## 200mmØ WATERMAIN TABLE

| STATION | SURFACE ELEVATION | TOP OF WM ELEVATION | DESCRIPTION |
|---|---|---|---|
| 0+00 | 82.70 | ±80.30 ✳ | TEE CONNECTION TO EXISTING 200mmØ WATERMAIN |
| 0+09 | 82.82 | 80.42 | 45° HORIZONTAL BEND |
| 0+12.9 | 82.85 | 80.45 | V&VB @ PROPERTY LINE |
| 0+15 | 82.95 | 80.55 | 45° HORIZONTAL BEND |
| 0+20 | 83.15 | 80.75 | CROSS BELOW 200mmØ STM SEWER (CLEARANCE = 0.95m±) |
| 0+23.5 | 83.30 | 80.90 | 50mmØ SERVICE (1+00) |
| 0+25 | 83.35 | 80.95 | - - - |
| 0+50 | 83.25 | 80.85 | - - - |
| 0+54.2 | 83.24 | 80.84 | CROSS BELOW 375mmØ STM SEWER (CLEARANCE = 0.80m±) |
| 0+57.7 | 83.23 | 80.83 | 50mmØ SERVICE (2+00) |
| 0+64.4 | 83.16 | 80.76 | CROSS BELOW 375mmØ STM SEWER (CLEARANCE = 0.85m±) |
| 0+66.7 | 83.14 | 80.74 | CROSS BELOW 200mmØ STM SEWER (CLEARANCE = 0.95m±) |
| 0+75 | 83.18 | 80.78 | - - - |
| 0+77.2 | 83.30 | 80.90 | 200x200x150 TEE - FIRE HYDRANT LEAD (4+00) |
| 0+99 | 83.39 | 80.99 | 50mmØ SERVICE (5+00) |
| 0+100 | 83.40 | 81.00 | 200mmØ CAP AND THRUSTBLOCK |

✳ EXACT DEPTH OF EXISTING WATERMAIN TO BE DETERMINED AT TIME OF EXCAVATION, CONTRACTOR TO CONFIRM TOP OF WATERMAIN. PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAIL W22 WHERE COVER IS LESS THAN 2.4m

## 150mmØ FIRE HYDRANT LEAD

| STATION | SURFACE ELEVATION | TOP OF WM ELEVATION | DESCRIPTION |
|---|---|---|---|
| 4+00 | 83.30 | 80.90 | 200x200x150 TEE - FIRE HYDRANT LEAD |
| 4+01.0 | 83.30 | 80.90 | V&VB |
| 4+02.7 | 83.52 | 81.12 | CROSS BELOW 600mmØ STM SEWER (CLEARANCE = 0.54m±) |
| 4+04.8 | 83.62 | 81.22 | FIRE HYDRANT |

## 50mmØ WATER SERVICE TABLE

| STATION | SURFACE ELEVATION | TOP OF WM ELEVATION | DESCRIPTION |
|---|---|---|---|
| 1+00 | 83.30 | 80.90 | 50mmØ SERVICE (0.23.5) |
| 1+02.3 | 83.50 | 80.95 | 50mmØ STAND POST |
| 1+03.3 | 83.60 | 80.95 | 50mmØ CAP FOR BUILDING SERVICE |
| 2+00 | 83.23 | 80.83 | 50mmØ SERVICE (0.57.7) |
| 2+25 | 83.45 | 81.05 | - - - |
| 2+28.8 | 83.48 | 81.08 | CROSS ABOVE 200mmØ SAN SEWER (CLEARANCE = 0.40m±) |
| 2+46 | 83.62 | 81.22 | 50mmØ STAND POST |
| 2+50 | 83.75 | 81.35 | - - - |
| 2+52.1 | 83.75 | 81.35 | 50mmØ CAP FOR BUILDING SERVICE |
| 3+00 | 83.60 | 81.20 | 50mmØ CAP FOR BUILDING SERVICE |
| 3+11.7 | 83.45 | 81.05 | CROSS ABOVE 200mmØ SAN SEWER (CLEARANCE = 0.33m±) |
| 3+24.5 | 83.62 | 81.22 | 50mmØ STAND POST |
| 3+33.1 | 83.80 | 81.22 | 50mmØ CAP FOR BUILDING SERVICE |
| 5+00 | 83.39 | 80.99 | 50mmØ SERVICE (0+99) |
| 5+02.7 | 83.45 | 81.26 ✳✳ | CROSS BELOW 600mmØ STM SEWER (CLEARANCE = 0.45m±) |
| 5+09 | 83.55 | 81.30 ✳✳ | 50mmØ STAND POST |
| 5+9.8 | 83.65 | 81.25 | 50mmØ CAP FOR BUILDING SERVICE |

✳✳ WATERMAIN CROSSING ABOVE SANITARY SEWER AS PER CITY OF OTTAWA STANDARD DETAIL W25.2. PROVIDE ADEQUATE INSULATION AS PER CITY OF OTTAWA STANDARD DETAIL W22

## WATERMAIN NOTES:

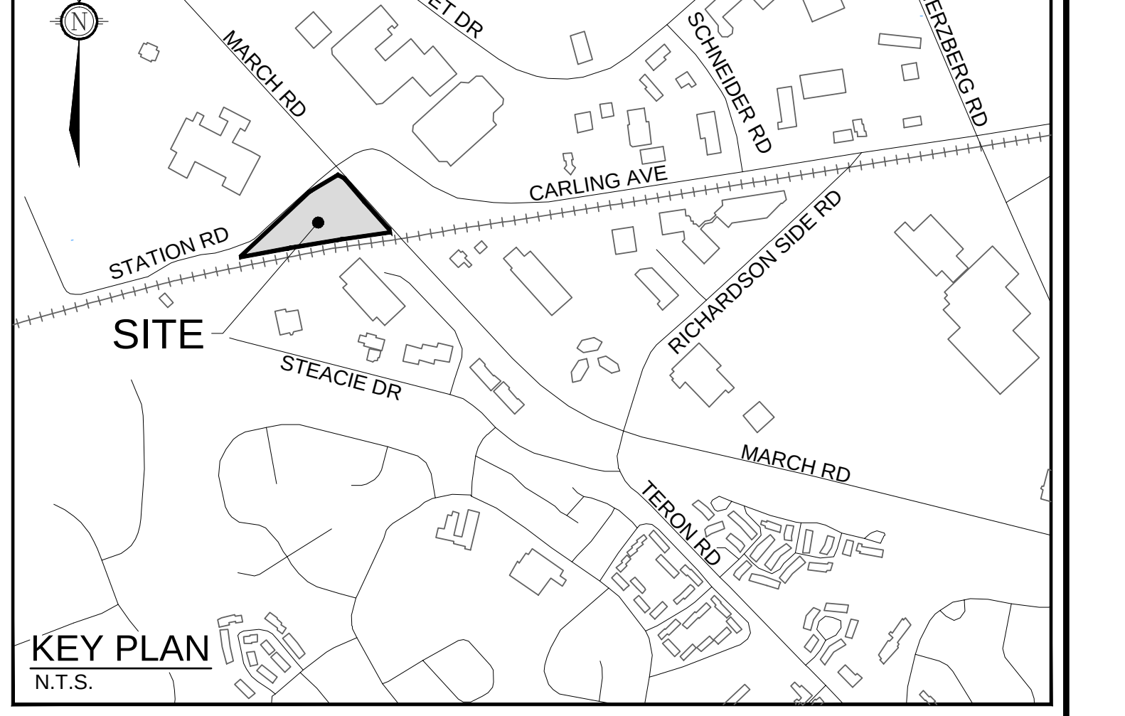
1. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH ALL CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS, SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.

2. SPECIFICATIONS:

| ITEM | SPEC. No. | REFERENCE |
|---|---|---|
| WATERMAIN TRENCHING | W17 | CITY OF OTTAWA |
| THERMAL INSULATION IN SHALLOW TRENCHES | W22 | CITY OF OTTAWA |
| THERMAL INSULATION OF WATERMAIN AT OPEN STRUCTURES | W23 | CITY OF OTTAWA |
| WATERMAIN CROSSING BELOW SEWER | W25 | CITY OF OTTAWA |
| HYDRANT INSTALLATION | W19 | CITY OF OTTAWA |
| WATERMAIN 150mmØ AND LARGER | PVC DR 18 | |
| WATERMAIN 50mmØ AND SMALLER | PEX SDR 9 | |

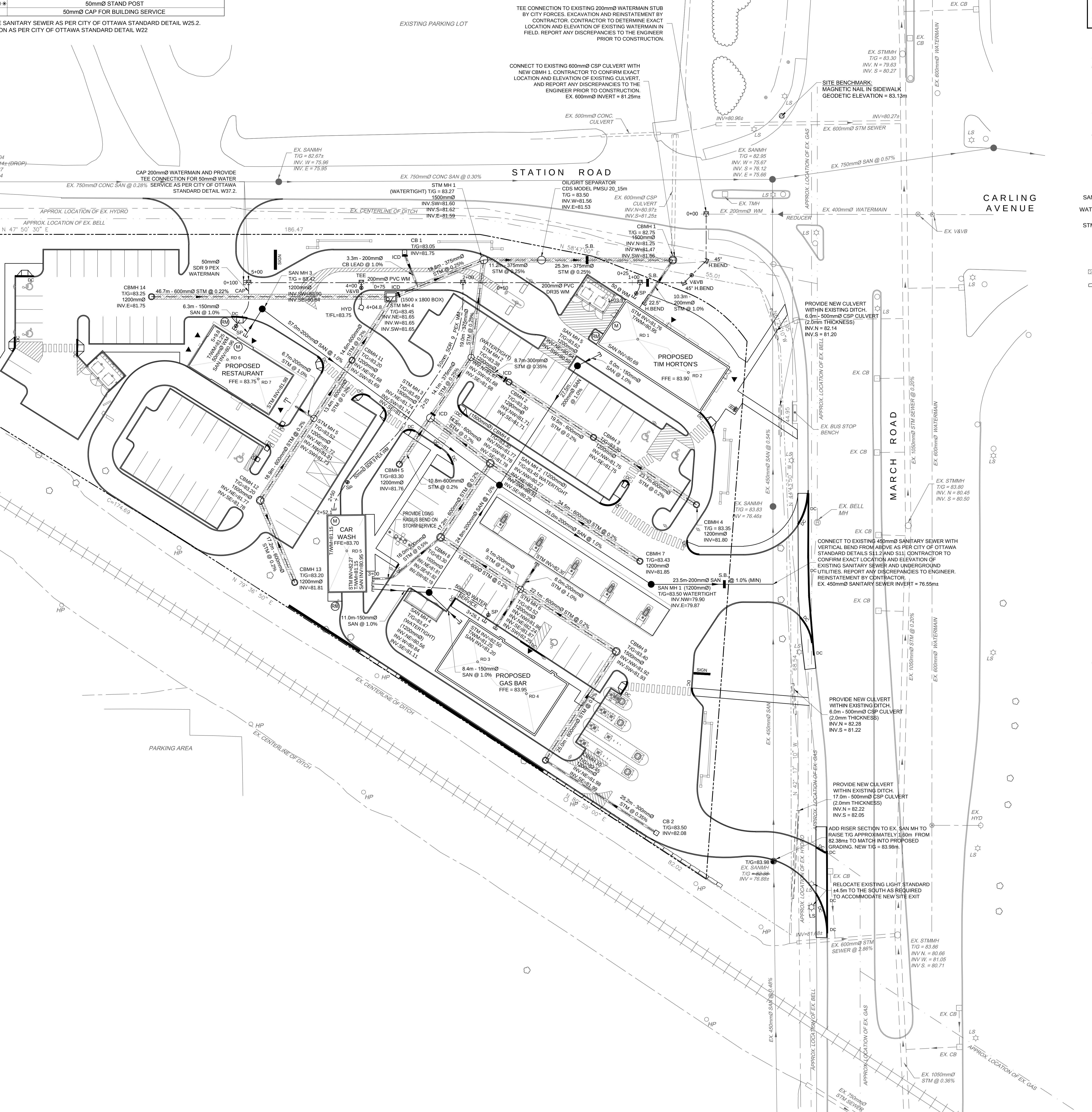
3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.

4. WATER SERVICES ARE TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.



NORTH

KEY PLAN
N.T.S.



TEE CONNECTION TO EXISTING 200mmØ WATERMAIN STUB BY CITY FORCES. EXCAVATION AND REINSTATEMENT BY CONTRACTOR. CONTRACTOR TO DETERMINE EXACT LOCATION AND ELEVATION OF EXISTING WATERMAIN IN FIELD. REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.

CONNECT TO EXISTING 600mmØ CSP CULVERT WITH NEW CBMH 1. CONTRACTOR TO CONFIRM EXACT LOCATION AND ELEVATION OF EXISTING CULVERT, AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
EX. 600mmØ INVERT = 81.25m±

PROVIDE NEW CULVERT WITHIN EXISTING DITCH.
6.0m - 500mmØ CSP CULVERT
(2.0mm THICKNESS)
INV.N = 82.14
INV.S = 81.20

CONNECT TO EXISTING 450mmØ SANITARY SEWER WITH VERTICAL BEND FROM ABOVE AS PER CITY OF OTTAWA STANDARD DETAILS S11.2 AND S11. CONTRACTOR TO CONFIRM EXACT LOCATION AND ELEVATION OF EXISTING SANITARY SEWER AND UNDERGROUND UTILITIES. REPORT ANY DISCREPANCIES TO ENGINEER. REINSTATEMENT BY CONTRACTOR.
EX. 450mmØ SANITARY SEWER INVERT = 76.55m±

PROVIDE NEW CULVERT WITHIN EXISTING DITCH.
6.0m - 500mmØ CSP CULVERT
(2.0mm THICKNESS)
INV.N = 82.28
INV.S = 81.22

PROVIDE NEW CULVERT WITHIN EXISTING DITCH.
17.0m - 500mmØ CSP CULVERT
(2.0mm THICKNESS)
INV.N = 82.22
INV.S = 82.05

ADD RISER SECTION TO EX. SAN MH TO RAISE T/G APPROXIMATELY 1.60m FROM 82.38m± TO MATCH INTO PROPOSED GRADING. NEW T/G = 83.98m.

RELOCATE EXISTING LIGHT STANDARD ±4.5m TO THE SOUTH AS REQUIRED TO ACCOMMODATE NEW SITE EXIT

## LEGEND

| | |
|---|---|
| — - - — | PROPERTY LINE |
| ═ | PROPOSED CURB |
| DC | PROPOSED DEPRESSED CURB |
| 150mmØ | PROPOSED WATERMAIN AND DIAMETER |
| SP ⊗ | PROPOSED STANDPOST |
| V&VB ⊗ | PROPOSED VALVE AND VALVE BOX |
| [ | PROPOSED CAP |
| Ⓜ | PROPOSED WATER METER |
| RM | PROPOSED REMOTE METER |
| SANMH 1 ● | PROPOSED SANITARY MANHOLE & SEWER |
| WATERTIGHT (W/T) ● | PROPOSED WATERTIGHT FRAME AND COVER |
| STMMH 1 ○ | PROPOSED STORM MANHOLE & SEWER |
| ICD ▌ | PROPOSED INLET CONTROL DEVICE |
| ► | DIRECTION OF FLOW |
| ▨ | PROPOSED SHALLOW SEWER INSULATION |
| ▭ | PROPOSED RETAINING WALL (MAX. 1.0m HEIGHT) |
| S.B. ▌ | PROPOSED SEEPAGE BARRIER (PER GEOTECHNICAL REPORT) |
| CB 1 ⊡ | PROPOSED CATCHBASIN AND LEAD |
| CBMH 1 ▢ | PROPOSED CATCHBASIN MANHOLE |
| RD1 ○ | PROPOSED ROOF DRAIN |
| ▼ | PROPOSED BUILDING ENTRANCE |
| ○ | *EXISTING UTILITY POLE C/W GUY WIRES* |
| V&VB ⊗ | *EXISTING WATERMAIN C/W VALVE & VALVE BOX* |
| ○ ⊗ | *EXISTING HYDRANT C/W VALVE & LEAD* |
| SAN MH ● | *EXISTING SANITARY MANHOLE & SEWER* |
| STM MH ○ | *EXISTING STORM MANHOLE & SEWER* |
| CB 1 ⊡ | *EXISTING CATCHBASIN C/W CATCHBASIN LEAD* |
| ☼ | *EXISTING LIGHT STANDARD* |

## GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $2,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL REPORT (No. 13-339, DATED NOVEMBER, 2013), PREPARED BY HOULE CHEVRIER ENGINEERING LTD. FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT (R-2013-210) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE PAINTING AND PARKING LOT MARKINGS.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

## SEWER NOTES:

1. SPECIFICATIONS:

| ITEM | SPEC. No. | REFERENCE |
|---|---|---|
| CATCHBASIN (600x600mm) | 705.010 | OPSD |
| STORM / SANITARY MANHOLE (1200Ø) | 701.010 | OPSD |
| STORM MANHOLE (1500Ø) | 701.011 | OPSD |
| STORM MANHOLE (1500x1800 BOX) | - | - |
| CB, FRAME & COVER | 400.020 | OPSD |
| STORM / SANITARY MH FRAME & COVER | 401.010 | OPSD |
| WATERTIGHT FRAME & COVER | 401.030 | OPSD |
| SEWER TRENCH | S6, S7 | CITY OF OTTAWA |
| STORM SEWER 600mmØ AND LARGER | CONC. 65-D | |
| STORM SEWER 375mmØ AND SMALLER | PVC DR 35 | |
| SANITARY SEWER | PVC DR 35 | |

2. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.
3. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
4. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
5. STORM MANHOLES AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
6. ALL CATCHBASINS AND CATCHBASIN MANHOLES TO BE PROVIDED WITH MINIMUM 3 METER LONG PERFORATED SUBDRAINS WHICH EXTEND IN AT LEAST TWO DIRECTIONS FROM EACH CATCHBASIN AT PAVEMENT SUBGRADE LEVEL.
7. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.

## AREA A2 - INLET CONTROL DEVICE DATA - CB 1

| DESIGN EVENT | IPEX TEMPEST MODEL | DIAMETER OF OUTLET PIPE (mm) | DESIGN FLOW (L/s) | UPSTREAM HEAD (m) | SURFACE PONDING (m) | VOLUME (m³) |
|---|---|---|---|---|---|---|
| 1:5 YR | LMF - VORTEX ICD | 200 | 5.2 | 1.36 | 0.16 | 9.0 |
| 1:100 YR | LMF - VORTEX ICD | 200 | 5.3 | 1.44 | 0.24 | 24.1 |

## AREA A3 - INLET CONTROL DEVICE DATA - CBMH 2

| DESIGN EVENT | IPEX TEMPEST MODEL | DIAMETER OF OUTLET PIPE (mm) | DESIGN FLOW (L/s) | UPSTREAM HEAD (m) | SURFACE PONDING (m) | VOLUME (m³) |
|---|---|---|---|---|---|---|
| 1:5 YR | LMF - VORTEX ICD | 300 | 4.3 | 1.52 | 0.08 | 28.4 |
| 1:100 YR | LMF - VORTEX ICD | 300 | 4.4 | 1.60 | 0.16 | 66.8 |

## AREA A4 - INLET CONTROL DEVICE DATA - STM MH 3

| DESIGN EVENT | IPEX TEMPEST MODEL | DIAMETER OF OUTLET PIPE (mm) | DESIGN FLOW (L/s) | UPSTREAM HEAD (m) | SURFACE PONDING (m) | VOLUME (m³) |
|---|---|---|---|---|---|---|
| 1:5 YR | PLUG ICD-105mmØ ORIFICE | 375 | 16.0 | 0.45 | - - - | 54.8 |
| 1:100 YR | PLUG ICD-105mmØ ORIFICE | 375 | 29.5 | 1.55 | 0.18 | 102.2 |

## AREA A5 - INLET CONTROL DEVICE DATA - STM MH 4

| DESIGN EVENT | IPEX TEMPEST MODEL | DIAMETER OF OUTLET PIPE (mm) | DESIGN FLOW (L/s) | UPSTREAM HEAD (m) | SURFACE PONDING (m) | VOLUME (m³) |
|---|---|---|---|---|---|---|
| 1:5 YR | PLUG ICD - 76mmØ ORIFICE | 375 | 15.1 | 1.47 | 0.11 | 52.4 |
| 1:100 YR | PLUG ICD - 76mmØ ORIFICE | 375 | 15.6 | 1.59 | 0.23 | 130.2 |

## ROOF DRAIN TABLE - RD 1 - 7

| AREA ID | ROOF DRAIN No. | ROOF DRAIN OPENING | 1:5 YEAR RELEASE RATE | APPROX. 5 YR PONDING DEPTH | 1:100 YEAR RELEASE RATE | APPROX. 100 YR PONDING DEPTH |
|---|---|---|---|---|---|---|
| B1 | RD 1 | CLOSED | 0.76 L/s | 0.07 m | 0.76 L/s | 0.10 m |
| B1 | RD 2 | CLOSED | 0.76 L/s | 0.07 m | 0.76 L/s | 0.10 m |
| B2 | RD 3 | CLOSED | 0.76 L/s | 0.07 m | 0.76 L/s | 0.10 m |
| B2 | RD 4 | CLOSED | 0.76 L/s | 0.07 m | 0.76 L/s | 0.10 m |
| B3 | RD 5 | 1/4 EXPOSED | 0.85 L/s | 0.07 m | 0.95 L/s | 0.10 m |
| B4 | RD 6 | 1/4 EXPOSED | 0.82 L/s | 0.07 m | 1.95 L/s | 0.10 m |
| B4 | RD 7 | 1/4 EXPOSED | 0.82 L/s | 0.07 m | 1.95 L/s | 0.10 m |

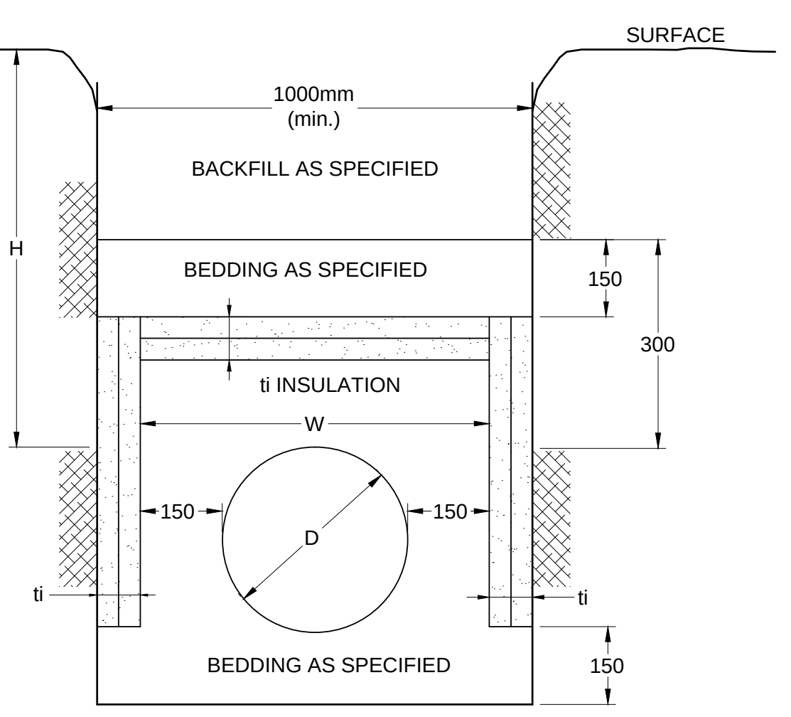
* ALL PROPOSED ROOF DRAINS TO BE WATTS ACCUTROL ADJUSTABLE FLOW CONTROL ROOF DRAINS. REFER TO APPENDIX 'F' IN THE STORMWATER MANAGEMENT REPORT (R-2013-210) FOR ROOF DRAIN DETAILS.

ti = THICKNESS OF INSULATION (mm)
h = DEPTH OF COVER
W = D + 300 (1000 min.)
W = WIDTH OF INSULATION (mm)
D = O.D OF PIPE (mm)

| COVER (mm) | INSULATION THICKNESS (mm) |
|---|---|
| 1500-1200 | 50 |
| 1200-900 | 75 |
| 900-600 | 100 |

NOTES:

1. INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 1.5m COVER WITH EXPANDED POLYSTYRENE INSULATION AS SHOWN.
2. THE THICKNESS OF INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER (SEE TABLE)



TYPICAL INSULATION DETAIL (SEWERS ONLY)
NOT TO SCALE

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER INFORMATION
STARBANK DEVELOPMENTS 401 CORP.
329 BROOKE AVENUE
TORONTO, ONTARIO, M5M 2L4

DUNG LAM
PHONE: (416) 922-2222
E-MAIL: starbank@rogers.com

| No. | REVISION | DATE | BY |
|---|---|---|---|
| 4. | REVISED PER CITY COMMENTS | OCT 31/14 | MS |
| 3. | REVISED PER CITY COMMENTS | JUN 5/14 | MS |
| 2. | ISSUED FOR SITE PLAN APPROVAL | DEC 20/13 | MS |
| 1. | ISSUED FOR REVIEW | DEC 13/13 | MS |

SCALE
1:400
1:400
0 4 8 12 16

| | |
|---|---|
| DESIGN | MS |
| CHECKED | SM / MS |
| DRAWN | MTM / SM |
| CHECKED | SM / MS |
| APPROVED | MS |

**FOR REVIEW ONLY**

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
OCT 31/14
PROVINCE OF ONTARIO

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Email: novainfo@novatech-eng.com

LOCATION
401 MARCH ROAD, KANATA
STARBANK DEVELOPMENTS

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No.
113023-00

REV
REV # 4

DRAWING No.
113023-GP

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PLANB1.DWG - 1000mmx707mm