

TOWN OF HARWICH

TOWN PIER REPLACEMENT

WYCHMERE HARBOR

HARWICH, MASSACHUSETTS

DECEMBER, 1979

AS-BUILT DRAWINGS SEPT. 24, 1980

PROJECT COMPLETION DATE: JUNE 19, 1980

CONTRACTOR:

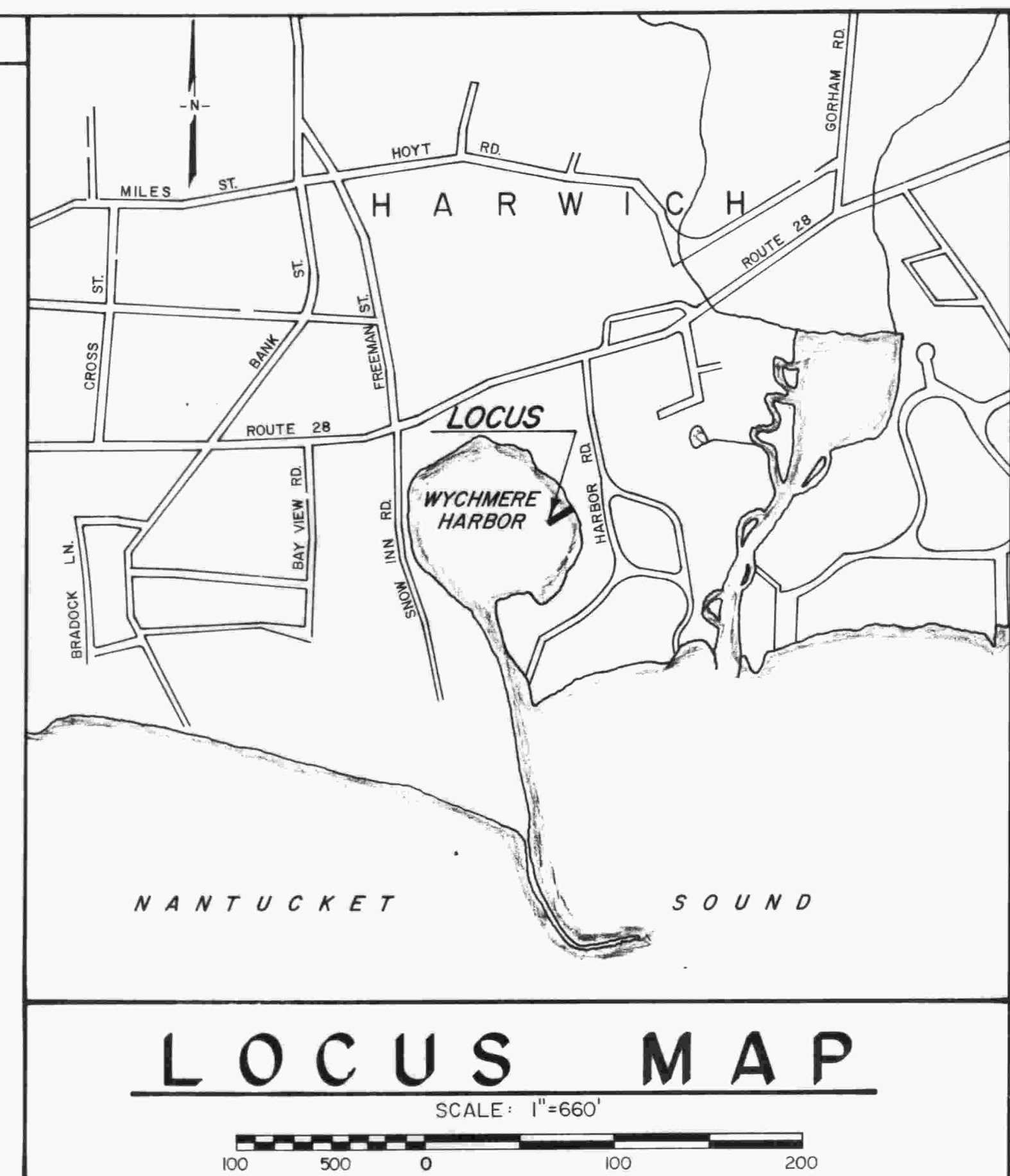
FELDMAN CONSTRUCTION CO., INC.
3 SANDY BAY TERRACE
ROCKPORT, MASSACHUSETTS



Robert C. Verade

Dr. Frederick M. Law P.E.
Structural Engineer

Frederick M. Law

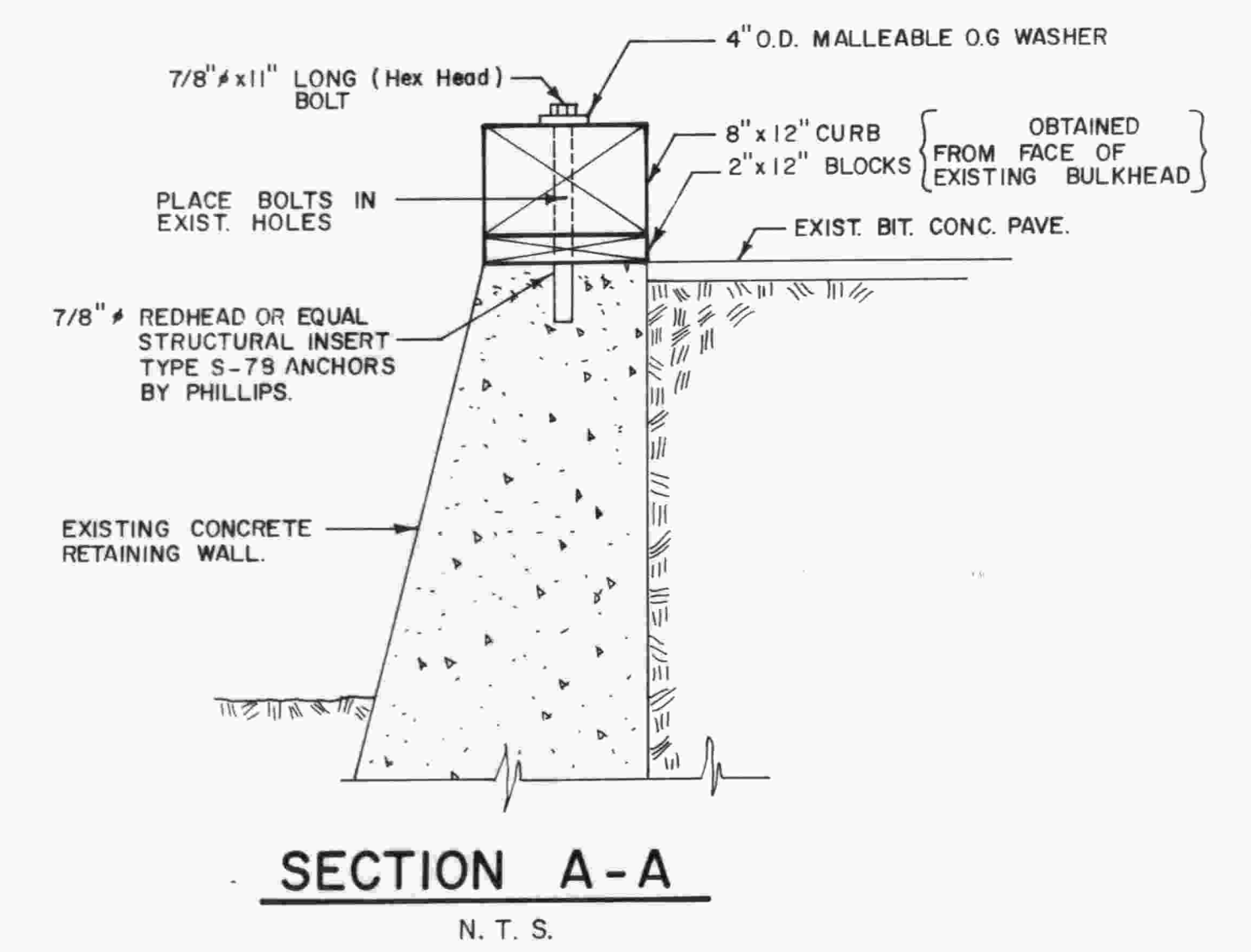
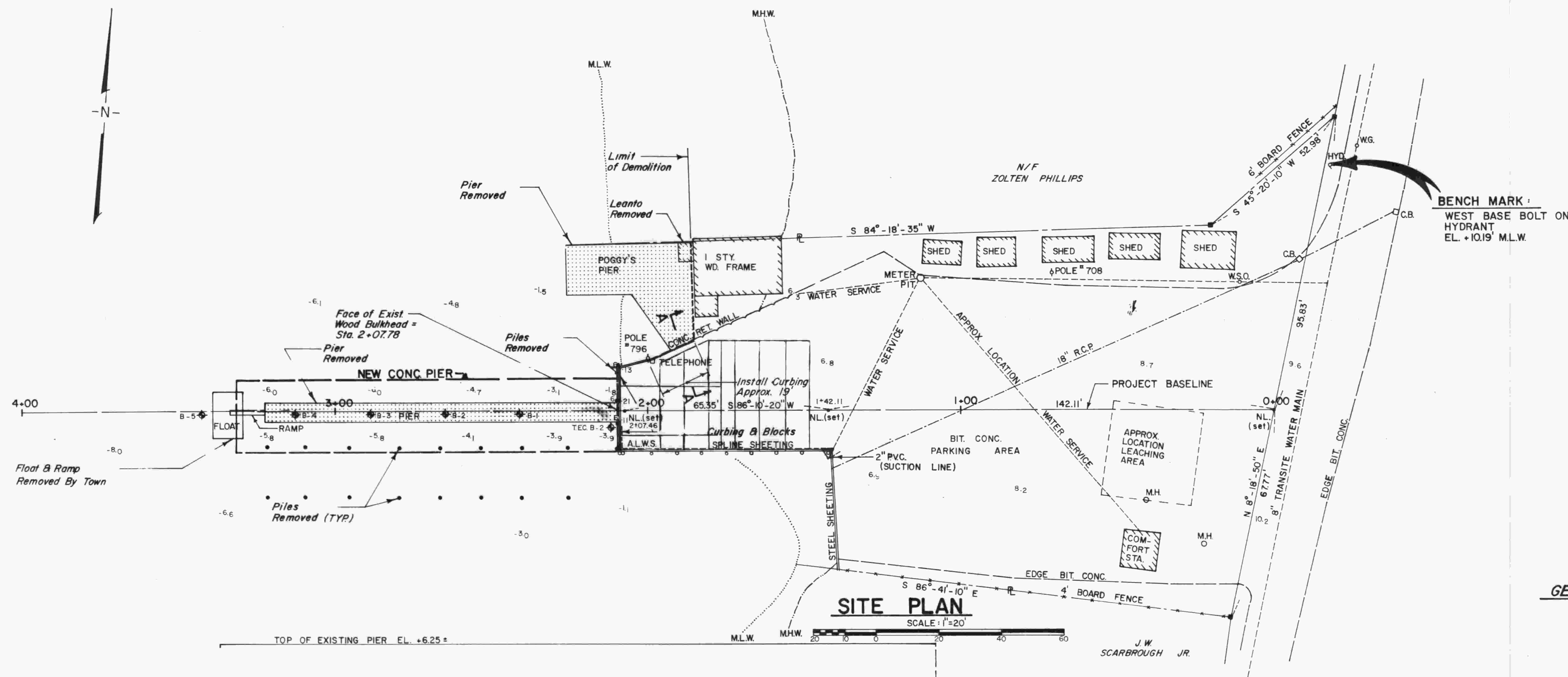


INDEX TO DRAWINGS

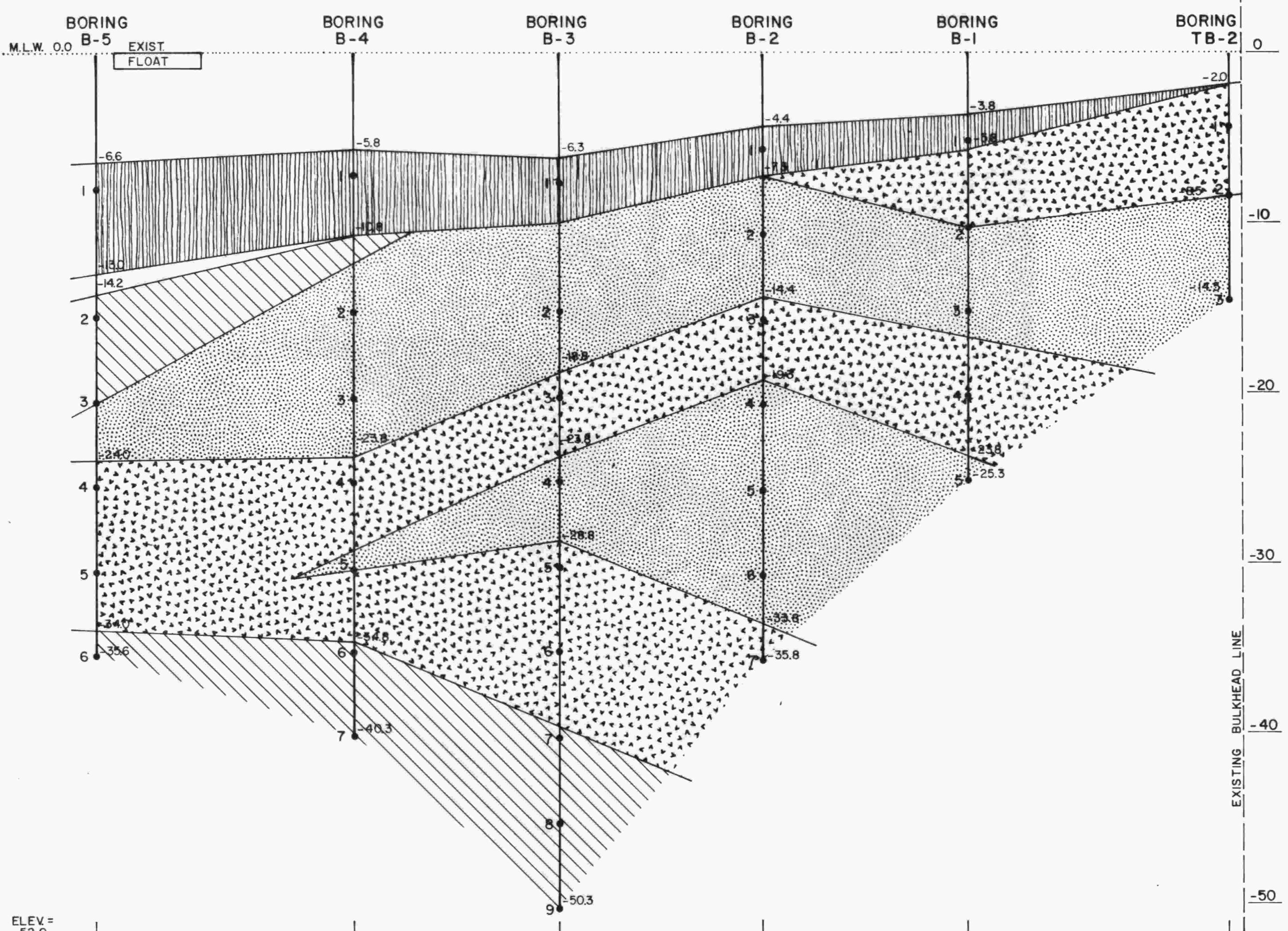
SHEET NO.	TITLE
1	TITLE
2	SITE & DEMOLITION PLAN
3	GENERAL ARRANGEMENT & PILE DETAIL
4	TYPICAL SECTION & PILE CAP DETAILS
5	DECK LAYOUT & DETAILS
6	FENDER & CAPLOG CONNECTION DETAILS
7	WATER & ELECTRICAL SYSTEMS LAYOUT & DETAILS

PREPARED BY

tec tibbetts engineering corp.
New Bedford, Massachusetts
CONSULTING ENGINEERS



- GENERAL STRUCTURAL NOTES:**
- 1.) The design live load for the pier is 250 p.s.f. or an AASHTO HS15-44 truck loading.
 - 2.) All precast concrete has the minimum compressive strength indicated in the notes for each precast element.
 - 3.) All reinforcing bars conform to ASTM A-615 and all prestressing strands conform to ASTM A-416 and all steel is the grade indicated in the notes for each precast element.
 - 4.) All structural steel conforms to ASTM A-36 and is galvanized after fabrication in accordance with ASTM A-123. All bolts are ASTM A307 bolts. All bolts and other hardware are galvanized in accordance with ASTM A-153.
 - 5.) All lumber has a minimum allowable "f" of 1,200 p.s.i. and is pressure impregnated with a preservative in accordance with the specifications.
 - 6.) All timber is rough saw.



SUMMARY OF BLOWS PER FOOT *

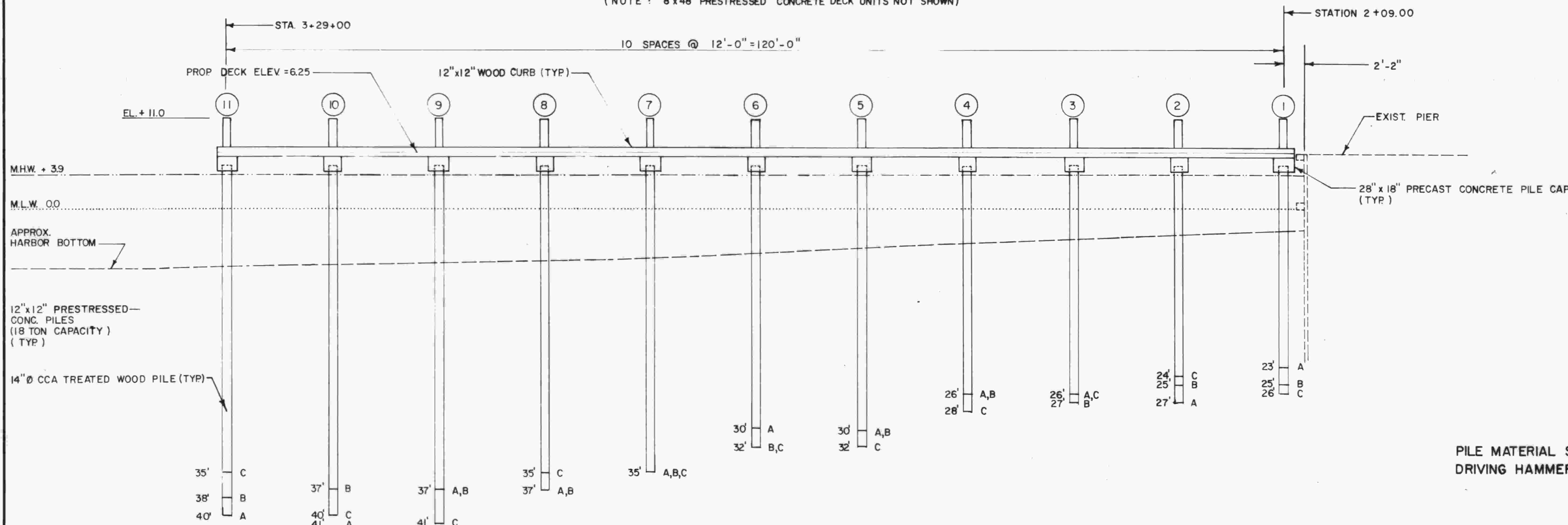
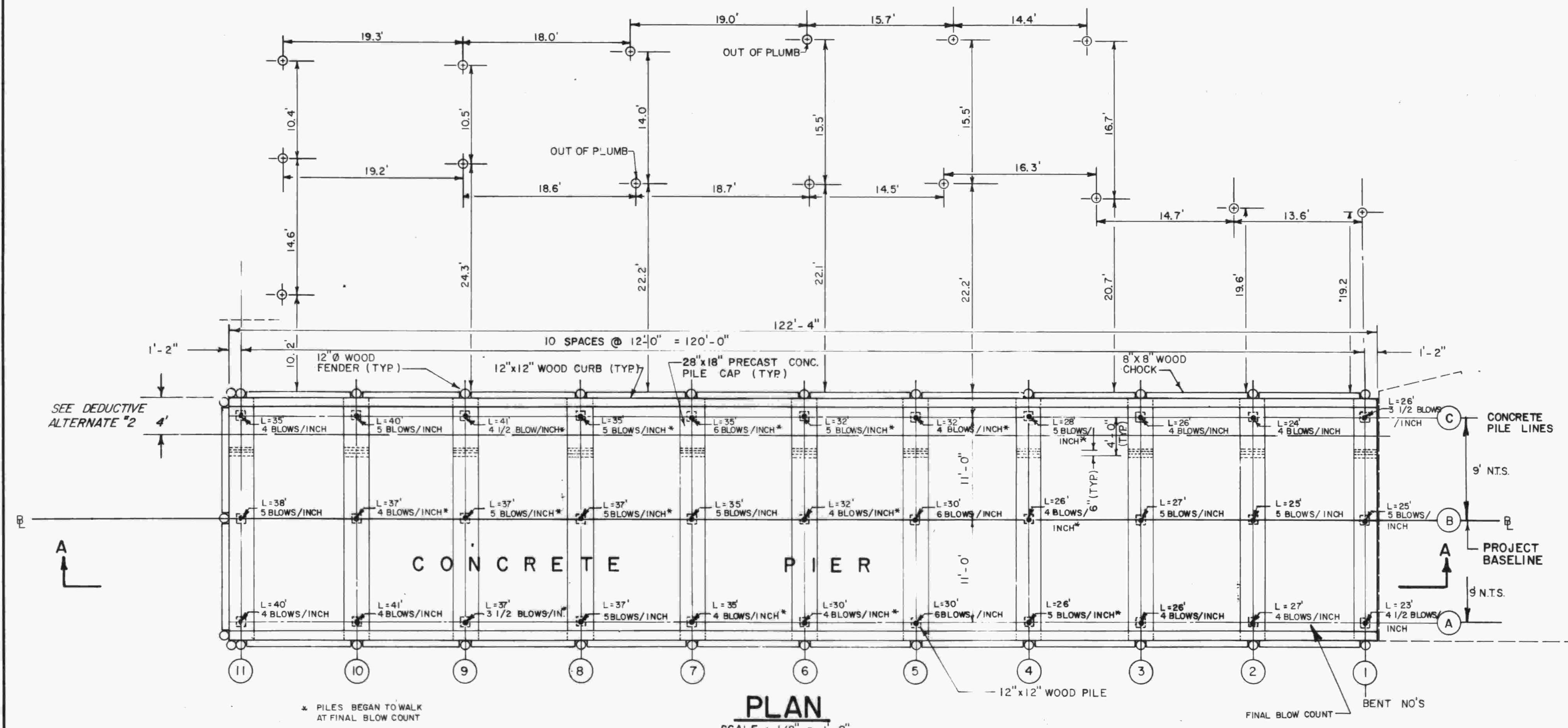
SOIL SAMPLE NUMBER	B-1	B-2	B-3	B-4	B-5	TB-2
1	PUSH	PUSH	PUSH	PUSH	PUSH	16
2	14	11	11	24	14	44
3	25	12	13	11	17	52
4	24	22	6	14	20	
5	41	33	6	8	11	
6		23	29	55	71	
7		73	6	59		
8			8			
9			13			

* STANDARD PENETRATION TEST, SEE SPECIFICATIONS FOR ACTUAL BORING LOGS.

LEGEND

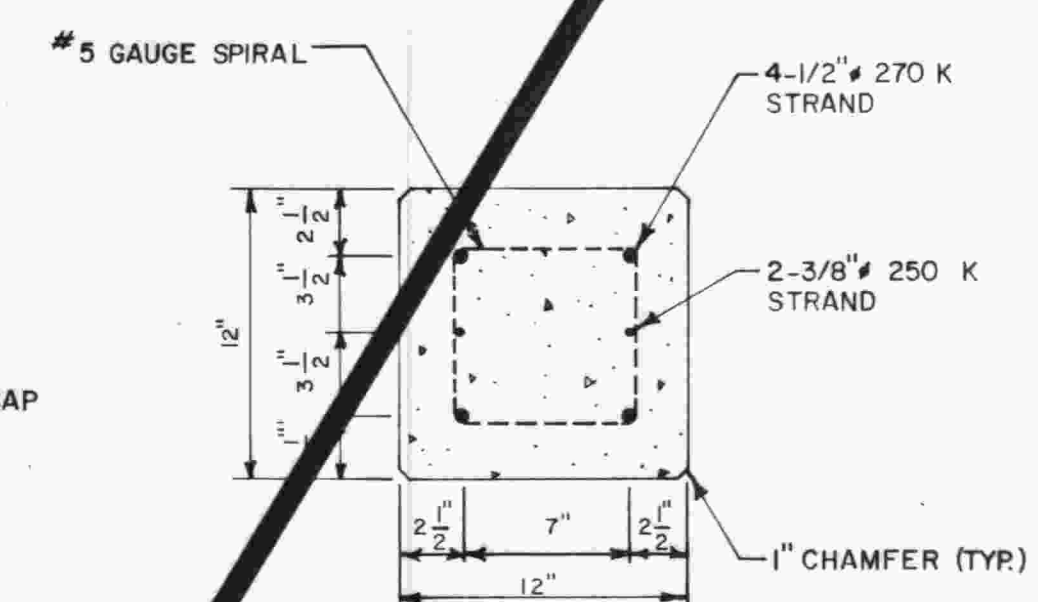
- OL ORGANIC SILTS & CLAYS
- PT PEAT
- SP POORLY GRADED SANDS, CLEAN
- SM SILTY SANDS (NON PLASTICS)
- GP POORLY GRADED GRAVEL, CLEAN
- 4 SOIL SAMPLE TAKEN AND NO.

AS-BUILT DRAWING		9-24-80 R.V.	
SYM.	DESCRIPTION	DATE	BY
TOWN OF HARWICH, MASSACHUSETTS WYCHMERE HARBOR			
TOWN PIER REPLACEMENT SITE & DEMOLITION PLAN			
DES. BY: RCV.		SCALE: AS NOTED	
DR. BY: J.S./A.A.		DATE: DEC. 1979	
CHK. BY: R.A.E.			



PRESTRESSED CONCRETE

- PILE NOTES:**
- Concrete strength shall be 3500 p.s.i. at release of prestress, 4000 p.s.i. minimum at delivery, and 5000 p.s.i. at 28 days.
 - Tensile strength of prestressing strands, type 270 K and 250 K ASTM designation A-416, shall be 270,000 p.s.i. and 250,000 p.s.i. respectively, initial locking force shall be 126,000 lbs. total, effective prestress and losses shall be 100,800 lbs. total.
 - Spirals shall conform to ASTM A-82.
 - Piles shall be manufactured in accordance with ACI Committee 543, Title 70-50 and AASHTO - PCI Joint Committee Recommendations.
 - All piles shall be driven to the depths indicated or until they develop the design load of 18 tons based on the engineering news record driving formula.



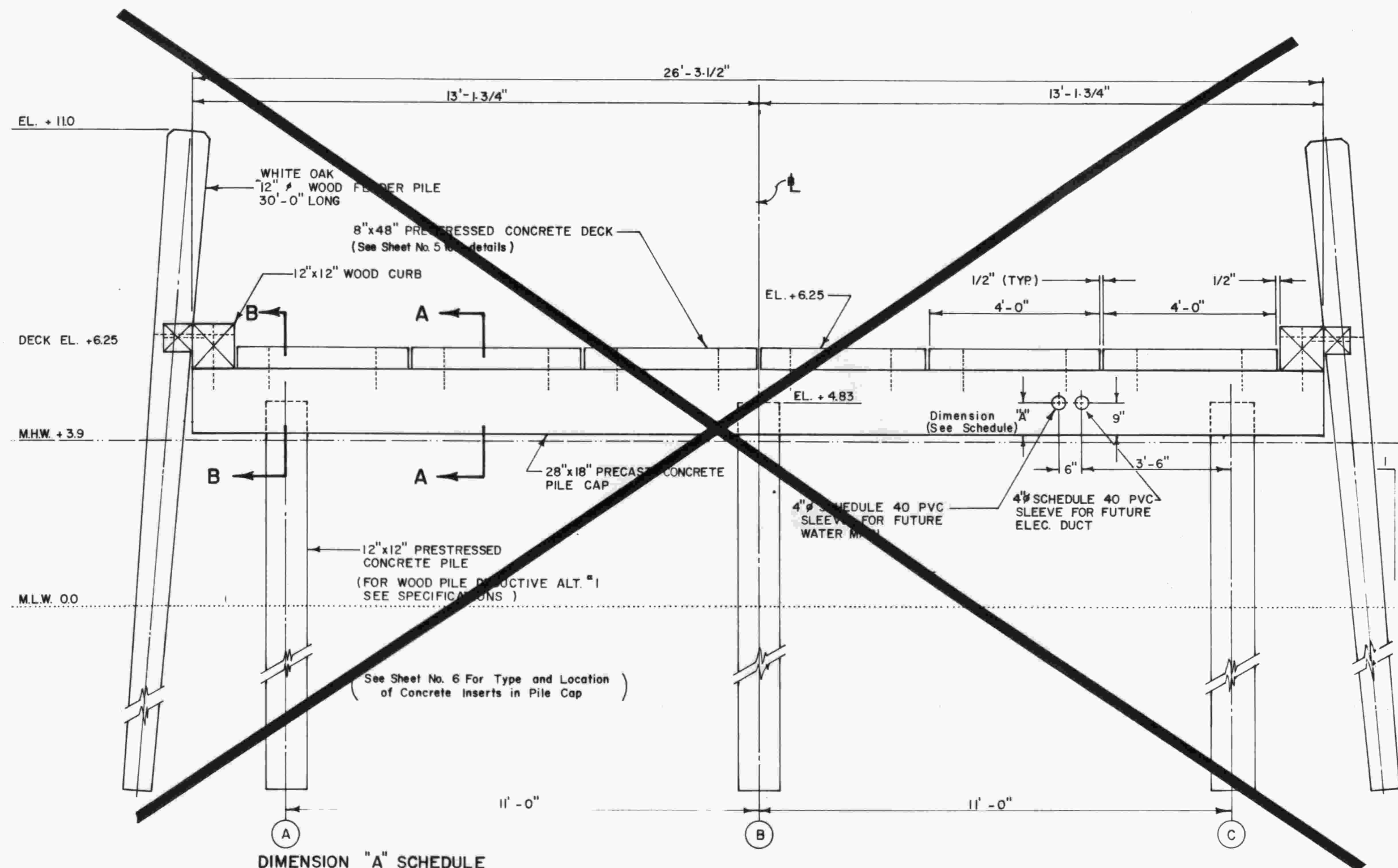
SPIRAL PATTERN
SCALE: 1" = 1'-0"

PRESTRESSED CONCRETE PILE DETAIL

NOT USED

PILE MATERIAL SOUTHERN YELLOW PINE (CCA TREATED)
DRIVING HAMMER "DELMAG D-5" - 9100 FT. LBS. RATED ENERGY.

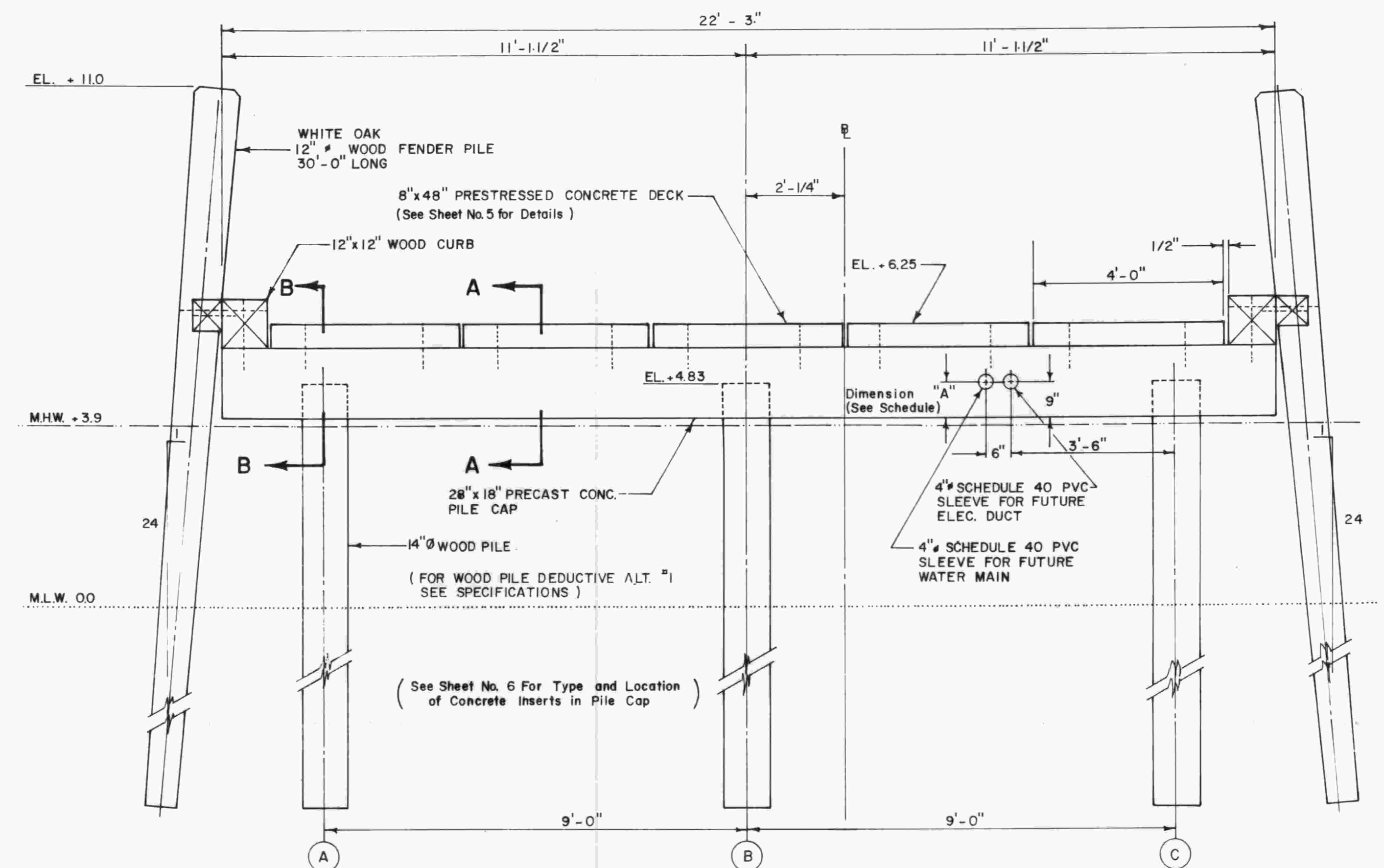
AS-BUILT DRAWING		9-24-80 R.V.	
SYM.	DESCRIPTION	DATE	BY
	TOWN OF HARWICH, MASSACHUSETTS WYCHMERE HARBOR		
TOWN PIER REPLACEMENT GENERAL ARRANGEMENT AND PILE DETAIL			
DES. BY: RV/FL.		SCALE: AS NOTED	
DR. BY: J.S./A.A.		DATE: DEC. 1979	
CHK. BY: C.P.S.			



BENT NO.	1	2	3	4	5	6	7	8	9	10	11
DIMENSION A	7'	7 3/8'	7 3/4'	8 1/8'	8 1/2'	8 7/8'	9 1/4'	9 5/8'	10'	10 3/8'	10 3/4'

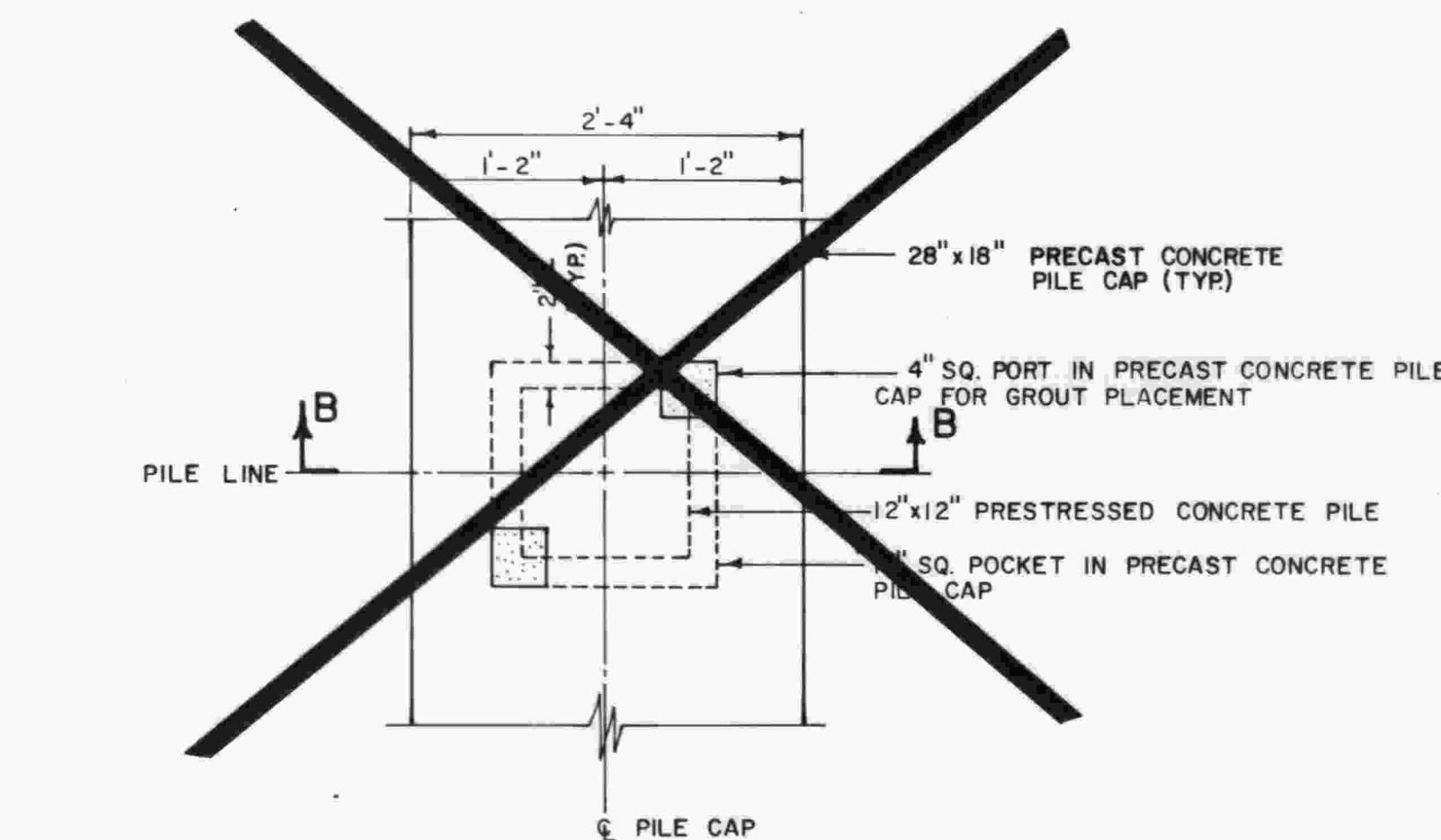
TYPICAL CROSS SECTION THRU CONCRETE PIER-24' DECK

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



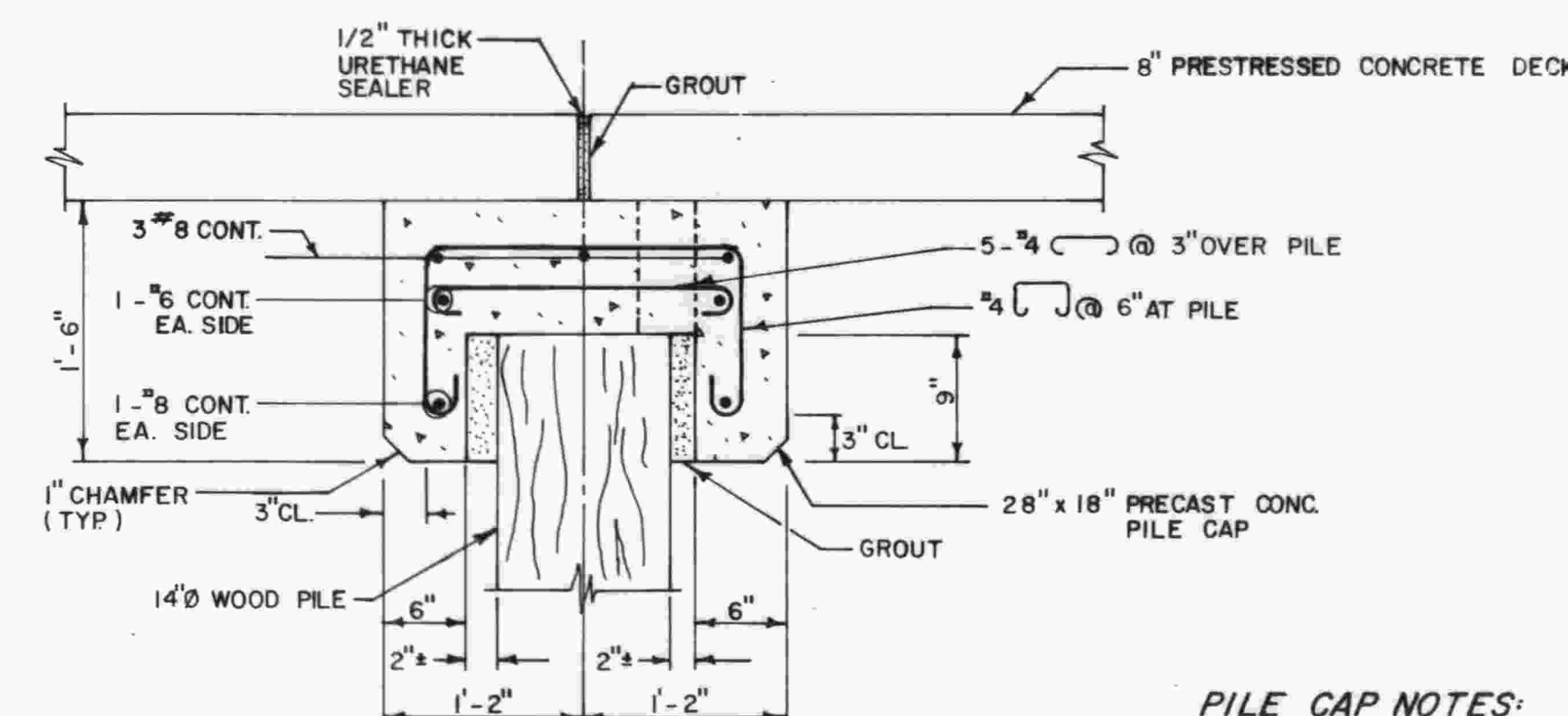
THIS SECTION AS CONSTRUCTION
ALTERNATE TYPICAL CROSS SECTION THRU CONCRETE PIER-20' DECK

SCALE: 1/2" = 1'-0"
(DEDUCTIVE ALTERNATE # 2)



PARTIAL PLAN OF PILE CAP AT PILE

SCALE: 1" = 1'-0"

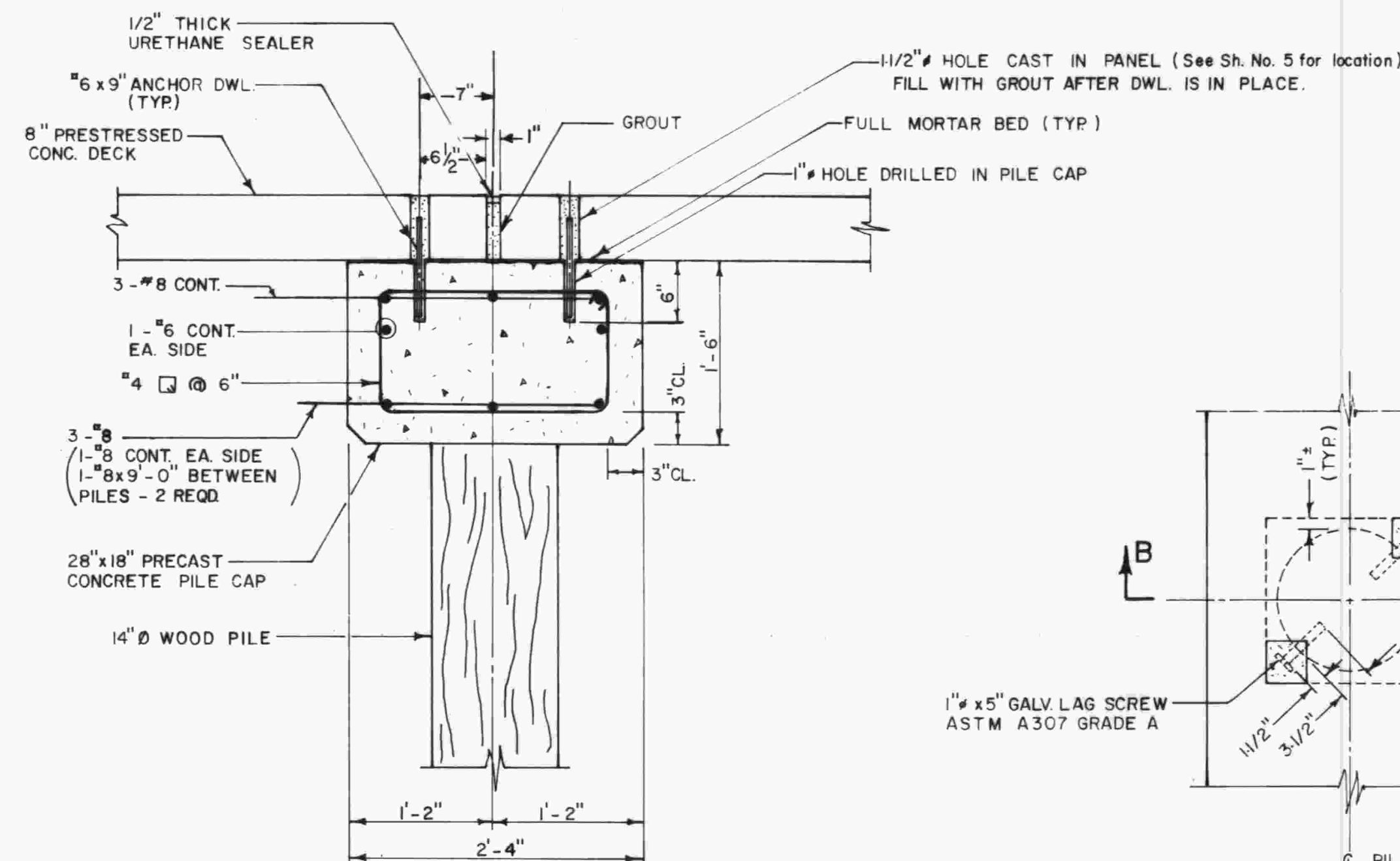


SECTION B-B
(TYPICAL SECTION AT PILES)

SCALE: 1" = 1'-0"

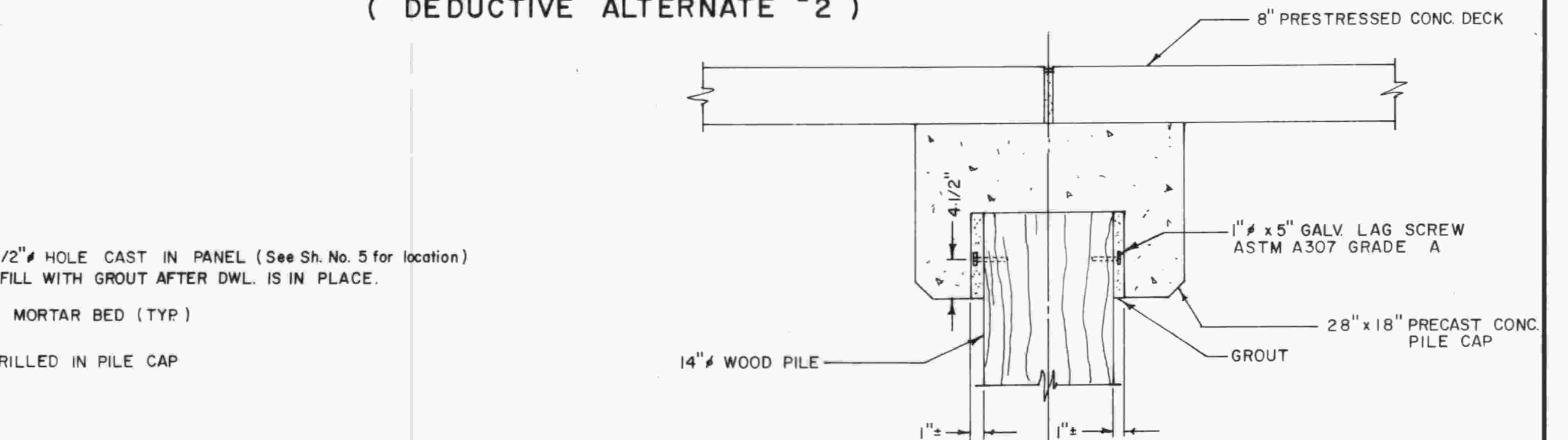
PILE CAP NOTES:

- 1) CONC. STRENGTH SHALL BE 4000 P.S.I. AT 28 DAYS.
- 2) LONGITUDINAL REINFORCING BARS TO BE ASTM A 615 GRADE 60
- 3) STIRRUPS TO BE ASTM A 615 GRADE 40

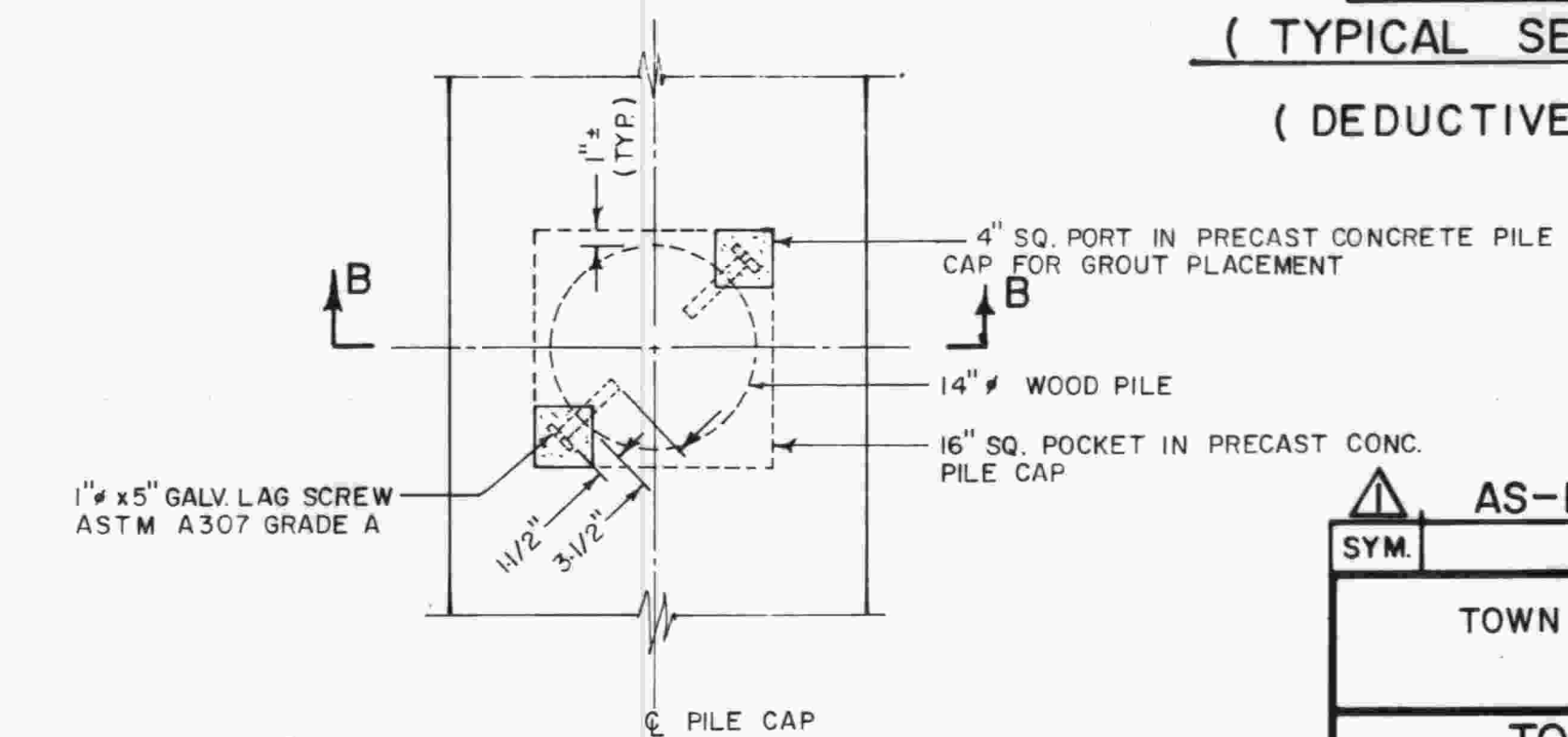


SECTION A-A
(TYPICAL SECTION BETWEEN PILES)

SCALE: 1" = 1'-0"



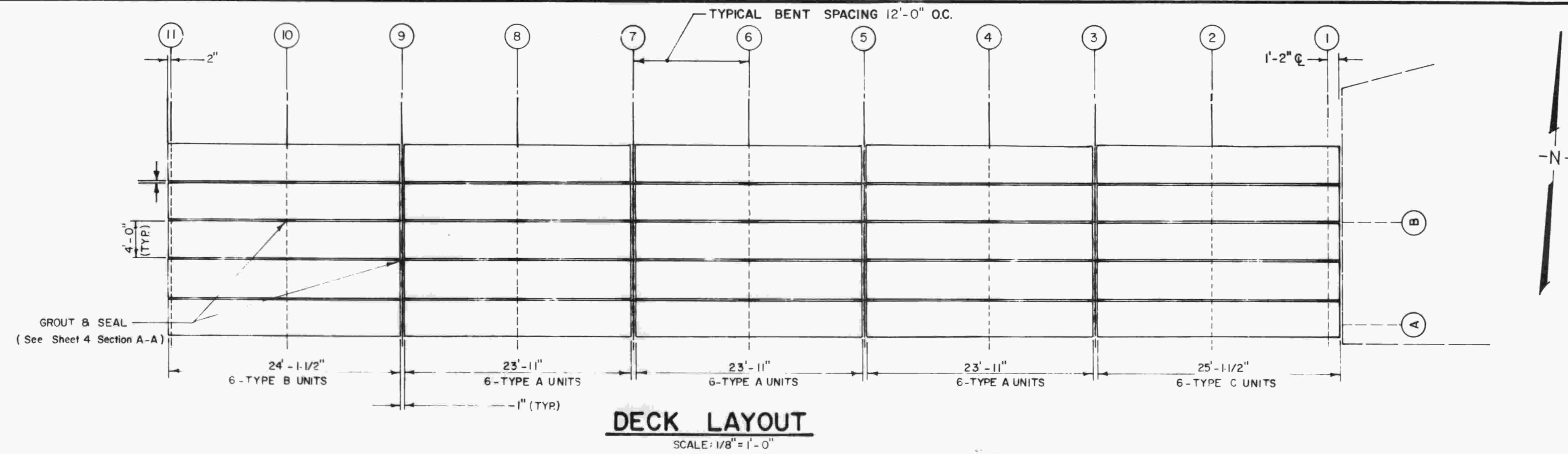
SECTION B-B
(TYPICAL SECTION AT PILES)
N.T.S.
(DEDUCTIVE ALTERNATE # 1)



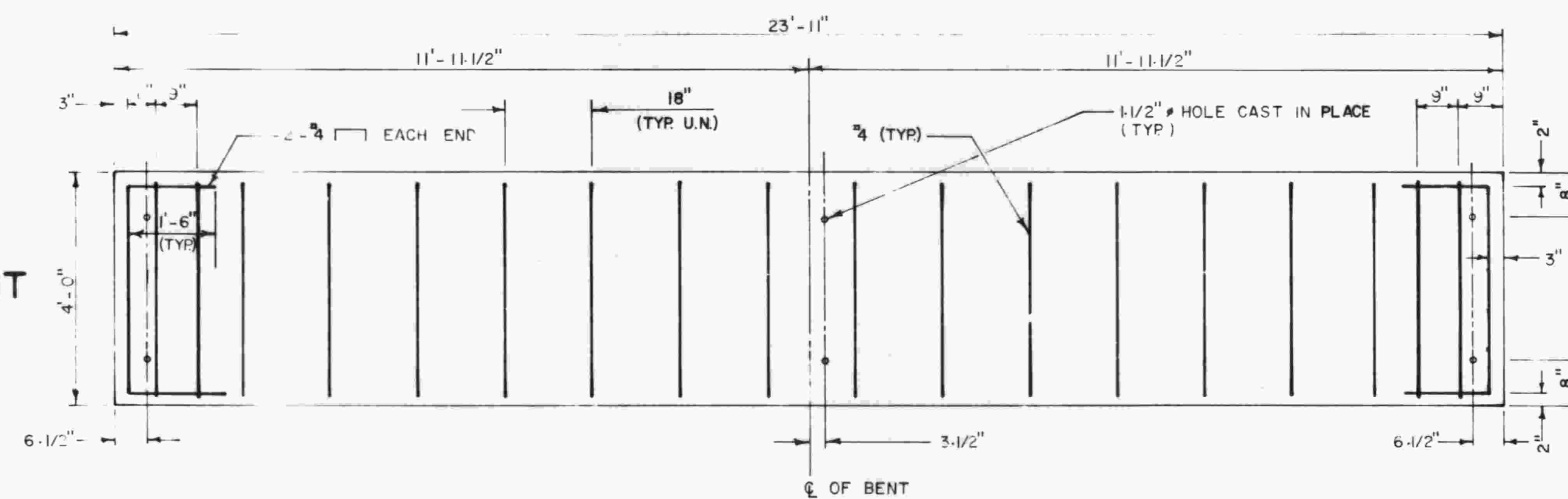
PARTIAL PLAN OF PILE CAP AT PILE
N.T.S.
(DEDUCTIVE ALTERNATE # 1)

Dr. Frederick M. Law P.E.
Structural Engineer

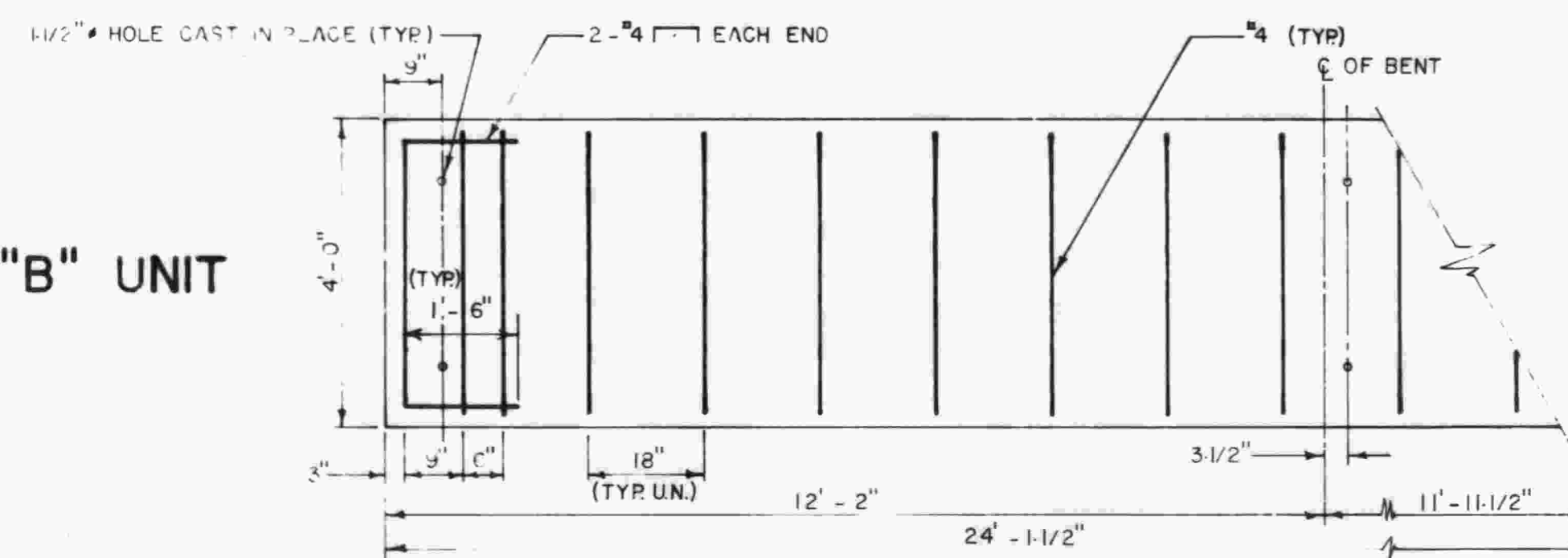
AS-BUILT DRAWING		9-24-80	R.V.
SYM.	DESCRIPTION	DATE	BY
	TOWN OF HARWICH, MASSACHUSETTS WYCHMERE HARBOR		
	TOWN PIER REPLACEMENT TYPICAL SECTION AND PILE CAP DETAILS		
 tibbetts engineering corp. new bedford, mass.			
DES. BY: R.V./E.L.		SCALE: AS NOTED	
DR. BY: J.S./A.A.		DATE: DEC. 1979	
CHK. BY: C.P.S.			



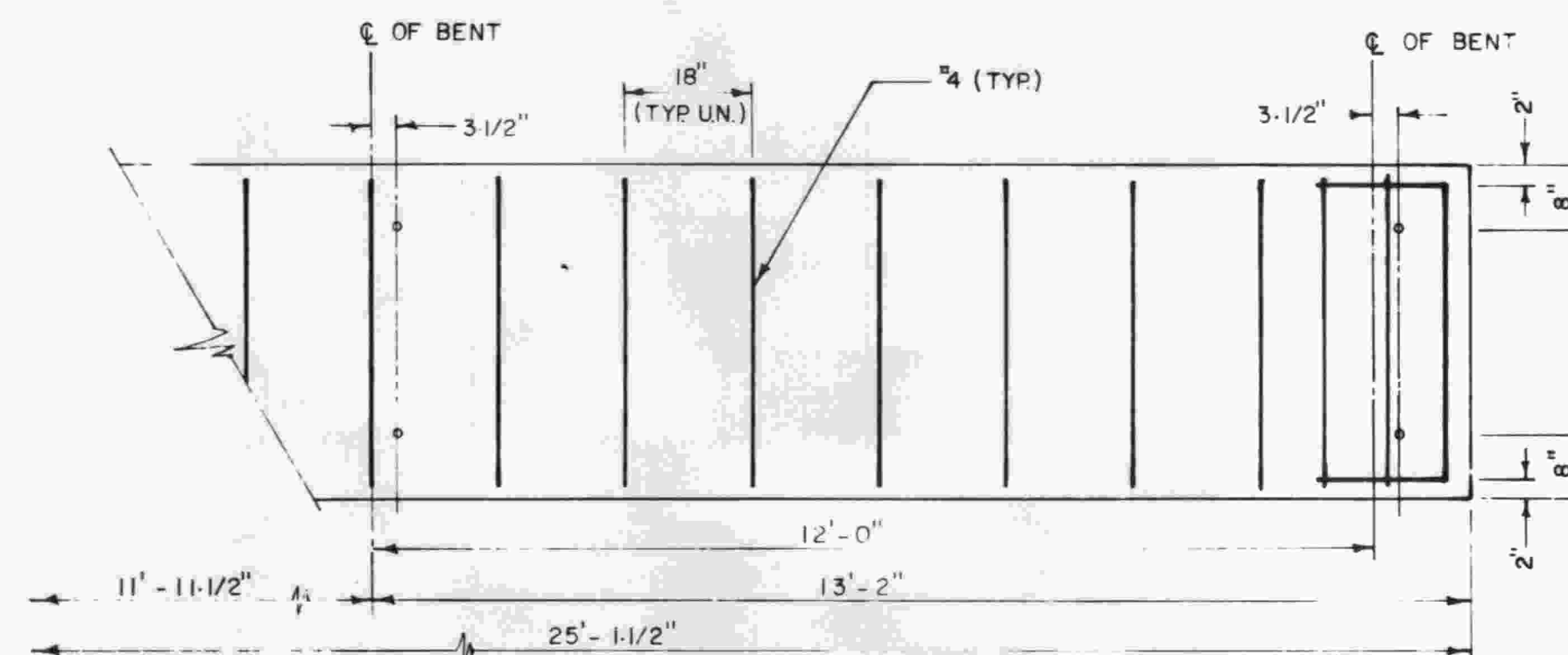
TYPE "A" UNIT



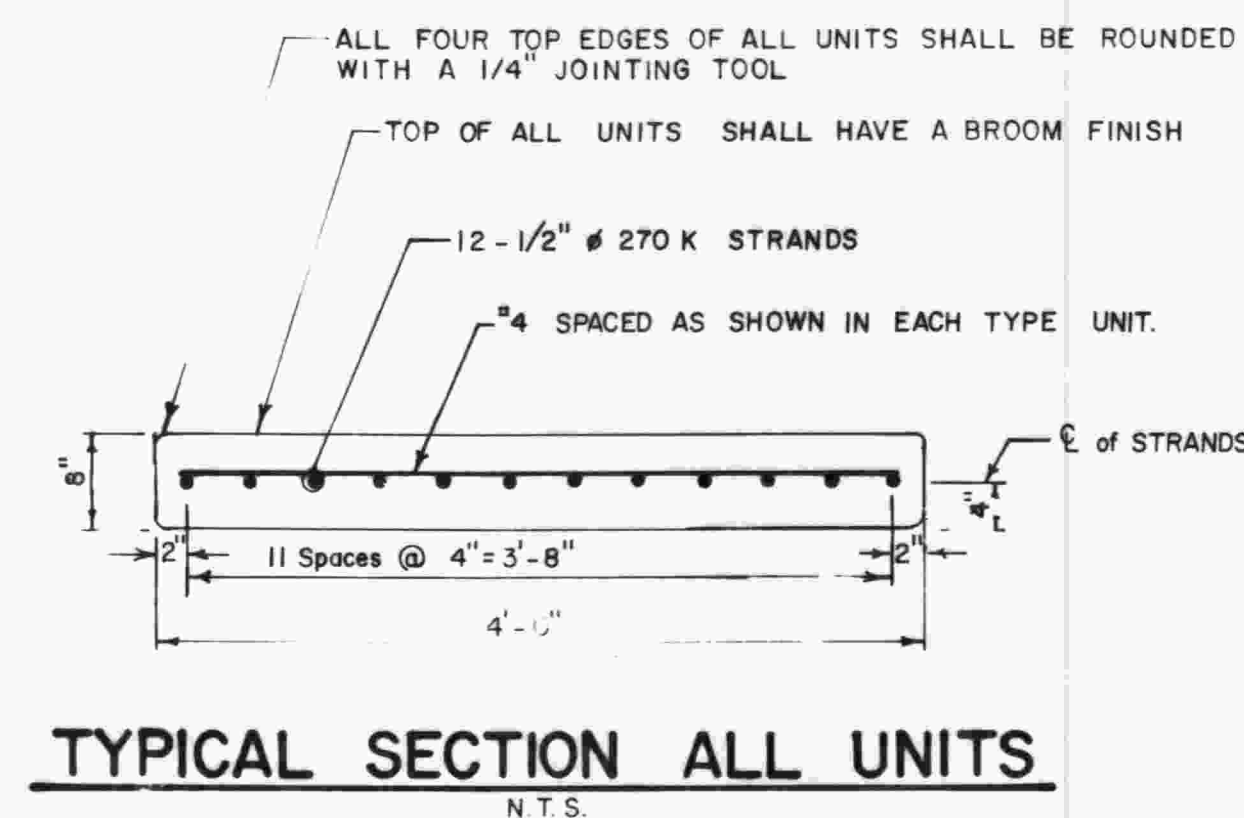
TYPE "B" UNIT



TYPE "C" UNIT



PRESTRESSED CONCRETE DECK UNITS
SCALE: 1/8" = 1'-0"

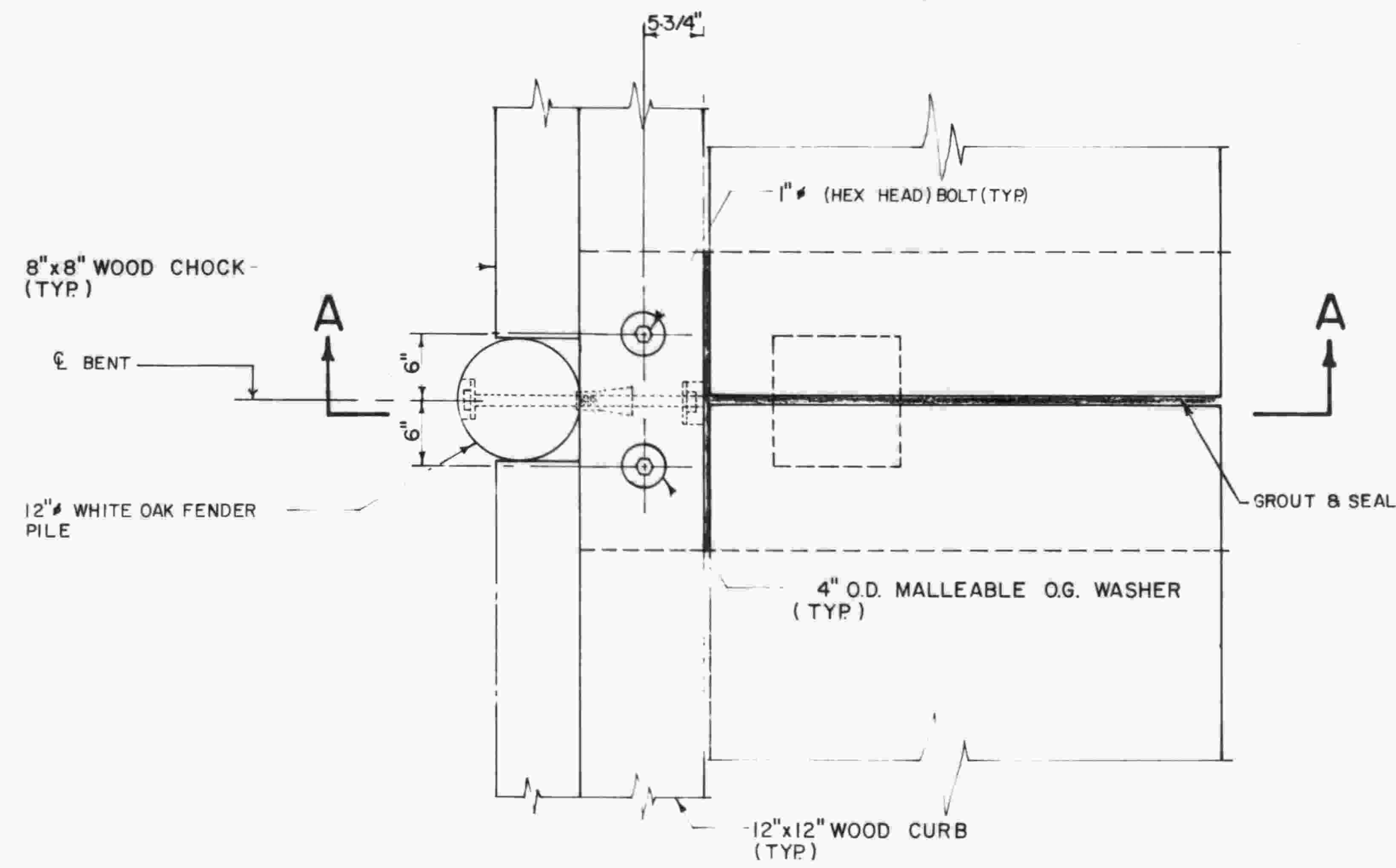


DECK NOTES:

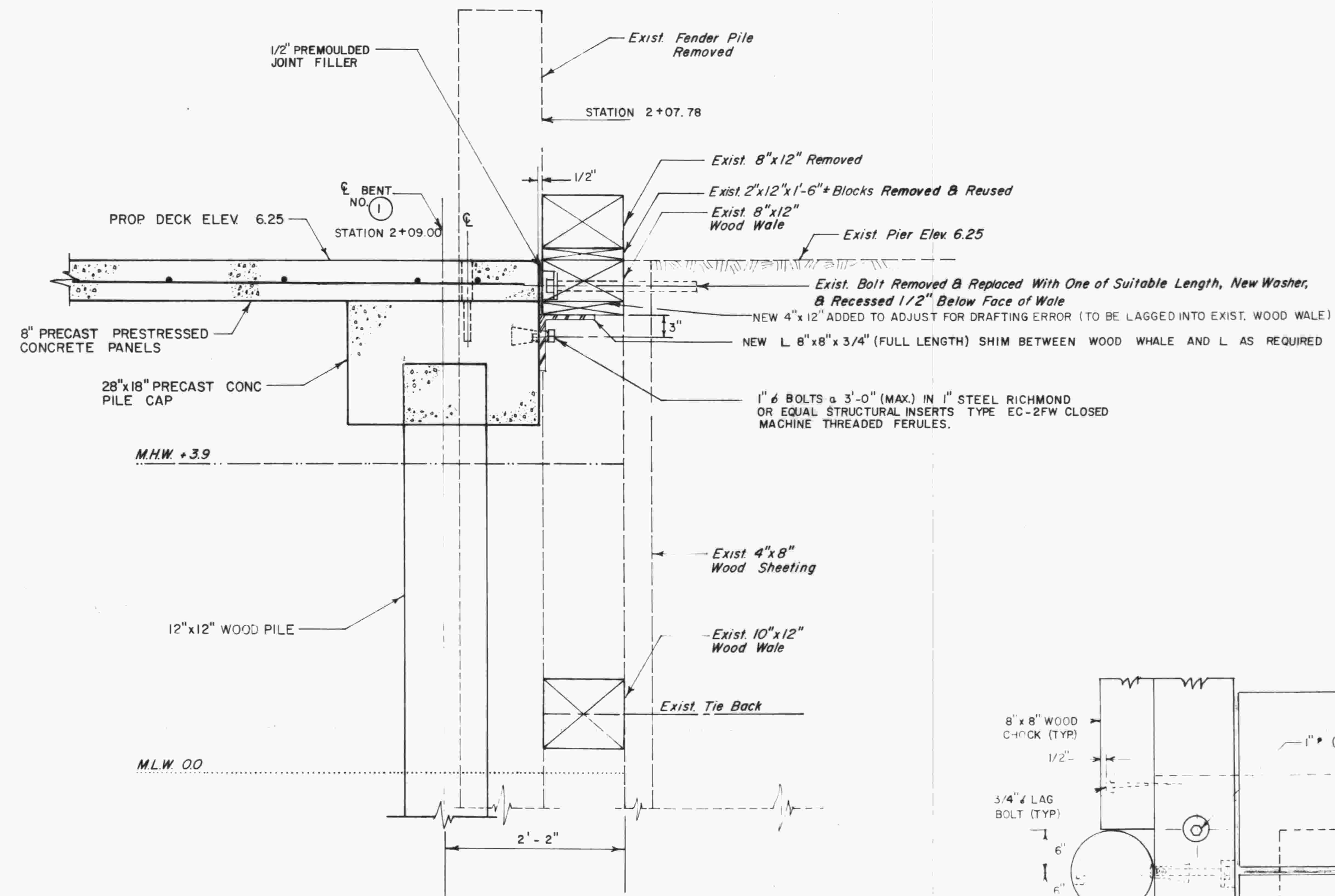
- Concrete strength shall be 3500 p.s.i. at release of prestress and 5000 p.s.i. at 28 days.
- Tensile strength of prestressing strand, type 270 K, ASTM designation A416 shall be 270,000 p.s.i., initial jacking stress, 190,000 p.s.i., final stress after losses, 160,000 p.s.i.
- #4 Reinforcing bars to be ASTM A 615-Grade 40

AS-BUILT DRAWING		9-24-80 R.V.	
SYM.	DESCRIPTION	DATE	BY
	TOWN OF HARWICH, MASSACHUSETTS WYCHMERE HARBOR		
	TOWN PIER REPLACEMENT DECK LAYOUT AND DETAILS		
 tibbetts engineering corp. new bedford mass.		DES. BY: R.V./E.L. DR. BY: J.S./A.A. CHK. BY: C.P.S.	
		SCALE: AS NOTED DATE: DEC. 1979	

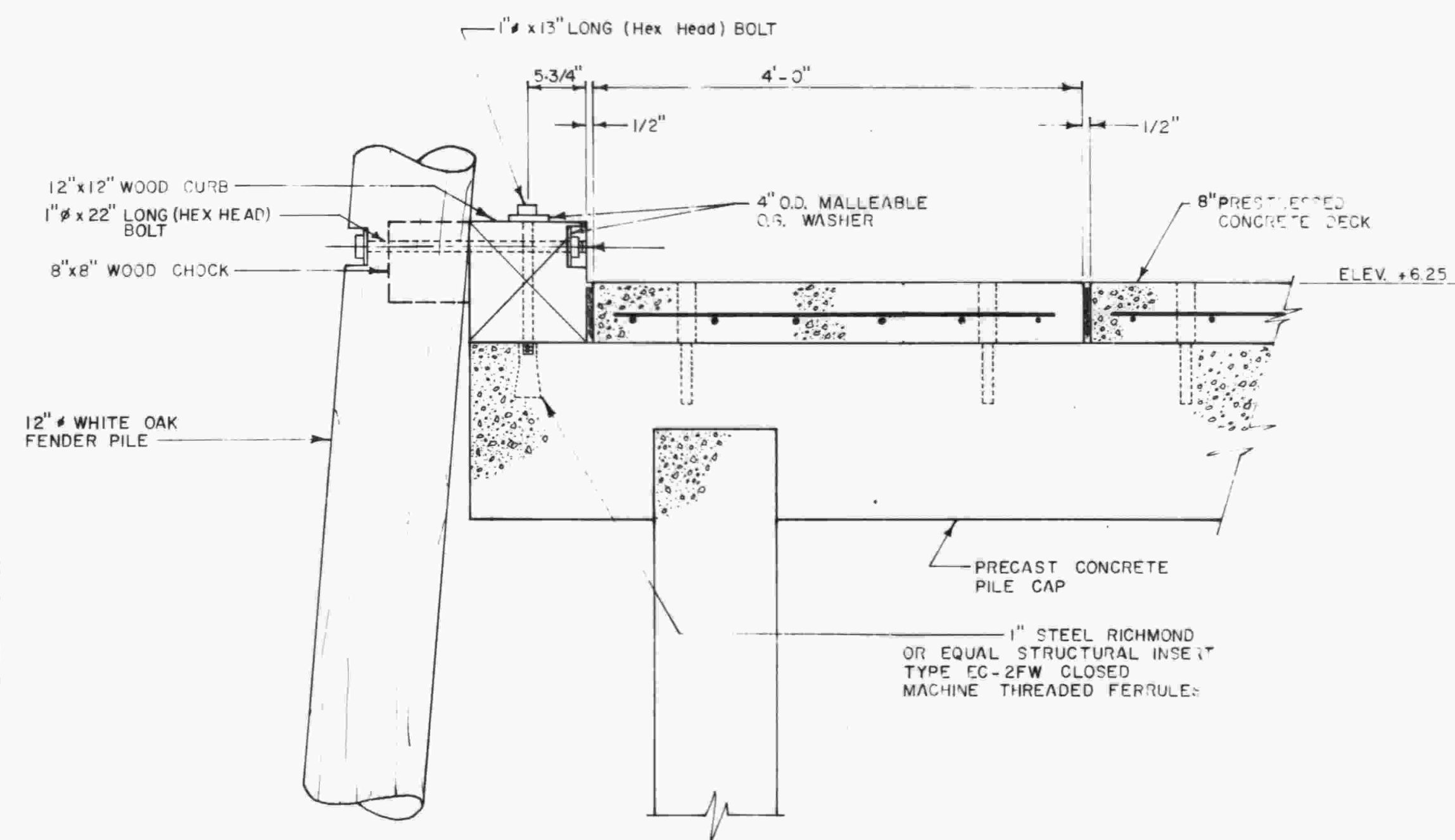
Dr. Frederick M. Law, P.E.
Structural Engineer



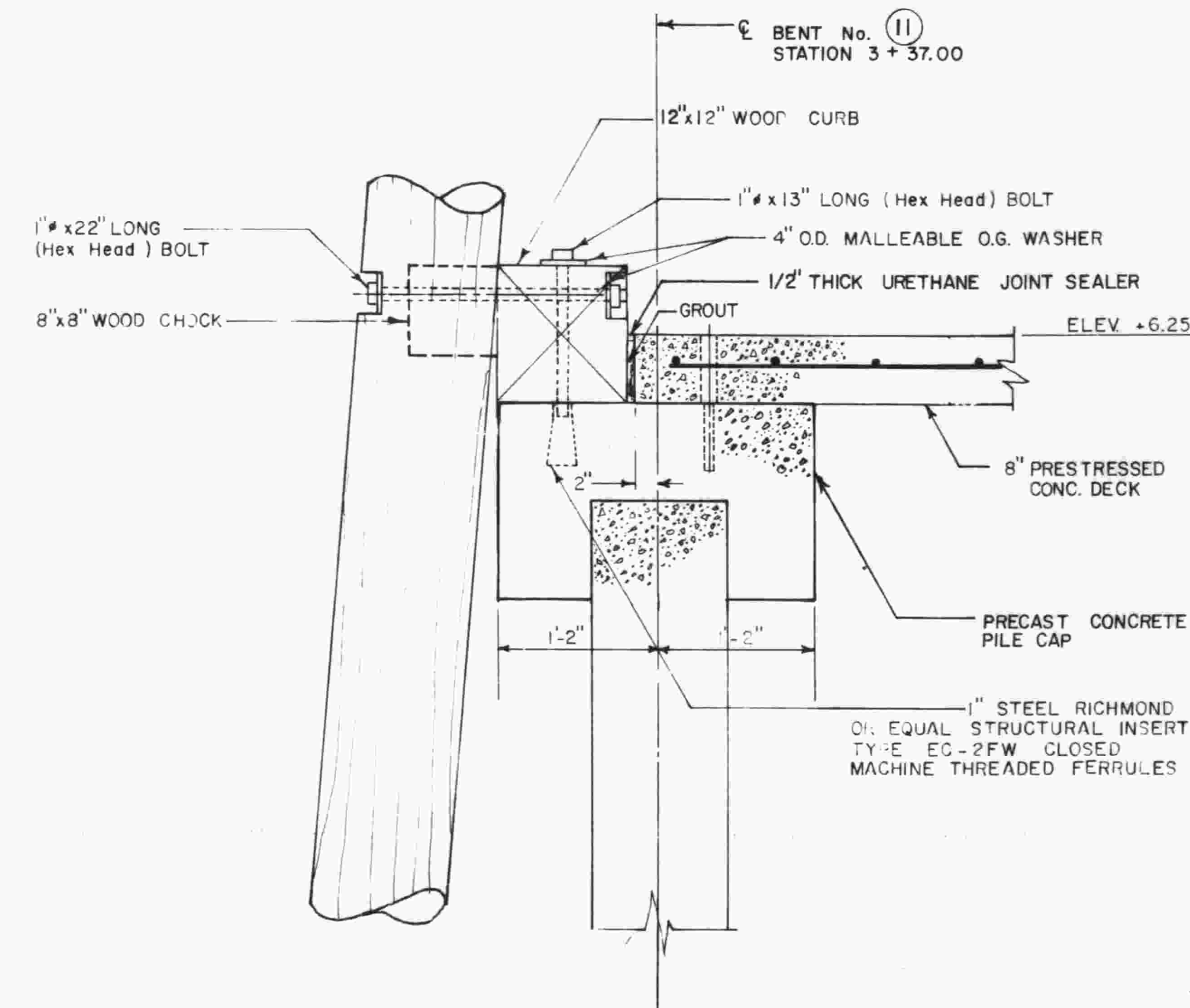
PLAN AT WOOD FENDER
N.T.S.



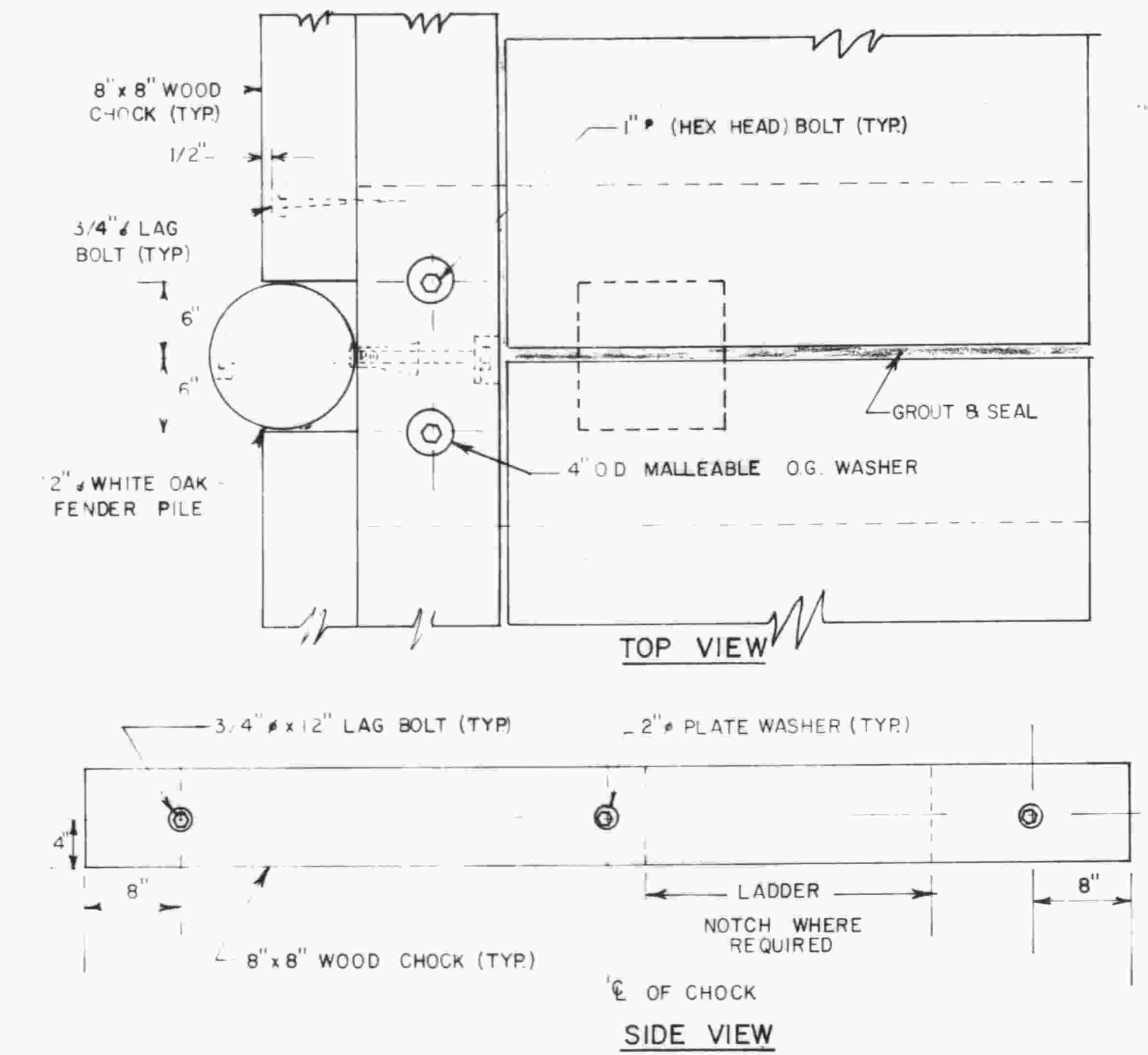
SECTION AT EXISTING BULKHEAD
N.T.S.



SECTION "A-A"
AT SIDE OF PIER
N. T. S.



SECTION AT OUTBOARD END OF PIER
N. T. S.

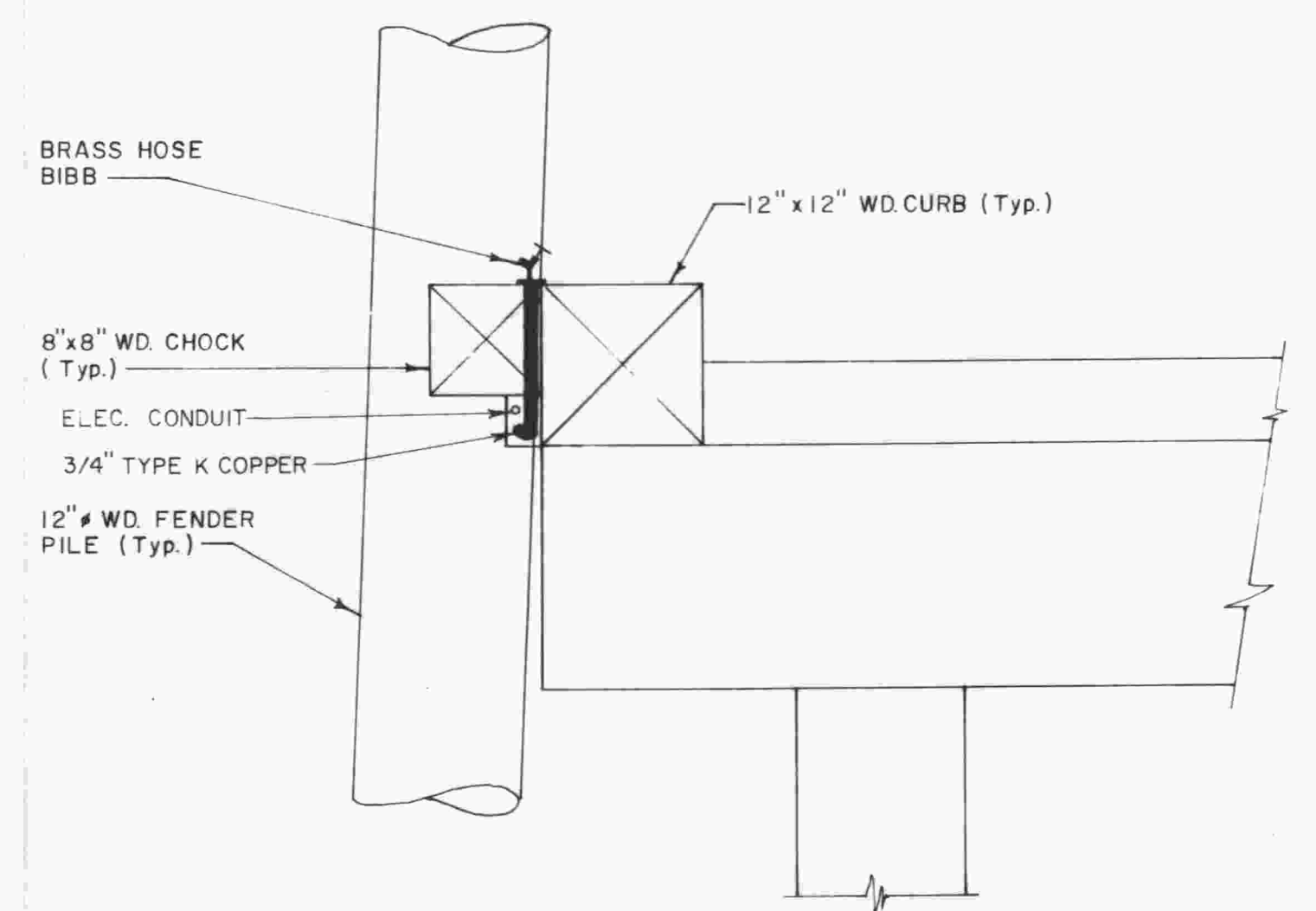


CHOCK FASTENING DETAIL
SCALE: 1" = 1'-0"

AS-BUILT DRAWING 9-24-80 R.V.

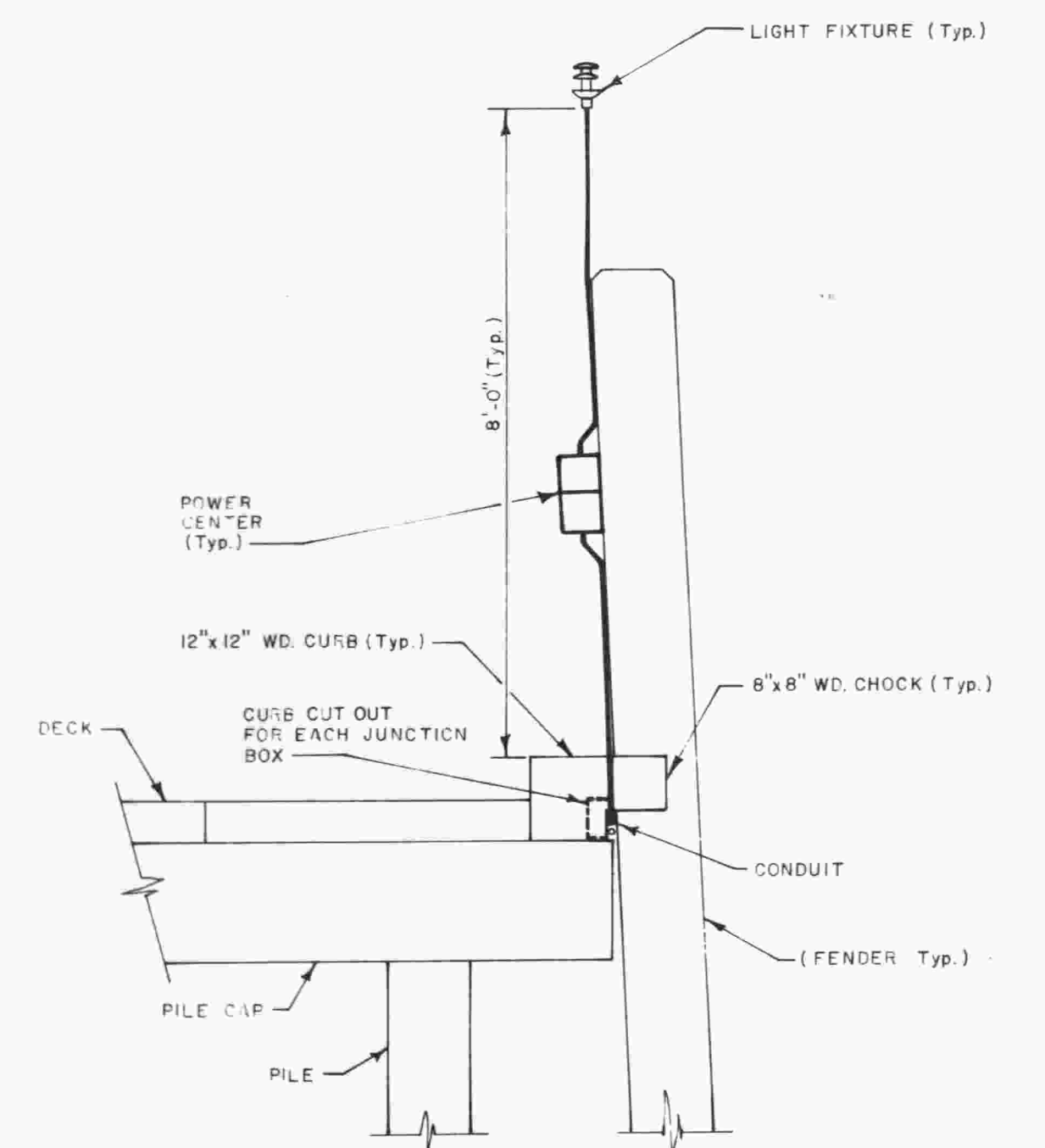
SYM.	DESCRIPTION	DATE	BY
	TOWN OF HARWICH, MASSACHUSETTS WYCHMERE HARBOR		
	TOWN PIER REPLACEMENT FENDER AND CAPLOG CONNECTION DETAILS		
	 tibbetts engineering corp. new bedford, mass. CONSULTING ENGINEERS	DES. BY: RV/FL DR. BY: JS/A.A. CHK. BY: C. P.S.	
		SCALE: AS NOTED DATE: DEC. 1979	

Dr. Frederick M. Law P.E.
Structural Engineer



WATER SYSTEM LAYOUT PLAN

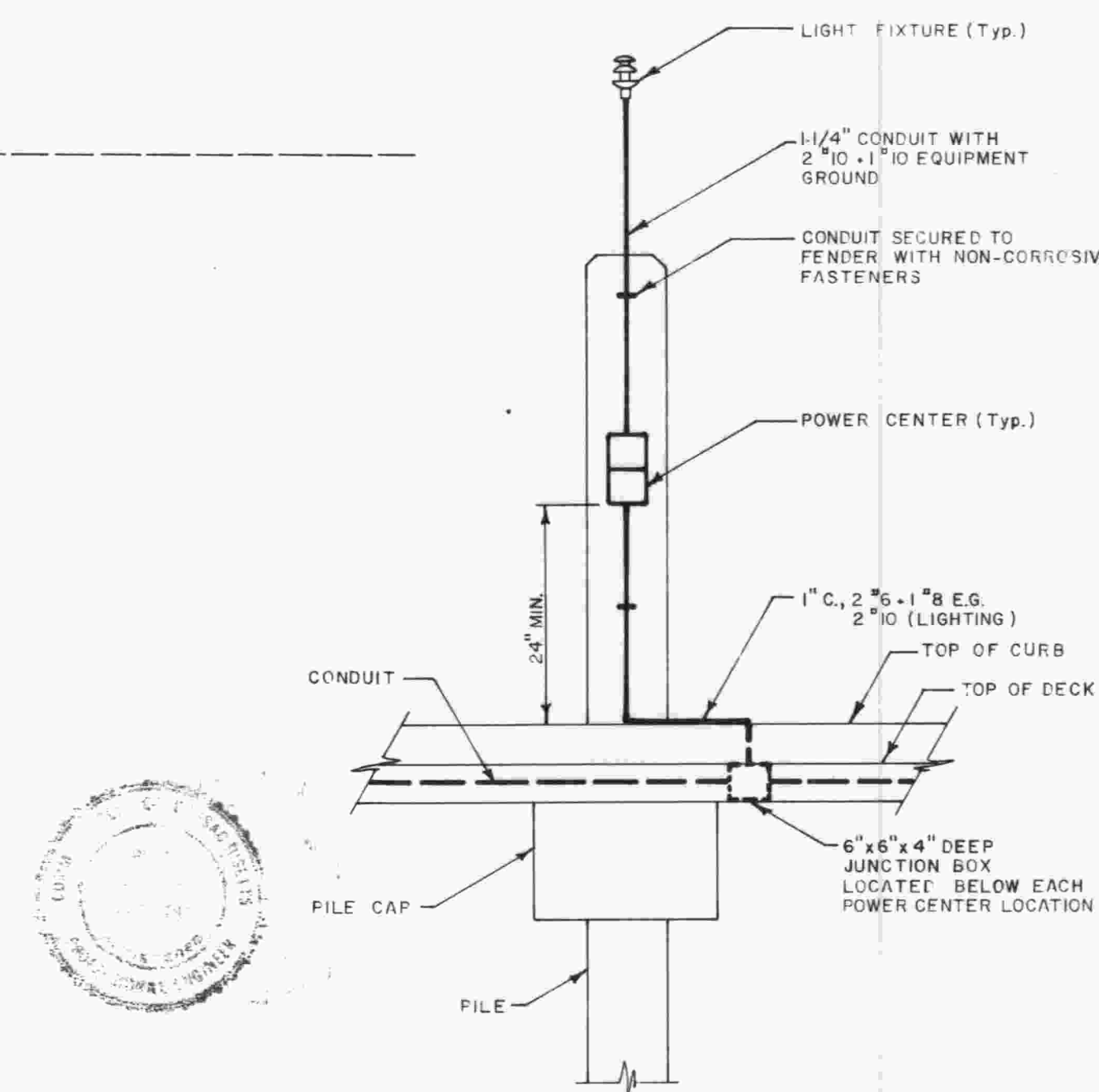
SCALE: 1/8" = 1' - 0"



ELECTRICAL SYSTEM LAYOUT PLAN

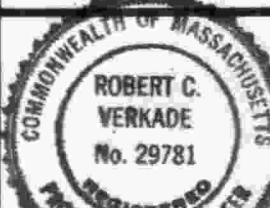
SCALE : 1/8" = 1'-0"

 THE UTILITY LOCATIONS ARE APPROXIMATE ONLY.



SECTION "B - B"

NOT TO SCALE

AS-BUILT DRAWING		9-24-80RV	
SYM	DESCRIPTION	DATE	BY
TOWN OF HARWICH, MASSACHUSETTS WYCHMERE HARBOR			
TOWN PIER REPLACEMENT WATER & ELECTRICAL SYSTEMS LAYOUT & DETAILS			
		 tibbetts engineering corp. new bedford, mass.	
DES. BY: RCV DR. BY: J.S. CHK. BY: RCV		SCALE: AS NOTED DATE: DEC. 1979	