DocuSign Envelope ID: C8260C1E-0B21-4796-AAF6-3BD6925057A5

RAL-WS077

| COMPUTED BY: | Jim Davis | DATE: | 03/05/19 |
|---|---|---|---|
| CHECKED BY: | REO | DATE: | 10/22/19 |

| PROJECT NO. | SHEET NO. |
|---|---|
| R-5797 | 3D-1 |

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
# DIVISION OF HIGHWAYS

**Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.**
**See "Standard Specifications For Roads and Structures, Section 300-5".**

## *LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)*

| LINE & STATION (SIZE / THICKNESS OR GAUGE) | OFFSET | | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12 | 15 | 18 | 24 | 30 | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. S. PIPE 12 (.064) | 15 (.064) | 18 (.064) | R. C. PIPE CLASS III 12 | 15 | 18 | 24 | 30 | 36 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 20+28 | 63 | RT | 0403 | | 83.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0403 | 0402 | | 80.2 | 76.4 | | | 32 | | | | X | X | X | | X | | | | | | | | | | | | | | | | | | | | | |
| L 19+35 | 63 | RT | 0404 | | 84.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0404 | 0403 | | 81.7 | 80.2 | | | | | | | | | | | | | | | | | | | | | | 96 | | | | | | | | | | |
| L 21+90 | 128 | LT | 0405A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0405A | 0405B | | 77.3 | 76.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 21+90 | 0 | CL | 0405B | | 83.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0405B | 0405C | | 76.9 | 76.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 22+36 | 0 | CL | 0406 | | 83.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 22+36 | 69 | RT | 0407 | | 85.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0407 | 0408 | | 78.8 | 76.7 | | | | 32 | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| L 21+70 | 132 | LT | 0409 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0409 | 0410 | | 76.6 | 76.5 | | | | | | 32 | | X | X | X | X | | | | | | | | | | | | | | | | | | | | | |
| L 21+55 | 104 | LT | 0410 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 20+45 | 79 | RT | 0411 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0411 | 0412 | | 76.4 | 76.4 | | | | | | | | | | | | | | | | | | | 16 | | | | | | | | | | | | | |
| L 15+15 | 56 | LT | 0413 | | 88.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0413 | 0414 | | 85.3 | 80.9 | | | 36 | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 30+00 | 0 | CL | 0501 | | 85.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0501 | 0503 | | 81.5 | 81.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RPC 13+91 | 23 | RT | 0503 | | 84.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0503 | 0502 | | 81.1 | 79.0 | | | | | 32 | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| L 30+60 | 0 | CL | 0504 | | 85.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0504 | 0501 | | 81.7 | 81.5 | 0.3 | | | 56 | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| RPC 13+26 | 23 | RT | 0505 | | 84.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0505 | 0503 | | 81.8 | 81.6 | | | | | | | | | | | | | | | | | | | | | | 64 | | | | | | | | | | |
| RPB 17+53 | 23 | LT | 0506 | | 91.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0506 | 0507 | | 88.9 | 88.3 | | | | | | | | | | | | | | | | | | | | | | 56 | | | | | | | | | | |
| RPB 16+93 | 23 | LT | 0507 | | 91.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0507 | 0508 | | 88.3 | 84.6 | | | 24 | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | |
| RPC 18+49 | 0 | CL | 0509 | | | 81.0 | 80.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 128 | | | |
| Y1A 19+50 | 18 | LT | 0510 | | 91.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0510 | 0511 | | 88.2 | 86.4 | | | 28 | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1A 19+50 | | RT | 0510A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1A 22+87 | 2 | LT | 0512 | | 102.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0512 | 0513 | | 99.0 | 98.2 | | | | | | | | | | | | | | | | | | | | | | 20 | | | | | | | | | | |
| Y1A 22+87 | 24 | LT | 0513 | | 101.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0513 | 0517 | | 98.2 | 97.7 | | | | | | | | | | | | | | | | | | | | | | 116 | | | | | | | | | | |
| L 34+10 | 0 | CL | 0514 | | 85.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0514 | 0504 | | 82.9 | 81.7 | 0.3 | | 348 | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| Y1A_S 24+44 | 20 | RT | 0515 | | 106.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0515 | 0516 | | 102.6 | 101.5 | | | | | | | | | | | | | | | | | | | | | | 68 | | | | | | | | | | |
| Y1A 24+84 | 5 | LT | 0516A | | 107.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0516A | 0516 | | 104.5 | 101.5 | | | | | | | | | | | | | | | | | | | | | | 84 | | | | | | | | | | |
| Y1A 24+00 | 3 | LT | 0516 | | 105.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0516 | 0517 | | 101.5 | 97.7 | | | | | | | | | | | | | | | | | | | | | | 24 | | | | | | | | | | |
| Y1A 24+00 | 29 | LT | 0517 | | 104.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0517 | 0518 | | 97.7 | 85.9 | 0.7 | | 88 | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | |
| RPB 24+13 | 14 | LT | 0525 | | 108.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0525 | 0527 | | 105.3 | 102.9 | | | | | | | | | | | | | | | | | | | | | | 36 | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | 556 | 88 | 32 | 32 | | | | | | | | | | | | | 16 | | | 564 | | | | | | | | 128 | | |

| STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | 18" WELDED STEEL PIPE 0.50" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH | A: 5' THRU 10' LIN. FT. | B: 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | OPEN THROAT C.B. STD. 840.04 OR STD. 840.05 | CONCRETE BRIDGE APPROACH D.I. STD. 840.13 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0403 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | 1 | | |
| 0403 | 0402 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0404 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | 1 | | |
| 0404 | 0403 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0405A | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0405A | 0405B | 128 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0405B | | | | | | | 1 | 1.1 | | | | | | | | | | | | | 1 | | | | | 1 |
| 0405B | 0405C | 100 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0406 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | | | 1 |
| 0407 | | | | | | | 1 | 1.2 | | | | | | | | | | | | | | | | | | |
| 0407 | 0408 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0409 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0409 | 0410 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0410 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0411 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0411 | 0412 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0413 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | 1 | | |
| 0413 | 0414 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0501 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | | | 1 |
| 0501 | 0503 | | 92 | | | | | | | | | | | | | | | | | | | | | | | |
| 0503 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | 1 | | |
| 0503 | 0502 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0504 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | | | 1 |
| 0504 | 0501 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0505 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | 1 | | |
| 0505 | 0503 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0506 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | 1 | | |
| 0506 | 0507 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0507 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | 1 | | |
| 0507 | 0508 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0509 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0510 | | | | | | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | |
| 0510 | 0511 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0510A | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0512 | | | | | | | 1 | | | | | | | 1 | | | | 1 | 1 | | | | | | | |
| 0512 | 0513 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0513 | | | | | | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | |
| 0513 | 0517 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0514 | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | | | 1 |
| 0514 | 0504 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0515 | | | | | | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | |
| 0515 | 0516 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0516A | | | | | | | 1 | | | | | | | 1 | | | | 1 | 1 | | | | | | | |
| 0516A | 0516 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0516 | | | | | | | 1 | | | | | | | 1 | | | | 1 | 1 | | | | | | | |
| 0516 | 0517 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0517 | | | | | | | 1 | 2.2 | | 1 | | 1 | | | | | | | | | | | | | | |
| 0517 | 0518 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0525 | | | | | | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | |
| 0525 | 0527 | | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | 228 | 92 | | | | 21 | 4.5 | | 5 | | 4 | 1 | 3 | | | | 3 | 3 | | 12 | | | 7 | | 5 |

| STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | ANGLED VANE GRATES AND FRAMES STD. 840.33 | T.B.J.B. STD. 840.34 | T.B.D.I. STD. 840.35 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | ##" SPRING BOX PIPE | SPRING BOX STD. 840.41 | MODIFIED CONCRETE FLUME | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | CONVERT DI TO JB | ADJUST C.B. | ADJUST D.I. | PIPE CLEANOUT (EACH) | 15" SIDE DRAIN PIPE ELBOW | 15" PARALLEL PIPE END SCTION | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0403 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0403 | 0402 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0404 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0404 | 0403 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0405A | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0405A | 0405B | | | | | | | | | | | | | | | | | | | | | | | | |
| 0405B | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0405B | 0405C | | | | | | | | | | | | | | | | | | | | | | | | |
| 0406 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0407 | | | 1 | | | | | | | | | | | 1 | | | | | | | | | | | |
| 0407 | 0408 | | | | | | | | | | | | | | | | | | | | | | | | REMOVE 15' OF 15" RCP |
| 0409 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0409 | 0410 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0410 | | | | | | | | | | | | | | | | | | | | | | 0.6560 | | | 30" CONC. COLLAR |
| 0411 | | | | | | | | | | | | | | | | | | | | | | 0.6560 | | | 30" CONC. COLLAR |
| 0411 | 0412 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0413 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0413 | 0414 | | | | | | | | | | | | | | | | | | 2 | | | | | | |
| 0501 | | | | | | | | | | | | | | | | | | | | | 4 | | | | |
| 0501 | 0503 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0503 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0503 | 0502 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0504 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0504 | 0501 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0505 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0505 | 0503 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0506 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0506 | 0507 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0507 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0507 | 0508 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0509 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0510 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0510 | 0511 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0510A | | | | | | | | | | | | 1 | | | | | | | | | | | | | SEE SHEET 2C-7 FOR SPECIAL DETAIL |
| 0512 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0512 | 0513 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0513 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0513 | 0517 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0514 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0514 | 0504 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0515 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0515 | 0516 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0516A | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0516A | 0516 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0516 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0516 | 0517 | | | | | | | | | | | | | | | | | | | | | | | | |
| 0517 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0517 | 0518 | | | | | | | | | | | | | | | | | | 2 | | | | | | |
| 0525 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0525 | 0527 | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | 1 | | | | | | | | | 1 | | 1 | | | | | 4 | | 4 | 1.3120 | | | |

**ABBREVIATIONS**

| | |
|---|---|
| C.A.A. | CORRUGATED ALUMINIUM ALLOY |
| C.B. | CATCH BASIN |
| C.S. | CORRUGATED STEEL |
| D.I. | DROP INLET |
| G.D.I. | GRATED DROP INLET |
| H.D.P.E. | HIGH DENSITY POLYETHYLENE |
| J.B. | JUNCTION BOX |
| M.H. | MANHOLE |
| N.S. | NARROW SLOT |
| P.V.C. | POLYVINYL CHLORIDE |
| R.C. | REINFORCED CONCRETE |
| T.B.D.I. | TRAFFIC BEARING DROP INLET |
| T.B.J.B. | TRAFFIC BEARING JUNCTION BOX |
| W.S. | WIDE SLOT |