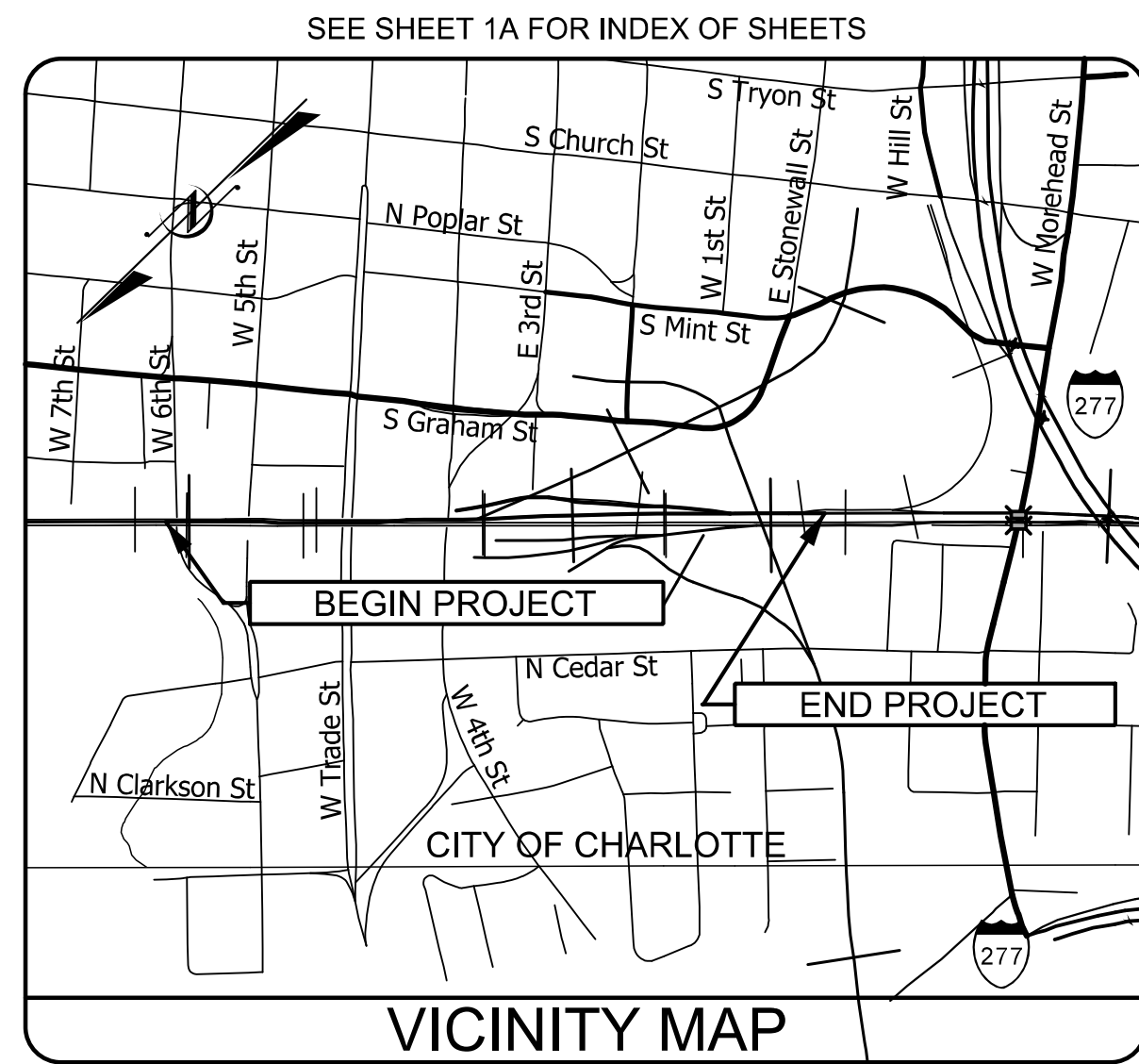


**TIP PROJECT: P-5705BA**

**CONTRACT: RD-18002**

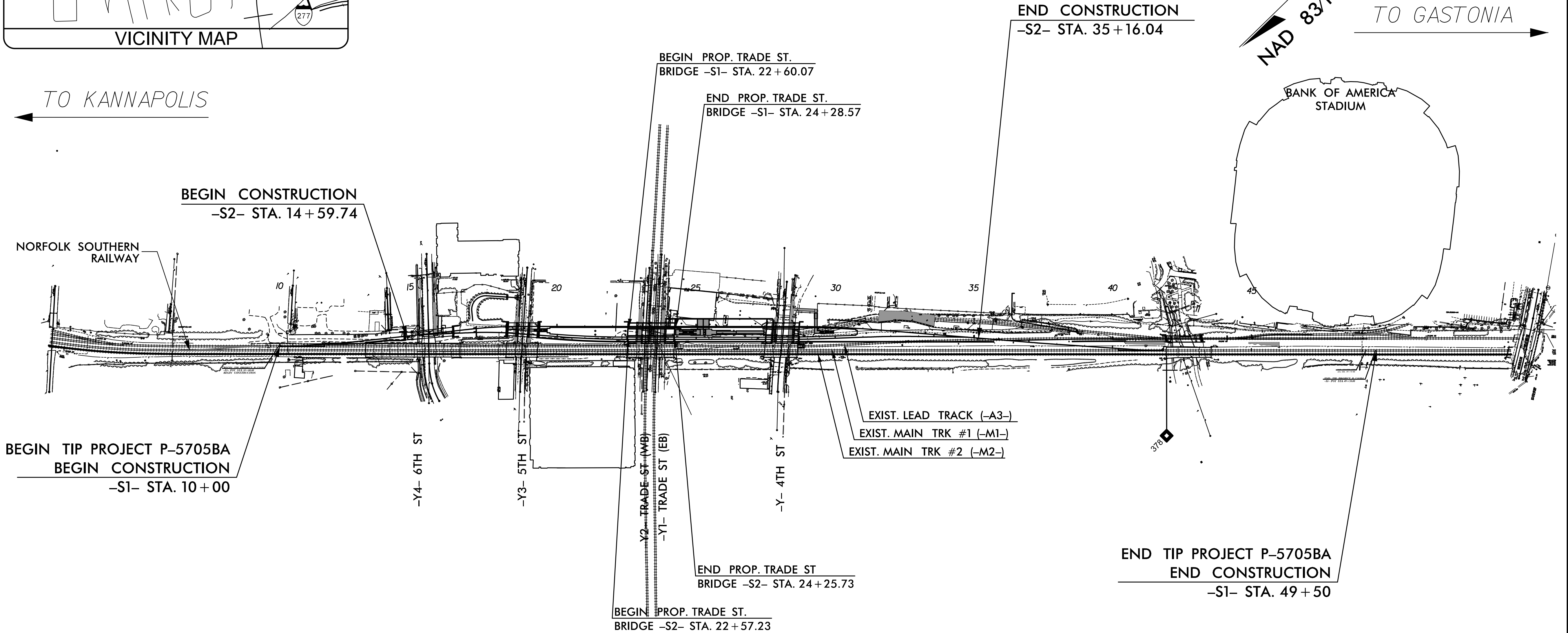


STATE OF NORTH CAROLINA  
RAIL DIVISION

**MECKLENBURG COUNTY**

**LOCATION: CHARLOTTE GATEWAY STATION - TRACK, STRUCTURE AND SIGNALS**  
**TYPE OF WORK: STRUCTURE AND TRAFFIC CONTROL**

| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.              | TOTAL SHEETS |
|-----------------|-----------------------------|------------------------|--------------|
| N.C.            | P-5705BA                    | 1                      |              |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION            |              |
| 44475.1.2       |                             | P.E. / UTIL P.E. / ROW |              |
| 44475.3.2       |                             | CONST./UTIL CONST.     |              |
|                 |                             |                        |              |
|                 |                             |                        |              |
|                 |                             |                        |              |



REV #1: REVISE LETTING DATE

| PROJECT LENGTH                   |             |
|----------------------------------|-------------|
| LENGTH OF RAIL TIP PROJECT       | 0.612 MILES |
| LENGTH OF STRUCTURES TIP PROJECT | 0.136 MILES |
| TOTAL LENGTH OF RAIL TIP PROJECT | 0.748 MILES |
| LENGTH MEASURED ALONG -S1-       |             |

NCDOT CONTACT: MATTHEW SIMMONS, P.E.  
NCDOT PROJECT MANAGER

**HNTB** HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
N/A

LETTING DATE:  
JANUARY 30, 2018

COREY VERNIER, P.E.  
RAIL PROJECT ENGINEER

DAVID HAWKINS, P.E.  
STRUCTURE PROJECT ENGINEER

MATTHEW SIMMONS, P.E.  
NCDOT PROJECT MANAGER

STRUCTURES ENGINEER

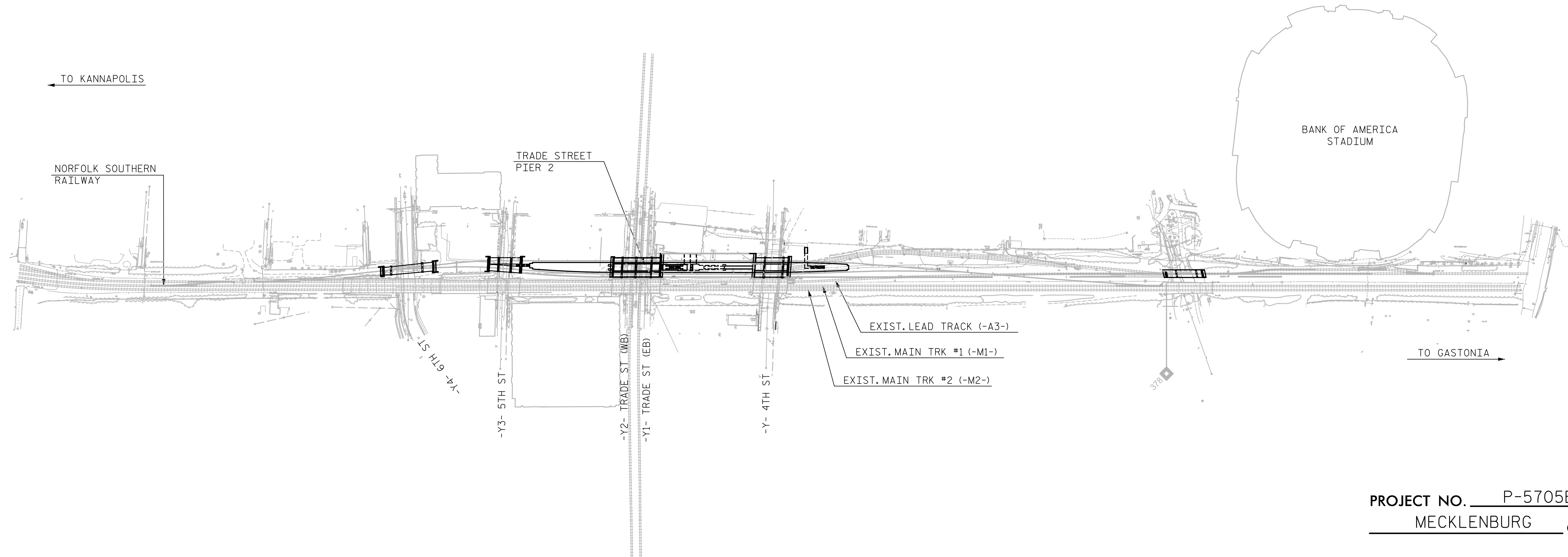
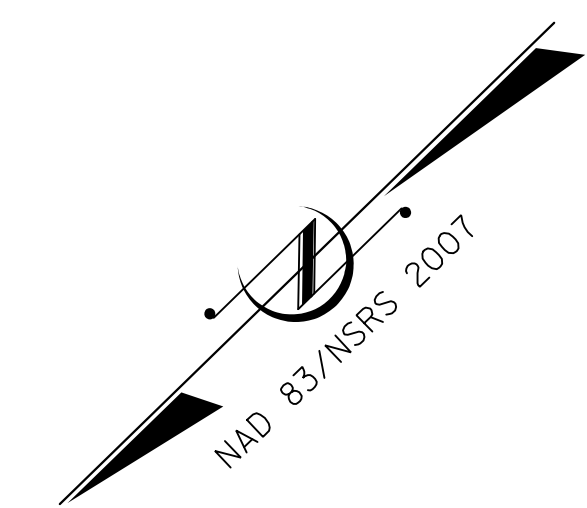
**DAVID W. HAWKINS**  
ENGINEER  
SEAL 27812  
1/21/2018

DocuSigned by:  
*David W. Hawkins*  
SIGNATURE: P.E.

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

NC DEPARTMENT OF TRANSPORTATION  
**RAIL DIVISION**  
DESIGN AND CONSTRUCTION

| INDEX OF SHEETS  |                                  |
|------------------|----------------------------------|
| SHEET NUMBER     | DESCRIPTION                      |
| 1                | COVER SHEET                      |
| 1A               | INDEX                            |
| 1C-1 THRU 1C-4   | SURVEY CONTROL SHEETS            |
| 1D-1             | PROPOSED ALIGNMENT CONTROL SHEET |
| 2 THRU 2A        | PROPERTY EXHIBITS                |
| 2H-1             | STOCKPILE CONTAINMENT DETAIL     |
| S1 THRU S6       | STRUCTURE PLANS (TRADE PIER 2)   |
| TMP-1 THRU TMP-4 | TRANSPORTATION MANAGEMENT PLANS  |



PROJECT NO. P-5705BA  
MECKLENBURG COUNTY



Documented by  
*David W. Hawkins*  
1/21/2018  
DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

INDEX

|  |  |   |                            |                            |                            |                            |                                 |
|--|--|---|----------------------------|----------------------------|----------------------------|----------------------------|---------------------------------|
| <b>HNTB</b> HNTB NORTH CAROLINA, P.C.<br>NC License No. C-1554<br>343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | REVISIONS  |   |                            |                            |                            |                            | SHEET NO.<br>1A<br>TOTAL SHEETS |
|  | DRAWN BY <u>J. BAYNE</u> DATE <u>10/17</u><br>CHECKED BY <u>D. HAWKINS</u> DATE <u>10/17</u> | NO. <u>1</u><br>BY <u>NMR</u><br>DATE <u>01/16/2018</u> | NO. <u>3</u><br>BY<br>DATE | NO. <u>4</u><br>BY<br>DATE | NO. <u> </u><br>BY<br>DATE | NO. <u> </u><br>BY<br>DATE |                                 |
| DWG. NO.   |  |   |                            |                            |                            |                            |                                 |

|                       |           |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| P-5705B               | 1C-1      |
| Location and Surveys  |           |

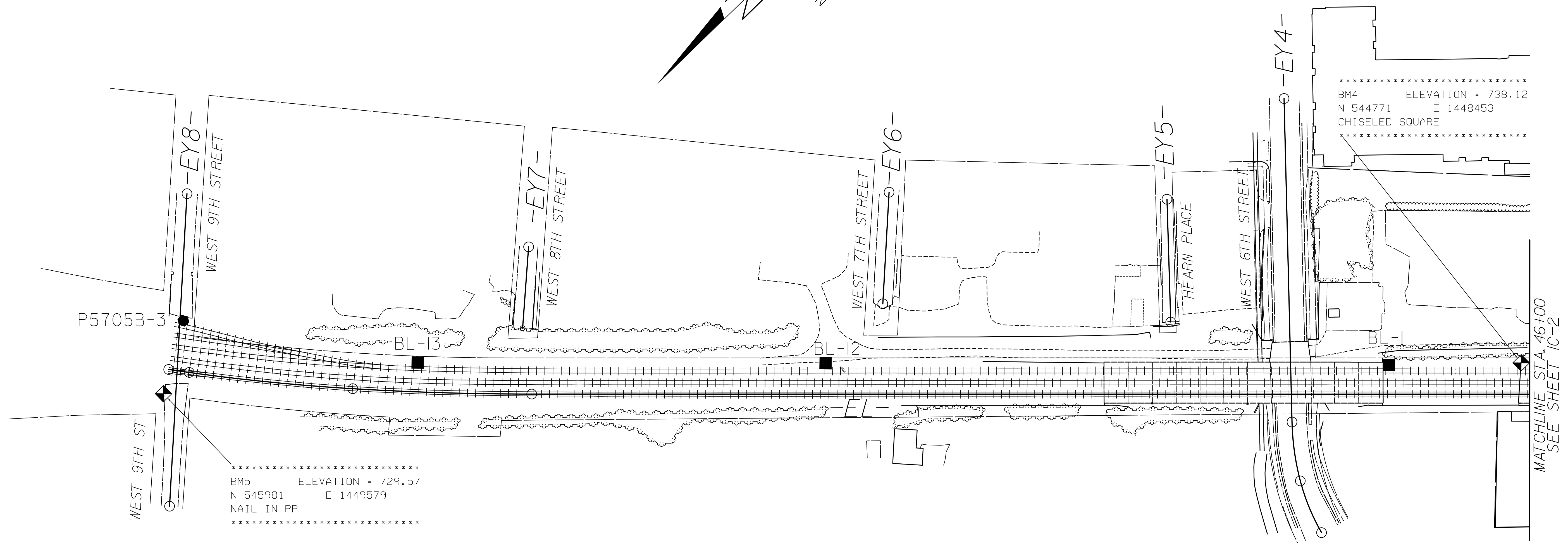
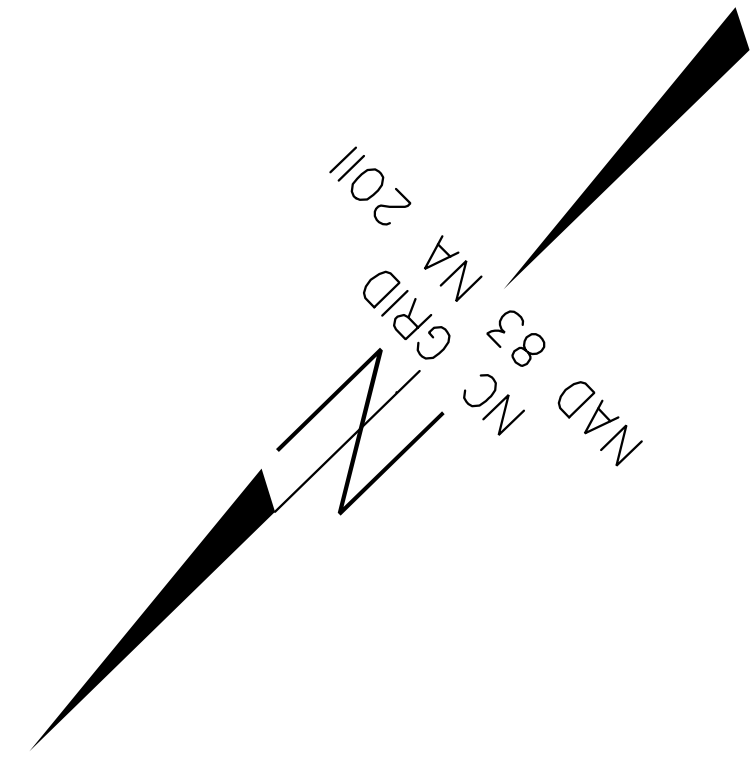
# SURVEY CONTROL SHEET

## W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

← TO KANNAPOLIS

→ TO GASTONIA

P5705B-4



\*\*\*\*\*  
 BM4 ELEVATION = 738.12  
 N 544771 E 1448453  
 CHISELED SQUARE  
 \*\*\*\*\*

\*\*\*\*\*  
 BM5 ELEVATION = 729.57  
 N 545981 E 1449579  
 NAIL IN PP  
 \*\*\*\*\*

### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "P5705B-2"  
 WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF  
 NORTHING: 542629.390(ft) EASTING: 1445444.637(ft)  
 ELEVATION: 683.308(ft)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998447800  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "P5705B-2" TO -S1- STATION 10+00.00 IS  
 N 52°33'53.8" E 4499.67'  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

### NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

NOTE: DRAWING NOT TO SCALE

MATCHLINE STA. 46+00  
SEE SHEET 1C-2

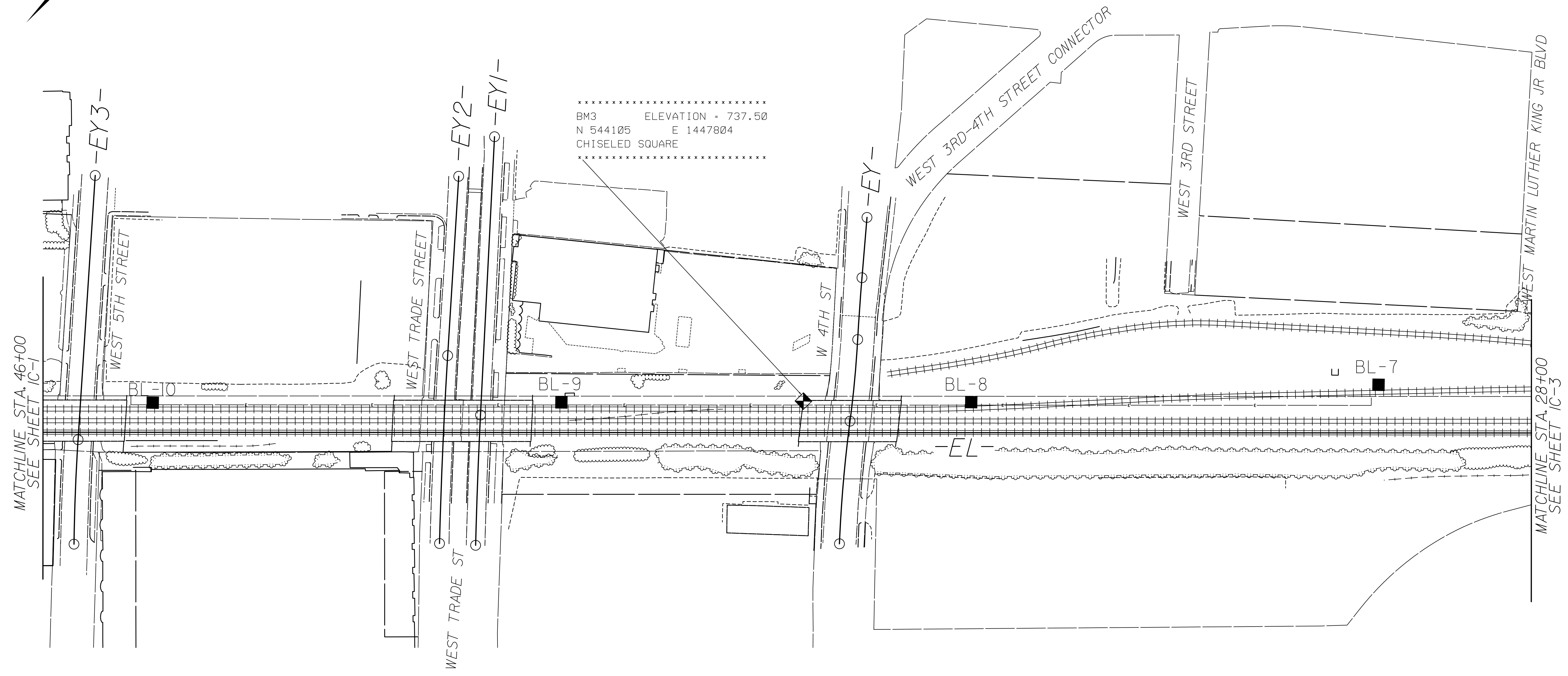
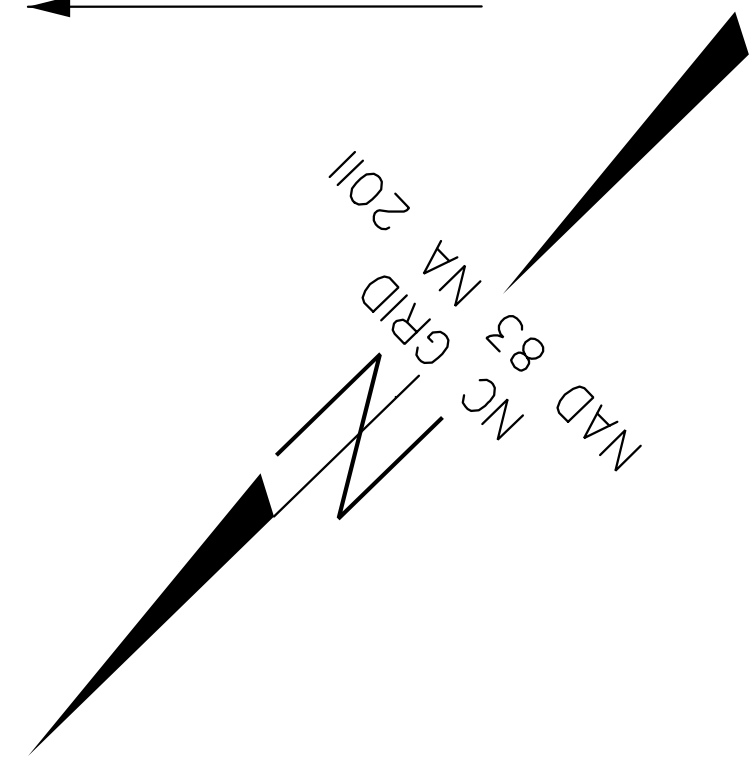
|                       |           |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| P-5705B               | 1C-2      |
| Location and Surveys  |           |

# SURVEY CONTROL SHEET

## W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

← TO KANNAPOLIS

TO GASTONIA →



MATCHLINE STA. 46+00  
SEE SHEET 1C-1

MATCHLINE STA. 28+00  
SEE SHEET 1C-3

### NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
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NOTE: DRAWING NOT TO SCALE

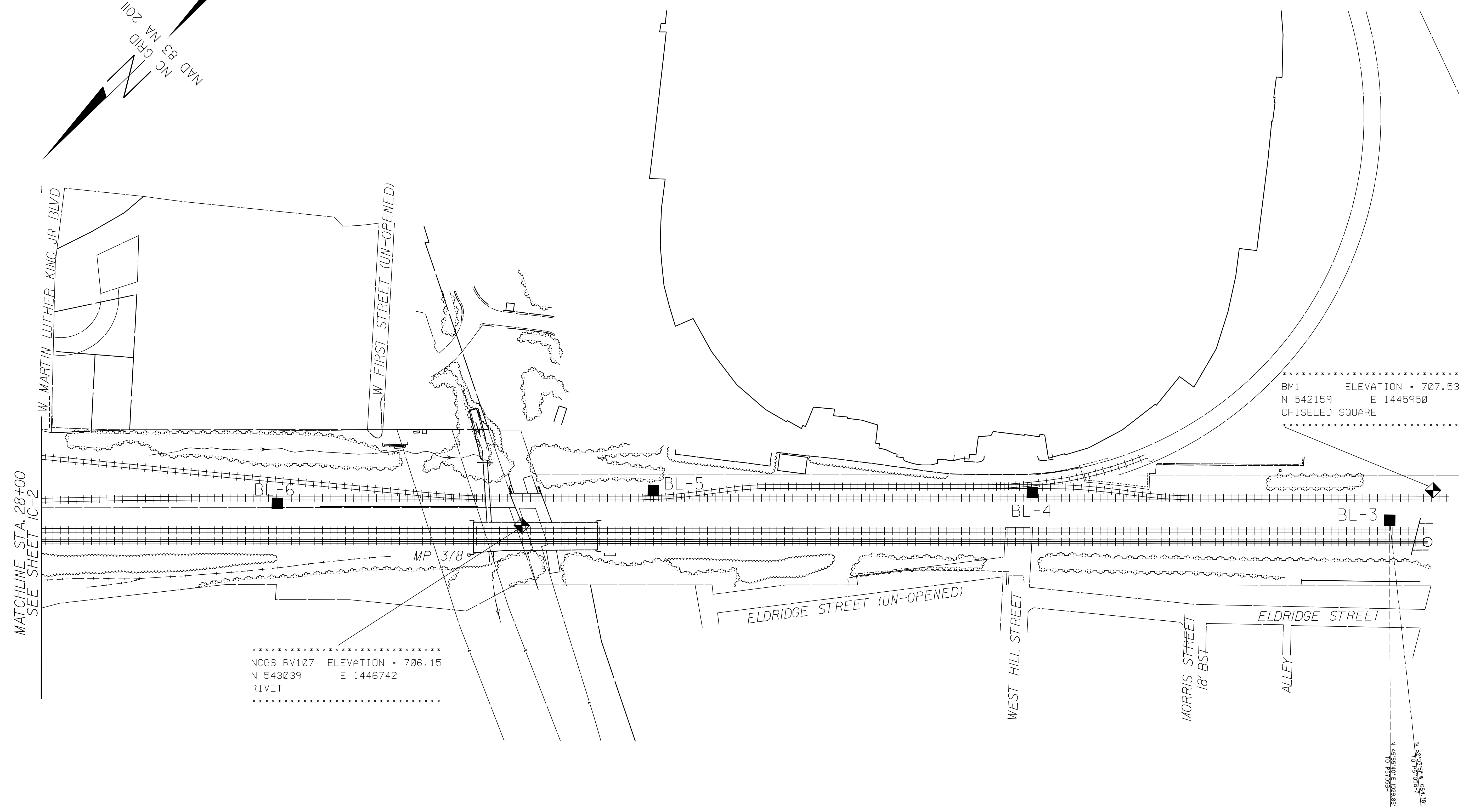
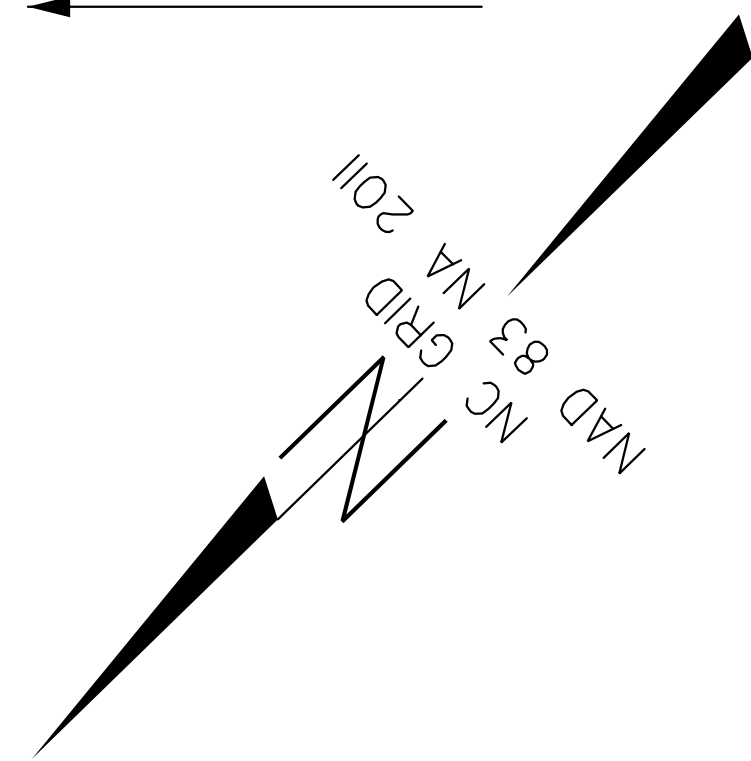
|                       |           |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| P-5705B               | 1C-3      |
| Location and Surveys  |           |

# SURVEY CONTROL SHEET

## W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

← TO KANNAPOLIS

→ TO GASTONIA



\*\*\*\*\*  
 NCGS RV107 ELEVATION = 706.15  
 N 543039 E 1446742  
 RIVET  
 \*\*\*\*\*

\*\*\*\*\*  
 BM1 ELEVATION = 707.53  
 N 542159 E 1445950  
 CHISELED SQUARE  
 \*\*\*\*\*

N 52°05'10.25" E  
 15.023482'  
 TO  
 N 45°55'40.14" E  
 10.292482'  
 TO  
 N 53°05'10.25" E  
 15.023482'

### NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

NOTE: DRAWING NOT TO SCALE

# SURVEY CONTROL SHEET

## BASELINE

| BL POINT | DESC.        | NORTH       | EAST         | ELEVATION |
|----------|--------------|-------------|--------------|-----------|
| 1        | GPS P5705B-1 | 542943.1696 | 1445221.1543 | 670.09    |
| 2        | GPS P5705B-2 | 542629.3900 | 1445444.6370 | 683.31    |
| 3        | BL -3        | 542226.8456 | 1445961.0633 | 711.07    |
| 4        | BL -4        | 542534.2325 | 1446310.5454 | 706.62    |
| 5        | BL -5        | 542885.1262 | 1446655.7118 | 706.95    |
| 6        | BL -6        | 543246.8513 | 1446984.0832 | 713.51    |
| 7        | BL -7        | 543592.5959 | 1447333.3859 | 724.54    |
| 8        | BL -8        | 543960.2705 | 1447661.8381 | 735.08    |
| 9        | BL -9        | 544315.6877 | 1448007.2578 | 737.60    |
| 10       | BL -10       | 544670.0759 | 1448351.7409 | 737.03    |
| 11       | BL -11       | 544887.9468 | 1448563.5695 | 735.72    |
| 12       | BL -12       | 545377.9010 | 1449043.5256 | 730.95    |
| 13       | BL -13       | 545733.0461 | 1449390.5540 | 728.48    |
| 14       | GPS P5705B-3 | 545901.9120 | 1449625.9940 | 728.32    |
| 15       | GPS P5705B-4 | 545446.5087 | 1450075.8714 | 737.50    |

\*\*\*\*\*  
 BM1 ELEVATION = 707.53  
 N 542159 E 1445950  
 CHISELED SQUARE  
 \*\*\*\*\*  
 BM2 ELEVATION = 706.15  
 N 543039 E 1446742  
 RIVET  
 \*\*\*\*\*  
 BM3 ELEVATION = 737.50  
 N 544105 E 1447804  
 CHISELED SQUARE  
 \*\*\*\*\*  
 BM4 ELEVATION = 738.12  
 N 544771 E 1448453  
 CHISELED SQUARE  
 \*\*\*\*\*  
 BM5 ELEVATION = 729.57  
 N 545981 E 1449579  
 NAIL IN PP  
 \*\*\*\*\*  
 NCGS RV107 ELEVATION = 706.15  
 N 543039 E 1446742  
 RIVET  
 \*\*\*\*\*

| EL POINT | N          | E           | BEARING         | DIST    | DELTA           | D           | L      | T      | R       |
|----------|------------|-------------|-----------------|---------|-----------------|-------------|--------|--------|---------|
| POT      | 542211.253 | 1445906.755 |                 |         |                 |             |        |        |         |
| LINE     |            |             | N 44°14'46.1" E | 4814.93 |                 |             |        |        |         |
| PC       | 545660.421 | 1449266.331 |                 |         |                 |             |        |        |         |
| CURVE    |            |             | N 45°57'35.6" E | 217.82  | 03°25'39.1"(RT) | 01°34'24.0" | 217.85 | 108.96 | 3641.71 |
| PCC      | 545811.842 | 1449422.912 |                 |         |                 |             |        |        |         |
| CURVE    |            |             | N 49°55'18.7" E | 200.11  | 04°29'47.0"(RT) | 02°14'47.1" | 200.16 | 100.13 | 2550.55 |
| PCC      | 545940.677 | 1449576.028 |                 |         |                 |             |        |        |         |
| CURVE    |            |             | N 52°24'58.5" E | 25.23   | 00°29'32.7"(RT) | 01°57'06.5" | 25.23  | 12.61  | 2935.53 |
| PT       | 545940.677 | 1449576.028 |                 |         |                 |             |        |        |         |

| EY POINT | N          | E           | BEARING         | DIST   | DELTA           | D           | L      | T     | R       |
|----------|------------|-------------|-----------------|--------|-----------------|-------------|--------|-------|---------|
| POT      | 543894.750 | 1447910.079 |                 |        |                 |             |        |       |         |
| LINE     |            |             | N 41°01'12.8" W | 73.23  |                 |             |        |       |         |
| PC       | 543949.998 | 1447862.018 |                 |        |                 |             |        |       |         |
| CURVE    |            |             | N 41°48'53.5" W | 74.95  | 01°35'21.4"(LT) | 02°07'12.9" | 74.96  | 37.48 | 2702.32 |
| PCC      | 544005.862 | 1447812.044 |                 |        |                 |             |        |       |         |
| CURVE    |            |             | N 40°25'12.6" W | 99.17  | 04°22'43.2"(RT) | 04°24'50.5" | 99.20  | 49.62 | 1298.04 |
| PCC      | 544081.365 | 1447747.740 |                 |        |                 |             |        |       |         |
| CURVE    |            |             | N 40°52'55.1" W | 148.99 | 05°18'08.1"(LT) | 03°33'27.5" | 149.04 | 74.57 | 1610.51 |
| PT       | 544081.365 | 1447747.740 |                 |        |                 |             |        |       |         |

| EY1 POINT | N          | E           | BEARING         | DIST   | DELTA           | D           | L      | T     | R       |
|-----------|------------|-------------|-----------------|--------|-----------------|-------------|--------|-------|---------|
| POT       | 544149.466 | 1448294.217 |                 |        |                 |             |        |       |         |
| LINE      |            |             | N 42°54'13.0" W | 337.21 |                 |             |        |       |         |
| PC        | 544396.472 | 1448064.655 |                 |        |                 |             |        |       |         |
| CURVE     |            |             | N 43°37'33.0" W | 157.78 | 01°26'40.0"(LT) | 00°54'55.6" | 157.79 | 78.90 | 6258.87 |
| PT        | 544396.472 | 1448064.655 |                 |        |                 |             |        |       |         |

| EY2 POINT | N          | E           | BEARING         | DIST   | DELTA           | D           | L      | T      | R       |
|-----------|------------|-------------|-----------------|--------|-----------------|-------------|--------|--------|---------|
| POT       | 544213.920 | 1448290.108 |                 |        |                 |             |        |        |         |
| LINE      |            |             | N 42°16'05.4" W | 217.32 |                 |             |        |        |         |
| PC        | 544374.735 | 1448143.941 |                 |        |                 |             |        |        |         |
| CURVE     |            |             | N 43°18'11.5" W | 227.69 | 02°04'12.2"(LT) | 00°54'32.7" | 227.70 | 113.86 | 6302.54 |
| PT        | 544374.735 | 1448143.941 |                 |        |                 |             |        |        |         |

| EY3 POINT | N          | E           | BEARING         | DIST   | DELTA           | D           | L      | T     | R       |
|-----------|------------|-------------|-----------------|--------|-----------------|-------------|--------|-------|---------|
| POT       | 544528.238 | 1448597.381 |                 |        |                 |             |        |       |         |
| LINE      |            |             | N 42°04'21.4" W | 320.44 |                 |             |        |       |         |
| PC        | 544766.096 | 1448382.666 |                 |        |                 |             |        |       |         |
| CURVE     |            |             | N 43°32'07.4" W | 126.52 | 02°55'32.0"(LT) | 02°18'43.3" | 126.54 | 63.28 | 2478.15 |
| PT        | 544766.096 | 1448382.666 |                 |        |                 |             |        |       |         |

| EY4 POINT | N          | E           | BEARING         | DIST   | DELTA           | D           | L     | T     | R      |
|-----------|------------|-------------|-----------------|--------|-----------------|-------------|-------|-------|--------|
| POT       | 544753.376 | 1448885.088 |                 |        |                 |             |       |       |        |
| LINE      |            |             | N 47°09'58.1" W | 393.81 |                 |             |       |       |        |
| PC        | 545021.115 | 1448596.298 |                 |        |                 |             |       |       |        |
| CURVE     |            |             | N 53°48'34.0" W | 72.36  | 13°17'11.8"(LT) | 18°19'15.9" | 72.52 | 36.42 | 312.73 |
| PCC       | 545063.841 | 1448537.901 |                 |        |                 |             |       |       |        |
| CURVE     |            |             | N 68°03'15.8" W | 68.06  | 15°12'11.7"(LT) | 22°16'15.9" | 68.26 | 34.33 | 257.27 |
| PT        | 545063.841 | 1448537.901 |                 |        |                 |             |       |       |        |

| EY5 POINT | N          | E           | BEARING         | DIST   |
|-----------|------------|-------------|-----------------|--------|
| POT       | 544941.038 | 1448896.711 |                 |        |
| LINE      |            |             | N 47°31'55.9" W | 149.53 |
| POT       | 545042.000 | 1448786.406 |                 |        |

| EY6 POINT | N          | E           | BEARING         | DIST   |
|-----------|------------|-------------|-----------------|--------|
| POT       | 545177.393 | 1449138.838 |                 |        |
| LINE      |            |             | N 42°32'40.2" W | 136.00 |
| POT       | 545277.592 | 1449046.880 |                 |        |

| EY7 POINT | N          | E           | BEARING         | DIST  |
|-----------|------------|-------------|-----------------|-------|
| POT       | 545538.047 | 1449397.267 |                 |       |
| LINE      |            |             | N 41°29'52.3" W | 99.23 |
| POT       | 545612.365 | 1449331.521 |                 |       |

| EY8 POINT | N          | E           | BEARING         | DIST   |
|-----------|------------|-------------|-----------------|--------|
| POT       | 545790.830 | 1449733.737 |                 |        |
| LINE      |            |             | N 42°33'48.3" W | 380.99 |
| POT       | 546071.439 | 1449476.035 |                 |        |

### NOTES:

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- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

# PROPOSED ALIGNMENT CONTROL SHEET

A1

| TYPE | STATION  | NORTH       | EAST         |
|------|----------|-------------|--------------|
| POT  | 35+87.79 | 543496.7714 | 1447233.8636 |
| POT  | 36+19.04 | 543476.2284 | 1447210.3148 |
| PC   | 38+47.19 | 543309.8433 | 1447054.2047 |
| PT   | 39+53.72 | 543232.8411 | 1446980.5999 |
| POT  | 48+42.17 | 542596.3343 | 1446360.7516 |
| POT  | 49+15.28 | 542543.8320 | 1446309.8770 |

A6

| TYPE | STATION  | NORTH       | EAST         |
|------|----------|-------------|--------------|
| POT  | 44+11.83 | 542904.6403 | 1446660.9888 |
| POT  | 44+41.83 | 542883.1477 | 1446640.0587 |
| PC   | 45+32.64 | 542810.7032 | 1446585.2941 |
| PT   | 45+92.21 | 542765.4617 | 1446546.4327 |
| POT  | 47+18.47 | 542674.9999 | 1446458.3519 |

S1

| TYPE | STATION  | NORTH       | EAST         |
|------|----------|-------------|--------------|
| POT  | 10+00.00 | 545364.5649 | 1449017.5662 |
| POT  | 10+39.98 | 545335.9225 | 1448989.6733 |
| TS   | 11+56.77 | 545247.0124 | 1448913.9457 |
| SC   | 11+96.77 | 545216.4857 | 1448888.0979 |
| CS   | 12+53.24 | 545172.7295 | 1448852.3906 |
| ST   | 12+93.24 | 545141.2854 | 1448827.6669 |
| POT  | 12+98.24 | 545137.3459 | 1448824.5879 |
| POT  | 13+38.22 | 545105.8457 | 1448799.9681 |
| POT  | 14+59.74 | 545010.1003 | 1448725.1357 |
| POT  | 14+99.72 | 544978.6001 | 1448700.5159 |
| TS   | 16+73.33 | 544841.8174 | 1448593.6098 |
| SC   | 17+35.33 | 544793.2629 | 1448555.0575 |
| CS   | 18+19.93 | 544729.5302 | 1448499.4104 |
| ST   | 18+81.93 | 544684.7830 | 1448456.4976 |
| TS   | 28+53.03 | 543989.0635 | 1447778.9861 |
| SC   | 28+84.03 | 543966.8870 | 1447757.3250 |
| CS   | 31+32.61 | 543796.0340 | 1447576.8418 |
| ST   | 31+63.61 | 543775.6202 | 1447553.5121 |
| POT  | 33+11.81 | 543678.1944 | 1447441.8315 |
| POT  | 33+51.79 | 543651.9125 | 1447411.7041 |
| POT  | 34+77.81 | 543569.0698 | 1447316.7403 |
| POT  | 35+17.79 | 543542.7879 | 1447286.6129 |
| POT  | 35+87.79 | 543496.7714 | 1447233.8636 |
| POT  | 36+19.04 | 543476.2284 | 1447210.3148 |
| TS   | 36+98.79 | 543423.8025 | 1447150.2182 |
| SC   | 37+29.79 | 543403.4028 | 1447126.8762 |
| CS   | 37+81.55 | 543369.0985 | 1447088.1213 |
| ST   | 38+12.55 | 543348.4054 | 1447065.0390 |
| POT  | 41+44.04 | 543126.9013 | 1446818.4088 |
| POT  | 41+84.02 | 543098.2655 | 1446790.5091 |
| POT  | 49+50.00 | 542549.6314 | 1446255.9797 |

Y5

| TYPE | STATION  | NORTH       | EAST         |
|------|----------|-------------|--------------|
| POT  | 10+00.00 | 543344.1813 | 1447318.1107 |
| PC   | 10+80.08 | 543401.0694 | 1447261.7529 |
| PT   | 11+08.41 | 543403.1978 | 1447235.8219 |
| POT  | 13+34.24 | 543270.8262 | 1447052.8461 |

Y6


| TYPE | STATION  | NORTH       | EAST         |
|------|----------|-------------|--------------|
| POT  | 10+29.00 | 544802.8691 | 1448599.9271 |
| PC   | 10+64.06 | 544781.1647 | 1448627.4549 |
| PT   | 11+50.97 | 544704.8336 | 1448630.0532 |
| POT  | 12+74.93 | 544621.6394 | 1448538.1527 |

S2

| TYPE | STATION  | NORTH       | EAST         |
|------|----------|-------------|--------------|
| POT  | 14+59.74 | 545010.1003 | 1448725.1357 |
| POT  | 14+99.72 | 544978.6001 | 1448700.5159 |
| TS   | 16+58.94 | 544859.9602 | 1448594.3327 |
| SC   | 17+20.94 | 544814.0808 | 1448552.6326 |
| CS   | 18+17.49 | 544746.0421 | 1448484.1231 |
| ST   | 18+79.49 | 544704.6596 | 1448437.9570 |
| TS   | 19+86.23 | 544634.0276 | 1448357.9348 |
| SC   | 20+17.23 | 544613.4785 | 1448334.7241 |
| CS   | 22+45.81 | 544455.8812 | 1448169.2106 |
| ST   | 22+76.81 | 544433.7047 | 1448147.5495 |
| TS   | 28+04.14 | 544055.9098 | 1447779.6421 |
| SC   | 28+35.14 | 544033.6683 | 1447758.0478 |
| CS   | 29+27.51 | 543966.3466 | 1447694.8013 |
| ST   | 29+58.51 | 543943.4072 | 1447673.9498 |
| TS   | 31+09.22 | 543831.7313 | 1447572.7444 |
| SC   | 31+71.22 | 543785.9406 | 1447530.9451 |
| CS   | 32+54.09 | 543725.9611 | 1447473.7618 |
| ST   | 33+16.09 | 543682.0250 | 1447430.0173 |
| POT  | 34+76.06 | 543569.0698 | 1447316.7403 |
| POT  | 35+16.04 | 543542.7879 | 1447286.6129 |

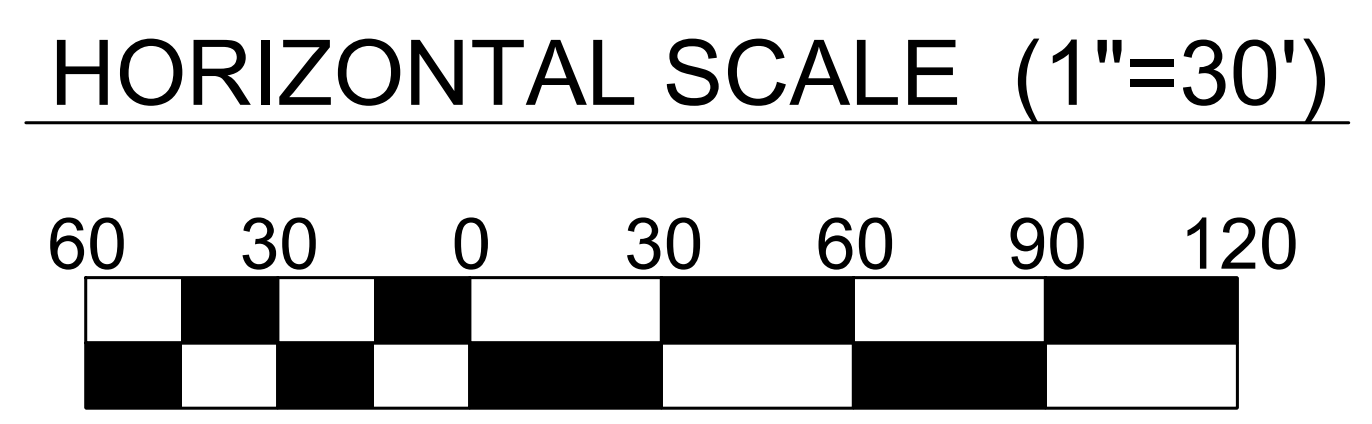
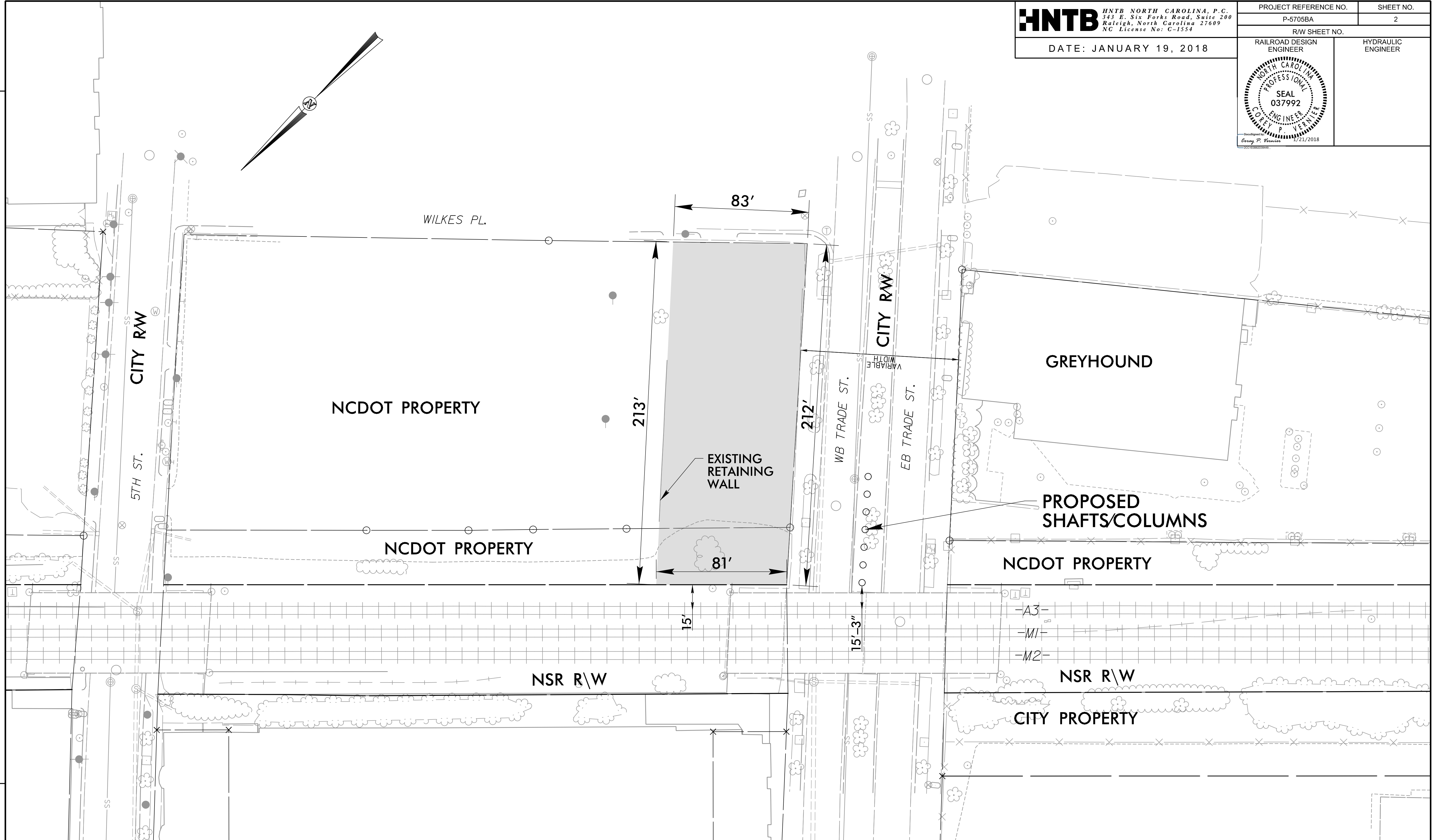
**HNTB** HNTB NORTH CAROLINA, P.C.  
 343 E. Six Forks Road, Suite 200  
 Raleigh, North Carolina 27609  
 NC License No: C-1554

DATE: JANUARY 19, 2018


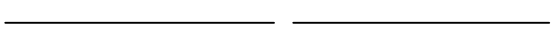
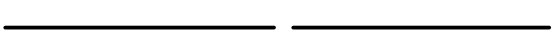
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| PROJECT REFERENCE NO.<br>P-5705BA   | SHEET NO.<br>2     |
| R/W SHEET NO.   |                    |
| RAILROAD DESIGN ENGINEER  | HYDRAULIC ENGINEER |
|  |                    |

REVISIONS

REV #1: NEW SHEET ADDED



**LEGEND**

|   |  |
|---|--|
|  | NCDOT PROPERTY AVAILABLE FOR USE BY CONTRACTOR |
|  | PROPERTY LINE                                  |
|  | NSR R/W  |

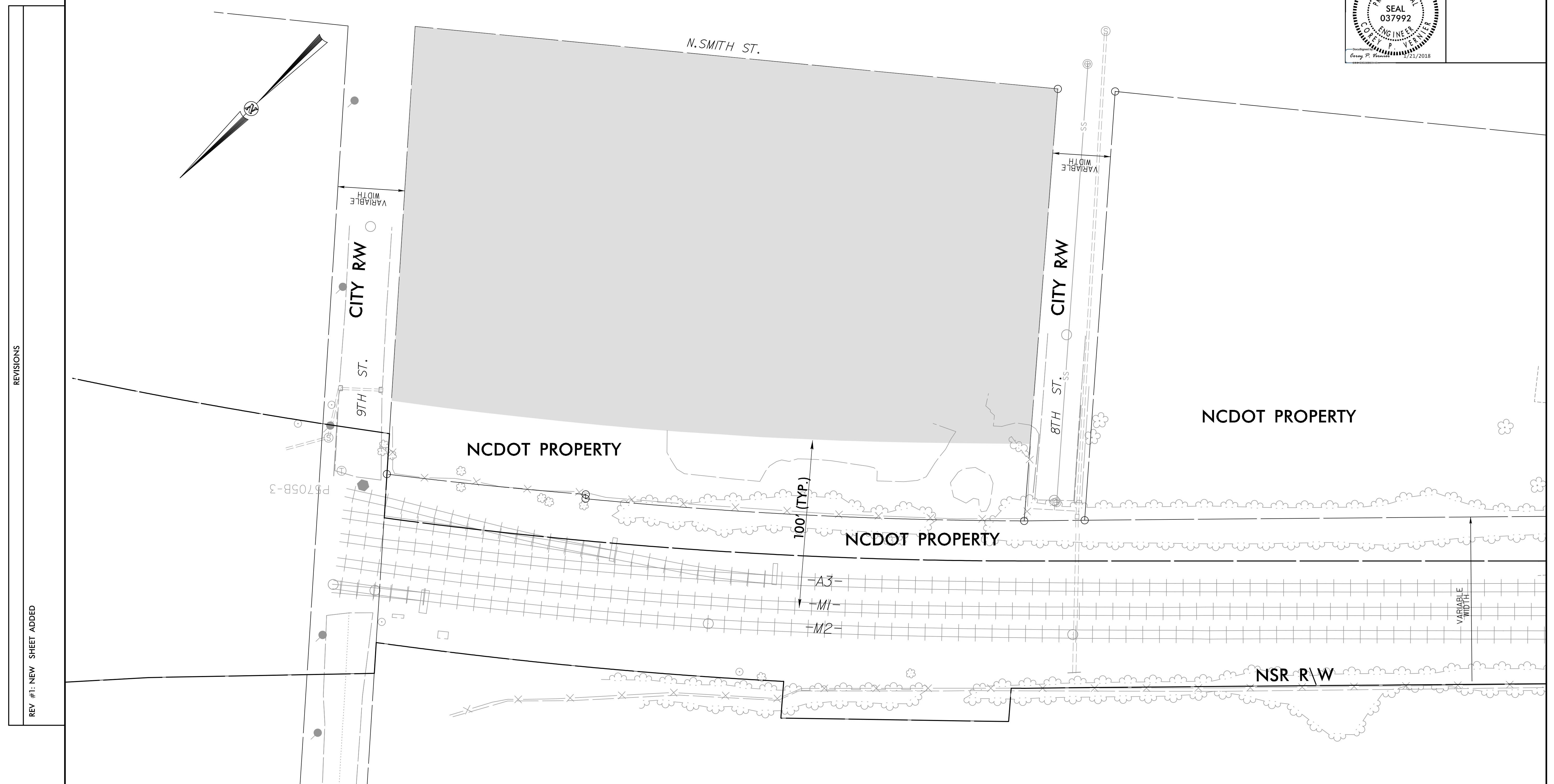
**PROPERTY EXHIBIT #1**  
 NCDOT CONTRACT: RD-18002  
 NCDOT PROPERTY AVAILABLE FOR USE BY CONTRACTOR  
 JANUARY 19, 2018



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DATE: JANUARY 19, 2018

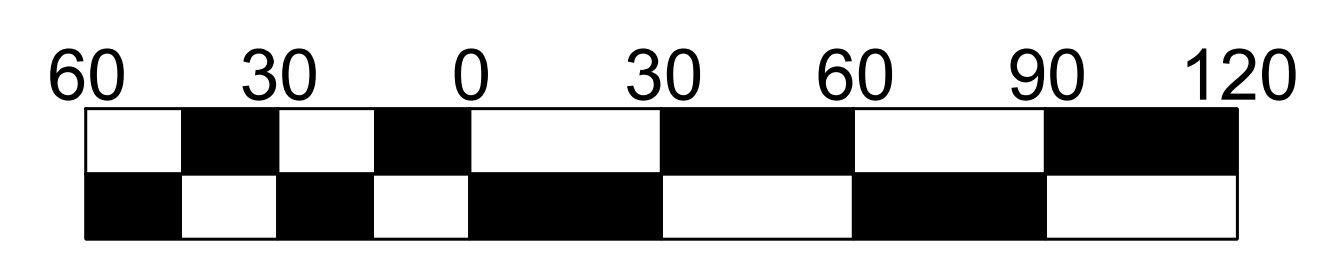
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|-----------------------------------|--------------------|
| PROJECT REFERENCE NO.<br>P-5705BA | SHEET NO.<br>2A    |
| R/W SHEET NO.                     |                    |
| RAILROAD DESIGN ENGINEER          | HYDRAULIC ENGINEER |
|                                   |                    |



REVISIONS

REV #1: NEW SHEET ADDED


**HORIZONTAL SCALE (1"=30')**



**LEGEND**

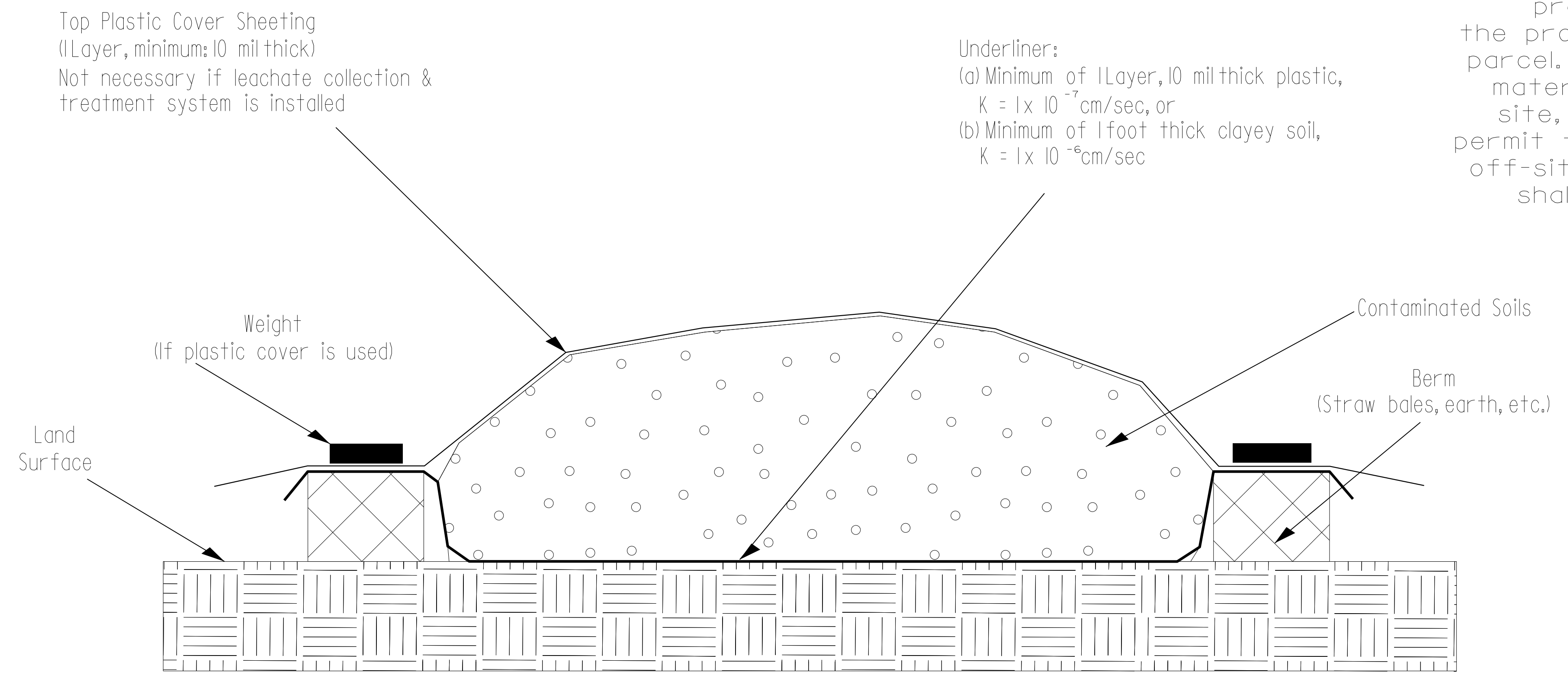
- NCDOT PROPERTY AVAILABLE FOR USE BY CONTRACTOR
- PROPERTY LINE
- NSR R/W

**PROPERTY EXHIBIT #2**  
**NCDOT CONTRACT: RD-18002**  
**NCDOT PROPERTY AVAILABLE**  
**FOR USE BY CONTRACTOR**  
**JANUARY 19, 2018**

|   |               |                      |
|---|---------------|----------------------|
| <b>PROJECT REFERENCE NO.</b><br>P-5705BA  |               | <b>SHEET</b><br>2H-1 |
| GEOENVIRONMENTAL ENGINEER   |               | ENGINEER             |
|  |               |                      |
| DocuSigned by:<br><i>Cyrus Parker</i> 12/22/2017                                    |               |                      |
| _____<br>SIGNATURE  | _____<br>DATE | _____<br>SIGNATURE   |

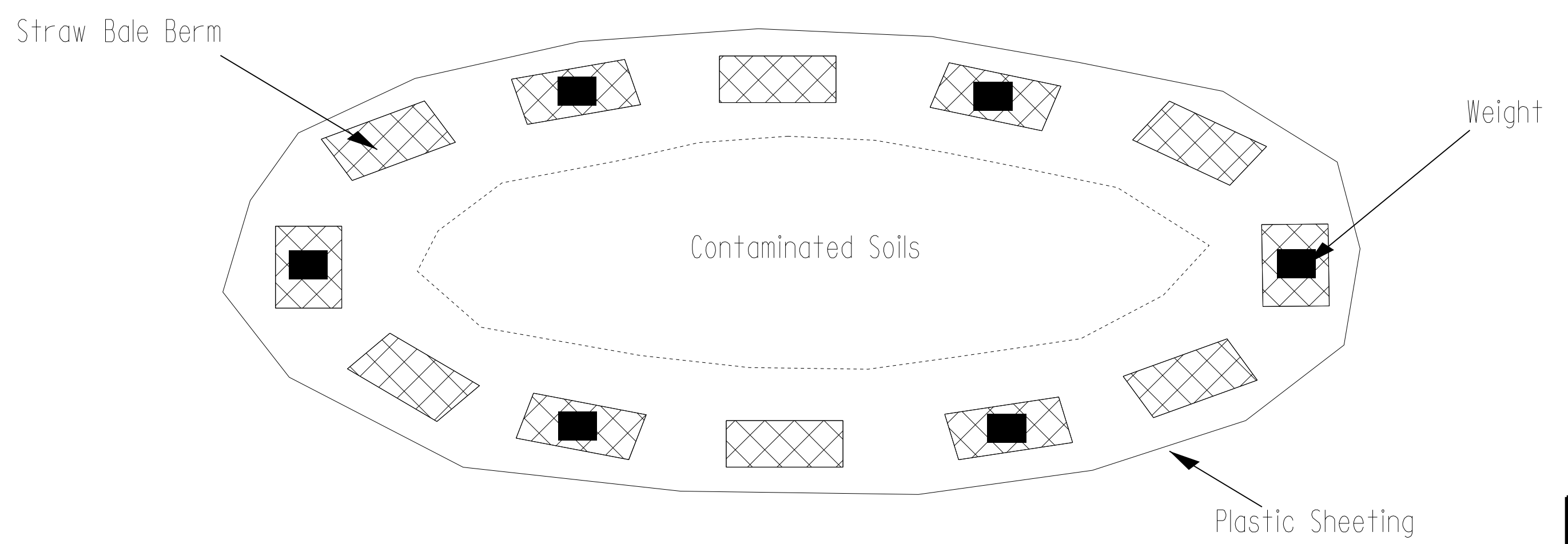
## Detail for Temporary Containment of Contaminated Soil

### Cross-Section View



**NOTE:**  
The Contractor shall stockpile all contaminated soil excavated from a property in a location within the property boundaries of the source parcel. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDEQ UST Section for off-site temporary storage. Stockpile shall be removed within 45 days.

### Map View



**GEOTECHNICAL ENGINEERING UNIT**

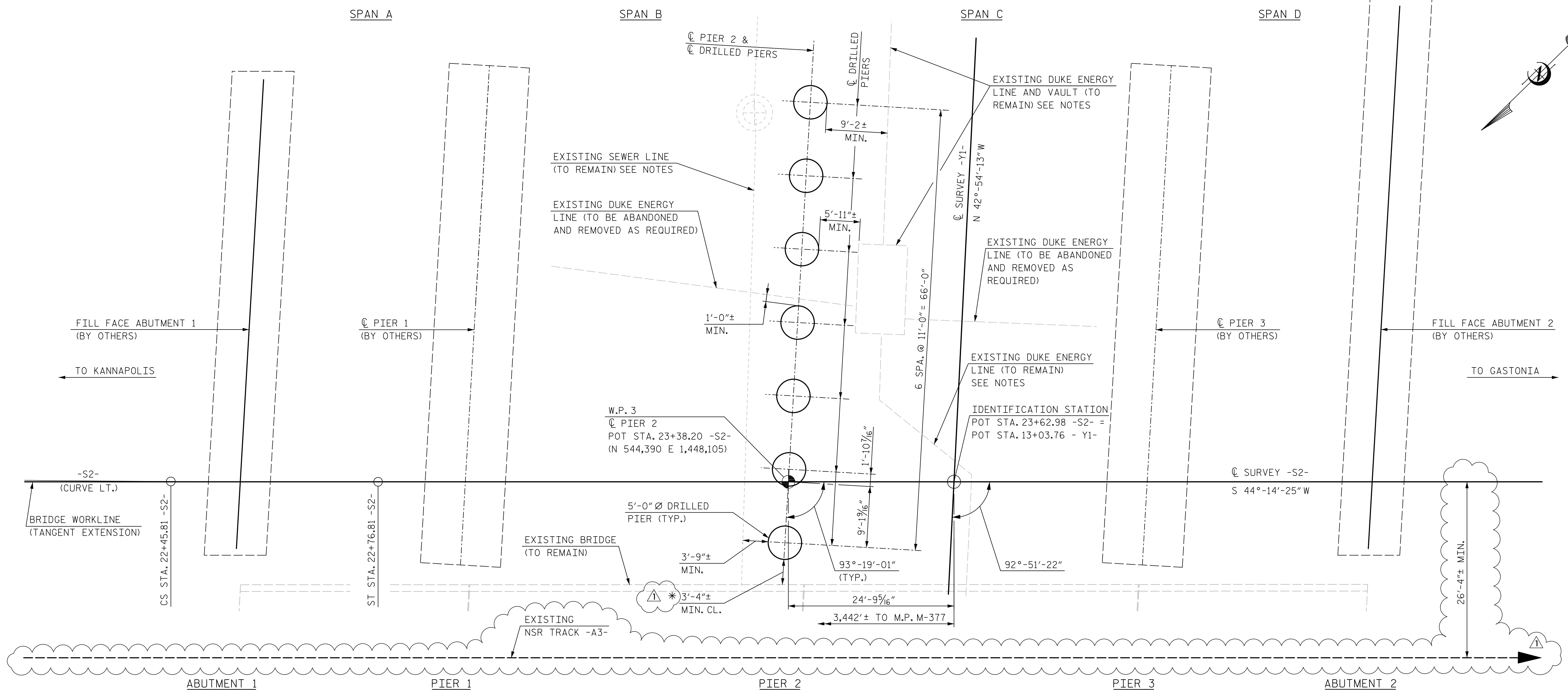
EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

**STATE OF NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**RALEIGH**

### STOCKPILE CONTAINMENT DETAIL

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

|                |         |
|----------------|---------|
| PREPARED BY: _ | DATE: _ |
| REVIEWED BY: _ | DATE: _ |



**FOUNDATION LAYOUT**

**FOUNDATION NOTES:**

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 540 TONS PER DRILLED PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP BEARING OF 20 TSF.

INSTALL DRILLED PIERS TO A TIP ELEVATION NO HIGHER THAN 653 FT. (1), 648 FT. (2), 649.5 FT. (3), 652 FT. (4), 656.5 FT. (5), 657 FT. (6), AND 641.5 FT (7), SATISFY THE REQUIRED TIP BEARING AND HAVE A PENETRATION OF AT LEAST 20 FT INTO WEATHERED ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS. DRILLED PIERS ARE NUMBERED LEFT TO RIGHT LOOKING AHEAD STATION.

PERMANENT (SEGMENTAL OR CONTINUOUS) STEEL CASING IS REQUIRED AT DRILLED PIER NO. 7. INSTALL CASING TO ELEV. 670 FT. TELESCOPING CASING WILL NOT BE ALLOWED.

FOR DRILLED PIERS NOS. 1 THROUGH 6, INSTALL A TEMPORARY CASING A MINIMUM OF 20 FT BELOW DRILLING GRADE PRIOR TO BEGINNING SLURRY EXCAVATION.

SPT ARE REQUIRED FOR DRILLED PIERS. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

POLYMER SLURRY CONSTRUCTION IS REQUIRED FOR DRILLED PIERS.

THE DRILLED PIER CONTRACTOR IS REQUIRED TO HAVE A TECHNICALLY COMPETENT REPRESENTATIVE PRESENT DURING CONSTRUCTION OF DRILLED PIER NO. 7 OR AS DIRECTED BY THE ENGINEER.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES AND TESTING ARE REQUIRED FOR DRILLED PIERS. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

THERMAL INTEGRITY PROFILING IS REQUIRED FOR DRILLED PIERS. FOR THERMAL INTEGRITY PROFILING, SEE GEOTECHNICAL SPECIAL PROVISION.

THE CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES WITHIN THE VICINITY OF PIER CONSTRUCTION AND NOTIFY THE ENGINEER OF ANY CONFLICTS PRIOR TO CONSTRUCTION.

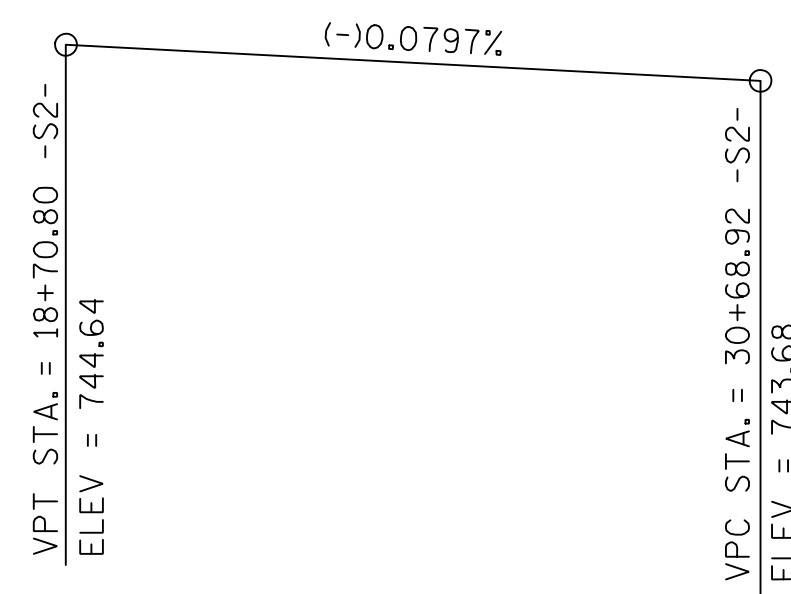
ALL DIMENSIONS ARE PARALLEL OR NORMAL TO C PIER.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE "SUBSTRUCTURE: PIER 2" SHEETS.

FOR ABUTMENT 1, PIER 1, PIER 3, AND ABUTMENT 2, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

**-S2- TRACK CURVE DATA**

PIs STA. 22+56.14  
Δs = 0° 15' 30.0" (L.T.)  
Ls = 31.00'  
LT = 20.67'  
ST = 10.33'



**GRADE DATA -S2-**

\* CLEARANCE DIMENSIONS SHOWN TO THE EXISTING BRIDGE ARE BASED ON THE MINIMUM OF THE CLEARANCE TO THE EXISTING SUPERSTRUCTURE OR CLEARANCE TO THE EXISTING SUBSTRUCTURE.

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
STATION: POT STA. 23+62.98 -S2-

MILE POST: NS 377.64  
SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
FOUNDATION LAYOUT  
AND  
FOUNDATION NOTES

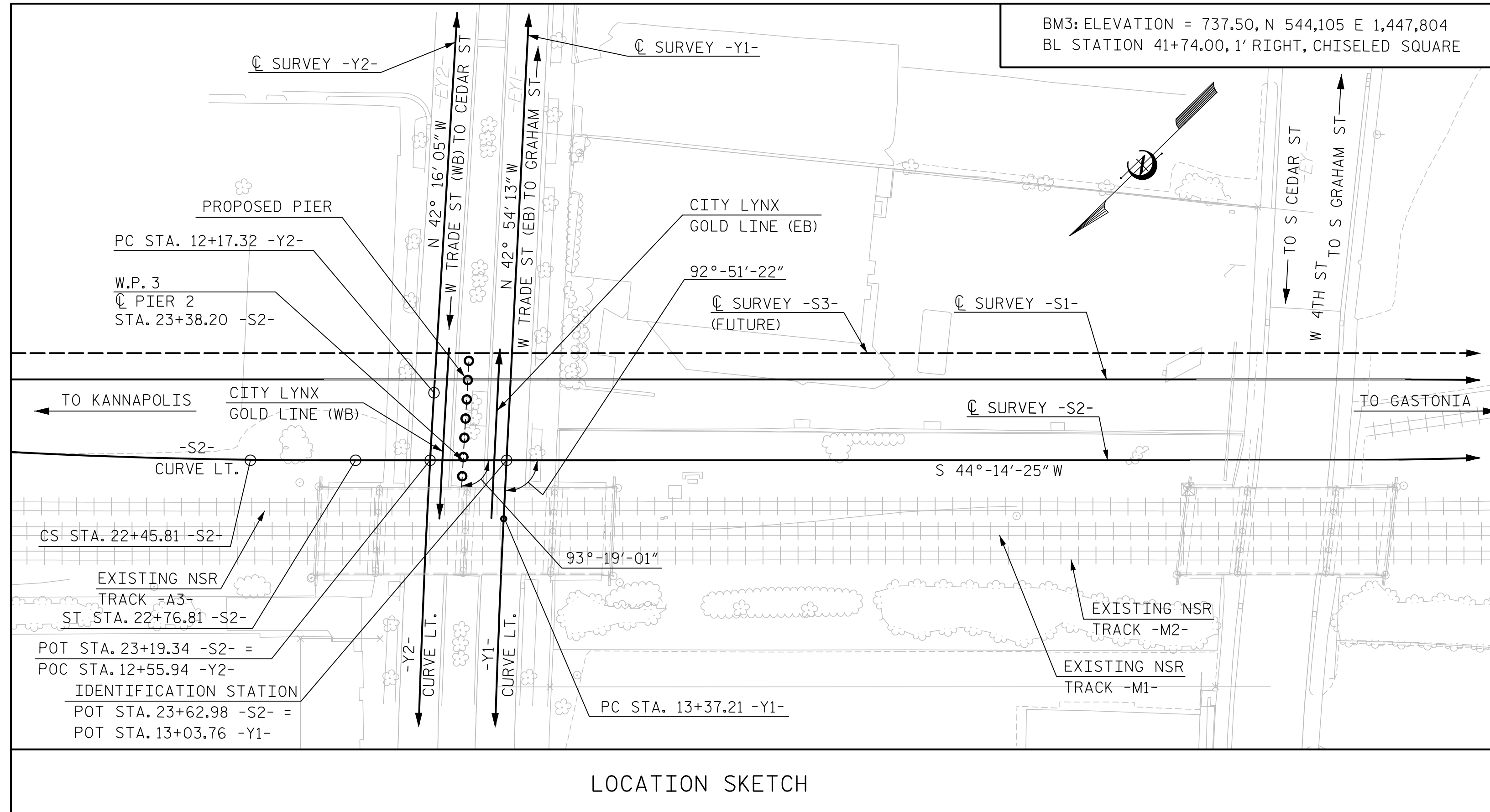


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|                            |                    |  |  |
|----------------------------|--------------------|--|--|
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| DRAWN BY: <u>B. VAUGHN</u> | DATE: <u>9/17</u>  | DWG. NO. <u>1</u>  |  |
| CHECKED BY: <u>L. RAPP</u> | DATE: <u>10/17</u> |  |  |

| REVISIONS |     |            |     |    |      |
|-----------|-----|------------|-----|----|------|
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| 1         | JRR | 01/19/2018 | 3   |    |      |
| 2         |     |            | 4   |    |      |

|              |     |
|--------------|-----|
| SHEET NO.    | S-1 |
| TOTAL SHEETS | 6   |



| TOTAL BILL OF MATERIAL |                                  |                                      |  |                 |             |                            |             |                   |                   |                                 |               |                       |
|------------------------|----------------------------------|--------------------------------------|--|-----------------|-------------|----------------------------|-------------|-------------------|-------------------|---------------------------------|---------------|-----------------------|
|                        | 5'-0" DIA. DRILLED PIERS IN SOIL | 5'-0" DIA. DRILLED PIERS NOT IN SOIL | PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER | SID INSPECTIONS | SPT TESTING | THERMAL INTEGRITY PROFILER | CSL TESTING | CLASS AA CONCRETE | REINFORCING STEEL | SPIRAL COLUMN REINFORCING STEEL | WATERPROOFING | METHOD B DAMPPROOFING |
|                        | L.F.                             | L.F.                                 | L.F.   | EACH            | EACH        | EACH                       | EACH        | CU. YARDS         | LBS.              | LBS.                            | SQ. YARDS     | SQ. YARDS             |
| *PIER 2                | 356.3                            | 111                                  | 47.8   | 7               | 14          | 7                          | 7           | 48.1              | 87,124            | 35,250                          | 27.5          | 28.4                  |
| TOTAL                  | 356.3                            | 111                                  | 47.8   | 7               | 14          | 7                          | 7           | 48.1              | 87,124            | 35,250                          | 27.5          | 28.4                  |

\*PIER 2 QUANTITIES ARE FOR COLUMNS AND DRILLED PIERS ONLY. FOR CAP AND PLATFORM GIRDER STEM WALL QUANTITIES, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
STATION: POT STA. 23+62.98 -S2-

MILE POST: NS 377.64  
SHEET 2 OF 3



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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
LOCATION SKETCH AND  
TOTAL BILL OF MATERIAL

|   |           |     |            |     |    |                                       |      |
|---|-----------|-----|------------|-----|----|---------------------------------------|------|
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|   | NO.       | BY  | DATE       | NO. | BY |                                       | DATE |
|   | 1         | JRR | 01/19/2018 | 3   |    |                                       |      |
|   |           |     | 4          |     |    |                                       |      |

GENERAL NOTES:

ASSUMED LIVE LOAD = AREMA E80 OR ALTERNATE LIVE LOAD

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

THIS PIER HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND "NORFOLK SOUTHERN GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES, UNDERPASS GRADE SEPARATION DESIGN CRITERIA".

THIS PIER HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING VOL. 2, CHP. 9, SEISMIC DESIGN FOR RAILWAY".

REINFORCING STEEL SHALL BE ASTM DESIGNATION A615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED. FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", A.C.I. 315-80.

DAMPPROOFING: PIER COLUMNS UP TO GROUND LINE SHALL BE DAMPPROOFED WITH METHOD "B" DAMPPROOFING.

WATERPROOFING IS REQUIRED ALONG FULL CIRCUMFERENCE OF EACH BOTTOM OF COLUMN TO TOP OF DRILLED PIER INTERFACE.

WATERPROOFING SHALL BE 24" WIDE AND SHALL BE CENTERED OVER JOINTS OR CRACKS.

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 BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2018, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS.

ALL CONCRETE SHALL BE 4,500 PSI CLASS AA CONCRETE WITH NO. 57 OR 67 COARSE AGGREGATE AND SHALL BE AIR-ENTRAINED. MINIMUM CEMENT CONTENT PER CUBIC YARD OF CONCRETE SHALL BE 6.5 BAGS. NO SUBSTITUTION OF FLYASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. CHAMFER ALL EXPOSED EDGES AND CORNERS 3/4" EXCEPT AS NOTED. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THIS STRUCTURE.

CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED SATISFACTORY TO THE ENGINEER AND COMPLIANT WITH THE DESIGN STANDARDS OF NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY, AS A SUBMITTAL THROUGH THE ENGINEER, AT LEAST TWO WEEKS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.

FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.

FOR FINE AND COARSE AGGREGATE, SEE SPECIAL PROVISIONS.

FOR BACKFILL AROUND THE STRUCTURE, SEE SPECIAL PROVISION "BACKFILLING AROUND STRUCTURES".

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.



INDEX OF DRAWINGS

- 1 GENERAL DRAWING: FOUNDATION LAYOUT AND FOUNDATION NOTES (SHEET 1 OF 3)
- 2 GENERAL DRAWING: LOCATION SKETCH AND TOTAL BILL OF MATERIAL (SHEET 2 OF 3)
- 3 GENERAL DRAWING: GENERAL NOTES (SHEET 3 OF 3)
- 4 SUBSTRUCTURE: PIER 2 (SHEET 1 OF 3)
- 5 SUBSTRUCTURE: PIER 2 (SHEET 2 OF 3)
- 6 SUBSTRUCTURE: PIER 2 (SHEET 3 OF 3)

FOR PIER 2 CAP AND PLATFORM GIRDER STEM WALL, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

FOR ABUTMENT 1, PIER 1, PIER 3, AND ABUTMENT 2 SHEETS, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

FOR TRACK 1 SUPERSTRUCTURE SHEETS, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

FOR TRACK 2 SUPERSTRUCTURE SHEETS, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

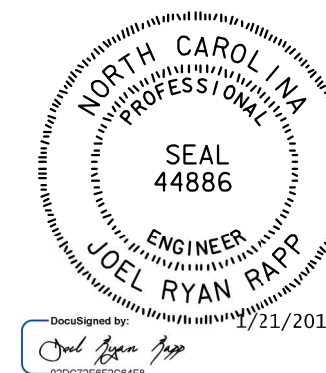
PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
STATION: POT STA. 23+62.98 -S2-

MILE POST: NS 377.64  
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

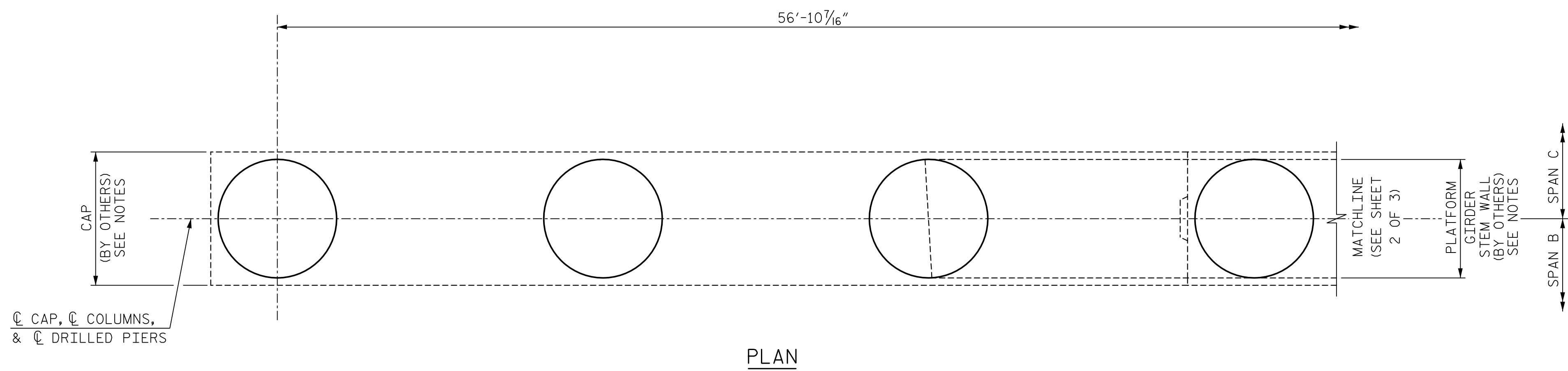
GENERAL DRAWING

GENERAL NOTES



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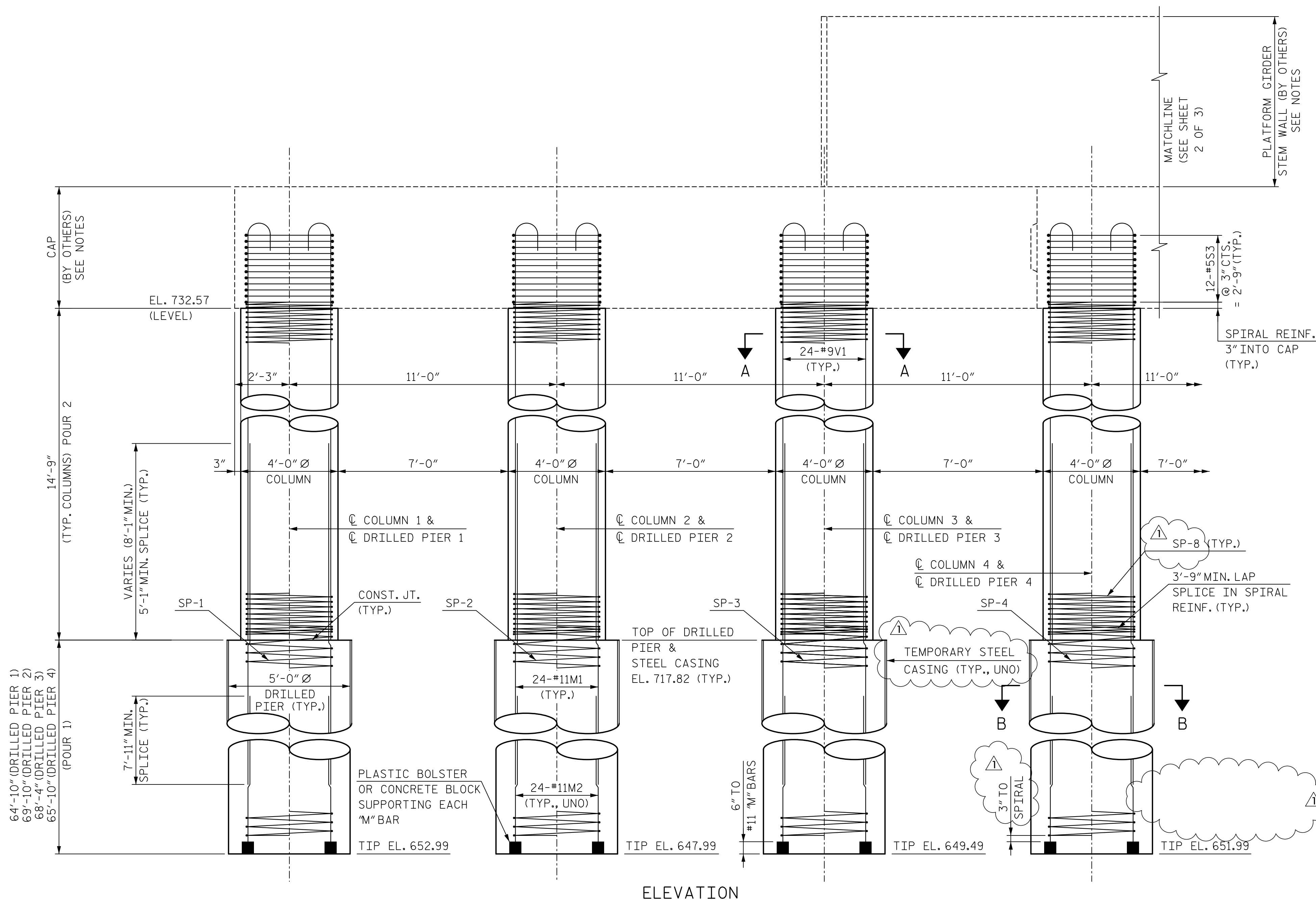
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|  | NO.        | BY  | DATE       | NO. | BY | DATE |   |
|  | 1          | JRR | 01/19/2018 | 3   |    |      |   |
| DRAWN BY <u>B. VAUGHN</u> DATE <u>9/17</u><br>CHECKED BY <u>L. RAPP</u> DATE <u>10/17</u>                  | DWG. NO. 3 |     | 4          |     |    |      |   |



PLAN

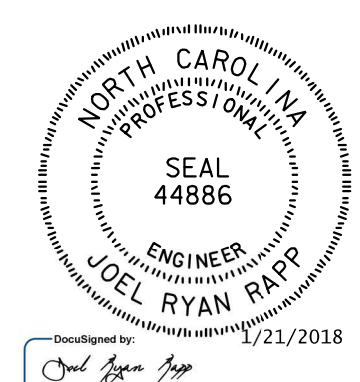
NOTES:

ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C PIER UNLESS NOTED.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.  
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".  
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FT. OF EXTRA LENGTH.  
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1'-0" BELOW THE GROUND LINE.  
 FOR CAP AND PLATFORM GIRDER STEM WALL, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).



ELEVATION

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
 STATION: POT STA. 23+62.98 -S2-  
 MILE POST: NS 377.64  
 SHEET 1 OF 3

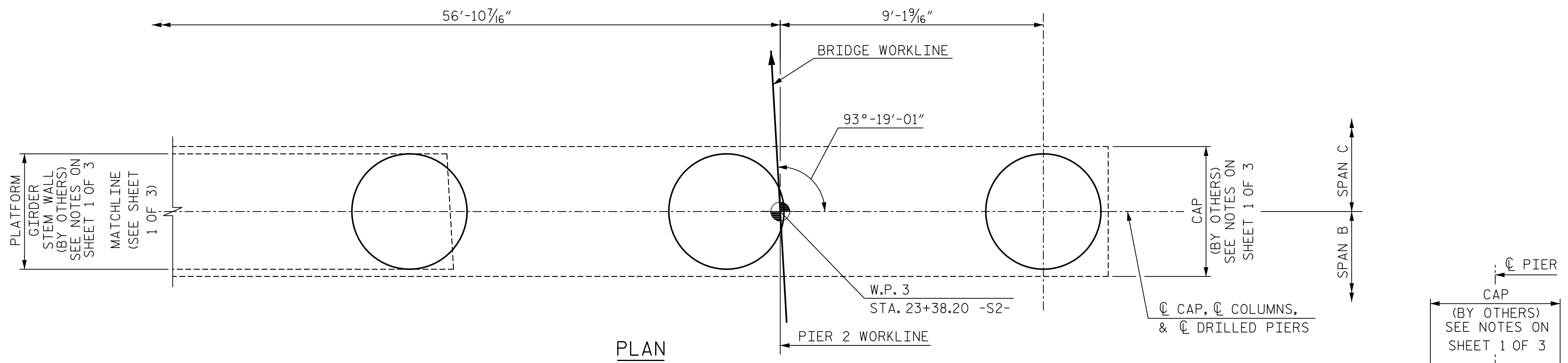


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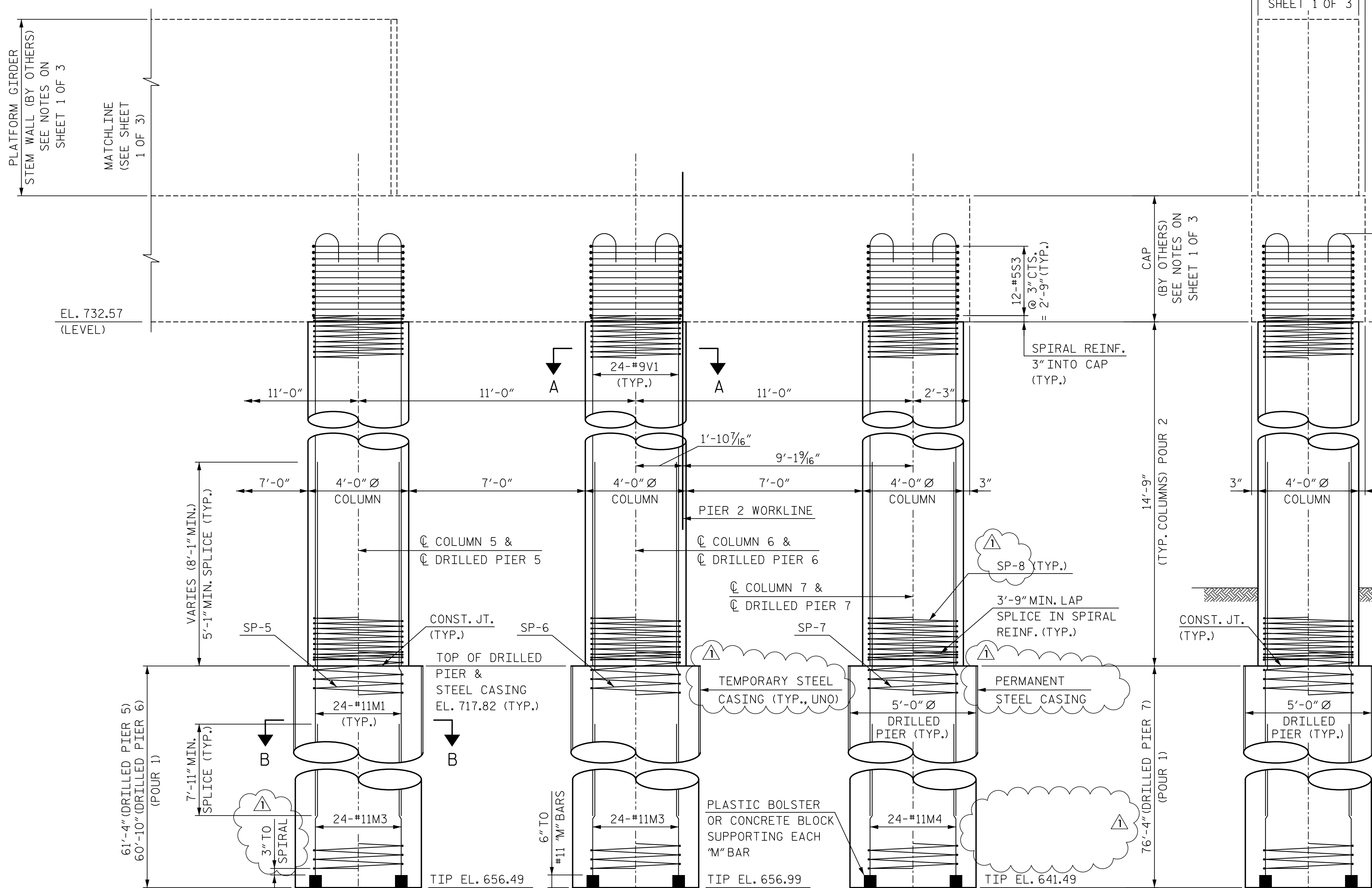
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 PIER 2

|   |            |     |            |     |    |                   |      |
|---|------------|-----|------------|-----|----|-------------------|------|
| <b>HNTB</b><br>HNTB NORTH CAROLINA, P.C.<br>NC License No. C-1554<br>343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | REVISIONS  |     |            |     |    | SHEET NO.<br>S-4  |      |
|   | NO.        | BY  | DATE       | NO. | BY |                   | DATE |
|   | 1          | JRR | 01/19/2018 | 3   |    |                   |      |
| DRAWN BY: <u>L. JEFFERS</u> DATE: <u>9/17</u><br>CHECKED BY: <u>L. RAPP</u> DATE: <u>10/17</u>                            | DWG. NO. 4 |     | 2          | 4   |    | TOTAL SHEETS<br>6 |      |

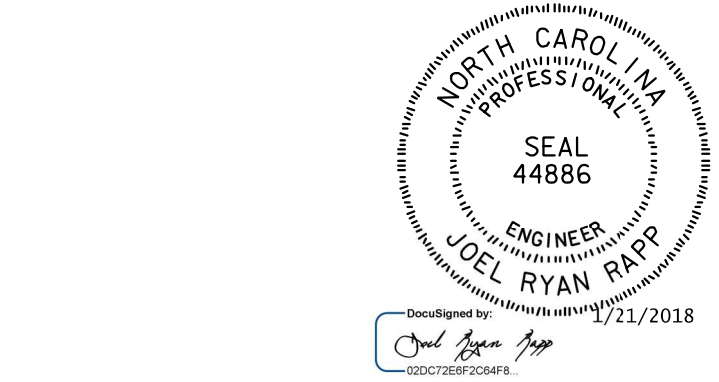


PLAN



ELEVATION

END ELEVATION



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PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
STATION: POT STA. 23+62.98 -S2-  
MILE POST: NS 377.64  
SHEET 2 OF 3

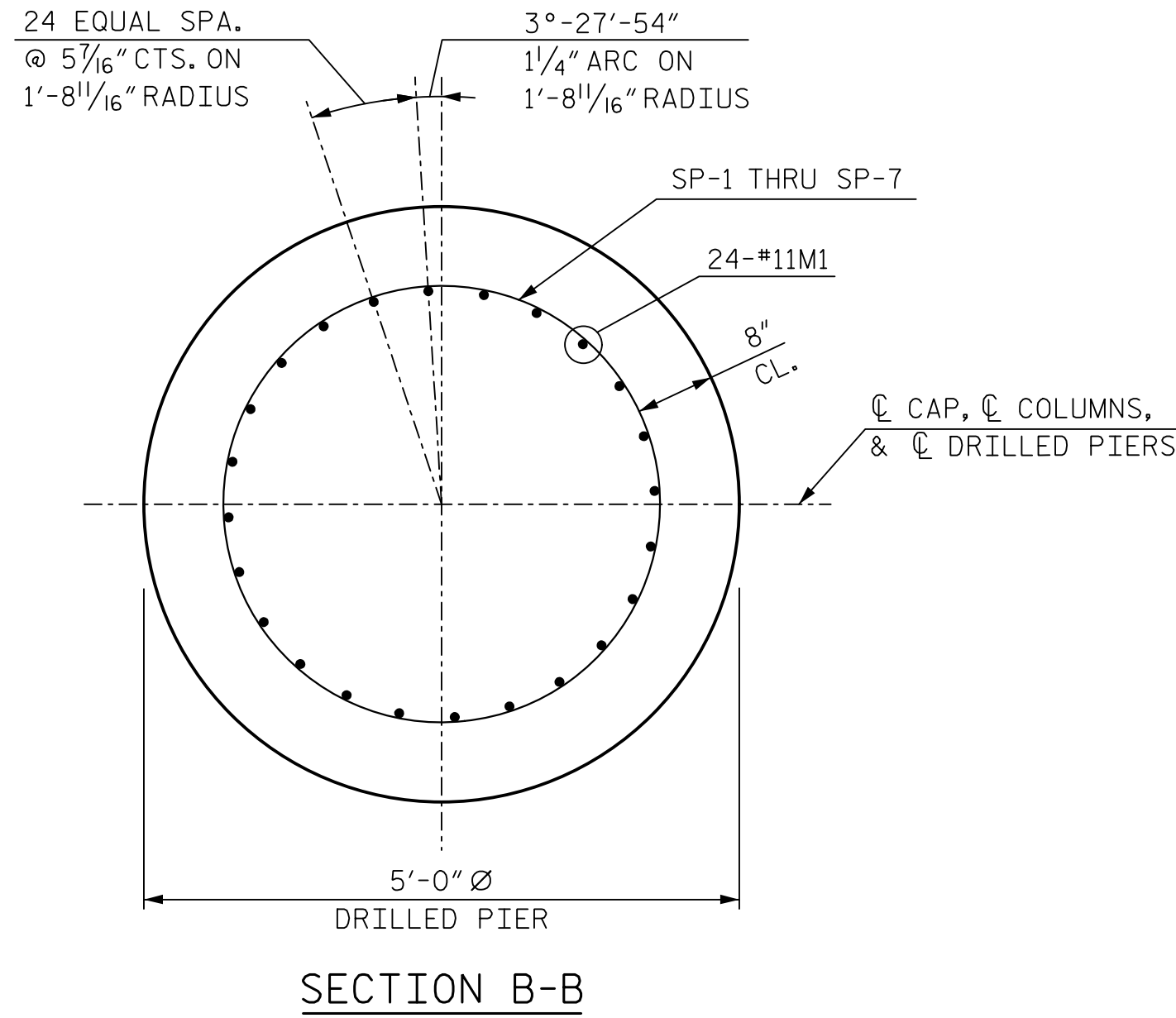
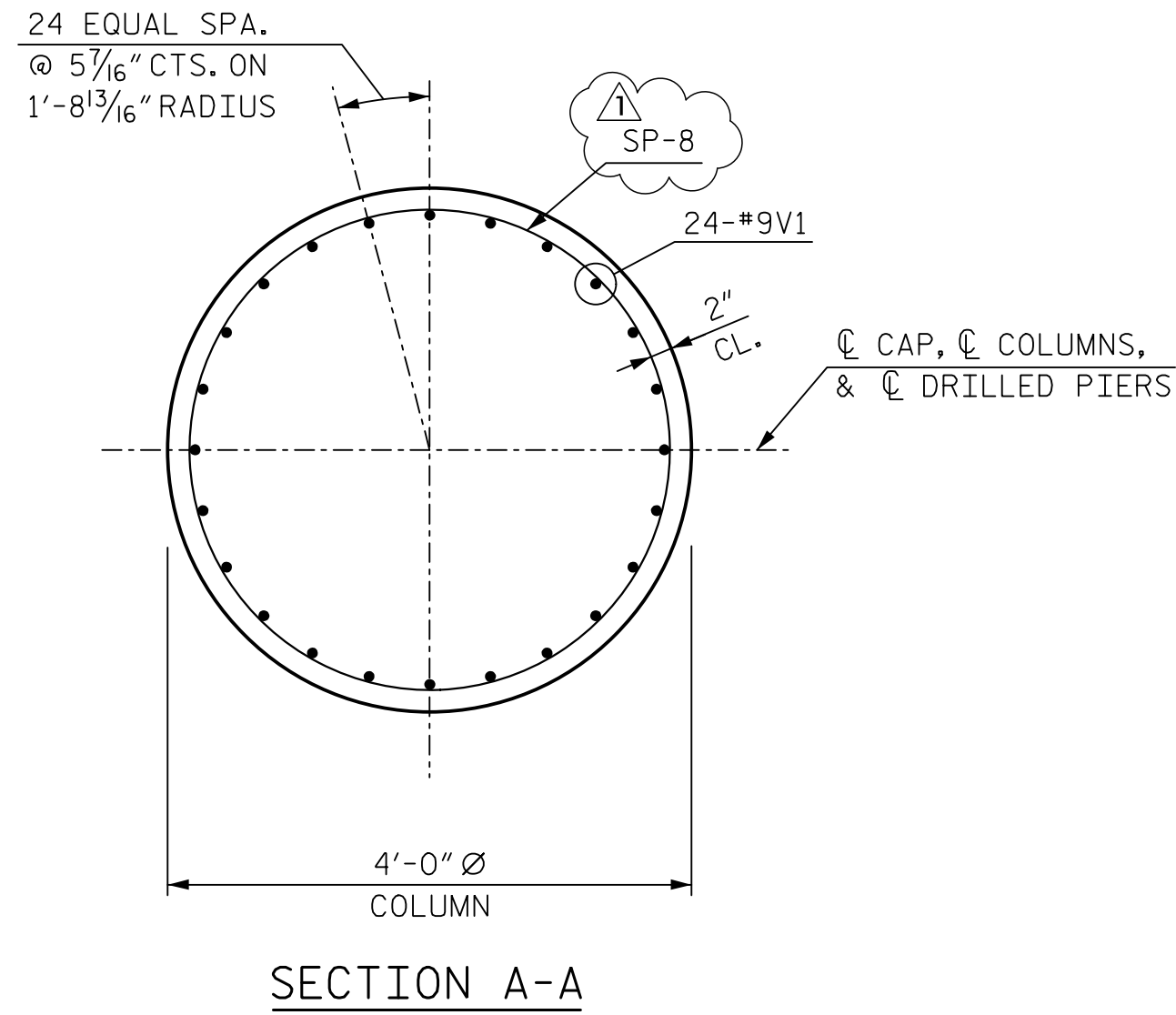
STATE OF NORTH CAROLINA  
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SUBSTRUCTURE  
PIER 2

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343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY L. JEFFERS DATE 9/17  
CHECKED BY L. RAPP DATE 10/17 DWG. NO. 5

| REVISIONS |     |            |     |    |      | SHEET NO.    |
|-----------|-----|------------|-----|----|------|--------------|
| NO.       | BY  | DATE       | NO. | BY | DATE | S-5          |
| 1         | JRR | 01/19/2018 | 3   |    |      | TOTAL SHEETS |
| 2         |     |            | 4   |    |      | 6            |



| BAR TYPES  |   |    |   | BILL OF REINFORCING   |        |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|--|---|----|---|---|--------|------|------|-----------|--------|--|--|--|--|------|-----|------|------|--------|--------|-----|----|---|---|--------|-------|----|-----|----|------|--------|--------|----|----|----|------|--------|--------|----|----|----|------|---------|-------|----|----|----|------|---------|-------|----|-----|---|---|--------|--------|------|---|----|---|-----------|-------|------|---|----|---|-----------|-------|------|---|----|---|-----------|-------|------|---|----|---|-----------|-------|------|---|----|---|------------|-------|------|---|----|---|-----------|-------|------|---|----|---|-----------|-------|------|---|----|---|---------|-------|
|  |   |    |   | PIER 2  |        |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | MARK  | NO.    | SIZE | TYPE | LENGTH    | WEIGHT |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="6" style="text-align: center;">PIER 2</td> </tr> <tr> <td>MARK</td> <td>NO.</td> <td>SIZE</td> <td>TYPE</td> <td>LENGTH</td> <td>WEIGHT</td> </tr> <tr> <td>*S3</td> <td>84</td> <td>5</td> <td>2</td> <td>11'-7"</td> <td>1,015</td> </tr> <tr> <td>M1</td> <td>168</td> <td>11</td> <td>STR.</td> <td>60'-0"</td> <td>53,555</td> </tr> <tr> <td>M2</td> <td>96</td> <td>11</td> <td>STR.</td> <td>25'-4"</td> <td>12,921</td> </tr> <tr> <td>M3</td> <td>48</td> <td>11</td> <td>STR.</td> <td>16'-10"</td> <td>4,293</td> </tr> <tr> <td>M4</td> <td>24</td> <td>11</td> <td>STR.</td> <td>31'-10"</td> <td>4,059</td> </tr> <tr> <td>V1</td> <td>168</td> <td>9</td> <td>1</td> <td>19'-9"</td> <td>11,281</td> </tr> <tr> <td>SP-1</td> <td>2</td> <td>**</td> <td>3</td> <td>2,000'-6"</td> <td>4,173</td> </tr> <tr> <td>SP-2</td> <td>2</td> <td>**</td> <td>3</td> <td>2,154'-2"</td> <td>4,494</td> </tr> <tr> <td>SP-3</td> <td>2</td> <td>**</td> <td>3</td> <td>2,108'-1"</td> <td>4,397</td> </tr> <tr> <td>SP-4</td> <td>2</td> <td>**</td> <td>3</td> <td>2,031'-3"</td> <td>4,237</td> </tr> <tr> <td>SP-5</td> <td>2</td> <td>**</td> <td>3</td> <td>1,892'-11"</td> <td>3,949</td> </tr> <tr> <td>SP-6</td> <td>2</td> <td>**</td> <td>3</td> <td>1,877'-6"</td> <td>3,916</td> </tr> <tr> <td>SP-7</td> <td>2</td> <td>**</td> <td>3</td> <td>2,354'-1"</td> <td>4,911</td> </tr> <tr> <td>SP-8</td> <td>7</td> <td>**</td> <td>3</td> <td>708'-6"</td> <td>5,173</td> </tr> </table> |        |      |      | PIER 2    |        |  |  |  |  | MARK | NO. | SIZE | TYPE | LENGTH | WEIGHT | *S3 | 84 | 5 | 2 | 11'-7" | 1,015 | M1 | 168 | 11 | STR. | 60'-0" | 53,555 | M2 | 96 | 11 | STR. | 25'-4" | 12,921 | M3 | 48 | 11 | STR. | 16'-10" | 4,293 | M4 | 24 | 11 | STR. | 31'-10" | 4,059 | V1 | 168 | 9 | 1 | 19'-9" | 11,281 | SP-1 | 2 | ** | 3 | 2,000'-6" | 4,173 | SP-2 | 2 | ** | 3 | 2,154'-2" | 4,494 | SP-3 | 2 | ** | 3 | 2,108'-1" | 4,397 | SP-4 | 2 | ** | 3 | 2,031'-3" | 4,237 | SP-5 | 2 | ** | 3 | 1,892'-11" | 3,949 | SP-6 | 2 | ** | 3 | 1,877'-6" | 3,916 | SP-7 | 2 | ** | 3 | 2,354'-1" | 4,911 | SP-8 | 7 | ** | 3 | 708'-6" | 5,173 |
|  |   |    |   | PIER 2  |        |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | MARK  | NO.    | SIZE | TYPE | LENGTH    | WEIGHT |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | *S3   | 84     | 5    | 2    | 11'-7"    | 1,015  |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | M1  | 168    | 11   | STR. | 60'-0"    | 53,555 |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | M2  | 96     | 11   | STR. | 25'-4"    | 12,921 |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | M3  | 48     | 11   | STR. | 16'-10"   | 4,293  |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | M4  | 24     | 11   | STR. | 31'-10"   | 4,059  |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | V1  | 168    | 9    | 1    | 19'-9"    | 11,281 |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
|  |   |    |   | SP-1  | 2      | **   | 3    | 2,000'-6" | 4,173  |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SP-2   | 2 | ** | 3 | 2,154'-2"   | 4,494  |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SP-3   | 2 | ** | 3 | 2,108'-1"   | 4,397  |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SP-4   | 2 | ** | 3 | 2,031'-3"   | 4,237  |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SP-5   | 2 | ** | 3 | 1,892'-11"  | 3,949  |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SP-6   | 2 | ** | 3 | 1,877'-6"   | 3,916  |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SP-7   | 2 | ** | 3 | 2,354'-1"   | 4,911  |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SP-8   | 7 | ** | 3 | 708'-6"   | 5,173  |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| QUANTITIES   |   |    |   |   |        |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| ITEM   |   |    |   | TOTAL   |        |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| REINFORCING STEEL                                  |   |    |   | LBS   | 87,124 |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SPIRAL COLUMN REINFORCING STEEL                    |   |    |   | LBS   | 35,250 |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| CLASS AA CONCRETE:                                 |   |    |   |   |        |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| POUR 2   |   |    |   | C.Y.  | 48.1   |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| TOTAL  |   |    |   | C.Y.  | 48.1   |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| 5'-0" DIA. DRILLED PIERS                           |   |    |   | NO.   | 7      |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| DRILLED PIER IN SOIL                               |   |    |   | L.F.  | 356.3  |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| DRILLED PIER NOT IN SOIL                           |   |    |   | L.F.  | 111    |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| DRILLED PIER CONCRETE POUR 1                       |   |    |   | C.Y.  | 339.9  |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER |   |    |   | L.F.  | 47.8   |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SID INSPECTIONS                                    |   |    |   | EACH  | 7      |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| SPT TESTING  |   |    |   | EACH  | 14     |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| CSL TESTING  |   |    |   | EACH  | 7      |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |
| THERMAL INTEGRITY PROFILER                         |   |    |   | EACH  | 7      |      |      |           |        |  |  |  |  |      |     |      |      |        |        |     |    |   |   |        |       |    |     |    |      |        |        |    |    |    |      |        |        |    |    |    |      |         |       |    |    |    |      |         |       |    |     |   |   |        |        |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |            |       |      |   |    |   |           |       |      |   |    |   |           |       |      |   |    |   |         |       |

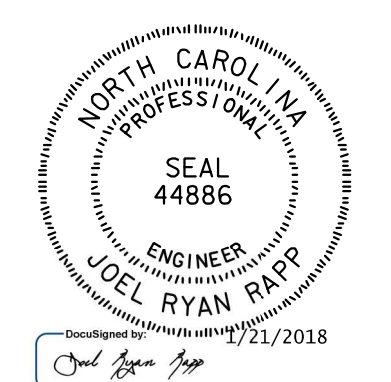
ALL BAR DIMENSIONS ARE OUT TO OUT

\* #5S3 CIRCULAR TIES SHALL BE ASTM DESIGNATION A706, GRADE 60. FABRICATION TO BE IN ACCORDANCE WITH THE 'MANUAL OF STANDARD PRACTICE', A.C.I. 315.80.

▲ \*\* THE SP-1 THRU SP-7 SPIRAL REINFORCING STEEL SHALL BE BUNDLED #5 PLAIN OR DEFORMED BAR.

\*\*\* THE SP-8 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

PROJECT NO. P-5705BA  
MECKLENBURG COUNTY  
 STATION: POT STA. 23+62.98 -S2-  
 MILE POST: NS 377.64  
 SHEET 3 OF 3



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 PIER 2

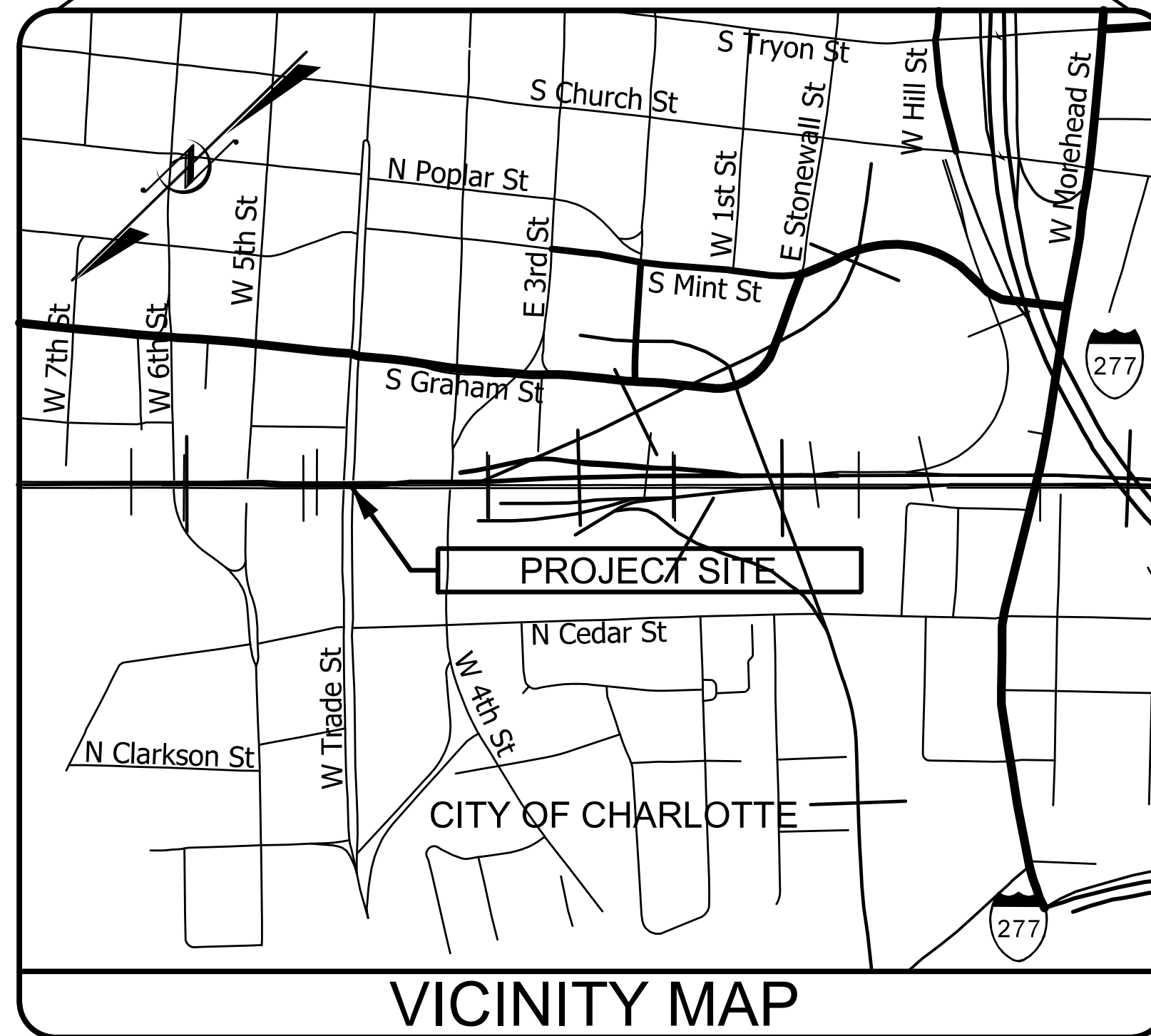
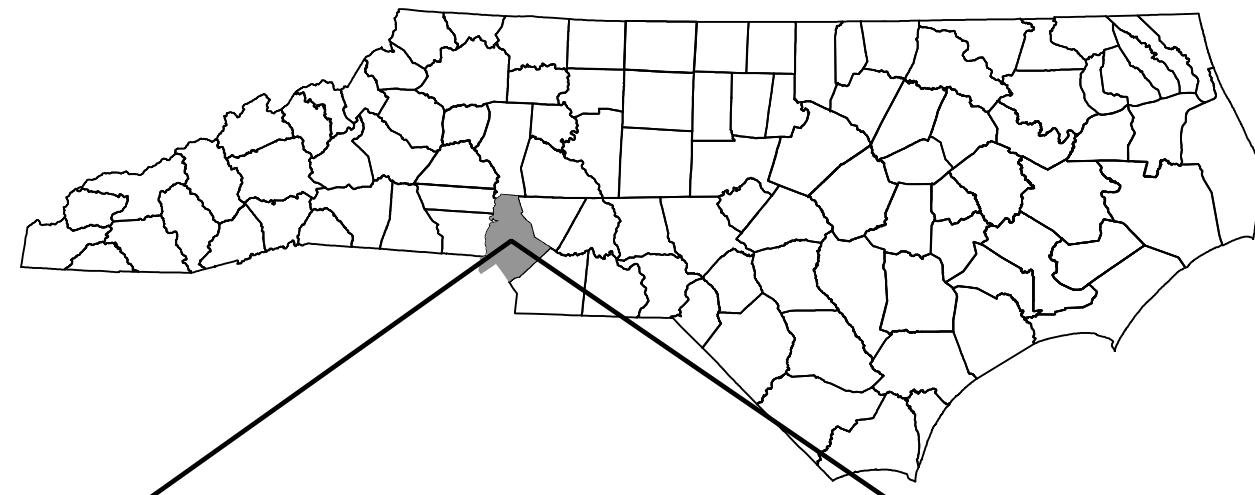
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| <b>HNTB</b> HNTB NORTH CAROLINA, P.C.<br>NC License No. C-1554<br>343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 |  | REVISIONS |     |            |     | SHEET NO.<br>S-6  |
|  |  | NO.       | BY  | DATE       | NO. |                   |
| DRAWN BY <u>J. JEFFERS</u> DATE <u>9/17</u>  |  | 1         | JRR | 01/19/2018 | 3   |                   |
| CHECKED BY <u>L. RAPP</u> DATE <u>10/17</u>  |  | 2         |     |            | 4   |                   |
| DWG. NO. 6   |  |           |     |            |     | TOTAL SHEETS<br>6 |



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

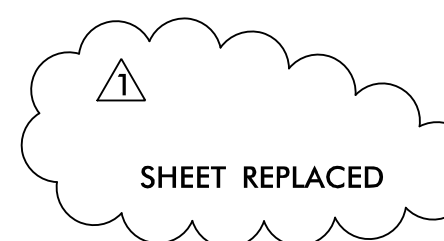
**MECKLENBURG COUNTY**



VICINITY MAP

**LOCATION: CHARLOTTE GATEWAY STATION - TRACK, STRUCTURE AND SIGNALS**  
**TYPE OF WORK: DRAINAGE, PAVING, GRADING, STRUCTURE**

NCDOT CONTACT: MATTHEW SIMMONS, P.E.  
NCDOT PROJECT MANAGER



**INDEX OF SHEETS**

| <u>SHEET NO.</u> | <u>TITLE</u>   |
|------------------|--|
| TMP-1            | TITLE SHEET, VICINITY MAP AND INDEX OF SHEETS                          |
| TMP-1A & 1B      | LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND AND GENERAL NOTES |
| TMP-2            | TEMPORARY TRAFFIC CONTROL DETOUR DETAIL                                |
| TMP-3            | TRADE STREET CONSTRUCTION PHASING                                      |
| TMP-4            | SIGN DESIGN  |

R. B. EARLY, P.E. TRAFFIC CONTROL PROJECT ENGINEER  
R. B. EARLY, P.E. QUALITY CONTROL ENGINEER  
J. PHILLIPS TRAFFIC CONTROL DESIGN ENGINEER

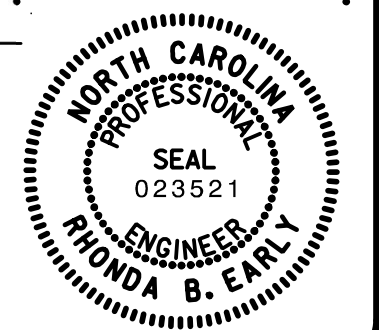
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**HNTB**

HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Ste 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

APPROVED:   
DATE: 1/22/2018

SEAL



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# CDOT - WORK AREA TRAFFIC CONTROL HANDBOOK

THE CHARLOTTE DEPARTMENT OF TRANSPORTATION - WORK AREA TRAFFIC CONTROL HANDBOOK ("WATCH") - IS APPLICABLE TO THIS PROJECT AND CONSIDERED A PART OF THESE PLANS.

## ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

| STD. NO. | TITLE   |
|----------|---|
| 1160.01  | TEMPORARY CRASH CUSHION                           |
| 1165.01  | WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION |
| 1180.01  | SKINNY-DRUM                                       |

### LEGEND

#### GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- REMOVAL
- INCIDENTAL STONE
- WEDGE / WIDEN (USING FLAGGERS)
- TEMPORARY PAVEMENT

#### TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

#### TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

## GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS, OR RESULT IN DUPLICATE, OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING OR REMOVAL OF DEVICES, AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

#### LANE CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAINS WITHIN THE CLOSED TRAVEL LANE.

#### TRAFFIC PATTERN ALTERATIONS

- C) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

#### SIGNING

- D) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.  
  
PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.
- E) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.  
  
COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.
- F) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
- G) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 500' IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

#### TRAFFIC CONTROL DEVICES

- K) WHEN LANE CLOSURES ARE NOT IN EFFECT, SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH), EXCEPT 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPENED TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES), AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.
- L) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.
- M) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES (DRUMS) PERPENDICULAR TO THE EDGE OF THE TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

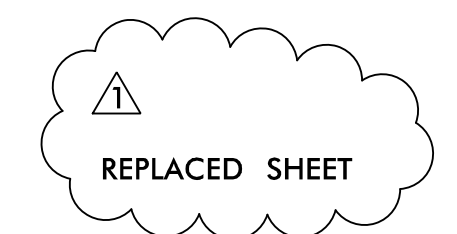
#### MISCELLANEOUS

- N) LAW ENFORCEMENT SHALL BE USED TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS AS DIRECTED BY THE ENGINEER.
- O) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAYS TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION, AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 500 FT AND 1000 FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.
- P) COORDINATE WITH ENGINEER FOR APPROPRIATE DETOUR SIGNING IN THE EVENT THAT TRADE STREET IS CLOSED FOR CONSTRUCTION ON ADJACENT PROJECT.
- Q) PRIOR TO RESURFACING, CONTRACTOR SHALL RECORD LOCATION OF EXISTING MARKINGS.
- R) THE CONTRACTOR SHALL PLACE PROPOSED MARKING IN EXISTING LOCATION UNLESS OTHERWISE NOTED IN THE PAVEMENT MARKING PLANS.

REVISIONS

REV #1: REPLACE ENTIRE SHEET TO CORRECT PLOTTING ISSUE.

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REPLACED SHEET

DATE: DECEMBER 8, 2017

THESE NOTES MUST APPEAR ON ANY TRAFFIC CONTROL PLAN

- A. Street space is at a minimum so no more space should be used for construction or maintenance work than is absolutely necessary. Through barricading and channelization, the remaining street space is to be used to carry the traffic around the work area in the best way possible under prevailing conditions.
- B. Traffic control devices shall be set up prior to the start of construction or maintenance operations, and shall be removed or relocated as the work is finished or work conditions change. The agency doing the work shall patrol the work site as required to ensure that all traffic control devices are in place and operating at all times.
- C. All traffic control signs for the work area shall be reflectorized. The reflective materials used shall be equal to or better than the Type 1, Level A reflective sheeting requirements in Section 633 of the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-74).
- D. At night, adequate barricades with reflectorized material and lights are required to call attention to and to indicate the actual location of obstructions and hazards.
- E. When not in use during work hours or construction inactivity, equipment shall be parked a minimum of 10' away from the travel lane in such a manner as to not create a sight distance problem for motorists.
- F. The minimum width for temporary travel lanes is 10'; however, a 12' lane is advisable and should be provided whenever possible.
- G. Whenever traffic must be routed across the centerline the two directions of traffic must be physically separated. Traffic cones can be effectively used for this purpose during daylight hours; reflectorized drums must be used at night.
- H. Traffic shall not be routed across centerline with cones or drums during non-working hours. Contractor must be on site or change pavement marking appropriately.
- I. Generally, the peak flow of traffic occurs in Charlotte between the hours of 7-9 a.m. and 4:30-6:30 p.m., (4-6 p.m. in the CBD) Monday through Friday. During these hours construction activity that involves a lane closure will not be allowed on thoroughfare streets except in emergency situations or with approval from the Charlotte Department of Transportation.
- J. The agency doing the work shall provide flaggers and/or Police control when required. Contractor may also be required to provide a uniformed officer to control traffic when working in and around a signalized intersection.
- K. Every attempt shall be made to schedule and expedite the work to cause the least inconvenience to the traveling public.
- L. In situations not covered in this design, the protection of the traveling public and the protection of the workers on site will dictate the measures to be taken consistent with the City of Charlotte Work Area Traffic Control Handbook (WATCH).
- M. The contractor, utility company, or governmental agency involved in the work shall notify the Charlotte Department of Transportation (Jimmy Rhyne at 704-336-3905) of the construction start date and any major work where the number of travel lanes are reduced [Continued next column]

- from normal conditions or the street is required to be closed. Except in emergencies, the following notification is required:
  - \*Construction start date - 5 working days in advance
  - \*Closing 1 or more travel lanes during Peak Travel Times - 5 working days prior to the scheduled work
  - \*Closing a street - 10 working days prior to the scheduled work.
- This lead-time is necessary for planning and notifying the public of expected changes in the normal traffic conditions.
- N. Where complete street closure is necessary, the Department of Transportation will coordinate closure of the street and, if necessary, fully sign a detour route.
- O. The City Engineer or Director of the Department of Transportation or their representatives are authorized to stop any construction or maintenance activity which is not properly signed and barricaded as required by this standard, the WATCH, and/or the MUTCD until such requirements are met.
- P. This design standard cannot be used for all roadway construction situations. It is intended only to be used as a guideline. Specific situations may require engineering judgment in the placement of traffic control devices because of limited vertical and/or horizontal sight distance.
- Q. When personnel and/or equipment are within 2' of the edge of an open travel lane, the contractor shall refer to the WATCH for proper lane closure.
- R. Operational signs are generally mounted on portable supports. These are usually used for short-term operations to warn and guide traffic. Advanced warning signs (Construction Ahead) shall be mounted on stationary supports seven days prior to the beginning of construction of the roadway.
- S. All drums shall be ballasted in such a manner that they will be stable under wind and vehicle action. Ballasting shall be done with sandbags or other yielding material situated in the base of the drums.
- T. Construction work shall not be allowed on both sides of the road simultaneously within the same area, unless the roadway is median divided.
- U. At the end of each work day the contractor shall backfill up to the edge and elevation of the existing pavement areas within 2 feet of an open travel lane that include a drop off of more than 3 inches in accordance with the WATCH (see Detail)
- V. Pavement markings are to be installed by the contractor. Pre-lines must be approved by CDOT prior to placement of the pavement markings. The contractor shall notify Jimmy Rhyne (704-336-3905) of CDOT 5 working days in advance of placing the pre-lines.
- W. Traffic Signal work is to be performed by CDOT. The contractor shall notify Jimmy Rhyne (704-336-3905) of CDOT at least 60 days in advance of needed signal work. If a traffic signal uses steel poles and/or mast arms, at least 90 days' advance notice is required.

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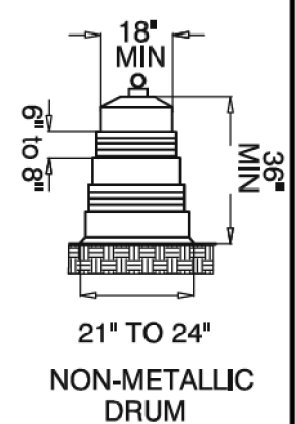
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|                                | BARRICADE WARNING LIGHTS |                          |                       |
|--------------------------------|--------------------------|--------------------------|-----------------------|
|                                | Low Intensity<br>Type A  | High Intensity<br>Type B | Steady Burn<br>Type C |
| Hours of Operation             | Dusk to Dawn             | 24 Hrs/Day               | Dusk to Dawn          |
| Minimum Beam Candle Power **   | -                        | -                        | 2 Candles             |
| Minimum Effective Intensity ** | 4.0 Candelas             | 35 Candelas              | -                     |
| Flash Duration                 | 10%                      | 8%                       | Constant              |
| Flash Rate/Minute ***          | 55 to 75                 | 55 to 75                 | Constant              |
| Lens Directional Faces         | 1 or 2                   | 1                        | 1 or 2                |

\*\* These values must be maintained within a full 9 degrees on each side of the vertical axis, and 5 degrees above and 5 degrees below the horizontal axis.  
\*\*\* Length of time that instantaneous intensity is equal to or greater than effective intensity.

TYPE C STEADY BURN WARNING LIGHTS are most commonly mounted on separate portable supports or on Type I or Type II barricades and are intended to continually warn the driver that he is approaching or adjacent to a hazardous area. Barricade warning lights are portable, lens directed, enclosed lights. The color of the light emitted shall be yellow.

Barricade warning lights shall be in accordance with the requirements of the Institute of Transportation Engineers' (ITE) Standard for Flashing and Steady Burn Barricade Warning Lights (1971).



|   |  |
|---|--|
| <br>Connecting Charlotte | Charlotte<br>Department of<br>Transportation |
|---|--|

| WORK ZONE<br>TRAFFIC CONTROL NOTES |   |
|------------------------------------|---|
| DATE                               | REVISION                                |
| 7/29/04                            | INITIAL VERSION                         |
| 11/15/04                           | CHANGED NOTE "M", ADDED NOTES "V" & "W" |
|                                    |   |
|                                    |   |







