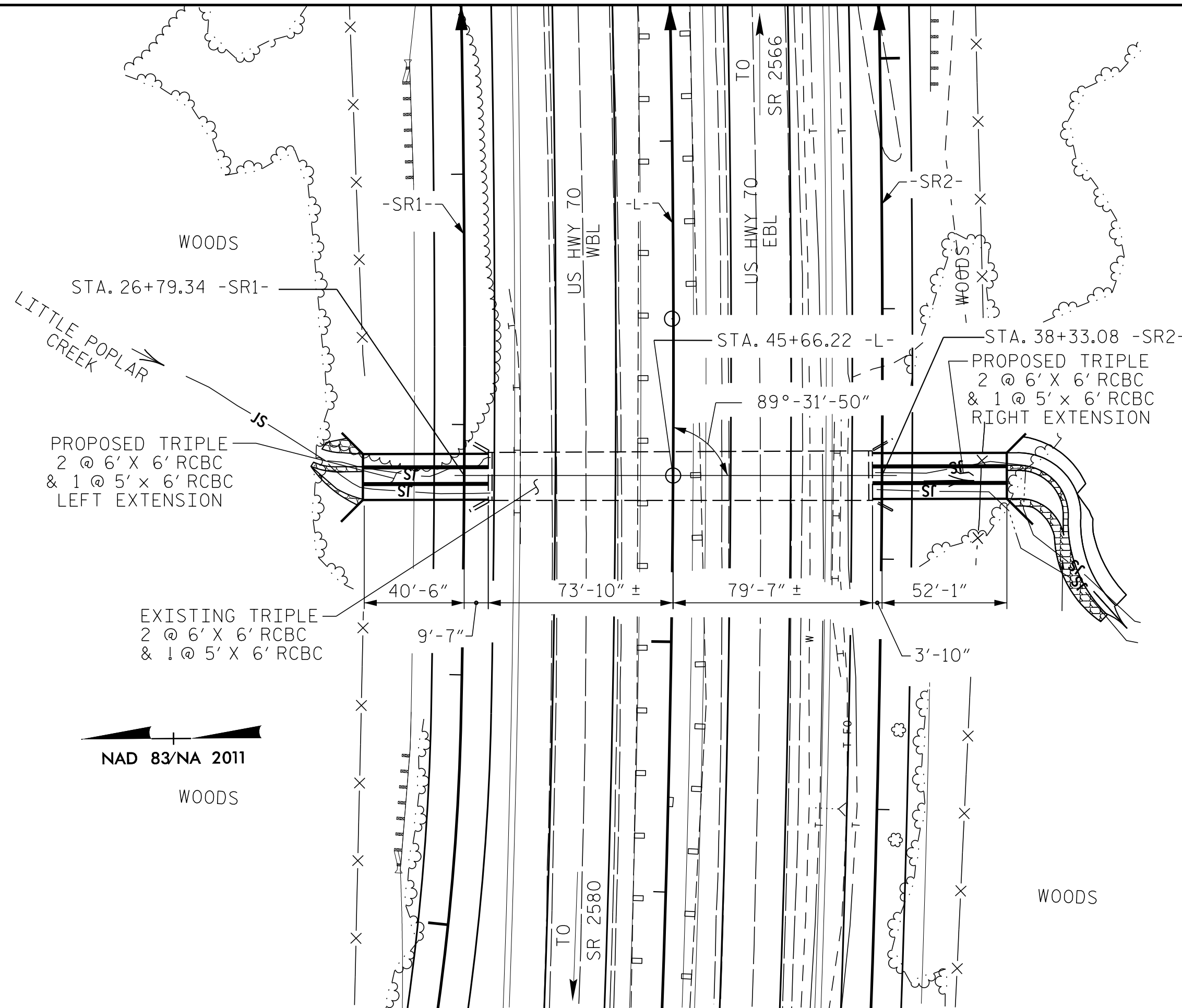


Bm #3, BENCH TIE NAIL SET IN 18" PINE, STA. 48+76.43 -L-, 226.36 RT., EL. 258.83 N670403, E2180067

F.A. PROJECT NO. HISP-0070(163)



ROADWAY DATA

GRADE POINT ELEV. @ STA 45+66.22 -L- = 248.13
 BED ELEV. @ STATION 45+66.22 -L- = 233.05
 ROADWAY SLOPES = 3:1

HYDRAULIC DATA

DESIGN DISCHARGE = 480 CFS
 FREQUENCY OF DESIGN FLOOD = 50 YEARS
 DESIGN HIGH WATER ELEVATION = 238.3
 DRAINAGE AREA = 1.73 SQ. MI.
 BASE DISCHARGE (Q100) = 540 CFS
 BASE HIGH WATER ELEVATION = 238.7

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 710+ CFS
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YEAR
 OVERTOPPING FLOOD ELEVATION = 251.7
 OVERTOPPING OCCURS AT THE TOP OF THE BARRIER RAIL AT THE PROPOSED SAG STA. 44+18.99 -L-

LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES

ASSUMED LIVE LOAD ----- HL-93 OR ALTERNATE LOADING.
 DESIGN FILL TO BOTTOM OF TOP SLAB ----- 10.0' (MAX.) AND 7.0' (MIN.).
 FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN THE CULVERT TO BE POURED IN THE FOLLOWING ORDER:
 STAGE I:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT.

STAGE II

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY THE ENTIRE 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 AND BOTH FACES OF INTERIOR WALLS 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.

THE EXISTING STRUCTURE CONSISTING OF A 2 @ 6'x6' AND 1 @ 5'x6' REINFORCED CONCRETE BOX CULVERT 153'-5" LONG ALONG THE CENTERLINE OF CULVERT SHALL BE RETAINED AND EXTENDED. THE EXISTING CULVERT IS PRESENTLY NOT POSTED FOR LOAD LIMIT.

FOR CULVERT DIVERSIONS DETAILS AND PAY ITEM, 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 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.

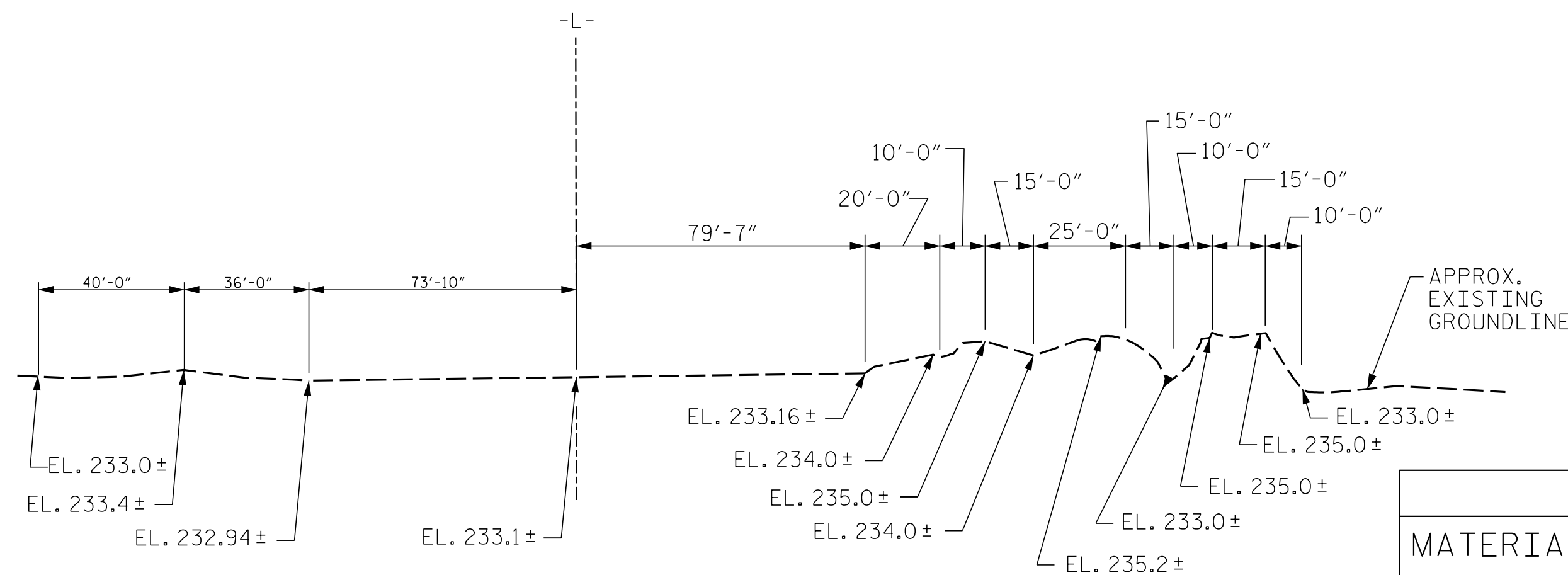
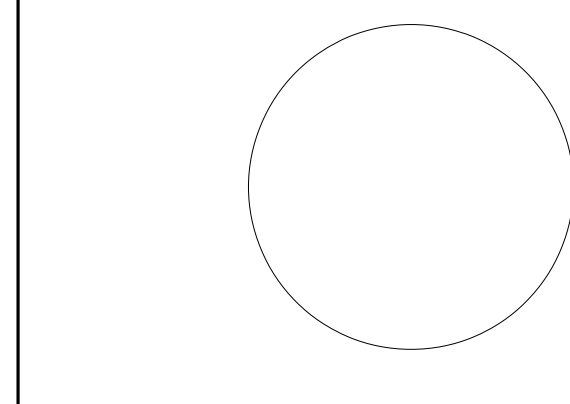
IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE 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 SHEET SN.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

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 SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



PROFILE ALONG CULVERT

TOTAL BILL OF MATERIAL

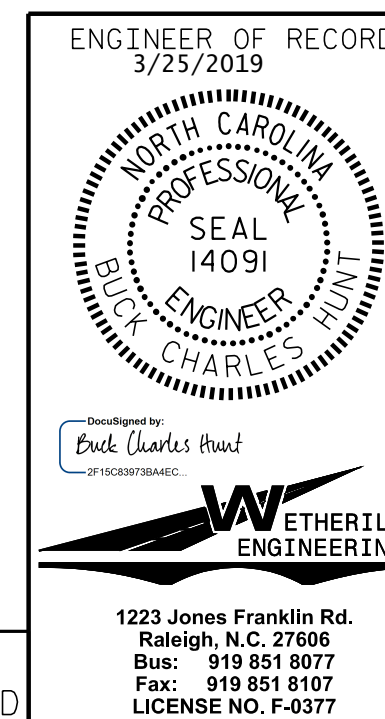
| MATERIAL | ELEMENT | STAGE I | STAGE I | STAGE II | STAGE II |
|-------------------------------|---------------|-----------|------------|-----------|------------|
| | | LEFT EXT. | RIGHT EXT. | LEFT EXT. | RIGHT EXT. |
| CLASS A CONCRETE (CU. YDS.) | BARREL | 28.2 | 31.5 | 61.5 | 68.7 |
| | HEADWALLS | ---- | ---- | 0.9 | 0.9 |
| | CURTAIN WALLS | 0.4 | 0.4 | 0.7 | 0.7 |
| | WINGS | 5.9 | 5.9 | 5.9 | 5.9 |
| | TOTAL | 34.5 | 37.8 | 69.0 | 76.2 |
| REINFORCING STEEL (LBS.) | BARREL | 4547 | 5073 | 8818 | 9841 |
| | WINGS | 328 | 328 | 328 | 328 |
| | TOTAL | 4875 | 5401 | 9146 | 10169 |
| | | TOTAL | 29591 | | |
| FOUNDATION COND. MAT'L (TONS) | | 35 | 40 | 50 | 60 |
| | | TOTAL 185 | | | |
| CULVERT EXCAVATION | | LUMP SUM | | | |

| 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" |

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND fy = 60 ksi.

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 45+66.22 -L-

SHEET 1 OF 10 BRIDGE NO. E2076



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
TRIPLE BARREL
2 @ 6 FT. X 6 FT.
1 @ 5 FT. X 6 FT.
CONCRETE BOX
CULVERT
LEFT & RIGHT EXTENSIONS

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | C1-1 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 10 |

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DRAWN BY : B.C. HUNT DATE : 4-18
 CHECKED BY : J.A. DILWORTH DATE : 5-18

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

| LEVEL | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING # | MINIMUM RATING FACTORS (RF) | TONS = W x RF | STRENGTH I LIMIT STATE | | | | | | | | COMMENT NUMBER | | |
|--------------------|-----------------------------------|----------------------|---------------------------------|-----------------------------------|---------------|---|---------------|----------|--------------|--|---------------|----------|--------------|----------------|--|--|
| | | | | | | LIVE-LOAD FACTORS (γ _{L1}) | MOMENT | | | | SHEAR | | | | | |
| | | | | | | | RATING FACTOR | BOX NO. | ELEMENT TYPE | DISTANCE FROM LEFT END OF ELEMENT (FT) | RATING FACTOR | BOX NO. | ELEMENT TYPE | | DISTANCE FROM LEFT END OF ELEMENT (FT) | |
| DESIGN LOAD RATING | HL-93 (INVENTORY) | N/A | ① | 1.80 | -- | 1.75 | 2.50 | 1 | TOP SLAB | 6.67 | 1.80 | 1 | TOP SLAB | 6.67 | | |
| | HL-93 (OPERATING) | N/A | | 2.33 | -- | 1.35 | 3.24 | 1 | TOP SLAB | 6.67 | 2.33 | 1 | TOP SLAB | 6.67 | | |
| | HS-20 (INVENTORY) | 36,000 | ② | 2.22 | 79.92 | 1.75 | 3.02 | 1 | TOP SLAB | 3.00 | 2.22 | 1 | TOP SLAB | 6.67 | | |
| | HS-20 (OPERATING) | 36,000 | | 2.88 | 103.68 | 1.35 | 3.91 | 1 | TOP SLAB | 3.00 | 2.88 | 1 | TOP SLAB | 6.67 | | |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13,500 | | 3.84 | 51.84 | 1.40 | 5.38 | 1 | TOP SLAB | 3.00 | 3.84 | 1 | TOP SLAB | 6.67 | |
| | | SNGARBS2 | 20,000 | | 3.61 | 72.20 | 1.40 | 4.95 | 1 | TOP SLAB | 3.00 | 3.61 | 1 | TOP SLAB | 6.67 | |
| | | SNAGRIS2 | 22,000 | | 3.84 | 84.48 | 1.40 | 5.19 | 1 | TOP SLAB | 3.00 | 3.84 | 1 | TOP SLAB | 6.67 | |
| | | SNCOTTS3 | 27,250 | | 2.36 | 64.31 | 1.40 | 3.30 | 1 | TOP SLAB | 6.67 | 2.36 | 1 | TOP SLAB | 6.67 | |
| | | SNAGGRS4 | 34,925 | ③ | 2.11 | 73.69 | 1.40 | 3.22 | 1 | TOP SLAB | 3.00 | 2.11 | 1 | TOP SLAB | 6.67 | |
| | | SNS5A | 35,550 | | 2.20 | 78.21 | 1.40 | 3.57 | 1 | TOP SLAB | 3.00 | 2.20 | 1 | TOP SLAB | 6.67 | |
| | | SNS6A | 39,950 | | 2.16 | 86.29 | 1.40 | 3.03 | 1 | TOP SLAB | 6.67 | 2.16 | 1 | TOP SLAB | 6.67 | |
| | | SNS7B | 42,000 | | 2.15 | 90.30 | 1.40 | 3.04 | 1 | TOP SLAB | 6.67 | 2.15 | 1 | TOP SLAB | 6.67 | |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33,000 | | 2.94 | 97.02 | 1.40 | 4.75 | 1 | TOP SLAB | 6.67 | 2.94 | 1 | TOP SLAB | 6.67 | |
| | | TNT4A | 33,075 | | 2.78 | 91.95 | 1.40 | 3.88 | 1 | TOP SLAB | 6.67 | 2.78 | 1 | TOP SLAB | 6.67 | |
| | | TNT6A | 41,600 | | 2.19 | 91.10 | 1.40 | 3.36 | 1 | TOP SLAB | 3.00 | 2.19 | 1 | TOP SLAB | 6.67 | |
| | | TNT7A | 42,000 | | 2.35 | 98.70 | 1.40 | 3.60 | 1 | TOP SLAB | 3.00 | 2.35 | 1 | TOP SLAB | 6.67 | |
| | | TNT7B | 42,000 | | 2.19 | 91.98 | 1.40 | 3.25 | 1 | TOP SLAB | 6.67 | 2.19 | 1 | TOP SLAB | 6.67 | |
| | | TNAGRIT4 | 43,000 | | 2.47 | 106.21 | 1.40 | 3.89 | 1 | TOP SLAB | 6.67 | 2.47 | 1 | TOP SLAB | 6.67 | |
| TNAGT5A | 45,000 | | 2.54 | 114.30 | 1.40 | 4.01 | 1 | TOP SLAB | 6.67 | 2.54 | 1 | TOP SLAB | 6.67 | | | |
| TNAGT5B | 45,000 | | 2.25 | 101.25 | 1.40 | 3.86 | 1 | TOP SLAB | 6.67 | 2.25 | 1 | TOP SLAB | 6.67 | | | |

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 | -- |

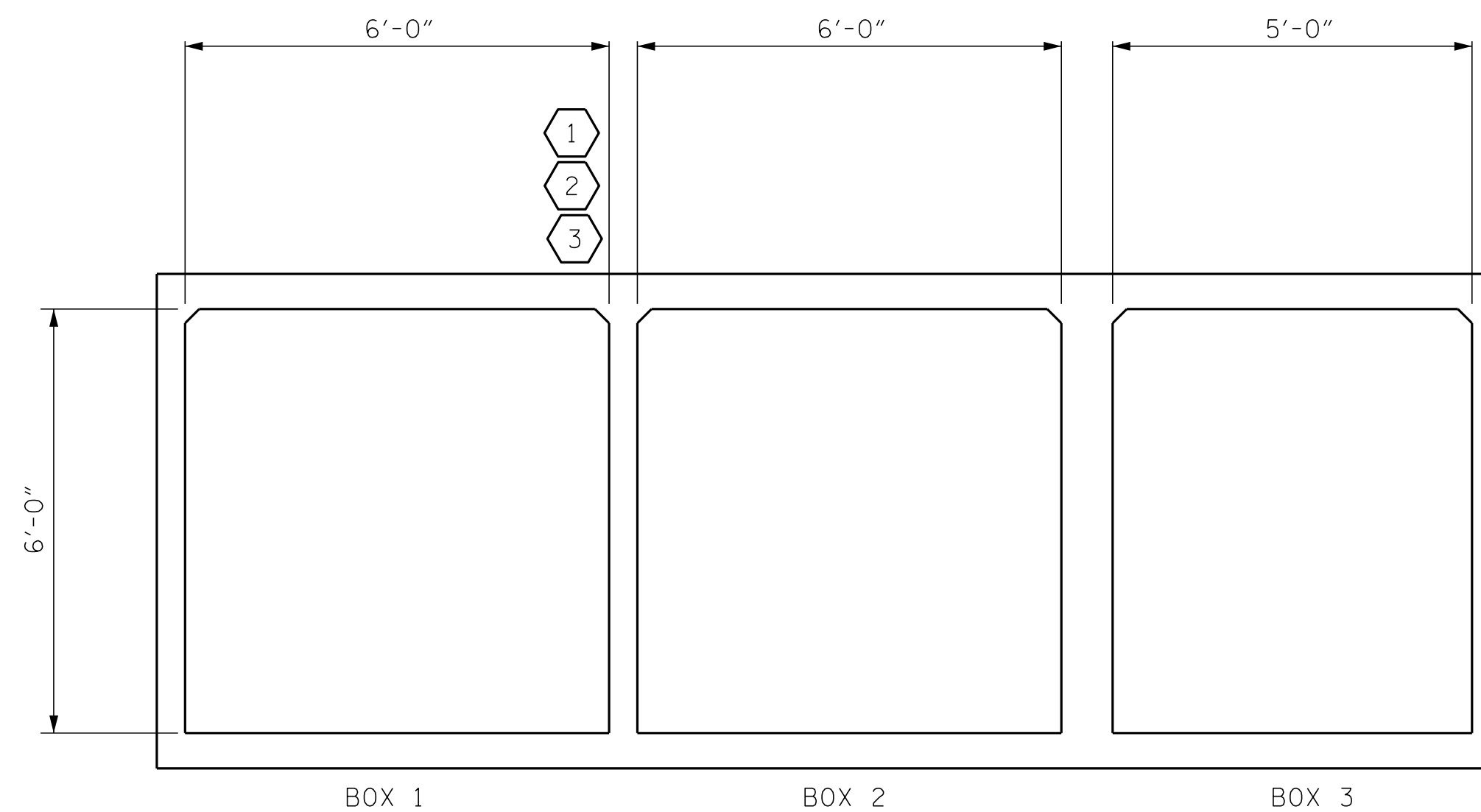
NOTE:

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 |

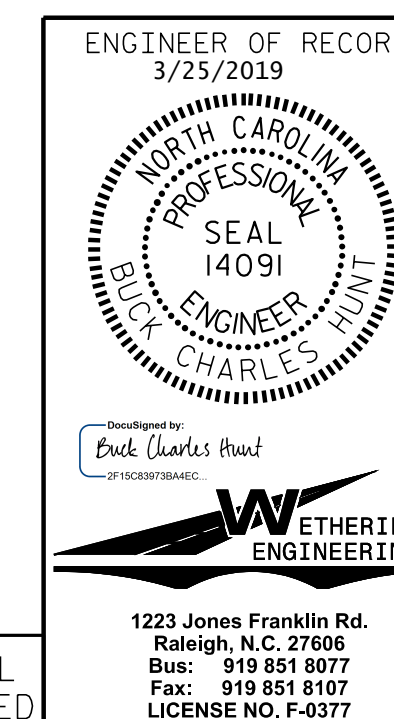


LRFR SUMMARY

(LOOKING UPSTREAM)

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 45+66.22 -L-

SHEET 2 OF 10



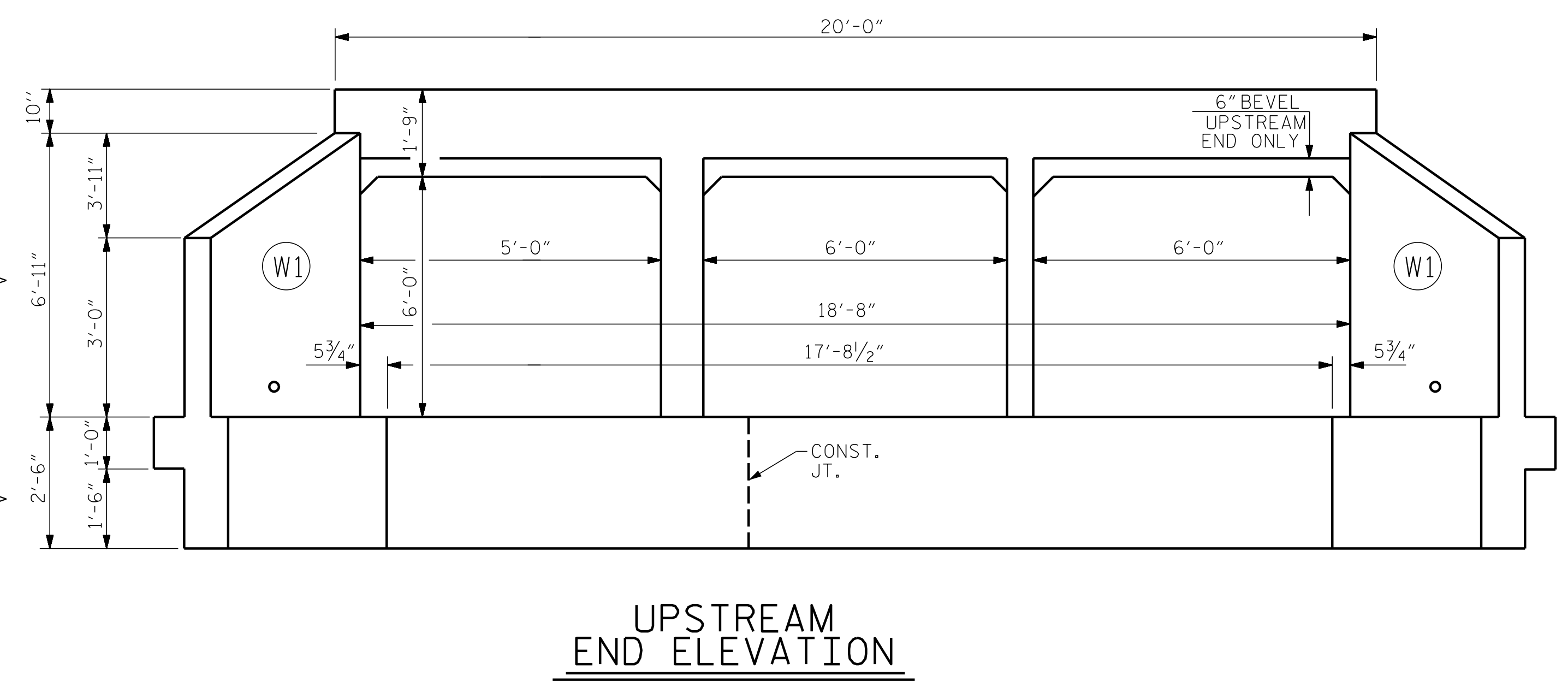
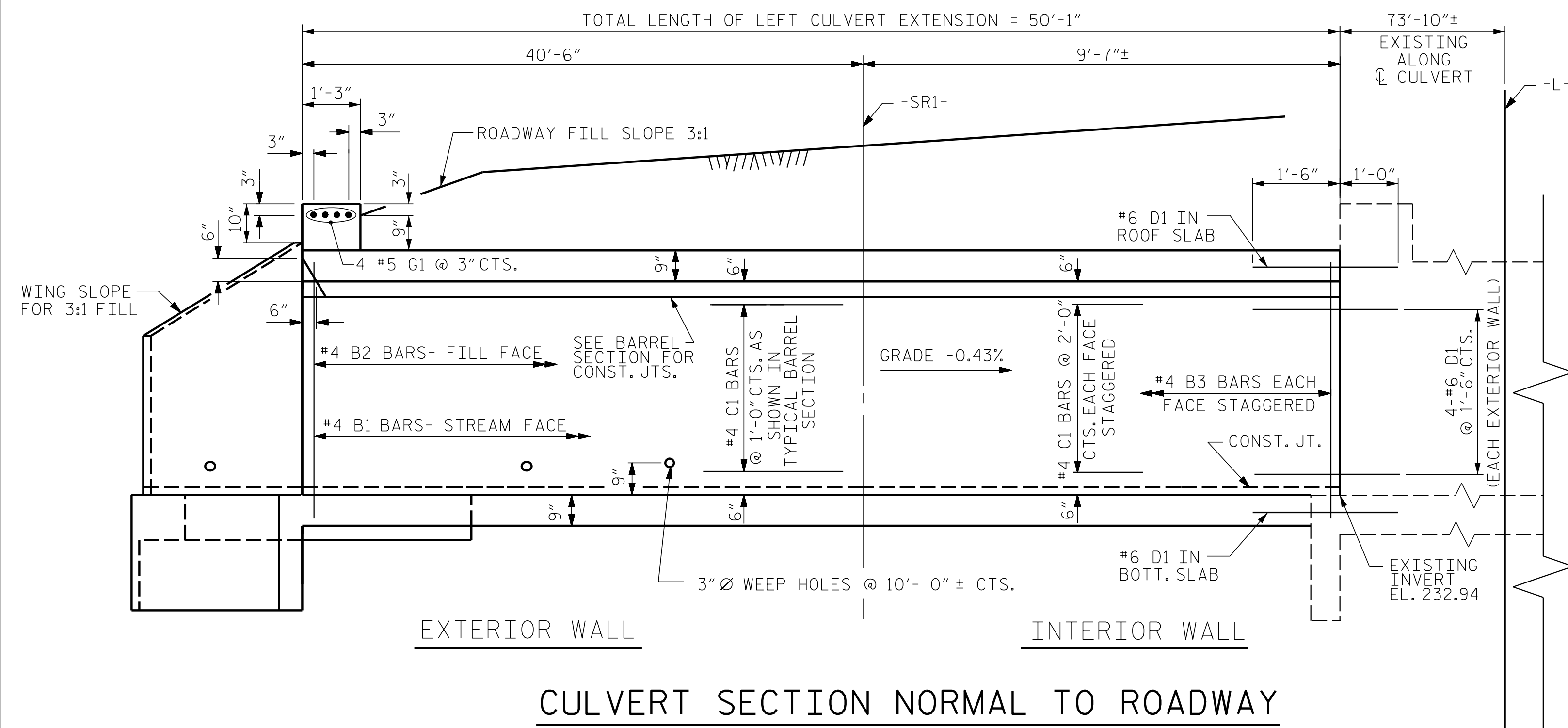
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | C1-2 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 10 |

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 LICENSE NO. F-0377

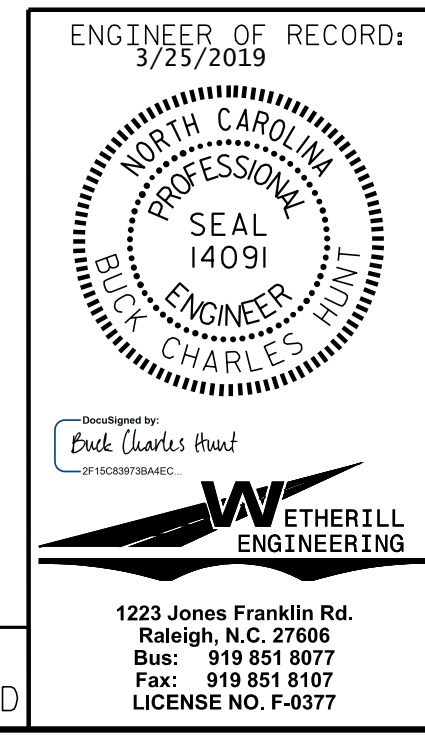
STD. NO. LRFR5



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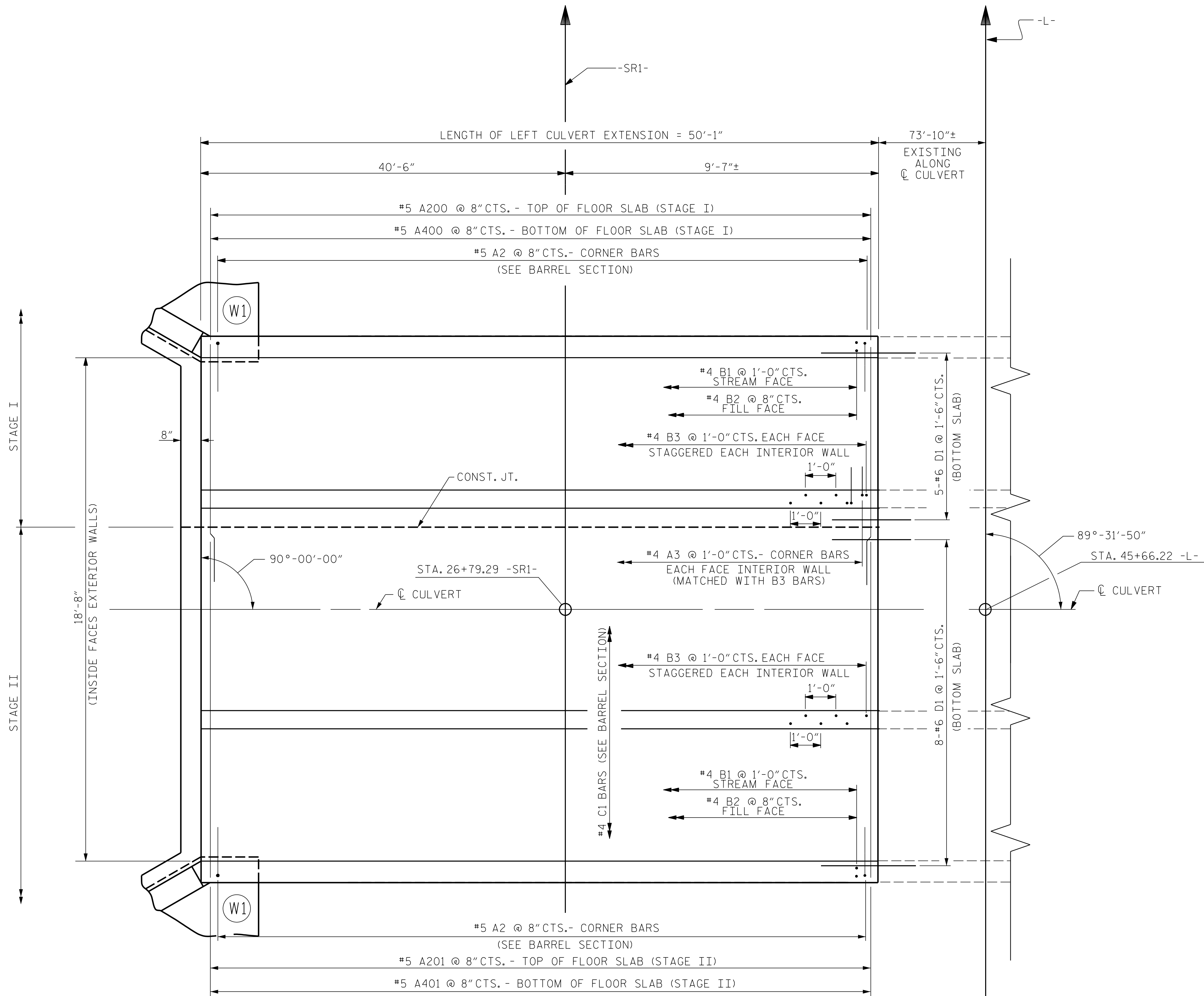


PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 45+66.22 -L-
 SHEET 3 OF 10

| | | | | | |
|--|-----|-------|-----|-----|-----------------|
| ENGINEER OF RECORD: 3/25/2019 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14091 BUCK CHARLES HUNT | | | | | |
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH TRIPLE BARREL 2 @ 6 FT. X 6 FT. 1 @ 5 FT. X 6 FT. CONCRETE BOX CULVERT LEFT EXTENSION | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
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| SHEET NO. C1-3 | | | | | TOTAL SHEETS 10 |

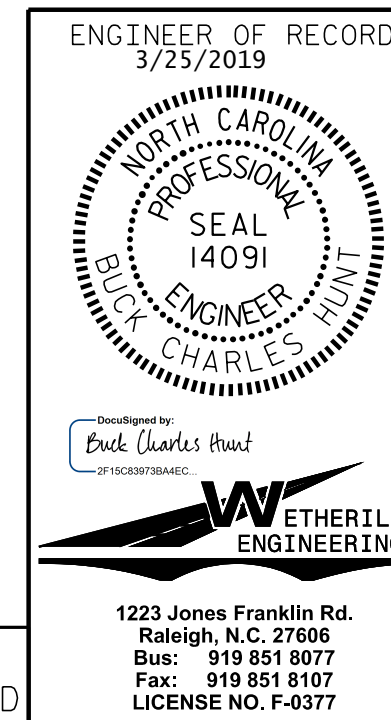
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 Fax: 919 851 8107
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PLAN - FLOOR SLAB

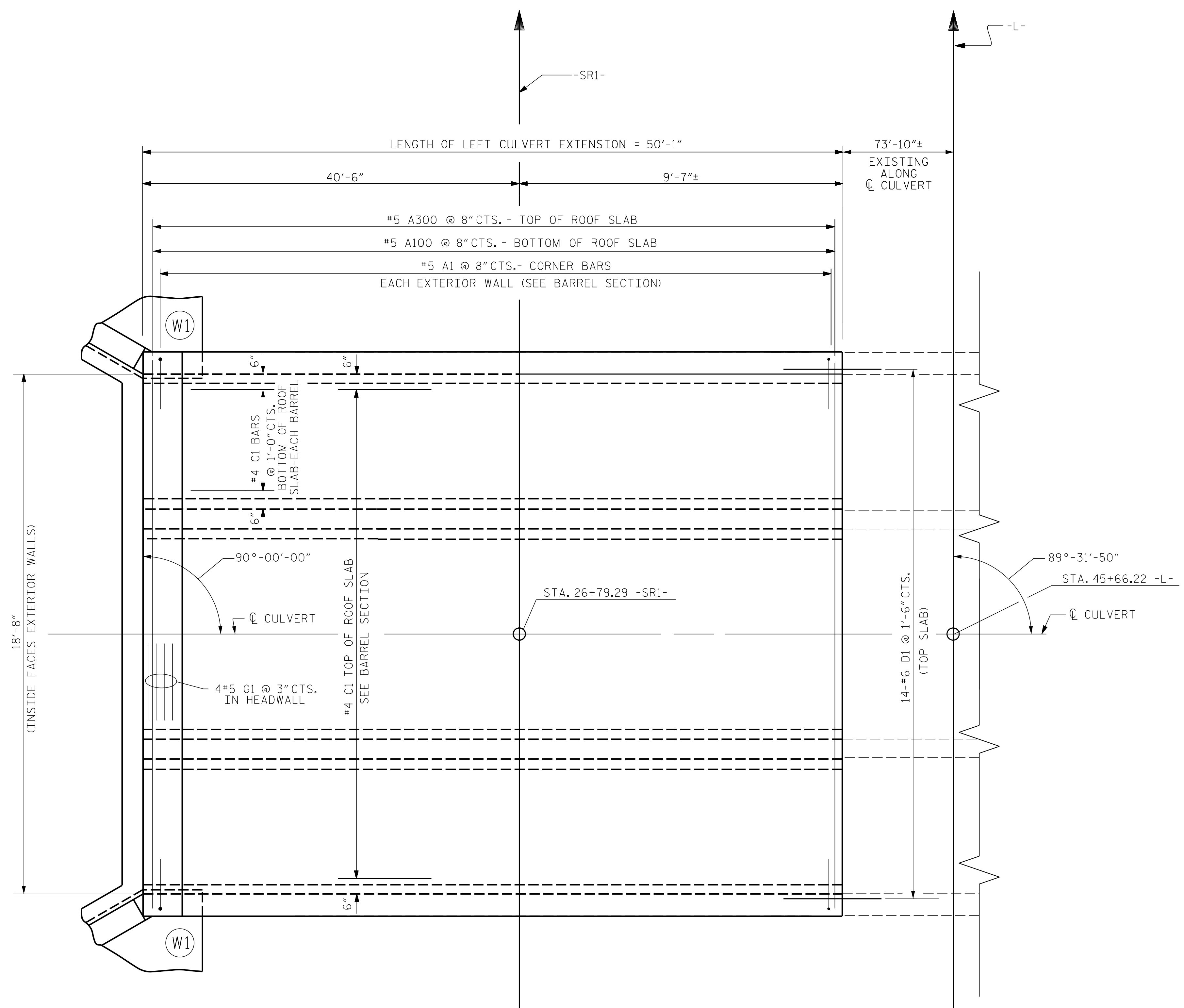
PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 45+66.22 -L-
 SHEET 4 OF 10



| | | | | | |
|---|-----|-------|-----|-----|-------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH TRIPLE BARREL 2 @ 6 FT. X 6 FT. 1 @ 5 FT. X 6 FT. CONCRETE BOX CULVERT LEFT EXTENSION | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
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| SHEET NO. | | | | | C1-4 |
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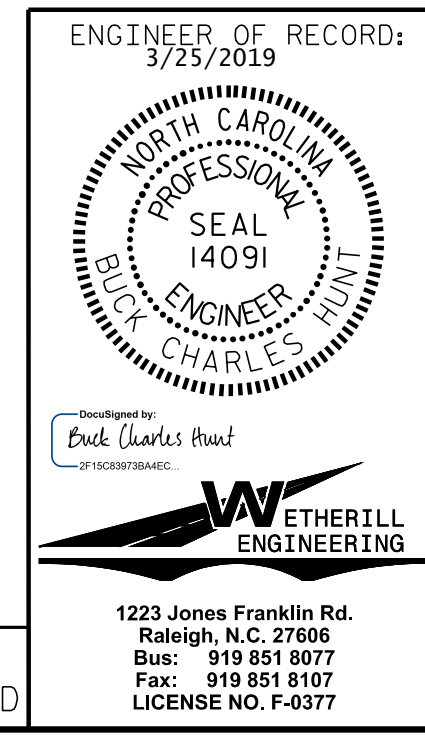
PLAN - ROOF SLAB

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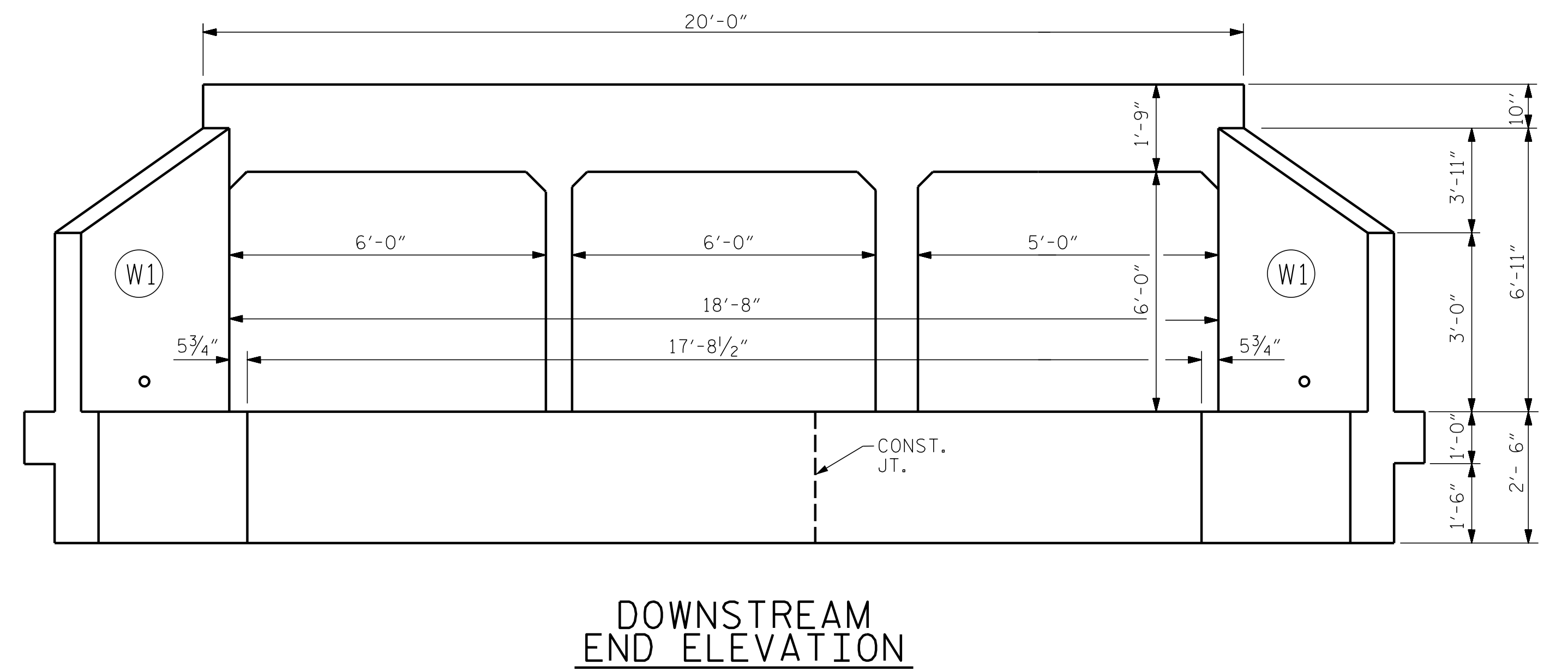
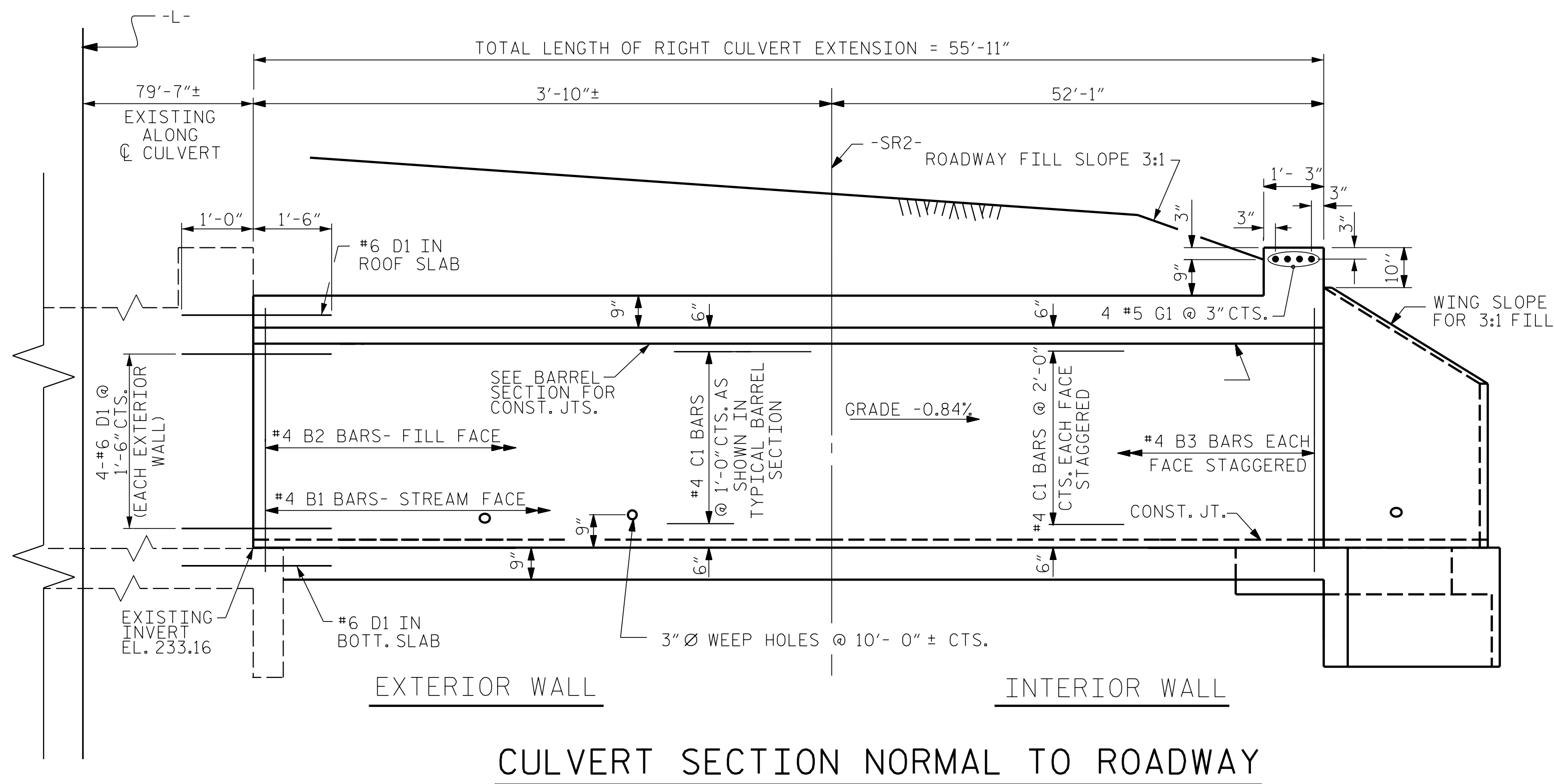
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PROJECT NO. W-5600
JOHNSTON COUNTY
STATION: 45+66.22 -L-
SHEET 5 OF 10



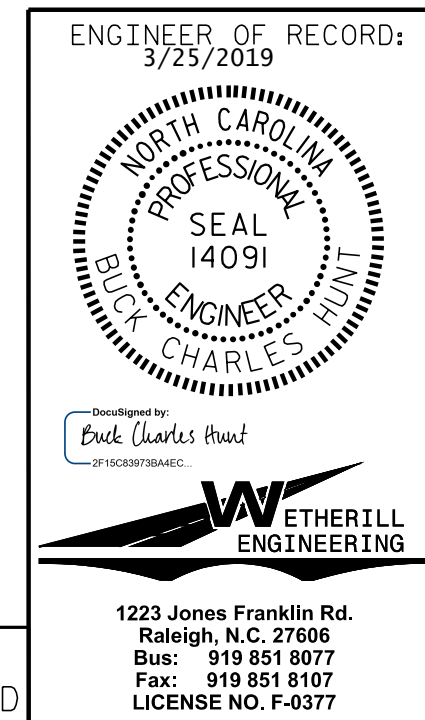
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| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| TRIPLE BARREL 2 @ 6 FT. X 6 FT. 1 @ 5 FT. X 6 FT. CONCRETE BOX CULVERT LEFT EXTENSION | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | | SHEET NO. C1-5 |
| | | | | | TOTAL SHEETS 10 |



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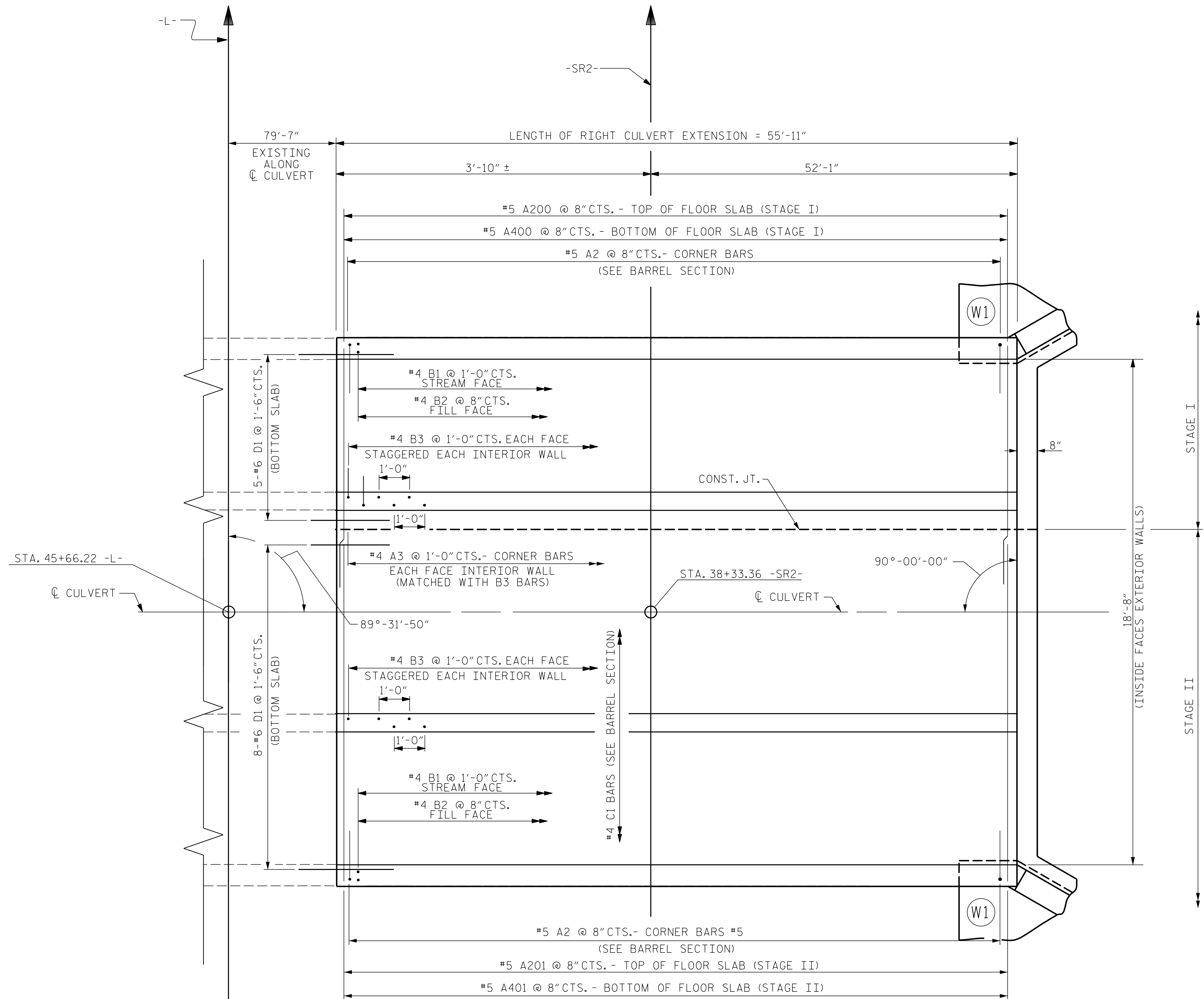
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PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 45+66.22 -L-
 SHEET 6 OF 10

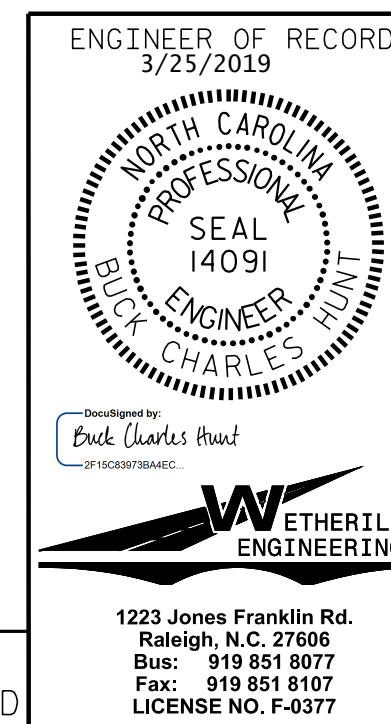
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| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH TRIPLE BARREL 2 @ 6 FT. X 6 FT. 1 @ 5 FT. X 6 FT. CONCRETE BOX CULVERT RIGHT EXTENSION | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | | SHEET NO. C1-6 TOTAL SHEETS 10 |



PLAN - FLOOR SLAB

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 45+66.22 -L-

SHEET 7 OF 10



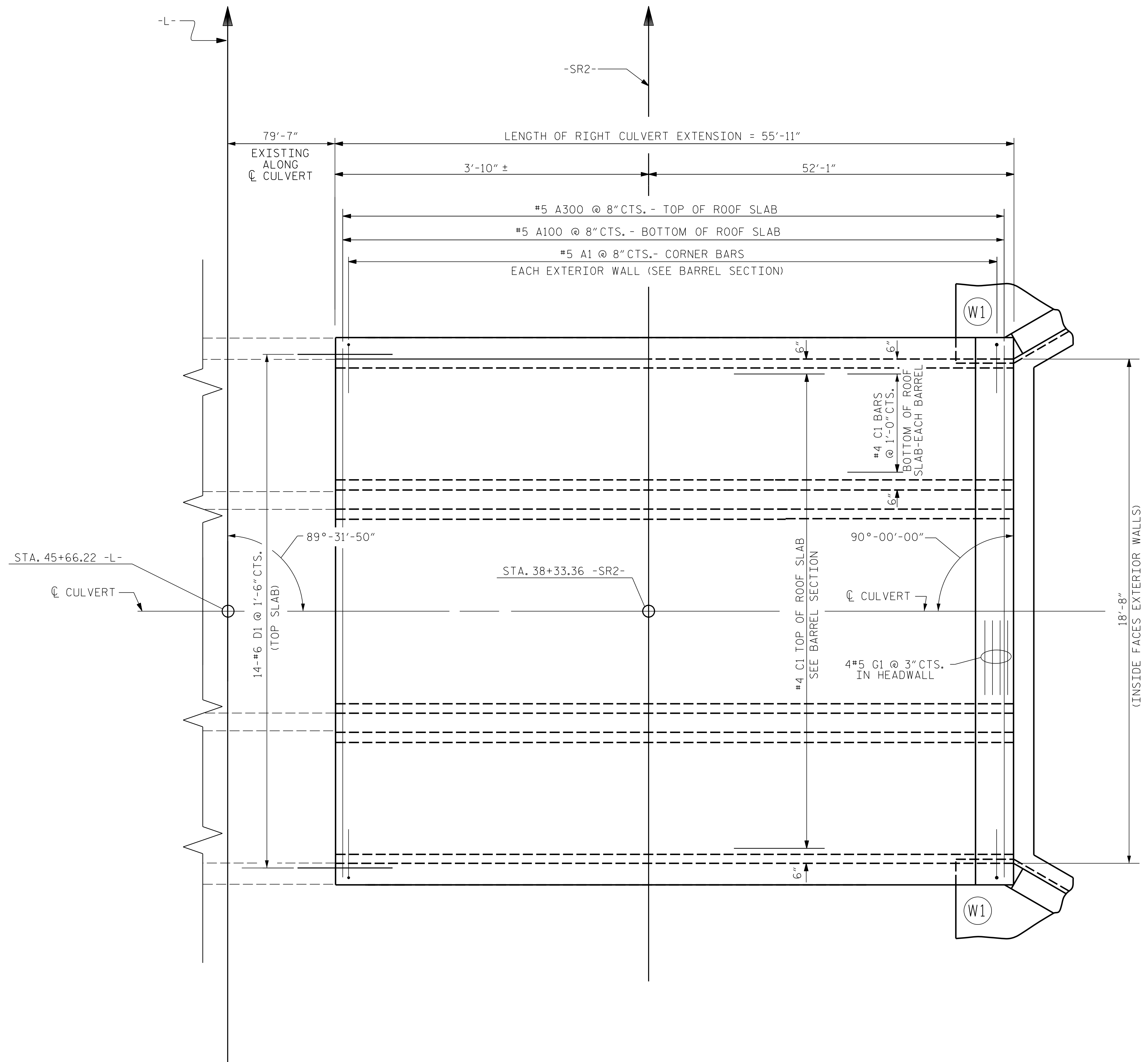
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
TRIPLE BARREL
2 @ 6 FT. X 6 FT.
1 @ 5 FT. X 6 FT.
CONCRETE BOX
CULVERT
RIGHT EXTENSION

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | C1-7 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 10 |

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 CHECKED BY : J.A. DILWORTH DATE : 5-18

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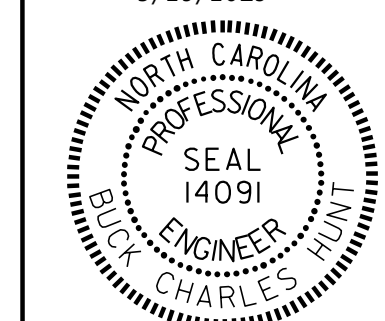


PLAN - ROOF SLAB

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 45+66.22 -L-

SHEET 8 OF 10

ENGINEER OF RECORD:
 3/23/2019



1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
 Fax: 919 851 8107
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TRIPLE BARREL
 2 @ 6 FT. X 6 FT.
 1 @ 5 FT. X 6 FT.
 CONCRETE BOX
 CULVERT
 RIGHT EXTENSION

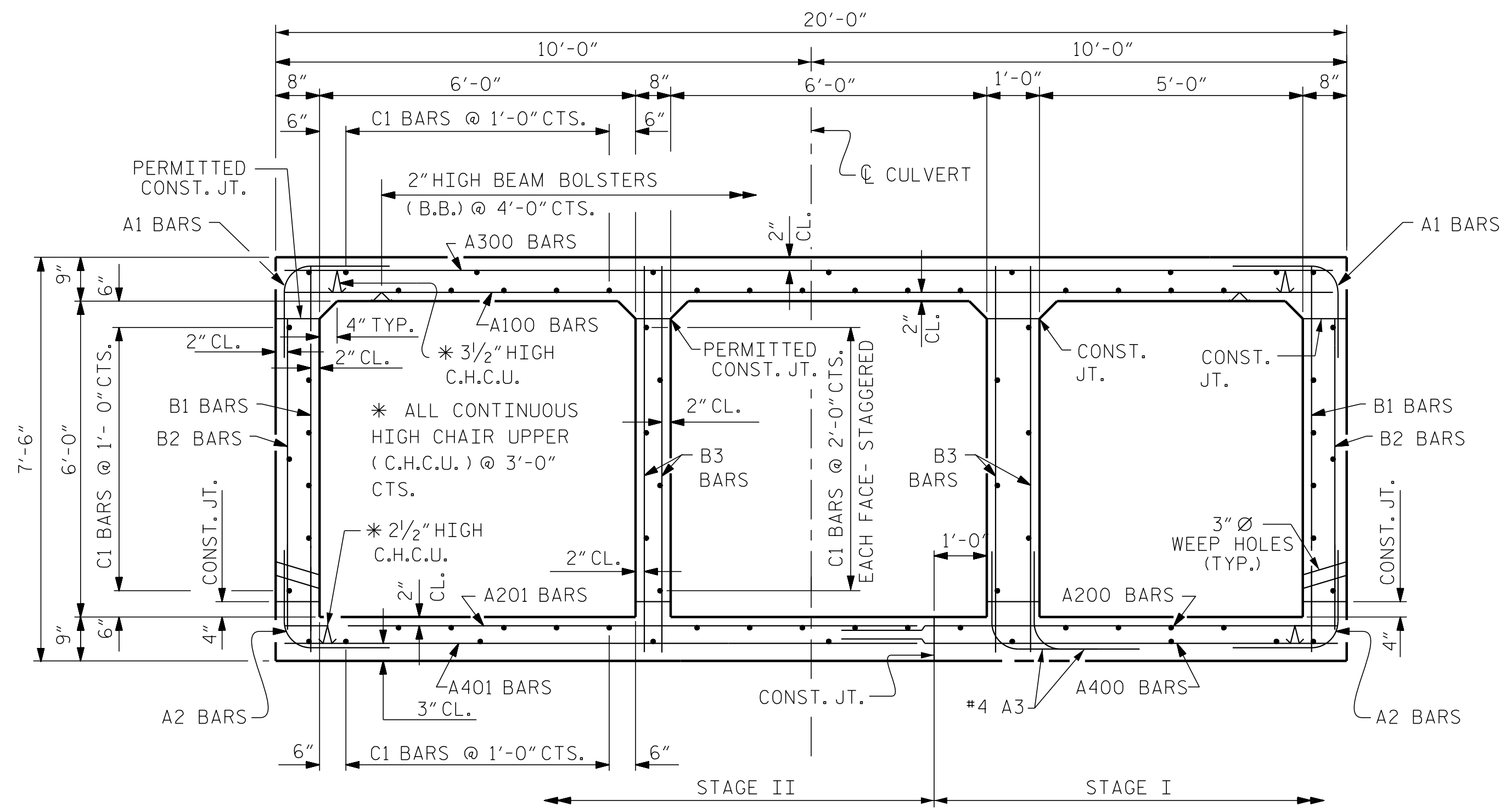
REVISIONS

| NO. | BY: | DATE: | NO. | BY: | DATE: | SHEET NO. |
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| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 10 |

DOCUMENT NOT CONSIDERED FINAL
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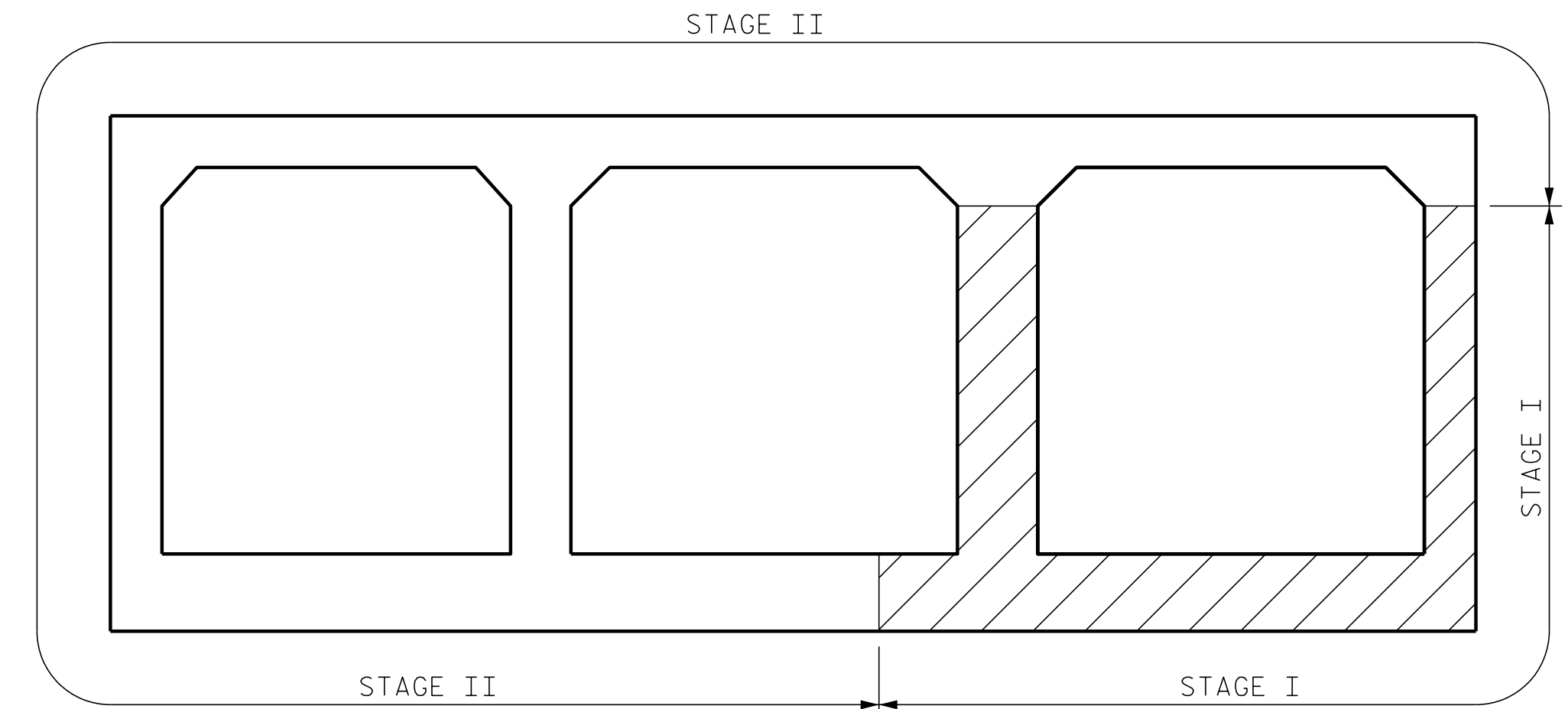
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DRAWN BY : B.C. HUNT DATE : 4-18
 CHECKED BY : J.A. DILWORTH DATE : 5-18



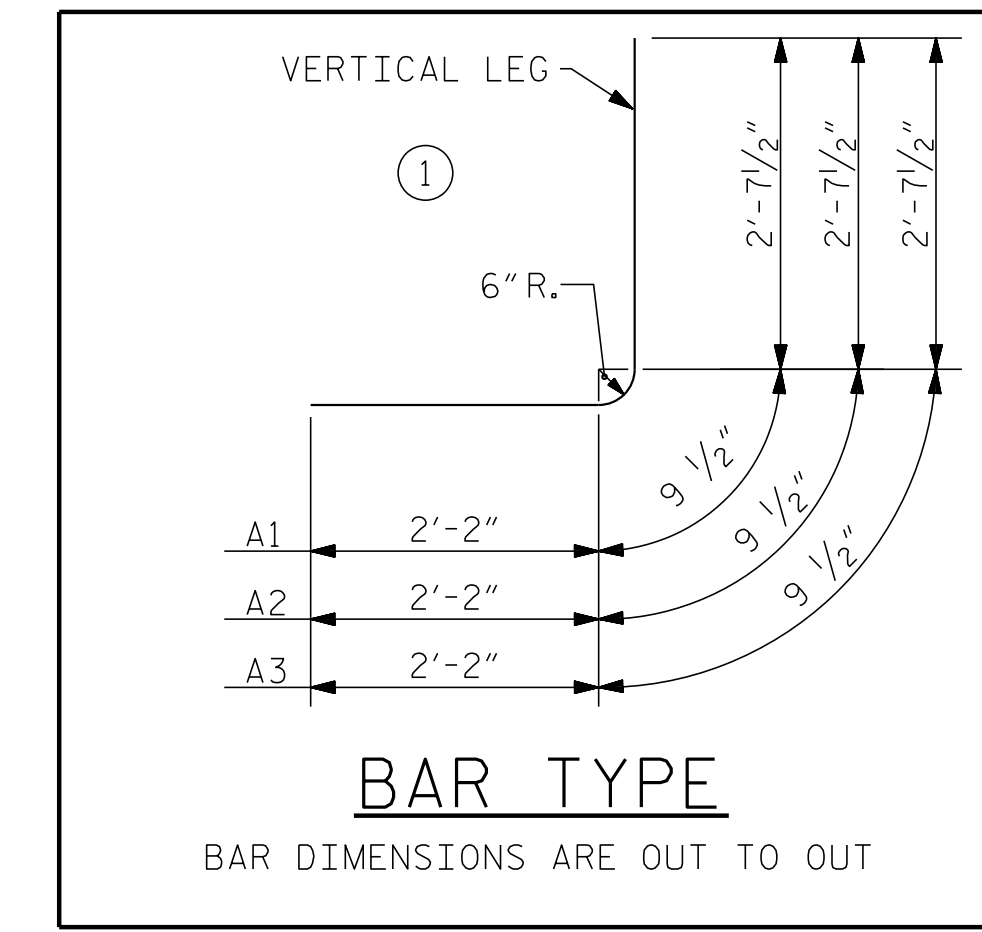
RIGHT ANGLE SECTION OF BARREL
LOOKING UPSTREAM

THERE ARE 74 "C" BARS IN SECTION OF BARREL.



CONSTRUCTION SEQUENCE
LOOKING UPSTREAM

| BARREL REINFORCING STEEL | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|----|------|------|---------|--------|---------------------------|-------------------|------|------|---------|--------|---------------------------|-----------|-------------------|------|--------|--------|----------------------------|-----|-----------|-------------------|--------|--------|--|--|--|-----------|
| LEFT EXTENSION - STAGE I | | | | | | LEFT EXTENSION - STAGE II | | | | | | RIGHT EXTENSION - STAGE I | | | | | | RIGHT EXTENSION - STAGE II | | | | | | | | | |
| 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 | 75 | 5 | 1 | 5'-7" | 437 | A1 | 75 | 5 | 1 | 5'-7" | 437 | A1 | 84 | 5 | 1 | 5'-7" | 489 | A1 | 84 | 5 | 1 | 5'-7" | 489 | | | | |
| A2 | 75 | 5 | 1 | 5'-7" | 437 | A2 | 75 | 5 | 1 | 5'-7" | 437 | A2 | 84 | 5 | 1 | 5'-7" | 489 | A2 | 84 | 5 | 1 | 5'-7" | 489 | | | | |
| A3 | 99 | 4 | 1 | 5'-7" | 369 | | | | | | | A3 | 111 | 4 | 1 | 5'-7" | 414 | | | | | | | | | | |
| A200 | 75 | 5 | STR | 9'-8" | 756 | A100 | 75 | 5 | STR | 19'-8" | 1538 | A200 | 84 | 5 | STR | 9'-8" | 847 | A100 | 84 | 5 | STR | 19'-8" | 1723 | | | | |
| A400 | 75 | 5 | STR | 9'-8" | 756 | A201 | 75 | 5 | STR | 12'-2" | 952 | A400 | 84 | 5 | STR | 9'-8" | 847 | A201 | 84 | 5 | STR | 12'-2" | 1066 | | | | |
| | | | | | | A300 | 75 | 5 | STR | 19'-8" | 1538 | | | | | | | A300 | 84 | 5 | STR | 19'-8" | 1723 | | | | |
| B1 | 50 | 4 | STR | 7'-1" | 237 | A401 | 75 | 5 | STR | 12'-2" | 952 | B1 | 56 | 4 | STR | 7'-1" | 265 | A401 | 84 | 5 | STR | 12'-2" | 1066 | | | | |
| B2 | 75 | 4 | STR | 5'-8" | 284 | | | | | | | B2 | 84 | 4 | STR | 5'-8" | 318 | | | | | | | | | | |
| B3 | 99 | 4 | STR | 7'-1" | 468 | B1 | 50 | 4 | STR | 7'-1" | 237 | B3 | 111 | 4 | STR | 7'-1" | 525 | B1 | 56 | 4 | STR | 7'-1" | 265 | | | | |
| | | | | | | B2 | 75 | 4 | STR | 5'-8" | 284 | | | | | | | B2 | 84 | 4 | STR | 5'-8" | 318 | | | | |
| C1 | 44 | 4 | STR | 25'-10" | 759 | B3 | 99 | 4 | STR | 7'-1" | 468 | C1 | 44 | 4 | STR | 28'-9" | 845 | B3 | 111 | 4 | STR | 7'-1" | 525 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D1 | 9 | 6 | STR | 2'-6" | 34 | C1 | 104 | 4 | STR | 25'-10" | 1795 | D1 | 9 | 6 | STR | 2'-6" | 34 | C1 | 104 | 4 | STR | 28'-9" | 1997 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | D1 | 26 | 6 | STR | 2'-6" | 98 | | | | | | | D1 | 26 | 6 | STR | 2'-6" | 98 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | G1 | 4 | 5 | STR | 19'-8" | 82 | | | | | | | G1 | 4 | 5 | STR | 19'-8" | 82 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REINFORCING STEEL | | | | | | 4,547 LBS | REINFORCING STEEL | | | | | | 8,818 LBS | REINFORCING STEEL | | | | | | 5,073 LBS | REINFORCING STEEL | | | | | | 9,841 LBS |



| SPLICE LENGTHS CHART | | |
|----------------------|------|---------------|
| BAR | SIZE | SPLICE LENGTH |
| A200 | #5 | 2'-2" |
| A400 | #5 | 2'-2" |
| B1 | #4 | 1'-9" |
| B3 | #4 | 1'-9" |
| C1 | #4 | 1'-11" |

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 45+66.22 -L-

SHEET 9 OF 10

ENGINEER OF RECORD:
3/23/2019

1223 Jones Franklin Rd.
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
LICENSE NO. F-0377

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TRIPLE BARREL
 2 @ 6 FT. X 6 FT.
 1 @ 5 FT. X 6 FT.
 CONCRETE BOX
 CULVERT
 LEFT & RIGHT EXTENSIONS

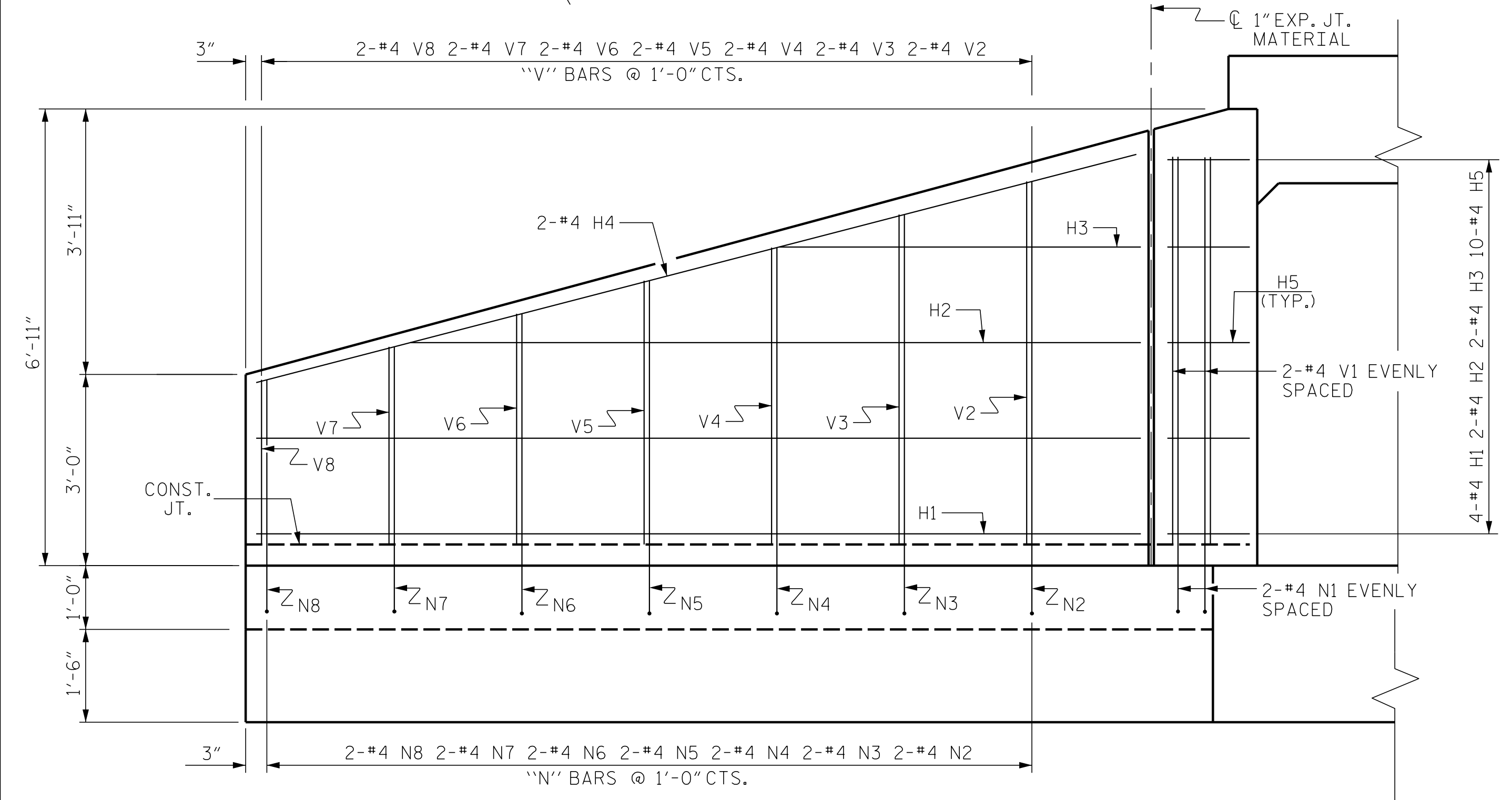
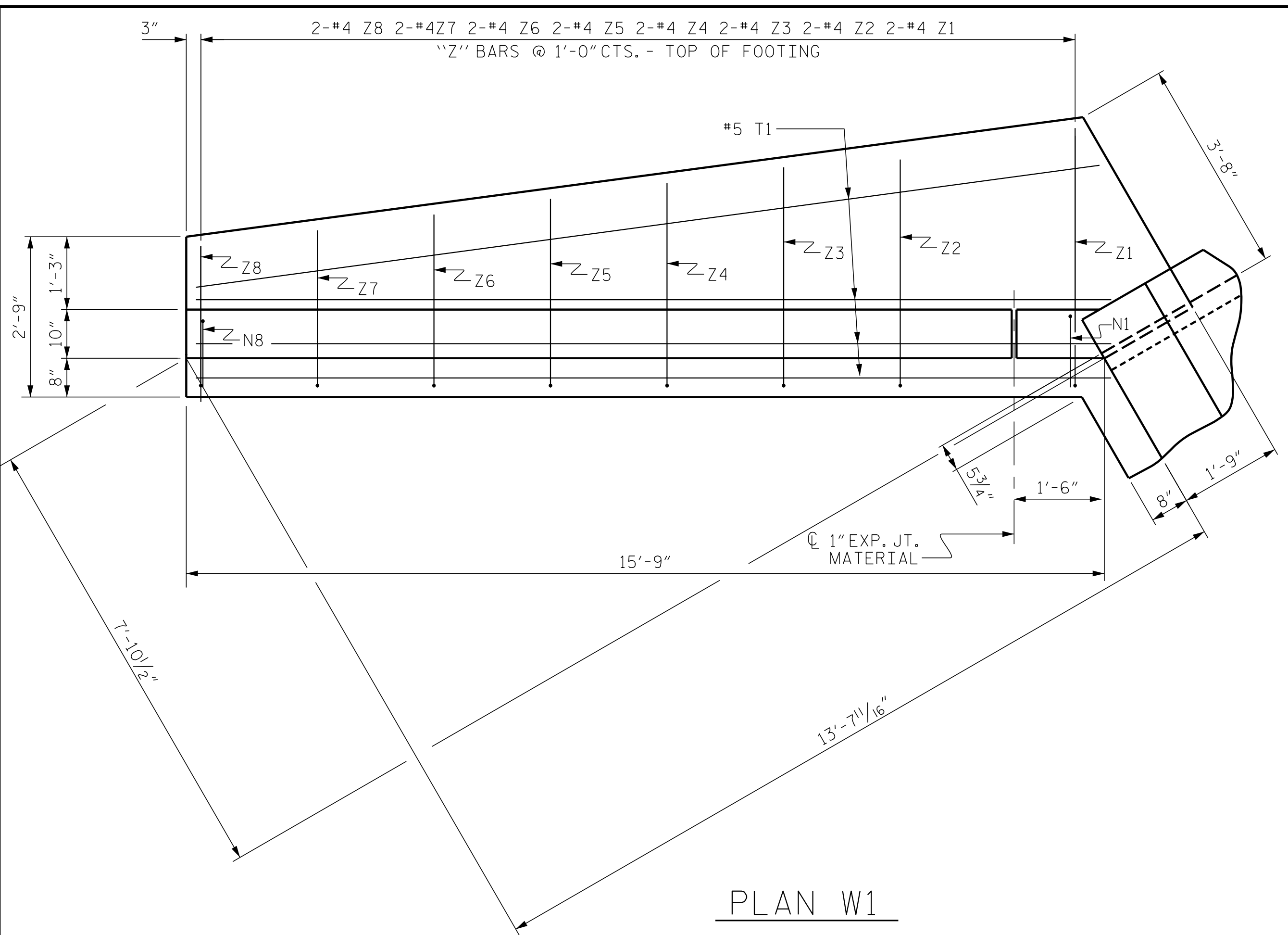
| REVISIONS | | | | | |
|-----------|-----|-------|-----|-----|-------|
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| 1 | | | 3 | | |
| 2 | | | 4 | | |

SHEET NO. C1-9
 TOTAL SHEETS 10

DRAWN BY: B.C. HUNT DATE: 4-18
 CHECKED BY: J.A. DILWORTH DATE: 5-18

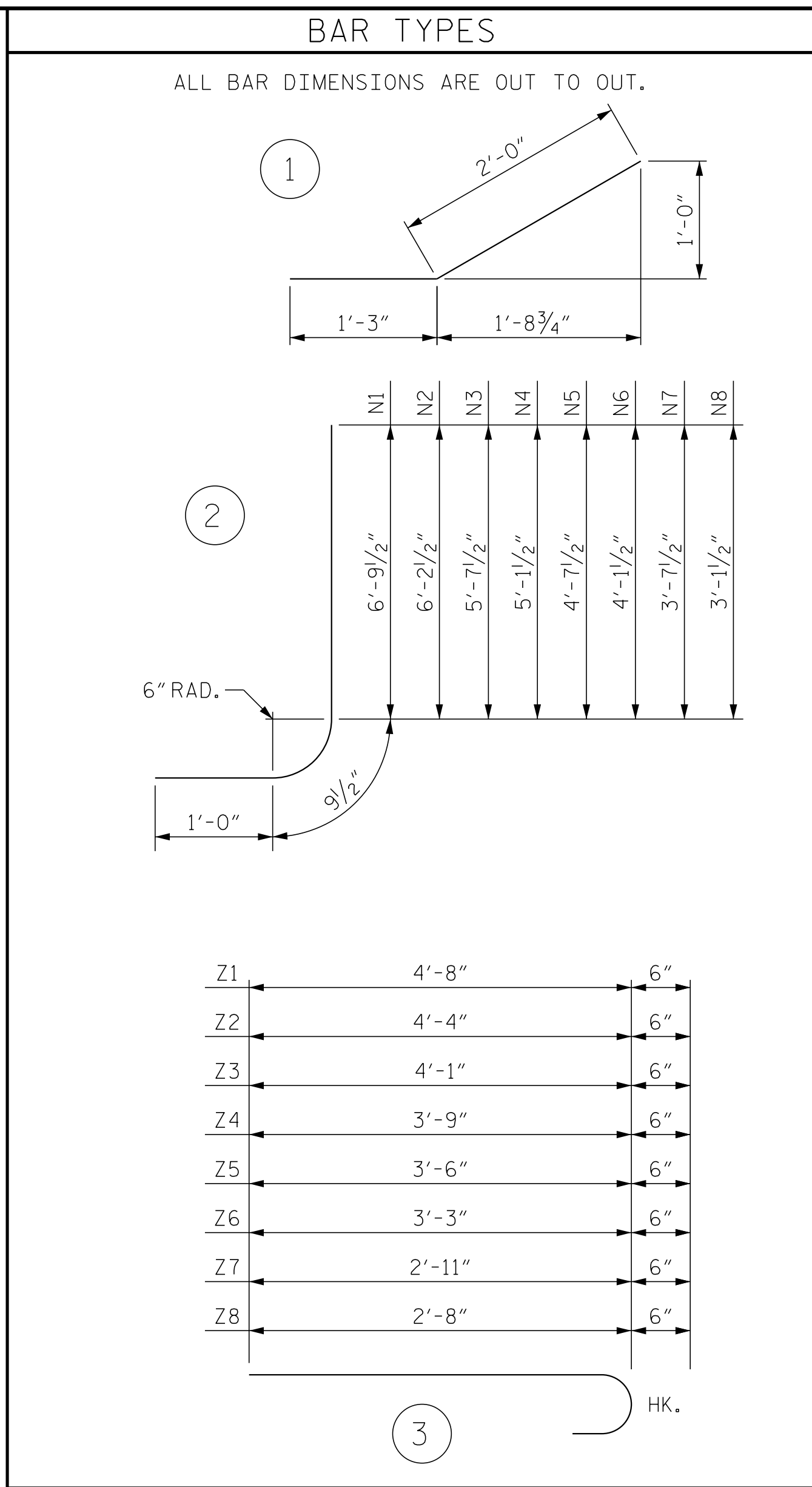
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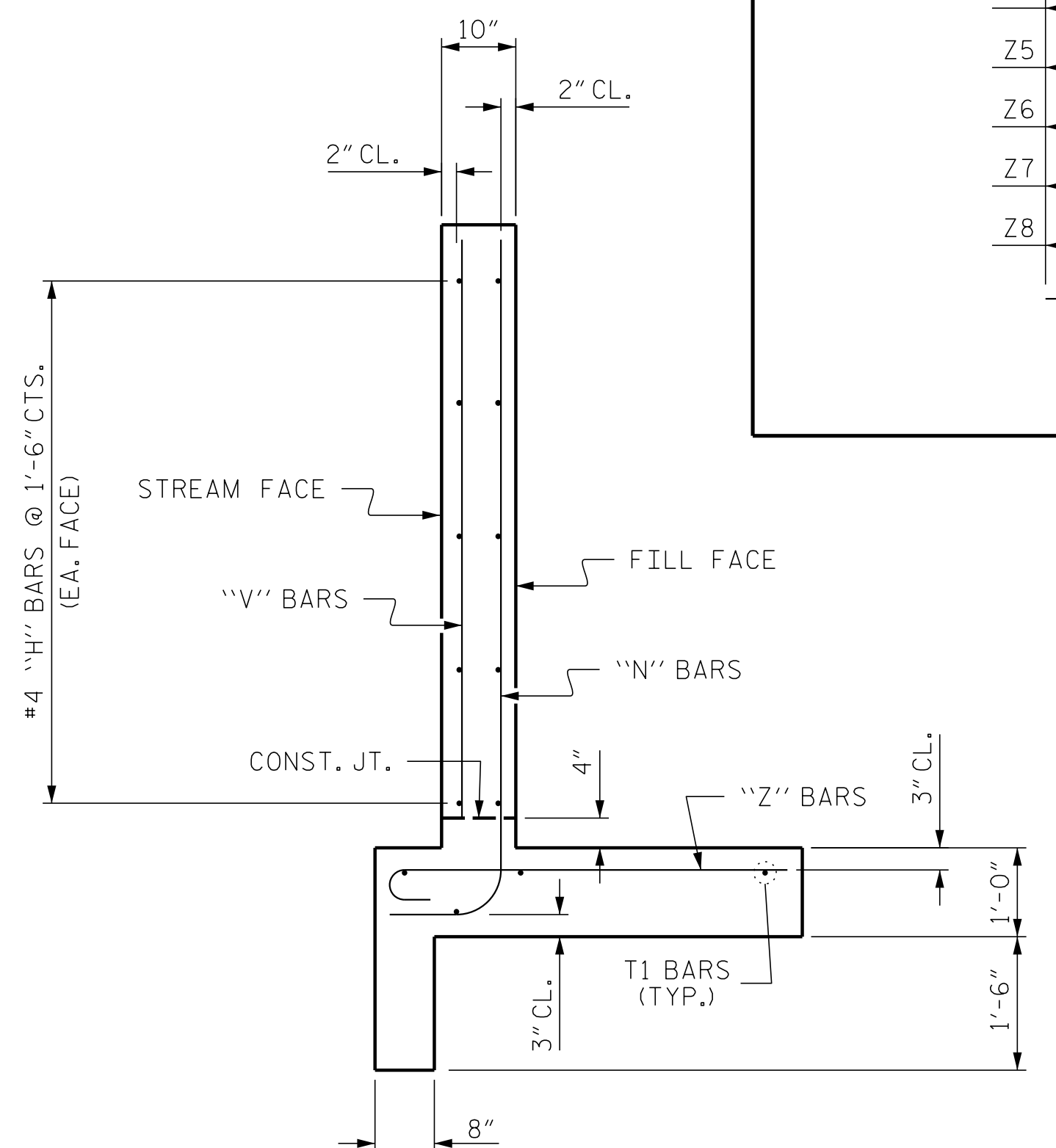
ELEVATION W1

DRAWN BY: B.C. HUNT DATE: 4/18
 CHECKED BY: J.A. DILLWORTH DATE: 4/18



| | | |
|----|--------|----|
| Z1 | 4'-8" | 6" |
| Z2 | 4'-4" | 6" |
| Z3 | 4'-1" | 6" |
| Z4 | 3'-9" | 6" |
| Z5 | 3'-6" | 6" |
| Z6 | 3'-3" | 6" |
| Z7 | 2'-11" | 6" |
| Z8 | 2'-8" | 6" |

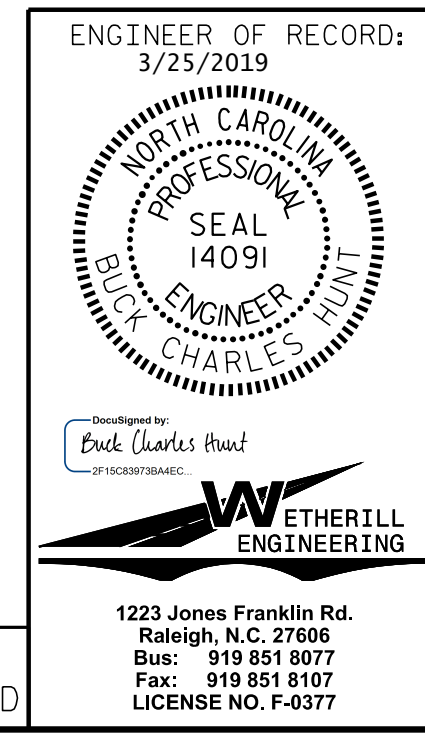
| BILL OF MATERIAL | | | | | |
|--------------------------------------|-----|------|------|---------|---------------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| H1 | 16 | #4 | STR | 13'-10" | 148 |
| H2 | 8 | #4 | STR | 11'-5" | 61 |
| H3 | 8 | #4 | STR | 5'-8" | 30 |
| H4 | 8 | #4 | STR | 14'-3" | 76 |
| H5 | 40 | #4 | 1 | 3'-3" | 87 |
| N1 | 8 | #4 | 2 | 8'-7" | 46 |
| N2 | 8 | #4 | 2 | 8'-0" | 43 |
| N3 | 8 | #4 | 2 | 7'-5" | 40 |
| N4 | 8 | #4 | 2 | 6'-11" | 37 |
| N5 | 8 | #4 | 2 | 6'-5" | 34 |
| N6 | 8 | #4 | 2 | 5'-11" | 32 |
| N7 | 8 | #4 | 2 | 5'-5" | 29 |
| N8 | 8 | #4 | 2 | 4'-11" | 26 |
| T1 | 16 | #5 | STR | 15'-7" | 260 |
| V1 | 8 | #4 | STR | 6'-1" | 33 |
| V2 | 8 | #4 | STR | 5'-8" | 30 |
| V3 | 8 | #4 | STR | 5'-2" | 28 |
| V4 | 8 | #4 | STR | 4'-7" | 24 |
| V5 | 8 | #4 | STR | 4'-1" | 22 |
| V6 | 8 | #4 | STR | 3'-7" | 19 |
| V7 | 8 | #4 | STR | 3'-1" | 16 |
| V8 | 8 | #4 | STR | 2'-7" | 14 |
| Z1 | 8 | #4 | 3 | 5'-2" | 28 |
| Z2 | 8 | #4 | 3 | 4'-10" | 26 |
| Z3 | 8 | #4 | 3 | 4'-7" | 24 |
| Z4 | 8 | #4 | 3 | 4'-3" | 23 |
| Z5 | 8 | #4 | 3 | 4'-0" | 21 |
| Z6 | 8 | #4 | 3 | 3'-9" | 20 |
| Z7 | 8 | #4 | 3 | 3'-5" | 18 |
| Z8 | 8 | #4 | 3 | 3'-2" | 17 |
| REINFORCING STEEL (FOR 4 WINGS) | | | | | 1312 LBS |
| CLASS A CONCRETE WINGS (FOR 4 WINGS) | | | | | TOTAL 23.6 CY |



WING SECTION

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. W-5600
 JOHNSTON COUNTY
 STATION: 45+66.22 -L-
 SHEET 10 OF 10



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

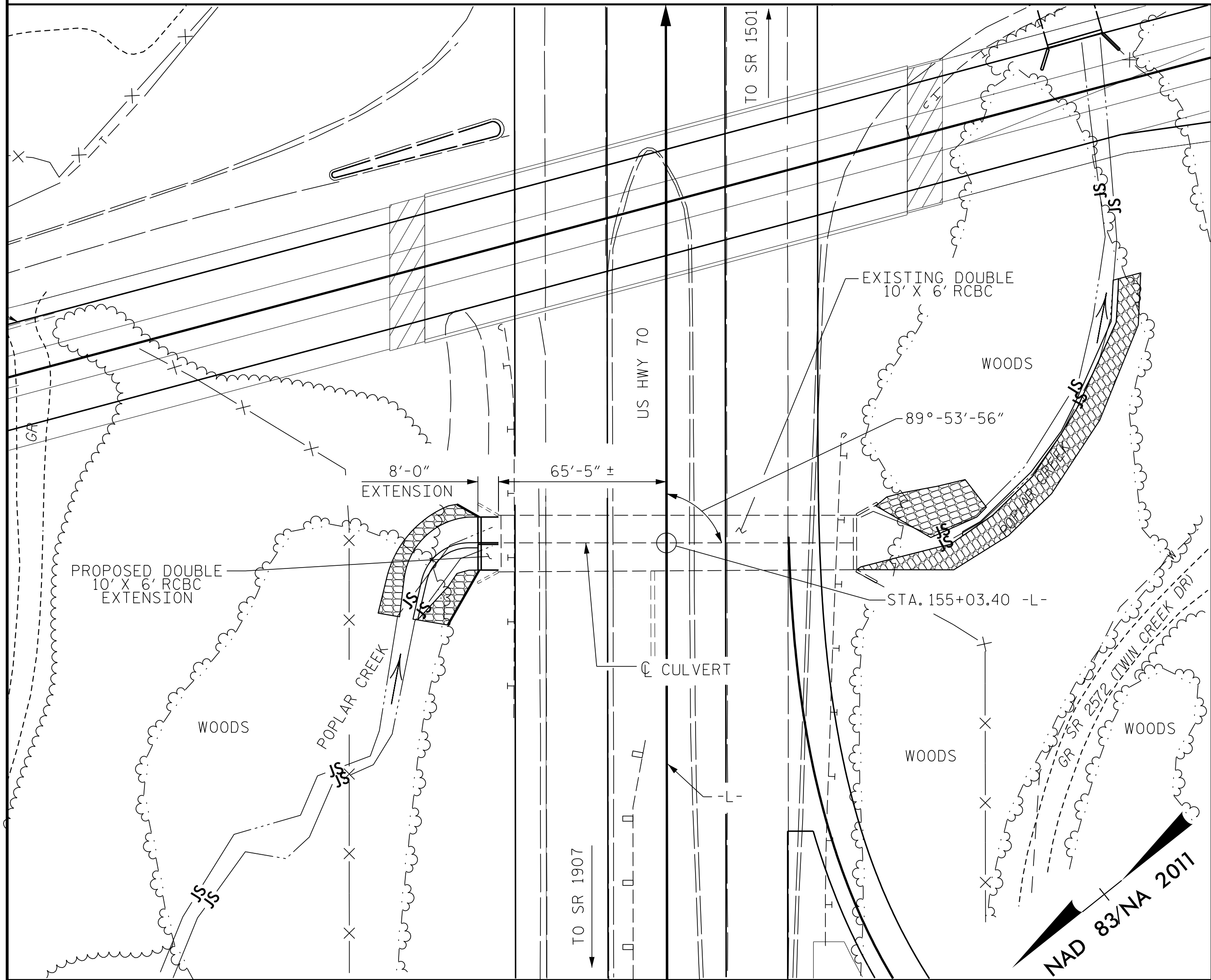
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
WING W1

SHEET NO. C1-10
 TOTAL SHEETS 10

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BM #11 BENCH TIE NAIL SET IN 18" PINE, STA. 39+10.93 -Y7-, 134.85 RT, ELEV. 1396.42, N=664851 E=2188605

F.A. PROJECT NO. HISP-0070(163)



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

ROADWAY DATA

GRADE POINT ELEV. @ STA 155+03.40 -L- = 194.75
 BED ELEV. @ STATION 155+03.40 -L- = 184.92
 ROADWAY SLOPES = 3:1

HYDRAULIC DATA

DESIGN DISCHARGE = 560 CFS
 FREQUENCY OF DESIGN FLOOD = 50 YEARS
 DESIGN HIGH WATER ELEVATION = 189.0
 DRAINAGE AREA = 2.3 SQ. MI.
 BASE DISCHARGE (Q100) = 640 CFS
 BASE HIGH WATER ELEVATION = 189.6

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 840+ CFS
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YEAR
 OVERTOPPING FLOOD ELEVATION = 194.0
 OVERTOPPING OCCURS AT THE FALSE CUT INTERFACE AT THE GRADE SEPERATION OF -L- AND -Y7- AND FLOWS LINE AHEAD ALONG -L- IN DITCHLINE (LT)

NOTES

ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
 DESIGN FILL TO BOTTOM OF TOP SLAB ----- 2.69'
 FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
 CONCRETE IN CULVERT TO BE POURED IN THE FOLLOWING ORDER:
 STAGE I:
 1. WING FOOTING AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS
 2. THE REMAINING PORTIONS OF THE WALLS AND WING FULL HEIGHT.
 STAGE II
 1. WING FOOTING AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALL.
 2. THE REMAINING PORTIONS OF THE WALLS AND WING FULL HEIGHT FOLLOWED BY THE ENTIRE ROOF SLAB AND HEADWALL.
 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 AND BOTH FACES OF INTERIOR 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.
 NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.
 DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.
 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.
 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.
 THE EXISTING STRUCTURE CONSISTING OF A 10'x6' DOUBLE BARREL REINFORCED CONCRETE BOX CULVERT LOCATED AT PROPOSED SITE SHALL BE RETAINED AND EXTENDED TO THE LIMITS SHOWN. THE EXISTING CULVERT IS PRESENTLY NOT POSTED FOR LOAD LIMIT.
 FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
 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 SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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" |

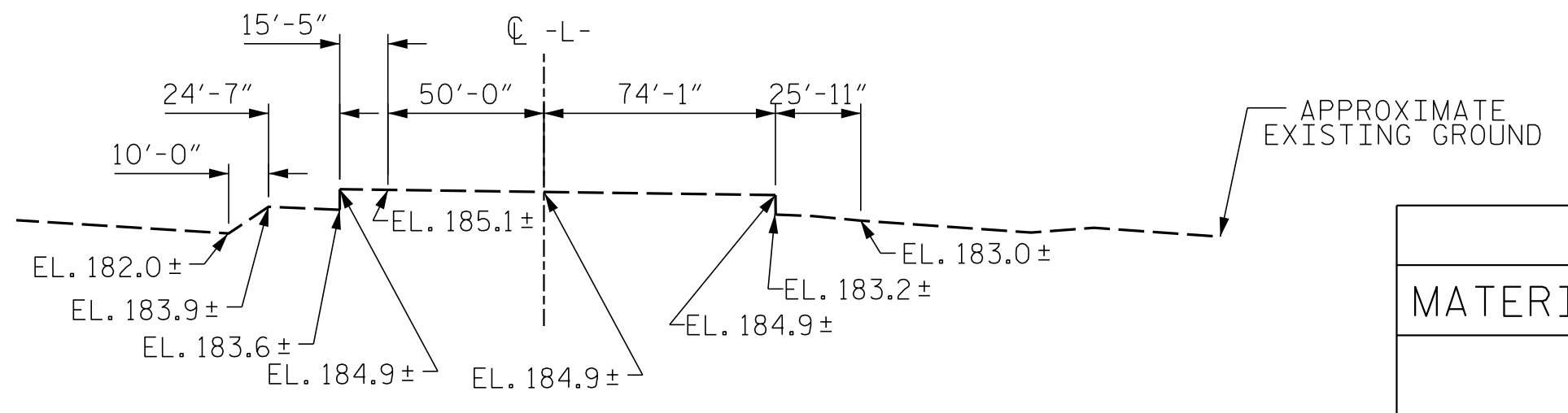
NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND fy = 60 ksi.

PROJECT NO. W-5600

JOHNSTON COUNTY

STATION: 155+03.40 -L-

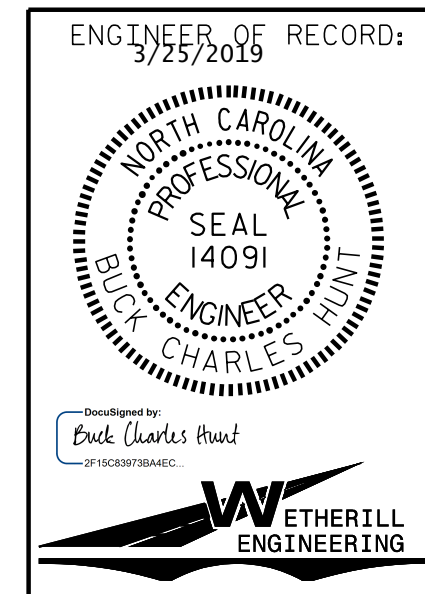
SHEET 1 OF 7 EXISTING STRUCTURE NO. 513



PROFILE ALONG CULVERT

| TOTAL BILL OF MATERIAL | | | |
|-------------------------------|---------------|----------|----------|
| MATERIAL | ELEMENT | STAGE I | STAGE II |
| CLASS A CONCRETE (CU. YDS.) | BARREL | 6.5 | 13.4 |
| | HEADWALLS | ---- | 1.0 |
| | CURTAIN WALLS | 2.4 | 1.9 |
| | WINGS | 7.8 | 12.6 |
| TOTAL | | 16.7 | 28.9 |
| TOTAL | | 45.6 | |
| REINFORCING STEEL (LBS.) | BARREL | 1431 | 2395 |
| | WINGS | 407 | 752 |
| | TOTAL | 1838 | 3147 |
| TOTAL | | 4985 | |
| FOUNDATION COND. MAT'L (TONS) | --- | 9 | 7 |
| | TOTAL | | 16 |
| CULVERT EXCAVATION | | LUMP SUM | |

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
DOUBLE 10 FT. X 6 FT. CONCRETE BOX CULVERT EXTENSION
 89°-53'-56" SKEW

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | C2-1 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 7 |

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1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
 Fax: 919 851 8107
 LICENSE NO. F-0377

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 3/20/2019 1:12:15 PM

DRAWN BY : B.C. HUNT DATE : 4-18
 CHECKED BY : J.A. DILWORTH DATE : 5-18

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

| LEVEL | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING # | MINIMUM RATING FACTORS (RF) | TONS = W x RF | STRENGTH I LIMIT STATE | | | | | | | | COMMENT NUMBER | | |
|--------------------|-----------------------------------|----------------------|---------------------------------|-----------------------------------|---------------|---|---------------|-------------|--------------|--|---------------|-------------|--------------|----------------|--|--|
| | | | | | | LIVE-LOAD FACTORS (γ _{L1}) | MOMENT | | | | SHEAR | | | | | |
| | | | | | | | RATING FACTOR | BOX NO. | ELEMENT TYPE | DISTANCE FROM LEFT END OF ELEMENT (FT) | RATING FACTOR | BOX NO. | ELEMENT TYPE | | DISTANCE FROM LEFT END OF ELEMENT (FT) | |
| DESIGN LOAD RATING | HL-93 (INVENTORY) | N/A | ① | 1.19 | -- | 1.75 | 2.31 | 1 | TOP SLAB | 4.60 | 1.19 | 1 | TOP SLAB | 9.65 | | |
| | HL-93 (OPERATING) | N/A | | 1.54 | -- | 1.35 | 3.00 | 1 | TOP SLAB | 4.60 | 1.54 | 1 | TOP SLAB | 9.65 | | |
| | HS-20 (INVENTORY) | 36,000 | ② | 1.67 | 60.12 | 1.75 | 2.45 | 1 | TOP SLAB | 4.60 | 1.67 | 1 | TOP SLAB | 9.65 | | |
| | HS-20 (OPERATING) | 36,000 | | 2.16 | 77.76 | 1.35 | 3.18 | 1 | TOP SLAB | 4.60 | 2.16 | 1 | TOP SLAB | 9.65 | | |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13,500 | | 3.58 | 48.33 | 1.40 | 4.46 | 1 | TOP SLAB | 4.60 | 3.58 | 1 | TOP SLAB | 9.65 | |
| | | SNGARBS2 | 20,000 | | 3.22 | 64.40 | 1.40 | 4.18 | 1 | TOP SLAB | 4.60 | 3.22 | 1 | TOP SLAB | 9.65 | |
| | | SNAGRIS2 | 22,000 | | 3.05 | 67.10 | 1.40 | 4.46 | 1 | TOP SLAB | 4.60 | 3.05 | 1 | BOTTOM SLAB | 9.83 | |
| | | SNCOTTS3 | 27,250 | ③ | 1.61 | 43.87 | 1.40 | 3.08 | 1 | TOP SLAB | 4.60 | 1.61 | 1 | TOP SLAB | 9.65 | |
| | | SNAGGRS4 | 34,925 | | 1.93 | 67.40 | 1.40 | 3.83 | 1 | TOP SLAB | 4.60 | 1.93 | 1 | BOTTOM SLAB | 9.83 | |
| | | SNS5A | 35,550 | | 1.87 | 66.48 | 1.40 | 3.66 | 1 | TOP SLAB | 4.60 | 1.87 | 1 | TOP SLAB | 9.65 | |
| | | SNS6A | 39,950 | | 1.77 | 70.71 | 1.40 | 3.66 | 1 | TOP SLAB | 4.60 | 1.77 | 1 | TOP SLAB | 9.65 | |
| | | SNS7B | 42,000 | | 1.77 | 74.34 | 1.40 | 3.85 | 1 | TOP SLAB | 4.60 | 1.77 | 1 | TOP SLAB | 9.65 | |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33,000 | | 2.06 | 67.98 | 1.40 | 4.46 | 1 | TOP SLAB | 4.60 | 2.06 | 1 | BOTTOM SLAB | 9.83 | |
| | | TNT4A | 33,075 | | 1.90 | 62.84 | 1.40 | 3.67 | 1 | TOP SLAB | 4.60 | 1.90 | 1 | TOP SLAB | 9.65 | |
| | | TNT6A | 41,600 | | 1.83 | 76.13 | 1.40 | 3.76 | 1 | TOP SLAB | 4.60 | 1.83 | 1 | TOP SLAB | 9.65 | |
| | | TNT7A | 42,000 | | 1.79 | 75.18 | 1.40 | 3.72 | 1 | TOP SLAB | 4.60 | 1.79 | 1 | BOTTOM SLAB | 9.83 | |
| | | TNT7B | 42,000 | | 1.86 | 78.12 | 1.40 | 3.60 | 1 | TOP SLAB | 4.60 | 1.86 | 1 | TOP SLAB | 9.65 | |
| | | TNAGRIT4 | 43,000 | | 1.81 | 77.83 | 1.40 | 3.67 | 1 | TOP SLAB | 4.60 | 1.81 | 1 | TOP SLAB | 9.65 | |
| TNAGT5A | 45,000 | | 1.81 | 81.45 | 1.40 | 3.90 | 1 | TOP SLAB | 4.60 | 1.81 | 1 | TOP SLAB | 9.65 | | | |
| TNAGT5B | 45,000 | | 1.61 | 72.45 | 1.40 | 3.58 | 1 | BOTTOM SLAB | 10.67 | 1.61 | 1 | BOTTOM SLAB | 9.83 | | | |

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 | -- |

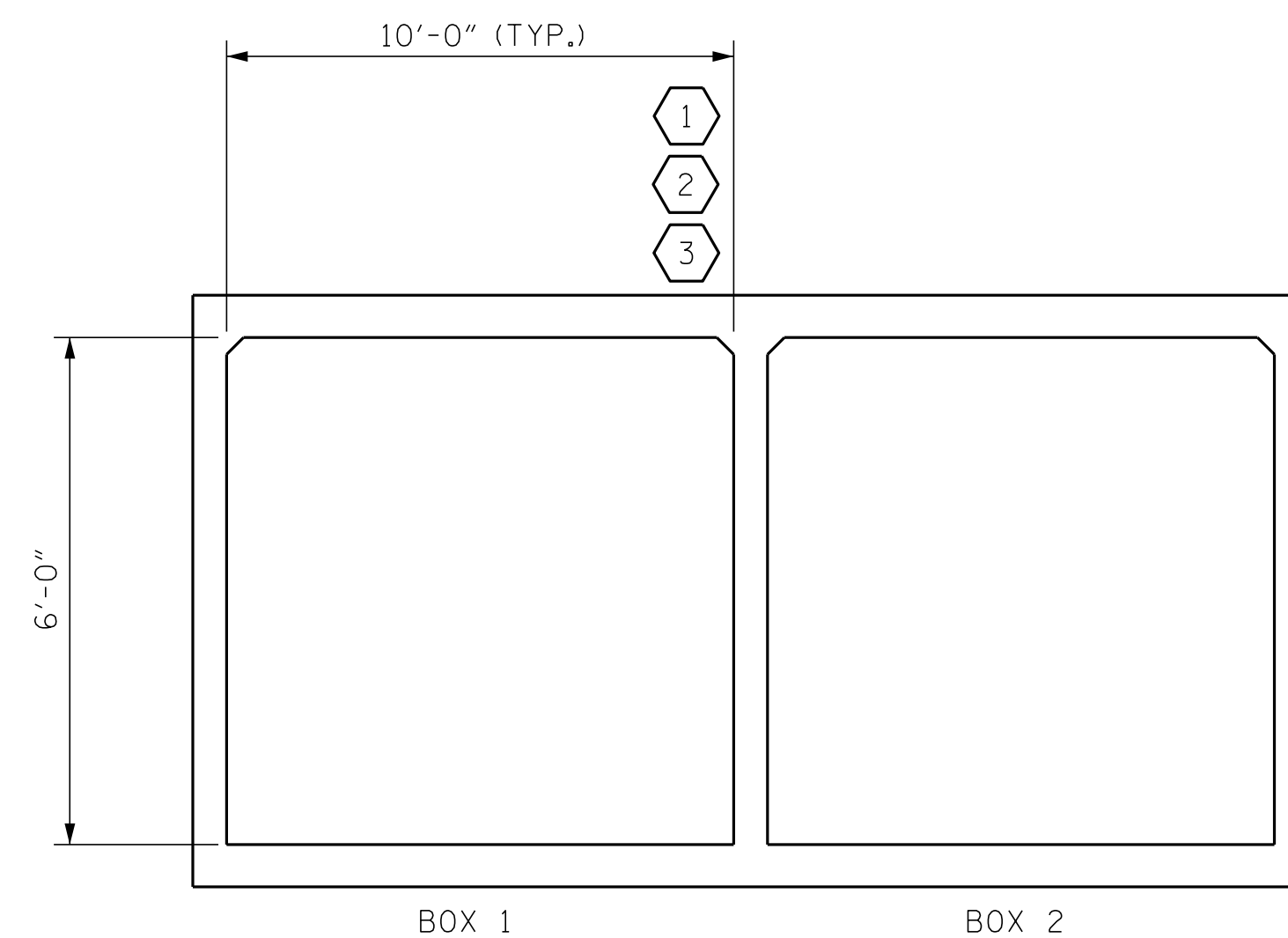
NOTE:

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 |



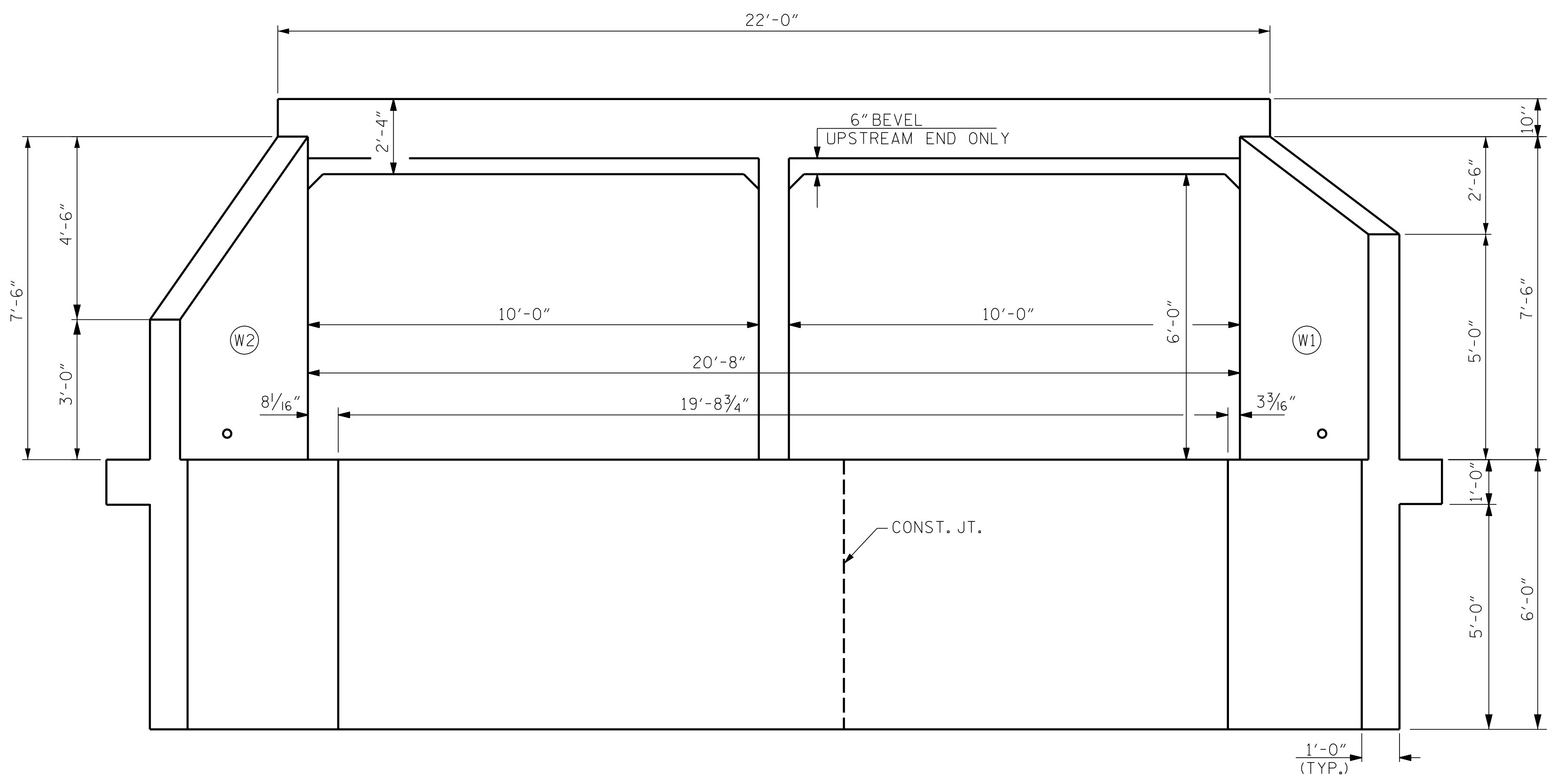
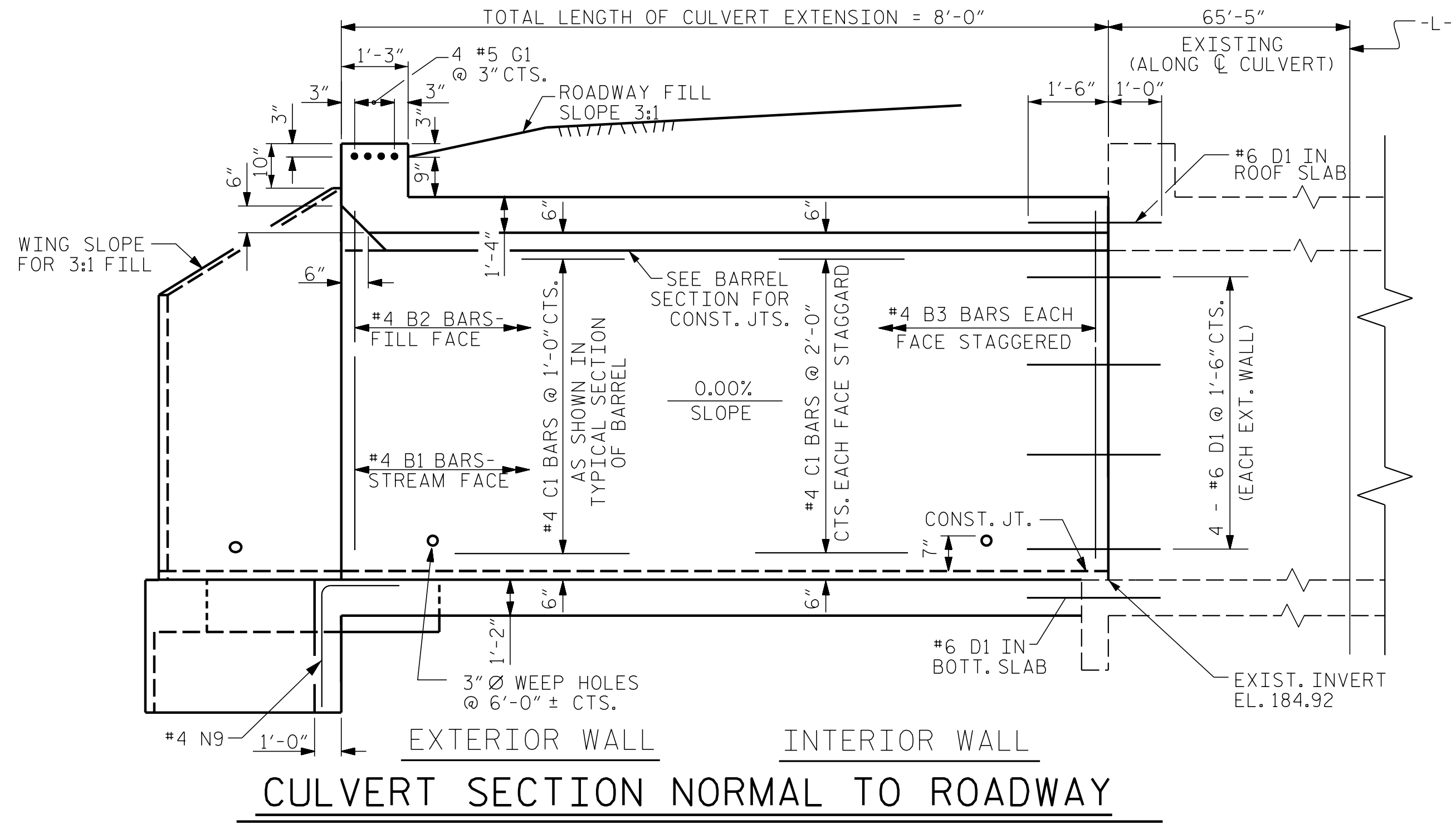
LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 155+03.40 -L-

SHEET 2 OF 7

| ENGINEER OF RECORD: 3/25/2019 RICK CHARLES HUNT ENGINEER | STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC) | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|-----------|-----|-----|-------|--|--|-----|-----|-------|-----|-----|-------|---|--|--|---|--|--|---|--|--|---|--|--|
| 1223 Jones Franklin Rd. Raleigh, N.C. 27606 Bus: 919 851 8077 Fax: 919 851 8107 LICENSE NO. F-0377 | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table> | REVISIONS | | | | | | NO. | BY: | DATE: | NO. | BY: | DATE: | 1 | | | 3 | | | 2 | | | 4 | | |
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STD. NO. LRFR5



INLET END ELEVATION

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DRAWN BY : B.C. HUNT DATE : 4-18
 CHECKED BY : J.A. DILWORTH DATE : 5-18

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 155+03.40 -L-

SHEET 3 OF 7

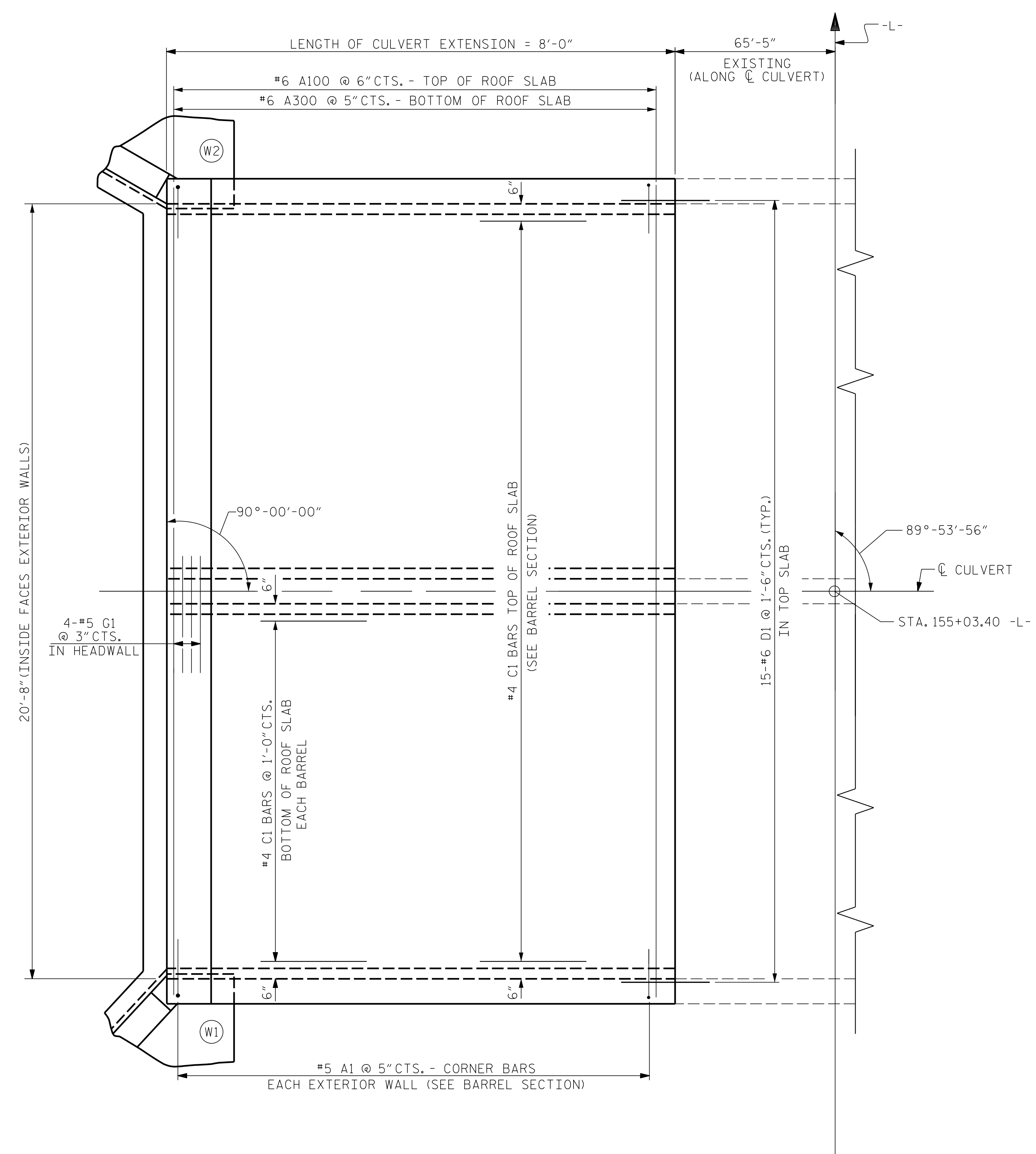
ENGINEER OF RECORD:
 3/25/2019

 Seal 14091
 PUBLIC ENGINEER
 CHARLES HUNT

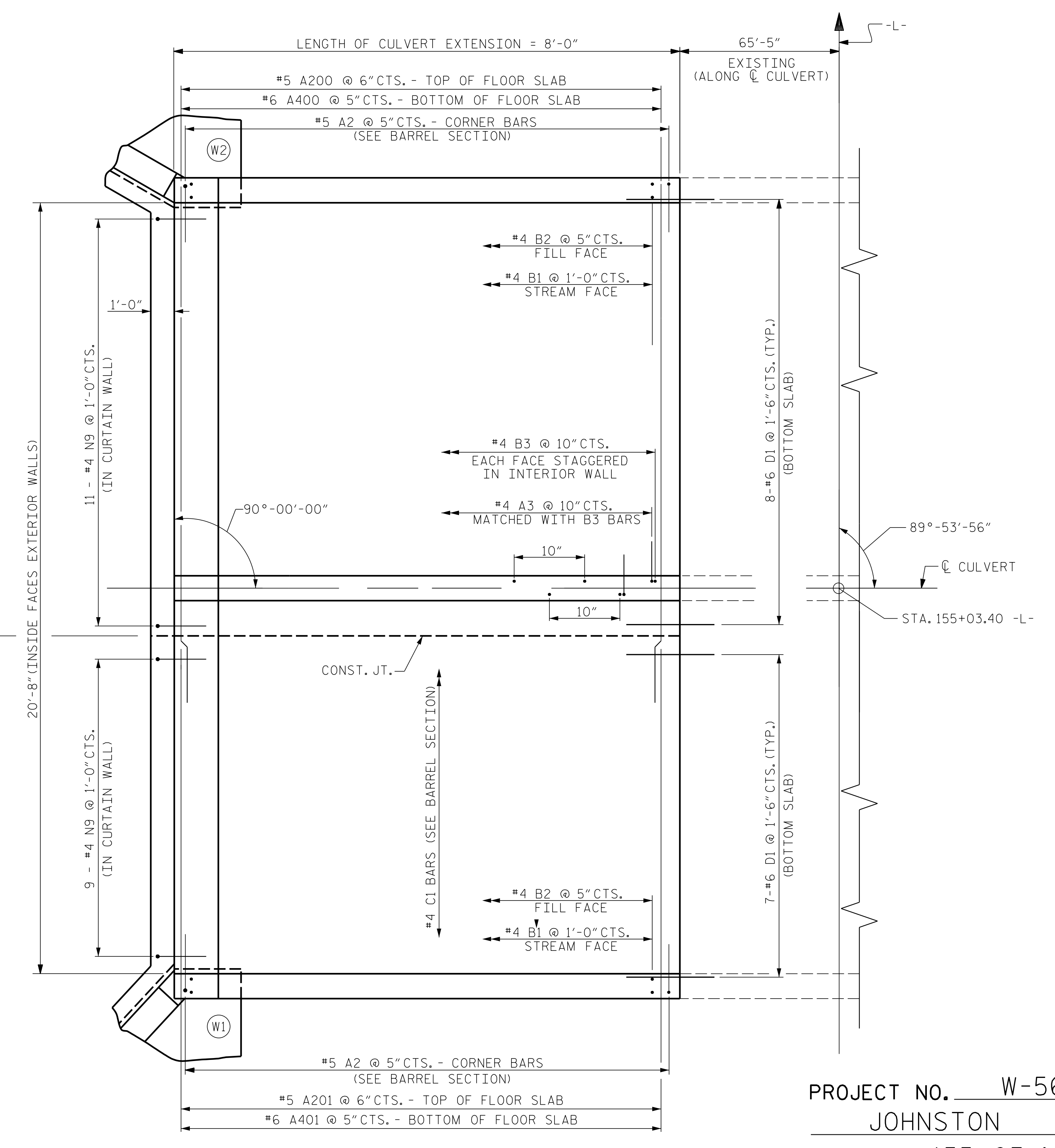
DEPARTMENT OF TRANSPORTATION
 STATE OF NORTH CAROLINA
**DOUBLE 10 FT. X 6 FT.
 CONCRETE BOX CULVERT
 EXTENSION**
89'-53'-56" SKEW

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| REVISIONS | | REVISIONS | | REVISIONS | | SHEET NO. |
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PART PLAN - ROOF SLAB



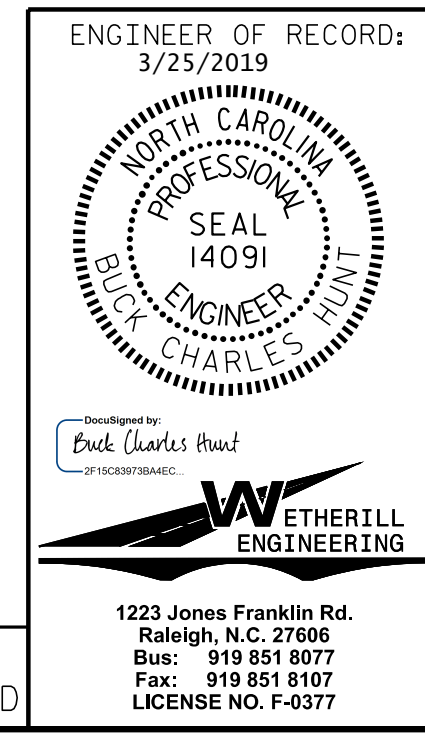
PART PLAN - FLOOR SLAB

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 155+03.40 -L-
 SHEET 4 OF 7

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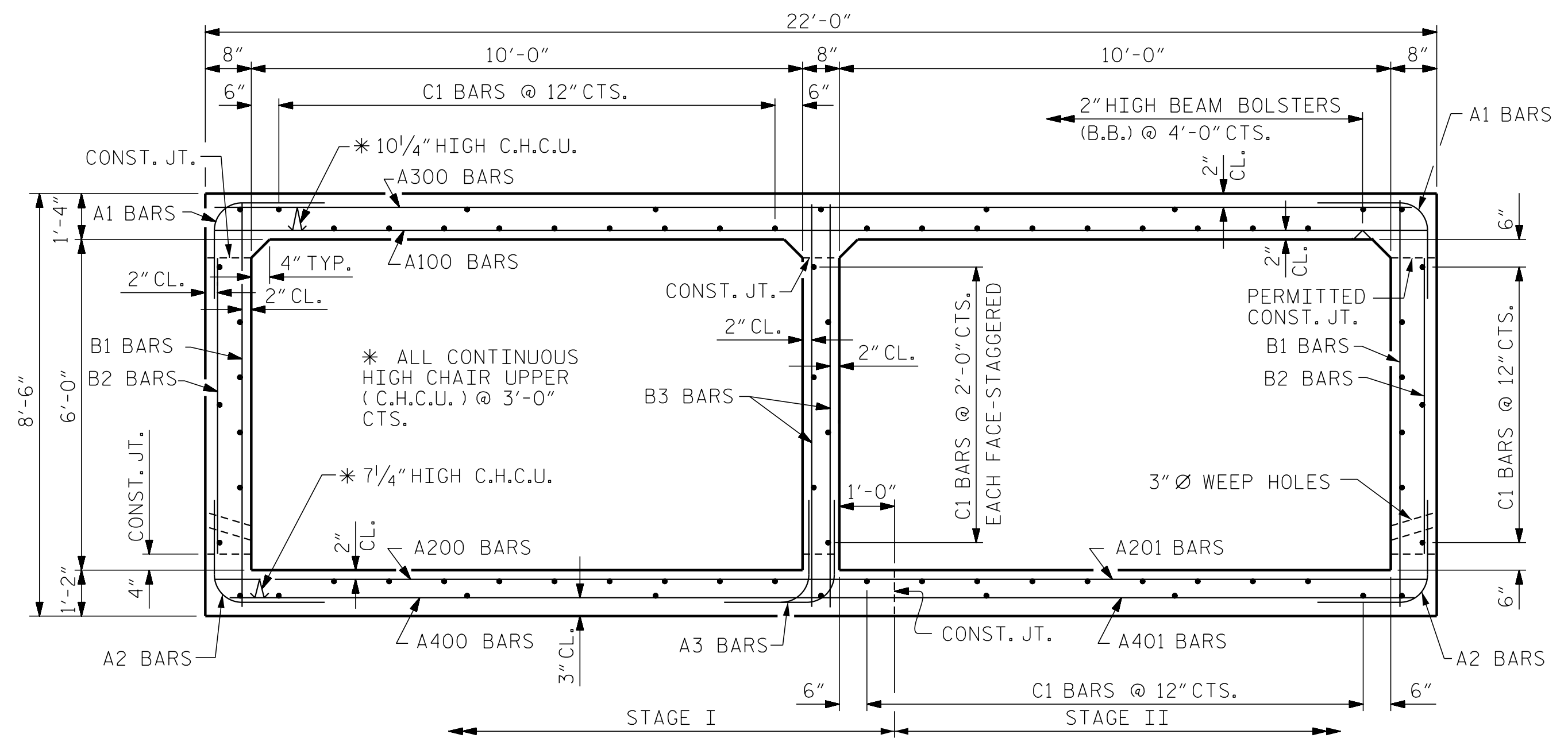
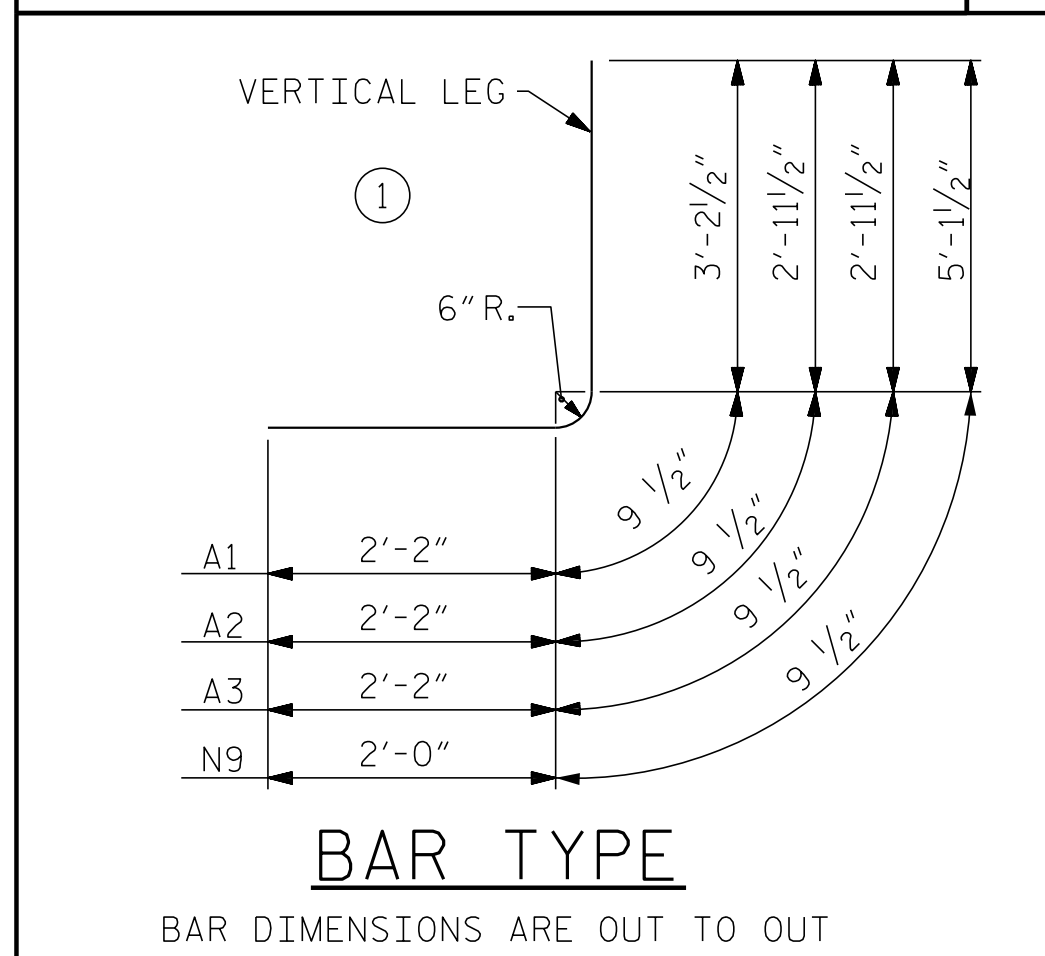
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|--|-----|-------|-----|-----|-------------------|
| ENGINEER OF RECORD: 3/25/2019 | | | | | |
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH DOUBLE 10 FT. X 6 FT. CONCRETE BOX CULVERT EXTENSION 89'-53'-56" SKEW | | | | | |
| REVISIONS | | | | | |
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BARREL REINFORCING STEEL

| STAGE I | | | | | | STAGE II | | | | | |
|-------------------|----|------|------|---------|----------|-------------------|----|------|------|--------|----------|
| BAR | NO | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO | SIZE | TYPE | LENGTH | WEIGHT |
| A1 | 19 | 5 | 1 | 6'-2" | 122 | A1 | 19 | 5 | 1 | 6'-2" | 122 |
| A2 | 19 | 5 | 1 | 5'-11" | 117 | A2 | 19 | 5 | 1 | 5'-11" | 117 |
| A3 | 16 | 4 | 1 | 5'-11" | 63 | | | | | | |
| | | | | | | A100 | 16 | 6 | STR | 21'-8" | 521 |
| A200 | 16 | 5 | STR | 14'-4" | 239 | A201 | 16 | 5 | STR | 9'-6" | 159 |
| A400 | 19 | 6 | STR | 14'-11" | 426 | A300 | 19 | 6 | STR | 21'-8" | 618 |
| | | | | | | A401 | 19 | 6 | STR | 9'-6" | 271 |
| B1 | 8 | 4 | STR | 8'-1" | 43 | | | | | | |
| B2 | 19 | 4 | STR | 5'-8" | 72 | B1 | 8 | 4 | STR | 8'-1" | 43 |
| B3 | 19 | 4 | STR | 8'-1" | 103 | B2 | 19 | 4 | STR | 5'-8" | 72 |
| | | | | | | | | | | | |
| C1 | 28 | 4 | STR | 7'-8" | 143 | C1 | 46 | 4 | STR | 7'-8" | 236 |
| | | | | | | | | | | | |
| D1 | 12 | 6 | STR | 2'-6" | 45 | D1 | 26 | 6 | STR | 2'-6" | 98 |
| | | | | | | | | | | | |
| N9 | 11 | 4 | 1 | 7'-11" | 58 | G1 | 4 | 5 | STR | 21'-8" | 90 |
| | | | | | | | | | | | |
| | | | | | | N9 | 9 | 4 | 1 | 7'-11" | 48 |
| | | | | | | | | | | | |
| REINFORCING STEEL | | | | | 1431 LBS | REINFORCING STEEL | | | | | 2395 LBS |

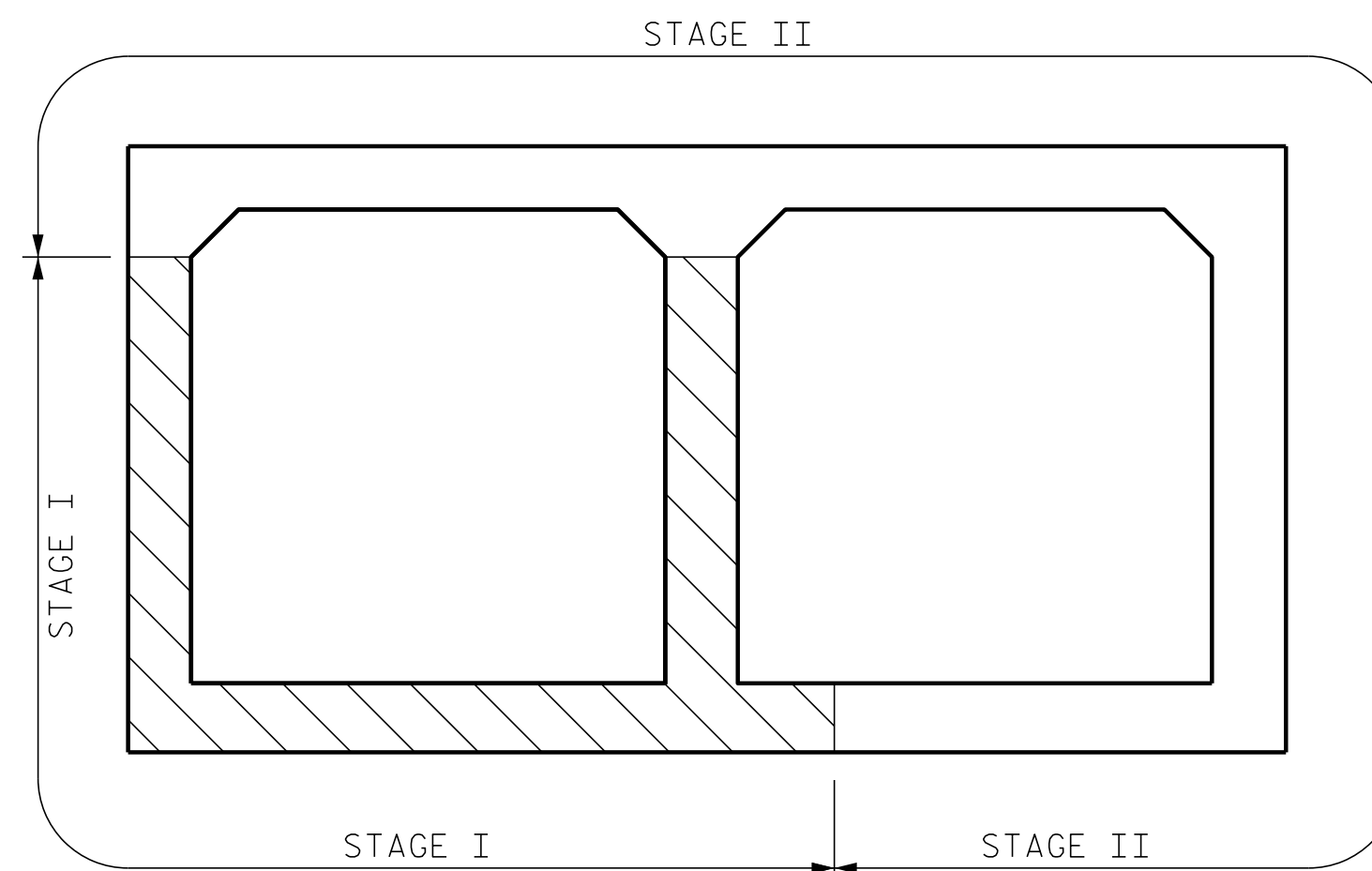
SPLICE LENGTHS CHART

| BAR | SIZE | SPLICE LENGTH |
|------|------|---------------|
| A200 | #5 | 2'-2" |
| A400 | #6 | 2'-9" |
| B1 | #4 | 1'-9" |
| B3 | #4 | 1'-9" |
| C1 | #4 | 1'-11" |



RIGHT ANGLE SECTION OF BARREL

LOOKING DOWNSTREAM
THERE ARE 74 "C" BARS IN SECTION OF BARREL.

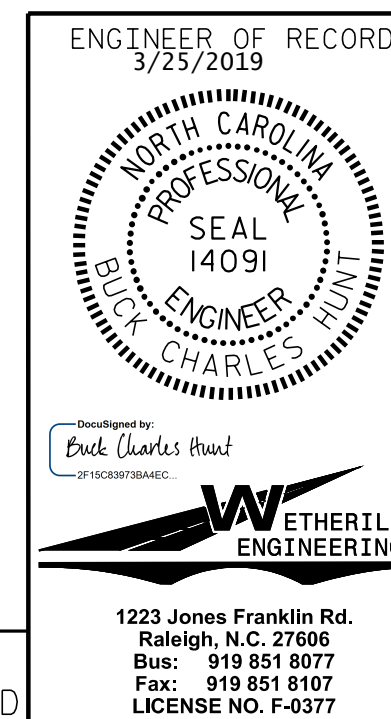


CONSTRUCTION SEQUENCE

LOOKING DOWNSTREAM

PROJECT NO. W-5600
JOHNSTON COUNTY
STATION: 155+03.40 -L-

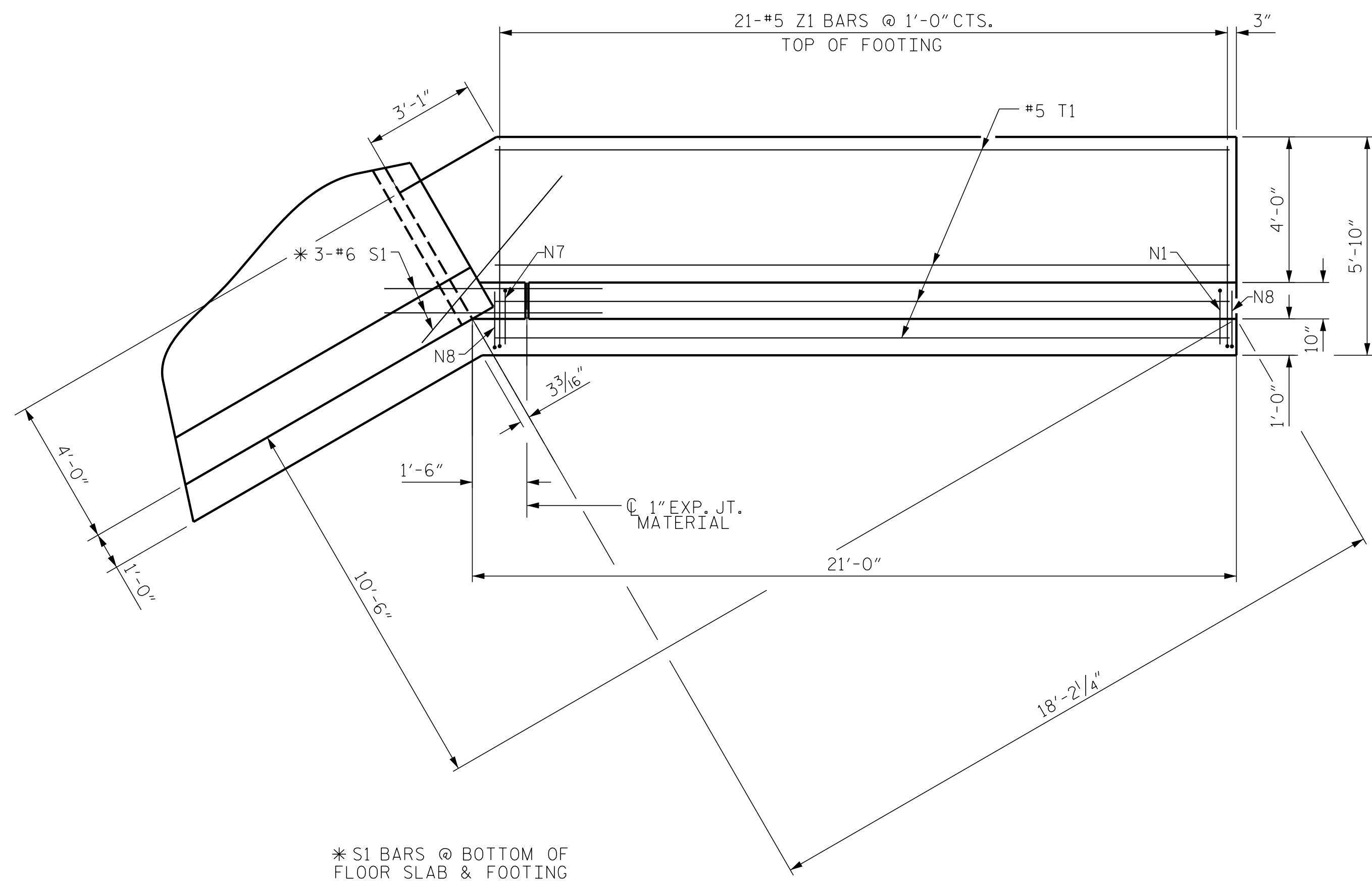
SHEET 5 OF 7



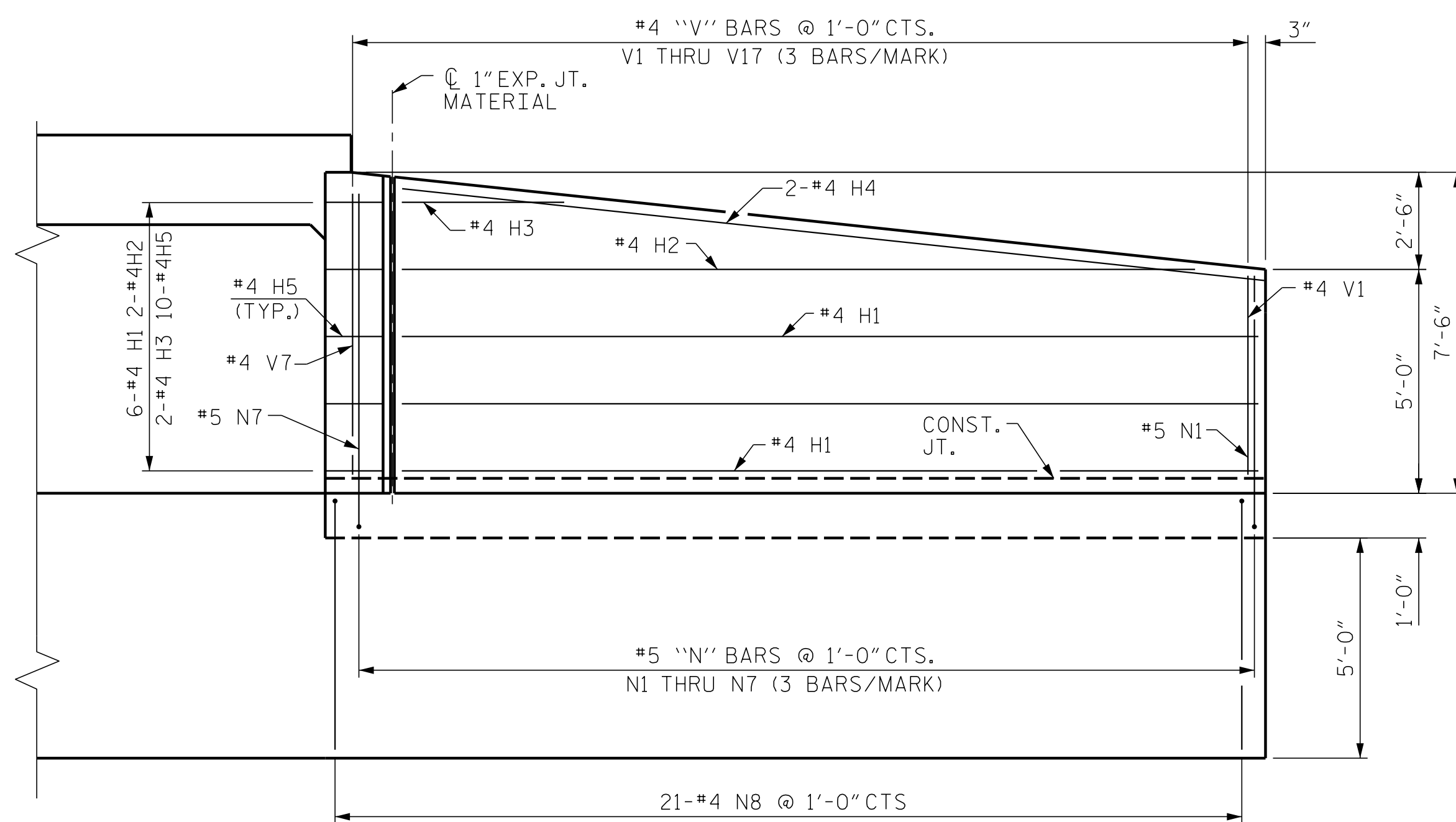
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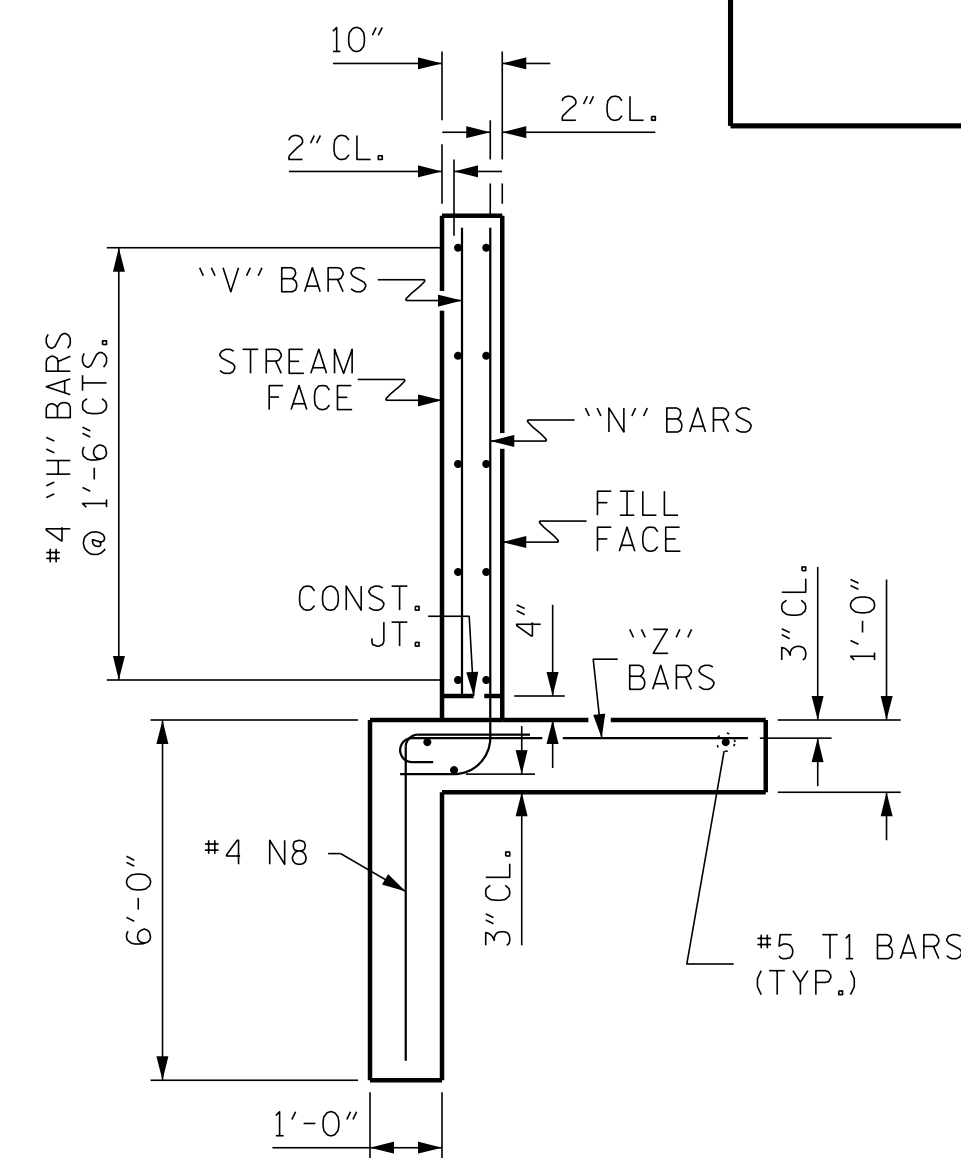


PLAN W1



ELEVATION W1

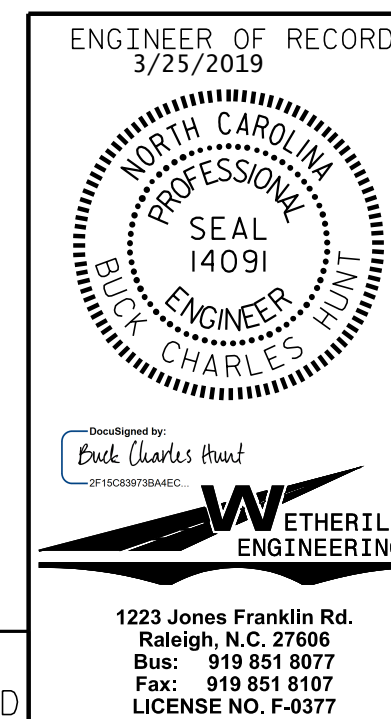
| BAR TYPES | | | | BILL OF MATERIAL | | | |
|------------------------------------|-----|------|------|------------------|--------|-----|--|
| ALL BAR DIMENSIONS ARE OUT TO OUT. | | | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | | |
| H1 | 6 | #4 | STR | 19'-1" | 76 | | |
| H2 | 2 | #4 | STR | 17'-8" | 24 | | |
| H3 | 2 | #4 | STR | 3'-7" | 5 | | |
| H4 | 2 | #4 | STR | 19'-4" | 26 | | |
| H5 | 10 | #4 | 1 | 3'-3" | 22 | | |
| N1 | 3 | #5 | 3 | 6'-11" | 22 | | |
| N2 | 3 | #5 | 3 | 7'-1" | 22 | | |
| N3 | 3 | #5 | 3 | 7'-5" | 23 | | |
| N4 | 3 | #5 | 3 | 7'-9" | 24 | | |
| N5 | 3 | #5 | 3 | 8'-1" | 25 | | |
| N6 | 3 | #5 | 3 | 8'-4" | 26 | | |
| N7 | 3 | #5 | 3 | 8'-9" | 27 | | |
| N8 | 21 | #4 | 3 | 7'-11" | 111 | | |
| S1 | 3 | #6 | STR | 6'-0" | 27 | | |
| T1 | 4 | #5 | STR | 20'-2" | 84 | | |
| V1 | 3 | #4 | STR | 4'-5" | 9 | | |
| V2 | 3 | #4 | STR | 4'-8" | 9 | | |
| V3 | 3 | #4 | STR | 5'-0" | 10 | | |
| V4 | 3 | #4 | STR | 5'-3" | 11 | | |
| V5 | 3 | #4 | STR | 5'-7" | 11 | | |
| V6 | 3 | #4 | STR | 5'-11" | 12 | | |
| V7 | 3 | #4 | STR | 6'-3" | 13 | | |
| Z1 | 21 | #5 | 4 | 6'-1" | 133 | | |
| REINFORCING STEEL | | | | | 752 | LBS | |
| CLASS A CONCRETE WING | | | | | 12.6 | CY | |
| TOTAL | | | | | 12.6 | CY | |



WING SECTION

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 155+03.40 -L-

SHEET 6 OF 7



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

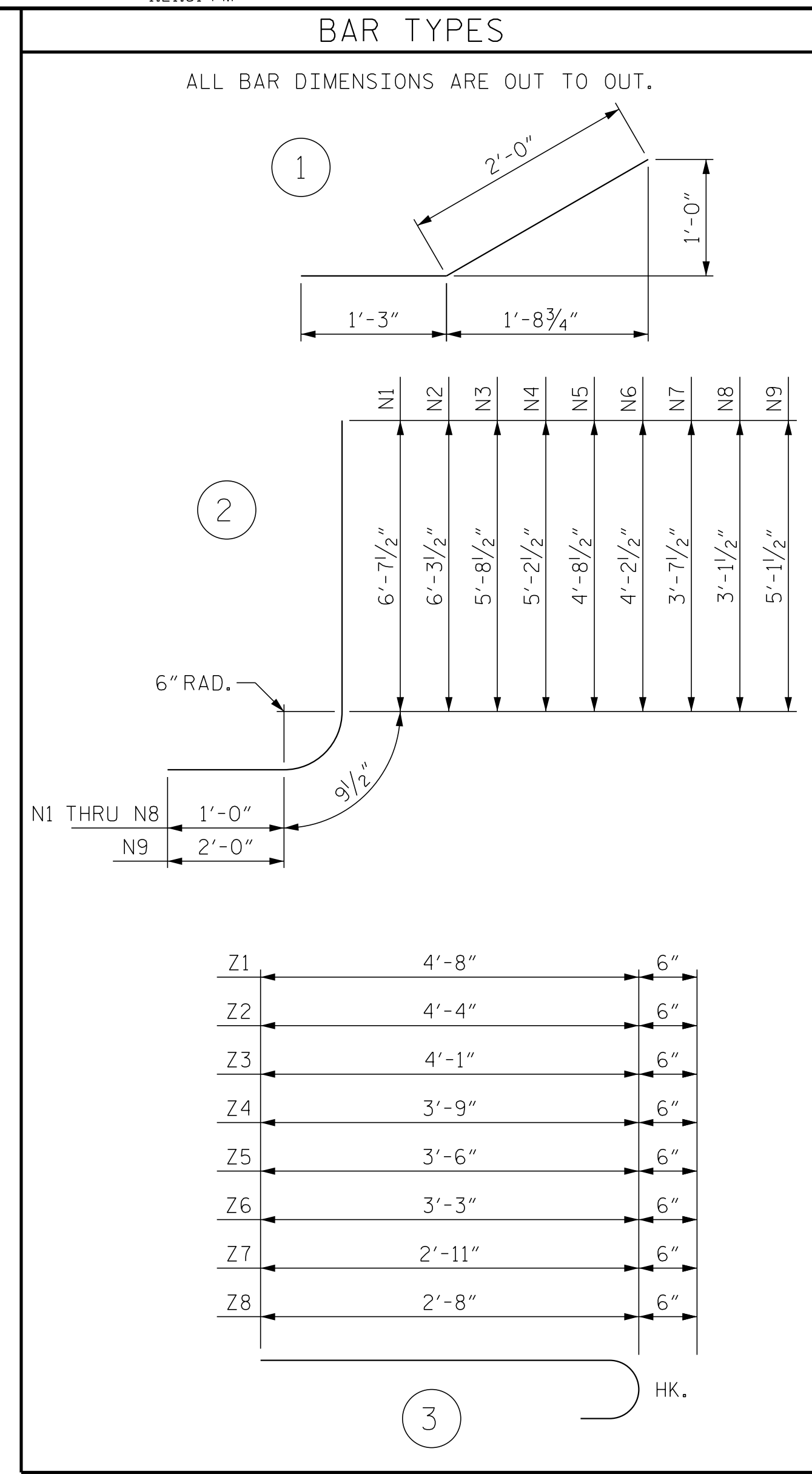
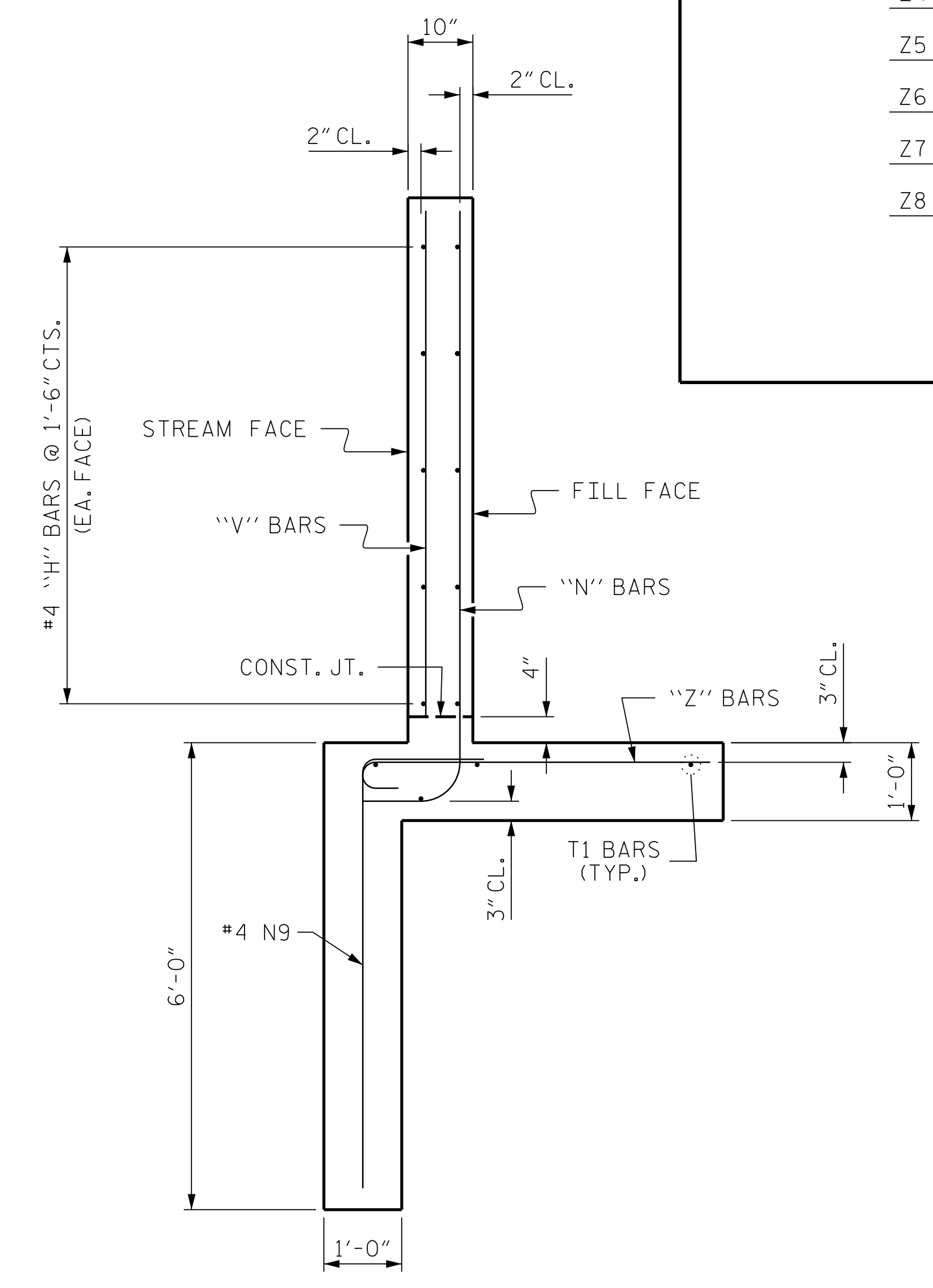
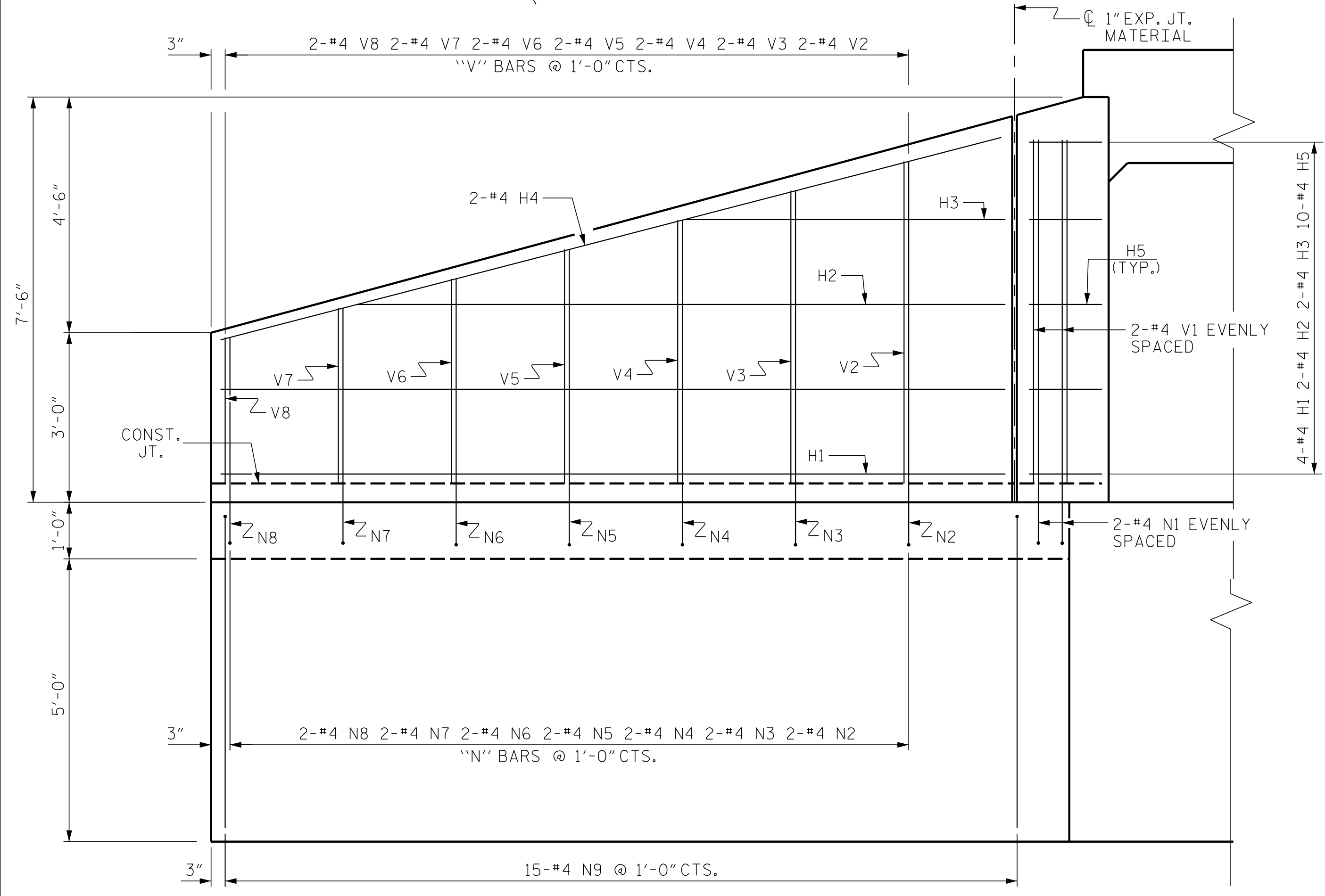
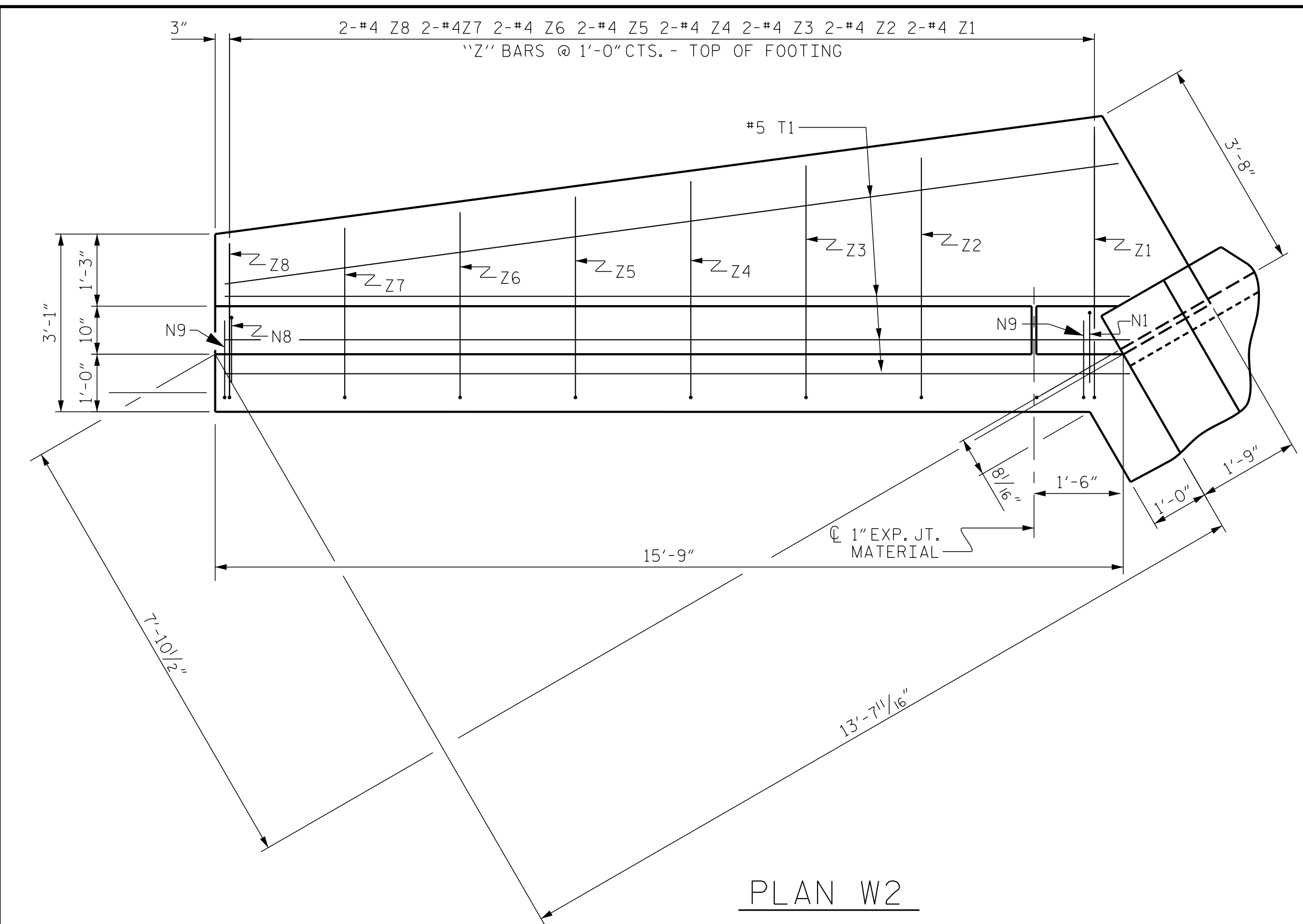
WING
 W1

REVISIONS

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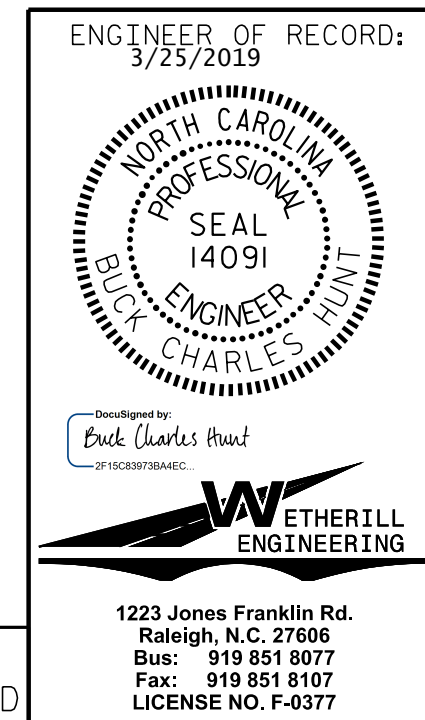
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 LICENSE NO. F-0377



| BILL OF MATERIAL | | | | | |
|------------------|-----|------|------|---------|--------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| H1 | 4 | #4 | STR | 13'-10" | 37 |
| H2 | 2 | #4 | STR | 11'-5" | 15 |
| H3 | 2 | #4 | STR | 5'-8" | 8 |
| H4 | 2 | #4 | STR | 14'-3" | 19 |
| H5 | 10 | #4 | 1 | 3'-3" | 22 |
| N1 | 2 | #4 | 2 | 8'-5" | 11 |
| N2 | 2 | #4 | 2 | 8'-1" | 11 |
| N3 | 2 | #4 | 2 | 7'-6" | 10 |
| N4 | 2 | #4 | 2 | 7'-0" | 9 |
| N5 | 2 | #4 | 2 | 6'-6" | 9 |
| N6 | 2 | #4 | 2 | 6'-0" | 8 |
| N7 | 2 | #4 | 2 | 5'-5" | 7 |
| N8 | 2 | #4 | 2 | 4'-11" | 7 |
| N9 | 15 | #4 | 2 | 7'-11" | 79 |
| T1 | 4 | #5 | STR | 15'-7" | 65 |
| V1 | 2 | #4 | STR | 6'-1" | 8 |
| V2 | 2 | #4 | STR | 5'-8" | 8 |
| V3 | 2 | #4 | STR | 5'-2" | 7 |
| V4 | 2 | #4 | STR | 4'-7" | 6 |
| V5 | 2 | #4 | STR | 4'-1" | 5 |
| V6 | 2 | #4 | STR | 3'-7" | 5 |
| V7 | 2 | #4 | STR | 3'-1" | 4 |
| V8 | 2 | #4 | STR | 2'-7" | 3 |
| Z1 | 2 | #4 | 3 | 5'-2" | 7 |
| Z2 | 2 | #4 | 3 | 4'-10" | 6 |
| Z3 | 2 | #4 | 3 | 4'-7" | 6 |
| Z4 | 2 | #4 | 3 | 4'-3" | 6 |
| Z5 | 2 | #4 | 3 | 4'-0" | 5 |
| Z6 | 2 | #4 | 3 | 3'-9" | 5 |
| Z7 | 2 | #4 | 3 | 3'-5" | 5 |
| Z8 | 2 | #4 | 3 | 3'-2" | 4 |

| | | |
|-------------------|-----|-----|
| REINFORCING STEEL | 407 | LBS |
| CLASS A CONCRETE | 7.8 | CY |
| WING | 7.8 | CY |
| TOTAL | 7.8 | CY |

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 155+03.40 -L-
 SHEET 7 OF 7

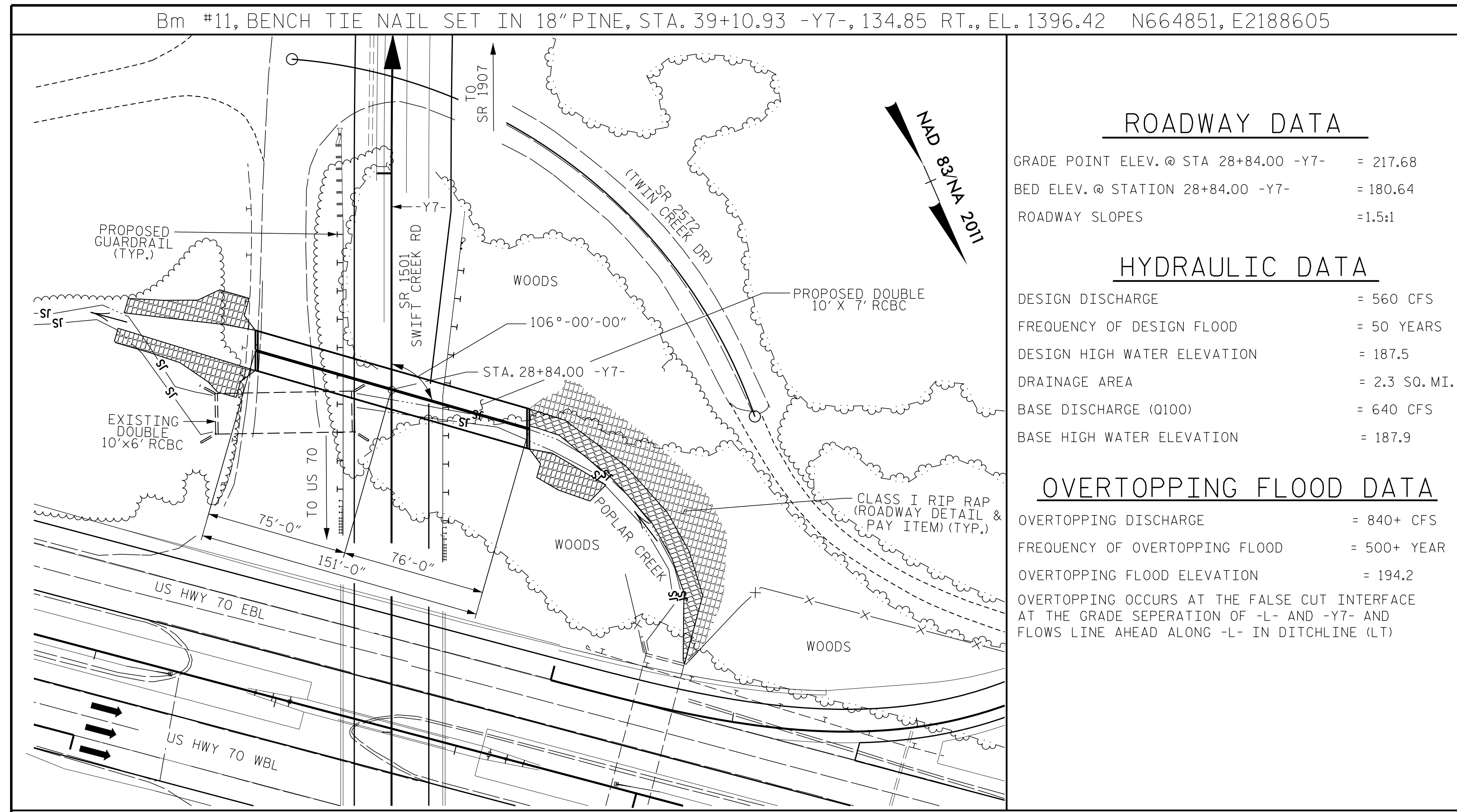


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DRAWN BY: B.C. HUNT DATE: 3-18
 CHECKED BY: J. DILWORTH DATE: 3-18

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ROADWAY DATA

| | |
|---------------------------------------|----------|
| GRADE POINT ELEV. @ STA 28+84.00 -Y7- | = 217.68 |
| BED ELEV. @ STATION 28+84.00 -Y7- | = 180.64 |
| ROADWAY SLOPES | = 1.5:1 |

HYDRAULIC DATA

| | |
|-----------------------------|---------------|
| DESIGN DISCHARGE | = 560 CFS |
| FREQUENCY OF DESIGN FLOOD | = 50 YEARS |
| DESIGN HIGH WATER ELEVATION | = 187.5 |
| DRAINAGE AREA | = 2.3 SQ. MI. |
| BASE DISCHARGE (Q100) | = 640 CFS |
| BASE HIGH WATER ELEVATION | = 187.9 |

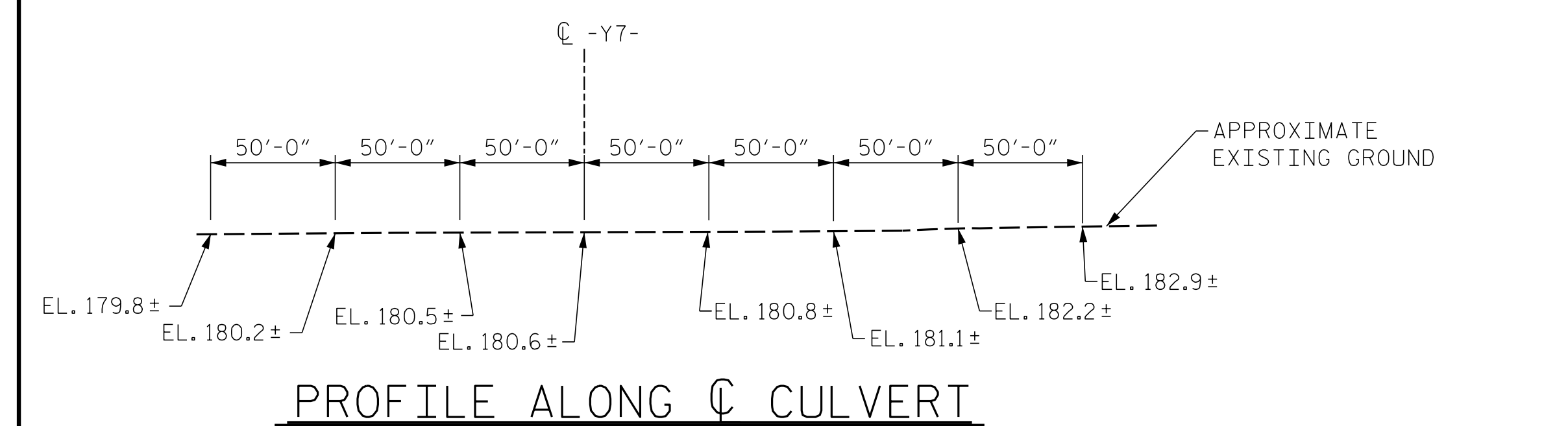
OVERTOPPING FLOOD DATA

| | |
|--------------------------------|-------------|
| OVERTOPPING DISCHARGE | = 840+ CFS |
| FREQUENCY OF OVERTOPPING FLOOD | = 500+ YEAR |
| OVERTOPPING FLOOD ELEVATION | = 194.2 |

OVERTOPPING OCCURS AT THE FALSE CUT INTERFACE AT THE GRADE SEPERATION OF -L- AND -Y7- AND FLOWS LINE AHEAD ALONG -L- IN DITCHLINE (LT)

LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.



| 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" |

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND fy = 60 ksi.

| TOTAL BILL OF MATERIAL | | | |
|-------------------------------|---------------|----------|----------|
| MATERIAL | ELEMENT | STAGE I | STAGE II |
| CLASS A CONCRETE (CU. YDS.) | BARREL | 197.8 | 373.5 |
| | HEADWALLS | ---- | 2.1 |
| | CURTAIN WALLS | 1.4 | 1.1 |
| | SILLS | 1.5 | ---- |
| | WINGS | 9.1 | 9.1 |
| | TOTAL | 209.8 | 385.8 |
| | TOTAL | 595.6 | |
| REINFORCING STEEL (LBS.) | BARREL | 26454 | 37727 |
| | WINGS | 828 | 829 |
| | TOTAL | 27282 | 38556 |
| | TOTAL | 65838 | |
| FOUNDATION COND. MAT'L (TONS) | | 155 | 130 |
| | TOTAL | 285 | |
| REMOVAL OF EXISTING STRUCTURE | | LUMP SUM | |
| CULVERT EXCAVATION | | LUMP SUM | |
| ASBESTOS ASSESSMENT | | LUMP SUM | |

NOTES

- ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
- DESIGN FILL TO BOTTOM OF TOP SLAB, 28.85' (MIN.) AND 30.12' (MAX.)
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN THE CULVERT TO BE POURED IN THE FOLLOWING ORDER:
- STAGE I:
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT.
- STAGE II
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALL.
 2. THE REMAINING PORTIONS OF THE WALL AND WINGS FULL HEIGHT FOLLOWED BY THE ENTIRE 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.
- TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS 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.
- THE EXISTING STRUCTURE CONSISTING OF A 10'x6' DOUBLE BARREL REINFORCED CONCRETE BOX CULVERT 74'-3" LONG ALONG CENTERLINE OF CULVERT AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING CULVERT IS PRESENTLY NOT POSTED FOR LOAD LIMIT.
- 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.
- FOR CULVERT DIVERSIONS DETAILS AND PAY ITEM, 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 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.

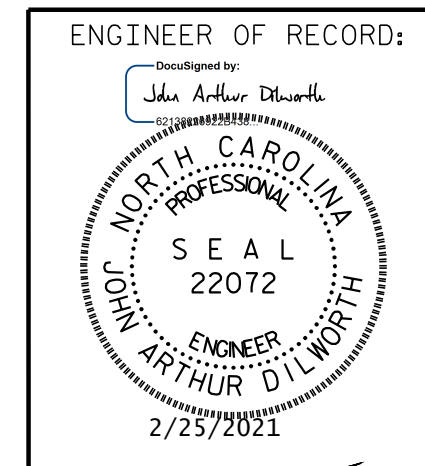
NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL TO A DEPTH OF 1 FOOT. CLASS B RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS. COST OF BACKFILLING THE CULVERT SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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 SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITES, SEE SPECIAL PROVISIONS.

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 28+84.00 -Y7-
 SHEET 1 OF 8 REPLACES STRUCTURE NO. 514

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**DOUBLE 10 FT. X 7 FT.
 CONCRETE BOX CULVERT
 106° SKEW**

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|---------|-----|-----|-------|----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | C3-1 |
| 1 | JCP | 2-25-21 | 3 | | | TOTAL SHEETS 8 |
| 2 | | | 4 | | | |

DRAWN BY : B.C. HUNT DATE : 5-18
 CHECKED BY : J.A. DILWORTH DATE : 5-18

⚠ CORRECTED STAGE I CONCRETE QUANTITY FROM 290.8 TO 209.8

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

| LEVEL | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING # | MINIMUM RATING FACTORS (RF) | TONS = W × RF | STRENGTH I LIMIT STATE | | | | | | | | COMMENT NUMBER | |
|--------------------------|----------------|----------------------|---------------------------------|-----------------------------------|---------------|---|---------------|---------|-----------------|--|---------------|---------|-----------------|----------------|--|
| | | | | | | LIVE-LOAD FACTORS (γ _{LL}) | MOMENT | | | | SHEAR | | | | |
| | | | | | | | RATING FACTOR | BOX NO. | ELEMENT TYPE | DISTANCE FROM LEFT END OF ELEMENT (FT) | RATING FACTOR | BOX NO. | ELEMENT TYPE | | DISTANCE FROM LEFT END OF ELEMENT (FT) |
| DESIGN LOAD RATING | PERMANENT LOAD | N/A | (S) | 1.04 | -- | N/A | 1.16 | 1 | BOTTOM SLAB | 10.88 | 1.04 | 1 | BOTTOM SLAB | 9.34 | 1,2 |

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 | -- |

NOTE:

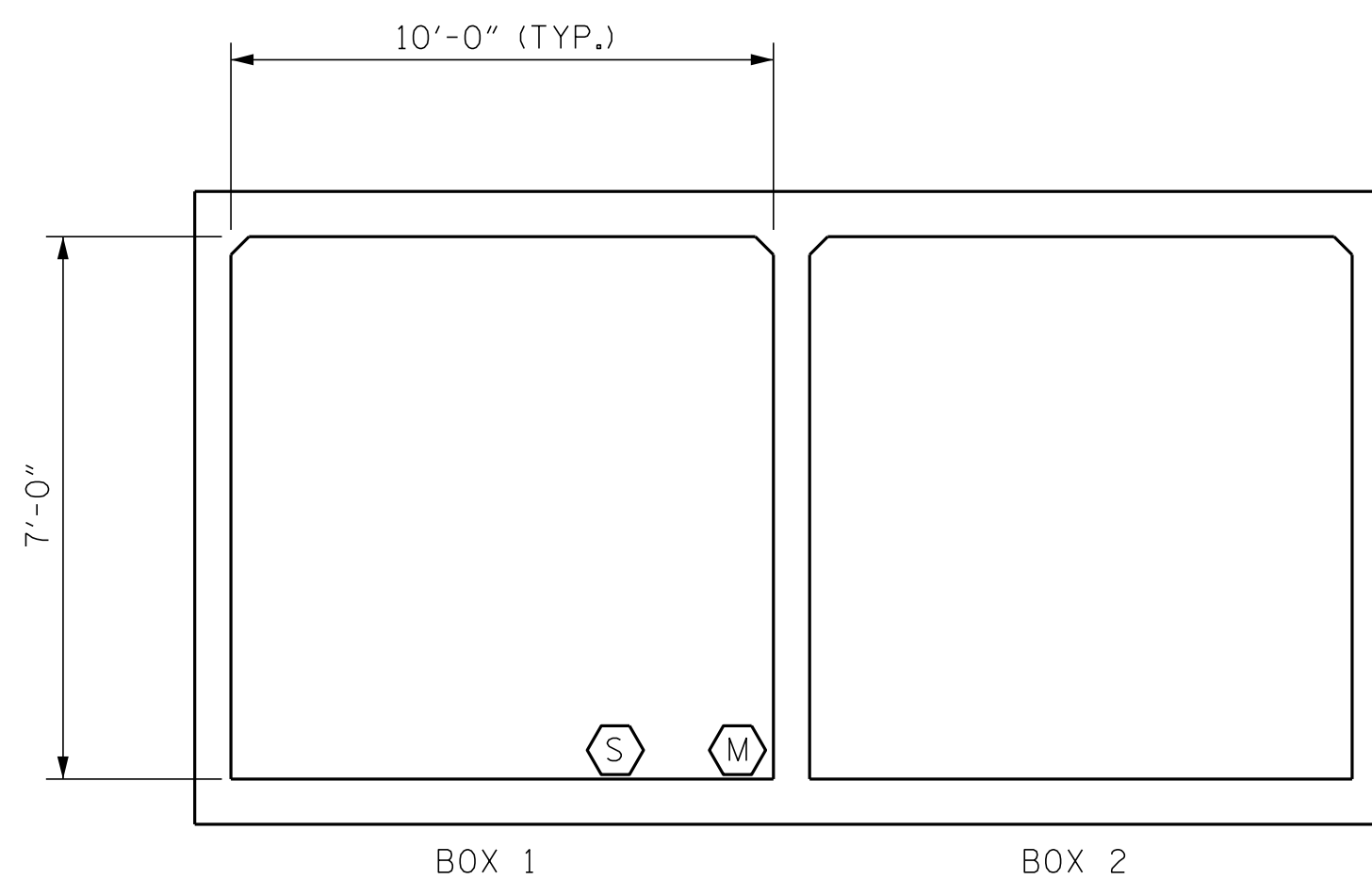
RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

FILL HEIGHT (27.50') EXCEEDS THE DISTANCE BETWEEN FACES OF END WALLS (20'-8").
DESIGN CONTROLLED BY DEAD LOAD ONLY. SEE AASHTO 3.6.1.2.6

CULVERT LOAD RATED FOR PERMANENT LOAD ONLY.

COMMENTS:

1. CALCULATED MOMENT RATING FACTOR EQUALS MOMENT CAPACITY DIVIDED BY DEAD LOAD MOMENT.
2. CALCULATED SHEAR RATING FACTOR EQUALS SHEAR CAPACITY DIVIDED BY DEAD LOAD SHEAR.

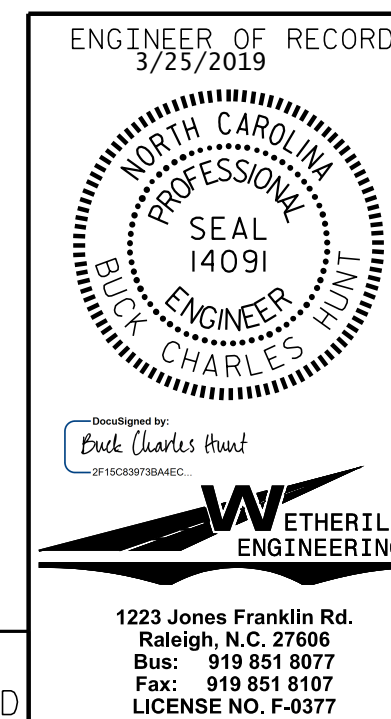


(M) MOMENT RATING FACTOR
(S) SHEAR RATING FACTOR

LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. W-5600
JOHNSTON COUNTY
STATION: 28+84.00 -Y7-

SHEET 2 OF 8



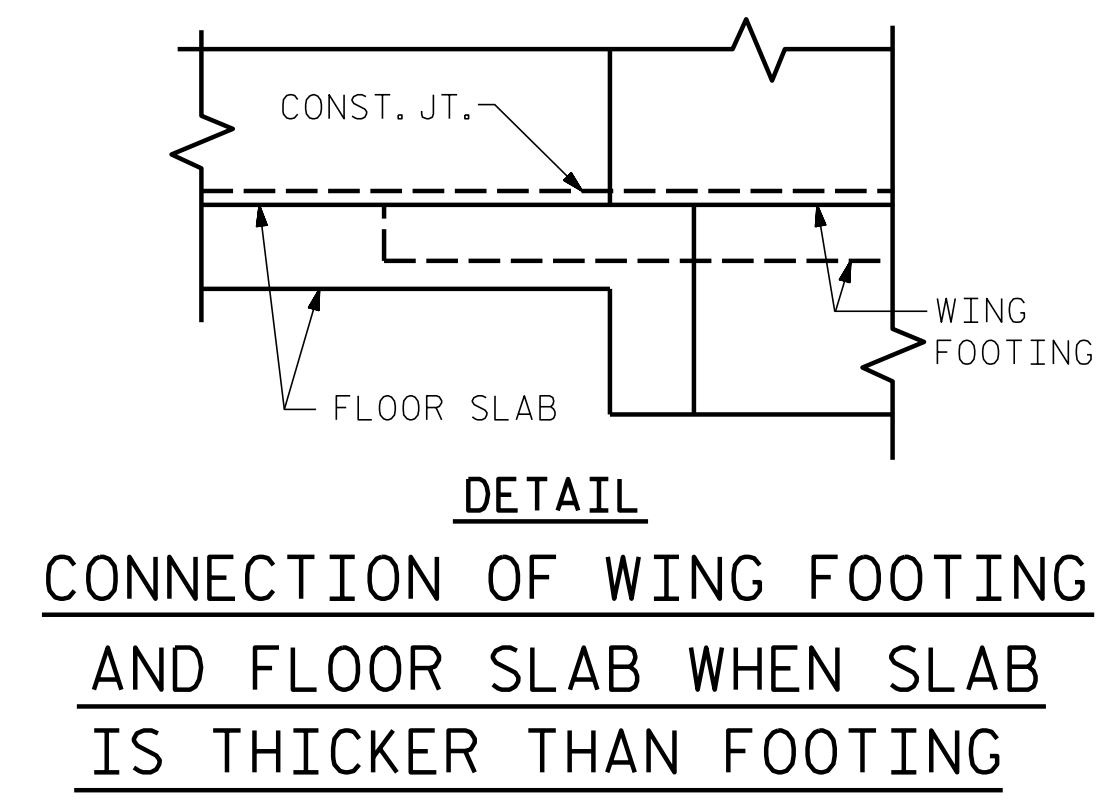
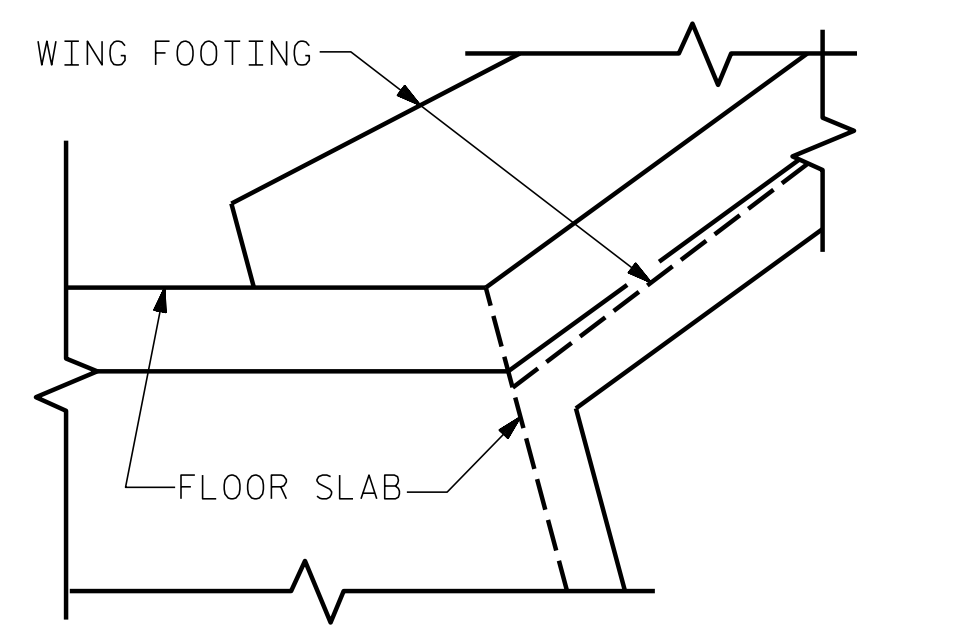
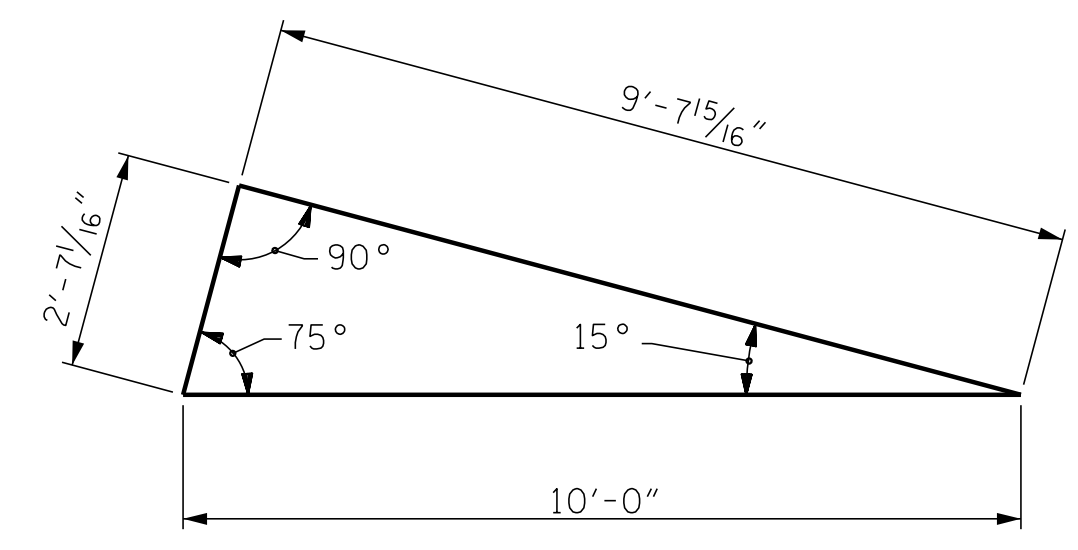
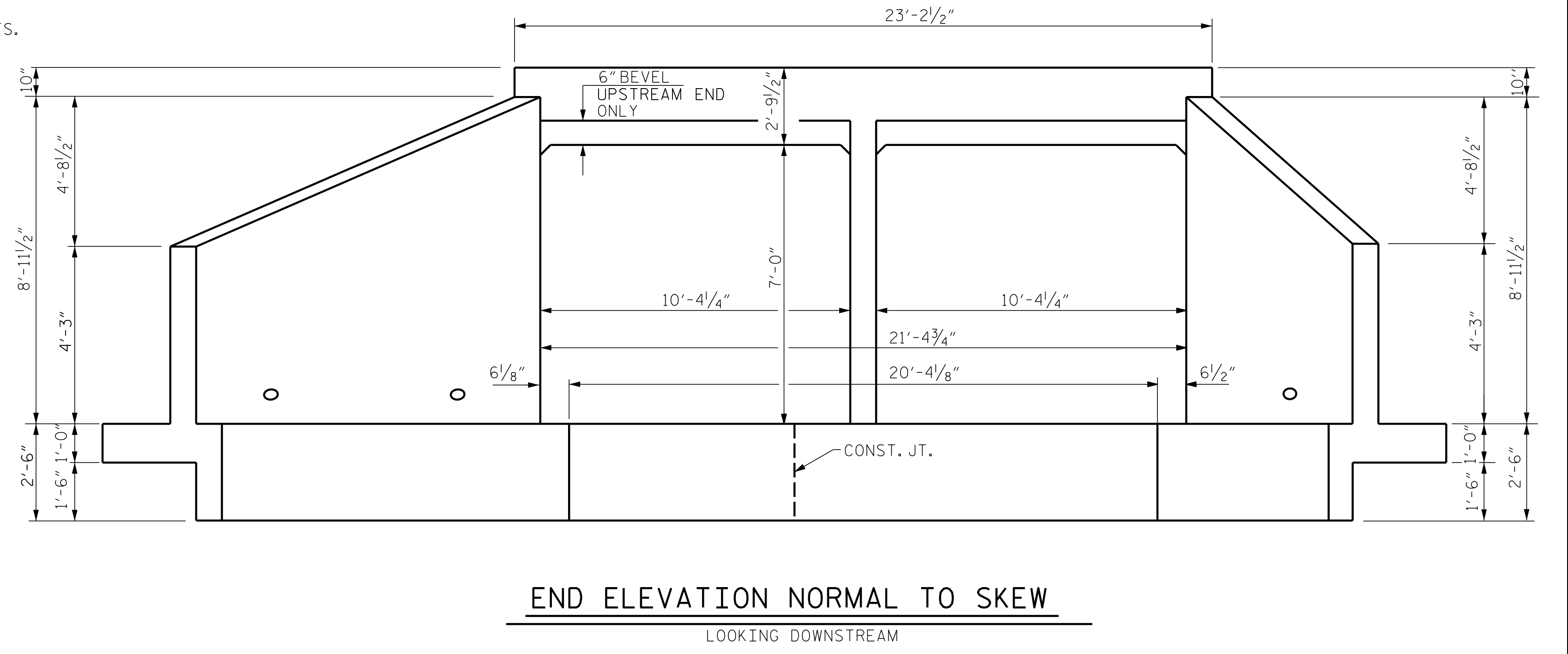
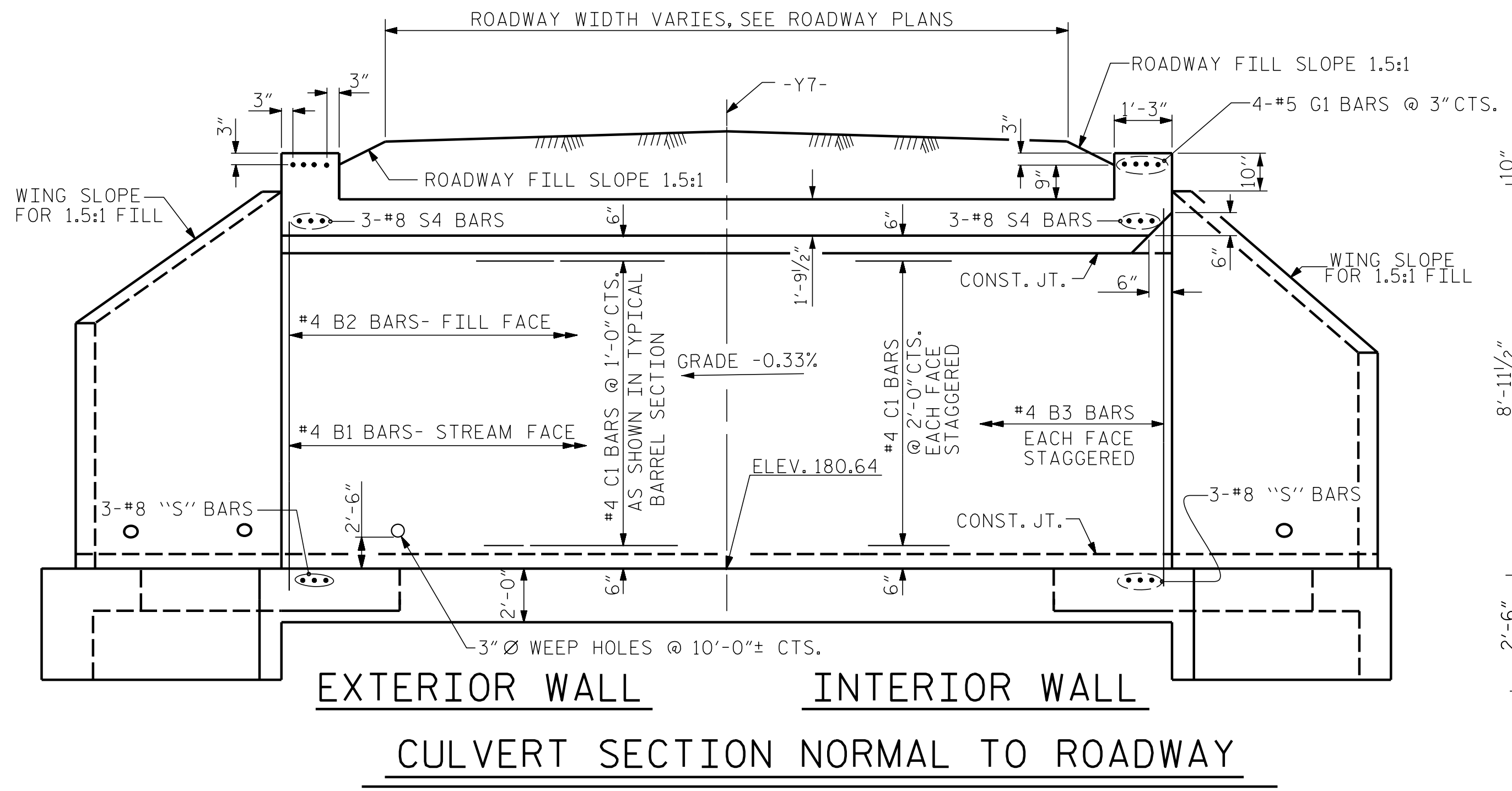
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**LRFR SUMMARY FOR
REINFORCED CONCRETE
BOX CULVERTS
(NON-INTERSTATE TRAFFIC)**

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | C3-2 |
| 1 | | | 3 | | | TOTAL SHEETS 8 |
| 2 | | | 4 | | | |

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| | |
|----------------------------|---------------------|
| ASSEMBLED BY : B.C. HUNT | DATE : 5-18 |
| CHECKED BY : J.A. DILWORTH | DATE : 5-18 |
| DRAWN BY : WMC 7/11 | REV. 10/1/11 MAA/GM |
| CHECKED BY : 7/11 | REV. 12/17 MAA/THC |



PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 28+84.00 -Y7-
 SHEET 3 OF 8

ENGINEER OF RECORD:
 3/25/2019

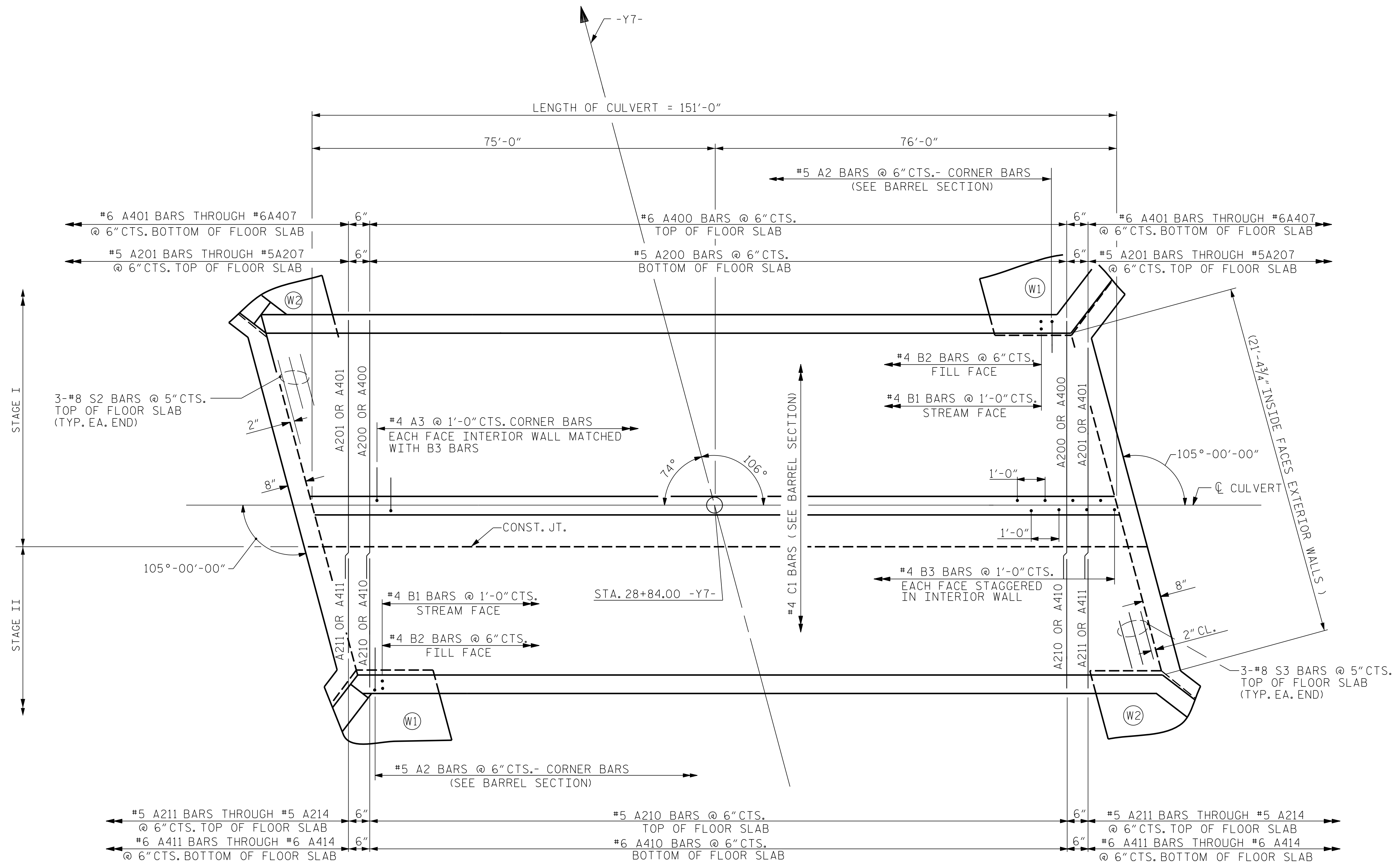
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 WETHERILL ENGINEERING
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 Fax: 919 851 8107
 LICENSE NO. F-0377

| | | | | | |
|--|-----|-------|-----|-----|-------------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| DOUBLE 10 FT. X 7 FT. CONCRETE BOX CULVERT 106° SKEW | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | | SHEET NO. C3-3 |
| | | | | | TOTAL SHEETS 8 |

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 CHECKED BY: J.A. DILWORTH DATE: 5-18

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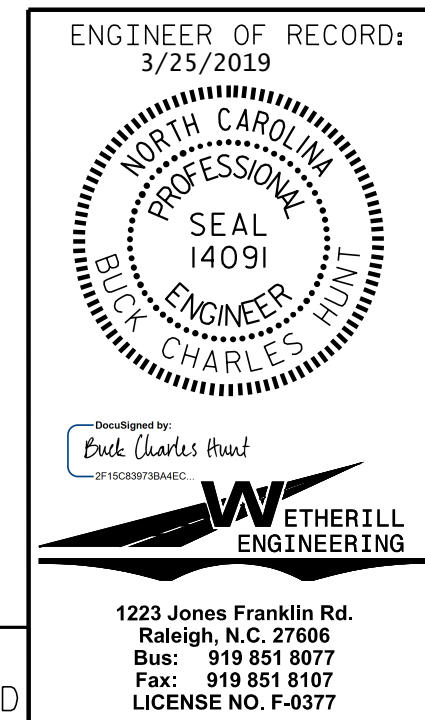
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FLOOR SLAB

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 28+84.00 -Y7-

SHEET 4 OF 8



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**DOUBLE 10 FT. X 7 FT.
 CONCRETE BOX CULVERT
 106° SKEW**

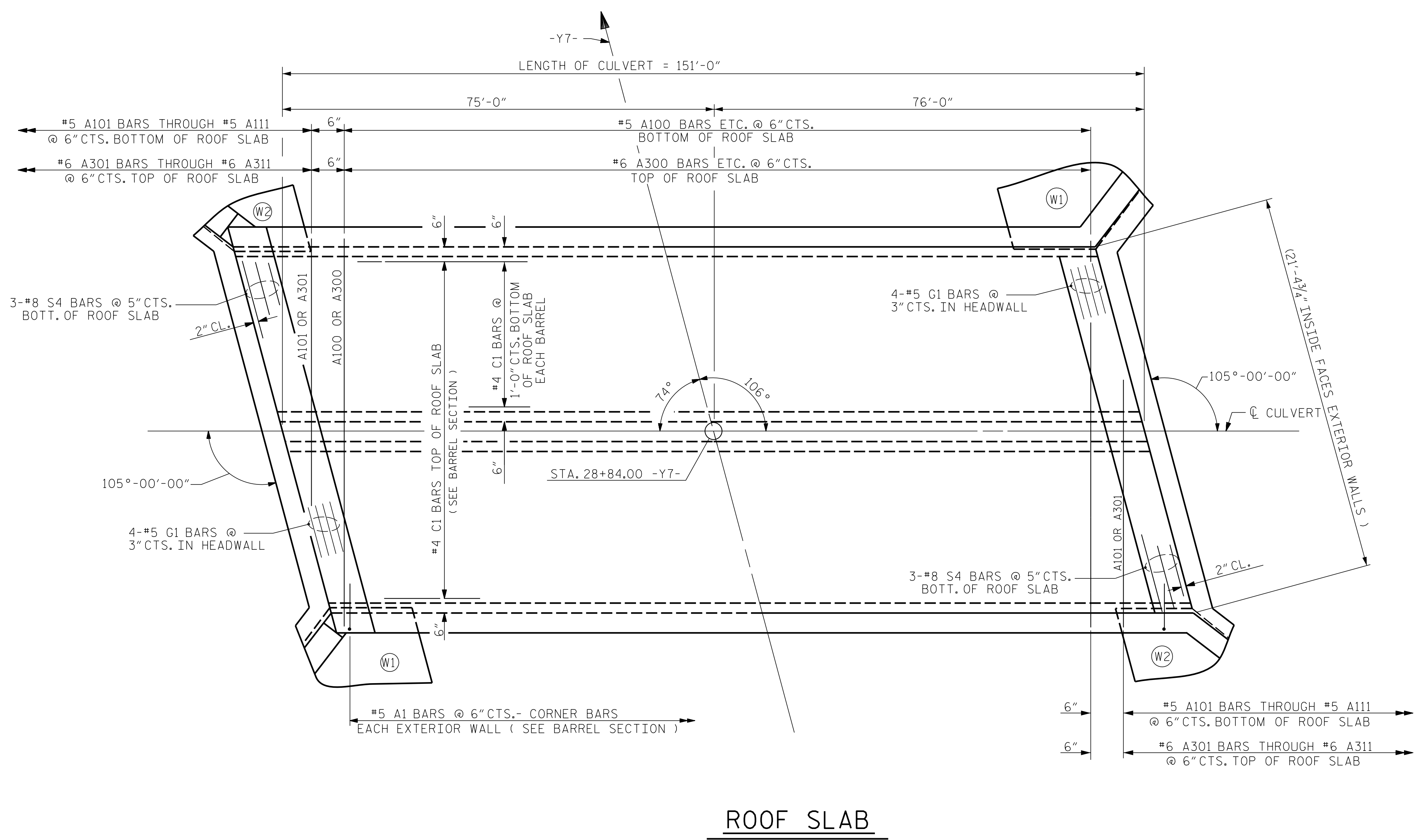
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|-----------|-----|-------|-----|-----|-------|----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | C3-4 |
| 1 | | | 3 | | | TOTAL SHEETS 8 |
| 2 | | | 4 | | | |

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ROOF SLAB

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 28+84.00 -Y7-

SHEET 5 OF 8

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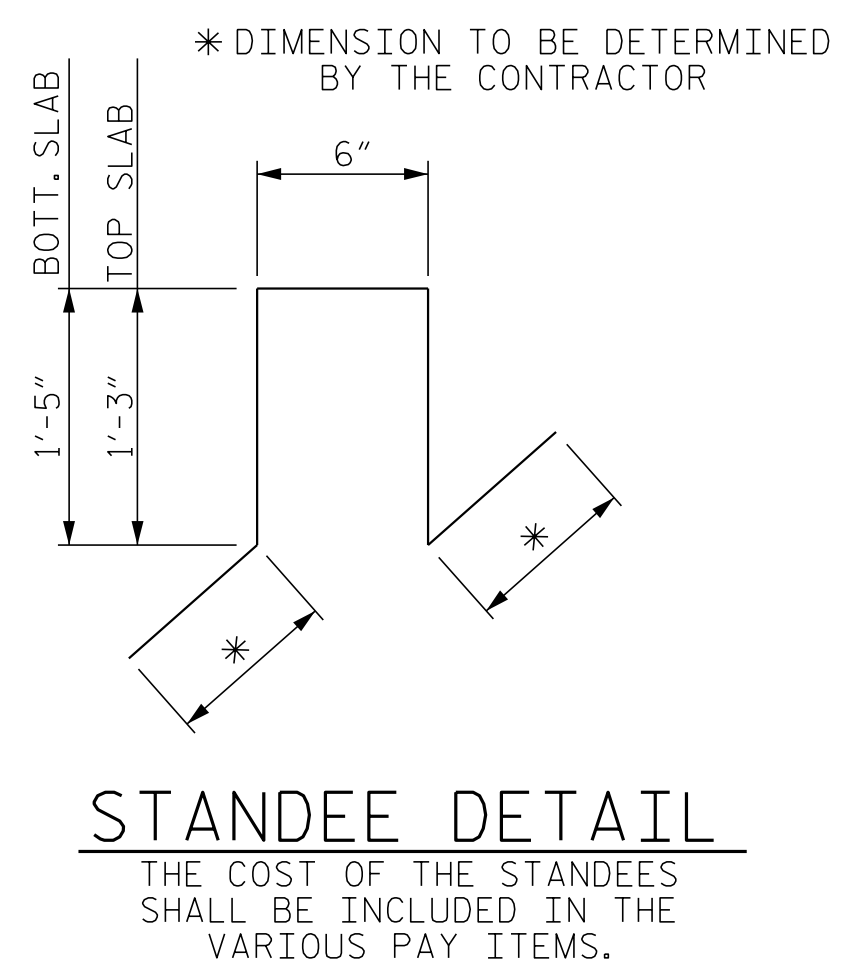
ENGINEER OF RECORD:
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Developed by:
Buck Charles Hunt
SECRETARY

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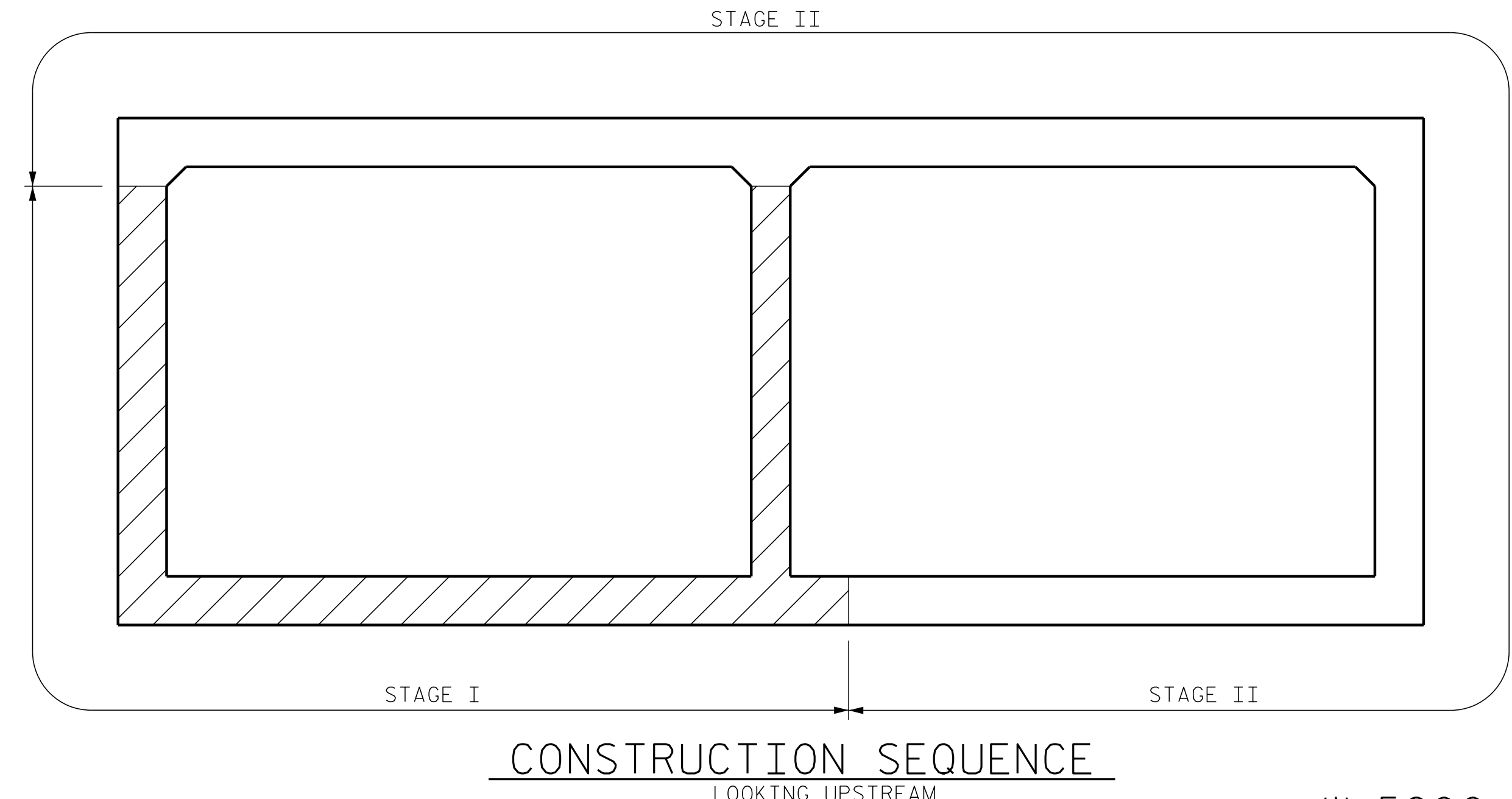
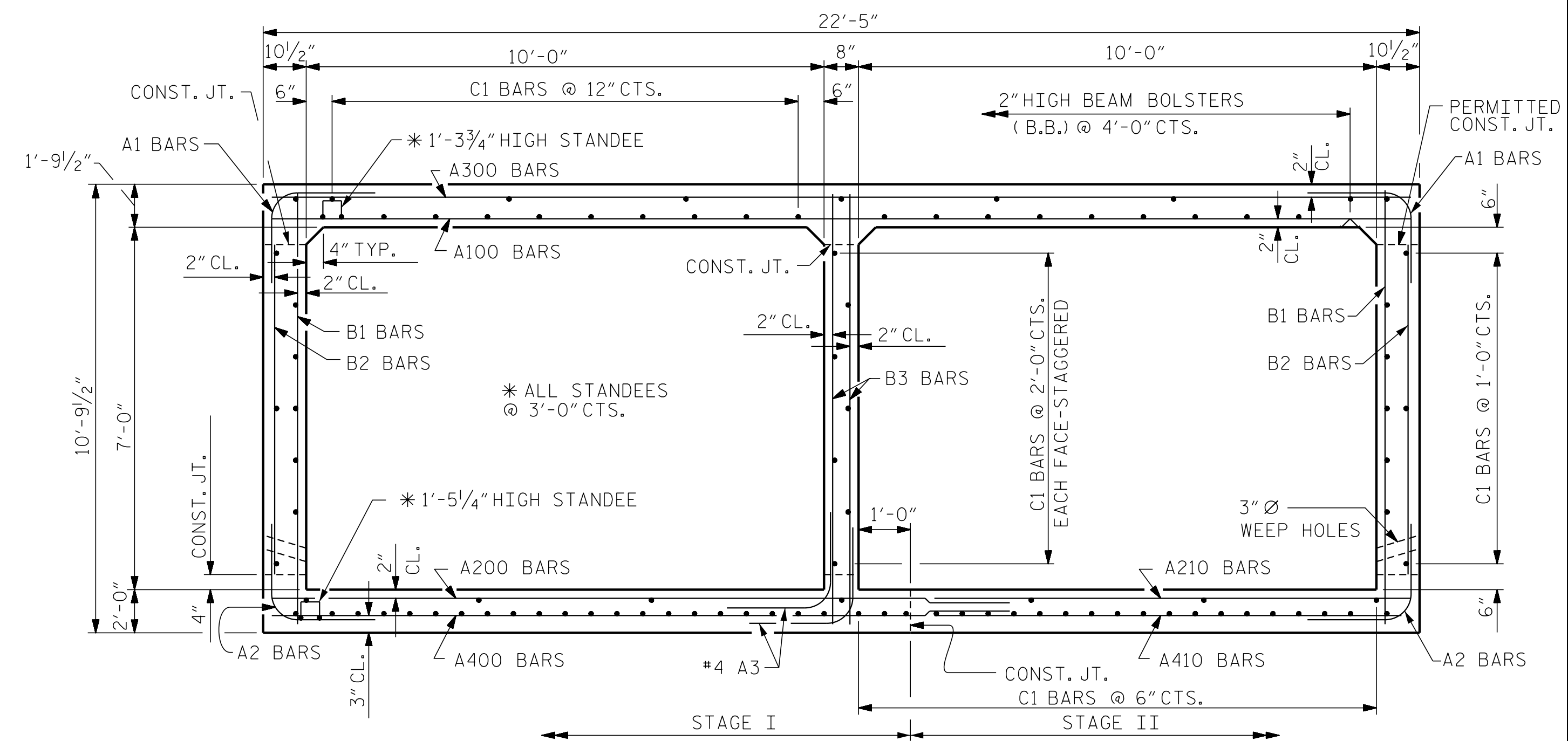
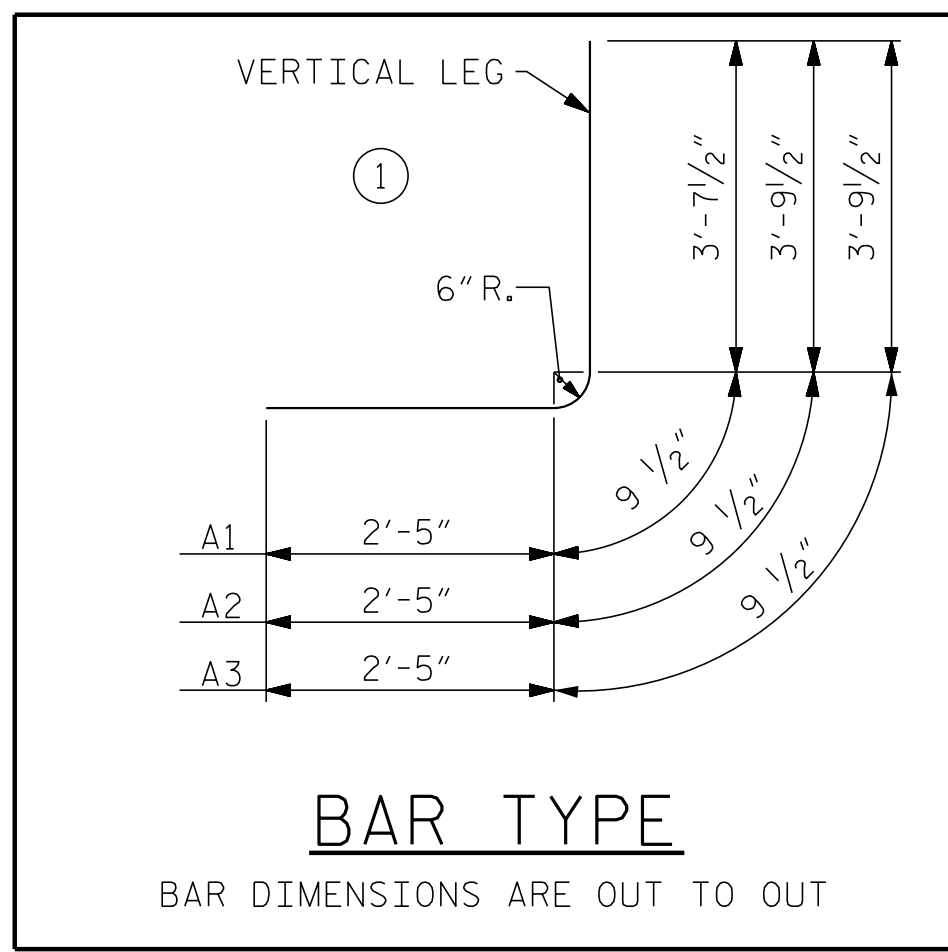
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|--|-----|-------|-----|-----|-------------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| DOUBLE 10 FT. X 7 FT. CONCRETE BOX CULVERT 106° SKEW | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| SHEET NO. C3-5 | | | | | TOTAL SHEETS 8 |

| BARREL REINFORCING STEEL | | | | | | | | | | | |
|--------------------------|-----|------|------|--------|------------|-------------------|-----|------|------|---------|------------|
| STAGE I | | | | | | STAGE II | | | | | |
| BAR | NO | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO | SIZE | TYPE | LENGTH | WEIGHT |
| A1 | 301 | 5 | 1 | 6'-10" | 2145 | A1 | 301 | 5 | 1 | 6'-10" | 2145 |
| A2 | 301 | 5 | 1 | 7'-0" | 2198 | A2 | 301 | 5 | 1 | 7'-0" | 2198 |
| A3 | 301 | 4 | 1 | 7'-0" | 1407 | | | | | | |
| A200 | 294 | 5 | STR | 14'-6" | 4446 | A100 | 290 | 5 | STR | 22'-1" | 6680 |
| A201 | 2 | 5 | STR | 13'-2" | 27 | A101 | 2 | 5 | STR | 20'-8" | 43 |
| A202 | 2 | 5 | STR | 11'-3" | 23 | A102 | 2 | 5 | STR | 18'-9" | 39 |
| A203 | 2 | 5 | STR | 9'-5" | 20 | A103 | 2 | 5 | STR | 16'-11" | 35 |
| A204 | 2 | 5 | STR | 7'-6" | 16 | A104 | 2 | 5 | STR | 15'-0" | 31 |
| A205 | 2 | 5 | STR | 5'-8" | 12 | A105 | 2 | 5 | STR | 13'-2" | 27 |
| A206 | 2 | 5 | STR | 3'-10" | 8 | A106 | 2 | 5 | STR | 11'-4" | 24 |
| A207 | 2 | 5 | STR | 2'-0" | 4 | A107 | 2 | 5 | STR | 9'-5" | 20 |
| | | | | | | A108 | 2 | 5 | STR | 7'-7" | 16 |
| | | | | | | A109 | 2 | 5 | STR | 5'-8" | 12 |
| A400 | 294 | 6 | STR | 15'-1" | 6661 | A110 | 2 | 5 | STR | 3'-10" | 8 |
| A401 | 2 | 6 | STR | 13'-5" | 40 | A111 | 2 | 5 | STR | 2'-0" | 4 |
| A402 | 2 | 6 | STR | 11'-6" | 35 | | | | | | |
| A403 | 2 | 6 | STR | 9'-8" | 29 | A210 | 297 | 5 | STR | 9'-8" | 2994 |
| A404 | 2 | 6 | STR | 7'-10" | 24 | A211 | 2 | 5 | STR | 7'-11" | 17 |
| A405 | 2 | 6 | STR | 5'-11" | 18 | A212 | 2 | 5 | STR | 6'-0" | 13 |
| A406 | 2 | 6 | STR | 4'-1" | 12 | A213 | 2 | 5 | STR | 4'-2" | 9 |
| A407 | 2 | 6 | STR | 2'-3" | 7 | A214 | 2 | 5 | STR | 2'-4" | 5 |
| | | | | | | | | | | | |
| B1 | 151 | 4 | STR | 10'-4" | 1042 | A300 | 290 | 6 | STR | 22'-1" | 9619 |
| B2 | 301 | 4 | STR | 6'-4" | 1273 | A301 | 2 | 6 | STR | 20'-8" | 62 |
| B3 | 301 | 4 | STR | 10'-4" | 2078 | A302 | 2 | 6 | STR | 18'-9" | 56 |
| | | | | | | A303 | 2 | 6 | STR | 16'-11" | 51 |
| | | | | | | A304 | 2 | 6 | STR | 15'-0" | 45 |
| | | | | | | A305 | 2 | 6 | STR | 13'-2" | 40 |
| | | | | | | A306 | 2 | 6 | STR | 11'-4" | 34 |
| | | | | | | A307 | 2 | 6 | STR | 9'-5" | 28 |
| | | | | | | A308 | 2 | 6 | STR | 7'-7" | 23 |
| | | | | | | A309 | 2 | 6 | STR | 5'-8" | 17 |
| | | | | | | A310 | 2 | 6 | STR | 3'-10" | 12 |
| | | | | | | A311 | 2 | 6 | STR | 2'-0" | 6 |
| | | | | | | | | | | | |
| | | | | | | A410 | 297 | 6 | STR | 9'-8" | 4312 |
| | | | | | | A411 | 2 | 6 | STR | 7'-11" | 24 |
| | | | | | | A412 | 2 | 6 | STR | 6'-0" | 18 |
| | | | | | | A413 | 2 | 6 | STR | 4'-2" | 13 |
| | | | | | | A414 | 2 | 6 | STR | 2'-4" | 7 |
| | | | | | | | | | | | |
| | | | | | | B1 | 151 | 4 | STR | 10'-4" | 1042 |
| | | | | | | B2 | 302 | 4 | STR | 6'-4" | 1278 |
| | | | | | | | | | | | |
| | | | | | | C1 | 336 | 4 | STR | 26'-9" | 6004 |
| | | | | | | | | | | | |
| | | | | | | G1 | 8 | 5 | STR | 22'-10" | 191 |
| | | | | | | | | | | | |
| | | | | | | S3 | 6 | 8 | STR | 9'-11" | 159 |
| | | | | | | S4 | 6 | 8 | STR | 22'-10" | 366 |
| | | | | | | | | | | | |
| REINFORCING STEEL | | | | | 26,454 LBS | REINFORCING STEEL | | | | | 37,727 LBS |



SPLICE LENGTHS CHART

| BAR | SIZE | SPLICE LENGTH |
|--------|------|---------------|
| A200 | #5 | 2'-2" |
| A400 | #6 | 2'-9" |
| B1, B3 | #4 | 1'-9" |
| C1 | #4 | 1'-11" |
| "S" | #8 | 4'-11" |



PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 28+84.00 -Y7-
 SHEET 6 OF 8

ENGINEER OF RECORD:
 3/25/2019

 Buck Charles Hunt
 ENGINEER
 WETHERILL ENGINEERING
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**DOUBLE 10 FT. X 7 FT.
 CONCRETE BOX CULVERT
 106° SKEW**

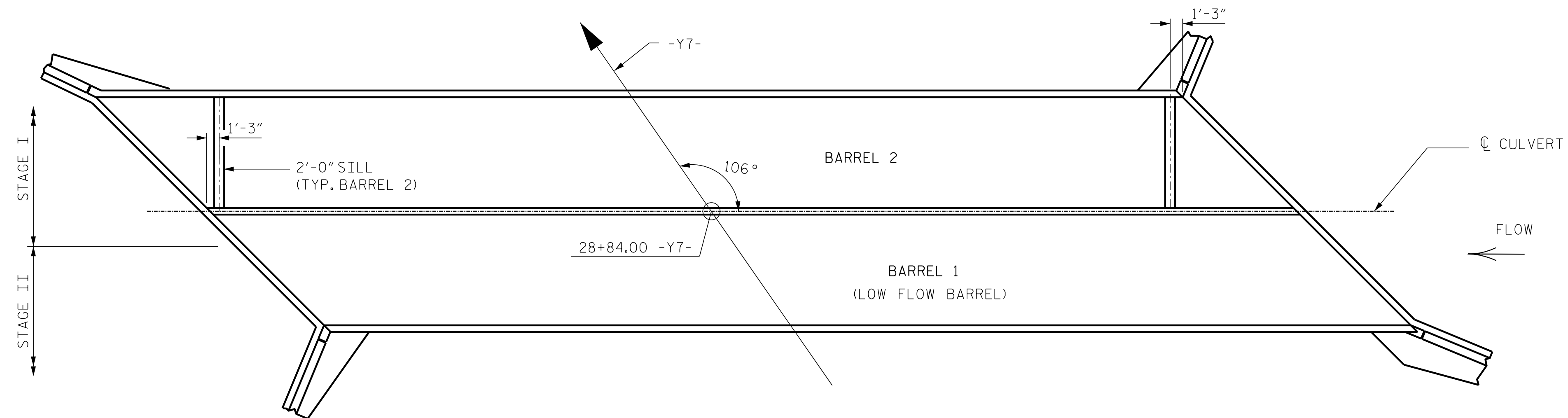
| REVISIONS | | | | | |
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SHEET NO. C3-6
 TOTAL SHEETS 8

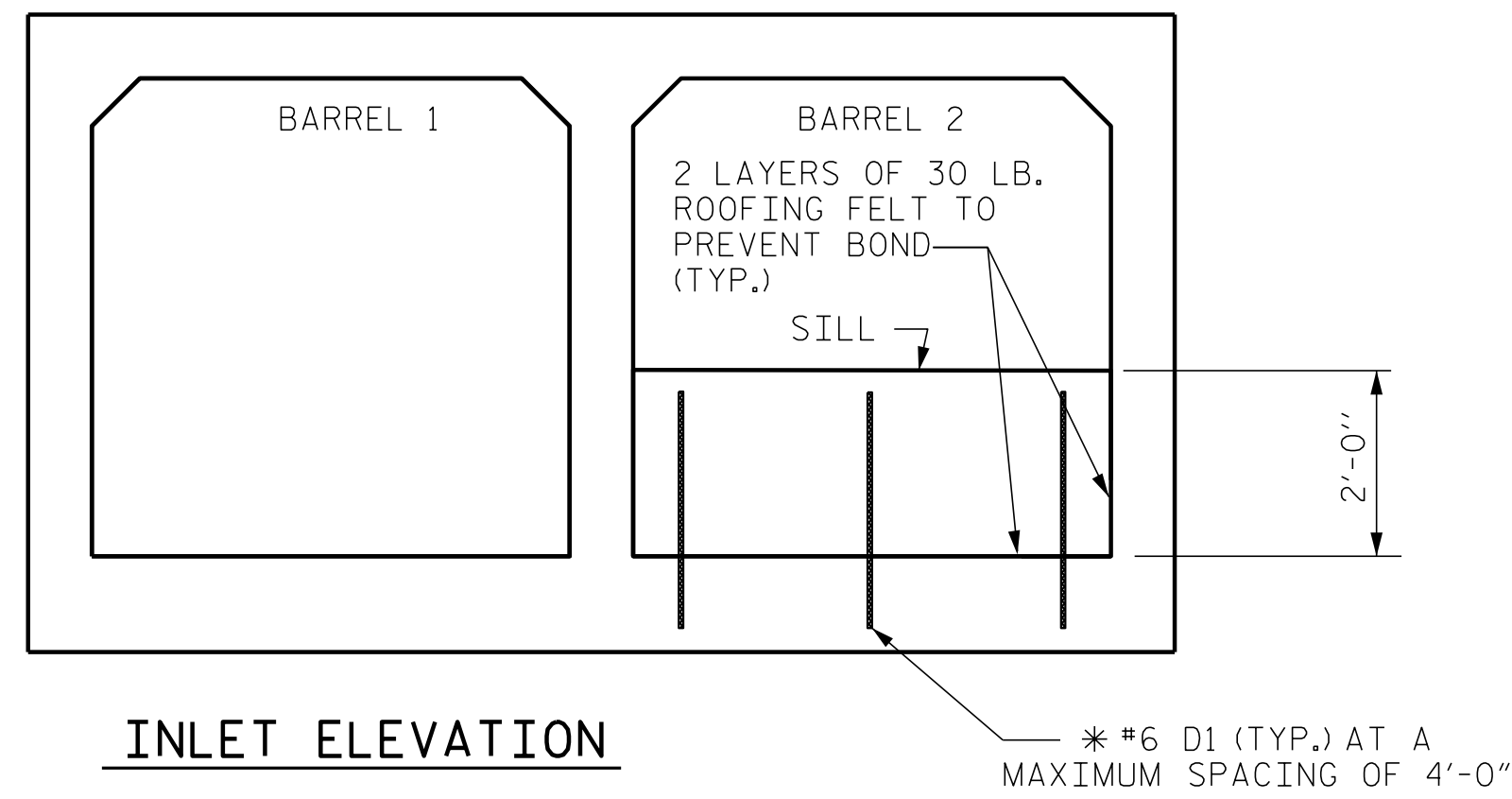
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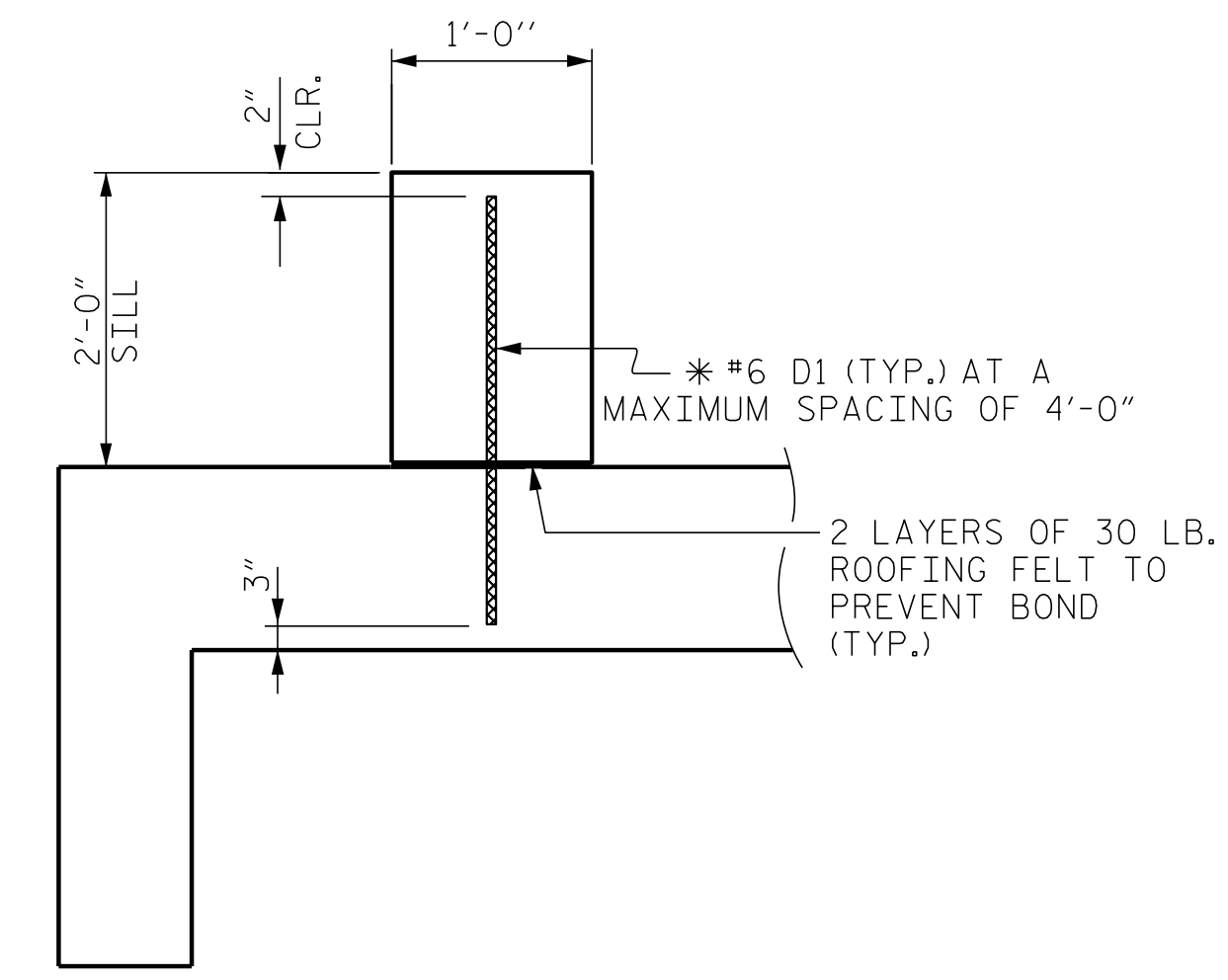
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PLAN - SILL LOCATION
SHOWING PLACEMENT OF SILLS



INLET ELEVATION
LOOKING DOWNSTREAM



SECTION THROUGH SILL

* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

CULVERT SILL DETAILS

PROJECT NO. W-5600
JOHNSTON COUNTY
STATION: 28+84.00 -Y7-

SHEET 7 OF 8

ENGINEER OF RECORD:
3/25/2019

Developed by
Buck Charles Hunt
ETHERILL ENGINEERING

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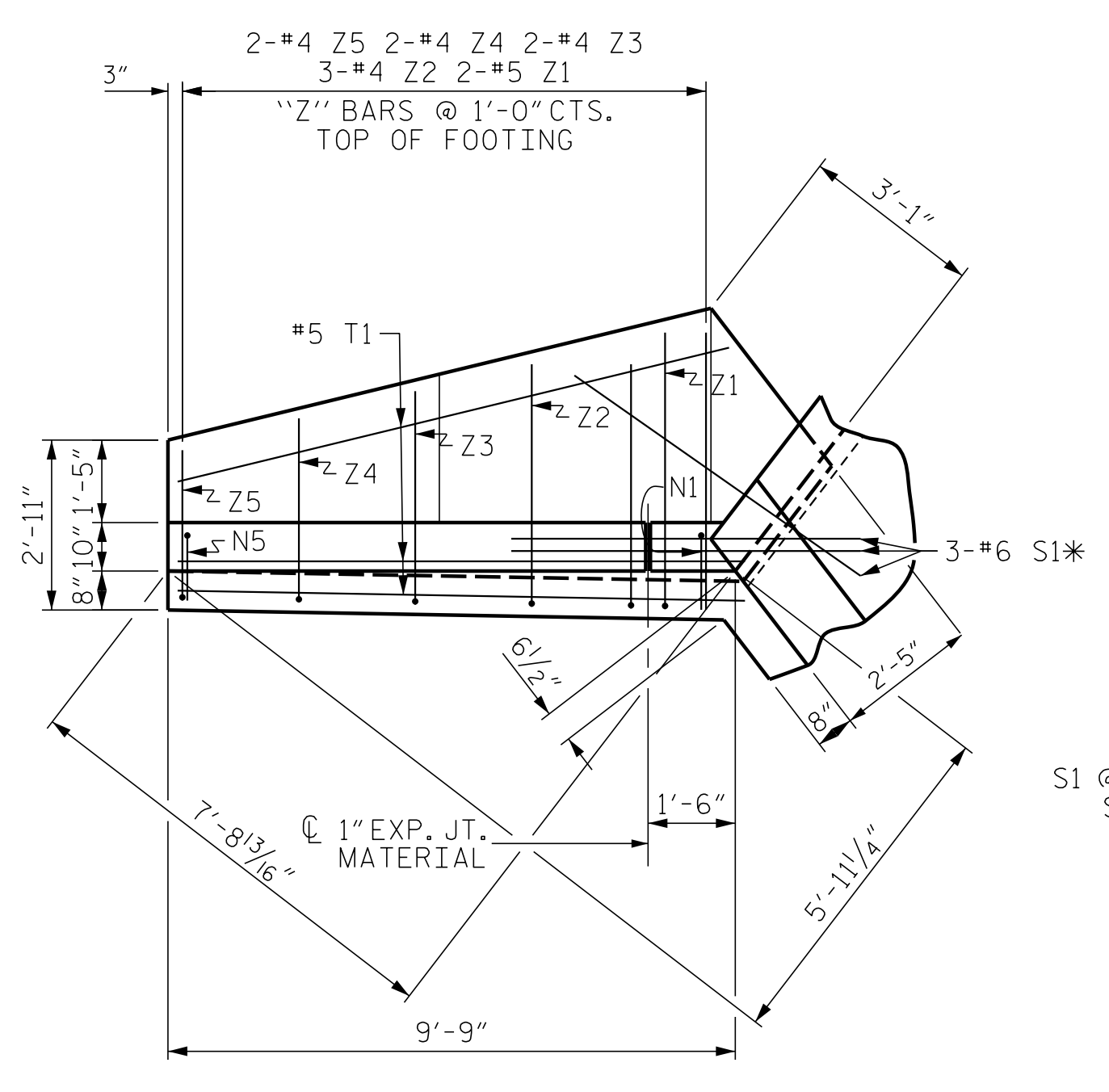
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**DOUBLE 10 FT. X 7 FT.
CONCRETE BOX CULVERT
106° SKEW**

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | C3-7 |
| 1 | | | 3 | | | TOTAL SHEETS 8 |
| 2 | | | 4 | | | |

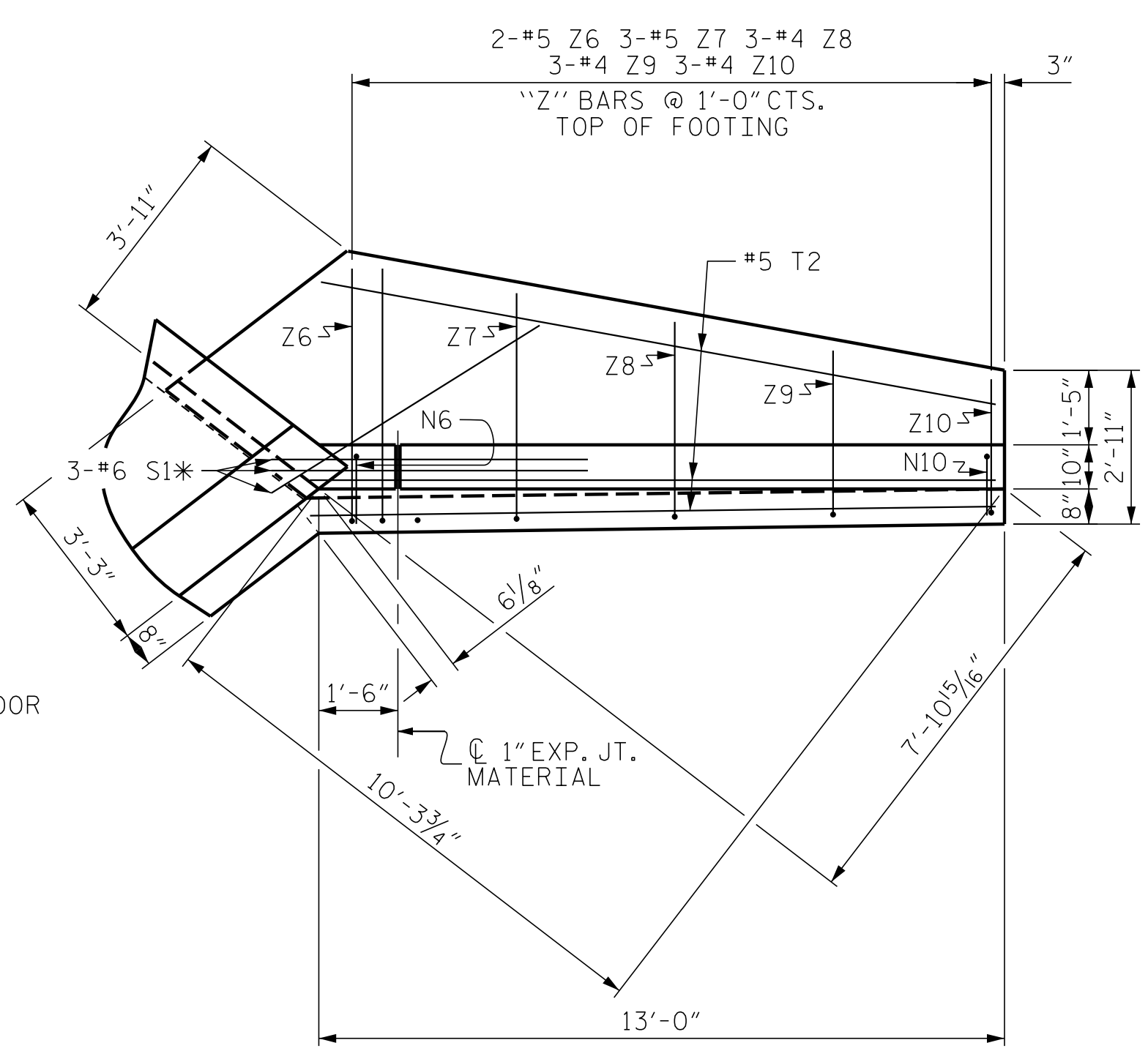
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CHECKED BY : J.A. DILWORTH DATE : 5-18

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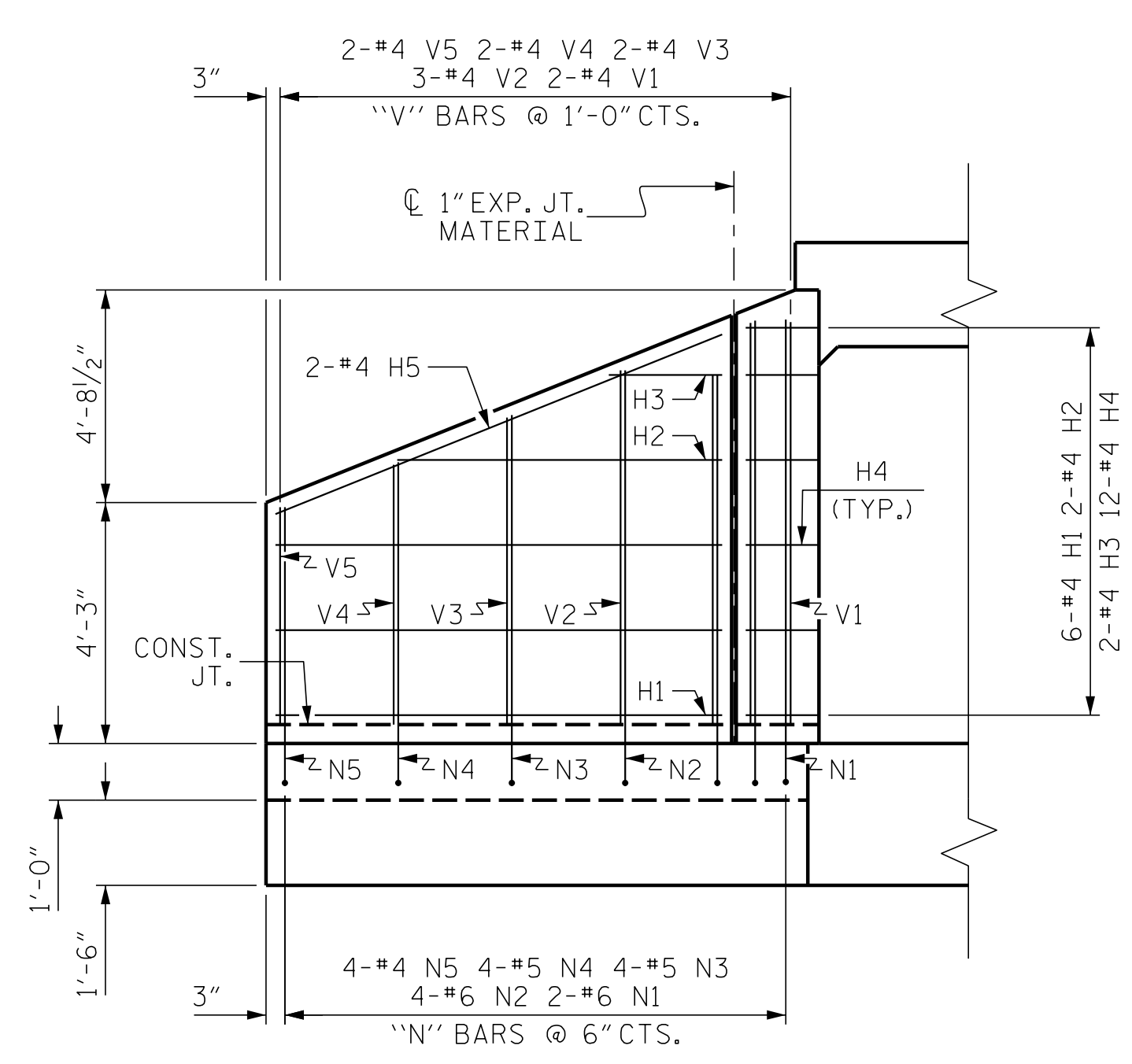
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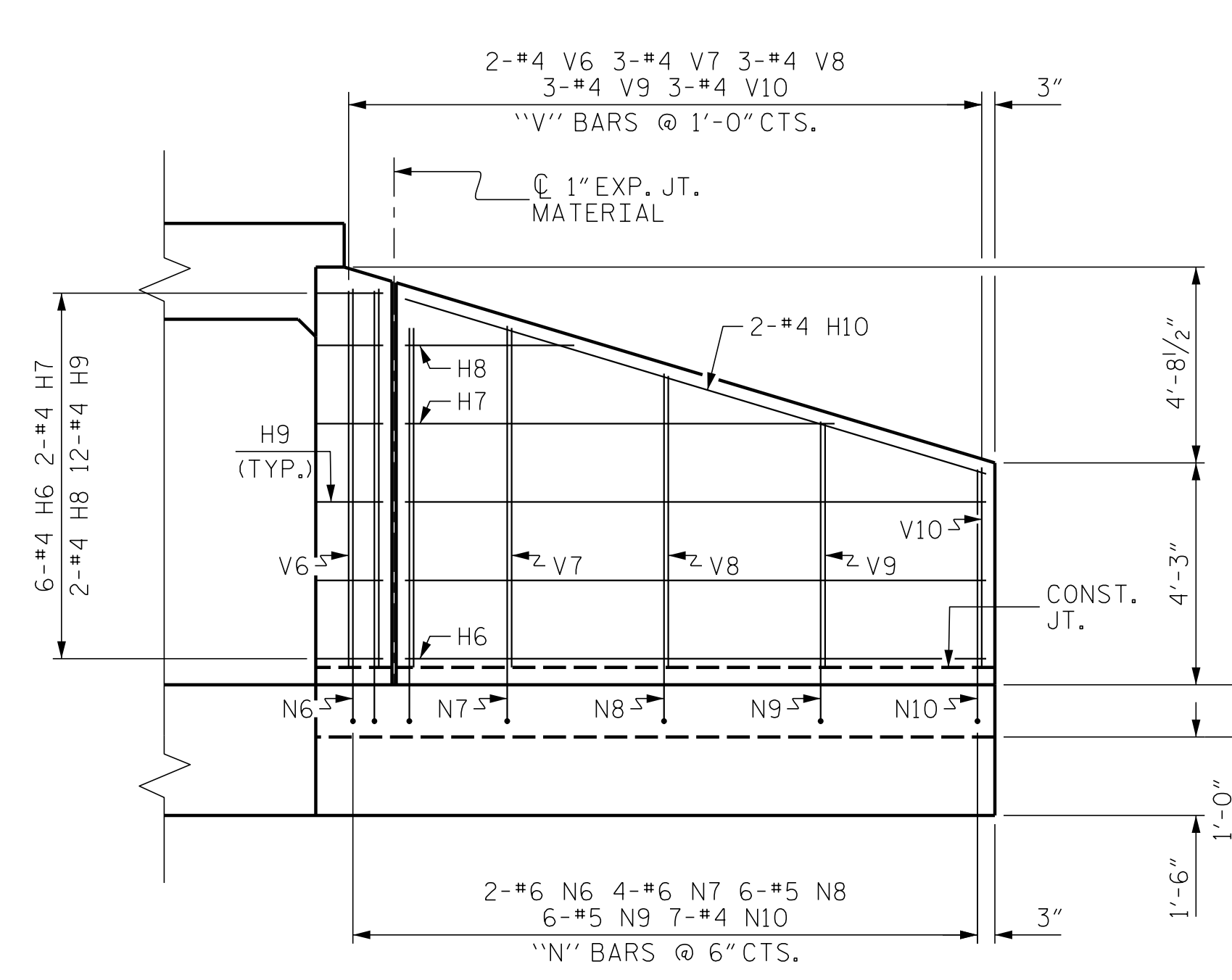
PLAN W1



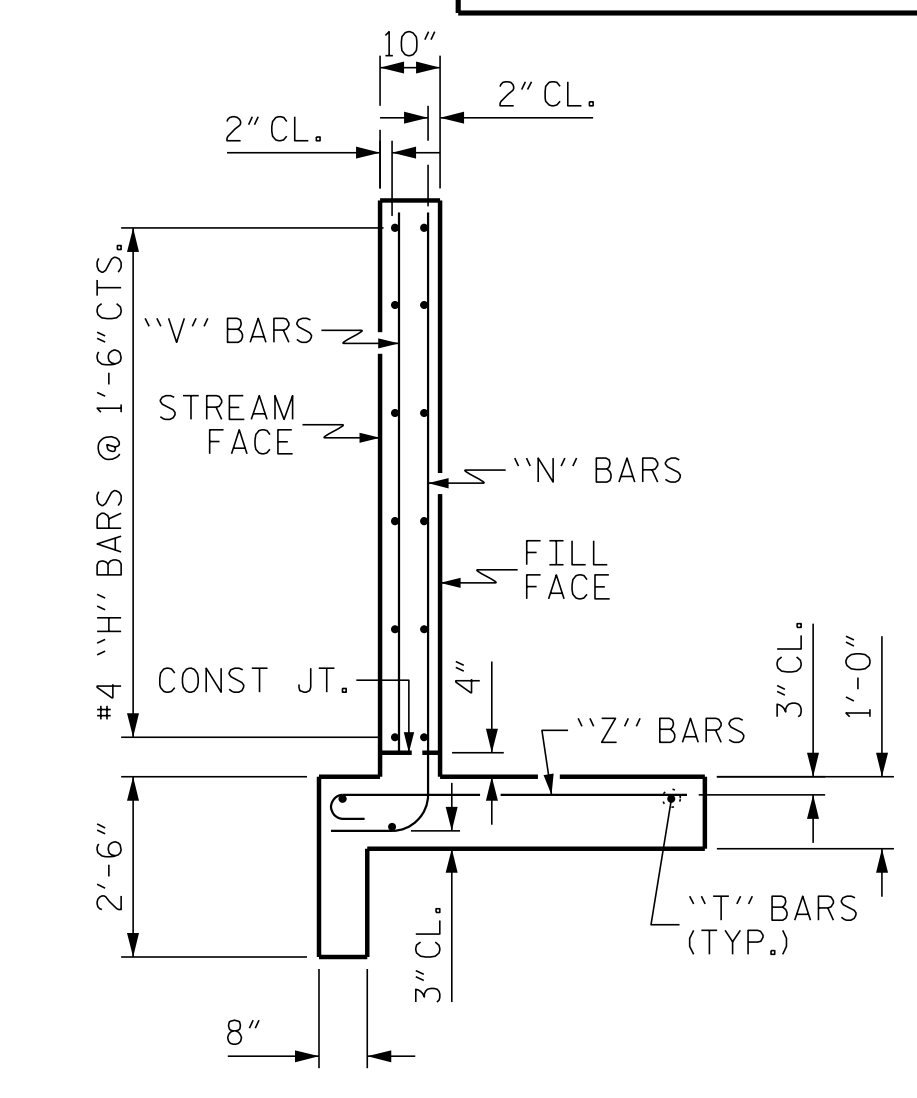
PLAN W2



ELEVATION W1



ELEVATION W2



TYPICAL WING SECTION

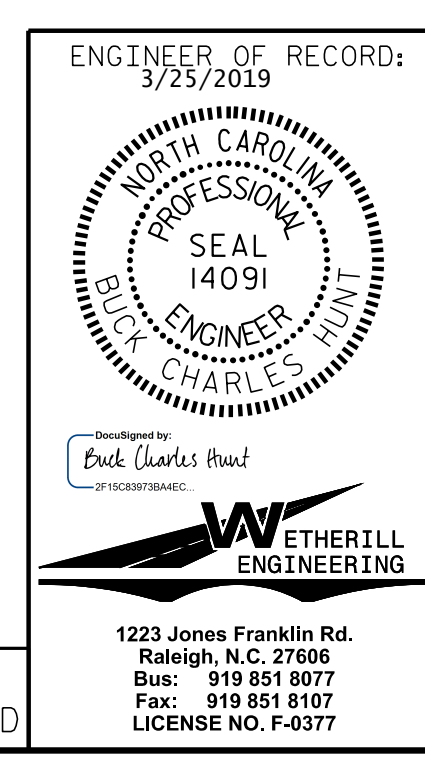
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

| NO. | SIZE | TYPE | LENGTH | WEIGHT |
|-----|------|------|--------|--------|
| N1 | #6 | 3 | 9'-2" | 55 |
| N2 | #6 | 3 | 8'-3" | 99 |
| N3 | #5 | 3 | 7'-6" | 63 |
| N4 | #5 | 3 | 6'-8" | 56 |
| N5 | #4 | 3 | 5'-10" | 31 |
| N6 | #6 | 3 | 9'-3" | 56 |
| N7 | #6 | 3 | 8'-7" | 103 |
| N8 | #5 | 3 | 7'-8" | 96 |
| N9 | #5 | 3 | 6'-9" | 84 |
| N10 | #4 | 3 | 5'-10" | 55 |
| S1 | #6 | STR | 6'-0" | 108 |
| T1 | #5 | STR | 9'-9" | 61 |
| T2 | #5 | STR | 13'-0" | 81 |
| V1 | #4 | STR | 7'-1" | 19 |
| V2 | #4 | STR | 6'-3" | 25 |
| V3 | #4 | STR | 5'-5" | 14 |
| V4 | #4 | STR | 4'-7" | 12 |
| V5 | #4 | STR | 3'-10" | 10 |
| V6 | #4 | STR | 7'-3" | 19 |
| V7 | #4 | STR | 6'-6" | 26 |
| V8 | #4 | STR | 5'-7" | 22 |
| V9 | #4 | STR | 4'-8" | 19 |
| V10 | #4 | STR | 3'-10" | 15 |
| Z1 | #5 | 4 | 5'-4" | 22 |
| Z2 | #4 | 4 | 4'-8" | 19 |
| Z3 | #4 | 4 | 4'-2" | 11 |
| Z4 | #4 | 4 | 3'-8" | 10 |
| Z5 | #4 | 4 | 3'-1" | 8 |
| Z6 | #5 | 4 | 5'-5" | 23 |
| Z7 | #5 | 4 | 4'-11" | 31 |
| Z8 | #4 | 4 | 4'-3" | 17 |
| Z9 | #4 | 4 | 3'-8" | 15 |
| Z10 | #4 | 4 | 3'-1" | 12 |

| BILL OF MATERIAL | | | | | |
|-------------------------------|-----|------|------|--------|--------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| H1 | 12 | #4 | STR | 7'-10" | 63 |
| H2 | 4 | #4 | STR | 5'-8" | 15 |
| H3 | 4 | #4 | STR | 2'-0" | 5 |
| H4 | 24 | #4 | 1 | 3'-3" | 52 |
| H5 | 4 | #4 | STR | 8'-5" | 22 |
| H6 | 12 | #4 | STR | 11'-1" | 89 |
| H7 | 4 | #4 | STR | 8'-2" | 22 |
| H8 | 4 | #4 | STR | 3'-3" | 9 |
| H9 | 24 | #4 | 2 | 3'-3" | 52 |
| H10 | 4 | #4 | STR | 11'-7" | 31 |
| N1 | 4 | #6 | 3 | 9'-2" | 55 |
| N2 | 8 | #6 | 3 | 8'-3" | 99 |
| N3 | 8 | #5 | 3 | 7'-6" | 63 |
| N4 | 8 | #5 | 3 | 6'-8" | 56 |
| N5 | 8 | #4 | 3 | 5'-10" | 31 |
| N6 | 4 | #6 | 3 | 9'-3" | 56 |
| N7 | 8 | #6 | 3 | 8'-7" | 103 |
| N8 | 12 | #5 | 3 | 7'-8" | 96 |
| N9 | 12 | #5 | 3 | 6'-9" | 84 |
| N10 | 14 | #4 | 3 | 5'-10" | 55 |
| S1 | 12 | #6 | STR | 6'-0" | 108 |
| T1 | 6 | #5 | STR | 9'-9" | 61 |
| T2 | 6 | #5 | STR | 13'-0" | 81 |
| V1 | 4 | #4 | STR | 7'-1" | 19 |
| V2 | 6 | #4 | STR | 6'-3" | 25 |
| V3 | 4 | #4 | STR | 5'-5" | 14 |
| V4 | 4 | #4 | STR | 4'-7" | 12 |
| V5 | 4 | #4 | STR | 3'-10" | 10 |
| V6 | 4 | #4 | STR | 7'-3" | 19 |
| V7 | 6 | #4 | STR | 6'-6" | 26 |
| V8 | 6 | #4 | STR | 5'-7" | 22 |
| V9 | 6 | #4 | STR | 4'-8" | 19 |
| V10 | 6 | #4 | STR | 3'-10" | 15 |
| Z1 | 4 | #5 | 4 | 5'-4" | 22 |
| Z2 | 6 | #4 | 4 | 4'-8" | 19 |
| Z3 | 4 | #4 | 4 | 4'-2" | 11 |
| Z4 | 4 | #4 | 4 | 3'-8" | 10 |
| Z5 | 4 | #4 | 4 | 3'-1" | 8 |
| Z6 | 4 | #5 | 4 | 5'-5" | 23 |
| Z7 | 6 | #5 | 4 | 4'-11" | 31 |
| Z8 | 6 | #4 | 4 | 4'-3" | 17 |
| Z9 | 6 | #4 | 4 | 3'-8" | 15 |
| Z10 | 6 | #4 | 4 | 3'-1" | 12 |
| REINFORCING STEEL FOR 4 WINGS | | | | 1657 | LBS |
| CLASS A CONCRETE 4 WINGS | | | | 18.2 | CY |

PROJECT NO. W-5600
JOHNSTON COUNTY
 STATION: 28+84.00 -Y7-
 SHEET 8 OF 8



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

WINGS FOR CONCRETE BOX CULVERT
 H = 7'-0" SLOPE = 1.5:1
 105° SKEW

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

SHEET NO. C3-8
 TOTAL SHEETS 8

ASSEMBLED BY : J. PENDERGRAFT DATE : 2-18
 CHECKED BY : J. DILWORTH DATE : 3-18
 DRAWN BY : CCJ 12/99
 CHECKED BY : RWW 03/00

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
 Fax: 919 851 8107
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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 OF TIMBER | - - - - - | 375 LBS. PER SQ. IN. |
| 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 $\frac{3}{16}$ " 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 $\frac{1}{16}$ " INCH 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.

ENGLISH

JANUARY, 1990

STD. NO. SN