WKST1

| COMPUTED BY: | RBR | DATE: | 6/15/2018 |
|---|---|---|---|
| CHECKED BY: | ECOLOGICAL ENGINEERING, LLP | DATE: | 6/15/2018 |

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
# DIVISION OF HIGHWAYS

| PROJECT NO. | SHEET NO. |
|---|---|
| U-4405 | 3D-7 |

**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 | TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 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 | 48 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 61+39 | 72 | LT | 0719 | | 213.9 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0719 | 0720 | | 209.4 | 209.3 | | | | 24 | | | | | | | | | | | | | | | | | |
| L 61+39 | 49 | LT | 0720 | | 215.9 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0720 | 0825 | | 209.3 | 208.3 | | | | | | | | | | | | | | | | | | | | | |
| L 56+75 | 50 | RT | 0722 | | 219.5 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0722 | 0713 | | 216.5 | 216.0 | | | | | | | | | | | | | | | | | | | | | |
| L 63+50 | 5 | LT | 0801 | | 215.0 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0801 | 0824 | | 211.9 | 208.8 | | | | | | | | | | | | | | | | | | | | | |
| L 64+55 | 78 | RT | 0802 | | 211.5 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0802 | 0804 | | 210.0 | 209.6 | 0.5 | | 24 | | | | | | | | | | | | | | | | | | |
| L 64+70 | 50 | RT | 0803 | | 214.9 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0803 | 0804 | | 211.6 | 209.9 | | | 20 | | | | | | | | | | | | | | | | | | |
| L 64+75 | 67 | RT | 0804 | | 213.0 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0804 | 0805 | | 209.6 | 209.6 | | | | 12 | | | | | | | | | | | | | | | | | |
| L 64+88 | 67 | RT | 0805 | | 212.3 | | | | | | | | | | | | | | | | | | | | | | | |
| L 66+25 | 5 | LT | 0806 | | 212.3 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0806 | 0824 | | 209.1 | 208.8 | | | | | | | | | | | | | | | | | | | | | |
| L 65+30 | 38 | LT | 0807 | | 212.1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0807 | 0812 | | 205.9 | 205.3 | | | | | | | | | | | | | | | | | | | | | |
| L 65+50 | 63 | LT | 0808 | | 210.3 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0808 | 0807 | | 207.8 | 207.7 | | | 32 | | | | | | | | | | | | | | | | | | |
| L 67+21 | 68 | RT | 0809 | | 211.2 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0809 | 0813 | | 207.0 | 206.1 | 0.5 | | | 36 | | | | | | | | | | | | | | | | | |
| L 67+55 | 13 | RT | 0810 | | 211.6 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0810 | 0812 | | 205.4 | 205.3 | | | | | | | | | | | | | | | | | | | | | |
| L 67+55 | 50 | RT | 0811 | | 212.2 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0811 | 0810 | | 205.5 | 205.4 | | | | | | | | | | | | | | | | | | | | | |
| L 67+55 | 49 | LT | 0812 | | 209.8 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0812 | 0815 | | 203.8 | 203.3 | | | | | | | | | | | | | | | | | | | | | |
| L 67+55 | 74 | RT | 0813 | | 208.6 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0813 | 0811 | | 205.6 | 205.5 | | | | | 24 | | | | | | | | | | | | | | | | |
| L 68+25 | 12 | RT | 0814 | | 210.9 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0814 | 0810 | | 207.7 | 207.5 | | | | | | | | | | | | | | | | | | | | | |
| L 69+10 | 50 | LT | 0815 | | 208.6 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0815 | 0819 | | 203.0 | 199.3 | | | | | | | | | | | | | | | | | | | | | |
| L 69+10 | 65 | LT | 0816 | | 208.8 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0816 | 0815 | | 205.8 | 205.6 | | | 16 | | | | | | | | | | | | | | | | | | |
| L 71+30 | 74 | RT | 0817 | | 205.8 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0817 | 0818 | | 203.6 | 203.5 | | | 16 | | | | | | | | | | | | | | | | | | |
| L 71+30 | 57 | RT | 0818 | | 206.5 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0818 | 0822 | | 203.5 | 199.1 | | | | | | | | | | | | | | | | | | | | | |
| L 73+00 | 50 | LT | 0819 | | 204.5 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0819 | 0904 | | 199.3 | 195.8 | | | | | | | | | | | | | | | | | | | | | |
| L 73+00 | 1 | RT | 0820 | | 205.5 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0820 | 0819 | | 202.3 | 201.5 | | | | | | | | | | | | | | | | | | | | | |
| L 73+52 | 83 | RT | 0821 | | 201.4 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0821 | 0822 | | 199.2 | 199.1 | | | 24 | | | | | | | | | | | | | | | | | | |
| L 73+63 | 60 | RT | 0822 | | 203.4 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0822 | 0902 | | 198.8 | 198.3 | | | | | | | | | | | | | | | | | | | | | |
| L 74+40 | 1 | RT | 0823 | | 203.5 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | SHEET TOTALS | | 132 | 72 | 24 | | | | | | | | | | | | | | | | |

| LINE & STATION | FROM | TO | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 30" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL | 30" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL | 36" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL | 36" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL | 15" SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) 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 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 61+39 | 0719 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0719 | 0720 | | | | | | | | | | | | | | | | | | | | | | |
| L 61+39 | 0720 | | | | | | | | | | | | | | | | 1 | 1.5 | | 1 | | | 1 | |
| | 0720 | 0825 | | | | | 148 | | | | | | | | | | | | | | | | | |
| L 56+75 | 0722 | | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | | |
| | 0722 | 0713 | | 124 | | | | | | | | | | | | | | | | | | | | |
| L 63+50 | 0801 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0801 | 0824 | | 180 | | | | | | | | | | | | | | | | | | | | |
| L 64+55 | 0802 | | | | | | | | | | | | | | | | | | | | | | | |
| | 0802 | 0804 | | | | | | | | | | | | | | | | | | | | | | |
| L 64+70 | 0803 | | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | | |
| | 0803 | 0804 | | | | | | | | | | | | | | | | | | | | | | |
| L 64+75 | 0804 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0804 | 0805 | | | | | | | | | | | | | | | | | | | | | | |
| L 64+88 | 0805 | | | | | | | | | | | | | | | | | | | | | | | |
| L 66+25 | 0806 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0806 | 0824 | | 92 | | | | | | | | | | | | | | | | | | | | |
| L 65+30 | 0807 | | | | | | | | | | | | | | | | 1 | 1.2 | | 1 | | | 1 | |
| | 0807 | 0812 | | | | | | 220 | | | | | | | | | | | | | | | | |
| L 65+50 | 0808 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0808 | 0807 | | | | | | | | | | | | | | | | | | | | | | |
| L 67+21 | 0809 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0809 | 0813 | | | | | | | | | | | | | | | | | | | | | | |
| L 67+55 | 0810 | | | | | | | | | | | | | | | | 1 | 1.2 | | | | | | |
| | 0810 | 0812 | | | | 60 | | | | | | | | | | | | | | | | | | |
| L 67+55 | 0811 | | | | | | | | | | | | | | | | 1 | 1.7 | | 1 | | 1 | | |
| | 0811 | 0810 | | | | 36 | | | | | | | | | | | | | | | | | | |
| L 67+55 | 0812 | | | | | | | | | | | | | | | | 1 | 1.0 | | 1 | | | 1 | |
| | 0812 | 0815 | | | | | | | 152 | | | | | | | | | | | | | | | |
| L 67+55 | 0813 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0813 | 0811 | | | | | | | | | | | | | | | | | | | | | | |
| L 68+25 | 0814 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0814 | 0810 | | 68 | | | | | | | | | | | | | | | | | | | | |
| L 69+10 | 0815 | | | | | | | | | | | | | | | | 1 | 0.6 | | 1 | | | 1 | |
| | 0815 | 0819 | | | | | | | 388 | | | | | | | | | | | | | | | |
| L 69+10 | 0816 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0816 | 0815 | | | | | | | | | | | | | | | | | | | | | | |
| L 71+30 | 0817 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0817 | 0818 | | | | | | | | | | | | | | | | | | | | | | |
| L 71+30 | 0818 | | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | | |
| | 0818 | 0822 | | 232 | | | | | | | | | | | | | | | | | | | | |
| L 73+00 | 0819 | | | | | | | | | | | | | | | | 1 | 0.3 | | 1 | | | 1 | |
| | 0819 | 0904 | | | | | | | 248 | | | | | | | | | | | | | | | |
| L 73+00 | 0820 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0820 | 0819 | | 48 | | | | | | | | | | | | | | | | | | | | |
| L 73+52 | 0821 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| | 0821 | 0822 | | | | | | | | | | | | | | | | | | | | | | |
| L 73+63 | 0822 | | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | | |
| | 0822 | 0902 | | | 128 | | | | | | | | | | | | | | | | | | | |
| L 74+40 | 0823 | | | | | | | | | | | | | | | | 1 | | | | | | | |
| SHEET TOTALS | | | | 744 | 128 | 96 | 148 | 220 | 788 | | | | | | | | 24 | 7.5 | | 10 | | 5 | 5 | |

| LINE & STATION | FROM | TO | 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 | 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. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | 15" SLOTTED DRAIN | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | T.B.J.B. STD. 840.34 | T.B.D.I. STD. 840.35 | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | CONVERT EXISTING C.B. TO J.B. | CONVERT EXISTING D.I. TO J.B. | ADJUST C.B. | ADJUST D.I. | ADJUST JB W/MH | 15" C.S. ELBOW | 18" C.S. ELBOW | 12" DRAINAGE PIPE ELBOW | 15" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | 30" DRAINAGE PIPE ELBOWS | 48" DRAINAGE PIPE ELBOW | PIPE CLEAN OUT CY | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 61+39 | 0719 | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0719 | 0720 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 61+39 | 0720 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0720 | 0825 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 56+75 | 0722 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0722 | 0713 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 63+50 | 0801 | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0801 | 0824 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 64+55 | 0802 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0802 | 0804 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 64+70 | 0803 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0803 | 0804 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 64+75 | 0804 | | | | | | | | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | | | | | | |
| | 0804 | 0805 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 64+88 | 0805 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.4465 | | | |
| L 66+25 | 0806 | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0806 | 0824 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 65+30 | 0807 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0807 | 0812 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 65+50 | 0808 | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0808 | 0807 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 67+21 | 0809 | | | | | | | | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | | | | | | |
| | 0809 | 0813 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 67+55 | 0810 | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0810 | 0812 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 67+55 | 0811 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0811 | 0810 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 67+55 | 0812 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0812 | 0815 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 67+55 | 0813 | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0813 | 0811 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 68+25 | 0814 | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0814 | 0810 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 69+10 | 0815 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0815 | 0819 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 69+10 | 0816 | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0816 | 0815 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 71+30 | 0817 | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0817 | 0818 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 71+30 | 0818 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0818 | 0822 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 73+00 | 0819 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0819 | 0904 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 73+00 | 0820 | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0820 | 0819 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 73+52 | 0821 | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0821 | 0822 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 73+63 | 0822 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0822 | 0902 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 74+40 | 0823 | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | 6 | | | 12 | 12 | | | | | | | | 2 | | | | | 2 | | | | | | | | | | | | | | 0.4465 | | | |

**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 |