

| OBSERVATION DATE           | FROM | HI | TO | HT | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ   | EDM SLOPE   | CBL M-TO-M | AZIMUTH (NSF) | STATIONS        | LATITUDE         | LONGITUDE         | ELLIP HT    | ORHTO HT    |
|----------------------------|------|----|----|----|--------------|-----------|----------------|-------------|-----------|-------------|-------------|------------|---------------|-----------------|------------------|-------------------|-------------|-------------|
| 1977                       | 1    |    | 7  |    | 91°08'09"    |           |                | 91 07 49.01 |           | 32138.958 m | 32138.985 m | N / A      | 19°09'41.47"  | 1 = BALDY       | N30°38'08.16078" | W104°10'25.29518" | 8311.005 ft | 8380.889 ft |
| PROJECT NAME               | 7    |    | 1  |    | 89°07'44"    | 180-15-53 | 15'-53"        | 89 07 04.58 | 180-14-54 |             |             | N / A      | 199°13'04.62" | 7 = McELROY     | N30°54'33.28202" | W104°03'48.23123" | 6459.418 ft | 6530.827 ft |
| NGS - McDonald Observatory |      |    |    |    |              |           |                |             |           |             |             | N / A      |               |                 |                  |                   |             |             |
|                            | 1    |    | 13 |    | 91°03'44"    |           |                | 91 12 52.93 |           | 39476.260 m | 39476.328 m | N / A      | 66°22'38.01"  | 1 = BALDY       | N30°38'08.16078" | W104°10'25.29518" | 8311.005 ft | 8380.889 ft |
|                            | 13   |    | 1  |    | 89°15'34"    | 180-19-18 | 19'-18"        | 89 05 20.73 | 180-18-14 |             |             | N / A      | 246°34'12.27" | 13 = STAR RM 3  | N30°46'39.61054" | W103°47'45.72668" | 5908.596 ft | 5980.033 ft |
|                            |      |    |    |    |              |           |                |             |           |             |             | N / A      |               |                 |                  |                   |             |             |
|                            | 1    |    | 20 |    | 90°40'36"    |           |                | 90 39 48.64 |           | 76957.102 m | 76957.129 m | N / A      | 124°34'55.67" | 1 = BALDY       | N30°38'08.16078" | W104°10'25.29518" | 8311.005 ft | 8380.889 ft |
|                            | 20   |    | 1  |    | 89°56'32"    | 180-37-08 | 37'-08"        | 89 55 45.40 | 180-35-34 |             |             | N / A      | 304°54'55.76" | 20 = ORD 2 RM 3 | N30°14'24.26028" | W103°30'56.44182" | 6693.215 ft | 6762.126 f  |
|                            |      |    |    |    |              |           |                |             |           |             |             | N / A      |               |                 |                  |                   |             |             |
|                            | 1    |    | 4  |    | 90°32'21"    |           |                | 90 31 22.35 |           | 92882.083 m | 92882.032 m | N / A      | 290°10'54.88" | 1 = BALDY       | N30°38'08.16078" | W104°10'25.29518" | 8311.005 ft | 8380.889 ft |
|                            | 4    |    | 1  |    | 90°12'12"    | 180-44-33 | 44'-33"        | 90 11 30.56 | 180-42-53 |             |             | N / A      | 109°42'55.23" | 4 = EAGLE 3     | N30°55'16.80905" | W105°05'07.60036" | 7430.632 ft | 7505.891 ft |
|                            |      |    |    |    |              |           |                |             |           |             |             | N / A      |               |                 |                  |                   |             |             |
|                            | 1    |    | 21 |    | 90°49'49"    |           |                | 90 49 15.88 |           | 74361.904 m | 74361.946 m | N / A      | 199°54'08.53" | 1 = BALDY       | N30°38'08.16078" | W104°10'25.29518" | 8311.005 ft | 8380.889 ft |
|                            | 21   |    | 1  |    | 89°45'41"    | 180-35-30 | 35'-30"        | 89 45 11.99 | 180-34-28 |             |             | N / A      | 19°46'11.87"  | 21 = DIPPER     | N30°00'17.47323" | W104°26'09.45920" | 6037.722 ft | 6110.880 ft |
|                            |      |    |    |    |              |           |                |             |           |             |             | N / A      |               |                 |                  |                   |             |             |
|                            | 1    |    | 24 |    | 90°50'01"    |           |                | 90 49 38.99 |           | 52518.318 m | 52518.345 m | N / A      | 247°24'32.36" | 1 = BALDY       | N30°38'08.16078" | W104°10'25.29518" | 8311.005 ft | 8380.889 ft |
|                            | 24   |    | 1  |    | 89°35'13"    | 180-25-14 | 25'-14"        | 89 34 36.02 | 180-24-15 |             |             | N / A      | 67°09'09.09"  | 24 = VIEJA RESE | N30°27'09.76407" | W104°40'42.01996" | 6430.242 ft | 6504.580 ft |
|                            |      |    |    |    |              |           |                |             |           |             |             | N / A      |               |                 |                  |                   |             |             |
|                            | 1    |    | 14 |    | 91°09'00"    |           |                | 91 08 29.31 |           | 66128.076 m | 66128.136 m | N / A      | 71°02'20.42"  | 1 = BALDY       | N30°38'08.16078" | W104°10'25.29518" | 8311.005 ft | 8380.889 ft |
|                            | 14   |    | 1  |    | 89°22'35"    | 180-31-35 | 31'-35"        | 89 22 02.28 | 180-30-32 |             |             | N / A      | 251°22'22.45" | 14 = BEARD 2    | N30°49'39.66310" | W103°31'13.10146" | 4952.065 ft | 5025.909 ft |

| OBSERVATION DATE             | FROM | HI      | TO | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ   | EDM SLOPE | CBL M-TO-M | AZIMUTH (NSF)   | STATIONS | LATITUDE       | LONGITUDE      | ELLIP HT    | ORHTO HT  |
|------------------------------|------|---------|----|---------|--------------|-----------|----------------|-------------|-----------|-------------|-----------|------------|-----------------|----------|----------------|----------------|-------------|-----------|
| NOV 09 2015                  | 27   | 1.687 m | 28 | 1.661 m | 90-00-11     |           |                | 89 59 55.50 |           | 1538.418 m  | N / A     | N / A      | 9.8927005 deg   | 27       | N40.021176 deg | W74.732228 deg | _ 53.131 ft | 53.840 ft |
| PROJECT NAME                 | 28   | 1.652 m | 27 | 1.687 m | 90-01-00     | 180-01-11 | 01'-11"        | 90 00 46.04 | 180-00-42 | 5047.295 ft | N / A     | N / A      | 189.8946922 deg | 28       | N40.034825 deg | W74.729132 deg | _ 52.412 ft | 54.570 ft |
| RTE 206 MP 27 & 28<br>151109 |      |         |    |         |              |           |                |             |           |             |           |            |                 |          |                |                |             |           |

| OBSERVATION DATE              | FROM | HI      | TO   | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ  | EDM SLOPE  | CBL M-TO-M  | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE        | ELLIP HT | ORHTO HT  |
|-------------------------------|------|---------|------|---------|--------------|-----------|----------------|-------------|-----------|------------|------------|-------------|---------------|----------|------------------|------------------|----------|-----------|
| MARCH 08 2016                 | 0    | 1.547 m | 1100 | 1.605 m | 89-40-31     |           |                | 89 40 26.82 |           | 1100.012 m | 1099.996 m | 1100.0032 m | 27°39'42"     | 0        | N39°15'06.17997" | W76°55'49.95688" | 79.075 m | 111.204 m |
| PROJECT NAME                  | 1100 | 1.605 m | 0    | 1.547 m | 90-19-58     | 180-00-29 | 29"            | 90 20 03.73 | 180-00-31 |            |            |             | 207°39'55"    | 1100     | N39°15'37.77118" | W76°55'28.65652" | 85.355 m | 117.447 m |
| Clarksville EDM CBL<br>160308 |      |         |      |         |              |           |                |             |           |            |            |             |               |          |                  |                  |          |           |
|                               | 0    | 1.589 m | 150  | 1.595 m | 90-22-18     |           |                | 90 20 08.08 |           | 149.998 m  | 149.989 m  | 149.9916 m  | 27°39'44"     | 0        | N39°15'06.17997" | W76°55'49.95688" | 79.075 m | 111.204 m |
|                               | 150  | 1.595 m | 0    | 1.589 m | 89-37-51     | 180-00-09 | 9"             | 89 39 56.09 | 180-00-04 |            |            |             | 207°39'46"    | 150      | N39°15'10.48776" | W76°55'47.05262" | 78.192 m | 110.211 m |
|                               |      |         |      |         |              |           |                |             |           |            |            |             |               |          |                  |                  |          |           |
|                               | 150  | 1.595 m | 425  | 1.566 m | 89-43-56     |           |                | 89 43 54.77 |           | 275.012 m  | 275.008 m  | 275.0112 m  | 27°39'41"     | 150      | N39°15'10.48776" | W76°55'47.05262" | 78.192 m | 110.211 m |
|                               | 425  | 1.566 m | 150  | 1.595 m | 90-16-18     | 180-00-14 | 14"            | 90 16 12.85 | 180-00-08 |            |            |             | 207°39'45"    | 425      | N39°15'18.38598" | W76°55'41.72774" | 79.513 m | 111.534 m |

| OBSERVATION DATE               | FROM | HI      | TO | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ  | EDM SLOPE | CBL M-TO-M | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE        | ELLIP HT    | ORHTO HT  |
|--------------------------------|------|---------|----|---------|--------------|-----------|----------------|-------------|-----------|------------|-----------|------------|---------------|----------|------------------|------------------|-------------|-----------|
| MARCH 30 2016                  | 1    | 5.35 ft | 2  | 5.48 ft | 90-14-24     |           |                | 90 14 20.58 |           | 142.698 m  | N / A     | N / A      | 72°22'54"     | 1        | N39.98618874 deg | W74.82256309 deg | _ 67.435 ft | 39.738 ft |
| PROJECT NAME                   | 2    | 5.48 ft | 1  | 5.35 ft | 89-45-43     | 180-00-07 | 7"             | 89 45 43.37 | 180-00-04 | 468.170 ft | N / A     | N / A      | 252°22'58"    | 2        | N39.98657772 deg | W74.82097073 deg | _ 69.511 ft | 37.659 ft |
| HAINESPORT "L" SHAPE<br>160330 |      |         |    |         |              |           |                |             |           |            |           |            |               |          |                  |                  |             |           |
|                                | 2    | 5.47 ft | 3  | 5.48 ft | 89-55-25     |           |                | 89 55 27.70 |           | 129.435 m  | N / A     | N / A      | 162°10'58"    | 2        | N39.98657772 deg | W74.82097073 deg | _ 69.511 ft | 37.659 ft |
|                                | 3    | 5.48 ft | 2  | 5.47 ft | 90-04-41     | 180-00-06 | 6"             | 90 04 35.89 | 180-00-04 | 424.656 ft | N / A     | N / A      | 342°10'59"    | 3        | N39.98546790 deg | W74.82050704 deg | _ 68.946 ft | 38.223 ft |

| OBSERVATION DATE             | FROM | HI      | TO | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ  | EDM SLOPE | CBL M-TO-M | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE        | ELLIP HT    | ORHTO HT  |
|------------------------------|------|---------|----|---------|--------------|-----------|----------------|-------------|-----------|------------|-----------|------------|---------------|----------|------------------|------------------|-------------|-----------|
| APRIL 20 2016                | A    | 1.522 m | B  | 1.607 m | 90-04-32     |           |                | 90 04 31.77 |           | 60.906 m   | N / A     | N / A      | 299°36'51"    | A        | N39.97290725 deg | W74.85747059 deg | _ 88.496 ft | 18.742 ft |
| PROJECT NAME                 | B    | 1.607 m | A  | 1.522 m | 89-55-33     | 180-00-05 | 5"             | 89 55 29.92 | 180-00-02 | 199.823 ft | N / A     | N / A      | 119°36'49"    | B        | N39.97317831 deg | W74.85809042 deg | _ 89.040 ft | 18.199 ft |
| 200 FOOT "L" SHAPE<br>160420 |      |         |    |         |              |           |                |             |           |            |           |            |               |          |                  |                  |             |           |
|                              | B    | 1.609 m | C  | 1.560 m | 87-57-53     |           |                | 87 57 53.32 |           | 60.846 m   | N / A     | N / A      | 236°39'55"    | B        | N39.97317831 deg | W74.85809042 deg | _ 89.040 ft | 18.199 ft |
|                              | C    | 1.560 m | B  | 1.609 m | 92-02-12     | 180-00-05 | 5"             | 92 02 08.36 | 180-00-02 | 199.625 ft | N / A     | N / A      | 56°39'54"     | C        | N39.97287737 deg | W74.85868509 deg | _ 81.787 ft | 25.452 ft |

| OBSERVATION DATE | FROM | HI      | TO  | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ | EDM SLOPE | CBL M-TO-M | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE        | ELLIP HT | ORHTO HT |
|------------------|------|---------|-----|---------|--------------|-----------|----------------|-------------|-----------|-----------|-----------|------------|---------------|----------|------------------|------------------|----------|----------|
| OCT 07 2016      | 0    | 1.600 m | 150 | 1.580 m | 90°21'16"    |           |                | 90 21 25.23 |           | 149.979 m | 149.981 m | 149.9793 m | 221°42'03"    | 0        | N39°36'05.83045" | W74°50'35.86948" | -4.734 m | 28.878 m |
| PROJECT NAME     | 150  | 1.580 m | 0   | 1.600 m | 89°38'48"    | 180-00-04 | 4"             | 89 38 38.93 | 180-00-04 |           | 149.981 m |            | 41°42'01"     | 150      | N39°36'02.19964" | W74°50'40.05131" | -5.647 m | 27.973 m |

| Folsom EDM CBL S8 |      |         |      |         |           |           |         |             |            |            |             |            |      |                  |                  |           |          |  |
|-------------------|------|---------|------|---------|-----------|-----------|---------|-------------|------------|------------|-------------|------------|------|------------------|------------------|-----------|----------|--|
| 161007            | 0    | 1.708 m | 1000 | 1.816 m | 90°35'41" |           |         | 90 34 49.32 | 1000.213 m | 1000.220 m | 1000.2174 m | 221°41'57" | 0    | N39°36'05.83045" | W74°50'35.86948" | -4.734 m  | 28.878 m |  |
|                   | 1000 | 1.816 m | 0    | 1.708 m | 89°25'27" | 180-01-08 | 01'-08" | 89 25 38.43 | 180-00-28  | 1000.219 m |             | 41°41'39"  | 1000 | N39°35'41.61584" | W74°51'03.75399" | -14.906 m | 18.640 m |  |
|                   | 150  | 1.580 m | 400  | 1.715 m | 90°59'21" |           |         | 90 58 08.29 | 250.149 m  | 250.152 m  | 250.1511 m  | 221°41'45" | 150  | N39°36'02.19964" | W74°50'40.05131" | -5.647 m  | 27.973 m |  |
|                   | 400  | 1.715 m | 150  | 1.580 m | 89°00'47" | 180-00-08 | 8"      | 89 01 58.65 | 180-00-07  | 250.151 m  |             | 41°41'41"  | 400  | N39°35'56.14415" | W74°50'47.02437" | -10.008 m | 23.525 m |  |
|                   | 400  | 1.715 m | 900  | 1.371 m | 90°33'15" |           |         | 90 33 10.78 | 500.121 m  | 500.121 m  | 500.1164 m  | 221°41'51" | 400  | N39°35'56.14415" | W74°50'47.02437" | -10.008 m | 23.525 m |  |
|                   | 900  | 1.371 m | 400  | 1.715 m | 89°27'04" | 180-00-19 | 19"     | 89 27 03.10 | 180-00-14  | 500.120 m  |             | 41°41'42"  | 900  | N39°35'44.03650" | W74°51'00.96665" | -14.474 m | 19.054 m |  |
|                   | 400  | 1.715 m | 1000 | 1.816 m | 90°27'37" |           |         | 90 27 37.17 | 600.094 m  | 600.098 m  | 600.0966 m  | 221°41'52" | 400  | N39°35'56.14415" | W74°50'47.02437" | -10.008 m | 23.525 m |  |
|                   | 1000 | 1.816 m | 400  | 1.715 m | 89°32'47" | 180-00-24 | 24"     | 89 32 39.47 | 180-00-17  | 600.098 m  |             | 41°41'41"  | 1000 | N39°35'41.61584" | W74°51'03.75399" | -14.906 m | 18.640 m |  |
|                   | 900  | 1.371 m | 1000 | 1.816 m | 89°59'04" |           |         | 89 59 34.57 | 99.983 m   | 99.983 m   | 99.9811 m   | 221°41'47" | 900  | N39°35'44.03650" | W74°51'00.96665" | -14.474 m | 19.054 m |  |
|                   | 1000 | 1.816 m | 900  | 1.371 m | 90°01'03" | 180-00-07 | 7"      | 90 00 28.21 | 180-00-03  | 99.983 m   |             | 41°41'45"  | 1000 | N39°35'41.61584" | W74°51'03.75399" | -14.906 m | 18.640 m |  |

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|--------------------|------|---------|----|---------|--------------|-----------|----------------|-------------|-----------|-------------|-----------|------------|---------------|----------|-----------------|------------------|------------|----------|
| OCT 20 2016        | 1    | 4.71 ft | 3  | 4.71 ft | 90°00'03"    |           |                | 90 00 07.61 |           | 2551.373 ft | N/A       | N/A        | 32°47'53"     | 1        | 39.40084319 deg | -75.05611290 deg | -85.141 ft | 26.01 ft |
| PROJECT NAME       | 3    | 4.71 ft | 1  | 4.71 ft | 90°00'07"    | 180-00-10 | 10"            | 90 00 13.98 | 180-00-22 |             | N/A       | N/A        | 212°48'04"    | 3        | 39.40673097 deg | -75.05122201 deg | -85.101 ft | 26.02 ft |
| Union Lake GNSS T2 |      |         |    |         |              |           |                |             |           |             |           |            |               |          |                 |                  |            |          |
| 161020             | 1    | 4.71 ft | 4  | 4.71 ft | 90°00'04"    |           |                | 90 00 05.76 |           | 2552.029 ft | N/A       | N/A        | 32°50'19"     | 1        | 39.40084319 deg | -75.05611290 deg | -85.141 ft | 26.01 ft |
|                    | 4    | 4.71 ft | 1  | 4.71 ft | 90°00'04"    | 180-00-08 | 8"             | 90 00 15.84 | 180-00-22 |             | N/A       | N/A        | 212°50'30"    | 4        | 39.40672980 deg | -75.05121538 deg | -85.078 ft | 26.04 ft |
|                    | 2    | 4.71 ft | 4  | 4.71 ft | 90°00'04"    |           |                | 90 00 07.62 |           | 2553.467 ft | N/A       | N/A        | 32°48'35"     | 2        | 39.40083795 deg | -75.05611182 deg | -85.119 ft | 26.03 ft |
|                    | 4    | 4.71 ft | 2  | 4.71 ft | 90°00'09"    | 180-00-13 | 13"            | 90 00 13.98 | 180-00-22 |             | N/A       | N/A        | 212°48'46"    | 4        | 39.40672980 deg | -75.05121538 deg | -85.078 ft | 26.04 ft |

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|-------------------|------|---------|----|---------|--------------|-----------|----------------|-------------|-----------|-------------|-----------|------------|---------------|----------|-----------------|------------------|-------------|----------|
| NOV 01 2016       | 1    | 1.613 m | 2  | 1.613 m | 90-00-33     |           |                | 90 00 33.71 |           | 7311.312 ft | N/A       | N/A        | 268°37'15"    | 1        | 39.92566516 deg | -75.05705953 deg | -106.825 ft | 0.86 ft  |
| PROJECT NAME      | 2    | 1.613 m | 1  | 1.613 m | 90-00-34     | 180-01-07 | 01'-07"        | 90 00 27.97 | 180-01-02 |             | N/A       | N/A        | 88°36'15"     | 2        | 39.92517914 deg | -75.08312032 deg | -106.924 ft | 0.84 ft  |
| Cooper River Lake |      |         |    |         |              |           |                |             |           |             |           |            |               |          |                 |                  |             |          |
| 161101            | 1    | 1.585 m | 2  | 1.585 m | 90-00-29     |           |                | 90 00 33.71 |           | 7311.312 ft | N/A       | N/A        | 268°37'15"    | 1        | 39.92566516 deg | -75.05705953 deg | -106.825 ft | 0.86 ft  |
|                   | 2    | 1.585 m | 1  | 1.585 m | 90-0027      | 180-00-56 | 56"            | 90 00 27.97 | 180-01-02 |             | N/A       | N/A        | 88°36'15"     | 2        | 39.92517914 deg | -75.08312032 deg | -106.924 ft | 0.84 ft  |

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|-----------------------------|------|---------|----|---------|--------------|-----------|----------------|-------------|-----------|-------------|-----------|------------|---------------|----------|----------------|----------------|-------------|-----------|
| NOV 6 2016                  | 27   | 5.66 ft | 28 | 4.96 ft | 90-00-22     |           |                | 90 00 20.57 |           | 1538.42 m   | N/A       | N/A        | 9°53'33"      | 27       | N40.021176 deg | W74.732228 deg | _ 53.131 ft | 53.840 ft |
| PROJECT NAME                | 28   | 4.96 ft | 27 | 5.66 ft | 90-00-04     | 180-00-26 | 26"            | 90 00 22.18 | 180-00-43 | 5047.287 ft | N/A       | N/A        | 189°53'41"    | 28       | N40.034825 deg | W74.729132 deg | _ 52.412 ft | 54.570 ft |
| RTE 206 MP 27&28 LEVEL LINE |      |         |    |         |              |           |                |             |           |             |           |            |               |          |                |                |             |           |
| 161106                      |      |         |    |         |              |           |                |             |           |             |           |            |               |          |                |                |             |           |
| NOV 14 2016                 | 27   | 5.51 ft | 28 | 4.78 ft | 90-00-09     |           |                | 90 00 20.57 |           | 1538.42 m   | N/A       | N/A        | 9°53'33"      | 27       | N40.021176 deg | W74.732228 deg | _ 53.131 ft | 53.840 ft |
| RTE 206 MP 27&28 LEVEL LINE | 28   | 4.78 ft | 27 | 5.51 ft | 89-59-54     | 180-00-03 | 3"             | 90 00 22.18 | 180-00-43 | 5047.287 ft | N/A       | N/A        | 189°53'41"    | 28       | N40.034825 deg | W74.729132 deg | _ 52.412 ft | 54.570 ft |
| 161114                      |      |         |    |         |              |           |                |             |           |             |           |            |               |          |                |                |             |           |

| OBSERVATION DATE            | FROM | HI      | TO | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ   | EDM SLOPE | CBL M-TO-M | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE        | ELLIP HT    | ORHTO HT  |
|-----------------------------|------|---------|----|---------|--------------|-----------|----------------|-------------|-----------|-------------|-----------|------------|---------------|----------|------------------|------------------|-------------|-----------|
| NOV 17 2016                 |      |         |    |         |              |           |                |             |           |             |           |            |               |          |                  |                  |             |           |
| RTE 206 MP 27&28 LEVEL LINE |      |         |    |         |              |           |                |             |           |             |           |            |               |          |                  |                  |             |           |
| SET A - 10:05 TO 10:28      | 27   | 1.679 m | 28 | 1.457 m | 90-00-36     |           |                | 90 00 21.64 |           | 1538.42 m   | N/A       | N/A        | 9°53'33"      | 27       | N40.02117622 deg | W74.73222851 deg | _ 53.184 ft | 53.788 ft |
|                             | 28   | 1.457 m | 27 | 1.679 m | 90-00-30     | 180-01-06 | 01'-06"        | 90 00 21.11 | 180-00-43 | 5047.287 ft | N/A       | N/A        | 189°53'41"    | 28       | N40.03482542 deg | W74.72913182 deg | _ 52.464 ft | 54.518 ft |
| SET B - 10:56 TO 11:20      | 27   | 1.679 m | 28 | 1.457 m | 90°00'39"    |           |                | 90 00 21.64 |           | 1538.42 m   | N/A       | N/A        | 9°53'33"      | 27       | N40.02117622 deg | W74.73222851 deg | _ 53.184 ft | 53.788 ft |
|                             | 28   | 1.457 m | 27 | 1.679 m | 90°00'35"    | 180-01-14 | 01'-14"        | 90 00 21.11 | 180-00-43 | 5047.287 ft | N/A       | N/A        | 189°53'41"    | 28       | N40.03482542 deg | W74.72913182 deg | _ 52.464 ft | 54.518 ft |
| SET C - 12:07 TO 12:33      | 27   | 1.679 m | 28 | 1.457 m | 90°00'39"    |           |                | 90 00 21.64 |           | 1538.42 m   | N/A       | N/A        | 9°53'33"      | 27       | N40.02117622 deg | W74.73222851 deg | _ 53.184 ft | 53.788 ft |
|                             | 28   | 1.457 m | 27 | 1.679 m | 90°00'35"    | 180-01-14 | 01'-14"        | 90 00 21.11 | 180-00-43 | 5047.287 ft | N/A       | N/A        | 189°53'41"    | 28       | N40.03482542 deg | W74.72913182 deg | _ 52.464 ft | 54.518 ft |
| SET D - 12:50 TO 13:10      | 27   | 1.679 m | 28 | 1.457 m | 90°00'36"    |           |                | 90 00 21.64 |           | 1538.42 m   | N/A       | N/A        | 9°53'33"      | 27       | N40.02117622 deg | W74.73222851 deg | _ 53.184 ft | 53.788 ft |
|                             | 28   | 1.457 m | 27 | 1.679 m | 90°00'37"    | 180-01-13 | 01'-13"        | 90 00 21.11 | 180-00-43 | 5047.287 ft | N/A       | N/A        | 189°53'41"    | 28       | N40.03482542 deg | W74.72913182 deg | _ 52.464 ft | 54.518 ft |

|                        |    |         |    |         |           |           |         |             |           |             |     |     |            |    |                  |                  |            |           |
|------------------------|----|---------|----|---------|-----------|-----------|---------|-------------|-----------|-------------|-----|-----|------------|----|------------------|------------------|------------|-----------|
| SET E - 13:24 TO 13:44 | 27 | 1.679 m | 28 | 1.457 m | 90°00'35" |           |         | 90 00 21.64 |           | 1538.42 m   | N/A | N/A | 9°53'33"   | 27 | N40.02117622 deg | W74.73222851 deg | _53.184 ft | 53.788 ft |
|                        | 28 | 1.457 m | 27 | 1.679 m | 90°00'34" | 180-01-09 | 01'-09" | 90 00 21.11 | 180-00-43 | 5047.287 ft | N/A | N/A | 189°53'41" | 28 | N40.03482542 deg | W74.72913182 deg | _52.464 ft | 54.518 ft |
| SET F - 14:02 TO 14:28 | 27 | 1.679 m | 28 | 1.457 m | 90°00'30" |           |         | 90 00 21.64 |           | 1538.42 m   | N/A | N/A | 9°53'33"   | 27 | N40.02117622 deg | W74.73222851 deg | _53.184 ft | 53.788 ft |
|                        | 28 | 1.457 m | 27 | 1.679 m | 90°00'30" | 180-01-00 | 01'-00" | 90 00 21.11 | 180-00-43 | 5047.287 ft | N/A | N/A | 189°53'41" | 28 | N40.03482542 deg | W74.72913182 deg | _52.464 ft | 54.518 ft |

| OBSERVATION DATE         | FROM | HI      | TO | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ  | EDM SLOPE | CBL M-TO-M | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE        | ELLIP HT   | ORHTO HT  |  |
|--------------------------|------|---------|----|---------|--------------|-----------|----------------|-------------|-----------|------------|-----------|------------|---------------|----------|------------------|------------------|------------|-----------|--|
| AUG 14 2017              | 1    | 5.55 ft | 4  | 5.55 ft | 88-18-09     |           |                | 88 18 23.37 |           | 118.637 m  | N/A       | N/A        | 89°58'54"     | 1        | N39°59'59.99799" | W74°59'59.99945" | -69.371 ft | 38.419 ft |  |
| PROJECT NAME             | 4    | 5.55 ft | 1  | 5.55 ft | 91-41-58     | 180-00-07 | 7"             | 91 41 39.91 | 180-00-03 | 389.227 ft | N/A       | N/A        | 269°58'57"    | 4        | N39°59'59.99919" | W74°59'55.00020" | -57.860 ft | 49.925 ft |  |
| N40 W75                  |      |         |    |         |              |           |                |             |           |            |           |            |               |          |                  |                  |            |           |  |
| 170802_N40_W75           | 1    | 5.55 ft | 6  | 5.55 ft | 89-45-35     |           |                | 89 45 36.46 |           | 154.160 m  | N/A       | N/A        | 180°00'06"    | 1        | N39°59'59.99799" | W74°59'59.99945" | -69.371 ft | 38.419 ft |  |
| 170909_N40_W75_DiNi      | 6    | 5.55 ft | 1  | 5.55 ft | 90-14-32     | 180-00-07 | 7"             | 90 14 27.83 | 180-00-04 | 505.772 ft | N/A       | N/A        | 0°00'06"      | 6        | N39°59'54.99981" | W74°59'59.99963" | -67.246 ft | 40.535 ft |  |
| 170814_N40_W75_T2_ZA_RTK |      |         |    |         |              |           |                |             |           |            |           |            |               |          |                  |                  |            |           |  |

| OBSERVATION DATE | FROM | HI      | TO | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ  | EDM SLOPE  | CBL M-TO-M | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE        | ELLIP HT   | ORHTO HT  |  |
|------------------|------|---------|----|---------|--------------|-----------|----------------|-------------|-----------|------------|------------|------------|---------------|----------|------------------|------------------|------------|-----------|--|
| SEPT 09 2017     | 1    | 5.25 ft | 2  | 5.00 ft | 89-43-01     |           |                | 89 42 57.41 |           | 359.473 ft | 359.472 ft | N/A        | 84°56'05"     | 1        | N39°53'00.71000" | W75°01'31.28276" | -66.757 ft | 40.894 ft |  |
| PROJECT NAME     | 2    | 5.00 ft | 1  | 5.25 ft | 90-17-03     | 180-00-04 | 4"             | 90 17 05.62 | 180-00-03 |            | 359.473 ft | N/A        | 264°56'08"    | 2        | N39°53'01.02364" | W75°01'26.68954" | -64.724 ft | 42.925 ft |  |
| CROWS WOODS      |      |         |    |         |              |           |                |             |           |            |            |            |               |          |                  |                  |            |           |  |
| 170917           | 2    | 5.00 ft | 3  | 5.27 ft | 89-41-29     |           |                | 89 41 28.19 |           | 237.773 ft | 237.776 ft | N/A        | 178°30'44"    | 2        | N39°53'01.02364" | W75°01'26.68954" | -64.724 ft | 42.925 ft |  |
|                  | 3    | 5.27 ft | 2  | 5.00 ft | 90-18-33     | 180-00-02 | 2"             | 90 18 33.82 | 180-00-02 |            | 237.774 ft | N/A        | 358°30'44"    | 3        | N39°52'58.67464" | W75°01'26.61035" | -63.710 ft | 43.941 ft |  |
|                  | 3    | 5.27 ft | 1  | 5.25 ft | 90-25-11     |           |                | 90 25 13.89 |           | 418.445 ft | 418.447 ft | N/A        | 299°29'09"    | 3        | N39°52'58.67464" | W75°01'26.61035" | -63.710 ft | 43.941 ft |  |
|                  | 1    | 5.25 ft | 3  | 5.27 ft | 89-34-54     | 180-00-05 | 5"             | 89 34 49.65 | 180-00-04 |            | 418.447 ft | N/A        | 119°29'06"    | 1        | N39°53'00.71000" | W75°01'31.28276" | -66.757 ft | 40.894 ft |  |
|                  | 1    | 5.25 ft | 4  | 5.24 ft | 89-14-13     |           |                | 89 14 12.29 |           | 647.104 ft | 647.106 ft | N/A        | 182°13'45"    | 1        | N39°53'00.71000" | W75°01'31.28276" | -66.757 ft | 40.894 ft |  |
|                  | 4    | 5.24 ft | 1  | 5.25 ft | 90-45-55     | 180-00-08 | 8"             | 90 45 53.19 | 180-00-05 |            | 647.108 ft | N/A        | 2°13'45"      | 4        | N39°52'54.32036" | W75°01'31.60561" | -58.121 ft | 49.535 ft |  |
|                  | 2    | 5.00 ft | 4  | 5.24 ft | 89-29-51     |           |                | 89 29 51.39 |           | 779.099 ft | 779.105 ft | N/A        | 209°28'01"    | 2        | N39°53'01.02364" | W75°01'26.68954" | -64.724 ft | 42.925 ft |  |
|                  | 4    | 5.24 ft | 2  | 5.00 ft | 90-30-18     | 180-00-09 | 9"             | 90 30 15.20 | 180-00-07 |            | 779.107 ft | N/A        | 29°27'58"     | 4        | N39°52'54.32036" | W75°01'31.60561" | -58.121 ft | 49.535 ft |  |
|                  | 3    | 5.27 ft | 4  | 5.24 ft | 89-27-30     |           |                | 89 27 31.87 |           | 588.050 ft | 588.052 ft | N/A        | 221°28'16"    | 3        | N39°52'58.67464" | W75°01'26.61035" | -63.710 ft | 43.941 ft |  |
|                  | 4    | 5.24 ft | 3  | 5.27 ft | 90-32-36     | 180-00-06 | 6"             | 90 32 33.10 | 180-00-05 |            | 588.054 ft | N/A        | 41°28'13"     | 4        | N39°52'54.32036" | W75°01'31.60561" | -58.121 ft | 49.535 ft |  |

| OBSERVATION DATE  | FROM | HI      | TO   | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ  | EDM SLOPE  | CBL M-TO-M  | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE        | ELLIP HT  | ORHTO HT |  |
|-------------------|------|---------|------|---------|--------------|-----------|----------------|-------------|-----------|------------|------------|-------------|---------------|----------|------------------|------------------|-----------|----------|--|
| OCT 26 2017       | 0    | 1.647 m | 150  | 1.610 m | 90°21'36"    |           |                | 90 21 41.73 |           | 149.980 m  | 149.982 m  | 149.9793 m  | 221°55'31"    | 0        | N39°36'05.75463" | W74°50'35.75963" | -4.647 m  | 28.878 m |  |
| PROJECT NAME      | 150  | 1.610 m | 0    | 1.647 m | 89°38'31"    | 180-00-07 | 7"             | 89 38 22.44 | 180-00-04 |            | 149.982 m  |             | 41°55'29"     | 150      | N39°36'02.13649" | W74°50'39.95985" | -5.555 m  | 27.973 m |  |
| Folsom EDM CBL S7 |      |         |      |         |              |           |                |             |           |            |            |             |               |          |                  |                  |           |          |  |
| 171026            | 0    | 1.647 m | 400  | 1.593 m | 90°46'43"    |           |                | 90 46 37.08 |           | 400.123 m  | 400.128 m  | 400.124 m   | 221°55'20"    | 0        | N39°36'05.75463" | W74°50'35.75963" | -4.647 m  | 28.878 m |  |
|                   | 400  | 1.593 m | 0    | 1.647 m | 89°13'46"    | 180-00-29 | 29"            | 89 13 34.02 | 180-00-11 |            | 400.128 m  |             | 41°55'13"     | 400      | N39°35'56.10215" | W74°50'46.96338" | -10.008 m | 23.525 m |  |
|                   | 0    | 1.647 m | 900  | 1.602 m | 90°38'02"    |           |                | 90 37 54.43 |           | 900.237 m  | 900.245 m  | 900.2382 m  | 221°55'21"    | 0        | N39°36'05.75463" | W74°50'35.75963" | -4.647 m  | 28.878 m |  |
|                   | 900  | 1.602 m | 0    | 1.647 m | 89°22'35"    | 180-00-37 | 37"            | 89 22 30.54 | 180-00-25 |            | 900.246 m  |             | 41°55'05"     | 900      | N39°35'44.03650" | W74°51'00.96665" | -14.474 m | 19.054 m |  |
|                   | 0    | 1.647 m | 1000 | 1.611 m | 90°35'36"    |           |                | 90 35 36.95 |           | 1000.217 m | 1000.225 m | 1000.2174 m | 221°55'22"    | 0        | N39°36'05.75463" | W74°50'35.75963" | -4.647 m  | 28.878 m |  |
|                   | 1000 | 1.611 m | 0    | 1.647 m | 89°24'59"    | 180-00-35 | 35"            | 89 24 50.80 | 180-00-28 |            | 1000.227 m |             | 41°55'05"     | 1000     | N39°35'41.62437" | W74°51'03.76625" | -14.906 m | 18.640 m |  |
|                   | 150  | 1.610 m | 1000 | 1.611 m | 90°37'59"    |           |                | 90 38 00.12 |           | 850.238 m  | 850.245 m  | 850.2396 m  | 221°55'18"    | 150      | N39°36'02.13649" | W74°50'39.95985" | -5.555 m  | 27.973 m |  |
|                   | 1000 | 1.611 m | 150  | 1.610 m | 89°22'30"    | 180-00-29 | 29"            | 89 22 23.47 | 180-00-24 |            | 850.246 m  |             | 41°55'03"     | 1000     | N39°35'41.62437" | W74°51'03.76625" | -14.906 m | 18.640 m |  |
|                   | 400  | 1.593 m | 900  | 1.602 m | 90°30'51"    |           |                | 90 30 45.18 |           | 500.116 m  | 500.122 m  | 500.1164 m  | 221°55'15"    | 400      | N39°35'56.10215" | W74°50'46.96338" | -10.008 m | 23.525 m |  |
|                   | 900  | 1.602 m | 400  | 1.593 m | 89°29'28"    | 180-00-19 | 19"            | 89 29 28.70 | 180-00-14 |            | 500.121 m  |             | 41°55'06"     | 900      | N39°35'44.03650" | W74°51'00.96665" | -14.474 m | 19.054 m |  |
|                   | 900  | 1.602 m | 1000 | 1.611 m | 90°13'58"    |           |                | 90 14 34.05 |           | 99.982 m   | 99.983 m   | 99.9811 m   | 221°55'18"    | 900      | N39°35'44.03650" | W74°51'00.96665" | -14.474 m | 19.054 m |  |
|                   | 1000 | 1.611 m | 900  | 1.602 m | 89°46'07"    | 180-00-05 | 5"             | 89 45 28.72 | 180-00-03 |            | 99.983 m   |             | 41°55'16"     | 1000     | N39°35'41.62437" | W74°51'03.76625" | -14.906 m | 18.640 m |  |

| OBSERVATION DATE   | FROM  | HI       | TO    | HT       | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ   | EDM SLOPE   | CBL M-TO-M | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE        | ELLIP HT   | ORHTO HT  |
|--|-------|----------|-------|----------|--------------|-----------|----------------|-------------|-----------|-------------|-------------|------------|---------------|----------|------------------|------------------|------------|-----------|
| SEPT 26, 29,30 2018  | 27    | 5.325 ft | 27-25 | 5.467 ft | 90°11'36"    |           |                | 90 11 29.18 |           | 1317.612 ft | 1317.618 ft | N / A      | 9°48'30"      | 27       | N40°01'18.37232" | W74°43'55.54467" | -54.935 ft | 52.037 ft |
| <b>PROJECT NAME</b><br>RTE 206 MP 27 & 28 (1/4 MILE)<br>180930 | 27-25 | 5.467 ft | 27    | 5.325 ft | 89°48'57"    | 180-00-33 | 33"            | 89 48 41.98 | 180-00-11 |             | 1317.616 ft | N / A      | 189°48'32"    | 27-25    | N40°01'31.20299" | W74°43'52.65939" | -59.442 ft | 47.533 ft |
|  | 27    | 5.325 ft | 27-50 | 5.496 ft | 90°05'18"    |           |                | 90 05 06.19 |           | 2634.999 ft | 2635.006 ft | N / A      | 9°52'43"      | 27       | N40°01'18.37232" | W74°43'55.54467" | -54.935 ft | 52.037 ft |
|  | 27-50 | 5.496 ft | 27    | 5.325 ft | 89°55'36"    | 180-00-54 | 54"            | 89 55 16.12 | 180-00-25 |             | 2635.006 ft | N / A      | 189°52'47"    | 27-50    | N40°01'44.02610" | W74°43'49.73338" | -58.874 ft | 48.102 ft |
|  | 27    | 5.325 ft | 28    | 5.154 ft | 89°55'31"    |           |                | 89 55 07.61 |           | 5270.391 ft | 5270.409 ft | N / A      | 9°54'32"      | 27       | N40°01'18.37232" | W74°43'55.54467" | -54.935 ft | 52.037 ft |
|  | 28    | 5.154 ft | 27    | 5.325 ft | 90°05'44"    | 180-01-15 | 01'-15"        | 90 05 37.03 | 180-00-45 |             | 5270.412 ft | N / A      | 189°54'40"    | 28       | N40°02'09.67881" | W74°43'43.88452" | -46.967 ft | 60.017 ft |
|  | 27-25 | 5.467 ft | 27-50 | 5.496 ft | 89°58'44"    |           |                | 89 58 31.99 |           | 1317.394 ft | 1317.399 ft | N / A      | 9°56'57"      | 27-25    | N40°01'31.20299" | W74°43'52.65939" | -59.442 ft | 47.533 ft |
|  | 27-50 | 5.496 ft | 27-25 | 5.467 ft | 90°01'53"    | 180-00-37 | 37"            | 90 01 39.17 | 180-00-11 |             | 1317.400 ft | N / A      | 189°56'59"    | 27-50    | N40°01'44.02610" | W74°43'49.73338" | -58.874 ft | 48.102 ft |
|  | 27-50 | 5.496 ft | 27-75 | 5.355 ft | 89°56'41"    |           |                | 89 56 31.61 |           | 1318.195 ft | 1318.202 ft | N / A      | 10°01'48"     | 27-50    | N40°01'44.02610" | W74°43'49.73338" | -58.874 ft | 48.102 ft |
|  | 27-75 | 5.355 ft | 27-50 | 5.496 ft | 90°03'51"    | 180-00-32 | 32"            | 90 03 39.55 | 180-00-11 |             | 1318.203 ft | N / A      | 190°01'50"    | 27-75    | N40°01'56.85381" | W74°43'46.78192" | -57.366 ft | 49.613 ft |
|  | 27-50 | 5.312 ft | 28    | 5.253 ft | 89°44'55"    |           |                | 89 44 43.67 |           | 2635.415 ft | 2635.430 ft | N / A      | 9°56'26"      | 27-50    | N40°01'44.02610" | W74°43'49.73338" | -58.874 ft | 48.102 ft |
|  | 28    | 5.253 ft | 27-50 | 5.312 ft | 90°15'51"    | 180-00-46 | 46"            | 90 15 38.65 | 180-00-22 |             | 2635.430 ft | N / A      | 189°56'30"    | 28       | N40°02'09.67881" | W74°43'43.88452" | -46.967 ft | 60.017 ft |
|  | 27-75 | 5.355 ft | 28    | 5.398 ft | 89°33'01"    |           |                | 89 32 50.32 |           | 1317.238 ft | 1317.247 ft | N / A      | 9°51'05"      | 27-75    | N40°01'56.85381" | W74°43'46.78192" | -57.366 ft | 49.613 ft |
|  | 28    | 5.398 ft | 27-75 | 5.355 ft | 90°27'28"    | 180-00-29 | 29"            | 90 27 20.83 | 180-00-11 |             | 1317.250 ft | N / A      | 189°51'07"    | 28       | N40°02'09.67881" | W74°43'43.88452" | -46.967 ft | 60.017 ft |

| OBSERVATION DATE                             | FROM | HI      | TO   | HT      | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ  | EDM SLOPE  | CBL M-TO-M  | AZIMUTH (NSF) | STATIONS | LATITUDE        | LONGITUDE        | ELLIP HT  | ORHTO HT |
|--|------|---------|------|---------|--------------|-----------|----------------|-------------|-----------|------------|------------|-------------|---------------|----------|-----------------|------------------|-----------|----------|
| OCT 03 2018                                  | 0    | 1.590 m | 150  | 1.600 m | 90°20'38"    |           |                | 90 20 42.62 |           | 149.977 m  | 149.979 m  | 149.9793 m  | 221°55'28"    | 0        | 39°36'05.75449" | -74°50'35.75974" | -4.624 m  | 28.902 m |
| <b>PROJECT NAME</b><br>181003_Folsom_EDM_CBL | 150  | 1.600 m | 0    | 1.590 m | 89°39'38"    | 180-00-16 | 16"            | 89 39 21.54 | 180-00-04 |            | 149.977 m  |             | 41°55'26"     | 150      | 39°36'02.13639" | -74°50'39.95979" | -5.536 m  | 27.992 m |
|  | 0    | 1.661 m | 400  | 1.709 m | 90°46'18"    |           |                | 90 45 54.32 |           | 400.120 m  | 400.118 m  | 400.124 m   | 221°55'18"    | 0        | 39°36'05.75449" | -74°50'35.75974" | -4.624 m  | 28.902 m |
|  | 400  | 1.709 m | 0    | 1.661 m | 89°14'50"    | 180-01-08 | 01'-08"        | 89 14 16.78 | 180-00-11 |            | 400.117 m  |             | 41°55'11"     | 400      | 39°35'56.10201" | -74°50'46.96331" | -10.004 m | 23.529 m |
|  | 0    | 1.661 m | 1000 | 1.645 m | 90°35'56"    |           |                | 90 35 38.20 |           | 1000.210 m | 1000.210 m | 1000.2174 m | 221°55'22"    | 0        | 39°36'05.75449" | -74°50'35.75974" | -4.624 m  | 28.902 m |
|  | 1000 | 1.645 m | 0    | 1.661 m | 89°25'06"    | 180-01-02 | 01'-02"        | 89 24 49.55 | 180-00-28 |            | 1000.210 m |             | 41°55'04"     | 1000     | 39°35'41.62438" | -74°51'03.76614" | -14.909 m | 18.637 m |
|  | 150  | 1.600 m | 400  | 1.585 m | 91°01'29"    |           |                | 91 01 40.18 |           | 250.150 m  | 250.153 m  | 250.1511 m  | 221°55'10"    | 150      | 39°36'02.13639" | -74°50'39.95979" | -5.536 m  | 27.992 m |
|  | 400  | 1.585 m | 150  | 1.600 m | 88°58'44"    | 180-00-13 | 13"            | 88 58 26.75 | 180-00-07 |            | 250.151 m  |             | 41°55'05"     | 400      | 39°35'56.10201" | -74°50'46.96331" | -10.004 m | 23.529 m |
|  | 400  | 1.585 m | 900  | 1.657 m | 90°30'22"    |           |                | 90 30 20.85 |           | 500.114 m  | 500.113 m  | 500.1164 m  | 221°55'16"    | 400      | 39°35'56.10201" | -74°50'46.96331" | -10.004 m | 23.529 m |
|  | 900  | 1.657 m | 400  | 1.585 m | 89°29'54"    | 180-00-16 | 16"            | 89 29 53.02 | 180-00-14 |            | 500.114 m  |             | 41°55'08"     | 900      | 39°35'44.03650" | -74°51'00.96665" | -14.474 m | 19.054 m |
|  | 400  | 1.709 m | 1000 | 1.644 m | 90°28'36"    |           |                | 90 28 36.29 |           | 600.093 m  | 600.096 m  | 600.0966 m  | 221°55'18"    | 400      | 39°35'56.10201" | -74°50'46.96331" | -10.004 m | 23.529 m |
|  | 1000 | 1.645 m | 400  | 1.709 m | 89°31'50"    | 180-00-26 | 26"            | 89 31 40.35 | 180-00-17 |            | 600.096 m  |             | 41°55'07"     | 1000     | 39°35'41.62438" | -74°51'03.76614" | -14.909 m | 18.637 m |
|  | 900  | 1.657 m | 1000 | 1.616 m | 90°15'46"    |           |                | 90 16 23.41 |           | 99.980 m   | 99.980 m   | 99.9811 m   | 221°55'14"    | 900      | 39°35'44.03650" | -74°51'00.96665" | -14.474 m | 19.054 m |
|  | 1000 | 1.616 m | 900  | 1.657 m | 89°44'19"    | 180-00-05 | 5"             | 89 43 39.37 | 180-00-03 |            | 99.979 m   |             | 41°55'13"     | 1000     | 39°35'41.62438" | -74°51'03.76614" | -14.909 m | 18.637 m |

| OBSERVATION DATE                                 | FROM | HI       | TO | HT       | ZENITH ANGLE | SUM ZAs   | PLUMBLINE TILT | INVERS3D*   | INV3D SUM | DELTA XYZ  | EDM SLOPE  | CBL M-TO-M | AZIMUTH (NSF) | STATIONS | LATITUDE         | LONGITUDE         | ELLIP HT  | ORHTO HT |
|--|------|----------|----|----------|--------------|-----------|----------------|-------------|-----------|------------|------------|------------|---------------|----------|------------------|-------------------|-----------|----------|
| OCT 30 2018                                      | 2    | 5.266 ft | 1  | 5.266 ft | 88°18'00"    |           |                | 88 17 54.82 |           | 389.180 FT | 389.186 ft | N / A      | 89°59'36"     | 2        | 39°59'59.997419" | -74°59'59.998701" | -19.790 m | 13.065 m |
| <b>PROJECT NAME</b><br>N40 W75 L-Shape<br>181030 | 1    | 5.266 ft | 2  | 5.266 ft | 91°42'06"    | 180-00-06 | 6"             | 91 42 08.46 | 180-00-03 |            | 389.184 ft | N / A      | 269°59'39"    | 1        | 39°59'59.997836" | -74°59'55.000062" | -16.267 m | 16.585 m |
|  | 2    | 5.266 ft | 3  | 5.266 ft | 89°45'41"    |           |                | 89 45 36.40 |           | 505.738 FT | 505.744 ft | N / A      | 180°00'44"    | 2        | 39°59'59.997419" | -74°59'59.998701" | -19.790 m | 13.065 m |
|  | 3    | 5.266 ft | 2  | 5.266 ft | 90°14'25"    | 180-00-06 | 6"             | 90 14 27.89 | 180-00-04 |            | 505.744 ft | N / A      | 0°00'44"      | 3        | 39°59'54.999576" | -75°00'00.000084" | -19.143 m | 13.709 m |

\* SEE "YYMMDD\_INVERSE3D.TXT" FOR OUTPUT RESULTS FROM ( [https://www.ngs.noaa.gov/cgi-bin/Inv\\_Fwd/invers3d.pr1](https://www.ngs.noaa.gov/cgi-bin/Inv_Fwd/invers3d.pr1) ) WITH HEIGHTS OF INSTRUMENT AND TARGETS APPLIED TO THE ELLIPSOID HEIGHT TO CALCULATE BETTER APPROXIMATIONS OF THE APPARENT ZENITH DISTANCE, IE, ANGLE.