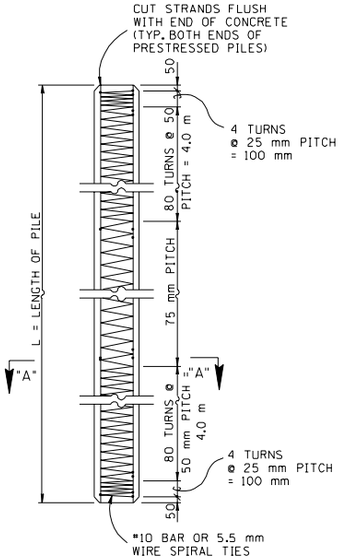
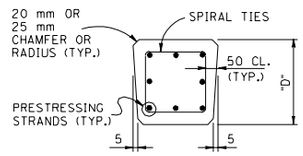


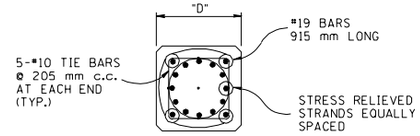
BURIED PILE DETAILS

(SHOWING SPIRAL TIE SPACING)
(TYPICAL FOR REINFORCED OR PRESTRESSED PILES)



SECTION "A"-"A"

STRAND LOCATION SHALL BE SYMMETRICAL ABOUT THE AXIS OF THE PILE WITH NO MORE THAN ONE STRAND DIFFERENCE BETWEEN ANY TWO ADJACENT SIDES.



(ALTERNATE) SECTION "A"-"A"

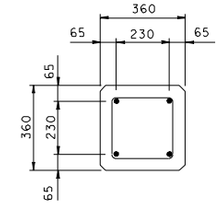
END REINFORCMENT REQUIRED AT TIP END AND DRIVING END FOR ALL PILES WITH CIRCULAR STRAND PATTERN.

"PRESTRESSED PILE PROPERTIES"

	ASTM GRADE (MPa)	STRAND DIAMETER (mm)	* NUMBER OF STRANDS - PER PILE "D" =360 SQ.	"D" =410 SQ.	"D" =457 SQ.	MINIMUM ULTIMATE TENSILE STRENGTH PER STRAND (kN)	INITIAL PRESTRESSING FORCE PER STRAND (kN)
	1724	10	14	16	22	89.0	62.2
		11	10	12	16	120.1	84.8
		13	8	10	12	160.1	111.9
	1862	10	12	14	18	102.3	71.8
		11	8	12	14	137.9	98.1
		13	6	8	10	183.7	128.7
LOW RELAXATION	1724	10	12	14	18	89.0	66.6
		11	8	12	14	120.1	90.8
		13	6	8	10	160.1	119.9
	1862	10	10	12	16	102.3	76.9
		11	8	10	12	137.9	105.1
		13	6	8	10	183.7	137.9

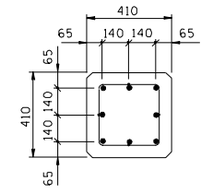
* DENOTES: NUMBER BASED ON FINAL PRESTRESSING FORCE OF 4.83 MPa. WHEN ADDITIONAL PRESTRESSING IS REQUIRED FOR DESIGN, THE CONTRACT PLANS SHALL SHOW THE NUMBER OF STRANDS.

PRECAST PRESTRESSED CONCRETE PILES



(SIZE-1 PILE) SECTION "A"-"A"

(FOR LENGTHS UP TO 12.20 m)



(SIZE-2 PILE) SECTION "A"-"A"

(FOR LENGTHS TO 18.30 m)

LENGTH OF PILE m	LONGITUDINAL REINFORCEMENT SIZE 1 PILE "D" = 360 mm BAR SIZE	NO. REQ'D	SIZE 2 PILE "D" = 410 mm BAR SIZE	NO. REQ'D
UP TO 10.7	22	4	16	8
11.0-12.2	25	4	19	8
12.5-13.7			22	8
14.0-15.2			25	8
15.5-16.8			29	8
17.1-18.3			32	8

PRECAST REINFORCED CONCRETE PILES

(MAXIMUM LENGTH = 18.3 m)

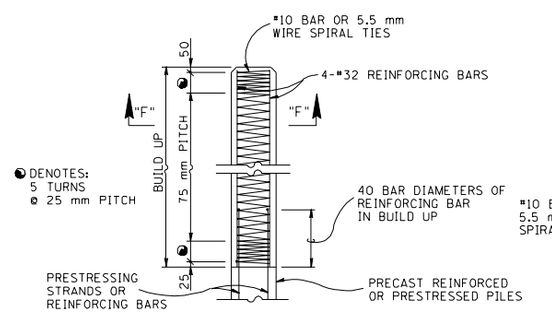
PROJECT NO.	YEAR	SHEET NO.
	1996	

REVISIONS

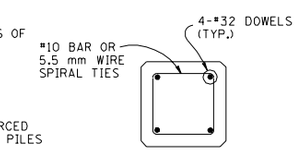
	NO.	DATE	BY	BRIEF DESCRIPTION
M/R	1	6-10-96	BRB	NEW METRIC STANDARD

general notes

1. SPECIFICATIONS: STANDARD ROAD AND BRIDGE SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION.
2. DESIGN SPECIFICATIONS: CURRENT EDITION OF AASHTO WITH ADDENDA.
3. CHOICE OF PILES: TO BE SPECIFIED ON THE CONTRACT DRAWINGS OF EACH BRIDGE.
4. REINFORCING STEEL: TO BE ASTM A615M, Fy = 400 MPa; SPIRAL TIES SHALL BE TIED TO CORNER STRANDS AT INTERVALS ADEQUATE TO PREVENT EXCESSIVE MOVEMENT DURING VIBRATION.
5. DRIVING FORMULA: PILES SHALL BE DRIVEN TO A MINIMUM CAPACITY AS SPECIFIED ON THE CONTRACT DOCUMENTS AS DETERMINED BY THE DRIVING FORMULAS STIPULATED IN THE SPECIFICATIONS.
6. MILL TEST REPORTS: NOTARIZED MILL TEST REPORTS WILL BE REQUIRED FOR ALL STEEL PILES.
7. WELDING SPECIFICATIONS: AASHTO STANDARD SPECIFICATIONS FOR WELDING OF STRUCTURAL STEEL HIGHWAY BRIDGES, CURRENT EDITION.
8. STRUCTURAL STEEL: SHALL CONFORM TO ASTM A709M GRADE 250.
9. PILE TIPS: WHEN CALLED FOR ON THE CONTRACT DOCUMENTS, STRUCTURAL STEEL FOR CAST POINTS SHALL CONFORM TO ASTM A148M OR ASTM A27M. ATTACHMENT OF CAST STEEL POINTS SHALL BE BY WELDING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ANSI/AASHTO/AWS D 1.5-88 SPECIFICATIONS.
10. CONCRETE IN THE PRECAST, PRESTRESSED AND PRECAST PILES SHALL BE CLASS P AND SHALL HAVE A MINIMUM COMPRESSIVE CYLINDER STRENGTH (f'c) OF 35 MPa AT 28 DAYS. COMPRESSIVE CYLINDER STRENGTH AT TRANSFER OF THE PRESTRESSING FORCE SHALL NOT BE LESS THAN 28 MPa. CONCRETE IN BUILD-UPS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE CYLINDER STRENGTH (f'c) OF 24 MPa.
11. PRESTRESSING REINFORCEMENT: SEVEN WIRE STRESS RELIEVED STRAND SHALL CONFORM TO THE GENERAL REQUIREMENTS OF ASTM A416. BROKEN WIRES WITHIN INDIVIDUAL STRANDS WILL BE PERMITTED UP TO 2 % OF THE TOTAL NUMBER OF WIRES IN EACH PILE, PROVIDING THAT THERE IS NOT MORE THAN ONE BROKEN WIRE PER STRAND. TWO OR MORE BROKEN WIRES PER STRAND WILL BE CAUSE FOR REPLACEMENT OF THE STRAND, EVEN THOUGH THE TWO BROKEN WIRES ARE WITHIN THE 2 % LIMITATION.
12. BUILD-UPS: TO BE PROVIDED FOR BUILD-UPS OF PILES WHERE AUTHORIZED BY THE ENGINEER, CONCRETE SHALL BE CUT BACK TO EXPOSE THE STRANDS OR REINFORCING FOR A DISTANCE SUFFICIENT TO PROVIDE A LAP OF 40 DIAMETERS OF THE REINFORCING BARS IN THE BUILD-UP. REINFORCING FOR BUILD-UP SHALL HAVE MINIMUM AREA EQUAL TO 1¼ % WITH ¼ %± OF THE GROSS SECTION OF PILE. PLACEMENT OF BARS SHALL BE IN A SYMMETRICAL PATTERN OF NOT LESS THAN FOUR BARS. SEE SECTION 606 OF THE STANDARD SPECIFICATIONS.
13. IF SIZE 1 PILES ARE SPECIFIED IN THE CONTRACT DOCUMENTS AND IT BECOMES NECESSARY TO USE SIZE 2 PRECAST CONCRETE PILING BECAUSE OF LENGTHS IN EXCESS OF 12.2 m, THE CONTRACTOR WILL BE ALLOWED AN INCREASE IN THE SIZE 1 BID OF 25 %. NO INCREASE WILL BE ALLOWED FOR PRESTRESSED CONCRETE PILES DUE TO EXTRA LENGTHS.
14. IF SIZE 2 PILES ARE SPECIFIED IN THE CONTRACT DOCUMENTS, NO INCREASE IN COST WILL BE ALLOWED AND A PRECAST, PRESTRESSED PILE OF EQUAL DIMENSIONS MAY BE SUBSTITUTED.
15. IF PRECAST, PRESTRESSED CONCRETE PILES ARE SPECIFIED IN THE CONTRACT DOCUMENTS, ALTERNATE PRECAST, CONCRETE PILE DETAILS MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.



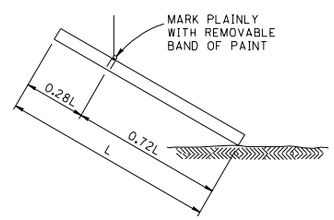
ELEVATION



SECTION "F"-"F"

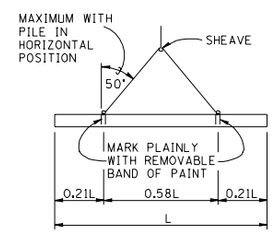
BUILD-UP DETAILS

NOTE: DRIVING OF BUILT-UP PILES SHALL BE PERMITTED ONLY WITH THE APPROVAL OF THE ENGINEER.



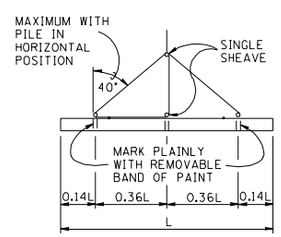
ONE POINT PICK-UP

(MAXIMUM L = 18.3 m)



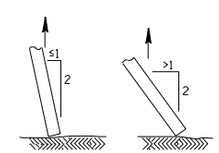
TWO POINT PICK-UP ✡

(MAXIMUM L = 25.9 m)



THREE POINT PICK-UP ✡

(FOR GREATER THAN 25.9 m)



✡ ENDS OF PILES ARE NOT TO TOUCH GROUND UNLESS PILES INCLINED 1:2 OR STEEPER. (TO BE USED WITH TWO AND THREE POINT PICK-UP ONLY.)

PILE HANDLING DETAILS

NOTE: PILES TO BE MARKED AT PICK-UP POINTS WITH A REMOVABLE BAND OF PAINT TO INDICATE PROPER PLACE FOR ATTACHING HANDLING LINES. IN HANDLING THE PILES, THEY SHALL BE SUPPORTED ONLY AT THE POINTS INDICATED. PILES TO BE PICKED UP BY PULLING ON BOTH LINES UNIFORMLY.

ALL UNITS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

M/R MINOR REVISION - FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STANDARD PILE DETAILS 1996

DESIGNED BY M. HOLLORAN DATE
DRAWN BY KEITH DOUGLAS DATE 11-90
SUPERVISED BY KLF, KDF, & MAH DATE 11-90
CHECKED BY DATE

CORRECT Edward P. Wasserman
ENGINEER OF STRUCTURES

DIVISION OF METRIC

SHEET 1 OF 2
STDM-5-1