

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.		45	

PILE SIZE	AREA Ac	APPROX. WEIGHT PER LF (1)	MINIMUM PRESTRESS FORCE (2)	STRANDS PER PILE DIAMETER 7/16" (3) 1/2"	SECTION MODULUS	PERIMETER	DESIGN BEARING CAPACITY CONCRETE STRENGTH 5000 PSI (4)
10"	100 Sq. in.	105 #	70 Kips	4	167 in ³	40 in.	50 Tons
12"	144 "	150 #	101 Kips	6	288 in ³	48 in.	72 Tons

NOTES:

ALTERNATE PILE HEADS:

REINFORCEMENT MAY BE SPECIFIED TO PROJECT FROM THE PILE INTO THE CAP OR FOOTING. IF SO REQUIRED, ATTACHMENT OF THE PILE TO THE CAP OR FOOTING MAY BE MADE BY ANY ONE OF THE FOLLOWING METHODS UNLESS OTHERWISE SPECIFIED.

1. ALLOW ALL STRANDS TO PROJECT A MINIMUM OF 24". (SPECIAL DRIVING HEAD REQ.)
2. CAST MILD REINFORCING STEEL IN PILE HEAD WITH BARS PROJECTING FOR ANCHORAGE. (SPECIAL DRIVING HEAD REQUIRED)
3. PROVIDE CORED HOLES IN PILE HEAD FOR SUBSEQUENT USE OF GROUTED DOWEL BARS.
4. DRILL HOLES IN PILE HEAD FOR INSTALLATION OF GROUTED DOWEL BARS. SPECIAL CARE SHALL BE TAKEN TO PREVENT DAMAGE TO THE PILE HEAD.

IF MILD REINFORCING STEEL IS USED FOR PROJECTION INTO CAP OR FOOTING THE MINIMUM AREA OF STEEL REQUIRED SHALL BE TWICE THE AREA OF THE PRESTRESSING STRANDS WITH NOT LESS THAN FOUR BARS BEING USED. ARRANGEMENT OF BARS SHALL BE IN A SYMMETRICAL PATTERN WITH BARS AS CLOSE AS PRACTICAL TO THE SIDES OF THE PILE. ANCHORAGE OF BARS SHALL BE SUFFICIENT TO DEVELOP STRENGTH OF BAR BUT NOT LESS THAN 20 BAR DIAMETERS.

CONCRETE:

CONCRETE IN THE PRECAST PRESTRESSED PILES SHALL HAVE A MINIMUM COMPRESSIVE CYLINDER STRENGTH (F'_c) OF 5000 PSI AT 28 DAYS. COMPRESSIVE CYLINDER STRENGTH OF TRANSFER OF PRESTRESSING FORCE SHALL BE NOT LESS THAN 4000 PSI.

HIGHER CONCRETE STRENGTHS MAY BE USED AND ADVANTAGE MAY BE TAKEN OF SUCH GREATER STRENGTH FOR HANDLING AND DRIVING STRESSES AND COLUMN LOADING, SUBJECT TO APPROVAL OF ENGINEER.

AIR-ENTRAINED CONCRETE IS REQUIRED FOR PILES WHICH WILL BE SUBJECTED TO CYCLES OF FREEZING AND THAWING AND WETTING AND DRYING.

PRESTRESSING REINFORCEMENT:

SEVEN WIRE STRESS RELIEVED STRAND SHALL CONFORM TO THE GENERAL REQUIREMENTS OF ASTM DESIGNATION A421, AND MAY BE EITHER REGULAR OR HIGH STRENGTH, IN ACCORDANCE WITH STRAND MANUFACTURER'S PUBLISHED TABLES. SUBJECT TO THE APPROVAL OF THE ENGINEER, PRESTRESSING MAY BE INCREASED AS REQUIRED FOR HANDLING OR DRIVING BY INCREASING THE NUMBER OR SIZE OF STRANDS. IN GENERAL THE UNIT PRESTRESS AFTER LOSSES SHOULD NOT EXCEED 0.2 F'_c. UNLESS SPECIAL CONDITIONS WARRANT AND APPROPRIATE ADJUSTMENT IS MADE IN ALLOWABLE PILE CAPACITY. BROKEN WIRES WITHIN INDIVIDUAL STRANDS WILL BE PERMITTED UP TO 1% OF THE TOTAL NUMBER OF WIRES IN EACH PILE, PROVIDED 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.

SPLICES:

TWO PRESTRESSED PILE SECTIONS MAY BE SPLICED BY THE USE OF DOWELS EXTENDING FROM THE TIP OF THE UPPER PRESTRESSED SECTION INTO CORED OR DRILLED HOLES IN THE LOWER PRESTRESSED SECTION. THE DOWELS SHALL HAVE AN AREA EQUAL TO THAT OF THE CROSS SECTION OF PILE AND SHALL BE ADEQUATELY BONDED INTO BOTH SECTIONS. THE DOWEL HOLES AND SPACE BETWEEN SPLICED SECTIONS SHALL BE ADEQUATELY BONDED INTO BOTH SECTIONS. THE DOWEL HOLES AND SPACE BETWEEN SPLICED SECTIONS SHALL BE FILLED WITH A MATERIAL HAVING PROPERTIES FULLY EQUAL TO THAT OF THE CONCRETE AND ADHESIVE STRENGTH EQUAL TO THE SHEAR AND TENSILE STRENGTH OF THE CONCRETE. SUCH PROPERTIES SHALL BE OBTAINED WITHIN A TIME LIMIT CONSISTENT WITH THE DRIVING REQUIREMENTS OF THE PILE.

ANY ALTERNATE METHOD OF SPLICING PROVIDING EQUAL RESULTS MAY BE CONSIDERED FOR APPROVAL.

CHAMFERS AND CORNERS:

ALL CORNERS OF SQUARE PILES SHALL BE CHAMFERED TO AT LEAST 3/16" OR ROUNDED TO APPROXIMATELY 1" RADIUS.

FORMS:

FOR FORMING THE EXTERIOR OF PILES, THE USE OF STEEL FORMS ON CONCRETE FOUNDED CASTING BEDS IS REQUIRED, UNLESS OTHERWISE APPROVED BY THE ENGINEER. SIDE FORMS MAY HAVE A MAXIMUM DRAFT ON EACH SIDE NOT EXCEEDING 1/4" PER FOOT.

PICK-UP AND HANDLING:

MAXIMUM LENGTH FOR PICK-UP ARE DETERMINED USING THE FOLLOWING STRESS ASSUMPTIONS.

LOADING: 1-1/2 TIMES FULL DEAD LOAD. ALLOWABLE TENSILE STRESS EQUALS 6.0 F'_c. THESE STRESS AND LOADING CRITERIA ARE BASED ON NORMAL CARE IN HANDLING THE PILE. IF HANDLING IS SUCH THAT DAMAGE TO THE PILE BECOMES EVIDENT, THE ENGINEER MAY REQUIRE A HIGHER LOAD FACTOR OR LOWER ALLOWABLE STRESS AS NECESSARY TO INSURE NO DAMAGE TO PILES.

DRIVING:

PILE HEADS SHALL BE PROTECTED FROM DIRECT IMPACT OF THE HAMMER BY CUSHION BLOCKS CONSISTING OF SEVERAL PLIES OF SOFT COMPRESSIBLE WOOD OR OTHER APPROVED MATERIAL.

JETTING WILL BE PERMITTED AND/OR REQUIRED WHEN NECESSARY TO OBTAIN THE REQUIRED PENETRATION. INTERNAL JETS MAY BE INSTALLED PROVIDED THEY ARE SECURELY ANCHORED TO THE PILE AND ARE IMBEDDED IN THE CONCRETE.

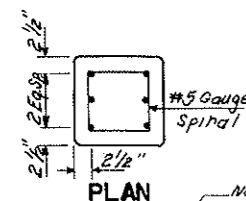
THE DRIVING HEAD (HELMET) SHALL BE SUFFICIENTLY LARGE AND SHALLOW SO AS NOT TO BIND THE HEAD OF THE PILE IF IT TWISTS SLIGHTLY DURING DRIVING.

TOLERANCES:

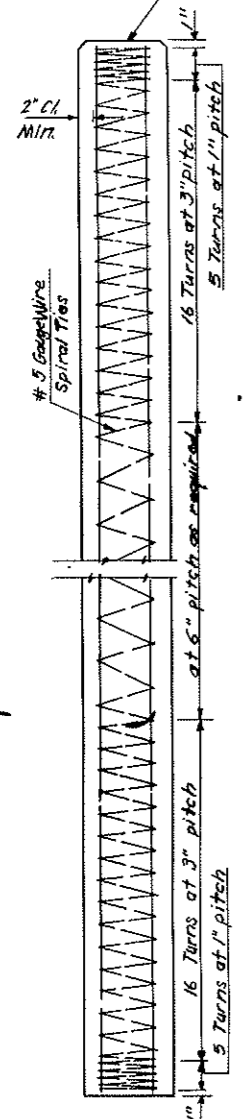
PILE ENDS SHALL BE PLANE SURFACES AND PERPENDICULAR TO AXIS OF PILE WITH A MAXIMUM TOLERANCE OF 1/8" PER FOOT TRANSVERSELY.

THE MAXIMUM SWEEP (DEVIATION FROM STRAIGHTNESS MEASURED ALONG TWO PERPENDICULAR FACES OF THE PILE, WHILE NOT SUBJECT TO BENDING FORCES) SHALL NOT EXCEED 1/8" IN ANY 10' OF ITS LENGTH.

PILE PROPERTIES

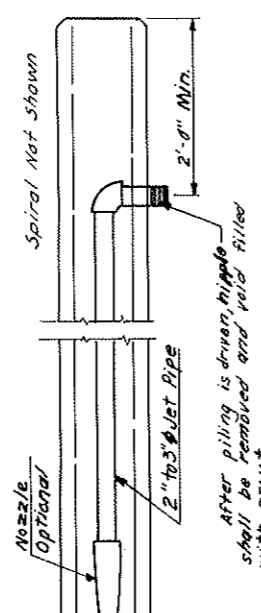


Note: For Method of Attachment of pile head to footing or Cap, See Notes on Alternate pile heads. Typical all pile heads.

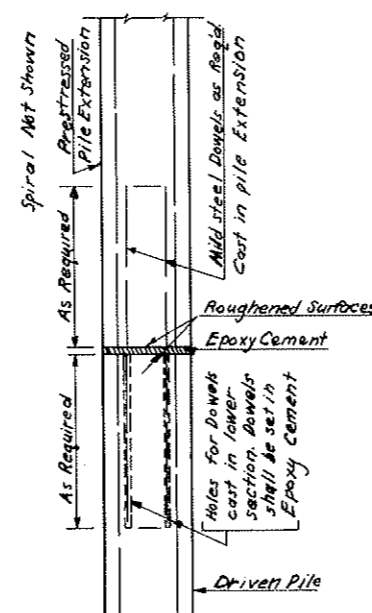


ELEVATION

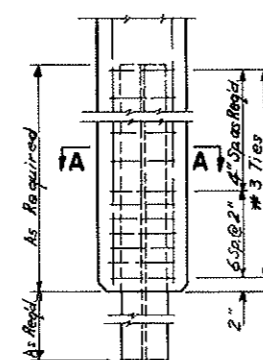
1. WEIGHTS BASED ON 150 LB. PER CUBIC FOOT OF REGULAR CONCRETE.
2. MINIMUM PRESTRESS FORCE BASED ON UNIT PRESTRESS OF 700 PSI AFTER LOSSES.
3. BASED ON 7/16" AND 1/2" HIGH STRENGTH STRAND WITH AN ULTIMATE STRENGTH OF 31,000 LBS. AND 41,300 LBS. RESPECTIVELY. IF REGULAR STRENGTH STRAND IS USED, THE NUMBER OF STRANDS PER PILE SHOULD BE INCREASED ACCORDINGLY IN CONFORMANCE WITH STRAND MANUFACTURER'S TABLES.
4. DESIGN BEARING CAPACITY BASED ON 5000 PSI CONCRETE AND AN ALLOWABLE UNIT STRESS ON THE TIP OF THE PILE OF .2 F'_c Ac. THESE BEARING CAPACITY VALUES MAY BE INCREASED IF HIGHER STRENGTH CONCRETE IS USED.



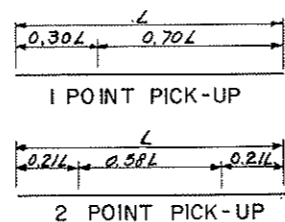
JET PIPE DETAILS



DOWELED SPLICE



A-A ALTERNATE PILE TIP



PICKING POINTS: UNLESS SPECIAL LIFTING DEVICES ARE ATTACHED FOR PICK-UP POINTS SHALL BE PLAINLY MARKED ON ALL PILES AFTER REMOVAL OF THE FORMS AND ALL LIFTING SHALL BE DONE AT THESE POINTS.

THE USE OF SPECIAL EMBEDDED OR ATTACHED LIFTING DEVICES, THE EMPLOYMENT OF OTHER PICK-UP POINTS OR ANY OTHER METHOD OF PICK-UP SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.

ALTERNATE PILE TIPS:

WHEN DRIVING INTO ROCK OR HARD STRATA ALTERNATE TIPS MAY BE USED IN LIEU OF THE STANDARD FLAT TIP. SIZE AND LENGTH OF STEEL SECTION USED SHALL BE AS DETERMINED BY THE ENGINEER FOR ADEQUATE PENETRATION.

QUANTITIES	
STANDARD PRESTRESSED CONCRETE PILE	

DETAILS CHECKED BY RLA
MADE BY JLS
TRACING CHECKED BY JLS
QUANTITIES CHECKED BY JLS