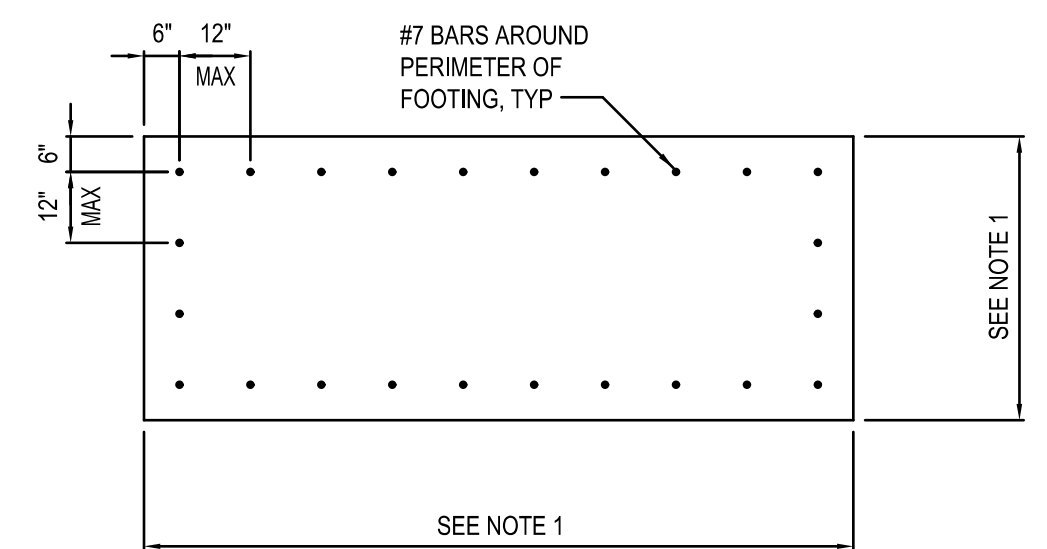
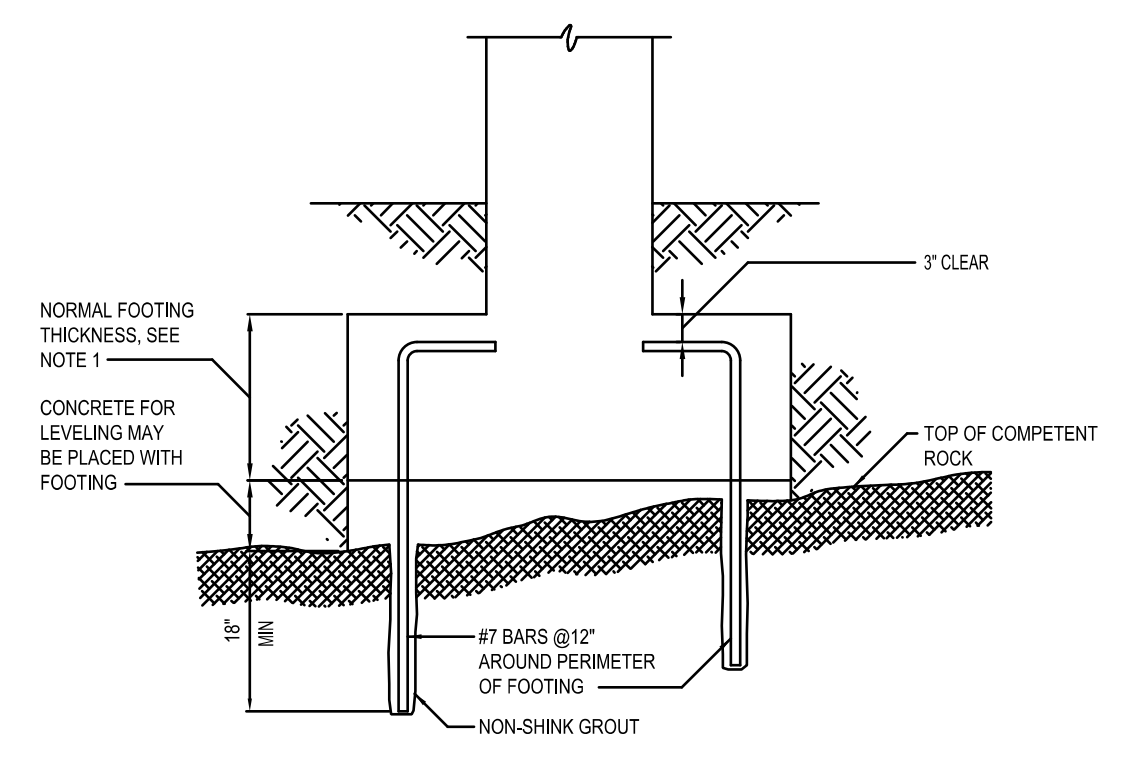


| CASING PIPE DIA. "D" (IN.) | "H" (FT.) | THICKNESS "A" (IN.) | PIER WIDTH "B" (FT.) | FOOTING LENGTH "C" (FT.) | FOOTING WIDTH "D" (FT.) |
|----------------------------|-----------|---------------------|----------------------|--------------------------|-------------------------|
| 6-12 | ≤ 6 | 12 | 2'-4" | 5'-6" | 3'-0" |
| | 8 | 12 | 2'-4" | 6'-3" | 3'-0" |
| | 10 | 12 | 2'-4" | 6'-8" | 3'-0" |
| 14-20 | ≤ 6 | 12 | 2'-4" | 7'-2" | 3'-0" |
| | 8 | 12 | 3'-0" | 8'-0" | 3'-0" |
| | 10 | 12 | 3'-0" | 9'-0" | 3'-0" |
| 22-28 | ≤ 6 | 12 | 3'-0" | 10'-6" | 3'-0" |
| | 8 | 14 | 3'-8" | 8'-9" | 4'-0" |
| | 10 | 14 | 3'-8" | 10'-0" | 4'-0" |
| 30-36 | ≤ 6 | 14 | 3'-8" | 11'-10" | 4'-0" |
| | 8 | 18 | 4'-4" | 9'-0" | 4'-0" |
| | 10 | 18 | 4'-4" | 10'-6" | 4'-0" |
| 38-48 | ≤ 6 | 18 | 5'-4" | 9'-6" | 5'-0" |
| | 8 | 18 | 5'-4" | 11'-0" | 5'-0" |
| | 10 | 18 | 5'-4" | 12'-0" | 5'-0" |
| 51-56 | ≤ 6 | 18 | 5'-4" | 12'-10" | 5'-0" |
| | 8 | 18 | 6'-4" | 9'-10" | 5'-0" |
| | 10 | 18 | 6'-4" | 11'-4" | 5'-0" |

NOTES:

- SHALLOW FOUNDATION DESIGN SHOWN ON THIS DETAIL IS BASED ON THE FOLLOWING PARAMETERS:
ALLOWABLE SOIL BEARING CAPACITY = 2000 PSF
CONCRETE COMPRESSIVE STRENGTH = 4000 PSI
GRADE 60 REINFORCING STEEL
MAXIMUM STREAM VELOCITY = 10 FT/SEC
MAXIMUM SUPPORT HEIGHT (H) = 12'-0"
- IF FIELD CONDITIONS REQUIRE ANY DEVIATION FROM THESE PARAMETERS, THE FOUNDATION DESIGN SHALL BE REVIEWED BY A STRUCTURAL ENGINEER.
- IF SUBGRADE AT LOCATION OF SUPPORTS IS DEEMED UNABLE TO WITHSTAND 2000 PSF BEARING PRESSURE, A PILE SUPPORTED FOUNDATION SHALL BE UTILIZED AS PER DETAILS ON THIS SHEET.
- IF BEDROCK IS ENCOUNTERED WHICH WILL PREVENT 3-FEET MINIMUM COVER OVER FOOTING, DOWELS SHALL BE DRILLED INTO BEDROCK PRIOR TO PLACING FOUNDATION. SEE CONCRETE PIER ON BEDROCK DETAIL, THIS SHEET.
- TWELVE-INCH AND FOURTEEN-INCH THICK PIERS AND FOOTINGS SHALL BE REINFORCED WITH #5 BARS AT 12 INCHES OC IN EACH DIRECTION ON EACH FACE. EIGHTEEN-INCH WIDE PIERS AND FOOTINGS SHALL BE REINFORCED WITH #7 BARS AT 12 INCHES OC IN EACH DIRECTION ON EACH FACE.
- EIGHTEEN-INCH THICK PIERS SHALL REQUIRE TWO STRAPS OVER THE PIPE INSTEAD OF ONE (AS SHOWN).
- WHEN CONCRETE SUPPORTS ARE REQUIRED TO BE LOCATED WITHIN A STREAM AND ARE NOT COVERED WITH BACKFILL SEE CONCRETE SUPPORT DETAIL, THIS SHEET FOR MODIFICATIONS TO UPSTREAM FACE OF SUPPORT.

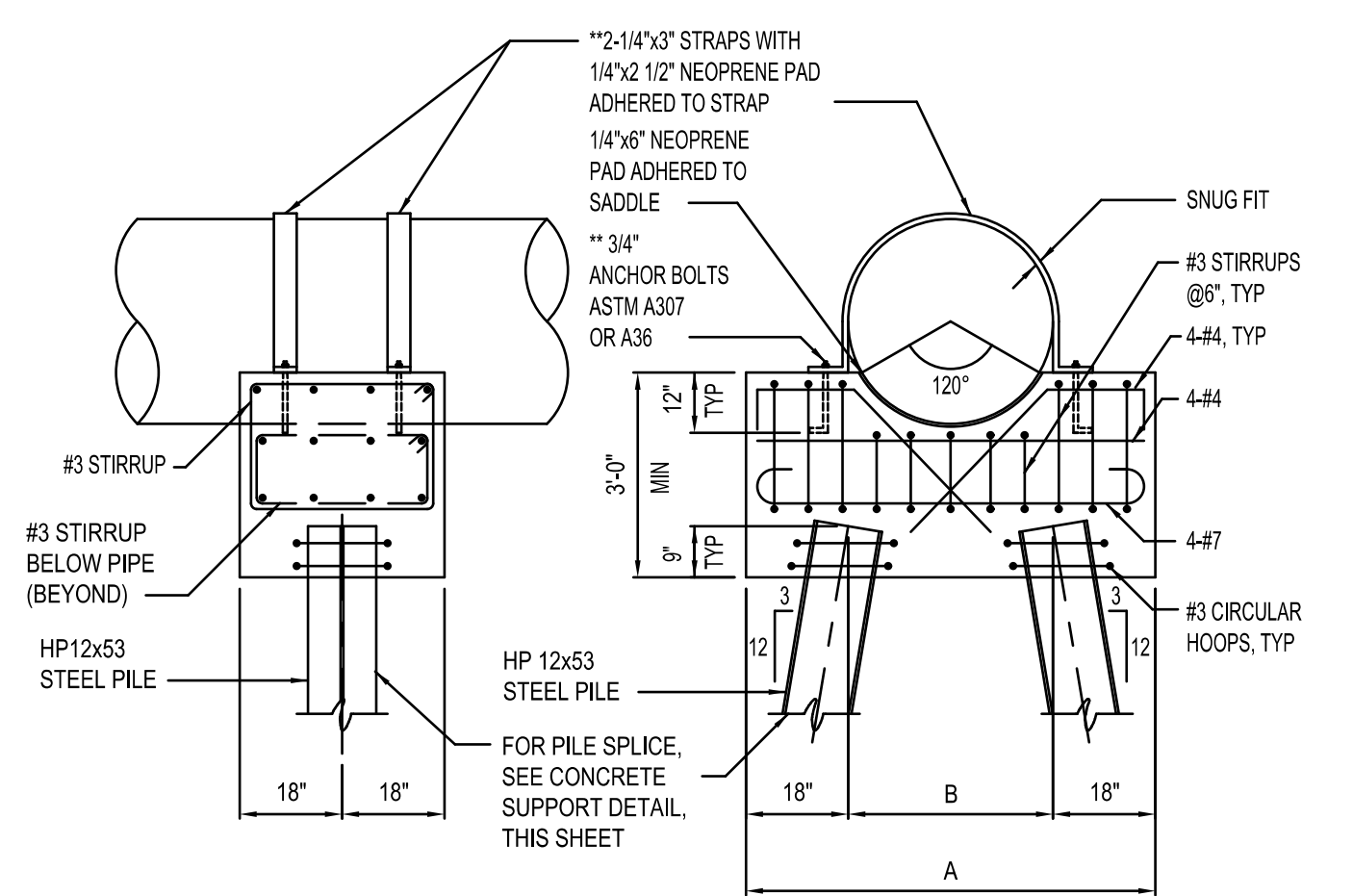
CONCRETE PIER DETAIL



NOTES:

- GEOMETRY OF FOOTING SHALL MATCH GEOMETRY OF CONCRETE PIERS WITH HEIGHT OF 6 FEET OR LESS AS PER CONCRETE PIER DETAIL, THIS SHEET.
- NON-SHRINK GROUT SHALL BE PER NCDOT SPECIFICATIONS.

CONCRETE PIER ON BEDROCK

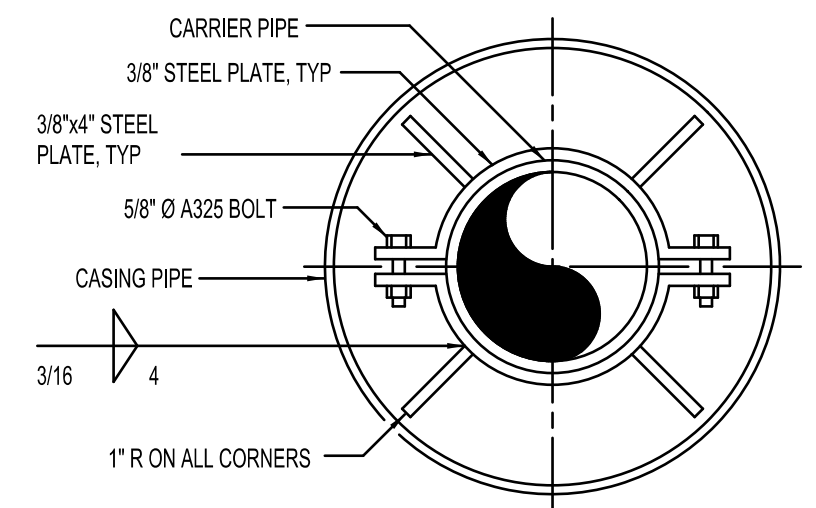
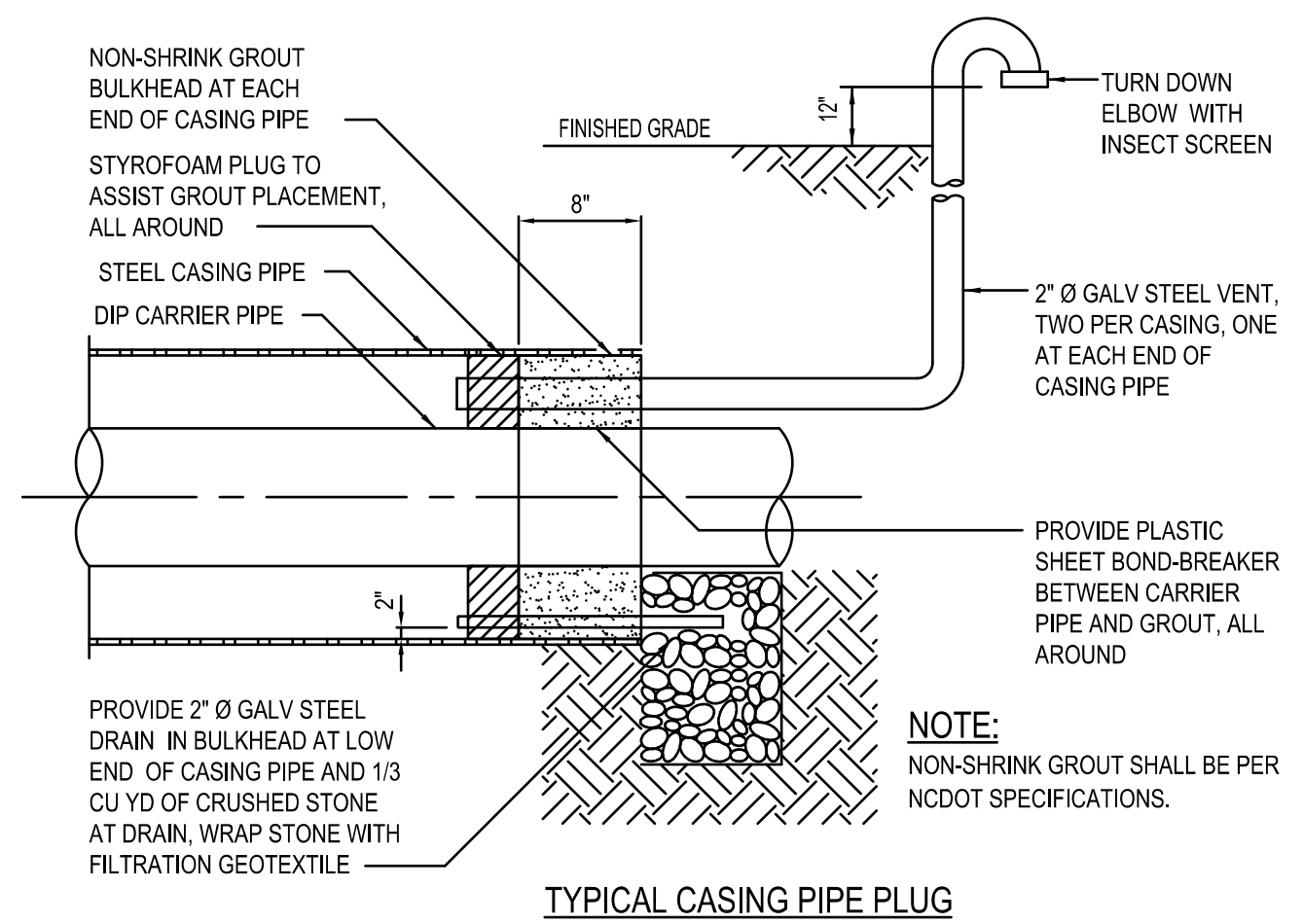


| WIDTH OF PILE CAP | | |
|----------------------------|-----------------------|------------------------|
| CASING PIPE DIAMETER (IN.) | TOTAL WIDTH "A" (FT.) | PILE SPACING "B" (FT.) |
| ≤ 36 | 6'-0" | 3'-0" |
| 38-42 | 6'-6" | 3'-6" |
| 45-51 | 7'-3" | 4'-3" |
| 54-60 | 8'-0" | 5'-0" |

NOTES:

- PILE SUPPORTED FOUNDATION DESIGN SHOWN ON THIS DETAIL IS BASED ON THE FOLLOWING PARAMETERS:
MINIMUM CAPACITY OF HP12x53 PILE = 30 TONS
CONCRETE COMPRESSIVE STRENGTH = 4000 PSI
GRADE 60 REINFORCING STEEL
MAXIMUM STREAM VELOCITY = 10 FT/SEC
- IF FIELD CONDITIONS REQUIRE ANY DEVIATION FROM THESE PARAMETERS, FOUNDATION DESIGN SHALL BE REVIEWED BY A STRUCTURAL ENGINEER.
- LENGTH OF PILES SHALL BE AS REQUIRED TO DEVELOP 30 TON CAPACITY BY EITHER END BEARING, FRICTION OR A COMBINATION OF END BEARING AND FRICTION. AS A MINIMUM, PILES SHALL BE DRIVEN AT LEAST 15 FEET INTO UNDISTURBED SOIL.

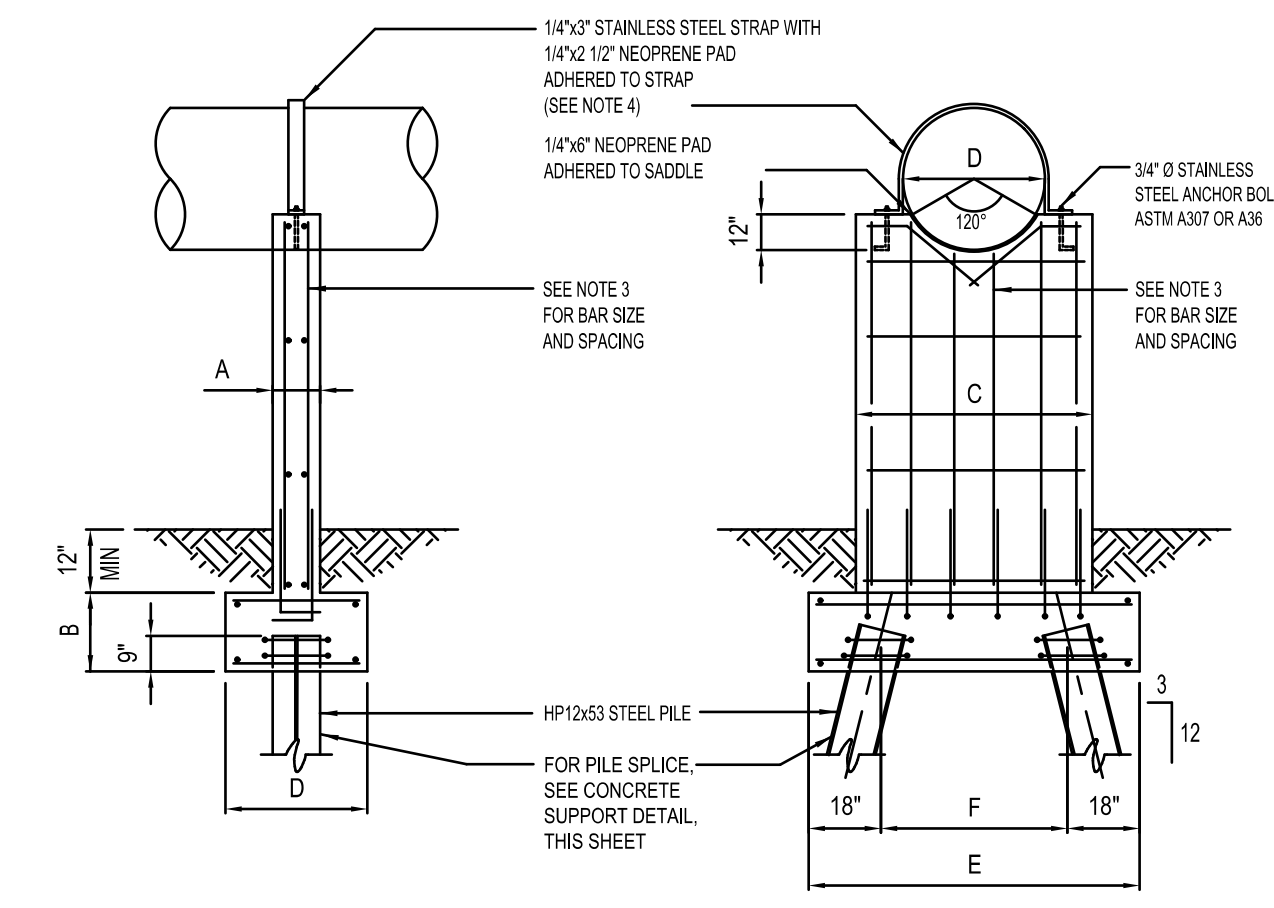
PILE CAP DETAIL



PIPE ALIGNMENT GUIDE

NOTE: USE A MINIMUM OF 2 SPIDERS PER JOINT PLACED ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT.

CASING PIPE DETAILS

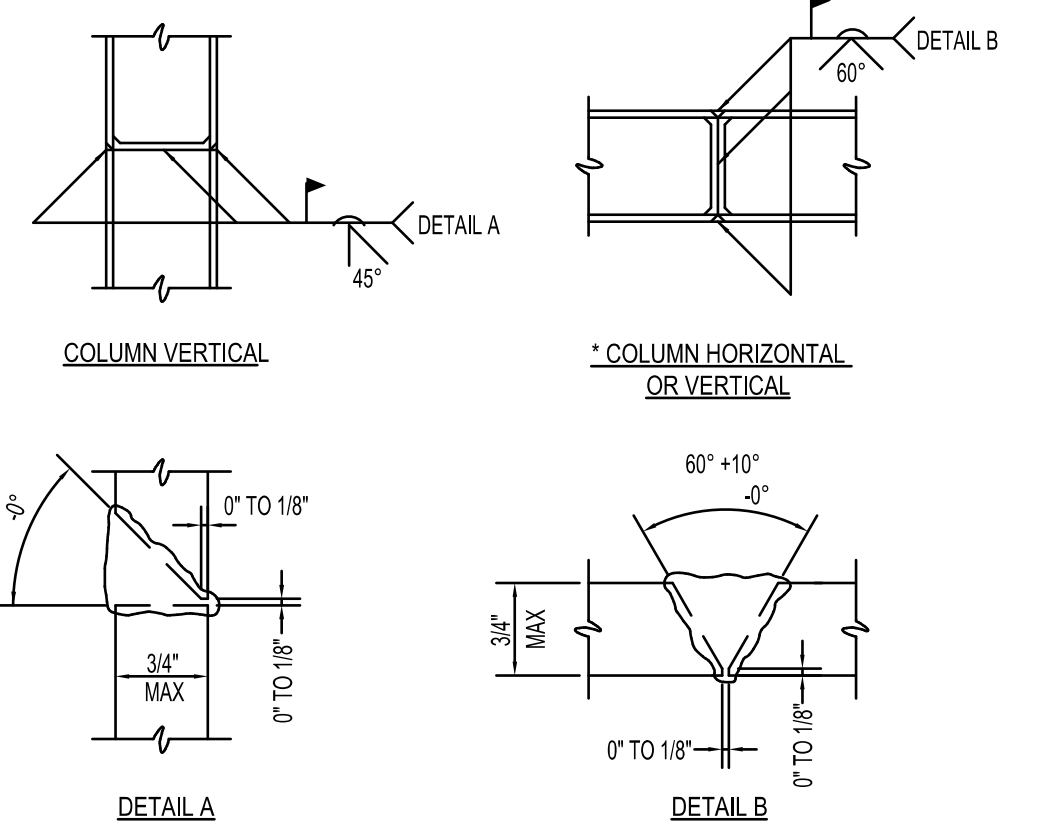


NOTES:

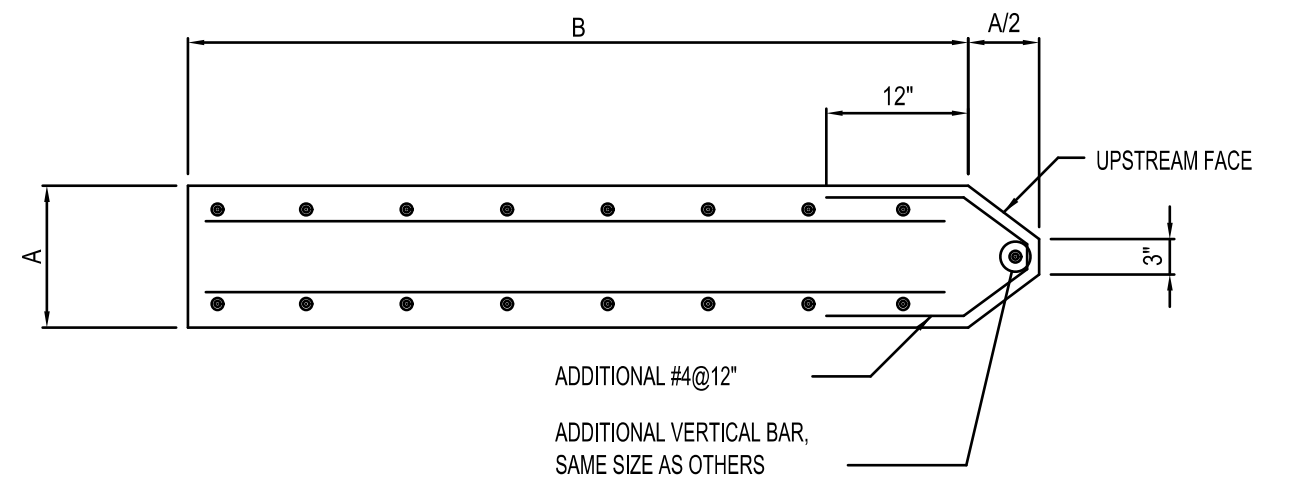
- PILE SUPPORTED PIER FOUNDATION DESIGN SHOWN ON THIS DETAIL IS BASED ON THE FOLLOWING PARAMETERS:
MINIMUM CAPACITY OF HP12x53 PILE = 30 TONS
CONCRETE COMPRESSIVE STRENGTH = 4000 PSI
GRADE 60 REINFORCING STEEL
MAXIMUM STREAM VELOCITY = 10 FT/SEC
- IF FIELD CONDITIONS REQUIRE ANY DEVIATION FROM THESE PARAMETERS, THE FOUNDATION DESIGN SHALL BE REVIEWED BY A STRUCTURAL ENGINEER.
- LENGTH OF PILES SHALL BE AS REQUIRED TO DEVELOP 30 TON CAPACITY BY EITHER END BEARING, FRICTION OR A COMBINATION OF END BEARING AND FRICTION. AS A MINIMUM, PILES SHALL BE DRIVEN AT LEAST 15 FEET INTO UNDISTURBED SOIL.
- TWELVE-INCH AND FOURTEEN-INCH WIDE PIERS SHALL BE REINFORCED WITH #5 BARS AT 12 INCHES OC IN EACH DIRECTION ON EACH FACE. EIGHTEEN-INCH WIDE PIERS SHALL BE REINFORCED WITH #7 BARS AT 12 INCHES OC IN EACH DIRECTION ON EACH FACE. FOOTINGS SHALL BE REINFORCED TYPICALLY TO PIERS.
- EIGHTEEN-INCH WIDE PIERS SHALL REQUIRE TWO STRAPS OVER THE PIPE INSTEAD OF ONE (AS SHOWN).
- WHEN CONCRETE SUPPORTS ARE REQUIRED TO BE LOCATED WITHIN A STREAM AND ARE NOT COVERED WITH BACKFILL, SEE DRAWING S-19 FOR MODIFICATIONS TO UPSTREAM FACE OF SUPPORT.

PILE SUPPORTED PIER DETAIL

| CASING PIPE DIA. "D" (IN.) | PIER THICKNESS "A" (IN.) | FOOTING THICKNESS "B" (IN.) | PIER WIDTH "C" (FT.) | FOOTING WIDTH "D" (FT.) | FOOTING LENGTH "E" (FT.) | PILE SPACING "F" (FT.) |
|----------------------------|--------------------------|-----------------------------|----------------------|-------------------------|--------------------------|------------------------|
| 6-12 | 12 | 20 | 2'-4" | 3'-0" | 6'-0" | 3'-0" |
| 14-20 | 12 | 20 | 3'-0" | 3'-0" | 8'-0" | 5'-0" |
| 22-28 | 18 | 26 | 3'-8" | 4'-0" | 8'-9" | 5'-9" |
| 30-36 | 18 | 26 | 4'-4" | 4'-0" | 9'-0" | 6'-0" |
| 38-48 | 18 | 26 | 5'-4" | 5'-0" | 9'-6" | 6'-6" |
| 51-60 | 18 | 26 | 6'-4" | 5'-0" | 9'-10" | 6'-10" |



STEEL PILE SPLICE



PLAN - CONCRETE SUPPORT NOSING (WHEN EXPOSED TO STREAM FLOW)

CONCRETE SUPPORT DETAILS