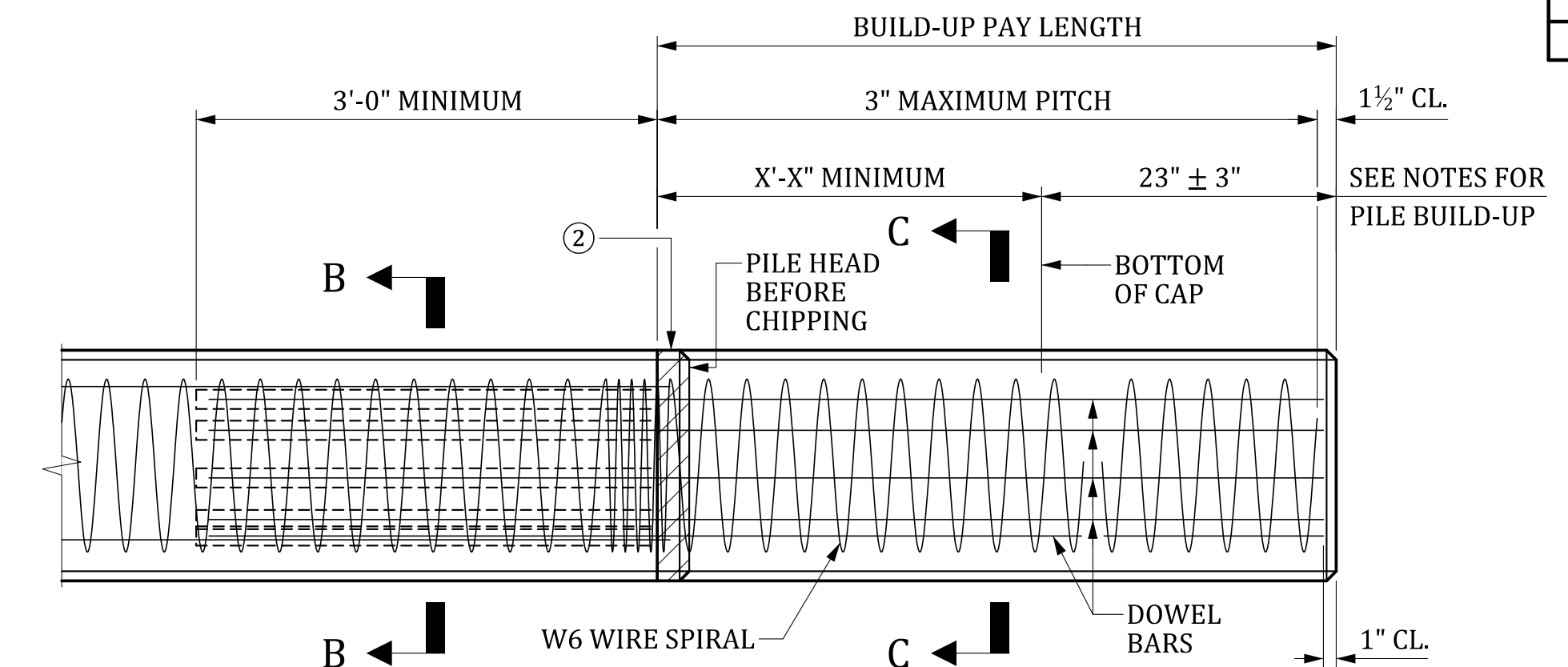
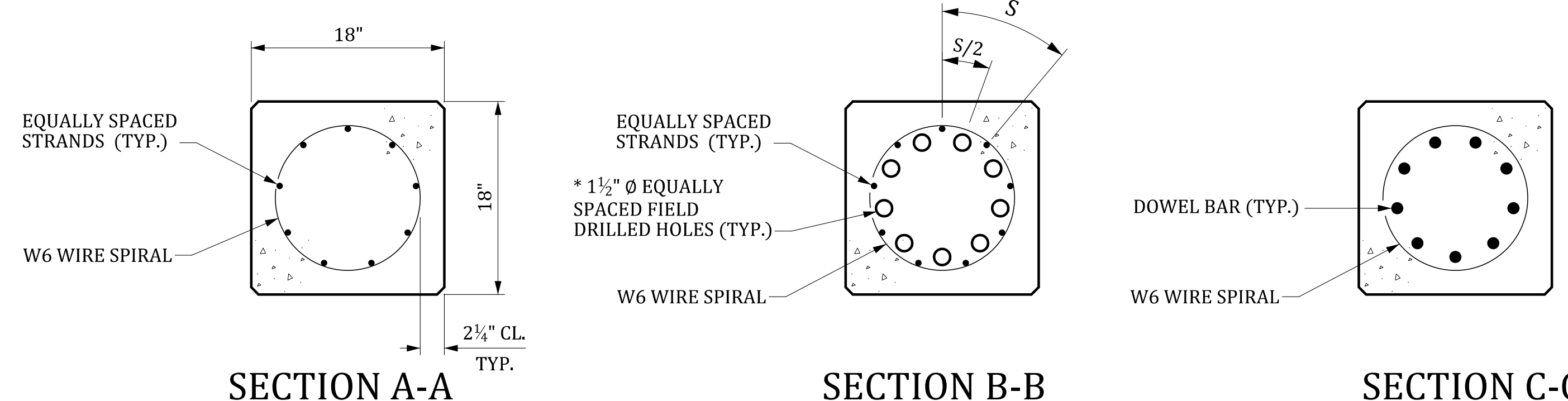


**ELEVATION**



**BUILD-UP**

② TO LENGTHEN PILE IN PLACE, CHIP TOP OF PILE BACK 2 1/2" MINIMUM TO EXPOSE WIRE SPIRAL AND PROVIDE FULL STRENGTH LAP WELD (4" MINIMUM LENGTH). ALSO, REMOVE PILE AS NECESSARY TO ENSURE PROPER DISTANCE IS MAINTAINED BETWEEN THE PILE/BUILD-UP JOINT AND THE BOTTOM OF CAP.



**SECTION A-A**

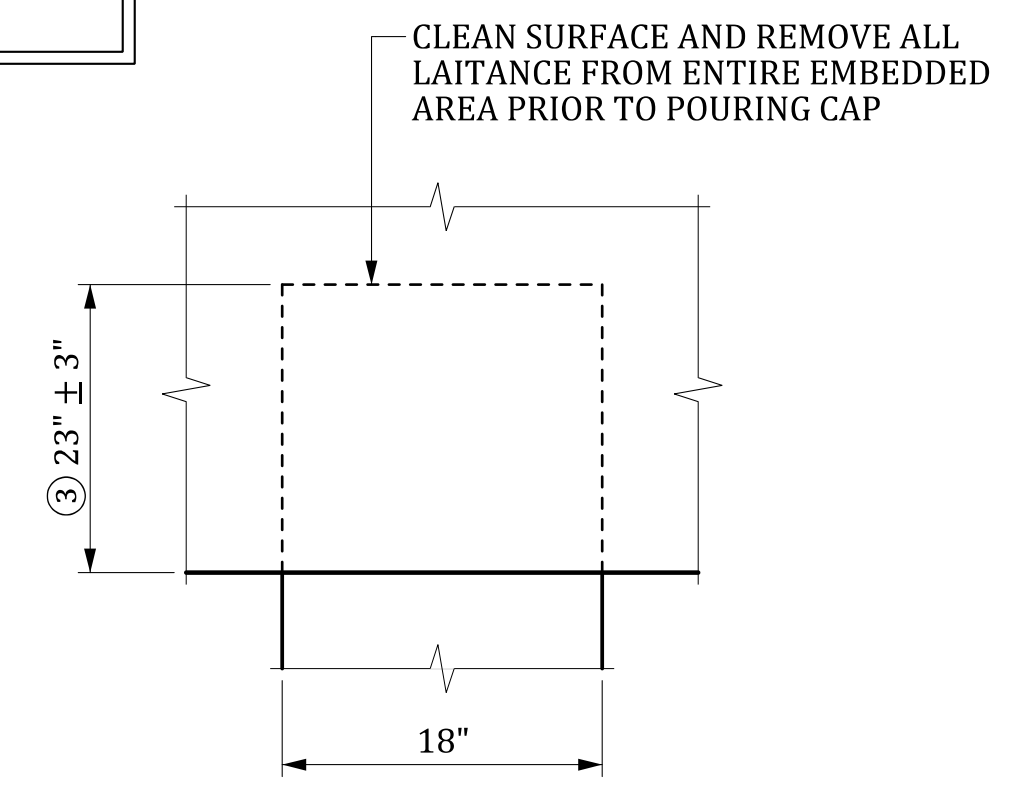
**SECTION B-B**

**SECTION C-C**

DESIGN DATA	
STRANDS:	LOW RELAXATION GRADE 270
	INITIAL PRESTRESS (0.75 fpu) = 202.5 KSI
CONCRETE:	
	f <sub>c</sub> = 5.0 KSI
	f <sub>ci</sub> = 3.5 KSI

PILE DATA					
STRANDS	STRESS (KSI)	DOWEL BARS	MAXIMUM L		
			1 PICK-UP POINT	2 PICK-UP POINTS	3 PICK-UP POINTS
9 - 0.6"	0.890	9 # 8	58'	83'	119'

STRAND DATA		
DIAMETER	AREA (INCH <sup>2</sup> )	TENSIONING LOAD
0.6"	0.217	43.9 KIPS



**PILE ANCHORAGE DETAILS**

③ IF THIS DIMENSION IS LESS THAN 20", BUILD UP THE PILE AS DETAILED ABOVE.

① ORIENT PILE SUCH THAT "TOP SIDE" OF PILE IS PARALLEL TO  $\phi$  BENT

**GENERAL NOTES**

- SPLICE WIRE SPIRAL USING FULL STRENGTH LAP WELDS.
- CHAMFER ALL EXPOSED EDGES 3/4" UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO CENTERS OF BARS (EXCEPT AS NOTED).
- RELEASE ALTERNATE STRANDS SIMULTANEOUSLY AT OPPOSITE ENDS WITHOUT SHOCK.
- TIE WIRE SPIRAL TO CABLES AND REINFORCING BARS AS REQUIRED TO MAINTAIN PITCH OF THE SPIRAL.
- MARK PILES AT PICK-UP POINTS TO INDICATE PROPER POINTS FOR ATTACHING HANDLING LINES.
- ANCHOR THE PILES INTO THE BENT CAPS USING THE DETAILS SHOWN ON THIS SHEET. INCLUDE ALL COSTS FOR THIS WORK IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE PILING.

**NOTES FOR BUILD-UP**

CHIP BACK TOP OF PILES AND FIELD DRILL HOLES AS SHOWN. GROUT DOWEL BARS IN THE HOLES USING AN APPROVED NON-SHRINK GROUT WITH f<sub>c</sub> = 5.0 KSI. TERMINATE DOWEL BARS 1" CLEAR FROM THE TOP OF PILE. SUBMIT DOWEL BAR LENGTHS TO THE RCE FOR APPROVAL. SPLICES ARE NOT ALLOWED IN THE DOWEL BARS. INCLUDE ALL COSTS ASSOCIATED WITH PREPARATION OF THE PILE FOR BUILD-UP IN THE UNIT PRICE BID FOR PILE BUILD-UP PREPARATION.

BUILD UP ALL PILES THAT HAVE AN EMBEDMENT LENGTH LESS THAN THE MINIMUM SHOWN IN THE PLANS. USE THE BUILD-UP DETAILS SHOWN ON THIS SHEET. THE OPTION IS AVAILABLE TO CAST BUILD-UPS WITH BENT CAPS PROVIDED REBAR AND WIRE SPIRAL ARE CONTINUED A DISTANCE EQUAL TO 23" INTO THE CAP AND THE CAP IS CAST WITH CLASS 5000 CONCRETE REGARDLESS OF THE ACTUAL CLASS USED. INCLUDE AN EMBEDMENT LENGTH OF 23" IN THE PILE BUILD-UP LENGTH MEASURED FOR PAYMENT. PAY FOR THE PILE BUILD-UP, INCLUDING ALL COSTS FOR DOWEL BARS, WIRE SPIRALS, AND BUILD-UP CONCRETE, AS AN ADDITIONAL LENGTH OF PRESTRESSED CONCRETE PILING EQUAL TO THE BUILD-UP PAY LENGTH SHOWN IN THE BUILD-UP DETAIL.

**MATERIALS**

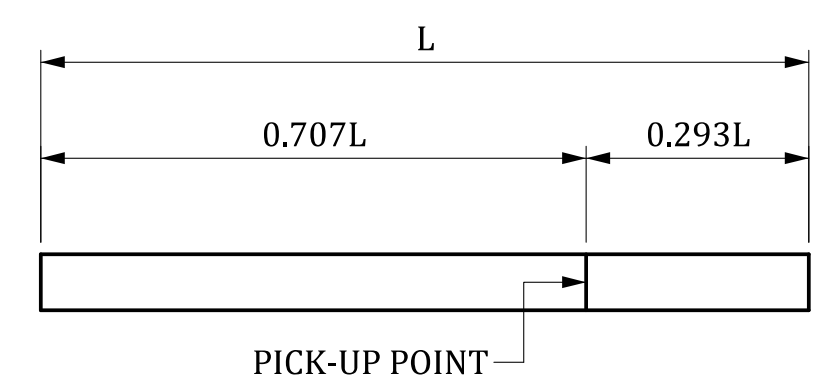
- PRESTRESSING STRAND - GRADE 270, LOW RELAXATION AASHTO M 203
- WIRE SPIRAL - AASHTO M 32, M 225
- REINFORCING STEEL - GRADE 60, AASHTO M 31, TYPE W
- CONCRETE - f<sub>c</sub> = 5.0 KSI, STANDARD SPEC. SECT. 701

**PILE ORIENTATION DETAIL**

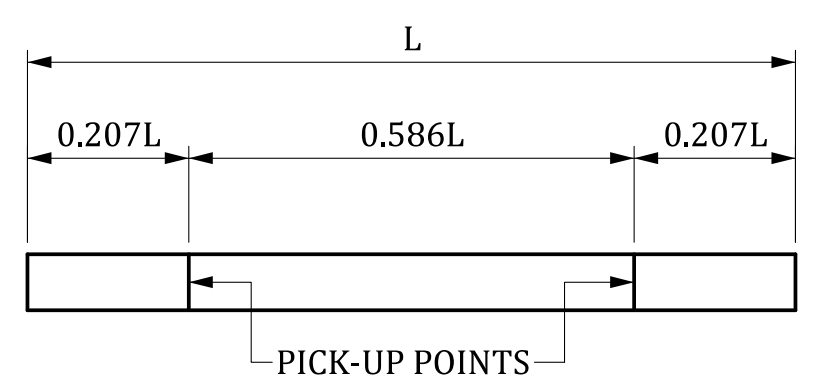
① "TOP SIDE" IS THE TOP SURFACE OF THE PILE WHEN IT WAS POURED IN THE CASTING BED.

THIS DRAWING IS FURNISHED FOR INFORMATION ONLY. ALL DIMENSIONS SHOWN ARE SHEET SPECIFIC. ANY USE OF THIS DESIGN AND DRAWING, INCLUDING DIMENSIONS, MUST BE CHECKED BY THE USER'S ENGINEER TO ENSURE DESIGN IS ADEQUATE FOR THE INTENDED USE. ALL DRAWINGS MUST BE SIGNED AND SEALED BY A SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER WHEN USED.

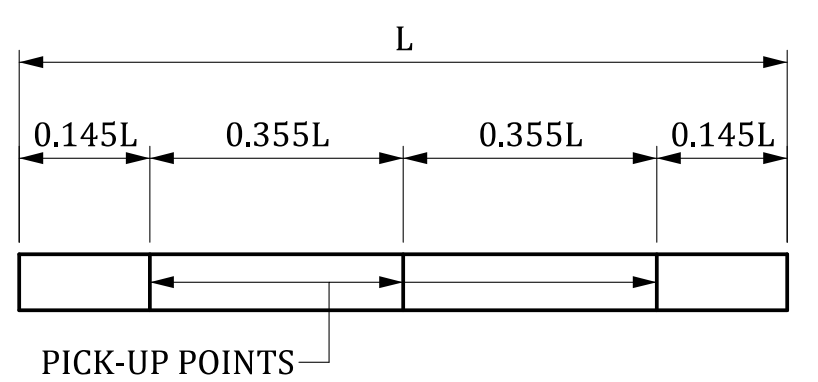
CONSULTANT NAME/LOGO	
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION	
18" SQUARE PRESTRESSED CONCRETE PILE	
COUNTY: ####	ROUTE: ####



**SINGLE POINT PICK-UP**

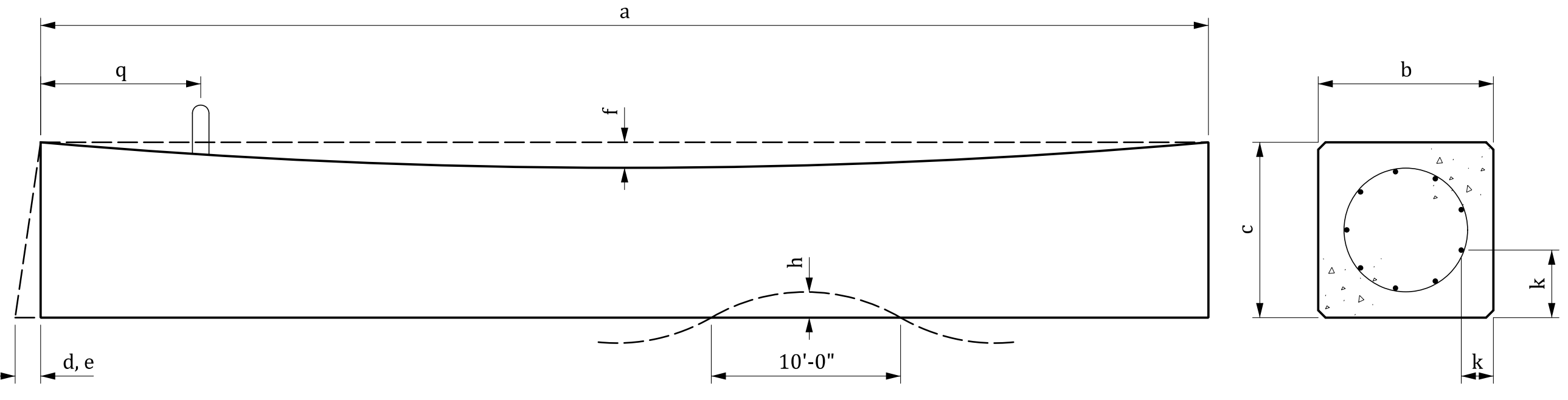


**DOUBLE POINT PICK-UP**



**TRIPLE POINT PICK-UP**

**TOLERANCES**



**ELEVATION**

**CROSS SECTION**

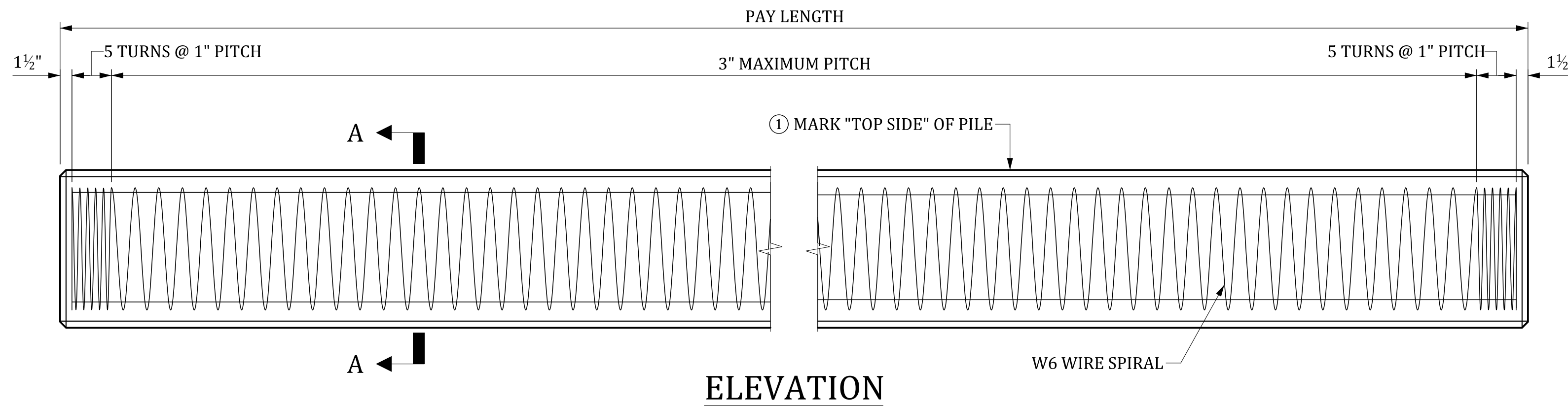
a	LENGTH	±1"
b	WIDTH OR DIAMETER	±3/8", +1/2" (INCLUDING FORM DRAFT)
c	DEPTH	±3/8"
d	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	±1/4" PER 12", ±1/2" MAXIMUM
e	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	±1/4" PER 12", ±1/2" MAXIMUM
f	SWEEP (VARIATION FROM STRAIGHT LINE PARALLEL TO CENTERLINE OF MEMBER) (CONSIDERED TO BE A FORM TOLERANCE)	±3/8" PER 10'
h	LOCAL SMOOTHNESS OF ANY SURFACE	1/4" IN 10'
k	LOCATION OF STRAND	±1/4"
q	LOCATION OF HANDLING DEVICE	±6"
	LONGITUDINAL SPACING OF STIRRUPS OR SPIRAL REINFORCEMENT	±3/4"

REV.	BY	CHK.	DATE	DESCRIPTION OF REVISION

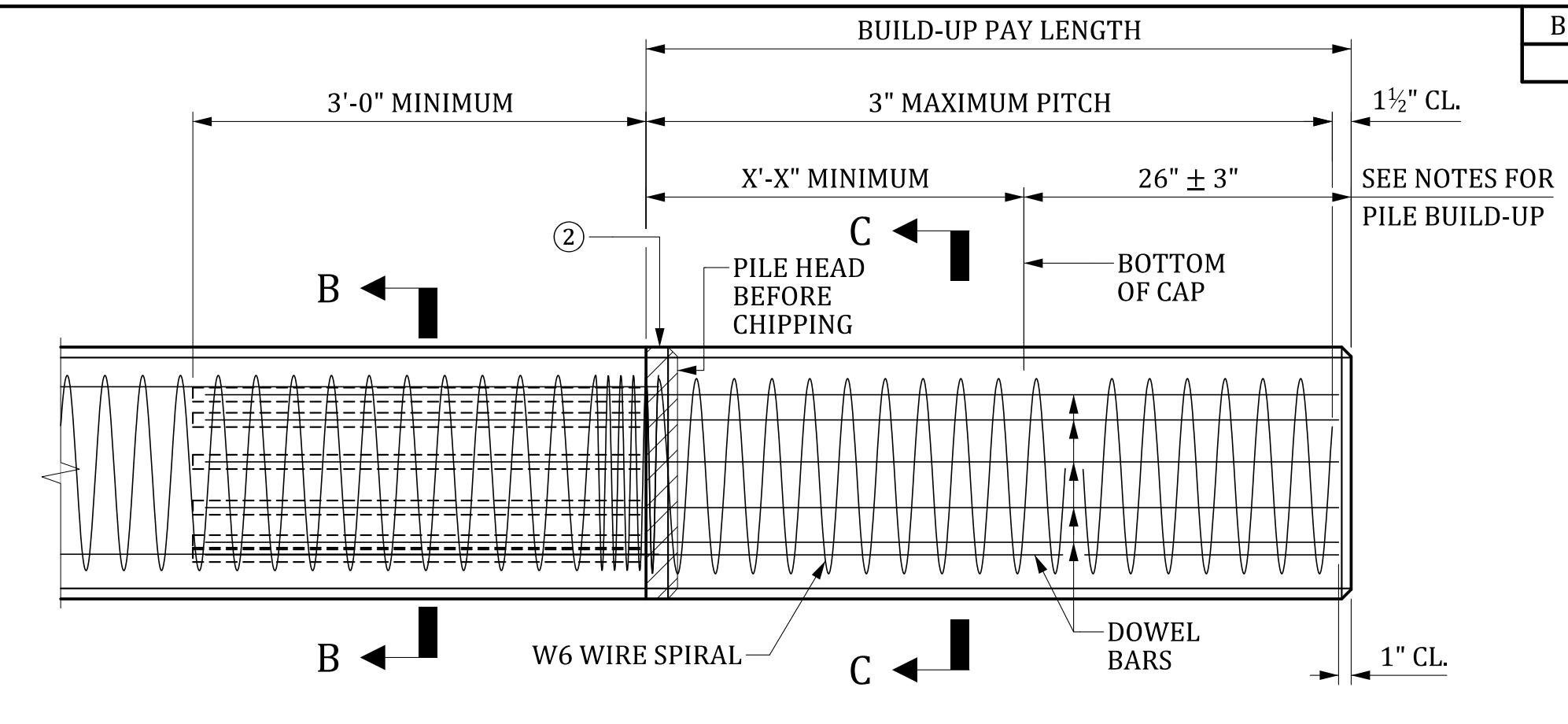
  

REVIEWED	QUAN.	DR.	DES.	BY	CHK.	DATE

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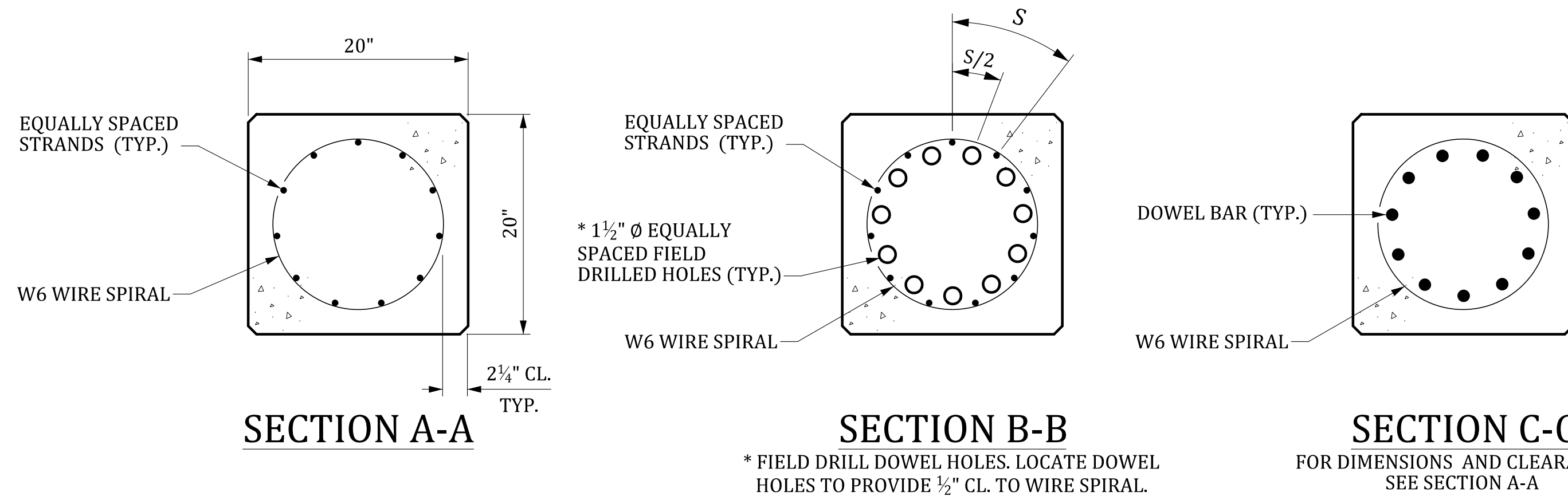


ELEVATION



BUILD-UP

② TO LENGTHEN PILE IN PLACE, CHIP TOP OF PILE BACK 2 1/2" MINIMUM TO EXPOSE WIRE SPIRAL AND PROVIDE FULL STRENGTH LAP WELD (4" MINIMUM LENGTH). ALSO, REMOVE PILE AS NECESSARY TO ENSURE PROPER DISTANCE IS MAINTAINED BETWEEN THE PILE/BUILD-UP JOINT AND THE BOTTOM OF CAP.



**DESIGN DATA**

STRANDS:  
 LOW RELAXATION GRADE 270  
 INITIAL PRESTRESS (0.75 fpu) = 202.5 KSI

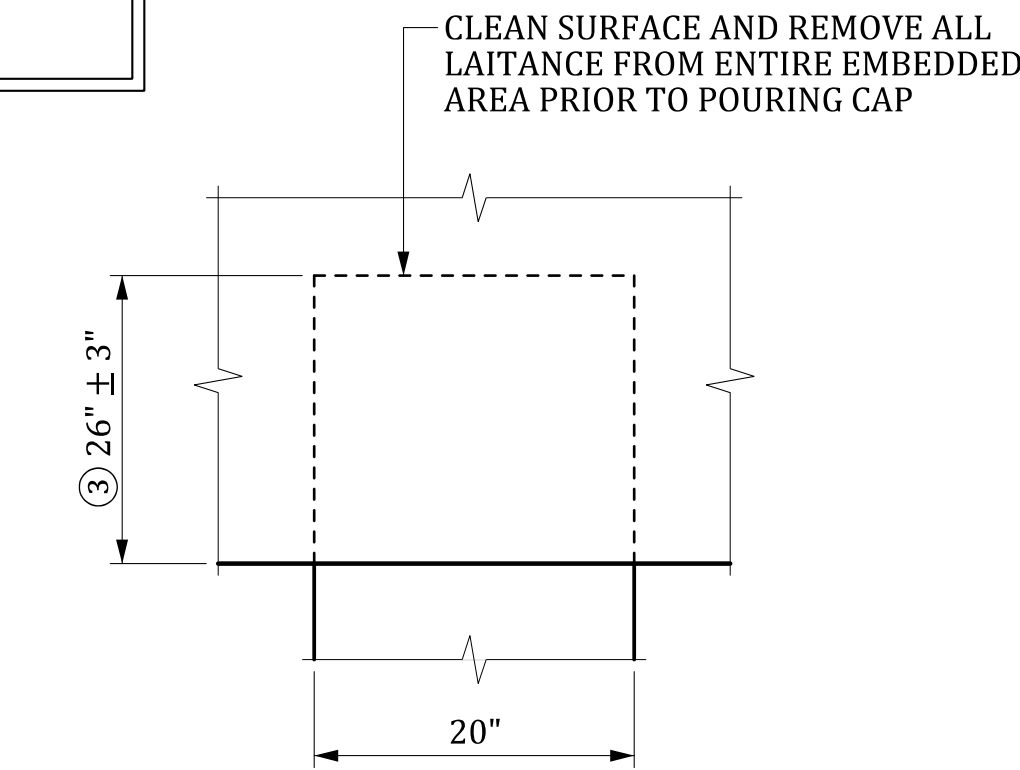
CONCRETE:  
 f'c = 5.0 KSI  
 f'ci = 3.5 KSI

**PILE DATA**

STRANDS	STRESS (KSI)	DOWEL BARS	MAXIMUM L		
			1 PICK-UP POINT	2 PICK-UP POINTS	3 PICK-UP POINTS
11 - 0.6"	0.880	11 # 8	62'	88'	126'

**STRAND DATA**

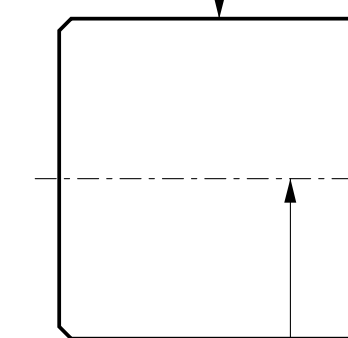
DIAMETER	AREA (INCH <sup>2</sup> )	TENSIONING LOAD
0.6"	0.217	43.9 KIPS



PILE ANCHORAGE DETAILS

③ IF THIS DIMENSION IS LESS THAN 23", BUILD UP THE PILE AS DETAILED ABOVE.

① ORIENT PILE SUCH THAT "TOP SIDE" OF PILE IS PARALLEL TO  $\phi$  BENT



PILE ORIENTATION DETAIL

① "TOP SIDE" IS THE TOP SURFACE OF THE PILE WHEN IT WAS POURED IN THE CASTING BED.

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**GENERAL NOTES**

- SPLICE WIRE SPIRAL USING FULL STRENGTH LAP WELDS.
- CHAMFER ALL EXPOSED EDGES 3/4" UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO CENTERS OF BARS (EXCEPT AS NOTED).
- RELEASE ALTERNATE STRANDS SIMULTANEOUSLY AT OPPOSITE ENDS WITHOUT SHOCK.
- TIE WIRE SPIRAL TO CABLES AND REINFORCING BARS AS REQUIRED TO MAINTAIN PITCH OF THE SPIRAL.
- MARK PILES AT PICK-UP POINTS TO INDICATE PROPER POINTS FOR ATTACHING HANDLING LINES.
- ANCHOR THE PILES INTO THE BENT CAPS USING THE DETAILS SHOWN ON THIS SHEET. INCLUDE ALL COSTS FOR THIS WORK IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE PILING.

**NOTES FOR BUILD-UP**

CHIP BACK TOP OF PILES AND FIELD DRILL HOLES AS SHOWN. GROUT DOWEL BARS IN THE HOLES USING AN APPROVED NON-SHRINK GROUT WITH f'c = 5.0 KSI. TERMINATE DOWEL BARS 1" CLEAR FROM THE TOP OF PILE. SUBMIT DOWEL BAR LENGTHS TO THE RCE FOR APPROVAL. SPLICES ARE NOT ALLOWED IN THE DOWEL BARS. INCLUDE ALL COSTS ASSOCIATED WITH PREPARATION OF THE PILE FOR BUILD-UP IN THE UNIT PRICE BID FOR PILE BUILD-UP PREPARATION.

BUILD UP ALL PILES THAT HAVE AN EMBEDMENT LENGTH LESS THAN THE MINIMUM SHOWN IN THE PLANS. USE THE BUILD-UP DETAILS SHOWN ON THIS SHEET. THE OPTION IS AVAILABLE TO CAST BUILD-UPS WITH BENT CAPS PROVIDED REBAR AND WIRE SPIRAL ARE CONTINUED A DISTANCE EQUAL TO 26" INTO THE CAP AND THE CAP IS CAST WITH CLASS 5000 CONCRETE REGARDLESS OF THE ACTUAL CLASS USED. INCLUDE AN EMBEDMENT LENGTH OF 26" IN THE PILE BUILD-UP LENGTH MEASURED FOR PAYMENT. PAY FOR THE PILE BUILD-UP, INCLUDING ALL COSTS FOR DOWEL BARS, WIRE SPIRALS, AND BUILD-UP CONCRETE, AS AN ADDITIONAL LENGTH OF PRESTRESSED CONCRETE PILING EQUAL TO THE BUILD-UP PAY LENGTH SHOWN IN THE BUILD-UP DETAIL.

**MATERIALS**

- PRESTRESSING STRAND - GRADE 270, LOW RELAXATION AASHTO M 203
- WIRE SPIRAL - AASHTO M 32, M 225
- REINFORCING STEEL - GRADE 60, AASHTO M 31, TYPE W
- CONCRETE - f'c = 5.0 KSI, STANDARD SPEC. SECT. 701

CONSULTANT NAME/LOGO

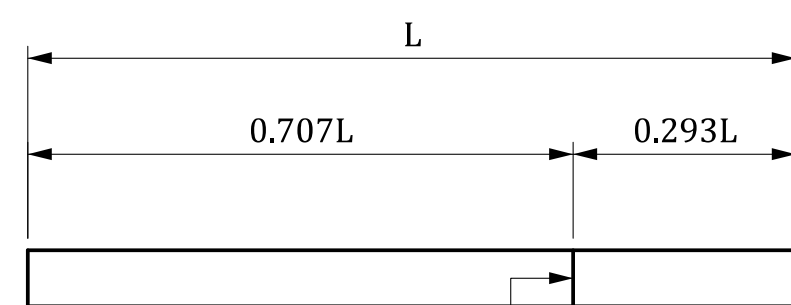
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

20" SQUARE PRESTRESSED CONCRETE PILE

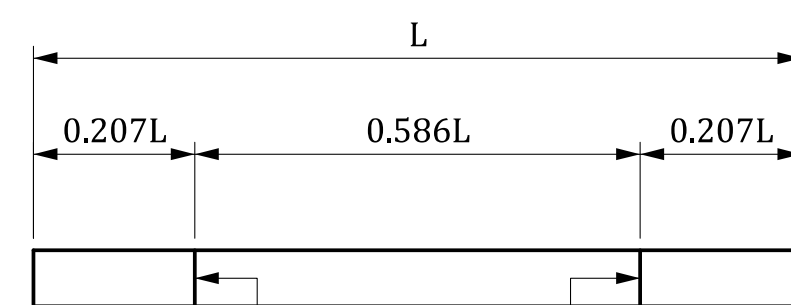
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ROUTE: ####

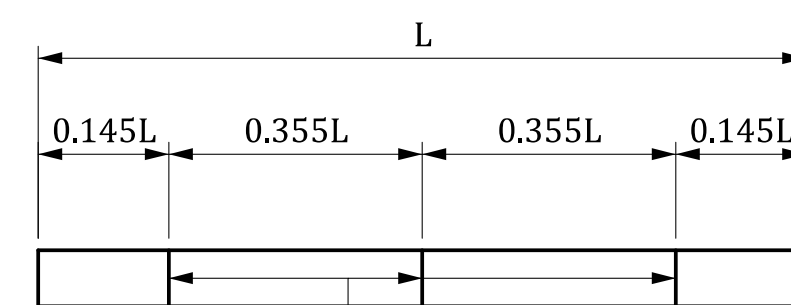
DRAWING NUMBER: 704-PCP.20



SINGLE POINT PICK-UP

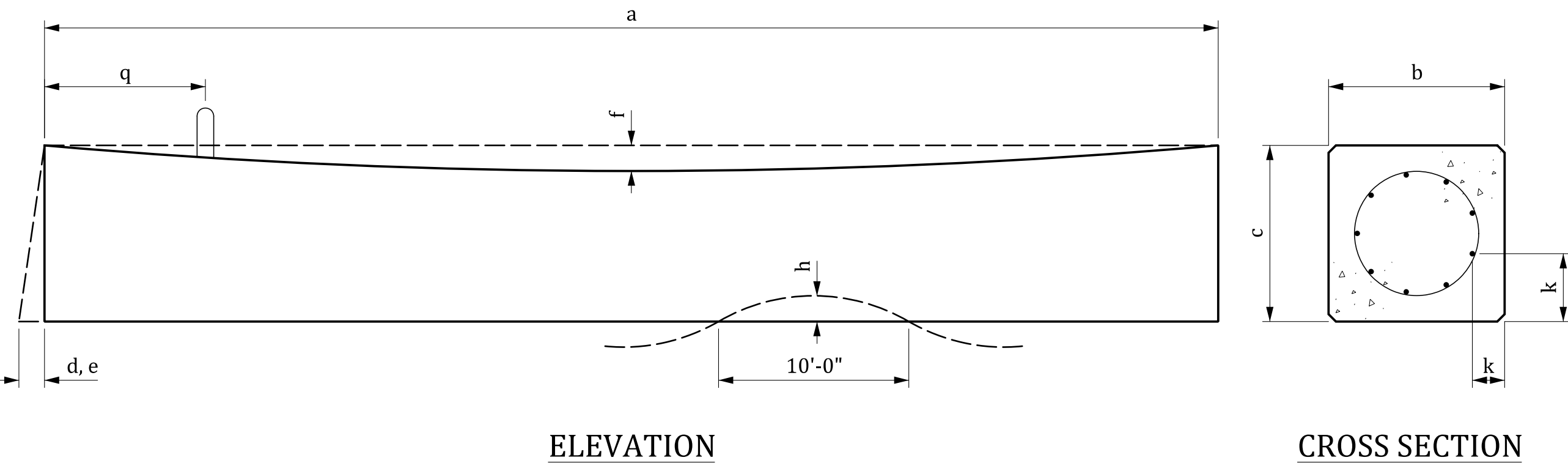


DOUBLE POINT PICK-UP



TRIPLE POINT PICK-UP

**TOLERANCES**



ELEVATION

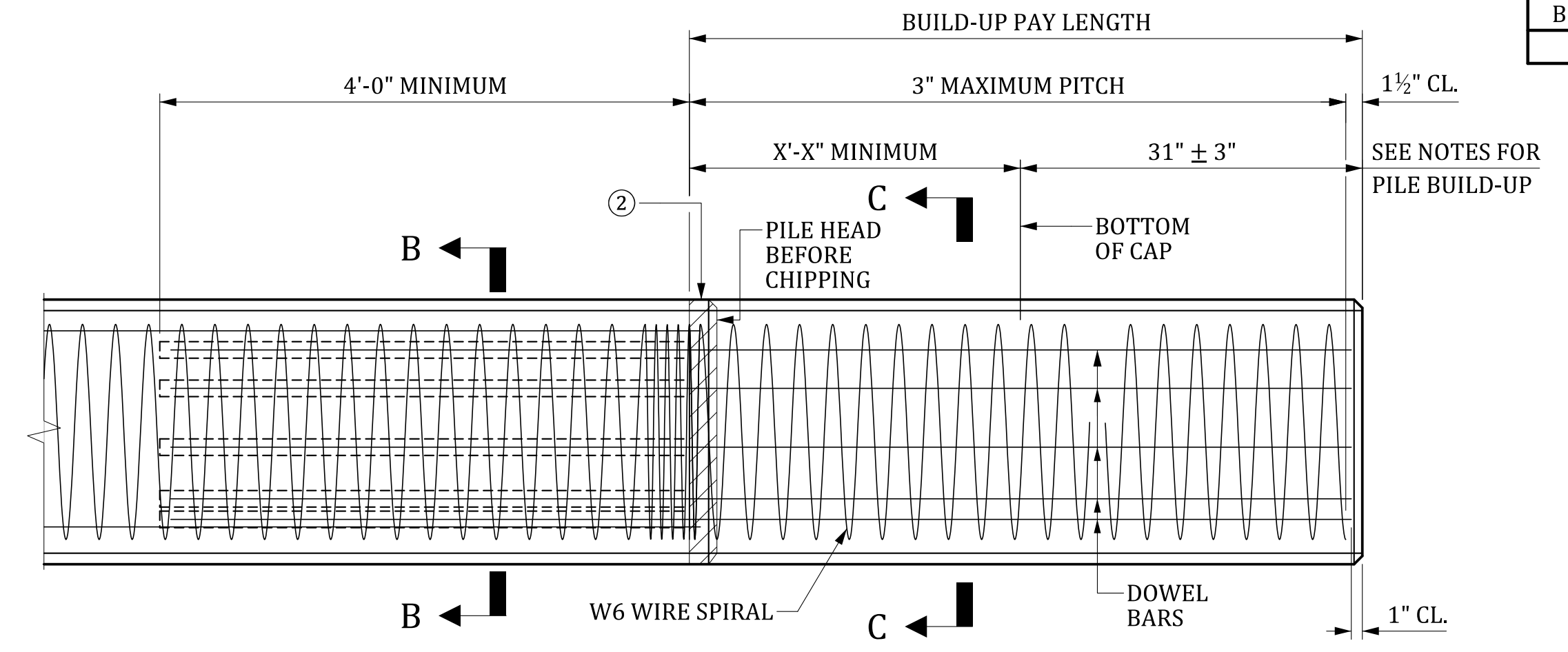
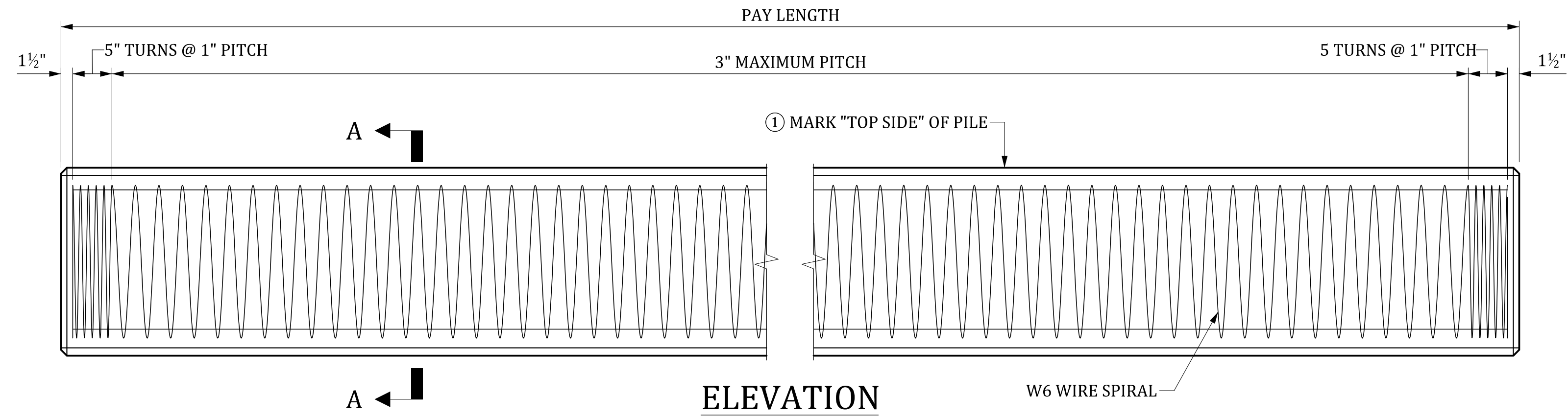
CROSS SECTION

a	LENGTH	±1"
b	WIDTH OR DIAMETER	±3/8", +1/2" (INCLUDING FORM DRAFT)
c	DEPTH	±3/8"
d	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	±1/4" PER 12", ±1/2" MAXIMUM
e	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	±1/4" PER 12", ±1/2" MAXIMUM
f	SWEEP (VARIATION FROM STRAIGHT LINE PARALLEL TO CENTERLINE OF MEMBER) (CONSIDERED TO BE A FORM TOLERANCE)	±1/8" PER 10'
h	LOCAL SMOOTHNESS OF ANY SURFACE	1/4" IN 10'
k	LOCATION OF STRAND	±1/4"
q	LOCATION OF HANDLING DEVICE	±6"
	LONGITUDINAL SPACING OF STIRRUPS OR SPIRAL REINFORCEMENT	±3/4"

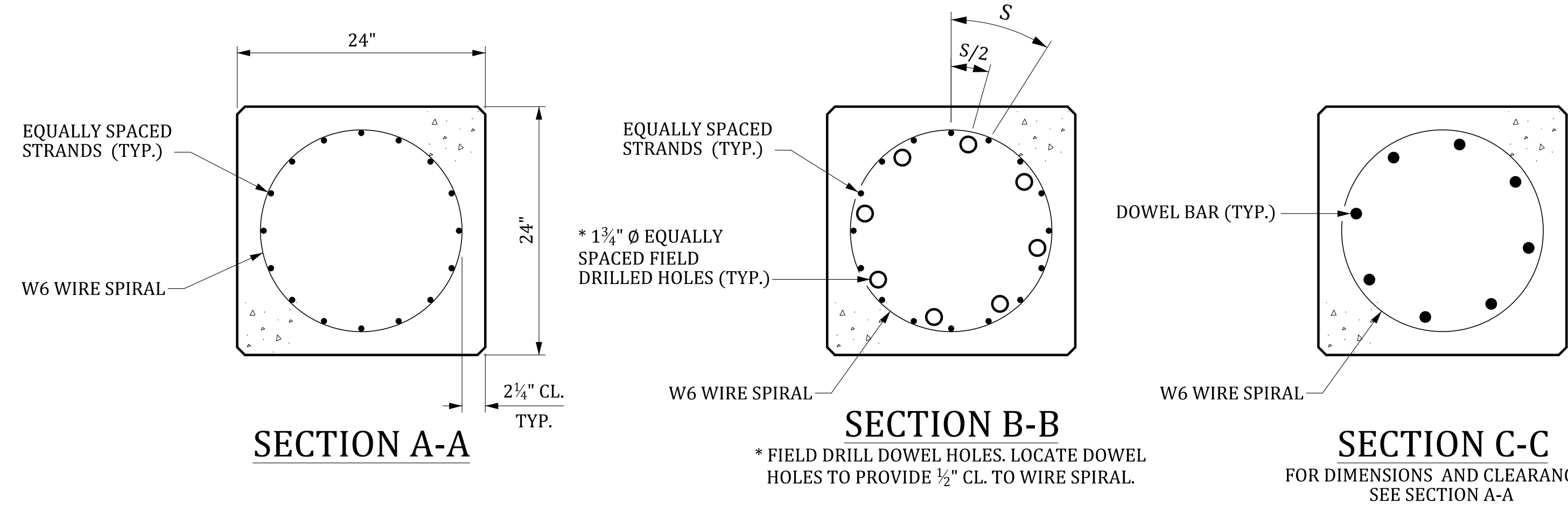
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REV.	BY	CHK.	DATE	DESCRIPTION OF REVISION

REVIEWED	QUAN.	DR.	DES.	BY	CHK.	DATE



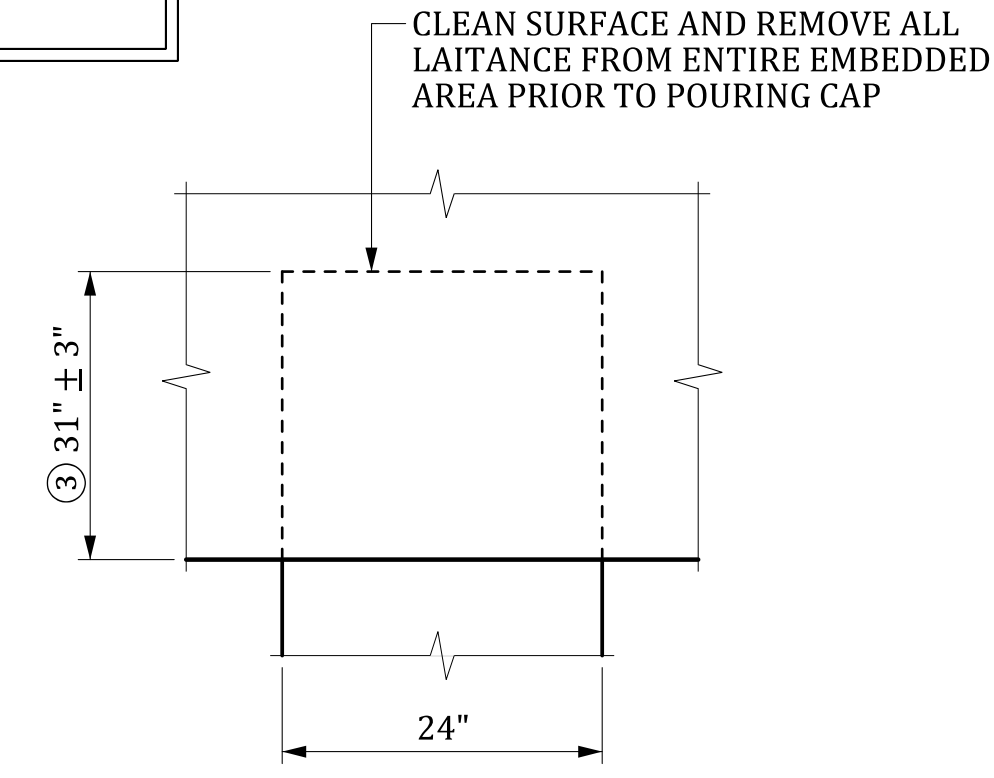
② TO LENGTHEN PILE IN PLACE, CHIP TOP OF PILE BACK 2 1/2" MINIMUM TO EXPOSE WIRE SPIRAL AND PROVIDE FULL STRENGTH LAP WELD (4" MINIMUM LENGTH). ALSO, REMOVE PILE AS NECESSARY TO ENSURE PROPER DISTANCE IS MAINTAINED BETWEEN THE PILE/BUILD-UP JOINT AND THE BOTTOM OF CAP.



DESIGN DATA	
STRANDS:	LOW RELAXATION GRADE 270
	INITIAL PRESTRESS (0.75 fpu) = 202.5 KSI
CONCRETE:	f'c = 5.0 KSI
	f'ci = 3.5 KSI

PILE DATA					
STRANDS	STRESS (KSI)	DOWEL BARS	MAXIMUM L		
			1 PICK-UP POINT	2 PICK-UP POINTS	3 PICK-UP POINTS
16 - 0.6"	0.890	8 # 10	68'	96'	137'

STRAND DATA		
DIAMETER	AREA (INCH <sup>2</sup> )	TENSIONING LOAD
0.6"	0.217	43.9 KIPS



### PILE ANCHORAGE DETAILS

③ IF THIS DIMENSION IS LESS THAN 28", BUILD UP THE PILE AS DETAILED ABOVE.

① ORIENT PILE SUCH THAT "TOP SIDE" OF PILE IS PARALLEL TO  $\phi$  BENT

### GENERAL NOTES

- SPlice WIRE SPIRAL USING FULL STRENGTH LAP WELDS.
- CHAMFER ALL EXPOSED EDGES 3/4" UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO CENTERS OF BARS (EXCEPT AS NOTED).
- RELEASE ALTERNATE STRANDS SIMULTANEOUSLY AT OPPOSITE ENDS WITHOUT SHOCK.
- TIE WIRE SPIRAL TO CABLES AND REINFORCING BARS AS REQUIRED TO MAINTAIN PITCH OF THE SPIRAL.
- MARK PILES AT PICK-UP POINTS TO INDICATE PROPER POINTS FOR ATTACHING HANDLING LINES.
- ANCHOR THE PILES INTO THE BENT CAPS USING THE DETAILS SHOWN ON THIS SHEET. INCLUDE ALL COSTS FOR THIS WORK IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE PILING.

### NOTES FOR BUILD-UP

CHIP BACK TOP OF PILES AND FIELD DRILL HOLES AS SHOWN. GROUT DOWEL BARS IN THE HOLES USING AN APPROVED NON-SHRINK GROUT WITH f'c = 5.0 KSI. TERMINATE DOWEL BARS 1" CLEAR FROM THE TOP OF PILE. SUBMIT DOWEL BAR LENGTHS TO THE RCE FOR APPROVAL. SPLICES ARE NOT ALLOWED IN THE DOWEL BARS. INCLUDE ALL COSTS ASSOCIATED WITH PREPARATION OF THE PILE FOR BUILD-UP IN THE UNIT PRICE BID FOR PILE BUILD-UP PREPARATION.

BUILD UP ALL PILES THAT HAVE AN EMBEDMENT LENGTH LESS THAN THE MINIMUM SHOWN IN THE PLANS. USE THE BUILD-UP DETAILS SHOWN ON THIS SHEET. THE OPTION IS AVAILABLE TO CAST BUILD-UPS WITH BENT CAPS PROVIDED REBAR AND WIRE SPIRAL ARE CONTINUED A DISTANCE EQUAL TO 31" INTO THE CAP AND THE CAP IS CAST WITH CLASS 5000 CONCRETE. PAY FOR CAP CONCRETE AS CLASS 4000 CONCRETE REGARDLESS OF THE ACTUAL CLASS USED. INCLUDE AN EMBEDMENT LENGTH OF 31" IN THE PILE BUILD-UP LENGTH MEASURED FOR PAYMENT. PAY FOR THE PILE BUILD-UP, INCLUDING ALL COSTS FOR DOWEL BARS, WIRE SPIRALS, AND BUILD-UP CONCRETE, AS AN ADDITIONAL LENGTH OF PRESTRESSED CONCRETE PILING EQUAL TO THE BUILD-UP PAY LENGTH SHOWN IN THE BUILD-UP DETAIL.

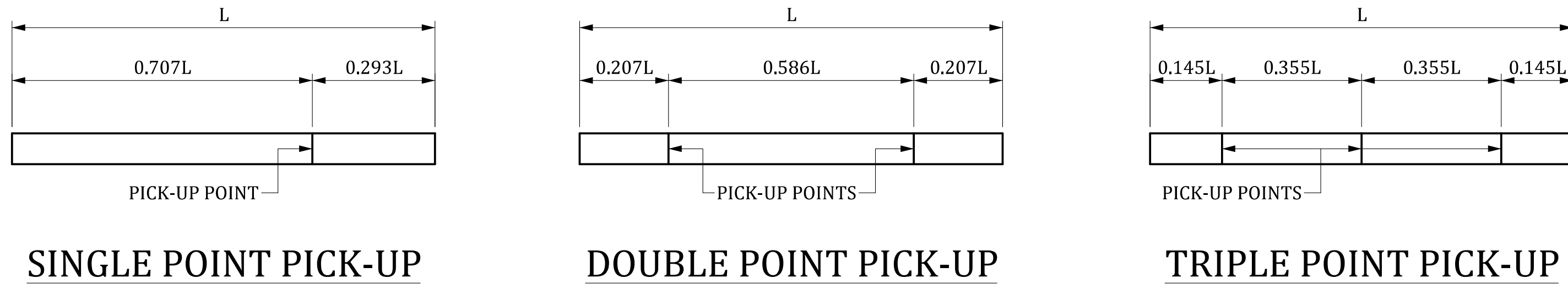
### MATERIALS

- PRESTRESSING STRAND - GRADE 270, LOW RELAXATION AASHTO M 203
- WIRE SPIRAL - AASHTO M 32, M 225
- REINFORCING STEEL - GRADE 60, AASHTO M 31, TYPE W
- CONCRETE - f'c = 5.0 KSI, STANDARD SPEC. SECT. 701

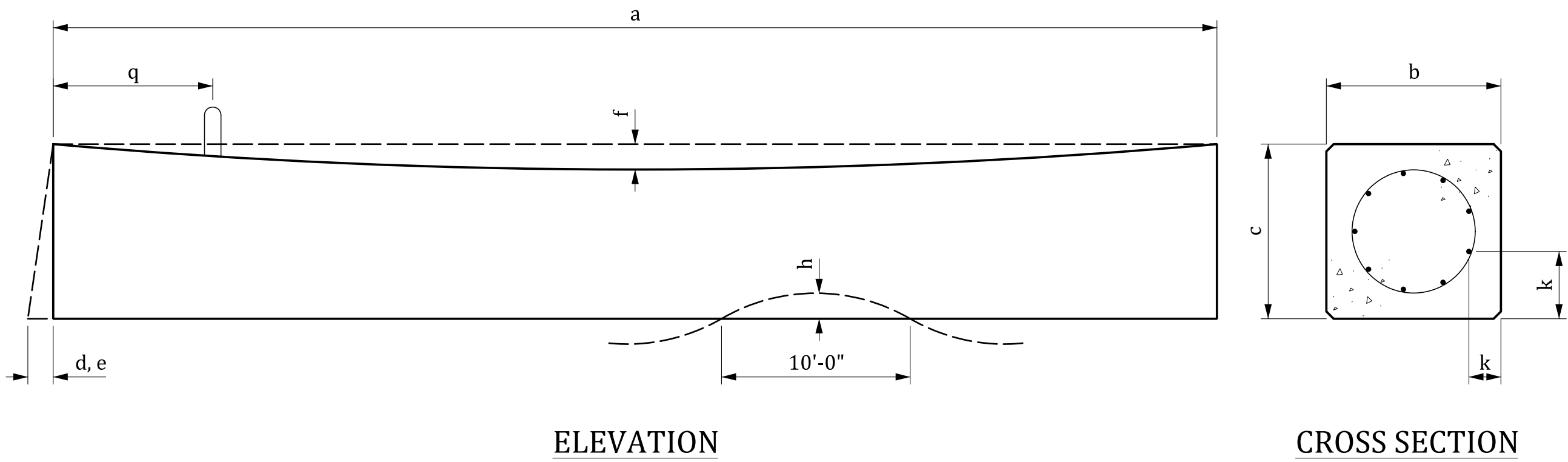
### PILE ORIENTATION DETAIL

① "TOP SIDE" IS THE TOP SURFACE OF THE PILE WHEN IT WAS POURED IN THE CASTING BED.

THIS DRAWING IS FURNISHED FOR INFORMATION ONLY. ALL DIMENSIONS SHOWN ARE SHEET SPECIFIC. ANY USE OF THIS DESIGN AND DRAWING, INCLUDING DIMENSIONS, MUST BE CHECKED BY THE USER'S ENGINEER TO ENSURE DESIGN IS ADEQUATE FOR THE INTENDED USE. ALL DRAWINGS MUST BE SIGNED AND SEALED BY A SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER WHEN USED.



### TOLERANCES



a	LENGTH	±1"
b	WIDTH OR DIAMETER	±3/8", +1/2" (INCLUDING FORM DRAFT)
c	DEPTH	±3/8"
d	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	±1/4" PER 12", ±1/2" MAXIMUM
e	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	±1/4" PER 12", ±1/2" MAXIMUM
f	SWEEP (VARIATION FROM STRAIGHT LINE PARALLEL TO CENTERLINE OF MEMBER) (CONSIDERED TO BE A FORM TOLERANCE)	±3/8" PER 10'
h	LOCAL SMOOTHNESS OF ANY SURFACE	1/4" IN 10'
k	LOCATION OF STRAND	±1/4"
q	LOCATION OF HANDLING DEVICE	±6"
	LONGITUDINAL SPACING OF STIRRUPS OR SPIRAL REINFORCEMENT	±3/4"

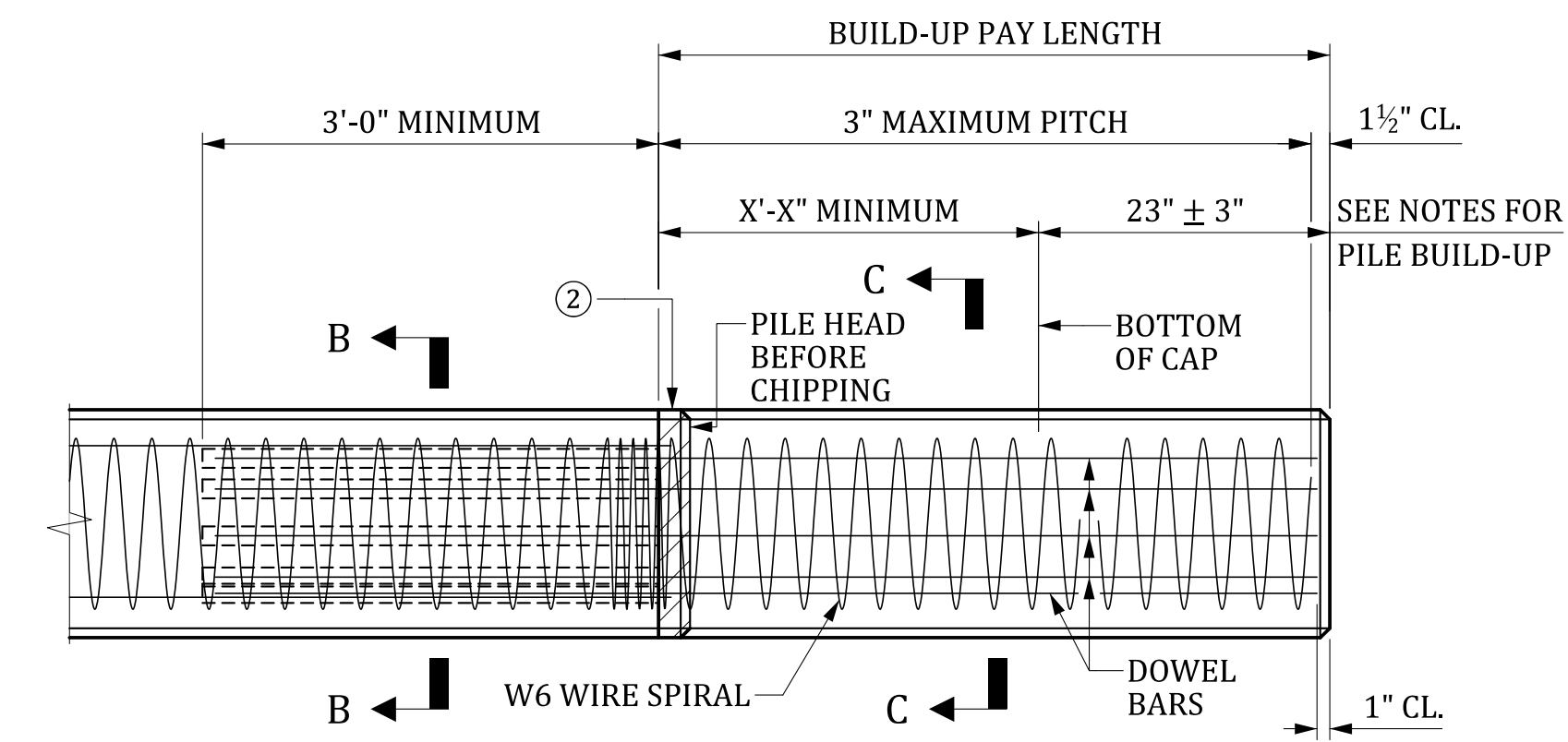
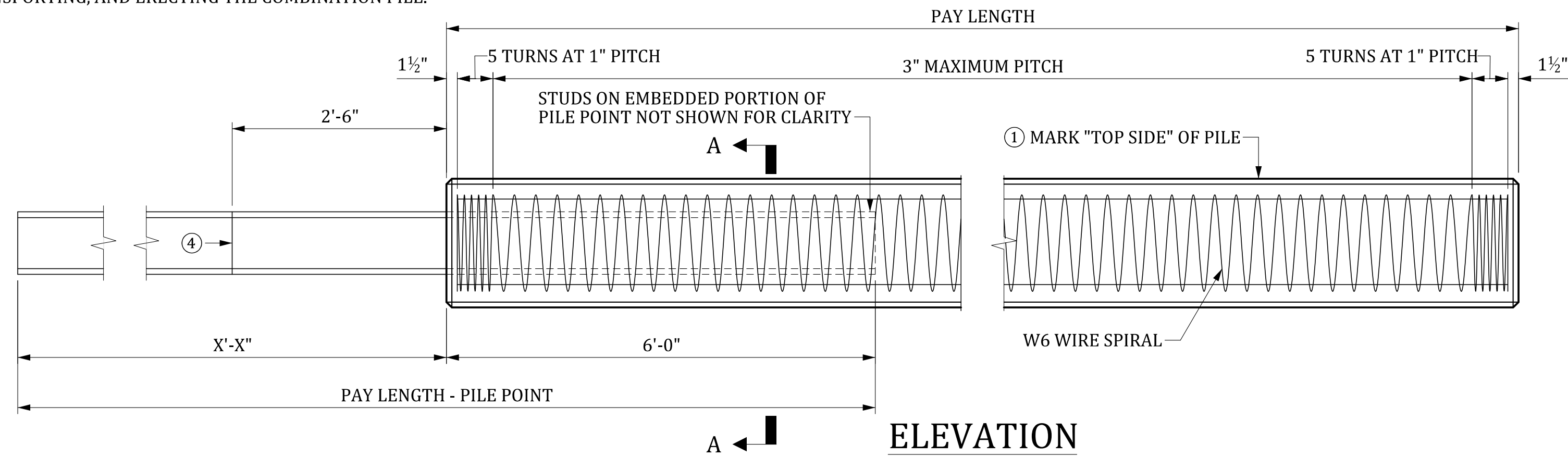
CONSULTANT NAME/LOGO	
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION	
24" SQUARE PRESTRESSED CONCRETE PILE	
COUNTY: ####	ROUTE: ####

REV.	BY	CHK.	DATE	DESCRIPTION OF REVISION

REVIEWED	QUAN.	DR.	DES.	BY	CHK.	DATE

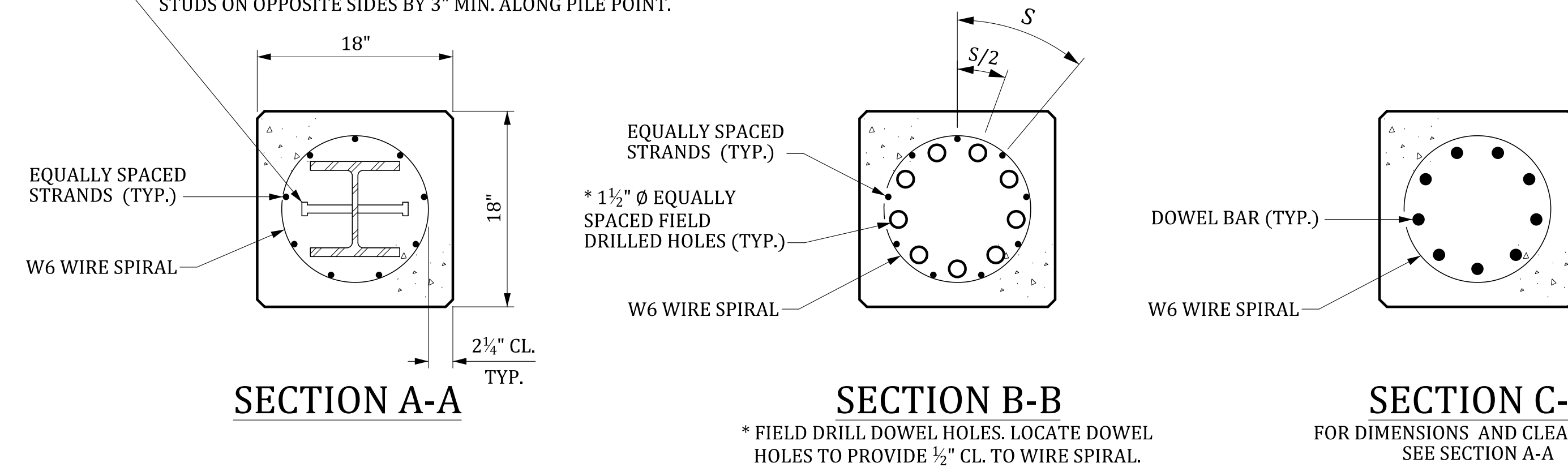
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④ EXTENSION MAY BE ATTACHED TO EMBEDDED PORTION OF PILE POINT PRIOR TO HANDLING, TRANSPORTING, AND ERECTING THE COMBINATION PILE.



**BUILD-UP**  
 ② TO LENGTHEN PILE IN PLACE, CHIP TOP OF PILE BACK 2½" MINIMUM TO EXPOSE WIRE SPIRAL AND PROVIDE FULL STRENGTH LAP WELD (4" MINIMUM LENGTH). ALSO, REMOVE PILE AS NECESSARY TO ENSURE PROPER DISTANCE IS MAINTAINED BETWEEN THE PILE/BUILD-UP JOINT AND THE BOTTOM OF CAP.

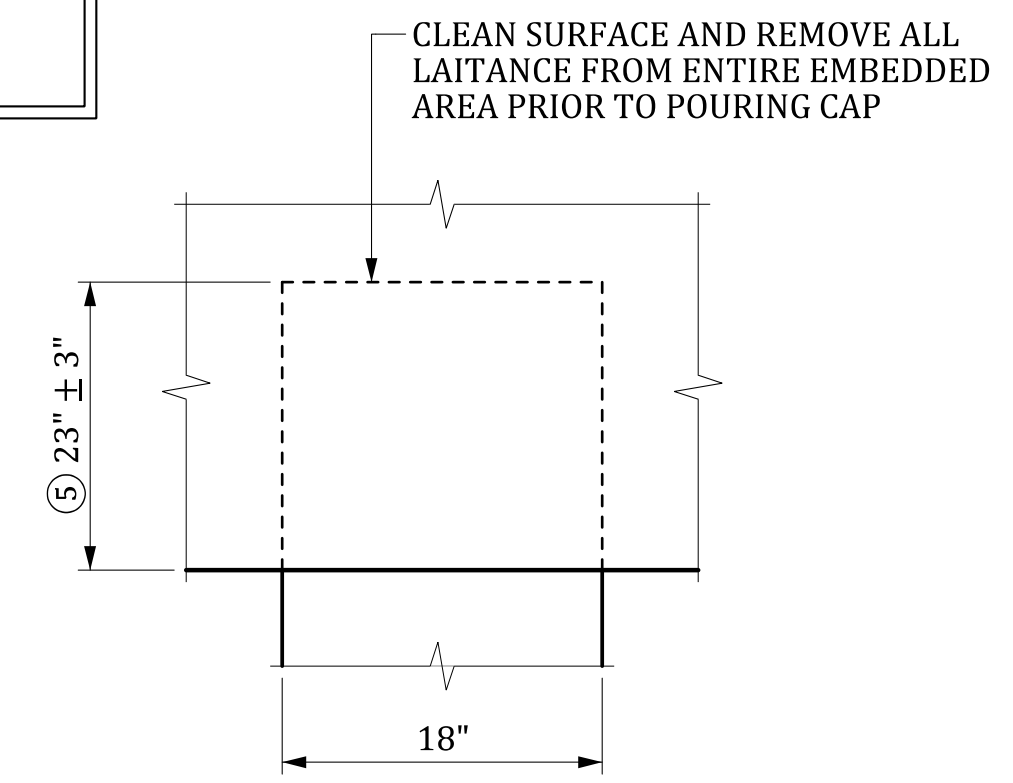
12-¾" Ø x 5" WELDED STUDS SPACED AT 1'-0" MAX. (6 EACH SIDE OF WEB). STAGGER STUDS ON OPPOSITE SIDES BY 3" MIN. ALONG PILE POINT.



DESIGN DATA	
STRANDS:	LOW RELAXATION GRADE 270
	INITIAL PRESTRESS (0.75 fpu) = 202.5 KSI
CONCRETE:	f'c = 5.0 KSI
	f'ci = 3.5 KSI

**GENERAL NOTES**

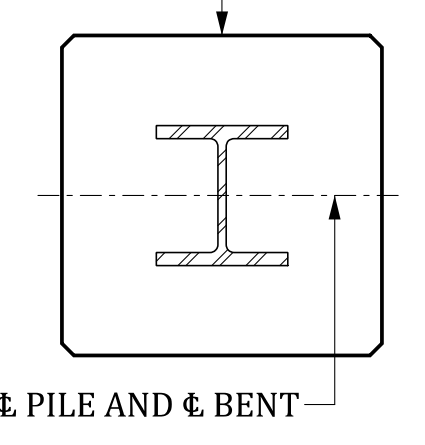
- SPLICE WIRE SPIRAL USING FULL STRENGTH LAP WELDS.
- CHAMFER ALL EXPOSED EDGES ¾" UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO CENTERS OF BARS (EXCEPT AS NOTED).
- RELEASE ALTERNATE STRANDS SIMULTANEOUSLY AT OPPOSITE ENDS WITHOUT SHOCK.
- TIE WIRE SPIRAL TO CABLES AND REINFORCING BARS AS REQUIRED TO MAINTAIN PITCH OF THE SPIRAL.
- ANCHOR THE PILES INTO THE BENT CAPS USING THE DETAILS SHOWN ON THIS SHEET. INCLUDE ALL COSTS FOR THIS WORK IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE PILING.



**PILE ANCHORAGE DETAILS**

⑤ IF THIS DIMENSION IS LESS THAN 20", BUILD UP THE PILE AS DETAILED ABOVE.

① ORIENT PILE SUCH THAT "TOP SIDE" OF PILE IS PARALLEL TO  $\phi$  BENT



**PILE ORIENTATION DETAIL**

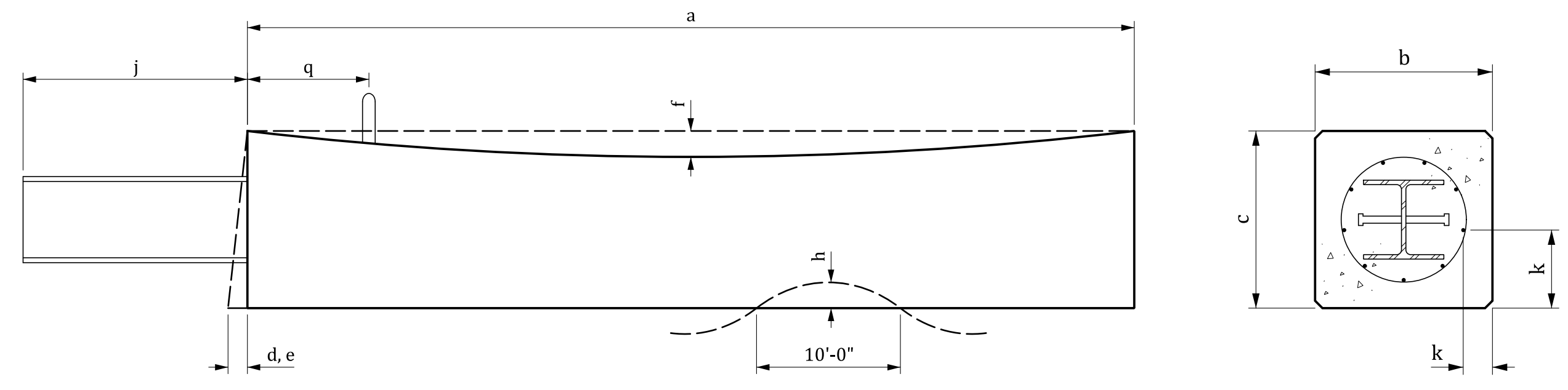
① "TOP SIDE" IS THE TOP SURFACE OF THE PILE WHEN IT WAS POURED IN THE CASTING BED.

③ PILE DATA			
STRANDS	STRESS (KSI)	DOWEL BARS	PILE POINT SIZE
9 - 0.6"	0.890	9 # 8	W8x58

STRAND DATA		
DIAMETER	AREA (INCH <sup>2</sup> )	TENSIONING LOAD
0.6"	0.217	43.9 KIPS

- ③ DETERMINE PICK-UP POINTS USING THE FOLLOWING:
- DETERMINE MAXIMUM LENGTHS FOR PICK-UP OF THE COMBINATION PILE (AS A UNIT OR IN PARTS) USING THE FOLLOWING LOAD ASSUMPTION AND ALLOWABLE STRESSES.
    - A. LOADING: 1.5 TIMES THE FULL DEAD LOAD
    - B. ALLOWABLE TENSILE STRESS IN PRECAST, PRESTRESSED CONCRETE PORTION OF THE PILE: 0.158  $\sqrt{f'ci}$  (KSI)
    - C. ALLOWABLE COMPRESSIVE STRESS IN PRECAST, PRESTRESSED CONCRETE PORTION OF THE PILE: 0.6 x f'ci (KSI)
    - D. ALLOWABLE BENDING STRESS IN PILE POINT SECTION: 20 KSI.
  - STRESS AND LOADING CRITERIA ARE BASED ON NORMAL CARE IN HANDLING THE PILE. IF HANDLING IS SUCH THAT DAMAGE IN THE PILE BECOMES EVIDENT, THE ENGINEER MAY REQUIRE A HIGHER LOAD FACTOR OR LOWER ALLOWABLE STRESS AS NECESSARY TO INSURE NO DAMAGE TO PILES.
  - MARK PILES AT PICK-UP POINTS TO INDICATE PROPER POINTS FOR ATTACHING HANDLING LINES.

**TOLERANCES**



a	LENGTH	±1"
b	WIDTH OR DIAMETER	±¾", +½" (INCLUDING FORM DRAFT)
c	DEPTH	± ¾"
d	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	±¼" PER 12", ±½" MAXIMUM
e	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	±¼" PER 12", ±½" MAXIMUM
f	SWEEP (VARIATION FROM STRAIGHT LINE PARALLEL TO CENTERLINE OF MEMBER) (CONSIDERED TO BE A FORM TOLERANCE)	± 1/8" PER 10'
h	LOCAL SMOOTHNESS OF ANY SURFACE	¼" IN 10'
j	PROJECTION OF STEEL PILE POINT FROM END OF PILE	± 1"
	POSITION OF STEEL PILE POINT	± ½"
	ALIGNMENT OF STEEL PILE POINT	± ½"
	LENGTH OF STEEL PILE POINT	- 3", +6"
k	LOCATION OF STRAND	± ¼"
q	LOCATION OF HANDLING DEVICE	±6"
	LONGITUDINAL SPACING OF STIRRUPS OR SPIRAL REINFORCEMENT	±¾"

THIS DRAWING IS FURNISHED FOR INFORMATION ONLY. ALL DIMENSIONS SHOWN ARE SHEET SPECIFIC. ANY USE OF THIS DESIGN AND DRAWING, INCLUDING DIMENSIONS, MUST BE CHECKED BY THE USER'S ENGINEER TO ENSURE DESIGN IS ADEQUATE FOR THE INTENDED USE. ALL DRAWINGS MUST BE SIGNED AND SEALED BY A SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER WHEN USED.

CONSULTANT NAME/LOGO

SOUTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
**18" SQUARE  
 PRESTRESSED CONCRETE PILE  
 WITH POINT**

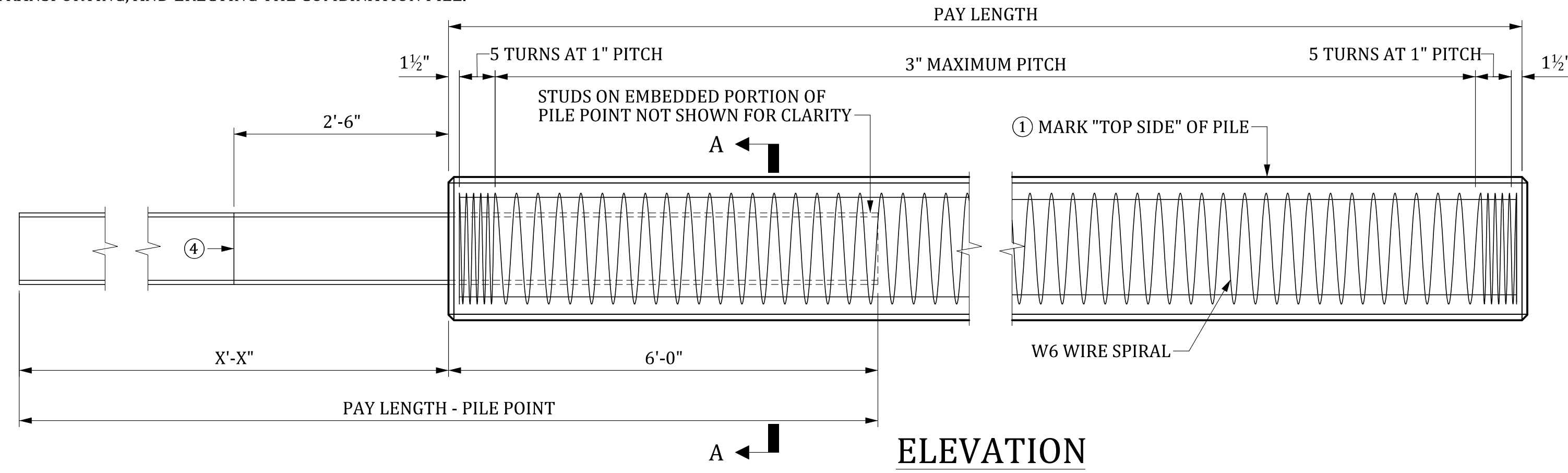
COUNTY: ##### ROUTE: #####

REVIEWED	QUAN	DR	DES.	BY	CHK	DATE

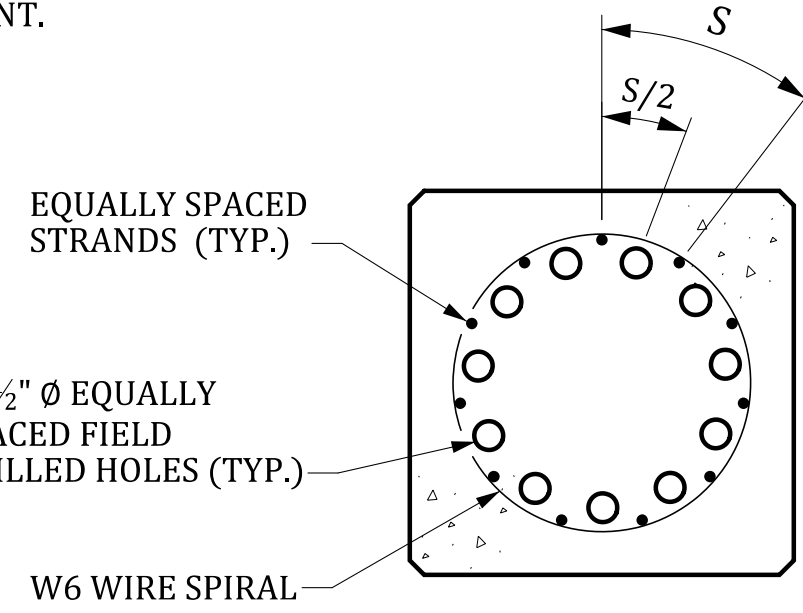
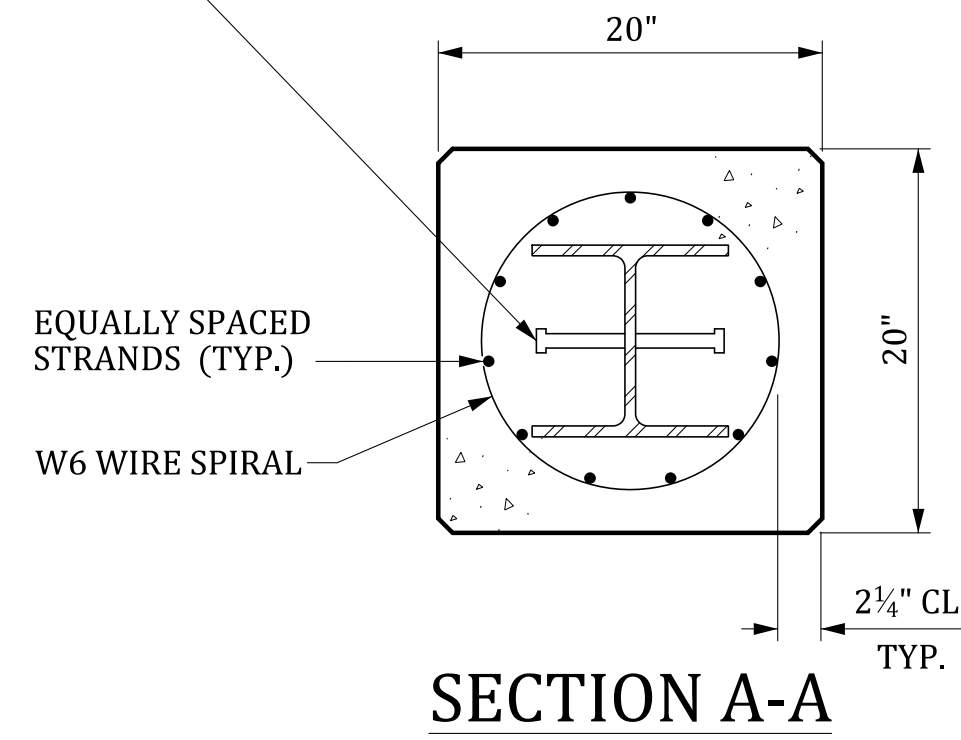
REV.	BY	CHK	DATE	DESCRIPTION OF REVISION

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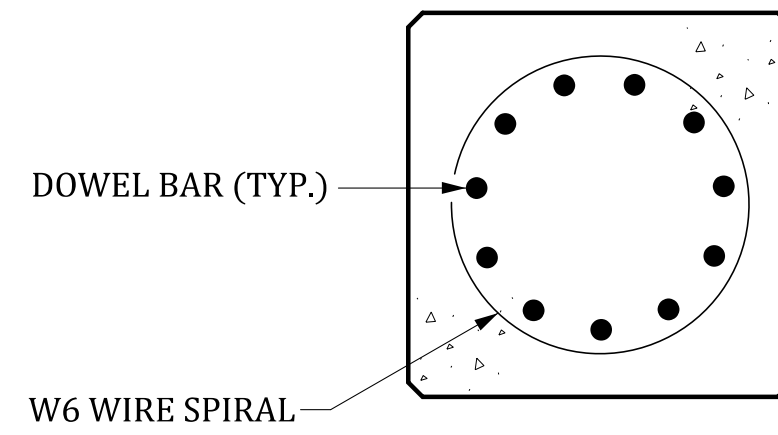
④ EXTENSION MAY BE ATTACHED TO EMBEDDED PORTION OF PILE POINT PRIOR TO HANDLING, TRANSPORTING, AND ERECTING THE COMBINATION PILE.



12-3/4" Ø x 5" WELDED STUDS SPACED AT 1'-0" MAX. (6 EACH SIDE OF WEB). STAGGER STUDS ON OPPOSITE SIDES BY 3" MIN. ALONG PILE POINT.



\* FIELD DRILL DOWEL HOLES. LOCATE DOWEL HOLES TO PROVIDE 1/2" CL. TO WIRE SPIRAL.



DESIGN DATA	
STRANDS:	LOW RELAXATION GRADE 270
	INITIAL PRESTRESS (0.75 fpu) = 202.5 KSI
CONCRETE:	
f'c	= 5.0 KSI
f'ci	= 3.5 KSI

③ PILE DATA			
STRANDS	STRESS (KSI)	DOWEL BARS	PILE POINT SIZE
11 - 0.6"	0.880	11 # 8	HP10x57

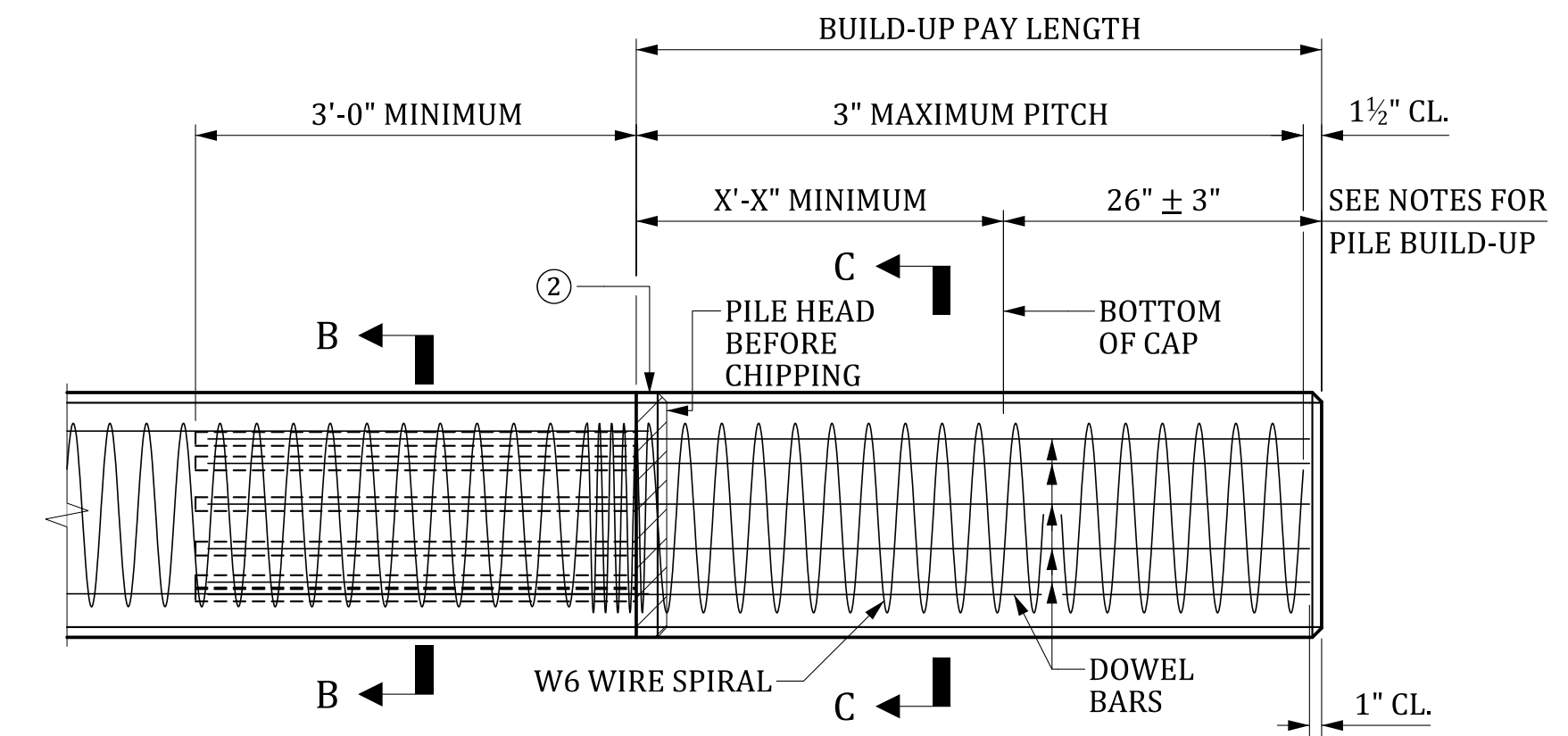
STRAND DATA		
DIAMETER	AREA (INCH <sup>2</sup> )	TENSIONING LOAD
0.6"	0.217	43.9 KIPS

### SECTION C-C

FOR DIMENSIONS AND CLEARANCES, SEE SECTION A-A

③ DETERMINE PICK-UP POINTS USING THE FOLLOWING:

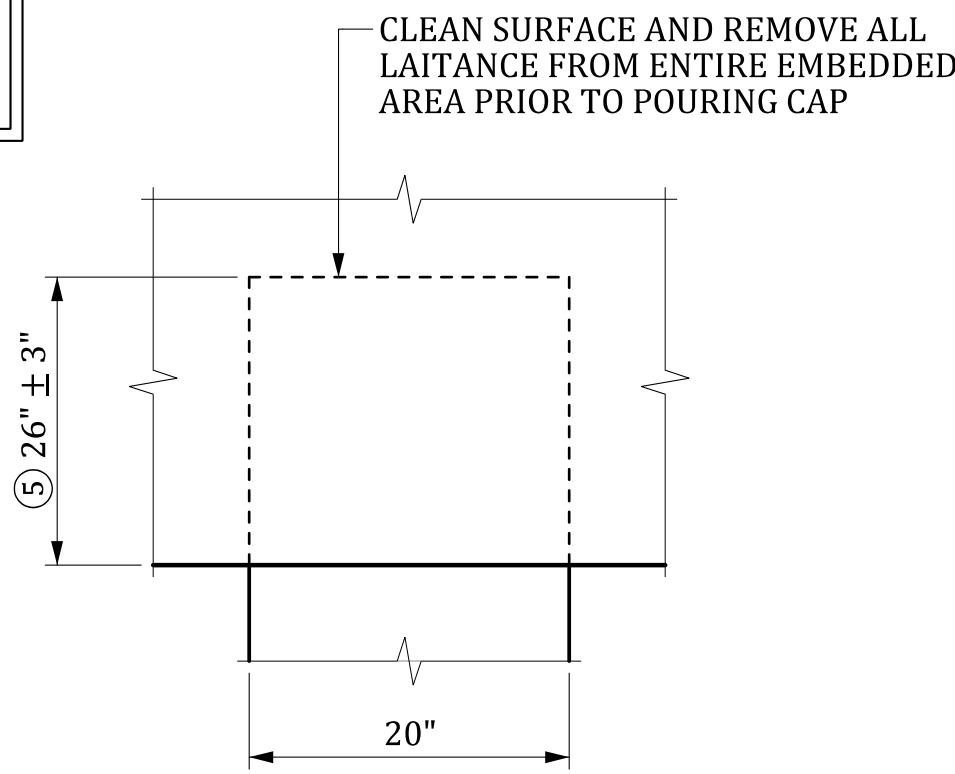
1. DETERMINE MAXIMUM LENGTHS FOR PICK-UP OF THE COMBINATION PILE (AS A UNIT OR IN PARTS) USING THE FOLLOWING LOAD ASSUMPTION AND ALLOWABLE STRESSES.
  - A. LOADING: 1.5 TIMES THE FULL DEAD LOAD
  - B. ALLOWABLE TENSILE STRESS IN PRECAST, PRESTRESSED CONCRETE PORTION OF THE PILE: 0.158 √f'ci (KSI)
  - C. ALLOWABLE COMPRESSIVE STRESS IN PRECAST, PRESTRESSED CONCRETE PORTION OF THE PILE: 0.6 x f'ci (KSI)
  - D. ALLOWABLE BENDING STRESS IN PILE POINT SECTION: 20 KSI.
2. STRESS AND LOADING CRITERIA ARE BASED ON NORMAL CARE IN HANDLING THE PILE. IF HANDLING IS SUCH THAT DAMAGE IN THE PILE BECOMES EVIDENT, THE ENGINEER MAY REQUIRE A HIGHER LOAD FACTOR OR LOWER ALLOWABLE STRESS AS NECESSARY TO INSURE NO DAMAGE TO PILES.
3. MARK PILES AT PICK-UP POINTS TO INDICATE PROPER POINTS FOR ATTACHING HANDLING LINES.



**BUILD-UP**  
 ② TO LENGTHEN PILE IN PLACE, CHIP TOP OF PILE BACK 2 1/2" MINIMUM TO EXPOSE WIRE SPIRAL AND PROVIDE FULL STRENGTH LAP WELD (4" MINIMUM LENGTH). ALSO, REMOVE PILE AS NECESSARY TO ENSURE PROPER DISTANCE IS MAINTAINED BETWEEN THE PILE/BUILD-UP JOINT AND THE BOTTOM OF CAP.

### GENERAL NOTES

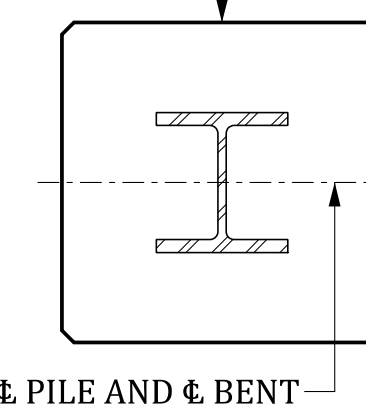
- SPLICE WIRE SPIRAL USING FULL STRENGTH LAP WELDS.
- CHAMFER ALL EXPOSED EDGES 3/4" UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO CENTERS OF BARS (EXCEPT AS NOTED).
- RELEASE ALTERNATE STRANDS SIMULTANEOUSLY AT OPPOSITE ENDS WITHOUT SHOCK.
- TIE WIRE SPIRAL TO CABLES AND REINFORCING BARS AS REQUIRED TO MAINTAIN PITCH OF THE SPIRAL.
- ANCHOR THE PILES INTO THE BENT CAPS USING THE DETAILS SHOWN ON THIS SHEET. INCLUDE ALL COSTS FOR THIS WORK IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE PILING.



### PILE ANCHORAGE DETAILS

⑤ IF THIS DIMENSION IS LESS THAN 23", BUILD UP THE PILE AS DETAILED ABOVE.

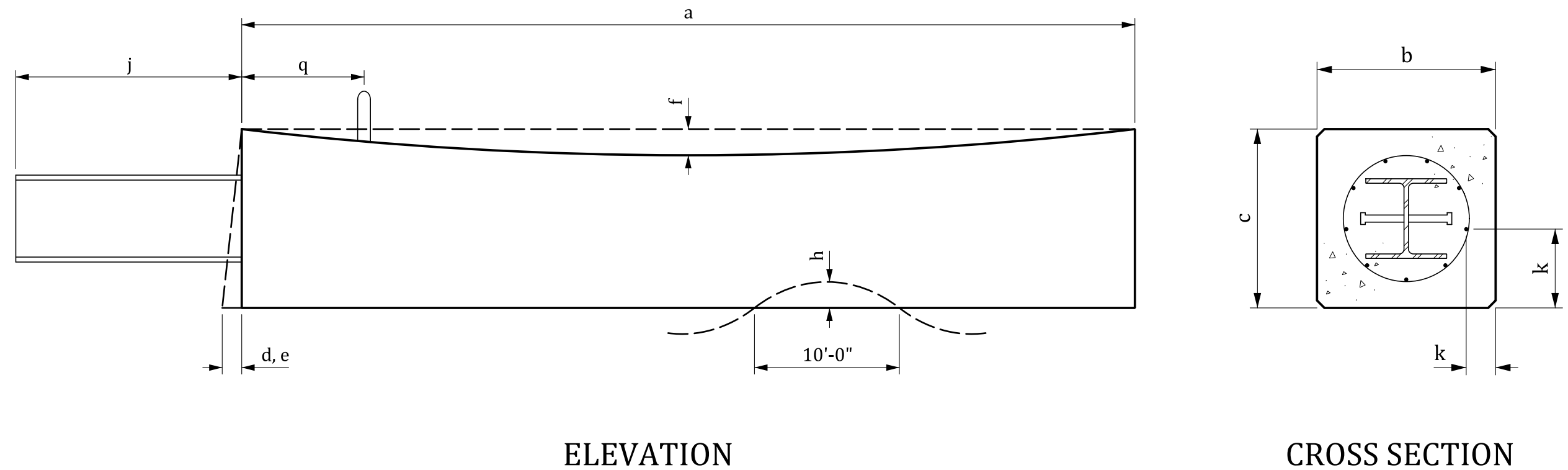
① ORIENT PILE SUCH THAT "TOP SIDE" OF PILE IS PARALLEL TO CL BENT



### PILE ORIENTATION DETAIL

① "TOP SIDE" IS THE TOP SURFACE OF THE PILE WHEN IT WAS POURED IN THE CASTING BED.

### TOLERANCES



a	LENGTH	±1"
b	WIDTH OR DIAMETER	±3/8", +1/2" (INCLUDING FORM DRAFT)
c	DEPTH	± 3/8"
d	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	±1/4" PER 12", ±1/2" MAXIMUM
e	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	±1/4" PER 12", ±1/2" MAXIMUM
f	SWEEP (VARIATION FROM STRAIGHT LINE PARALLEL TO CENTERLINE OF MEMBER) (CONSIDERED TO BE A FORM TOLERANCE)	±1/8" PER 10'
h	LOCAL SMOOTHNESS OF ANY SURFACE	1/4" IN 10'
j	PROJECTION OF STEEL PILE POINT FROM END OF PILE	± 1"
	POSITION OF STEEL PILE POINT	±1/2"
	ALIGNMENT OF STEEL PILE POINT	±1/2"
	LENGTH OF STEEL PILE POINT	- 3", +6"
k	LOCATION OF STRAND	±1/4"
q	LOCATION OF HANDLING DEVICE	±6"
	LONGITUDINAL SPACING OF STIRRUPS OR SPIRAL REINFORCEMENT	±3/4"

THIS DRAWING IS FURNISHED FOR INFORMATION ONLY. ALL DIMENSIONS SHOWN ARE SHEET SPECIFIC. ANY USE OF THIS DESIGN AND DRAWING, INCLUDING DIMENSIONS, MUST BE CHECKED BY THE USER'S ENGINEER TO ENSURE DESIGN IS ADEQUATE FOR THE INTENDED USE. ALL DRAWINGS MUST BE SIGNED AND SEALED BY A SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER WHEN USED.

CONSULTANT NAME/LOGO

SOUTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
**20" SQUARE  
 PRESTRESSED CONCRETE PILE  
 WITH POINT**

COUNTY: ####

ROUTE: ####

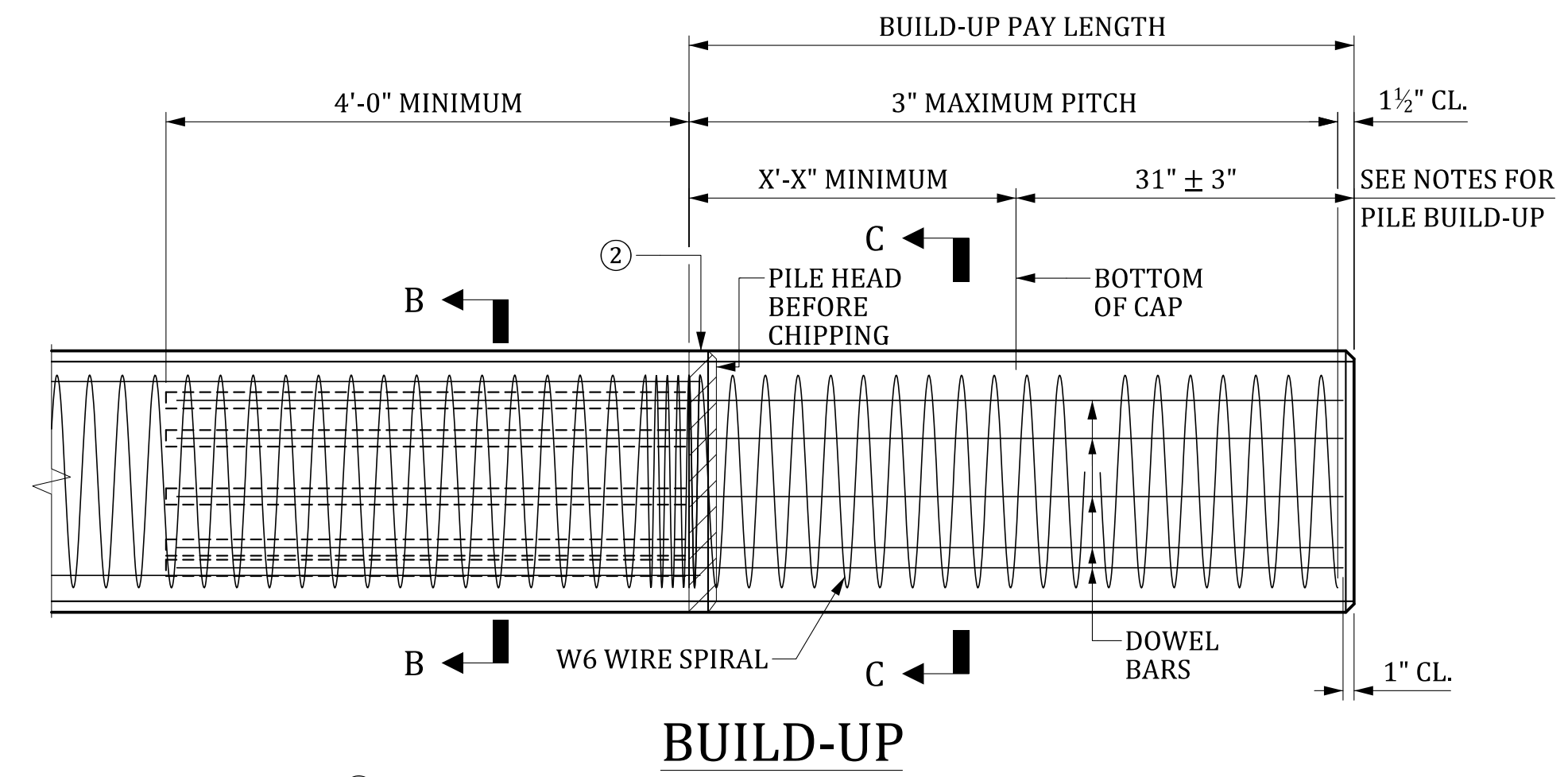
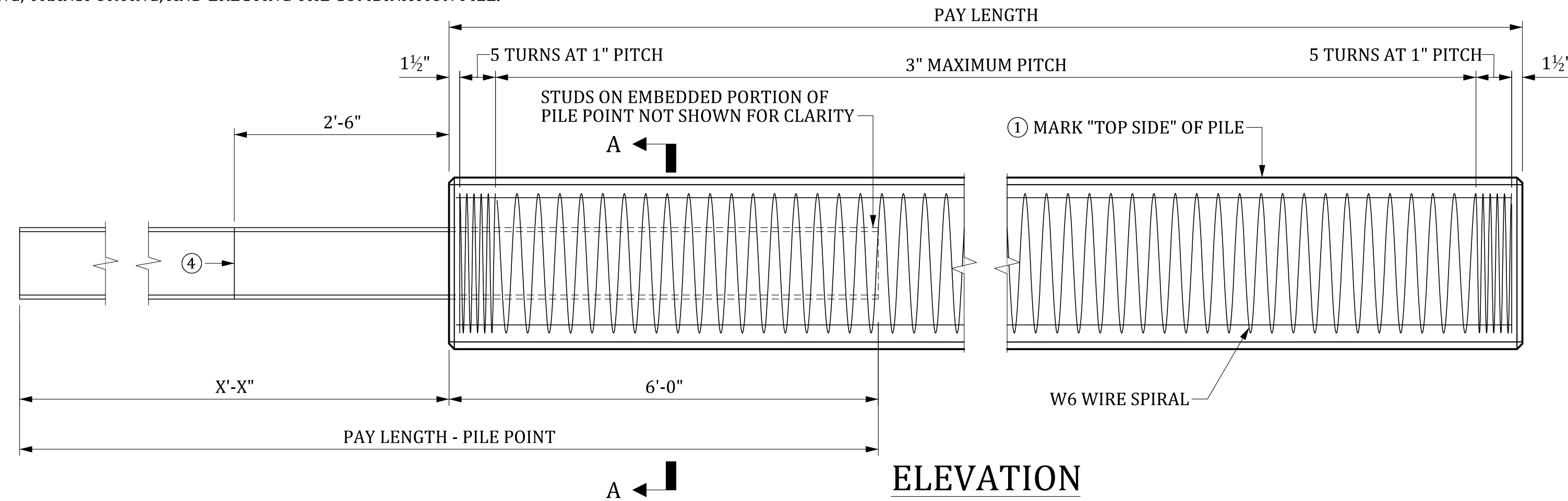
DRAWING NUMBER: 704-PCPP.20

REV.	BY	CHK.	DATE	DESCRIPTION OF REVISION

REVIEWED	QUAN.	DR.	DES.	GMC	MWB	DPP	AIP	BY	CHK.	DATE

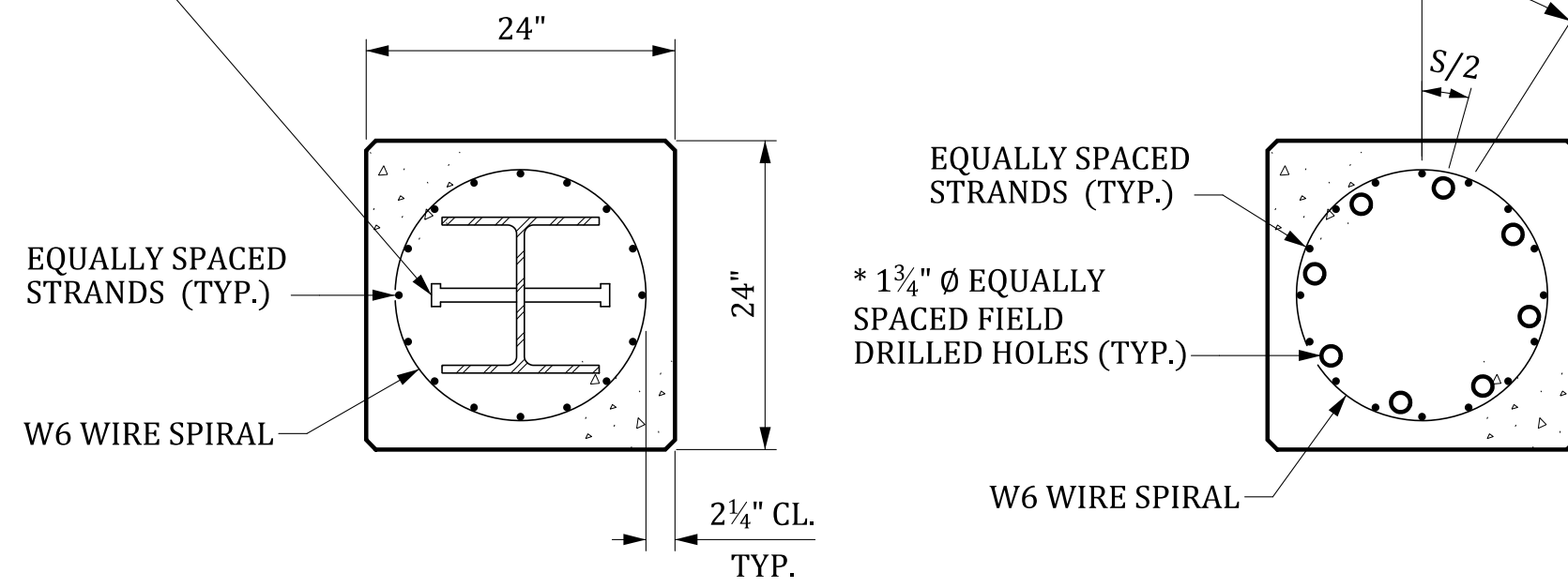
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④ EXTENSION MAY BE ATTACHED TO EMBEDDED PORTION OF PILE POINT PRIOR TO HANDLING, TRANSPORTING, AND ERECTING THE COMBINATION PILE.

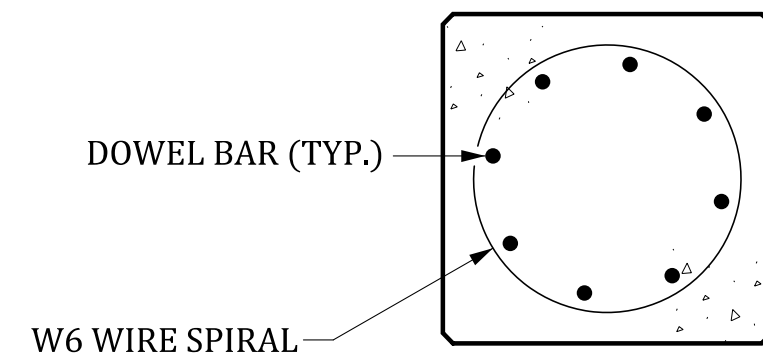


② TO LENGTHEN PILE IN PLACE, CHIP TOP OF PILE BACK 2½" MINIMUM TO EXPOSE WIRE SPIRAL AND PROVIDE FULL STRENGTH LAP WELD (4" MINIMUM LENGTH). ALSO, REMOVE PILE AS NECESSARY TO ENSURE PROPER DISTANCE IS MAINTAINED BETWEEN THE PILE/BUILD-UP JOINT AND THE BOTTOM OF CAP.

12-¾" Ø x 5" WELDED STUDS SPACED AT 1'-0" MAX. (6 EACH SIDE OF WEB). STAGGER STUDS ON OPPOSITE SIDES BY 3" MIN. ALONG PILE POINT.



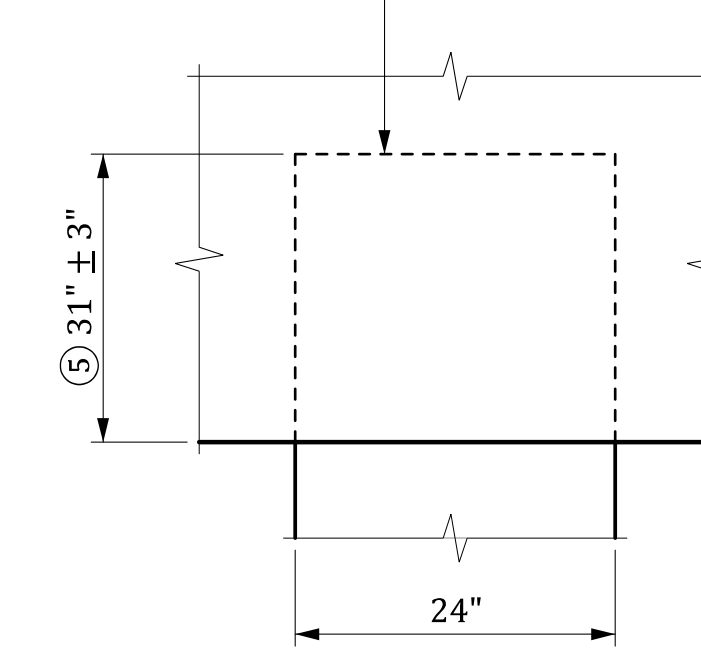
\* FIELD DRILL DOWEL HOLES. LOCATE DOWEL HOLES TO PROVIDE ½" CL. TO WIRE SPIRAL.



FOR DIMENSIONS AND CLEARANCES, SEE SECTION A-A

DESIGN DATA	
STRANDS:	LOW RELAXATION GRADE 270 INITIAL PRESTRESS (0.75 fpu) = 202.5 KSI
CONCRETE:	f'c = 5.0 KSI f'ct = 3.5 KSI

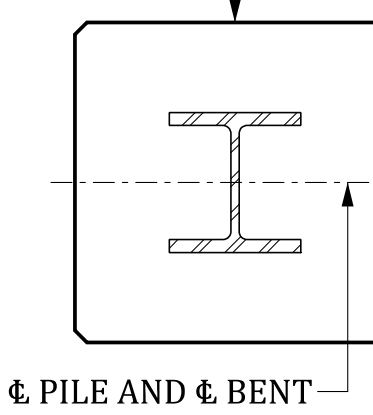
CLEAN SURFACE AND REMOVE ALL LAITANCE FROM ENTIRE EMBEDDED AREA PRIOR TO POURING CAP



**PILE ANCHORAGE DETAILS**

⑤ IF THIS DIMENSION IS LESS THAN 28", BUILD UP THE PILE AS DETAILED ABOVE.

① ORIENT PILE SUCH THAT "TOP SIDE" OF PILE IS PARALLEL TO CL BENT



**PILE ORIENTATION DETAIL**

① "TOP SIDE" IS THE TOP SURFACE OF THE PILE WHEN IT WAS POURED IN THE CASTING BED.

THIS DRAWING IS FURNISHED FOR INFORMATION ONLY. ALL DIMENSIONS SHOWN ARE SHEET SPECIFIC. ANY USE OF THIS DESIGN AND DRAWING, INCLUDING DIMENSIONS, MUST BE CHECKED BY THE USER'S ENGINEER TO ENSURE DESIGN IS ADEQUATE FOR THE INTENDED USE. ALL DRAWINGS MUST BE SIGNED AND SEALED BY A SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER WHEN USED.

**GENERAL NOTES**

- SPLICE WIRE SPIRAL USING FULL STRENGTH LAP WELDS.
- CHAMFER ALL EXPOSED EDGES ¾" UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO CENTERS OF BARS (EXCEPT AS NOTED).
- RELEASE ALTERNATE STRANDS SIMULTANEOUSLY AT OPPOSITE ENDS WITHOUT SHOCK.
- TIE WIRE SPIRAL TO CABLES AND REINFORCING BARS AS REQUIRED TO MAINTAIN PITCH OF THE SPIRAL.
- ANCHOR THE PILES INTO THE BENT CAPS USING THE DETAILS SHOWN ON THIS SHEET. INCLUDE ALL COSTS FOR THIS WORK IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE PILING.

**NOTES FOR BUILD-UP**

- CHIP BACK TOP OF PILES AND FIELD DRILL HOLES AS SHOWN. GROUT DOWEL BARS IN THE HOLES USING AN APPROVED NON-SHRINK GROUT WITH f'c = 5.0 KSI. TERMINATE DOWEL BARS 1" CLEAR FROM THE TOP OF PILE. SUBMIT DOWEL BAR LENGTHS TO THE RCE FOR APPROVAL. SPLICES ARE NOT ALLOWED IN THE DOWEL BARS. INCLUDE ALL COSTS ASSOCIATED WITH PREPARATION OF THE PILE FOR BUILD-UP IN THE UNIT PRICE BID FOR PILE BUILD-UP PREPARATION.
- BUILD UP ALL PILES THAT HAVE AN EMBEDMENT LENGTH LESS THAN THE MINIMUM SHOWN IN THE PLANS. USE THE BUILD-UP DETAILS SHOWN ON THIS SHEET. THE OPTION IS AVAILABLE TO CAST BUILD-UPS WITH BENT CAPS PROVIDED REBAR AND WIRE SPIRAL ARE CONTINUED A DISTANCE EQUAL TO 31" INTO THE CAP AND THE CAP IS CAST WITH CLASS 5000 CONCRETE. PAY FOR CAP CONCRETE AS CLASS 4000 CONCRETE REGARDLESS OF THE ACTUAL CLASS USED. INCLUDE AN EMBEDMENT LENGTH OF 31" IN THE PILE BUILD-UP LENGTH MEASURED FOR PAYMENT. PAY FOR THE PILE BUILD-UP, INCLUDING ALL COSTS FOR DOWEL BARS, WIRE SPIRALS, AND BUILD-UP CONCRETE, AS AN ADDITIONAL LENGTH OF PRESTRESSED CONCRETE PILING EQUAL TO THE BUILD-UP PAY LENGTH SHOWN IN THE BUILD-UP DETAIL.

**MATERIALS**

- PRESTRESSING STRAND - GRADE 270, LOW RELAXATION AASHTO M 203
- WIRE SPIRAL - AASHTO M 32, M 225
- REINFORCING STEEL - GRADE 60, AASHTO M 31, TYPE W
- CONCRETE - f'c = 5.0 KSI, STANDARD SPEC. SECT. 701
- HP PILE POINT - GRADE 36 OR 50, AASHTO M 270
- STUDS - GRADE 1015, 1018, OR 1020, AASHTO M 169

CONSULTANT NAME/LOGO

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

**24" SQUARE PRESTRESSED CONCRETE PILE WITH POINT**

COUNTY: #### ROUTE: ####

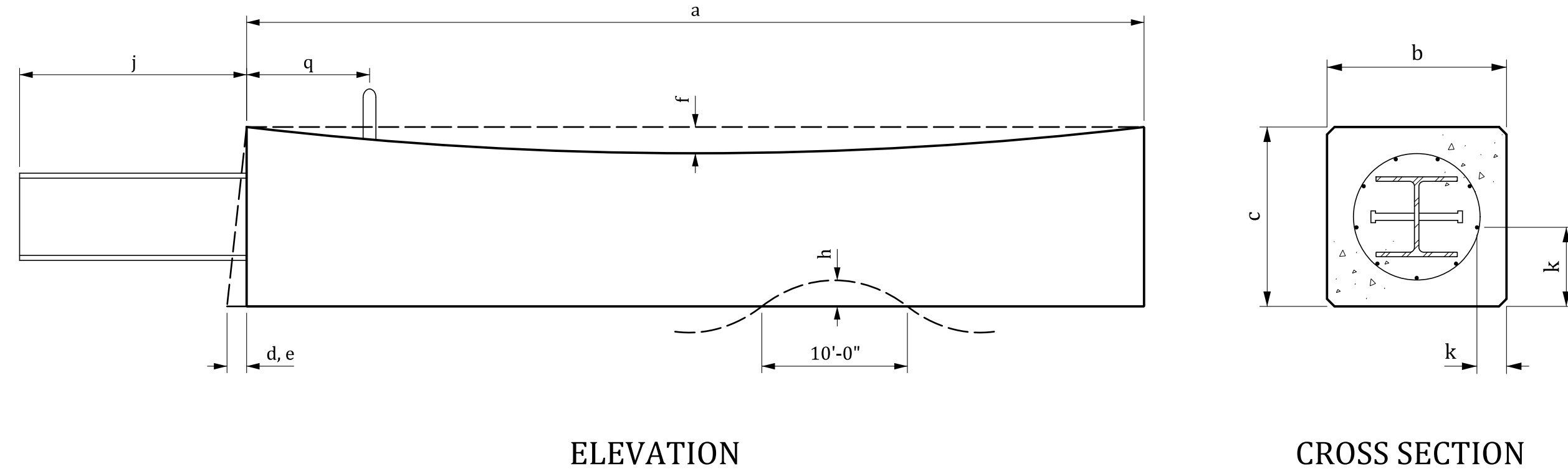
③ PILE DATA			
STRANDS	STRESS (KSI)	DOWEL BARS	PILE POINT SIZE
16 - 0.6"	0.890	8 # 10	HP12x74

STRAND DATA		
DIAMETER	AREA (INCH <sup>2</sup> )	TENSIONING LOAD
0.6"	0.217	43.9 KIPS

③ DETERMINE PICK-UP POINTS USING THE FOLLOWING:

- DETERMINE MAXIMUM LENGTHS FOR PICK-UP OF THE COMBINATION PILE (AS A UNIT OR IN PARTS) USING THE FOLLOWING LOAD ASSUMPTION AND ALLOWABLE STRESSES.
  - A. LOADING: 1.5 TIMES THE FULL DEAD LOAD
  - B. ALLOWABLE TENSILE STRESS IN PRECAST, PRESTRESSED CONCRETE PORTION OF THE PILE: 0.158 √f'ci (KSI)
  - C. ALLOWABLE COMPRESSIVE STRESS IN PRECAST, PRESTRESSED CONCRETE PORTION OF THE PILE: 0.6 x f'ci (KSI)
  - D. ALLOWABLE BENDING STRESS IN PILE POINT SECTION: 20 KSI.
- STRESS AND LOADING CRITERIA ARE BASED ON NORMAL CARE IN HANDLING THE PILE. IF HANDLING IS SUCH THAT DAMAGE IN THE PILE BECOMES EVIDENT, THE ENGINEER MAY REQUIRE A HIGHER LOAD FACTOR OR LOWER ALLOWABLE STRESS AS NECESSARY TO INSURE NO DAMAGE TO PILES.
- MARK PILES AT PICK-UP POINTS TO INDICATE PROPER POINTS FOR ATTACHING HANDLING LINES.

**TOLERANCES**



a	LENGTH	±1"
b	WIDTH OR DIAMETER	±¾", +½" (INCLUDING FORM DRAFT)
c	DEPTH	±¾"
d	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	±¼" PER 12", ±½" MAXIMUM
e	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	±¼" PER 12", ±½" MAXIMUM
f	SWEEP (VARIATION FROM STRAIGHT LINE PARALLEL TO CENTERLINE OF MEMBER) (CONSIDERED TO BE A FORM TOLERANCE)	±⅙" PER 10'
h	LOCAL SMOOTHNESS OF ANY SURFACE	¼" IN 10'
j	PROJECTION OF STEEL PILE POINT FROM END OF PILE	± 1"
	POSITION OF STEEL PILE POINT	±½"
	ALIGNMENT OF STEEL PILE POINT	±½"
	LENGTH OF STEEL PILE POINT	- 3", +6"
k	LOCATION OF STRAND	±¼"
q	LOCATION OF HANDLING DEVICE	±6"
	LONGITUDINAL SPACING OF STIRRUPS OR SPIRAL REINFORCEMENT	±¾"

REV.	BY	CHK.	DATE	DESCRIPTION OF REVISION

REVIEWED	QUAN.	DR.	DES.	BY	CHK.	DATE

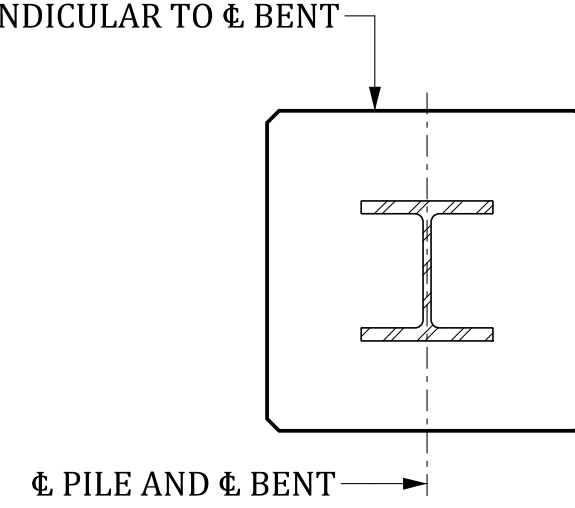
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REVIEWED	QUAN.	DR.	DES.	BY	CHK.	DATE
		GMC	MWB			12-23
		DPP	AJP			06/23

REV.	BY	CHK.	DATE	DESCRIPTION OF REVISION

OPTIONAL PILE ORIENTATION DETAIL  
FOR PILES WITH POINTS

① ORIENT PILE SUCH THAT "TOP SIDE"  
OF PILE IS PERPENDICULAR TO  $\phi$  BENT

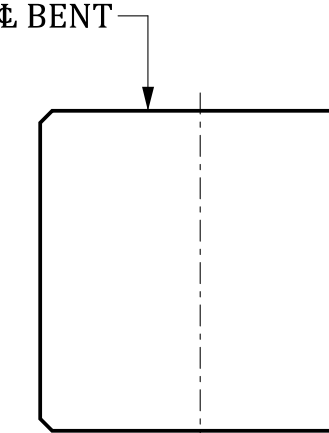


$\phi$  PILE AND  $\phi$  BENT

PILE ORIENTATION  
DETAIL

OPTIONAL PILE ORIENTATION DETAIL  
FOR PILES WITHOUT POINTS

① ORIENT PILE SUCH THAT "TOP SIDE"  
OF PILE IS PERPENDICULAR TO  $\phi$  BENT



$\phi$  PILE AND  $\phi$  BENT

PILE ORIENTATION  
DETAIL

NOTE:  
DO NOT INSERT THIS SHEET  
INTO THE PLANS. IF  
APPROPRIATE, REPLACE THE  
PILE ORIENTATION DETAIL  
WITH THE APPLICABLE DETAIL  
FROM THIS SHEET.

PILE ORIENTATION DETAILS  
SUPPLEMENTAL