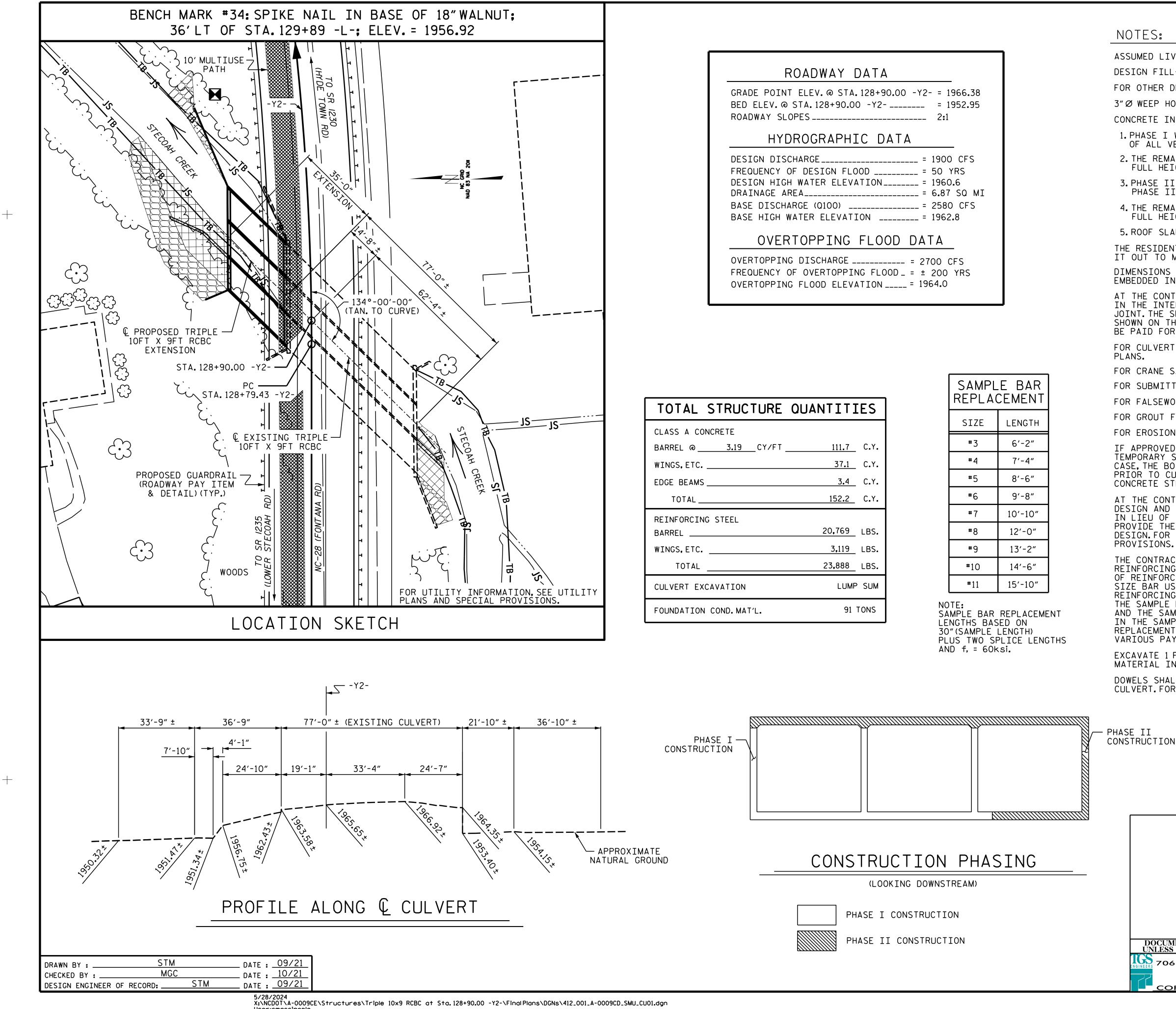
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User:smassinople

NOTES:

| GRADE POINT ELEV. @ STA. 128+90.00 -Y2 | - = 1966.38 |
|--|-------------|
| BED ELEV. @ STA. 128+90.00 -Y2 | = 1952.95 |
| ROADWAY SLOPES | 2:1 |

| DESIGN DISCHARGE | = | 1900 CFS |
|-----------------------------|---|------------|
| FREQUENCY OF DESIGN FLOOD | = | 50 YRS |
| DESIGN HIGH WATER ELEVATION | = | 1960.6 |
| DRAINAGE AREA | = | 6.87 SQ MI |
| BASE DISCHARGE (Q100) | = | 2580 CFS |
| BASE HIGH WATER ELEVATION | = | 1962.8 |
| | | |

| OVERTOPPING DISCHARGE = 2700 CFS |
|--|
| FREQUENCY OF OVERTOPPING FLOOD _ = ± 200 YRS |
| OVERTOPPING FLOOD ELEVATION = 1964.0 |

| TOTAL STRUCTURE | QUANTITIES |
|------------------------|-------------------|
| CLASS A CONCRETE | |
| BARREL @ CY/FT | <u>111.7</u> C.Y. |
| WINGS, ETC. | <u> </u> |
| EDGE BEAMS | <u> </u> |
| TOTAL | <u>152.2</u> C.Y. |
| REINFORCING STEEL | |
| BARREL | 20,769 LBS. |
| WINGS,ETC. | 3,119 LBS. |
| TOTAL | 23,888 LBS. |
| CULVERT EXCAVATION | LUMP SUM |
| FOUNDATION COND.MAT'L. | 91 TONS |

| SAMPLE BAR REPLACEMENT | | | | | | | |
|---------------------------|---------|--|--|--|--|--|--|
| SIZE | LENGTH | | | | | | |
| #3 | 6'-2" | | | | | | |
| #4 | 7'-4" | | | | | | |
| # 5 | 8'-6" | | | | | | |
| #6 | 9′-8″ | | | | | | |
| # 7 | 10'-10" | | | | | | |
| #8 | 12'-0" | | | | | | |
| #9 | 13'-2" | | | | | | |
| #10 | 14'-6" | | | | | | |
| #11 | 15′-10″ | | | | | | |
| TE. | | | | | | | |

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSION. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN.FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT.SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

EXCAVATE 1 FOOT BELOW CULVERT AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414-4 OF THE STANDARD SPECIFICATIONS. DOWELS SHALL BE USED TO CONNECT THE PROPOSED EXTENSION TO THE EXISTING CULVERT.FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

F.A. PROJECT NO.:

ASSUMED I TVE LOAD ----- HL-93 OR ALTERNATE LOADING.

DESIGN FILL----- 3.90' MAX.

FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. PHASE I WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF OF ALL VERTICAL WALLS.

2. THE REMAINING PORTIONS OF PHASE I WALLS AND PHASE I WINGS FULL HEIGHT.

3. PHASE II WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF PHASE II VERTICAL WALLS.

4. THE REMAINING PORTIONS OF PHASE II WALLS AND PHASE II WINGS

FULL HEIGHT.

5. ROOF SLAB AND HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS.EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

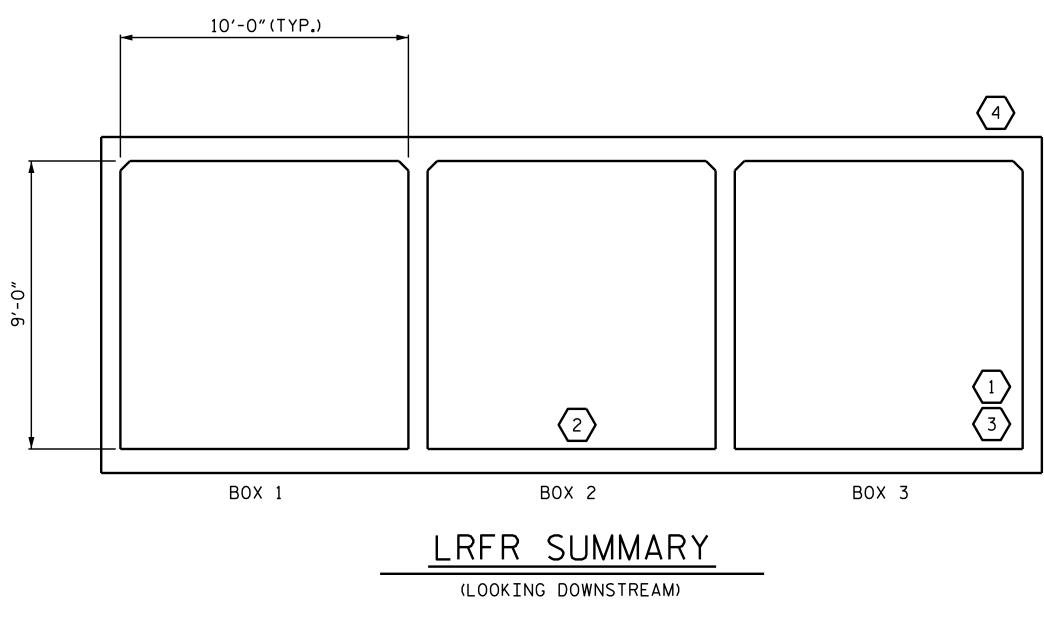
FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

PROJECT NO. A-0009CE GRAHAM COUNTY STATION: 128+90.00 -Y2-SHEET 1 OF 7 STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH Sheek, Jr. TRIPLE 10 FT.X 9 FT. **-2031225**3A CONCRETE BOX CULVERT LEFT EXTENSION 7/22/2024 134°-00'-00" SKEW DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SHEET NO REVISIONS TGS ENGINEERS 706 HILLSBOROUGH STREET SUITE 200 RALEIGH, NC 27603 PH (919) 773–8887 CORP. LICENSE NO.: C-0275 NO. C1-1 DATE: BY: DATE: BY: TOTAL SHEETS

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| | | | | | FOR | KEIN | FURU | ED (| LUNC | RETE BO> | | LVER | 15 | | | |
|----------------|--------------|-------------------|----------------------|---------------------|-----------------------------------|---------------|---|---------------|---------|-----------------|--|---------------|-------------|-----------------|--|--|
| | | | | | | | | | | STRENGTH | I LIM | IT ST | ATE | | | |
| | | | | | | | | | | MOMENT | | | | SHEAR | | |
| LEVEL | | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING (#) | MINIMUM RATING FACTORS (RF) | TONS = W × RF | LIVE-LOAD FACTORS (Y _{LL}) | RATING FACTOR | BOX NO. | ELEMENT TYPE | DISTANCE FROM LEFT END OF ELEMENT (f+) | RATING FACTOR | BOX NO. | ELEMENT TYPE | DISTANCE FROM LEFT END OF ELEMENT (f†) | |
| | | HL-93 (INVENTORY) | N⁄A | $\langle 1 \rangle$ | 1.41 | | 1.75 | 1.43 | 1 | BOTTOM SLAB | 5.75 | 1.41 | 3 | BOTTOM SLAB | 32.08 | |
| DESIGN LOAD | | HL-93 (OPERATING) | N/A | | 1.83 | | 1.35 | 1.85 | 1 | BOTTOM SLAB | 5.75 | 1.83 | 3 | BOTTOM SLAB | 32.08 | |
| RATING | | HS-20 (INVENTORY) | 36.000 | 2 | 1.43 | 51.48 | 1.75 | 1.43 | 1 | BOTTOM SLAB | 5.75 | 1.48 | 3 | TOP SLAB | 32.08 | |
| | | HS-20 (OPERATING) | 36.000 | | 1.85 | 66.60 | 1.35 | 1.85 | 1 | BOTTOM SLAB | 5.75 | 1.92 | 3 | TOP SLAB | 32.08 | |
| | | SNSH | 13.500 | | 2.44 | 32.94 | 1.40 | 2.44 | 1 | EXT WALL | 0.38 | 3.28 | 1 | TOP SLAB | 0.75 | |
| | Ш | SNGARBS2 | 20.000 | | 2.44 | 48.80 | 1.40 | 2.44 | 1 | EXT WALL | 0.38 | 3.05 | 1 | TOP SLAB | 0.75 | |
| | ICL | SNAGRIS2 | 22.000 | | 2.44 | 53.68 | 1.40 | 2.44 | 1 | EXT WALL | 0.38 | 2.83 | 3 | BOTTOM SLAB | 32.08 | |
| | VEH () | SNCOTTS3 | 27 . 250 | | 1.75 | 47.69 | 1.40 | 2.01 | 1 | TOP SLAB | 5.75 | 1.75 | 3 | TOP SLAB | 32.08 | |
| | SLE (S | SNAGGRS4 | 34.925 | | 1.73 | 60.42 | 1.40 | 1.73 | 1 | BOTTOM SLAB | 5.75 | 1.79 | 3 | BOTTOM SLAB | 32.08 | |
| | SINGL | SNS5A | 35 . 550 | | 1.72 | 61.15 | 1.40 | 1.72 | 1 | BOTTOM SLAB | 5.75 | 1.76 | 3 | BOTTOM SLAB | 32.08 | |
| | | SNS6A | 39 . 950 | | 1.55 | 61.92 | 1.40 | 1.55 | 1 | BOTTOM SLAB | 5.75 | 1.57 | 3 | BOTTOM SLAB | 32.08 | |
| LEGAL LOAD | | SNS7B | 42.000 | | 1.53 | 64.26 | 1.40 | 1.57 | 1 | BOTTOM SLAB | 5.75 | 1.53 | 3 | BOTTOM SLAB | 32.08 | |
| RATING | LER | TNAGRIT3 | 33.000 | | 1.90 | 62.70 | 1.40 | 1.95 | 1 | BOTTOM SLAB | 5.75 | 1.90 | 3 | BOTTOM SLAB | 32.08 | |
| | RAI | TNT4A | 33.075 | | 1.80 | 59.54 | 1.40 | 1.80 | 1 | BOTTOM SLAB | 5.75 | 1.89 | 3 | BOTTOM SLAB | 32.08 | |
| | T-IN | TNT6A | 41.600 | | 1.60 | 66.56 | 1.40 | 1.70 | 1 | BOTTOM SLAB | 5.75 | 1.60 | 3 | BOTTOM SLAB | 32.08 | |
| | SEMI- | TNT7A | 42.000 | | 1.54 | 64.68 | 1.40 | 1.54 | 1 | BOTTOM SLAB | TTOM SLAB 5.75 1.58 3 | 3 | BOTTOM SLAB | 32.08 | | |
| | CTOR (TT) | TNT7B | 42.000 | | 1.51 | 63.42 | 1.40 | 1.51 | 1 | BOTTOM SLAB | 5.75 | 1.57 | 3 | BOTTOM SLAB | 32.08 | |
| | TRAC | TNAGRIT4 | 43.000 | | 1.43 | 61.49 | 1.40 | 1.43 | 1 | BOTTOM SLAB | 5.75 | 1.46 | 3 | BOTTOM SLAB | 32.08 | |
| | TRUCK | TNAGT5A | 45.000 | | 1.39 | 62.55 | 1.40 | 1.43 | 1 | BOTTOM SLAB | 5.75 | 1.39 | 3 | BOTTOM SLAB | 32.08 | |
| | TRL | TNAGT5B | 45.000 | $\langle 3 \rangle$ | 1.39 | 62.55 | 1.40 | 1.39 | 1 | BOTTOM SLAB | 5.75 | 1.39 | 3 | BOTTOM SLAB | 32.08 | |
| EMERGEN | | EV2 | 28.750 | | 2.18 | 62.68 | 1.30 | 2.21 | 1 | BOTTOM SLAB | 5.75 | 2.18 | 1 | TOP SLAB | 0.75 | |
| VEHICLE | (EV) | EV3 | 43.000 | $\langle 4 \rangle$ | 1.43 | 61.49 | 1.30 | 1.45 | 1 | BOTTOM SLAB | 5.75 | 1.43 | 3 | TOP SLAB | 32.08 | |



| ASSEMBLED BY : | STM | DATE : | 05/24 |
|-----------------------------------|--------------|----------------------------|-------------------|
| CHECKED BY : | MGC | DATE : | |
| DRAWN BY : WMC CHECKED BY : GM | 7/II 7/II | REV. 10/1/11 REV. 12/17 | MAA/GM MAA/THC |

5/10/2024 X:\NCDOT\A-0009CE\Structures\Triple 10x9 RCBC at Sta.128+90.00 -Y2-\FinalPlans\DGNs\412_003_A-0009CD_SMU_CU02.dgn User:smassinople





LOAD FACTORS:

| LOAD TYPE | MAX FACTOR | MIN FACTOR | | | | | | | |
|-----------|---------------|---------------|--|--|--|--|--|--|--|
| DC | 1.25 | 0.90 | | | | | | | |
| DW | 1.50 | 0.65 | | | | | | | |
| EV | 1.30 | 0.90 | | | | | | | |
| ЕН | 1.35 | 0.90 | | | | | | | |
| ES | 1.35 | 0.90 | | | | | | | |
| LS | 1.75 | | | | | | | | |
| WA | 1.00 | | | | | | | | |

DESTON LOAD RATING EACTORS

NOTE:

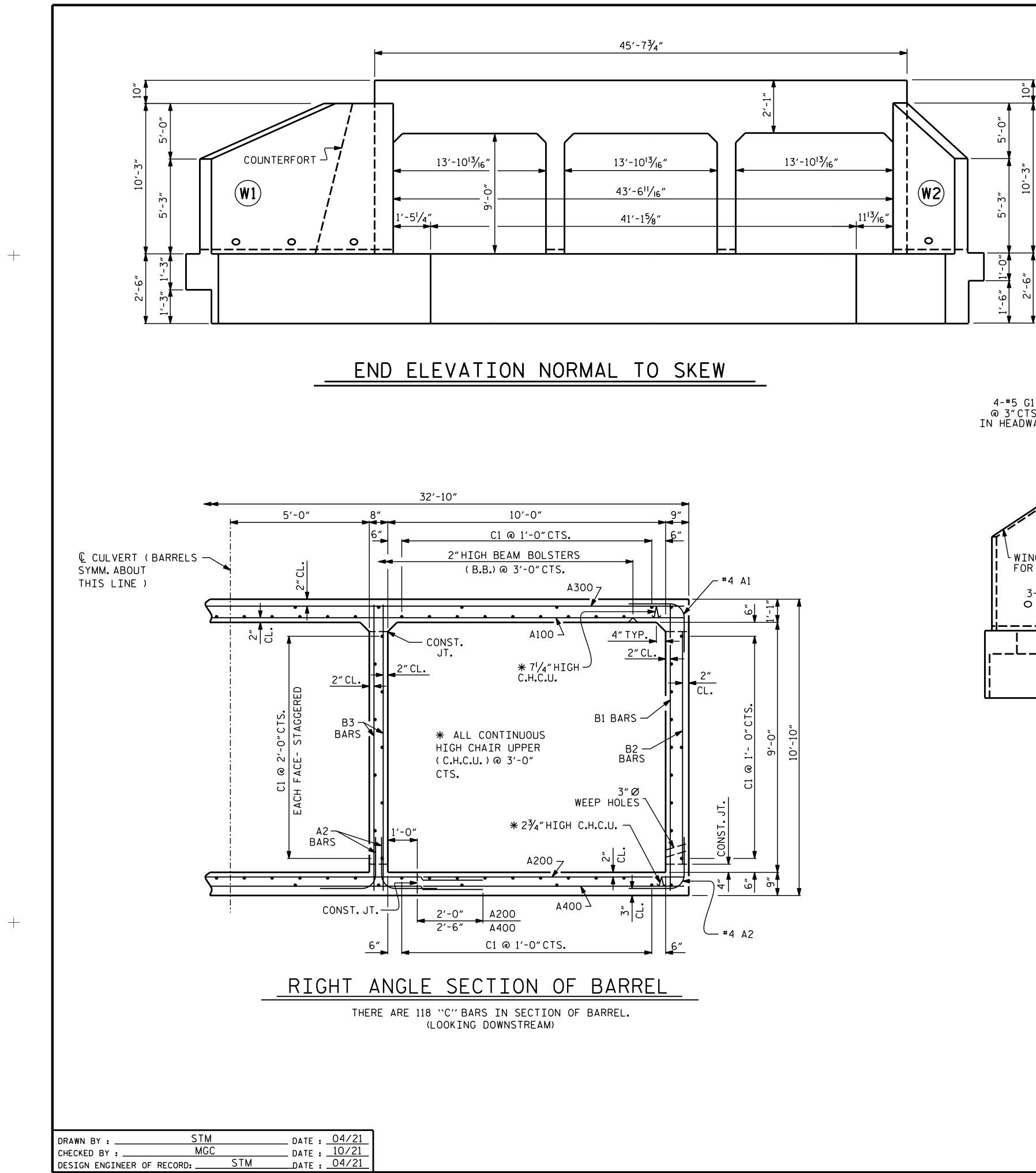
RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

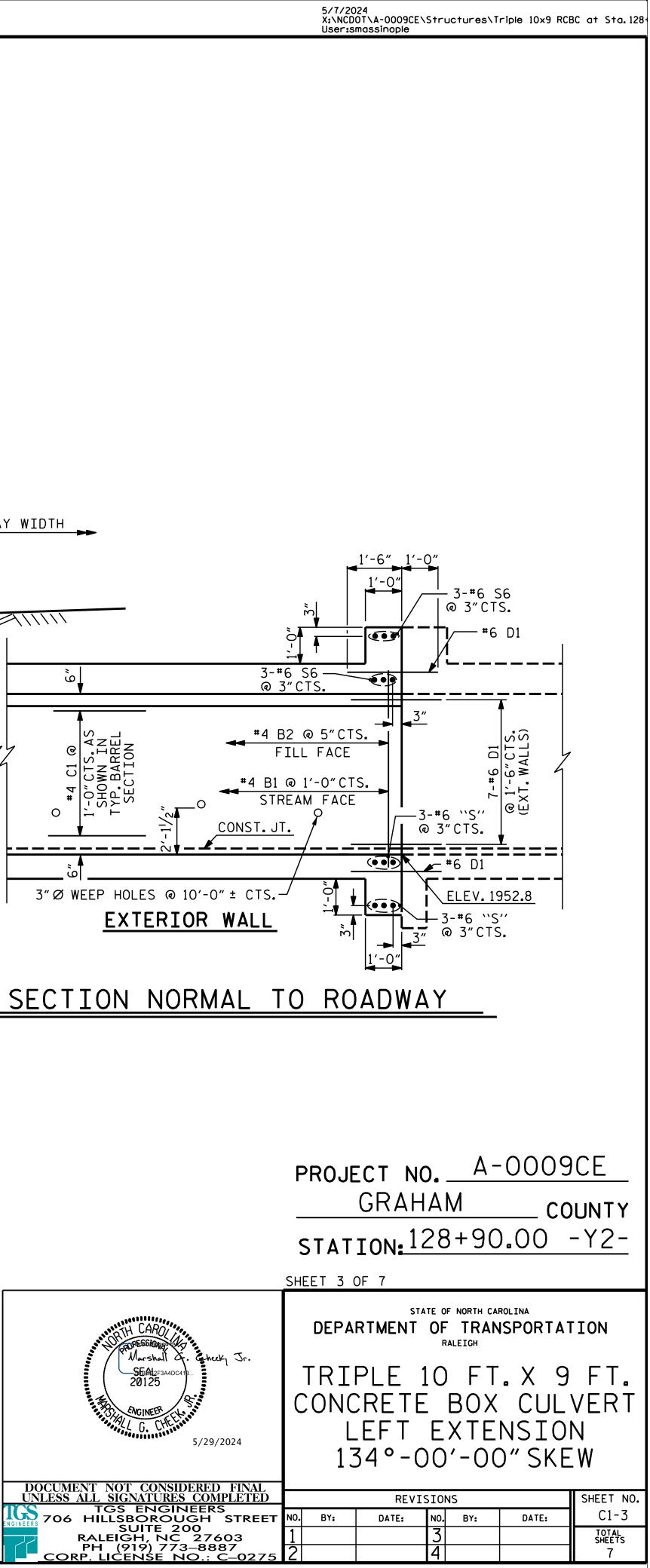
COMMENTS:

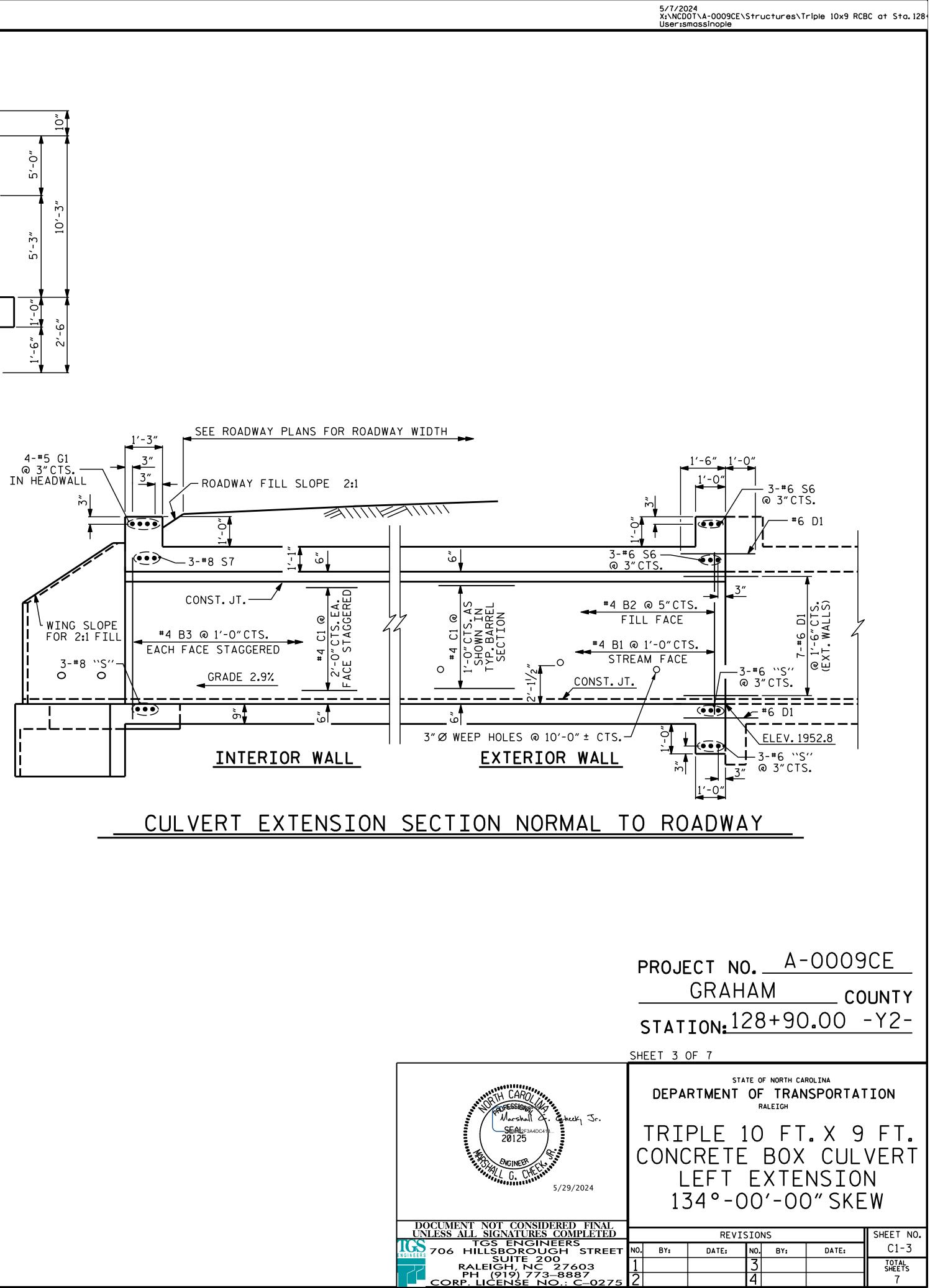
- 1.
- 2.
- 3.
- 4.
- (#) CONTROLLING LOAD RATING 1 DESIGN LOAD RATING (HL-93) 2 DESIGN LOAD RATING (HS-20) 3 LEGAL LOAD RATING ** ** SEE CHART FOR VEHICLE TYPE

| | PROJECT NO. <u>A-0009CE</u> GRAHAM COUNTY |
|---|--|
| | STATION: 128+90.00 - Y2- |
| | SHEET 2 OF 7 |
| Marshall G. Check, Jr. SEALF3A4DC41 20125 SNGINEER H. S. 5/29/2024 | DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS |
| | (NON-INTERSTATE TRAFFIC) |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | REVISIONS SHEET NO. |
| TGS ENGINEERS 706 HILLSBOROUGH STREET | C1_2 |
| SUITE 200 RALEIGH, NC 27603 PH (919) 773–8887 <u>CORP. LICENSE NO.: C–0275</u> | 1 3 TOTAL SHEETS 2 4 7 |
| | STD.NO.LRFR5 |





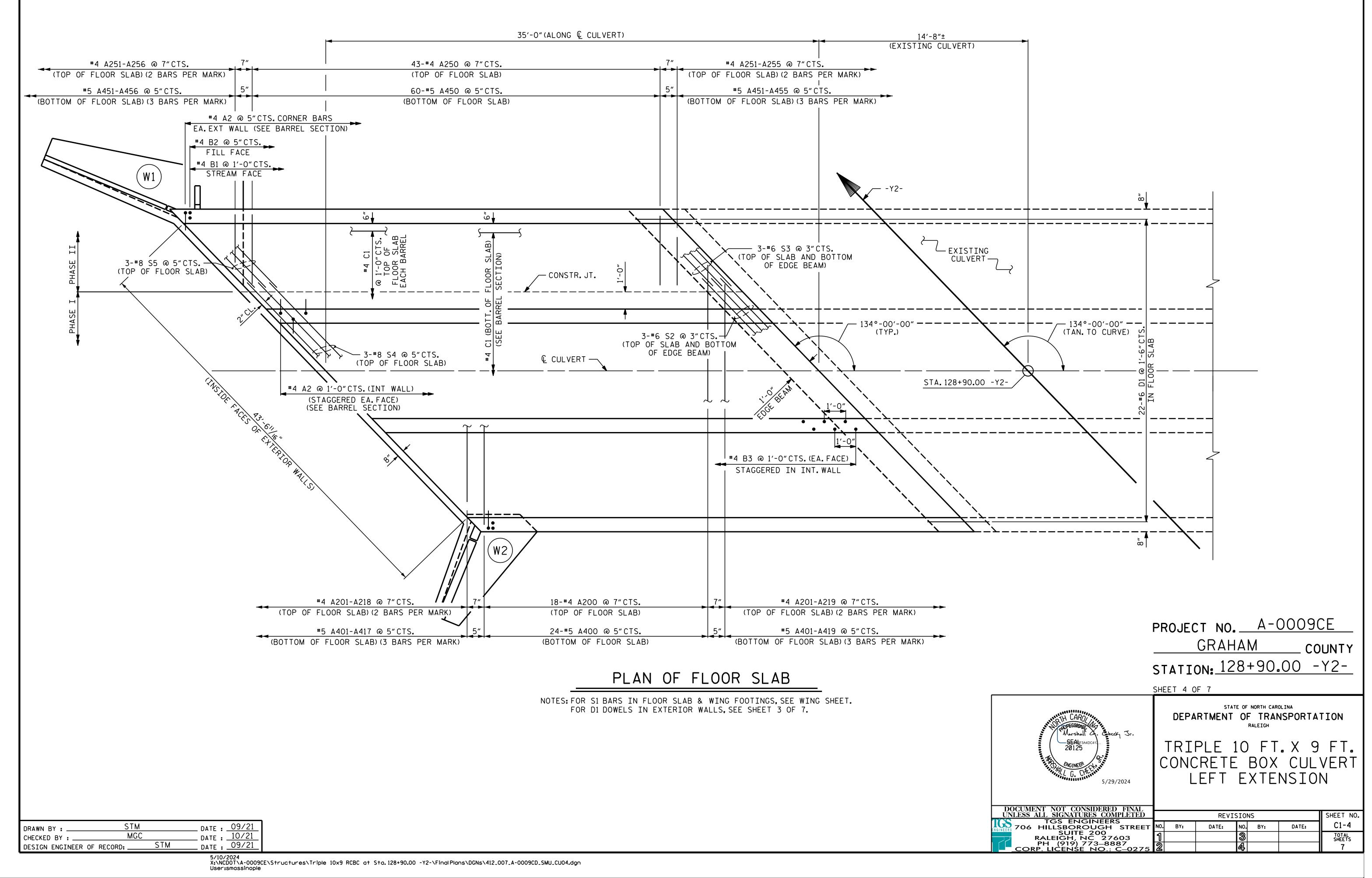


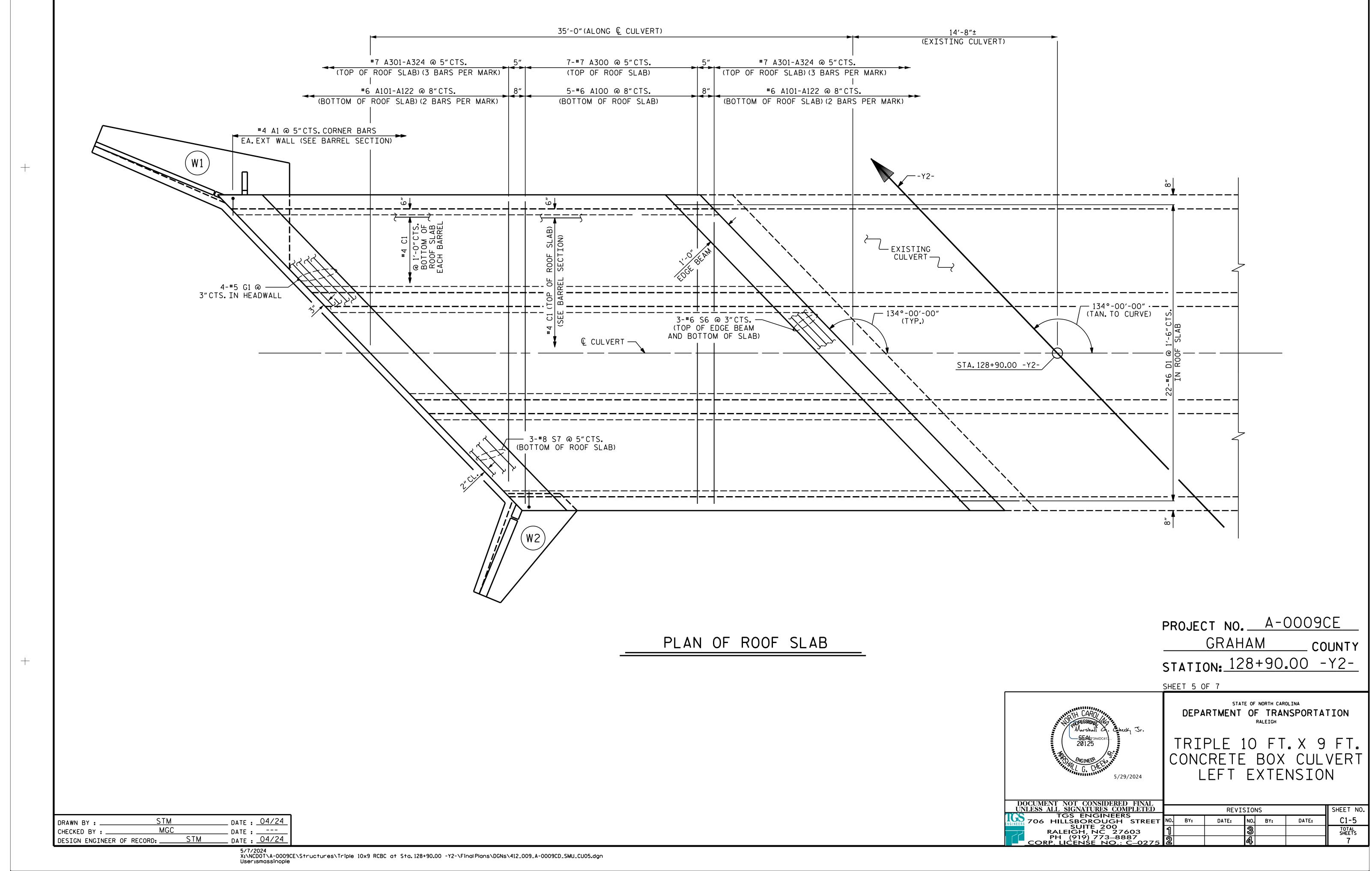




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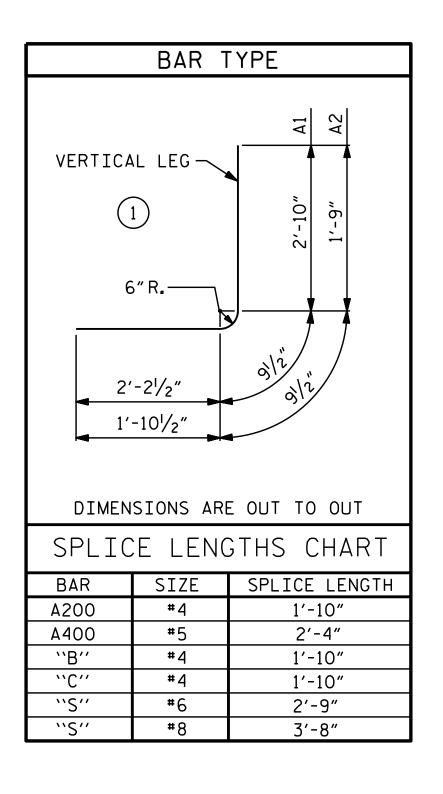
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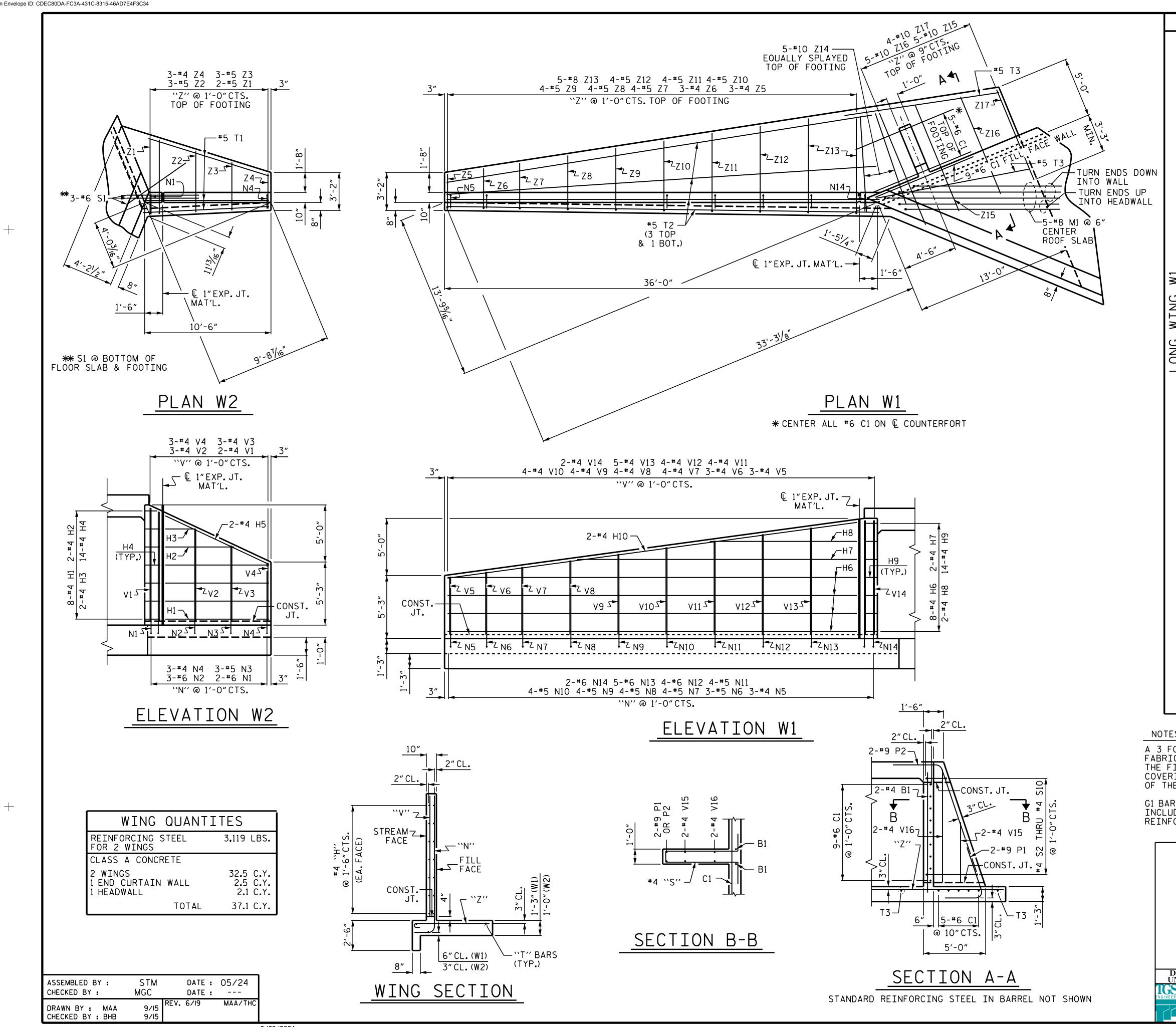
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| | | | | | | | | | | | | | В | AR | SCHE | DULE | | | | | | | | | | | | | |
|------|-----|------|------|---------|--------|------|-----|------|------|---------|--------|------|-----|------|------|---------|--------|------|-----|------|------|---------|--------|------|--------|------------|------|---------|--------|
| BAF | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| A1 | 166 | #4 | 1 | 5′-10″ | 647 | A200 | 18 | #4 | STR | 24'-10" | 299 | A300 | 7 | #7 | STR | 32'-4" | 463 | A400 | 24 | #5 | STR | 25'-4" | 634 | B1 | 70 | #4 | STR | 10′-5″ | 487 |
| A2 | 304 | #4 | 1 | 4′-5″ | 897 | A201 | 4 | #4 | STR | 23′-9″ | 63 | A301 | 6 | #7 | STR | 31'-3" | 383 | A401 | 6 | #5 | STR | 24'-3" | 152 | B2 | 166 | #4 | STR | 8'-4" | 924 |
| | | | | | | A202 | 4 | #4 | STR | 22'-7" | 60 | A302 | 6 | #7 | STR | 30'-0" | 368 | A402 | 6 | #5 | STR | 23'-0" | 144 | B3 | 138 | #4 | STR | 10′-5″ | 960 |
| A100 |) 5 | #6 | STR | 32'-4″ | 243 | A203 | 4 | #4 | STR | 21′-5″ | 57 | A303 | 6 | #7 | STR | 28'-9" | 353 | A403 | 6 | #5 | STR | 21′-9″ | 136 | | | | | | |
| A10 | l 4 | #6 | STR | 31′-0″ | 186 | A204 | 4 | #4 | STR | 20'-3" | 54 | A304 | 6 | #7 | STR | 27'-6" | 337 | A404 | 6 | #5 | STR | 20'-6" | 128 | C1 | 118 | #4 | STR | 34'-4" | 2706 |
| A102 | 2 4 | #6 | STR | 29'-8″ | 178 | A205 | 4 | #4 | STR | 19'-1" | 51 | A305 | 6 | #7 | STR | 26'-3" | 322 | A405 | 6 | #5 | STR | 19'-3" | 120 | | | | | 1 | |
| A10 | 3 4 | #6 | STR | 28'-4" | 170 | A206 | 4 | #4 | STR | 17'-11" | 48 | A306 | 6 | #7 | STR | 25'-0" | 307 | A406 | 6 | #5 | STR | 18'-0" | 113 | D1 | 58 | # 6 | STR | 2'-6" | 218 |
| A104 | 4 4 | #6 | STR | 27'-0" | 162 | A207 | 4 | #4 | STR | 16′-8″ | 45 | A307 | 6 | #7 | STR | 23'-9" | 291 | A407 | 6 | #5 | STR | 16'-9" | 105 | | | | | ,, | |
| A10 | 5 4 | #6 | STR | 25'-8" | 154 | A208 | 4 | #4 | STR | 15′-6″ | 41 | A308 | 6 | #7 | STR | 22'-6" | 276 | A408 | 6 | #5 | STR | 15′-6″ | 97 | G1 | 4 | # 5 | STR | 45'-2" | 188 |
| A10 | 5 4 | #6 | STR | 24'-4" | 146 | A209 | 4 | #4 | STR | 14'-4" | 38 | A309 | 6 | #7 | STR | 21'-3" | 261 | A409 | 6 | #5 | STR | 14'-2" | 89 | | | | | ,, | |
| A10 | 7 4 | #6 | STR | 23'-0" | 138 | A210 | 4 | #4 | STR | 13'-2" | 35 | A310 | 6 | #7 | STR | 19'-11" | 244 | A410 | 6 | #5 | STR | 12'-11" | 81 | S2 | 6 | #6 | STR | 34'-10" | 314 |
| A10 | 3 4 | #6 | STR | 21'-7" | 130 | A211 | 4 | #4 | STR | 12'-0" | 32 | A311 | 6 | #7 | STR | 18'-8" | 229 | A411 | 6 | #5 | STR | 11'-8" | 73 | S3 | 6 | # 6 | STR | 13'-2" | 119 |
| A109 | 3 4 | #6 | STR | 20'-3" | 122 | A212 | 4 | #4 | STR | 10'-10" | 29 | A312 | 6 | #7 | STR | 17'-5″ | 214 | A412 | 6 | #5 | STR | 10'-5″ | 65 | S4 | 3 | #8 | STR | 35'-8″ | 286 |
| A110 |) 4 | #6 | STR | 18'-11" | 114 | A213 | 4 | #4 | STR | 9′-8″ | 26 | A313 | 6 | #7 | STR | 16'-2" | 198 | A413 | 6 | #5 | STR | 9'-1" | 57 | S5 | 3 | #8 | STR | 13'-2" | 105 |
| A111 | 4 | #6 | STR | 17'-7" | 106 | A214 | 4 | #4 | STR | 8'-6" | 23 | A314 | 6 | #7 | STR | 14'-11" | 183 | A414 | 6 | #5 | STR | 7'-11" | 50 | S6 | 6 | # 6 | STR | 45'-2" | 407 |
| A112 | 4 | #6 | STR | 16'-3" | 98 | A215 | 4 | #4 | STR | 7'-4" | 20 | A315 | 6 | #7 | STR | 13'-8" | 168 | A415 | 6 | #5 | STR | 6′-8″ | 42 | S7 | 3 | #8 | STR | 45'-2" | 362 |
| A113 | 4 | #6 | STR | 14'-11" | 90 | A216 | 4 | #4 | STR | 6'-2" | 16 | A316 | 6 | #7 | STR | 12'-5″ | 152 | A416 | 6 | #5 | STR | 5′-5″ | 34 | | | | | 20.70 | |
| A114 | 4 | #6 | STR | 13′-7″ | 82 | A217 | 4 | #4 | STR | 5'-0" | 13 | A317 | 6 | #7 | STR | 11'-3" | 138 | A417 | 6 | #5 | STR | 4'-2" | 26 | REIN | IFORCI | NG S | IEEL | 20,16 | 9 LBS |
| A115 | 4 | #6 | STR | 12'-3" | 74 | A218 | 4 | #4 | STR | 3'-10" | 10 | A318 | 6 | #7 | STR | 9'-11" | 122 | A418 | 3 | #5 | STR | 2'-10" | 9 | | | | | | |
| A116 | . 4 | #6 | STR | 10'-11" | 66 | A219 | 2 | #4 | STR | 2'-8" | 4 | A319 | 6 | #7 | STR | 8'-8" | 106 | A419 | 3 | #5 | STR | 1'-8" | 5 | | | | | | |
| A117 | 4 | #6 | STR | 9′-7″ | 58 | | | | | | | A320 | 6 | #7 | STR | 7'-5" | 91 | | | | | | | | | | | | |
| A118 | 4 | #6 | STR | 8′-3″ | 50 | A250 | 43 | #4 | STR | 9'-4" | 268 | A321 | 6 | #7 | STR | 6'-2" | 76 | A450 | 60 | #5 | STR | 9'-4" | 584 | | | | | | |
| A119 | 4 | #6 | STR | 6'-11" | 42 | A251 | 4 | #4 | STR | 8'-4" | 22 | A322 | 6 | #7 | STR | 4'-11" | 60 | A451 | 6 | #5 | STR | 8'-3" | 52 | | | | | | |
| A120 |) 4 | #6 | STR | 5′-7″ | 34 | A252 | 4 | #4 | STR | 7'-2″ | 19 | A323 | 6 | #7 | STR | 3'-8" | 45 | A452 | 6 | #5 | STR | 7'-0″ | 44 | | | | | | |
| A121 | 4 | #6 | STR | 4'-3" | 26 | A253 | 4 | #4 | STR | 6'-0" | 16 | A324 | 6 | #7 | STR | 2'-5" | 30 | A453 | 6 | #5 | STR | 5′-9″ | 36 | | | | | | |
| A122 | 2 4 | #6 | STR | 2'-11" | 18 | A254 | 4 | #4 | STR | 4'-10" | 13 | | | | | | | A454 | 6 | #5 | STR | 4'-6" | 28 | | | | | | |
| | | | | | | A255 | 4 | #4 | STR | 3′-8″ | 10 | 1 | | | | | | A455 | 6 | #5 | STR | 3'-3" | 20 | | | | | | |
| | | | | | | A256 | 2 | #4 | STR | 2'-7" | 3 | 1 | | | | | | A456 | 3 | #5 | STR | 2'-0" | 6 | | | | | | |
| | | | | | | | - | | | | | | | | | | | | | | | | | | | | | | |



| DRAWN BY : | STM | | DATE : 09/21 |
|-----------------|------------|-----|---------------------|
| CHECKED BY : | MGC | | DATE : 10/21 |
| DESIGN ENGINEER | OF RECORD: | STM | DATE : <u>09/21</u> |

| | PROJECT NO. <u>A-0009CE</u> <u>GRAHAM</u> COUNTY STATION: 128+90.00 -Y2- | | | | |
|--|---|--|--|--|--|
| Marshall G. CHELLAND Marshall G. CHELLAND 20125 MGINEER H.L. G. CHELLAND 5/29/2024 | DEPARTMENT OF TRANSPORTATION RALEIGH TRIPLE 10 FT. X 9 FT. CONCRETE BOX CULVERT LEFT EXTENSION 134 DEG. SKEW | | | | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED TGS ENGINEERS | REVISIONS SHEET NO. | | | | |
| 706 HILLSBOROUGH STREET SUITE 200 RALEIGH, NC 27603 | NO.BY:DATE:C1-613TOTAL SHEETS | | | | |
| PH (919) 773–8887 CORP. LICENSE NO.: C–0275 | | | | | |
| | | | | | |



5/28/2024 X:\NCDOT\A-0009CE\Structures\Triple 10x9 RCBC at Sta.128+90.00 -Y2-\FinalPlans\DGNs\412_013_A-0009CD_SMU_CU07.dgn User:smassinople

| | | . | ~ - | | | | | | _ | | - \ / - - | 6 | |
|---|-----------------|---------------------------|---------------|-------------------|-----------------------------|-----------------|----------------------------|---|--------------------------------------|-----------------------------|-------------------------------------|---|---|
| ļ | B. bar | ILL NO. | OF ISIZE | MAT Type | ERIAL | WEIGHT | ┣— | , | | | ΤΥΡΕ | | |
| | BAR B1 | NU. 2 | *4 | STR | 10'-0" | NEIGHT 13 | | <u>'-10/8</u> 9 /8″ | ″ Н9 Н4 | | | 15'-0" | 1 |
| | C1 | 14 | *6 | STR | 9'-0" | 189 | | <u>- 8/r</u> | | <u>.</u> | * 7 - | | |
| | H6 | 8 | #4 | STR | 34'-1" | 182 | | (1) | , , , , , , , , | | <u>`</u> – <u>↓</u> | | |
| | Н7 | 8 2 2 | #4 | STR | 23'-3" | <u> </u> | [| 1'-3" | | | | | |
| | H8 H9 | 14 | #4 #4 | STR 1 | 12'-2" 3'-3" | 30 | | | N N N N N N N | N5 N5 | NG N8 | N10 N11 | N12 N13 |
| | H10 | 2 | #4 | STR | 34'-4" | 46 | | Г | | | | | |
| | M1 | 5 | #8 | 2 | 16'-4" | 218 | | | 01/2" 01/2" | 5/2" 1/2" |) ¹ /2" 1/2" 31/2" | 3 /2 " /2 " | 01/2″ 51/2″ 01/2″ |
| | N5 N6 | 3 | #4 #5 | 3 | 6'-10" | 14 | (. | 3) | 9′-8// 8′-3// 6′-10// | <u>5'-5 /</u> 5'-4 / | 5′-9/ 6′-1/ 6′-8/ | 7'-3 7'-9 8'-4 | 8'-10', 9'-5 / 10'-0 |
| | N6 N7 | 4 | #5 #5 | 3 | 7'-3" 7'-7" | 22 32 | 6 RA | " D. | <u> </u> | \downarrow \downarrow , | | \downarrow \downarrow \downarrow \downarrow | |
| | N8 N9 | 4 | #5 #5 | <u>3</u> 3 | 8'-2" 8'-9" | 34 37 | | 3" 3 | i) | | | | |
| | N10 N11 | 4 | #5 #5 | 3 | 9'-3" 9'-10" | <u> </u> | ╽╺╾ | | | 1'-3" | | 712 | 5′-6 ¹ /2″ |
| | N12 N13 | 4 | #6 #6 | <u> </u> | <u>10'-4"</u> 11'-3" | 62 84 | | - | | | č | \bigwedge | I ‴6″ RAD. |
| | N13 N14 | 2 | #6 #6 | 3 | 11'-6" | 35 | | | \mathbb{A} | يس _ف\ | ò, ò, | | 5 RAD. |
| W1 | P1 | 2 | #9 | 4 | 7'-3" | 49 | | 6″ RA | D J. | | Ł | | <u>`</u> |
| ပ | P2 | 2 | #9 | 5 | 13'-2" | 90 | | 2′-6 ¹ | /2" | N | Ļ | 3'-6" | |
| ŽI | S2 S3 | 1 | #4 #4 | 6 6 | 11'-9" 11'-1" | 8 7 | | · – – – – – – – – – – – – – – – – – – – | | | | | <u> </u> |
| \geq | S4 | <u>1</u> <u>1</u> 1 | #4 | 6 | 10'-5" | 7 7 7 | | | | | → HK. (| 6'-2" | Z1 |
| ONG | S5 S6 | 1 1 | #4 #4 | 6 6 | 9'-9" 9'-1" | 6 | "ი | | | | 7" | <u>5'-1"</u> 4'-0" | Z2 Z3 |
| | S7 S8 | 1 1 | #4 #4 | 6 6 | 8'-3" 7'-7" | 6 5 | | _ <u></u> | , r | | 6″ | 3'-11" | Z4 |
| | S9 S10 | 1 | #4 #4 | 6 6 | 6'-11" 6'-3" | 5 4 | <u>S2</u> | | -) | | 6" 6" | 2'-10' 3'-4" | Z6 |
| | T2 | 4 | * 5 | STR | 36'-0" | 150 | <u>S3</u> S4 | 3'. | -11" | | 7" 7" | 3'-10' 4'-6" | Z8 |
| | T3 | 4 | *5 *5 | STR | <u> </u> | 27 | <u>55</u> 56 | 3'. | -3" | | 7" 7" | <u>5'-2"</u> 5'-10' | Z9 |
| | ٧5 | 3 | #4 | STR | 4'-9" | 10 | <u></u> <u></u> | ′ <u> </u> | -6″ | | 7" | 6'-6" | Z11 |
| | V6 V7 | 3 4 | #4 #4 | STR STR | 5'-2" 5'-7" | 10 14 | 59 | 1'- | -10″ | | 11″ | <u>7'-2"</u> 7'-10' | |
| | V8 V9 | 4 | #4 #4 | STR STR STR | 6'-2" 6'-8" | <u>16</u> 18 | <u></u> | 0 1'- | 6″ | | 1'-5" | 8'-0" | Z14 |
| | V10 | 4 | #4 | STR | 7'-3" | 19 | | | MENSI | | RE OUT | | |
| | V11 V12 | 4 | #4 #4 | STR STR | 7'-9" 8'-4" | 21 22 | | BAR H1 | NO. 8 | SIZE #4 | TYPE STR | LENGTH 8'-7" | WEIGHT 46 |
| | V13 V14 | 5 2 | #4 #4 | STR STR | 8'-10" 9'-6" | 30 13 | | H2 | 2 | #4 | STR | 5′-5″ | 7 |
| | V15 | 2 2 2 | #4 #4 | STR | 4'-6" 8'-9" | <u>6</u> 12 | | H3 H4 | 2 14 | #4 #4 | STR 1 | 2'-3" 3'-3" | 3 30 |
| | V16 | | | STR | | | | H5 | 2 | #4 | STR | 9'-6" | 13 |
| | Z5 Z6 | 3 3 | #4 #4 | 7 7 | 3'-4" 3'-10" | 7 8 | W2 | N1 N2 | 2 3 | #6 #6 | 3 | 11'-2" 9'-9" | 34 44 |
| | Z7 Z8 | 4 | #5 #5 | 777 | 4'-5" 5'-1" | 18 21 | | N3 | 3 | # 5 | <u> </u> | 8'-4" | 26 |
| | Z9 Z10 | 4 | #5 #5 | 7 | 5'-9" 6'-5" | 24 27 | ING | N4 | 3 | #4 | | 6'-11" | 14 |
| | Z11 | 4 | # 5 | 7 | 7'-1″ | 30 | X | S1 | 3 | # 6 | STR | 6'-0" | 27 |
| | Z12 Z13 | 4 5 | #5 #8 | 7 7 | 7'-9" 8'-9" | 32 117 | RT | Τ1 | 3 | # 5 | STR | 10'-6" | 33 |
| | Z14 Z15 | 5 5 | #10 #10 | 7 STR | 9'-5" 10'-1" | 203 217 | SHOR | V1 V2 | 2 3 | #4 #4 | STR STR | 9'-1" 7'-7" | 12 15 |
| | Z16 Z17 | 5 | #10 #10 | STR STR STR | 9'-4" 8'-7" | 201 148 | S | ٧3 | 3 | #4 | STR | 6'-2" | 12 |
| | REINF | ORCIN | NG STE | | - | 148 D LBS. | | V4 | 3 | #4 | STR | 4'-10" | 10 |
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| ΈS | | | | | _ | | | Z3 Z4 | <u> </u> | #5 #4 | 7 | 4'-7" 3'-5" | 14 7 |
| |)T STF SHALL | | F FIL ATTA | | 0 | | | REINF | ORCIN | IG STE | - | | 79 LBS. |
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DESIGN DATA:

| SPECIFICATIONS | | AASHTO (CURRENT) |
|---------------------------------------|--|-------------------------|
| LIVE LOAD | | SEE PLANS |
| IMPACT ALLOWANCE | | SEE AASHTO |
| STRESS IN EXTREME STRUCTURAL STEEL | 20,000 LBS. PER SQ. IN. | |
| | - AASHTO M270 GRADE 50W | 27,000 LBS. PER SQ. IN. |
| | - AASHTO M270 GRADE 50 | 27,000 LBS. PER SQ. IN. |
| REINFORCING STEEL | IN TENSION - GRADE 60 | 24,000 LBS. PER SQ. IN. |
| CONCRETE IN COMPR | 1,200 LBS. PER SQ. IN. | |
| CONCRETE IN SHEAR | | SEE AASHTO |
| STRUCTURAL TIMBER | - TREATED OR UNTREATED EXTREME FIBER STRESS | 1,800 LBS. PER SQ. IN. |
| COMPRESSION PERPE | ENDICULAR TO GRAIN OF TIMBER | 375 LBS. PER SQ. IN. |
| EQUIVALENT FLUID P | 30 LBS. PER CU. FT. (MINIMUM) | |

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS, AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A $\frac{1}{4}$ " RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION. VERTICAL CURVE ORDINATE. AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

STRUCTURAL STEEL:

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

STANDARD NOTES

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE $\frac{7}{8}$ " \oslash Shear studs for the $\frac{3}{4}$ " Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \oslash STUDS FOR 4 - $\frac{3}{4}$ " \oslash STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \oslash STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \oslash studs based on the ratio of 3 - $\frac{7}{8}$ " \oslash STUDS FOR 4 - $\frac{3}{4}$ " Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY $\frac{1}{16}$ " OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.