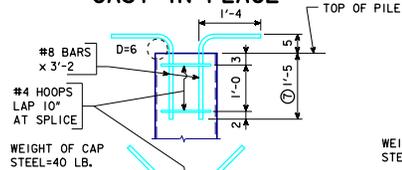
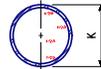


REVISION 11-15 - CHANGED THE WORD "SHOULD" TO "SHALL" IN THE NOTE "IT SHOULD BE USED IF PILE EMBEDMENT IS LESS THAN 1'-6." IN THE 2ND PARAGRAPH 2ND SENTENCE OF "GENERAL NOTES".  
 ENCL15MISCELLANEOUSBRIDGE.DGN - PLOL - THIS SHEET ISSUED 01-05.

**CAST IN PLACE**



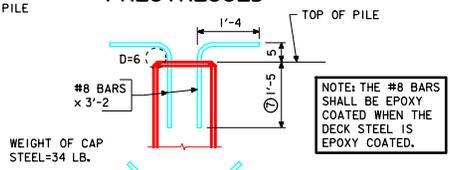
**CAP STEEL DETAILS**



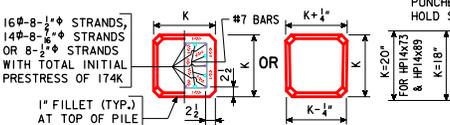
WEIGHT OF CAP STEEL=40 LB.

**SPIRAL WELDED OR SEAMLESS STEEL PIPE ASTM A252 GR. 2 OR GR. 3**

**PRESTRESSED**



**CAP STEEL DETAILS**



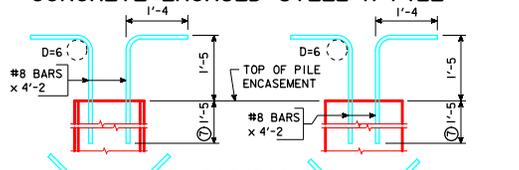
NOTE: THE #8 BARS SHALL BE EPOXY COATED WHEN THE DECK STEEL IS EPOXY COATED.

THE CONTRACTOR HAS THE OPTION TO INSTALL THE CAP STEEL AS DOWELS FOLLOWING THE DOWEL SETTING PROCEDURE NOTES SHOWN ON THIS SHEET.

PROVIDE 2 - L 1/4 x 1/2 x 1/2 PUNCHED TO HOLD SPIRAL

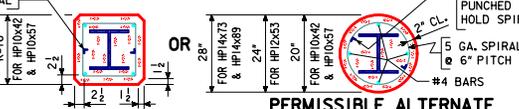
FOR HP14X73 & HP14X89 K=20"  
 FOR HP12X63 K=18"  
 FOR HP10X42 & HP10X57 K=16"

**CONCRETE ENCASED STEEL H PILE**



**SQUARE PILES CAP STEEL DETAILS**

**ROUND PILES CAP STEEL DETAILS**



WEIGHT OF CAP STEEL=45 LB.

PROVIDE 2 - L 1/4 x 1/2 x 1/2 PUNCHED TO HOLD SPIRAL

FOR HP14X73 & HP14X89 28"  
 FOR HP12X63 24"  
 FOR HP10X42 & HP10X57 20"

**GENERAL NOTES:**

EXCEPT AS NOTED ELSEWHERE, MATERIAL, CONSTRUCTION, DRIVING AND EXTENSIONS OR BUILD UPS WHEN NECESSARY SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS OF THE IOWA D.O.T. AND CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE.

CAP STEEL SHALL BE AS DETAILED ON THIS SHEET. (D=PIN DIAMETER). IT SHALL BE USED IF PILE EMBEDMENT IS LESS THAN 1'-6.

"NOMINAL RESISTANCE Pn", "G", AND "H" AS GIVEN IN TABLES ARE RECOMMENDED DESIGN VALUES FOR ORDINARY CONDITIONS, BUT MAY BE MODIFIED FOR SPECIAL CONDITIONS ON ANY GIVEN JOB.

NOMINAL RESISTANCE Pn AND PILE SIZE REQUIRED SHALL IN ALL CASES BE AS SPECIFIED ON THE PLANS.

NOMINAL RESISTANCE Pn SHOWN ARE FOR FRICTION RESISTANCE EXCEPT FOR TYPE 3 PILING WHERE THE RESISTANCE VALUES SHOWN SHOULD BE EITHER FRICTION OR POINT RESISTANCE.

COST OF ALL DRIVING POINTS AND CAP STEEL IS TO BE INCLUDED IN THE PRICE BID PER LINEAL FOOT FOR PILING.

WIRE SPIRAL SHALL CONFORM TO ASTM A82.

**CAST IN PLACE PILE NOTES:**

SHELL THICKNESSES SHOWN ARE MINIMUM REQUIREMENTS. THE METHOD OF DRIVING STEEL SHELL PILES SHALL BE ADAPTED TO THE TYPE AND THICKNESS OF SHELL SPECIFIED. ANY SHELLS WHICH HAVE BEEN IMPROPERLY DRIVEN, BROKEN OR ARE OTHERWISE DEFECTIVE SHALL BE REMOVED AND REPLACED BY THE BRIDGE CONTRACTOR.

ALL CAST IN PLACE PILES SHALL HAVE A CLOSURE PLATE. DRIVING POINTS SHALL BE USED IF SPECIFIED ON THE PLANS.

**PRESTRESSED PILE NOTES:**

EXCEPT AS OTHERWISE NOTED ALL EXPOSED CORNERS 90° OR SHARPER SHALL BE FILLETED 3/4".

DRIVING POINTS FOR PRESTRESSED PILES, IF CALLED FOR ON THE PLANS, SHALL BE AS DETAILED.

HEADS OF PRESTRESSED PILES TO BE FINISHED SMOOTH AND NORMAL TO AXIS OF PILE.

**BIDDING NOTES:**

THE PLANS SHALL DESIGNATE THE SIZE OF PILE TO BE USED. THEY SHALL ALSO SPECIFY THE TYPE, EITHER TYPE 1, TYPE 2, OR TYPE 3. IF THE OPTION OF TYPE 1 OR 2 IS GIVEN ON THE PLANS, THE CONTRACTOR SHALL CHOOSE THE TYPE TO BE USED. IF TYPE 3 IS SPECIFIED, TYPE 3 SHALL BE USED, BUT THE CONTRACTOR MAY CHOOSE THE SHAPE OF THE ENCASEMENT. IT SHOULD BE KEPT IN MIND THAT FOR A GIVEN SIZE AND RESISTANCE VALUE, LENGTH MAY VARY WITH THE SHAPE (SQUARE OR ROUND).

PILES SHALL BE BID DESIGNATING THE SIZE, TYPE AND LENGTH.

TYPE 1 PILING WILL BE BID PER LINEAL FOOT OF PILE.

TYPE 2 PILING WILL BE BID PER LINEAL FOOT OF PILE.

TYPE 3 PILING WILL BE BID PER LINEAL FOOT OF PILE AND LINEAL FOOT OF ENCASEMENT. PRICE BID FOR ENCASEMENT SHALL BE FULL PAYMENT FOR NECESSARY EXCAVATION AND FOR FURNISHING AND PLACING ALL MATERIAL.

**DOWEL SETTING PROCEDURE:**

IF CAP STEEL IS REQUIRED FOR THE PRESTRESSED PILES THE #8 DEFORMED BARS ARE TO BE SET AS DOWELS INTO THE PILES WITH POLYMER GROUT IN ACCORDANCE WITH ARTICLE 2301.03, E, OF THE STANDARD SPECIFICATIONS OR BY THE FOLLOWING PROCEDURE.

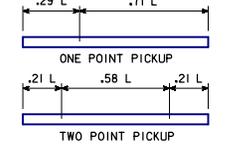
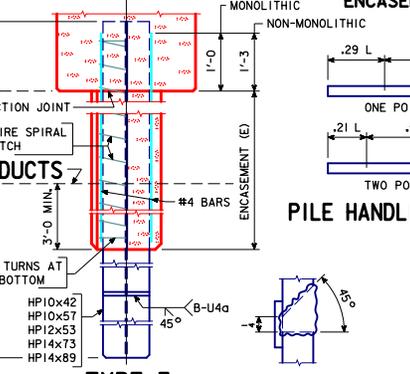
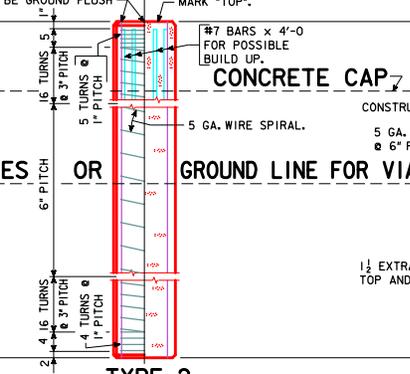
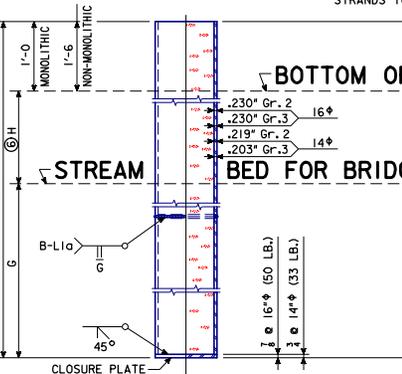
- DRILL HOLE APPROXIMATELY TWICE THE DIAMETER OF THE DOWEL BAR AND TO THE DEPTH INDICATED.
- FILL HOLE WITH WATER AND ALLOW TO STAND LONG ENOUGH TO THOROUGHLY SATURATE THE SURROUNDING CONCRETE (ABOUT FOUR HOURS).
- BLOW OUT ALL FREE WATER AND FILL HOLE 2/3 FULL OF MORTAR.
- INSERT DOWEL BY DRIVING, IF NECESSARY, AND MANIPULATE OR TAP WITH A HAMMER TO CONSOLIDATE MORTAR AND SECURE COMPLETE EMBEDMENT.
- ADD MORE MORTAR, IF NECESSARY, TO FILL HOLE.
- MORTAR SHALL CONSIST OF EQUAL PARTS PORTLAND CEMENT AND SAND WITH JUST ENOUGH WATER TO MAKE A WORKABLE MIX.

APPROVED BY: *Norman C. McQuinn*  
 BRIDGE ENGINEER

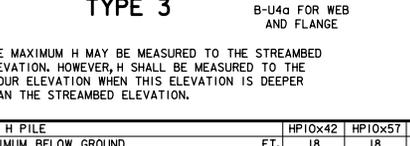
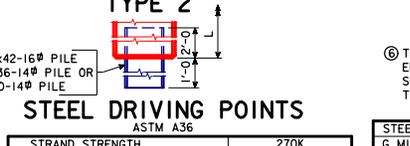
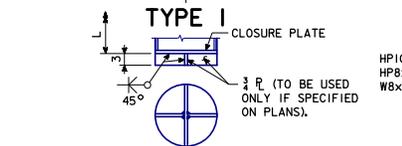
STANDARD DESIGN  
**CONCRETE AND STEEL PILES**  
 CAST IN PLACE, PRESTRESSED AND ENCASED  
 FOR USE IN  
**LRFD TRESTLE PILE BENTS - PIOL**

LATEST REVISION  
 DATE: 11-15

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_ FILE NO. \_\_\_\_\_ DESIGN NO. \_\_\_\_\_



**PILE HANDLING DIAGRAM**



**STEEL DRIVING POINTS**

STRAND STRENGTH	270K		
	14#	16#	
K DIMENSION	IN.	14#	16#
G MIN. BELOW GROUND	FT.	24	27
H MAX. ABOVE GROUND	FT.	18	22
CONCRETE (L=40')	C.Y.	2.01	2.62
CONCRETE 1' CHANGE	C.Y.	0.050	0.066
REINFORCING (L=40')	LB.	232	280
REINFORCING 1' CHANGE	LB.	3.93	5.10
MAX. L 1 FT. PICK-UP	FT.	57	60
MAX. L 2 FT. PICK-UP	FT.	82	86
f'c	KSI	5.0	5.0
NOMINAL RESISTANCE Pn	KIPS	127	146
INITIAL PRESTRESS	KIPS	174	231

**STEEL DRIVING POINTS**  
 ASTM A36

K DIMENSION	14#				16#			
	IN.	14#	16#	GR. 2	GR. 3	GR. 2	GR. 3	
G MIN. BELOW GROUND	FT.	24	27					
H MAX. ABOVE GROUND	FT.	18	22					
SHELL ASTM A-252		GR. 2	GR. 3	GR. 2	GR. 3			
CONCRETE (L=40')	C.Y.	1.49	1.49	1.95	1.95			
CONCRETE 1' CHANGE	C.Y.	0.0372	0.0373	0.0488	0.0488			
WT. OF SHELL (L=40')	LB.	1325	1231	1600	1600			
WT. OF SHELL 1' CHANGE	LB.	32.26	29.94	38.77	38.77			
f'c	KSI	4.0	4.0	4.0	4.0			
NOMINAL RESISTANCE Pn	KIPS	119	119	137	137			

① INCLUDES WEIGHT OF CLOSURE PLATE.  
 ② INCLUDES PRESTRESSING STRANDS.  
 ③ INCREASE 5% FOR ARTIFICIAL CURING.

**STEEL H PILE**

	HP10x42	HP10x57	HP12x53	HP14x73	HP14x89	
G MINIMUM BELOW GROUND	FT.	18	18	21	24	24
H MAX. ABOVE GROUND W/MONOLITHIC	FT.	19	19	23	28	29
H MAX. ABOVE GROUND W/NON-MONOLITHIC	FT.	15	16	20	25	26
CONCRETE (E=18')	C.Y.	1.12	1.10	1.41	1.74	1.72
CONCRETE 1' CHANGE	C.Y.	0.062	0.061	0.078	0.097	0.096
REINFORCING (E=18')	LB.	96	96	99	103	103
REINFORCING 1' CHANGE	LB.	4.98	4.98	5.13	5.28	5.28
CONCRETE (E=18')	C.Y.	1.40	1.38	2.02	2.75	2.73
CONCRETE 1' CHANGE	C.Y.	0.078	0.076	0.112	0.153	0.152
REINFORCING (E=18')	LB.	97	97	102	107	107
REINFORCING 1' CHANGE	LB.	5.02	5.02	5.26	5.50	5.50
NOMINAL RESISTANCE Pn	KIPS	154	208	192	265	324

f'c = 4.0 KSI

① INCLUDES WEIGHT OF PUNCHED L 1/2 x 1/2 x 1/2

② SEE BRIDGE DESIGN MANUAL 6.6.4.2 FOR ADDITIONAL INFORMATION