REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED

BERTHING PIERS (2ND INCREMENT) PIER 24
NAVAL STATION NORFOLK, VIRGINIA

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3 D-2	129796	4029796	PILE PLAN OF PIER TO BE DEMOLISHED
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7 SO-6	129800	4029800	PRECAST CONCRETE - SECTIONS AND DETAILS II (A)
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42 S-22	129835	4029835	ENERGY FENDER SYSTEM PLAN, ~~ADDITIVE NO. 1~~ (A) DELETED
43 S-23	129836	4029836	ENERGY FENDER SYSTEM DETAILS, ~~ADDITIVE NO. 1~~ (A) DELETED
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64 E-11	129857	4029857	CONDUIT PLAN VAULT NO. 3
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70 SO-1	129863	4029863	PRECAST DECK OPTION
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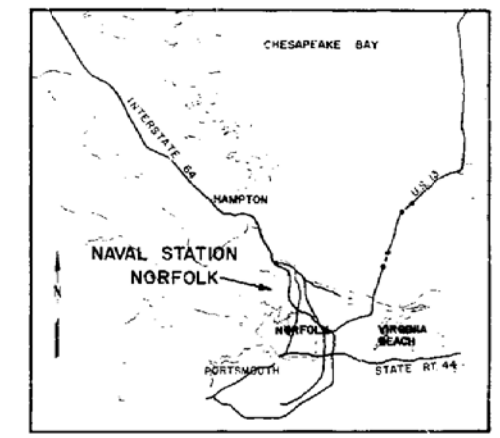
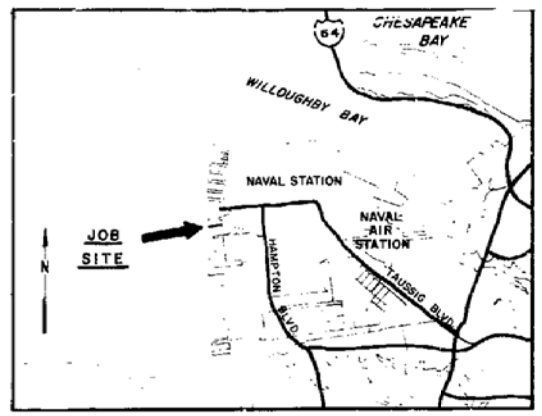
~~72 SO-3~~	~~129865~~	~~4029865~~	~~BULKHEAD SECTIONS & DETAILS - TYPE "E" OPTION~~ (A) DELETED



VICINITY MAP
NO SCALE



LOCATION MAP
NO SCALE

LEGEND

TS	TITLE SHEET	A	ARCHITECTURAL
D	DEMOLITION	S	STRUCTURAL
C	CIVIL	M	MECHANICAL
B	SOILS	E	ELECTRICAL

SO STRUCTURAL OPTION

TS-1

EFD DWG. NO.	129794
JOB ORDER NO.	54505429
DES.	C.W. WEBSTER PE
DRWN.	W.G. WHITE - J.D.R.
TR	
CHK.	C.W. WEBSTER PE FOR J. QUIROS
RR MGR.	T.P. MICHALOS PE
DES. DIR.	J. QUIROS PE
SATISFACTORY TO / DATE	
APPROVED / DATE	1 NOV 1976

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION NORFOLK, VA.
NAVAL STATION NORFOLK, VA.
BERTHING PIERS (2ND INCREMENT)
PIER 24
TITLE SHEET

USE	F	ACTIVITY NO.	80091
SCALE	NONE	DWG. NO.	05-75-5429
		NAVFAC DWG. NO.	4029794
		CONTRACT NO.	N62470-75-B-5429
		SHEET	1 of 72

REVISIONS			
NO.	DESCRIPTION	DATE	APPROVED
A	INCREASE PARKING AREA - CHANGE GRADING	11/30/76	AR
B	REVISED AS-BUILT	4/12/21	WRG

NEW PAVEMENT SURFACE TO MATCH M.H. RIM ELEV.

CONSTANT SLOPE BETWEEN EXISTING PAVEMENT SURFACE

FENCE AROUND EXIST AREAS TO BE REMOVED BY GOVERNMENT

REMOVE EXIST GUARDRAIL

LOWER MH RIMS TO NEW GRADE

RELOCATE

REMOVE BITU CONC 1½" THK

SUBSURFACE WOOD PILES TWO (2') FEET BELOW GRADE (B)

(B) CONC. MASS 6' BELOW ASPHALT

CONC. WALL - 2' THK × 7' DEEP TO BE REMOVED

(B) CONC. MASS OF UNKNOWN PROPORTIONS

NEW P.S.

SEE DWG NO. C-4 FOR GRADING P.S.

EXIST. STEEL BULKHEAD

FACE NEW CONC BULKHEAD

EXIST. PIER TO BE REMOVED SEE DWG D-1 TO D-8

NEW PIER

SLOPE TRAILS

12" SALTWATER (B)

STA 1+22 INV +1.49 (4-45° ELBOWS USED TO DETOUR S.W. BELOW STORM DRAIN W/18' OF PIPE BETWEEN)

8" UP-5 (B)

EXIST TIMBER BULK HEAD

FACE NEW CONC BULKHEAD

RIDGE

EXIST TIMBER BULKHEAD

CONC. 4'-0" WIDE CONTINUOUS 198 LF - 18" (B)

CONC. FDN (B)

SUBSURFACE WOOD PILES TWO (2') FT BELOW GRADE (B)

CONC. WALL EL +4.57 (B) 99 LF-84"

CONC. FDN EL +9.39 (B)

LARGE CONC. FDN OF UNKNOWN PROPORTIONS (B)

STA 2+95 EL +10.93 (B)

3' CAST IRON PIPE (B)

84" CAST IRON PIPE CUT TO INSTALL STORM DRAIN, BOTH ENDS PLUGGED (B)

CONC. FDN & WIDE, 5' DEEP CONTINUOUS (B)

CONC. FDN ON WOOD PILES (B)

SUBSURFACE WOOD PILES CUT TWO (2') FT. BELOW GRADE (B)

CONC. MASS 9' BELOW GRADE (B)

CONC. SLAB 4' THICK JUST ABOVE STORM DRAIN (B)

H.P. NEW ROAD

BARLEY PIT - FILL VOID & LEAVE IN PLACE.

REINFORCED CONC FDN MIN. 6' BELOW GRADE (B)

CONC. FDN ON WOOD PILES (B)

GRAVEL ROAD

WASHED OUT AREA FILLED W/ RUBBLE

DEMOLISH EXIST TIMBER BULKHEAD STA 0+00 (B)

MATCH LINE SEE DWG C-5

MATCH LINE STA 10+77

BM#1

BM#2

BM#3

(A) REMOVE TOP & RIM OF BELOW CONC (TRAFFIC TYPE) ELEC. & TEL. MH'S. REPLACE TOP IN KIND SO RIM SHALL BE FLUSH WITH NEW PVMT SURFACE. SEE SHEET E-3, MH# 8512 FOR TYPICAL DETAILS OF REPLACEMENT. MAINTAIN 7' CLEAR HEIGHT IN MH.

(B) VOID NOTE ABOVE, LOWER MANHOLE TOP & RIMS ACCORDING TO DETAILS ON SHEET C-5

* TOP OF 12" ID ASBESTOS CEMENT PIPE (B)

EXIST. SITE, GRADING, & SOIL BORINGS

SCALE: 1"=30'

GRAPHIC SCALE 1"=30'

RECORD DRAWING LETTER DATED 29 OCT 1979

C-2

EFD DWG. NO.	129804
NAVFAC DWG NO.	54505429
DES. W.R. GIBBINGS PE	
DRAWN WRG 6/21/76	
CHK. ORG P.P. Wilson	
APP. WITH PIC	
DES. DIR. J. Davis P.E.	
SATISFACTORY TO	DATE
APPROVED	DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION NORFOLK, VA.
NAVAL STATION NORFOLK, VA.
BERTHING PIERS (2ND INCREMENT)
PIER 24
SITE PLAN - GRADING

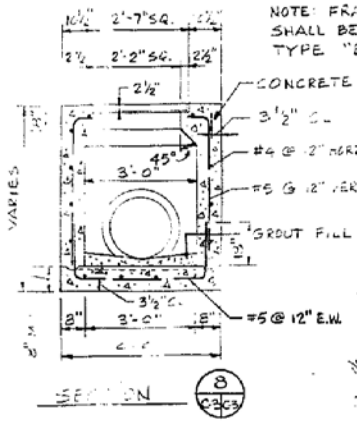
SER. NO.	DRAWING NO.
F 80091	4029804

CONTRACT NO. N62470-75-B-5489

SCALE 1" = 30' | DES. 08-75-5489 | SHT. 11 OF 72

REVISIONS			
A	ILLEGIBLE PARKING AREA & MISC. DETAILS	11/30/78	[illegible]
B	REVISED AS-BUILT	2/1/81	[illegible]

NOTE: FRAME & GRATE TOP SHALL BE AS SHOWN FOR TYPE "B" CATCH BASIN

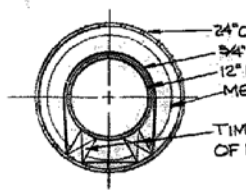


SECTION (8 C3/C3)

PLAN

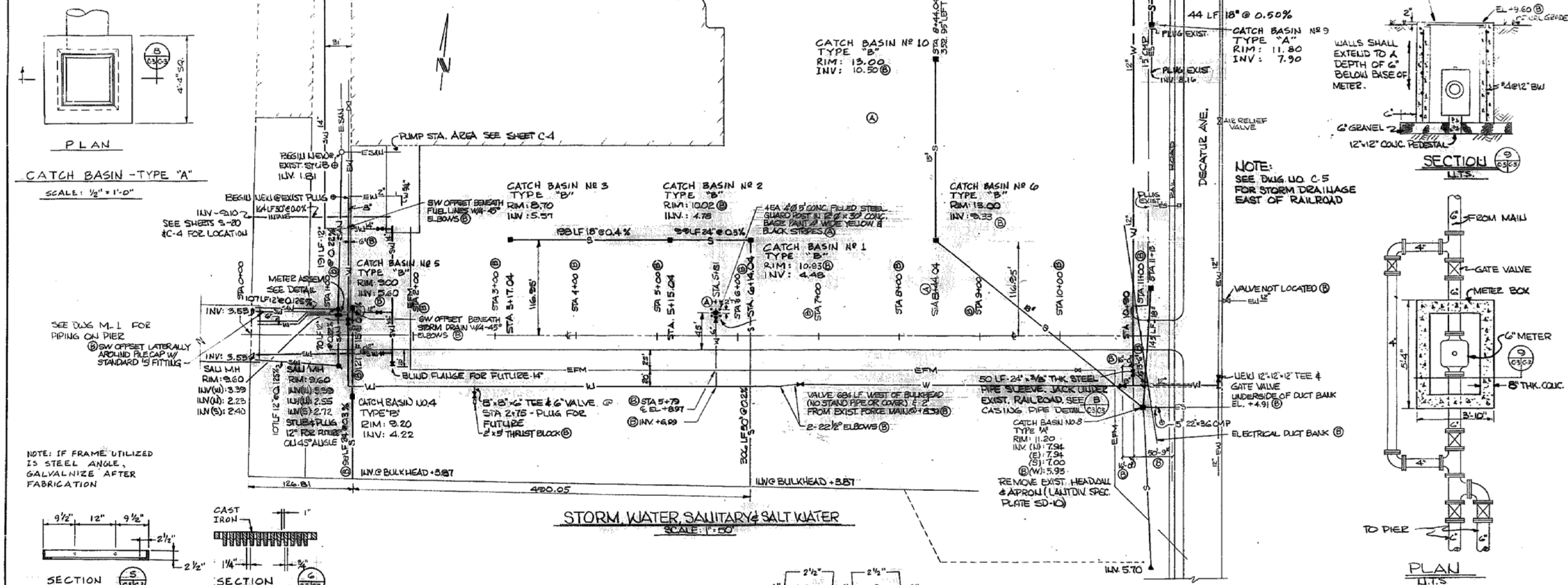
CATCH BASIN - TYPE "A"

SCALE: ½" = 1'-0"

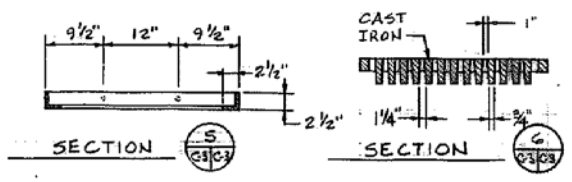


CASING PIPE DETAIL (8 C3/C4)

N.T.S

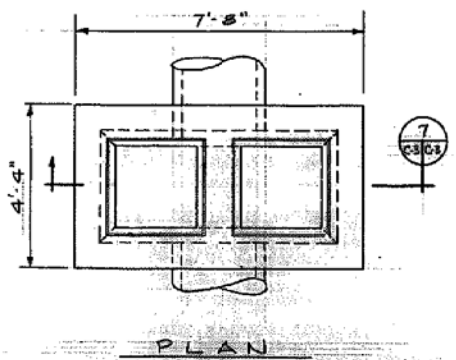


NOTE: IF FRAME UTILIZED IS STEEL ANGLE, GALVANIZE AFTER FABRICATION



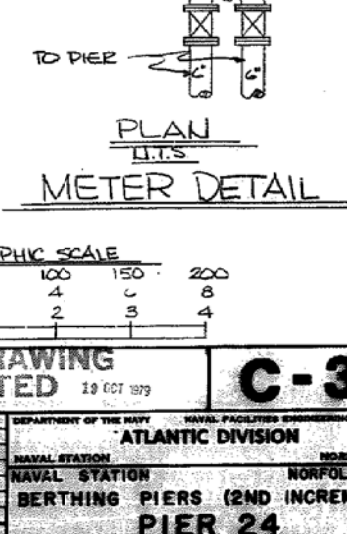
FRAME & GRATE FOR TYPE "A" & "B" C.B.

SCALE: 1" = 1'-0"



CATCH BASIN - TYPE "B"

SCALE: ½" = 1'-0"



METER DETAIL

GRAPHIC SCALE

1" = 50'	0	50	100	150	200
½" = 1'-0"	0	2	4	6	8
1" = 1'-0"	0	1	2	3	4

RECORD DRAWING
LETTER DATED 19 OCT 1979

C-3

EFD DWG. NO.	129805
JOB ORDER NO.	54805429
DES.	WRG
DRAWN	WRG 8/0/76
TR.	
CHK.	WRG PP.
SR. MGR.	HK
DES. SUP.	J. DAVIS JR.
SATISFACTORY TO	DATE
APPROVED	DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION NORFOLK, VA.
NAVAL STATION NORFOLK, VA.
BERTHING PIERS (2ND INCREMENT)
PIER 24
SITE PLAN - UTILITIES

DIV.	SUBDIV. NO.		
F	80091	4029805	
NOTED	DR. 05-78-5429	SCALE 1" = 1'-0"	

SUBMITTED FOR COMMENCEMENT OF CONSTRUCTION

REVISIONS			
NO.	DESCRIPTION	DATE	APPROVED

BORING NB-1

DEPTH	DESCRIPTION	N
	SAND, FINE TO MEDIUM, LITTLE SILT, TAN TO BLACK TO LIGHT GRAY	11
		11
	TRACE SMALL GRAVEL	6
		24
15		12
		10
20	SAND & SILT ALTERNATING STRATA OF BLACK GREY TO B[illegible]	6
25	SAND[illegible] TO MEDIUM, LITTLE SILT, TRACE ORGANICS, DARK GRAY	17
		25
30		10
	T, SOME SAND, TRACE ORGANICS, DARK GRAY	
		5
45		WOH
		WOH
50		WOH
		WOH
60		WOH
		WOH
70	LITTLE SHELL	WOH
75	SAND, SOME SILT, LITTLE SHELL, GRAY-GREEN	30
		39
85		36
	BORING TERMINATED 86.0' WATER 5.5' @ 24 HRS.	
90		

BORING NB-2

DEPTH	DESCRIPTION	N
	SAND & COAL DUST, FINE TO MED.	40
	SANDY, FINE TO COARSE SOME SHELL, LITTLE SILT, TAN	28
		14
	GRAY	11
	TRACE SHELL	16
		9
	TRACE SILT	5
		WOH
	SOME SILT	2
		WOH
25		12
	SILT, TRACE SHELL, LITTLE ORGANICS, DARK GRAY	
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
	SAND, SOME SILT, LITTLE SHELL GRAY-GREEN	23
75		27
	BORING TERMINATED 76' WATER 5.5' @ 24 HRS	

BORING NB-3

DEPTH	DESCRIPTION	N
	SAND, GRAVEL & COAL, TRASH BLACK	16
	SAND, FINE TO MEDIUM, TAN	28
		9
	TRACE SILT, TRACE SHELL GRAY	8
		9
		3
		WOH
		WOH
25	SILT, TRACE FINE SAND, TRACE ORGANICS, DARK GRAY	WOH
		WOH
	SAND, AND SILT, FINE TO MEDIUM, TRACE ORGANICS GRAY-GREEN	12
		WOH
		WOH
	LITTLE SILT, TRACE SHELL	12
		WOH
	SOME SILT, TRACE CLAY, LITTLE SHELL, TAN	17
		WOH
	LITTLE SILT	32
		50
		23
		WOH
		WOH
60	BORING TERMINATED 61' WATER 5.3' @ 24 HRS.	
75		

BORING B-1

DEPTH	DESCRIPTION	W	N
	SAND, SILT, COAL, WOOD FRAGMENTS, (FILL) BLACK	16.6	11
		9.9	13
		10.3	6
		26.4	28
		18.0	41
		20.1	22
15	SAND, FINE TO MEDIUM, TRACE SHELL, GRAY		6
			1
20	SOME SHELL, LENSES OF CLAYEY SILT		1
			2
25	TRACE SHELL		6
			30
			14
			35
			12
			40
			2
45	CLAYEY SILT, SOME FINE SAND, GRAY		3
			50
	NO SAND		4
			55
	PEAT, LENSES OF FINE SAND, BROWN TO GRAY		6
			4
60			60
			4
65	SAND, FINE, SOME SILT, SOME SHELL, GRAY TO GREEN		7
			20
			51
75			75
			34
			80
85			26
			85
90			30
	BORING TERMINATED 92.0' WATER 9.0' @ 0.0 HRS.		27

BORING B-2

DEPTH	DESCRIPTION	N
	WATER TO -14.5'	
15	SAND, SILT, COAL, BLACK	WOH
		WOH
20		7
		WOH
	CLAY, SOME SILT, GRAY	WOH
25		WOH
		WOH
		WOH
		WOH
		11
		WOH
	SAND, VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	58
		50
		86
		90
		62
		60
		62
75		58
	BORING TERMINATED 77'	

BORING B-3

DEPTH	DESCRIPTION	N
	WATER TO -20.5'	
	SAND, SILT, CLAY, COAL, BLACK	WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
	SAND, FINE TO VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	50
		50
		41
	SAND, FINE TO VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	41
		51
		74
		53
75		57
	BORING TERMINATED 77'	

BORING B-4

DEPTH	DESCRIPTION	N
	WATER TO -21.3'	
	SAND, SILT, CLAY, COAL, BLACK	WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
	SAND, FINE TO VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	50
		50
		41
		41
		46
		74
		74
75		46
		64
	BORING TERMINATED 88'	85

BORING B-5

DEPTH	DESCRIPTION	N
	WATER TO -19.3'	
	SAND, SILT, CLAY, COAL BLACK	WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
		WOH
	SAND, FINE TO VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	50
		50
		64
		77
		77
		124
		64
75		120
	BORING TERMINATED 77'	

BORING B-6

DEPTH	DESCRIPTION	N
	WATER TO -21.3'	
	SAND, SILT, CLAY, COAL, BLACK	WOH
		WOH
		WOH
		WOH
	SILT AND CLAY, BLACK	WOH
		WOH
		WOH
		WOH
		WOH
		WOH
	SAND, VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	46
		50
		66
		55
		53
		60
		82
75		58
	BORING TERMINATED 77'	102

GENERAL NOTES:

1. BORINGS ADVANCED BY WASHING.
2. 'N' COLUMN INDICATES DEPTH OF SAMPLE AND NUMBER OF BLOWS REQUIRED TO DRIVE 2" O.D. SPLIT SPOON SAMPLER ONE FOOT INTO UNDISTURBED SOIL WITH A 140 LB. HAMMER FALLING 30" AS PER ASTM TEST D1586.
3. ALL DEPTHS AND LOCATIONS ARE APPROXIMATE.
4. BORINGS NB-1,-2,-3 DRILLED BY LANTDIV NAVFACENGCOM, CODE 411 IN APRIL 1974 BORINGS B-1 THROUGH B-26 DRILLED BY HERBERT AND ASSOCIATES IN JULY 1976.
5. DESCRIPTION OF SOIL IN ACCORDANCE WITH BURMISTER'S CLASSIFICATION ON BASIS OF VISUAL ESTIMATE BY DRILLER WITH LATER LABORATORY CLASSIFICATION OF GROUPS.

GRAPHIC SCALE

1"=5' VERT.

5' 0 5' 10' 15' 20' 25'

RECORD DRAWING
LETTER DATED 19 OCT 1976

B - 1

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION NORFOLK, VA.
BERTHING PIERS (END INCREMENT)
PIER 24
BORING B-1

DES.	DRAWING NO.	CONTRACT NO.
F	60091	4029810

SUBMITTED
APPROVED
DATE

REVISIONS			
NO.	DESCRIPTION	DATE	APPROVED

BORING B-7

DEPTH	DESCRIPTION	N
	WATER TO 20.6'	
	SAND, SILT, COAL DUST, BLACK, SOME WOOD	
	SAND, FINE TO VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	
	BORING TERMINATED 92'	

BORING B-8

DEPTH	DESCRIPTION	N
	WATER TO 22.5'	
	SAND, SILT, CLAY, COAL FRAGMENTS, BLACK, LIQUID TO VERY SOFT	
	SAND, FINE, SOME SILT TO WITH SILT, SOME SHELL GRAY-GREEN	
	BORING TERMINATED 77'	

BORING B-9

DEPTH	DESCRIPTION	N
	WATER TO 25.6'	
	SILT AND CLAY, SOME VERY FINE SAND, GRAY TO BLACK, ORGANICS PRESENT TRACE COAL	
	SAND, FINE TO VERY FINE SOME SILT, SOME SHELL GRAY-GREEN	
	BORING TERMINATED 77'	

BORING B-10

DEPTH	DESCRIPTION	N
	WATER TO 27.8'	
	SAND, SILT, CLAY, COAL DUST BLACK	
	SAND, FINE TO VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	
	BORING TERMINATED 92'	

BORING B-11

DEPTH	DESCRIPTION	N
	WATER TO 27.3'	
	SAND, SILT, CLAY, BLACK	
	SAND, FINE TO VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	
	BORING TERMINATED 77'	

BORING B-12

DEPTH	DESCRIPTION	N
	WATER TO 37.3'	
	SAND, SILT, CLAY, BLACK	
	CLAY WITH SILT, DARK GRAY	
	SAND, FINE TO VERY FINE, SOME SILT, SOME SHELL GRAY-GREEN	
	BORING TERMINATED 87.2'	

BORING B-13

DESCRIPTION	W	N	DEPTH
SAND, SHELL & ASPHALT, GRAY-BLACK	4.5	64	
CLAY, SILTY, MOTTLED, BROWN	10.3	8	
SAND, FINE TO COARSE, BROWN	14.5	10	5'
CLAY, SILTY, TRACE VERY FINE SAND, MOTTLED BROWN TO TAN	31.8	8	
	24.3	6	

BORING TERMINATED 10'
WATER 5' @ 0 HRS

BORING B-14

DESCRIPTION	W	N	DEPTH
SHELL, WITH FINE SAND WHITE	12.2	18	
	21.0	7	
SAND, TAN, FINE	20.3	7	5'
	12.2	14	
	9.0	3	

BORING TERMINATED 10'
WATER 8' @ 0 HRS.

BORING B-15

DESCRIPTION	W	N	DEPTH
SHELL & FINE SAND, WHITE	-	-	
SAND, FINE, SOME CLAYEY SILT, TAN	22.3	14	
SAND, TRACE SHELL FINE TO MEDIUM, GRAY	20.8	14	5'
	12.0	3	
	16.5	5	

BORING TERMINATED 10'
WATER 5' @ 0 HRS.

BORING B-16

DESCRIPTION	W	N	DEPTH
SAND AND COAL, FINE TO MEDIUM	11.6	8	
	9.2	11	
SAND, TRACE SHELL FINE TO MEDIUM, TAN TO GRAY	14.8	5	5'
	20.2	7	
	26.9	2	

BORING TERMINATED 10'
WATER 6.5' @ 0 HRS.

BORING B-17

DESCRIPTION	W	N	DEPTH
COAL, FINE, BLACK	11.9	7	
	12.6	7	
SAND, SOME SHELL, FINE, TAN TO GRAY	15.5	1	5'
	11.1	2	
	28.8	6	

BORING TERMINATED 10'
WATER 8' @ 0 HRS.

BORING B-18

DESCRIPTION	W	N	DEPTH
COAL, 1/4" GRAVEL, SAND, AND BROKEN CONCRETE GRAY	8.6	7	
	10.8	31	
SAND, SOME SHELL FINE TO MEDIUM TAN TO GRAY	24.2	22	5'
	13.2	12	
	11.6	21	

BORING TERMINATED 10'
WATER 7' @ 0 HRS.

BORING B-19

DESCRIPTION	W	N	DEPTH
	18.4	12	
SAND, FINE TO MEDIUM, SOME SHELL, SOME SILT TAN AND GRAY	12.1	15	
	14.5	12	
	41.1	31	
SAND, FINE, TRACE SILT, TAN	65.5	34	

BORING TERMINATED 10'
WATER NOT ENCOUNTERED

BORING B-20

DESCRIPTION	W	N	DEPTH
SAND, FINE, SOME SILT, TRACE GRAVEL, GRAY BROWN CINDERS 1' 3' TO 4'	4.3	13	
	14.2	32	
SAND, FINE, SOME SILT SOME SHELL BROWN AND GRAY TO TAN	5.8	16	5'
NO SHELL	17.0	14	
	59	28	

BORING TERMINATED 10'
WATER NOT RECORDED

BORING B-21

DESCRIPTION	W	N	DEPTH
SAND, SHELL, SILT, BLACK	6.0	9	
SAND, FINE TO MEDIUM, TRACE SHELL, TAN NO SHELL	18	11	
	6.2	13	5'
	6.1	16	
LIGHT GRAY	5.5	13	

BORING TERMINATED 10'
WATER 8' @ 0 HRS.

BORING B-22

DESCRIPTION	W	N	DEPTH
SAND SILT, COAL, BLACK	4.8	7	
SAND, FINE, SOME SHELL TAN INTO GRAY	7.4	10	
	10.5	6	5'
	17.9	5	
	22.5	8	

BORING TERMINATED 10'
WATER 8' @ 0.0 HRS

BORING B-23

DESCRIPTION	W	N	DEPTH
SAND, FINE, GRAY, SILTY CLAY TAN IN LAYERS SOME SHELL	17.8	9	
	6.7	11	
SAND, FINE TO MEDIUM SOME SHELL, SOME CLAY LUMPS, TAN INTO GRAY	11.4	6	5'
	21.1	7	
	19.9	2	

BORING TERMINATED 10'
WATER 8.5' @ 0.0 HRS.

BORING B-24

DESCRIPTION	W	N	DEPTH
SAND, SILT, COAL, BLACK	18.7	9	
SAND, FINE TO MEDIUM, CLAY LUMPS, TAN	24.0	7	
	11.4	11	5'
	16.2	22	
	16.8	12	

BORING TERMINATED 10'
WATER 8.5' @ 0.0 HRS.

BORING B-25

DESCRIPTION	W	N	DEPTH
SAND, SILT, WOOD CINDERS (FILL) DARK G	69	51	
	11.1	39	
SAND, TRACE SILT, SOME SHELL, TAN, FINE	11.3	39	5'
	7.2	36	
	17.5	17	

BORING TERMINATED 10'
WATER 8' @ 0.0 HRS.

BORING B-26

DESCRIPTION	W	N	DEPTH
SAND, FINE TO MEDIUM SOME SILT	10.2	17	
	7.8	13	
	8.8	3	5'
COARSE, TRACE GRAVEL	26.1	17	
CLAYEY SILT LUMPS	11.9	12	

BORING TERMINATED 10'
WATER 4.5' @ 0.0 HRS

W COLUMN INDICATES SAMPLE MOISTURE CONTENT.

GRAPHIC SCALE

1"=5' VERT.

5' 0 5' 10' 15' 20' 25'

RECORD DRAWING
LETTER DATED 19 OCT 1979

B - 2

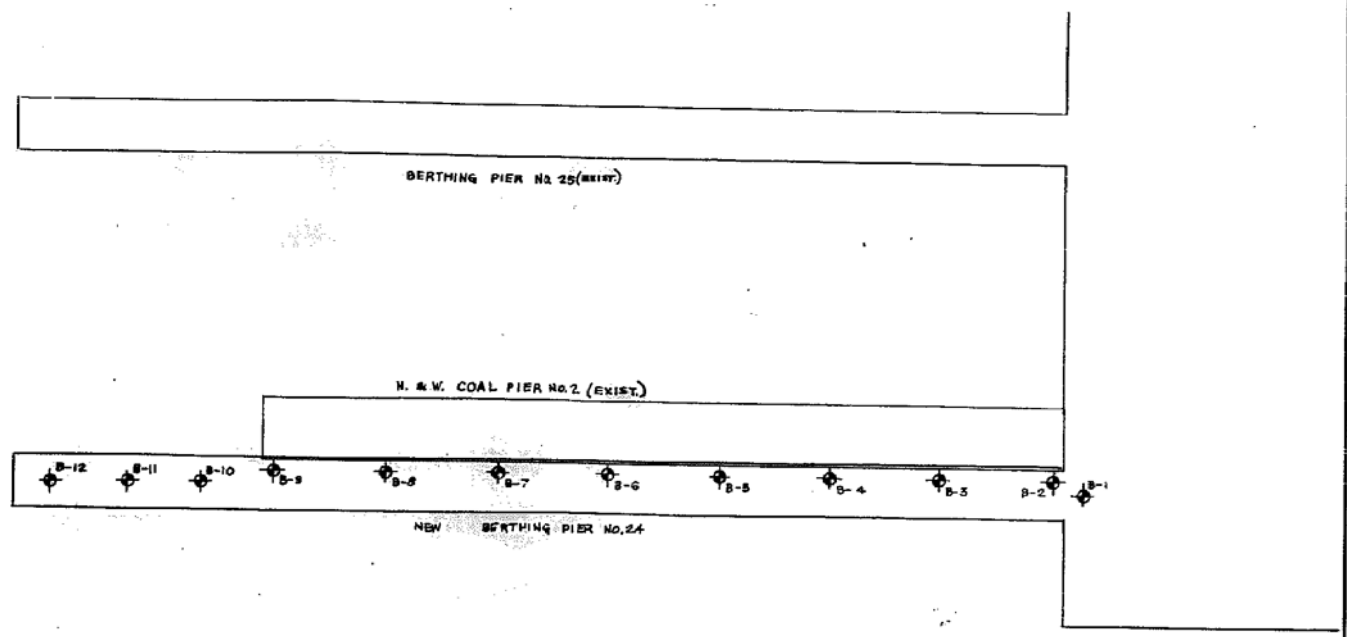
EFD DWG. NO.	12981
JOB ORDER NO.	54505429
DES.	
DRWN.	
TR.	
CHK.	T.D. Wilson
SO. MGR.	R.P. McCandless PE
DES. SUP.	J. Lewis PE
SATISFACTORY TO	DATE
APPROVED	DATE 21 NOV 1979

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION NORFOLK, VA.

NAVAL STATION NORFOLK, VA.
BERTHING PIERS (2ND INCREMENT)
PIER 24
BORING LOG

CODE IDENT. NO.	F	80091	SIZE 402981
NAVFAC DRAWING NO.	NAVFAC 2470-75-B-5429		
SUPERSEDES NAVFAC NO.	NOTED		
DRAWING NO.	05-75-5429	SHEET NO.	18 OF 72

BORING C-5			BORING C-6			BORING C-7		
DEPTH	DESCRIPTION	N	DEPTH	DESCRIPTION	N	DEPTH	DESCRIPTION	N
5	WATER			WATER			WATER	
	SAND, FINE TO MEDIUM, LITTLE SILT, LITTLE CLAY BROWN	18				5	SAND, FINE TO MEDIUM GRAY, LITTLE SILT	3
10	SILT, TRACE CLAY	16				10		
15	RACE SHELL	16	15	SAND, FINE TO MEDIUM, SOME SILT, TRACE GRAVEL, GRAY,	15	15		
20	LITTLE SHELL, TRACE SILT GRAY	26	19			20	BROWN, SOME SILT TRACE CLAY, SOME SHELL	26
25		28	25	FINE TO COARSE	55	25	GRAY, LITTLE SHELL, TRACE SILT	26
30	TRACE SHELL	42	30		6	30	TRACE SHELL	21
35	LITTLE SILT	30	35	CLAY, SOME SAND, SOME SILT, GRAY	4	35	TRACE CLAY	19
40		31	40	NO SAND	3	40		21
45	NO CLAY, LITTLE SHELL TRACE SILT	50	45		2	45		23
50		45	50	LITTLE SILT	2	50		27
55		42	55	ORGANICS	15	55	TRACE SHELL & SILT NO CLAY	25
60	TRACE SHELL & CLAY	36	60		10	60		36
65		49	65		24	65		35
70		59	70	SAND, FINE, LITTLE CLAY, TRACE SILT, TRACE SHELL GRAY	27	70		37
75	LITTLE CLAY & TRACE SILT	34	75		35	75		45
80		31	80		35	80		43
85		26	85	LITTLE SHELL, TRACE CLAY	51	85	TRACE CLAY	45
90		25	90		23	90	SOME SHELL	39
95		28	95		28	95	TRACE SHELL	45
100		30	100	LITTLE SILT	46	100	NO CLAY	46
	BORING TERMINATED 101.5'			BORING TERMINATED 101.5'			BORING TERMINATED 101.5'	



BORING B-1 TO B-12 LOCATIONS
SCALE: 1"=100'

LOCATIONS OF BORINGS B-13 THROUGH B-26 AND C-5, C-6, AND C-7 SEE SHEET C-2.

GRAPHIC SCALE
5' 0 5' 10' 15' 20' 25'
1"=5' VERT.

REVISIONS			
NO.	DESCRIPTION	DATE	APPROVED

RECORD DRAWING
LETTER DATED 19 OCT 1979

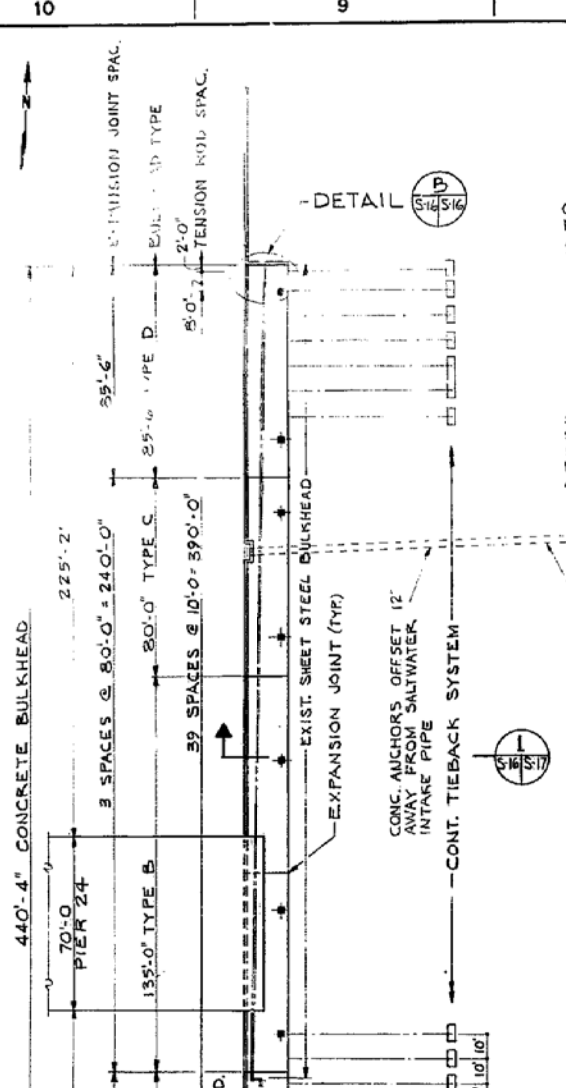
B-3

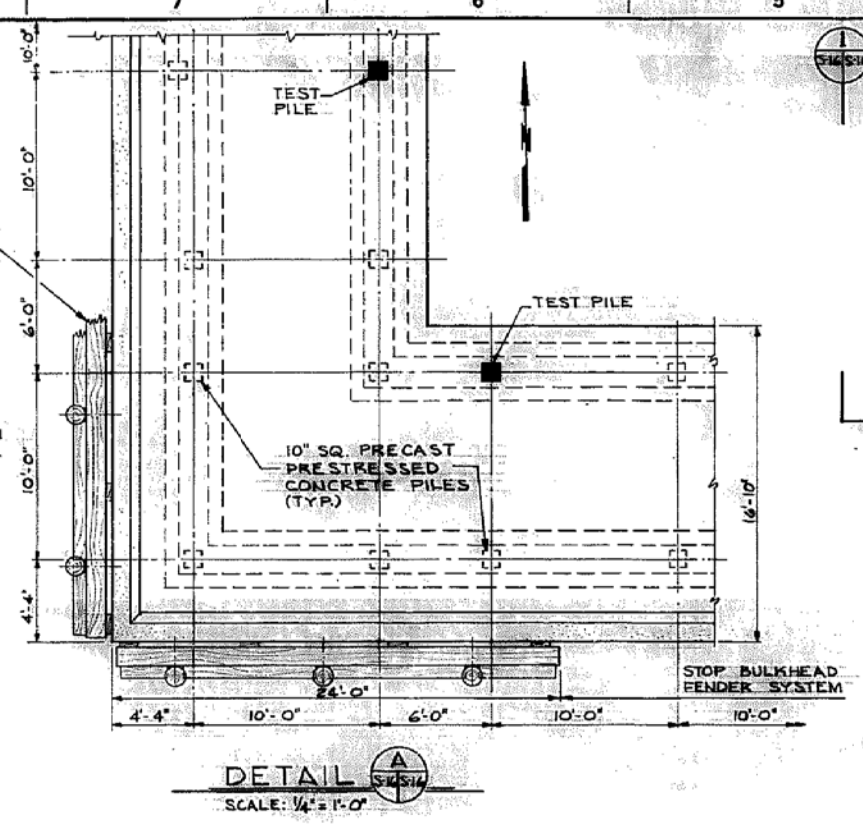
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION NORFOLK, VA.
BERTHING PIERS (2ND INCREMENT)
PIER 24
BORING LOG III

DRAWING NO.	SHEET NO.	CONTRACT NO.
F	80091	4029812

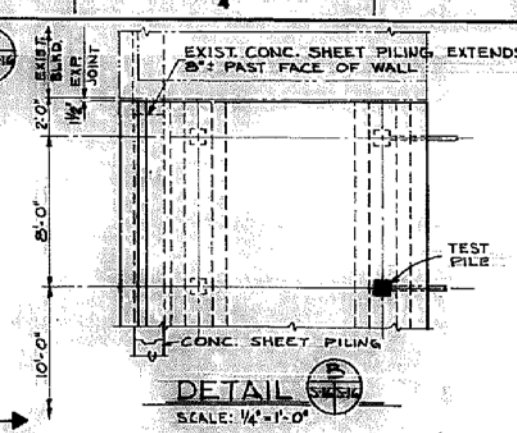
NOTED [illegible] 79-B-0459 [illegible] 19 OCT 79

REVISIONS			
A	REVISED AS-BUILT	6/14/81	Civil

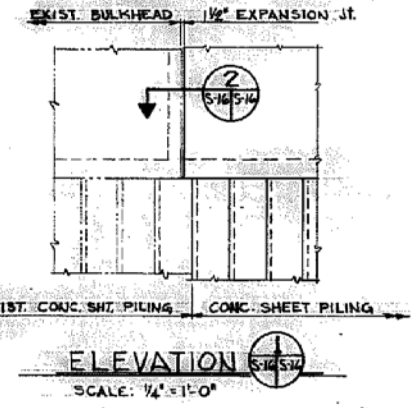




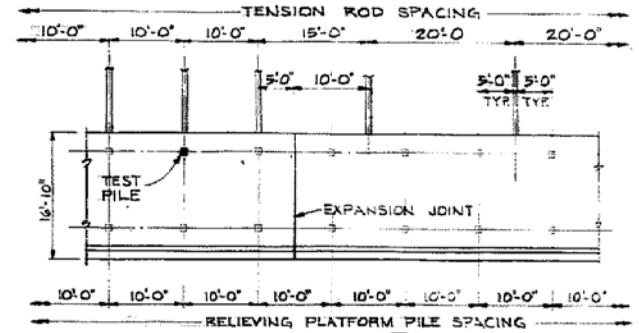
DETAIL A S-14/S-16
SCALE: 1/4" = 1'-0"



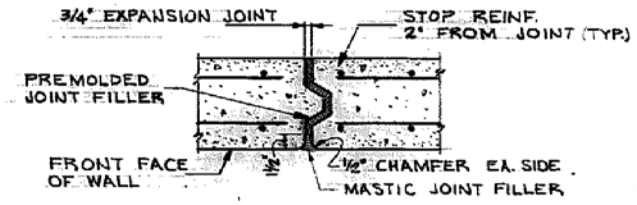
DETAIL B S-14/S-16
SCALE: 1/4" = 1'-0"



ELEVATION 1 S-14/S-16
SCALE: 1/4" = 1'-0"



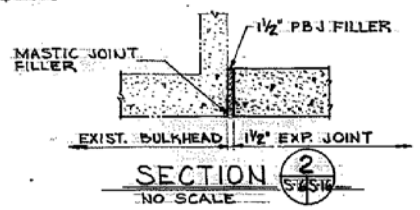
DETAIL C S-14/S-16
SCALE: 1" = 10'-0"



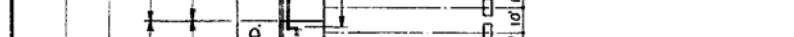
BULKHEAD EXPANSION JOINT DETAIL
NO SCALE

CONC. SHEET PILE KEY
NO SCALE

NOTE "A"
RAISE TENSION ROD ELEV. 3" AT PILE ANCHOR IN THIS AREA (5 ANCHORS)



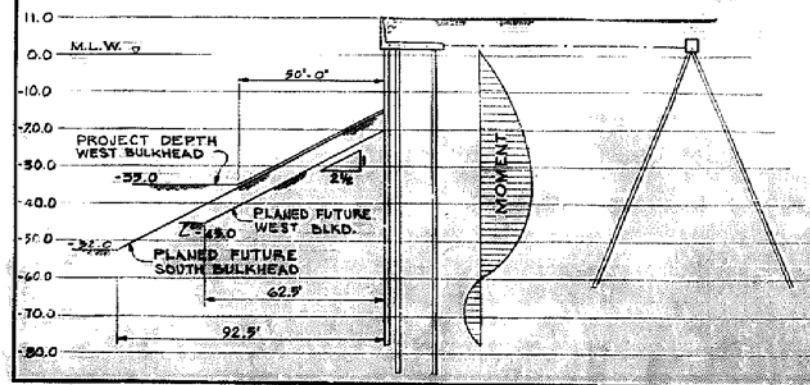
SECTION 2 S-14/S-16
NO SCALE



DETAIL A S-16/S-16

DETAIL C S-14/S-16

PLAN OF BULKHEAD
SCALE: 1" = 50'-0"



BULKHEAD DIAGRAM & DESIGN DATA

OPTION 'E' COL DELETED

BULKHEAD DESIGN DATA

BULKHEAD TYPE		A	B	C	D	E	A OPTION E
SHEET PILE	TIP ELEVATION	-78	-70	-60	-48	-55	-46
	MAX. MOMENT	140	129	129	70	40	60
	MAX. SHEAR	8.8	7.7	7.7	7.7	7.7	10.5
RELIEV PLATFORM	EID LENGTH	92	77	67	39	42	—
10" SQ. PILE	DESIGN CAP. (TONS)	60	60	60	60	60	—
	TEST PILES (Group)	2	5	4	4	8	—
TIE BACK 10" SQ. PILES EACH BLD.	COMPRESSION PILE	65	65	65	65	65	66
	TENSION PILE	65	65	65	65	65	66
	COMPRESSION DESIGN CAP. (TONS)	60	60	60	60	60	60

STRUCTURAL NOTES

1. LIVE LOADS
   A. SURCHARGE = 600 #/FT²
   B. SEISMIC ZONE 1
2. CAST-IN-PLACE CONCRETE
   A. f'c = 4000 AT 28 DAYS
   B. REINFORCING STEEL ASTM A615 GRADE 60
3. PIPE PROPERTIES (ALL PILES SHALL BE PRECAST/PRESTRESSED WITH A MIN f'c = 9000 PSI.)
   A. PRECAST 10" SQ. PILES SHALL BE CAPABLE OF SUPPORTING 60 TONS.
   B. CONTRACTOR IS TO SUBMIT DESIGN CALCULATIONS TO THE CONTRACTING OFFICER FOR CONCRETE SHEET PILING BASED ON THE MINIMUM VALUES SHOWN ON THIS SHEET. NO TENSION IS PERMITTED IN THE CONCRETE.
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36.

GRAPHIC SCALES
1" = 1'-0"
1" = 10'-0"
1" = 50'-0"

RECORD DRAWING
LETTER DATED 19 OCT 1978

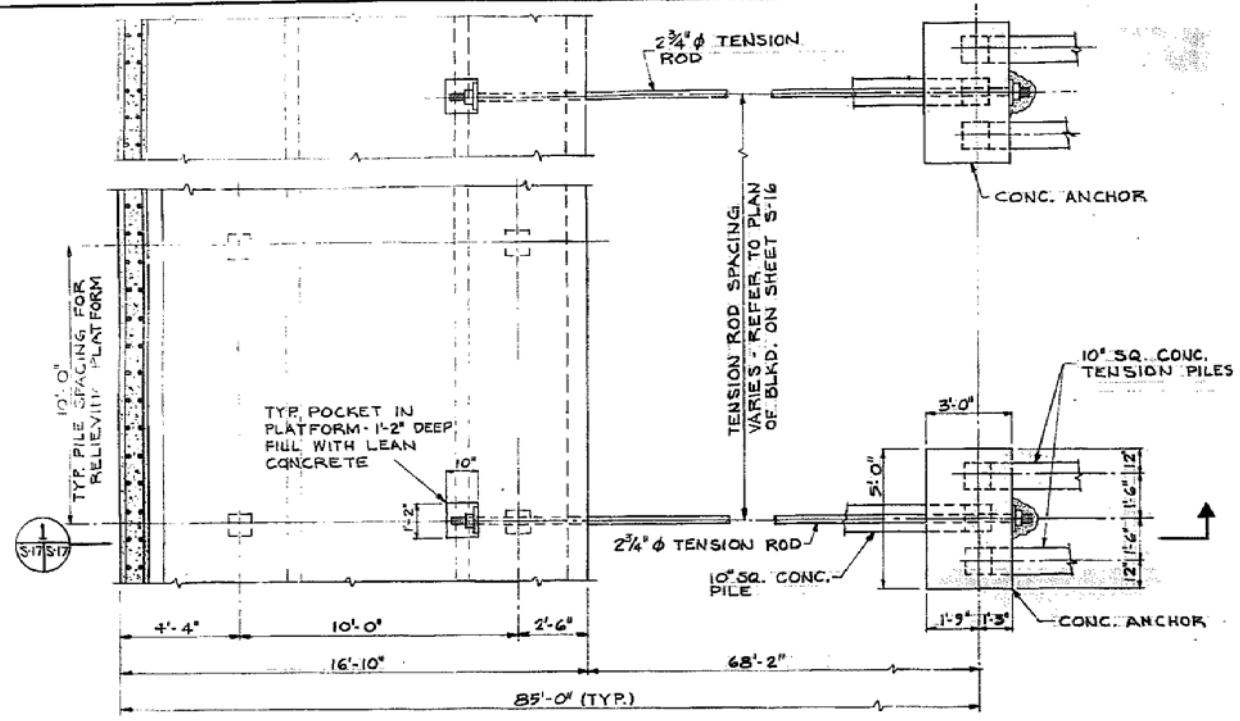
S-16

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION NORFOLK, VA.
BERTHING PIERS (2ND INCREMENT)
PIER 24
BULKHEAD PLAN & DETAILS

DES'D.	M.C.W.	
DRWN.	C.W. GRAESSLE JR.	
TR.		
QUAN.		
SPECIFICATION NO.		DATE
APPROVED		DATE
		11 NOV 1976
BUR. NO.	12823	
JOB ORDER NO.	5480429	
SUBD.	V.R. JACKSON P.E.	
CONTRACT NO.		
AS BUILT		
NOTED	06-19-1981	
DRAWING NO.	1028129	
SHEET NO.	16 OF 72	

A-E-1-76-5-5480]

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED AS-BUILT	1/5/81	

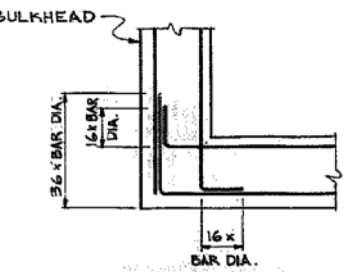


TYPICAL PART PLAN OF BULKHEAD SYSTEM

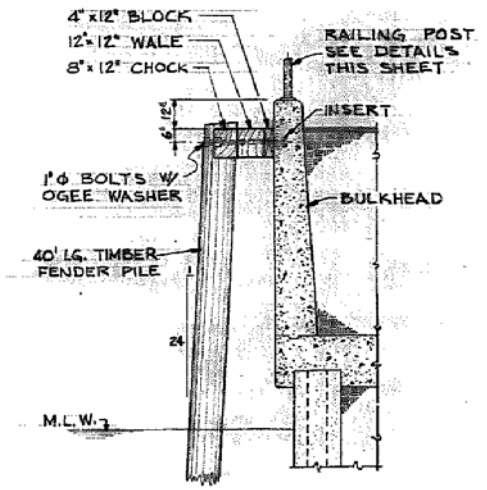
SCALE: 3/8" = 1'-0"

NOTE A

THE CONTRACTOR AT HIS OPTION MAY LEAVE THAT PORTION OF THE SHEET PILING BELOW ELEVATION 1.75 PROVIDED THERE IS NO INTERFERENCE WITH THE CONSTRUCTION OF THE NEW BULKHEAD.

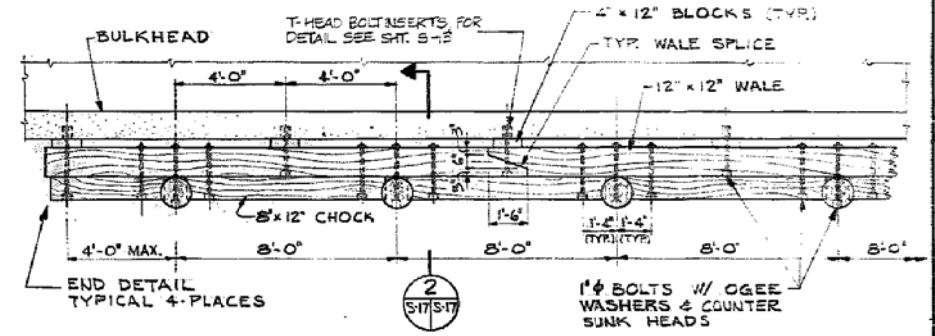


REINFORCING DETAIL AT CORNER OF WALL



SECTION (2 S-17 S-17)

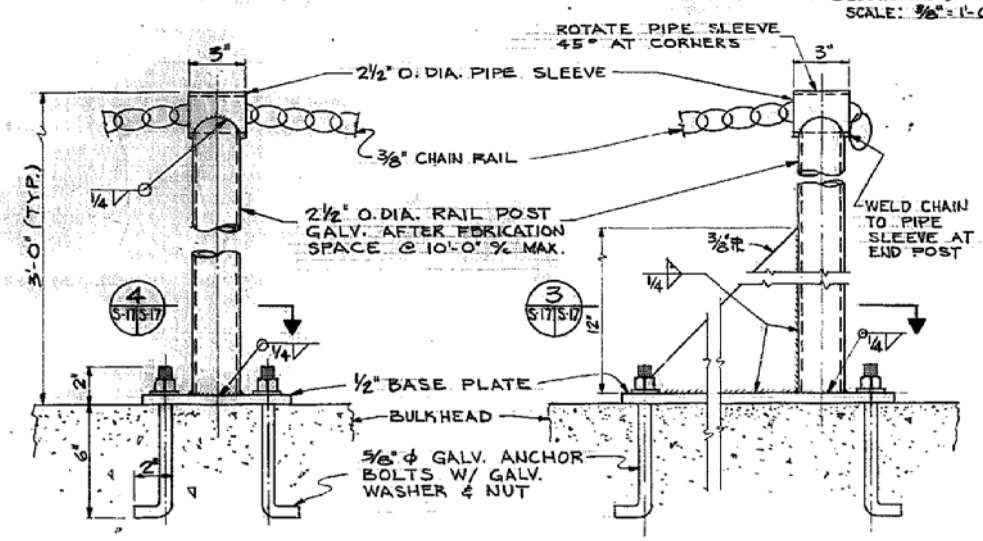
SCALE: 3/8" = 1'-0"



PART PLAN - BULKHEAD FENDER SYSTEM

(AT WEST BULKHEAD AND 24 FT. ALONG SOUTH BULKHEAD)

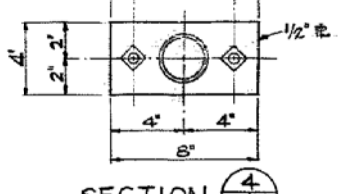
SCALE: 3/8" = 1'-0"



INTERMEDIATE RAIL POST

END RAIL POST

SECTION (3 S-17 S-17)

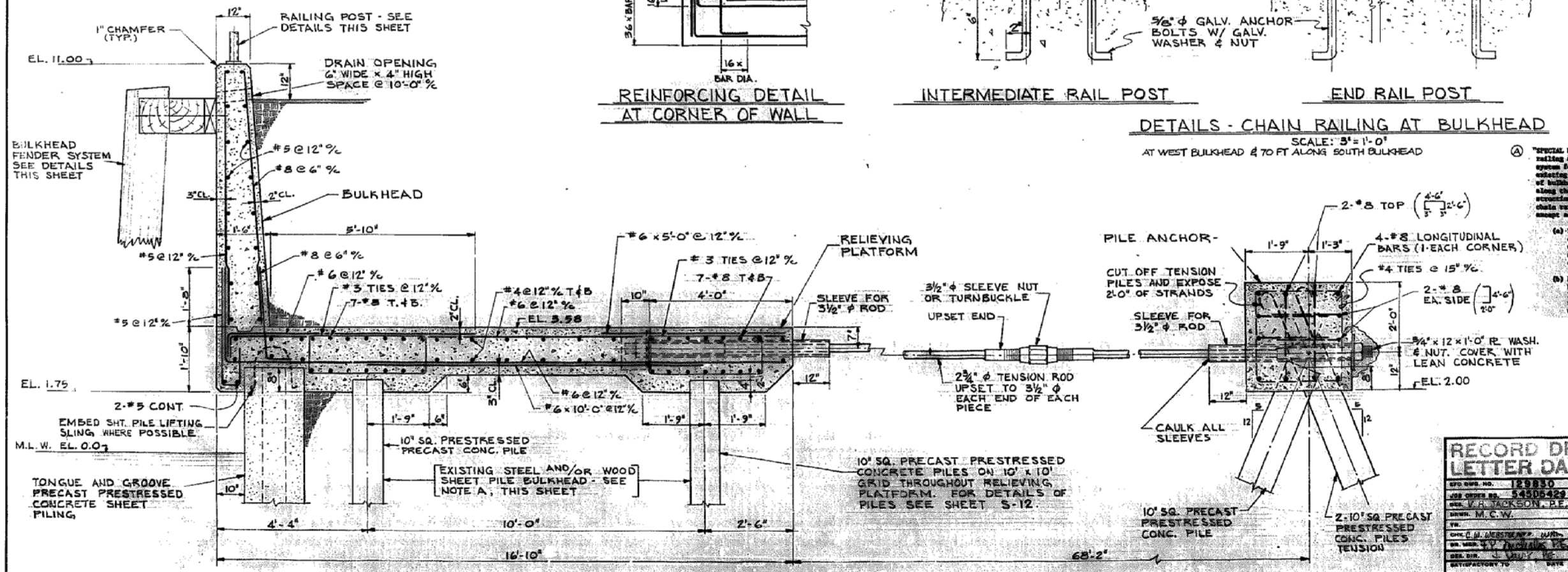


SECTION (4 S-17 S-17)

DETAILS - CHAIN RAILING AT BULKHEAD

SCALE: 3" = 1'-0"

AT WEST BULKHEAD & 70 FT ALONG SOUTH BULKHEAD



SECTION (1 S-16 S-17 S-17)

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

"SPECIAL NOTE: In addition to providing fender system and chain railing at new bulkheads, provide new fender system and chain railing system for the existing bulkhead on the north end and south side of existing Pier 25. This existing bulkhead includes 240 linear feet of bulkhead along the west bulkhead and 24 linear feet of bulkhead along the south bulkhead (north of Pier 25). Existing bulkhead and expansion joints are shown for new bulkhead. New fender system and chain railing for existing bulkhead shall be as shown for new bulkheads, except as follows:

(a) Delete securing fender system on existing bulkhead shall be connected with single load expansion shackle with an ultimate load capacity of at least 15,000 pounds and stand for 1½-inch round bolts. Bolts and shackle shall conform to FF-S-325, Group I, Type 1, Class 3.

(b) Delete securing chain railing posts to existing bulkhead shall be anchored with single load expansion shackle with an ultimate load capacity of at least 5000 pounds and stand for 1½-inch round bolts. Bolts and shackle shall conform to FF-S-325, Group I, Type 1, Class 1."

GRAPHIC SCALES

3/8" = 1'-0"

3/4" = 1'-0"

3" = 1'-0"

RECORD DRAWING
LETTER DATED 18 OCT 1979

S-17

NFD DWG. NO.	29830
JOB ORDER NO.	54505429
DES.	V.R. JACKSON, P.E.
DRWN.	M.C.W.
TR.	
CHK.	C.W. WESTERVELT, P.E.
DR. MGR.	T.V. TAVOULARIS, P.E.
DES. DIR.	J. DUDLEY, P.E.
SATISFACTORY TO	DATE
APPROVED	DATE 11 NOV 1976

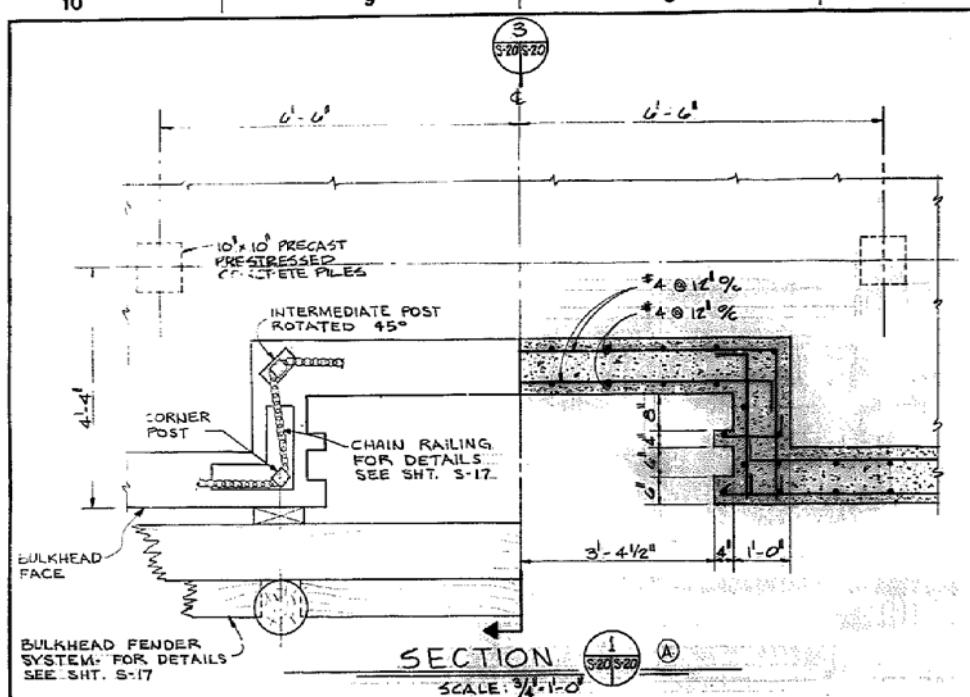
DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION — NORFOLK, VA.
NAVAL STATION — NORFOLK, VA.
BERTHING PIERS (2ND INCREMENT)
PIER 24
BULKHEAD SECTIONS & DETAILS

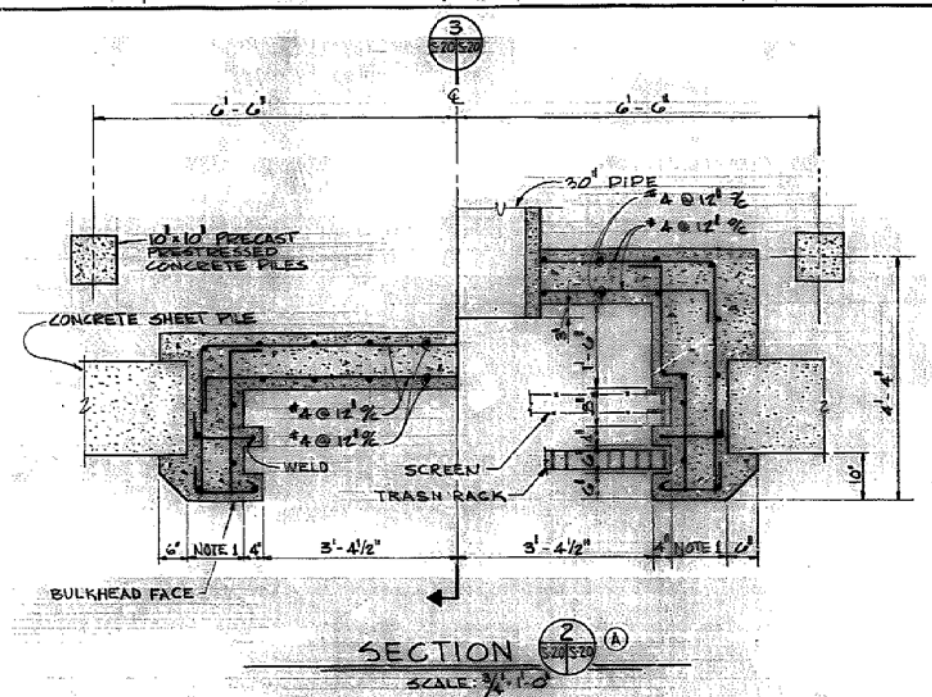
DES.	DRWG.	4029830
F	DEC. 91	CONTR. NO. N62470-76-B-5429
AS NOTED	DIM. 06-76-5429	SHT. 57 OF 72

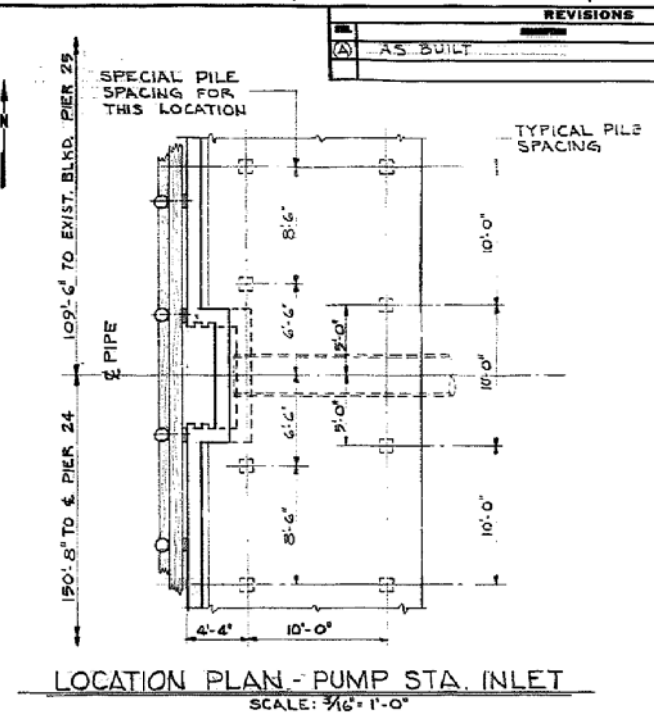
G F E D C B A

10 9 8 7 6 5 4 3 2 1

REVISIONS			
NO.	DESCRIPTION	DATE	APPROVED
(A)	AS BUILT	2/16/81	







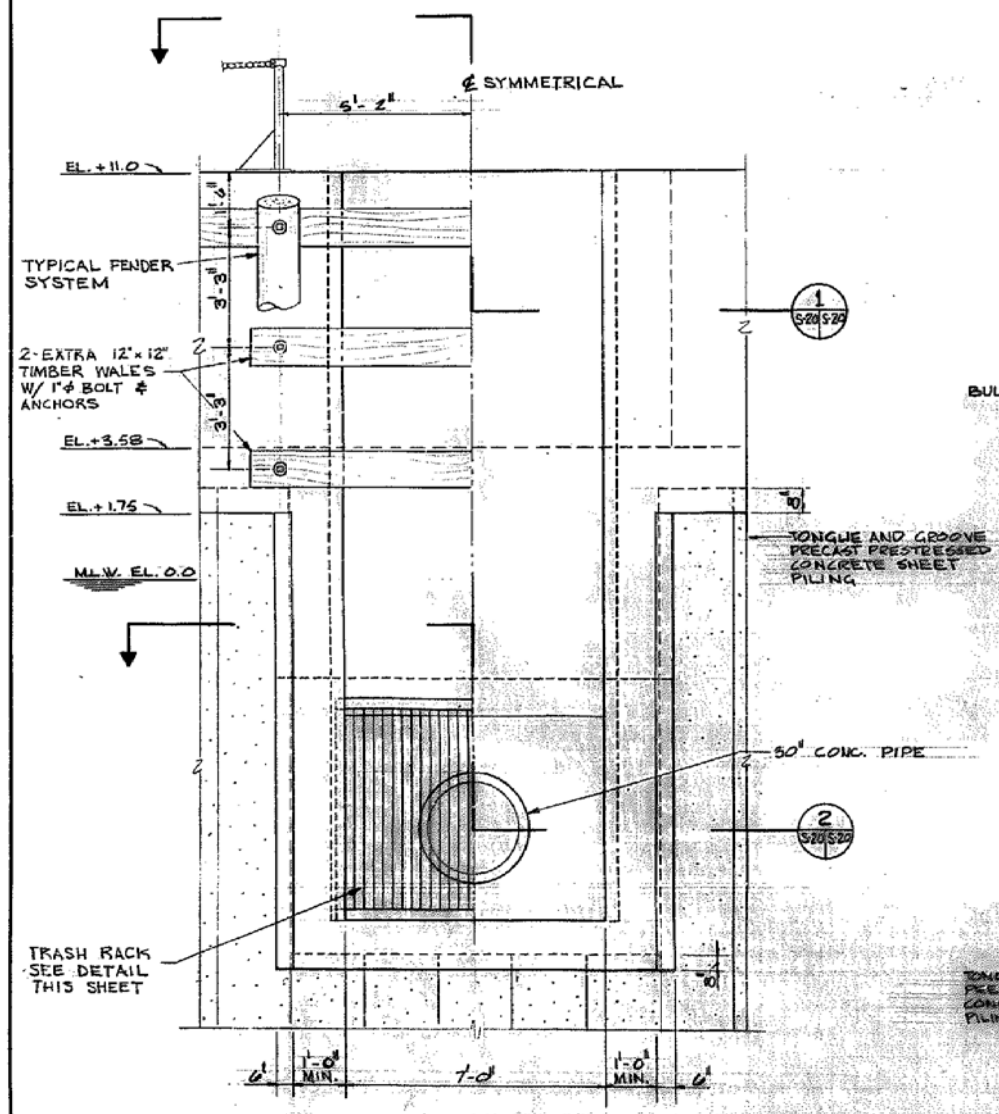
LOCATION PLAN - PUMP STA. INLET
SCALE: 3/16"=1'-0"

NOTES:

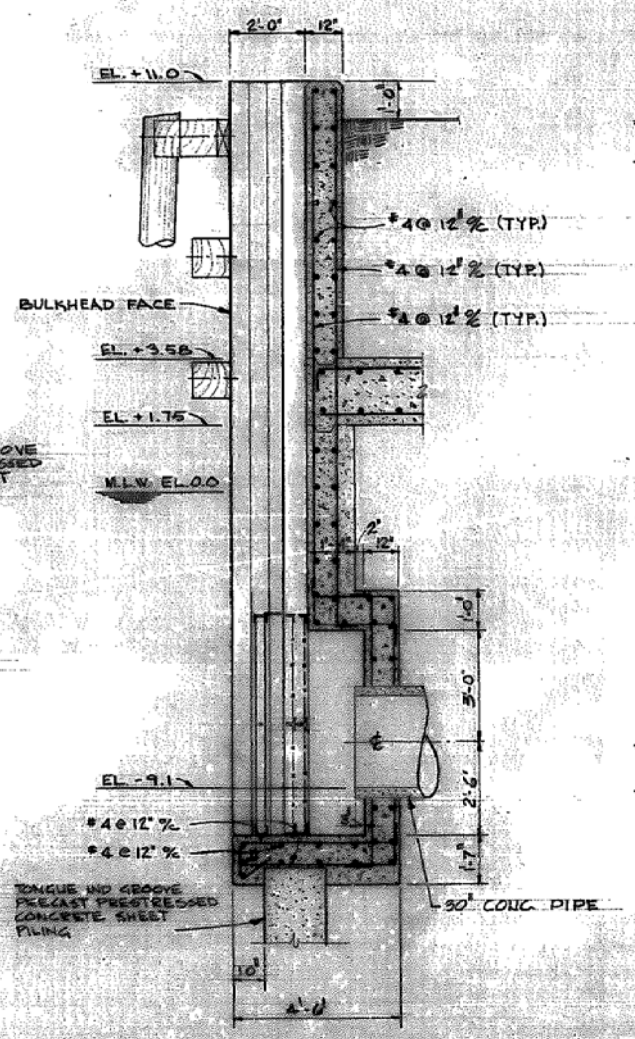
1-DIMENSION TO BE DETERMINED BY LOCATION OF CONCRETE SHEET PILE. ASSUME 2'-0" MAX. & 1'-0" MIN.

2-GALVANIZE TRASH RACK AND FINE SCREEN AFTER FABRICATION.

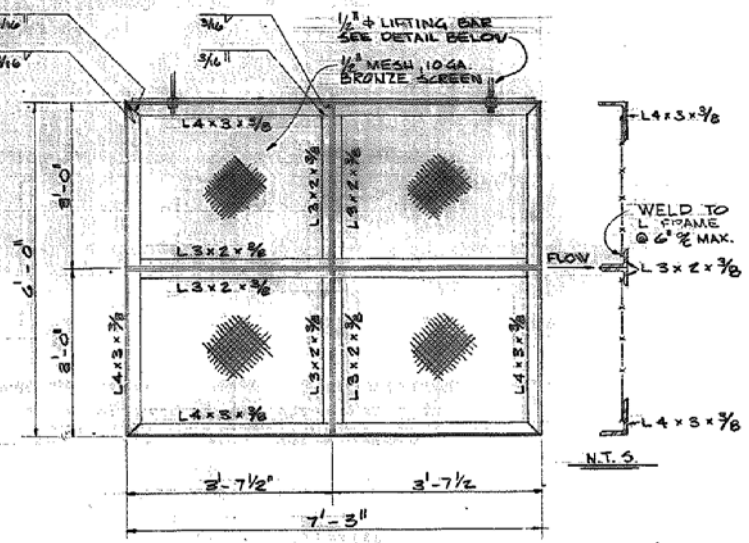
3-ALL REINFORCING NOT SPECIFIED ARE #4 BARS.



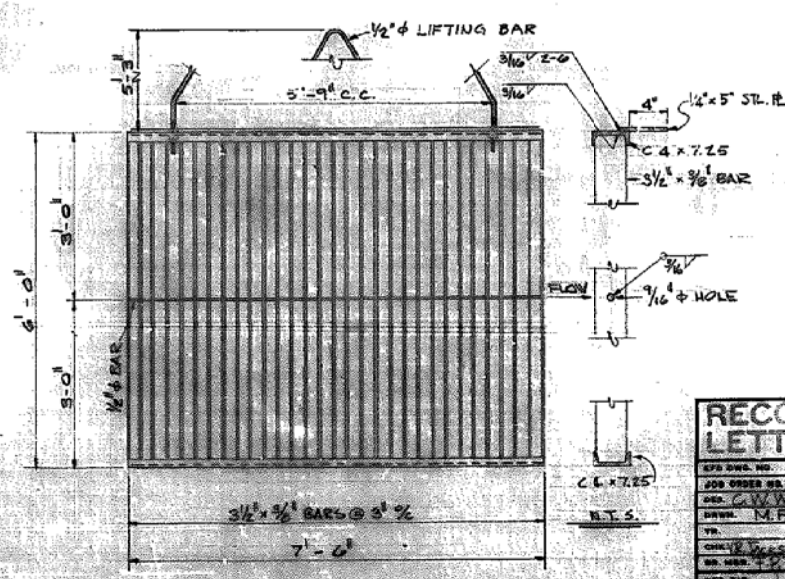
FRONT ELEVATION
SCALE: ½"=1'-0"



SECTION 3 S-20/S-20 A
SCALE: ½"=1'-0"



FINE SCREEN DETAILS (2 REQ'D)
SCALE: 3/4"=1'-0"



TRASH RACK DETAILS (1 REQ'D)
SCALE: 3/4"=1'-0"

GRAPHIC SCALES

1"=1'-0" 0 1' 2' 3' 4' 5' 6'

3/4"=1'-0" 0 1' 2' 3' 4' 5' 6'

1/2"=1'-0" 0 5' 10' 15'

RECORD DRAWING
LETTER DATED 29 OCT 1979

S-20

NAVFAC DWG. NO.	29833
JOB ORDER NO.	54505429
DES.	C.W.WEBSTER,RE
DRWN.	M.F.
TR.	
CHK.	
SUPV.	
DES. SUP.	
DATE OF ACCEPT BY	DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION NORFOLK, VA.
NAVAL STATION NORFOLK, VA.
BERTHING PIERS (2ND INCREMENT)
PIER 24
SALT WATER PUMPING STATION INLET DETAILS

C	CONTRACT	4029833
K	80091	

APPROVED DATE 1 NOV 1979
FOR CDR FOR COMMANDER NAVFAC

WHS NOTED | DRL 09-75-5429 | SHT 40 OF 72