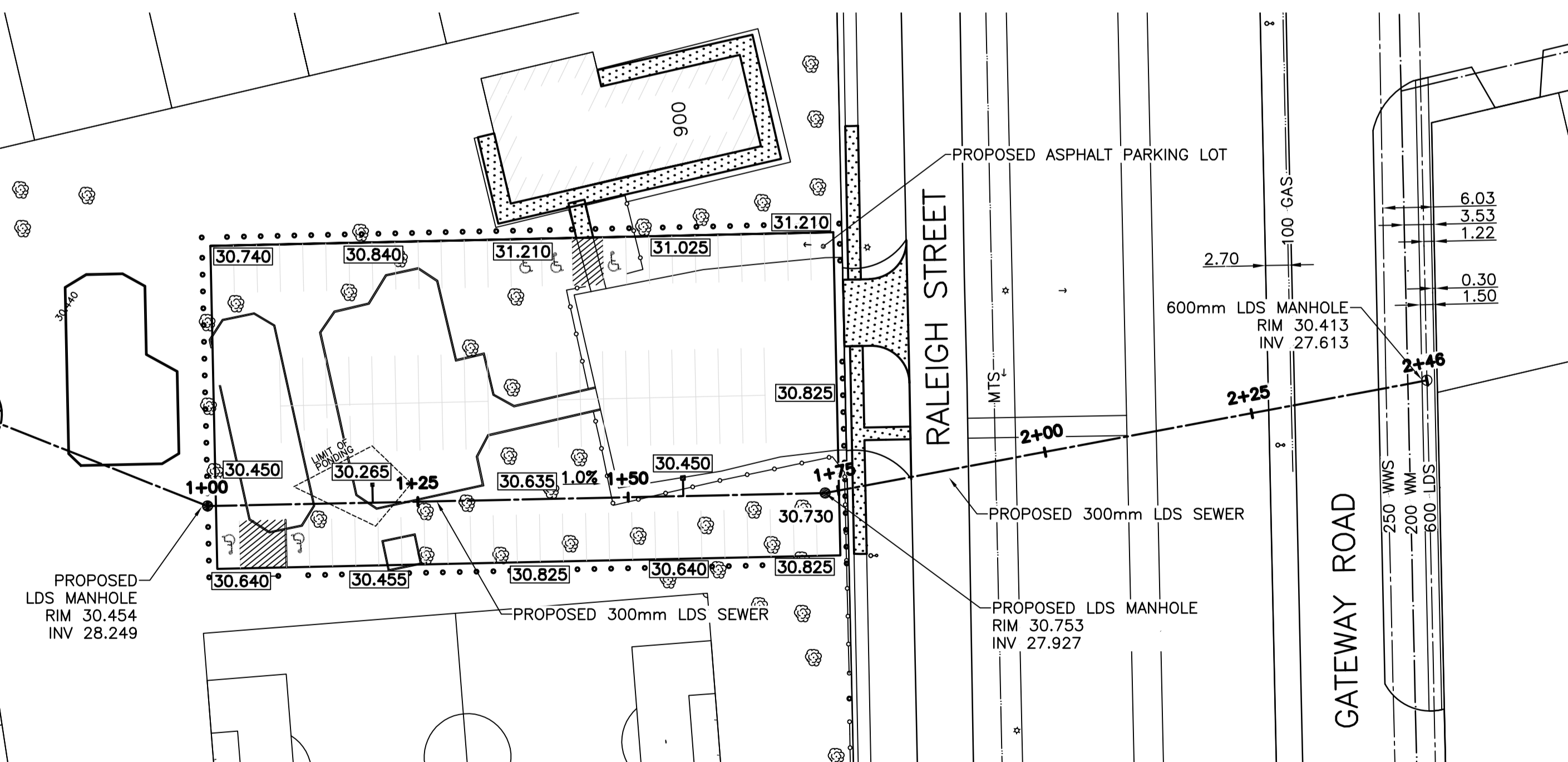
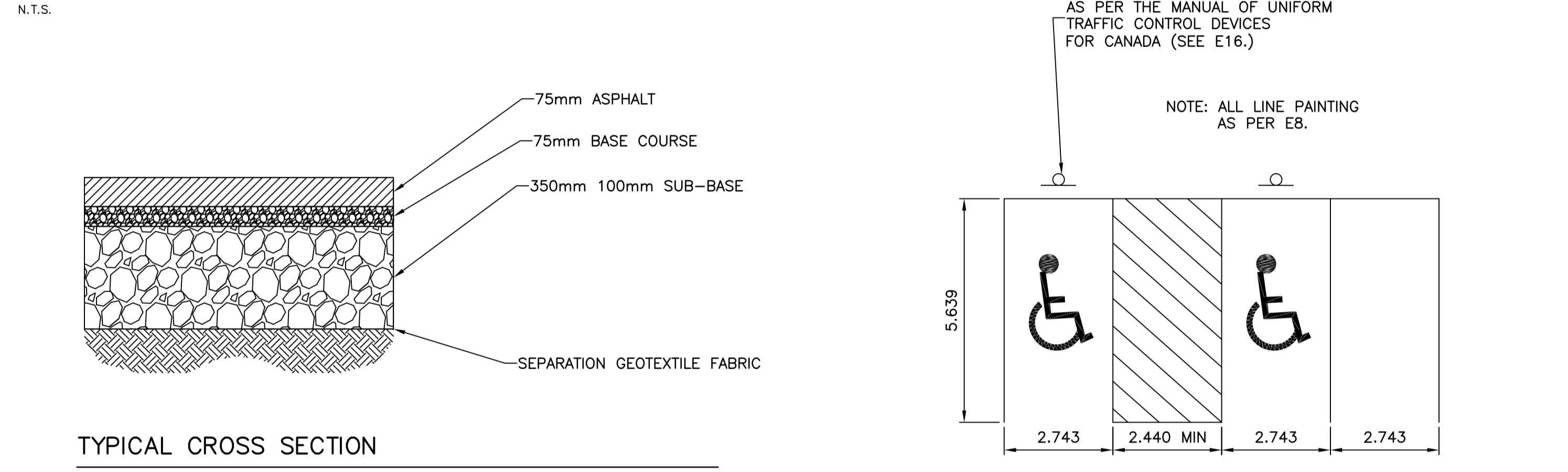


WOOD BOLLARD AND CHAIN GATE DETAILS (E12,E13,E14,E11)

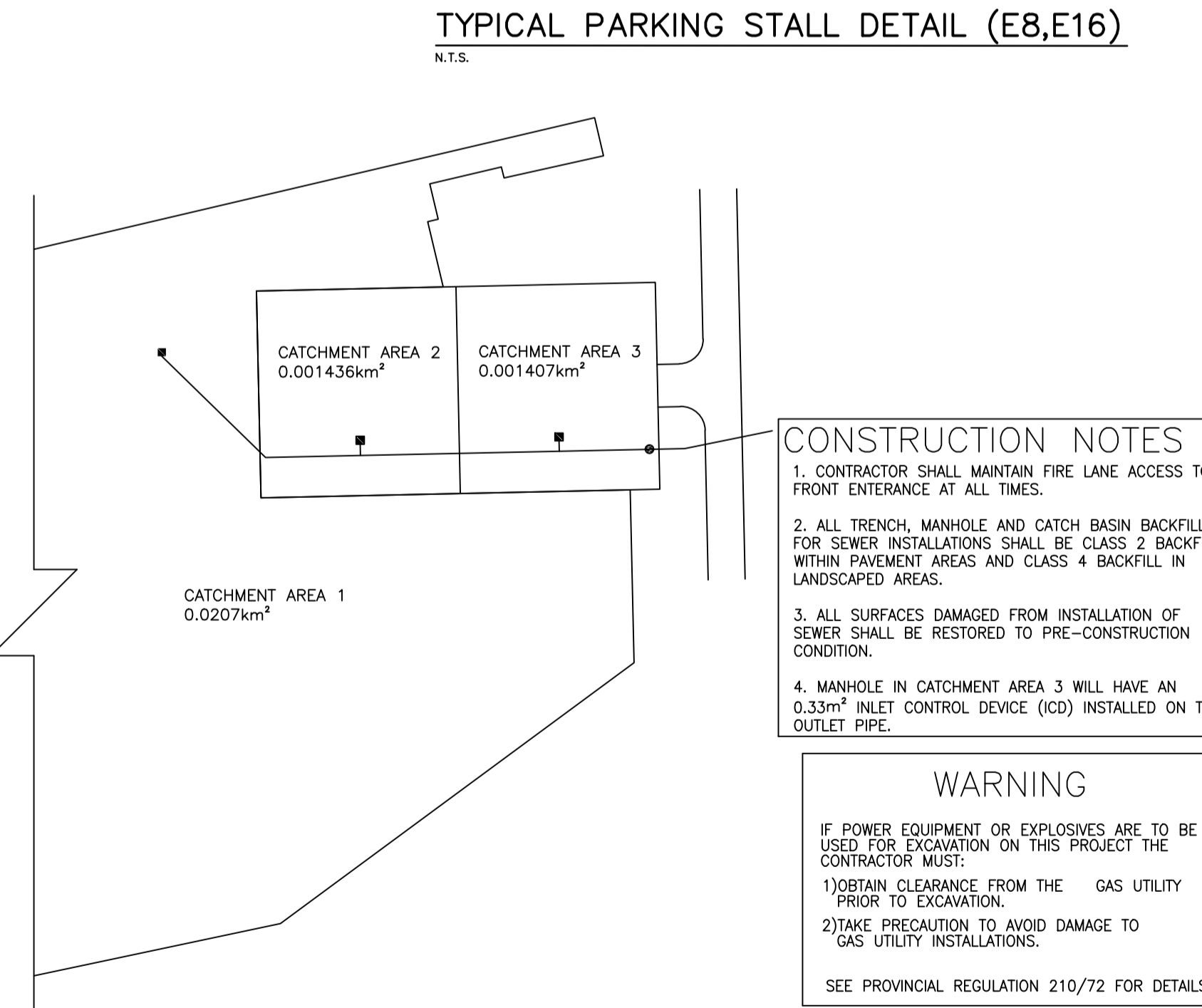


ISOCHRONE METHOD based on calculating impervious runoff based on filling depression storage and pervious runoff based on Horton infiltration equation

PROJECT: Anderson Park
 LOCATION: 900 Raleigh St
 DATE: Mar 12 2011

| Time (min) | 25 yr rainfall (mm) | infiltration (mm/hr) | sum of infiltrated storm ² (mm) | impervious runoff (mm/hr) | pervious runoff (mm/hr) | total per imp. flow (mm/hr) | allowable discharge (mm/hr) | net runoff (mm/hr) | mass sum of storage (mm) |
|------------|---------------------|----------------------|--|---------------------------|-------------------------|-----------------------------|-----------------------------|--------------------|--------------------------|
| 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 0.12 | 0.01 | 0.01 | 0.00 | 2.16 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 0.13 | 0.01 | 0.02 | 0.00 | 1.56 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | 0.15 | 0.01 | 0.03 | 0.00 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20 | 0.17 | 0.01 | 0.05 | 0.00 | 0.84 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25 | 0.19 | 0.02 | 0.06 | 0.00 | 0.65 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30 | 0.21 | 0.02 | 0.08 | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 |
| 35 | 0.23 | 0.02 | 0.10 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 |
| 40 | 0.26 | 0.02 | 0.12 | 0.16 | 0.30 | 0.00 | 0.00 | 0.16 | 0.16 |
| 45 | 0.29 | 0.02 | 0.15 | 0.20 | 0.25 | 0.04 | 0.22 | 0.42 | 0.42 |
| 50 | 0.33 | 0.03 | 0.17 | 0.23 | 0.18 | 0.24 | 1.21 | 1.51 | 1.51 |
| 55 | 0.42 | 0.04 | 0.21 | 0.30 | 0.10 | 0.37 | 1.67 | 2.25 | 2.25 |
| 60 | 0.53 | 0.04 | 0.25 | 0.37 | 0.16 | 0.61 | 3.12 | 3.65 | 3.65 |
| 65 | 0.76 | 0.06 | 0.32 | 0.53 | 0.15 | 0.61 | 5.62 | 6.49 | 6.49 |
| 70 | 1.24 | 0.10 | 0.42 | 0.87 | 0.14 | 1.10 | 8.28 | 9.38 | 9.38 |
| 75 | 2.96 | 0.25 | 0.87 | 2.08 | 0.12 | 2.63 | 14.45 | 16.53 | 16.53 |
| 80 | 7.86 | 0.68 | 1.32 | 5.52 | 0.13 | 7.73 | 39.54 | 45.06 | 45.06 |
| 85 | 3.93 | 0.33 | 1.65 | 2.76 | 0.13 | 3.80 | 19.46 | 22.22 | 22.22 |
| 90 | 2.29 | 0.19 | 1.84 | 1.61 | 0.12 | 2.17 | 11.08 | 12.69 | 12.69 |
| 95 | 1.54 | 0.13 | 1.97 | 1.08 | 0.12 | 1.42 | 7.25 | 8.33 | 8.33 |
| 100 | 1.17 | 0.10 | 2.07 | 0.62 | 0.12 | 1.05 | 5.37 | 6.19 | 6.19 |
| 105 | 0.92 | 0.08 | 2.14 | 0.65 | 0.12 | 0.80 | 4.09 | 4.74 | 4.74 |
| 110 | 0.75 | 0.06 | 2.20 | 0.53 | 0.12 | 0.63 | 3.23 | 3.75 | 3.75 |
| 115 | 0.65 | 0.05 | 2.26 | 0.46 | 0.12 | 0.53 | 2.72 | 3.17 | 3.17 |
| 120 | 0.58 | 0.05 | 2.31 | 0.41 | 0.12 | 0.48 | 2.38 | 2.77 | 2.77 |
| 125 | 0.51 | 0.04 | 2.35 | 0.36 | 0.12 | 0.39 | 2.00 | 2.36 | 2.36 |
| 130 | 0.45 | 0.04 | 2.39 | 0.32 | 0.12 | 0.33 | 1.70 | 2.01 | 2.01 |
| 135 | 0.40 | 0.03 | 2.42 | 0.28 | 0.12 | 0.28 | 1.44 | 1.72 | 1.72 |
| 140 | 0.35 | 0.03 | 2.45 | 0.25 | 0.12 | 0.23 | 1.19 | 1.43 | 1.43 |
| 145 | 0.30 | 0.03 | 2.47 | 0.21 | 0.12 | 0.18 | 0.93 | 1.14 | 1.14 |
| 150 | 0.26 | 0.02 | 2.50 | 0.16 | 0.12 | 0.14 | 0.73 | 0.91 | 0.91 |
| 155 | 0.22 | 0.02 | 2.51 | 0.15 | 0.12 | 0.10 | 0.52 | 0.68 | 0.68 |
| 160 | 0.19 | 0.02 | 2.53 | 0.13 | 0.12 | 0.07 | 0.37 | 0.50 | 0.50 |
| 165 | 0.17 | 0.01 | 2.54 | 0.12 | 0.12 | 0.05 | 0.27 | 0.39 | 0.39 |
| 170 | 0.16 | 0.01 | 2.56 | 0.11 | 0.12 | 0.04 | 0.21 | 0.33 | 0.33 |
| 175 | 0.15 | 0.01 | 2.57 | 0.11 | 0.12 | 0.03 | 0.16 | 0.27 | 0.27 |
| 180 | 0.14 | 0.01 | 2.58 | 0.10 | 0.12 | 0.02 | 0.11 | 0.21 | 0.21 |
| 185 | 0.13 | 0.01 | 2.59 | 0.09 | 0.12 | 0.01 | 0.08 | 0.15 | 0.15 |
| 190 | 0.12 | 0.01 | 2.60 | 0.08 | 0.12 | 0.01 | 0.06 | 0.09 | 0.09 |
| 195 | 0.12 | 0.01 | 2.61 | 0.08 | 0.12 | 0.00 | 0.01 | 0.09 | 0.09 |
| 261 | | | | | | | | | |

METRIC
 WHOLE NUMBERS INDICATE MILLIMETRES
 DECIMALIZED NUMBERS INDICATE METRES



| EXISTING | LEGEND - PLAN | PROPOSED | EXISTING | LEGEND - PLAN | PROPOSED | EXISTING | LEGEND - PROFILE | PROPOSED |
|----------|---------------------|----------|----------|---------------------|----------|----------|------------------|----------|
| ⊕ | HYDRANT | ⊕ | --- | LDS/WWS | --- | --- | --- | --- |
| ⊙ | VALVE | ⊙ | --- | WATERMAIN | --- | --- | --- | --- |
| ⊗ | CURB STOP | ⊗ | --- | GAS | --- | --- | --- | --- |
| ▬ | CONCRETE SIDEWALK | ▬ | ▬ | TRAFFIC SIGNALS | ▬ | --- | --- | --- |
| ○ | O.L.S. | ○ | ▬ | CONCRETE | ▬ | --- | --- | --- |
| ○ | MANHOLE | ○ | ▬ | CURB RENEWAL | ▬ | --- | --- | --- |
| □ | CATCH BASIN | □ | ▬ | ELEVATIONS | ▬ | 231.000 | 231.000 | 231.000 |
| △ | CURB INLET | △ | --- | PROPERTY LINE | --- | --- | --- | --- |
| ☆ | HYDRO POLE | ☆ | --- | SURVEY BAR | --- | --- | --- | --- |
| ⊕ | TRAFFIC SIGNAL POLE | ⊕ | --- | GEODETIC BENCH MARK | --- | --- | --- | --- |
| --- | | --- | --- | RAMP CURB | --- | --- | --- | --- |

LOCATION APPROVED UNDERGROUND STRUCTURES

GBM 12-058
 230.554

ENGINEERING DIVISION
 TECHNOLOGY SERVICES BRANCH
 106 - 1155 PACIFIC AVE

DESIGNED BY: R.M.
 CHECKED BY: C.T.
 DRAWN BY: R.M.
 APPROVED BY: J.B.

HOR. SCALE: 1 : 500
 VERTICAL: 1:20
 DATE: 2011/03/24

BID OPPORTUNITY NO. 111-2011

ENGINEER'S SEAL
 B.S. KIBBINS
 Member 24334
 REGISTERED PROFESSIONAL ENGINEER

THE CITY OF WINNIPEG
 PUBLIC WORKS DEPARTMENT

ANDERSON PARK
 ASPHALT PARKING LOT EXPANSION
 AND ASSOCIATED WORKS

CITY DRAWING NUMBER SE-11-17
 SHEET 2 OF 2

2