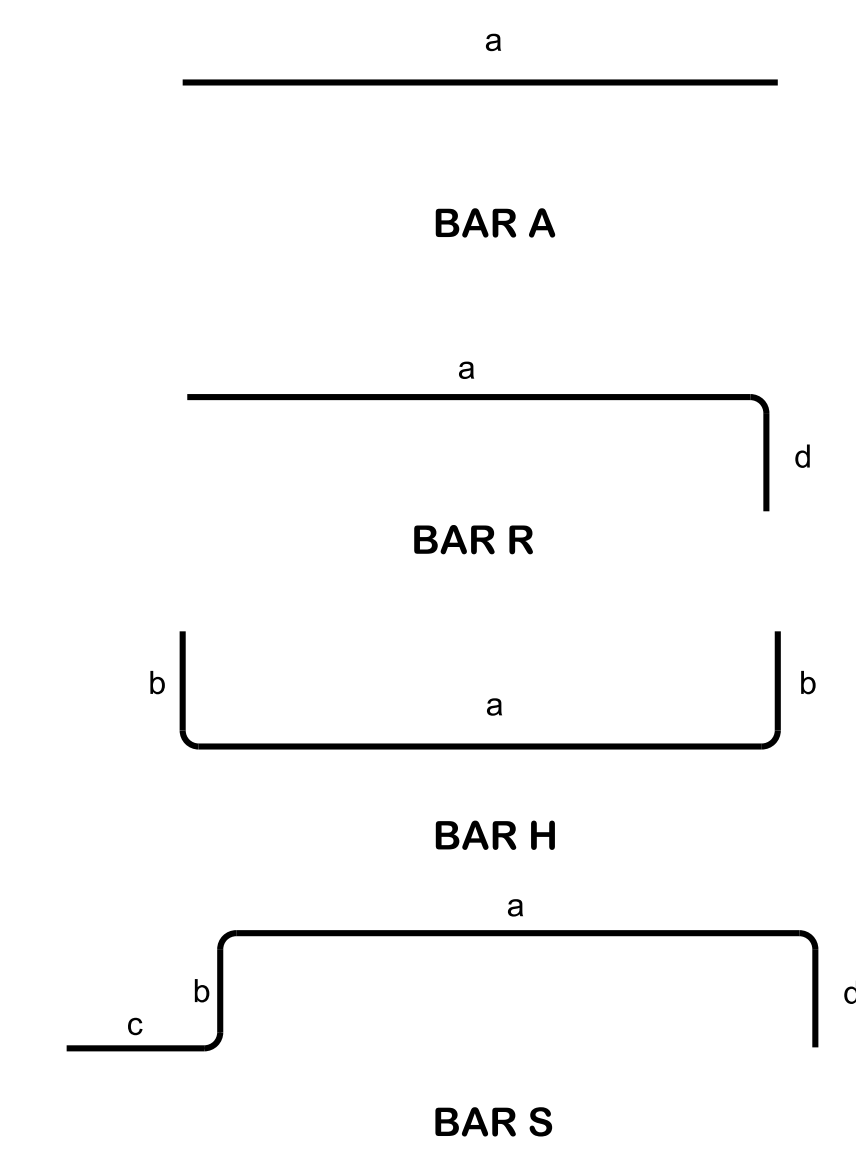


BILL OF STEEL

| CODE NO. | LOCATION | BAR SIZE | 3:1 WINGWALL SLOPE | | | | | | 4:1 WINGWALL SLOPE | | | | | | 6:1 WINGWALL SLOPE | | | | | |
|-------------|------------------------|----------|---|-------------|---------|---------|-----------|--------------|--------------------|-------------|---------|---------|-----------|--------------|--------------------|---------|---------|---|--------------|----------|
| | | | BENDING DIMENSIONS | | | | NO. REQ'D | LENGTH | BENDING DIMENSIONS | | | | NO. REQ'D | LENGTH | BENDING DIMENSIONS | | | | NO. REQ'D | LENGTH |
| | | | a | b | c | d | | | a | b | c | d | | | a | b | c | d | | |
| A400 | TOEWALL | 4 | 4' - 4" | - | - | - | 3 | 4' - 4" | 4' - 4" | - | - | - | 3 | 4' - 4" | 4' - 4" | - | - | - | 3 | 4' - 4" |
| A431 | WINGWALLS | 4 | 8' - 1" | - | - | - | 2 | 8' - 1" | - | - | - | - | - | - | - | - | - | - | - | - |
| A432 | WINGWALLS | 4 | 5' - 1" | - | - | - | 2 | 5' - 1" | - | - | - | - | - | - | - | - | - | - | - | - |
| A433 | WINGWALLS | 4 | 5' - 9 1/2" | - | - | - | 2 | 5' - 9 1/2" | - | - | - | - | - | - | - | - | - | - | - | - |
| A434 | WINGWALLS | 4 | 3' - 0" | - | - | - | 2 | 3' - 0" | - | - | - | - | - | - | - | - | - | - | - | - |
| A435 | WINGWALLS | 4 | 5' - 4" | - | - | - | 2 | 5' - 4" | - | - | - | - | - | - | - | - | - | - | - | - |
| A441 | WINGWALLS | 4 | - | - | - | - | - | - | 10' - 10" | - | - | - | 2 | 10' - 10" | - | - | - | - | - | - |
| A442 | WINGWALLS | 4 | - | - | - | - | - | - | 6' - 10" | - | - | - | 2 | 6' - 10" | - | - | - | - | - | - |
| A443 | WINGWALLS | 4 | - | - | - | - | - | - | 7' - 7 1/2" | - | - | - | 2 | 7' - 7 1/2" | - | - | - | - | - | - |
| A444 | WINGWALLS | 4 | - | - | - | - | - | - | 3' - 0" | - | - | - | 2 | 3' - 0" | - | - | - | - | - | - |
| A445 | WINGWALLS | 4 | - | - | - | - | - | - | 7' - 2 1/2" | - | - | - | 2 | 7' - 2 1/2" | - | - | - | - | - | - |
| A461 | WINGWALLS | 4 | - | - | - | - | - | - | - | - | - | - | - | 16' - 5" | - | - | - | 2 | 16' - 5" | |
| A462 | WINGWALLS | 4 | - | - | - | - | - | - | - | - | - | - | - | 10' - 5" | - | - | - | 2 | 10' - 5" | |
| A463 | WINGWALLS | 4 | - | - | - | - | - | - | - | - | - | - | - | 11' - 5 1/2" | - | - | - | 2 | 11' - 5 1/2" | |
| A464 | WINGWALLS | 4 | - | - | - | - | - | - | - | - | - | - | - | 3' - 0" | - | - | - | 2 | 3' - 0" | |
| A465 | WINGWALLS | 4 | - | - | - | - | - | - | - | - | - | - | - | 10' - 10" | - | - | - | 2 | 10' - 10" | |
| A700 | HEADWALL | 7 | 1' - 11" | - | - | - | 2 | 1' - 11" | 1' - 11" | - | - | - | 2 | 1' - 11" | 1' - 11" | - | - | - | 2 | 1' - 11" |
| A701 | HEADWALL | 7 | 2' - 4" | - | - | - | 2 | 2' - 4" | 2' - 4" | - | - | - | 2 | 2' - 4" | 2' - 4" | - | - | - | 2 | 2' - 4" |
| A702 | HEADWALL | 7 | 1' - 10" | - | - | - | 2 | 1' - 10" | 1' - 10" | - | - | - | 2 | 1' - 10" | 1' - 10" | - | - | - | 2 | 1' - 10" |
| A703 | HEADWALL | 7 | 3' - 0" | - | - | - | 1 | 3' - 0" | 3' - 0" | - | - | - | 1 | 3' - 0" | 3' - 0" | - | - | - | 1 | 3' - 0" |
| SERIES H430 | BOTTOM SLAB & WINGWALL | 4 | 4' - 4" | * | - | - | 1 | 89' - 2" | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | * DIMENSION "b" VARIES FROM 3'-9 1/2" TO 0'-9 1/2" IN INCREMENTS OF 0'-4" (10 BARS) | | | | | | | | | | | | | | | | | |
| H431 | BOTTOM SLAB & HEADWALL | 4 | 4' - 4" | 4' - 5 1/2" | - | - | 1 | 13' - 3" | - | - | - | - | - | - | - | - | - | - | - | - |
| SERIES H440 | BOTTOM SLAB & WINGWALL | 4 | - | - | - | - | - | - | 4' - 4" | * | - | - | 1 | 124' - 10" | - | - | - | - | - | - |
| | | | * DIMENSION "b" VARIES FROM 3'-11" TO 0'-8" IN INCREMENTS OF 0'-3" (14 BARS) | | | | | | | | | | | | | | | | | |
| H441 | BOTTOM SLAB & HEADWALL | 4 | - | - | - | - | - | - | 4' - 4" | 4' - 6" | - | - | 1 | 13' - 4" | - | - | - | - | - | - |
| SERIES H460 | BOTTOM SLAB & WINGWALL | 4 | - | - | - | - | - | - | - | - | - | - | - | 4' - 4" | * | - | - | 1 | 195' - 3" | |
| | | | * DIMENSION "b" VARIES FROM 4'-0 1/4" TO 0'-6 1/4" IN INCREMENTS OF 0'-2" (22 BARS) | | | | | | | | | | | | | | | | | |
| H461 | BOTTOM SLAB & HEADWALL | 4 | - | - | - | - | - | - | 4' - 4" | 4' - 6 1/4" | - | - | 1 | 13' - 4 1/2" | - | - | - | - | - | - |
| R430 | HEADWALL & WINGWALL | 4 | 11' - 1" | 0' - 7 1/2" | - | - | 2 | 11' - 8 1/2" | - | - | - | - | - | - | - | - | - | - | - | - |
| R431 | HEADWALL & WINGWALL | 4 | 2' - 1" | 1' - 0" | - | - | 2 | 3' - 1" | - | - | - | - | - | - | - | - | - | - | - | - |
| R440 | HEADWALL & WINGWALL | 4 | - | - | - | - | - | - | 14' - 10" | 0' - 7 1/2" | - | - | 2 | 15' - 5 1/2" | - | - | - | - | - | - |
| R441 | HEADWALL & WINGWALL | 4 | - | - | - | - | - | - | 2' - 10" | 1' - 0" | - | - | 2 | 3' - 10" | - | - | - | - | - | - |
| R460 | HEADWALL & WINGWALL | 4 | - | - | - | - | - | - | - | - | - | - | - | 22' - 5" | 0' - 7 1/2" | - | - | 2 | 23' - 0 1/2" | |
| R461 | HEADWALL & WINGWALL | 4 | - | - | - | - | - | - | - | - | - | - | - | 4' - 5" | 1' - 0" | - | - | 2 | 5' - 5" | |
| S430 | BOTTOM SLAB & TOEWALL | 4 | 11' - 1 1/2" | 0' - 4 1/2" | 0' - 8" | 1' - 5" | 6 | 13' - 7" | - | - | - | - | - | - | - | - | - | - | - | - |
| S440 | BOTTOM SLAB & TOEWALL | 4 | - | - | - | - | - | - | 14' - 11 1/2" | 0' - 4 1/2" | 0' - 8" | 1' - 5" | 6 | 17' - 5" | - | - | - | - | - | - |
| S460 | BOTTOM SLAB & TOEWALL | 4 | - | - | - | - | - | - | - | - | - | - | - | 22' - 7 1/2" | 0' - 4 1/2" | 0' - 8" | 1' - 5" | 6 | 25' - 1" | |

REINFORCING STEEL LEGEND



REINFORCING STEEL CODE

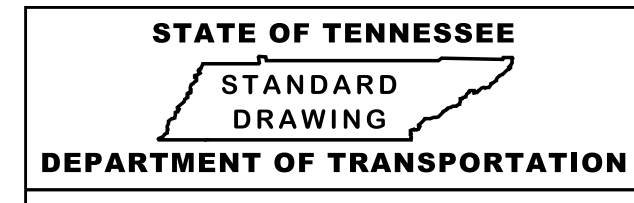
| TYPE | SIZE | SERIES |
|------|------|--------|
| A | 5 | 06 |

DIMENSIONS SHOWN ON THIS SHEET ARE OUTSIDE TO OUTSIDE OF BAR.
STANDARD C.R.S.I. HOOK DETAILS SHALL APPLY, EXCEPT AS NOTED.

PRECAST NOTES

- PRECAST UNITS:**
THE CONTRACTOR MAY, WITH PERMISSION FROM THE ENGINEER, SUBSTITUTE PRECAST ENDWALLS FOR CAST-IN-PLACE ENDWALLS PROVIDED THAT;
- APPROPRIATE SIZING AND LOCATION OF THE LIFTING INSERTS SHALL BE THE RESPONSIBILITY OF THE FABRICATOR TO ASSURE BALANCED HANDLING DURING INSTALLATION OF THE PRECAST ENDWALL.
 - THE CONTRACTOR TO PATCH ALL LIFTING INSERT HOLES AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.
 - PAYMENT FOR PRECAST ENDWALLS BASED ON THE QUANTITIES FOR CAST-IN-PLACE ENDWALLS IS ACCEPTABLE.
 - PRECAST ENDWALL UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE THE DAMAGED ENDWALL UNITS AT HIS OWN EXPENSE.
 - PIPE OPENINGS FOR HEADWALLS ARE BASED ON REINFORCED CONCRETE PIPE WITH TYPE "B" WALL THICKNESS (AASHTO M170).
 - ADDITIONAL REINFORCING STEEL NECESSARY TO MAINTAIN THE INTEGRITY OF THE STRUCTURE DURING HANDLING AND PLACEMENT SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.
- CONCRETE: Fc=4,500 POUNDS PER SQUARE INCH MINIMUM AT 28 DAYS.
REINFORCING STEEL: ASTM A615, Fy=60,000 POUNDS PER SQUARE INCH.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED



TYPE "U"
CROSS DRAIN ENDWALL
FOR 36" PIPE,
BILL OF STEEL AND
PRECAST NOTES

11/8/2019 8:23:31 AM C:\Users\jj005471\Desktop\DRAWINGS FOR IB SET \DADPE36B-20190628.dgn