

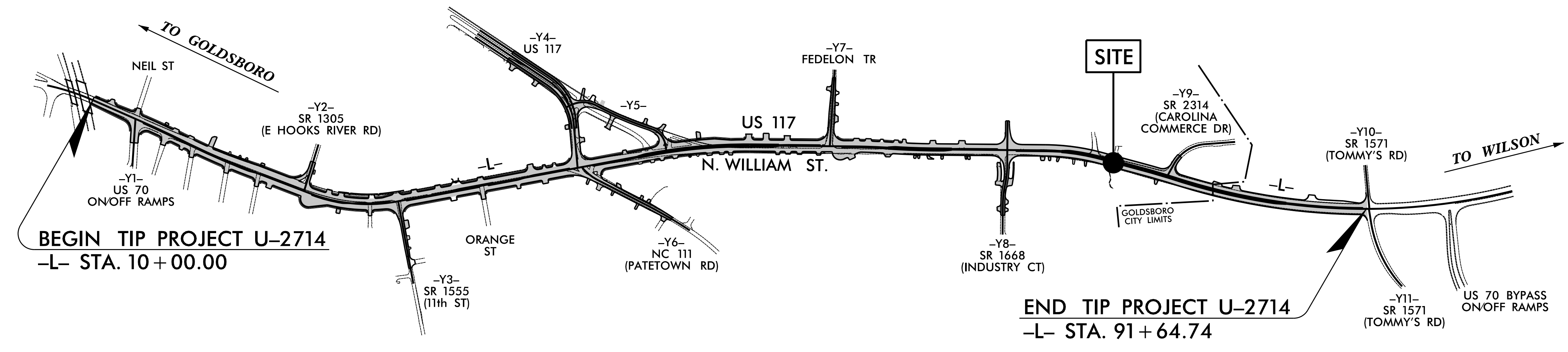
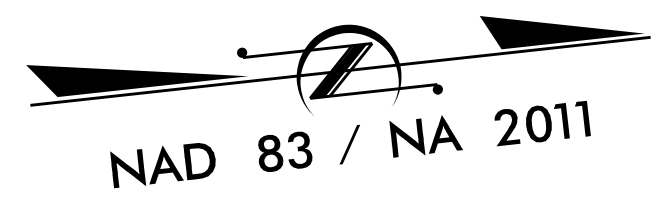
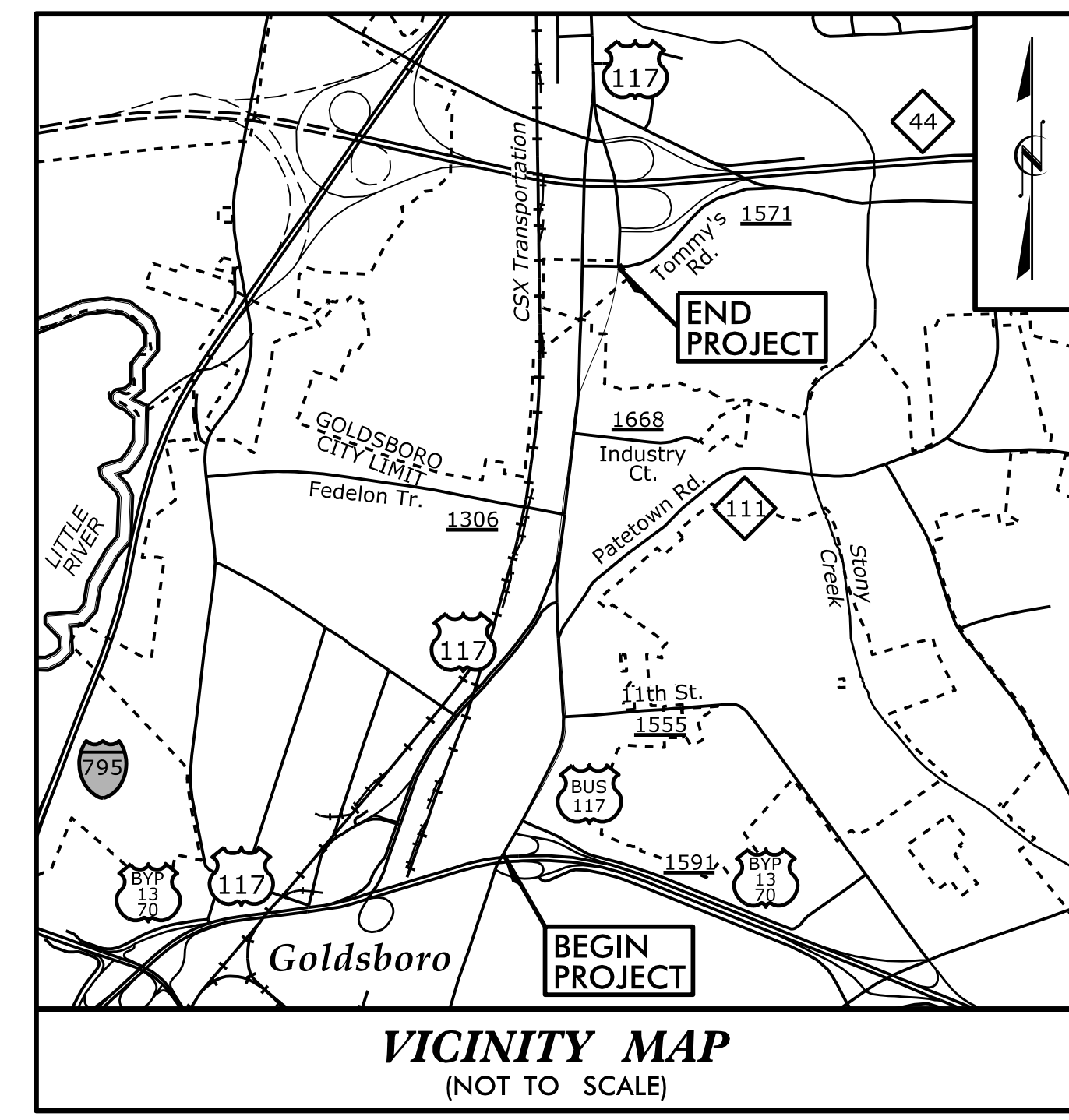
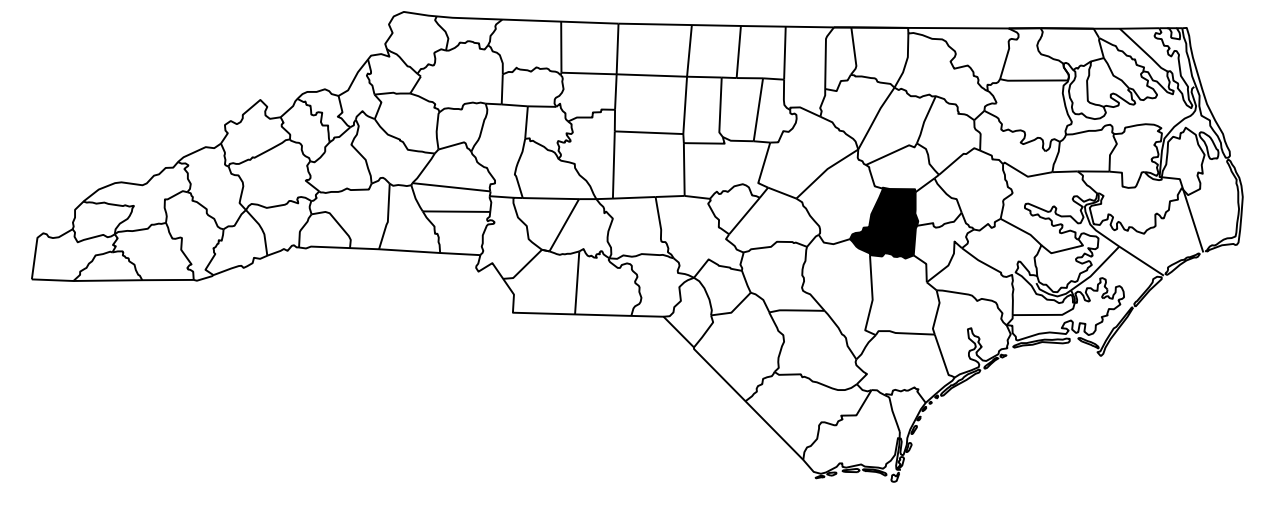
|                 |                             |             |              |
|-----------------|-----------------------------|-------------|--------------|
| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
| N.C.            | U-2714                      | 1           | 8            |
| STATE PROJ. NO. | F. A. PROJ. NO.             | DESCRIPTION |              |
| 38979.1.2       | N/A                         | P.E.        |              |
| 38979.2.1       | N/A                         | ROW & UTIL. |              |
| 38979.3.1       | N/A                         | CONSTR.     |              |
|                 |                             |             |              |
|                 |                             |             |              |
|                 |                             |             |              |

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# WAYNE COUNTY

**LOCATION: US 117 (N. WILLIAM ST.) FROM NORTH OF US 70 TO SR 1571 (TOMMY'S RD.)**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, CULVERT AND SIGNALS**



**TIP PROJECT: U-2714**

**CONTRACT: C204131**

PLOT DRIVER: U-2714\_PLOTTER.plt  
USER: WTOWE  
DATE: 12/9/2019  
PENTABLE: NCDOT\_STRUCTURES\_DEFAULT.PEN  
TIME: 6:41:58 AM  
FILE: NorthCarolina\Dept\_of\_Transportation\NCDOT\_Western\_Div\_0n-Coll\_M\_0-Progress-U-2714\_US117\_c\_16.0-CAD\_BIM\_6.2\_WorK\_In\_Progress-U-2714\_US117\_c\_13.0\_FinalPlans\_C

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III  
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF GOLDSBORO

**CONTRACT: C204131**

| DESIGN DATA            |          |
|------------------------|----------|
| ADT 2018               | = 17,390 |
| ADT 2038               | = 27,310 |
| DHV                    | = 9 %    |
| D                      | = 60 %   |
| T                      | = 4 % *  |
| V                      | = 40 MPH |
| (* TTST 1% + DUALS 3%) |          |
| FUNC. CLASS.           | =        |
| MINOR ARTERIAL (URBAN) |          |
| STATEWIDE TIER         |          |

| PROJECT LENGTH                    |               |
|-----------------------------------|---------------|
| LENGTH ROADWAY TIP PROJECT U-2714 | = 1.546 MILES |
| TOTAL LENGTH TIP PROJECT U-2714   | = 1.546 MILES |

|   |  |
|---|--|
| Prepared for the Office of:<br><b>DIVISION OF HIGHWAYS</b><br>1000 Birch Ridge Dr., Raleigh NC, 27610 |  |
| 2018 STANDARD SPECIFICATIONS  |  |
| <b>LETTING DATE:</b><br>MARCH 17, 2020  | CALVIN W. MOODY, III, P.E.<br>PROJECT ENGINEER   |
|   | CASEY E. HARRIS, P.E.<br>PROJECT DESIGN ENGINEER |

| STRUCTURES ENGINEER  |  |
|--|--|
|  |  |
| 1/30/2020  |  |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED |  |

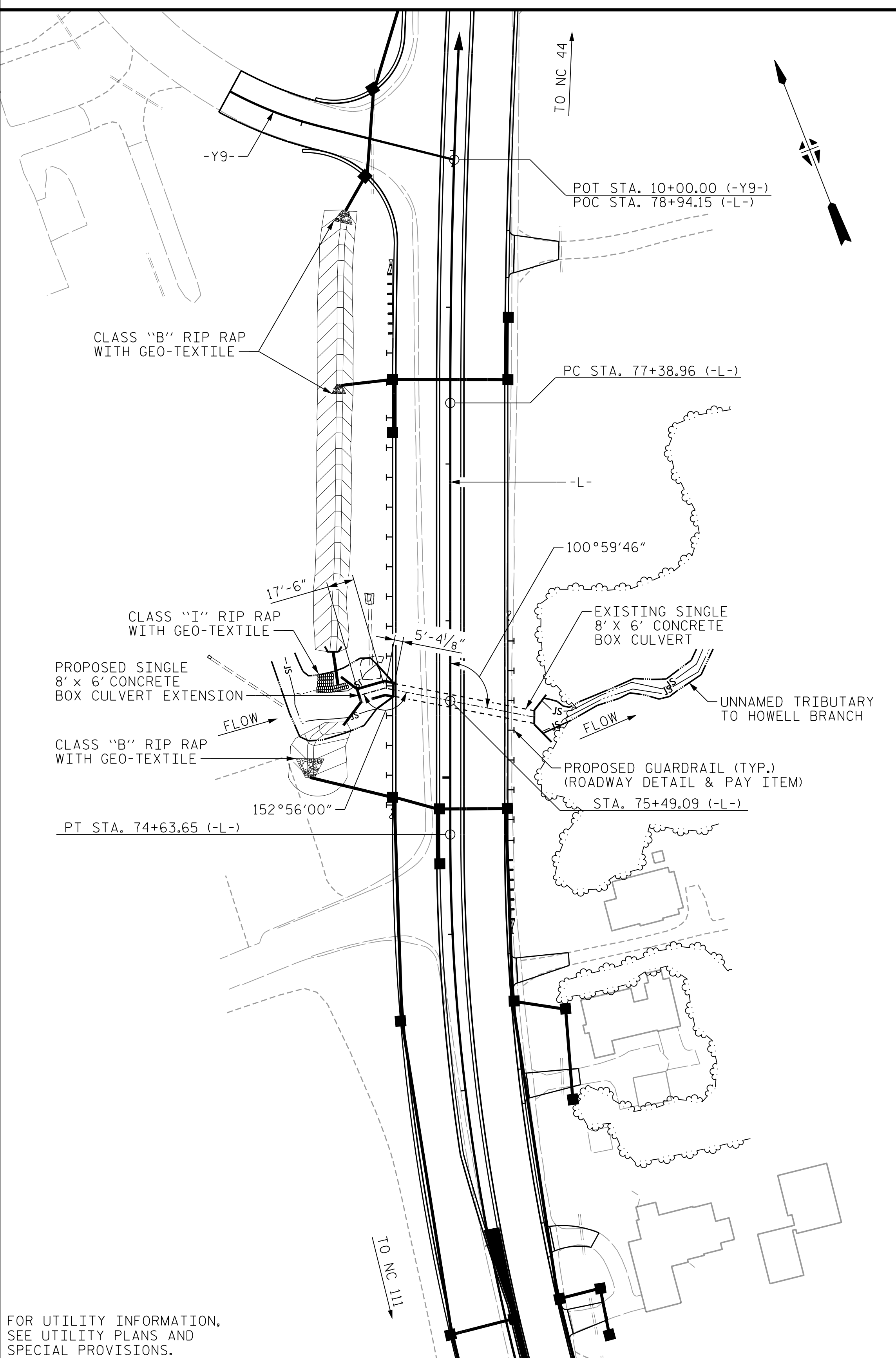


## STRUCTURES

PROJECT PREPARED BY:  
**HR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116



BENCHMARK: TBM#7 - 12" SPIKE IN POWER POLE, 392' LT. OF -Y8- STA. 13+48.00, N 608388, E 2303606, EL. = 123.21'



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

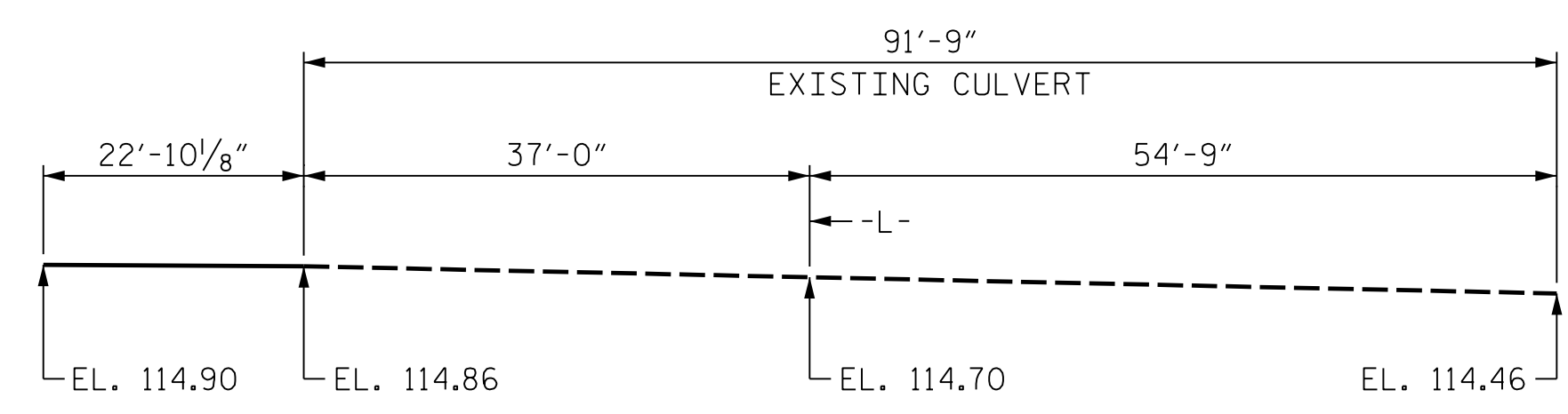
**NOTES**

- ASSUMED LIVE LOAD ----- HL-93 OR ALTERNATE LOADING.
- DESIGN FILL ----- 4.61'
- 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. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
  2. THE REMAINING PORTIONS OF THE WALLS AND WINGS TO FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF THE 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.
- AT THE CONTRACTOR'S OPTION, HE MAY SUBMIT TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE OPTION 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.
- IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. 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.
- DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE "STANDARD NOTES" SHEET.
- FOR CULVERT DIVERSION DETAILS, SEE EROSION CONTROL PLANS.
- A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

| TOTAL STRUCTURE QUANTITIES                    |                   |
|---|-------------------|
| CLASS A CONCRETE:                             |                   |
| BARREL @ 0.88 CY/FT                           | 20.1 C.Y.         |
| HEADWALL, EDGE BEAMS AND CURTAIN WALL         | 1.7 C.Y.          |
| WINGS   | 11.4 C.Y.         |
| <b>TOTAL</b>                                  | <b>33.2 C.Y.</b>  |
| REINFORCING STEEL:                            |                   |
| BARREL AND HEADWALL                           | 3,237 LBS.        |
| WINGS   | 880 LBS.          |
| <b>TOTAL</b>                                  | <b>4,117 LBS.</b> |
| FOUNDATION CONDITIONING MATERIAL, BOX CULVERT | 21 TONS           |
| CULVERT EXCAVATION, STA. 75+49.09 -L-         | LUMP SUM          |

| GRADE DATA                          |                |
|-------------------------------------|----------------|
| GRADE POINT EL. @ STA. 75+49.09 -L- | = 125.83       |
| BED EL. @ STA. 75+49.09 -L-         | = 114.7        |
| ROADWAY SLOPE                       | = 3:1          |
| HYDRAULIC DATA                      |                |
| DESIGN DISCHARGE                    | = 200 CFS      |
| FREQUENCY OF DESIGN FLOOD           | = 50 YR.       |
| DESIGN HIGH WATER ELEVATION         | = 120.3        |
| DRAINAGE AREA                       | = 0.30 SQ. MI. |
| BASE DISCHARGE (Q100)               | = 230 CFS      |
| BASE HIGH WATER ELEVATION           | = 120.7        |

| OVERTOPPING FLOOD DATA         |             |
|--------------------------------|-------------|
| OVERTOPPING DISCHARGE          | = 588 CFS   |
| FREQUENCY OF OVERTOPPING FLOOD | = 500 YR. + |
| OVERTOPPING FLOOD ELEVATION    | = 126.6     |



PROFILE ALONG CULVERT

PROJECT NO. U-2714  
 WAYNE COUNTY  
 STATION: 75+49.09 -L-  
 SHEET 1 OF 6



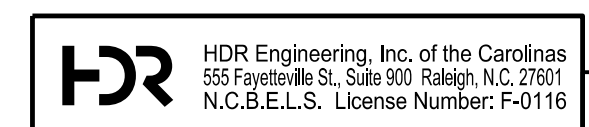
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SINGLE 8 FT. x 6 FT. CONCRETE BOX CULVERT**  
 101° SKEW

| REVISIONS |     |       |     |     |       |
|-----------|-----|-------|-----|-----|-------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |
| 1         |     |       | 3   |     |       |
| 2         |     |       | 4   |     |       |

SHEET NO. C-1  
 TOTAL SHEETS 7

|                     |             |                    |             |
|---------------------|-------------|--------------------|-------------|
| DES BY: A. HOUK     | DATE: 01/18 | DWG BY: W. TOWE    | DATE: 01/18 |
| DES CHK: T. ANDREWS | DATE: 01/18 | CHK BY: T. ANDREWS | DATE: 01/18 |



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLOT DRIVER: U-2714\_PLOTTER.plt  
 USER: WTOWE  
 DATE: 12/9/2019  
 TIME: 1:41:33 PM  
 FILE: ...3.0 FinalPlans\AC-1

## LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

| LEVEL                    | VEHICLE                              | WEIGHT (W)<br>(TONS) | CONTROLLING<br>LOAD RATING<br># | MINIMUM<br>RATING FACTORS<br>(RF) | TONS = W x RF | STRENGTH I LIMIT STATE                  |               |             |                 |  |               |             |                 | COMMENT NUMBER |  |   |
|--------------------------|--------------------------------------|----------------------|---------------------------------|-----------------------------------|---------------|---|---------------|-------------|-----------------|--|---------------|-------------|-----------------|----------------|--|---|
|                          |                                      |                      |                                 |                                   |               | MOMENT                                  |               |             |                 | SHEAR  |               |             |                 |                |  |   |
|                          |                                      |                      |                                 |                                   |               | LIVE-LOAD<br>FACTORS (γ <sub>LL</sub> ) | RATING FACTOR | BOX NO.     | ELEMENT<br>TYPE | DISTANCE FROM<br>LEFT END OF<br>ELEMENT (ft) | RATING FACTOR | BOX NO.     | ELEMENT<br>TYPE |                | DISTANCE FROM<br>LEFT END OF<br>ELEMENT (ft) |   |
| DESIGN<br>LOAD<br>RATING | HL-93 (INVENTORY)                    | N/A                  | ①                               | 1.17                              | --            | 1.75                                    | 1.17          | 1           | BOTTOM SLAB     | 4.67   | 1.53          | 1           | BOTTOM SLAB     | 1.27           | -  |   |
|                          | HL-93 (OPERATING)                    | N/A                  |                                 | 1.52                              | --            | 1.35                                    | 1.52          | 1           | BOTTOM SLAB     | 4.67   | 1.99          | 1           | BOTTOM SLAB     | 1.27           | -  |   |
|                          | HS-20 (INVENTORY)                    | 36.000               | ②                               | 1.22                              | 43.9          | 1.75                                    | 1.22          | 1           | BOTTOM SLAB     | 4.67   | 1.60          | 1           | BOTTOM SLAB     | 1.27           | -  |   |
|                          | HS-20 (OPERATING)                    | 36.000               |                                 | 1.58                              | 56.8          | 1.35                                    | 1.58          | 1           | BOTTOM SLAB     | 4.67   | 2.07          | 1           | BOTTOM SLAB     | 1.27           | -  |   |
| LEGAL<br>LOAD<br>RATING  | SINGLE VEHICLE<br>(SV)               | SNSH                 | 13.500                          |                                   | 2.54          | 34.2                                    | 1.40          | 2.54        | 1               | TOP SLAB                                     | 4.67          | 3.64        | 1               | TOP SLAB       | 1.27   | - |
|                          |                                      | SNGARBS2             | 20.000                          |                                   | 2.38          | 47.6                                    | 1.40          | 2.38        | 1               | TOP SLAB                                     | 4.67          | 3.41        | 1               | TOP SLAB       | 1.27   | - |
|                          |                                      | SNAGRIS2             | 22.000                          |                                   | 2.54          | 55.8                                    | 1.40          | 2.54        | 1               | TOP SLAB                                     | 4.67          | 3.64        | 1               | TOP SLAB       | 1.27   | - |
|                          |                                      | SNCOTTS3             | 27.250                          | ③                                 | 1.47          | 40.0                                    | 1.40          | 1.47        | 1               | BOTTOM SLAB                                  | 4.67          | 1.92        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          |                                      | SNAGGRS4             | 34.925                          |                                   | 1.82          | 63.5                                    | 1.40          | 1.82        | 1               | BOTTOM SLAB                                  | 4.67          | 2.36        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          |                                      | SNS5A                | 35.550                          |                                   | 1.70          | 60.4                                    | 1.40          | 1.70        | 1               | BOTTOM SLAB                                  | 4.67          | 2.21        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          |                                      | SNS6A                | 39.950                          |                                   | 1.70          | 67.9                                    | 1.40          | 1.70        | 1               | BOTTOM SLAB                                  | 4.67          | 2.21        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          |                                      | SNS7B                | 42.000                          |                                   | 1.70          | 71.4                                    | 1.40          | 1.70        | 1               | BOTTOM SLAB                                  | 4.67          | 2.21        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          | TRUCK TRACTOR SEMI-TRAILER<br>(TTST) | TNAGRIT3             | 33.000                          |                                   | 2.54          | 83.8                                    | 1.40          | 2.54        | 1               | TOP SLAB                                     | 4.67          | 3.64        | 1               | TOP SLAB       | 1.27   | - |
|                          |                                      | TNT4A                | 33.075                          |                                   | 1.75          | 57.8                                    | 1.40          | 1.75        | 1               | BOTTOM SLAB                                  | 4.67          | 2.28        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          |                                      | TNT6A                | 41.600                          |                                   | 1.70          | 70.7                                    | 1.40          | 1.70        | 1               | BOTTOM SLAB                                  | 4.67          | 2.21        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          |                                      | TNT7A                | 42.000                          |                                   | 1.73          | 72.6                                    | 1.40          | 1.73        | 1               | BOTTOM SLAB                                  | 4.67          | 2.25        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          |                                      | TNT7B                | 42.000                          |                                   | 1.70          | 71.4                                    | 1.40          | 1.70        | 1               | BOTTOM SLAB                                  | 4.67          | 2.21        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          |                                      | TNAGRIT4             | 43.000                          |                                   | 1.75          | 75.2                                    | 1.40          | 1.75        | 1               | BOTTOM SLAB                                  | 4.67          | 2.28        | 1               | BOTTOM SLAB    | 1.27   | - |
|                          |                                      | TNAGT5A              | 45.000                          |                                   | 1.75          | 78.7                                    | 1.40          | 1.75        | 1               | BOTTOM SLAB                                  | 4.67          | 2.28        | 1               | BOTTOM SLAB    | 1.27   | - |
| TNAGT5B                  | 45.000                               |                      | 1.75                            | 78.7                              | 1.40          | 1.75                                    | 1             | BOTTOM SLAB | 4.67            | 2.28   | 1             | BOTTOM SLAB | 1.27            | -              |  |   |

### LOAD FACTORS

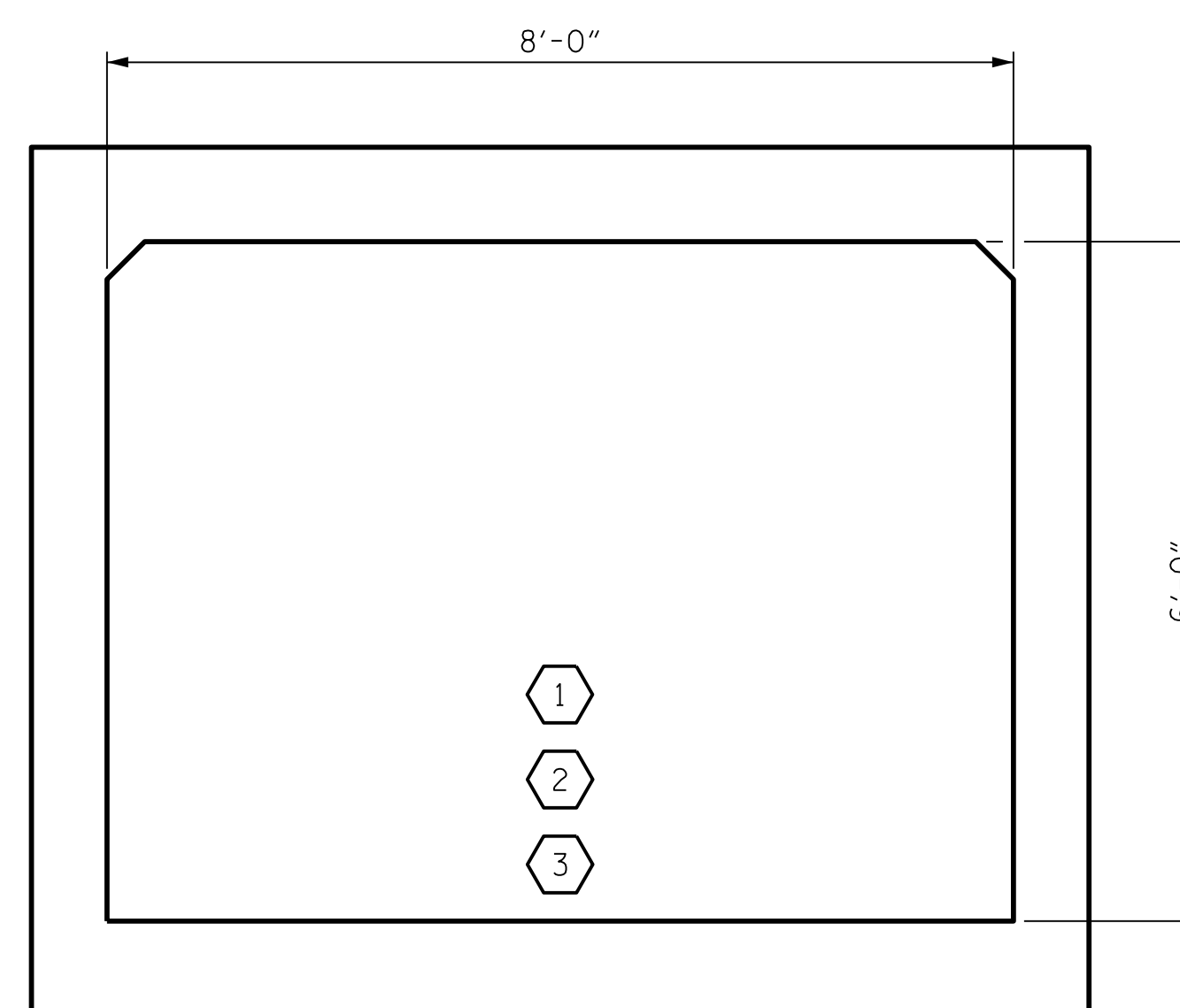
#### DESIGN LOAD RATING FACTORS

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

### NOTES

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.  
RATINGS ARE FOR NON-INTERSTATE TRAFFIC.  
LL SURCHARGE DEPTH = 3.8 FT.

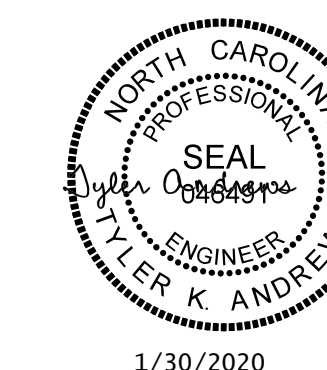
|   |                               |
|---|-------------------------------|
| # | CONTROLLING LOAD RATING       |
| ① | DESIGN LOAD RATING (HL-93)    |
| ② | DESIGN LOAD RATING (HS-20)    |
| ③ | LEGAL LOAD RATING **          |
|   | ** SEE CHART FOR VEHICLE TYPE |



**LRFR SUMMARY**  
(LOOKING DOWNSTREAM)

PROJECT NO. U-2714  
WAYNE COUNTY  
STATION: 75+49.09 -L-

SHEET 2 OF 6



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SINGLE 8 FT. x 6 FT.  
CONCRETE BOX CULVERT  
101° SKEW

#### REVISIONS

| NO. | BY: | DATE: | NO. | BY: | DATE: |
|-----|-----|-------|-----|-----|-------|
| 1   |     |       | 3   |     |       |
| 2   |     |       | 4   |     |       |

SHEET NO.  
C-2  
TOTAL SHEETS  
7

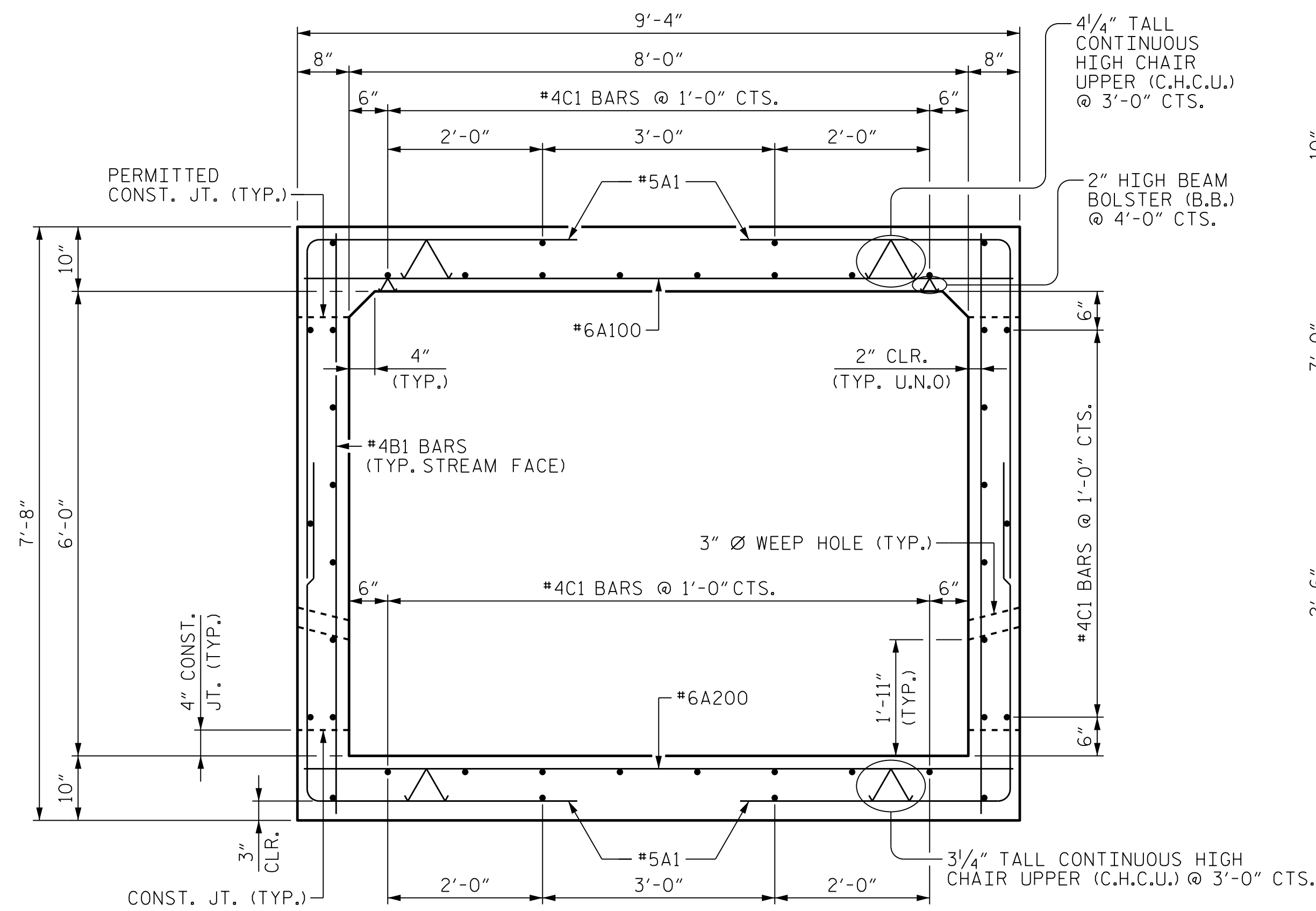


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UNLESS ALL SIGNATURES COMPLETED

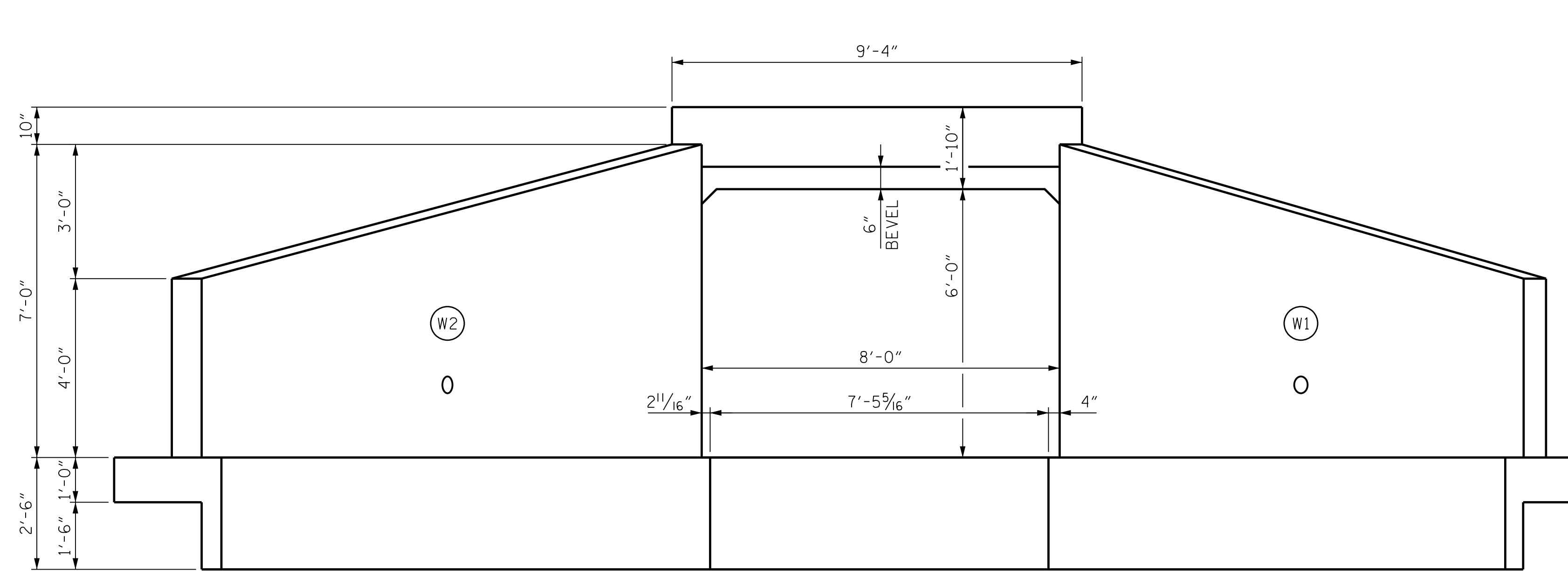
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 USER: WTOWE  
 FILE: ...3.0 FinalPlans\C-2  
 PENTABLE: NCDOT STRUCTURES DEFAULT PEN  
 DATE: 12/9/2019  
 TIME: 6:21:06 AM

|                            |                    |                           |                    |
|----------------------------|--------------------|---------------------------|--------------------|
| DES BY: <u>A. HOUK</u>     | DATE: <u>01/18</u> | DWG BY: <u>W. TOWE</u>    | DATE: <u>01/18</u> |
| DES CHK: <u>T. ANDREWS</u> | DATE: <u>01/18</u> | CHK BY: <u>T. ANDREWS</u> | DATE: <u>01/18</u> |

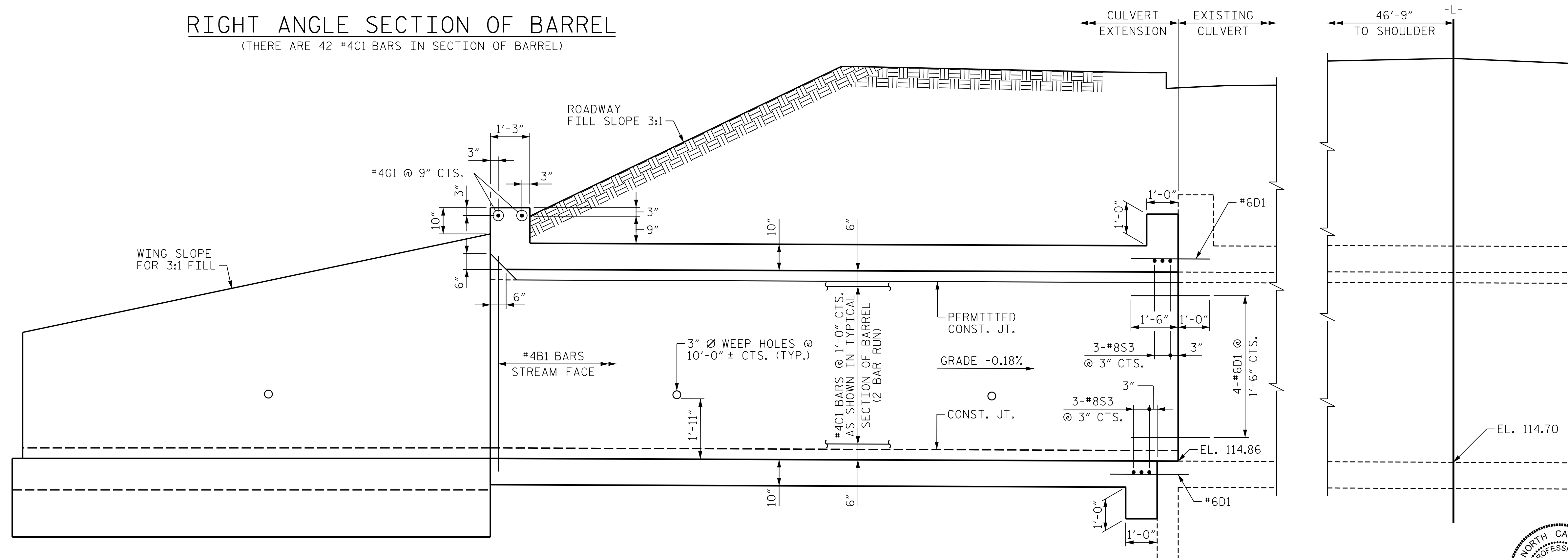




**RIGHT ANGLE SECTION OF BARREL**  
(THERE ARE 42 #4C1 BARS IN SECTION OF BARREL)



**INLET END ELEVATION NORMAL TO SKEW**



**CULVERT EXTENSION SECTION NORMAL TO ROADWAY**

PROJECT NO. U-2714  
WAYNE COUNTY  
 STATION: 75+49.09 -L-  
 SHEET 3 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SINGLE 8 FT. x 6 FT. CONCRETE BOX CULVERT  
 101° SKEW**

| REVISIONS |     |       |     |     |       |
|-----------|-----|-------|-----|-----|-------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |
| 1         |     |       | 3   |     |       |
| 2         |     |       | 4   |     |       |

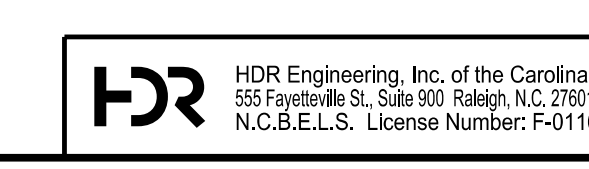
SHEET NO. C-3  
 TOTAL SHEETS 7



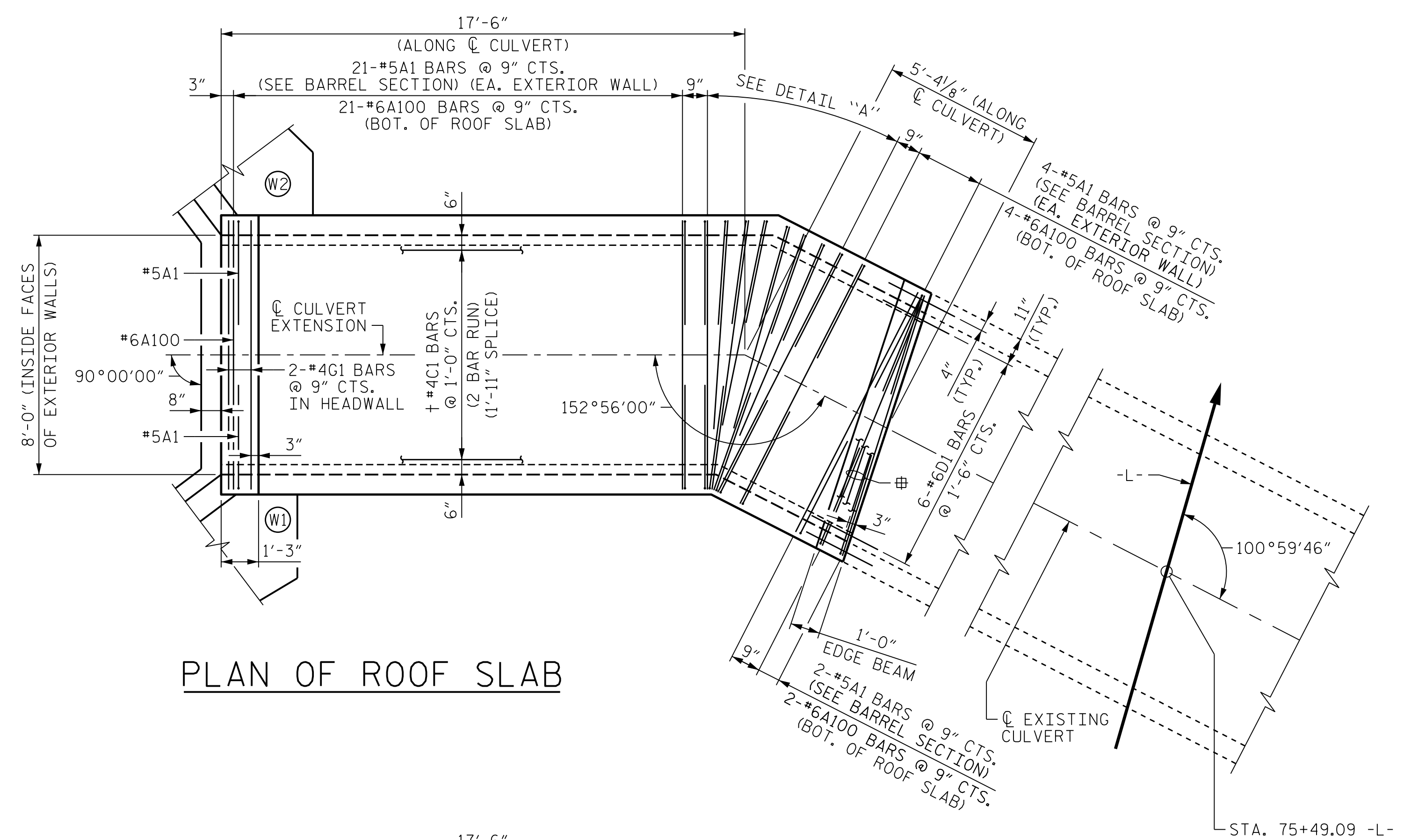
1/30/2020

PLOT DRIVER: U-2714\_PLOTTER.plt  
 USER: WTOWE DATE: 12/9/2019 TIME: 6:21:15 AM  
 FILE: ...3.0 FinalPlans\C-3

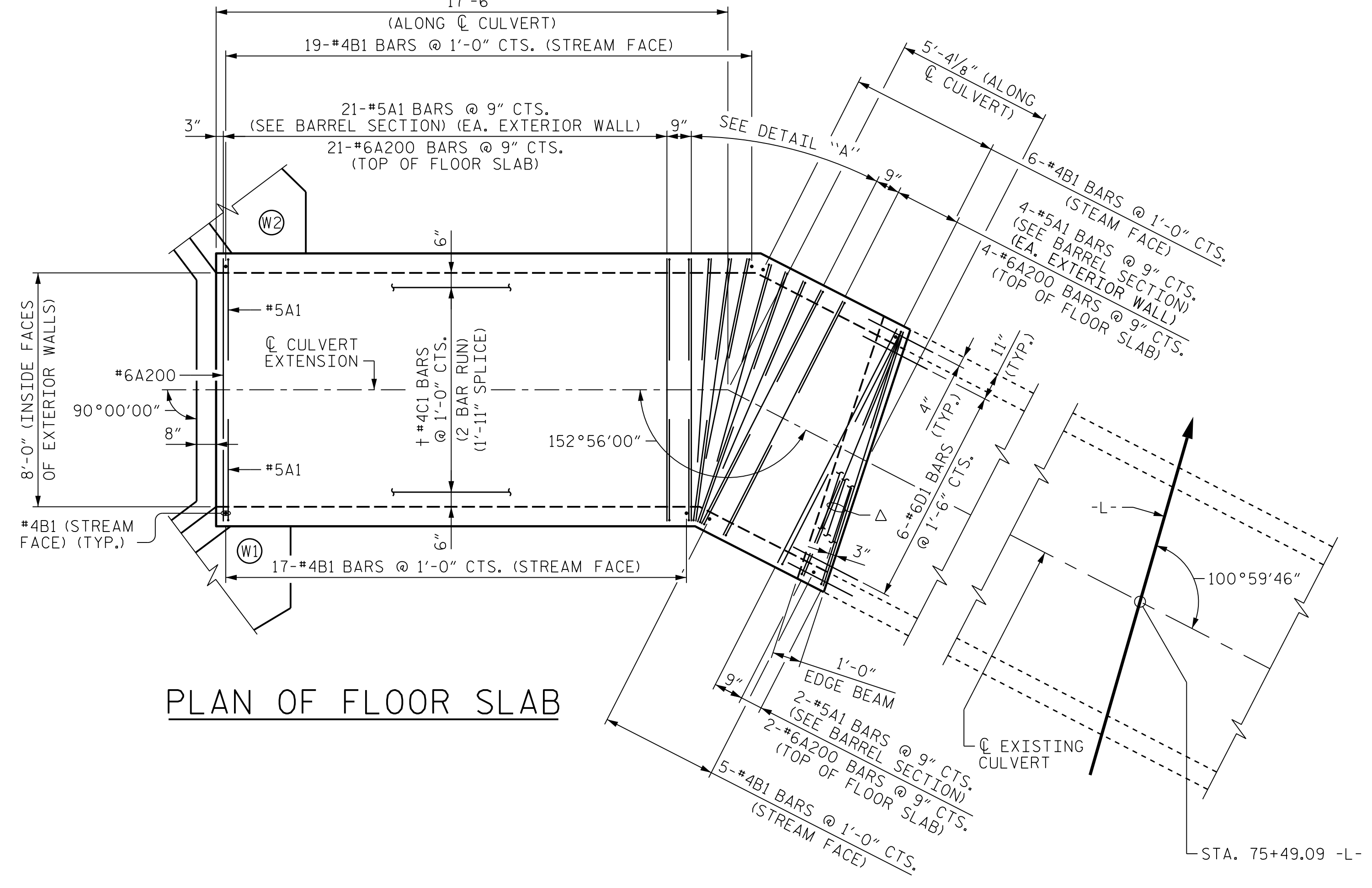
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| DES CHK: <u>T. ANDREWS</u> | DATE: <u>01/18</u> | CHK BY: <u>T. ANDREWS</u> | DATE: <u>01/18</u> |



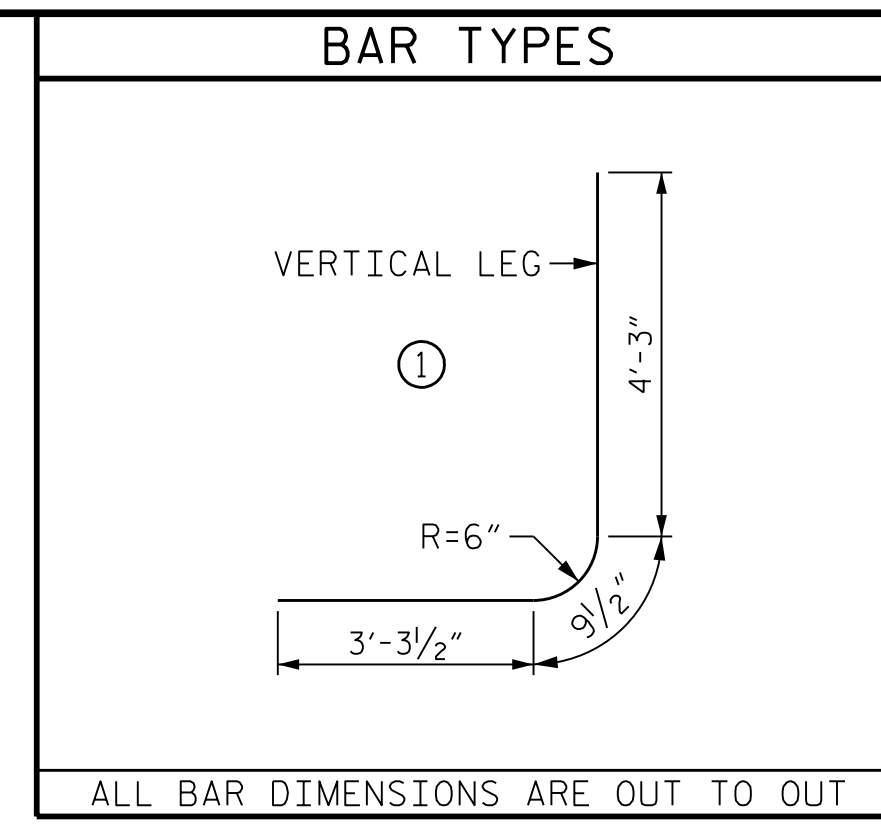
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**



PLAN OF ROOF SLAB



PLAN OF FLOOR SLAB



**SPLICE LENGTH CHART**

| BAR | SIZE | SPLICE LENGTH |
|-----|------|---------------|
| B1  | #4   | 1'-9"         |
| C1  | #4   | 1'-11"        |

**BILL OF MATERIAL**

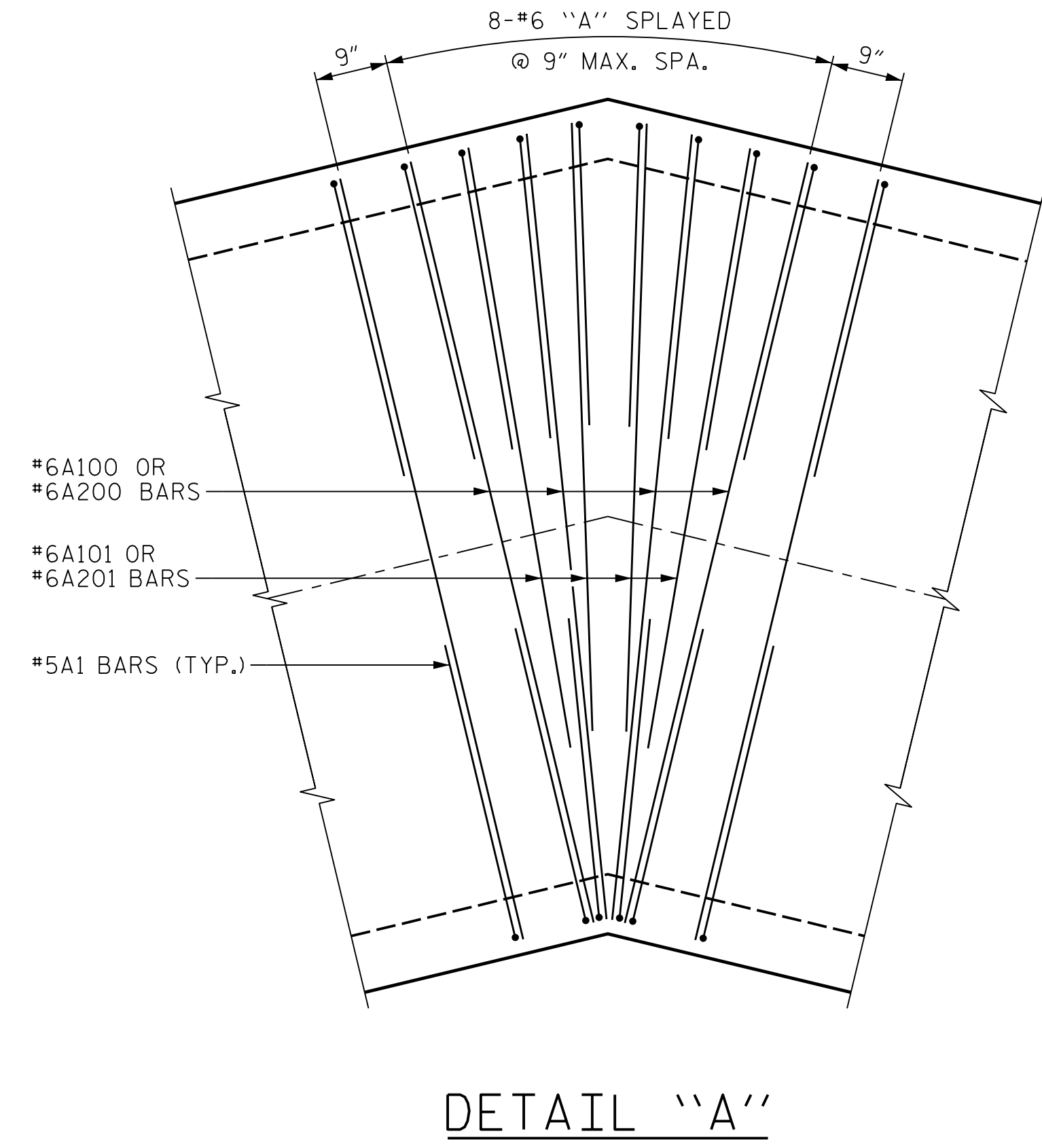
| BAR  | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|------|-----|------|------|--------|--------|
| A1   | 128 | #5   | 1    | 8'-4"  | 1,113  |
| A100 | 31  | #6   | STR. | 9'-0"  | 419    |
| A101 | 4   | #6   | STR. | 8'-0"  | 48     |
| A200 | 31  | #6   | STR. | 9'-0"  | 419    |
| A201 | 4   | #6   | STR. | 8'-0"  | 48     |
| B1   | 47  | #4   | STR. | 7'-3"  | 228    |
| C1   | 84  | #4   | STR. | 13'-0" | 729    |
| D1   | 20  | #6   | STR. | 2'-6"  | 75     |
| G1   | 2   | #4   | STR. | 9'-0"  | 12     |
| S3   | 6   | #8   | STR. | 9'-1"  | 146    |

REINFORCING STEEL 3,237 LBS.

CLASS A CONCRETE

|              |         |
|--------------|---------|
| BARREL       | 20.1 CY |
| HEADWALL     | 0.5     |
| CURTAIN WALL | 0.5     |
| EDGE BEAMS   | 0.7     |
| TOTAL        | 21.8 CY |

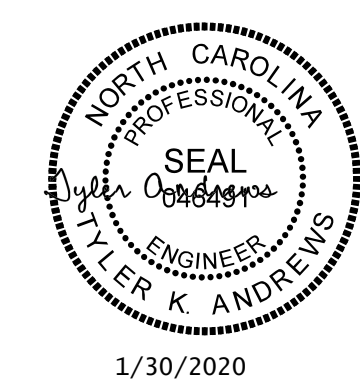
FOUNDATION CONDITIONING MATERIAL 21 TONS



DETAIL "A"

⊕ = 3-#8S3 BARS @ 3" CTS. (BOT. OF ROOF SLAB)  
 Δ = 3-#8S3 BARS @ 3" CTS. (TOP OF FLOOR SLAB)  
 † = FIELD BEND C1 BARS AS NECESSARY THROUGH BEND IN CULVERT

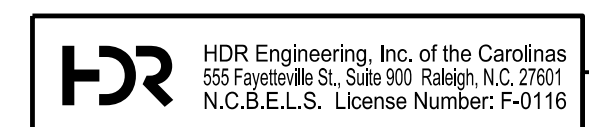
PROJECT NO. U-2714  
 WAYNE COUNTY  
 STATION: 75+49.09 -L-  
 SHEET 4 OF 6



1/30/2020

PLOT DRIVER: U-2714\_PLOTTER.plt  
 USER: WTOWE DATE: 12/9/2019 TIME: 6:21:23 AM  
 FILE: ... \3.0 FinalPlans\C-4

|                     |             |                    |             |
|---------------------|-------------|--------------------|-------------|
| DES BY: A. HOUK     | DATE: 01/18 | DWG BY: W. TOWE    | DATE: 01/18 |
| DES CHK: T. ANDREWS | DATE: 01/18 | CHK BY: T. ANDREWS | DATE: 01/18 |

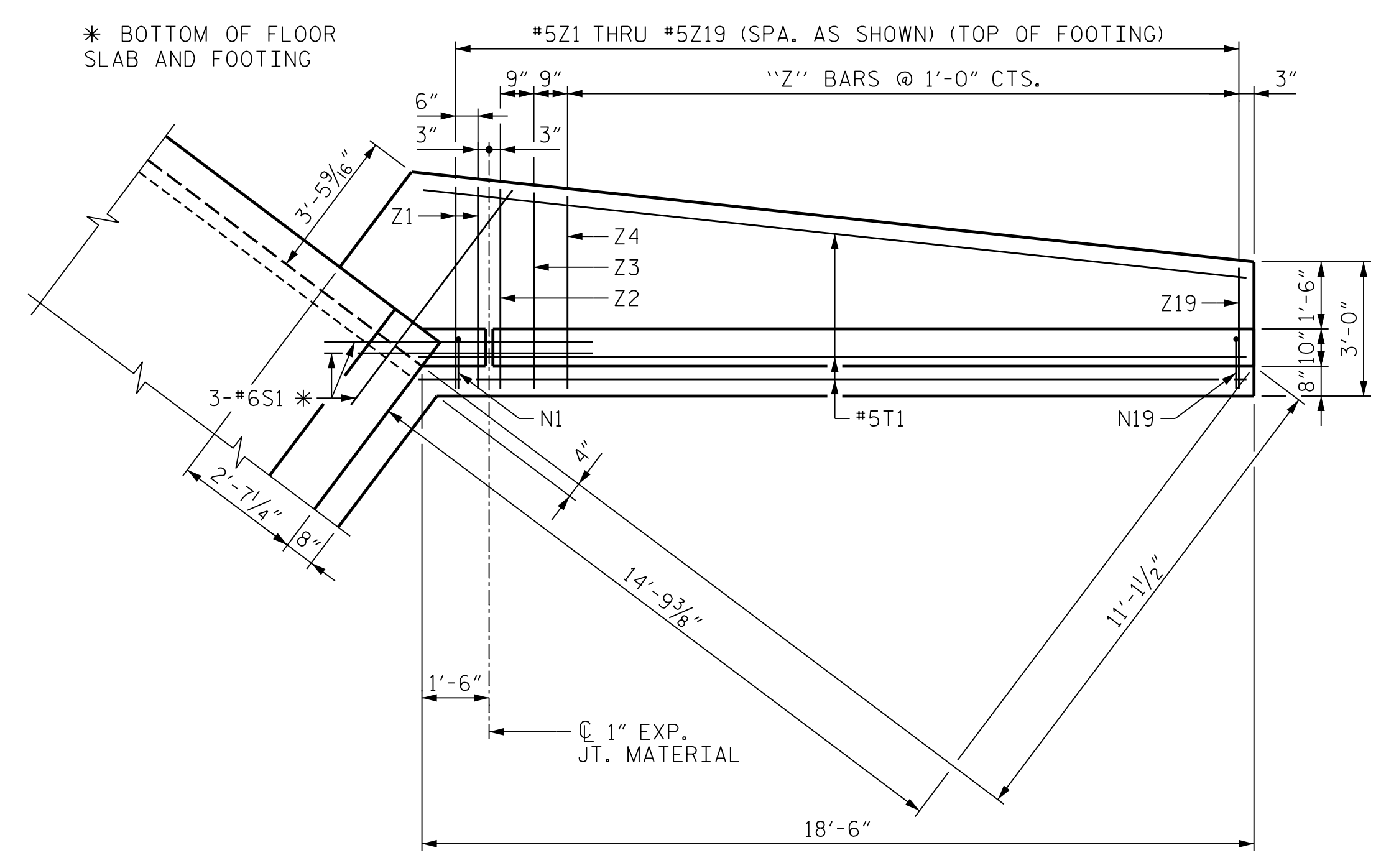


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

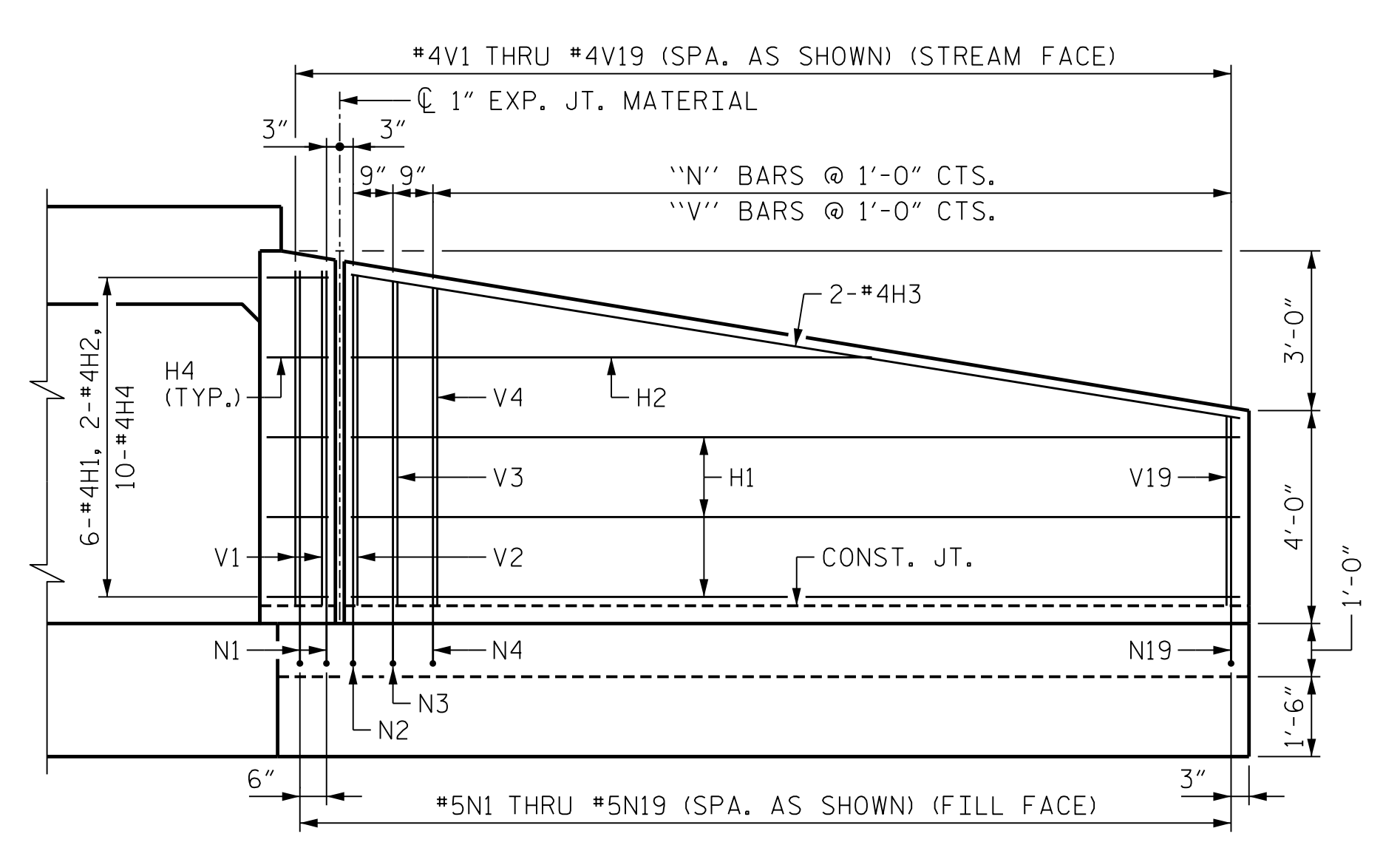
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SHEET NO. C-4  
 TOTAL SHEETS 7



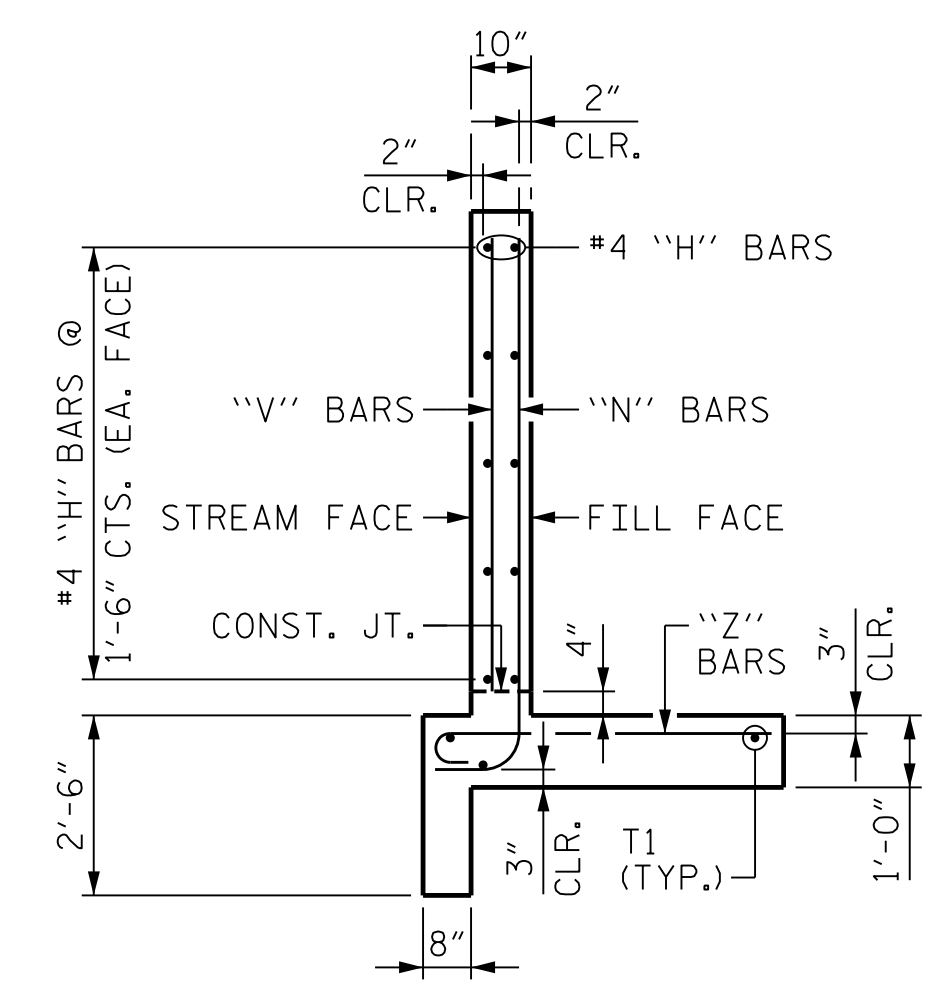


PLAN - WING W1

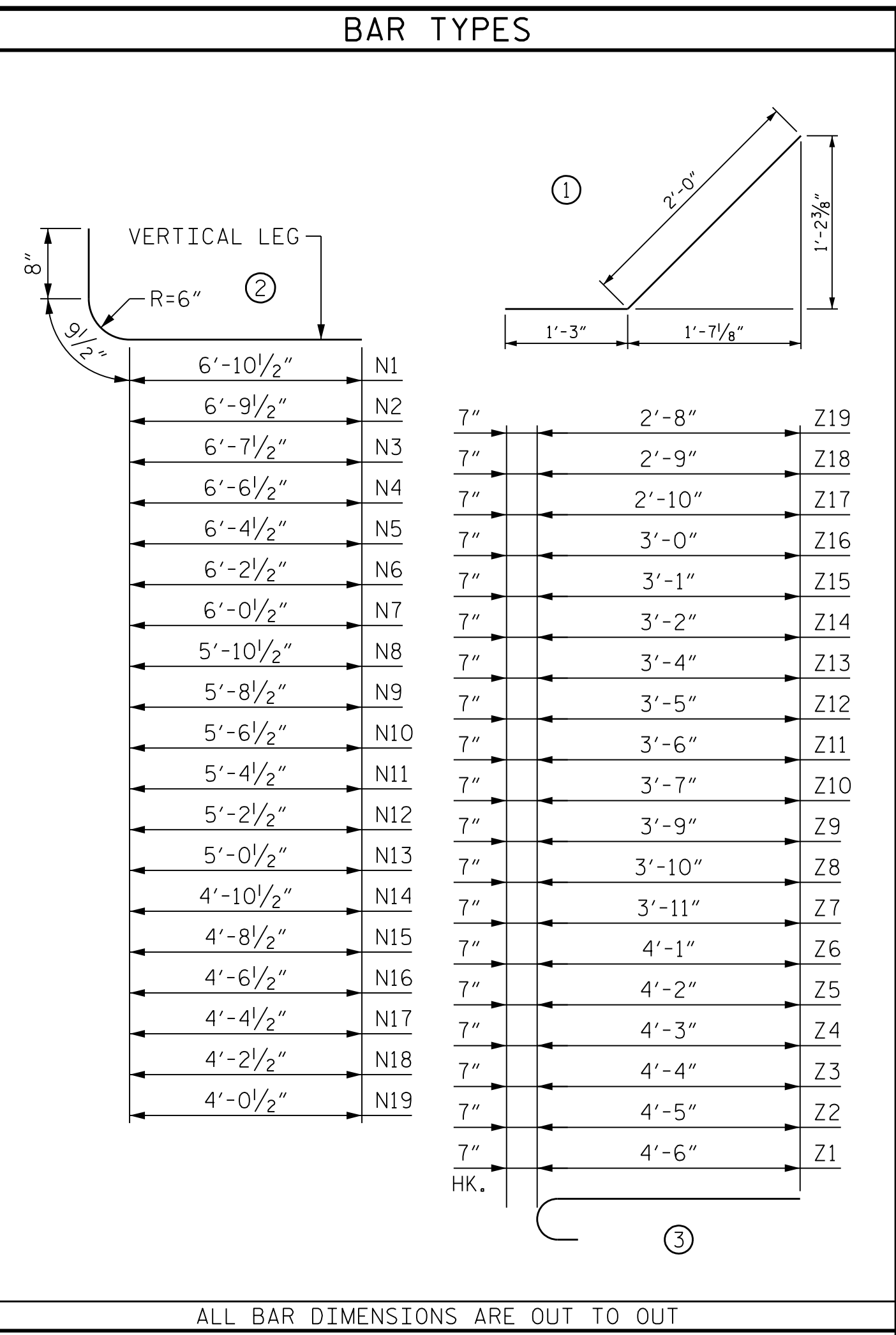


ELEVATION - WING W1

| BILL OF MATERIAL |     |      |      |         |        |     |     |      |      |                   |          |
|------------------|-----|------|------|---------|--------|-----|-----|------|------|-------------------|----------|
| BAR              | NO. | SIZE | TYPE | LENGTH  | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH            | WEIGHT   |
| H1               | 6   | #4   | STR. | 16'-8"  | 67     | V8  | 1   | #4   | STR. | 5'-3"             | 4        |
| H2               | 2   | #4   | STR. | 9'-5"   | 13     | V9  | 1   | #4   | STR. | 5'-1"             | 3        |
| H3               | 2   | #4   | STR. | 16'-10" | 22     | V10 | 1   | #4   | STR. | 4'-11"            | 3        |
| H4               | 10  | #4   | 1    | 3'-3"   | 22     | V11 | 1   | #4   | STR. | 4'-9"             | 3        |
|                  |     |      |      |         |        | V12 | 1   | #4   | STR. | 4'-8"             | 3        |
| N1               | 2   | #5   | 2    | 8'-4"   | 17     | V13 | 1   | #4   | STR. | 4'-6"             | 3        |
| N2               | 1   | #5   | 2    | 8'-3"   | 9      | V14 | 1   | #4   | STR. | 4'-4"             | 3        |
| N3               | 1   | #5   | 2    | 8'-1"   | 8      | V15 | 1   | #4   | STR. | 4'-2"             | 3        |
| N4               | 1   | #5   | 2    | 8'-0"   | 8      | V16 | 1   | #4   | STR. | 4'-0"             | 3        |
| N5               | 1   | #5   | 2    | 7'-10"  | 8      | V17 | 1   | #4   | STR. | 3'-10"            | 3        |
| N6               | 1   | #5   | 2    | 7'-8"   | 8      | V18 | 1   | #4   | STR. | 3'-8"             | 2        |
| N7               | 1   | #5   | 2    | 7'-6"   | 8      | V19 | 1   | #4   | STR. | 3'-6"             | 2        |
| N8               | 1   | #5   | 2    | 7'-4"   | 8      |     |     |      |      |                   |          |
| N9               | 1   | #5   | 2    | 7'-2"   | 7      | Z1  | 2   | #5   | 3    | 5'-1"             | 11       |
| N10              | 1   | #5   | 2    | 7'-0"   | 7      | Z2  | 1   | #5   | 3    | 5'-0"             | 5        |
| N11              | 1   | #5   | 2    | 6'-10"  | 7      | Z3  | 1   | #5   | 3    | 4'-11"            | 5        |
| N12              | 1   | #5   | 2    | 6'-8"   | 7      | Z4  | 1   | #5   | 3    | 4'-10"            | 5        |
| N13              | 1   | #5   | 2    | 6'-6"   | 7      | Z5  | 1   | #5   | 3    | 4'-9"             | 5        |
| N14              | 1   | #5   | 2    | 6'-4"   | 7      | Z6  | 1   | #5   | 3    | 4'-8"             | 5        |
| N15              | 1   | #5   | 2    | 6'-2"   | 6      | Z7  | 1   | #5   | 3    | 4'-6"             | 5        |
| N16              | 1   | #5   | 2    | 6'-0"   | 6      | Z8  | 1   | #5   | 3    | 4'-5"             | 5        |
| N17              | 1   | #5   | 2    | 5'-10"  | 6      | Z9  | 1   | #5   | 3    | 4'-4"             | 5        |
| N18              | 1   | #5   | 2    | 5'-8"   | 6      | Z10 | 1   | #5   | 3    | 4'-2"             | 4        |
| N19              | 1   | #5   | 2    | 5'-6"   | 6      | Z11 | 1   | #5   | 3    | 4'-1"             | 4        |
|                  |     |      |      |         |        | Z12 | 1   | #5   | 3    | 4'-0"             | 4        |
| S1               | 3   | #6   | STR. | 6'-0"   | 27     | Z13 | 1   | #5   | 3    | 3'-11"            | 4        |
|                  |     |      |      |         |        | Z14 | 1   | #5   | 3    | 3'-9"             | 4        |
| T1               | 3   | #5   | STR. | 18'-6"  | 58     | Z15 | 1   | #5   | 3    | 3'-8"             | 4        |
|                  |     |      |      |         |        | Z16 | 1   | #5   | 3    | 3'-7"             | 4        |
| V1               | 2   | #4   | STR. | 6'-3"   | 8      | Z17 | 1   | #5   | 3    | 3'-5"             | 4        |
| V2               | 1   | #4   | STR. | 6'-2"   | 4      | Z18 | 1   | #5   | 3    | 3'-4"             | 3        |
| V3               | 1   | #4   | STR. | 6'-1"   | 4      | Z19 | 1   | #5   | 3    | 3'-3"             | 3        |
| V4               | 1   | #4   | STR. | 5'-11"  | 4      |     |     |      |      |                   |          |
| V5               | 1   | #4   | STR. | 5'-9"   | 4      |     |     |      |      |                   |          |
| V6               | 1   | #4   | STR. | 5'-7"   | 4      |     |     |      |      |                   |          |
| V7               | 1   | #4   | STR. | 5'-5"   | 4      |     |     |      |      |                   |          |
|                  |     |      |      |         |        |     |     |      |      | REINFORCING STEEL | 511 LBS. |
|                  |     |      |      |         |        |     |     |      |      | CLASS A CONCRETE  | 6.7 CY   |



TYPICAL WING SECTION



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. U-2714  
 WAYNE COUNTY  
 STATION: 75+49.09 -L-  
 SHEET 5 OF 6



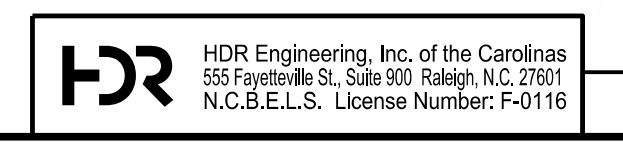
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SINGLE 8 FT. x 6 FT.  
 CONCRETE BOX CULVERT  
 101° SKEW

| REVISIONS |     |       |     |     |       |
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| NO.       | BY: | DATE: | NO. | BY: | DATE: |
| 1         |     |       | 3   |     |       |
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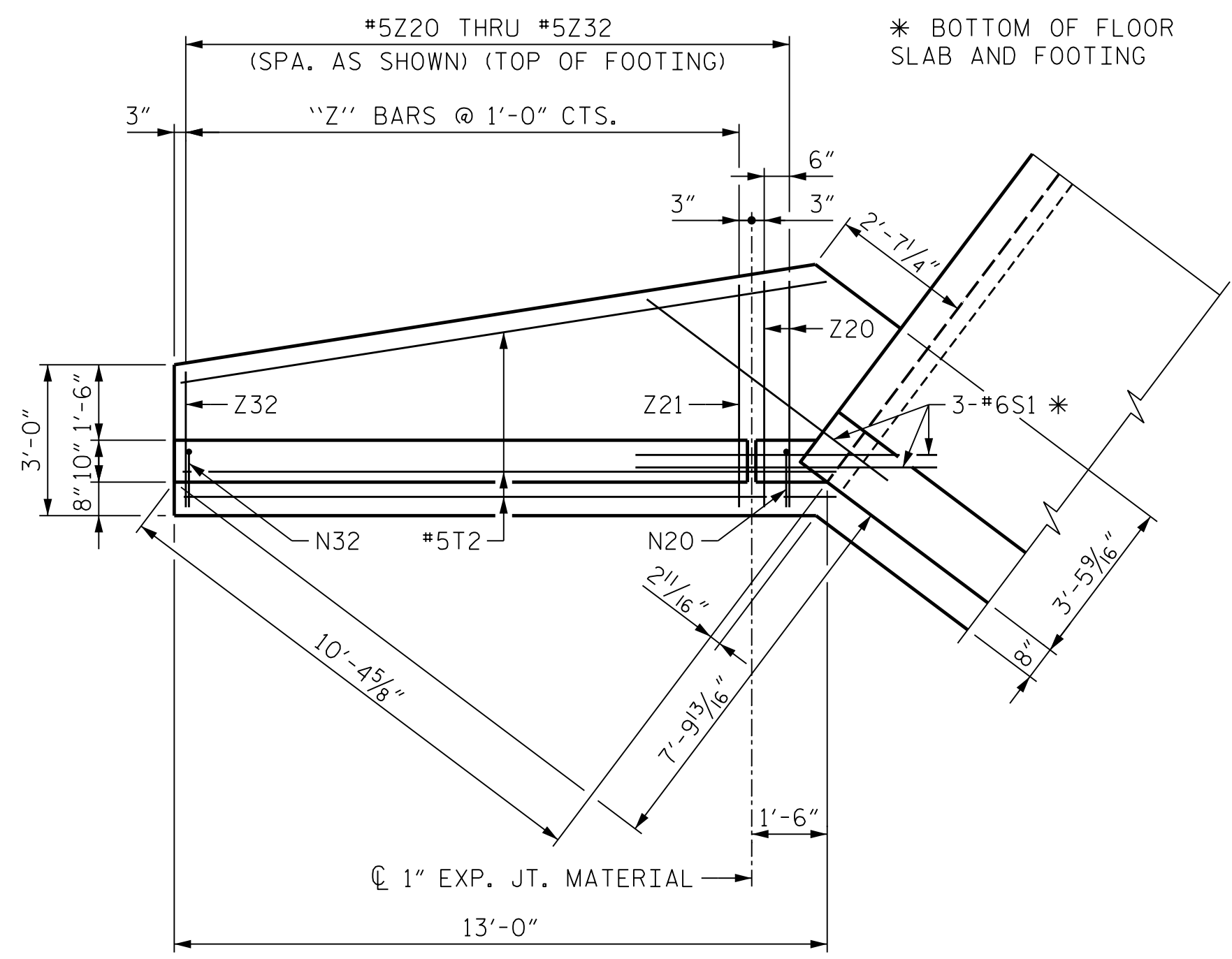
SHEET NO. C-5  
 TOTAL SHEETS 7

PLOT DRIVER: U-2714\_PLOTTER.plt  
 USER: WTOWE DATE: 12/9/2019  
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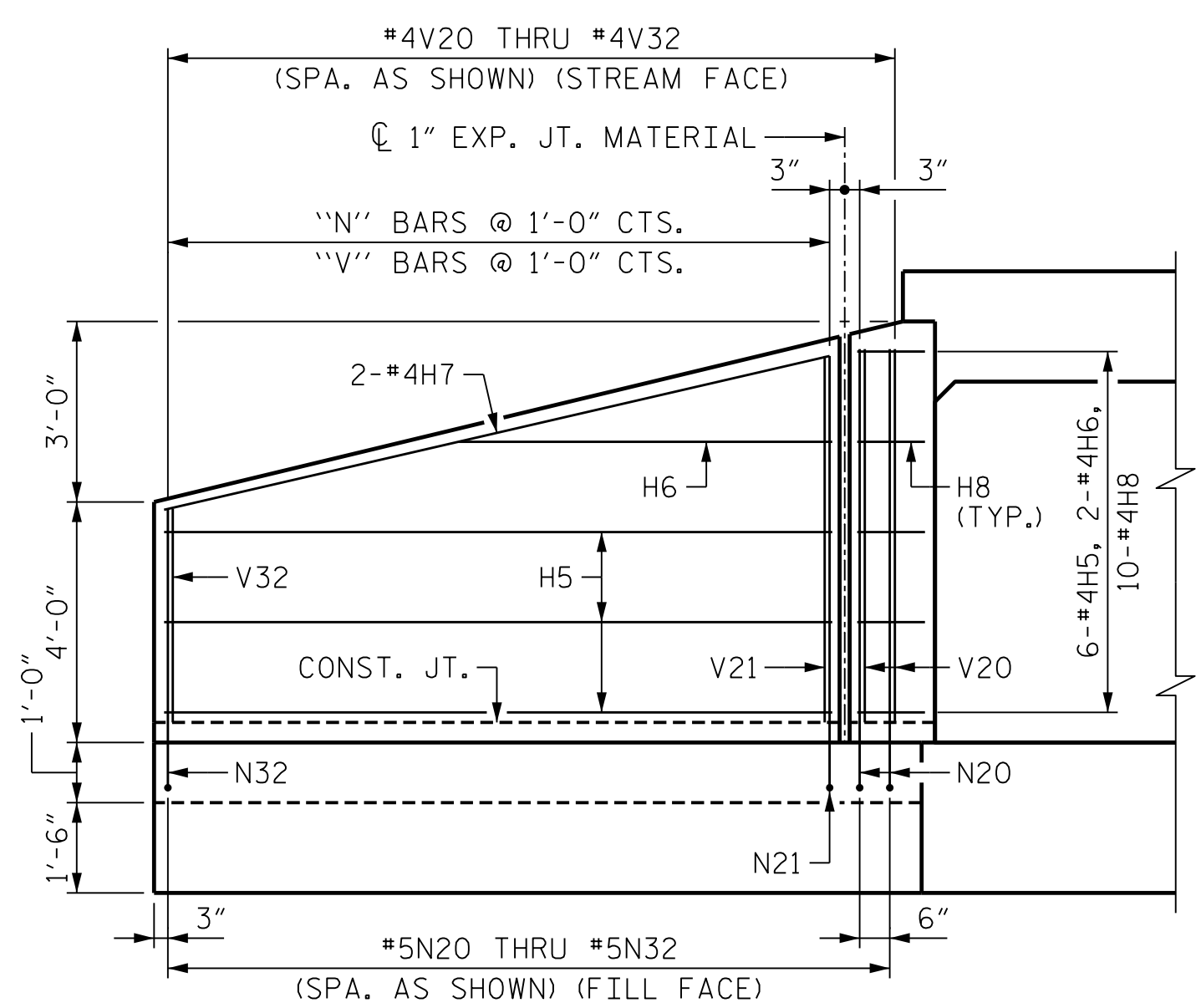
DES BY: A. HOUK DATE: 01/18  
 DES CHK: T. ANDREWS DATE: 01/18  
 DWG BY: W. TOWE DATE: 01/18  
 CHK BY: T. ANDREWS DATE: 01/18



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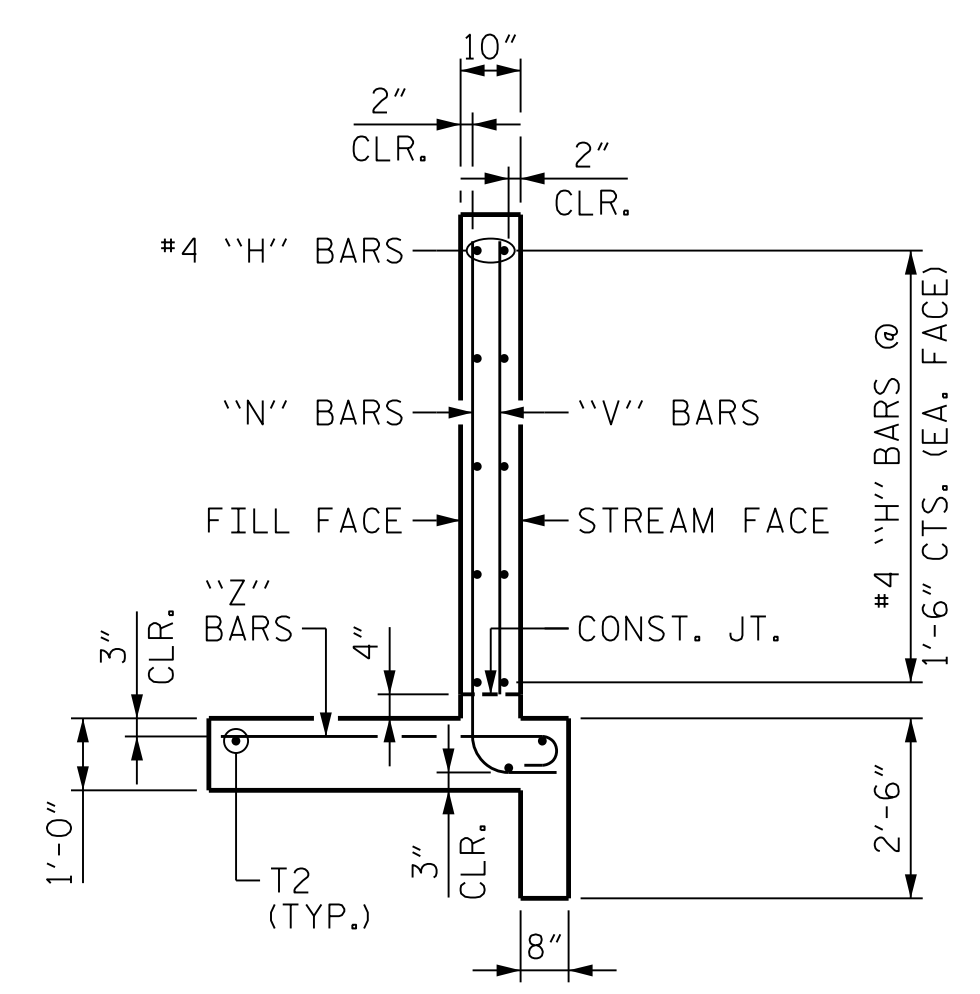
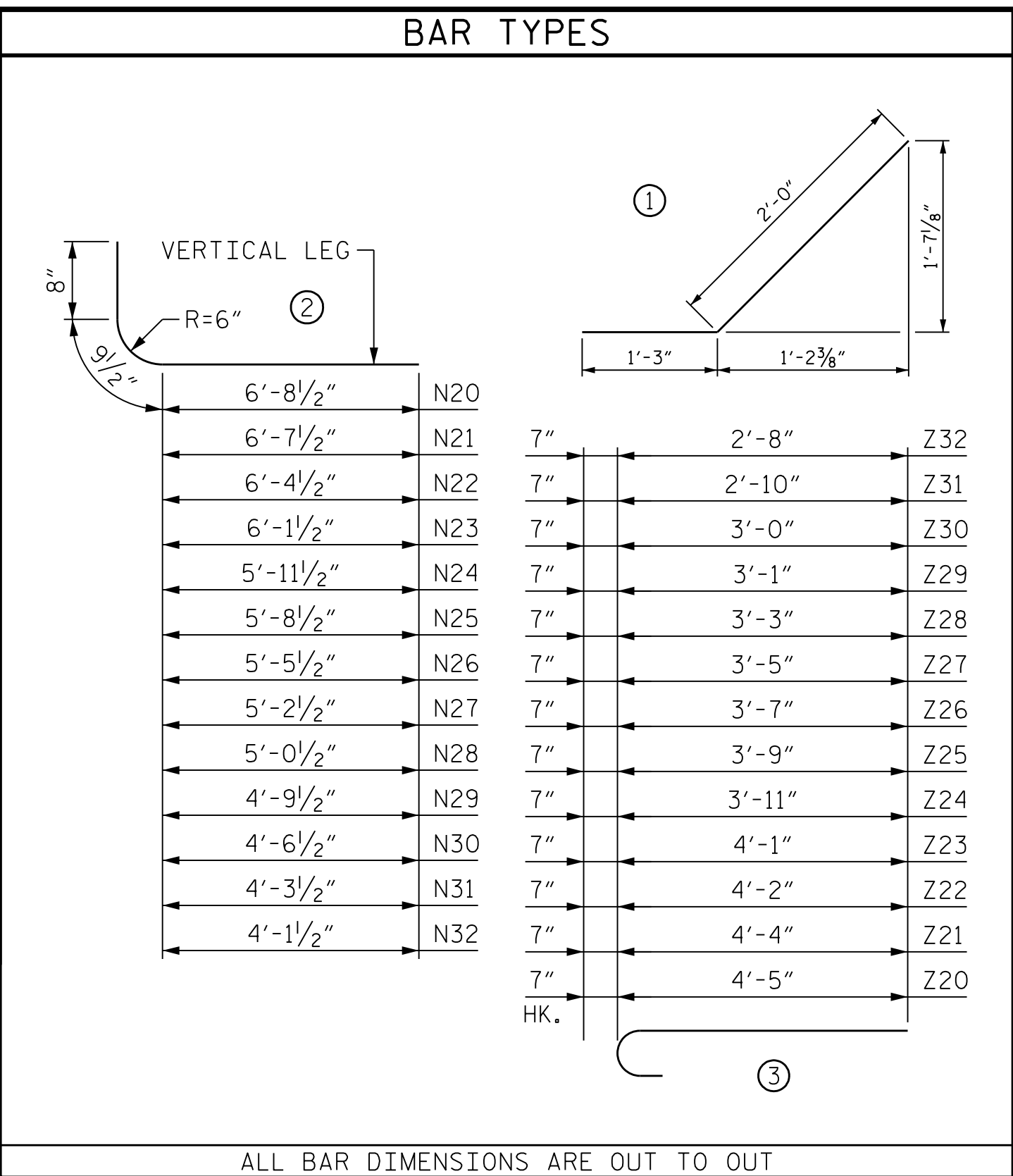


PLAN - WING W2



ELEVATION - WING W2

| BILL OF MATERIAL |     |      |      |        |        |     |     |      |      |                   |          |
|------------------|-----|------|------|--------|--------|-----|-----|------|------|-------------------|----------|
| BAR              | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH            | WEIGHT   |
| H5               | 6   | #4   | STR. | 11'-2" | 45     | V24 | 1   | #4   | STR. | 5'-4"             | 4        |
| H6               | 2   | #4   | STR. | 6'-2"  | 8      | V25 | 1   | #4   | STR. | 5'-1"             | 3        |
| H7               | 2   | #4   | STR. | 11'-5" | 15     | V26 | 1   | #4   | STR. | 4'-11"            | 3        |
| H8               | 10  | #4   | 1    | 3'-3"  | 22     | V27 | 1   | #4   | STR. | 4'-8"             | 3        |
|                  |     |      |      |        |        | V28 | 1   | #4   | STR. | 4'-5"             | 3        |
| N20              | 2   | #5   | 2    | 8'-2"  | 17     | V29 | 1   | #4   | STR. | 4'-2"             | 3        |
| N21              | 1   | #5   | 2    | 8'-1"  | 8      | V30 | 1   | #4   | STR. | 4'-0"             | 3        |
| N22              | 1   | #5   | 2    | 7'-10" | 8      | V31 | 1   | #4   | STR. | 3'-9"             | 3        |
| N23              | 1   | #5   | 2    | 7'-7"  | 8      | V32 | 1   | #4   | STR. | 3'-6"             | 2        |
| N24              | 1   | #5   | 2    | 7'-5"  | 8      |     |     |      |      |                   |          |
| N25              | 1   | #5   | 2    | 7'-2"  | 7      | Z20 | 2   | #5   | 3    | 5'-0"             | 10       |
| N26              | 1   | #5   | 2    | 6'-11" | 7      | Z21 | 1   | #5   | 3    | 4'-11"            | 5        |
| N27              | 1   | #5   | 2    | 6'-8"  | 7      | Z22 | 1   | #5   | 3    | 4'-9"             | 5        |
| N28              | 1   | #5   | 2    | 6'-6"  | 7      | Z23 | 1   | #5   | 3    | 4'-8"             | 5        |
| N29              | 1   | #5   | 2    | 6'-3"  | 7      | Z24 | 1   | #5   | 3    | 4'-6"             | 5        |
| N30              | 1   | #5   | 2    | 6'-0"  | 6      | Z25 | 1   | #5   | 3    | 4'-4"             | 5        |
| N31              | 1   | #5   | 2    | 5'-9"  | 6      | Z26 | 1   | #5   | 3    | 4'-2"             | 4        |
| N32              | 1   | #5   | 2    | 5'-7"  | 6      | Z27 | 1   | #5   | 3    | 4'-0"             | 4        |
|                  |     |      |      |        |        | Z28 | 1   | #5   | 3    | 3'-10"            | 4        |
| S1               | 3   | #6   | STR. | 6'-0"  | 27     | Z29 | 1   | #5   | 3    | 3'-8"             | 4        |
|                  |     |      |      |        |        | Z30 | 1   | #5   | 3    | 3'-7"             | 4        |
| T2               | 3   | #5   | STR. | 13'-0" | 41     | Z31 | 1   | #5   | 3    | 3'-5"             | 4        |
|                  |     |      |      |        |        | Z32 | 1   | #5   | 3    | 3'-3"             | 3        |
| V20              | 2   | #4   | STR. | 6'-2"  | 8      |     |     |      |      |                   |          |
| V21              | 1   | #4   | STR. | 6'-1"  | 4      |     |     |      |      |                   |          |
| V22              | 1   | #4   | STR. | 5'-10" | 4      |     |     |      |      |                   |          |
| V23              | 1   | #4   | STR. | 5'-7"  | 4      |     |     |      |      |                   |          |
|                  |     |      |      |        |        |     |     |      |      | REINFORCING STEEL | 369 LBS. |
|                  |     |      |      |        |        |     |     |      |      | CLASS A CONCRETE  | 4.7 CY   |



TYPICAL WING SECTION

PROJECT NO. U-2714  
 WAYNE COUNTY  
 STATION: 75+49.09 -L-  
 SHEET 6 OF 6

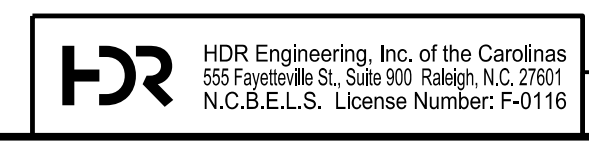


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SINGLE 8 FT. x 6 FT.  
 CONCRETE BOX CULVERT  
 101° SKEW

| REVISIONS |     |       |     |     |       |
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DES BY: A. HOUK DATE: 01/18  
 DES CHK: T. ANDREWS DATE: 01/18  
 DWG BY: W. TOWE DATE: 01/18  
 CHK BY: T. ANDREWS DATE: 01/18



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SHEET NO. C-6  
 TOTAL SHEETS 7



# STANDARD NOTES

## DESIGN DATA:

SPECIFICATIONS - - - - - A.A.S.H.T.O. (CURRENT)

LIVE LOAD - - - - - SEE PLANS

IMPACT ALLOWANCE - - - - - SEE A.A.S.H.T.O.

STRESS IN EXTREME FIBER OF

    STRUCTURAL STEEL - AASHTO M270 GRADE 36 - - 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 COMPRESSION - - - - - 1,200 LBS. PER SQ. IN.

CONCRETE IN SHEAR - - - - - SEE A.A.S.H.T.O.

STRUCTURAL TIMBER - TREATED OR UNTREATED

                                  - EXTREME FIBER STRESS - - - 1,800 LBS. PER SQ. IN.

COMPRESSION PERPENDICULAR TO GRAIN - - - - - 375 LBS. PER SQ. IN.

  OF TIMBER

EQUIVALENT FLUID PRESSURE OF EARTH - - - - - 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 2018 "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:

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.

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

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.

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.

## 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.

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.

## STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE  $\frac{7}{8}$ "  $\emptyset$  SHEAR STUDS FOR THE  $\frac{3}{4}$ "  $\emptyset$  STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF  $\frac{7}{8}$ "  $\emptyset$  STUDS ALONG THE BEAM AS SHOWN FOR  $\frac{3}{4}$ "  $\emptyset$  STUDS BASED ON THE RATIO OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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.

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. FINIS 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.

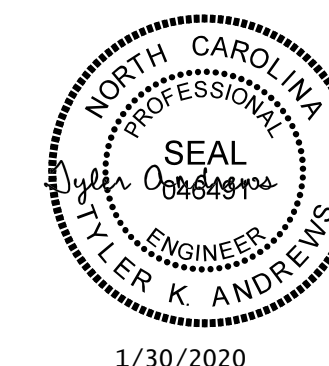
## SPECIAL NOTES:

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.

PROJECT NO. U-2714

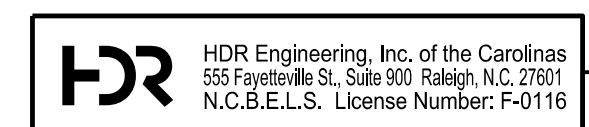
WAYNE COUNTY

STATION: 75+49.09 -L-



1/30/2020

|  |     |       |     |     |                                       |
|--|-----|-------|-----|-----|---------------------------------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                                       |
| STANDARD NOTES   |     |       |     |     |                                       |
| REVISIONS  |     |       |     |     |                                       |
| NO.  | BY: | DATE: | NO. | BY: | DATE:                                 |
| 1  |     |       | 3   |     |                                       |
| 2  |     |       | 4   |     |                                       |
|  |     |       |     |     | SHEET NO.<br>C-7<br>TOTAL SHEETS<br>7 |



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PLOT DRIVER: U-2714\_PLOTTER.plt  
 USER: WTOWE  
 DATE: 12/9/2019  
 TIME: 6:21:40 AM  
 FILE: ... \3.0 FinalPlans\C-7