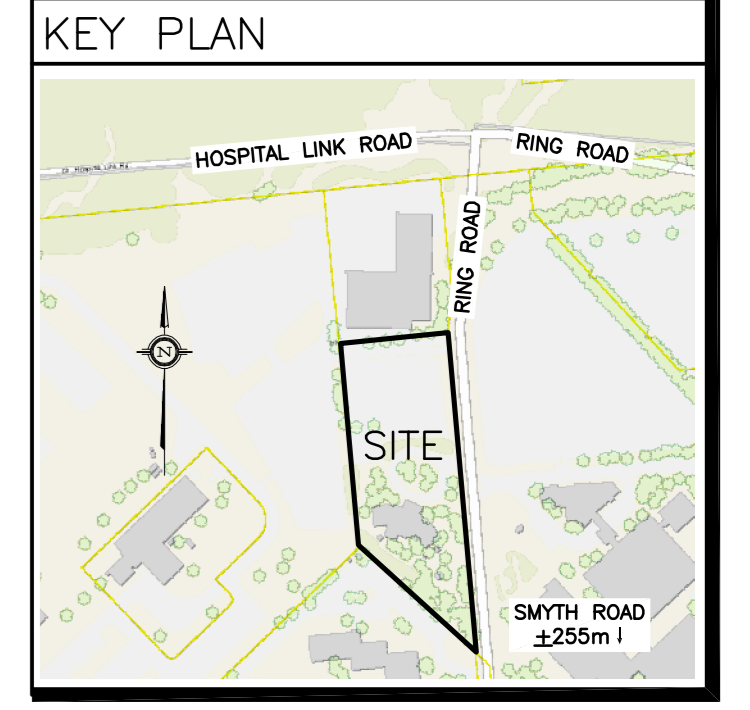


**LEGEND**

- FFL FINISHED FLOOR ELEVATION
- TOF TOP OF FOUNDATION
- BFL BASEMENT FLOOR ELEVATION
- USF UNDERSIDE OF FOOTING
- PROPERTY LINE
- C.R.Z. CRITICAL ROOT ZONE
- CB CATCH-BASIN
- MH STORM MANHOLE
- CB/MH CATCH-BASIN/MANHOLE
- MH SANITARY MANHOLE
- VC VALVE CHAMBER
- ⊗ SUBDRAINS IN CB
- ⊗ SUBDRAINS IN CB/MH
- FH FIRE HYDRANT
- FDC FIRE DEPARTMENT CONNECTION
- CS CURB STOP & STANDPOST
- VB VALVE & VALVE BOX
- ⊕ WATER METER
- ⊕ REMOTE WATER METER
- SAN SANITARY SEWER
- ST SANITARY SEWER
- WS/WM WATER SERVICE/WATERMAIN
- OBV OVERTOP OF PIPE
- SPL SPRINGLINE OF PIPE
- INV INVERT OF PIPE



**CROSSINGS TABLE**

REF	DETAILS	CLEARANCE
1	250 ST INV 75.88 375 ST TOP 74.62	1260mm
2	250 ST INV 75.88 150 SAN TOP 74.46	1420mm
3	375 ST INV 75.79 150 SAN TOP 74.44	1350mm
4	375 ST INV 75.87 150 WM TOP ±75.37	±500mm
5	375 ST INV 75.91 200 WM TOP ±75.37	±540mm

REFER TO NOTES & DETAILS ON DRAWINGS C-5 & C-6

**WATER SERVICE PROFILE TABLE**

MATERIAL:  
150mm PVC PRESSURE CLASS 150 DR18

STATION	DESCRIPTION	GRADE ELEVATION	TOP OF PIPE	DEPTH OF COVER	NOTES
A+00.0	CONNECT TO EXISTING 150 WM	77.65	±75.48	±2.17	-
A+03.0	-	77.68	75.46	2.22	CROSSING 150 SAN TOP 74.72 WM U/S 75.31 - 590mm CLEARANCE (MIN. 250mm REQ'D)
A+04.6	-	77.70	75.45	2.25	ENTRY INTO BUILDING

MATERIAL:  
150mm PVC PRESSURE CLASS 150 DR18

B+00.0	150mm x 150mm TEE (TO FIRE HYDRANT) TO CITY OF OTTAWA STANDARDS	77.39	±75.42	±1.97	START OF 50mm THICK INSULATION AS PER CITY OF OTTAWA DRAWING No. W22
B+01.0	150mm VALVE & VALVE BOX TO CITY OF OTTAWA STANDARDS	77.39	75.40	1.99	-
B+07.8	-	77.47	75.26	2.21	BOTTOM OF CURB
B+09.3	FIRE HYDRANT TO CITY OF OTTAWA STANDARDS	77.50	75.23	2.27	-

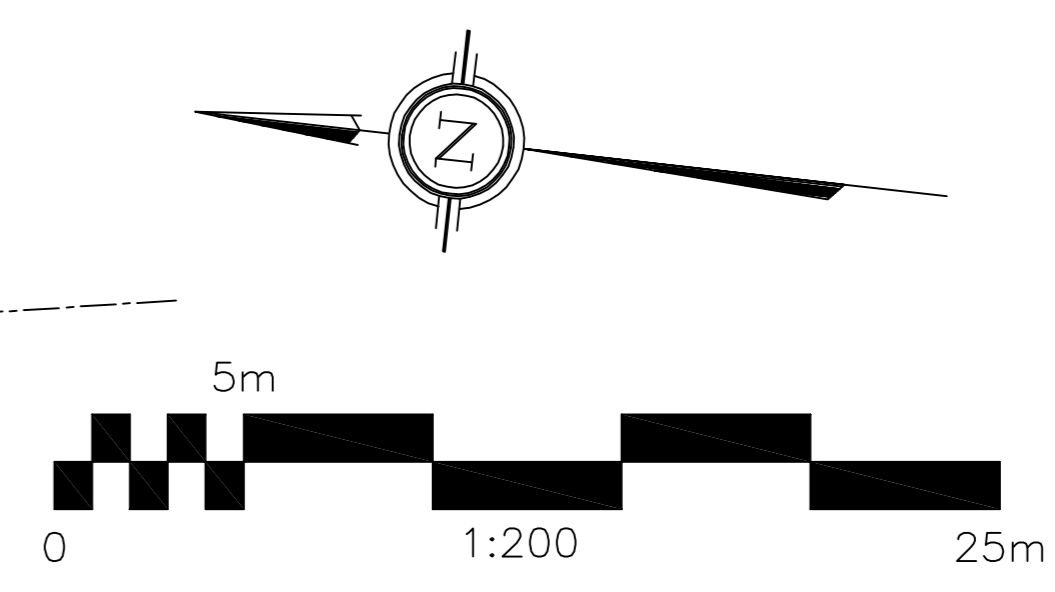
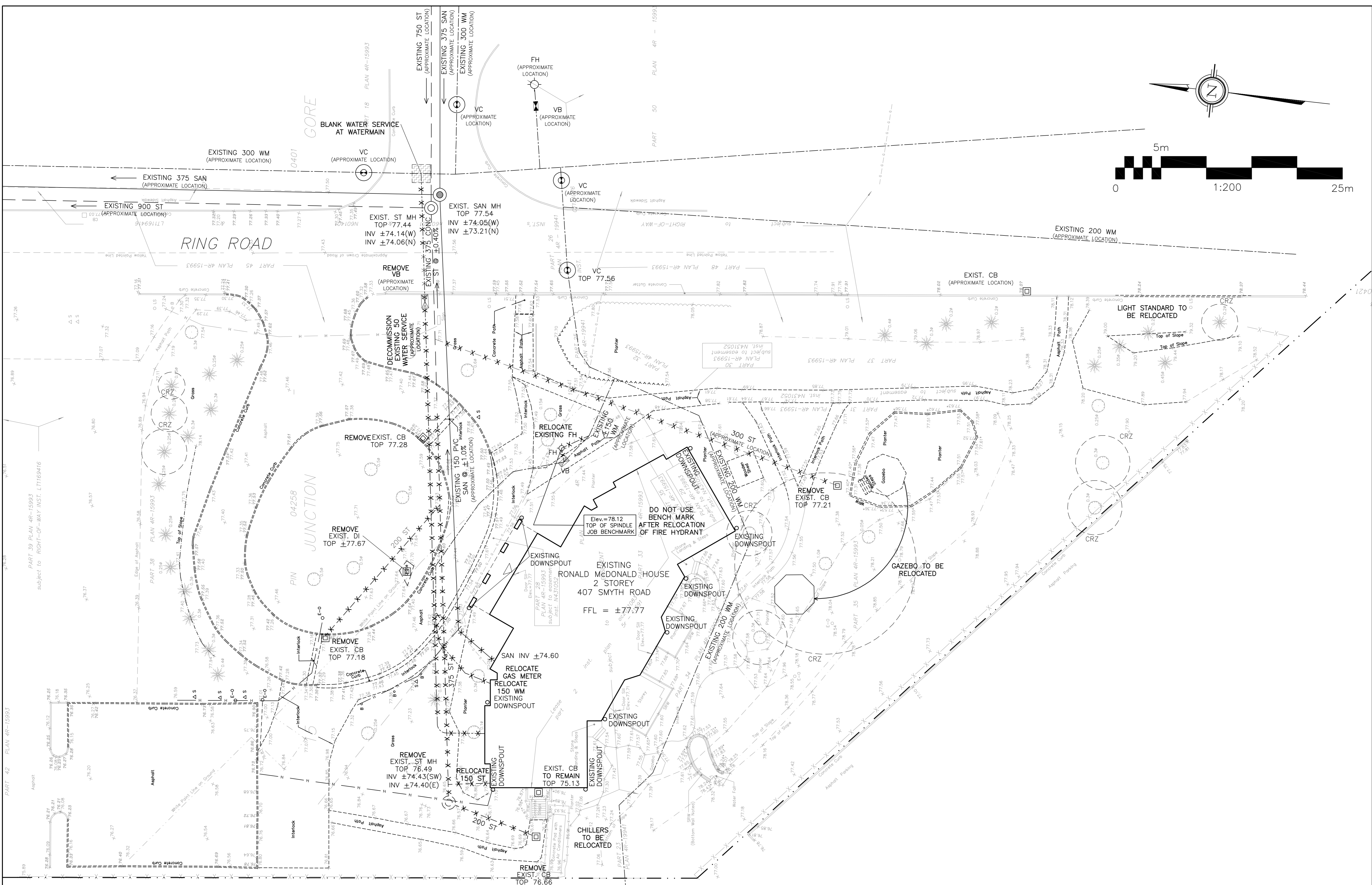
50mm THICK INSULATION AS PER CITY OF OTTAWA DRAWING No. W22 FROM B+00.0 TO B+09.3

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 Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermain  
 700 Long Point Circle 613-425-8044  
 Ottawa, Ontario d.gray@dbgrayengineering.com

Project  
**RONALD McDONALD HOUSE ADDITION**  
 407 SMYTH RD,  
 OTTAWA, ONTARIO

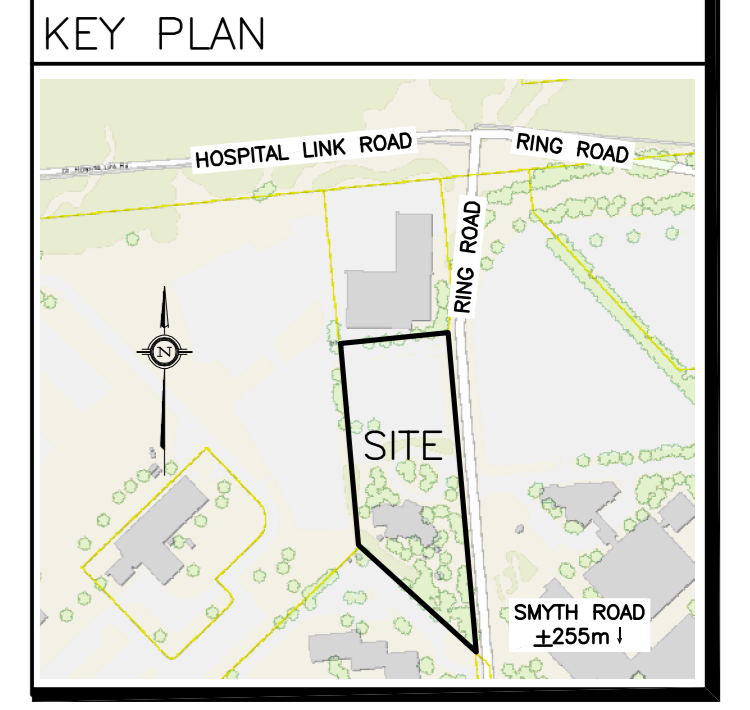
Drawing Title  
**SITE SERVICING PLAN**

Engineer's Seal  
  
 Drawn D.B.G.  
 Hor. Scale 1:200  
 Vert. Scale  
 Date OCT 30-20  
 Job No. 19111  
 Drawing No.  
**C-1**  
 of 8  
 NOT VALID UNLESS SIGNED & DATED



**LEGEND**

- FFL FINISHED FLOOR ELEVATION
- TOF TOP OF FOUNDATION
- BFL BASEMENT FLOOR ELEVATION
- USF UNDERSIDE OF FOOTING
- PROPERTY LINE
- C.R.Z. CRITICAL ROOT ZONE
- CB CATCH-BASIN
- MH STORM MANHOLE
- CB/MH CATCH-BASIN/MANHOLE
- MH SANITARY MANHOLE
- VC VALVE CHAMBER
- VC SANITARY IN CB
- VC SUBDRAINS IN CB/MH
- FH FIRE HYDRANT
- FDC FIRE DEPARTMENT CONNECTION
- CS CURB STOP & STANDPOST
- VB VALVE & VALVE BOX
- ⊙ WATER METER
- ⊙ REMOTE WATER METER
- SAN SANITARY SEWER
- ST STORM SEWER
- WS/WW WATER SERVICE/WATERMAIN
- OBV OVERT OF PIPE
- SPL SPRINGLINE OF PIPE
- INV INVERT OF PIPE

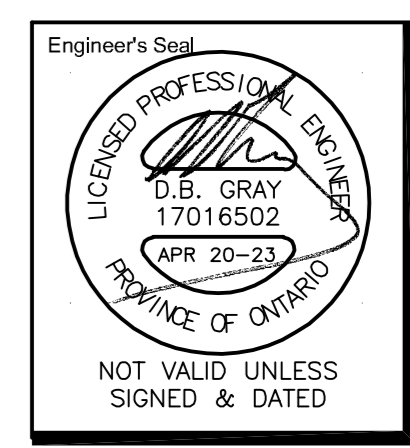


No.	DATE	REVISION
7	APR 20-23	RE-ISSUED FOR APPROVAL
6	MAR 17-23	RE-ISSUED FOR APPROVAL
5	FEB 17-23	PROGRESS SET
4	DEC 16-22	ISSUED FOR APPROVAL
3	NOV 25-22	ISSUED FOR CLIENT REVIEW
2	NOV 23-22	ISSUED FOR COORDINATION
1	OCT 20-22	PRELIMINARY

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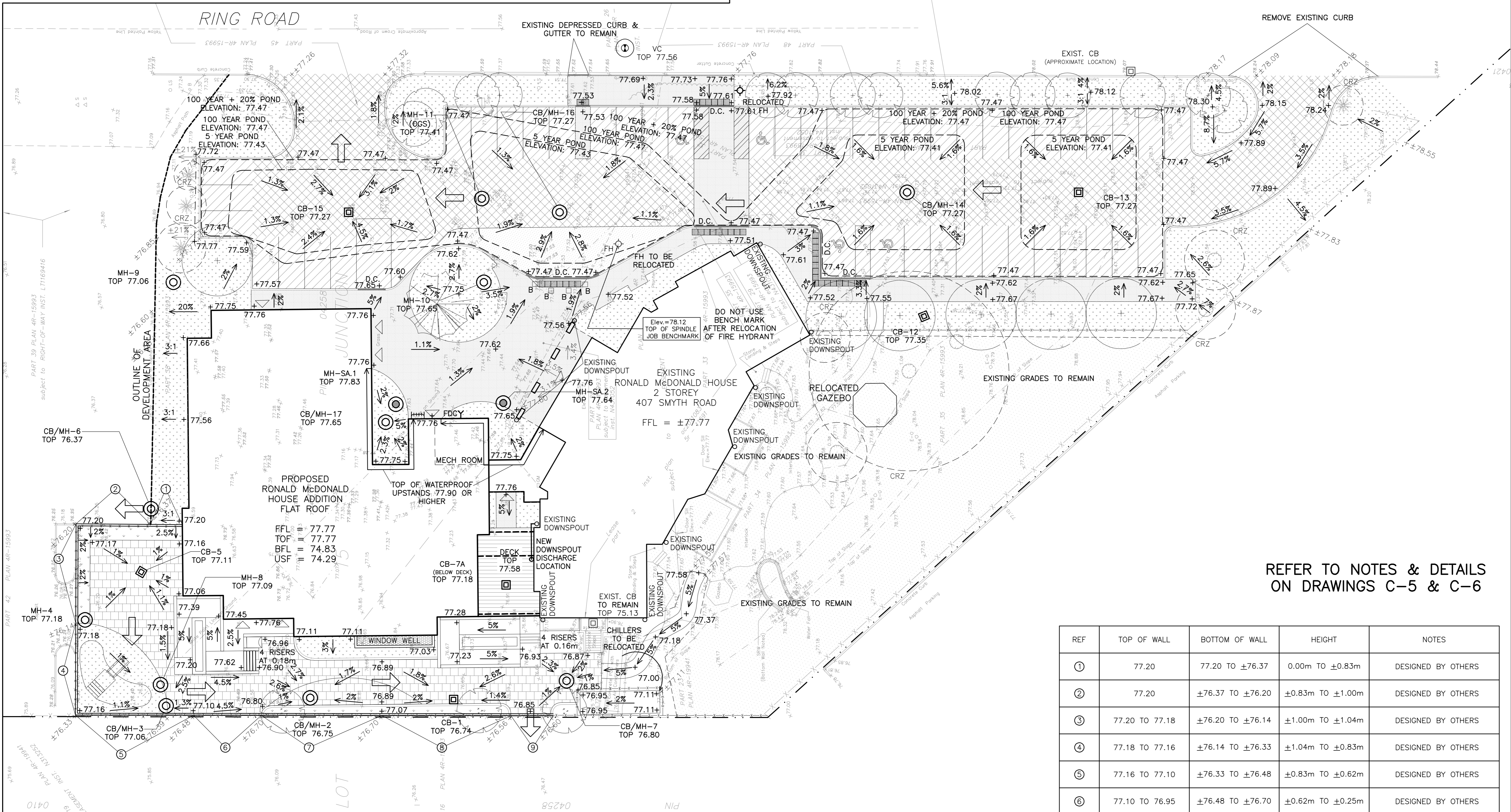
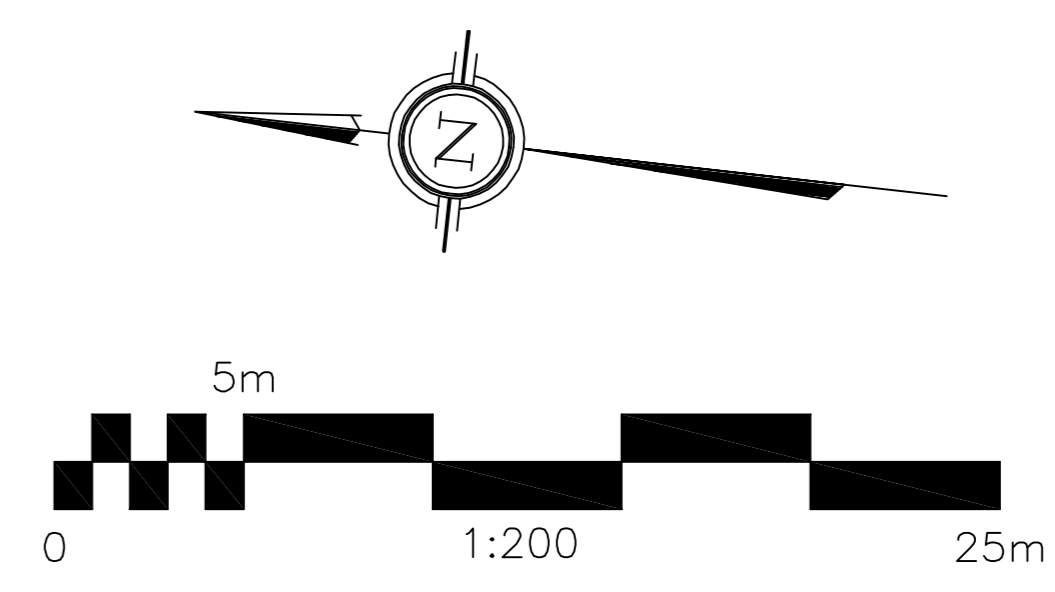
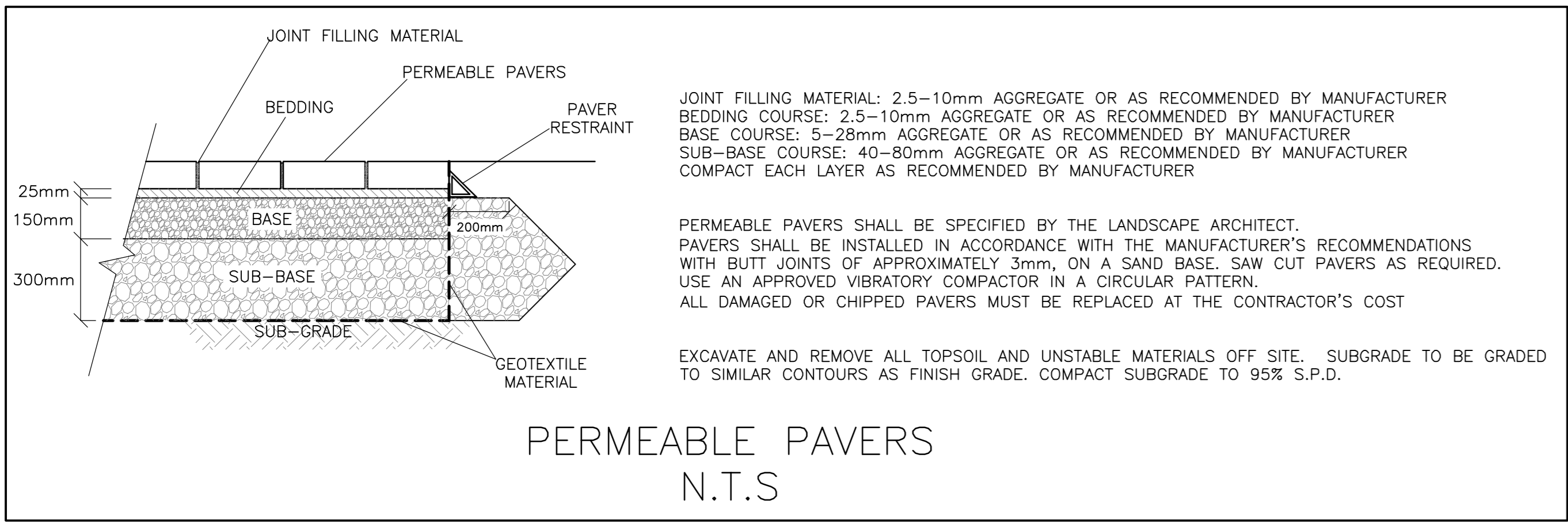
Drawing Title  
**EXISTING CONDITIONS, REMOVALS & DECOMMISSIONING**



Drawn D.B.G.  
 Hor. Scale 1:200  
 Vert. Scale  
 Date OCT 30-20  
 Job No. 19111

Drawing No.  
**C-2**  
 of 8

REFER TO NOTES & DETAILS  
 ON DRAWINGS C-5 & C-6



REFER TO NOTES & DETAILS  
ON DRAWINGS C-5 & C-6

REF	TOP OF WALL	BOTTOM OF WALL	HEIGHT	NOTES
①	77.20	77.20 TO ±76.37	0.00m TO ±0.83m	DESIGNED BY OTHERS
②	77.20	±76.37 TO ±76.20	±0.83m TO ±1.00m	DESIGNED BY OTHERS
③	77.20 TO 77.18	±76.20 TO ±76.14	±1.00m TO ±1.04m	DESIGNED BY OTHERS
④	77.18 TO 77.16	±76.14 TO ±76.33	±1.04m TO ±0.83m	DESIGNED BY OTHERS
⑤	77.16 TO 77.10	±76.33 TO ±76.48	±0.83m TO ±0.62m	DESIGNED BY OTHERS
⑥	77.10 TO 76.95	±76.48 TO ±76.70	±0.62m TO ±0.25m	DESIGNED BY OTHERS
⑦	76.95 TO 77.07	±76.70	±0.25m TO ±0.37m	DESIGNED BY OTHERS
⑧	77.07 TO 77.00	±76.70 TO ±76.56	±0.37m TO ±0.44m	DESIGNED BY OTHERS
⑨	76.85	±76.56 TO ±76.60	±0.29m TO ±0.25m	DESIGNED BY OTHERS

**LEGEND**

- F.F.L FINISHED FLOOR ELEVATION
- TOP OF FOUNDATION
- B.F.L BASEMENT FLOOR ELEVATION
- U.S.F UNDERSIDE OF FOOTING
- PROPERTY LINE
- C.R.Z CRITICAL ROOT ZONE
- CB CATCH-BASIN
- MH STORM MANHOLE
- CB/MH CATCH-BASIN/MANHOLE
- MH SANITARY MANHOLE
- VC VALVE CHAMBER
- FH FIRE HYDRANT
- FDC FIRE DEPARTMENT CONNECTION
- EXISTING GRADE ELEVATION
- PROPOSED GRADE ELEVATION
- EXISTING SLOPE OF GRADE
- PROPOSED SLOPE OF GRADE
- EMERGENCY OVERLAND FLOW
- T.O.S TOP OF SLOPE
- B.O.S BOTTOM OF SLOPE
- CENTERLINE OF SWALE
- 150mm BARRIER CURB
- D.C DEPRESSED CURB
- LIGHT-DUTY PAVEMENT
- HEAVY-DUTY PAVEMENT
- PERMEABLE PAVERS
- CONCRETE
- LANDSCAPE



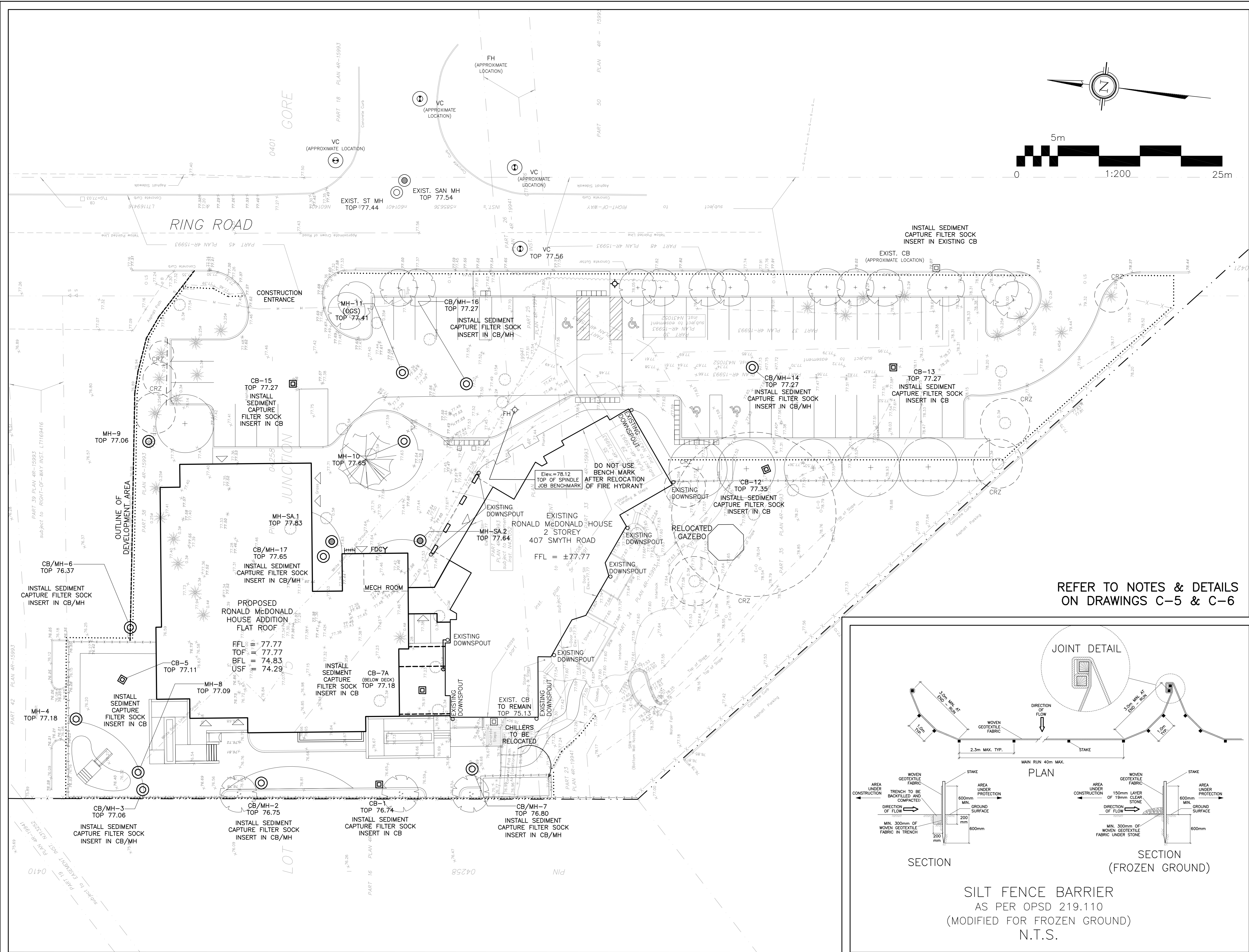
No.	DATE	REVISION
8	APR 20-23	RE-ISSUED FOR APPROVAL
7	MAR 17-23	RE-ISSUED FOR APPROVAL
6	MAR 9-23	ISSUED FOR COORDINATION
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		REVISION

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 Ottawa, Ontario d.gray@dbgrayengineering.com

Project  
**RONALD McDONALD HOUSE  
ADDITION**  
 407 SMYTH RD,  
 OTTAWA, ONTARIO

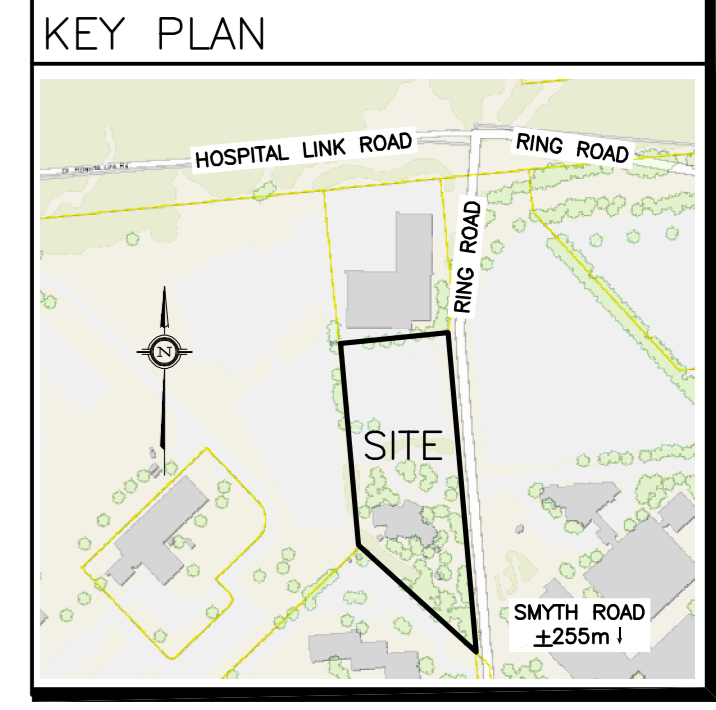
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**GRADING PLAN**

Engineer's Seal  
  
 Drawn: D.B.G  
 Hor. Scale: 1:200  
 Vert. Scale:  
 Date: OCT 20-22  
 Job No.: 19111  
 Drawing No.:  
**C-3  
of 8**  
 NOT VALID UNLESS  
 SIGNED & DATED



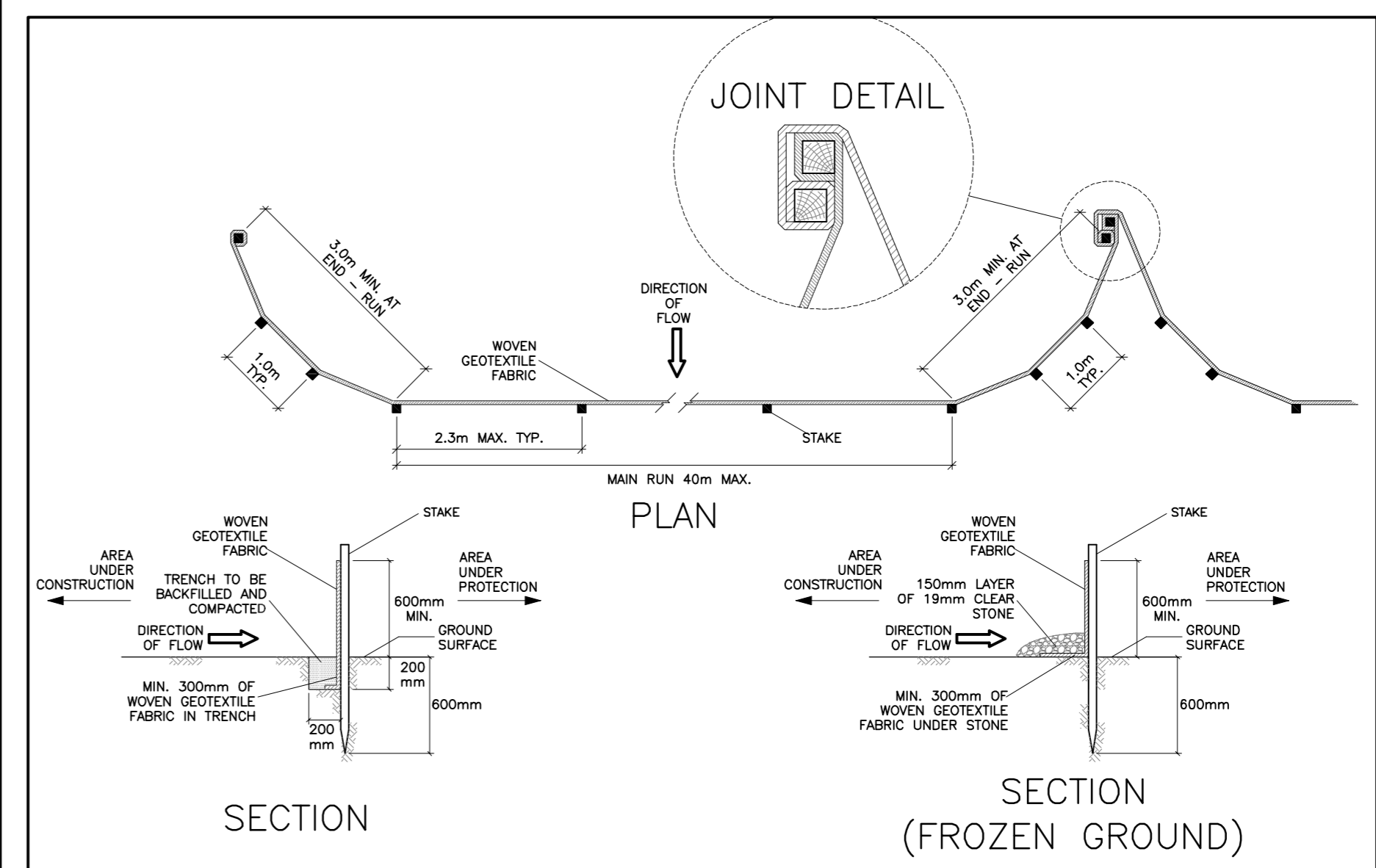
**LEGEND**

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- TFL TOP OF FOUNDATION
- BFL BASEMENT FLOOR ELEVATION
- USF UNDERSIDE OF FOOTING
- PROPERTY LINE
- - - CRZ CRITICAL ROOT ZONE
- CB CATCH-BASIN
- MH STORM MANHOLE
- CB/MH CATCH-BASIN/MANHOLE
- MH SANITARY MANHOLE
- VC VALVE CHAMBER
- FH FIRE HYDRANT
- ..... SILT FENCE BARRIER



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REFER TO NOTES & DETAILS ON DRAWINGS C-5 & C-6

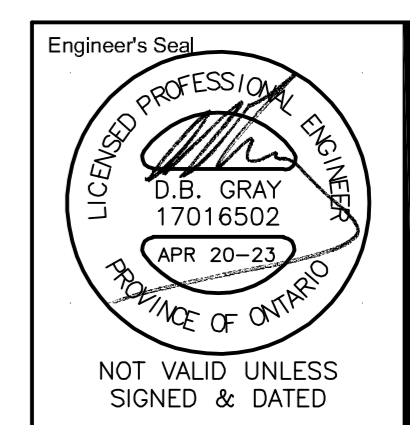


**SILT FENCE BARRIER**  
AS PER OPSP 219.110  
(MODIFIED FOR FROZEN GROUND)  
N.T.S.

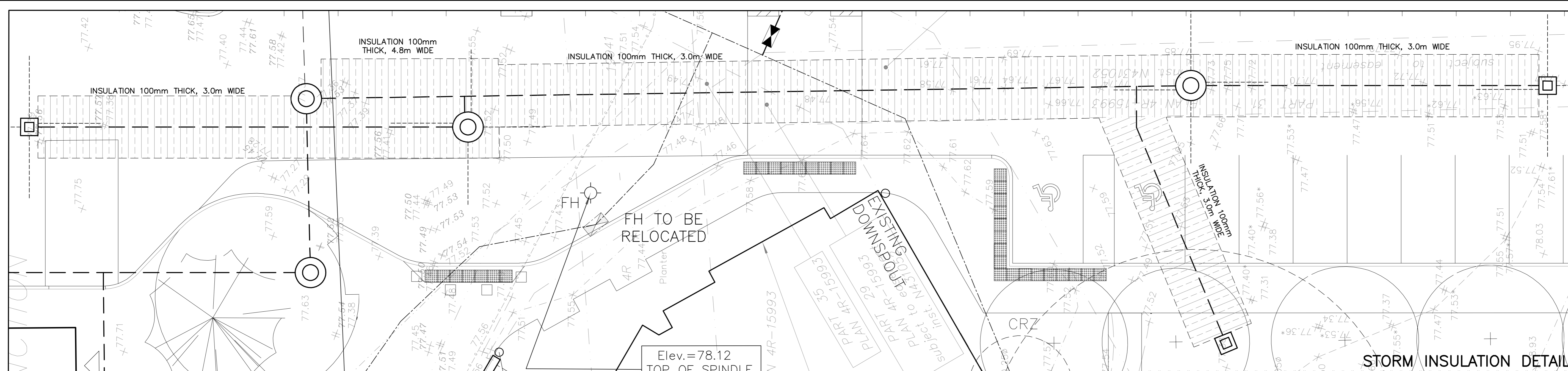
**D. B. GRAY ENGINEERING INC.**  
Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermain  
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Ottawa, Ontario d.gray@dbgrayengineering.com

Project  
**RONALD McDONALD HOUSE ADDITION**  
407 SMYTH RD,  
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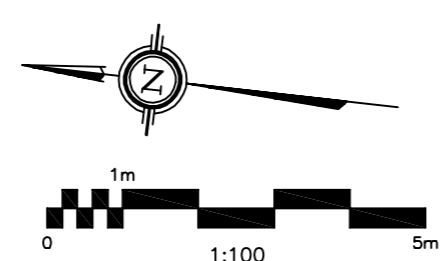
Drawing Title  
**EROSION & SEDIMENT CONTROL PLAN**



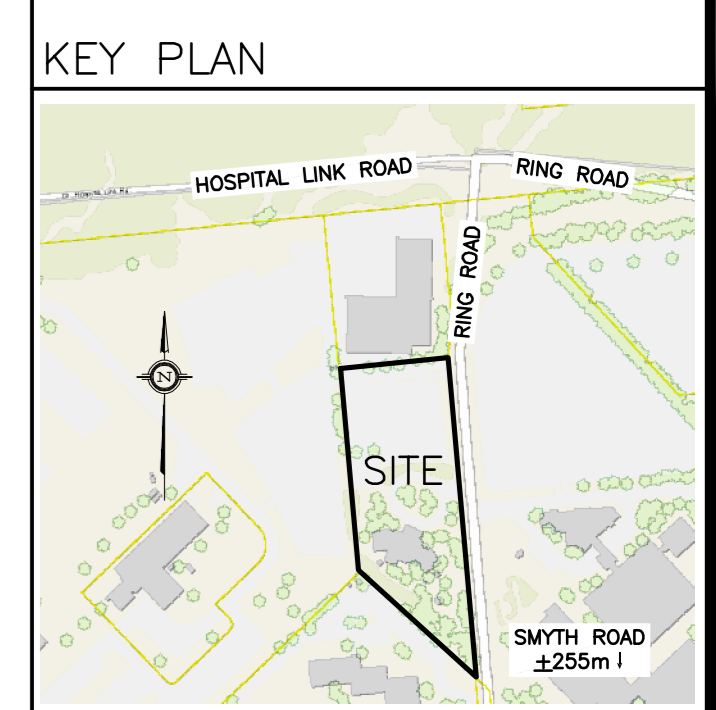
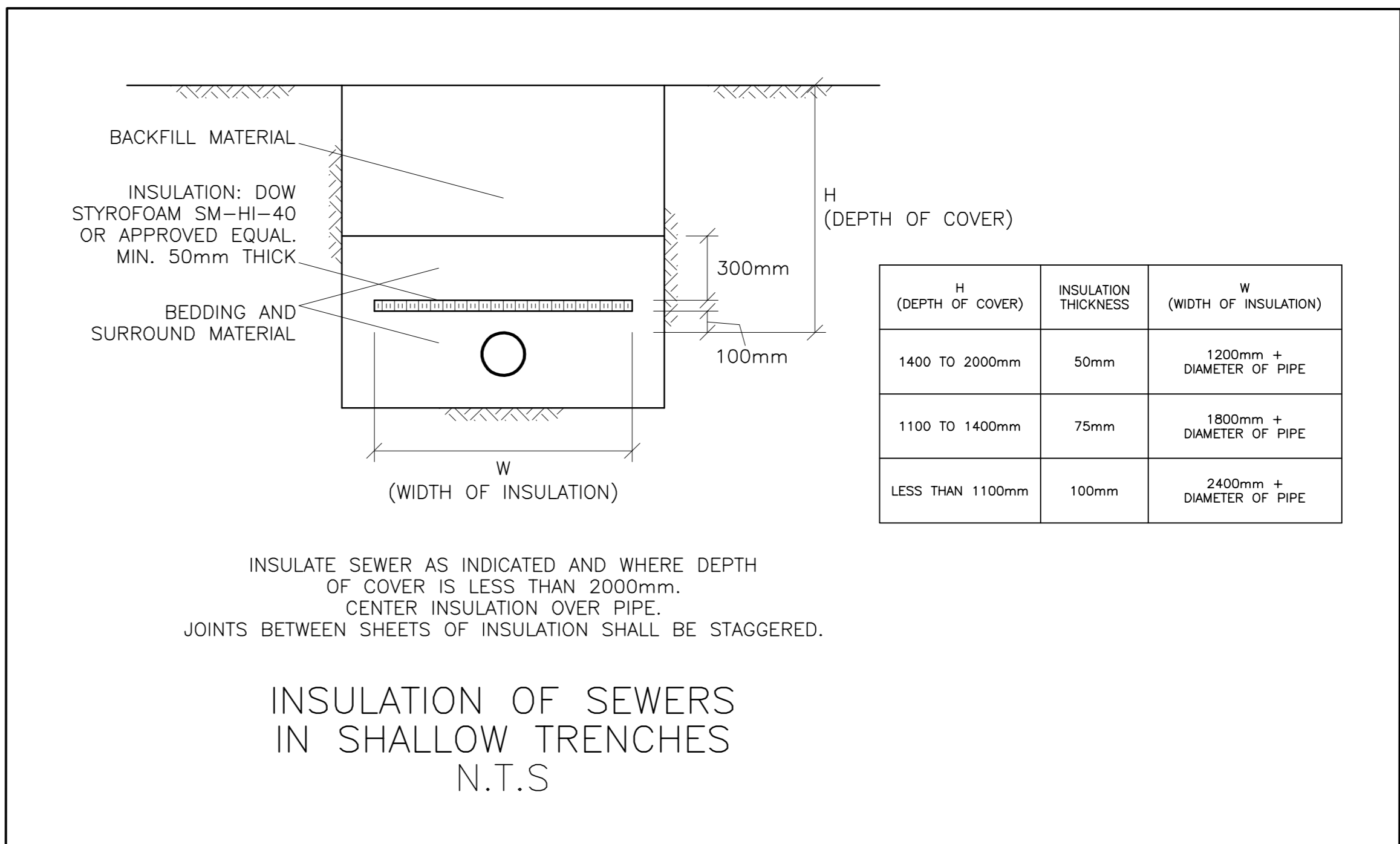
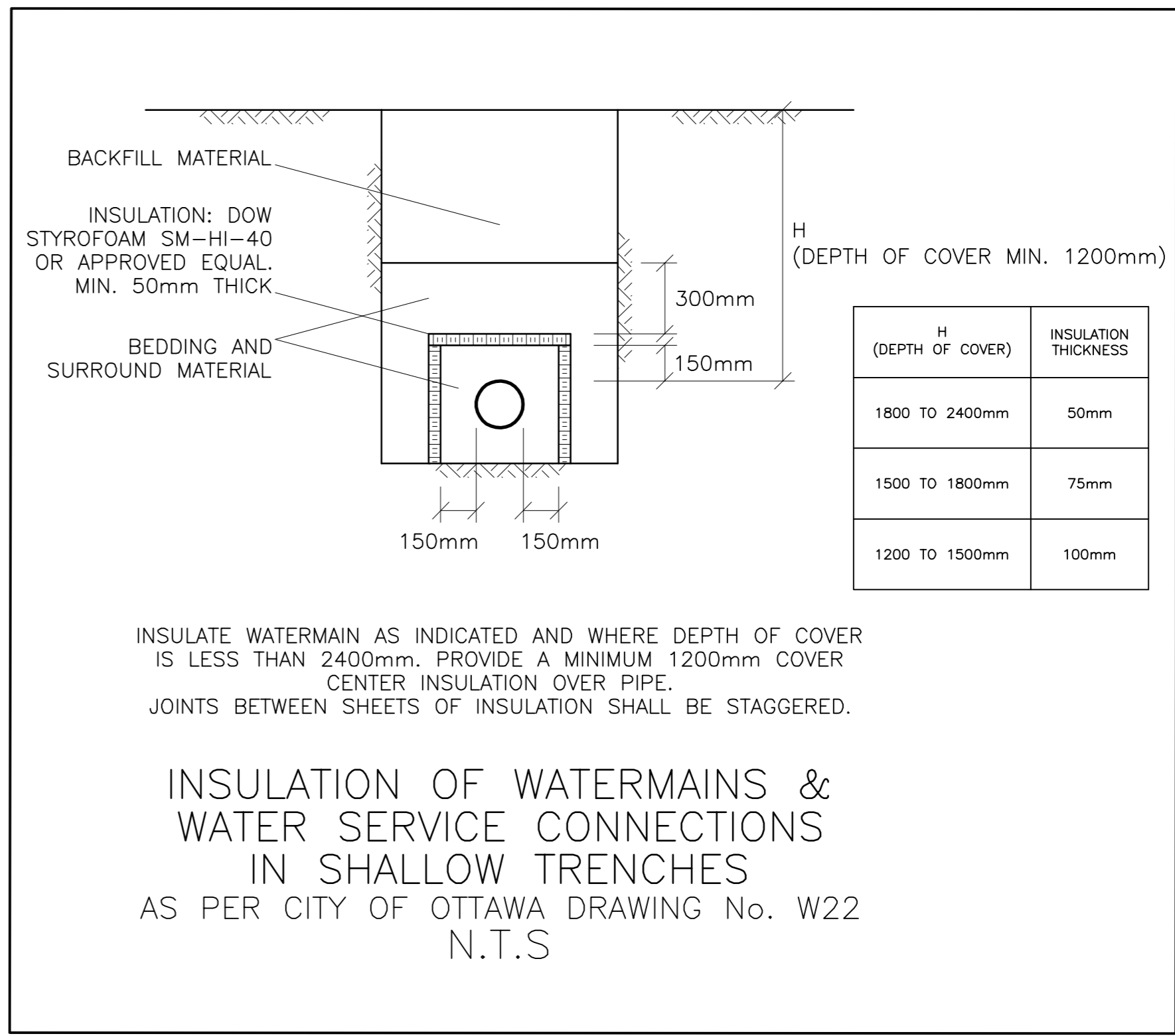
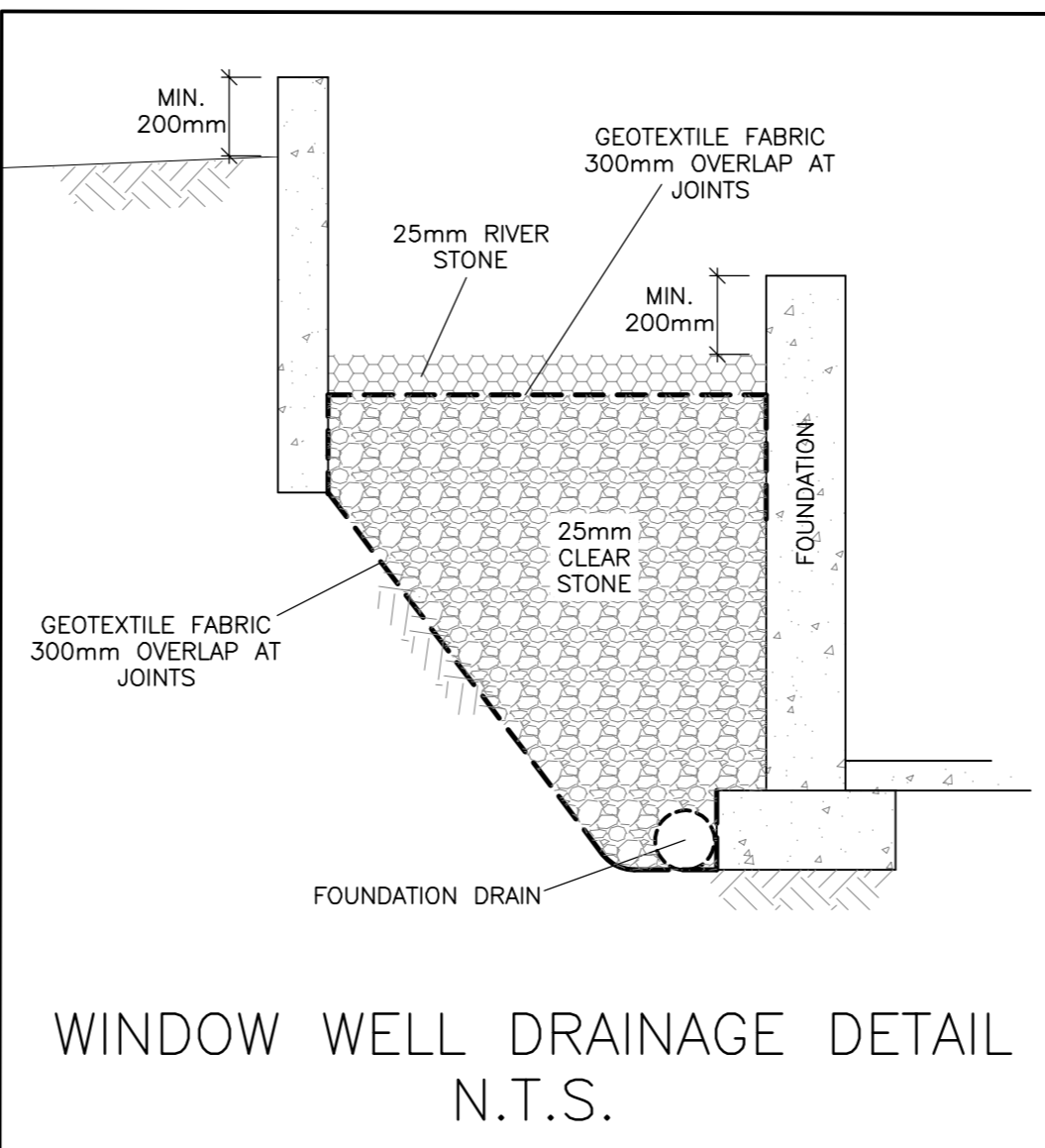
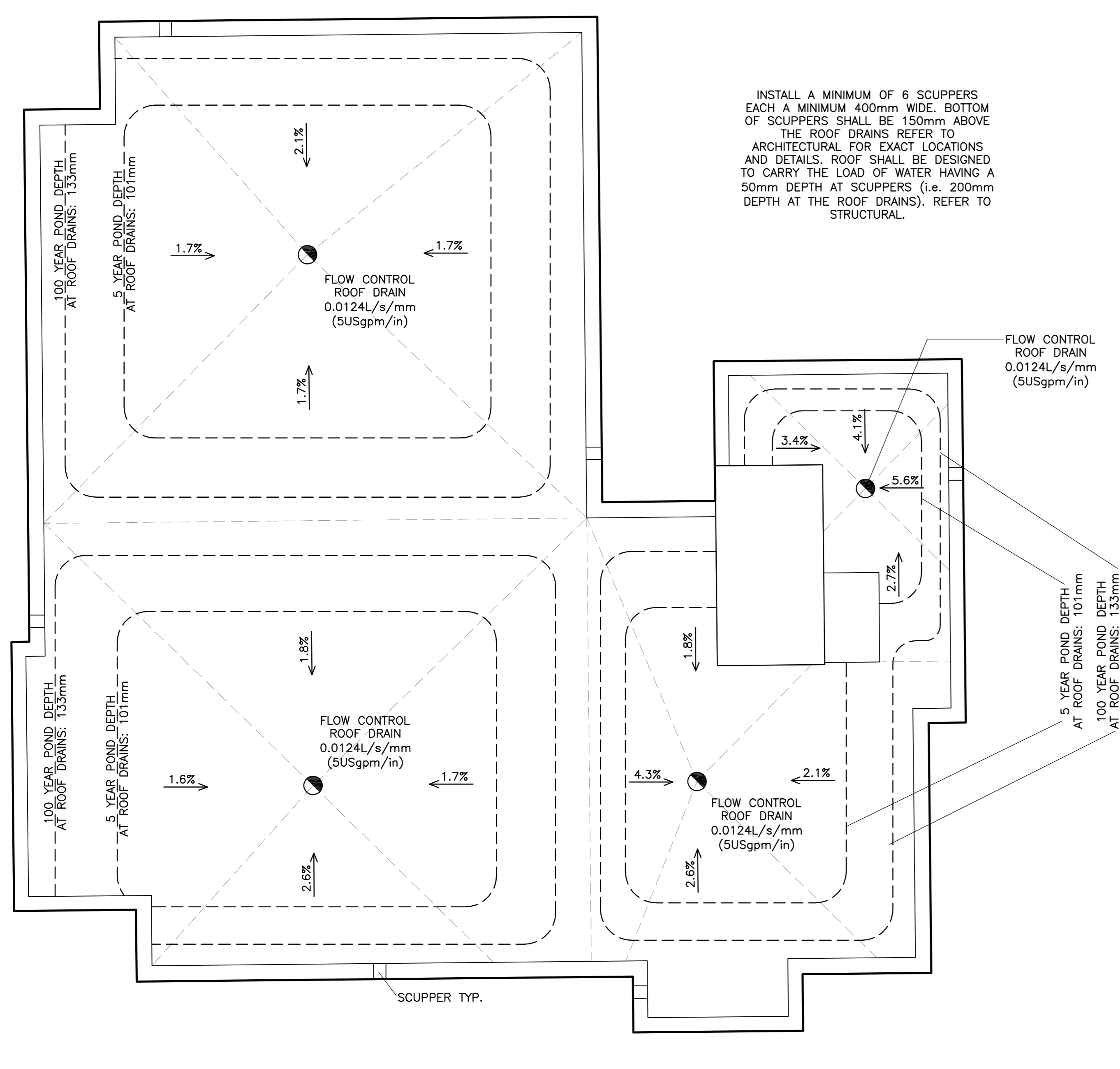
Drawn: D.B.G.  
Hor. Scale: 1:200  
Vert. Scale:  
Date: OCT 20-22  
Job No.: 19111  
Drawing No.:  
**C-4**  
of 8



ROOF DRAINAGE PLAN



INSTALL A MINIMUM OF 6 SCUPPERS EACH A MINIMUM 400mm WIDE. BOTTOM OF SCUPPERS SHALL BE 150mm ABOVE THE ROOF DRAINS REFER TO ARCHITECTURAL FOR EXACT LOCATIONS AND DETAILS. ROOF SHALL BE DESIGNED TO CARRY THE LOAD OF WATER HAVING A 50mm DEPTH AT SCUPPERS (i.e. 200mm DEPTH AT THE ROOF DRAINS). REFER TO STRUCTURAL.

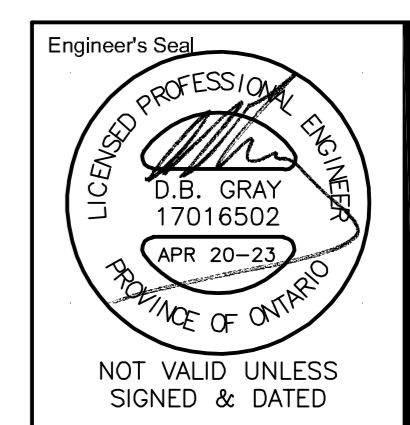


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 Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermain  
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 Ottawa, Ontario d.gray@dbgrayengineering.com

Project  
**RONALD McDONALD HOUSE ADDITION**  
 407 SMYTH RD,  
 OTTAWA, ONTARIO

Drawing Title  
**DETAILS**



Drawn: D.B.G.  
 Hor. Scale: 1:100  
 Vert. Scale:  
 Date: NOV 23-22  
 Job No.: 19111  
 Drawing No.:  
**C-5**  
 of 8

# CATCH BASIN & MANHOLE SCHEDULE

(SUBMIT SHOP DRAWINGS OF ALL CATCH BASINS & MANHOLES TO ENGINEER FOR APPROVAL)

REF	TOP	SIZE	TYPE	INVERT AT INLET	INVERT AT OUTLET	NOTES
<b>STORM SEWER</b>						
CB-1	76.74	600mm x 600mm	PRECAST CONCRETE CATCH-BASIN	-	74.82	TO OPSD 705.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S19
CB/MH-2	76.75	1200mm	PRECAST CONCRETE CATCH-BASIN/MANHOLE	74.76(S)	74.76(N)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S28.1 OR OPSD 401.010
CB/MH-3	77.06	1200mm	PRECAST CONCRETE CATCH-BASIN/MANHOLE	74.70(S)	74.70(NE)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S28.1 OR OPSD 401.010
MH-4	77.18	1200mm	PRECAST CONCRETE MANHOLE	74.65(SW)	74.65(SE)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S24.1 OR OPSD 401.010
CB-5	77.11	600mm x 600mm	PRECAST CONCRETE CATCH-BASIN	-	74.63	TO OPSD 705.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S19
CB/MH-6	76.37	1200mm	PRECAST CONCRETE CATCH-BASIN/MANHOLE	74.59(NW)	74.59(S)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S28.1 OR OPSD 401.010 INSTALL ICD IN OUTLET PIPE
CB-7A	77.18	600mm x 600mm	PRECAST CONCRETE CATCH-BASIN	-	75.04	TO OPSD 705.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S19
CB/MH-7	76.80	1200mm	PRECAST CONCRETE CATCH-BASIN/MANHOLE	74.97(S)	74.87(N)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S28.1 OR OPSD 401.010
MH-8	77.09	1200mm	PRECAST CONCRETE MANHOLE	74.70(S)	74.64(E)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S24.1 OR OPSD 401.010
MH-9	77.06	1200mm	PRECAST CONCRETE MANHOLE	74.50(W)	74.44(S)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S24.1 OR OPSD 401.010
MH-10	77.65	1200mm	PRECAST CONCRETE MANHOLE	74.22(N)	74.27(E)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S24.1 OR OPSD 401.010
MH-11	77.41	CDS PMSU2015-4	PRECAST CONCRETE MANHOLE	75.78(S) 74.24(W)	±74.23(E)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS EXCEPT WITH A DEEP SUMP AS REQUIRED BY CDS
CB-12	76.35	600mm x 600mm	PRECAST CONCRETE CATCH-BASIN	-	76.59	TO OPSD 705.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S19
CB-13	77.27	600mm x 600mm	PRECAST CONCRETE CATCH-BASIN	-	76.13	TO OPSD 705.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S19
CB/MH-14	77.27	1200mm	PRECAST CONCRETE CATCH-BASIN/MANHOLE	76.06(S)	76.06(N)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S28.1 OR OPSD 401.010 INSTALL ICD IN OUTLET PIPE
CB-15	77.27	600mm x 600mm	PRECAST CONCRETE CATCH-BASIN	-	75.94	TO OPSD 705.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S19
CB/MH-16	77.27	1200mm	PRECAST CONCRETE CATCH-BASIN/MANHOLE	75.85(N)	75.85(E)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S28.1 OR OPSD 401.010 INSTALL ICD IN OUTLET PIPE
CB/MH-7	77.65	1200mm	PRECAST CONCRETE CATCH-BASIN/MANHOLE	74.80(W)	74.79(E)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S28.1 OR OPSD 401.010
<b>SANITARY SEWER</b>						
MH-SA.1	77.83	1200mm	PRECAST CONCRETE MANHOLE	74.72(W)	74.66(S)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S24 OR OPSD 401.010
MH-SA.2	77.64	1200mm	PRECAST CONCRETE MANHOLE	74.55(N) 74.50(W)	±74.49(E)	TO OPSD 701.010 & CITY OF OTTAWA STANDARDS - FRAME & COVER TO CITY OF OTTAWA DRAWING No. S25 & S24 OR OPSD 401.010

1. GENERAL

1.1 USE BAR SCALE TO CONFIRM ACTUAL PLOT SCALE. EXISTING AND NEW ELEVATIONS AND INVERTS SHOWN ARE GEODETIC AND ARE IN METERS. ALL PIPE DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

1.2 UNLESS OTHERWISE STATED "ENGINEER" REFERS TO D. B. GRAY ENGINEERING INC.

1.3 EXISTING ELEVATIONS AND LOCATIONS, INVERTS AND SIZES OF EXISTING SERVICES & UTILITIES ARE NOT NECESSARILY SHOWN ON PLAN AND THOSE SHOWN ARE DERIVED FROM AVAILABLE INFORMATION AND MUST BE CONFIRMED ON SITE BEFORE COMMENCING CONSTRUCTION. REPORT ANY DIFFERENCES TO ENGINEER PRIOR TO UNDERGROUND LOCATES (INCLUDING ONTARIO ONE CALL: 1-800-400-2255) SHALL BE CONDUCTED PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION.

1.4 SITE BOUNDARIES AND EXISTING GRADES AND OTHER FEATURES DERIVED FROM TOPOGRAPHIC SURVEY PREPARED BY ANNIS O'SULLIVAN, VOLLEBERG LTD JOB No. 2100-20.

1.5 EXISTING AND NEW GRADE ELEVATIONS AND INVERT ELEVATIONS ON THE SURVEY PLAN AND THESE DRAWINGS ARE IN METERS AND ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM. IT IS THE RESPONSIBILITY OF THE USER OF THE SURVEY PLAN AND THESE DRAWINGS TO VERIFY THAT THE JOINT MARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON SURVEY PLAN AND THESE DRAWINGS.

1.6 REFER TO ARCHITECTURAL AND LANDSCAPE SITE PLANS FOR EXACT LOCATIONS OF BUILDINGS, PAVED AREAS, SIDEWALKS, PLANTERS ETC. LAYOUTS AND LOCATIONS OF EXISTING SERVICES & UTILITIES ARE NOT NECESSARILY SHOWN ON PLAN AND THOSE SHOWN ARE DERIVED FROM AVAILABLE INFORMATION AND MUST BE CONFIRMED ON SITE BEFORE COMMENCING CONSTRUCTION. REPORT ANY DIFFERENCES TO ENGINEER PRIOR TO UNDERGROUND LOCATES (INCLUDING ONTARIO ONE CALL: 1-800-400-2255) SHALL BE CONDUCTED PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION.

1.7 PREPARATION INCLUDING BUILDING SUB-GRADE PREPARATION AND PAVEMENT SUB-GRADE PREPARATION AND CONSTRUCTION OF THE PAVEMENT STRUCTURE AND EXCAVATION AND BACKFILLING, INCLUDING COMPACTION OF MATERIALS, SHALL CONFORM TO THE GEOTECHNICAL INVESTIGATION TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER.

1.8 DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SERVING BRIEF & STORM WATER MANAGEMENT REPORT No. 20069 PREPARED BY D. B. GRAY ENGINEERING INC.

1.9 REINSTATE ADJACENT PROPERTIES TO PRE-CONSTRUCTION CONDITIONS.

1.10 ALL RELEVANT WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT CITY STANDARDS AND SPECIFICATIONS.

1.11 ONTARIO PROVINCIAL STANDARDS WILL APPLY WHERE CITY STANDARDS ARE AVAILABLE.

1.12 ALL PROPOSED RETAINING WALLS SHALL BE SETBACK A MINIMUM 0.15m FROM PROPERTY LINE. ALL PROPOSED RETAINING WALLS GREATER THAN 1.0m IN HEIGHT SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN ONTARIO. ALL RETAINING WALLS OVER 0.6 m REQUIRE A GUARD RAIL (SEE ARCHITECTURAL).

2. EROSION AND SEDIMENT CONTROL PLAN

2.1 THE EROSION AND SEDIMENT CONTROL PLAN IS A LIVING DOCUMENT AND SHALL BE REVISED IN THE EVENT THE SPECIFIED CONTROL MEASURES ARE NOT SUFFICIENT. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATER COURSE DURING CONSTRUCTION ACTIVITIES. THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL USING SEDIMENT CAPTURE FILTER SOCKS IN CATCH BASINS AND MANHOLES AND INSTALLING SILT FENCES AND OTHER EFFECTIVE SEDIMENT TRAPS. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY. SPECIFICALLY THE CONTRACTOR SHALL INSTALL THE FOLLOWING CONTROL MEASURES AND THE CONTROL MEASURES:

2.2 PRIOR TO COMMENCEMENT OF CONSTRUCTION AT ALL MUNICIPAL CATCH BASINS ADJACENT TO THE SITE AND AT ANY MANHOLES OR CATCH BASINS THAT WILL RECEIVE DISCHARGE FROM DE-WATERING OPERATIONS AND ALL NEW CATCH BASINS AS THEY ARE INSTALLED: INSTALL SEDIMENT CAPTURE FILTER SOCK INSERTS (TERRAZI GEOTECHNICALS INC SILT SACK OR APPROVED EQUAL). INSPECT AT THE END OF EACH DAY AND AFTER EACH RAINFALL. REMOVE SEDIMENT AS RECOMMENDED BY THE MANUFACTURER. IMMEDIATELY REPAIR OR REPLACE ANY DAMAGED FILTER SOCK INSERTS. DO NOT REMOVE UNTIL CONSTRUCTION IS COMPLETE.

2.3 INSTALL A SILT FENCE BARRIERS AROUND SEDIMENT OR SOIL PRIOR TO COMMENCEMENT OF CONSTRUCTION INSTALL A SILT FENCE BARRIERS AS SHOWN ON PLANS. INSPECT ALL SILT FENCES AT THE END OF EACH DAY AND AFTER EACH RAINFALL. REMOVE SEDIMENT DEPOSITS WHEN THE LEVEL OF DEPOSITS REACHES ONE THIRD THE HEIGHT OF THE FENCE. IMMEDIATELY REPAIR OR REPLACE ANY DAMAGED SECTIONS OF FENCE. DO NOT REMOVE ANY SILT FENCES IN ANY PHASE UNTIL CONSTRUCTION IS COMPLETE.

2.4 ANY MATERIAL DEPOSITED ON A PUBLIC ROAD SHALL BE REMOVED BY SWEEPING AND SHOVELING OR VACUUMING AND DISPOSING SEDIMENT IN A CONTROLLED AREA. DO NOT SWEEP OR PLOW ONTO STORMWATER CONVEYANCE SYSTEM.

2.5 CONSTRUCTION IS CONSIDERED COMPLETE WHEN THE FOLLOWING CONDITIONS HAVE BEEN MET:

- ALL STRUCTURES HAVE BEEN BUILT.
- ALL HARD SURFACES HAVE BEEN CONSTRUCTED.
- ALL PROPOSED GRASSED AREAS ARE EITHER SODDED OR HAVE A FULL COVERAGE OF WELL ESTABLISHED TURF AND HAVE HAD A MINIMUM OF ONE FULL GROWING SEASON (MAY 15TH TO SEPTEMBER 15TH).
- THERE ARE NO AREAS OF EXPOSED EARTH.
- ALL STOCKPILED MATERIALS HAVE BEEN REMOVED.

2.6 REMOVE EROSION AND SEDIMENT CONTROL MEASURES WHEN CONSTRUCTION IS COMPLETE.

3. GRADING & DRAINAGE

3.1 NEW GRADES TO MATCH EXISTING AT PROPERTY LINE. NO EXCESS DRAINAGE WILL BE DIRECTED TOWARDS THE ADJACENT PROPERTIES DURING AND AFTER CONSTRUCTION. THERE WILL BE NO ALTERATION TO EXISTING GRADE AND DRAINAGE PATTERNS ON PROPERTY LINE.

3.2 ALL AREAS SHALL BE GRADED TO ENSURE ADEQUATE DRAINAGE AWAY FROM BUILDINGS TO CATCH BASINS, SWALES, DITCHES AND OTHER APPROVED DISPOSAL AREAS. GRADING SHALL BE GRADUAL BETWEEN FINISHED SPOT ELEVATIONS SHOWN ON DRAWINGS TO PREVENT PONDING OTHER THAN PONDING REQUIRED FOR WATER MANAGEMENT AND DETERMINE ITS EXACT LOCATION AND GEODETIC TOP OF GRADE.

3.3 WHETHER RESULT OF POOR WORKMANSHIP OR DAMAGE: DEFECTIVE GRADING SHALL BE CORRECTED. PROMPTLY MAKE GOOD OTHER CONTRACTOR'S WORK DAMAGED BY SUCH CORRECTIONS.

3.4 GEOTEXTILE FABRIC TO OPSD 1860 (NON-WOVEN SYNTHETIC FIBRE FABRIC SHALL BE USED IN SILT FENCE BARRIER (GEOSYNTHETIC HD10S OR APPROVED EQUAL). NON-WOVEN SYNTHETIC FIBRE FABRIC SHALL BE USED FOR MATERIAL SEPARATION. PRIOR TO INSTALLATION SUBMIT SHOP DRAWING TO ENGINEER FOR APPROVAL. GEOTEXTILE FABRIC SHALL BE FREE OF TEARS AND RESISTANT TO DEGRADATION BY ULTRA VIOLET AND HEAT EXPOSURE. PLACE GEOTEXTILE FABRIC BY UNIFORM STRIPS AND DETERMINE ITS EXACT LOCATION AND GEODETIC TOP OF GRADE. OVERLAP EACH SUCCESSIVE STRIP OF GEOTEXTILE 600mm OVER PREVIOUSLY Laid STRIP IN DIRECTION OF FLOW. ALTERNATIVELY THE FABRIC MAY BE LAPPED A MINIMUM OF 300mm AND PINNED TOGETHER. PROTECT INSTALLED GEOTEXTILE MATERIAL FROM DISPLACEMENT, DAMAGE OR DEGRADATION BEFORE, DURING AND AFTER PLACEMENT OF MATERIAL LAYERS AFTER INSTALLATION. COVER WITH OVERLYING LAYER WITHIN 4 HOURS OF PLACEMENT. DURING DELIVERY AND STORAGE, PROTECT GEOTEXTILES FROM DIRECT SUNLIGHT, ULTRAVIOLET RAYS, EXCESSIVE HEAT, MUD, DIRT, DUST, DEBRIS AND OTHER PRODUCTS. VEHICULAR TRAFFIC NOT PERMITTED DIRECTLY ON GEOTEXTILE. AVOID PUNCTURING GEOTEXTILE. REPLACE DAMAGED OR DEGRADED GEOTEXTILE.

4. SITE SERVICES

4.1 EXISTING WATER SERVICE CONNECTIONS TO BE DECOMMISSIONED SHALL BE BLANKED AT THE WATERMAIN. EXISTING SEWER SERVICE CONNECTIONS SHALL BE DECOMMISSIONED AS PER CITY OF OTTAWA STANDARDS AND CITY DRAWING S11.4.

4.2 THE DEPTH OF THE EXISTING 100mm WATERMAIN IS UNKNOWN BUT IS ESTIMATED TO BE 2.1m. PRIOR TO COMMENCEMENT OF CONSTRUCTION OF ANY SERVICE CONNECTIONS CAREFULLY LOCATE THE EXISTING 100mm WATERMAIN AND DETERMINE ITS EXACT LOCATION AND GEODETIC TOP OF GRADE. ELEVATION AND REPORT FINDINGS TO THE ENGINEER. SAW CUT THE ASPHALT, AS REQUIRED AND REMOVE THE EXISTING ASPHALT USING A MECHANICAL EXCAVATOR. ALL OTHER EXCAVATION SHALL BE BY HAND OR BY HYDROVAC EXCAVATOR. REMOVE ALL UNSUABLE MATERIALS OFF SITE.

4.3 WATER MAINS SHALL BE INSTALLED AS PER CITY OF OTTAWA DWG. No. W31

4.4 ALL WATER SERVICE MATERIALS AND CONSTRUCTION METHODS TO CITY OF OTTAWA STANDARDS AND ONTARIO PROVINCIAL STANDARDS SPECIFICATIONS (OPSS & OPSD). WATERMAIN AND WATER SERVICE MATERIALS SHALL BE PVC PRESSURE CLASS 150 DR18. PROVIDE THRUST BLOCKS AS PER CITY OF OTTAWA DWG. No. W25.3 & W25.4 AT ALL VALVES, TEES, CAPS, BENDS, REDUCERS AND HYDRANTS OR OTHER FITTINGS WHERE CHANGES OCCUR IN PIPE DIAMETER OR DIRECTION. RESTRAINING AS PER AS PER CITY OF OTTAWA DWG. No. W25.5 & W25.6 ALL CONNECTIONS, RESTRAINT RODS AND VALVE BOLTS TO BE STAINLESS STEEL. CATHODIC PROTECTION & ANODE INSTALLATION AS PER CITY OF OTTAWA DWG. No. W40, W42, W44 & W47.

4.5 PROVIDE A MINIMUM 2.4 m COVER OVER WATER SERVICE CONNECTION AND WATERMAIN. WHERE THE MINIMUM COVER IS NOT POSSIBLE, PROVIDE A MINIMUM 2.4 m CLEARANCE FROM AN OPEN STRUCTURE (EG. MANHOLES & CATCH BASINS) PLACE INSULATION AROUND WATERMAIN AND WATER SERVICE CONNECTIONS AS PER CITY OF OTTAWA DWG. No. W23.

4.6 WATER SERVICE CONNECTIONS AND WATERMAIN INSTALLED PARALLEL TO A SEWER SHALL BE LAID WITH A MINIMUM 2.5m BARREL TO BARREL HORIZONTAL SEPARATION FROM SEWERS AND SEWER MANHOLES.

4.7 THE WATERMAIN AND WATER SERVICE CONNECTIONS SHALL CROSS ABOVE THE SEWER AS PER CITY OF OTTAWA DRAWING No. W25.2: PROVIDE A MINIMUM 500mm BARREL TO BARREL VERTICAL SEPARATION AND ENSURE THAT THE POINT OF CROSSING IS AS FAR AS POSSIBLE FROM THE SEWER.

4.8 LOCATE FIRE HYDRANT AS PER CITY OF OTTAWA DWG. No. W18. INSTALL FIRE HYDRANT AS PER CITY OF OTTAWA DWG. No. W19. LOCATE FIRE HYDRANT 1.5 TO 2.5 m FROM FACE OF CURB. LOCATE FIRE HYDRANT A MINIMUM 0.6m FROM EDGE OF SIDEWALK. LOCATE FIRE HYDRANT 3m FROM ADJACENT DRIVEWAYS/BRANCH LOCATE FIRE HYDRANT LEAD 2m FROM OUTSIDE EDGE OF CATCH BASINS AND MANHOLES. THE HYDRANT SHALL BE INSTALLED WITH THE BREAKABLE FLANGE 50mm TO 150mm ABOVE FINISHED GRADE. THERE SHALL BE NO VEGETATION OR OTHER OBSTRUCTIONS IN FRONT OF HYDRANT AND WITHIN 1.5m OF FIRE HYDRANT. THE FIRE HYDRANT SHALL BE RED WITH WHITE BONNETS AND CAPS TO CITY STANDARDS. AT THE END OF CONSTRUCTION PERFORM A FIRE FLOW TEST AND SUBMIT REPORT TO THE ENGINEER AND COLOUR CODE THE BONNETS AND CAPS AS PER CITY OF OTTAWA AND NFPA STANDARDS.

4.10 THE SANITARY BUILDING DRAINS EACH BUILDING SHALL BE INSTALLED WITH A FULL-PORT BACKWATER VALVE TO CITY OF OTTAWA STANDARDS AND TO CITY OF OTTAWA DWG. No. S14.1 & S14.2. THE BACKWATER VALVE SHALL BE INSTALLED SO THAT PLUMBING FIXTURES ABOVE THE EXTERIOR GRADE ELEVATION DRAINS TO THE DOWNSTREAM SIDE OF THE VALVE AND ALL FIXTURES BELOW THE EXTERIOR GRADE ELEVATION DRAINS TO THE UPSTREAM SIDE OF THE VALVE.

4.11 THE DRAIN SERVING FOUNDATION DRAINS SHALL BE INSTALLED WITH A BACKWATER VALVE TO CITY OF OTTAWA STANDARDS AND TO CITY OF OTTAWA DWG. No. S14.

4.12 SEWER SHALL HAVE A MINIMUM 2.0m OF COVER OR SHALL BE INSULATED AS INDICATED AND AS PER THE DETAIL.

4.13 INSTALL CLEANOUTS ON THE STORM BUILDING DRAIN AND SANITARY BUILDING DRAIN AS CLOSE AS PRACTICAL TO THE WHERE THE SANITARY AND STORM DRAINS LEAVE THE BUILDING.

4.14 ALL SEWER MATERIALS AND CONSTRUCTION METHODS TO CITY OF OTTAWA STANDARDS AND ONTARIO PROVINCIAL STANDARDS SPECIFICATIONS (OPSS & OPSD). SEWER MATERIAL SHALL BE PVC SDR-35 (SDR-28 FOR DIAMETERS 150mm OR LESS) AND SHALL CONFORM TO CSA B182.2 AND SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS.

4.15 MANHOLES & CATCH BASINS:

- PRECAST MANHOLE UNITS: TO OPSD 1351 AND OPSD 701.010 WITH BASE SLAB OR MONOLITHIC BASE. TOP SECTIONS ECCENTRIC CONE OR FLAT LAB TOP TYPE WITH OPENING OFFSET FOR VERTICAL LADDER INSTALLATION.
- MANHOLE STEPS: TO OPSD 405.01.
- ADJUSTING RINGS: TO ASTM C 479M.
- ALUMINUM SURFACES IN CONTACT WITH OR CAST INTO CONCRETE SHALL HAVE POLYETHYLENE ANCHOR INSULATING SLEEVES.
- PRECAST CATCH BASIN SECTIONS: TO OPSD 1351.
- JOINTS SHALL BE MADE WATER TIGHT USING BUTYL BASED, FLEXIBLE WATERSTOP/JOINT SEALANT MATERIAL.
- SANITARY SEWERS: BENCH TO PROVIDE A SMOOTH U-SHAPED CHANNEL PER OPSD 701.021. SLOPE INVERT TO ESTABLISH SEWER GRADE.
- STORM SEWERS: MANHOLES SHALL HAVE A 300mm SUMP AND CATCH BASIN HAVE A 600mm SUMP.
- FRAMES, GRATES AND COVERS TO CITY OF OTTAWA DRAWINGS OR OPSD (AS PER CATCH BASIN & MANHOLE SCHEDULE). GRATES AND COVERS TO BEAR EVENLY ON FRAMES. PAINTED WITH ONE SHOP COAT OF ASPHALT OR THE BASE BLACK. ALL JOINTS AND CREVICES SHALL BE THOROUGHLY COATED.
- GRANULAR BEDDING AND BACKFILL: OPSD GRANULAR A, RE-CYCLED GRANULAR MATERIALS ARE NOT PERMITTED.
- AS INDICATED ON PLAN AT CATCH BASIN AND CATCH BASIN MANHOLES PROVIDE MINIMUM 3m LONG, 150mm DIAMETER, PERFORATED SUB-DRAINS AT THE SUB-GRADE LEVEL: HDPE C/W FILTER FABRIC SOCK AND END PLUG (BOSS 1000 OR APPROVED EQUAL).
- ROOF DRAINS SHALL BE FLOW CONTROL TYPE EACH INSTALLED WITH A WER WITH A PARABOLIC SLOT, EACH SLOT SHALL RELEASE 5 LITRES OF WATER. OPENING AT TOP OF FLOW CONTROL TYPE SHALL BE MINIMUM 50mm IN DIAMETER. WATER ROOF DRAIN WITH WELLS ACCUTROL WEIR RD-100-A1 OR EQUAL. PRIOR TO INSTALLATION SUBMIT SHOP DRAWING TO ENGINEER FOR APPROVAL.
- THE INLET CONTROL DEVICES (ICDs) LOCATED IN THE OUTLET PIPE OF CATCH BASIN/MANHOLES CB/MH-6, CB/MH-14 AND CB/MH-16 SHALL BE A HYDROVAC WITH 1 VERTICAL VORTEX FLOW CONTROL DEVICES (ICDs) LOCATED IN THE OUTLET PIPE OF CATCH BASIN/MANHOLES AS INDICATED ON PLAN. PRIOR TO INSTALLATION SUBMIT SHOP DRAWING TO ENGINEER FOR APPROVAL.

5. CONSTRUCTION

5.1 PRIOR TO COMMENCING WORK:

- OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE AUTHORITIES.
- VERIFY THE LOCATION AND LOCATIONS OF EXISTING SERVICES, UTILITIES AND STRUCTURES AS INDICATED ON THE DRAWINGS ARE FOR GUIDANCE ONLY. ALL EXISTING SERVICES, UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. COMPLETENESS AND ACCURACY ARE NOT GUARANTEED. NOTIFY ALL APPLICABLE OWNERS, UTILITY COMPANIES AND AUTHORITIES HAVING JURISDICTION OF PROPOSED WORK AND LOCATE AND CLEARLY IDENTIFY ALL EXISTING SERVICES, UTILITIES AND STRUCTURES ON AND ADJACENT TO THE SITE. UNDERGROUND LOCATES (INCLUDING ONTARIO ONE CALL: 1-800-400-2255) SHALL BE CONDUCTED PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION. CONFIRM LOCATIONS OF BURIED SERVICES AND UTILITIES BY CAREFUL TEST EXCAVATIONS AND REPORT ANY DIFFERENCES TO THE ENGINEER.
- EXISTING GRADE ELEVATIONS INDICATED ON THE DRAWINGS ARE FOR GUIDANCE ONLY. COMPLETENESS AND ACCURACY ARE NOT GUARANTEED. CONFIRM EXISTING GRADE ELEVATIONS AND REPORT ANY DIFFERENCES TO THE ENGINEER.
- COORDINATE AND SCHEDULE WORK WITH THE AUTHORITIES AND OTHER TRADES.
- SCHEDULE WORK TO PROVIDE THE MINIMUM DISRUPTION.
- INSTALL CONSTRUCTION FENCING AROUND THE AREA OF WORK. DO NOT REMOVE FENCING UNTIL WORK IS COMPLETE.
- MAINTAIN AND PROTECT FROM DAMAGE EXISTING UTILITIES ENCOUNTERED.
- PROTECT EXISTING BUILDINGS, TREES AND OTHER PLANTS, LAWNS, FENCING, SERVICE POLES, WIRES, PAVEMENT, SURVEY BENCH MARKS AND MONUMENTS AND OTHER SURFACE FEATURES FROM DAMAGE WHILE WORK IS IN PROGRESS. DO NOT DISTURB SOIL WITHIN BRANCH SPREAD OF TREES OR SHRUBS THAT ARE TO REMAIN.

5.4 PROVIDE TRAFFIC CONTROL AND SAFETY MEASURES INCLUDING ANY NECESSARY PERSONNEL AND THE SUPPLY, INSTALLATION, REMOVAL AND REPLACEMENT OF NECESSARY SIGNAGE AND BARRIERS, AS REQUIRED BY THE AUTHORITY. IF APPLICABLE, PROVIDE TRAFFIC MANAGEMENT PLAN AS PER CITY OF OTTAWA REQUIREMENTS.

5.5 FENCE OFF ALL OPEN EXCAVATIONS AT THE END OF EACH WORK DAY. FENCES SHALL BE INSTALLED AND MAINTAINED IN A GOOD AND WORKMAN LIKE MANNER.

5.6 REMOVE OBSTRUCTIONS, ICE AND SNOW, FROM SURFACES TO BE EXCAVATED.

5.7 CUT PAVEMENT AND / OR SIDEWALK NEATLY ALONG LIMITS OF PROPOSED EXCAVATION IN ORDER THAT SURFACE MAY BREAK EVENLY AND CLEARLY.

5.8 COORDINATE AND PAY FOR GEOTECHNICAL INSPECTIONS AND COMPACTION TESTS OF SUB-GRADE, PIPE BEDDING AND EACH LAYER OF SURROUND MATERIAL, BACKFILL, SUB-BASE, BASE AND ASPHALT TO THE SATISFACTION OF THE GEOTECHNICAL CONSULTANT AND ENGINEER. SUBMIT GEOTECHNICAL INSPECTIONS AND COMPACTION REPORTS TO ENGINEER FOR REVIEW.

5.9 CUT AND FILL AS NECESSARY TO ACHIEVE THE REQUIRED SUB-GRADE ELEVATION. DISPOSE OF SURPLUS AND UNSUITABLE EXCAVATED MATERIAL OFF SITE. FILL MATERIAL TO BE PLACED AND COMPACTION OF THE FILL WATER AND AS PER THE GEOTECHNICAL CONSULTANT AND ENGINEER. SATISFACTION OF THE GEOTECHNICAL CONSULTANT. STOCKPILE GRANULAR AND FILL MATERIALS IN MANNER TO PREVENT SEGREGATION AND PROTECT FROM CONTAMINATION. PLACE MATERIAL IN UNIFORM LAYERS NOT EXCEEDING 300mm COMPACTED THICKNESS. PROTECT WORK AREA AGAINST FLOODING AND DAMAGE DUE TO BREACH RUN-OFF. DEWATER AS REQUIRED TO KEEP WORK AREA FREE OF WATER. DISCHARGE FROM DEWATERING OPERATIONS SHALL BE DIRECTED TO A SEDIMENT CONTROL MEASURE AND/OR A VEGETATED DISCHARGE AREA. ENSURE THAT THE DISCHARGED WATER DOES NOT CAUSE EROSION OR OTHER DAMAGE TO ADJACENT LANDS.

5.10 EXCAVATION, TRENCHING, ENGINEERED FILL, COMPACTION & BACKFILL SHALL BE AS PER THE GEOTECHNICAL INVESTIGATION:

- SHORE AND BRACE EXCAVATIONS, PROTECT SLOPES AND BANKS AND PERFORM ALL WORK IN ACCORDANCE WITH ONTARIO REGULATION 213/91 UNDER THE ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT AND OTHER AUTHORITIES HAVING JURISDICTION.
- KEEP EXCAVATIONS FREE OF WATER WHILE WORK IS IN PROGRESS. PROTECT OPEN EXCAVATIONS AGAINST FLOODING AND DAMAGE DUE TO SURFACE RUN-OFF.
- EXCAVATION MUST NOT INTERFERE WITH BEARING CAPACITY OF ADJACENT FOUNDATIONS.
- DO NOT OBSTRUCT FLOW OF SURFACE DRAINAGE OR NATURAL FLOODCOURSES.
- PIPE BEDDING AND SURROUND MATERIAL SHALL BE OPSD GRANULAR A, RE-CYCLED GRANULAR MATERIALS ARE NOT PERMITTED.
- EARTH BOTTOMS OF EXCAVATIONS TO BE UNDISTURBED SOIL LEVEL, FREE FROM LOOSE, SOFT OR ORGANIC MATERIAL.
- ALL STRUCTURES WITHIN PAVED AREAS SHALL HAVE 4:1 FROST TAPERS FROM FROST LINE TO SUB-GRADE.
- CORRECT OVER-EXCAVATION WITH GRANULAR A COMPACTED TO NOT LESS THAN 95% OF CORRECTED MAXIMUM DRY DENSITY.
- SUB-GRADE AND AREAS TO BE BACKFILLED TO BE FREE FROM DEBRIS, SNOW, ICE, WATER AND FROZEN GROUND.
- DO NOT USE BACKFILL MATERIAL WHICH IS FROZEN OR CONTAINS ICE, SNOW OR DEBRIS.
- PIPE BEDDING AND SURROUND MATERIAL SHALL BE OPSD GRANULAR A, RE-CYCLED GRANULAR MATERIALS ARE NOT PERMITTED.
- DO NOT USE BEDDING, SURROUND OR BACKFILL MATERIAL WHICH IS FROZEN OR CONTAINS ICE, SNOW OR DEBRIS.
- PIPE BEDDING SHALL BE 150mm THICK. SHAPE BED TRUE TO GRADE AND TO PROVIDE CONFINEMENT, UNIFORM BEARING SURFACE FOR PIPE.
- PLACE SURROUND MATERIAL AROUND PIPES TO FULL WIDTH OF TRENCH AND TO 300mm ABOVE PIPES.
- PLACE BEDDING AND SURROUND MATERIAL IN UNIFORM LAYERS NOT EXCEEDING 150mm COMPACTED THICKNESS. PLACE FILL AND BACKFILL MATERIAL IN UNIFORM LAYERS NOT EXCEEDING 300mm COMPACTED THICKNESS.
- COMPACT EACH LAYER TO 95% OF CORRECTED DRY DENSITY BEFORE PLACING SUCCEEDING LAYER.
- DO NOT BACKFILL AROUND OR OVER CAST-IN-PLACE CONCRETE WITHIN 24 HOURS AFTER PLACING OF CONCRETE.
- BACKFILL MATERIALS WITHIN 1.8m OF PROPOSED GRADE SHALL MATCH THE MATERIALS EXPOSED ON THE TRENCH WALLS. BACKFILL BELOW 1.8m OF THE PROPOSED CAN CONSIST OF EITHER ACCEPTABLE NATURAL MATERIAL, ROCK, OR IMPORTED GRANULAR MATERIAL CONFORMING TO OPSD GRANULAR B TYPE I OR II. ANY ORGANIC SOILS OR TOPSOIL, IF ENCOUNTERED, SHALL BE REMOVED FROM THE EXCAVATION. IF ROCK IS USED AS BACKFILL IT SHALL BE WELL SHATTERED AND GRADED TO 200mm OR SMALLER TO PREVENT FINE MATERIAL INTO VOIDS IN THE ROCK FILL. THE UPPER SURFACE OF THE ROCK FILL SHALL BE COVERED WITH 150mm LAYER OF COMPACTED, WELL GRADED CRUSHED STONE PLACED ON GEOTEXTILE FABRIC.

5.11 PIPES:

- HANDLE PIPE USING METHODS APPROVED BY MANUFACTURER.
- LAY, CUT AND JOIN PIPES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- USE ONLY FITTINGS AS RECOMMENDED BY PIPE MANUFACTURER.
- LAY PIPES ON PREPARED BED, TRUE TO LINE AND GRADE AND ENSURE BARREL OF EACH PIPE IS IN CONTACT WITH SHAPED BED THROUGHOUT ITS FULL LENGTH, FREE OF SACS OR HIGH POINTS.
- DO NOT EXCEED MAXIMUM JOINT DEFLECTION RECOMMENDED BY PIPE MANUFACTURER.
- WHENEVER WORK IS SUSPENDED, INSTALL REMOVABLE WATER TIGHT BULKHEAD AT OPEN END OF LAST PIPE LAID TO PREVENT ENTRY OF FOREIGN MATERIALS.
- WHEN STOPPAGE OF WORK OCCURS, BLOCK PIPES TO PREVENT CREEP DURING DOWN TIME. MAKE WATER TIGHT CONNECTIONS TO MANHOLES.
- JOINTS SHALL BE STRUCTURALLY SOUND AND WATER TIGHT.
- REPAIR OR REPLACE PIPE, PIPE JOINT OR BEDDING FOUND DEFECTIVE.

5.12 SEWERS AND SEWER SERVICES:

- CONSTRUCT SEWER TRENCHES AS PER CITY DWG 56 & 57.
- RIGID STRUCTURES, INSTALL PIPE JOINTS NOT MORE THAN 1.2m FROM SIDE OF STRUCTURE.
- MAINTAIN EXISTING WATER SERVICE CONNECTIONS.
- PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS, SPECIFICALLY, THE LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSD 410. REPAIR AND RETEST SEWER LINE AS REQUIRED. REPAIR VISIBLE LEAKS REGARDLESS OF TEST RESULTS.
- CONDUCT TWO CCTV INSPECTIONS OF SEWERS. FIRST INSPECTION AFTER COMPLETION OF CONSTRUCTION, SECOND INSPECTION IMMEDIATELY PRIOR TO END OF WARRANTY PERIOD. A PAN AND TILT CAMERA SHALL BE USED. REPAIR SEWER LINE AS REQUIRED. SUBMIT REPORTS AND DVDS TO ENGINEER.
- CONDUCT DYE TEST OF SANITARY SEWERS AND COORDINATE WITH ENGINEER. DYE TEST SHALL BE WITNESSED BY ENGINEER.

5.13 WATERMAIN AND WATER SERVICE:

- INSTALL AND TEST TRACER WIRE ON THE WATER SERVICE CONNECTION AS PER 4.3.12 OF THE CITY OF OTTAWA WATER DISTRIBUTION DESIGN GUIDELINES AND DRAWING W36.
- PRESSURE TESTING AS PER AWWA C-605-05 AND CITY OF OTTAWA DESIGN GUIDELINES - WATER DISTRIBUTION SECTION 4.6.13.
- CHLORINATION AS PER AWWA C-651-05 AND CITY OF OTTAWA DESIGN GUIDELINES - WATER DISTRIBUTION SECTION 4.6.13 & CITY DWG. W46.

5.14 MANHOLES & CATCH BASINS:

- JOINTS SHALL BE MADE WATER TIGHT.
- SET PRECAST CONCRETE BASE ON 150mm MINIMUM OF GRANULAR BEDDING COMPACTED TO 100% CORRECTED MAXIMUM DRY DENSITY.
- MAKE EACH JOINT WATER TIGHT WITH RUBBER RING GASKETS.
- PLACE GRANULAR BACKFILL MATERIALS IN A UNIFORM LAYERS TO COMPACTED THICKNESS OF 150mm, COMPACT TO 95% CORRECTED MAXIMUM DRY DENSITY.
- PLACE FRAME AND COVER ON TOP SECTION TO ELEVATION AS INDICATED. IF ADJUSTMENT REQUIRED USE CONCRETE RISERS TO A MAXIMUM OF 300mm.
- CLEAN UNITS OF DEBRIS, FOREIGN AND SURPLUS MATERIALS. REMOVE FINNS AND SHARP PROJECTIONS. PREVENT DEBRIS FROM ENTERING SYSTEM.
- PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS, SPECIFICALLY, THE LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSD 407.

5.15 MAINTAIN RECORD DRAWINGS AND RECORD ACCURATELY DEVIATIONS FROM THE ORIGINAL CONTRACT DOCUMENTS CAUSED BY SITE CONDITIONS AND CHANGES MADE BY CHANGE ORDER OR ADDITIONAL INSTRUCTIONS. UPDATE DAILY AND MAKE AVAILABLE ON-SITE FOR REVIEW THROUGHOUT THE CONSTRUCTION PERIOD. MARK CHANGES IN RED INK. RECORD DRAWINGS SHALL INCLUDE BUT NOT NECESSARILY LIMITED TO CHANGES OF DIMENSION AND DETAIL; CHANGES TO GRADE ELEVATIONS; AND HORIZONTAL AND VERTICAL LOCATIONS OF UNDERGROUND SERVICES, UTILITIES AND STRUCTURES. MAINTAIN RECORD DRAWINGS AND WATERMAIN INSTALLED PARALLEL TO A SEWER SHALL BE LAID WITH A MINIMUM 2.5m BARREL TO BARREL HORIZONTAL SEPARATION FROM SEWERS AND SEWER MANHOLES. SUBMIT DRAWINGS TO ENGINEER AT THE END OF CONSTRUCTION. SUBMIT A RECORD DRAWING OF "AS-BUILT" GRADE ELEVATIONS, PREPARED BY A SURVEYOR, TO THE ENGINEER AT THE END OF CONSTRUCTION.

5.16 CLEAN CURBS SHALL BE CONSTRUCTED TO CITY OF OTTAWA DRAWING No. SC1.1. CONCRETE SIDEWALK SHALL BE CONSTRUCTED TO CITY OF OTTAWA DRAWING No. SC1.2. REPAIR AND RETEST SEWER LINE AS REQUIRED. REPAIR VISIBLE LEAKS REGARDLESS OF TEST RESULTS.

5.17 WHETHER RESULT OF POOR WORKMANSHIP, USE OF DEFECTIVE PRODUCTS OR DAMAGE, DEFECTIVE PORTIONS OF CURBS, SIDEWALKS AND ASPHALT SHALL BE CORRECTED OR REMOVED AND REPLACED. PROMPTLY MAKE GOOD OTHER CONTRACTOR'S WORK DAMAGED BY SUCH REMOVALS OR REPLACEMENTS.

5.18 REINSTATE ALL AREAS DISTURBED BY CONSTRUCTION. REINSTATE PAVEMENTS, CURBS AND SIDEWALKS, TO THICKNESS, STRUCTURE AND ELEVATION WHICH EXISTED BEFORE CONSTRUCTION. REINSTATE LANDSCAPED AREAS TO THE CONDITION AND ELEVATION WHICH EXISTED BEFORE CONSTRUCTION.

5.19 CLEAN AND REINSTATE AREAS AFFECTED BY THE WORK.

6. PAVEMENT

6.1 PAVEMENT STRUCTURE:

LIGHT DUTY PAVEMENT:

- 60mm HL-3 FINE ASPHALTIC CONCRETE
- 150mm OPSD GRANULAR A BASE
- 450mm OPSD GRANULAR B TYPE II SUB-BASE
- RE-CYCLED GRANULAR MATERIALS ARE NOT PERMITTED.

HEAVY DUTY PAVEMENT:

- 40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
- 50mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
- 150mm OPSD GRANULAR A BASE
- 450mm OPSD GRANULAR B TYPE II SUB-BASE
- RE-CYCLED GRANULAR MATERIALS ARE NOT PERMITTED.

ASPHALTIC CONCRETE SHALL BE PERFORMANCE GRADE PG58-34.

HOT MIX ASPHALT MATERIALS SHALL BE ACCORDING TO OPSD 1150 OR 1151.

PAVEMENT SUB-GRADE PREPARATION AND CONSTRUCTION OF THE PAVEMENT STRUCTURE SHALL CONFORM TO THE GEOTECHNICAL INVESTIGATION TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER.

6.2 ALL EXISTING ASPHALT TO BE REMOVED SHALL BE HAULLED TO A FACILITY APPROVED FOR ACCEPTING SUCH MATERIALS. REMOVE ALL MATERIALS TO THE SUB-GRADE LEVEL. REMOVE ORGANIC OR UNSUITABLE MATERIAL FROM SUB-GRADE WHERE ENCOUNTERED TO THE SATISFACTION OF THE GEOTECHNICAL CONSULTANT. SUB-GRADE TO BE FREE FROM DEBRIS, SNOW, ICE, WATER AND FROZEN GROUND. COMPACT SUB-GRADE TO 95%.

6.4 CONSTRUCT GRANULAR BASE AND SUB-GRADE TO DEPTH AND GRADE IN AREAS INDICATED. CONSTRUCT A 5H-VI FROST TAPER IN SUB-GRADE TO ALLOW FOR CURING. PAVING AND CONSTRUCTION EQUIPMENT SHALL NOT BE PERMITTED ONTO THE TACK COAT UNTIL IT HAS SET. TACK COAT MATERIAL SHALL CONSIST OF SS-1 EMULSIFIED ASPHALT DILUTED WITH AN EQUAL VOLUME OF WATER. THE UNDLUTED MATERIAL SHALL BE ACCORDING TO OPSD 11003.

6.11 SHAPE BASE TO SMOOTH CONTOUR AND COMPACT TO NOT LESS THAN 100% CORRECTED MAXIMUM DRY DENSITY BEFORE BEGINNING PAVING OPERATIONS.

6.12 APPLY ASPHALTIC CONCRETE ONLY WHEN BASE OR PREVIOUS COURSE IS DRY AND AIR TEMPERATURE IS ABOVE 5 DEG.C

6.13 ROLL UNTIL ROLLER MARKS ARE ELIMINATED AND COMPACTED TO NOT LESS THAN 95% OF DENSITY. COMPACT WITH HOT TAMPERS IN AREAS INACCESSIBLE TO A ROLLER. BEVEL EDGES ADJACENT TO GRANULAR SURFACES.

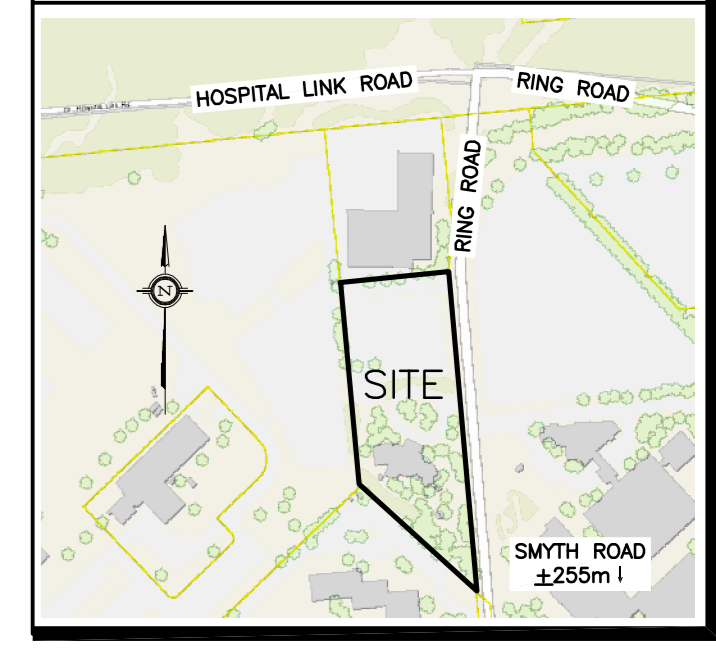
6.14 FINISH SURFACE SMOOTH, TRUE TO GRADE.

6.15 KEEP VEHICULAR TRAFFIC AND OTHER LOADS OFF NEWLY PAVED AREAS UNTIL 24 HOURS AFTER PAVING.

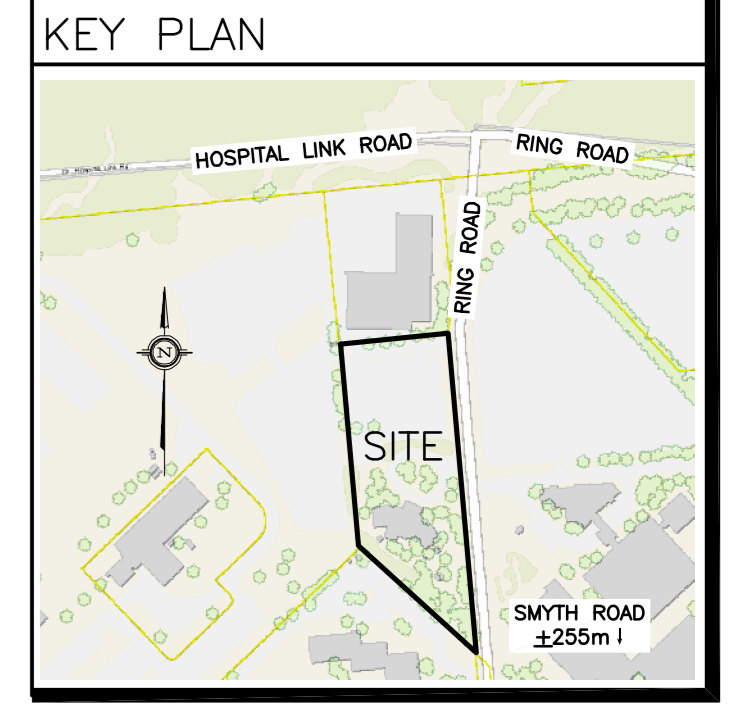
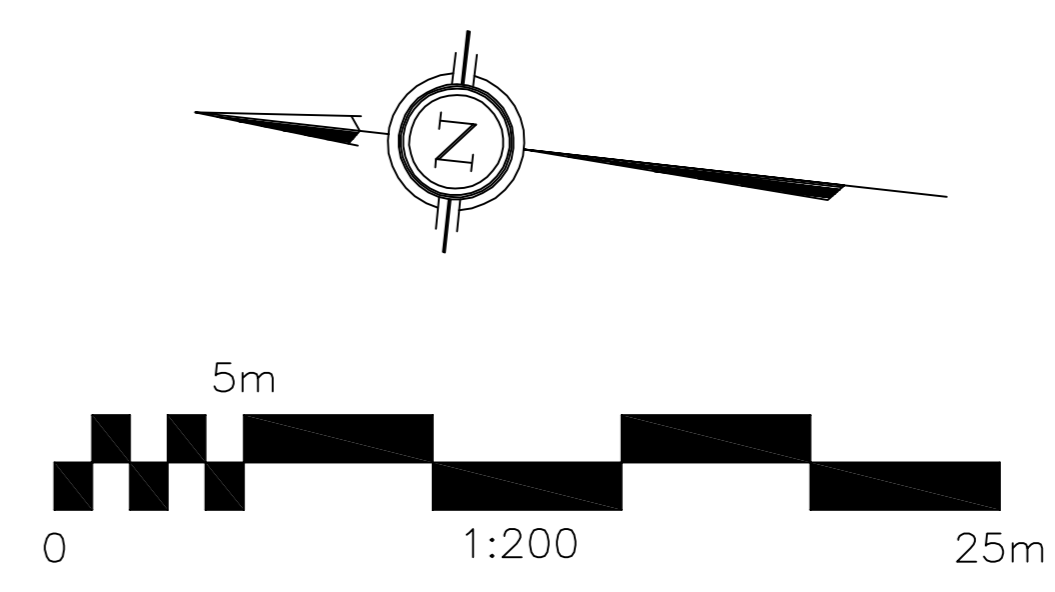
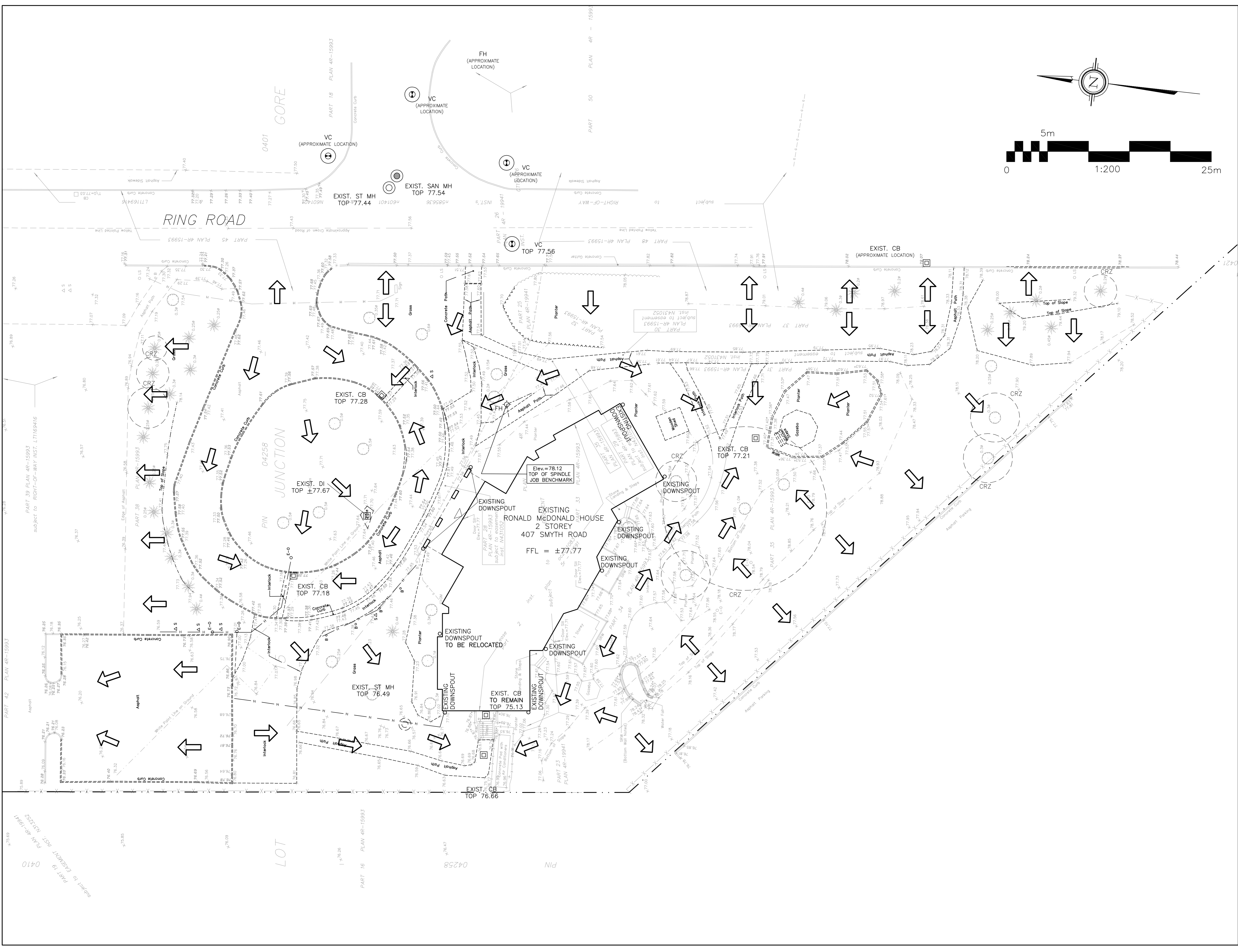
6.16 DIVERT UNUSED AND WASTE ASPHALT TO A FACILITY APPROVED FOR ACCEPTING SUCH MATERIALS.

6.17 APPLY TRAFFIC PAINT AS IDENTIFIED ON PLAN. TRAFFIC PAINT: NO DETERMINED, UNIFORM AND SMOOTH, FREE FROM SKIN, DIRT AND OTHER FOREIGN PARTICLES. APPLY TO PAVEMENT SURFACE FREE FROM FROST, ICE, DUST, OIL, GREASE AND OTHER FOREIGN MATERIALS. PROTECT PAVEMENT MARKINGS UNTIL DRY.

## KEY PLAN



No.	DATE	REVISION
5	APR 20-23	RE-ISSUED FOR APPROVAL
4	MAR 17-23	RE-ISSUED FOR APPROVAL
3	FEB 17-23	PROGRESS SET
2	DEC 16-22	ISSUED FOR APPROVAL



No.	DATE	REVISION
4	MAR 17-23	RE-ISSUED FOR APPROVAL
3	FEB 17-23	PROGRESS SET
2	DEC 16-22	ISSUED FOR APPROVAL
1	NOV 25-22	ISSUED FOR CLIENT REVIEW

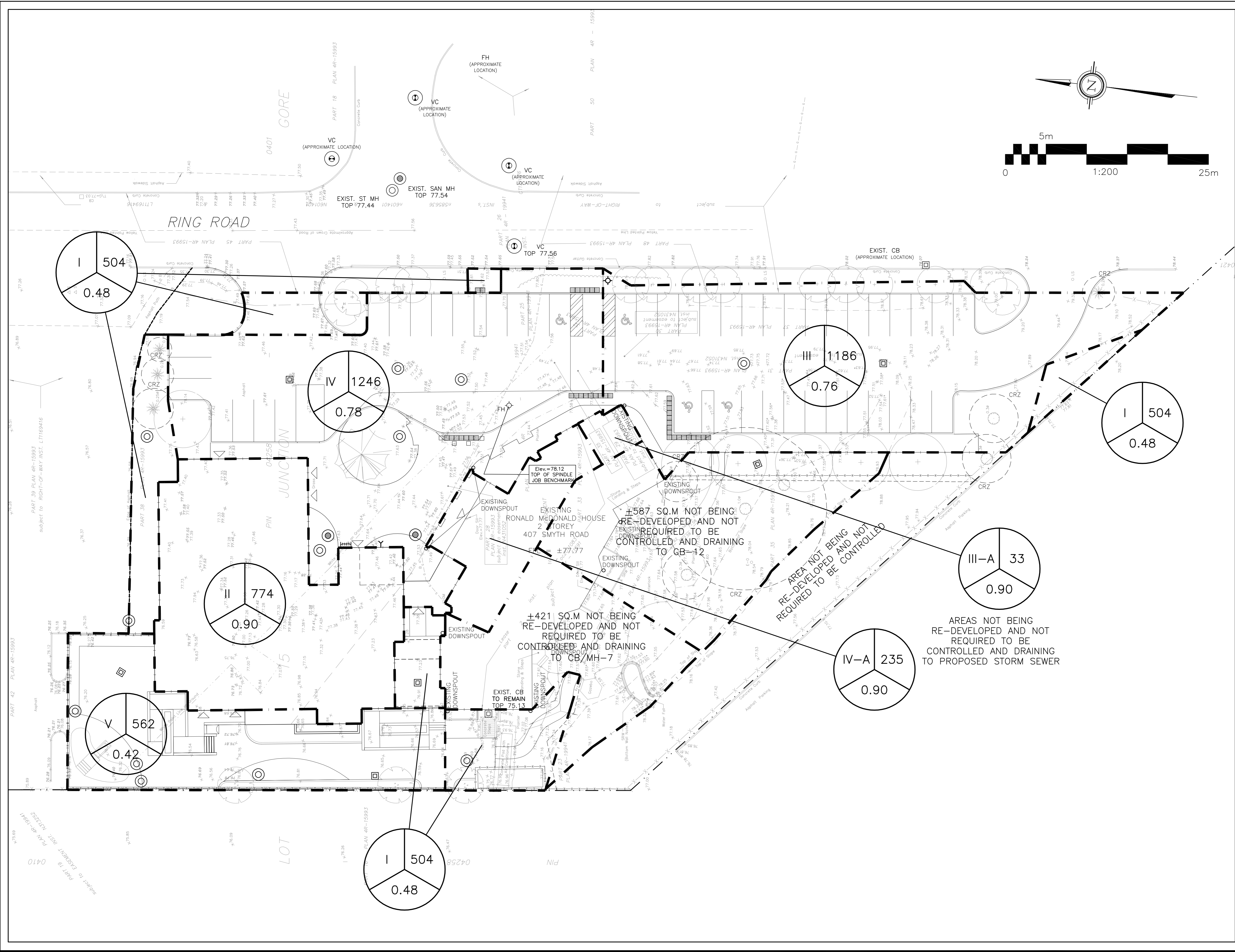
**D. B. GRAY ENGINEERING INC.**  
 Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermain  
 700 Long Point Circle 613-425-8044  
 Ottawa, Ontario d.gray@dbgrayengineering.com

Project  
**RONALD McDONALD HOUSE ADDITION**  
 407 SMYTH RD,  
 OTTAWA, ONTARIO

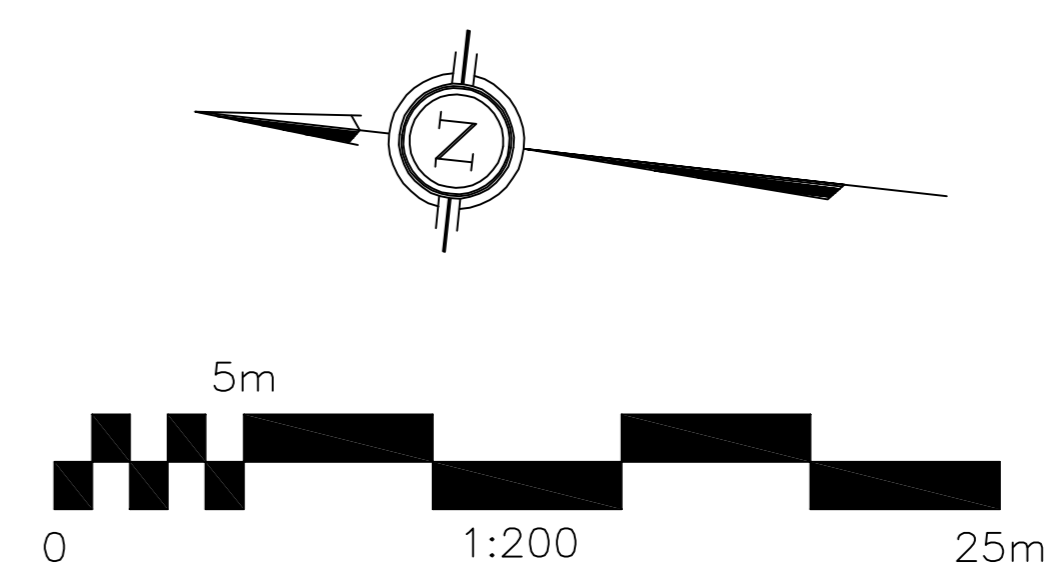
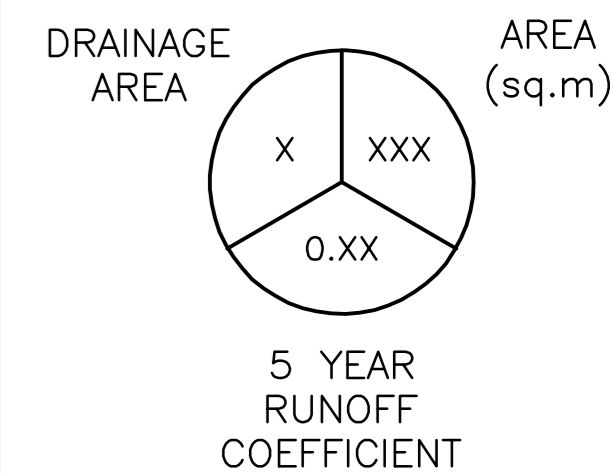
Drawing Title  
**PRE-DEVELOPMENT DRAINAGE PLAN**



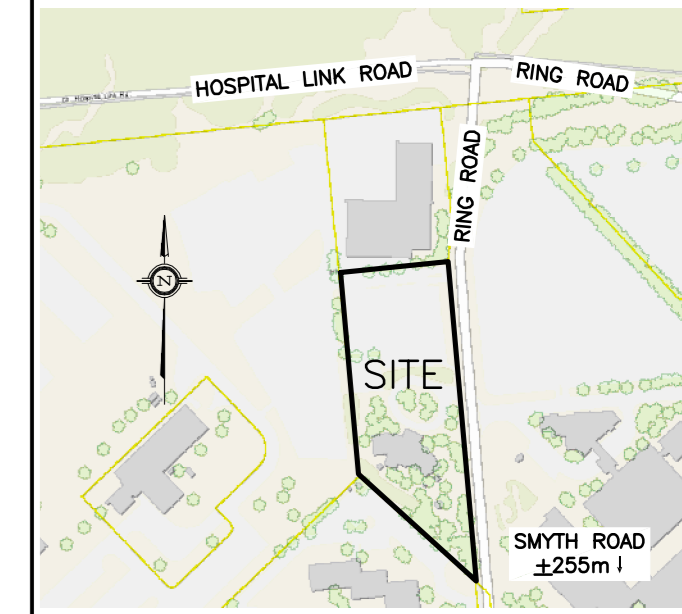
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 Hor. Scale: 1:200  
 Vert. Scale:  
 Date: NOV 25-22  
 Job No.: 19111  
 Drawing No.:  
**C-7**  
 of 8



**LEGEND**



**KEY PLAN**

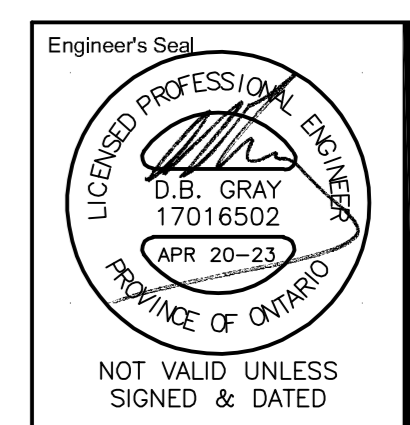


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Drawing Title  
**POST-DEVELOPMENT DRAINAGE PLAN**



Drawn: D.B.G.  
 Hor. Scale: 1:200  
 Vert. Scale:  
 Date: NOV 25-22  
 Job No.: 19111  
 Drawing No.:  
**C-8**  
 of 8