISION OF PORTS AND HARBORS, 555 MARKET STREET, PORTSMOUTH, NH MARKET STREET MARINE TERMINAL FUNCTIONAL REPLACEMENT BARGE DOCK</p>									
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<p>SHEET 17 OF 18</p>									

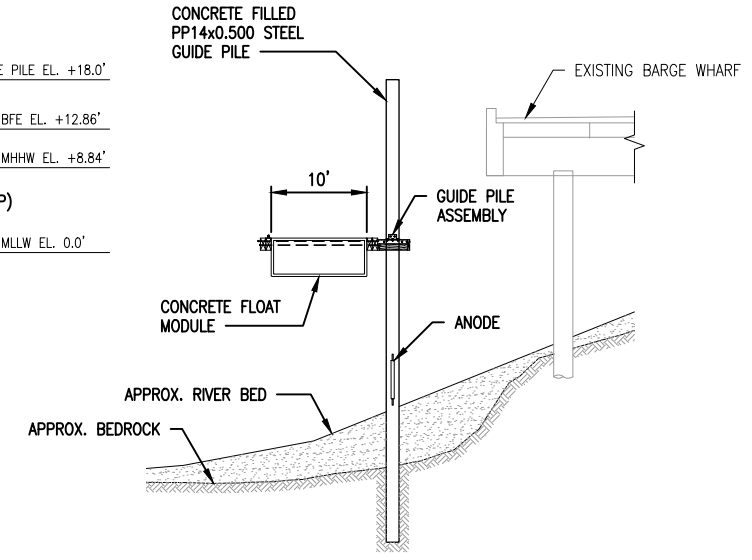
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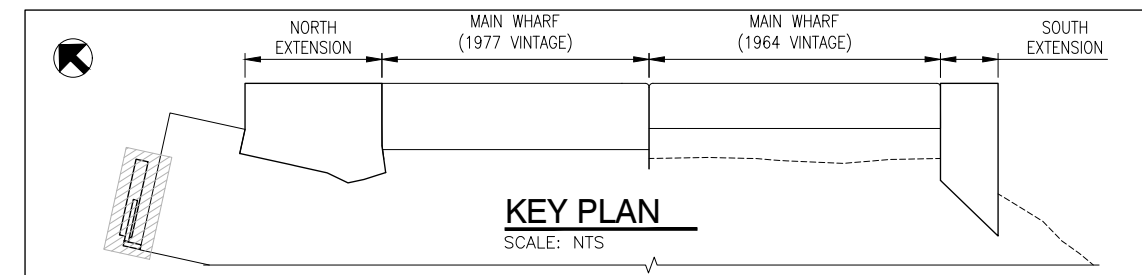
FLOATING DOCK PLAN
 SCALE: 1"=10'-0"
 PLAN NORTH



FLOATING DOCK ELEVATION
 SCALE: 1"=10'-0"
 B1



FLOATING DOCK SECTION
 SCALE: 1"=10'-0"
 B4



KEY PLAN
 SCALE: NTS

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FUNCTIONAL REPLACEMENT BARGE DOCK
 FLOATING DOCK PLAN AND DETAILS

PROJECT No.: 5213
 CAD DWG FILE: S104_permit_06_S-104.dwg
 DESIGNED BY: SND
 DRAWN BY: MDM
 CHECKED BY: NJE
 SCALE: AS SHOWN

S-104
 SHEET 18 OF 18

SECTION 31 23 01

UNDERWATER BLASTING
02/21; CHG 1: 11/21

PART 1 GENERAL

Work under this section covers the removal of underwater bedrock. Blasting operations outlined in this specification are only intended for removal of bedrock as depicted in the drawings and not general overburden excavation.

Underwater blasting must occur within the permitted window. The project requires the implementation of a Turbidity Control and Monitoring Plan for permit compliance. This plan can be found in Appendix D.

1.1 SCOPE

The breakage of rock and hard/unyielding materials may be conducted by any means, unless otherwise stated herein. If the contractor elects to use drilling and blasting for breakage or displacement of any units, this entire section is applicable and covers activities associated with drilling and blasting for rock excavation at the surface. Contained herein are procedures for all activities relating to drilling; blasting and the transportation, storage and use of explosives; breakage and displacement of rock. The Contractor's blasting program and methods are those necessary to accomplish the excavation shown on the Contract drawings in accordance with the provisions specified herein. Control the quantity of explosives fired in all blasting to prevent injuries to persons and to avoid damage to all structures, properties, governmental and nonprofit entities, commerce and businesses, and natural resources and their habitat.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ACOUSTICAL SOCIETY OF AMERICA (ASA)

ASA S1.13 (2005; R 2010) Methods for the Measurement of Sound Pressure Levels in Air (ASA 118)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASSE A10.12 (1998; R 2005) Safety Requirements for Excavation

ANSI/ASSE A10.7 (1997; R 2005) Commercial Explosives and Blasting Agents - Safety Requirements for Transportation, Storage, Handling and Use

ANSI S2.2 (1959; R 2006) American National Standard Methods for the Calibration of Shock and Vibration Pickups

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6 (2006) Safety Requirements for Demolition Operations

BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES (ATF)

ATF P 5400.7 Federal Explosives Law and Regulations (ACC).

INTERNATIONAL SOCIETY OF EXPLOSIVE ENGINEERS (ISEE)

Blaster's Handbook 18th Edition, 2014. Hardcover, 742pp., 7th Printing, 2014.

EE Handbook 4 (1989) Explosives Eng. Handbook Paper #4 - Blasting for Underwater Rock Excavation. IEE, by R.D.G Roberts, Summer

INTERNATIONAL SOCIETY OF AUTOMATION (ISA)

ISEE PSBS (2017) ISEE Performance Specification for Blasting Seismographs

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 495 (2018) Explosives Materials Code

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety -- Safety and Health Requirements Manual

EM 1110-2-3800 (2018) Engineering and Design -- Blasting for Rock Excavations

ER 385-1-95 (2014) Safety -- Safety and Health Requirements for Operations and Activities Involving Munitions and Explosives of Concern

ETL 1110-1-142 (1989) Blasting Vibration Damage and Noise Prediction and Control

1.3 DEFINITIONS

1.3.1 Controlled Blasting

Controlled blasting refers to blasting techniques used to better distribute the explosive charge to minimize adverse impacts. For underwater blasting, adverse impacts may be cited for the public's and contracted personnel's safety, lessening the fracturing of the rock being blasted, surrounding facilities' protection, and the avoidance of impacting natural resources or their habitats. Controlled blasting techniques must be deployed, such as careful loading to the pattern's design using the drilling log for each shot hole, stemming effectively the top of firm rock and any soft zones or voids, carefully observing maximum charge weight per delay, using delays between holes and rows of 25 milliseconds or greater, and avoiding rifling plumes by proper blasting techniques.

1.3.2 Flyrock

Flyrock is one of the three primary adverse impacts from blasting. Flyrock is defined as any airborne projectile flying the lesser distance of either 200 ft horizontally from the shot pattern or one-half the distance between the shot pattern and the Contractor work limits, whichever distance is the lesser.

1.3.3 Green Concrete

Green concrete is recently placed concrete that has initiated setting but may have substantial strength reduction from strong vibrations before the concrete has fully cured. Green concrete also includes the materials of shotcrete or cementitious grouts. Each Individual Shot Plan is required to consider vibrations emanating from its blast pattern reaching the location of the reported newly placed concrete to remain below allowable vibration levels depending upon the age of the concrete. Note the paragraph GREEN CONCRETE.

1.3.4 Pressure Waves

Pressure Waves, both Airblast (or noise) and Underwater Pressure Waves, are one of the three, primary adverse impacts from blasting. Airblast and Underwater Pressure Waves are solely compression waves passing through the air or water, respectively. Their units of measure may be in terms of pressure, Pascals (Pa) or pounds per square inch (psi), or in terms of the logarithmic scale, Decibels (dB). Note that pressures in dB have different reference values for Airblast and Underwater Pressure Waves, so the pressure waves through air are of a lower magnitude than pressure waves through water with the same numeric dB value.

1.3.5 Rock, Hard/Unyielding Material, Weathered Rock, Voids (Bit Drops), Sediment

1.3.5.1 Rock

Rock is natural solid, interlocking material with firmly cemented, laminated, and crystalline fabric, foliated masses or conglomerate deposits, none of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of high-energy mechanical devices; and, so classified for this project as submerged large boulders, which may be the minimum volume of 0.50 cubic yard.

1.3.5.2 Hard/Unyielding Material

Hard/Unyielding materials comprise weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" with stones greater than 1.0 inch in any dimension. These materials usually require the use of heavy excavation equipment or high-energy mechanical devices for breakage or displacement to remove the materials.

1.3.5.3 Weathered Rock

Weathered rock, for underwater percussion-drilling logging, is any original rock unit that has been altered to a weaker state that will not retain stemming when explosives are loaded into that material.

1.3.5.4 Voids

Voids, for underwater percussion-drilling logging, is any rapid bit drop with little or no resistance to the downward drilling pressure. Voids may be water or sediment filled, which may possibly determine that the original rock unit has been altered to a weaker state that will not retain the gaseous detonation products when the explosives are shot.

1.3.5.5 Sediment

Sediment is both: the loose to firm material that may be dredged above the surface of weathered or firm rock, which cannot be easily dredged; and the infill of voids as solid particles.

1.3.6 Unstable Material

Unstable materials are loose, submerged sediment that are easily displaced by water flow or turbulence and by vibrations or incidental impact.

1.3.7 Vibrations

Vibrations are one of the three, primary adverse impacts from blasting. Vibrations are the result of various wave forms emanating from the detonation or deflagration of ignited materials from a shot pattern. Peak particle velocity (PPV) is defined as the maximum absolute value among the three ground vibration velocities measured in the vertical, longitudinal, and transverse directions over a time of a record. Peak, total vector-sum particle velocity is the peak value over the full, time history of each time-unit's value of the square-root sum of the squared, component velocities. Velocity units are expressed in centimeters per second (cps) or inches per second (ips).

1.4 BASIS FOR BIDS

Payment will be at the contract unit price per cubic yard, multiplied by total cubic yards of acceptable bedrock removal.

1.5 SYSTEM DESCRIPTION

Boring logs are shown on the Contract Drawings.

1.5.1 Blasting

Perform blasting in accordance with EM 385-1-1 and in conformance with all Federal, State, and local laws, regulations, and ordinances. Submit notice 30 days prior to starting work. Submit a Master Blasting Plan for approval, prepared and signed by the Blasting Specialist that includes: a listing of all federal, state and local regulations and ordinances to conduct blasting at the project; the support documentation and certifications for all proposed blasting personnel; information and data sheets for all the explosives to be used at the project; the design approach to blasting; outlines of all required reports and formats for all the forms of the respective reports; and, the procedures to control all the adverse effects of blasting. Use the non-electric blasting caps for all underwater blasting. Obtain written approval prior to performing any blasting and notify the Owner 24 hours prior to blasting. Include provisions for storing, handling, and transporting explosives as well as for the blasting operations in the plan.

1.6 QUALITY ASSURANCE

When the nature of the material to be dredged requires blasting, the Contractor's blasting processes and methods must be in accordance with the applicable rules, regulations and standards established by the Regulatory Agencies, codes and professional societies listed herein, including rules and regulations for storage, transportation, and use of explosives. In case of conflict between codes and regulations, the more stringent shall apply.

Comply with ASA S1.13, ANSI/ASSE A10.12, ANSI/ASSE A10.7, ANSI S2.2, ASSE/SAFE A10.6, ATF P 5400.7, Blaster's Handbook, EE Handbook 3, EE Handbook 4, EM 385-1-1, ER 385-1-95, ETL 1110-1-142, EM 1110-2-3800 and local regulations.

Regulatory Agencies: All operations with explosives shall be conducted in accordance with controlling transportation, storage, and use are listed below:

a. U.S. Code of Federal Regulations (CFR)

(1) TITLE 27 CFR, PART 555, subparts D, G, and K - Commerce in Explosives, Bureau of Alcohol, Tobacco, and Firearms (ATF), U.S. Government Printing Office, Washington, D.C. 20402

(2) TITLE 29 CFR, SUBPARTS H 1910.109 AND 1926.900 - Occupational Health and Safety Organization (OSHA) U.S. Government Printing Office, Washington, D.C. 20402.

(3) TITLE 30 CFR, PART 55 - Mine Safety and Health Administration (MSHA), U.S. Department of Labor, Washington, D.C., 20402.

(4) TITLE 33 CFR, PART 126 - Handling of Dangerous Cargo at Waterfront Facilities, United States Coast Guard, Washington, D.C. 20593.

(5) TITLE 49, CFR, Chapter 1, PARTS 106, 107, 171-77 AND Chapter III, PARTS 383 and 390-394 - Transportation of Explosives on Highways, Rail, Air, or Water, Department of Transportation, (DOT), U.S. Government Printing Office, Wilmington, Delaware, 19899.

(6) TITLE 27, CFR, PART 55 Internal Revenue Service regulations Commerce in Explosives.

b. State Statute and Administrative Code

c. Non-regulating Industry Support Organizations:

(1) Vibration Subcommittee of the International Society of Explosive Engineers (ISEE), blast monitoring equipment operation standards (1999).

(2) IME (Institute of Makers of Explosives) Safety Library Publications (SLPs).

Legal Requirements: Comply with all applicable federal, state, and local laws pertaining to the purchase, transportation, storage, handling, and use of explosives. Obtain all required permits and licenses.

1.7 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Master Blasting Plan
Blasting Safety Plan
Navigation Control Plan
Test-Blast Plan
Certified Marine Survey
Pre-Blast Surveys
Blasting Consultant's Qualifications
Blasting Specialist's Qualifications
Blaster-In-Charge Qualifications
Blaster Qualifications
Blasting Administrator's Qualifications
Vibration Monitoring Specialty Firm
Public Notice Of Blasting Operations
Structural Inspection/Evaluation Specialist
Fisheries Observer
Marine Mammal Observer

SD-03 Product Data

Explosives and Blasting Equipment
Lightning Detection Device
Seismographs
Explosives, Boosters And Initiation System
Blast Initiators
Explosives And Blasting Agents
Delay Device

SD-05 Design Data

Individual Shot Plan

SD-06 Test Reports

Test-Blast Evaluation Report
Individual Shot Reports
Drilling Logs
Individual Shot Vibration Monitoring Report
Individual Shot Videos
Daily Blasting And Removal Log
Blasting Consultant's Report
Post-Blast Surveys
Reports of Required Safety, Protective, and Natural Resource Programs
Post-Test Blast Evaluation Report

SD-07 Certificates

Blasting Licenses and Credentials
Seismic Specialist
Seismograph Technicians
Magazine Keeper

SD-11 Closeout Submittals

Summary Report

1.8 COORDINATION

A coordination plan, with the appropriate authorities that mitigates navigation and traffic delays must be included in the Master Blasting Plan.

Coordinate, through the Owner, with other Contractors working onsite to minimize work stoppages during blasting.

1.9 LIABILITY

Compliance with provisions in the contract will not relieve the Contractor of their responsibility for any damages or injuries caused by, related to, or arising out of blasting or associated blasting activities. Notwithstanding federal, state, and local laws, regulations and ordinances, the Contractor assumes all liability and hold and save the Owner, its agents, officers, and employees harmless for any and all claims for personal injuries, property damage, or other claims arising out of or in connection with the handling of explosives or blasting under this contract.

1.10 CLOSEOUT SUBMITTALS

On completion of the work, furnish a Summary Report, countersigned by the Blasting Specialist, certifying that:

- a. All blasting is complete and all explosives materials, including detonators, detonating cord, explosives, and any unmixed components of a two-component explosive system, have been removed from the project limits.
- b. All boreholes loaded with explosives and any other sets of explosive charges have either been detonated or unloaded and explosives have been properly disposed.

PART 2 PRODUCTS

2.1 MATERIALS

Only water-resistant explosives, boosters and initiation system are to be used. Furnished materials and equipment required for underwater blasting operations, monitoring, protection to structures and the environment, material usage, including transportation and storage, must conform to all applicable regulatory agency and permit requirements.

A. Blast Initiators: Non-electric (NONEL) or electronic blast initiators must be used. Do not use cap and fuse method and electric detonators.

B. Explosives and Blasting Agents: Type recommended by Blasting Consultant and explosive manufacturer, and as allowed by authorities having jurisdiction. All explosives must be contained in cartridges or other manufacturer's semi-rigid container and/or loose granular, free flowing, pourable or pumpable explosives.

C. Delay Device and Timing: As recommended by Contractor. Delay timing shall be no less than 17 ms.

2.2 TRANSPORTATION, STORAGE AND USE OF EXPLOSIVES

2.2.1 General

Store, transport, handle, use, and otherwise secure explosives in accordance with best practices, as approved by the Owner, and in accordance with all Federal, State and Local laws and regulations. Comply with all special rules and regulations that may be made by the authorities having jurisdiction, or by the Owner, regarding construction of, and storage in magazines and precautions in blasting. Times and imposed restrictions concerning the use of explosives must be conducted in accordance with local, State, and Federal regulations. The Owner reserves the right to establish restrictions or time windows when blasting will not be allowed.

2.2.2 Blasting Products

2.2.2.1 Requirements

All explosive materials to be used on site must be proposed for approval in the Master Blasting Plan. Cartridged and bulk explosives may be used in different sections of the project. All explosive materials used on the project must be six months or less of age or no older than one half the

shelf life shown on the explosives manufacturer's technical data sheet for that product. Millisecond delay, shock-tube initiators, must be used as the initiation system. To ensure the accuracy of firing times of blasting caps, it is required that each cap period come from one lot number. Mixing of lot numbers for any single cap delay period within a shot pattern is strictly prohibited. For underwater blasting's ability to displace rock against the water load, the minimum delay both between shot holes and shot rows will be 25 milliseconds.

2.2.2.2 Prohibited Explosive Materials

Explosives that do not meet the manufacturer's specifications must not be used. Blasting products without date batch codes will not be permitted on site.

Bulk explosives, which are water sensitive, are strictly prohibited.

Detonation Cord is strictly prohibited for initiation transmission through the air and water to the shot holes. An approved non-electric shock tubing, proposed in the Master Blasting Plan, must be used to transmit the firing initiation to each shot hole. Detonation cord may be used within the shot hole by proper connection to the shock tubing beneath the highest elevation of firm-rock stemming.

2.2.3 Magazines

No explosives will be stored onsite. There must be no permanent explosive storage or overnight explosive storage onsite. The Contractor will either obtain daily deliveries of the explosives to the site from a manufacturer or supplier or secure offsite explosive magazines.

The Contractor must have two temporary magazines on board the drilling and loading barge of sufficient volume to hold the largest day's use of explosives and initiators separately. These temporary magazines must meet all ATF requirements and all regulations and ordinances of state and local government. No explosives may remain overnight in the temporary magazines. A daily-use log of explosives delivered, loaded by shot hole through the day, and removed at the last shift must account for the use of all explosives.

2.2.4 Magazine Keeper

Each magazine keeper must be experienced and familiar with the laws and general practices concerning the handling, care, use, and storage of explosives and detonators. The magazine keeper is responsible for maintaining a cleared area around each magazine. The magazine keeper will not be required to perform any duties that will in any way interfere with their duties as magazine keeper and being physically present at the magazines for every entry to the magazines for delivery, disbursement, and review of explosives at the magazines.

If explosives are delivered and returned daily from the manufacturer or supplier to the project, the driver of the truck will serve as the magazine keeper.

PART 3 EXECUTION

3.1 GENERAL EXCAVATION AND REMOVAL

Perform the excavation of every type of material encountered within the limits of the project to the lines, grades, and elevations indicated and as specified. Dredging, breakage, displacement, and excavation of all the materials will be accomplished by appropriate techniques and with special care, such that no individuals, cited natural resources, structures, navigation and other sensitive features, and activities suffer any adverse effects from blasting. Perform the submerged removal in accordance with the typical sections shown and the tolerances specified in paragraph SUBMERGED MATERIAL DISPOSAL.

The Contractor's blasting program and methods will be those controlled blasting techniques necessary to accomplish the excavation shown on the contract drawings in accordance with the procedures specified in this section. Make necessary plans, examinations, surveys, and test blasts to determine the quantity of explosives that can be fired to accomplish the breakage (or displacement) and removal of materials without injuries to persons, and aquatic wildlife (or other natural resources), or damage to personal or public property. Test blasts will be performed to slowly build to acceptable loading and timing of production shot patterns, to verify that the monitoring network performs as designed, to begin to assemble monitoring data collection, and to resolve that the submerged material is adequately broken or displaced for removal. Use the test blasting results to optimize remainder of work. The blasting program must abide by all applicable Federal, state, and local laws, regulations, and ordinances established for the project's location.

Process any and all claims of public entities, companies and private citizens arising from the transportation, storage, and use of explosives promptly in an acceptable time period set by the Owner; in particular, all injury and property damage claims must be acknowledged by the Contractor, or their representative, and be submitted immediately as directed by the Owner providing name of claimant, location, time and description of alleged injury, and damage, and estimated value. The claimed injury or damage will be evaluated and inspected by an appropriate specialist within 48 hours following initial notification, and processed to a conclusion (honored, denied, or compromised) within 90 days after cessation of all blasting on the contract; but, in no case will the claims remain unresolved for a period exceeding 6 months (180 calendar days). Submit evaluation and inspection results and actions taken to the Owner on a weekly basis.

3.1.1 Removal of Submerged Materials

3.1.1.1 Sediment Within the Project Limits for Removal Displacement

Sediment vertically above the project rock limits must be removed by dredging, prior to action upon deeper materials.

3.1.1.2 Breakage of Rock and Hard/Unyielding Materials for Excavation and Disposal

Blasting may be conducted to break or displace the rock and hard/underlying materials into sizes that may be removed by dredging or excavation equipment. Test blasting will be conducted to determine the parameters for the following production blasting. Care must be taken to prevent damage to any of the remaining specified materials, features or structures noted in

the drawings; and avoid adverse effects from blasting to personnel, the public, natural resources, structures, and features. The Contractor must curtail blasting activities in designated areas when, in the opinion of the Owner, damage to in-place units or adverse impacts may have occurred. Blasting will be curtailed in these designated areas until both remediation, as directed by the Owner, has been completed, and the Contractor has resolved a means to conduct the blasting without the damage or adverse impacts.

3.1.2 Disposal of Materials Within the Project Limits

Transport and place all dredged, displaced, or excavated materials within the limits of the disposal zones below the specified elevations, according to the requirements specified in paragraph SUBMERGED MATERIAL DISPOSAL.

3.2 SAFETY PROCEDURES

3.2.1 General

Ensure all work completed under this Contract is executed safely. Follow the safety procedures outlined in EM 385-1-1. EM 385-1-1 will govern all activity unless more stringent safety requirements are specified in other applicable Federal, State, and local laws, regulations, and ordinances.

3.2.2 Weekly Coordination Meeting

Coordinate all blasting schedules with the Owner at least one week in advance and hold a weekly blasting coordination meeting with the Owner. Provide an agenda for the blasting coordination meeting that lists project's prior week's shots, the forecasted shot schedule, and displays a scale site plan showing the locations of the schedule shots. The Blasting Specialist, Blaster in Charge, and Seismic Specialist are required to participate in discussion of agenda items and lessons learned.

3.2.3 Public Notice of Blasting Operations

Thirty days, prior to any blasting operations, prepare and submit to the Owner a public notification letter of the proposed blasting activities. The Owner will distribute copies of this notification letter by certified mail to local governments, law enforcement, public utilities, public users of project recreational facilities, and residents and commercial interests located within one half mile of the blast site. This notification letter must contain at minimum:

- a. Name, address, telephone number and e-mail address of the Contractor;
- b. Plan maps identifying the specific areas in which blasting will take place, and major and secondary roads, geographic features and auxiliary features;
- c. Duration of blasting activities, and on which days of the week and hours of the day that blasts can be expected to occur;
- d. Vehicular and pedestrian traffic control measures to be taken;
- e. Methods to limit access to the blasting area; and,
- f. Types, patterns and duration of audible warning and all-clear signals to be used before and after blasting.

3.2.4 Public Meetings

Fifteen calendar days prior to any blasting operations, provide the approved Blasting Specialist, Blasting Consultant, and Seismic Specialist to attend a public-relations meeting to be conducted on an evening to be determined by the Owner. This meeting will inform the public about the anticipated blasting operations. The Blasting Specialist, Blasting Consultant, and Seismic Specialist must each make a short presentation of blasting operations and answer any questions pertaining to public concerns dealing with the blasting operations, the magnitude of vibrations, airblast and potential for flyrock that may impact the public, and the project's required natural resource activities. Distribute points of contact should the public and local entities have an event of concern related to the blasting program.

3.2.5 Warnings and Signals

Establish a method of warning all employees on the job site of an impending blast following the guidance of EM 385-1-1. The signals must consist of a five-minute warning signal to notify all in the area that a blast will be initiated in five minutes. A second warning signal must be sounded one-minute before the blast. After the blast is over, sound an all-clear signal, once the blast site has been inspected for misfires by the Blaster in Charge to notify all in the area that the blasting operation is finished. No personnel other than the Blaster in Charge must enter the blast area, until it has been determined to be all clear.

3.2.6 Notification to Navigation

Notify the NHDOT a minimum of 14 calendar days prior to the commencement of blasting operations to allow for sufficient time to send out navigation notices. The information to be supplied will include the dates and time window of blasting operations.

3.2.7 Navigation Control During Drilling, Loading, and Blasting Operations

Notify the Coast Guard 24 hours prior to a scheduled blast and 2 hours prior to the actual blast's initiation. Contact should be made with: US Coast Guard's contact, whose name and an alternate's name will be provided at time of contract award.

Provide the number of patrol vessels as required by the U.S. Coast Guard and local harbormaster. Operate patrol vessel during blasting operations equipped with a visible yellow flashing light, audible horn, and radio with a hailer, whose sole function will be to monitor and maintain security in the blast area. Use patrol vessels during all blasting operations. Inspect and insure there is no vessel traffic within the work area prior to the firing of the blasting caps and until such time as the Contractor has sounded the "All-Clear Signal".

Establish and maintain a warning system as required by EM 385-1-1 and as stated in paragraph WARNINGS AND SIGNALS. Equip and maintain the floating plant with radio equipment capable of communications with the Coast Guard. The Contractor, after each blast, upon inspecting the area, notify the Coast Guard and the Owner if all clear or misfire is noted. Buoy the area with warning signs. The warning signs are to be legible at a distance required by the U.S. Coast Guard and local harbormaster and contain the message "DANGER - EXPLOSIVES IN USE" visible on either side of the sign.

Station patrol vessels at the drill barge and remain in the blasting area during all blasting operations.

3.2.8 Lightning Detection Device

Furnish, maintain, and operate lightning detection equipment during the entire period of blasting operations and during the periods that explosives are used at the site. Equipment must provide real time audio and visual alarm/signal and detection based on combined detection of electromagnetic, electrostatic, light wave spectral and audio disturbances, or a commercial service based on these, as a minimum for approved. Equipment must be capable of detecting lightning within 25 miles as a minimum of the blast area. Provide the equipment after approval. When and where the lightning detection device indicates a blasting hazard potential, immediately evacuate personnel from all areas where drilling is being conducted or explosives are present. When a lightning detector indicates a blasting hazard, perform the following actions.

- a. Clear the blasting area of all personnel. Place guards at all access points to the blast area.
- b. Immediately notify the Owner of the potential hazards and precautions being taken.
- c. Terminate the loading of holes and secure the unused explosives to an approved location.
- d. When the hazard dissipates, inform the Owner that the drilling and loading of holes will continue.

3.2.9 Drill-Boat or Barge Safety

All onboard day magazines must be permanently secured to the deck as required by the Coast Guard. No high explosives will be stored on the boat or barge deck in the open except for the one case that is to be loaded immediately into the shot holes. Any explosives remaining on deck must be returned to the day magazine prior to the firing of any blast. The firing line reel or spool will be mounted on the rig in a manner that it cannot be lost overboard. An approved blasting machine will be used for detonation regardless of the number of caps used. No electric blasting system can be used. The amount of explosives permitted aboard the drill boat or barge at any one time will be subject to the approval of the Owner, but in no case will such amount exceed the amount permitted by appropriate codes and regulations.

Make necessary arrangements to prevent damage to any vessel, moored or underway, building or structure and to preserve the crew or occupants thereon from exposure to injury because of the Contractor's operations. Automatic fire extinguishers of an appropriate type must be installed on air compressors and in all engine compartments aboard vessels (drill boats, barges) where explosives are stored, handled, and used. The Owner may require additional arrangements. Have a Certified Marine Survey of all floating plant proposed for underwater blasting work on this contract performed prior to starting any work and provide the results to the Owner. Remote fuel shut-offs and fire-signaling devices must be provided aboard the drill boat.

3.2.10 Inspection for the All-Clear Signal

The Blaster in Charge must thoroughly inspect the entire blast area for a minimum of five minutes following a blast. The five-minute delay between blasting and commencing work is needed to ensure that no misfires have occurred. Details of the misfire procedures were provided in the Blasting Safety Plan, including the distance of the restricted area when a misfire is discovered.

3.2.10.1 Check for Misfires

During the five-minute delay, it is the responsibility of the Blaster in Charge to enter and inspect the shot-pattern area and verify for all loaded shot holes that all explosives have been detonated.

3.2.10.2 Misfire-Handling Procedures

Should an inspection indicate that complete detonation of all charges did not occur, only critical personnel involved in the blasting operation or excavation of the unexploded material are allowed within the established shot-pattern area. Restrict the site until the Blaster in Charge or the Blasting Specialist indicate the site is safe. If the misfire poses problems that cannot be safely corrected by the Blaster in Charge or the Blasting Specialist, a consultant, or an explosives company representative skilled in correcting misfires must be called to resolve the problem. Provide within 60 minutes of the recognition of a misfire, a notice to the Owner and all applicable agencies and offices for public safety. Compliance with this or any other provision in the Contract will not relieve the Contractor of responsibility for any damages or injuries caused by, related to, or arising out of blasting or associated blasting activities.

Provide the details of the misfire and the correction measures in the Individual Shot Report for shot with the misfire to the Owner and the emailed addressees the next business day.

3.2.11 Natural Resource Protection (Environmental Resource Protection)

The Contractor is required to utilize the following to avoid and minimize techniques designed to mitigate the impacts of underwater blasting that have been developed, in coordination with other Federal agencies, in compliance with the federal, state, and local environmental laws and regulations and with applicable regulations and requirements of Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. All activities requiring the Contractors' action or coordination are included in paragraph NATURAL RESOURCE ASSESSMENTS, Mitigation and Monitoring. The Contractor has full responsibility for not violating all the mitigation requirements. Associated fines for violations will be borne by the Contractor.

3.3 OPERATIONAL REQUIREMENTS

3.3.1 Coordination

3.3.1.1 Schedules

Coordinate schedules for blasting with the proper authorities, federal, state, local. No blasting will be conducted unless the Contractor is notified by the appropriate parties that blasting may proceed. In addition, if channel restrictions of navigable waters are required for

drilling and blasting, the Contractor must coordinate with the U.S. Coast Guard.

3.3.1.2 Permits

Obtain all necessary permits from the state and local authorities to transport explosives and all blasting agents necessary. The Owner will be notified in writing that all permits have been obtained and will be furnished copies of all permits. All work must be in accordance with the issued permits.

3.3.2 Work Restrictions

3.3.2.1 Confined Detonations

The rock excavation after blasting will be more effective if each loaded drill hole is well confined by stemming within sound rock. The intent is to confine the gaseous detonation products of each shot hole, such that no rifling plumes, the visual result, are produced in any shot patterns. The premature release of the gaseous products reduces or eliminates effective fracturing and displacement and causes large water-borne pressures potentially damaging to natural resources. Drill-hole logging is required to recognize the depth of firm rock and voids, and to adjust the designed Individual Shot Plan loading of each shot hole with explosives and stemming according to the position of sound rock relative to the paid elevation of removal. Video recording of each blast will detail the effectiveness of avoiding rifling plumes.

3.3.2.2 Temporal, Weekly and Seasonal Restrictions for Blasting

Blasting must occur within the permitted window. Blast initiation is only permitted, during the period from one-hour after sunrise to one-hour before sunset. The Contractor will not be constrained by weather conditions, except for lightning, for underwater blasting in depths of water greater than 3.0 ft for which airblast is often negligible.

3.3.2.3 Allowable Vibration

Conduct all the required monitoring as noted in paragraph IMPACT MONITORING. Conduct all blasting by controlled blasting methods to avoid exceeding the allowable vibration in applicable federal, state, and local laws, regulations and ordinances at all structures and facilities, as monitored by blast seismographs.

The allowable vibration at any structure or facility must not exceed the maximum PPV of 2.0 inches/second (ips), nor exceed the PPV amplitude in the Frequency versus Particle Velocity Graph Figure in NFPA 495 (Figure 11.2.1) for the frequency of the half-cycle amplitude.

3.3.2.4 Limiting Blast-Induced Vibrations at Green Concrete

During the performance period, other construction activities may be placing concrete at varied locations on or near the project. Coordinate with other project contractors.

- a. Assuree that a seismograph is monitoring vibrations from blasting at a location, which is closer to the blast pattern than the Green Concrete. Seismic monitoring must be conducted near the concrete placement from prior to placement until 72 hours after placement.

- b. The table below indicates that maximum allowable peak particle velocity (PPV) permitted, relative to the age of the recently-place concrete, as measured at an acceptable location or within 50 ft of the most recently placed concrete on the side of closest approach to the blast.

Age of Concrete (hours)	less than 12	12 to 24	24 to 72
PPV (inch/second)	0.1	1.0	2.0

- c. Adjust all blasting to conform to the table's maximum allowable PPV at the seismograph near the Green Concrete. See paragraph BLAST-EFFECTS MONITORING.

3.3.2.5 Allowable Airblast

Conduct all the required monitoring as noted in paragraph IMPACT MONITORING. Conduct all blasting by controlled blasting methods to avoid exceeding the allowable airblast in applicable federal, state, and local laws, regulations and ordinances at all structures and facilities, as monitored by blast seismographs. Peak airblast overpressure must be held below 133 dB (linear peak scale), 0.015 pounds/square inch (psi) at the nearest residential or inhabited structure or other designated location.

3.4 BLASTING PERSONNEL

3.4.1 Blasting Consultant

The Blasting Consultant, Blasting Specialist, Blasting Administrator, Blaster in Charge, and Vibration Specialist cannot be the same person. Retain a recognized Blasting Consultant to assist both with the project's blast design and with the resolution of any blasting issues for the project. Submit the Blasting Consultant's expertise submission within 15 days of the Notice to Proceed. The Blasting Consultant must be approved by the Owner two weeks prior to the submission of the Master Blasting Plan.

3.4.1.1 Blasting Consultant's Responsibilities

The Contractor's Blasting Consultant must be available to review the Master Blasting Plan, assist with controlled blasting techniques, and resolve difficult or complex issues with blasting for the project. The Blasting Consultant will recommend controlled blasting methods, as necessary, to meet safety and natural resource requirements, retain airblast and vibration within the allowable limits, and protect the rock foundation. Proposed controlled blasting methods must be submitted in the Master Blasting Plan.

The Blasting Consultant must provide advice for, and review, the Master Blasting Plan, attend the public meeting(s), and be available for consultation on an "as needed" basis, as determined separately by the Contractor or by the Owner. The Blasting Consultant is not required to be at the project site for review of the Master Blasting Plan or of any specific shot plans or records. The Blasting Consultant must be present at the project site for any required shot issue or, if requested, for the subsequent shot following a misfire or significant exceedance of any onsite blasting issues.

The Blasting Consultant must provide a written summary of all site visits

and special assignments within 2 business days of performing such actions to both the Contractor and the Owner.

The Blasting Consultant must submit a short, signed Blasting Consultant's Report each month stating that he/she has briefly reviewed the individual shot documents, including blast videos, and has collaborated with the Contractor on all issues, concerns, or errors in the individual shot documents. This report is due within 3 business days after the end of the month.

If problems with vibration, airblast, rifling of a shot hole producing a water column plume, or production blasting occur, the Owner will require the Contractor to immediately summon the approved Blasting Consultant and have their presence on site within 10 days after the problem develops to:

- a. Approve each Individual Shot Plan;
- b. Observe in person shot-hole drilling, logging, revision to that hole's plan, and loading with the full authority to stop or delay any blast he/she considers unsafe;
- c. Review and sign each Individual Shot Record at no additional cost to the Owner; and,
- d. Submit and sign a written checklist that all necessary precautions were reviewed and followed by the drilling and blasting crews.

The checklist must be as defined under the section on Individual Shot Reports. The signed checklist must be attached to each Individual Shot Report.

3.4.1.2 Blasting Consultant's Expertise

The consultant must be able to demonstrate involvement in at least 15 projects with controlled blasting. The consultant must provide, as a minimum, the credentials and experience for each outlined following items:

- a. The consultant must have at least 10 years of experience in construction blasting within 250 ft of protected structures, and had consultation on three underwater blasting programs;
- b. The consultant must be able to demonstrate that he has attended at least 15 short courses, seminars, or conferences on blasting technology, or university engineering class studies on blast design during the past 20 years, including a complete understanding of blasting seismology with emphasis on vibration frequency, acceleration, and displacement (ground strain);
- c. For the past 10 years the consultant must have derived their primary source of income from providing specialized blasting consulting services;
- d. A list of recent projects containing a description of the projects' details, summarize the blasting plans, and any modifications made during the projects from your consulting;
- e. Provide the names and telephone numbers of contacts, who have sufficient stature with, and knowledge of, their individual project to verify the submitted information in competency and ability, for at

least three recent projects;

- f. Hands-on experience as a blaster for at least 3 years; and,
- g. The Blasting Consultant, Blasting Specialist, Blaster in Charge, and Seismic Specialist cannot be the same person.

3.4.1.3 Blasting Consultant's Qualifications Submissions

Submit the resume, education, experience, current blasting licenses and credentials, and training of the proposed Blasting Consultant, and a formal letter of commitment from the consultant verifying their availability on an "as needed" basis for the duration of the Contract. The consultant must be a drilling and blasting expert, who has derived their primary source of income by providing specialized blasting and blasting consulting services. The provided consultation must have included at least three, large underwater blasting projects. The consultant must not be an employee of the Contractor, an explosives manufacturer, an explosives distributor, or any other sub-contractor. There must be no additional cost to the Owner for the Blasting Consultant's duties, even when required by the Owner.

3.4.2 Blasting Specialist

The Blasting Specialist is the Contractor's employee most responsible for the project's blasting and conducting all coordination and providing all documentation for the underwater blasting. The Blasting Specialist must coordinate with the Owner on all issues dealing with blasting. The Blasting Specialist must be on the job site each day. The Contractor must submit the Blasting Specialist's expertise submission within 15 days of the Notice to Proceed. The Blasting Specialist must be approved by the Owner two weeks prior to the submission of the Master Blasting Plan.

3.4.2.1 Blasting Specialist's Responsibilities

The Blasting Specialist is responsible for the project's blast design, preparing and submitting all necessary blasting documentation, and conducting quality control. The Contractor may employ a documentation assistant to aid the Blasting Specialist with all the blasting documentation creation and submissions. The Blasting Specialist is solely responsible for the accuracy and timely submission of all blast documentation.

3.4.2.2 Blasting Specialist's Expertise

The Blasting Specialist must be able to demonstrate involvement in at least three projects with underwater blasting. The Blasting Specialist must provide, as a minimum, the credentials and experience for each outlined following items:

- a. The proposed individual must have at least 10 years of verifiable experience utilizing controlled blasting techniques and have had conducted controlled blasting on three underwater projects;
- b. Within the last five years, the proposed individual must have completed at least five days of classroom training that has familiarized the person with the most current drilling and controlled blasting methods;
- c. The proposed individual must be a licensed blaster in the State of New Hampshire and hold all credentials that may be required by local

jurisdictions;

- d. In the last five years the proposed individual must have been responsible for the blast design or execution of underwater rock excavation projects, similar in scope and complexity as this project;
- e. The names and telephone numbers of contacts, who have sufficient stature with, and knowledge of, their individual project to verify the submitted information in competency and ability, for at least three underwater blasting projects; and,
- f. The Blasting Consultant, Blasting Specialist, Blaster in Charge, and Seismic Specialist cannot be the same person.

3.4.2.3 Blasting Specialist's Qualifications Submission

Submit the resume, education, experience, current blasting licenses and credentials, and training of the proposed Blasting Specialist. Their credentials must include a list of the projects, including the location, duration, scope, description, geologic conditions, and the challenges that developed though the course of the projects and how the challenges were resolved.

3.4.3 Blaster in Charge

The Blaster in Charge may create the Individual Shot Plan for approval by the Blasting Specialist. The Blaster in Charge, in the absence of the Blasting Specialist, is the Contractor's employee responsible for on-deck supervision of all underwater blasting activities and its documentation. The Contractor must submit the Blaster-in-Charge's expertise submission within 15 days of the Notice to Proceed. The Blaster in Charge must be approved by the Owner two weeks prior to the submission of the Master Blasting Plan.

3.4.3.1 Blaster-in-Charge's Responsibilities

The Blaster in Charge, in the absence of the Blasting Specialist, is responsible for on-deck supervision of the drilling, shot-hole logging, possible revisions of the Individual Shot Plan, loading or abandoning of individual shot holes, and firing the blast. The Blaster in Charge is responsible for: the accurate placement of the shot holes' locations for drilling; conducting the drilling and shot-hole logging accurately; accounting for the relevant geology within each shot-hole's log; assuring the careful recording of every shot-hole's log and their submission with the Individual Shot Report; loading the blastholes according to the Individual Shot Plan or the revision thereto based on the shot-hole's log; coordinating the likely time of the blast pattern's initiation; coordinating all notices of imminent blasting and providing the signaling before and after the shot; initiating the blast; performing the post-blast inspection; providing the All-Clear signal or instituting the notices and actions for a misfire; and, providing the documentation for, and signing, the Individual Shot Report.

3.4.3.2 Blaster-in-Charge's Expertise

The Blaster in Charge must be able to demonstrate involvement in at least two projects with underwater blasting. The Blaster in Charge must provide, as a minimum, the credentials and experience for each outlined following items:

- a. The proposed individual must have verifiable experience in equivalently responsible roles for controlled blasting projects for at least 3 years and with underwater projects;
- b. Within the last 5 years, the proposed individual must have completed at least five days of classroom training that has familiarized the person with the most current drilling and controlled blasting methods;
- c. The proposed individual must be a licensed blaster in the State of New Hampshire and hold all credentials that may be required by local jurisdictions; and,
- d. The Blasting Consultant, Blasting Specialist, Blaster-in-Charge, and Seismic Specialist cannot be the same person.

3.4.3.3 Blaster-in-Charge Qualifications Submission

Submit the resume, experience, current blasting licenses and credentials, and training of the proposed Blaster-in-Charge. Their credentials must include a list of the projects, including the location, duration, scope, description, geologic conditions, and the challenges that developed though the course of the projects and how the challenges were resolved.

3.4.4 Blasters

The Contractor may elect to employ multiple Blasters. Each Blaster is a Contractor's employee responsible for on-deck, underwater drilling and blasting activities under the supervision of the on-deck, Blasting Specialist or Blaster in Charge, whoever is present. The Blaster in Charge or a Blaster will log each shot hole, as the hole is being drilled. Each Blaster must be approved by the Owner after the submission of the Master Blasting Plan.

Blaster qualifications require each Blaster must be able to demonstrate prior experience with drilling and blasting. The proposed individuals must be a licensed or certified blaster in the State of New Hampshire and hold all credentials that may be required by local jurisdictions. Submit the resume, experience, current blasting licenses and credentials, and training of each proposed Blaster with the Master Blasting Plan.

3.4.5 Blasting Administrator

The duties of the Blasting Administrator are to be the direct assistant of the Blasting Specialist in preparing all necessary paperwork, and in performing quality control on all issues dealing with blasting. The primary function is to assist the Blasting Specialist in the preparation and completion of submittals, prepare the detailed post blast report, and the individual shot videos for submittal to the Owner, and submit the drilling logs with the post blast report. The Blasting Administrator cannot sign any paperwork. The Blasting Administrator must be approved by the Owner.

Blasting Administrator's qualifications require the Blasting Administrator to possess the following minimum qualifications and experience:

- a. Holds a current Blaster's license;
- b. Have prior experience in underwater blasting;

- c. Must have completed at least five days of classroom training within the last five years that has equipped the person with the most current knowledge in blasting procedures; and the software to be used on the project; and,
- d. Have proven proficiency with blasting software and spreadsheets.

3.4.6 Vibration Monitoring Specialty Firm

Retain the services of a vibration monitoring specialty firm that specializes in the prediction, monitoring, and control of ground vibration and airblasts. The firm must have experience conducting installation of seismographs for vibration monitoring, communicating vibration and airblast results, and developing and maintaining a site attenuation curve. The firm must have on staff at least two Seismic Specialists that specialize in vibration monitoring and analysis. The firm must have on staff at least four Seismograph Technicians that have five years or more experience with seismograph installation and vibration monitoring. Submit resumes for all personnel and for the firm for approval citing, in addition to other pertinent data, experience, training, and education, at least 60 days prior to the commencement of blasting. The Seismograph Technicians must be persons capable of setting up the seismographs at designated locations, effectively recording the blast, and appropriately interpreting results. The Seismic Specialists must interpret the seismograph records to ensure that the seismic data must be effectively utilized in the control of the blasting operations with respect to the existing structures. The Seismograph Technicians must supervise the placement, operation, and maintenance of the seismographs. The Seismic Specialists must conduct the airblast and particle velocity regression analysis as described in this Section. The Owner may require the Seismic Specialists and Seismograph Technicians to be present during the test blast program, production blasting, or both.

3.4.7 Seismic Specialist

The Contractor will retain the services of an independent, seismic-monitoring firm with employees capable of monitoring, assessing, and predicting vibrations and airblast due to blasting. The Seismic Specialist must be an employee of the independent, seismic-monitoring firm, and must not be an employee of the Contractor. The Seismic Specialist will conduct, or assure the actions are being taken to obtain, the required blast seismograph monitoring for the project. The Seismic Specialist will supervise all Seismograph Technicians deployed to the project to deploy and maintain all the seismographs for recording vibrations and airblast, and to properly retain, store and submit all seismic records of the blasting. The Contractor must submit the independent, seismic-monitoring firm's, Seismic Specialist's expertise submission within 15 days of the Notice to Proceed. The firm and Seismic Specialist must be approved by the Owner two weeks prior to the submission of the Master Blasting Plan.

3.4.7.1 Seismic Specialist's Responsibilities

The Seismic Specialist must be a person able to deploy blast seismographs, effectively record and transmit the seismic data, comprehensively assess, and interpret seismic data regarding the monitored blast's parameters, and remotely supervise the firm's Seismograph Technicians. The Seismic Specialist must also interpret the seismic records to ensure that the seismic data will be effectively utilized in the control of the blasting

operations with respect to the existing structures and conduct of an optimized blasting program.

3.4.7.2 Seismic Specialist's Expertise

The Seismic Specialist must be able to demonstrate monitoring deployment, seismic data assessment and interpretation, prediction of vibration and airblast from blasting, and remote supervision of field personnel for five blasting projects. The Seismic Specialist must provide, as a minimum, the credentials and experience for each outlined following items:

- a. The proposed individual must have verifiable experience in equivalently responsible roles for controlled blasting projects for at least 3 years;
- b. Within the last five years, the proposed individual must have completed at least five days of classroom training concerning seismic monitoring equipment, data telemetry, and seismic data interpretation;
- c. The Blasting Consultant, Blasting Specialist, Blaster in Charge, and Seismic Specialist cannot be the same person. The proposed Seismic Specialist and Structural Inspection/Evaluation Specialist may be the same person.

3.4.7.3 Seismic Specialist Qualifications' Submission

Submit the credentials of the proposed seismic-monitoring firm with documentation for the Seismic Specialist. Submit the firm's history for this office, if there are multiple offices, years under the present office's leadership, the regional extent of clients, the approximate number of projects in the past year, and the number of present employees at this office. Submit the resume, education, experience, credentials, and training of the proposed Seismic Specialist. Their credentials must include a list of the projects, including the location, duration, scope, description, and the monitoring challenges that developed through the course of the projects and how the challenges were resolved. The documentation must provide experience and capability for the proposed Seismic Specialist to provide remote blast monitoring and supervision of support personnel while the individual is not on site.

3.4.8 Seismograph Technicians

The approved, independent, seismic-monitoring firm may provide Seismograph Technicians to assist the Seismic Specialist with the project's vibration and airblast monitoring. Each Seismograph Technician must be approved by the Owner after the submission of the Master Blasting Plan.

Each Seismograph Technician must be able to demonstrate prior experience with blast seismic monitoring on a prior project of equivalent size and similar telemetry requirements. The proposed individuals must have the required training and hold all credentials that may be required by local jurisdictions. Submit the resume, experience, credentials, and training of each proposed Seismograph Technician with the Master Blasting Plan.

3.4.9 Structural Inspection/Evaluation Specialist

Pre- and Post-Blast structural inspections must be performed by specialists with at least five years' experience in pre-blast and post-blast surveys. Submit the resume, education, experience, credentials, and training of the proposed Structural Inspection/Evaluation Specialist to the Owner with the

Master Blasting Plan. The proposed Seismic Specialist and Structural Inspection/Evaluation Specialist may be the same person.

3.4.10 Magazine Keeper

The Magazine Keeper and an Alternate are the Contractor's employees responsible for explosive magazines and its record keeping. The position of Magazine Keeper is required only if the Contractor elects to have explosives' magazines under his control. The Magazine Keeper must be approved by the Owner after the submission of the Master Blasting Plan.

The Magazine Keeper must be familiar with the laws and general practices concerning the handling, care, use, and storage of explosives and detonators. The Magazine Keeper must be responsible for maintaining a cleared area around each magazine, and accounting for by record the throughput of explosives and detonators. The Magazine Keeper must be present for any transfer of explosives and detonators into or out of the magazines. The Magazine Keeper must not be required to perform any duties that will in any way interfere with his or her duties as Magazine Keeper.

The Magazine Keeper must be able to demonstrate prior experience explosives' magazines. The proposed individual must hold all credentials that may be required by the State of New Hampshire and local jurisdictions. Submit the resume, experience, credentials, and training of the proposed Magazine Keeper with the Master Blasting Plan.

3.5 RECORD KEEPING

3.5.1 Pre-Blast Surveys

Prior to the commencement of blasting, conduct a pre-blast survey of nearest buildings, structures, and utilities within 1,000 ft from the blast area by azimuth about the blasting zone to document pre-existing conditions. The pre-blast surveys will be conducted by, or under the supervision of, the Structural Inspection/Evaluation Specialist, who will also sign and date each survey. The survey extent and method used must be acceptable to both the Contractor's insurance company and the Owner. Submit a copy of all pre-blast surveys at least two weeks prior to the first Test Blast. Provide owners of surveyed structures a copy of their Pre-Blast Survey before, or with the notice of, blasting commencement. Notify owners and occupants of local buildings 10 days prior to the commencement of blasting.

Perform the following when conducting pre-blast survey.

- a. Provide methodology to be used in conducting the pre-blast survey and listing of structures, determined from the survey to be sensitive, with reasons for these structures being sensitive.
- b. Each structure must be documented (including photography and video recordings) as to its construction, foundation type, condition, and closest distance to excavation blasting. The general condition and all observable defects of each structure must be documented.
- c. The Commodity storage facilities that may be impacted by blasting must be addressed by the Contractor for safety and continued operation during the blasting program.
- d. Freestanding structures (such as retaining walls) must be inspected on

the exterior and on the interior as a room. All concrete walks, driveways, etc. must be inspected for cracks, level condition, holes, and defects.

- e. Industrial structures, silo/elevators and special facilities, and office space must be described relative to their present conditions and tolerance to vibration. Besides the inspection of walls, columns and stairwells, the Contractor must survey the work areas and structures for distress.
- f. An inspection of accessible structures must be made and a list of all structures, which could not be surveyed or refused to allow survey, must be completed. The dates of possible subsequent surveys and physical constraints prohibiting the survey must be documented.
- g. Certify that the survey was prepared prior to the start of any blasting under this Contract.

3.5.2 Post-Blast Surveys

Post-blast surveys must be conducted at any location, where a reasonable notice of damage from blasting has been provided. Post-blast surveys will be conducted by, or under the supervision of, the Structural Inspection/Evaluation Specialist, who will also sign and date each survey. The survey extent and method used must be acceptable to both the Contractor's insurance company and the Owner. The post-blast surveys must be conducted within a week of the notice of damage from blasting. Submit a copy of all post-blast surveys within two business days of the on-premises surveys to both the structure's owner and the Owner.

3.5.3 Daily Explosives' Magazine Inventory and Daily Explosives' Accounting

Accurate daily records must be kept by the Magazine Keeper, who must account for each piece of explosive, detonator, and equipment from the time of delivery at the magazine until its discharge in use or return to the magazine. If explosive products will be delivered and returned daily, the records of the driver must agree with the amount used in the day and a copy of each driver's record must be provided with the Daily Blasting and Removal Log submission. No explosive can be accepted until it has been plainly labeled and delivered as new stock in sound condition. Dates of manufacture and lot numbers will be recorded for all explosives delivered to the site. No explosive material older than 1 year will be used. Containers for explosives must be approved in advance by the Owner. Remaining inventory must be checked each day and any discrepancies must be immediately reported, regardless of the potential of accounting error, loss, or theft of explosive material.

Should a loss or theft of explosives occur, all circumstances and details of the loss or theft must be immediately reported to the nearest office of Alcohol, Tobacco and Firearms, as well as to the local law enforcement authorities and the Owner.

3.6 BLASTING DOCUMENTS

3.6.1 Master Blasting Plan

The Master Blasting Plan must be submitted for approval by the Owner and by the environmental agencies before the first anticipated Test Blast. No blasting may be conducted prior to the approval of the Master Blasting

Plan. No deviation from the Master Blasting Plan will be conducted by the Contractor. Any request for change or revision to the Master Blasting Plan must be provided in writing and approved by the Owner and environmental agencies before such change or revision can be performed. The Owner's Representative will have a minimum of 30 calendar days to review prior to submitting to the environmental agencies. The agencies will have a minimum of 21 calendar days to review.

Submit a Test Blasting Plan within the Master Blasting Plan that includes calculations for all noted adverse impacts. Non-electric blasting caps must be used for all underwater shots. The Master Blasting Plan must contain provisions for storing, handling, and transporting explosives, as well as for the blasting operations. The means of surveying and locating the shot-hole positions horizontally and vertically must be described in detail within the Master Blasting Plan. Provide a signed statement by the Blasting Consultant that the plan represents a safe and efficient set of means and methods with which to achieve the goals of the work. The Master Blasting Plan must be submitted with the signature and date of the Blasting Specialist.

3.6.1.1 Proposed Blasting Personnel

Submit all the approved and proposed blasting personnel and their required information from paragraph BLASTING PERSONNEL. List and copies of licenses, permits, and clearances required, including permit numbers, when applied for, and date of approval or anticipated approval by Federal, State, and local concerns. Provide their police records for every approved and proposed blasting individual. Submit the complete Project Team Organization with duties, responsibilities and authorities clearly defined. Identify the on-site Safety Officer and include a listing of all personnel authorized to sign for, receive and use explosives on this contract.

3.6.1.2 Explosives and Blasting Equipment

Submit all the explosives, their use, and their data sheets for the project. Data sheets, which include the products' specific gravity and water resistance, for all explosives and blasting agents that may be used.

3.6.1.3 Blasting Safety Plan

Submit Blasting Safety Plan, that is in accordance with EM 385-1-1, Section 29, and all other Federal, state, and local regulations. Implement all other applicable safety requirements in addition to that required below. Include, as a minimum, the following items.

- a. Permanently secure all onboard magazines to the deck as required by all applicable Code of Federal Regulations.
- b. Do not store explosives on the boat or barge deck in the open except for the one case that is to be loaded immediately into the shot holes. Return explosives remaining on deck to the day magazine prior to the firing of any blast. Clearly identify the location of the day magazine in the 'Blasting Safety Plan'.
- c. Mount the non-electric, shock tubing spool on the rig in a manner that it cannot be lost overboard. Use an approved blasting machine for detonation regardless of the number of caps used. Do not use an electric blasting system.

- d. Limit the amount of explosives aboard the drill boat at any one time to be in accordance with the amount permitted by appropriate codes and regulations. Do not exceed the amount permitted.
- e. Make arrangements to prevent damage to any vessel, moored or underway, building or structure and preserve the crew or occupants thereon from exposure to injury as a result of the Contractor's operations. The Owner may require additional arrangements.
- f. Perform a certified marine survey of all floating plant proposed for underwater blasting work on this contract prior to starting any work.
- g. Install automatic fire extinguishers of an appropriate type on air compressors and in all engine compartments aboard vessels including but not limited to (drill boats, barges) where explosives are stored, handled, and used.
- h. Provide remote fuel shut-offs and fire signaling devices aboard the drill boats.
- i. Coordination Plans with the local Coast Guard office to provide notice of blasting and for vessel traffic control.
- j. Alert sequence signals and public notice of blasting and all clear. See paragraph PUBLIC NOTICE OF BLASTING OPERATIONS in this section.

3.6.1.4 Navigation Control Plan

Submit the Navigation Control Plan in accordance with EM 385-1-1, Section 29, and all other Federal, state, and local laws and regulations. Implement all other applicable safety requirements in addition to that are required below.

Develop a Navigation Control Plan, which is incorporated into the Master Blasting Plan, that will provide the procedures required to maintain safe passage of all vessels during the project.

The Contractor will buoy the area with floating warning signs. The warning signs will be legible from a distance of 200 ft and must contain the message "DANGER - EXPLOSIVES IN USE" visible on either side of the sign.

Operate two or more patrol vessels during blasting operations equipped with a visible yellow flashing light, audible horn, and radio with a hailer, whose sole function will be to monitor and maintain security in the blast area. A patrol vessel will be stationed at the drill barge and remain in the blasting area during all blasting operations. Land oriented access control and visual observation locations should be determined and approved by the Owner. Inspect and insure there is no vessel traffic within the buoyed work area prior to providing the Shot's Warning Signals and until such time as the "All Clear Signal" has sounded. Establish and maintain a warning system as required by the Corps of Engineers Safety Manual. Equip and maintain floating plant with radio equipment capable of communications with the Coast Guard. After each blast, upon inspecting the area, immediately notify the U.S. Coast Guard and the Owner of the all clear or of a misfire.

3.6.1.5 Production Blasting Design

No blasting, including the Test Blasting, may differ from the approved Master Blasting Plan. Shot-hole drilling must not begin until the Master Blasting Plan is approved in writing. Reflect changes to the blasting or monitoring procedures, equipment, plant, products or personnel in a revised Master Blasting Plan or portion thereof. Obtain approval from the Owner, in writing, prior to implementation of any Master Blasting Plan changes or revisions.

Confine the loaded charge with angular, granular stemming materials, placed within competent rock, to perform the most work and to avoid a rifling plume from occurring within any shot hole. See paragraph STEMMING. The shortest delay period both between two adjacent shot holes and between two adjacent shot rows in the shot pattern is 25 milliseconds (ms). The maximum charge weight per delay may not exceed (to be determined) pounds of all combined explosives and blasting agents in each 25-ms delay period.

Include in the Production Blasting Design Section, as a minimum, the following items.

- a. Proposed method of transportation, storage, and handling of explosives.
- b. Procedure for monitoring the blast operations and handling misfires.
- c. Plan showing the intended layout of the shot-hole patterns, timing and sequence, anticipated burden dimensions and depth of sub-drilling for a specified maximum charge weight per delay. Identify each drill hole by a unique, sequential identifier.
- d. Typical size, depth, and spacing of blast holes; methodology to assure loading of explosives is only within sound rock; the maximum load density (in pounds per foot of drill hole length) and the maximum powder factor (in pounds of explosive per cubic yard of rock shot); type of explosive and method of loading and detonating; procedure to confine the charge with stemming; and maximum number of holes to be detonated for a production shot pattern. Initiation system to be deployed and the means to assure each shot hole fires on its own delay.
- e. Sequencing of delays for each shot hole that will be employed during blasting and the maximum explosive loading in pounds of explosive per delay.
- f. Indication as to whether decking or boosters will be used.
- g. Type and number of drill frames, including drill hole diameter, and expected production rates/day.
- h. Type of blast seismographs to be used, manufacturer, and when last calibrated or certified, and types of video cameras.
- i. The formats of all logs and reports to be used throughout the life of the project designed to record pertinent data before, during, and after the blasting operation. Pertinent information includes, but not be limited to, those items specified in paragraphs detailing the submittals.
- j. Names, office mailing addresses and phone numbers of Contractor's representatives (Blasting Consultant, Blasting Specialist, Blaster in

Charge, and Seismic Specialist) to which any informational inquiries may be addressed.

- k. Location plan, manufacturer's literature, and parameters to be used in site selection for the blast seismographs and video cameras. The location of any other monitoring equipment, when used.
- l. The methods that will be used to prevent all cited adverse impacts during the blasting activities, including protection of natural resources.
- m. Complete list of floating plant involved in production blasting operations.
- n. Within the blasting plan consider the multiple types of commercial vessels that will be on the water over the period of the excavation and removal program. Notify the sail/yacht clubs, etc., of plans to blast in advance and what traffic control and proximity restrictions will be implemented.
- o. Cite the methods to be used to recover and dispose of all shock cord/tubing and initiation transmission-line debris immediately following each shot.

3.6.1.6 Test-Blast Plan

In conjunction with the Master Blasting Plan, submit a copy of the Test Blast Plan for review. The Contractor may be required to revise and resubmit the plan. Concurrence with the revised plan will not relieve the Contractor of responsibility to produce safe and satisfactory results as set forth by these specifications.

The test blast program must be conducted by the Contractor consisting of at least 3 test blasts, consisting of 5 to 10 blast holes, for underwater excavation. Demonstrate that the test blasting program complies with all requirements described within the specifications and meets the needs of the Contractor in determining the amount of rock breakage for the equipment being used. If the results of the test blast are determined to be unsatisfactory by the Owner's Representative, revise methods as necessary to achieve required results. All costs incurred by the Contractor in adopting revised blasting methods necessary to produce an acceptable test shot shall be considered incidental to the contract unit prices for controlled blasting. The test blast plan shall be conducted and reported in strict accordance with procedures outlined in the sections of these specifications covering Vibration and Air Blast Control and the following:

- a. The Contractor will not be allowed to drill ahead of the test shot area until the test section has been evaluated and approved by the Owner's Representative.
- b. Notify the Owner's Representative sufficiently in advance of each test blast in order for Owner representatives to be present during the test blasts.
- c. Each test blast program shall involve all drill boats that will be used for any portion of the contract. No drill boat shall be used for the contract that has not participated in a test blast program.
- d. After the test blasts, the examine the representative structures of

the pre-blast survey as previously specified. All new damage resulting from the test blasting shall be reported in detail to the Owner's Representative, including photographs.

e. Upon evidence of any damage to test structures, test blasting shall cease until the Owner's Representative has been notified, and adjustments made.

f. The test events must begin with a small number of charges and extend upward to the maximum yield to be used. The final test event shall simulate as close as practicable to the explosive charge type, size, overlying water depth, charge configuration, charge separation, initiation methods, and emplacement conditions anticipated for the production blasting. One copy of the record for the test blasts shall be submitted in tabular form to the Owner's Representative daily.

g. At the conclusion of the test blast program, the Contractor shall produce a Post-Test Blast Evaluation Report which examines all reports, surveys, test data, and other pertinent information and conclusions reached to produce a complete Operational Blasting procedure. Submit a copy of the Post-Test Blast Evaluation Report for review. In no event shall operational blasting plan proceed until review of the report's proposed blasting procedure has been completed. If the report's proposed blasting procedure is not acceptable, revise and resubmit the report. The report shall include sketches showing blasting patterns, weights of explosives, wiring, charge emplacement, and determination of the safe peak particle velocity (PPV) for all structures identified in the pre-blasting surveys. Four copies of the Post-Test Blast Evaluation Report shall be submitted for review to the Owner's Representative and upon completion of the review and acceptance; it shall be appended to and become a part of the Operational Blasting Plan.

3.6.1.7 Marine Species Minimization Measures

The following minimization measures are required to protect marine species and must be included in the Master Blasting Plan.

- a. Stemming and decking of individual charges;
- b. Staggered detonation of charges in a sequential blasting circuit;
- c. Blasting during periods of slack tide
- d. Use of a fish detecting and startle system to avoid blasting when fish are present or transiting through the area;
- e. Require the use of sonar and the presence of a fisheries and marine mammal observer;
- f. Prohibiting blasting during the passage of schools of fish, or in the presence of marine mammals, unless human safety is a concern.

3.6.2 Individual Shot Plans

Submit an Individual Shot Plan 24 hours prior to any subsequent drilling and blasting for that shot pattern. The format may utilize a spreadsheet for ease data entry but requires an actual signature and handwritten date for its submission.

Prior to each blast, including Test Blasts, the Contractor must submit for the Owner's documentation a plan detailing all the data required in the Individual Shot Plan's format of the approved Master Blasting Plan. The plan will provide all the pertinent aspects of the blast design including, but not limited to, the loading, firing, delay sequence, and special considerations. The Individual Shot Plan will provide the location and depth of holes, inclination of all holes that will not be vertical, the proposed depth and the spacing of the blast holes, amount, and strength of explosives per hole and per pattern, the proposed sequence of firing and time delays, and estimated time and day for the pattern's initiation. Each proposed shot pattern will be designed by the Contractor's Blasting Specialist with changes being determined by observation of the way the rock breaks as the operations progress. The Contractor must take such precautions as are necessary to prevent displacement, cracking or damaging the rock outside the prescribed limits of dredging or excavation. The rock outside the limits of the dredging must be left in as sound and undamaged a condition as possible.

- a. Submit an Individual Shot Plan to the Owner, with the anticipated plan for the next shot pattern prior to drilling the shot holes. Furnish each submitted Individual Shot Plan as a signed paper copy and in digital form to the e-mail listing required by the Owner. The Individual Shot Plan may be developed in a format that easily provides data that remains the same for the actual shot information in the Daily Blasting and Removal Log and the Individual Shot Report with its included reports.
- b. The Individual Shot Plan includes, as a minimum, the following items:
 - (1) The shot pattern's name/number, coordinate locations of the outermost holes of the shot pattern, any specific purpose for the shot, the anticipated time, date, weather conditions, and the water conditions and its elevation at the anticipated time of the shot;
 - (2) The total number of holes to be shot, the shot-hole diameter, the total weight of explosives, number of delays, load density and powder factor for the shot, the maximum charge weight per delay, the closest approach, scaled distance and estimated PPV and airblast overpressures at each monitoring location;
 - (3) A large-scale plan map depicting the proposed layout of shot hole pattern, timing and delay sequence;
 - (4) An elevation sketch showing a typical hole's loading from the water surface to the bottom of the drill hole with an elevation scale, including the elevation of the removal grade, the top of sound rock, the top and bottom elevation of stemming, the top and bottom position of explosive materials, and the position of all detonators, boosters and primers in the hole;
 - (5) A tabular listing, which may be a printed spreadsheet page, by hole in the ascending total delay time order by the describing: row and number within the row of the shot hole, total delay time, the total charge weight of explosive materials for the entire hole, the largest charge weight of any deck within a hole on a separate 25-ms delay if any, top of sound rock elevation, bottom hole elevation or the top of stemming elevation at the bottom of a shot hole that was over-drilled in depth and backfilled, stemming

elevations, and detonator, primer and booster elevations in the hole;

- (6) The estimated PPV and airblast overpressure at each seismograph location and the lateral close approach distance from the shot pattern to each seismograph;
- (7) the means to remove and dispose of all shock cord/tubing and/or initiation transmission-line debris immediately following the shot;
- (8) The name, title, and signature of the Blasting Specialist providing the form with the date of the signature.

3.6.3 Test-Blast Evaluation Report

Provide a report summarizing the Test Blasting and submit the report with the Individual Shot Report of the first apparently successful production shot.

3.6.4 Individual Shot Reports

Submit an Individual Shot Reports, both in writing to the Owner and by e-mail distribution to the required e-mail addresses, on the next business day and prior to any subsequent drilling and blasting for the next shot pattern. The supporting reports related to each shot pattern, which was not included with the Individual Shot Report, must be provided with their required data by the submission date of each supporting submission. The Individual Shot Report may utilize the spreadsheets, maps, and sketches of that shot's Individual Shot Plan, which have been corrected or revised for the actual shot-hole use, loading, timing firing, and observed or recorded impacts.

Submit for the Area Office's documentation a specific set of reports of all the actual information from an initiated shot pattern, including Test Blasts, required in the Individual Shot Report's format of the approved Master Blasting Plan. The record will provide all the pertinent aspects of the blast design including, but not limited to: the time, date and weather conditions at the blast's initiation; proposed shot holes that were abandoned; the actual shot holes' positions and elevations of stemming, loading, decking, its delay and firing sequence, and special considerations; the total weight of explosives and the maximum charge weight per delay for the pattern; all pertinent factors about signaling and providing the all-clear signal; the peak particle velocity of all seismographs; and, any delays to shot initiation and all blast impediments, including by not limited to, shot-hole rifling plumes, observed impacts from blasting, misfiring, and reports of damage from blasting. The Individual Shot Report will include or be followed with all the supporting reports from the shot pattern. Each Individual Shot Report will be signed by the Contractor's Blasting Specialist or Blaster in Charge, whoever initiated the shot pattern's firing. Take such precautions as are necessary to prevent displacement, cracking or damaging the rock outside the prescribed limits of dredging or excavation. The rock outside the limits of the dredging must be left in as sound and undamaged a condition as possible.

- a. The Individual Shot Report may be developed in a format that easily provides data that remains the same from the proposed design of the Individual Shot Plan and the actual shot information for the shot's supporting reports and in the Daily Blasting.

- b. The Individual Shot Record includes, as a minimum, the following items:
- (1) The shot pattern's name/number, coordinate locations of the outermost holes of the shot pattern, any specific purpose for the shot, the anticipated time, date, weather conditions, water conditions and its elevation at the time of the shot;
 - (2) The total number of holes to be shot, the shot-hole diameter, the total weight of explosives, number of delays, load density and powder factor for the shot, the maximum charge weight per delay, the closest approach, scaled distance and recorded PPV and airblast overpressures at each monitoring location;
 - (3) A large-scale plan map depicting the layout of shot hole pattern, timing, and delay sequence;
 - (4) A tabular listing, which may be a printed spreadsheet page, by the loaded shot hole in the ascending total delay time order by the describing: row and number within the row of the shot hole, total delay time, the total charge weight of explosive materials for the entire hole, the largest charge weight of any deck within a hole on a separate 25-ms delay if any, top of sound rock elevation, bottom hole elevation or the top of stemming elevation at the bottom of a shot hole that was over-drilled in depth and backfilled, stemming elevations, and detonator, primer and booster elevations in the hole;
 - (5) The recorded PPV and airblast overpressure at each seismograph location and the lateral close approach distance from the shot pattern to each seismograph;
 - (6) The removal and disposal of all shock cord/tubing and initiation transmission-line debris immediately following the shot;
 - (7) A short narrative of any peculiarities or impediments or adverse impacts or accident/misfire with the shot, if any;
 - (8) The name, title, and signature of the Blasting Specialist providing the form with the date of the signature.

3.6.4.1 Drilling Logs

The Blaster in Charge or a Blaster with the assistance of the driller will log each shot hole, as the hole is being advanced. No drilling will be initiated without the Blaster in Charge or a Blaster to log the hole by a measurement means of drill bit's depth, the downward rig pressure, advancement rate of drilling, and air-water return of cutting with the driller's full assistance. The log must record the material encountered at the drill bit's depth to a precision of 0.1 ft. The drilling for each shot hole must be assessed to determine, and the log must record, the vertical depth/elevation of encountering sediment, weathered rock, the Top of Firm Rock, and voids to the total drilled depth. The shot-hole logs for all the shot holes in a shot pattern must be provided at the same time as the Individual Shot Report. An acceptable sample drilling log is provided in EM 1110-2-3800.

3.6.4.2 Individual Shot Vibration Monitoring Report

After each shot, submit an Individual Shot Vibration Monitoring Report, which will require the use of blast seismographs, to measure the vibration created from the blasting activities. Submit the Individual Shot Vibration Report to the Owner by or before Noon of the second business day following the shot, which is being reported. Submit each Individual Shot Vibration Report as a signed paper copy and in digital form to the e-mail listing required by the Owner. This will be provided at the pre-construction meeting.

Direct the specialty firm providing the seismic specialist, with approval of the Owner, to place blast seismographs, consisting of three component seismographs, (1) at important structures, and (2) other locations designated by the Owner. At least three seismograph locations will be required for every blast during this project.

Samples of possible Individual Shot Vibration Report formats are in EM 1110-2-3800, pp B-9 and B-10. The minimum required information to be submitted in the Individual Shot Vibration Report includes:

- a. Date and time of recording from each seismograph;
- b. Type (brand and model) of three-component seismographs used, serial #, and position name;
- c. Who performed, and the date of, the most recent calibration of each seismograph, and its sensitivity;
- d. The firm and employee who placed the blast seismograph;
- e. Seismograph installation procedures to prevent disturbance during monitoring, vandalism, and damage, and whether the seismic data is being telemetered or downloaded individually;
- f. Set trigger levels;
- g. Maximum for each of the three, component PPV in units of pounds per square inch (psi), the maximum total vector-sum peak particle velocity in units of pounds per square inch (psi), and a log-log graph of all maximum total vector-sum peak particle velocity versus square-root scaled distance in units of $\sqrt{\text{ft/lb}}$ for all seismic records of all prior shots for this project;
- h. A graph of the PPV versus frequency for each seismograph location that triggered;
- i. The maximum airblast overpressures in units of pounds per square inch (psi) at any triggered monitoring location and the results from noise tests before blasting in the first report;
- j. A narrative description of any peculiarities or impediments or adverse impacts or accident/misfire for the shot; and,
- k. The name, title, and signature of the Seismic Specialist processing and interpreting the data and providing the report with the date of the signature.

3.6.4.3 Individual Shot Videos

The Contractor will make a video recording of each shot pattern in a clear and consistent manner. Video recording must include date, time, and location. The digital video file must be furnished with the Individual Shot Report in a format noted within the Master Blasting Plan and approved by the Owner. The submission must be made to the Project Office and to all on the e-mail address listing. A library of blast videos will be maintained for all blasts and will be readily cross referenced with individual blast plans and post blast evaluations.

3.6.4.4 Reports of Required Safety, Protective, and Natural Resource Programs

Specify the data submission for required safety, protective, and natural-resource actions. A summary report must be submitted by noon 2 business days after the shot of the special monitoring of a critical or essential facility or commercial structure, an avian or mammalian watch program for assurance that a shot is not initiated at a time when the cited species is present, underwater pressure wave monitoring, or other agreed/negotiated program.

3.6.5 Daily Blasting and Removal Log

The Contractor must submit a Daily Blasting and Removal Log, both in writing to the Owner and by e-mail distribution to the required e-mail addresses, on the next business day. The Daily Blasting and Removal Log summaries all the drilling and blasting activities, surveying, dredging or removal of spoils, and disposal operations for any day that one or more of those operations were conducted. The Daily Blasting and Removal Log will be signed by the designated representative of the Contractor, approved in the Master Blasting Plan.

3.7 DRILLING AND BLASTING

3.7.1 Underwater Shot Holes

No drilling will be initiated without the Blaster in Charge or a Blaster to log the hole and confirm the proper positioning of the shot hole. For underwater blasting, the Contractor must be prepared to: drill; log the hole; resolve the units encountered in drilling; reassess the Shot Plan's intent for that particular shot hole; load explosives, boosters, initiators and delays, place stemming in sound rock; and raise the firing line. If a shot hole cannot be drilled or cleaned out, the Contractor will be required to re-drill that shot hole or properly correct the shot design to delete that hole.

3.7.2 Shot Hole Logging

The Blaster in Charge or a Blaster will log each drilled hole, as the hole is being drilled. The Blaster in Charge or a Blaster will log the shot hole by a measurement means of drill bit's elevation, the downward rig pressure, advancement rate of drilling, and air-water return of cutting with the driller's full assistance. The shot holes must be logged during drilling and measured upon completion with a weighted tape for its full depth before any explosives are loaded into any of the holes.

If any holes are too deep, then these holes will be filled to the proper depth with stemming. Repeated, significant voids, 0.5 ft or larger, must

be reported to the Owner. The Blasting Consultant may need to assess the issue of voids. Should voids become confinement issue blasting will be delayed until the Contracting Office is satisfied that potential problems related to blasting around the void have been properly addressed.

3.7.3 Stemming

All shot holes must have appropriately sized stemming material of the proper vertical placement length to optimize the blast design. Loss of explosive confinement can be due to improper stemming material type and poorly placed stemming. Tamped stemming must be placed from the top of firm rock (or hard material), as determined from the drilling log, to the top of the explosive charge. Stemming must also be used to fill voids, if any, as noted on the drilling log of that shot hole.

3.7.3.1 Stemming Material

Stemming must consist of well-graded, crushed, angular stone without fines. The gradation of the crushed, angular stone is between 1/8 inch and 3/8 inch in diameter. No soil or drill cuttings or rounded particles of the noted grading may be used as stemming material.

3.7.3.2 Length of Stemming

The minimum vertical length of tamped stemming within rock, or hard materials, of a shot hole must be the greater of 2.0 ft or eight times the shot hole's diameter. This minimum length of stemming must be placed in firm rock, or hard materials, to contain the gaseous products of detonation both below the top of firm rock and on either side of (above or below) voids, if any, with an explosive charge.

3.7.4 Loading Shot Holes

Stemming, decking, shot hole explosives' loading, and shot plan revisions for each shot hole must be made upon completion of drilling to the total depth from the logging of that underwater shot hole. Resolve whether to abandon the shot hole or load the hole from the Shot Plan's intent and the information resolved by the shot hole's log.

3.8 IMPACT MONITORING

Monitoring of the blasting may be required for public safety or natural-resource protection. The Contractor will be responsible for the payment and services of one or more, independent, third-party firms to conduct the required monitoring. The Contractor will make available the schedule and blasting documents to coordinate with other specialists monitoring issues for: the public's safety; environmental concerns for air, water, and property; natural resource protection; and the safety of structures and features.

3.8.1 Public-Use Area Effects

The Contractor will provide personnel, patrolling vessels or vehicles, and the signage necessary to assure safe distances from all shot patterns are maintained and physically monitored at public-use areas on land or on water, and at occupied structures or highways or other features requiring control.

3.8.2 Airblast and Seismic Monitoring

Airblast and vibration monitoring must conform to current industry standards and use equipment developed for blast monitoring. The Contractor will hire a subcontracted specialty firm, independent of the Contractor's firm and other sub-contractors to locate, maintain, and record the airblast and vibrations from every shot. The subcontracted seismic firm through their employee, the Seismic Specialist, will monitor the three seismic positions shown on the plans or accepted by the Owner. Additional seismographs may be required temporarily for (green) concrete placement or other temporary considerations or as required by the Owner for specific airblast or vibration issues due to blasting suspected at locations without seismographs. The seismic records and the Individual Shot Vibration Monitoring Reports will inform the Contractor of the actual airblast and vibration parameters from every shot and assure the Owner that the blasting has remained within the allowable airblast and vibration levels.

Provide 3 blast Seismographs capable of sampling rates of 15,000 samples per second or higher that meets ISEE PSBS. The 15,000 samples per second accuracy is required to acquire reproducible vibration readings. Each seismograph provided to the project must have been calibrated by the manufacturer within six months of its installation. No seismograph may be used at the project may have manufacturer's calibration longer than eleven months prior to its date of use. The units must be self-contained except for external geophones and microphones. The seismographs without erasing the stored data must be capable of telemetering the digital data or downloading the digital data to a portable device. The units must be programmed with specific data for each site of seismograph placement, which includes seismograph location, geophone burial or mounting method, calibration signal, date, and time of the record. The seismographs must be housed in protective enclosures, if vandalism or high-traffic concerns or weather or other conditions could limit the continuous, proper recording by the seismographs.

The blast seismographs must not be placed inside of a structure, unless required for the designated purpose and authorized by the Owner. The seismographs should not be placed near a structure unless the intent is to measure that particular structure's specific response to the blast. The microphone must be positioned to avoid wave reflections of the airblast from the vertical, front or side of a structure, wall or rock face. The microphone should be placed at a height of 3.0 ft. The geophone for each seismograph must appropriate for buried in soil or for being physically secured to rock or sidewalk or pavement or a concrete foundation.

The seismographs must be operated continuously beginning seven days before the first anticipated Test Blast. All The airblast and vibration amplitudes' maximal, frequencies of those amplitudes, repeated occurrences, and other parameters for the first period of operation before the first Test Blast will be reported as the project's background conditions in the first Individual Shot Vibration Monitoring Report.

The seismographs must be operated continuously until the excavation has been approved by the Owner. The seismograph may be removed from the project and replaced after their initial deployment, if there will be no blasting for a period of seven days or longer and if there will be no explosives stored onsite during that period.

3.8.3 Individual Shot Videos

Record every shot pattern's blast with Full High Definition, 1080p, digital video recordings with a minimum of 30 frames per second from two designated locations, approximately perpendicular to one another, that provide side and front or rear views of the blast and area above it. The video images must not contain any other text than the shot number. Include metadata consisting of the blast ID, date, and time of the blast. Index the two video recordings to properly identify each blast. Submit the proposed locations of the two video recorders on a map with the Individual Shot Plan. Furnish electronic file copies of video recordings on the sFTP within 24 hours of a blast. If the Owner requests that a copy of the video be submitted earlier, then deliver a copy within one hour of the request. Maintain a digital video library of all blasts.

3.8.4 Air, Water or Land Protections

Assure that all escaping or released gases, fluids, and solids are within applicable limits of all federal, state, and local laws, regulations, ordinances, and guidelines. Any releases of fluids or solids that are not such limits will be immediately reported, mitigated, retained, and removed from the project.

Remove all shock cord/tubing and initiation transmission-line debris immediately following each shot.

3.8.5 Natural Resource Assessments, Mitigation and Monitoring

Conduct blasting during periods of slack tide. Blasting will be prohibited during the passage of schools of fish or in the presence of marine mammals. Include the following sections in the Master Blasting Plan.

3.8.5.1 Fish-Repelling Noise

Use a fish detecting and startle system to avoid blasting when fish are present or transitioning through the area.

3.8.5.2 Watch Program

A fisheries observer and marine mammal observer must be present during blasting operations in a small vessel. Sonar will be used to detect fish and mammals. Submit name and qualifications of the fisheries observer and marine mammal observer for approval by approved by the Owner. Qualifications must be acceptable to the National marine Fisheries services.

3.8.5.3 Post-Blast Fish Surveys

Submit a plan to count, collect, ID, and report on any fish kills that occur during blasting. Send report to National Marine Fisheries Services(NMFS) no more than seven days after blasting. If fish kills exceed 100, notify NMFS within 24 hours and before the next scheduled blast. Alternate measures may be required to reduce fish kills.

3.9 SUBMERGED MATERIAL DISPOSAL

Transport and place all dredged, displaced, or excavated materials within the limits of the disposal zones below the specified elevations, as specified in Section 35 20 23 DREDGING.

Functional Replacement Barge Dock

NHDOT Project No.: 15731
Federal Project No.: A000(909)

-- End of Section --

SECTION 35 20 23

DREDGING
08/20

PART 1 GENERAL

1.1 GENERAL INFORMATION

The work under this section includes Contractor's operations for dredging at the Market Street Marine Terminal and offshore disposal at Isles of Shoals Dredge Disposal Site. Work under this section also includes quality control of dredging operations through pre, post, and periodic check hydrographic surveys.

The Contractor is responsible for making their own investigation of submerged, surface, and overhead structures in the work areas and other locations they find necessary to traverse.

Dredging must occur within the permitted dredge window. The project requires the implementation of a Turbidity Control and Monitoring Plan for permit compliance. This plan can be found in Appendix D.

1.2 DEFINITIONS

1.2.1 Overburden Material

Overburden material is defined as river sediments generally consisting of brown to gray fine to coarse sand and/or gravel with varying amounts of silt and shell fragments.

1.2.2 Hard Material (Bedrock)

Hard material is defined as material requiring blasting or the use of special equipment for economical removal, and includes boulders or fragments too large to be removed in one piece by the dredge.

1.2.3 Specified Limits

Specified limit is defined as the dredge depth, including side slopes.

1.2.4 Overdredge Depth

Overdredge depth is that depth that may be necessary in order to achieve the specified limit. It is dependent on the contractors, means, methods, equipment, and operator experience.

1.2.5 Incidental Fallback

Incidental fallback is the redeposit of small volumes of dredged material that is incidental to excavation activity in waters of the United States when such material falls back to substantially the same place as the initial removal. Examples of incidental fallback include soil that is disturbed when dirt is shoveled and the back-spill that comes off a bucket when such small volume of soil or dirt falls into substantially the same place from which it was initially removed.

1.3 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety -- Safety and Health Requirements Manual

EM 1110-2-1003 (2013) Hydrographic Surveying

1.4 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Letter Of Acceptance Of Owner's Pre-Dredge Hydrographic Survey And Associated Dredge Volumes

Pre-Dredge Hydrographic Survey

Method For Computing Dredge Quantities

Dredging Operations Plan

Schedule Of Plant And Equipment

Contractor Quality Control Survey Plan

Charts

Survey Personnel

Scow Cards

SD-05 Design Data

Contractor Quality Control Surveys

SD-07 Certificates

USACE Notification

SD-11 Closeout Submittals

Post-Dredge Hydrographic Survey

Approved Manifest

1.5 MATERIAL TO BE REMOVED

The material to be removed is silt, sand, gravel, and debris that may be present from historical operations at the facility.

1.5.1 Debris

It is anticipated that debris of various size/composition will be encountered and may include items such as rocks and construction debris.

1.5.2 Submerged Cables

There are six known steel cables located within the dredge area that require removal. Approximate location is shown on the Contract Drawings.

1.5.3 Hard Material

Removal of hard material must be in accordance with Section 31 23 01 UNDERWATER BLASTING.

1.6 ARTIFICIAL OBSTRUCTIONS

The Owner has knowledge of debris of various size/composition such as, but not limited to, rocks and construction debris. The Owner has no knowledge of existing wrecks, wreckage, or other material of such size or character as to require the use of explosives or special or additional equipment for its economical removal.

Prior to dredging, rake the dredge areas and remove debris encountered. Debris removed from the dredged area must be removed from the water and placed in the dewatering area separate from the dredge material, and must be rinsed for review by the Owner. All artificial obstructions shall become the property of the Contractor unless otherwise directed or indicated, and must be properly disposed of off the Owner's property at the end of the project, at no additional cost to the Owner.

1.7 QUANTITY OF MATERIAL

The total estimated amount of material to be removed from within the specified limits, including side slopes, but excluding overdepths, is shown on the Contract Drawings. The dredge slope shown is the maximum permissible slope and basis for permitted sediment removal quantity. Complete the work specified whether the quantities involved are greater or less than those estimated.

1.8 OVERDEPTH DREDGING

To cover unavoidable inaccuracies of dredging processes, material removed to a depth of one foot below the depth specified and within the dredging limits will be measured and paid for at full contract price. The one foot overdepth is the maximum permitted. The Contractor is not required to utilize the full permitted overdepth volume and shall only over dredge the minimum required to ensure the contracted dredge depths are achieved.

1.9 SIDE SLOPES

Dredging on side slopes must follow, as closely as practicable, the lines indicated or specified. Side slopes depicted on the Contract Drawings are maximum permissible slope and are the basis of the permitted sediment removal quantity. Take precautions as to not undermine existing riprap. Do not remove riprap. Notify the Owner's Representative if riprap is located within the side slope area.

1.10 EXCESSIVE DREDGING

Material removed beyond the limits stated in paragraph entitled OVERDEPTH DREDGING and SIDE SLOPES and on the Contract Drawings will be deducted from the total amount dredged as excessive overdepth dredging, and payment will not be made for this additional quantity.

1.11 USACE NOTIFICATION

Notify the USACE of dredge operations and disposal plan. Notification must include confirmation of disposal site location. Do not proceed with disposal operations until USACE issues a letter of authorizing disposal.

1.12 ENVIRONMENTAL COMPLIANCE AND PROTECTION

Comply with conditions and requirements of State or Federal permits. The Owner will secure the permit for dredging and placement of material as indicated. Permits are included in Appendix D.

During the life of the contract, provide and maintain environmental protective measures. Also, environmental protective measures required to correct conditions, such as oil spills or debris, that occur during the dredging operations, must be provided. Comply with Federal, State, and local regulations pertaining to water, air, and noise pollution.

1.13 CHARGES

The Contractor must pay all costs associated with dredging, transportation, and disposal of the dredge materials.

1.14 BASIS FOR BIDS

Payment will be at the contract unit price per cubic yard, multiplied by total cubic yards of acceptable dredging. Base bids on total cubic yards of dredging as shown on the Contract Drawings. Include a bid unit price per cubic yard of dredging based on the quantity shown on the Contract Drawings. Dredging conditions specified and indicated describe conditions which are known. However, the Contractor is responsible for other conditions encountered which are not unusual when compared to conditions recognized in the dredging business as usual in dredging activities such as those required under this contract.

1.15 SCHEDULE OF PLANT AND EQUIPMENT

Submit a schedule of the plant and equipment the Contractor will employ in the performance of the work on this contract. Submit copies of all applicable inspections and certifications for all floating plant and equipment.

1.16 DREDGING OPERATIONS PLAN

Submit a Dredging Operations Plan indicating the proposed method by which the dredge work will be conducted. Describe in detail the operations, equipment, personnel, and processes to complete the work. The plan must include discussion of the following items:

- a. Implementation and compliance with State and Federal Permit requirements
- b. Type of dredge equipment to be used throughout the project

- c. Coordination and communication efforts between site personnel to minimize impact to facility operations
- d. Horizontal and vertical survey control
- e. Means to avoid damage to adjacent structures, vessels, and moorings
- f. Means to avoid dredging beyond the limits
- g. Methods to dispose of all dredge materials
- h. Methods to prevent spillage from barges when transporting, loading, and unloading material
- i. Provide name and resume of contractor's third party hydrographic surveyor as well as details explaining how survey will be incorporated into dredge quality control

1.17 LAYOUT WORK AND SURVEYS

Employ a licensed surveyor to layout the limits of the work, establish vertical control, and perform surveys. Provide all buoys, ranges, and other controls necessary to accomplish the work and facilitate inspection.

Hydrographic surveys must use multi-beam sonar transducers and must provide 100 percent bottom coverage including a method to correct for side slope and beam angle error. Survey methodology must conform to the US Army Corps of Engineers specification EM 1110-2-1003. Survey accuracy shall be as follows: horizontal positioning: less than 1 meter; NADIR (vertical): plus or minus 0.15 feet.

The surveys must be corrected to Mean Lower Low Water (MLLW) and must be in an Owner approved format. Submit the hydrographic surveys to the Owner within five days after completion. Survey plans must be stamped by a licensed surveyor.

Submit the information electronically, together with hard copies of the information. Drawings shall be accessible with AutoCAD 2015 by AutoDesk, Inc. Software.

1.17.1 Contractor Quality Control Survey Plan

Submit a detailed plan describing the survey methods to be used during the work. Include the equipment to be utilized, tidal data, general site plan map, line designation map, any corrections to the MLLW datum used, calibration procedures to be used, expected horizontal and vertical accuracies, and pertinent information to describe the methods, and results to be obtained. Do not begin field surveys until these plans are approved.

1.17.2 Charts

Submit current and tide charts to be used for the areas being dredged.

1.17.3 Survey Personnel

Furnish a listing of the personnel who will perform the survey work required by this contract.

1.17.4 Horizontal Positioning Procedures and Accuracies

Vessel positioning systems utilized on this contract must conform to the allowable horizontal positioning criteria in EM 1110-2-1003. The positioning system used shall be capable of meeting or exceeding the accuracy requirements and must not exceed the allowable ranges where indicated. The Contractor may be required to demonstrate to the Owner's Representative that its positioning system is capable of meeting or exceeding the accuracy requirements in EM 1110-2-1003.

1.17.5 Vertical Reference Datums

Depth measurements must be reduced to the specified datum using RTK GPS or staff/gage readings, as described in EM 1110-2-1003. Recording tides using RTK GPS is recommended and can be used in lieu of tide staffs/gages. RTK tide data must be referenced and documented to an existing tide gage daily. When needed, tide staffs/gages must be constructed, referenced, maintained, stilled, and read in accordance with the criteria in EM 1110-2-1003.

1.17.6 Field Data Recording, Reductions, and Plotting Requirements

The data format fields for submitting reduced hydrographic data to the Owner is x y (+)z. Digital data must be emailed, unless the data set is too large for email. In such cases, data must be sent via CD-ROM or file transfer site as established by the Owner.

1.17.7 Volume Computations by the Contractor

The Contractor must have the capability to compute excavation quantities from work performed under this contract. Compute volumes using any of the techniques given in Chapter 15 of EM 1110-2-1003. Section drawings must be made at the horizontal and vertical scales given in EM 1110-2-1003.

1.17.8 Automated System Synchronization Checks

The Owner's Representative reserves the right to check each automated hydrographic survey system to insure adequacy of correlation between position and depth. Methods for performing this check are given in EM 1110-2-1003.

1.17.9 Contractor Quality Control Surveys

Examine the dredge work by conducting hydrographic surveys at the following interval: monthly. Additionally, conduct a hydrographic survey prior to any request for a Owner survey for final acceptance. Submit Contractor Quality Control Surveys to the Owner and when a progress payment request is submitted.

1.17.10 Pre-Dredge Hydrographic Survey

Prior to commencing work, complete a Pre-Dredge Hydrographic Survey to confirm that the Owner's pre-dredge Hydrographic Survey and associated dredge volumes accurately reflect conditions prior to dredging. Submit a Pre-Dredge Hydrographic Survey indicating the original depth of the river bottom prior to dredging. Survey must be conducted by a Licensed Professional Land Surveyor with at least 5 years of hydrographic survey experience.

Submit a Letter of Acceptance of Owner's Pre-Dredge Hydrographic Survey and associated dredge volumes shown in the Contract Drawings.

1.17.11 Post-Dredge Hydrographic Survey

After completion of all work, perform a post-dredge hydrographic survey throughout the dredge area. The survey must be taken within five days after completion of the dredging. Notify the Owner seven days in advance of the scheduled survey. The submitted survey must clearly depict any areas that are within the specified limits that are shallower than the designed dredge elevation depicted.

1.17.12 Data Submission Requirements for All Contractor Surveys

All Contractor Quality Control Surveys submissions shall include the following:

a. Field Data

- (1) Raw multibeam data zipped by day
- (2) Sound velocity casts zipped by day
- (3) Daily tide tables and/or files
- (4) Depth sounder rolls (if used) corrected for tide and corresponding boat plot
- (5) Reduced hydrographic 3x3 average and 3x3 minimum XY(+)Z files. The 3x3 average file shall have the average sounding in the center of the cell and the 3x3 minimum file shall have the minimum sounding in its actual location
- (6) Field notes, daily logs, and quantity computations

b. 3x3 Minimum Plot

- (1) Noted Information
 - (a) Name of project
 - (b) Name of surveying/contract company
 - (c) Date(s) of survey
 - (d) Horizontal Datum
 - (e) Distance units
 - (f) Vertical Datum
 - (g) Sonar system
 - (h) Sounding frequency
 - (i) GPS System
 - (j) Software used

- (k) Sounding sort distance and confirmation that soundings shown
 - (l) represent shoalest values
 - (m) V-Datum version used (if applicable)
- (2) Plotted Information
- (a) dredge area
 - (b) Minimum sorted soundings
 - (c) 3x3 minimum contour at design depth
 - (d) 3x3 minimum contour at design depth
 - (e) Scale bar
 - (f) North arrow
 - (g) Grid
 - (h) Stationing
 - (i) Navigation aids
 - (j) Sheet setup
 - (k) The scale of the plot shall match that of the contract drawings and the soundings shall be sorted as appropriate (e.g., 20 feet for 100 scale plot, 40 feet for 200 scale plot, etc). The font size shall be the appropriate size to prevent soundings from being overwritten on the plot

The above data will be used by the Owner's Representative to verify achievement of contract depth, and compare actual progress and in-place quantities dredged with scheduled progress.

1.17.13 Contractor Progress Payment

Submit Contractor Quality Control Survey data for any periods for which progress payments are requested. Furnish the data listed above in subpart "Data Submission Requirements for Contractor Surveys", to the Owner, who will use the data as necessary to determine the amount of progress payments. The owner does not conduct progress surveys.

1.18 METHOD FOR COMPUTING DREDGE QUANTITIES

Submit Method for Computing Dredge Quantities. Method must be a generally recognized technique using TIN subtraction or average end area method of calculation and must be compatible with AutoCAD Civil 3D 2010 software.

1.19 MATERIALS TRANSPORTATION

Contractor must transport materials to disposal site and submit Approved Manifest.

1.20 WORK AREA

1.20.1 Protection of Existing Waterways

Conduct operations in such a manner that the material or other debris are not pushed outside of dredging limits or otherwise deposited in existing side channels, basins, docking areas, or other areas being utilized by vessels or moored boats. The Contractor will be required to change his method of operations to comply with the above requirements. Should any bottom material or other debris be pushed into areas described above as a result of the Contractor's operations, the material must be promptly removed.

1.20.2 Adjacent Property and Structures

Conduct dredging operations such that it does not undermine, weaken, or otherwise impair existing structures located in or near the areas to be dredged.

Damage to private or public property or structures resulting from disposal or dredging operations must be repaired promptly by the Contractor at his expense. Damage to structures resulting from the Contractor's negligence will require prompt repair at the Contractor's expense.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 INSPECTION

Inspect the work, keep records of work performed, and ensure that gages, targets, ranges, and other markers are in place and usable for the intended purpose. Provide, at the request of the Owner, boats, boatmen, laborers, and materials necessary for inspecting, supervising, and surveying the work. When required, provide transportation for the Owner and inspectors to and from the placement area and between the dredging plant and adjacent points on shore.

Before any machinery or mechanized equipment is placed in service, it must be inspected and tested by the Contractor and certified to be in safe operating condition.

3.2 DREDGING

3.2.1 Order of Work

The Owner will direct the Contractor on the order of work. The Owner reserves the right to change the order of work at any time.

3.2.2 Interference with Navigation

Coordinate all marine vessel movements with the Owner. Submit a weekly updated schedule showing proposed dredge locations and vessel movements.

Minimize interference with facility operations and the use of channels and passages. The Contractor is responsible for shifting or moving of dredges or the interruption of dredging operations to accommodate the movement of

vessels and floating equipment, if necessary. Adhere to Coast Guard Regulations for passing vessels.

3.2.3 Lights

Each night, between sunset and sunrise and during periods of restricted visibility, provide lights for floating plants, pipelines, ranges, and markers. Also, provide lights for buoys that could endanger or obstruct navigation. When night work is in progress, maintain lights from sunset to sunrise for the observation of dredging operations. Lighting must conform to United States Coast Guard requirements for visibility and color.

3.2.4 Ranges, Gages, and Lines

Provide, set, and maintain ranges, buoys, and markers needed to define the work and to facilitate inspection. Establish and maintain gages in locations observable from each part of the work so that the depth may be determined. Suspend dredging when the gages or ranges cannot be seen or followed.

3.2.5 Dredge Plant and Equipment

Maintain all dredge plant and associated equipment such as, but not limited to, scows, coamings, barges, and pipelines, to meet the requirements of the work.

3.2.5.1 Location Data Collection for Dredge Bucket

The dredge plant must be equipped to record real time location data for the position of the bucket, to include horizontal and vertical positioning (xyz data). This data must be available on a continuous basis.

3.2.5.2 Sufficient Capacity

Keep on the job sufficient plant and equipment to meet the requirements of the work. The plant and equipment must be in satisfactory operating condition and be capable of safely and efficiently performing the work.

3.2.5.3 Reduction in Capacity

No reduction in the capacity of the plant and equipment employed on the work shall be made except by written permission of the Owner. The measure of the capacity of the plant and equipment must be its actual performance on the work covered by this contract.

3.2.5.4 Inspections and Certifications

Prior to commencement of work at the site provide copies of all applicable inspections and certifications of floating plant and equipment as required by Federal, State and local laws and regulations. See also EM 385-1-1, Sections 16, 18, 19, and 20. Such inspections and certifications must be current and maintained in force for the duration of this contract. Each item of floating plant and equipment must have on board a waste oil management plan which details the intended disposal method for waste oil.

Each vessel exceeding twenty-six feet in length, excluding sheer, which is used for pushing, hauling alongside, or any other method of towing must adhere to the requirements set forth in 46 CFR Subchapter M.

The plant and equipment shall be subject to the inspection of the Owner at all times. The responsibility for actual supervision and direction of dredging operations including the safe and efficient operation of dredge plant and equipment lies with the Contractor.

3.2.5.5 License Requirements

Each vessel exceeding twenty-six feet in length, excluding sheer, which is used for pushing, hauling alongside, or any other method of towing, and not required by law to have a valid Certificate of Inspection by the U.S. Coast Guard, must be under the actual direction and control of a person licensed for towing in the geographic area of the work by the U.S. Coast Guard. Licensed persons shall not perform command or other duties in excess of twelve hours in any consecutive twenty-four hour period except in an emergency.

3.2.5.6 Automatic Identification System Requirements

All dredge and plant equipment, including scows, must be registered with the AUTOMATIC IDENTIFICATION SYSTEM (AIS) in order to ensure that the entire footprint of the Contract's working vessels and scows are available on marine trafficker's electronic chart displays.

3.2.5.7 Tow Boats

All tow boats used for towing to disposal areas must be equipped with DGPS navigational equipment, radar, corrected compass, marine radio, and depth sounding equipment which is to be maintained in operating condition during each tow. The tow boats utilized by the Contractor for this purpose must be a size adequate for towing in heavy seas and must have necessary reserve power for maneuvering with scows in rough seas and under emergency conditions as well as for control of scows at the disposal site.

3.2.5.8 Scows

Provide and maintain markings on all scows clearly indicating the draft of the scow and provide scow cards for each scow used on the contract work. Submit scow cards for each scow to be used for contract work. The scow cards must show dimensions and volumes of individual pockets of scows and total volumes for varying depths below coaming or top of pockets. This is to enable the Owner to make a determination of scow volume and corresponding drafts under partial and full load conditions. These measurements are to be made at the time of initial use of each scow. This information will then be furnished to disposal inspectors to enable them to estimate scow volume from draft of scows for each scow being towed to the disposal area. The scow volume estimates are for use in connection with disposal area monitoring studies and are not intended to be used in determining quantities dredged. At the beginning of the work and as additional scows arrive on the project, sufficient time shall be allowed by the Contractor and assistance of Contractor personnel shall be made available by the Contractor for the purpose of obtaining the measurements of each scow under various partial and full load conditions's. During the entire period of contract work, the Contractor must provide and maintain sufficient spot of floodlights to permit the reading of the draft on the sides of scows at bow and stern from the tow boat at night and when visibility is impaired. The draft readings and each pocket/compartments measurement are required for each scow towed to the disposal area and will be made by the disposal inspector. Measurements are to be taken and recorded prior to departure from the dredge site and upon arrival at the

immediate disposal location. Ensure that adequate time is allowed by the tow boat captain for these readings to be obtained.

3.2.5.9 Scow Pocket Doors

Due to the fine nature of some of the dredged material, the Contractor must achieve proper closure and watertightness of the bottom-dumping scow pocket doors to eliminate seepage or leakage of material. The use of plastic material to cover cracks in scow pockets is not be allowed.

3.2.6 Dredging

Dredging is limited to mechanical methods.

3.2.7 Disposal of Excavated Material

Provide for safe transportation of dredged materials to the designated disposal site. Transportation must include measures to prevent loss of material during movement. Contractor is responsible to follow all haul restrictions and requirements imposed by the permits. The deposit of dredged materials in unauthorized places is forbidden. Comply with rules and regulations of local port and harbor governing authorities.

3.2.7.1 NOAA Off Shore Disposal Requirements

- a. Year-round, disposal vessels including tugs, barges, and scows transiting between the dredge site and the disposal site shall operate at speeds not to exceed 10 knots. For unanticipated conditions, a vessel may operate at a speed necessary to maintain safe maneuvering speed instead of the required 10 knots. The intent of this condition is to reduce the potential for vessel collisions with endangered turtles, fish, and whales.
- b. A marine mammal/turtle observer with written approval from the National Marine Fisheries Service (NMFS), hereafter referred to as the "endangered species observer" and contracted and paid for by the contractor, must be present aboard disposal vessels for transportation and disposal activities to and from the disposal site. The name of the endangered species observer must be recorded in the logbook and is required to be on lookout for marine mammals and sea turtles for the duration of the trip.
- c. The captain or endangered species observer shall:
 - (1) Check communication media for the latest information regarding North Atlantic right whale sighting locations. These media may include, but are not limited to, the Whale Alert app (<https://www.fisheries.noaa.gov/resource/tool-app/whale-alert-smartphone-app>), <https://portal.nrwbuoys.org/ab/dash/> or <https://www.nefsc.noaa.gov/psb/surveys>. Check communication media before the initial disposal operation to determine the potential presence of whales in the area; and
 - (2) Lookout for turtles and whales and advise the captain of turtle or whale sightings.
 - (3) Report any interactions (i.e., vessel strikes, captures, etc.) with any ESA-listed species as soon as possible (within 24-hours) to the NMFS Marine Animal Response Hotline at (866) 755-NOAA or

USCG via CH-16 and immediately report any injured or dead marine mammals or sea turtles to NMFS at (866) 755-NOAA.

- (4) Every three months after the initial dredge action for as long as the dredging and disposal continues and at the end of a disposal operation, submit a report by email to Roosevelt Mesa, ESA Section 7 Biologist, Greater Atlantic Regional Fisheries Office, Protected Resources Division, roosevelt.mesa@noaa.gov, summarizing the vessel route taken, number of trips, sightings of ESA-listed species, and any action taken to avoid interactions with ESA-listed species.

d. The vessel captain shall:

- (1) Lookout for turtles and whales; and
- (2) Avoid transit and disposal when visibility is lessened (e.g., at night, fog) to an extent that would preclude an endangered species observer from spotting a whale within 1,500 feet or a sea turtle within 600 feet. Disposal shall not be permitted if these requirements cannot be met due to weather or sea conditions. In that regard, the permittee and contractor should be aware of predicted conditions before departing for the disposal site. The intent of this condition is to reduce the potential for vessel collisions with endangered species, including right whales.
- (3) Avoid harassment of or direct impact to turtles and whales except when precluded by safety considerations; and
- (4) Ensure that the disposal vessel adheres to the enclosed NMFS regulations for approaching right whales, 50 CFR 224.103(c), which restrict approaches within 1,500 feet (500 yards) of a right whale and specify avoidance measures for vessels that encounter right whales; and
- (5) Ensure that dredged material is not released if whales are within 1,500 feet or turtles are within 600 feet of the specified disposal point. The captain must check in with the endangered species observer prior to releasing the dredged material. If whales or turtles are within these distances and appear to be moving away from the specified disposal point, within these distances and appear to be remaining stationary, or outside these distances but appear to be moving towards the specified disposal point, the vessel captain shall wait until they have cleared the specified disposal point by these distances and are not moving towards it, and then proceed with disposal at the specified disposal point.

3.2.8 Dredging Requirements

Dredge area and depth is shown on the Contract Drawings.

3.2.9 Method Of Communication

Provide a system of communication between the dredge crew and the crew at the disposal area. A portable two-way radio is acceptable.

3.2.10 Quality Control

Establish and maintain quality control for operations to assure compliance with contractual requirements and maintain records of this quality control for dredging operations.

While performing all dredging work control the horizontal positioning of the dredge with electronic positioning.

3.2.11 Salvaged Material

Anchors, chains, firearms, and other articles of value, which are brought to the surface during dredging operations, must remain or become the property of the Owner and will be placed on shore at a convenient location near the site of the work, as directed by the Owner.

3.2.12 Safety of Structures

The prosecution of work must ensure the stability of piers, bulkheads, and other structures lying on or adjacent to the site of the work, insofar as structures may be jeopardized by dredging operations. Repair damage resulting from dredging operations is the responsibility of the Contractor, insofar as such damage may be caused by variation in locations or depth of dredging, or both, from that indicated or permitted under the contract. The Contractor is responsible for coordinating with the owner of the structure for any necessary repairs.

3.2.13 Plant Storage

When not in use, plant equipment must be stored at an approved location. Stored plant equipment must not interfere with Facility operations.

3.2.14 Plant Removal

Upon completion of the work, promptly remove plant, including ranges, buoys, piles, and other markers or obstructions.

3.2.15 Blasting

Hard material is expected. Blasting must be completed in accordance with Section 31 23 01 UNDERWATER BLASTING.

3.3 PLACEMENT OPERATIONS

3.3.1 Misplaced Dredged Material

Any dredged materials deposited at locations other than in areas designated or approved by the Owner's Representative will be considered misplaced material and will not be paid for until the Contractor, at his own expense, removes and deposits such misplaced material where directed. This required removal and redeposit of the misplaced material and any necessary placement site restoration work is not the basis for a time extension or additional compensation under this contract.

3.4 MEASUREMENT

Complete a pre-dredge hydrographic survey before dredging and a post-dredge hydrographic survey after dredging and submit a plan showing the results of each survey(s) to the Owner for review. Total dredge volume measurement

shall be determined based on the differences between the pre and post dredge survey.

3.4.1 Method of Measurement

The material removed will be measured by cubic yard in place, by means of surveys taken before and after dredging. The drawings represent existing conditions based on current available information, but will be verified and corrected, if necessary, by surveys taken before dredging. Surveys must be taken by multibeam sonar methods, as determined by the Owner; results of survey will be the basis for payment. Areas surveyed more than 30 days prior to dredging will be re-surveyed when requested by the Owner.

3.4.2 Periodic Estimates

Periodic estimates of work completed will be based on the result of soundings taken during the progress of the work. Deductions will be made for dredging and placement not in accordance with the specifications.

3.5 FINAL EXAMINATION AND ACCEPTANCE

As soon as practicable after the completion of areas, which in the opinion of the Owner, will not be affected by further dredging operations, each area will be examined by the Owner by sounding or sweeping, or both. Remove shoals and lumps as required by methods approved by the Owner. Notify the Owner when soundings or sweepings are to be made and will be permitted to accompany the sounding or sweeping party and to inspect the data and methods used in preparing the final estimate. When areas are found to be in a satisfactory condition, the work therein will be accepted as complete. Final estimates will be subject to deductions or correction of deductions previously made because of excessive overdepth, dredging outside or authorized areas, or disposal of material in an unauthorized manner.

-- End of Section --

Memo

NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

Maps and NHB record pages are confidential and should be redacted from public documents.

To: Stephen Hoffmann
53 Regional Drive
Concord, NH 03301

From: NHB Review, NH Natural Heritage Bureau

Date: 2/7/2023 (valid until 02/07/2024)

Re: Review by NH Natural Heritage Bureau

Permits: NHDES - Alteration of Terrain Permit, NHDES - Shoreland Standard Permit, NHDES - Wetland Standard Dredge & Fill - Major, USACE - General Permit, USCEQ - Federal: NEPA Review, USEPA - Stormwater Pollution Prevention

NHB ID: NHB23-0281

Town: Portsmouth

Location: 555 Market Street

Description: This DataCheck request is to update NHB21-3815. This project will consist of the following components: 1) Construction of a new dock structure approximately 60 x 120 feet to extend the south end of the existing wharf; 2) Construction of a new dock structure approximately 145 x 80 feet to extend the north end of the existing wharf; 3) Installation of a new fender system along the length of the main wharf; 4) Dredging of approximately 55,000 square feet of the river bed adjacent to the north end of the extended wharf; 4) Shoreside alterations, including soil and rock removal, grading, drainage, and paving within a 80,000-square foot area. Dredging, blasting, and the majority of concrete demolition will occur between November 15 and March 15. A blasting plan will be prepared by the contractor.

cc: NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments NHB: No comments at this time.

F&G: Please continue coordination with Mike Dionne NHFG Environmental Review Coordinator.

Vertebrate species

	State ¹	Federal	Notes
Atlantic Sturgeon (<i>Acipenser oxyrinchus oxyrinchus</i>)	T	T	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).
Shortnose Sturgeon (<i>Acipenser brevirostrum</i>)	E	E	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).

¹Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Memo

NH Natural Heritage Bureau NHB DataCheck Results Letter

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For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section below.

Disclaimer: A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

IMPORTANT: NHFG Consultation

If this NHB Datacheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to <https://wildlife.state.nh.us/wildlife/environmental-review.html>. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB Datacheck results letter number and “Fis 1004 consultation request” in the subject line.**

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule*), coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email: Kim Tuttle kim.tuttle@wildlife.nh.gov with a copy to NHFGreview@wildlife.nh.gov, and include the NHB Datacheck results letter number and “review request” in the email subject line.

Contact NH Fish & Game at (603) 271-0467 with questions.

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB23-0281

