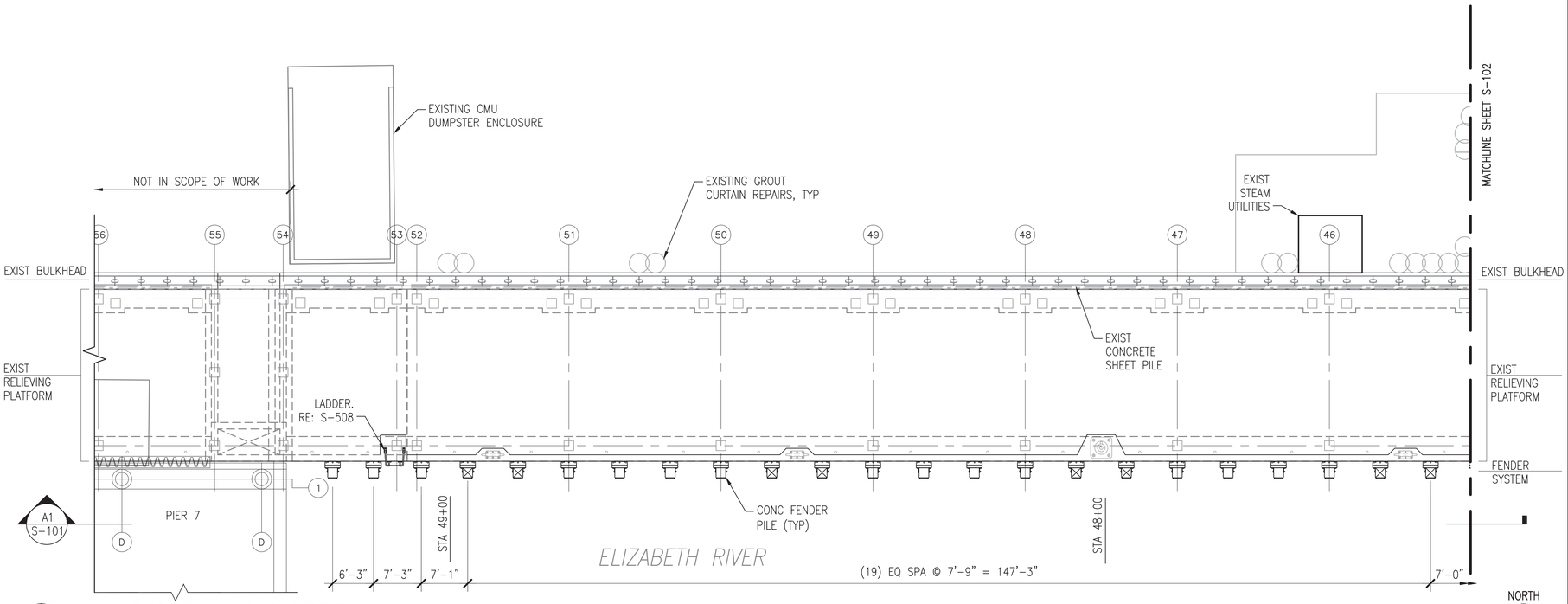
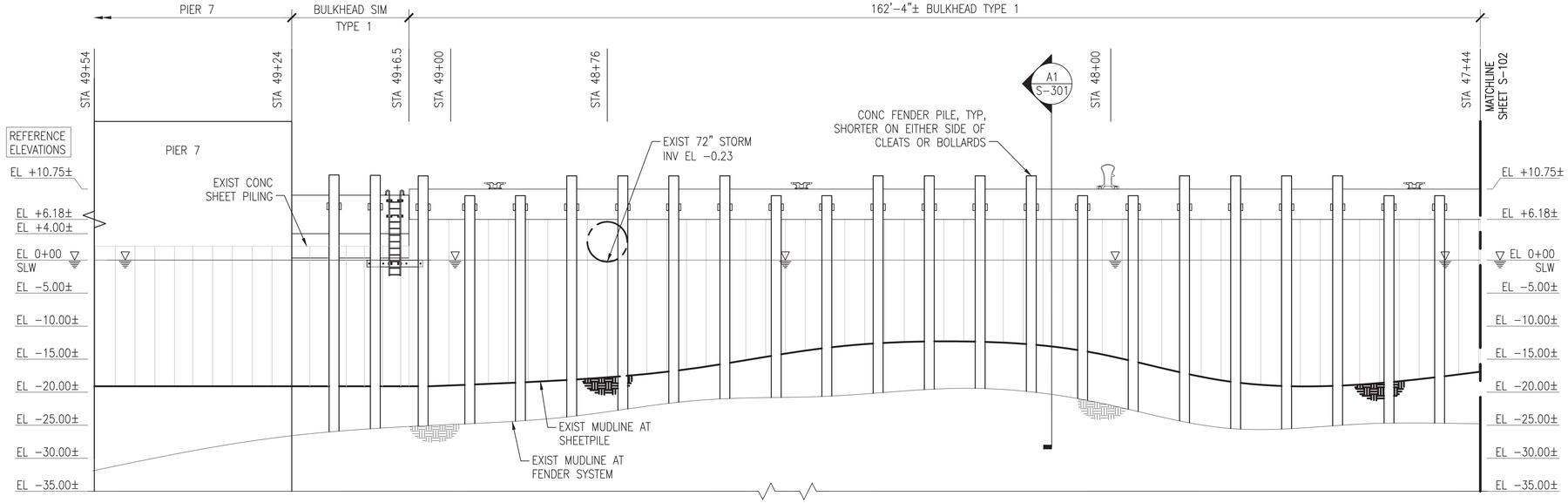


C1 PLAN - Z-308 BULKHEAD (1 OF 7)

SCALE: 1" = 10'



A1 ELEVATION AT FENDER SYSTEM

SCALE: 1" = 10'

S-101

GENERAL SHEET NOTES @ Z-308

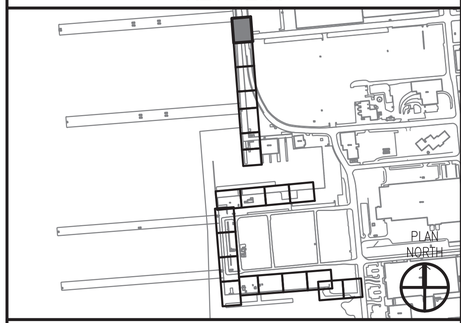
1. PROVIDE Z-308 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRETE PILES, WELDMENTS, RUBBER COMPONENTS, AND SPACERS.
2. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
3. PROVIDE NEW LADDER(S) AND CLEAT(S) AS IDENTIFIED ON THE DRAWINGS.
4. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
5. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD, WITH THE TOP OF CURBING ELEVATION AT +11.0 FEET ABOVE MLW. THE CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH THE CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
6. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
7. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	23	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	–	EA
	24" CLEAT	–	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW KAD | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CJT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

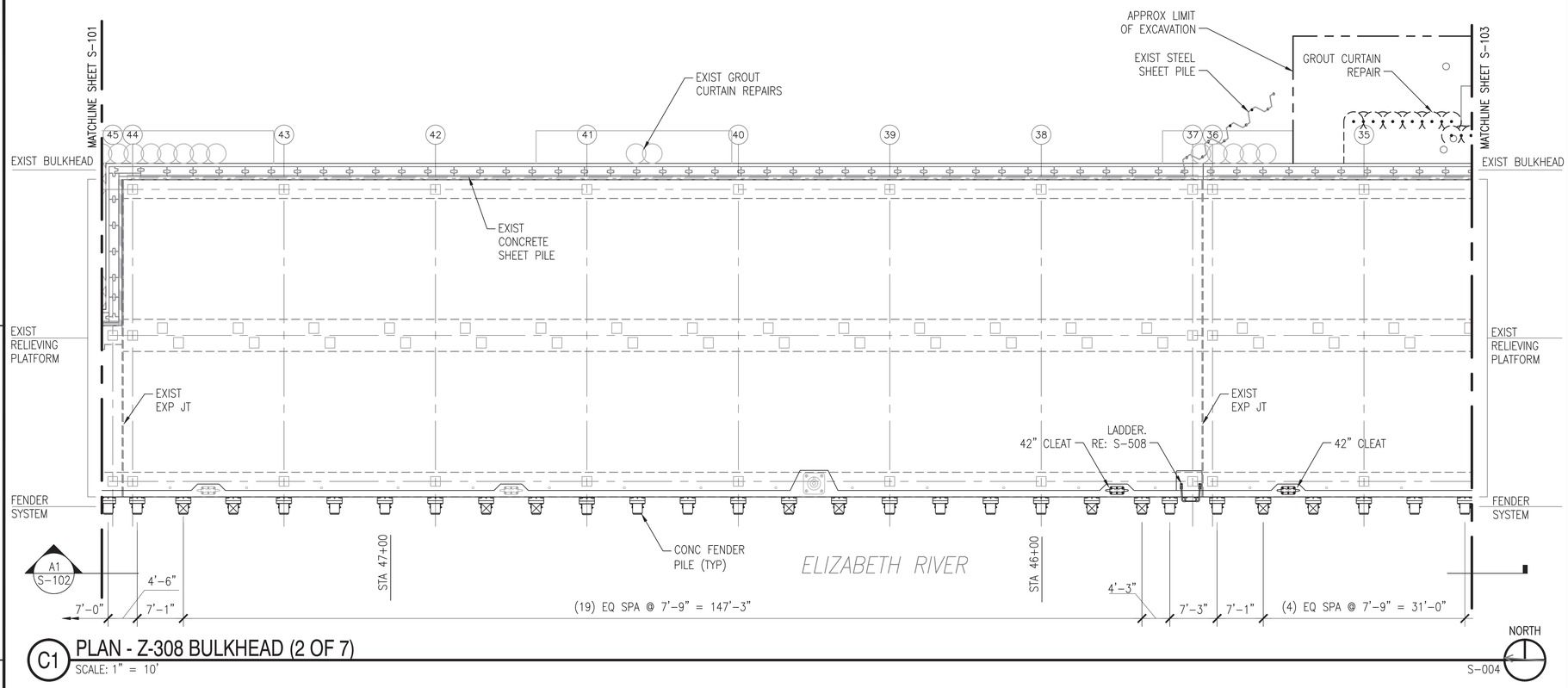
STRUCTURAL PLAN & ELEV (1 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,744
SHEET 89 OF 158

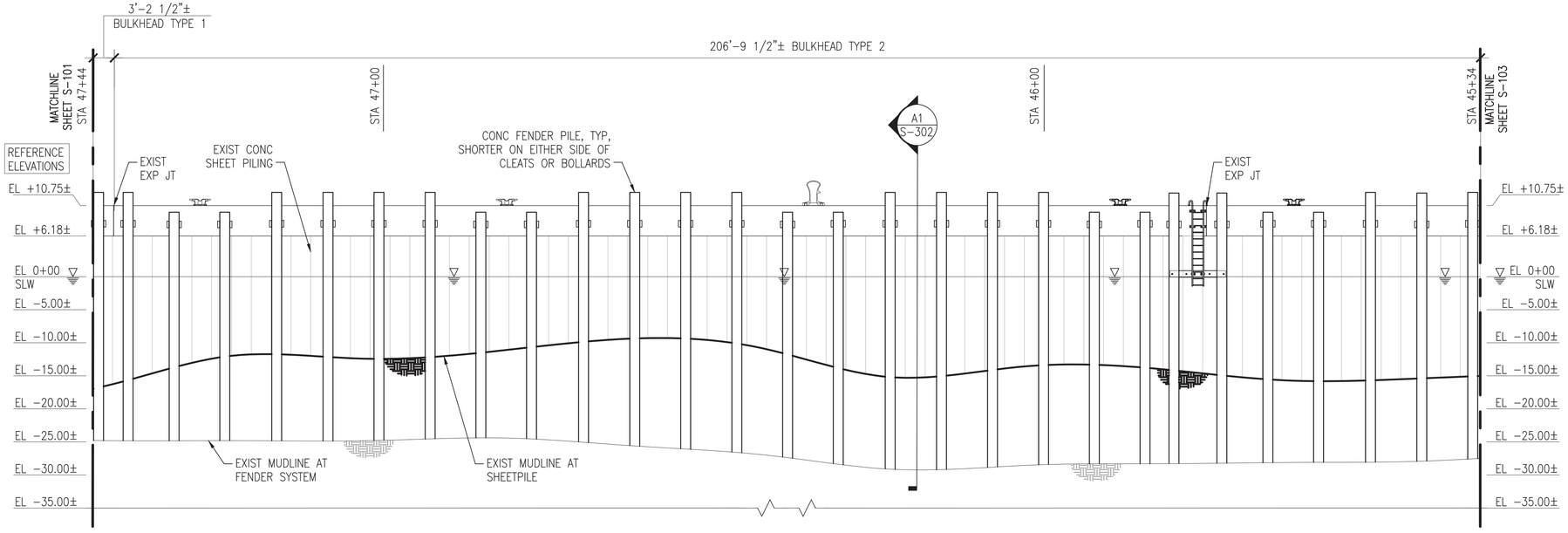
S-101

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NavalStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762-308Report\B_Design\Drawings\Sheet\07_Structure\1370817_S-100 SERIES.dwg LAYOUT NAME: S-101 STRUCTURAL PLAN & ELEV (1 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.o.davis2



C1 **PLAN - Z-308 BULKHEAD (2 OF 7)**
SCALE: 1" = 10'



A1 **ELEVATION AT FENDER SYSTEM**
SCALE: 1" = 10'

S-102

GENERAL SHEET NOTES @ Z-308

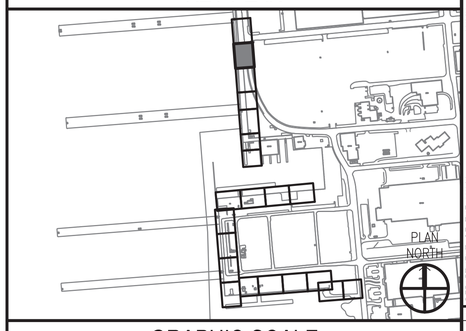
1. PROVIDE Z-308 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRETE PILES, WELDMENTS, RUBBER COMPONENTS, AND SPACERS.
2. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
3. PROVIDE NEW LADDER(S) AND CLEAT(S) AS IDENTIFIED ON THE DRAWINGS.
4. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
5. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD, WITH THE TOP OF CURBING ELEVATION AT +11.0 FEET ABOVE MLW. THE CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH THE CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
6. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
7. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	29	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	2	EA
	24" CLEAT	–	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
(-Y-Y-)	GROUT CURTAIN	23	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

								APPR
								DATE
								DESCRIPTION
								CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW KAD | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CLT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

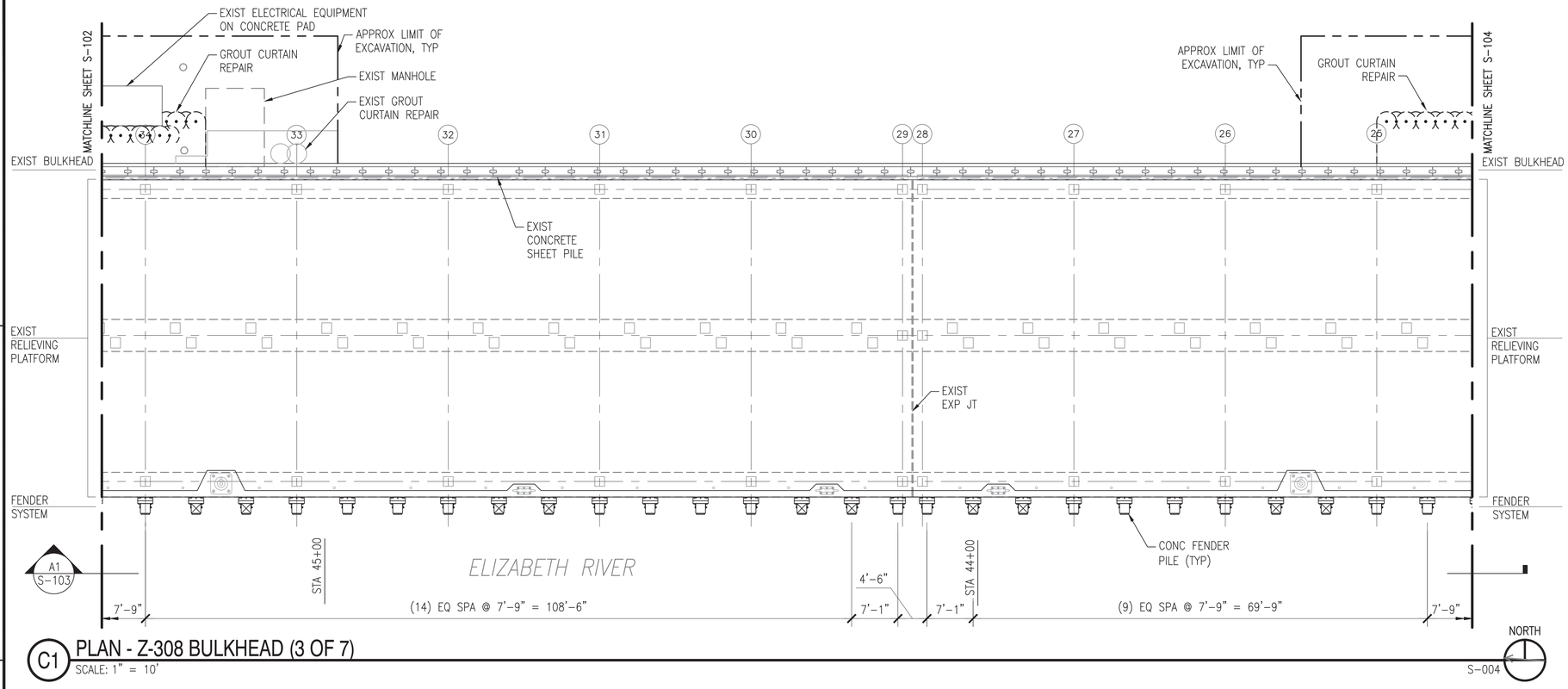
STRUCTURAL PLAN & ELEV (2 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,745
SHEET 90 OF 158

S-102

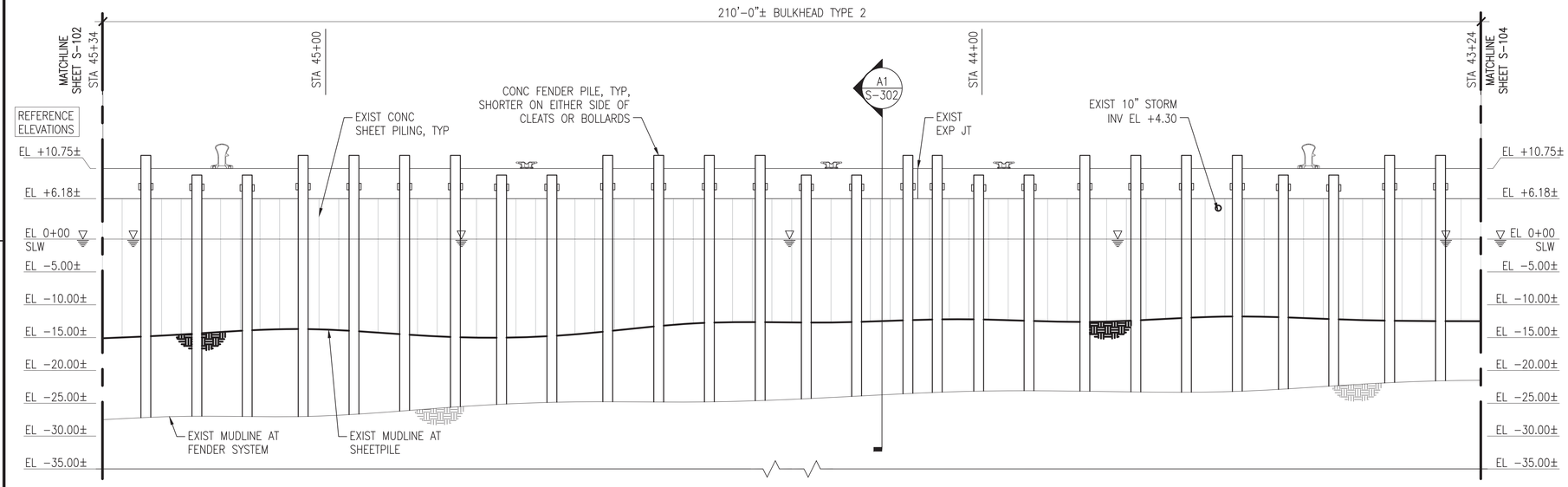
DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NewsStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Repair\B_Design\Drawings\Sheet\07_Structure\1370817_S-100 SERIES.dwg LAYOUT NAME: S-102 STRUCTURAL PLAN & ELEV (2 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.o.davis2



C1 PLAN - Z-308 BULKHEAD (3 OF 7)

SCALE: 1" = 10'



A1 ELEVATION AT FENDER SYSTEM

SCALE: 1" = 10'

S-103

GENERAL SHEET NOTES @ Z-308

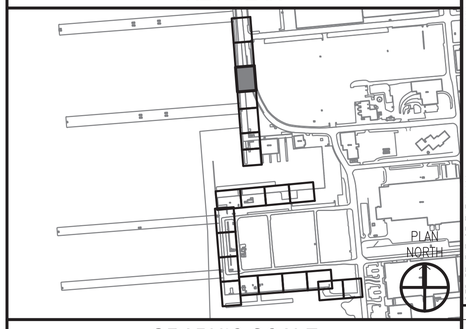
1. PROVIDE Z-308 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRETE PILES, WELDMENTS, RUBBER COMPONENTS, AND SPACERS.
2. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
3. PROVIDE NEW LADDER(S) AND CLEAT(S) AS IDENTIFIED ON THE DRAWINGS.
4. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
5. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD, WITH THE TOP OF CURBING ELEVATION AT +11.0 FEET ABOVE MLW. THE CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH THE CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
6. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
7. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	27	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	–	EA
	24" CLEAT	–	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
	GROUT CURTAIN	36	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW KAD | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CLT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (3 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

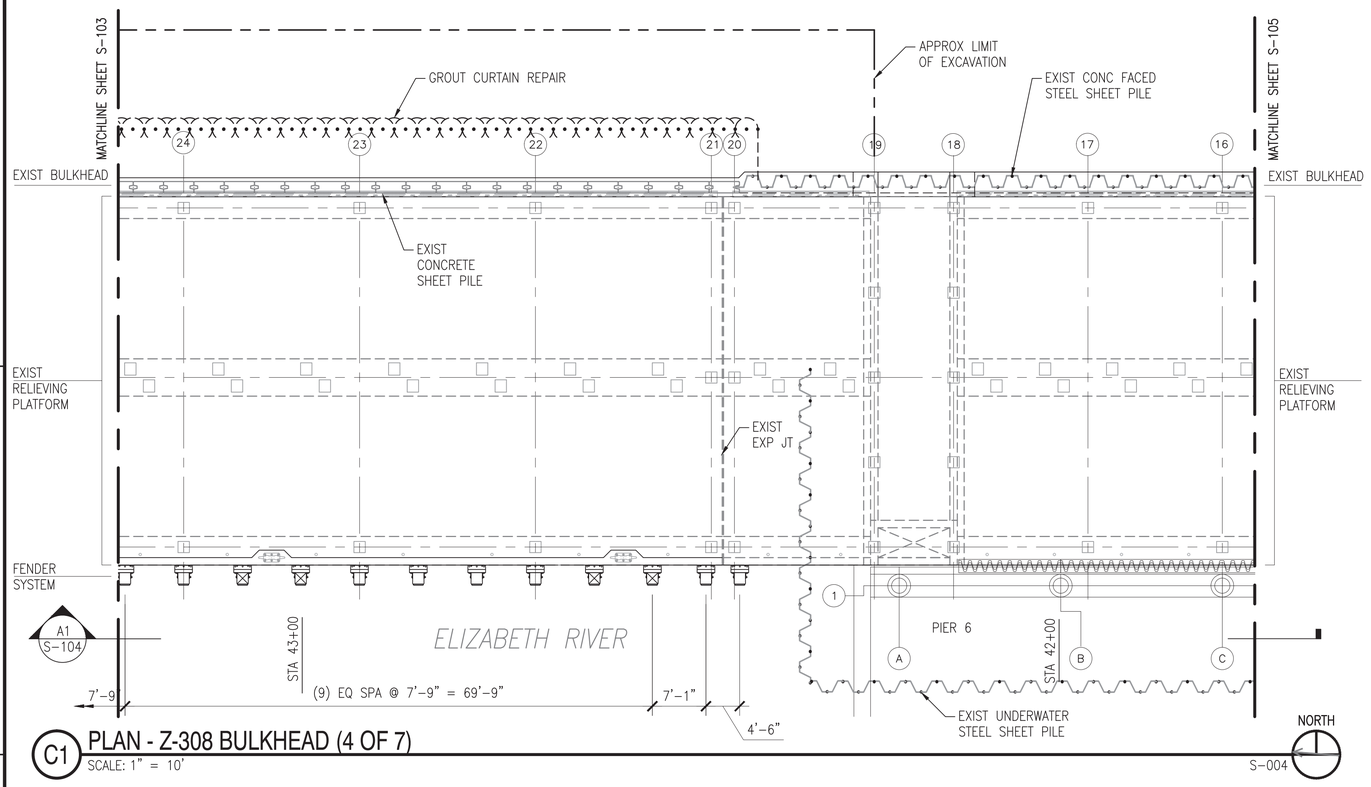
NAVFAC DRAWING NO. 12,729,746

SHEET 91 OF 158

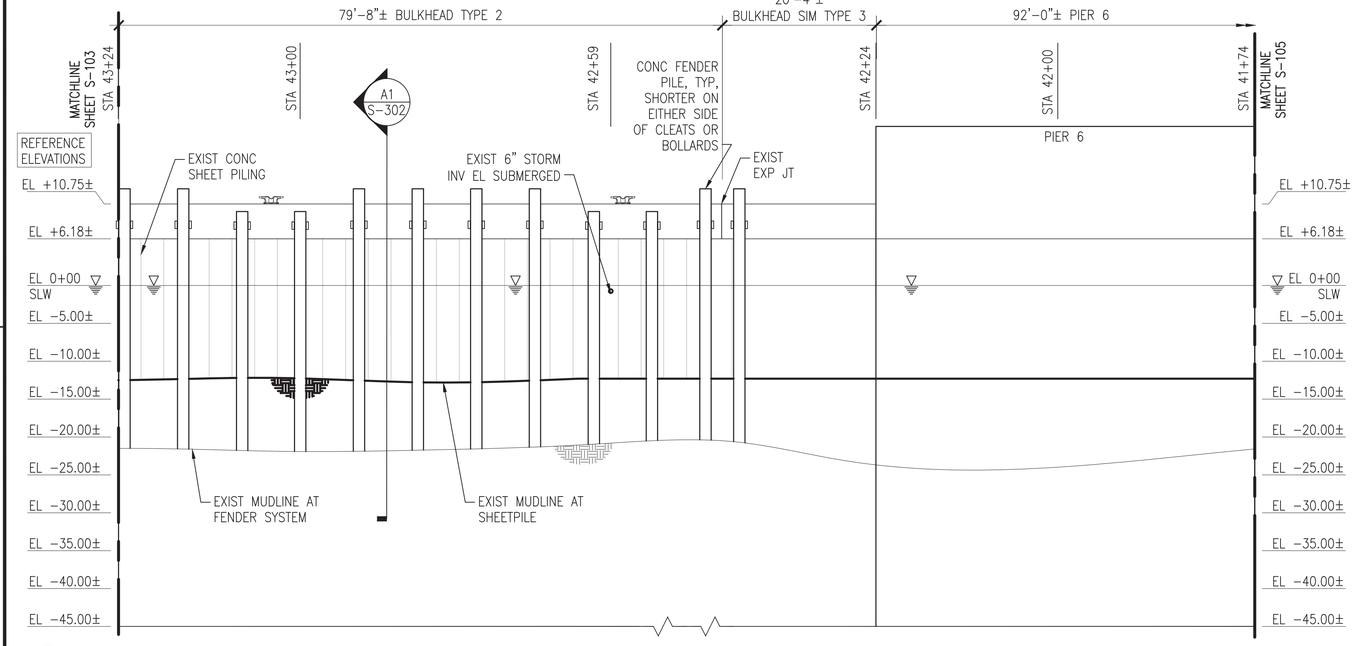
S-103

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NewsStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762-308Report\B_Design\Drawings\Sheet\07_Structure\1370817_S-100 SERIES.dwg LAYOUT NAME: S-103 STRUCTURAL PLAN & ELEV (3 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.o.davis2



C1 **PLAN - Z-308 BULKHEAD (4 OF 7)**
SCALE: 1" = 10'



A1 **ELEVATION AT FENDER SYSTEM**
SCALE: 1" = 10'

S-104

GENERAL SHEET NOTES @ Z-308

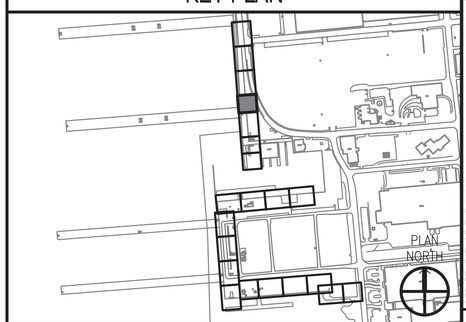
1. PROVIDE Z-308 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRETE PILES, WELDMENTS, RUBBER COMPONENTS, AND SPACERS.
2. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
3. PROVIDE NEW LADDER(S) AND CLEAT(S) AS IDENTIFIED ON THE DRAWINGS.
4. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
5. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD, WITH THE TOP OF CURBING ELEVATION AT +11.0 FEET ABOVE MLW. THE CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH THE CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
6. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
7. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	12	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	–	EA
	24" CLEAT	–	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
(-X-X-)	GROUT CURTAIN	90	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES ELT DRW KAD CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CHT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

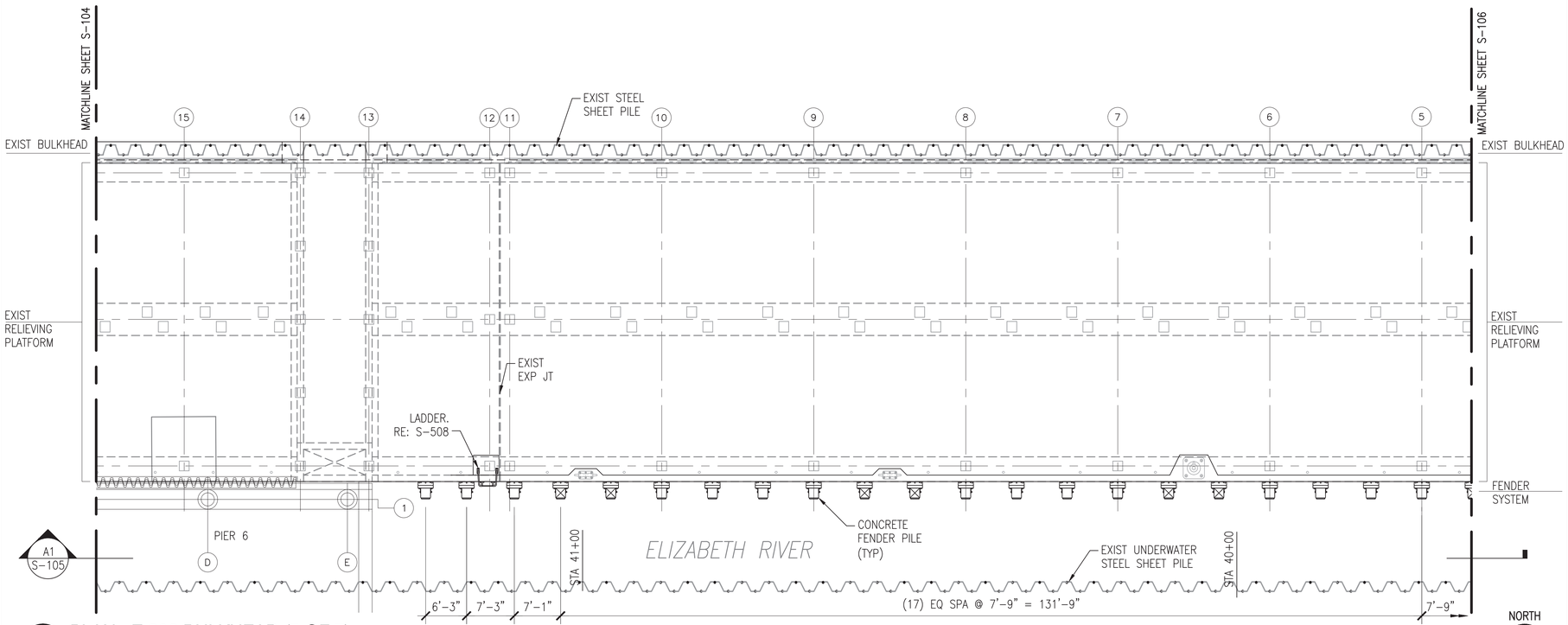
STRUCTURAL PLAN & ELEV (4 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,747
SHEET 92 OF 158

S-104

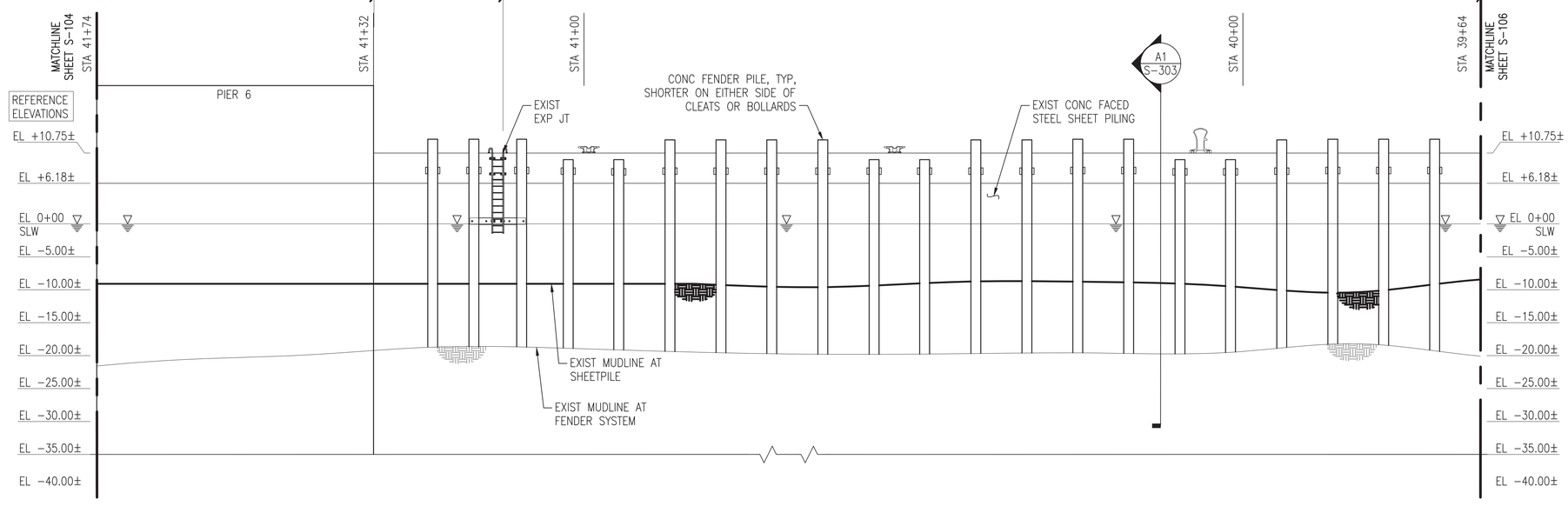
DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762 - 308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-104 STRUCTURAL PLAN & ELEV (4 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.o.davis2



C1 PLAN - Z-308 BULKHEAD (5 OF 7)

SCALE: 1" = 10'



A1 ELEVATION AT FENDER SYSTEM

SCALE: 1" = 10'

S-105

GENERAL SHEET NOTES @ Z-308

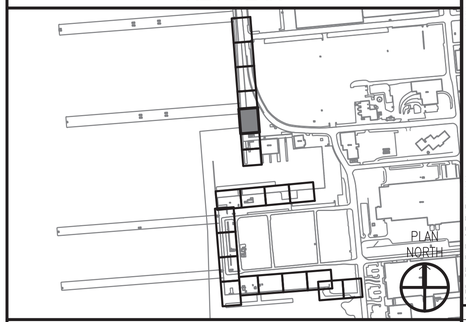
1. PROVIDE Z-308 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRETE PILES, WELDMENTS, RUBBER COMPONENTS, AND SPACERS.
2. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
3. PROVIDE NEW LADDER(S) AND CLEAT(S) AS IDENTIFIED ON THE DRAWINGS.
4. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
5. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD, WITH THE TOP OF CURBING ELEVATION AT +11.0 FEET ABOVE MLW. THE CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH THE CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
6. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
7. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	21	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	–	EA
	24" CLEAT	–	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW KAD | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CJT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

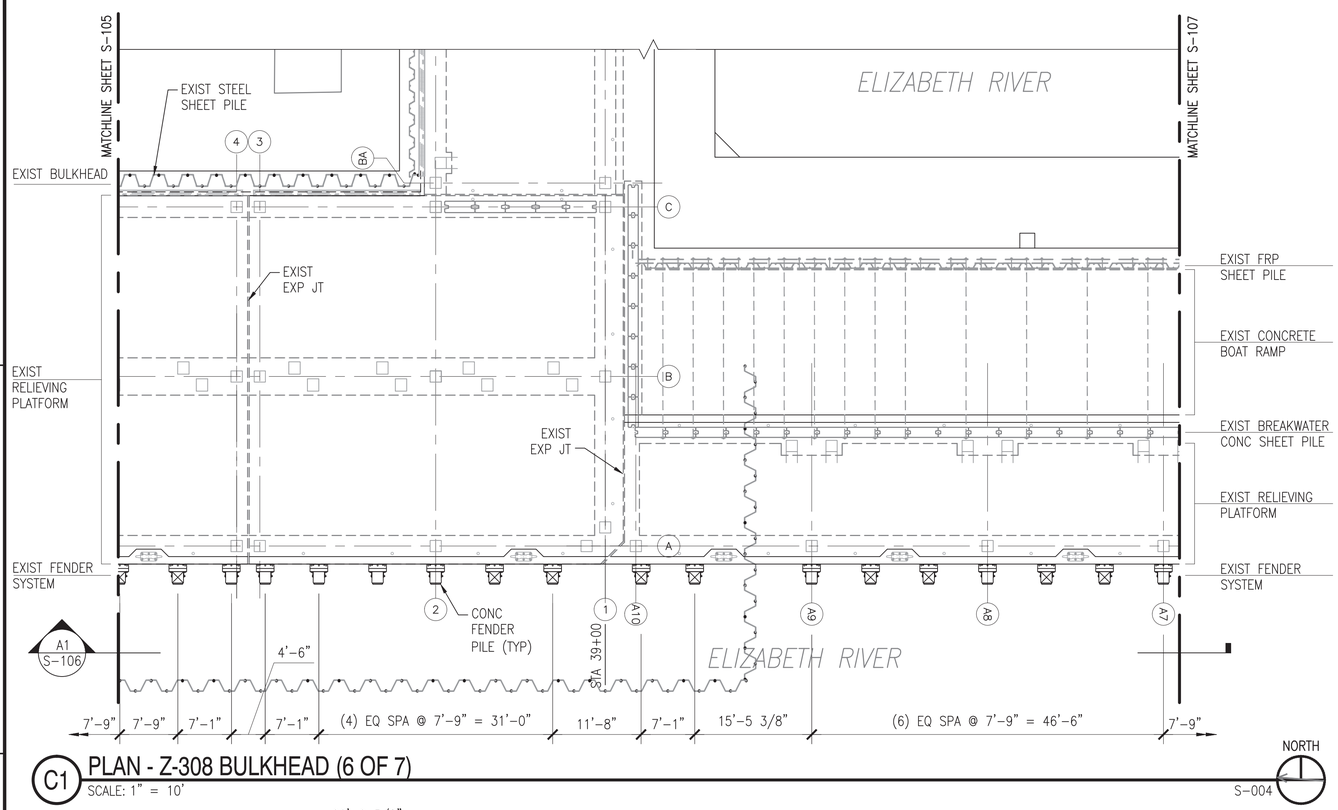
STRUCTURAL PLAN & ELEV (5 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,748
SHEET 93 OF 158

S-105

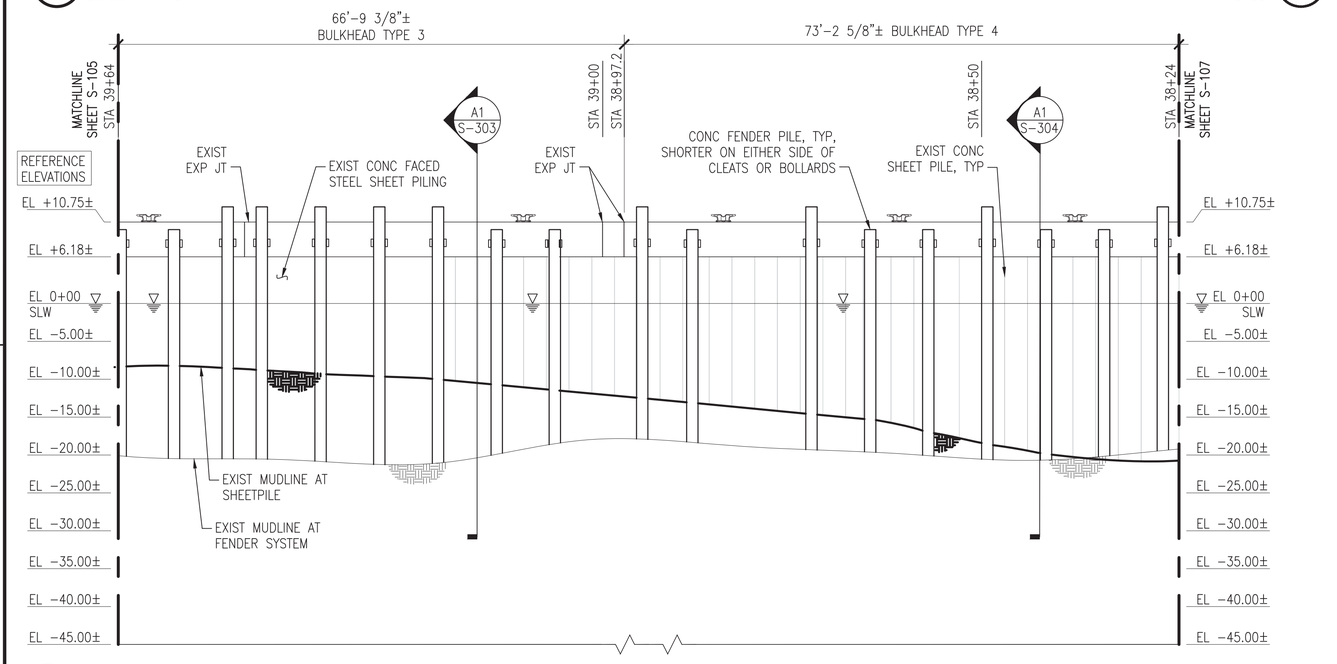
DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NavalStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-105 SERIES.dwg LAYOUT NAME: S-105 STRUCTURAL PLAN & ELEV (5 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.s.davis2



C1 PLAN - Z-308 BULKHEAD (6 OF 7)
SCALE: 1" = 10'

NORTH
S-004



A1 ELEVATION AT FENDER SYSTEM
SCALE: 1" = 10'

S-106

GENERAL SHEET NOTES @ Z-308

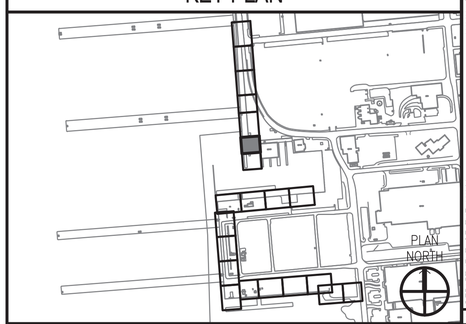
1. PROVIDE Z-308 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRETE PILES, WELDMENTS, RUBBER COMPONENTS, AND SPACERS.
2. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
3. PROVIDE NEW LADDER(S) AND CLEAT(S) AS IDENTIFIED ON THE DRAWINGS.
4. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
5. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD, WITH THE TOP OF CURBING ELEVATION AT +11.0 FEET ABOVE MLW. THE CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH THE CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
6. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
7. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	18	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	–	EA
	24" CLEAT	–	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
(-Y-Y-)	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR	DATE	DESCRIPTION	CTM

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW KAD | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CMT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK

NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

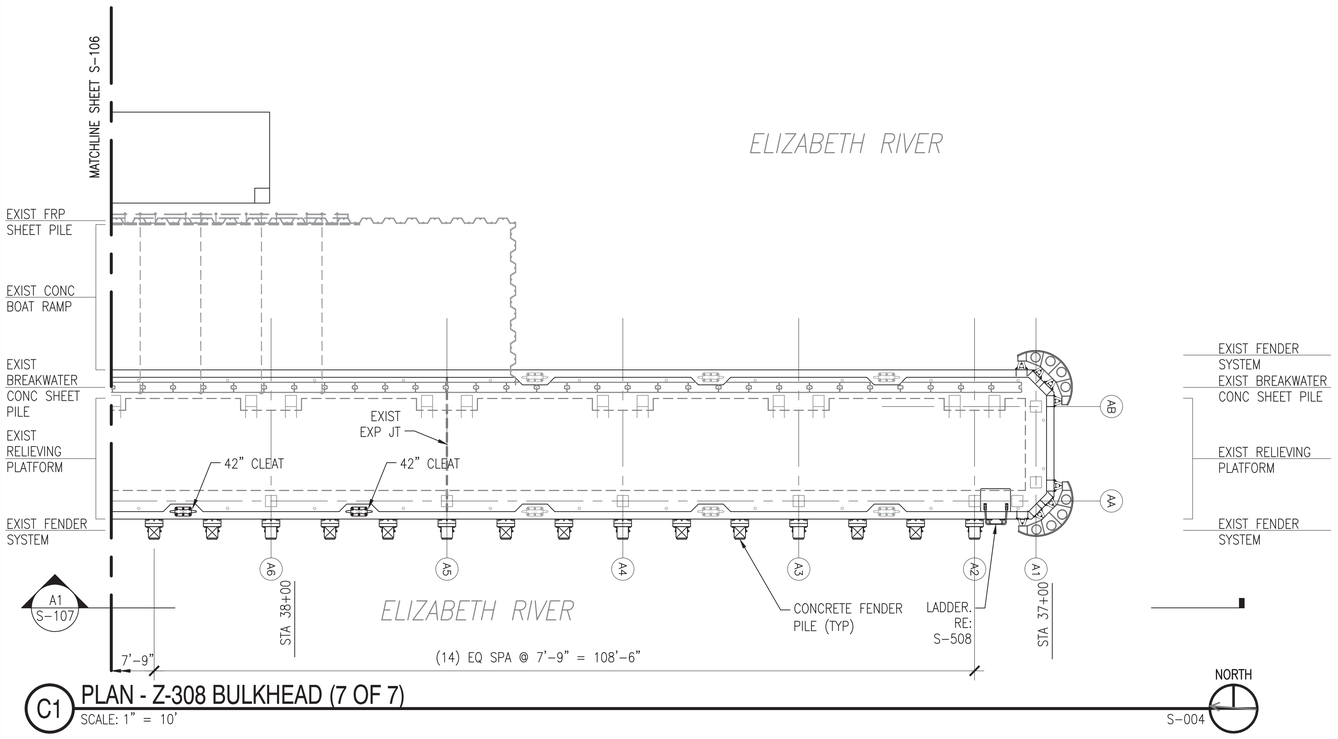
STRUCTURAL PLAN & ELEV (6 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,749
SHEET 94 OF 158

S-106

DRAWFORM REVISION: 10 MARCH 2009

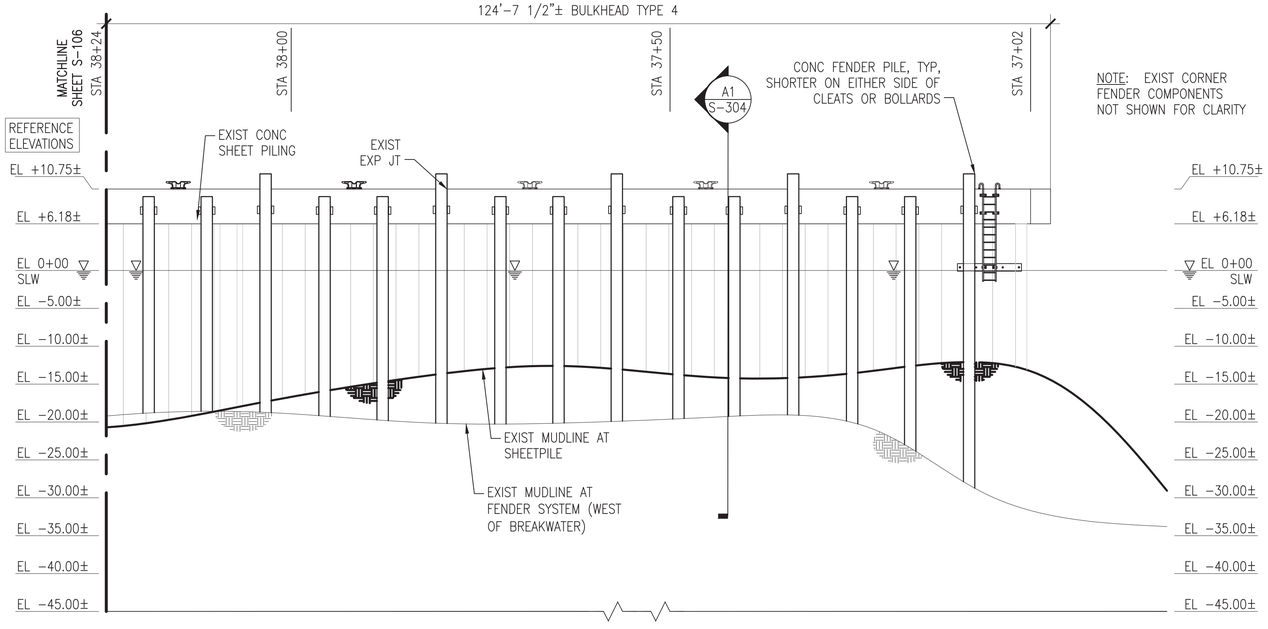
FILE NAME: P:\VA\NorvaStation\Norfolk\Bulkheads\2015_1370817_CEP-1752-308Repair\8_Design\Drawings\Sheet\07_Structural\1370817_S-106 SERIES.dwg LAYOUT NAME: S-106 STRUCTURAL PLAN & ELEV (6 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.o.davis2



C1 **PLAN - Z-308 BULKHEAD (7 OF 7)**
SCALE: 1" = 10'

NORTH

S-004



A1 **ELEVATION AT FENDER SYSTEM**
SCALE: 1" = 10'

S-107

GENERAL SHEET NOTES @ Z-308

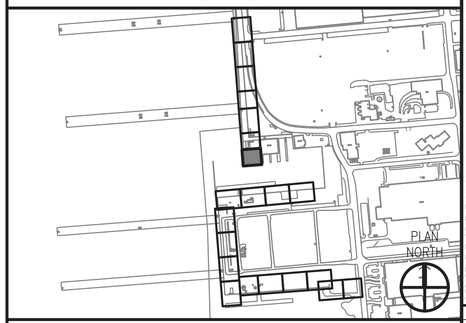
1. PROVIDE Z-308 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRETE PILES, WELDMENTS, RUBBER COMPONENTS, AND SPACERS.
2. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
3. PROVIDE NEW LADDER(S) AND CLEAT(S) AS IDENTIFIED ON THE DRAWINGS.
4. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
5. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD, WITH THE TOP OF CURBING ELEVATION AT +11.0 FEET ABOVE MLW. THE CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH THE CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
6. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
7. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	15	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	2	EA
	24" CLEAT	–	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

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APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW KAD | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CHT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

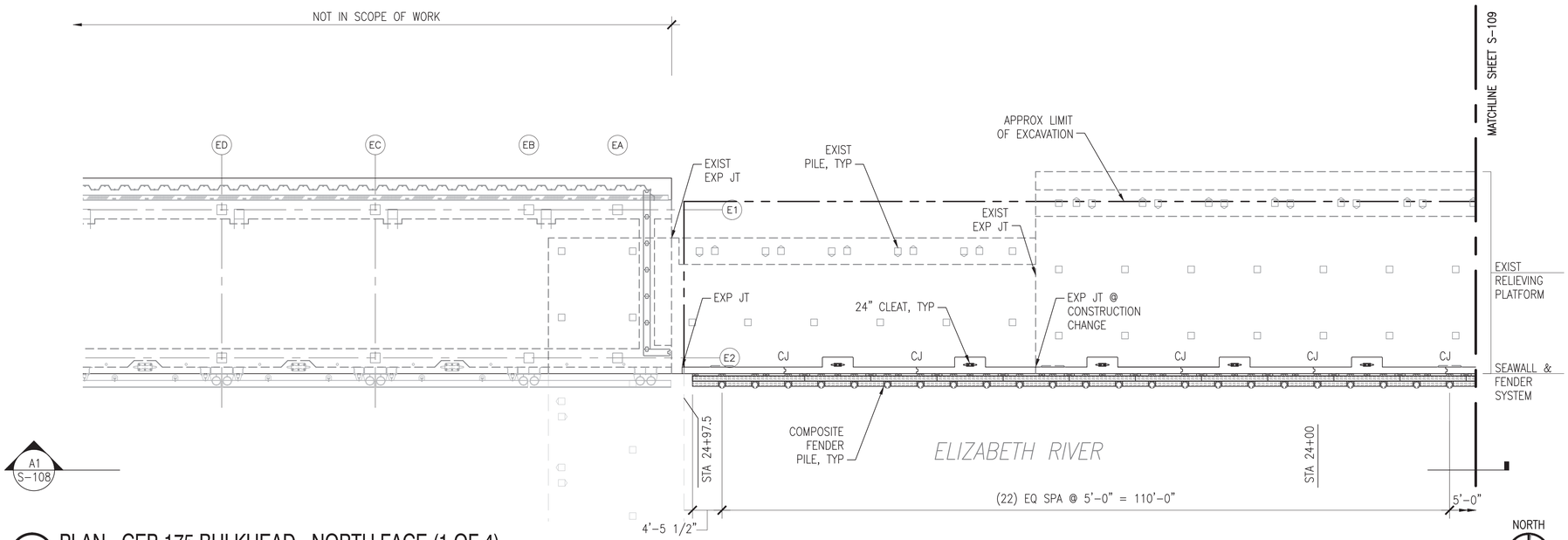
STRUCTURAL PLAN & ELEV (7 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,750
SHEET 95 OF 158

S-107

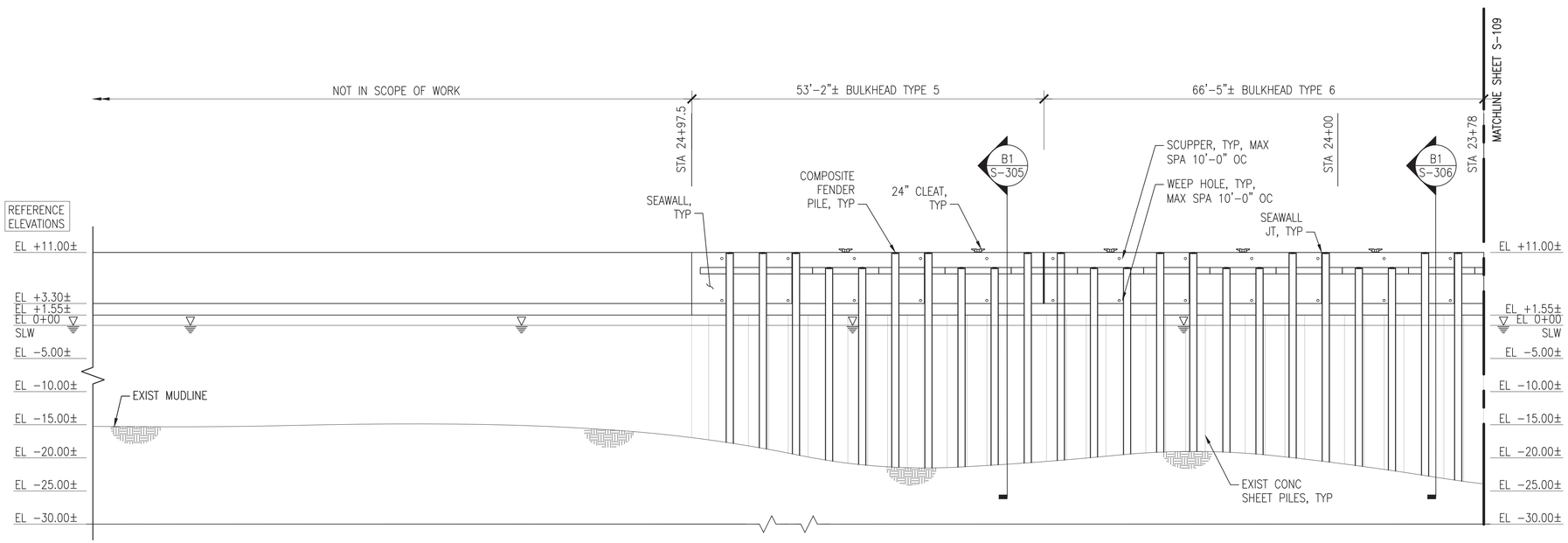
DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorfolkNavalStation\Waterfront\Bulkheads\2015_1370817_CEP-1762-308Report\B_Design\Drawings\Sheet\07_Structure\1370817_S-100 SERIES.dwg LAYOUT NAME: S-107 STRUCTURAL PLAN & ELEV (7 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.s.davis2



C1 PLAN - CEP-175 BULKHEAD - NORTH FACE (1 OF 4)

SCALE: 1" = 10'



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-108

GENERAL SHEET NOTES @ CEP-175

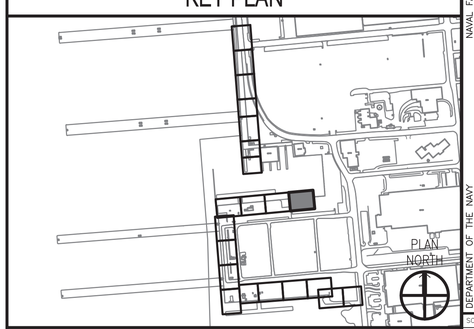
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	–	EA
	COMPOSITE FENDER PILE	23	EA
	42" CLEAT	–	EA
	24" CLEAT	5	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	120	LF
	TIMBER CHOCK WITH SPACERS	96	LF
(-Y-Y-)	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR	DATE	DESCRIPTION	CTM
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NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW KAD | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CGT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT – PWD NORFOLK

NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
NORFOLK NAVAL STATION

NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (8 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

NAVFAC DRAWING NO. 12,729,751

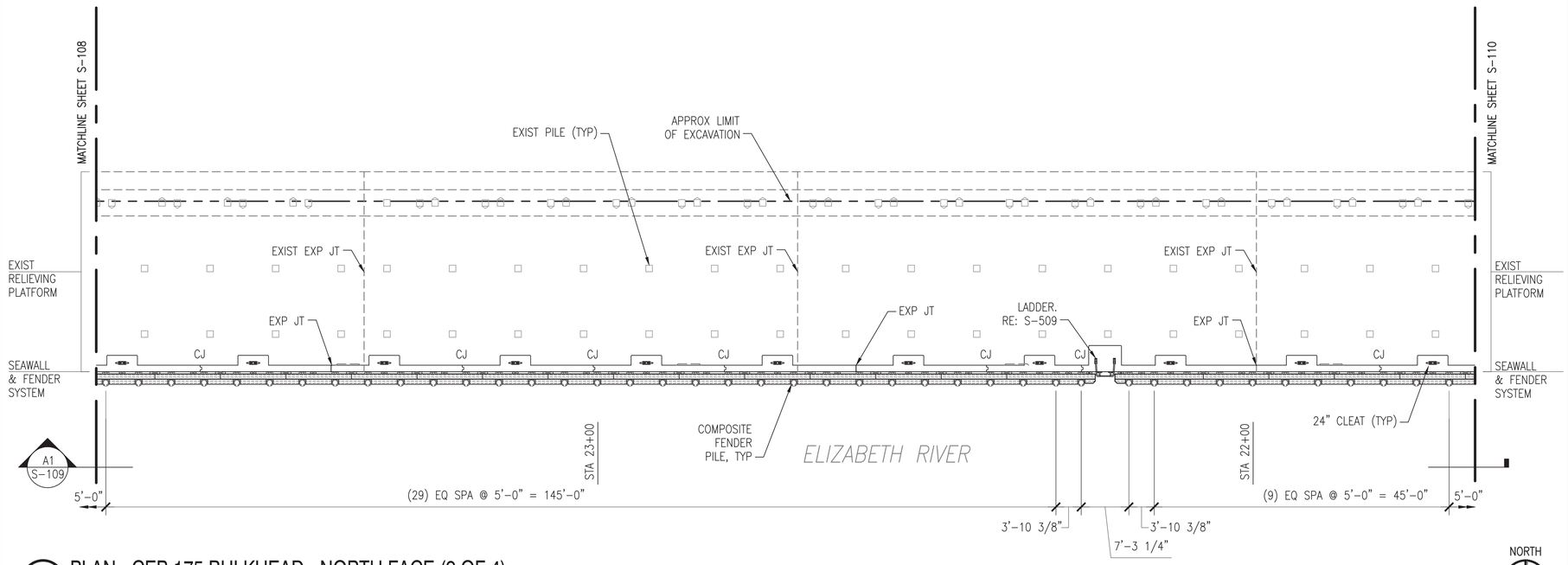
SHEET 96 OF 158

S-108

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Repair\8_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-108 STRUCTURAL PLAN & ELEV (8 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.o.davis2

FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-109 STRUCTURAL PLAN & ELEV (9 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.o.davis2

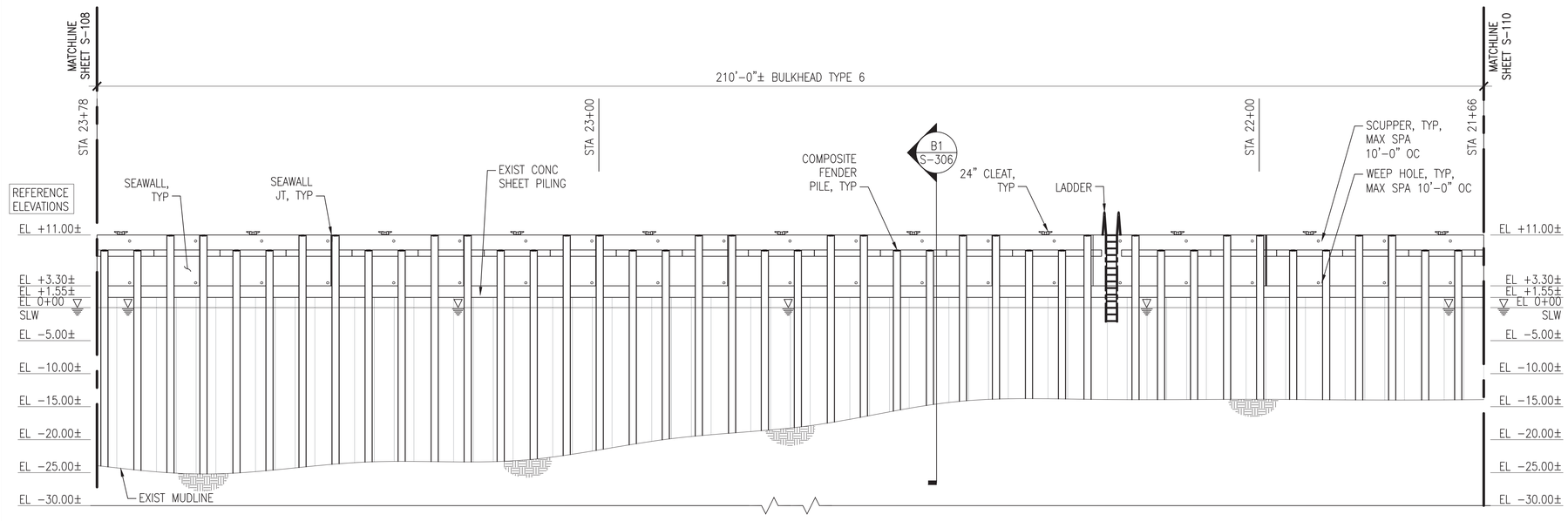


C1 PLAN - CEP-175 BULKHEAD - NORTH FACE (2 OF 4)

SCALE: 1" = 10'

NORTH

S-004



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-109

GENERAL SHEET NOTES @ CEP-175

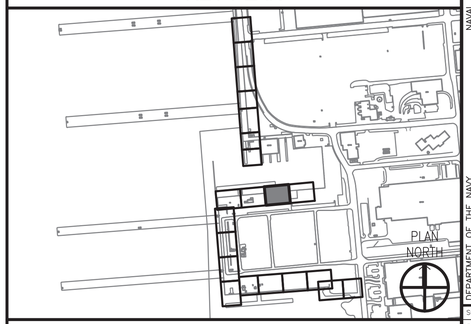
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	–	EA
	COMPOSITE FENDER PILE	42	EA
	42" CLEAT	–	EA
	24" CLEAT	11	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	210	LF
	TIMBER CHOCK WITH SPACERS	165	LF
	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR	DATE	DESCRIPTION	CTM
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NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT DRW KAD CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER

CHIEF ENGINEER J. HASTE, P.E.

TYPE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (9 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

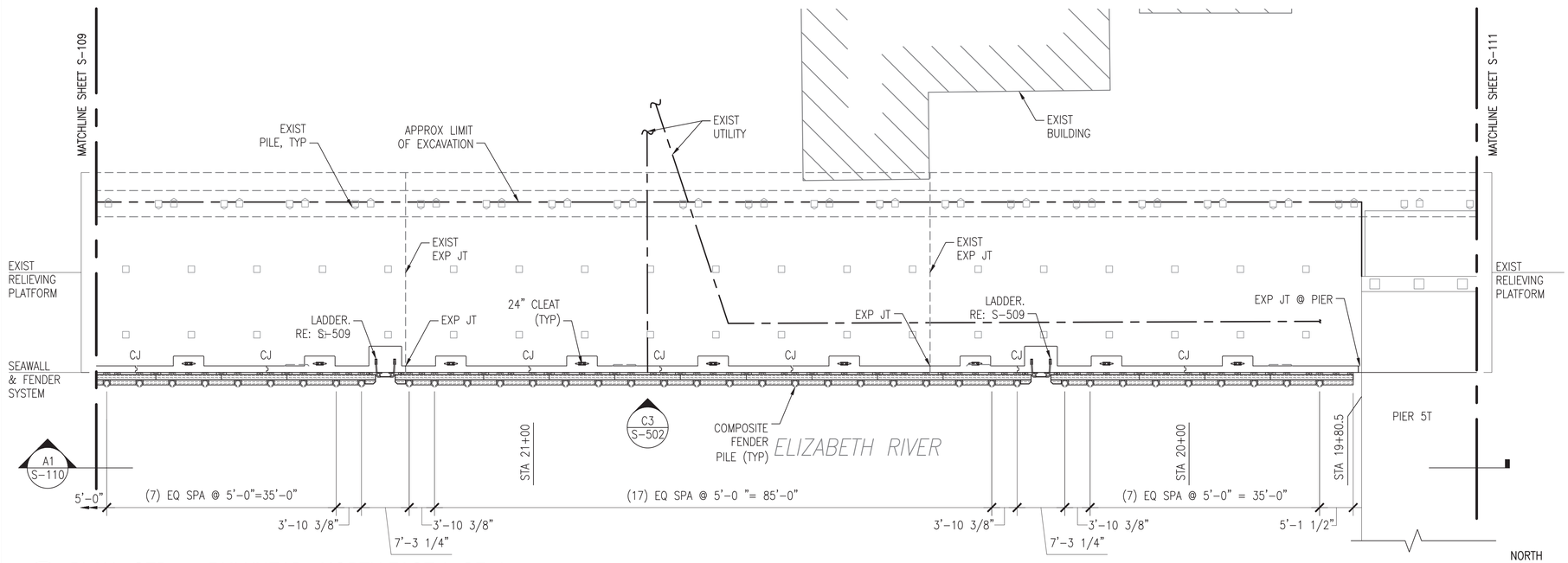
CONSTR. CONTR. NO. N/A

NAVFAC DRAWING NO. 12,729,752

SHEET 97 OF 158

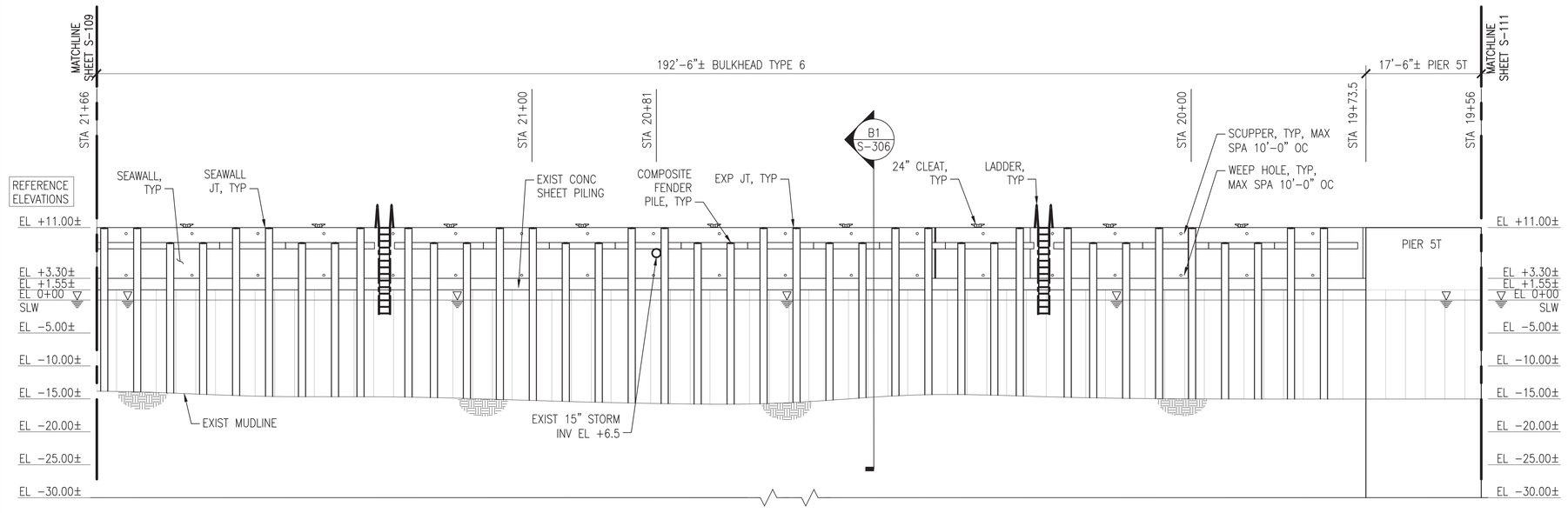
S-109

DRAWFORM REVISION: 10 MARCH 2009



C1 PLAN - CEP-175 BULKHEAD - NORTH FACE (3 OF 4)

SCALE: 1" = 10'



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-110

GENERAL SHEET NOTES @ CEP-175

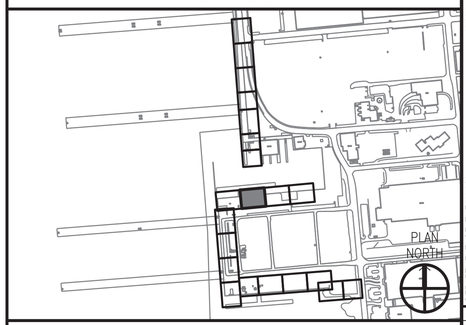
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	–	EA
	COMPOSITE FENDER PILE	38	EA
	42" CLEAT	–	EA
	24" CLEAT	9	EA
	LADDER	2	EA
	TIMBER WALE WITH BLOCKING	187	LF
	TIMBER CHOCK WITH SPACERS	146	LF
	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

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CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16
ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
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DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

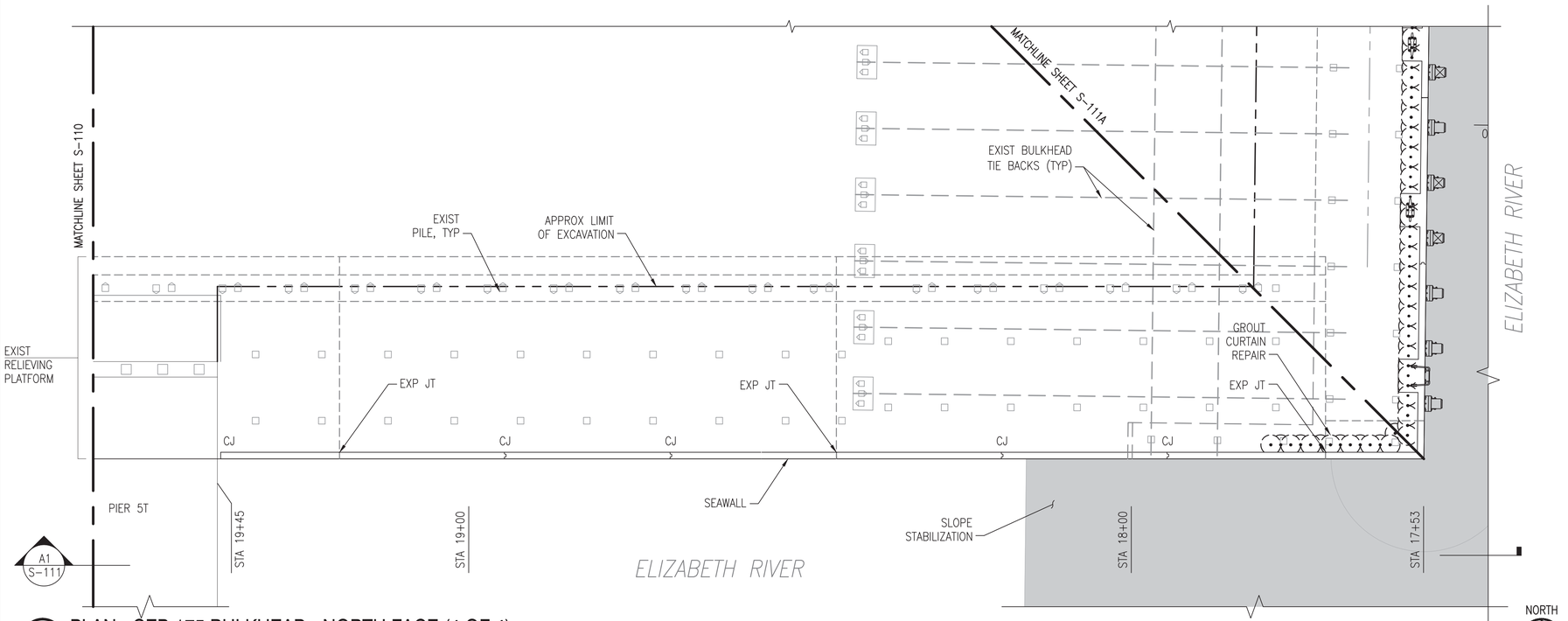
STRUCTURAL PLAN & ELEV (10 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,753
SHEET 98 OF 158

S-110

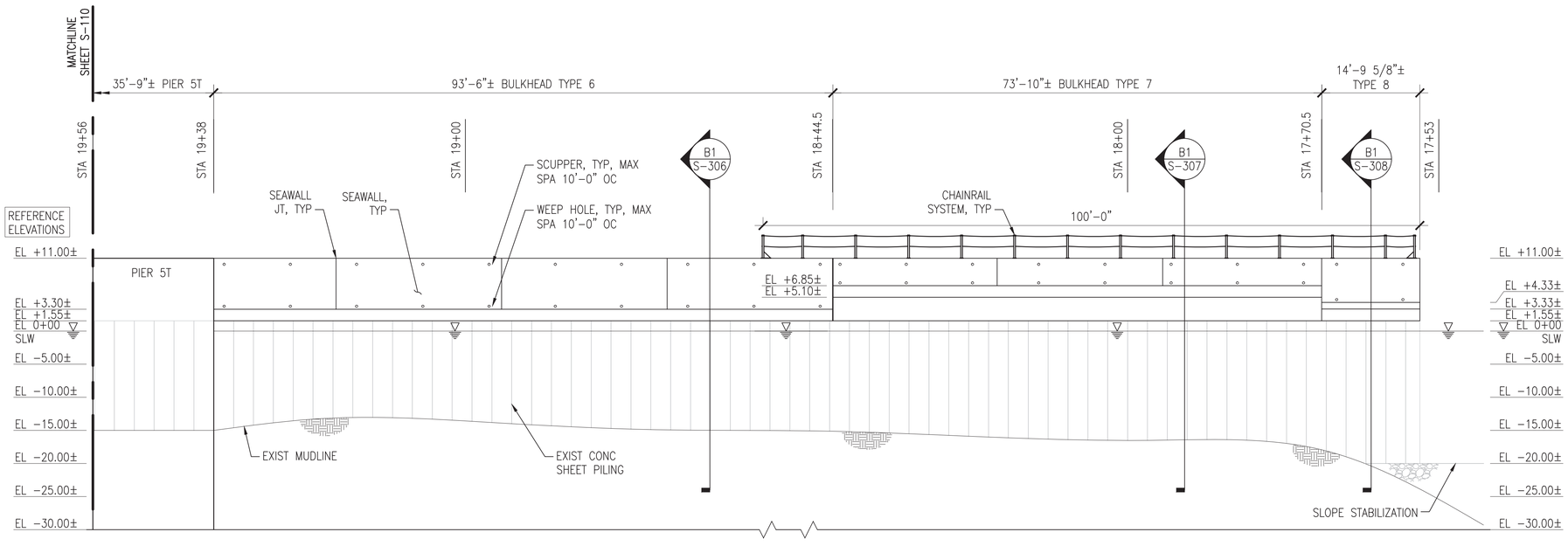
DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762-308Repair\B_Design\Drawings\Sheet\07_Structure\1370817_S-100 SERIES.dwg LAYOUT NAME: S-110 STRUCTURAL PLAN & ELEV (10 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:44pm USER: kimberly.a.davis2



C1 PLAN - CEP-175 BULKHEAD - NORTH FACE (4 OF 4)

SCALE: 1" = 10'



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-111

GENERAL SHEET NOTES @ CEP-175

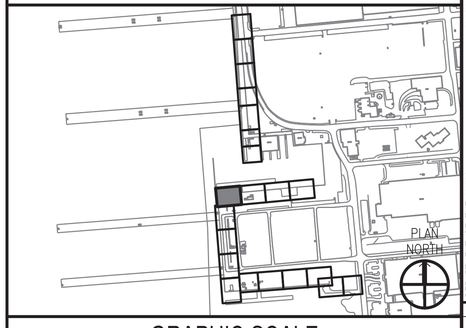
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	–	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	–	EA
	24" CLEAT	–	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
	GROUT CURTAIN	21	LF
	CHAIN / POSTS	100/14	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR	DATE	DESCRIPTION	CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW KAD | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CLT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND – MID-ATLANTIC
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK NAVAL STATION
HAMPTON ROADS IPT – PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (11 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

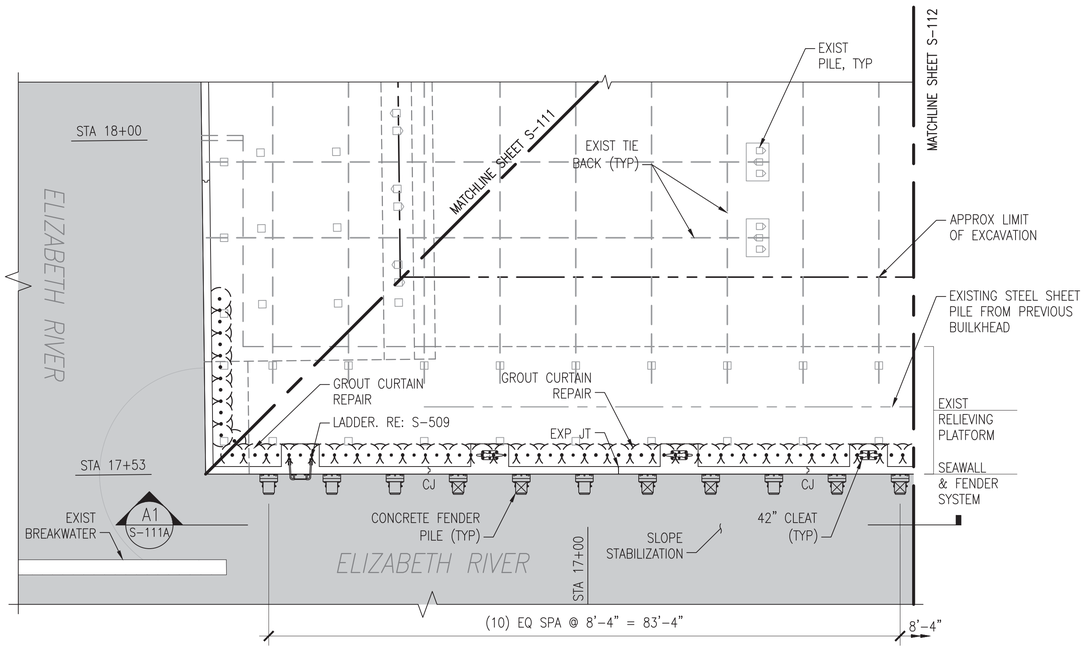
NAVFAC DRAWING NO. 12,729,754

SHEET 99 OF 158

S-111

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA Navy\Station\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Report\8_Design\Drawings\Sheet\07_Structure\1370817_S-100 SERIES.dwg LAYOUT NAME: S-111 STRUCTURAL PLAN & ELEV (11 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.a.davis2

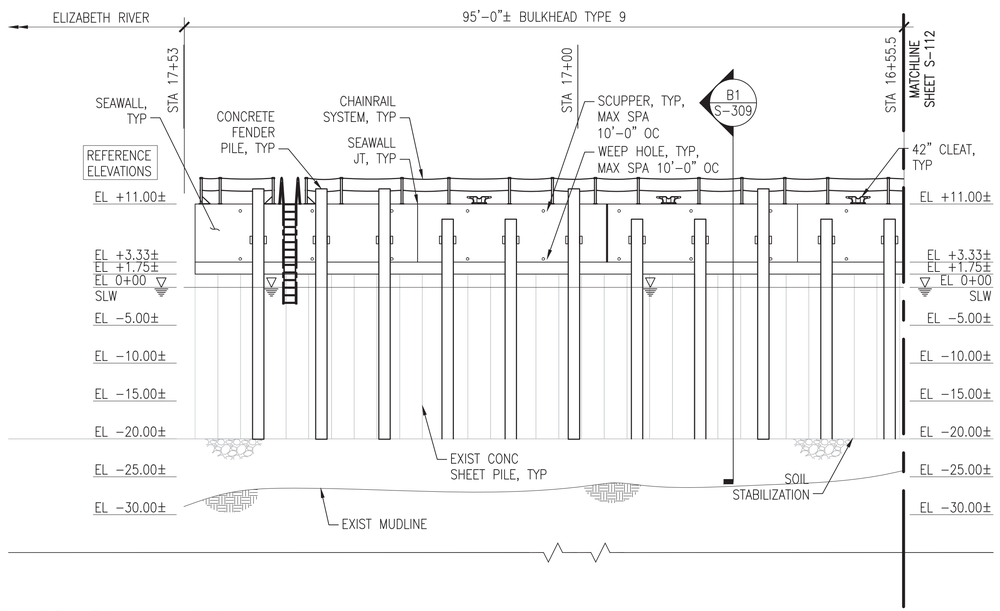


C1 PLAN - CEP-175 BULKHEAD - WEST FACE (1 OF 5)

SCALE: 1" = 10'

NORTH

S-004



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-111A

GENERAL SHEET NOTES @ CEP-175

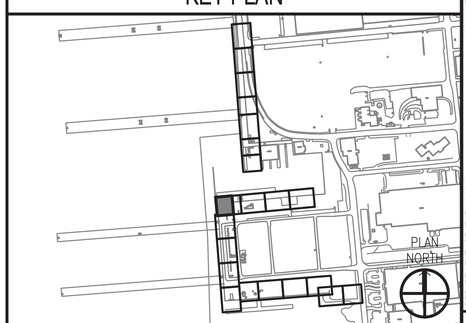
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	11	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	3	EA
	24" CLEAT	–	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
(-X-X-)	GROUT CURTAIN	93	LF
	CHAIN / POSTS	95/16	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT DRW KAD CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CHT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (11A OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

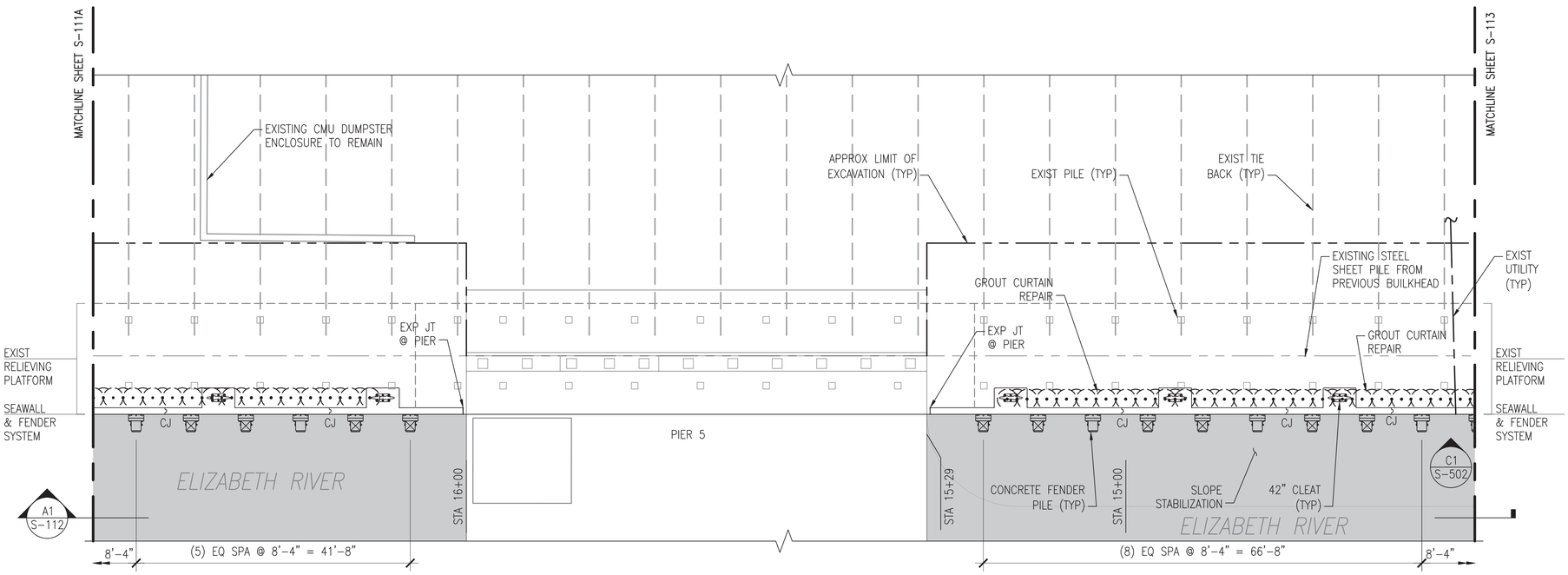
NAVFAC DRAWING NO. 12,729,755

SHEET 100 OF 158

S-111A

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvdStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-111A STRUCTURAL PLAN & ELEV (11A OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.dubois2

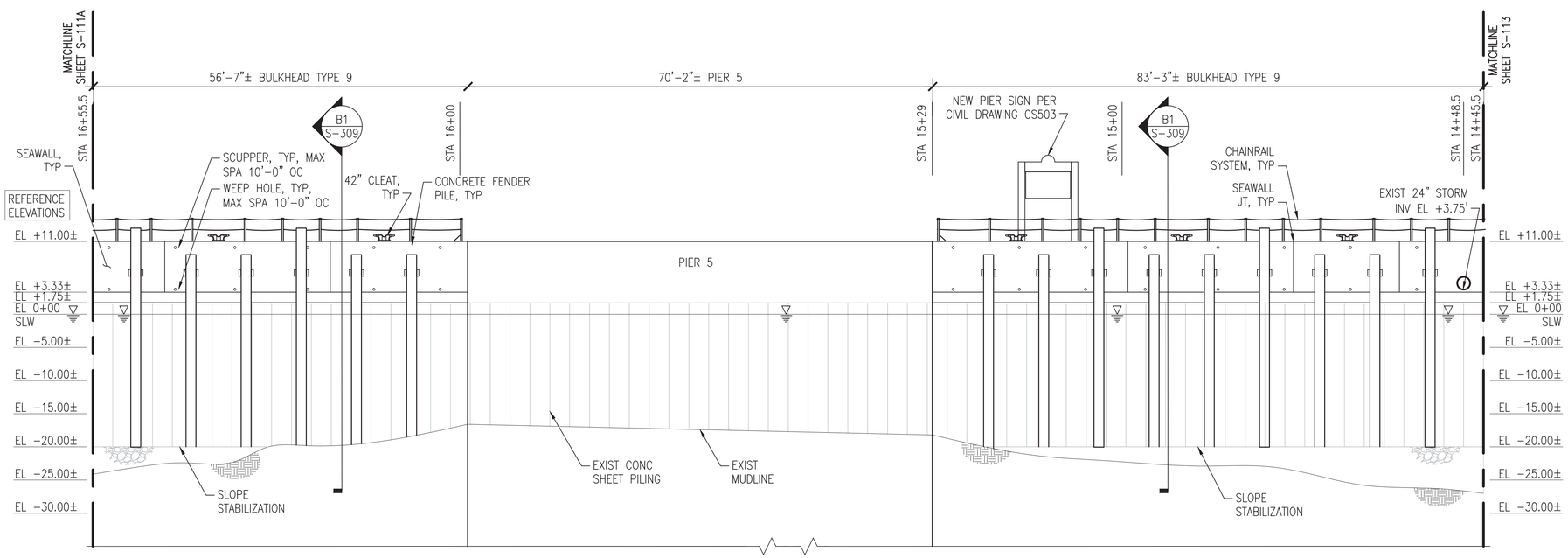


C1 PLAN - CEP-175 BULKHEAD - WEST FACE (2 OF 5)

SCALE: 1" = 10'

NORTH

S-004



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-112

GENERAL SHEET NOTES @ CEP-175

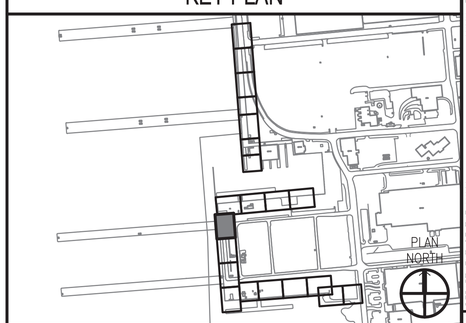
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	15	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	5	EA
	24" CLEAT	–	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
	GROUT CURTAIN	120	LF
	CHAIN / POSTS	140/22	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT DRW KAD CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CPT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT – PWD NORFOLK

NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
NORFOLK NAVAL STATION

NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (12 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

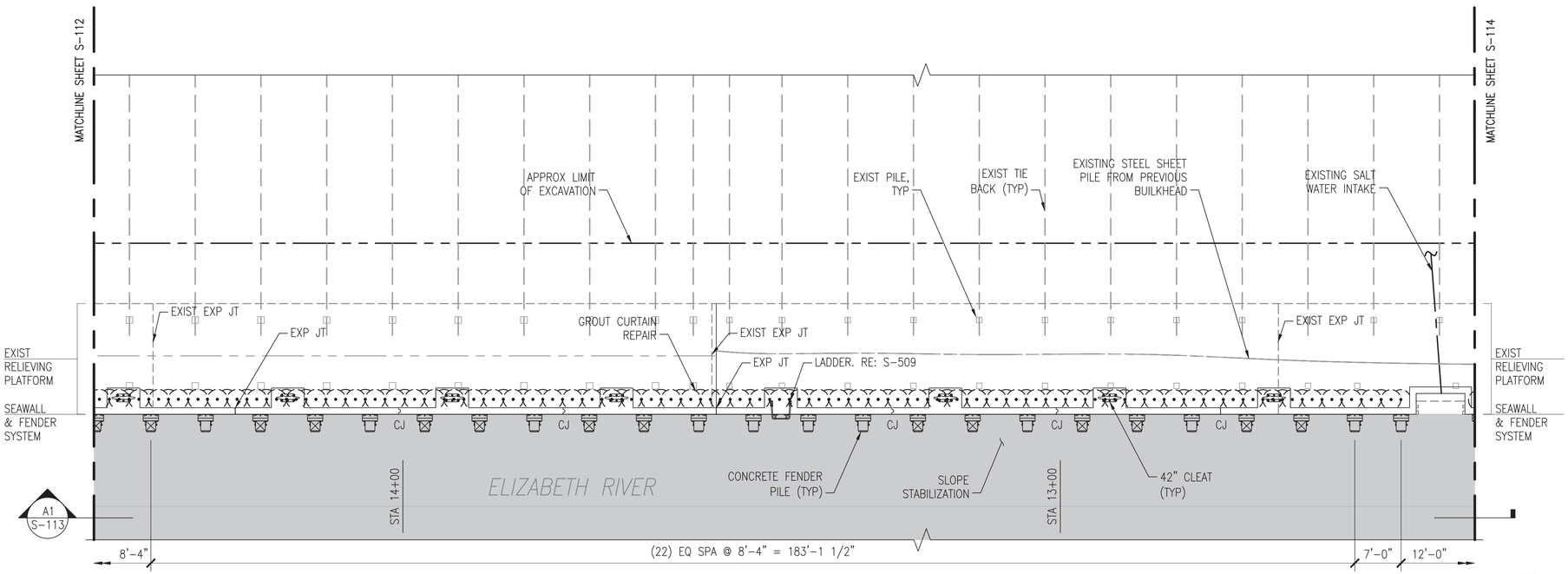
NAVFAC DRAWING NO. 12,729,756

SHEET 101 OF 158

S-112

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NewGlobalNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175(2-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-112 STRUCTURAL PLAN & ELEV (12 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.a.davis2

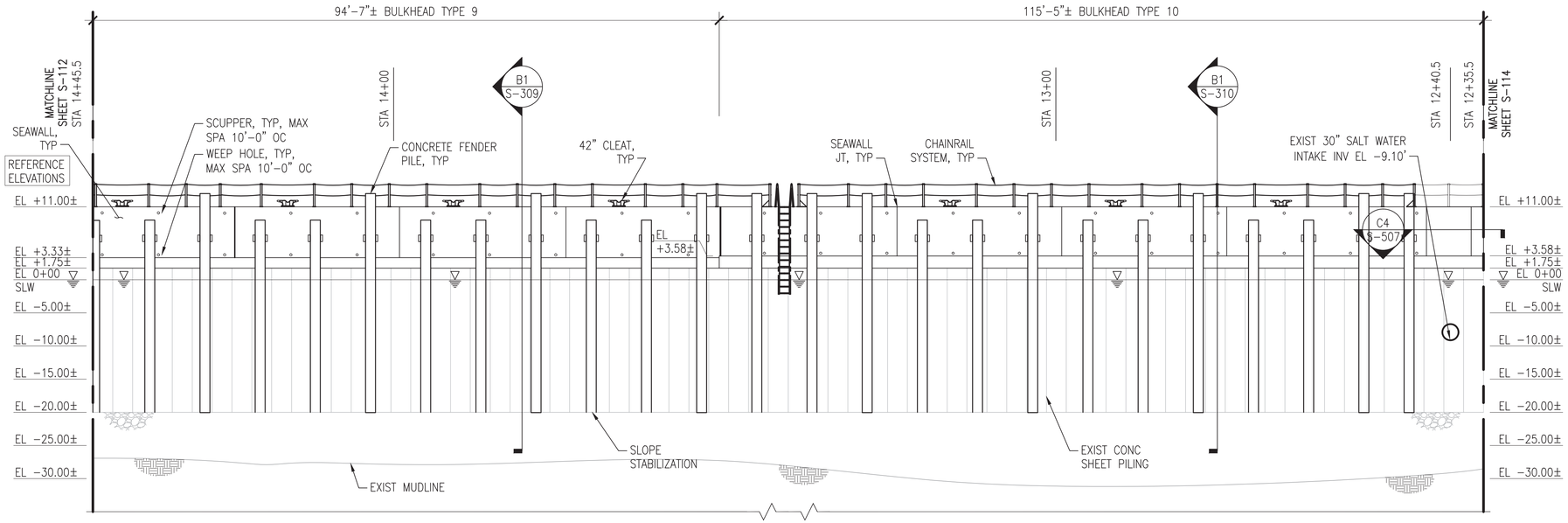


C1 PLAN - CEP-175 BULKHEAD - WEST FACE (3 OF 5)

SCALE: 1" = 10'

NORTH

S-004



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-113

GENERAL SHEET NOTES @ CEP-175

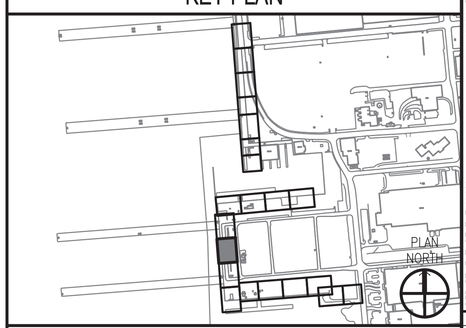
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	25	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	7	EA
	24" CLEAT	–	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
	GROUT CURTAIN	201	LF
	CHAIN / POSTS	210/37	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW KAD | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (13 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

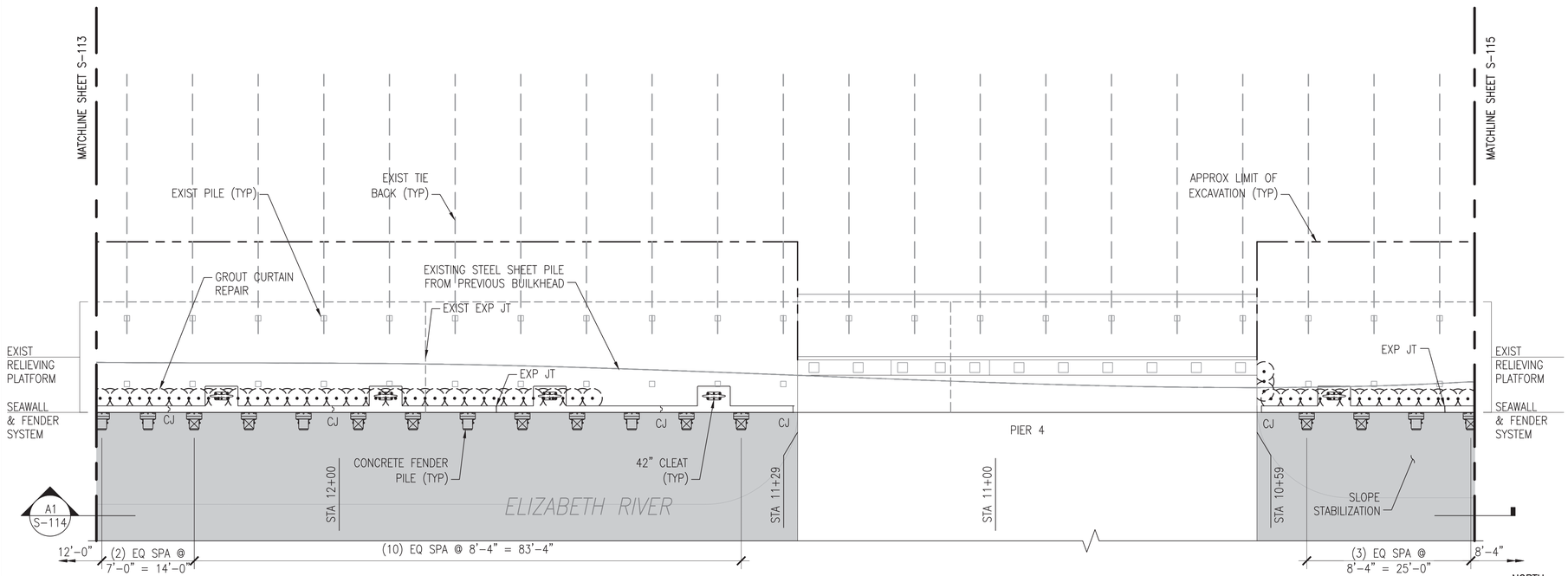
NAVFAC DRAWING NO. 12,729,757

SHEET 102 OF 158

S-113

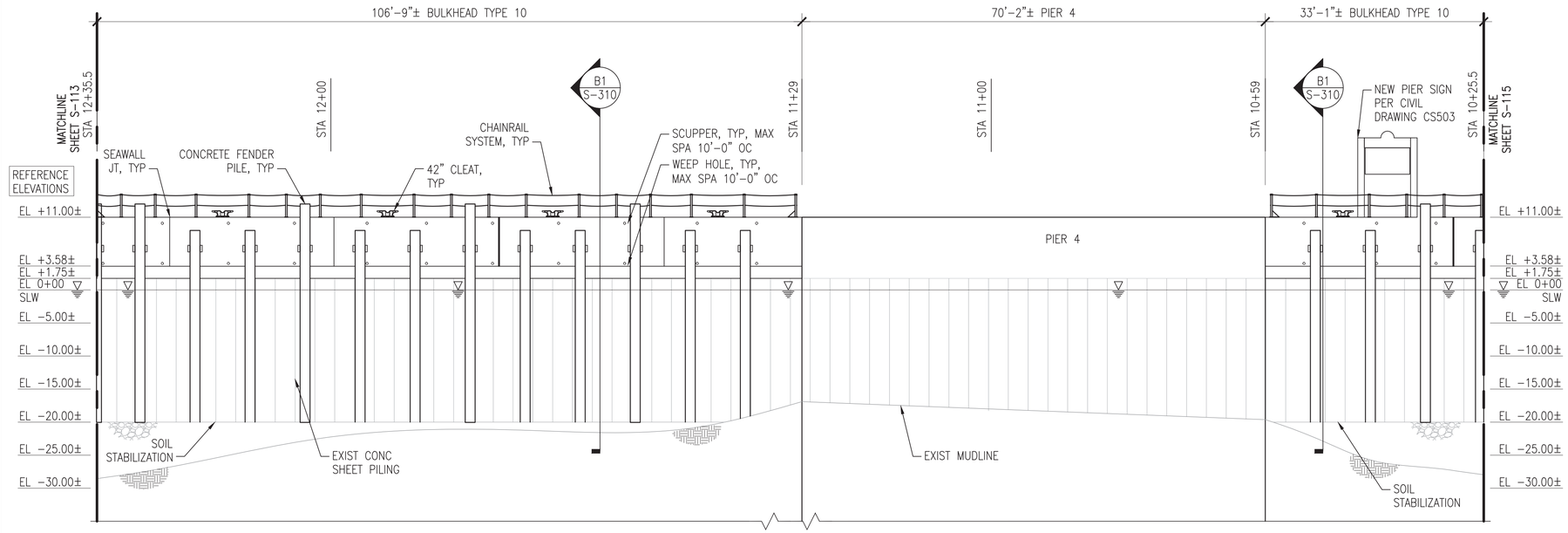
DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-113 STRUCTURAL PLAN & ELEV (13 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.a.davis2



C1 PLAN - CEP-175 BULKHEAD - WEST FACE (4 OF 5)

SCALE: 1" = 10'



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-114

GENERAL SHEET NOTES @ CEP-175

1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
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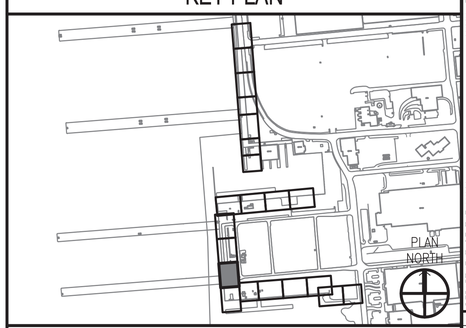
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	17	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	5	EA
	24" CLEAT	–	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
	GROUT CURTAIN	117	LF
	CHAIN / POSTS	140/23	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT DRW KAD CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CHF

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT – PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (14 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

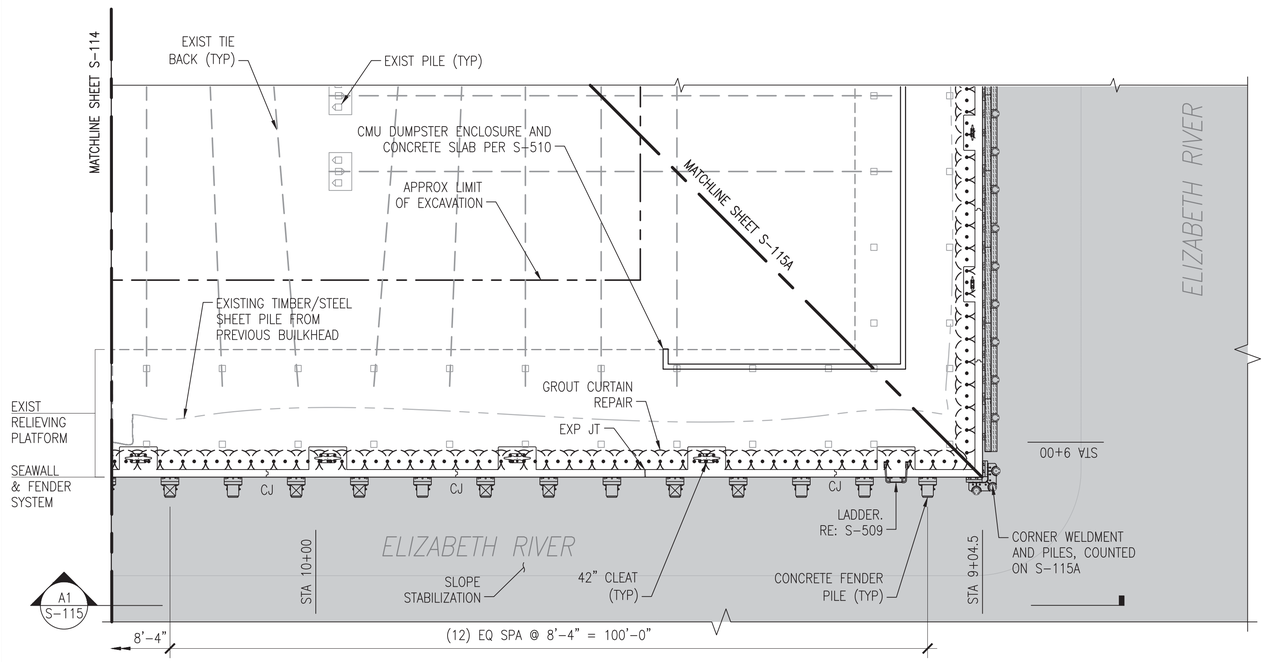
NAVFAC DRAWING NO. 12,729,758

SHEET 103 OF 158

S-114

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvaStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\8_Design\Drawings\Sheet\01_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-114 STRUCTURAL PLAN & ELEV (14 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.a.davis2

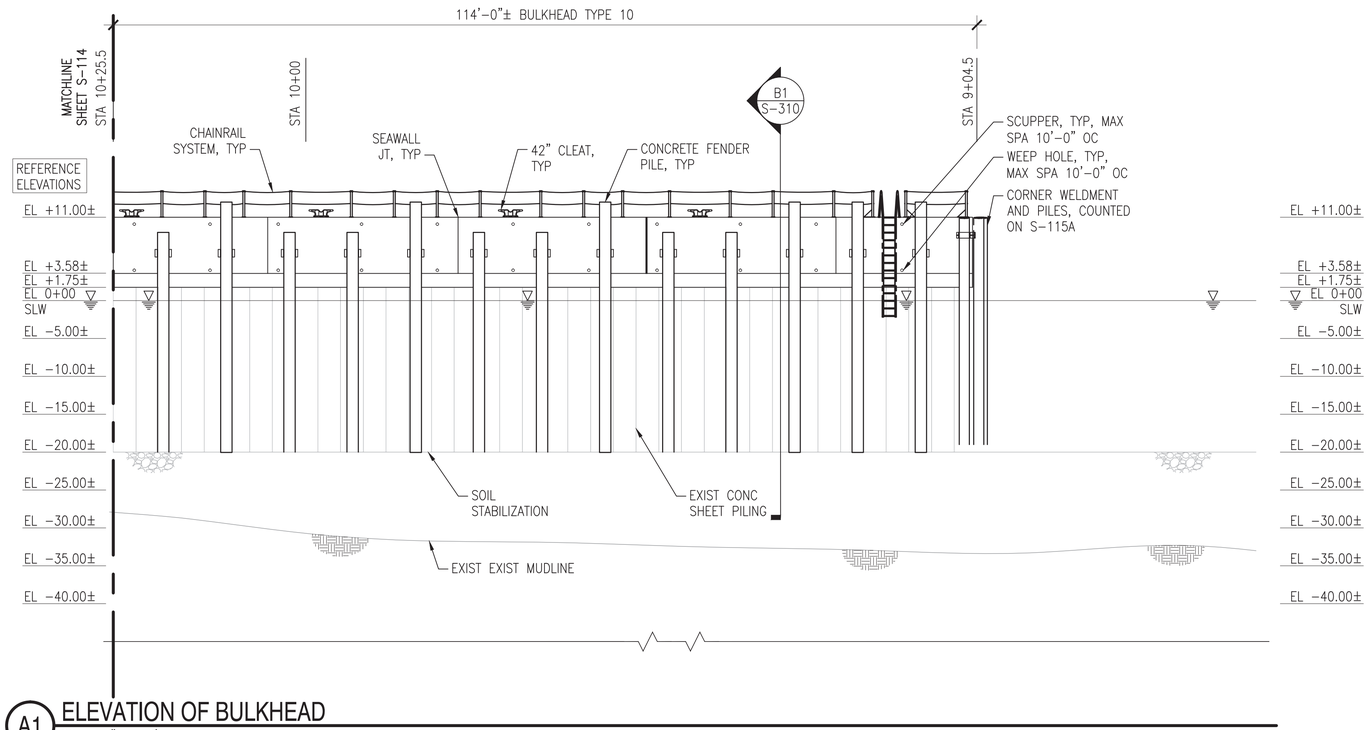


C1 PLAN - CEP-175 BULKHEAD - WEST FACE (5 OF 5)

SCALE: 1" = 10'

NORTH

S-004



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-115

GENERAL SHEET NOTES @ CEP-175

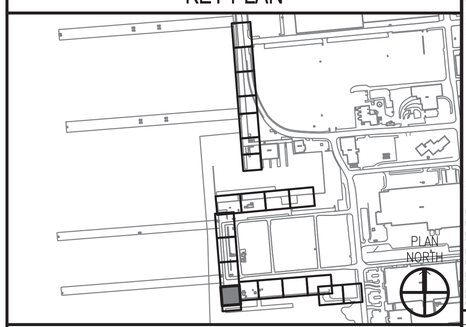
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	13	EA
	COMPOSITE FENDER PILE	–	EA
	42" CLEAT	4	EA
	24" CLEAT	–	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	–	LF
	TIMBER CHOCK WITH SPACERS	–	LF
	GROUT CURTAIN	114	LF
	CHAIN / POSTS	114/18	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

NO.	DESCRIPTION	DATE	APPR
1			
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CTM			

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT DRW KAD CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CPT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (15 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

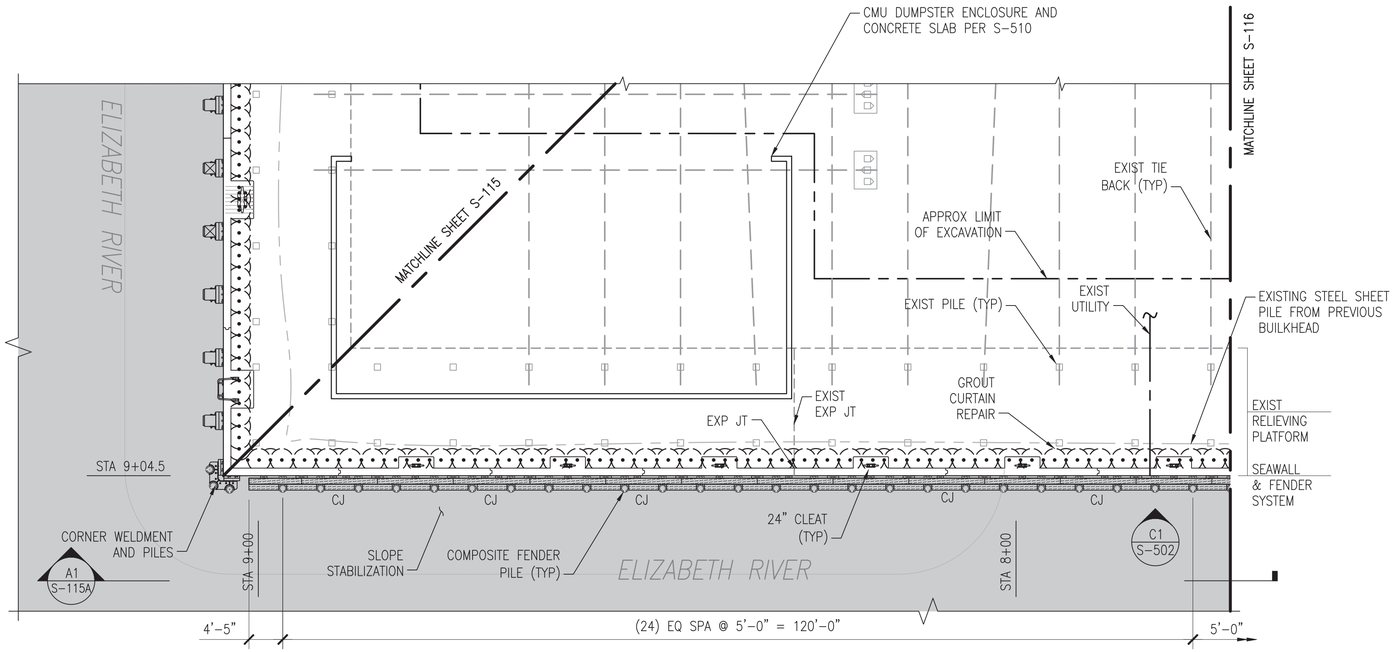
NAVFAC DRAWING NO. 12,729,759

SHEET 104 OF 158

S-115

DRAWFORM REVISION: 10 MARCH 2009

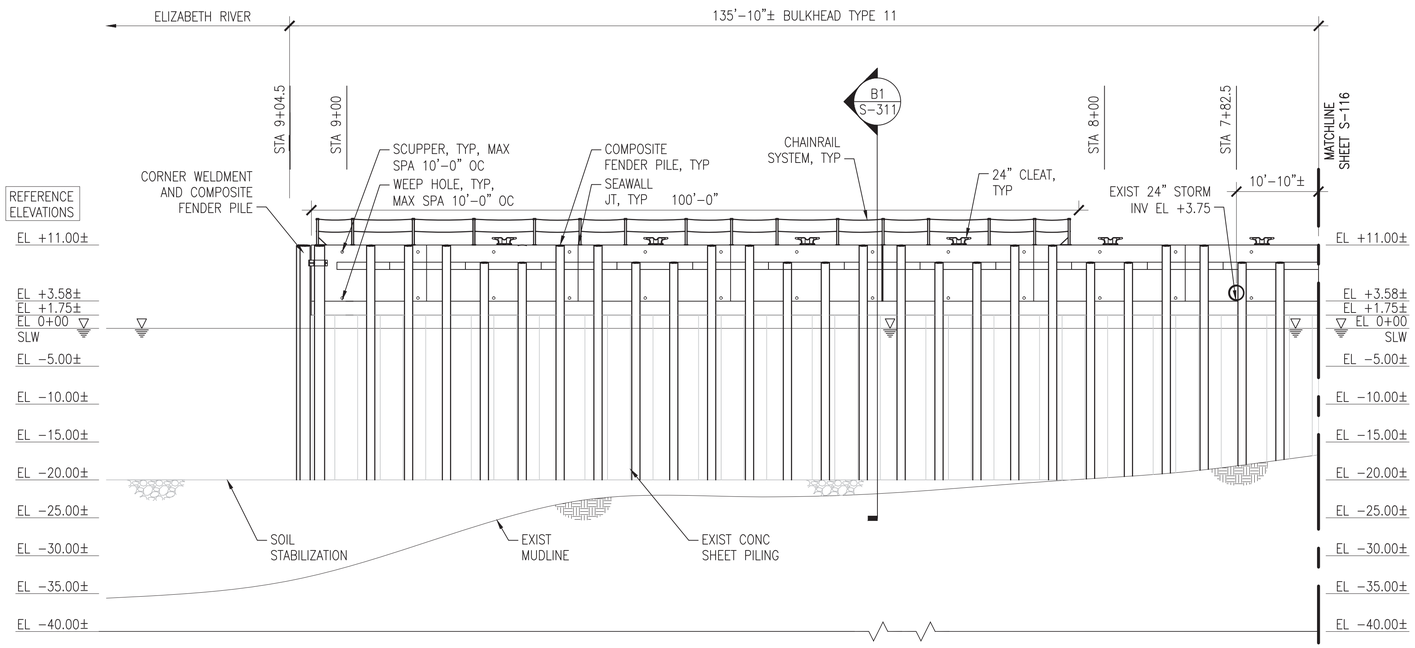
FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-115 STRUCTURAL PLAN & ELEV (15 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.a.davis2



C1 PLAN - CEP-175 BULKHEAD - SOUTH FACE (1 OF 5)

SCALE: 1" = 10'

S-004



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-115A

GENERAL SHEET NOTES @ CEP-175

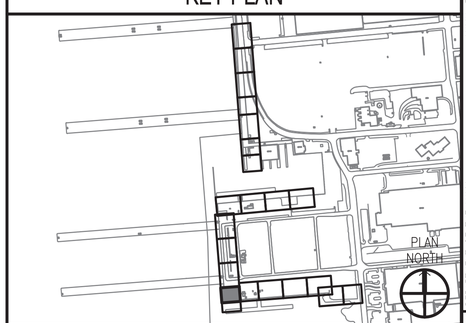
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	–	EA
	COMPOSITE FENDER PILE	28	EA
	42" CLEAT	–	EA
	24" CLEAT	6	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	132	LF
	TIMBER CHOCK WITH SPACERS	102	LF
(-X-X-)	GROUT CURTAIN	132	LF
	CHAIN / POSTS	100/16	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT DRW KAD CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CHT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT – PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (15A OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

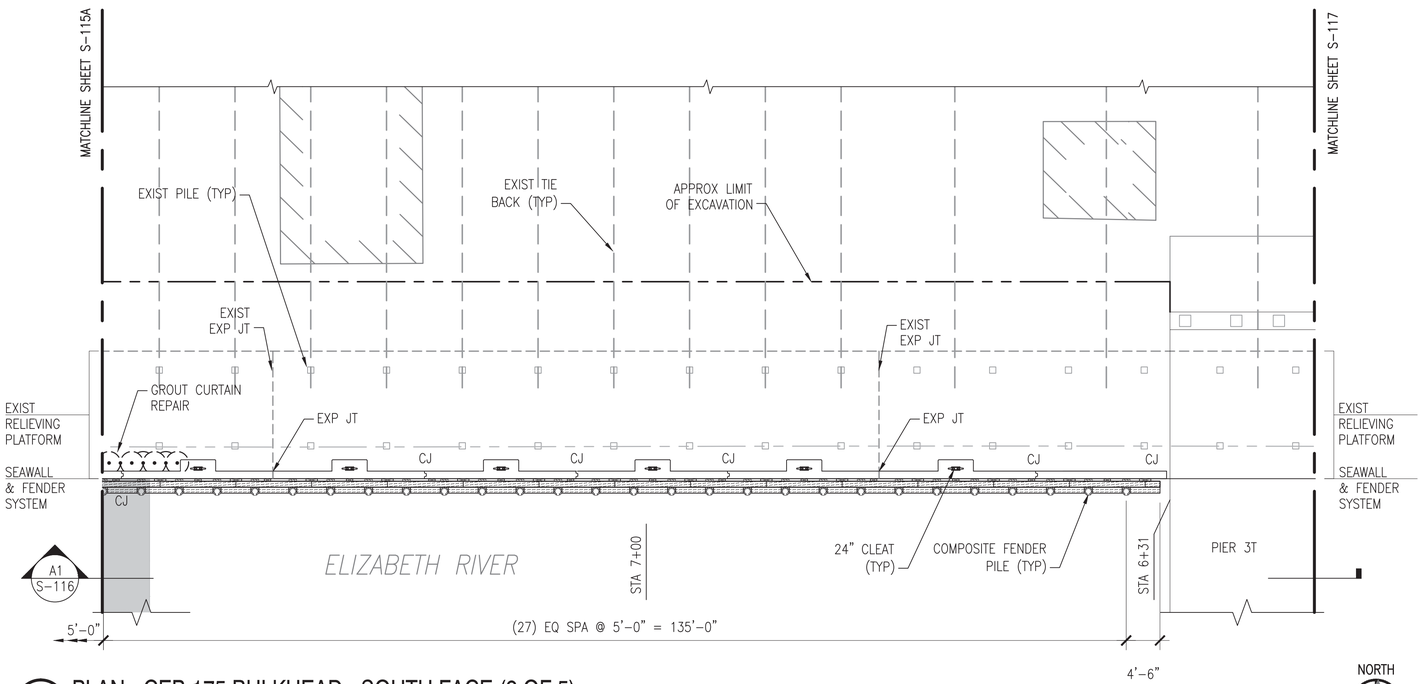
NAVFAC DRAWING NO. 12,729,760

SHEET 105 OF 158

S-115A

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762-308Repair\8_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-115A STRUCTURAL PLAN & ELEV (15A OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.s.davis2

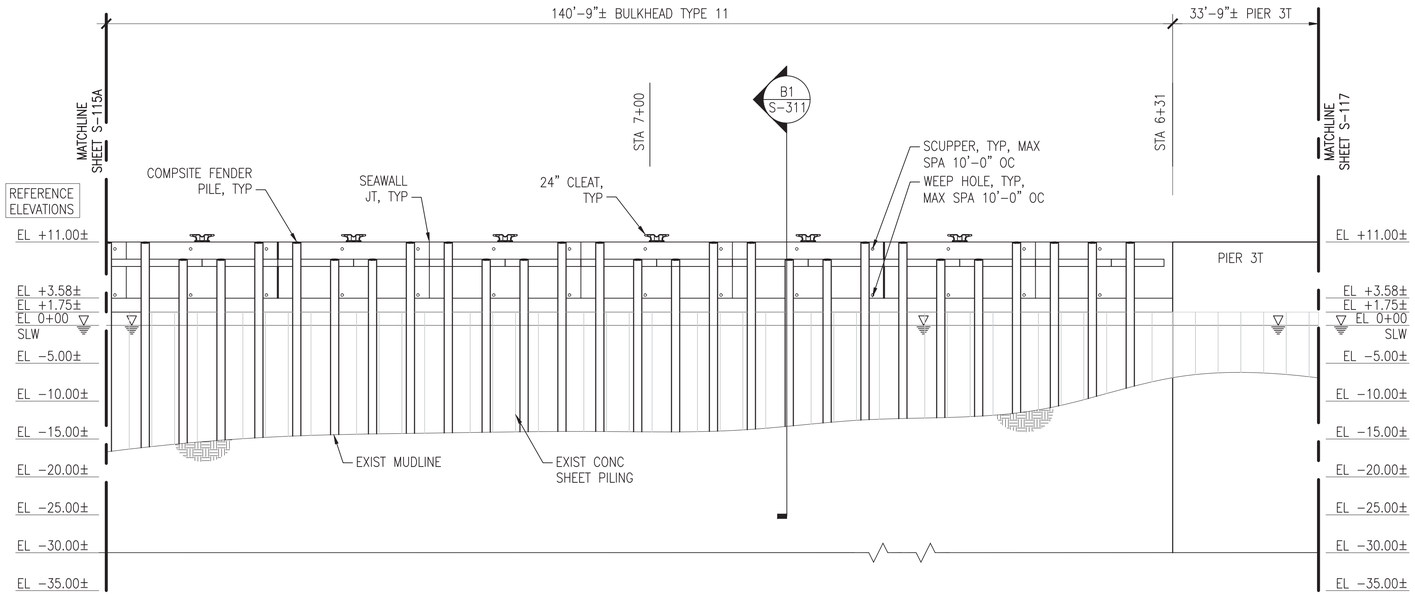


C1 PLAN - CEP-175 BULKHEAD - SOUTH FACE (2 OF 5)

SCALE: 1" = 10'

NORTH

S-004



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-116

GENERAL SHEET NOTES @ CEP-175

1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
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6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
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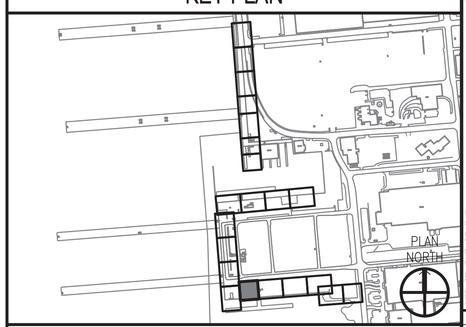
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	–	EA
	COMPOSITE FENDER PILE	28	EA
	42" CLEAT	–	EA
	24" CLEAT	6	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	135	LF
	TIMBER CHOCK WITH SPACERS	105	LF
	GROUT CURTAIN	12	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT DRW KAD CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CPT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT – PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (16 OF 21)

NORFOLK NAVAL STATION

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

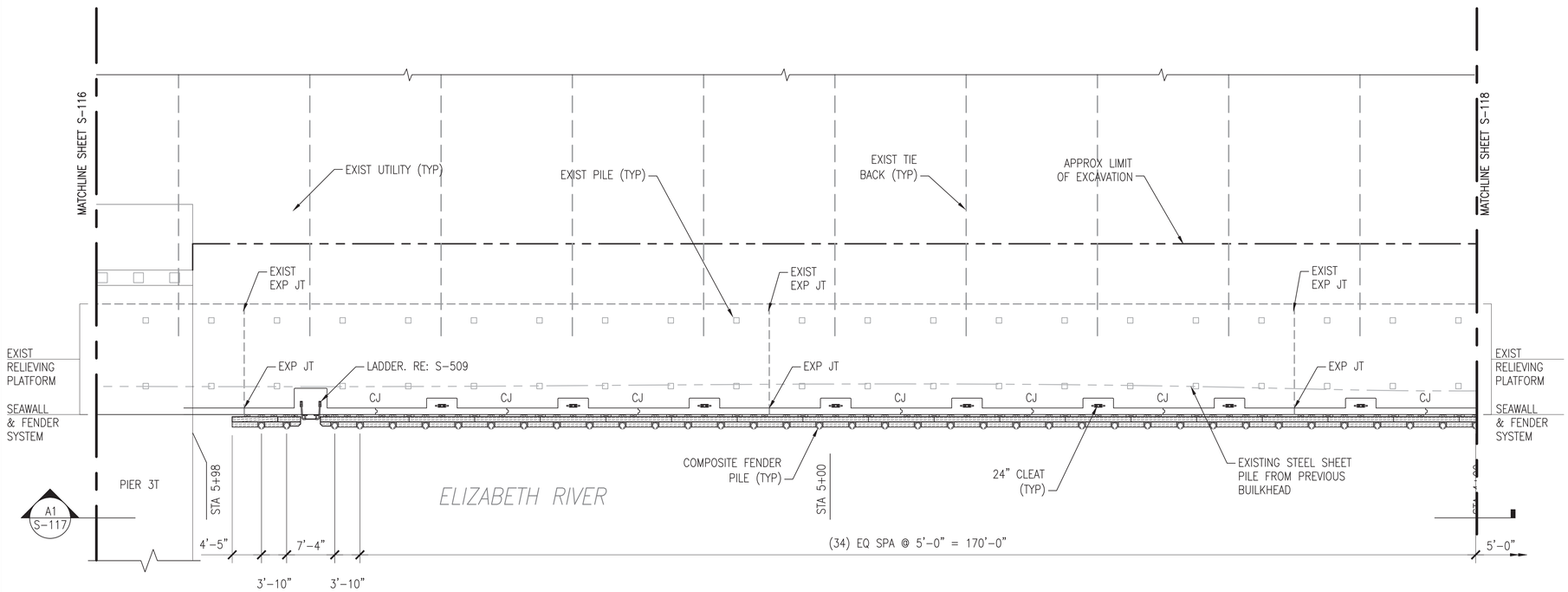
NAVFAC DRAWING NO. 12,729,761

SHEET 106 OF 158

S-116

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NavalStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-116 STRUCTURAL PLAN & ELEV (16 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.a.davis2

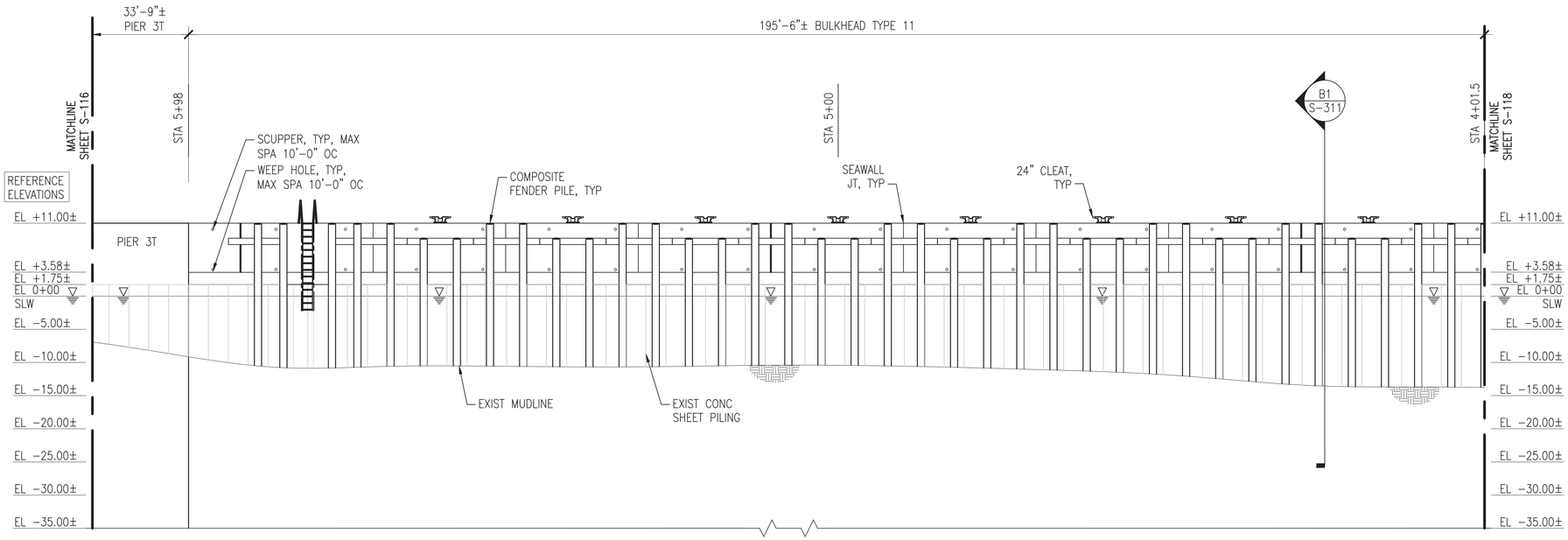


C1 PLAN - CEP-175 BULKHEAD - SOUTH FACE (3 OF 5)

SCALE: 1" = 10'

NORTH

S-004



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-117

GENERAL SHEET NOTES @ CEP-175

1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
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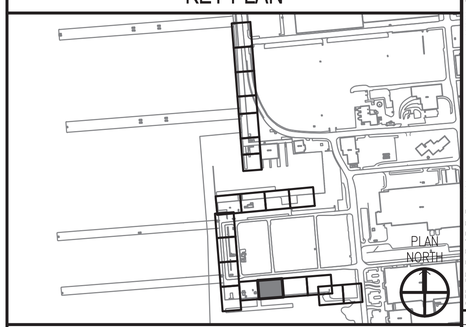
TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	–	EA
	COMPOSITE FENDER PILE	38	EA
	42" CLEAT	–	EA
	24" CLEAT	8	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	185	LF
	TIMBER CHOCK WITH SPACERS	144	LF
	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT DRW KAD CHK CLT

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BRANCH MANAGER CPT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

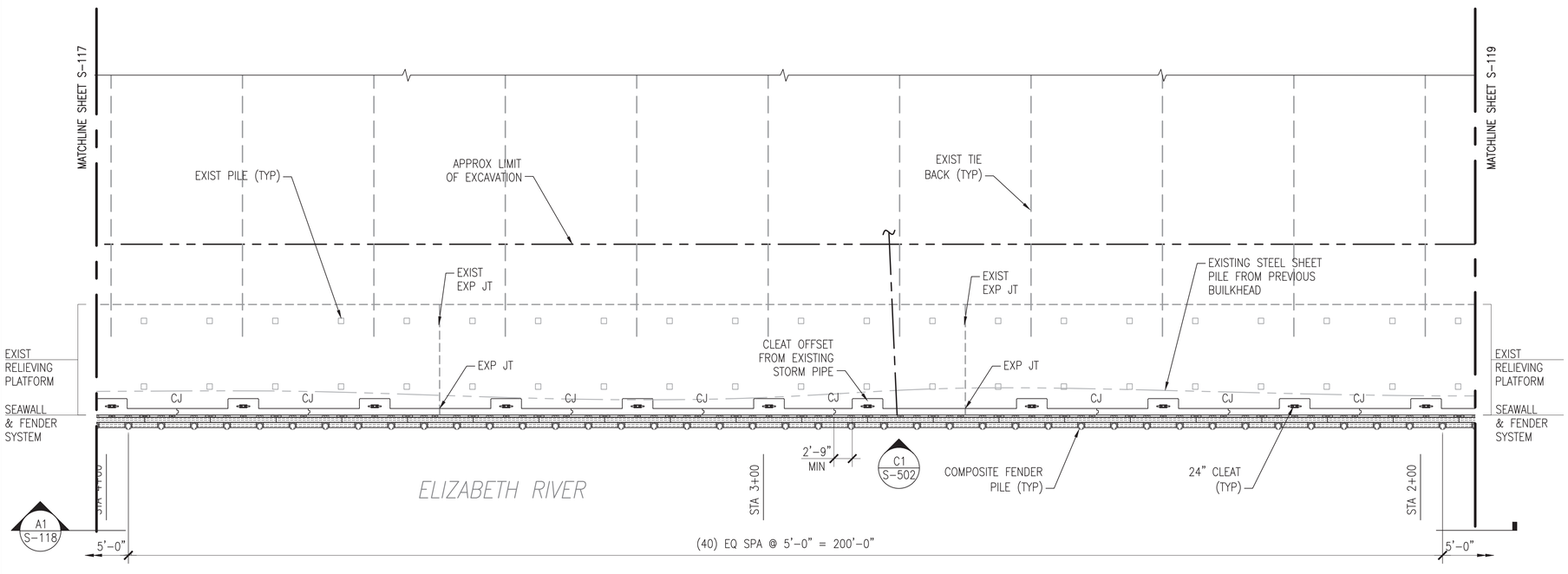
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK, VIRGINIA
NORFOLK NAVAL STATION
CEP-175 AND Z-308 BULKHEAD REPAIR
STRUCTURAL PLAN & ELEV (17 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,762
SHEET 107 OF 158

S-117

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NewOrleansNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-117 STRUCTURAL PLAN & ELEV (17 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.a.davis2

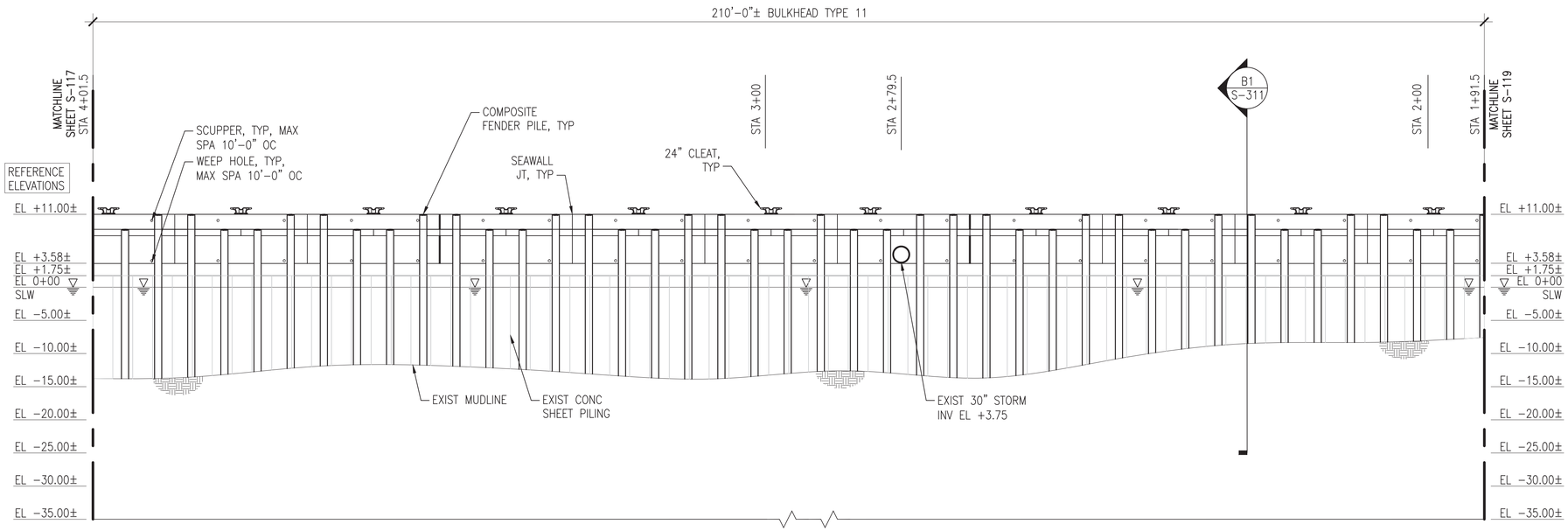


C1 PLAN - CEP-175 BULKHEAD - SOUTH FACE (4 OF 5)

SCALE: 1" = 10'

S-004

NORTH



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-118

GENERAL SHEET NOTES @ CEP-175

1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
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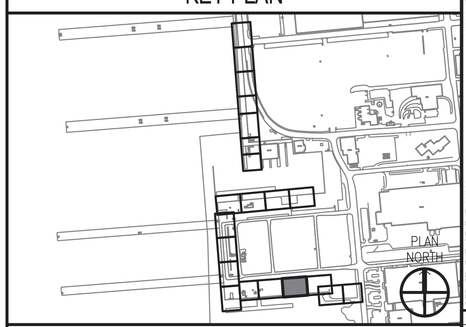
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	–	EA
	COMPOSITE FENDER PILE	42	EA
	42" CLEAT	–	EA
	24" CLEAT	11	EA
	LADDER	–	EA
	TIMBER WALE WITH BLOCKING	210	LF
	TIMBER CHOCK WITH SPACERS	165	LF
	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT DRW KAD CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CPT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND – MID-ATLANTIC
HAMPTON ROADS IPT – PWD NORFOLK

NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK NAVAL STATION

NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (18 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

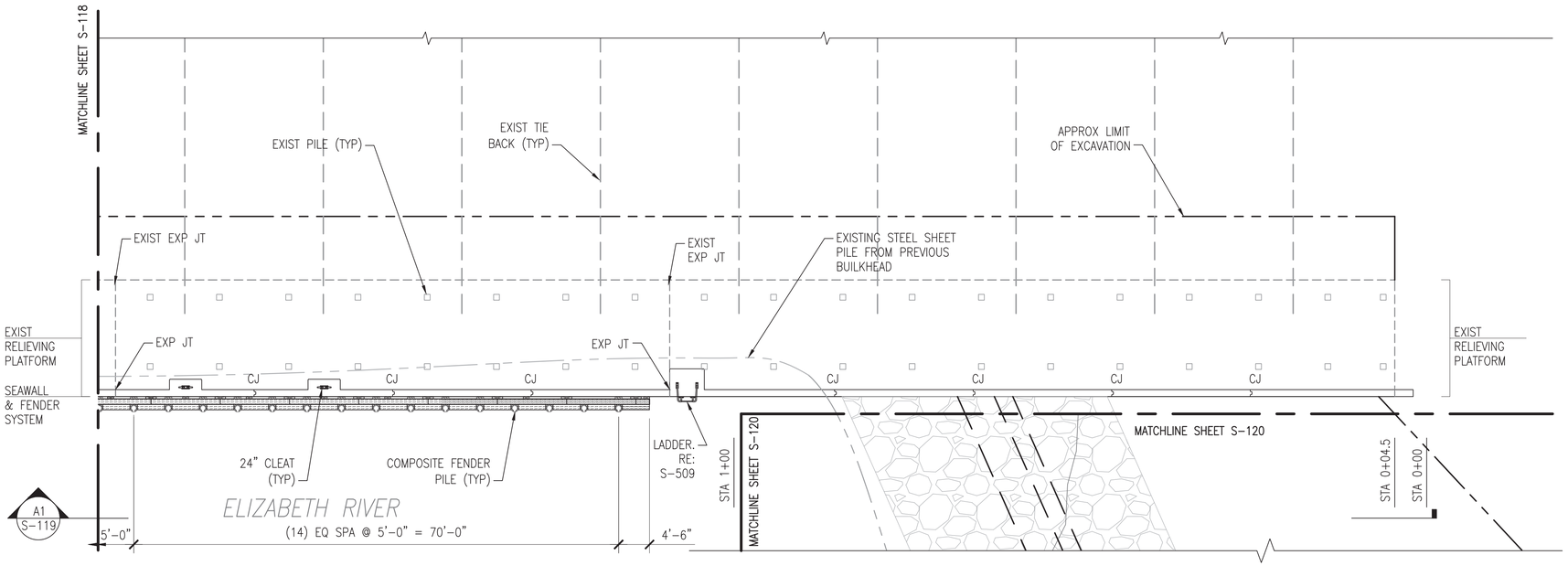
NAVFAC DRAWING NO. 12,729,763

SHEET 108 OF 158

S-118

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-118 STRUCTURAL PLAN & ELEV (18 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.a.davis2

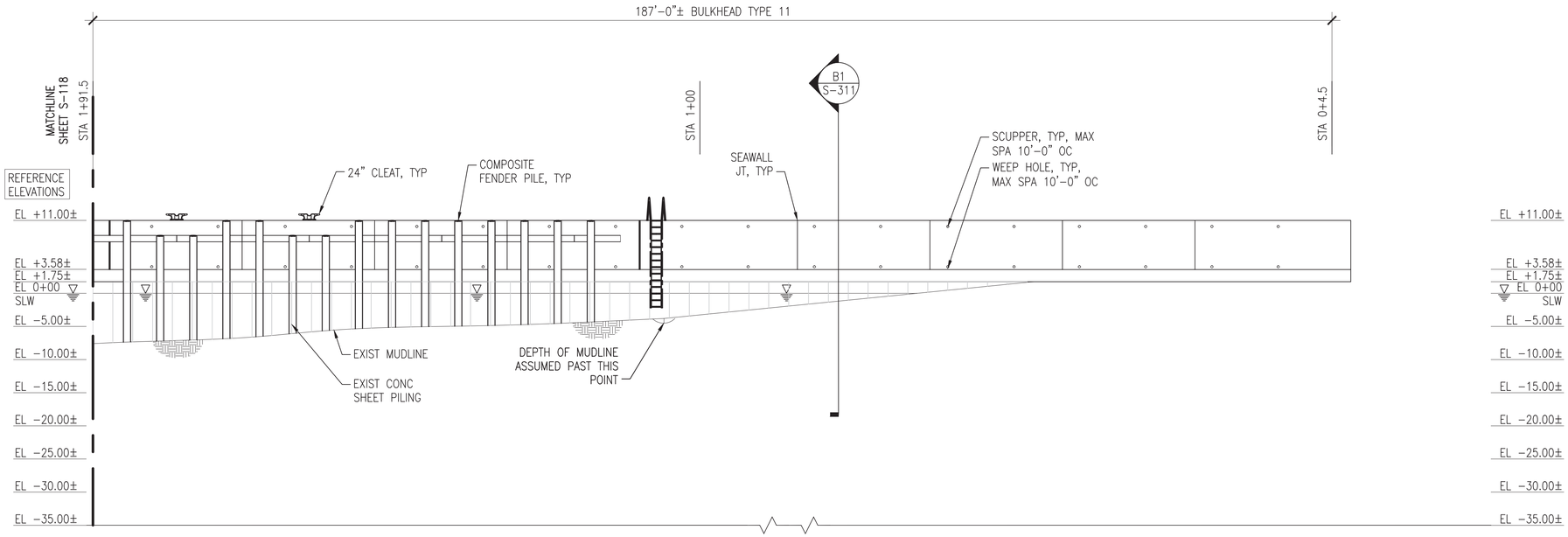


C1 PLAN - CEP-175 BULKHEAD - SOUTH FACE (5 OF 5)

SCALE: 1" = 10'

S-004

NORTH



A1 ELEVATION OF BULKHEAD

SCALE: 1" = 10'

S-119

GENERAL SHEET NOTES @ CEP-175

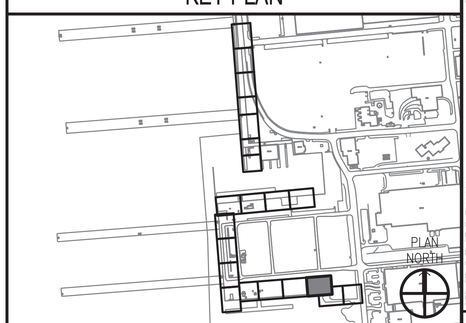
1. PROVIDE CEP-175 BULKHEAD FENDER SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, PRESTRESSED CONCRTE FENDER PILES (WEST FACE), COMPOSITE PILES (NORTH AND SOUTH FACES), CHOCKS, WALES, BLOCKING, WELDMENTS, AND SPACERS.
2. PROVIDE CEP-175 BULKHEAD SEAWALL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, SEAWALL, CURBING, CLEATS, AND LADDERS.
3. PROVIDE JET-GROUTED SOIL CURTAIN WALL REPAIRS BEHIND THE BULKHEAD AS SHOWN ON THE PLANS.
4. PROVIDE ADDITIONAL RIP RAP MATERIAL OVERLAY FOR SHIP PILE TOE STABILIZATION AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
5. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS. NOTE: POST SPACING IS 8'-0" MAX, BUT SHALL ADJUST AT CLEAT LOCATIONS, TO ENSURE CLEATS ARE CENTERED BETWEEN POSTS. CHAINRAIL SYSTEM SHALL BE ON THE WEST SIDE OF CEP-175 AND EXTEND AROUND THE CORNERS OF THE NORTH AND SOUTH SIDES OF CEP-175 APPROXIMATELY 100'-0". REFER TO DETAILS ON S-507.
6. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.
7. ELEVATIONS SHOWN ON THE SD SERIES DRAWINGS ARE NOTED AS REFERENCE ELEVATIONS, AND CORRESPOND TO THE PROVIDED AS-BUILT DRAWINGS FOR THE BULKHEAD. CONTRACTOR SHALL SET UP TEMPORARY BENCHMARKS AND COORDINATE REAL TIME ELEVATIONS WITH CIVIL DRAWINGS AND DATUM PROVIDED ON G-002.
8. FOR CONCRETE FENDER PILES, REFER TO SHEET S-505.
9. FOR COMPOSITE FENDER PILES, REFER TO SHEET S-506.
10. FOR TYPICAL EXPANSION JOINT, CONSTRUCTION JOINT, AND SEAWALL CORNER DETAILS, REFER TO SHEET S-502.

TABULATED NEW WORK QUANTITIES (THIS SHEET)

SYMBOL	ITEM	QUANTITY	UNIT
OR	CONCRETE FENDER PILE	–	EA
	COMPOSITE FENDER PILE	15	EA
	42" CLEAT	–	EA
	24" CLEAT	2	EA
	LADDER	1	EA
	TIMBER WALE WITH BLOCKING	80	LF
	TIMBER CHOCK WITH SPACERS	64	LF
	GROUT CURTAIN	–	LF
	CHAIN / POSTS	–	LF/EA

NOTE: ALL NEW WORK DIMENSIONS ARE APPROXIMATE AND REPRESENT THE OVERALL EXTENT OF WORK REQUIRED AT THAT LOCATION. REFER TO TYPICAL SECTIONS/DETAILS AND REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW KAD | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CPT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT – PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

STRUCTURAL PLAN & ELEV (19 OF 21)

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

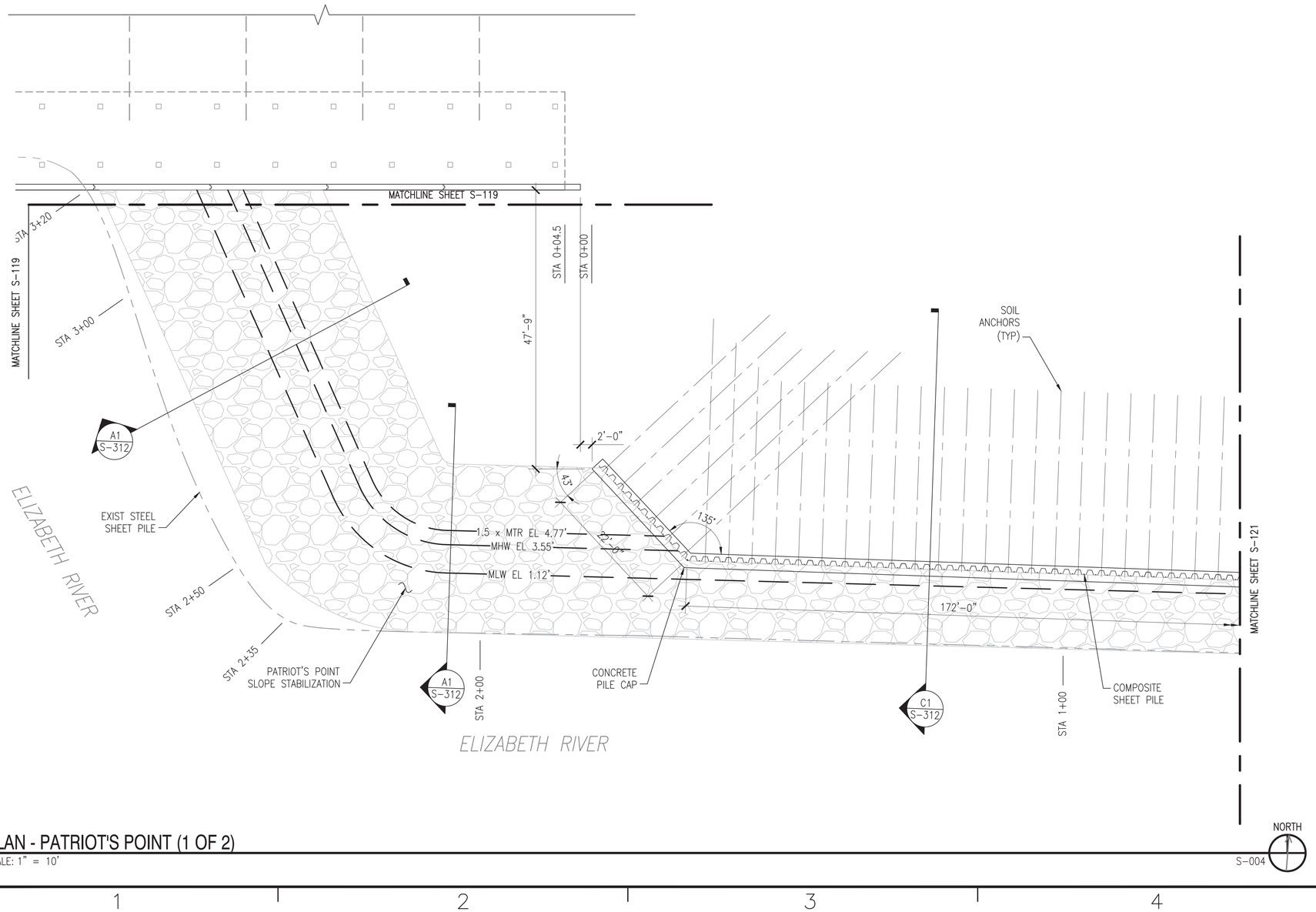
NAVFAC DRAWING NO. 12,729,764

SHEET 109 OF 158

S-119

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-119 STRUCTURAL PLAN & ELEV (19 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:45pm USER: kimberly.a.davis2



A1 PLAN - PATRIOT'S POINT (1 OF 2)
SCALE: 1" = 10'

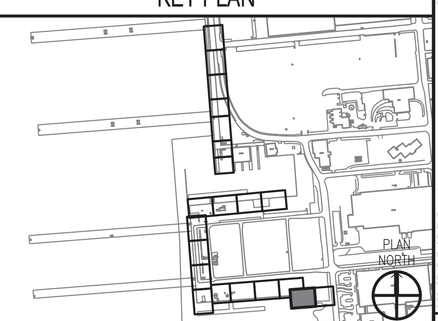
NORTH

S-004

GENERAL SHEET NOTES @ PP

1. PROVIDE A COMPOSITE SHEET PILE BULKHEAD SYSTEM BEHIND THE EXISTING DETERIORATED STEEL SHEET PILE BULKHEAD.
2. PROVIDE A FILTER FABRIC, STABILIZATION FABRIC, AND BACKFILLING WITH STONE RIP RAP BETWEEN THE EXISTING AND REPLACEMENT BULKHED AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
3. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS AT THE LOCATION OF THE NEW SHEET PILE CAP, AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS. REFER TO DETAILS ON S-507.
4. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.

KEY PLAN



GRAPHIC SCALE
1"=10' 0' 10' 20'

NO.	DESCRIPTION	DATE	APPR
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SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW KAD | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CRT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

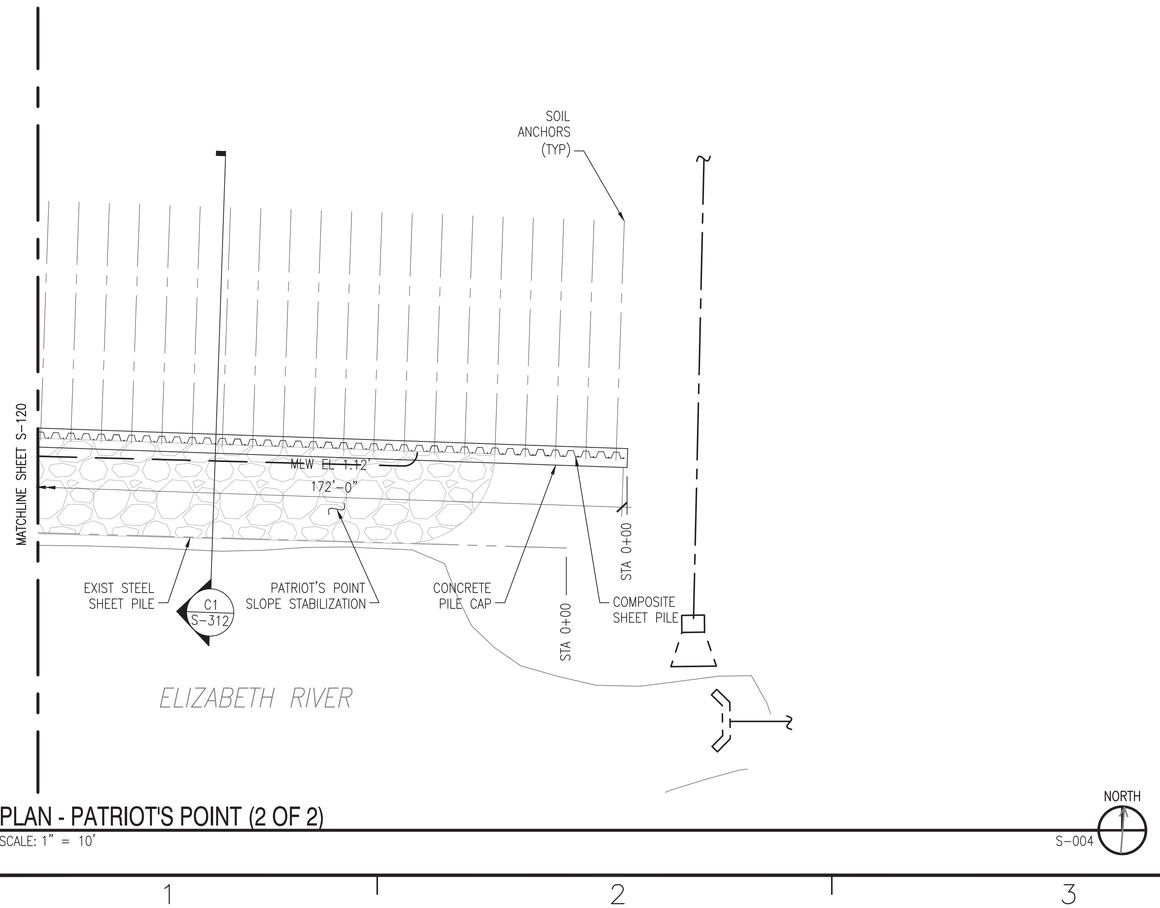
STRUCTURAL PLAN & ELEV (20 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,765
SHEET 110 OF 158

S-120

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NewsStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-120 STRUCTURAL PLAN & ELEV (20 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



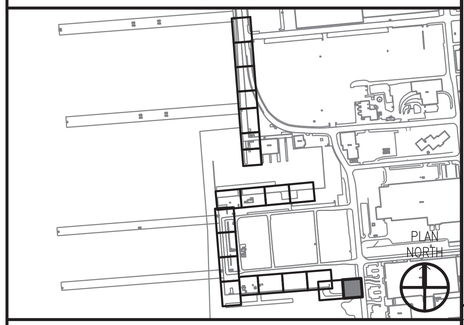
A1 PLAN - PATRIOT'S POINT (2 OF 2)
SCALE: 1" = 10'

NORTH
S-004

GENERAL SHEET NOTES @ PP

1. PROVIDE A COMPOSITE SHEET PILE BULKHEAD SYSTEM BEHIND THE EXISTING DETERIORATED STEEL SHEET PILE BULKHEAD.
2. PROVIDE A FILTER FABRIC, STABILIZATION FABRIC, AND BACKFILLING WITH STONE RIP RAP BETWEEN THE EXISTING AND REPLACEMENT BULKHED AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS.
3. PROVIDE CHAINRAIL SYSTEM COMPLETE, TO INCLUDE, BUT NOT LIMITED TO, CHAIN, POSTS, ANCHORS, AND FOUNDATIONS AT THE LOCATION OF THE NEW SHEET PILE CAP, AS SHOWN ON THE PLANS, SECTIONS, AND DETAILS. REFER TO DETAILS ON S-507.
4. MUDLINE INFORMATION IS BASED UPON NAVFAC HYDROLOGICAL SURVEY DATA FROM JANUARY 2015 AND IS PROVIDED FOR REFERENCE ONLY.

KEY PLAN



GRAPHIC SCALE

1"=10' 0' 10' 20'

							APPR	
							DATE	
							DESCRIPTION	
							CTM	

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES ELT DRW KAD CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CST
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

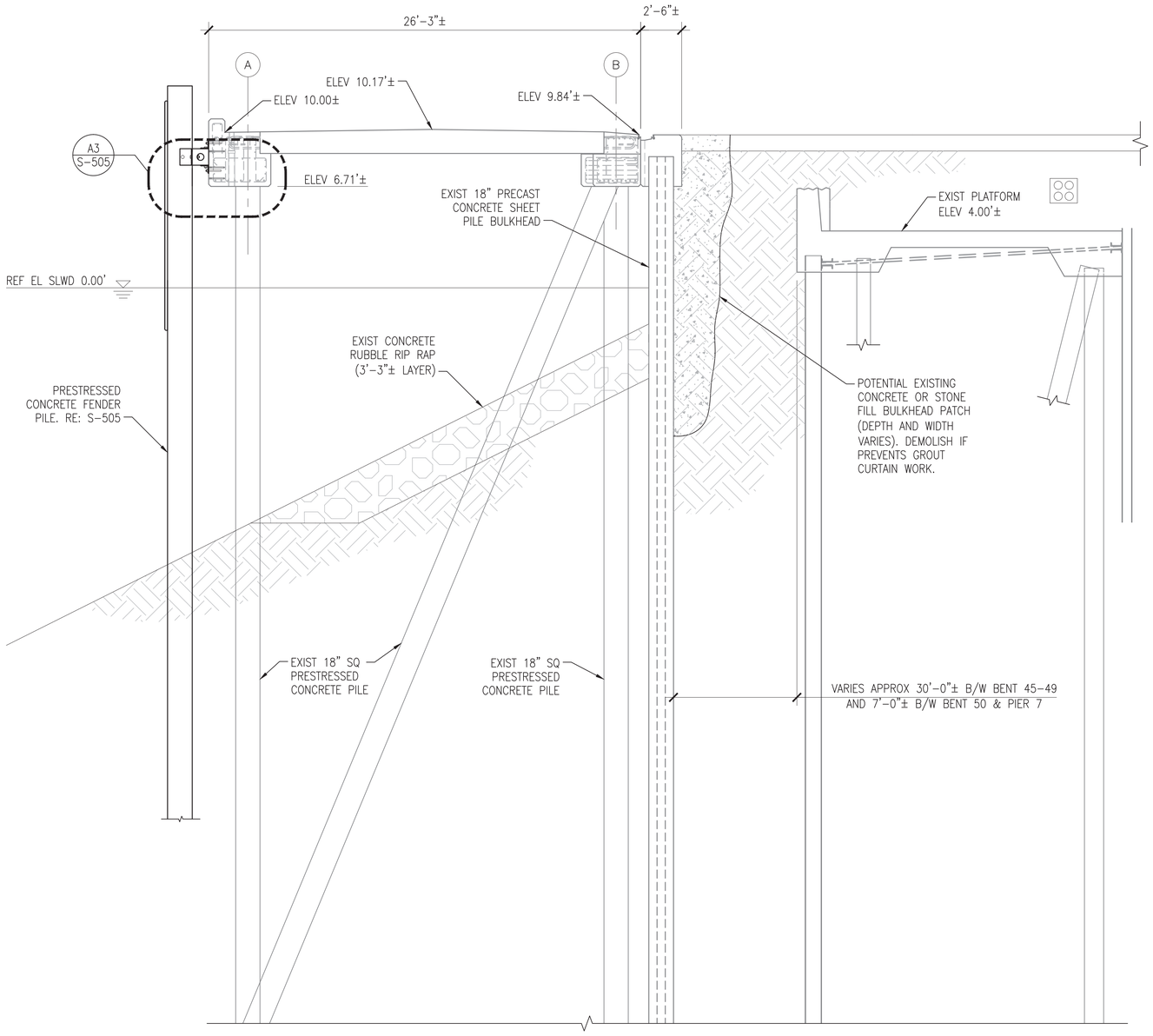
STRUCTURAL PLAN & ELEV (21 OF 21)

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,766
SHEET 111 OF 158

S-121

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-100 SERIES.dwg LAYOUT NAME: S-121 STRUCTURAL PLAN & ELEV (21 OF 21) PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



A1 SECTION - BULKHEAD TYPE 1

SCALE: 1/4" = 1'-0"

S-101

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR	DATE	DESCRIPTION	CTM
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NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CLT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

SECTIONS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

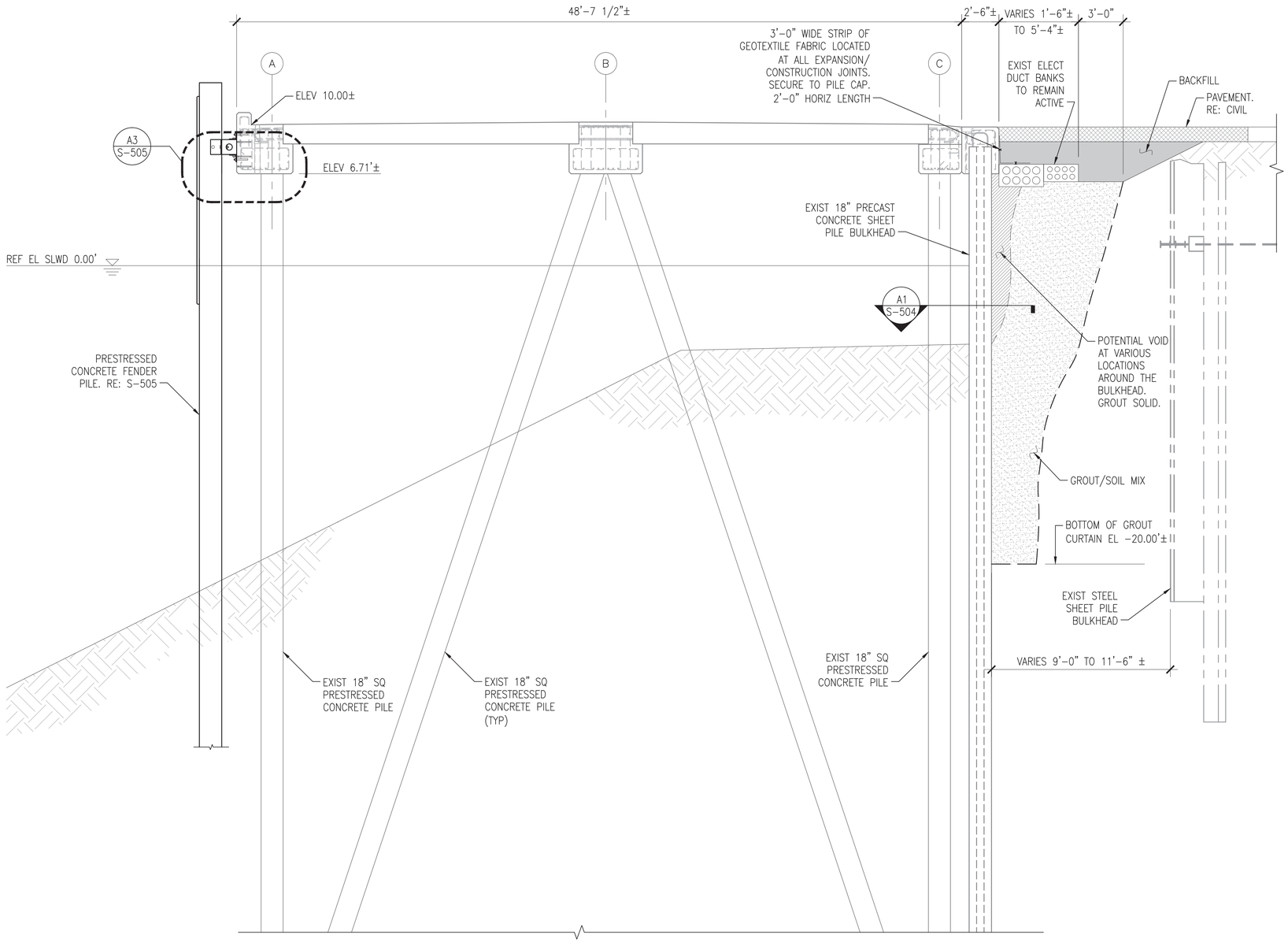
NAVFAC DRAWING NO. 12,729,767

SHEET 112 OF 158

S-301

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Repair\B_Design\Drawings\Sheet\07_Structure\1370817_S-300 SERIES.dwg LAYOUT NAME: S-301 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



A1 SECTION - BULKHEAD TYPE 2
SCALE: 1/4" = 1'-0"

S-102 TO S-104

GENERAL SHEET NOTES

1. REFER TO PLANS FOR LOCATIONS OF GROUT CURTAIN WORK.

TYPICAL Z-308 GROUT CURTAIN PROCEDURE:

1. GROUT CURTAIN INSTALLATION SHALL NOT BEGIN UNTIL ALL GAPS AND LOCATIONS OF FILL LOSS HAVE BEEN DETERMINED AND REPAIR AREAS APPROVED BY THE CONTRACTING OFFICER.
2. INSPECTION SHALL OCCUR FOR THE ENTIRE LENGTH OF THE BULKHEAD WALL BETWEEN PIERS 6 & 7, AND NOT JUST AT THE AREAS IDENTIFIED ON PLANS. EXTERIOR OF EXISTING SHEET PILES SHALL BE INSPECTED BY DIVERS AND ALL JOINTS PROBED TO DETERMINE IF FILL IS BEING LOST BETWEEN THE SHEETS.
3. FOR THE AREAS ALREADY IDENTIFIED ON THE PLANS, EXCAVATE THE TRENCH TO THE APPROXIMATE LIMITS SHOWN. EACH TRENCH SHALL BE FLOODED AND AN ENVIRONMENTALLY FRIENDLY DYE RELEASED. DIVERS SHALL MONITOR THE OPERATION TO DETERMINE ANY ADDITIONAL LOCATIONS OF POTENTIAL FILL LOSS.
4. ANY LOCATION, OUTSIDE OF THE AREAS MARKED ON PLANS, THAT HAVE THE POTENTIAL OF BECOMING A LOCATION FOR FUTURE FILL LOSS SHALL BE IDENTIFIED TO THE CONTRACTING OFFICER.
5. EXCAVATE SOIL AND PREVIOUSLY PLACED STONE/CONCRETE TO PROVIDE A DIVERSION TRENCH AND EXPOSE THE TOPS OF THE SHEET PILE/BOTTOMS OF DUCT BANKS. SLOPE ANY EXCAVATIONS IN ACCORDANCE WITH COE-EM385.
6. THE SPACING OF GROUT HOLES IS DEPENDENT UPON CONTRACTORS' PROPOSED METHOD OF GROUT INJECTION. SPACING OF HOLES TO PROVIDE A CONTINUOUS, IMPERVIOUS GROUT CURTAIN SHALL BE ESTABLISHED IN THE FILED BY PERFORMING A TEST SECTION OF THE PROPOSED GROUT CURTAIN. CONTINUITY SHALL BE VERIFIED BY TESTING TO THE SATISFACTION OF THE CONTRACTING OFFICER PRIOR TO STARTING BULKHEAD GROUTING.
7. INSERT TIP OF GROUT TUBE TO -20.00' AND BEGIN GROUTING. CONTRACTOR SHALL CONTINUOUSLY MONITOR AND PACK SHEET PILE INTERLOCK JOINTS AS NECESSARY TO PREVENT GROUT LOSS THRU THE BULKHEAD AS GROUT TUBE IS SLOWLY RAISED. DO NOT OVERLOAD SHEET PILES.
8. AFTER GROUTING PROCESS IS COMPLETE, BACKFILL, COMPACT, AND PROVIDE PAVEMENT REPAIRS.
9. DO NOT BEGIN PAVING OPERATIONS IN THE VICINITY OF THE GROUT CURTAIN UNTIL ALL GROUTING OPERATIONS ARE COMPLETE.
10. AT UTILITY BULKHEAD PENETRATIONS, ADJUST SPACING OF GROUT CURTAIN CELLS TO ENCOMPASS ENTIRE UTILITY LINE AND SEAL THE BULKHEAD. TO ENSURE FULL GROUTING AROUND LARGER UTILITIES, CONTRACTOR SHALL ANGLE BORE GROUT CURTAIN CELL TO ACCESS AREA AROUND UTILITY OTHERWISE INACCESSIBLE.

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW CMR | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CHT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

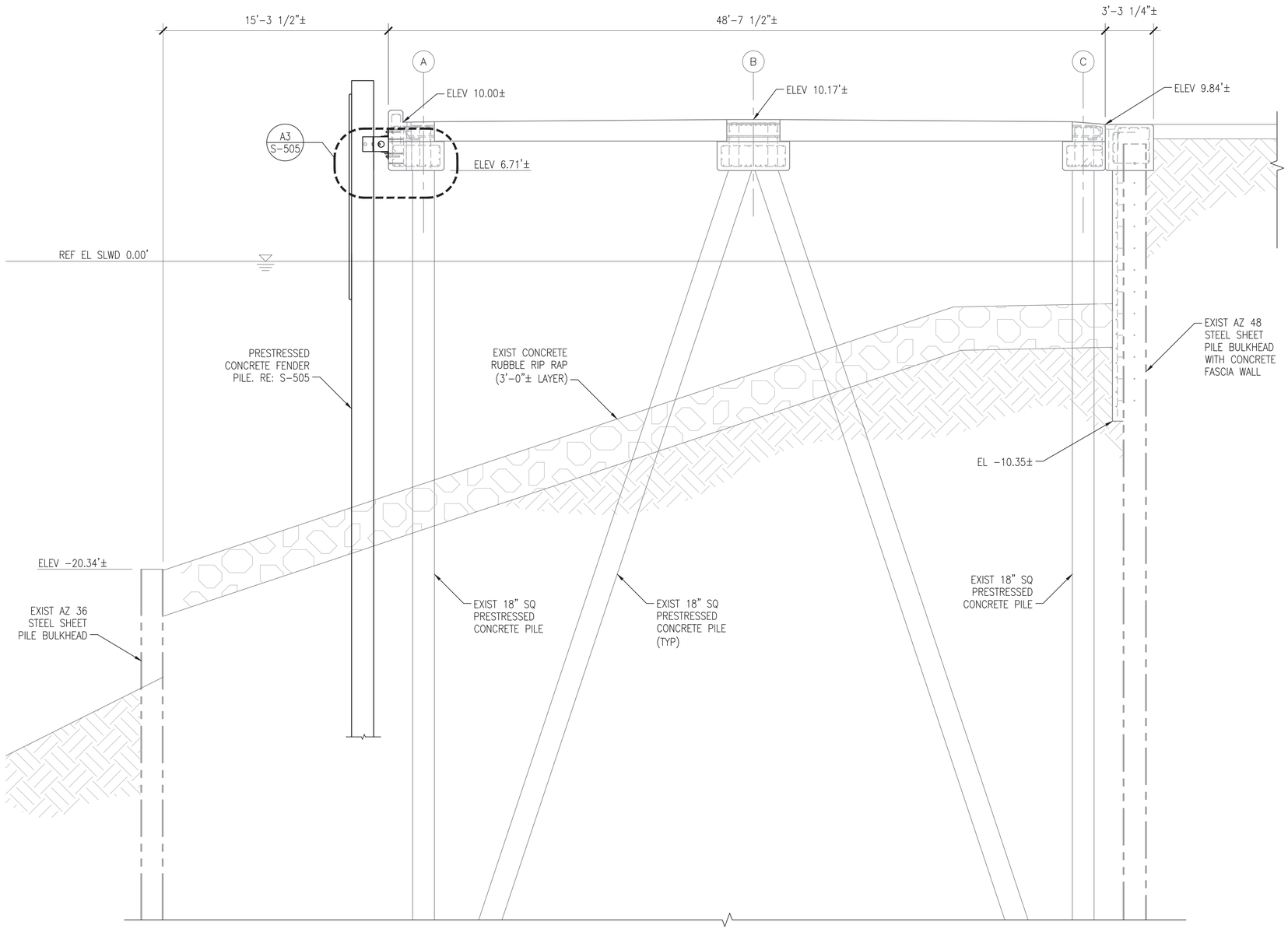
SECTIONS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,768
SHEET 113 OF 158

S-302

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752 - 308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-300 SERIES.dwg LAYOUT NAME: S-302 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



A1 SECTION - BULKHEAD TYPE 3
SCALE: 1/4" = 1'-0"

S-105 TO S-106

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR | DATE | DESCRIPTION | SYM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

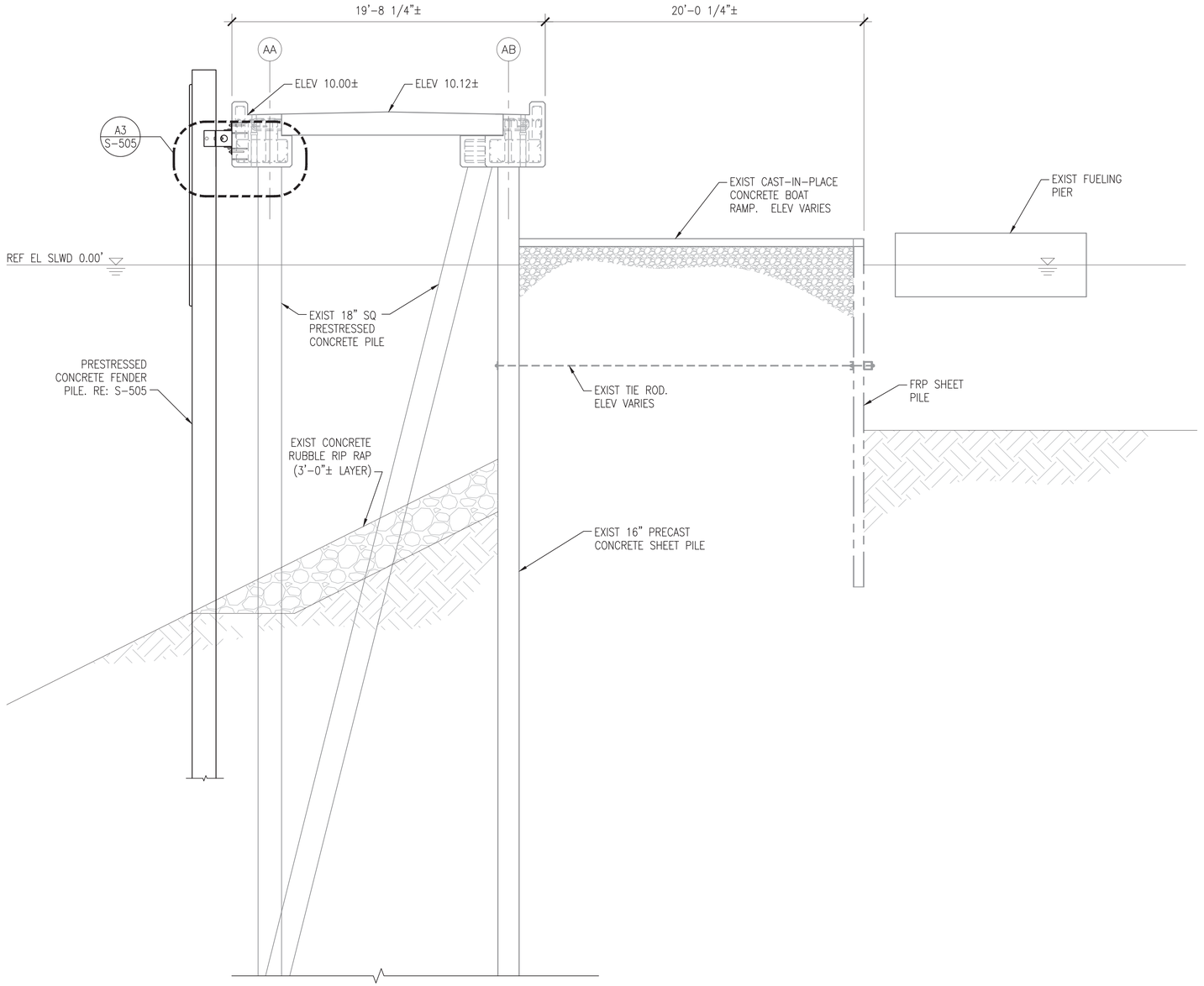
ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW CMR | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CLT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND--MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA
CEP-175 AND Z-308 BULKHEAD REPAIR
SECTIONS

SCALE: AS NOTED
EPROJECT NO.: 1370817
CONSTR. CONTR. NO.: N/A
NAVFAC DRAWING NO.: 12,729,769
SHEET 114 OF 158
S-303

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NewGISstionNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Report\8_Design\Drawings\Sheet\07_Structure\1370817_S-300 SERIES.dwg LAYOUT NAME: S-303 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



A1 SECTION - BULKHEAD TYPE 4

SCALE: 1/4" = 1'-0"

S-106 TO S-107

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

NO.	DESCRIPTION	DATE	APPR

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CPT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

SECTIONS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

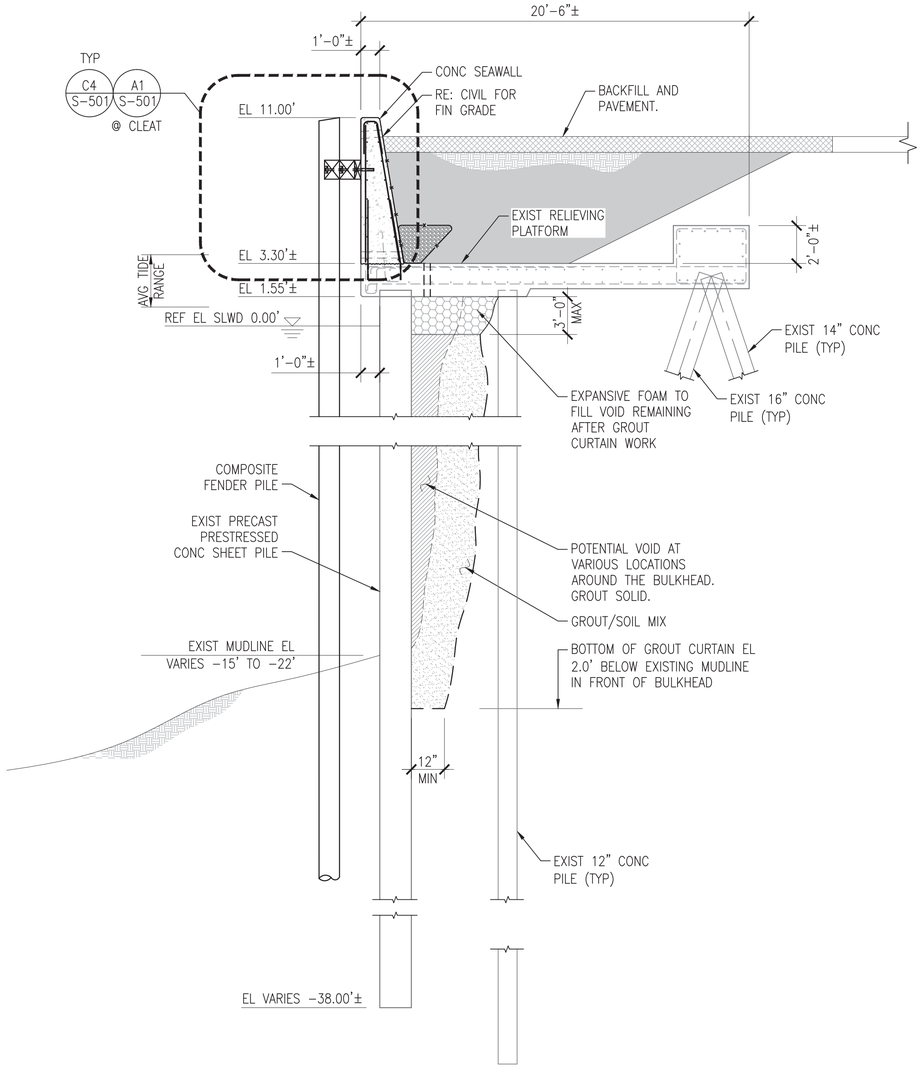
NAVFAC DRAWING NO. 12,729,770

SHEET 115 OF 158

S-304

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-300 SERIES.dwg LAYOUT NAME: S-304 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



B1 SECTION - BULKHEAD TYPE 5
SCALE: 1/4" = 1'-0"

S-108

GENERAL SHEET NOTES

1. REFER TO PLAN FOR LOCATIONS OF GROUT CURTAIN WORK. REFER TO S-504 FOR GROUT CURTAIN DETAILS AND PROCEDURES.

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR	DATE	DESCRIPTION	SYM
--	--	--	--

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CBT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND--MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

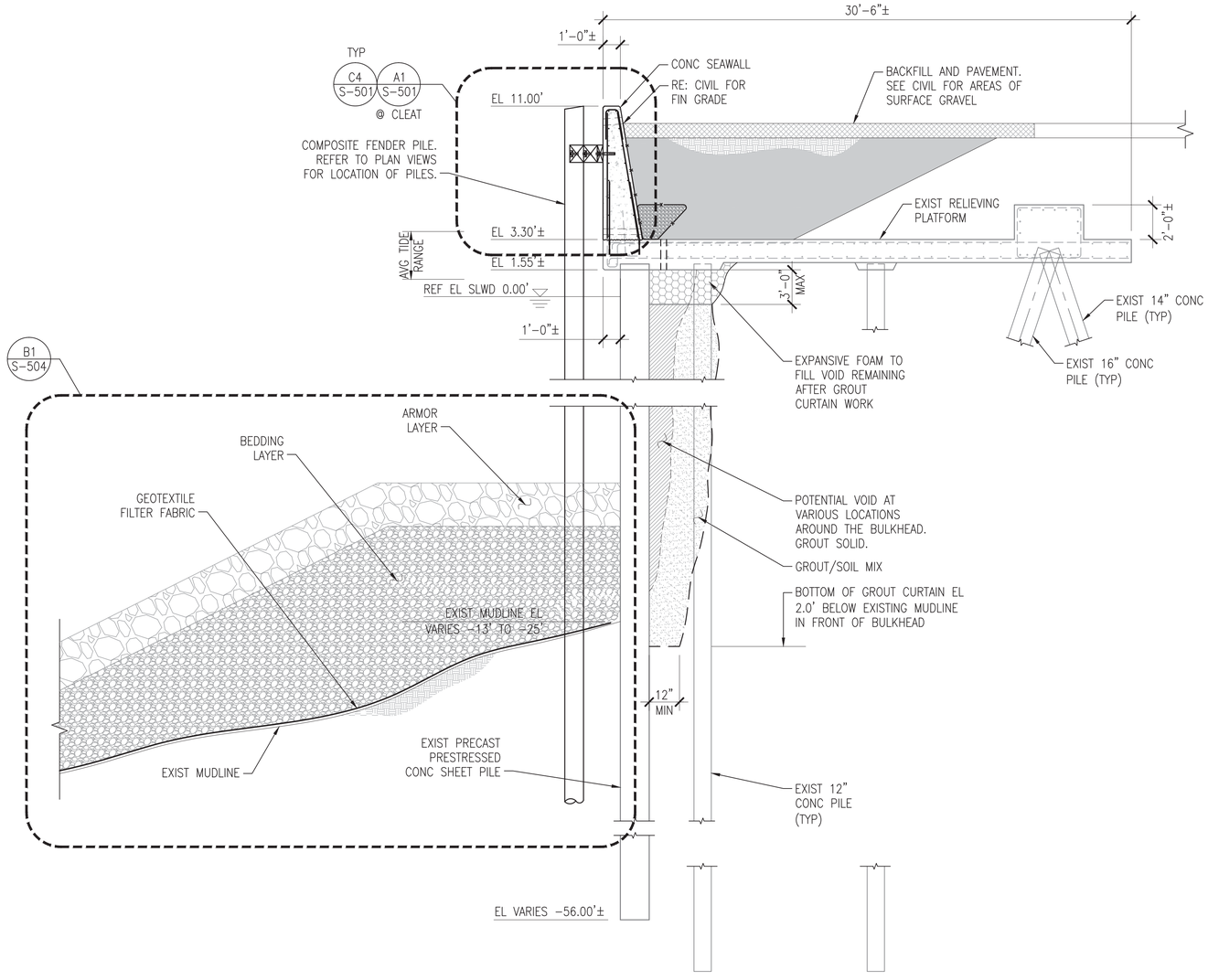
SECTIONS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,771
SHEET 116 OF 158

S-305

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-300 SERIES.dwg LAYOUT NAME: S-305 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



B1 SECTION - BULKHEAD TYPE 6

SCALE: 1/4" = 1'-0"

S-108 TO S-111

GENERAL SHEET NOTES

1. REFER TO PLAN FOR LOCATIONS OF GROUT CURTAIN WORK. REFER TO S-504 FOR GROUT CURTAIN DETAILS AND PROCEDURES.
2. REFER TO GRADING PLAN ON S-401 FOR LOCATION OF SLOPE STABILIZATION IN FRONT OF BULKHEAD.

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR | DATE | DESCRIPTION | SYM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CLT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA
CEP-175 AND Z-308 BULKHEAD REPAIR
SECTIONS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

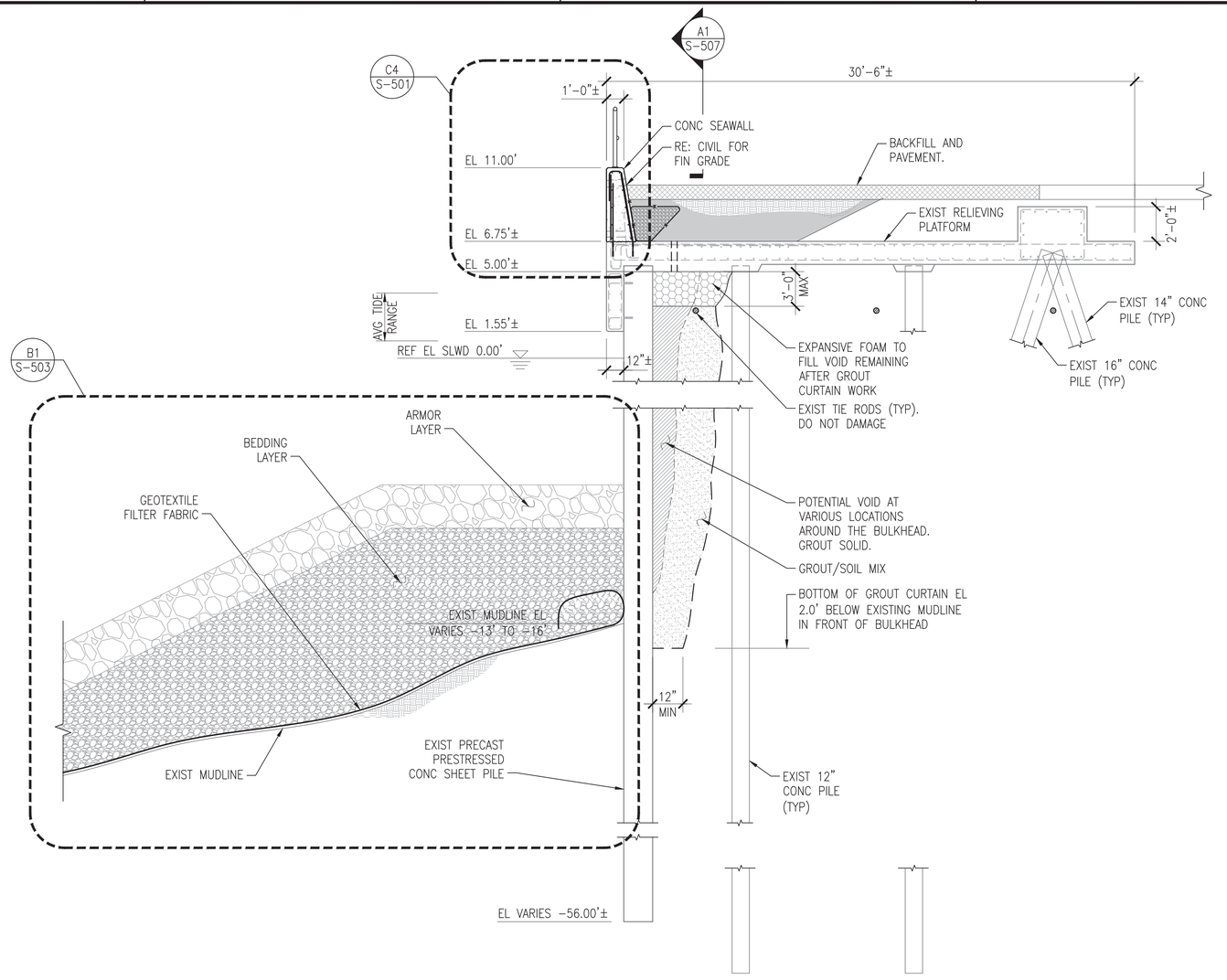
NAVFAC DRAWING NO. 12,729,772

SHEET 117 OF 158

S-306

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NewsStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Repair\8_Design\Drawings\Sheet\07_Structure\1370817_S-300 SERIES.dwg LAYOUT NAME: S-306 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



B1 SECTION - BULKHEAD TYPE 7

SCALE: 1/4" = 1'-0"

S-111

GENERAL SHEET NOTES

1. REFER TO PLAN FOR LOCATIONS OF GROUT CURTAIN WORK. REFER TO S-504 FOR GROUT CURTAIN DETAILS AND PROCEDURES.
2. REFER TO GRADING PLAN ON S-401 FOR LOCATION OF SLOPE STABILIZATION IN FRONT OF BULKHEAD.

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR | DATE | DESCRIPTION | CVM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CLT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT – PWD NORFOLK

NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
NORFOLK NAVAL STATION

NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

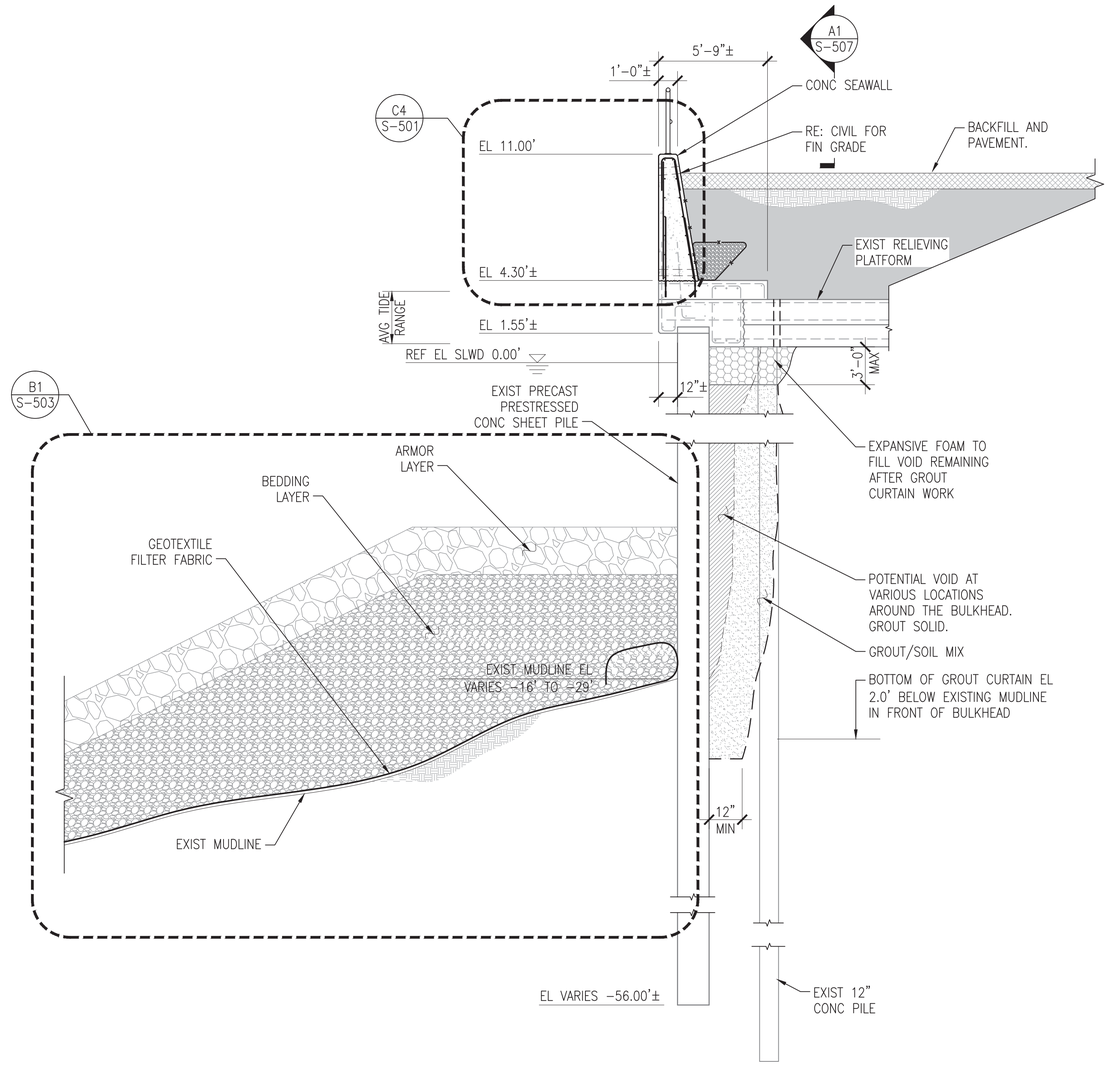
SECTIONS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,773
SHEET 118 OF 158

S-307

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NavalStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Repair\B_Design\Drawings\Sheet\07_Structural\1370817_S-300 SERIES.dwg LAYOUT NAME: S-307 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



B1 SECTION - BULKHEAD TYPE 8

SCALE: 1/4" = 1'-0"

S-111

GENERAL SHEET NOTES

1. REFER TO PLAN FOR LOCATIONS OF GROUT CURTAIN WORK. REFER TO S-504 FOR GROUT CURTAIN DETAILS AND PROCEDURES.
2. REFER TO GRADING PLAN ON S-401 FOR LOCATION OF SLOPE STABILIZATION IN FRONT OF BULKHEAD.

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR | DATE | DESCRIPTION | CYM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW CMR | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CJT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

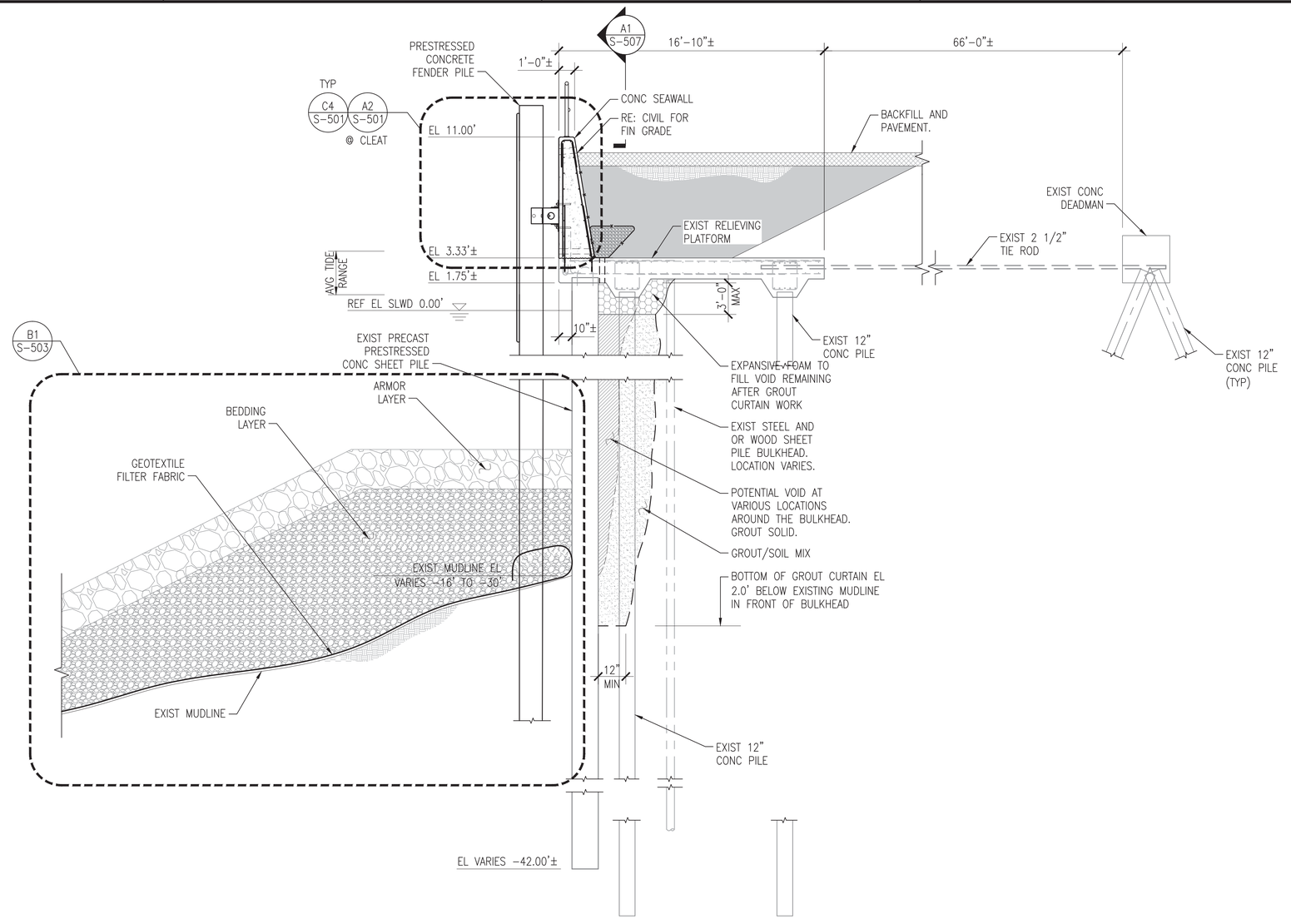
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA
CEP-175 AND Z-308 BULKHEAD REPAIR
SECTIONS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,774
SHEET 119 OF 158

S-308

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structure\1370817_S-300 SERIES.dwg LAYOUT NAME: S-308 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



B1 SECTION - BULKHEAD TYPE 9

SCALE: 1/4" = 1'-0"

S-111A TO S-113

GENERAL SHEET NOTES

1. REFER TO PLAN FOR LOCATIONS OF GROUT CURTAIN WORK. REFER TO S-504 FOR GROUT CURTAIN DETAILS AND PROCEDURES.
2. REFER TO GRADING PLAN ON S-401 FOR LOCATION OF SLOPE STABILIZATION IN FRONT OF BULKHEAD.

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR | DATE | DESCRIPTION | CVM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CLT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND--MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

SECTIONS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

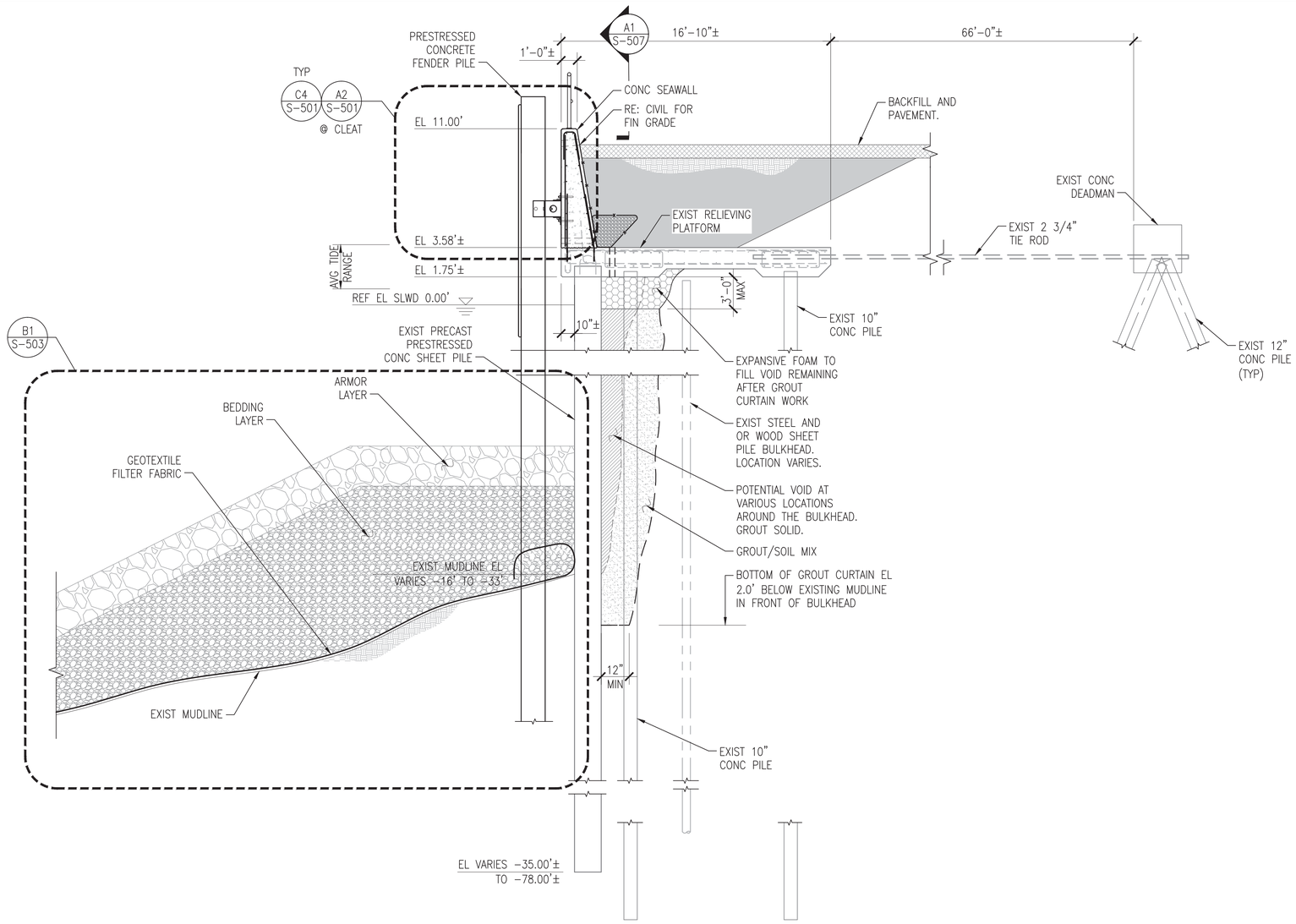
NAVFAC DRAWING NO. 12,729,775

SHEET 120 OF 158

S-309

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NewolkStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Report\8_Design\Drawings\Sheet\07_Structure\1370817_S-300 SERIES.dwg LAYOUT NAME: S-309 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



B1 SECTION - BULKHEAD TYPE 10

SCALE: 1/4" = 1'-0"

S-113 TO S-115

GENERAL SHEET NOTES

1. REFER TO PLAN FOR LOCATIONS OF GROUT CURTAIN WORK. REFER TO S-504 FOR GROUT CURTAIN DETAILS AND PROCEDURES.
2. REFER TO GRADING PLAN ON S-401 FOR LOCATION OF SLOPE STABILIZATION IN FRONT OF BULKHEAD.

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CHT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
HAMPTON ROADS IPT – PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA
CEP-175 AND Z-308 BULKHEAD REPAIR
SECTIONS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

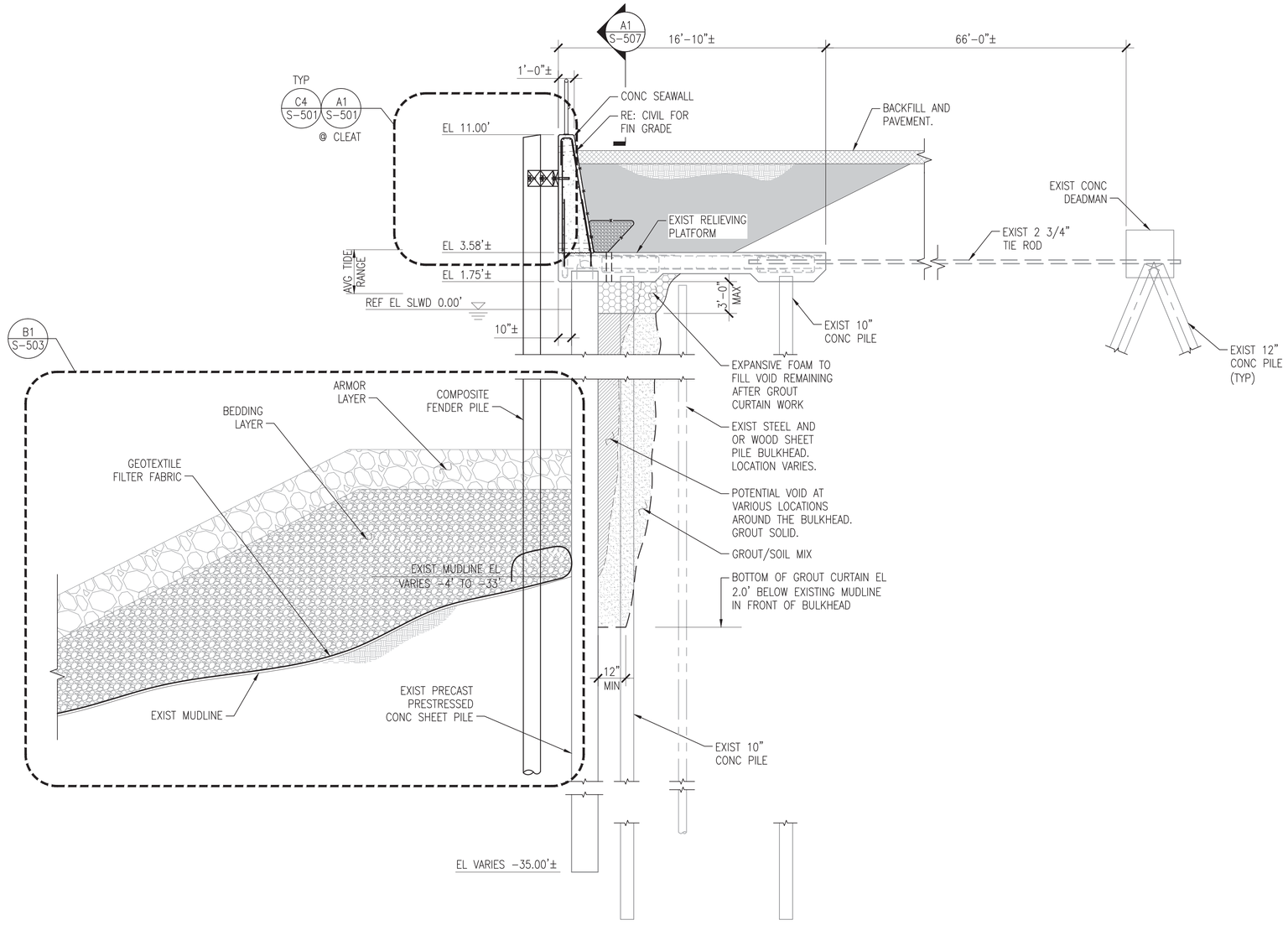
NAVFAC DRAWING NO. 12,729,776

SHEET 121 OF 158

S-310

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752 - 308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-300 SERIES.dwg LAYOUT NAME: S-310 SECTIONS PLOTTED: Tuesday, July 12, 2016 – 12:46pm USER: kimberly.a.davis2



B1 SECTION - BULKHEAD TYPE 11

SCALE: 1/4" = 1'-0"

S-115A TO S-119

GENERAL SHEET NOTES

1. REFER TO PLAN FOR LOCATIONS OF GROUT CURTAIN WORK. REFER TO S-504 FOR GROUT CURTAIN DETAILS AND PROCEDURES.
2. REFER TO GRADING PLAN ON S-401 FOR LOCATION OF SLOPE STABILIZATION IN FRONT OF BULKHEAD.

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR	DATE	DESCRIPTION	CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CAT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND—MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

SECTIONS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

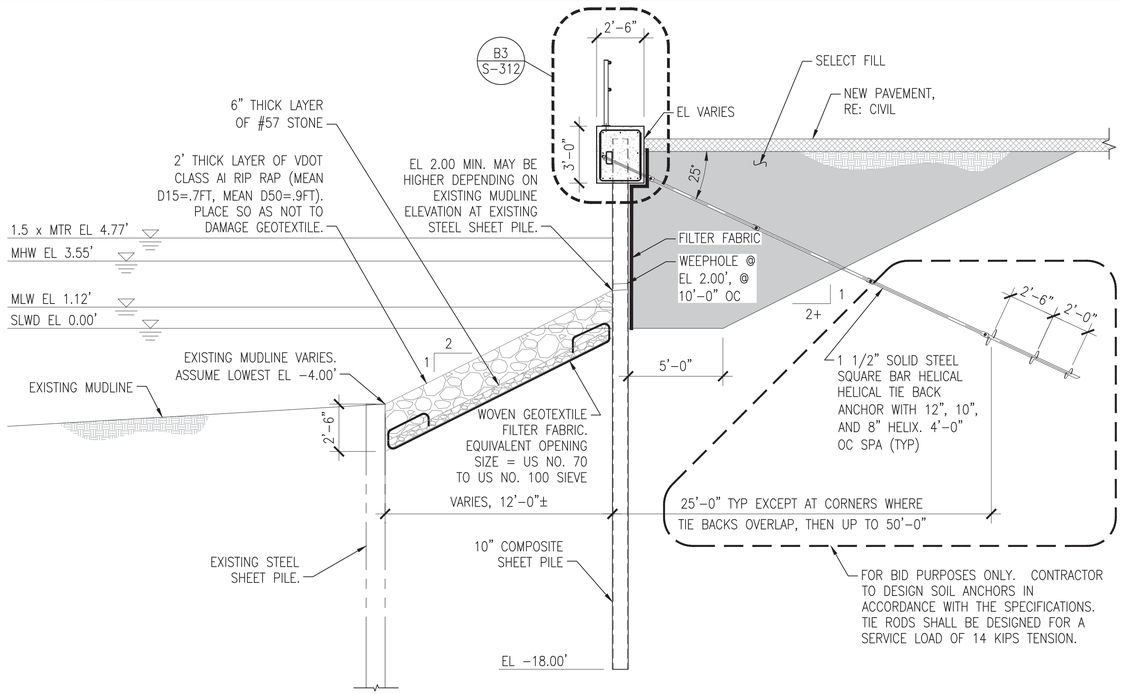
NAVFAC DRAWING NO. 12,729,777

SHEET 122 OF 158

S-311

DRAWFORM REVISION: 10 MARCH 2009

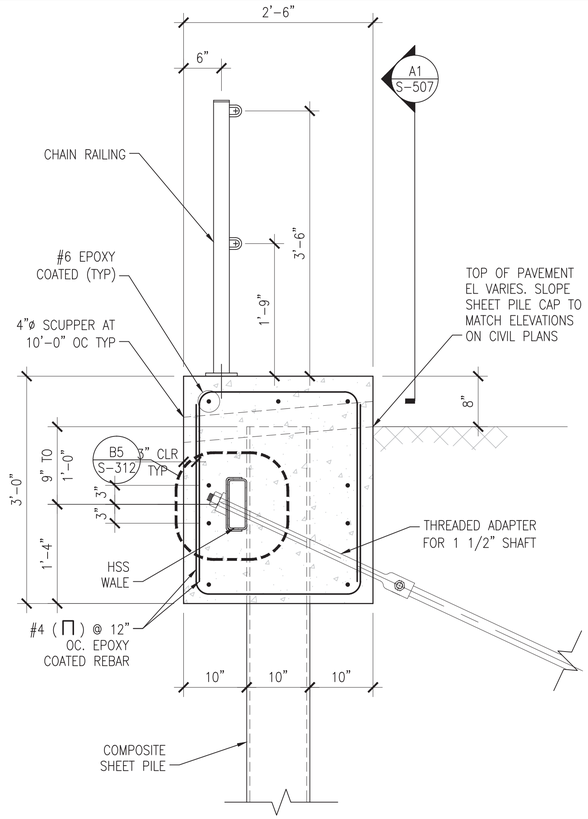
FILE NAME: P:\VA\NewsStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Report\8_Design\Drawings\Sheet\07_Structure\1370817_S-300 SERIES.dwg LAYOUT NAME: S-311 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



C1 SECTION PATRIOT'S PT

SCALE: 1/4" = 1'-0"

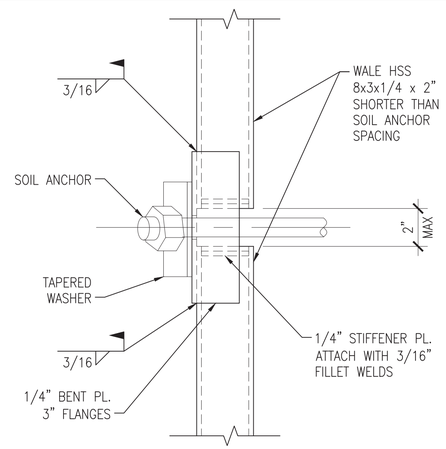
S-120 TO S-121



B3 PART SECTION PATRIOT'S PT

SCALE: 1" = 1'-0"

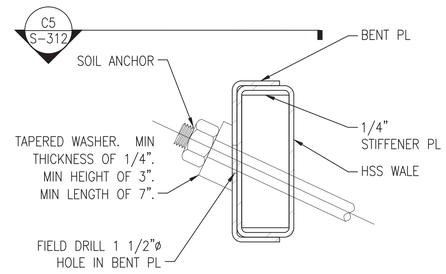
S-312



C5 PLAN DETAIL - WALE SPLICE

SCALE: 3" = 1'-0"

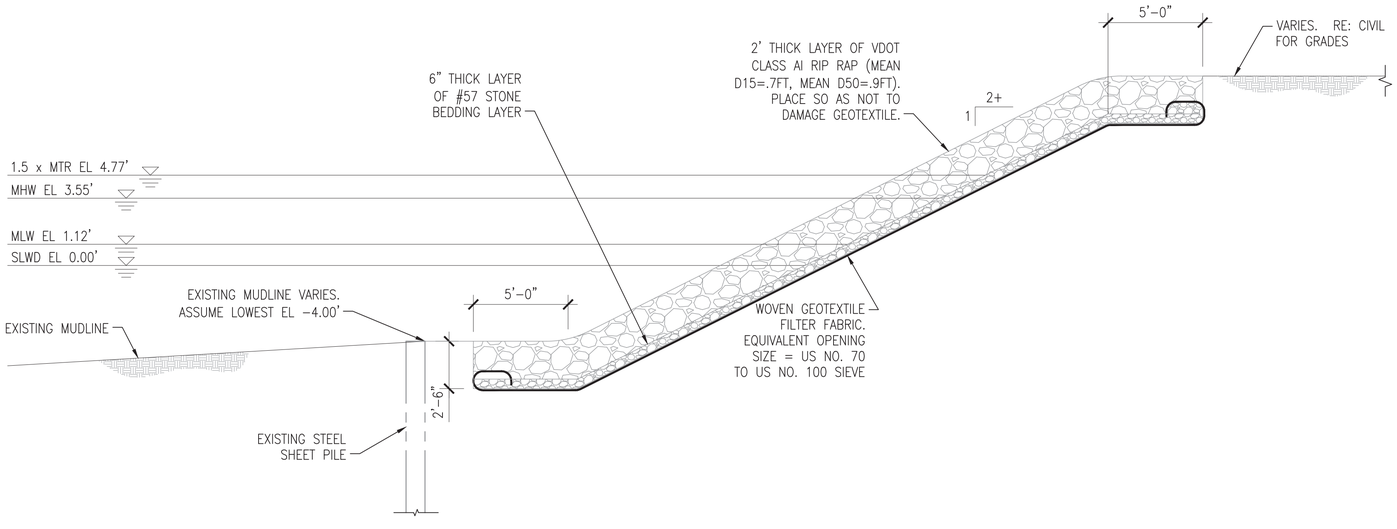
S-312



B5 SECTION - WALE SPLICE

SCALE: 3" = 1'-0"

S-312



A1 SECTION PATRIOT'S PT SLOPE PROTECTION

SCALE: 1/4" = 1'-0"

S-120

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

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

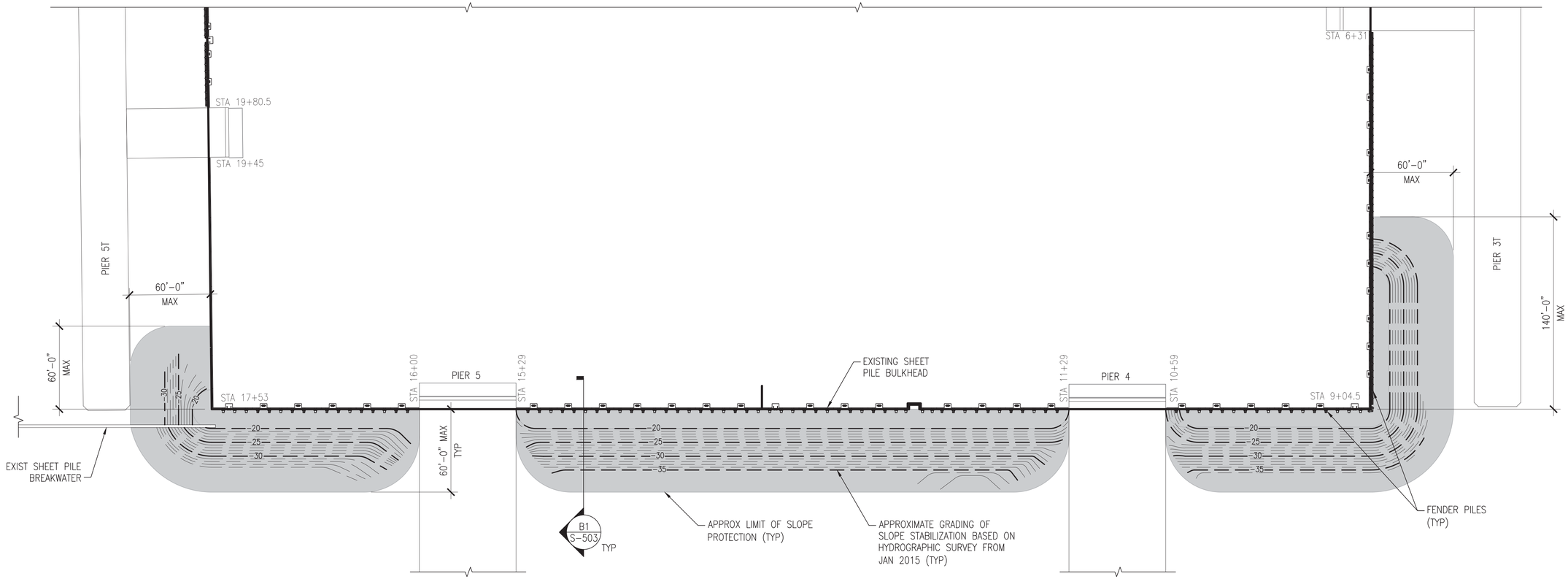
3"=1'-0" 0 3" 6" 9"

DEPARTMENT OF THE NAVY	NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC	NORFOLK, VIRGINIA
HAMPTON ROADS IPT – PWD NORFOLK	NORFOLK NAVAL STATION
CEP-175 AND Z-308 BULKHEAD REPAIR	SECTIONS
SCALE: AS NOTED	
EPROJECT NO. 1370817	
CONSTR. CONTR. NO. N/A	
NAVFAC DRAWING NO. 12,729,778	
SHEET 123 OF 158	
S-312	

APPROVED
FOR COMMANDER NAVFAC 7-12-16
ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW CMR | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CHF
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-300 SERIES.dwg LAYOUT NAME: S-312 SECTIONS PLOTTED: Tuesday, July 12, 2016 - 12:46pm USER: kimberly.a.davis2



B1 CEP-175 SLOPE REPAIR PLAN - PLACEMENT OF SLOPE REPAIR MATERIAL

SCALE: 1" = 40'

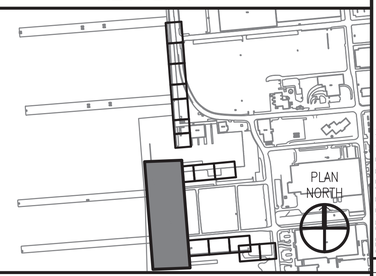
NORTH

S-004, S-306 TO S-311

GENERAL SHEET NOTES

1. APPROXIMATE LIMITS OF SLOPE STABILIZATION SHOWN BASED ON DATA FROM HYDROGRAPHIC SURVEY IN JANUARY 2015. EXISTING CONDITIONS AT TIME OF CONSTRUCTION WILL VARY. REFER TO SECTIONS AND DETAILS FOR INFORMATION ON SLOPES, ELEVATIONS, MATERIALS, ETC.

KEYPLAN



GRAPHIC SCALE

1"=40' 0' 40' 80'

APPR | DATE | DESCRIPTION | SYM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY: DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CPT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
HAMPTON ROADS IPT – PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

CEP-175 SLOPE REPAIR

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

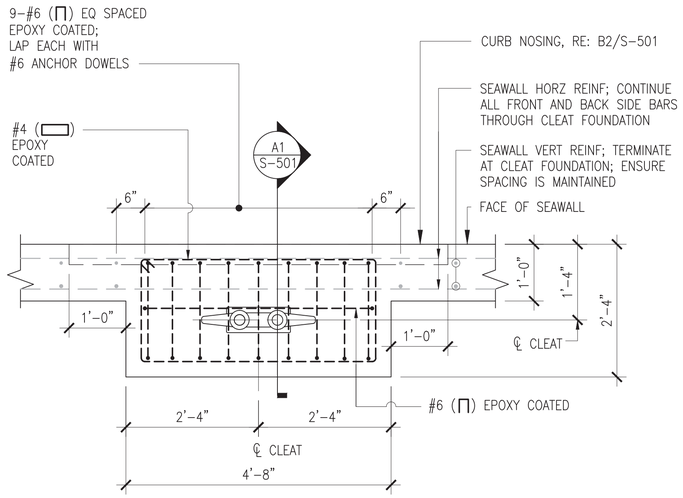
NAVFAC DRAWING NO. 12,729,779

SHEET 124 OF 158

S-401

DRAWFORM REVISION: 10 MARCH 2009

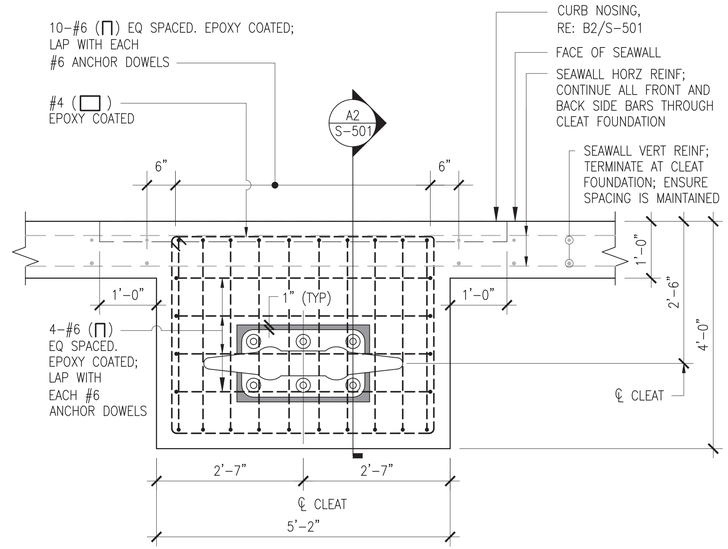
FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-401.dwg LAYOUT NAME: S-401 CEP-175 SLOPE REPAIR PLOTTED: Tuesday, July 12, 2016 - 1247pm USER: kimberly.a.davis2



C1 PLAN - 24 CLEAT FOUNDATION

SCALE: 3/4" = 1'–0"

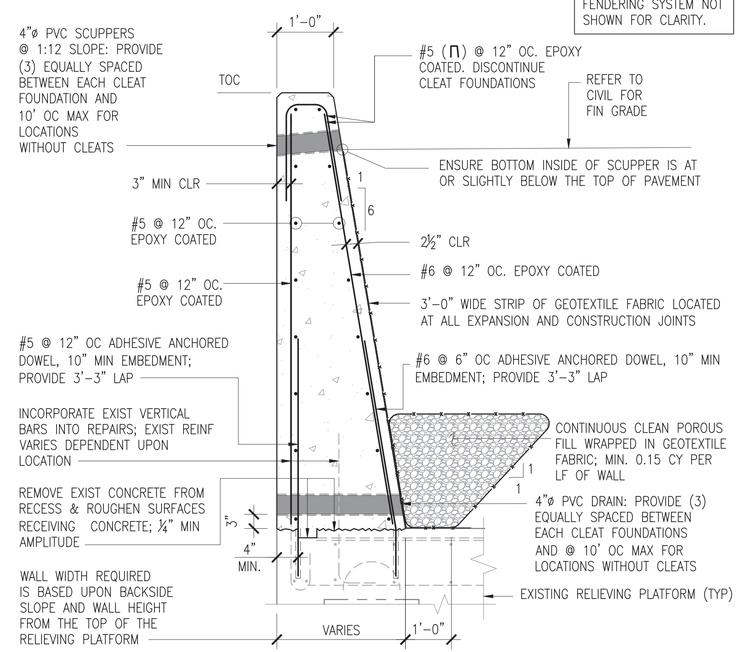
S–108 TO S–110, S–115A TO S–119



C2 PLAN - 42 CLEAT FOUNDATION

SCALE: 3/4" = 1'–0"

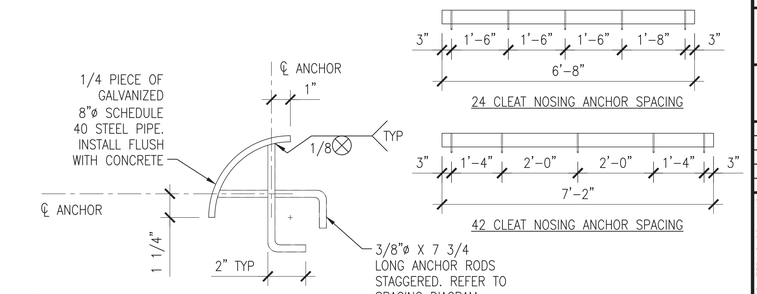
S–111A TO S–115



C4 SECTION - TYPICAL SEAWALL

SCALE: 3/4" = 1'–0"

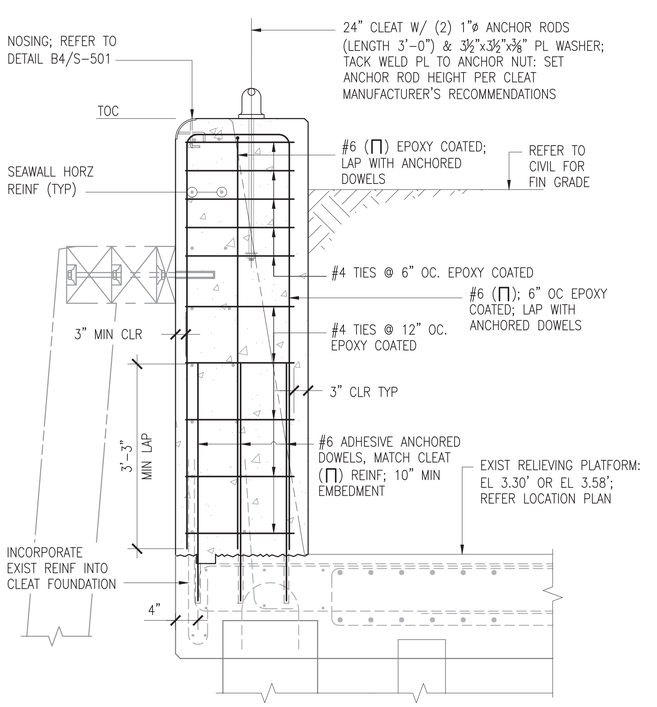
S–305 TO S–311



B4 NOSING DETAIL

SCALE: 3" = 1'–0"

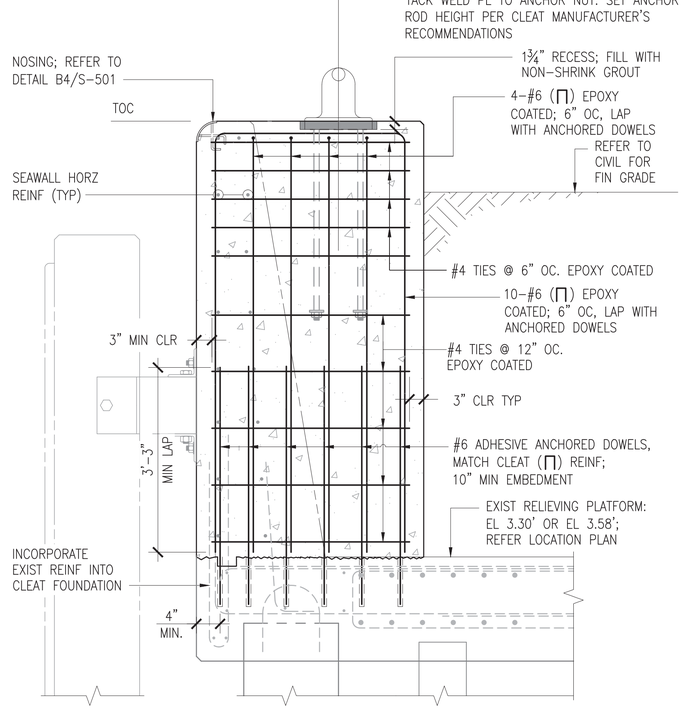
S–501



A1 SECTION - 24 INCH CLEAT (TYPICAL)

SCALE: 3/4" = 1'–0"

S–501, S–305, S–306, S–311



A2 SECTION - 42 CLEAT (TYPICAL)

SCALE: 3/4" = 1'–0"

S–501, S–309, S–310

GENERAL SHEET NOTES

1. REFER TO PARTIAL PLAN VIEWS (S–108 TO S–119) FOR TYPE AND LOCATION OF CLEATS. LOCATIONS AND SPACING ARE SHOWN FOR BIDDING PURPOSES AND SOME ADJUSTMENTS (5'±) MAY BE MAY WARRANTED DUE TO EXISTING CONDITIONS UNCOVERED DURING THE EXECUTION OF THE REPAIRS.

GRAPHIC SCALE

3/4"=1'–0" 0 1' 2' 3'

3"=1'–0" 0 3" 6" 9"

APPR	DATE	DESCRIPTION	CTM

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES: CMR DRW: CMR CHK: CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CKT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND – MID-ATLANTIC
NORFOLK NAVAL STATION
HAMPTON ROADS PT. – PWD NORFOLK

NAVAL FACILITIES ENGINEERING COMMAND – MID-ATLANTIC
NORFOLK, VIRGINIA
NORFOLK NAVAL STATION

CEP-175 AND Z-308 BULKHEAD REPAIR

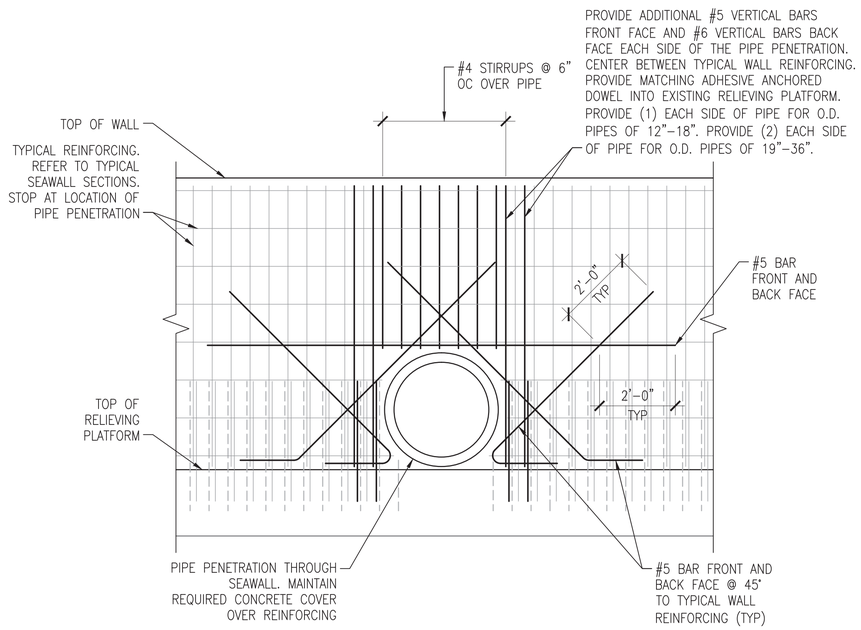
TYPICAL CLEATS AND SEAWALL DETAILS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,780
SHEET 125 OF 158

S-501

DRAWFORM REVISION: 10 MARCH 2009

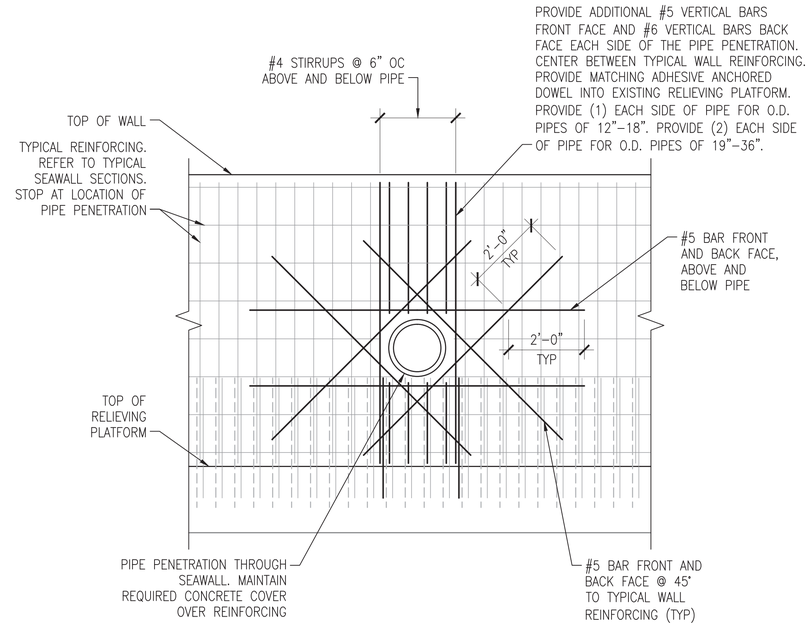
FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762-308Report\B_Design\Drawings\Sheet\07_Structure\S-505 FENDER SYSTEM REPAIRS.dwg LAYOUT NAME: S-501 TYPICAL CLEATS AND SEAWALL DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:47pm USER: kimberly.a.davis2



C1 PIPE PENETRATION - BOT OF WALL

SCALE: 1/2" = 1'–0"

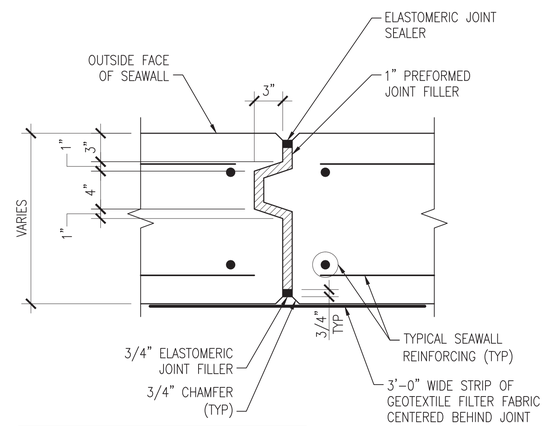
S–112, S–115A, S–118



C3 PIPE PENETRATION - MID OF WALL

SCALE: 1/2" = 1'–0"

S–110

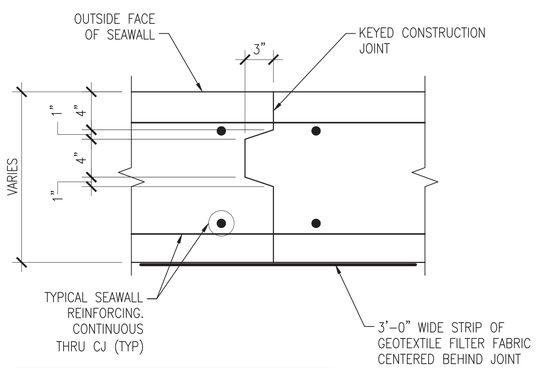


NOTE: ANCHORS INTO SEAWALL FOR RAILINGS, FENDERING SYSTEM, ETC SHALL NOT BE WITHIN 4" OF A JOINT.

A1 TYP DETAIL - EXPANSION JOINT

SCALE: 1 1/2" = 1'–0"

S–108 TO S–119

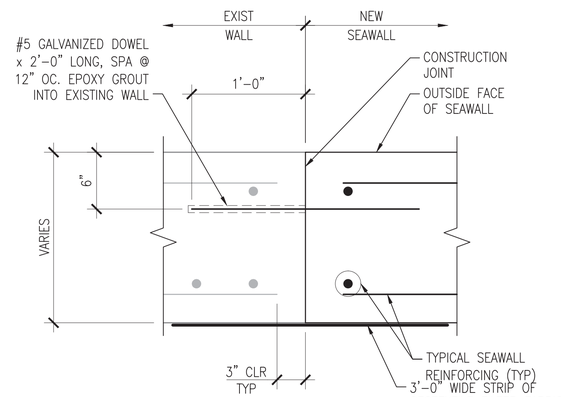


NOTE: SEE PLAN FOR LOCATIONS OF CJ. PLACE CJ AT 25' MAX ON CENTER IN SEAWALL. ANCHORS INTO SEAWALL FOR RAILINGS, FENDERING SYSTEM, ETC SHALL NOT BE WITHIN 4" OF A JOINT.

A2 TYP DETAIL - CONSTRUCTION JOINT

SCALE: 1 1/2" = 1'–0"

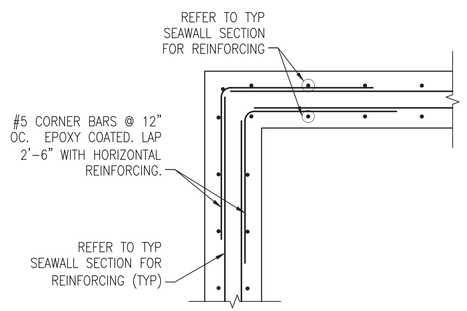
S–108 TO S–119



A3 DETAIL - CONSTRUCTION JOINT AT EXIST

SCALE: 1 1/2" = 1'–0"

S–108 TO S–119



A5 TYP PLAN DETAIL - SEAWALL CORNER

SCALE: 3/4" = 1'–0"

S–111, S–111A, S–115, S–115A

GRAPHIC SCALE

1/2"=1'–0" 0' 1' 2' 4'

1–1/2"=1'–0" 0 6" 1' 1'–6"

							APPR
							DATE
							DESCRIPTION
							CTM

NAVFAC

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES CMR | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CMT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION, NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

TYPICAL SEAWALL DETAILS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

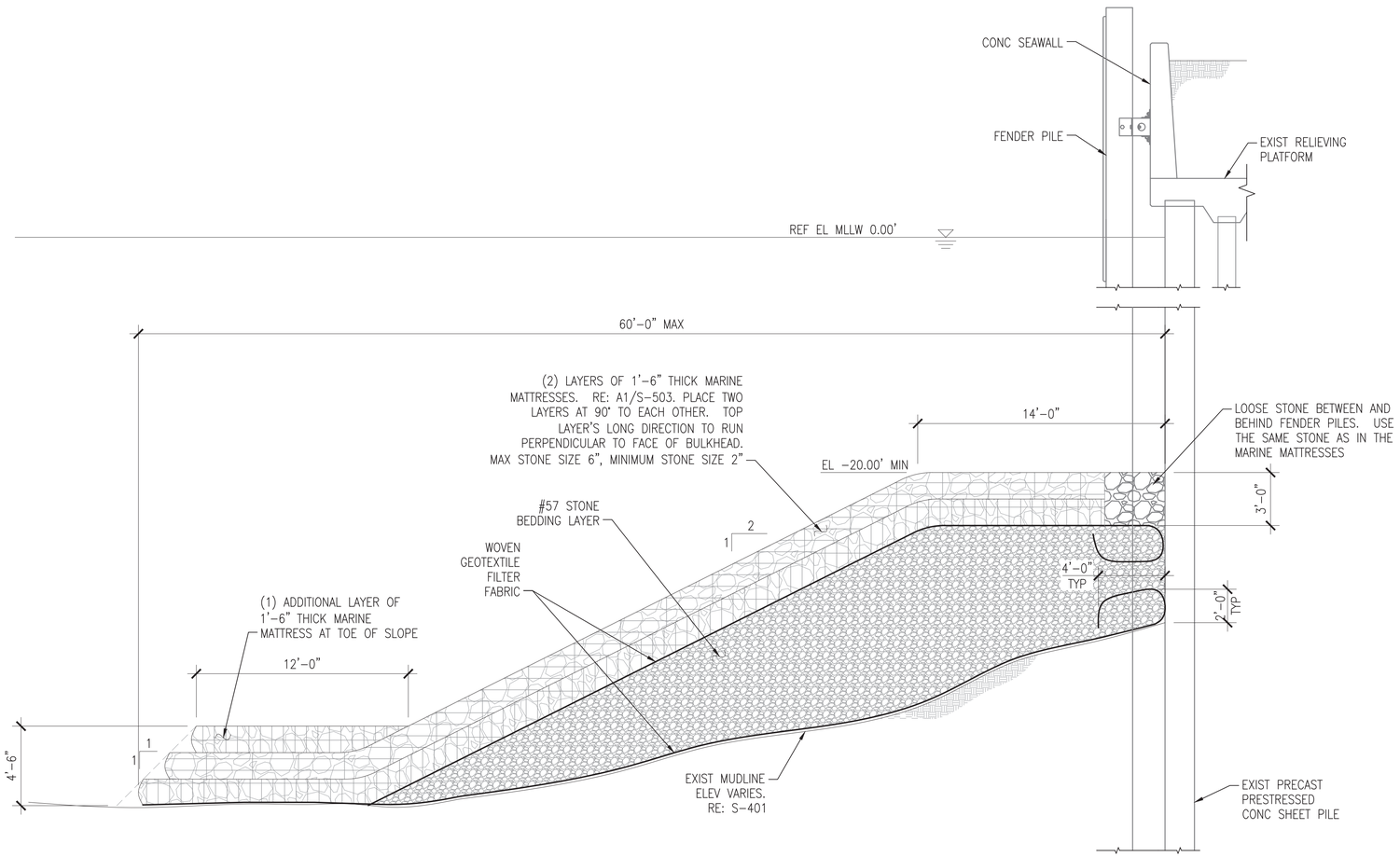
NAVFAC DRAWING NO. 12,729,781

SHEET 126 OF 158

S-502

DRAWFORM REVISION: 10 MARCH 2009

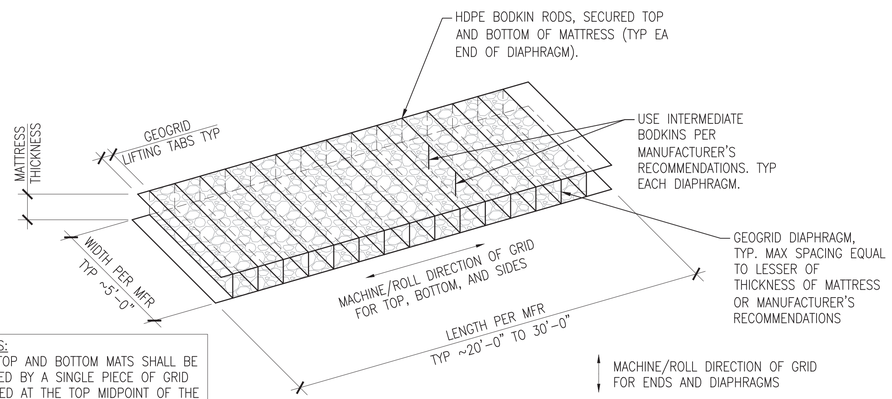
FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762-308Repair\IB_Design\Drawings\Sheet\07_Structure\1370817_S-500 SERIES.dwg LAYOUT NAME: S-502 TYPICAL SEAWALL DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:47pm USER: kimberly.a.davis2



B1 CEP-175 SLOPE STABILIZATION REPAIR

SCALE: 1/4" = 1'-0"

S-306 TO S-311, S-401



NOTES:
THE TOP AND BOTTOM MATS SHALL BE FORMED BY A SINGLE PIECE OF GRID SPLICED AT THE TOP MIDPOINT OF THE MAT BY SEAMING METHOD PER MFR RECOMMENDATIONS.

A1 TYPICAL MARINE MATTRESS

SCALE: NTS

S-503

GENERAL NOTES

1. NOTE, CONCRETE FENDER PILES SHOWN. COMPOSITE PILES SIMILAR.

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES CMR | DRW CMR | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CLT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

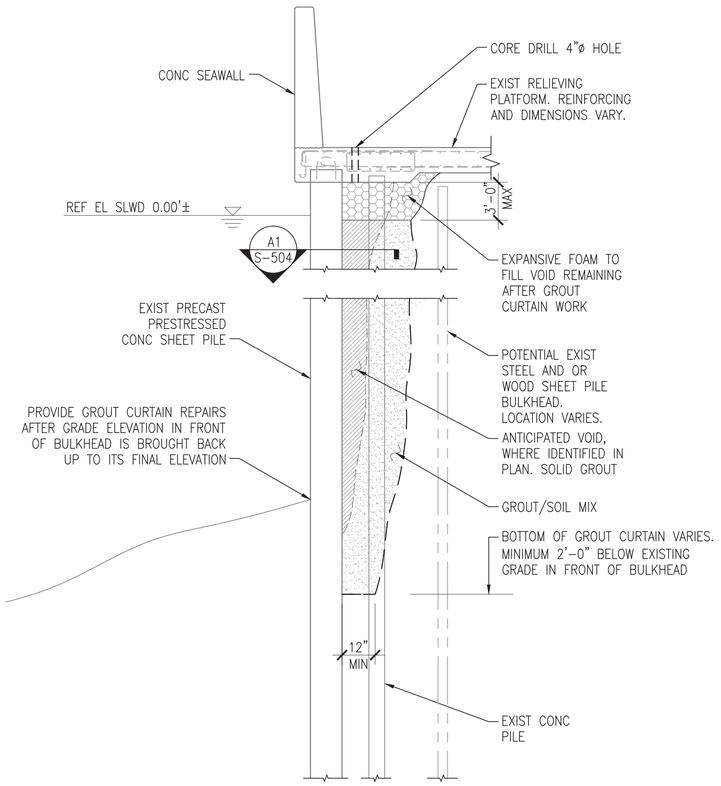
TYPICAL SLOPE STABILIZATION DETAILS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,782
SHEET 127 OF 158

S-503

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NewsStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Repair\B_Design\Drawings\Sheet\07_Structure\\1370817_S-500 SERIES.dwg LAYOUT NAME: S-503 TYPICAL SLOPE STABILIZATION DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:47pm USER: kimberly.a.davis2



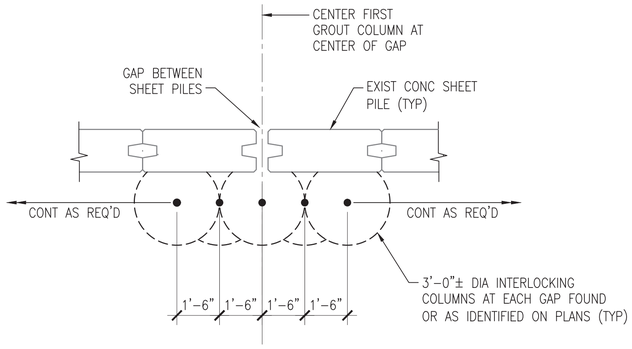
TYPICAL CEP-175 GROUT CURTAIN PROCEDURE:

1. GROUT CURTAIN INSTALLATION SHALL NOT BEGIN UNTIL ALL GAPS AND LOCATIONS OF FILL LOSS HAVE BEEN DETERMINED AND REPAIR AREAS APPROVED BY THE CONTRACTING OFFICER.
2. INSPECTION SHALL OCCUR FOR THE ENTIRE LENGTH OF THE CEP-175 BULKHEAD WALL, AND NOT JUST AT THE AREAS IDENTIFIED ON PLANS. EXTERIOR OF EXISTING SHEET PILES SHALL BE INSPECTED BY DIVERS AND ALL JOINTS PROBED TO DETERMINE IF FILL IS BEING LOST BETWEEN THE SHEETS.
3. ANY LOCATION, OUTSIDE OF THE AREAS MARKED ON PLANS, THAT HAVE THE POTENTIAL OF BECOMING A LOCATION FOR FUTURE FILL LOSS SHALL BE IDENTIFIED TO THE CONTRACTING OFFICER.
4. EXCAVATE TO EXPOSE TOP OF RELIEVING PLATFORM.
5. LOCATE ALL TIE RODS AND REINFORCING.
6. CORE DRILL 4"ø HOLE THRU RELIEVING PLATFORM @ 3'-0" OC MAX SPACING. AVOID EXISTING REINFORCING. THE SPACING OF GROUT HOLES IS DEPENDENT UPON CONTRACTORS' PROPOSED METHOD OF GROUT INJECTION. SPACING OF HOLES TO PROVIDE A CONTINUOUS, IMPERVIOUS GROUT CURTAIN SHALL BE ESTABLISHED IN THE FILED BY CONSTRUCTION OF A MINIMUM OF 1 TEST SECTION EVERY 400FT OF BULKHEAD. CONTINUITY SHALL BE VERIFIED BY TESTING TO THE SATISFACTION OF THE CONTRACTING OFFICER PRIOR TO STARTING BULKHEAD GROUTING.
7. INSERT TIP OF GROUT TUBE TO ELEVATION SHOWN AS "BOTTOM OF GROUT CURTAIN" AND BEGIN GROUTING. CONTRACTOR SHALL CONTINUOUSLY MONITOR AND PACK SHEET PILE INTERLOCK JOINTS AS NECESSARY TO PREVENT GROUT LOSS THRU THE BULKHEAD AS GROUT TUBE IS SLOWLY RAISED.
8. AT UTILITY BULKHEAD PENETRATIONS, ADJUST SPACING OF GROUT CURTAIN CELLS TO ENCOMPASS ENTIRE UTILITY LINE AND SEAL THE BULKHEAD. TO ENSURE FULL GROUTING AROUND LARGER UTILITIES, CONTRACTOR SHALL ANGLE BORE GROUT CURTAIN CELL TO ACCESS AREA AROUND UTILITY OTHERWISE INACCESSIBLE.
9. FILL THE REMAINING VOID AT THE TOP OF THE GROUT COLUMN REPAIR WITH EXPANSIVE FOAM IN ACCORDANCE WITH THE SPECIFICATIONS.
10. FILL CORE DRILLED HOLE THROUGH RELIEVING PLATFORM WITH NON-SHRINK GROUT.

B1 CEP-175 GROUT CURTAIN REPAIR

SCALE: 1/4" = 1'-0"

S-305 TO S-311



A1 DETAIL - GROUT CURTAIN

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

S-302, S-504

GRAPHIC SCALE

1/4"=1'-0" 0' 2' 4' 8'

3/8"=1'-0" 0' 2' 4' 6'

APPR	DATE	DESCRIPTION	CTM
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SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES ELT | DRW CMR | CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CLT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

TYPICAL GROUT CURTAIN DETAILS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

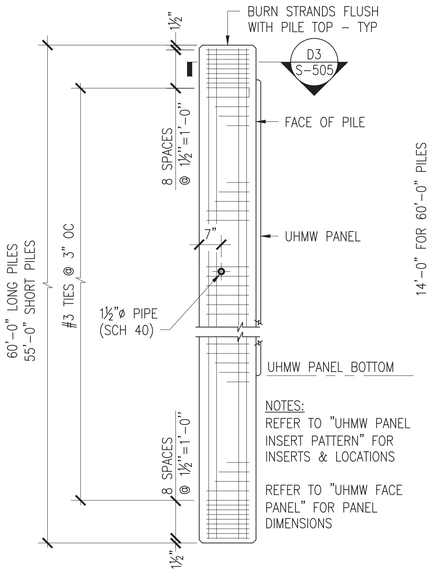
NAVFAC DRAWING NO. 12,729,783

SHEET 128 OF 158

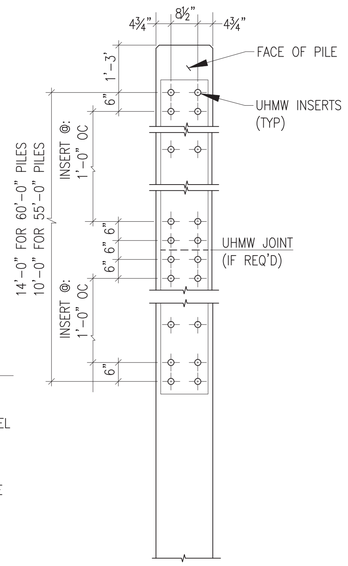
S-504

DRAWFORM REVISION: 10 MARCH 2009

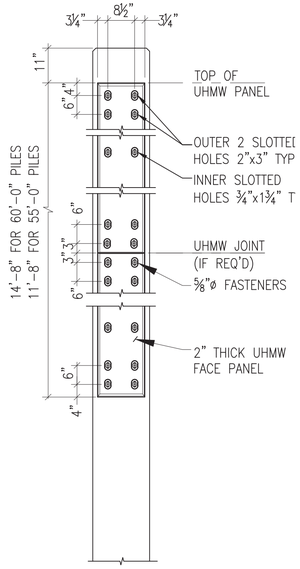
FILE NAME: P:\VA\NewsStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-175Z-308Repair\8_Design\Drawings\Sheet\07_Structure\1370817_S-500 SERIES.dwg LAYOUT NAME: S-504 TYPICAL GROUT CURTAIN DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:47pm USER: kimberly.o.davis2



PILE REINFORCEMENT



UHMW PANEL INSERT PATTERN

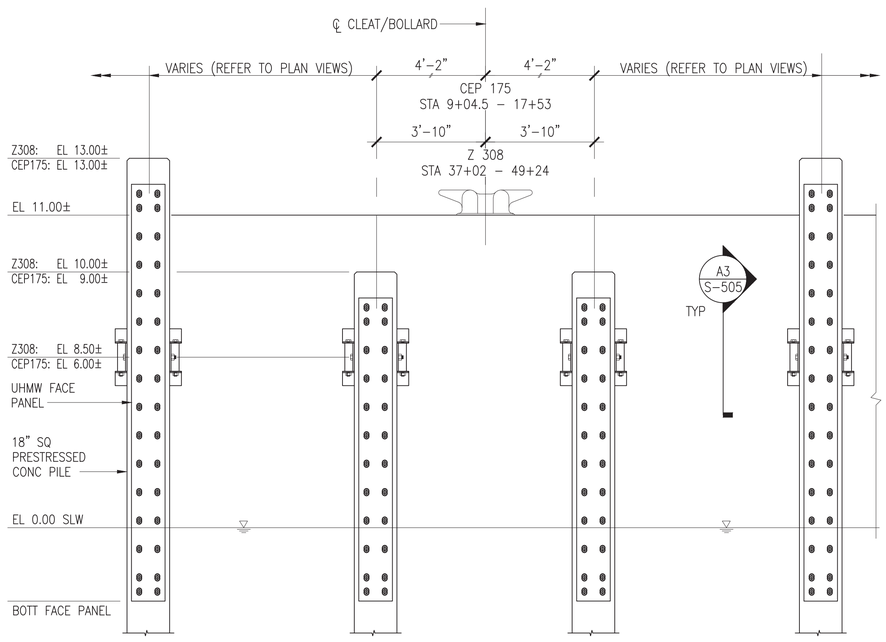


UHMW FACE PANEL

C1 PRESTRESSED FENDER PILE - ELEVATIONS & SECTIONS

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

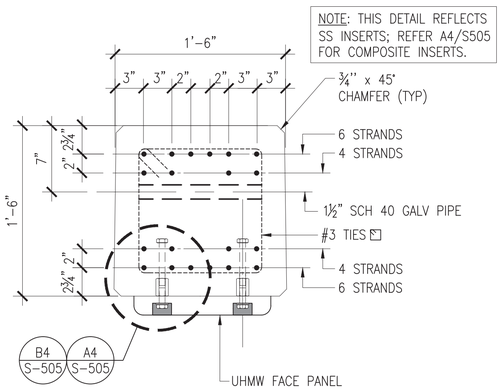
S-101 TO S-107, S-111A TO S-115



A1 ELEVATION - PRESTRESSED FENDER PILES AT MOORING FIXTURES

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

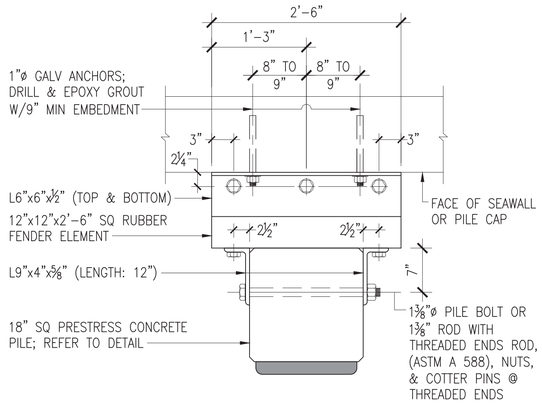
S-101 TO S-107, S-111A TO S-115



D3 PLAN - FENDER PILE SECTION

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

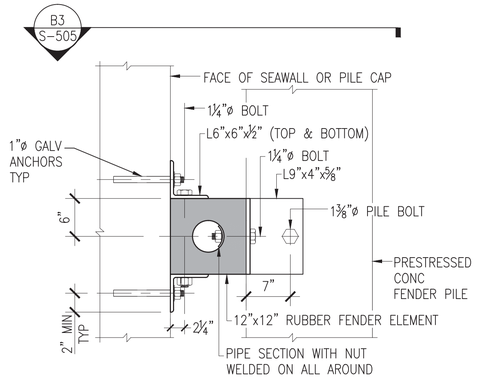
S-505



B3 PLAN - PRESTRESSED FENDER PILE BRACKETS

SCALE: 1" = 1'-0"

S-505



A3 ELEVATION - PRESTRESSED PILE BRACKETS

SCALE: 1" = 1'-0"

S-505

GENERAL SHEET NOTES

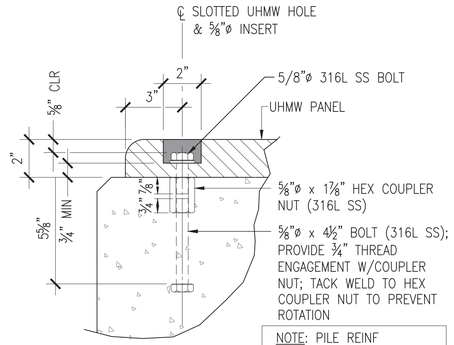
1. MINIMUM CONCRETE STRENGTH f'c=8000 PSI @ 28 DAY
2. TRANSFER OF PRESTRESSING FORCE @ f'c=5600 PSI OF CONCRETE STRENGTH
3. PRESTRESSING STEEL SHALL BE 20 – ½"ø 270 KSI SEVEN WIRE, UNCOATED, LOW RELAXATION STRANDS. STRAND DIMENSIONS MAY BE ADJUSTED TO ENSURE CLEARANCE OF UHMW INSERTS WITH CONTRACTING OFFICERS PRIOR APPROVAL.
4. #3 ◻ TIES SHALL CONFORM TO ASTM A615, GRADE 60.
5. RESIDUAL FINAL PRESTRESS AFTER LOSSES SHALL NOT BE LESS THAN 600 PSI.
6. INSTALL PILES WITH INSERTS FACING AWAY FROM THE PIER.
7. THERE SHALL BE (2) DIFFERENT TYPES OF INSERT ASSEMBLIES AND UHMW FASTENERS PROVIDED WITH THE FENDER PILES. Z-308 PILES SHALL BE PROVIDED WITH ALL 316L STAINLESS STEEL MATERIAL ("DETAIL B4") AND CEP-175 PILES SHALL HAVE ALL COMPOSITE MATERIAL ("DETAIL A4"). REFER TO CONTRACT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
8. UHMW IS INTENDED TO BE PROVIDED IN ONE CONTINUOUS SHEET, BUT MAY BE PROVIDED IN (2) SECTIONS. JOINT SHALL NOT OCCUR BETWEEN ELEVATIONS +6.0' AND -2.0'. ADDITIONAL INSERTS/BOLTS SHALL BE REQUIRED AT JOINT LOCATION.
9. FORM AND PLACE EPOXY SEALER ON TOP OF THE PILE.

PILE BID LENGTHS:

a) LONG: 60'-0" FOR PRESTRESSED FENDER PILES WITH TOP EL 13.00'

b) SHORT: 55'-0" FOR PRESTRESSED FENDER PILES WITH TOP EL 10.00' OR 9.00'

NOTE: THE 3" LONG COMPOSITE SLEEVE NUT IS NOT A COMMERCIALLY AVAILIBLE STANDARD LENGTH.

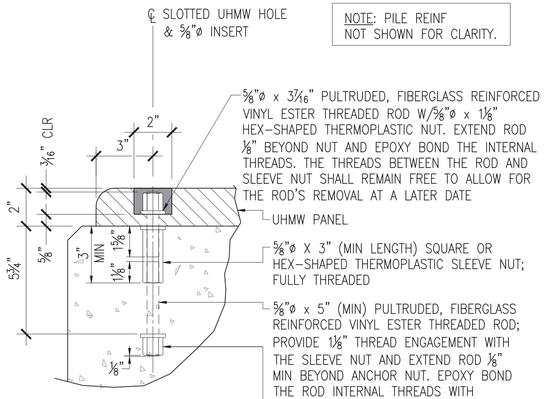


NOTE: PILE REINF NOT SHOWN FOR CLARITY.

B4 DETAIL - STAINLESS STEEL INSERT

SCALE: 3" = 1'-0"

S-505



NOTE: PROVIDE COATING ON ALL COMPOSITE SURFACES IN CONTACT WITH THE CONCRETE TO PROTECT MATERIAL FROM ALKIDES.

A4 DETAIL - COMPOSITE INSERT

SCALE: 3" = 1'-0"

S-505

APPROVED	
FOR COMMANDER NAVFAC	7-12-16
ACTIVITY	DAVE SEARS
SATISFACTORY TO DATE	6/17/2016
DES ELT	DRW ELT
CHK CLT	
DESIGN MANAGER	EDDY THEISZ
BRANCH MANAGER	CPT
CHIEF ENGINEER	J. HASTE, P.E.
FIRE PROTECTION	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT – PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

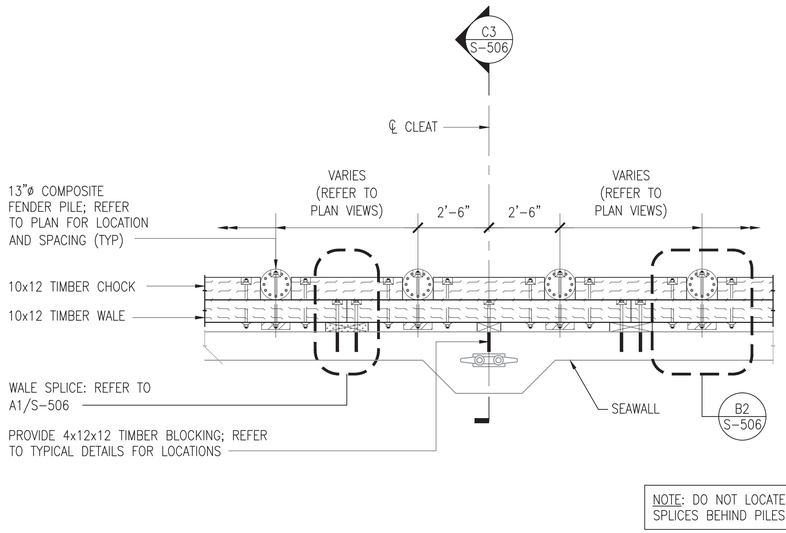
CONCRETE FENDER SYSTEM DETAILS

SCALE:	AS NOTED
EPROJECT NO.	1370817
CONSTR. CONTR. NO.	N/A
NAVFAC DRAWING NO.	12,729,784
SHEET	129 OF 158

S-505

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\R_Design\Drawings\Sheet\07_Structural\S-110 FENDER SYSTEM REPAIRS.dwg LAYOUT NAME: S-505 CONCRETE FENDER SYSTEM DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:47pm USER: kimberly.a.davis2

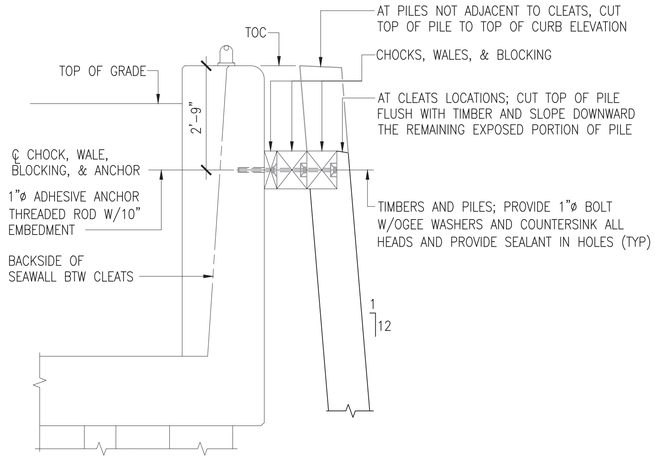


NOTE: DO NOT LOCATE WALE SPLICES BEHIND PILES.

C1 PLAN - COMPOSITE & TIMBER FENDER SYSTEM

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

S-108 TO S-111, S-115A TO S-119



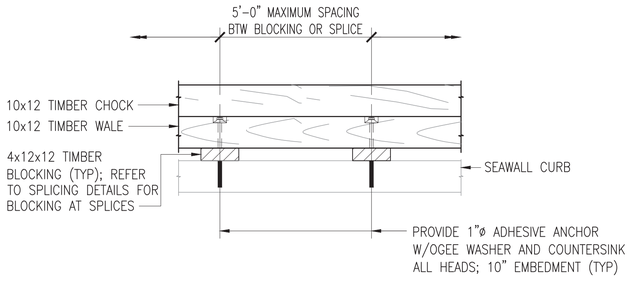
C3 SECTION - COMPOSITE & TIMBER FENDER SYSTEM

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

S-506

GENERAL SHEET NOTES

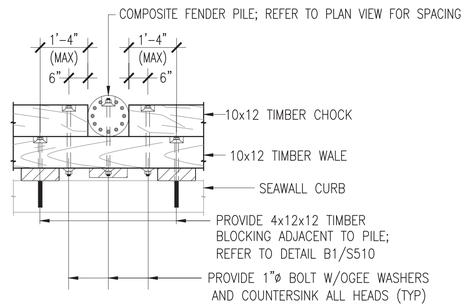
1. COMPOSITE PILES ARE REQUIRED TO BE SALVAGE AND REUSED FOR SOME OF THE OPTIONS. INSPECT AND SELECT PILES. PILES SHALL BE THE OF THE LONGEST LENGTH AND BE IN GOOD CONDITION. MINIMUM LENGTH OF PILE SHALL BE 60 FEET UNLESS DIRECTED OTHERWISE BY THE CONTRACTING OFFICER. PROPERLY DISPOSE OF ALL PILES AND SECTION OF PILES NOT SALVAGED FOR REUSE. PILES FOR REUSE SHALL BE APPROVED BY CONTRACTING OFFICER PRIOR TO INSTALLATION.
2. MINIMIZE SPLICES. PROVIDE WALE SPLICES AS INDICATED:
   a) PROVIDE A "LAP SPLICE" OR "BUTT SPLICE" WHEN THERE ARE LESS THAN (4) ANCHORS W/BLOCKING SECURING A SINGLE WALE SECTION TO THE PIER. A "TOE-NALLED" PORTION OF A "BUTT-SPLICE" SHALL NOT COUNT AS AN ANCHOR.
   b) "TOE-NAILED SPLICE" MAY ONLY BE PROVIDED WHEN THERE IS A MINIMUM OF (5) ANCHORS W/BLOCKING SECURING EACH WALE SECTION TO THE PIER. FOR LESS THAN (5) ANCHORS PER WALE SECTION A "BUTT" OR "LAP" SPLICE SHALL BE REQUIRED. THE TOE-NALLED PORTION OF THE CONNECTION SHALL NOT COUNT AS AN ANCHOR FOR THE SECTION IT CONNECTS. THE SECTION IT CONNECTS.
3. TIMBER CHOCKS, WALES, AND BLOCKING WHICH ARE COUNTERSUNK OR WHICH HAVE BEEN FIELD CUT SHALL RECEIVE A BRUSH APPLIED PRESERVATIVE PRIOR TO INSTALLATION.
4. SCORE ALL EXPOSED THREADS TO ENSURE NUTS DO NOT WORK LOOSE.



B1 PLAN - BLOCKING (TYPICAL)

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

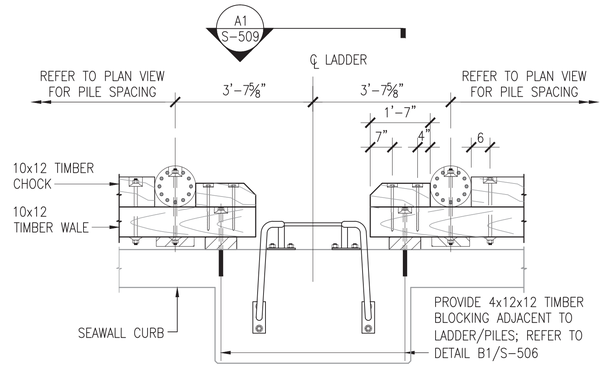
S-506



B2 PLAN - COMPOSITE PILE CONNECTION

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

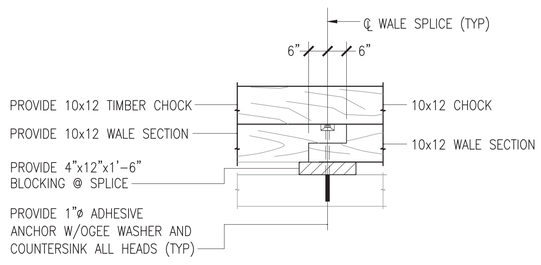
S-506



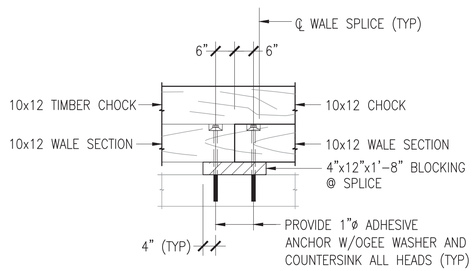
B4 PLAN - LADDER LOCATIONS

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

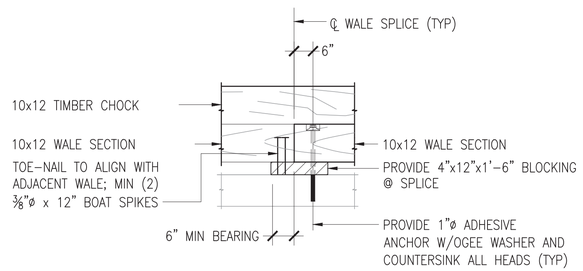
S-509



"LAP SPLICE"



"BUTT SPLICE"



"TOE-NAILED SPLICE"

A1 ACCEPTABLE WALE SPLICES

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

S-506

APPR	DATE	DESCRIPTION	CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW ELT | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CMT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

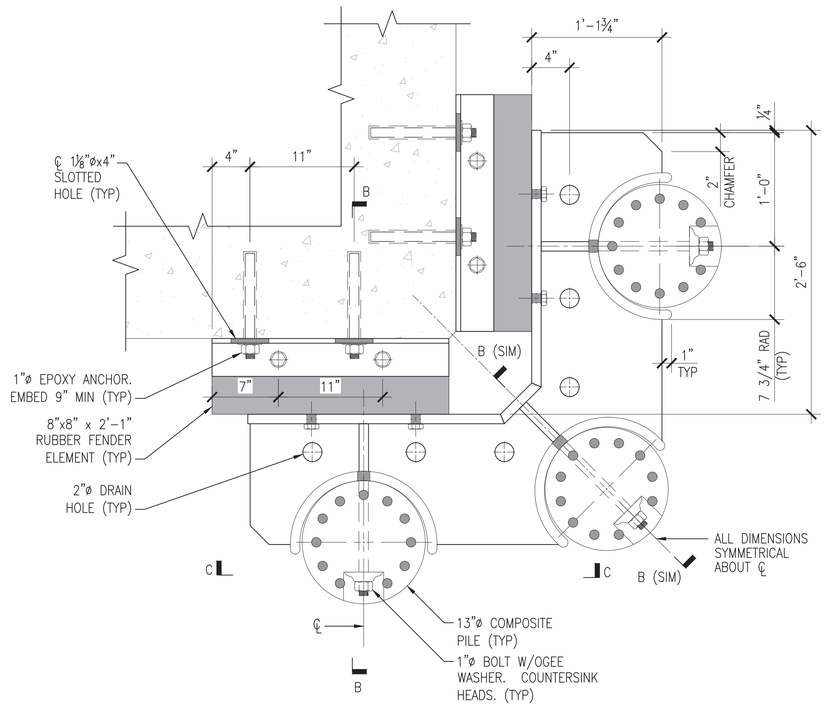
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
HAMPTON ROADS IPT - PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION, VIRGINIA
CEP-175 AND Z-308 BULKHEAD REPAIR
COMPOSITE FENDER SYSTEM DETAILS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,785
SHEET 130 OF 158

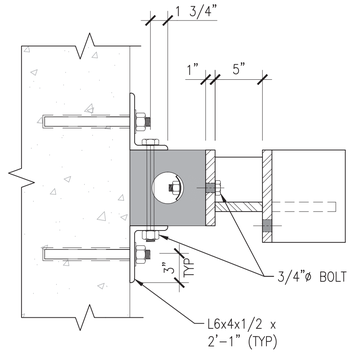
S-506

DRAWFORM REVISION: 10 MARCH 2009

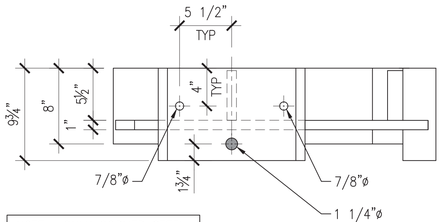
FILE NAME: P:\VA\NewsStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\8_Design\Drawings\Sheet\07_Structural\S110 FENDER SYSTEM REPAIRS.dwg LAYOUT NAME: S-506 COMPOSITE FENDER SYSTEM DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:47pm USER: kimberly.a.davis2



PLAN

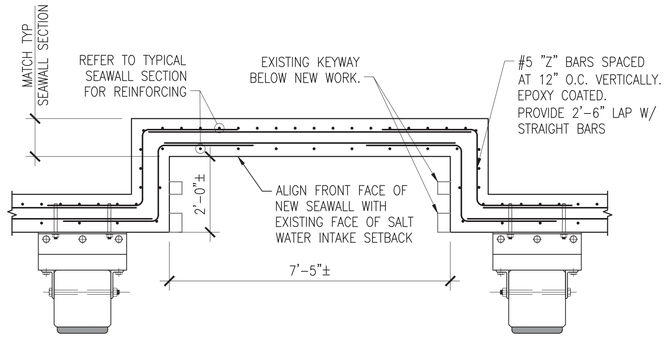


SECTION B-B



NOTE: ONLY CORNER STEEL BRACKET SHOWN FOR CLARITY

SECTION C-C

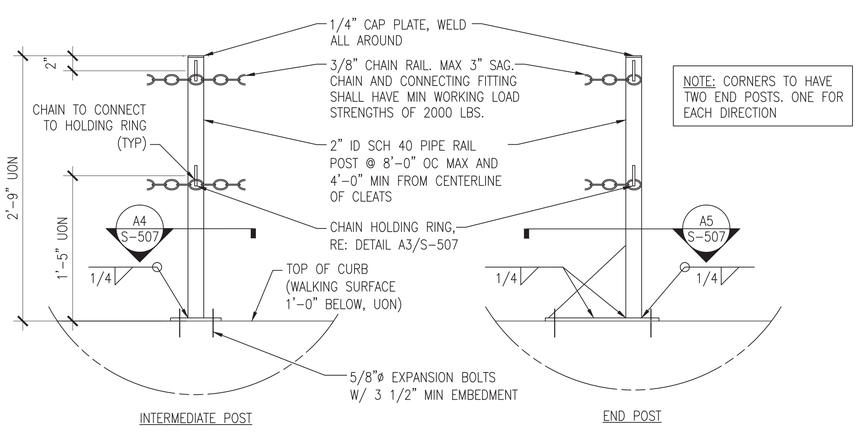


C4 PLAN DETAIL - SEAWALL AT SALT WATER INTAKE

SCALE: 1/2" = 1'-0" S-113

B1 DETAIL - CORNER FENDER PILE BRACKET

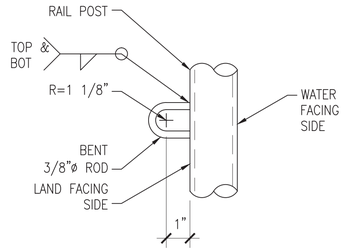
SCALE: 1 1/2" = 1'-0" S-115, S-115A



NOTE: CORNERS TO HAVE TWO END POSTS. ONE FOR EACH DIRECTION

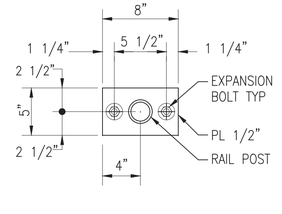
A1 CHAIN RAILING REPAIR ELEV DETAIL

SCALE: 1" = 1'-0" S-307 TO S-312



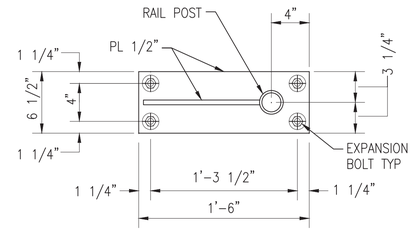
A3 CHAIN HOLDING RING DETAIL

SCALE: 3" = 1'-0" S-507



A4 INTERMED. POST SECTION

SCALE: 1 1/2" = 1'-0" S-507



A5 END POST SECTION

SCALE: 1 1/2" = 1'-0" S-507

GRAPHIC SCALE

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

1-1/2"=1'-0" 0 6" 1' 1'-6"

3"=1'-0" 0 3" 6" 9"

							APPR
							DATE
							DESCRIPTION
							SYM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

DES CMR DRW CMR CHK CLT

DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CHT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
HAMPTON ROADS IPT – PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

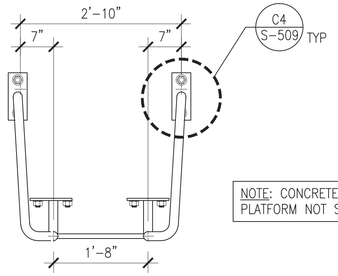
DETAILS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,786
SHEET 131 OF 158

S-507

DRAWFORM REVISION: 10 MARCH 2009

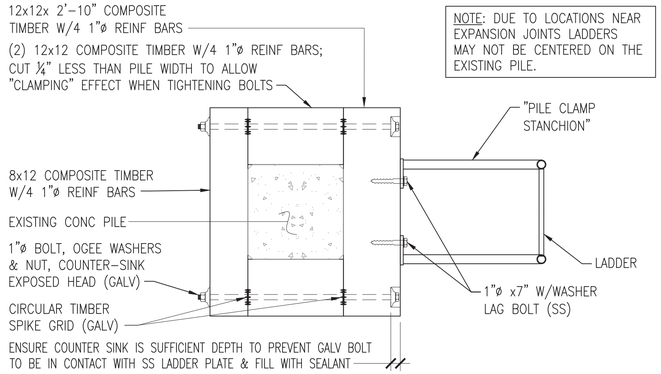
FILE NAME: P:\VA\NorvStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762 - 308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-500 SERIES.dwg LAYOUT NAME: S-507 DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:48pm USER: kimberly.a.davis2



NOTE: CONCRETE CURBING AND LANDING PLATFORM NOT SHOWN FOR CLARIFY.

C1 PLAN - LADDER

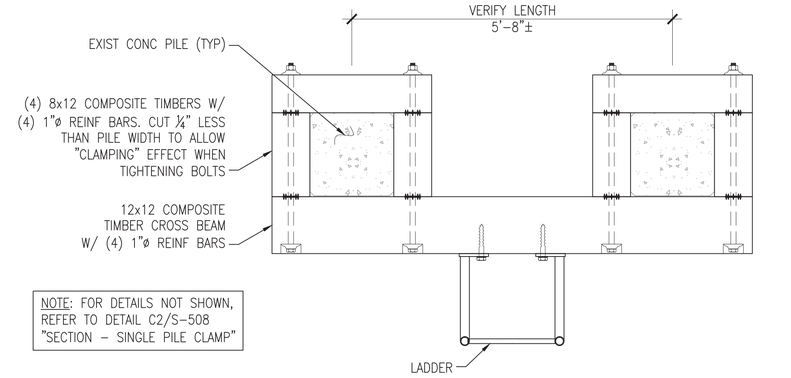
SCALE: 3/4" = 1'-0" S-508, S-509



NOTE: DUE TO LOCATIONS NEAR EXPANSION JOINTS LADDERS MAY NOT BE CENTERED ON THE EXISTING PILE.

C2 SECTION - SINGLE PILE CLAMP

SCALE: 3/4" = 1'-0" S-508

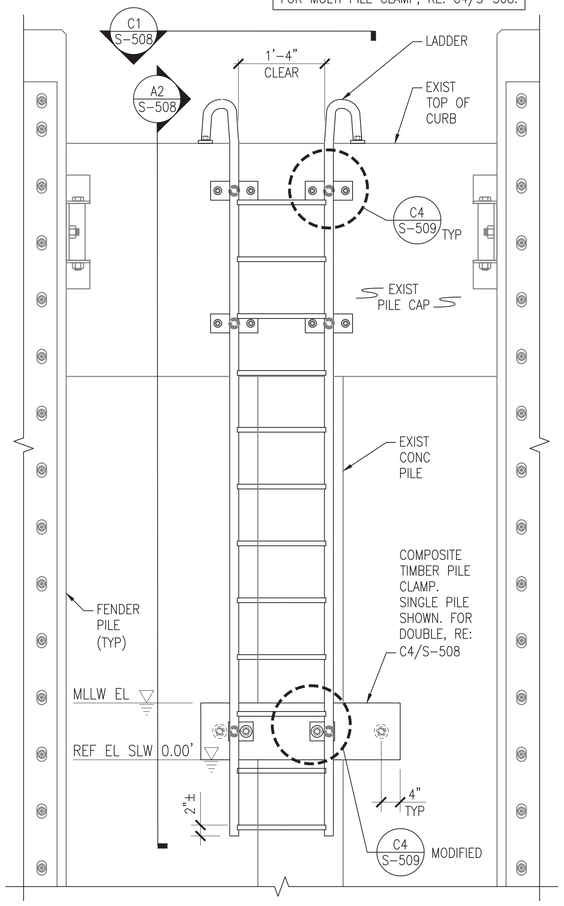


NOTE: FOR DETAILS NOT SHOWN, REFER TO DETAIL C2/S-508 "SECTION – SINGLE PILE CLAMP"

C4 SECTION - MULTI PILE CLAMP

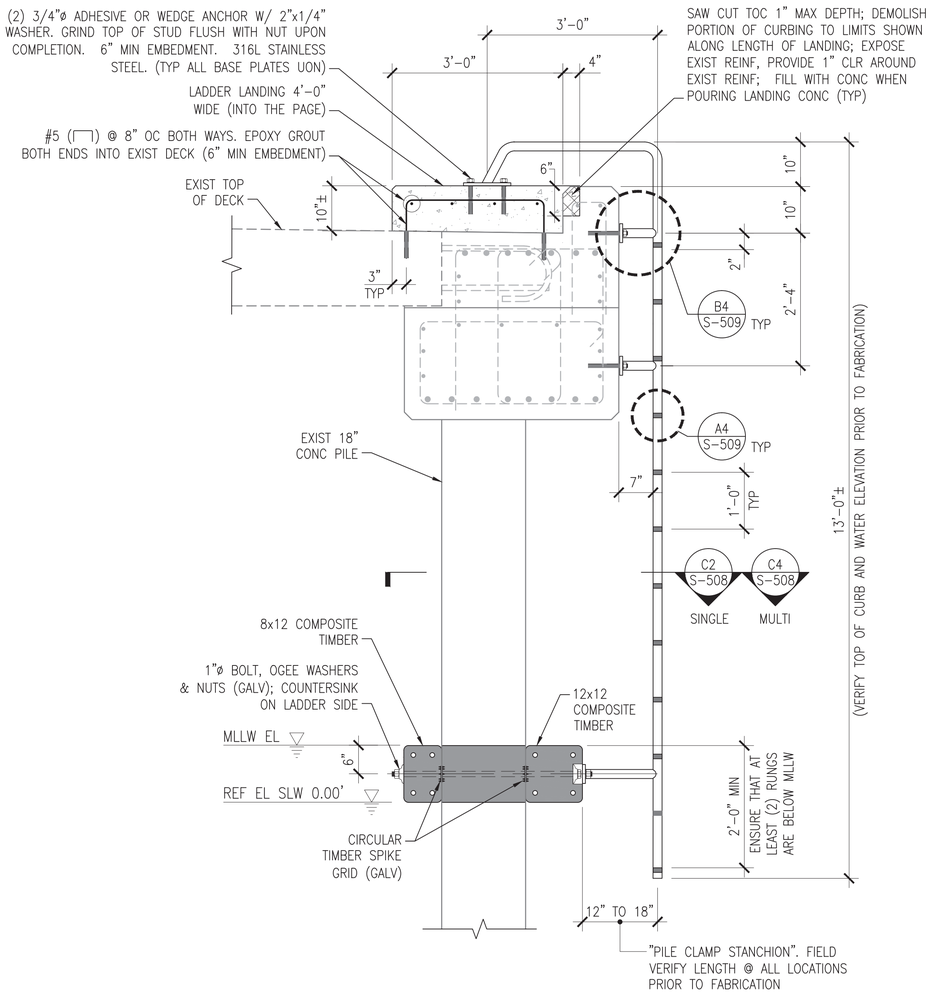
SCALE: 3/4" = 1'-0" S-508

NOTE: SINGLE PILE CLAMP SHOWN. FOR MULTI PILE CLAMP, RE: C4/S-508.



A1 ELEVATION - Z-308 LADDER

SCALE: 3/4" = 1'-0" S-101, S-102, S-105, S-107



A2 SECTION - Z-308 LADDER

SCALE: 3/4" = 1'-0" S-508

GENERAL SHEET NOTES

1. VERIFY EXISTING FIELD CONDITIONS AND OBTAIN ACCURATE FIELD MEASUREMENTS PRIOR TO FABRICATION OF LADDER STANCHIONS AND COMPOSITE TIMBERS. DUE TO VARIANCES IN THE EXISTING CONSTRUCTION, DIMENSIONS MAY NOT BE THE SAME AT ALL LOCATIONS.
2. ALL STEEL DETAILED ON THIS SHEET SHALL BE 316L STAINLESS STEEL, INCLUDING BUT NOT LIMITED TO PIPES, ANCHORS, PLATES, BOLTS, ETC. UON.

GRAPHIC SCALE

3/4"=1'-0" 0 1' 2' 3'

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES ELT | DRW CMR | CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CBT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
HAMPTON ROADS IPT – PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

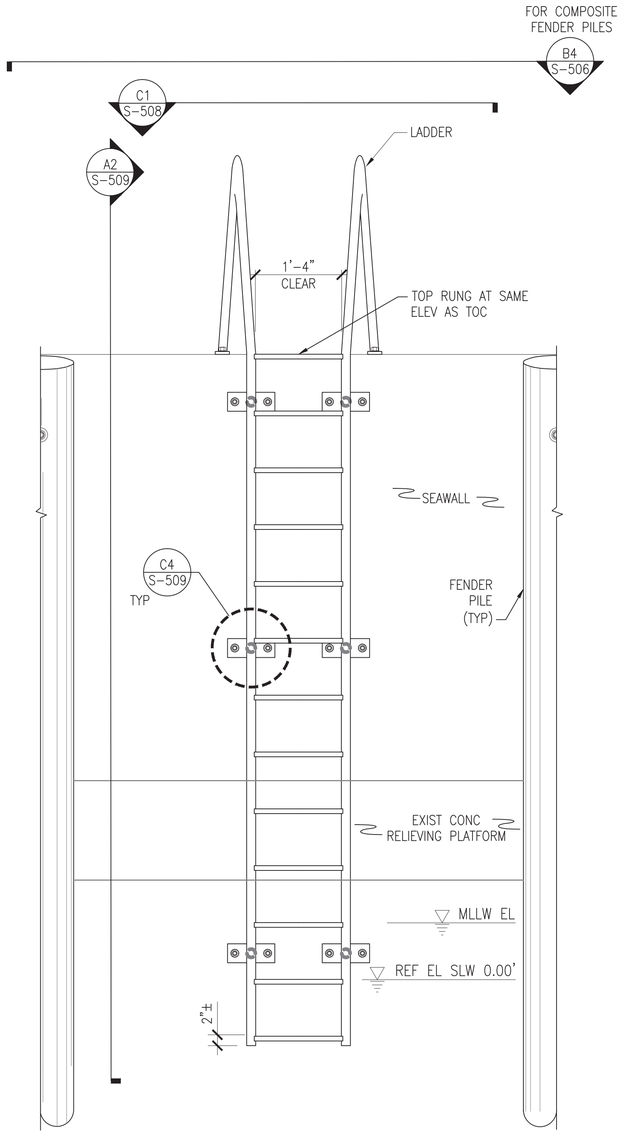
LADDER DETAILS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,787
SHEET 132 OF 158

S-508

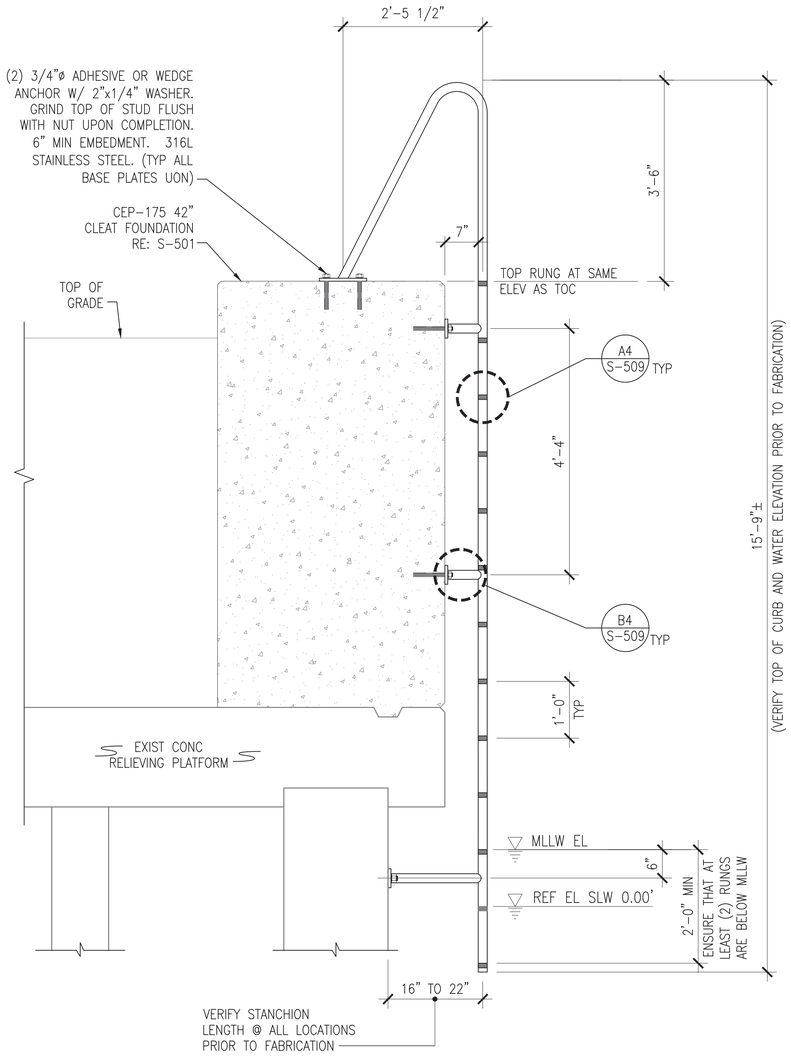
DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1762 - 308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-507.dwg LAYOUT NAME: S-508 LADDER DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:48pm USER: kimberly.a.davis2



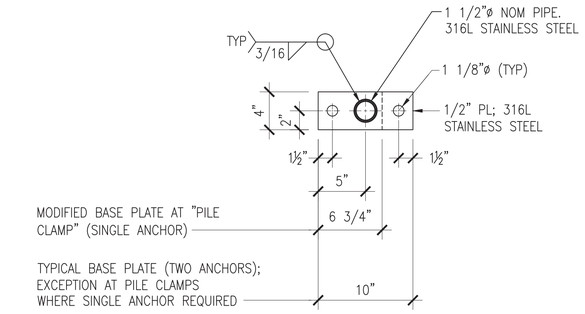
A1 ELEVATION - CEP-175 LADDER

SCALE: 3/4" = 1'-0" S-109, S-110, S-111A, S-113, S-115, S-117, S-119, S-506



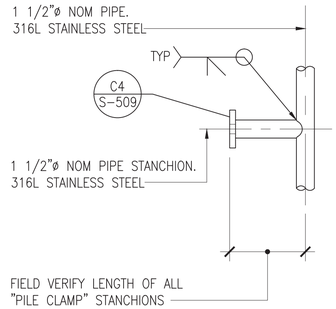
A2 SECTION - CEP-175 LADDER

SCALE: 3/4" = 1'-0" S-509



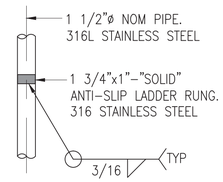
C4 DETAIL - RAIL & STANCHION BASE PLATE

SCALE: 1 1/2" = 1'-0" S-508, S-509



B4 DETAIL - LADDER STANCHION

SCALE: 1 1/2" = 1'-0" S-508, S-509



A4 DETAIL - LADDER RUNG

SCALE: 1 1/2" = 1'-0" S-508, S-509

GENERAL SHEET NOTES

1. VERIFY EXISTING FIELD CONDITIONS AND OBTAIN ACCURATE FIELD MEASUREMENTS PRIOR TO FABRICATION OF LADDER STANCHIONS AND COMPOSITE TIMBERS. DUE TO VARIANCES IN THE EXISTING CONSTRUCTION, DIMENSIONS MAY NOT BE THE SAME AT ALL LOCATIONS.
2. ALL STEEL DETAILED ON THIS SHEET SHALL BE 316L STAINLESS STEEL, INCLUDING BUT NOT LIMITED TO PIPES, ANCHORS, PLATES, BOLTS, ETC. UON.

GRAPHIC SCALE

3/4"=1'-0" 0 1' 2' 3'

1-1/2"=1'-0" 0 6" 1' 1'-6"

APPR | DATE | DESCRIPTION | CTM

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016
DES ELT DRW CMR CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CPT
CHIEF ENGINEER J. HASTE, P.E.
FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT – PWD NORFOLK
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

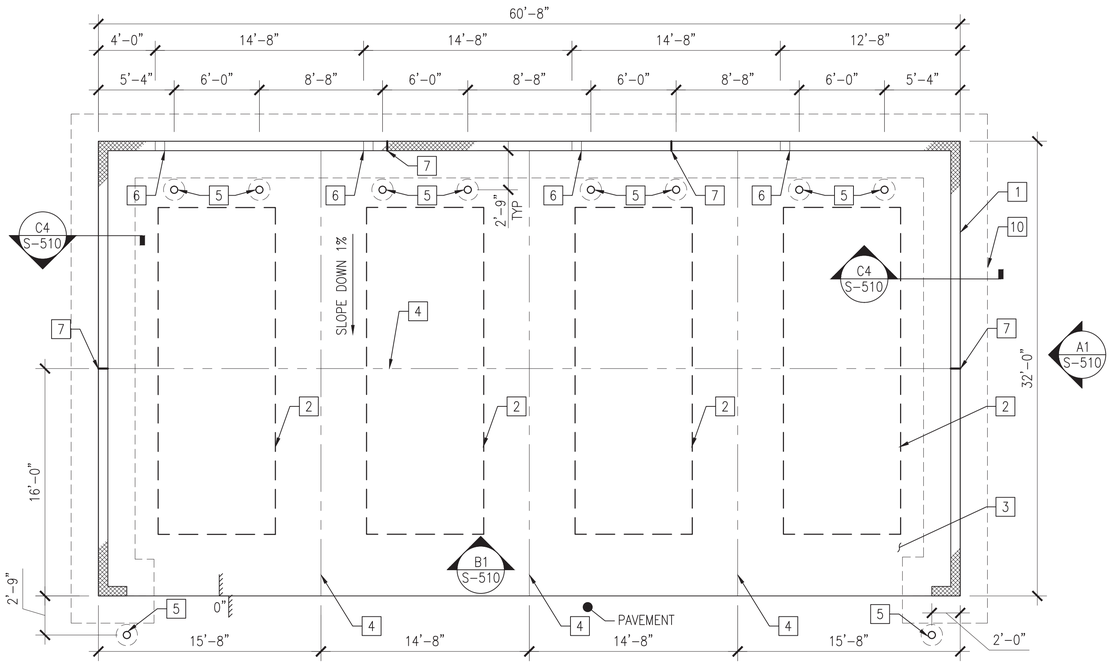
LADDER DETAILS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,788
SHEET 133 OF 158

S-509

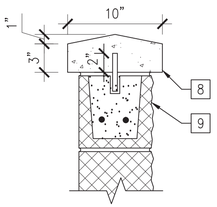
DRAWFORM REVISION: 10 MARCH 2009

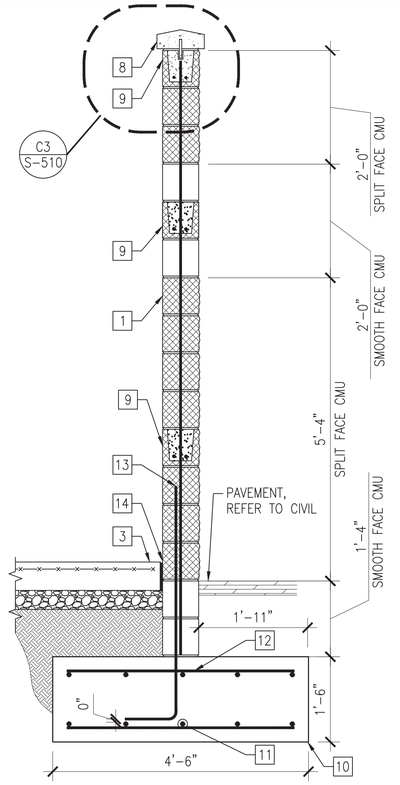
FILE NAME: P:\VA\NorvolStationNorfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_S-507.dwg LAYOUT NAME: S-509 LADDER DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:48pm USER: kimberly.a.davis2



C1 DUMPSTER ENCLOSURE PLAN

SCALE: 3/16" = 1'-0" S-115, S-115A



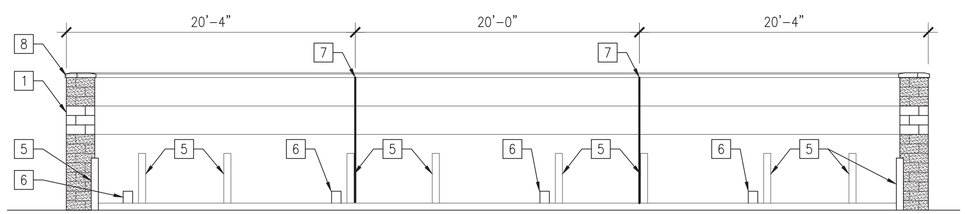


C3 DETAIL- PRECAST CAP

SCALE: 1 1/2" = 1'-0" S-510

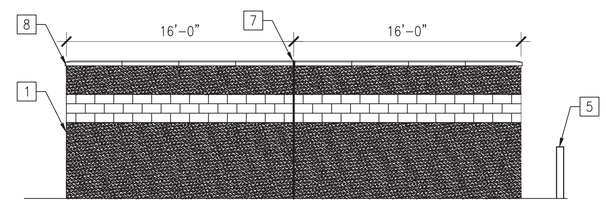
C4 WALL SECTION

SCALE: 3/4" = 1'-0" S-510



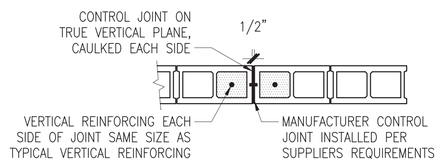
B1 DUMPSTER FRONT ELEVATION

SCALE: 3/16" = 1'-0" S-510



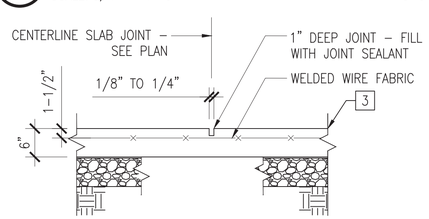
A1 DUMPSTER SIDE ELEVATION

SCALE: 3/16" = 1'-0" S-510



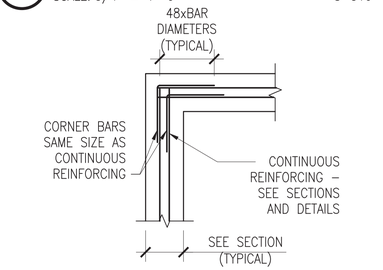
B2 TYP DETAIL - CMU JOINT

SCALE: 3/4" = 1'-0" S-510



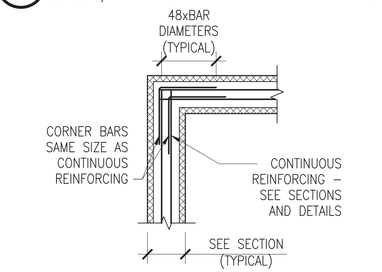
A2 TYP DETAIL - SLAB JOINT

SCALE: 3/4" = 1'-0" S-510



B4 DETAIL - FOOTING CORNER

SCALE: 3/4" = 1'-0" S-510



A4 TYP DETAIL- BOND BEAM CORNER

SCALE: 3/4" = 1'-0" S-510

NEW WORK KEYNOTES

1. 8" CMU WALL, REINFORCE W/(1) #6 BAR SPACED NO MORE THAN 1'-4" O.C. GROUT ALL CELLS WITH REINFORCING BARS AND CELLS BELOW GRADE.
2. REINSTALL EXISTING DUMPSTER/COMPACTOR.
3. 6" CONCRETE SLAB ON GRADE OVER 4" POROUS FILL ON COMPACTED SUBGRADE. REINFORCE SLAB W/ 6X6 W2.9XW2.9 WELDED WIRE FABRIC. PLACE REINFORCING 1-1/2" FROM TOP OF SLAB.
4. SLAB JOINT, REFER TO DETAIL.
5. BOLLARD, REFER TO CIVIL SHEET CS502.
6. 8" WIDE, ONE COURSE HIGH OPENING IN CMU FOR MECHANICAL/ELECTRICAL ACCESS.
7. CMU CONTROL JOINT, REFER TO DETAIL.
8. PRECAST CONCRETE CAP. PROVIDE MIN (2) ½" X 4" LONG STAINLESS STEEL DOWELS PER CAP. PROVIDE CAP IN SECTIONS NO MORE THAN 4'-0" LONG. DRILL AND GROUT ¾"ø X 3" HOLES IN BOND BEAM FOR STEEL SHEAR DOWELS.
9. 8" CMU BOND BEAM AT TOP OF WALL AND SPACED NO MORE THAN 4' O.C. VERTICALLY. REINFORCE BOND BEAM W/(2) #6 BARS SET 3" FROM BOTTOM OF BOND BEAM.
10. CONCRETE FOUNDATION.
11. (5) #6 BARS TOP AND BOTTOM CONTINUOUS.
12. #6 BARS TOP AND BOTTOM SPACED AT 8" O.C.
13. #6 DOWEL W/90° STD. HOOK INTO FOUNDATION MATCH SPACING WITH WALL REINFORCING. LAP WITH WALL REINFORCING 3'-0".
14. 1/2" PREFORMED EXPANSION JOINT MATERIAL WITH SEALANT, TYPICAL PERIMETER OF SLAB.

GRAPHIC SCALE

1-1/2"=1'-0" 0 6" 1' 1'-6"

3/4"=1'-0" 0 1' 2' 3'

3/16"=1'-0" 0' 4' 8' 12'

							APPR
							DATE
							DESCRIPTION
							CTM

SEAL

A/E INFO

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FOR COMMANDER NAVFAC 7-12-16

ACTIVITY

DAVE SEARS

SATISFACTORY TO DATE 6/17/2016

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DESIGN MANAGER EDDY THEISZ

BRANCH MANAGER CHT

CHIEF ENGINEER J. HASTE, P.E.

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND–MID-ATLANTIC
HAMPTON ROADS IPT – PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

DUMPSTER ENCLOSURE DETAILS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

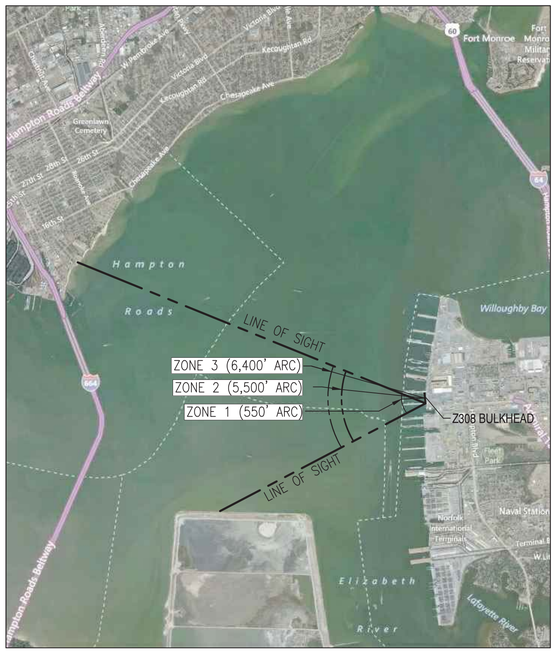
NAVFAC DRAWING NO. 12,729,789

SHEET 134 OF 158

S-510

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752 - 308Report\8_Design\Drawings\Sheet\07_Structural\1370817_S-510.dwg LAYOUT NAME: S-510 DUMPSTER ENCLOSURE DETAILS PLOTTED: Tuesday, July 12, 2016 - 12:48pm USER: kimberly.o.dinh2

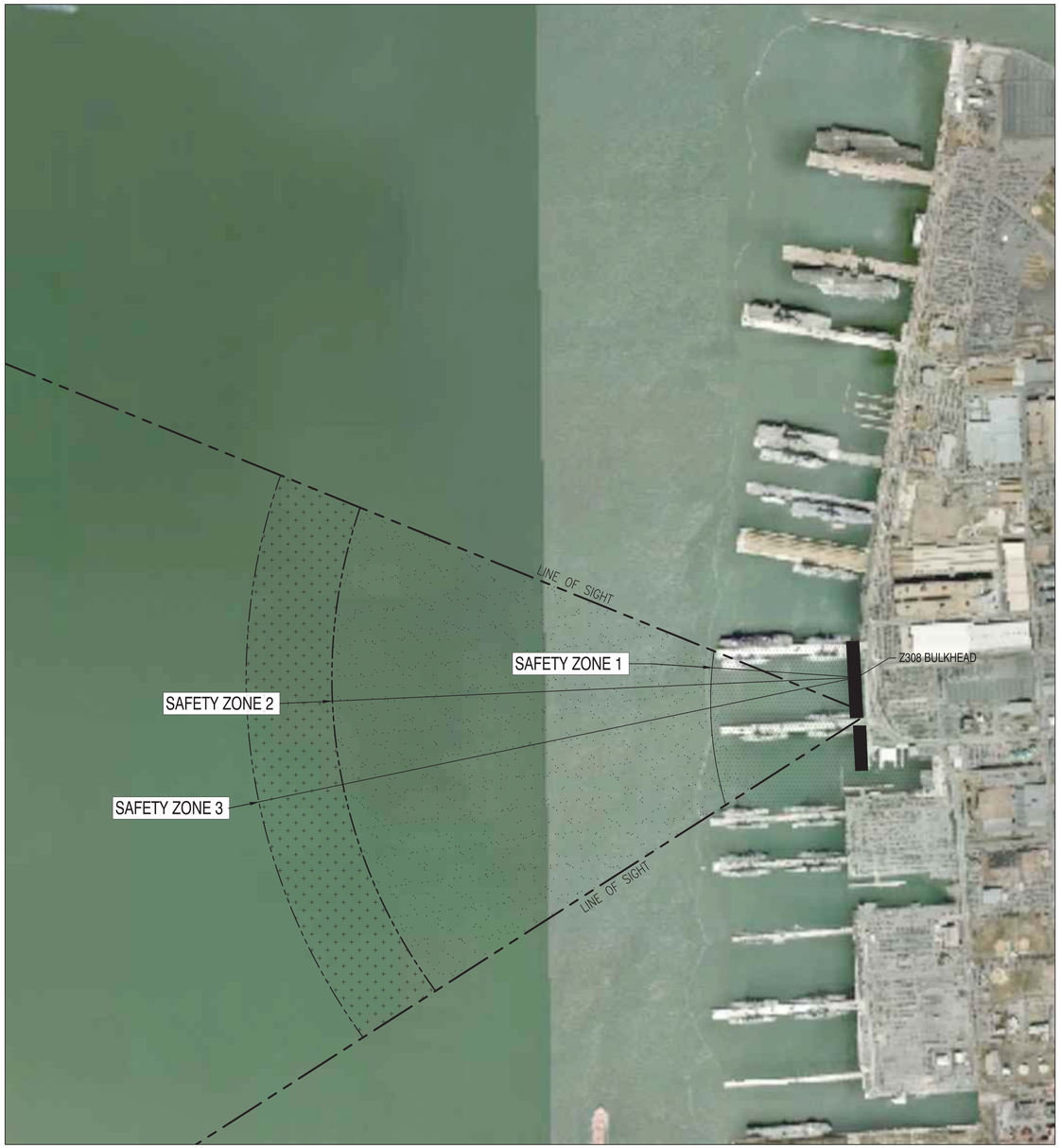


NOTE: HATCHING FOR DELINEATION OF "ZONES" NOT SHOWN FOR CLARITY. REFER TO "SITE MAP" FOR ACTUAL LOCATIONS.

Z308 BULKHEAD: SAFETY ZONES (REGIONAL MAP)

SCALE: 1" = 5000'

PLAN NORTH



Z308 BULKHEAD: SAFETY ZONES (SITE MAP)

SCALE: 1" = 750'

PLAN NORTH

GENERAL NOTES:

1. SAFETY ZONES HAVE BEEN ESTABLISHED FOR THE PROTECTION AND PREVENTION OF HARASSMENT OF MARINE MAMMALS. IF A MARINE MAMMAL IS OBSERVED APPROACHING, ENTERING OR FOUND WITHIN THE ESTABLISHED ZONE DURING THE ASSOCIATED IN-WATER WORK, ALL WORK SHALL STOP UNTIL IT HAS BEEN VERIFIED THAT THE MAMMAL HAS LEFT THE AREA. THE ZONE(S) ARE AS FOLLOWS:

   ZONE 1: IMPACT HAMMER FOR TIMBER OR CONCRETE PILES (ALL) – 550' FEET (OR AS IDENTIFIED)

   ZONE 2: VIBRATORY FOR TIMBER OR STEEL PILES (UP TO 24") – 5,500 FEET

   ZONE 3: IMPACT HAMMER FOR STEEL PILES (UP TO 24") – 6,400 FEET (NOTE: LIMITED TO "LINE OF SIGHT" BOUNDARIES)

2. THE ABOVE MAPS ARE PROVIDED TO ASSIST THE CONTRACTOR AND IDENTIFY THE APPROXIMATE AREA LIMITS WHICH ARE REQUIRED TO BE MONITORED DURING PILE REMOVAL OR INSTALLATION. THE ZONE SHALL BE BOUND BY THE "ENTIRE PIER SLIP" THE CONTRACTOR IS WORKING AND THE "LINE-OF-SIGHT" FROM THE OFFSHORE END OF THE PIER TO THE EXTENT OF UNDERWATER NOISE PROPAGATION "ARC" FOR THAT PARTICULAR PILE OPERATION BEING PREFORMED. THE ENTIRE VISIBLE WATER SURFACE SHALL BE CONTINUOUSLY MONITORED AS PRESCRIBED IN THE CONTRACT DOCUMENTS.

3. ZONES FOR PILES WITH CROSS SECTIONS GREATER THAN 24" ARE NOT ANTICIPATED TO BE REQUIRED FOR THIS PROJECT AND THEREFORE ARE NOT REFLECTED ON THIS DRAWING. CONTRACTORS PROPOSING TO INSTALL/EXTRACT STEEL SPUD PILES FOR USE IN MOORING OR TEMPLATES SHALL REQUIRE THE CONTRACTING OFFICER'S APPROVAL. VIBRATORY OR IMPACT EQUIPMENT SHALL NOT BE UTILIZED FOR THE INSTALLATION OR EXTRACTION OF STEEL SPUD PILES DUE TO THE EXTREME DISTANCES THAT SOUND TRAVELS UNDERWATER WITH THESE PILES.

GRAPHIC SCALES

1" = 750'-0" 0 375" 750" 1500"

1" = 5000'-0" 0 2500' 5000' 10000'

CTM	DESCRIPTION	DATE	APPR

NAVFAC

SEAL

A/E INFO

APPROVED
FOR COMMANDER NAVFAC 7-12-16

ACTIVITY
DAVE SEARS
SATISFACTORY TO DATE 6/17/2016

DES BJC DRW BJC CHK CLT
DESIGN MANAGER EDDY THEISZ
BRANCH MANAGER CST
CHIEF ENGINEER J. HASTE, P.E.
TYPE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
HAMPTON ROADS IPT - PWD NORFOLK

NAVAL FACILITIES ENGINEERING COMMAND-MID-ATLANTIC
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA
NORFOLK NAVAL STATION

CEP-175 AND Z-308 BULKHEAD REPAIR

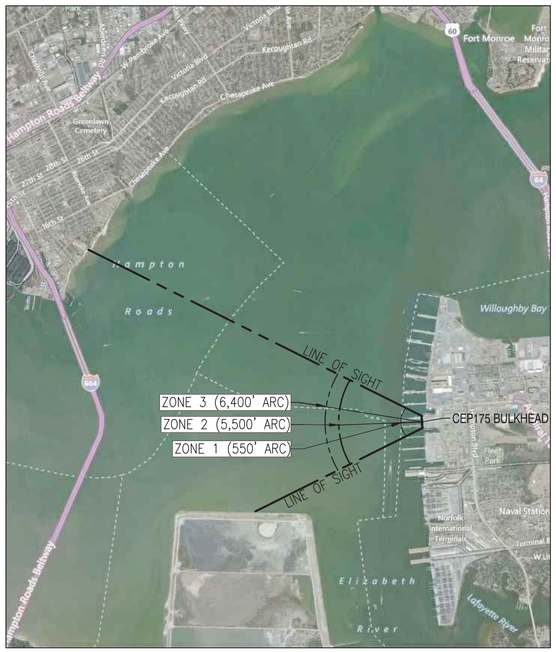
Z-308 – MMPA SAFETY ZONE MAPS

SCALE: AS NOTED
EPROJECT NO. 1370817
CONSTR. CONTR. NO. N/A
NAVFAC DRAWING NO. 12,729,790
SHEET 135 OF 158

MMPA-101

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvolStation\Norfolk\Waterfront\Bulkheads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_MMPA-101.dwg LAYOUT NAME: MMPA-101 Z-308 PLOTTED: Tuesday, July 12, 2016 - 12:48pm USER: kimberly.a.davis2



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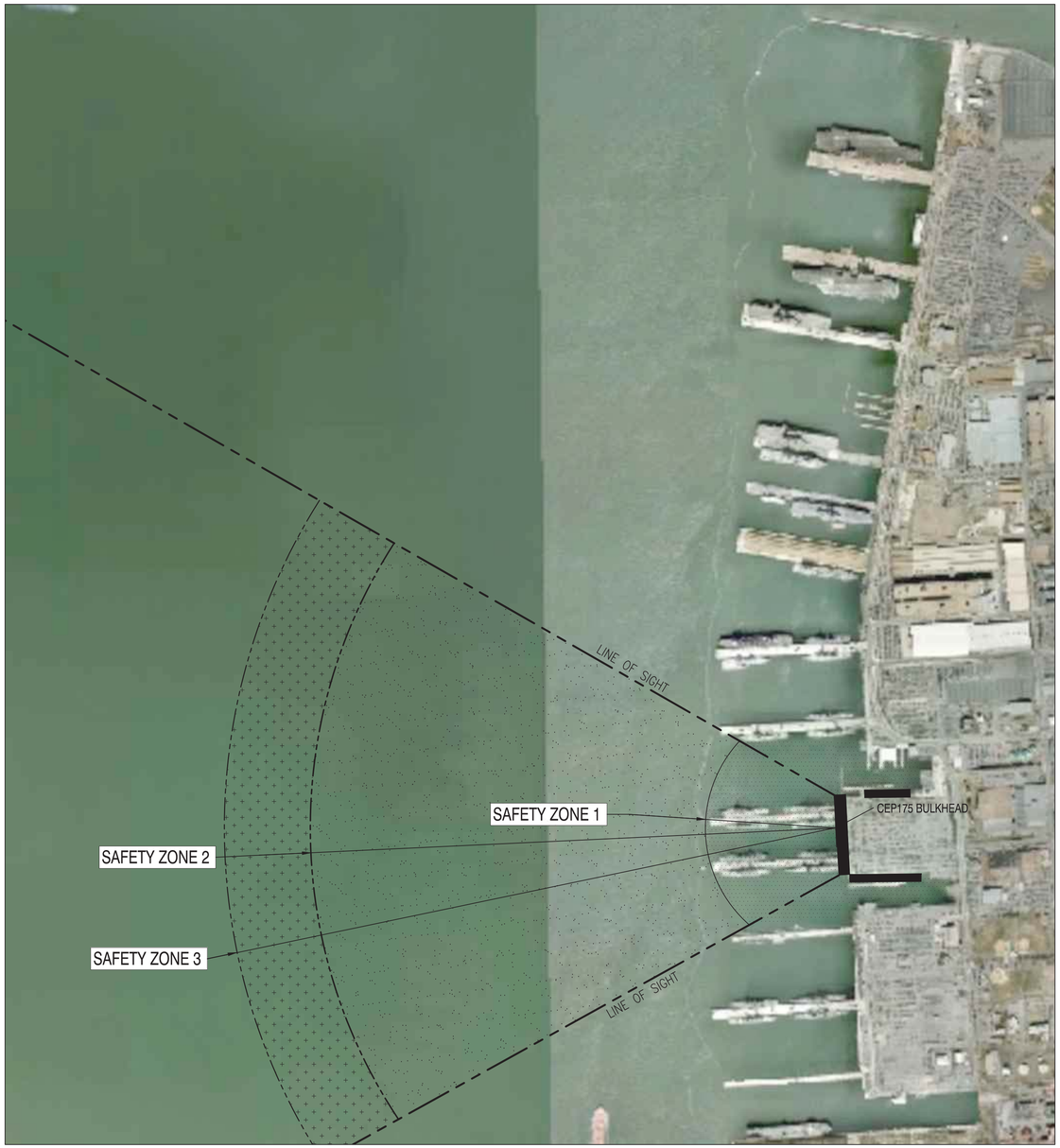
CEP175 BULKHEAD: SAFETY ZONES (REGIONAL MAP)

SCALE: 1" = 5000'

PLAN NORTH



CEP175 BULKHEAD: SAFETY ZONES (SITE MAP)

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PLAN NORTH

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HAMPTON ROADS IPT - PWD NORFOLK
NORFOLK NAVAL STATION
NORFOLK, VIRGINIA

CEP-175 AND Z-308 BULKHEAD REPAIR

CEP-175 - MMPA SAFETY ZONE MAPS

SCALE: AS NOTED

EPROJECT NO. 1370817

CONSTR. CONTR. NO. N/A

NAVFAC DRAWING NO. 12,729,791

SHEET 136 OF 158

MMPA-102

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: P:\VA\NorvaStation\Norfolk\Waterfront\BulkHeads\2015_1370817_CEP-1752-308Report\B_Design\Drawings\Sheet\07_Structural\1370817_MMPA-102.dwg LAYOUT NAME: MMPA-102 CEP-175 PLOTTED: Tuesday, July 12, 2016 - 12:48pm USER: kimberly.a.davis2