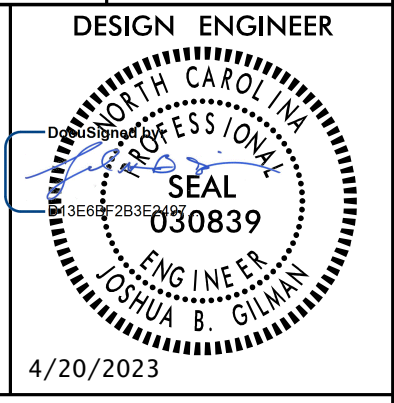


# R-2707D CHANNEL RELOCATION CLEVELAND COUNTY



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| VARIABLES   | Reference Reach                   | Reference Reach                     | Reference Reach                     | Existing Reach 2A                   | Design Reach 2A Upper               | Design Reach 2A Lower               | Existing Reach 2B                   | Design Reach 2B                     | Existing Reach 2C                   | Design Reach 2C                     |
|---|-----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| STATION   |                                   |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |
| 1. Stream Type (Rosgen)                               | C4                                | B4/1c                               | B4                                  | B3/1                                | B3/1                                | B3/1c                               | C4                                  | C4                                  | C4                                  | C                                   |
| 2. Drainage Area [mi2]                                | 0.21                              | 0.19                                | 0.81                                | 0.55                                | 0.57                                | 0.57                                | 0.56                                | 0.56                                | 1.14                                | 1.14                                |
| Riffle Dimensions                                     |                                   |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |
| 3. Bankfull Width (Wbkf) [ft]                         | Mean: 7.55<br>Range: 7.03   8.06  | Mean: 7.37<br>Range: 6.58   8.16    | Mean: 13.14<br>Range: 12.12   14.16 | Mean: 19.81<br>Range: 17.99   21.63 | Mean: 19.80<br>Range: 1.14   1.32   | Mean: 25.19<br>Range: 1.15          | Mean: 26.58<br>Range: 16.07   37.08 | Mean: 17.61<br>Range: 1.00          | Mean: 35.68<br>Range: 0.95          | Mean: 22.03<br>Range: 1.84          |
| 4. Mean Riffle Depth (dbkf) [ft]                      | Mean: 0.90<br>Range: 0.82   0.97  | Mean: 1.04<br>Range: 0.94   1.13    | Mean: 0.86<br>Range: 0.82   0.89    | Mean: 1.14<br>Range: 0.71   1.29    | Mean: 1.32<br>Range: 1.22           | Mean: 1.15<br>Range: 1.85           | Mean: 1.00<br>Range: 1.76           | Mean: 1.47<br>Range: 2.20           | Mean: 0.95<br>Range: 2.05           | Mean: 1.84<br>Range: 2.75           |
| 5. Maximum Riffle Depth (dmax) [ft]                   | Mean: 1.29<br>Range: 1.19   1.39  | Mean: 1.53<br>Range: 1.38   1.67    | Mean: 1.22<br>Range: 1.16   1.27    | Mean: 1.76<br>Range: 1.21   2.31    | Mean: 1.85<br>Range: 1.21           | Mean: 1.85<br>Range: 1.21           | Mean: 1.76<br>Range: 1.21   2.31    | Mean: 2.20<br>Range: 1.21           | Mean: 2.05<br>Range: 1.21           | Mean: 2.75<br>Range: 1.21           |
| 6. Width of Flood-Prone Area (Wfpa) [ft]              | Mean: 31<br>Range: 27   34        | Mean: 20<br>Range: 19   22          | Mean: 21<br>Range: 18   25          | Mean: 55<br>Range: 45   66          | Mean: 55<br>Range: 45   66          | Mean: 55<br>Range: 45   66          | Mean: 55<br>Range: 45   66          | Mean: 55<br>Range: 45   66          | Mean: 109<br>Range: 109             | Mean: 109<br>Range: 109             |
| 7. Riffle Inner Berm Width (Wib) [ft]                 | Mean: -<br>Range: -   -           | Mean: -<br>Range: -   -             | Mean: -<br>Range: -   -             | Mean: -<br>Range: -   -             | Mean: 11.3<br>Range: 11.3           | Mean: 13.1<br>Range: 13.1           | Mean: -<br>Range: -   -             | Mean: 8.0<br>Range: 8.0             | Mean: -<br>Range: -   -             | Mean: 9.8<br>Range: 9.8             |
| 8. Riffle Inner Berm Depth (dib) [ft]                 | Mean: -<br>Range: -   -           | Mean: -<br>Range: -   -             | Mean: -<br>Range: -   -             | Mean: -<br>Range: -   -             | Mean: 0.9<br>Range: 0.9             | Mean: 0.9<br>Range: 0.9             | Mean: -<br>Range: -   -             | Mean: 1.1<br>Range: 1.1             | Mean: -<br>Range: -   -             | Mean: 1.4<br>Range: 1.4             |
| 9. Riffle Inner Berm Area (Aib) [ft2]                 | Mean: -<br>Range: -   -           | Mean: -<br>Range: -   -             | Mean: -<br>Range: -   -             | Mean: -<br>Range: -   -             | Mean: 7.1<br>Range: 7.1             | Mean: 8.7<br>Range: 8.7             | Mean: -<br>Range: -   -             | Mean: 6.6<br>Range: 6.6             | Mean: -<br>Range: -   -             | Mean: 9.7<br>Range: 9.7             |
| 10. Riffle Cross-Sectional Area (Abkf) [ft2]          | Mean: 6.78<br>Range: 5.76   7.80  | Mean: 7.55<br>Range: 7.42   7.68    | Mean: 11.25<br>Range: 10.85   11.65 | Mean: 23.46<br>Range: 20.72   26.19 | Mean: 26.13<br>Range: 15.00         | Mean: 26.13<br>Range: 15.00         | Mean: 23.46<br>Range: 20.72   26.19 | Mean: 25.84<br>Range: 12.00         | Mean: 33.82<br>Range: 37.56         | Mean: 40.43<br>Range: 12.00         |
| 11. Riffle Width/Depth Ratio (Wbkf/dbkf)              | Mean: 8.44<br>Range: 8.31   8.57  | Mean: 7.25<br>Range: 5.82   8.68    | Mean: 15.44<br>Range: 13.62   17.27 | Mean: 32.34<br>Range: 12.46   52.23 | Mean: 15.00<br>Range: 1.40          | Mean: 15.00<br>Range: 1.40          | Mean: 32.34<br>Range: 12.46   52.23 | Mean: 12.00<br>Range: 1.50          | Mean: 37.56<br>Range: 2.16          | Mean: 12.00<br>Range: 1.50          |
| 12. Max Riffle Depth to Mean Riffle Depth (dmax/dbkf) | Mean: 1.44<br>Range: 1.43   1.45  | Mean: 1.47<br>Range: 1.47   1.48    | Mean: 1.43<br>Range: 1.30   1.55    | Mean: 1.75<br>Range: 1.70   1.79    | Mean: 1.40<br>Range: 1.60           | Mean: 1.40<br>Range: 1.60           | Mean: 1.75<br>Range: 1.70   1.79    | Mean: 1.50<br>Range: 4.00           | Mean: 2.16<br>Range: 3.06           | Mean: 1.50<br>Range: 4.00           |
| 13. Entrenchment Ratio (Wfpa/Wbkf)                    | Mean: 4.03<br>Range: 3.85   4.21  | Mean: 2.83<br>Range: 2.29   3.36    | Mean: 1.62<br>Range: 1.47   1.77    | Mean: 2.66<br>Range: 1.21   4.11    | Mean: 1.60<br>Range: 5.0            | Mean: 1.60<br>Range: 3.5            | Mean: 2.66<br>Range: 1.21   4.11    | Mean: 4.00<br>Range: 5.2            | Mean: 3.06<br>Range: 2.9            | Mean: 4.00<br>Range: 4.6            |
| 14. Bankfull Mean Velocity (Vbkf) [ft/s]              | Mean: -<br>Range: -   -           | Mean: -<br>Range: -   -             | Mean: -<br>Range: -   -             | Mean: -<br>Range: -   -             | Mean: 4.8<br>Range: 4.8   5.2       | Mean: 5.2<br>Range: 3.4   3.7       | Mean: -<br>Range: -   -             | Mean: 5.0<br>Range: 5.0   5.5       | Mean: 2.54<br>Range: 2.54   3.19    | Mean: 5.8<br>Range: 3.4   5.8       |
| 15. Bankfull discharge (Qbkf) [ft3/s]                 | Mean: -<br>Range: -   -           | Mean: -<br>Range: -   -             | Mean: -<br>Range: -   -             | Mean: 97.4<br>Range: 97.4           | Mean: 112.9<br>Range: 108.1   117.6 | Mean: 102.3<br>Range: 98.6   106.1  | Mean: -<br>Range: -   -             | Mean: 117.6<br>Range: 111.9   123.3 | Mean: 96.9<br>Range: 86.03   107.75 | Mean: 161.9<br>Range: 119.4   204.5 |
| Pool Dimensions                                       |                                   |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |
| 16. Pool Width (Wbkfp) [ft]                           | Mean: 9.72<br>Range: 8.87   10.57 | Mean: 10.6<br>Range: 10.55   10.65  | Mean: 10.37<br>Range: 9.27   11.46  | Mean: 16.67<br>Range: 14.93   18.4  | Mean: 20.79<br>Range: 1.85          | Mean: 26.45<br>Range: 1.61          | Mean: 40.97<br>Range: 1.03          | Mean: 22.89<br>Range: 2.20          | Mean: 58.72<br>Range: 1.03          | Mean: 28.63<br>Range: 2.20          |
| 17. Mean Pool Depth (dbkfp)                           | Mean: 1.25<br>Range: 0.84   1.65  | Mean: 1.43<br>Range: 1.4   1.45     | Mean: 1.22<br>Range: 0.85   1.58    | Mean: 1.79<br>Range: 1.05   2.53    | Mean: 1.85<br>Range: 1.05           | Mean: 1.61<br>Range: 1.05           | Mean: 1.03<br>Range: 1.54           | Mean: 2.20<br>Range: 1.30           | Mean: 1.03<br>Range: 1.65           | Mean: 2.20<br>Range: 1.30           |
| 18. Pool Cross-Sectional Area (Abkfp) [ft2]           | Mean: 11.75<br>Range: 8.9   14.6  | Mean: 15.07<br>Range: 14.73   15.41 | Mean: 13.02<br>Range: 7.87   18.16  | Mean: 28.62<br>Range: 19.4   37.84  | Mean: 41.81<br>Range: 1.40          | Mean: 46.18<br>Range: 1.40          | Mean: 42.14<br>Range: 3.27          | Mean: 46.52<br>Range: 2.94          | Mean: 60.37<br>Range: 2.77          | Mean: 72.77<br>Range: 3.67          |
| 19. Maximum Pool Depth (dmaxp)                        | Mean: 1.93<br>Range: 1.59   2.26  | Mean: 2.17<br>Range: 1.99   2.35    | Mean: 1.68<br>Range: 1.33   2.02    | Mean: 2.73<br>Range: 1.8   3.65     | Mean: 3.30<br>Range: 1.05           | Mean: 2.88<br>Range: 1.05           | Mean: 3.27<br>Range: 1.54           | Mean: 2.94<br>Range: 1.30           | Mean: 2.77<br>Range: 1.65           | Mean: 3.67<br>Range: 1.30           |
| 20. Pool Width to Riffle Width (Wbkfp/Wbkf)           | Mean: 1.29<br>Range: 1.17   1.40  | Mean: 1.44<br>Range: 1.43   1.45    | Mean: 0.79<br>Range: 0.71   0.87    | Mean: 0.84<br>Range: 0.75   0.93    | Mean: 1.05<br>Range: 1.40           | Mean: 1.05<br>Range: 1.40           | Mean: 1.54<br>Range: 1.03           | Mean: 1.30<br>Range: 1.50           | Mean: 1.65<br>Range: 1.08           | Mean: 1.30<br>Range: 1.50           |
| 21. Mean Pool Depth to Mean Riffle Depth (dbkfp/dbkf) | Mean: 1.39<br>Range: 0.93   1.83  | Mean: 1.38<br>Range: 1.35   1.39    | Mean: 1.42<br>Range: 0.99   1.84    | Mean: 1.57<br>Range: 0.92   2.22    | Mean: 1.40<br>Range: 1.60           | Mean: 1.40<br>Range: 1.60           | Mean: 1.03<br>Range: 1.80           | Mean: 1.50<br>Range: 1.80           | Mean: 1.08<br>Range: 1.79           | Mean: 1.50<br>Range: 1.80           |
| 22. Pool Area to Riffle Area (Abkfp/Abkf)             | Mean: 1.73<br>Range: 1.31   2.15  | Mean: 2.00<br>Range: 1.95   2.04    | Mean: 1.16<br>Range: 0.70   1.61    | Mean: 1.27<br>Range: 0.86   1.68    | Mean: 1.60<br>Range: 2.50           | Mean: 1.60<br>Range: 2.50           | Mean: 1.80<br>Range: 3.27           | Mean: 1.80<br>Range: 2.00           | Mean: 1.79<br>Range: 2.92           | Mean: 1.80<br>Range: 2.00           |
| 23. Max Pool Depth to Mean Riffle Depth (dbkfp/dbkf)  | Mean: 2.14<br>Range: 1.77   2.51  | Mean: 2.09<br>Range: 1.91   2.26    | Mean: 1.95<br>Range: 1.55   2.35    | Mean: 2.39<br>Range: 1.58   3.20    | Mean: 2.50<br>Range: 1.60           | Mean: 2.50<br>Range: 1.60           | Mean: 3.27<br>Range: 1.80           | Mean: 2.00<br>Range: 1.80           | Mean: 2.92<br>Range: 1.79           | Mean: 2.00<br>Range: 1.80           |
| Channel Pattern                                       |                                   |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |
| 24. Stream Meander Length (Lm)                        | Mean: 87.0<br>Range: 57.0   117.0 | Mean: 87.0<br>Range: 57.0   117.0   | Mean: 136.3<br>Range: 69.2   197.7  | Mean: 173.2<br>Range: 168.0   175.8 | Mean: 212.8<br>Range: 193.5   232.2 | Mean: 212.8<br>Range: 193.5   232.2 | Mean: 183.3<br>Range: 183.3         | Mean: 183.3<br>Range: 183.3         | Mean: 183.3<br>Range: 183.3         | Mean: 183.3<br>Range: 183.3         |
| 25. Stream Meander Length Ratio (Lm/Wbkf)             | Mean: 11.5<br>Range: 7.5   15.5   | Mean: 11.8<br>Range: 7.7   15.9     | Mean: 10.4<br>Range: 5.3   15.0     | Mean: 8.7<br>Range: 8.5   8.9       | Mean: 8.4<br>Range: 7.7   9.2       | Mean: 8.4<br>Range: 7.7   9.2       | Mean: 10.4<br>Range: 10.4           | Mean: 10.4<br>Range: 10.4           | Mean: 8.3<br>Range: 8.3             | Mean: 8.3<br>Range: 8.3             |
| 26. Radius of Curvature (Rc)                          | Mean: 12.9<br>Range: 7.6   17.3   | Mean: 61.7<br>Range: 45.0   80.0    | Mean: 85.0<br>Range: 41.0   132.0   | Mean: 55.5<br>Range: 32.0   80.0    | Mean: 82.7<br>Range: 68.0   95.0    | Mean: 82.7<br>Range: 68.0   95.0    | Mean: 116.8<br>Range: 45.0   296.0  | Mean: 116.8<br>Range: 45.0   296.0  | Mean: 72.5<br>Range: 50.0   95.0    | Mean: 72.5<br>Range: 50.0   95.0    |
| 27. Radius of Curvature to Riffle Width (Rc/Wbkf)     | Mean: 1.7<br>Range: 1.0   2.3     | Mean: 8.4<br>Range: 6.1   10.9      | Mean: 6.5<br>Range: 3.1   10.0      | Mean: 2.8<br>Range: 1.6   4.0       | Mean: 3.3<br>Range: 2.7   3.8       | Mean: 3.3<br>Range: 2.7   3.8       | Mean: 6.6<br>Range: 2.6   16.8      | Mean: 6.6<br>Range: 2.6   16.8      | Mean: 3.3<br>Range: 2.3   4.3       | Mean: 3.3<br>Range: 2.3   4.3       |
| 28. Belt Width (Wbit)                                 | Mean: 40.7<br>Range: 31.8   49.6  | Mean: -<br>Range: -   -             | Mean: 22.3<br>Range: 19.8   28.7    | Mean: 40.0<br>Range: 29.6   52.7    | Mean: 59.3<br>Range: 32.2   86.5    | Mean: 59.3<br>Range: 32.2   86.5    | Mean: 36.9<br>Range: 33.9   40.9    | Mean: 36.9<br>Range: 33.9   40.9    | Mean: 45.5<br>Range: 45.5           | Mean: 45.5<br>Range: 45.5           |
| 29. Meander Width Ratio (Wbit/Wbkf)                   | Mean: 5.4<br>Range: 4.2   6.6     | Mean: -<br>Range: -   -             | Mean: 1.7<br>Range: 1.5   2.2       | Mean: 2.0<br>Range: 1.5   2.7       | Mean: 2.4<br>Range: 2.0   2.7       | Mean: 2.4<br>Range: 2.0   2.7       | Mean: 2.1<br>Range: 1.9   2.3       | Mean: 2.1<br>Range: 1.9   2.3       | Mean: 2.1<br>Range: 0.0   0.0       | Mean: 2.1<br>Range: 0.0   0.0       |
| 30. Riffle Length (Lr)                                | Mean: 12.1<br>Range: 7.0   17.2   | Mean: 13.0<br>Range: 9.1   17.0     | Mean: 10.8<br>Range: 9.0   12.9     | Mean: 56.3<br>Range: 52.3   59.3    | Mean: 59.0<br>Range: 57.0   63.0    | Mean: 59.0<br>Range: 57.0   63.0    | Mean: 44.2<br>Range: 40.8   46.8    | Mean: 44.2<br>Range: 40.8   46.8    | Mean: 50.3<br>Range: 39.8   60.9    | Mean: 50.3<br>Range: 39.8   60.9    |
| 31. Riffle Length to Riffle Width (Lr/Wbkf)           | Mean: 1.6<br>Range: 0.9   2.3     | Mean: 1.6<br>Range: 0.9   2.3       | Mean: 0.8<br>Range: 0.7   1.0       | Mean: 2.8<br>Range: 2.6   3.0       | Mean: 2.3<br>Range: 2.3   2.5       | Mean: 2.3<br>Range: 2.3   2.5       | Mean: 2.5<br>Range: 2.3   2.7       | Mean: 2.5<br>Range: 2.3   2.7       | Mean: 2.3<br>Range: 1.8   2.8       | Mean: 2.3<br>Range: 1.8   2.8       |
| 32. Individual Pool Length (Lp)                       | Mean: 19.6<br>Range: 10.1   33.1  | Mean: 18.6<br>Range: 6.8   32.4     | Mean: 13.6<br>Range: 6.9   29.3     | Mean: 28.5<br>Range: 26.2   30.0    | Mean: 55.7<br>Range: 31.6   69.4    | Mean: 55.7<br>Range: 31.6   69.4    | Mean: 36.6<br>Range: 34.6   40.8    | Mean: 36.6<br>Range: 34.6   40.8    | Mean: 36.0<br>Range: 32.2   39.8    | Mean: 36.0<br>Range: 32.2   39.8    |
| 33. Individual Pool Length to Riffle Width (Lp/Wbkf)  | Mean: 2.6<br>Range: 1.3   4.4     | Mean: 2.5<br>Range: 0.9   4.4       | Mean: 1.0<br>Range: 0.5   2.2       | Mean: 1.4<br>Range: 1.3   1.5       | Mean: 2.2<br>Range: 1.3   2.8       | Mean: 2.2<br>Range: 1.3   2.8       | Mean: 2.1<br>Range: 2.0   2.3       | Mean: 2.1<br>Range: 2.0   2.3       | Mean: 1.6<br>Range: 1.5   1.8       | Mean: 1.6<br>Range: 1.5   1.8       |
| 34. Pool to Pool Spacing (Ps)                         | Mean: 51.6<br>Range: 30.5   69.3  | Mean: 31.1<br>Range: 25.2   36.4    | Mean: 26.8<br>Range: 20.7   34.4    | Mean: 86.0<br>Range: 80.5   88.2    | Mean: 106.6<br>Range: 87.6   126.4  | Mean: 106.6<br>Range: 87.6   126.4  | Mean: 80.9<br>Range: 76.2   85.9    | Mean: 80.9<br>Range: 76.2   85.9    | Mean: 97.4<br>Range: 97.4           | Mean: 97.4<br>Range: 97.4           |
| 35. Pool to Pool Spacing to Riffle Width (Ps/Wbkf)    | Mean: 6.8<br>Range: 4.0   9.2     | Mean: 4.2<br>Range: 3.4   4.9       | Mean: 2.0<br>Range: 1.6   2.6       | Mean: 4.3<br>Range: 4.1   4.5       | Mean: 4.2<br>Range: 3.5   5.0       | Mean: 4.2<br>Range: 3.5   5.0       | Mean: 4.6<br>Range: 4.3   4.9       | Mean: 4.6<br>Range: 4.3   4.9       | Mean: 4.4<br>Range: 4.4             | Mean: 4.4<br>Range: 4.4             |
| Channel Profile                                       |                                   |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |
| 36. Valley Slope (Svalley) [ft/ft]                    | Mean: 0.022<br>Range: 0.022       | Mean: 0.020<br>Range: 0.020         | Mean: 0.04<br>Range: 0.04           | Mean: 0.039<br>Range: 0.039         | Mean: 0.020<br>Range: 0.020         | Mean: 0.010<br>Range: 0.010         | Mean: 0.011<br>Range: 0.011         | Mean: 0.024<br>Range: 0.024         | Mean: 0.008<br>Range: 0.008         | Mean: 0.024<br>Range: 0.024         |
| 37. Average Water Surface Slope (S)                   | Mean: 0.016<br>Range: 0.016       | Mean: 0.018<br>Range: 0.018         | Mean: 0.022<br>Range: 0.022         | Mean: 0.033<br>Range: 0.033         | Mean: 0.019<br>Range: 0.019         | Mean: 0.009<br>Range: 0.009         | Mean: 0.0065<br>Range: 0.0065       | Mean: 0.023<br>Range: 0.023         | Mean: 0.0053<br>Range: 0.0053       | Mean: 0.023<br>Range: 0.023         |
| 38. Sinuosity (k) (Svalley/S)                         | Mean: 1.36<br>Range: 1.36         | Mean: 1.10<br>Range: 1.10           | Mean: 1.12<br>Range: 1.12           | Mean: 1.18<br>Range: 1.18           | Mean: 1.04<br>Range: 1.04           | Mean: 1.07<br>Range: 1.07           | Mean: 1.66<br>Range: 1.66           | Mean: 1.04<br>Range: 1.04           | Mean: 1.49<br>Range: 1.49           | Mean: 1.04<br>Range: 1.04           |