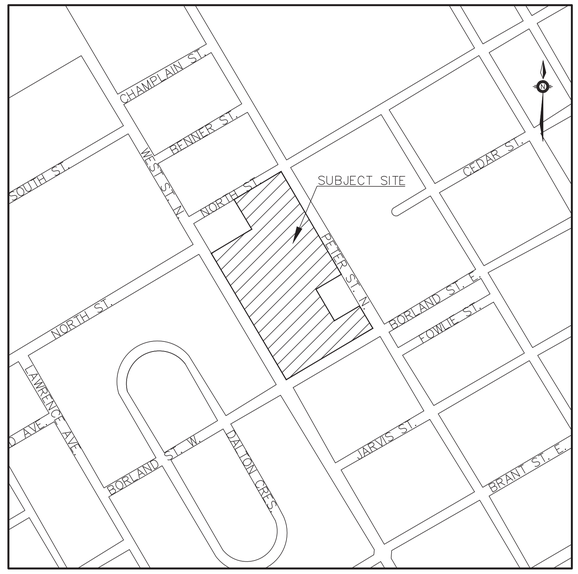
COUNTY OF SIMCOE
ORILLIA AFFORDABLE HOUSING
2 BORLAND STREET



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CITY OF ORILLIA
50 ANDREW STREET SOUTH, SUITE 300
ORILLIA, ON, L3V 7T5

COUNTY OF SIMCOE
1110 HIGHWAY 26
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20002 – 2 BORLAND ST. – 0 – NOVEMBER 2020

GENERAL NOTES

1. DRAWINGS

1.1 THE NOTES ON THIS SHEET APPLY TO ALL WORKS UNDER THIS CONTRACT UNLESS OTHER WISE NOTED ON THE PLAN AND PROFILE DRAWINGS AND/OR SPECIFIC DETAIL DRAWINGS.

1.2 THE STANDARD DRAWINGS OF THE CITY OF ORILLIA, ORILLIA HYDRO DISTRIBUTION, ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS (OPSS) AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) CONSTITUTE PART OF THE PLANS OF THIS CONTRACT.

1.3 ORDER OF PRECEDENCE OF STANDARD DRAWNGS IS FIRSTLY CITY OF ORILLIA AND SECONDLY ONTARIO PROVINCIAL STANDARD DRAWINGS.

1.4 THE STANDARD DRAWINGS INCLUDED WITH THESE PLANS ARE PROVIDED FOR CONVENIENCE ONLY AND ARE NOT TO BE CONSTRUED TO BE A COMPLETE SET FOR THE PURPOSE OF THE CONTRACT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL RELEVANT STANDARD DRAWINGS AND SPECIFICATIONS AS REQUIRED FOR THIS CONTRACT.

2. MEASUREMENTS

2.1 ALL DIMENSIONS ARE IN METRES (m), EXCEPT PIPE DIAMETERS, WHICH ARE IN MILLIMETRES (mm), UNLESS SPECIFIED OTHERWISE.

2.2 ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.

3. GENERAL

3.1 EXISTING SERVICES AND UTILITIES SHOWN ON THE CONTRACT DRAWINGS ARE BASED ON THE BEST INFORMATION AVAILABLE AND THEIR LOCATIONS ARE NOT GUARANTEED. THE CONTRACTOR SHALL INTERPRET THIS INFORMATION AS HE WISHES WITH THE UNDERSTANDING THAT THE OWNER ASSUMES ALL RESPONSIBILITY FOR ITS ACCURACY AND/OR SUFFICIENCY. THE CONTRACTOR IS REQUIRED TO NOTIFY THE VARIOUS UTILITY COMPANIES 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK.

3.2 A ROAD OCCUPANCY PERMIT IS REQUIRED FROM THE MUNICIPAL WORKS DEPARTMENT 72 HOURS PRIOR TO THE COMMENCEMENT OF WORK WITHIN ANY CITY RIGHT-OF-WAY. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN FOR APPROVAL BY THE ENGINEER AND THE CITY OF ORILLIA AT 20 JAMES STREET WEST.

3.3 PRIOR TO COMMENCING ANY WORK, INSTALL SNOW FENCING ALONG THE DRIP LINE OF THE DESIGNATED TREES AS SHOWN ON THE DRAWINGS. REFERENCE SHOULD ALSO BE MADE TO THE TREE PRESERVATION REQUIREMENTS AS SHOWN ON THE LANDSCAPE ARCHITECTS PLAN. MAINTAIN THE FENCE AT ALL TIMES TO ENSURE THAT ACCESS TO THE AREA BENEATH THE TREES IS PREVENTED. STORAGE OF EQUIPMENT AND SUPPLIES SHALL NOT BE PERMITTED WITHIN THIS AREA.

3.4 ALL SILT CONTROL AND EROSION PROTECTION DEVICES ARE TO BE IN PLACE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL CONSTRUCTION IS COMPLETE AND THE GRASS HAS ESTABLISHED GROWTH, SUBJECT TO APPROVAL BY THE CITY'S DIRECTOR OF MUNICIPAL WORKS.

3.5 NATIVE MATERIAL, SUITABLE FOR BACKFILL, SHALL BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.

3.6 GRANULAR MATERIAL, USED FOR BACKFILL, SHALL BE PLACED IN LAYERS 150mm IN DEPTH MAXIMUM AND COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).

3.7 UTILITY CROSSINGS, WHERE REQUIRED, SHALL BE SUPPORTED AS PER THE APPLICABLE UTILITY COMPANY CONCERNED.

3.8 THE CONTRACTOR IS RESPONSIBLE (IF REQUIRED) FOR SUPPORTING ANY EXISTING UTILITIES AND/OR STRUCTURES IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY CONCERNED.

3.9 ALL DISTURBED AREAS ARE TO BE REINSTATED TO THEIR ORIGINAL CONDITION OR BETTER, AS DETERMINED BY THE CITY MUNICIPAL WORKS DEPARTMENT. ALL GRASS AND VEGETATION COVERED AREAS SHALL BE RESTORED BY PLACING 100mm OF SCREENED TOPSOIL AND No.1 NURSERY SOD UNLESS NOTED OTHERWISE.

3.10 WRITTEN PERMISSION SHALL BE OBTAINED BY THE DEVELOPER FROM THE OWNERS OF THE LANDS EXTERNAL TO THE SUBJECT PROPERTY PRIOR TO UNDERTAKING ANY WORK ON THEIR PROPERTY. THE WORK TO BE UNDERTAKEN ON THESE LANDS INCLUDES TREE REMOVAL AND CONSTRUCTING SERVICED ROADWAYS. GRADING AS REQUIRED TO MATCH EXISTING GROUND INTO THE PROPOSED STREET LINE ELEVATIONS SHALL BE DONE AT A MAXIMUM SLOPE OF 3: 1. FURTHERMORE, ALL DISTURBED AREAS WITHIN THE LANDS AND LANDS SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER.

3.11 ALL GRADING MUST CONFORM TO THE CITY OF ORILLIA LOT GRADING POLICIES CURRENTLY IN EFFECT.

3.12 ALL REMOVALS ARE TO BE CARRIED OUT IN ACCORDANCE WITH OPSS 510.

3.13 DEWATERING TO BE CARRIED OUT IN ACCORDANCE WITH OPSS 517 AND 518 TO MAINTAIN ALL TRENCHES IN A DRY CONDITION. ALL ENGINE DRIVEN PUMPS ARE TO BY ADEQUATELY SILENCED FOR OPERATION IN RESIDENTIAL AREAS.

THE CORPORATION OF THE CITY OF ORILLIA DEPARTMENT OF PLANNING & DEVELOPMENT

ENGINEERING DESIGN STANDARDS — RESIDENTIAL DEVELOPMENT — **GENERAL**

DATE: AUGUST 2011 | SCALE: N.T.S. | SECTION: 1-3

DRAWN: GHic

4. ROADS

4.1 THE ROAD PAVEMENT STRUCTURE SHALL CONSIST OF A MINIMUM OF THE FOLLOWING:

8.5m ROAD	14.0m ROAD (COLLECTOR)
- 40mm HL3 ASPHALT	- 40mm HL3 ASPHALT
- 50mm HL4 OR HL8 ASPHALT	- 2-50mm LIFTS HL4 OR HL8
- 150mm GRANULAR "A"	- 150mm GRANULAR "A"
- 300mm CRUSHED GRANULAR "B"	- 300mm CRUSHED GRANULAR "B"

GRANULAR "B" SHALL BE AS PER CITY OF ORILLIA SPECIFICATIONS:

CITY OF ORILLIA GRANULAR 'B' 50mm CRUSHED GRAVEL

SIEVE	% PASSING
53.0mm	100
37.5mm	95-100
26.5mm	75-90
19.0mm	60-90
13.2mm	50-90
4.75mm	35-65
1.18mm	20-45
300um	5-25
75um % CRUSHED	0-10 40% MINIMUM

4.2 NATIVE SUBGRADE SHALL HAVE A CROSS'FALL OF 3%.

4.3 NATIVE SUBGRADE TO BE COMPACTED TO MINIMUM 95% SPMDD AND SHALL BE PROOF ROLLED AND APPROVED BY THE SOILS CONSULTANT PRIOR TO INSTALLATION OF GRANULAR. ALL GRANULAR MATERIAL SHALL BE COMPACTED TO 100% SPMDD.

4.4 THE ROAD BASE SHALL INCORPERATE A 3.0m MIN. 109mm PERFORATED SUBDRAIN C/W FACTORY INSTALLED FILTER FABRIC AT 1.0% SLOPE FROM EACH SIDE OF EVERY CATCHBASIN, MIN. 0.15M BELOW SUBGRADE OR IN ANY AREAS DEEMED NECESSARY BY THE ENGINEER.

4.5 JOINTS WITH EXISTING ASPHALT TO BE SAW CUT STRAIGHT AS DIRECTED BY THE ENGINEER PRIOR TO PLACEMENT OF NEW ASPHALT.

4.6 ALL CURB AND GUTTER SHALL BE CONSTRUCTED AS PER THE ENGINEERING DRAWINGS AS FOLLOWS:
- SINGLE STAGE CURB AS PER OPSD 600.040 FOR COLLECTOR AND ARTERIAL, ROADS AND MOUNTABLE CURB WITH NARROW GUTTER AS PER 600.100 FOR LOCAL ROADS.
- CURB TERMINATIONS AS PER OPSD 608.010.

4.7 ALL CURBS SHALL BE DEPRESSED AT ALL WALKWAY, DRIVEWAY AND SIDEWALK LOCATIONS.

4.8 ALL CURB RADII TO BE 9.0m AT THE EDGE OF ASPHALT, UNLESS SHOWN OTHERWISE.

4.9 CONCRETE STRENGTH FOR CURB AND GUTTER TO BE 30MPa AT 28 DAYS.

4.10 TEMPORAY ASPHALT CURB SHALL BE PLACE BEHIND ALL CB'S DURING BASE COURSE PLACEMENT. ASPHALT CURBS SHALL BE REPLACED WITH CONCRETE CURBS FOR THE FINAL ASPHALT LIFT.

4.11 SIDEWALKS TO COMPLY WITH OPSD 310.010 ANC ARE TO BE 1.5m WIDE. MINIMUM THICKNESS AS FOLLOWS:
- RESIDENTIAL DRIVEWAY, 150mm
- COMMERCIAL DRIVEWAY, 200mm (REINFORCEMENT AS PER OPSS IF REQUIRED)
- WHEN NO DRIVEWAY IS PRESENT, 125mm

4.11 SIDEWALKS TO BE CONSTRUCTED ON 150mm GRANULAR "A" BEDDING UNLESS OTHERWISE SPECIFIED BY THE DIRECTOR OF MUNICIPAL WORKS.

4.12 CONCRETE STRENGTH FOR SIDEWALK TO BE 30MPa AT 28 DAYS.

4.13 SIDEWALK RAMPS TO COMPLY WITH OPSD 310.030.

4.14 WALKWAYS TO COMPLY WITH CITY OF ORILLIA STANDARD AND SHALL BE CENTERED WITHIN THE WALKWAY BLOCKS AS SHOWN ON THE PLANS. THE WIDTHS OF THE BLOCKS ARE AS SHOWN ONTHE PLANS.

4.15 THEY WALKWAY SURFACE SHALL CONSIST OF 2.8m WIDE HL3 ASPHALT COMPACED TO 50mm THICNESS ON A BSE OF 200mm THE COMPACTED GRANULAR "A". THE REMAINDER OF THE WALKWAY BLOCK SHALL BE FINISHED WITH A 100mm TOPSOIL AND No.1 NURSERY SOD, AND SHALL BE SHAPED WITH A 150mm DEEP SWALE ON EITHER SIDE OF THE WALKWAY SURFACE SO AS TO PROVIDE POSITIVE DRAINAGE, OR AS SHOWN OTHERWISE. (SEE DETAIL ON SD-4)

4.16 WALKWAY GATES SHALL BE INSTALLED AT THE STREETLINE END(S) OF ALL WALKWAYS SET BACK 1.0m FROM STREET LINE AS DETAILS SHOW. MAXIMUM SPACING BETWEEN POSTS SHALL BE 1.5m. WALKWAYS ARE TO BE FENCED ON BOTH SIDES AS DETAILS SHOW.

4.17 DRIVEWAYS TO BE CONSTRUCTED WITH A MINIMUM OF 50mm HL3 ASPHALT ON A MINIMUM OF 300mm GRANULAR 'A' FOR RESIDENTIAL OR ALTERNATIVE EQUIVALENT MATERIAL AS APPROVED BY THE DIRECTOR OF MUNICIPAL WORKS.

4.18 DRIVEWAY GRADES TO BE A MINIMUM OF 0.5% AND A MAXIMUM OF 7.0%. DRIVEWAY WIDTH TO BE:
RESIDENTIAL — COMMERCIAL/INDUSTRIAL
SINGLE – 4.0m — THROAT WIDTH – 9.0m
DOUBLE - 6.0m — CURB RETURN – 6.0m (URBAN)
TRIPLE+(< 50% OF LOT FRONTAGE) CURBS RETURN -9.0 (SEMI-URBAN)
ENTRANCE DETAILS AS PER OPSD 351.010 AND PAVED TO STREETLINE

4.19 TEMPORARY DEAD END BARRICADE TO BE AS PER OPSD 912.532

THE CORPORATION OF THE CITY OF ORILLIA DEPARTMENT OF PLANNING & DEVELOPMENT

ENGINEERING DESIGN STANDARDS — RESIDENTIAL DEVELOPMENT — **ROADS**

DATE: AUGUST 2011 | SCALE: N.T.S. | SECTION: 4

DRAWN: GHic

5. SANITARY SEWERS

5.1 SANITARY SEWER TO BE LOCATED 1.5m OFF CENTRELINE OF THE ROAD UNLESS NOTED OTHERWISE.

5.2 MAXIMUM PIPE DEFLECTION FROM COMBINED LIVE AND DEAD LOADING SHALL NOT EXCEED ANY CSA, OPS OR MANUFACTURERS RECOMMENDED SPECIFICATIONS. FLEXIBLE PIPE SHALL BE PVC DR35 OR APPROVED EQUIVALENT, WITH RUBBER GASKET TYPE JOINTS AND SHALL CONFORM TO CSA (B-182.2, 3, 4). RIGID PIPE SHALL BE REINFORCED CONCRETE WITH STRENGTH OF 100kN/mmm CONFORMING TO CSA STANDARD A257.2-M1982 CLASS 1000. PIPE JOINTS ARE TO BE RUBBER GASKET AS PER CSA STANDARD A257.3.

5.3 FLEXIBLE SEWERS SHALL BE CONSTRUCTED WITH BEDDING AND BACKFILL AS PER OPSD 802.010 (GRANULAR 'A' FOR BEDDING, AND COVER MATERIAL TO BE SAND, GRANULAR 'A' OR QUARRY SCREENINGS PENDING A REVIEW BY THE ENGINEER). RIGID SEWERS SHALL BE CONSTRUCTED WITH CLASS "B" BEDDING (GRANULAR "A" MATERIAL) AS PER OPSD 802.030, 802.031 AND 802.032 AS APPLICABLE. MATERIAL MAY BE REPLACED ONLY BY APPROVAL OF THE DIRECTOR OF MUNICIPAL WORKS.

5.4 IN WET AREAS, FLEXABLE PIPE MAY BE LAID ON A 10mm CLEAR STONE BED, RIGID PIPE MAY BE LAID ON A 20mm CLEAR STONE BED. CLEAR STONE MUST BE WRAPPED IN GEOTEXTILE FIBRIC (TERRAFIX 270R OR APPROVED EQUAL).

5.5 NO FLEXIBLE PIPE SEWERS WILL BE INSTALLED WITH A DEPTH OF COVER GREATER THAN 6.0m UNLESS SPECIFICALLY APPROVED BY THE DIRECTOR OF MUNICIPAL WORKS.

5.6 TRENCH BACKFILL SHALL BE SELECT NATIVE MATERIAL OR IMPORTED SUBGRADE MATERIAL IF DIRECTED BY THE ENGINEER.

5.7 PRECAST MAINTENANCE HOLES SHALL BE IN ACCORDANCE WITH OPSD 701.010 (1200mm). PRECAST MAINTENANCE HOLES GREATER THAN 5.0m DEEP SHALL BE CONSTRUCTED WITH SAFETY PLATFORM IN ACCORDANCE WITH OPSD 404.020. FRAME AND COVER SHALL BE IN ACCORDANCE WITH OPSD 401.010 TYPE "A" AND MARKED "SANITARY". STEPS AS PER OPSD 405.010, ARE TO BE HOLLOW CIRCULAR ALUMINUM.

5.8 MAINTENANCE HOLE TOPS (FRAMES) ARE TO BE SET TO BASE COURSE ASPHALT GRADE, AND THEN ADJUSTED TO FINAL GRADE WHEN TOP LIFT OF ASPHALT IS PLACED. GRADE AND CROSS'FALL ADJUSTMENT SHALL BE MADE USING "THE ADJUSTABLE" (BIBBY-STE-CROIX CS0M-ONT) CONFORMING TO MULLER CANADA A-J633 OR APPROVED EQUIVALENT.

5.9 ALL CONNECTIONS TO THE SANITARY MAIN SHALL BE MADE WITH PRE-MANUFACTURED APPROVED TEES.

5.10 MAINTENANCE HOLES BENCHING SHALL CONFORM TO OPSD 701.021.

5.11 DROP STRUCTURES SHALL CONFORM TO OPSD 1003.01 AND 1003.02. ALTERNATIVELY, AND SUBJECT TO THE APPROVAL OF THE DIRECTOR OF MUNICIPAL WORKS, CONSIDERATION WILL BE GIVEN TO PRECAST MANHOLES COMPLETE WITH PRECAST DROP SECTIONS.

5.12 THE EXISTING SANITARY FLOWS ARE TO BE MAINTAINED AT ALL TIMES BY A METHOD APPROVED BY THE CITY.

5.13 MAINTAINANCE HOLES SHALL BE ABANDONED BY REMOVAL OF THE UPPER SECTIONS (BASE CAN REMAIN).

5.14 ABANONCED SANITARY SEWERS SHALL BE FILLED WITH NON-SHRINK FILL, OR REMOVED.

6. SANITARY SERVICE LATERALS

6.1 SANITARY LATERAL CONNECTIONS TO BE LOCATED AS SHOWN UNLESS DIRECTED BY THE ENGINEER.

6.2 PIPE TO BE MINIMUM 109mm PVC SDR28 RUBBER GASKET TYPE JOINTS AND SHALL CONFORM TO CSA (B-182.2, 3, 4) (COLOURED) FOR RESIDENTIAL HOUSE, AND MINIMUM 156mmd PVC SDR28 FOR INDUSTRIAL AND COMMERCIAL DEVELOPMENTS.

6.3 MINIMUM DEPTH OF LATERAL AT PROPERTY LINE SHALL BE 2.4m MEASURED FROM THE SEWER OBVERT TO FINISHED GROUND SURFACE ELEVATION UNLESS NOTED OTHERWISE.

6.4 MINIMUM PIPE SLOPE TO BE 2.0%, MAXIMUM 8.0% (SEE OPSD 1006.02).

6.5 SANITARY LATERAL CONNECTIONS ARE TO BE EXTENDED 2.0m BEYOND STREETLINE INTO THE LOTS AND PLUGGED.

6.6 THE LOCATION OF THE END OF EACH LATERAL ARE TO BE MARKED WITH A 50mm x 100mm WOOD MARKER PAINTED GREEN, EXTENDING FROM SERVICE INVERT TO 300mm ABOVE PROPOSED FINISHED GROUND LEVEL.

6.7 ALL CONNECTIONS TO NEW SANITARY MAINS SHALL BE WITH PRE-MANUFACTURED; APPROVED TEES.

THE CORPORATION OF THE CITY OF ORILLIA DEPARTMENT OF PLANNING & DEVELOPMENT

ENGINEERING DESIGN STANDARDS — RESIDENTIAL DEVELOPMENT — **SANITARY**

DATE: AUGUST 2011 | SCALE: N.T.S. | SECTION: 5 & 6

DRAWN: GHic

7. STORM SEWERS

7.1 MAXIMUM PIPE DEFLECTION FROM COMBINED LIVE AND DEAD LOADING SHALL NOT EXCEED ANY CSA, OPS OR MANUFACTURERS RECOMMENDED SPECIFICATION. FLEXIBLE PIPE SHALL BE PVC DR35 OR APPROVED EQUIVALENT, WITH RUBBER GASKET TYPE JOINTS AND SHALL CONFORM TO CSA (B-182.2, 3, 4). RIGID PIPE SHALL BE REINFORCED CONCRETE WITH A MINIMUM STRENGTH OF 65N/mmm CONFORMING TO CSA STANDARD A257.2-M1982 CLASS 65D AND OPSD 807.01. PIPE JOINTS ARE TO BE RUBBER GASKET AS PER CSA STANDARD A257.3.

7.2 ALL STORM LATERALS SHALL BE PLUGGED. THE LOCATION OF THE END OF EACH LATERAL IS TO BE MARKED WITH A 50mm x 100mm WOOD MARKER PAINTED WHITE, EXTENDING FROM SERVICE INVERT TO 300mm ABOVE PROPOSED FINISHED GROUND LEVEL.

7.3 ALL STORM PIPES WITH A DEPTH OF COVER EQUAL TO OR GREATER THAN 6.0m SHALL BE REINFORCED CONCRETE PIPE. ALL STORM PIPES WITH AN INSIDE DIAMETER GREATER THAN 900mm, IRRESPECTIVE OF DEPTH, SHALL ALSO BE REINFORCED CONCRETE PIPE.

7.4 STORM SEWERS ARE TO BE LOCATED GENERALLY 1.5m OFF CENTRE LINE UNLESS OTHERWISE SPECIFIED.

7.5 STORM SEWERS SHALL BE CONSTRUCTED AS PER OPSD 802.030, 802.031 AND 802.032 (AS APPLICABLE) WITH CLASS "B" BEDDING (GRANULAR "A" MATERIAL) FOR RIGID PIPE AND OPSD 802.010 (GRANULAR "A" TYPE 2 BEDDING AND COVER MATERIAL TO BE SAND, GRANULAR 'A' OR QUARRY SCREENINGS PENDING A REVIEW BY THE ENGINEER) FOR FLEXIBLE PIPE, UNLESS APPROVED OTHERWISE BY THE DIRECTOR OF PUBLIC WORKS.

7.6 TRENCH BACKFILL SHALL BE SELECT NATIVE MATERIAL OR IMPORTED SUBGRADE MATERIAL AS PER OPSS 1010, IF DIRECTED BY THE ENGINEER.

7.7 PRECAST MAINTENANCE HOLES SHALL BE 1200mm DIAMETER UNLESS OTHERWISE SPECIFIED. AND SHALL BE IN ACCORDANCE WITH OPSD 701.010, 701.011, 701.012 AND 701.013. PRECAST MAINTENANCE HOLES GREATER THAN 5.0m DEEP SHALL BE CONSTRUCTED WITH A SAFETY PLATFORM IN ACCORDANCE WITH OPSD 404.020. FRAME AND COVER SHALL BE IN ACCORDANCE WITH OPSD 401.010 TYPE "B" AND MARKED "STORM". STEPS AS PER OPSD 405.010, ARE TO BE HOLLOW CIRCULAR ALUMINUM.

7.8 CATCHBASINS TO BE 600mm SQUARE PRECAST CONCRETE TO OPSD 705.010, OR WHERE SPECIFIED, 800mm x 1450mm PRECAST CONCRETE TO OPSD 705.020, FRAME AND GRATE TO OPSD 400.110. DITCH INLET CATCHBASINS TO BE AS PER OPSD 705.030 OR 705.040, AS SPECIFIED COMPLETE WITH FRAME AND GRATE TO OPSD 403.010. DITCH INLET CATCHBASIN SLOPES ARE TO BE 3:1 UNLESS NOTED OTHERWISE.

7.9 PLACE ALL CATCHBASIN LATERALS AT 2% GRADE UNLESS OTHERWISE NOTED. PIPE SIZE IS TO BE A MINIMUM 300mm FOR SINGLE, 375mm FOR DOUBLE AND TO BE PVC DR35.

7.10 ALL CONNECTIONS TO THE STORM MAIN SHALL BE MADE WITH A STORM MANHOLE OR APPROVED FACTORY TEE CONNECTION AS PER OPSD 708.010. CATCHBASIN LATERALS CONNECTED TO MANHOLES SHALL HAVE A MAXIMUM INVERT TO INVERT DROP OF 900mm.

7.11 MAINTENANCE HOLE BENCHING, SHALL CONFORM TO OPSD 701.021. PIPE SUPPORT AT MANHOLES AND CATCHBASINS ARE TO BE AS PER OPSD 708.020.

7.12 MAINTENANCE HOLE AND CATCHBASIN TOPS ARE TO BE SET TO BASE COURSE ASPHALT GRADE AND THEN ADJUSTED TO FINAL GRADE WHEN TOP LIFT OF ASPHALT IS PLACED. GRADE AND CROSSFALL ADJUSTMENT SHALL BE MADE USING "THE ADJUSTABLE" (BIBBY-STE-CROIX CS0M-ONT) CONFORMING TO MUELLER CANADA A-J633 OR APPROVED EQUIVALENT.

7.13 PRECAST CONCRETE MAINTENANCE HOLE TEES, SHALL CONFORM TO OPSD 707.010.

7.14 PRIVATE REAR LOT CATCHBASINS SHALL CONFORM TO ACO DRAIN 620 SERIES POLYESTER POLYMER CONCRETE C/W GRATE AND TRASH BUCKET.

7.15 PLACE 3 m. 100 mm PERFORATED SUBDRAIN C/W FILTER SOCK AT 1.0% SLOPE FROM EACH SIDE OF EVERY CATCHBASIN AT MINIMUM OF 0.15 m BELOW SUB-GRADE UNLESS OTHERWISE SPECIFIED.

THE CORPORATION OF THE CITY OF ORILLIA DEPARTMENT OF PLANNING & DEVELOPMENT

ENGINEERING DESIGN STANDARDS — RESIDENTIAL DEVELOPMENT — **STORM SEWERS**

DATE: AUGUST 2011 | SCALE: N.T.S. | SECTION: 7

DRAWN: GHic

8. WATERMAINS

8.1 WATERMAIN MATERIAL IS TO BE POLYVINYL CHLORIDE, (PVC) CLASS 150 (DR18) OR DUCTILE IRON CLASS 52. TRACER WIRE (#12 TWU) SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF PVC WATERMAIN, BROUGHT UP AT EACH VALVE BOX, CHAMBER, AND HYDRANT, AND CONNECTED TO A FLANGE. TAPE IS TO BE USED TO AFFIX THE WIRE TO THE PIPE.

8.2 PVC PUSH-ON FITTINGS MEETING AWWA SPECIFICATIONS C-907 AND CSA B137.2. MAY BE USED ON PVC WATERMAIN 150mm - 200mm IN DIAMETER. DUCTILE IRON FITTINGS SHALL BE IN ACCORDANCE WITH AWWA C153 OR AWWA C110. MECHANICAL JOINTS SHALL CONFORM TO AWWA C111.

8.3 ALL MECHANICAL JOINT FITTINGS SHALL HAVE SACRIFICIAL ANODES "PROTECTO CAPS" INSTALLED ON EVERY BOLT.

8.4 WA TERMAIN TO BE LOCATED AS SHOWN ON THE CONTRACT DRAWINGS.

8.5 THE MINIMUM HORIZONTAL SEPARATION BETWEEN THE WATERMAIN AND THE SANITARY/STORM SEWER IS TO BE 2.5m.

8.6 A MINIMUM OF 0.5m VERTICAL CLEARANCE BETWEEN THE WATERMAIN AND ALL UTILITIES MUST BE KEPT WHILE STILL MAINTAINING A MINIMUM DEPTH OF COVER AT ALL TIMES.

8.7 WATERMAINS SHALL BE INSTALLED WITH A MINIMUM COVER OF 1.7m OVER THE MAINS. 75mm OF STYROFOAM H160 OR APPROVED EQUAL INSULATION TO BE PROVIDED TO PROTECT WATERMAIN AT ALL STORM AND CB LEAD CROSSINGS WITHIN 300mm FREE TO FACE.

8.8 THE CONTRACTOR SHALL INFORM THE CITY OF ORILLIA NO LESS THAN 48 HOURS IN ADVANCE OF COMMENCING WORK.

8.9 WATERMAIN SHALL BE CONSTRUCTED WITH BEDDINGS AS PER OPSD 802.010 (GRANULAR 'A' EMBEDMENT MATERIAL) FOR FLEXIBLE PIPES AND OPSD 802.030 OR 802.031 CLASS 'B' (GRANULAR "A" BEDDING) FOR RIGID PIPE UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF MUNICIPAL WORKS. COVER MATERIAL TO BE SAND, GRANULAR 'A' OR QUARRY SCREENINGS PENDING A REVIEW BY THE ENGINEER.

8.10 COPPER AND POLYETHYLENE SERVICES 19mm - 50mm IN DIAMETER SHALL BE EMBEDDED IN SAND 100mm ABOVE AND BELOW TO CONFORM TO OPSS 1004.05.05.

8.11 ALL FILL AREAS SHALL BE FILLED TO SUB-GRADE PRIOR TO INSTALLATION. FILL AREAS SHALL BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY PRIOR TO THE INSTALATION OF THE WATERMAIN.

8.12 WHERE THE WATERMAIN ELEVATION EXCEEDS THE ELEVATION OF ANY OTHER UTILITY/SERVICE AND WHERE THE VERTICAL SEPARATION BETWEEN THE WATERMAIN AND WHERE THE OTHER SERVICE EXCEEDS THE HORIZONTAL SEPARATION, THE WATERMAIN SHALL BE RESTRAINED.

8.13 PIPE DEFLECTION SHOULD BE USED WHEREVER POSSIBLE TO MINIMIZE THE USE OF BENDS. WHEREVER IT IS NECESSARY TO DEFLECT FROM A STRAIGHT LINE, EITHER IN THE VERTICAL OR HORIZONTAL PLANE, THE AMOUNT OF DEFLECTION SHALL NOT EXCEED THE MANUFACTURER'S SPECIFICATIONS.

8.14 CONCRETE THRUST BLOCKS ARE TO BE INSTALLED AT ALL TEES, BENDS, HYDRANTS, ENDS OF MAINS AND CONNECTIONS 100mm AND LARGER AS PER OPSD 1103.010 AND 1103.020

8.15 AT ALL THRUST BLOCK LOCATIONS IN FILL AREAS, ALL SEGMENTS OF THE FITTING AND THE WATERMAIN SHALL BE TIED USING EMCO UNDERGROUND BELL JOINT CLAMPS OR EQUIVALENT, OR TIE-RODS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. WHERE THE DEFLECTION ANGLE AT THE THRUST BLOCK IS MORE THAN 45°, ADDITIONAL TIE-ROD ASSEMBLIES SHALL BE INSTALLED FOR AT LEAST 10m AT EACH SIDE OF THE THRUST BLOCK. IMPORTED GRANULAR FILL (GRANULAR 'A' OR EQUIVALENT) IS TO BE USED BEHIND THE THRUST BLOCK AND FOR A MINIMUM DISTANCE OF 2m ON EACH SIDE OF THE THRUST BLOCK. THE IMPORTED GRANULAR FILL IS TO BE COMPACTED TO A MINIMUM OF 100% STANDARD PROCTOR MAXIMUM DRY DENSITY. PRIOR TO CONSTRUCTION OF THE THRUST BLOCKS, THE CONTRACTOR SHALL OBTAIN THE WRITTEN APPROVAL FOR THE BACKFILL FROM A QUALIFIED GEOTECHNICAL ENGINEER. TIE-RODS AND CLAMPS SHALL BE GIVEN TWO COATS OF BITUMASTIC PAINT.

8.16 FIRE HYDRANTS TO BE CANADA VALVE OR AAV MODEL 2780, CONFORMING TO OPSD 1106.010 C/W 115mm I.D. PUMPER NOZZLE AND CHAINS. HYDRANT TEES TO BE ANCHOR STYLE WITH ADJUSTABLE FLANGE. DRAIN HOLES SHALL BE PLUGGED. HYDRANT BARRELS ARE TO BE PAINTED RED, BONNETS AND PORT CAPS TO BE PAINTED WITH PRIMER, PRIVATE HYDRANTS TO BE PAINTED YELLOW.

8.17 HYDRANT FLANGE ELEVATIONS SHALL BE SET AT A GRADE THAT WILL GIVE A FLANGE ELEVATION OF 50mm - 100mm ABOVE THE FINAL GRADE.

8.18 HYDRANTS SHALL BE LOCATED A MINIMUM OF 1.0m FROM THE EDGE OF DRIVEWAYS, ROADWAYS, UTILITIES, OR OTHER ABOVE GRADE OBSTACLES.

8.19 HYDRANTS SHALL BE INSTALLED ON ALL DEAD-END WATERMAINS. AT THE DISCRETION OF THE CITY OF ORILLIA'S REPRESENTATIVE, A 50mm BLOW-OFF MAY BE UTILIZED INSTEAD OF A HYDRANT.

THE CORPORATION OF THE CITY OF ORILLIA DEPARTMENT OF PLANNING & DEVELOPMENT

ENGINEERING DESIGN STANDARDS — RESIDENTIAL DEVELOPMENT — **WATER**

DATE: AUGUST 2011 | SCALE: N.T.S. | SECTION: 8

DRAWN: GHic

8. WATERMAINS (cont.)

8.20 ALL VALVES ARE TO BE RESILIENT SEAT GATE VALVES COMPLETE WITH SLIDER TYPE VALVE BOX. VALVES SHALL BE LOCATED AT INTERSECTIONS IN THE BOULEVARD BEHIND THE CURB RADIUS (UNLESS OTHERWISE SHOWN).

8.21 VALVES IN EXCESS OF 1.7m IN DEPTH SHALL REQUIRE A VALVE STEM EXTENSION.

8.22 THE OPERATION OF FIRE HYDRANTS AND/OR VALVES ON POTABLE WATER BY OTHER THAN MUNICIPAL WORKS DEPARTMENTS IS PROHIBITED.

8.23 THE CONTRACTOR IS RESPONSIBLE FOR ALL TIE-INS INCLUDING MATERIALS, EXCAVATION AND BACKFILL AS REQUIRED TO FACILITATE THE SWABBING AND TESTING OF THE NEW WATERMAINS UNDER THE SUPERVISION OF THE CITY OF ORILLIA. ONE INITIAL TIE-IN COMPLETE WITH CONTROL VALVE MAY BE INSTALLED IN PLACE OF A BY-PASS COMPLETE WITH CHECK VALVE AND SHUT OFF.

8.24 THE CONTRACTOR WILL SWAB, PRESSURE TEST, CHLORINATE AND FLUSH THE NEW WATERMAINS. ANY SWABBING, PRESSURE TESTING, CHLORINATING AND FLUSHING BEYOND THE INITIAL PROCEDURE WILL BE THE CONTRACTORS RESPONSIBILITY. PRESSURE TEST WATERMAINS TO 1035kPa (150psi) FOR TWO HOURS, WITHOUT PRESSURE DROP. WATERMAINS ARE TO BE SWABBED AND CHLORINATED BY THE CONTRACTOR, UNDER THE SUPERVISION OF THE ENGINEER. UPON SUCCESSFUL TEST RESULTS OF THE CONTRACTORS INSTALLED SYSTEM, THE TEMPORARY BYPASSES ARE TO BE REMOVED. CHLORINATE AT 50mg/L CONCENTRATION FOR 24 HOURS. COLLECT SAMPLES FOR BACTERIOLOGICAL TESTING. SAMPLES ARE TO BE COLLECTED BY A "CERTIFIED OPERATOR". ALL PRIVATE SIDE WATERMAIN DESIGNATED AS FIRELINE AND/OR COMBINATION DOMESTIC AND FIRELINE SHALL BE TESTED IN CONJUNCTION WITH 1997 O.B.C. ARTICLE 7.2.11.1 WHICH REFERENCES NFPA 24.

9. WATER SERVICES

9.1 ALL RESIDENTIAL SERVICE FITTINGS SHALL BE COMPRESSION COPPER CONNECTIONS. DOUBLE BOLT AND BROAD BAND STAINLESS STEEL SERVICE SADDLES TO BE USED ON PVC WATERMAINS FOR TAPPING 19mm - 52mm, AND ON DUCTILE IRON WATERMAINS FOR TAPPING 38mm - 52mm

9.2 ALL DOMESTIC CONNECTIONS SHALL BE A MINIMUM OF 19mm IN DIAMETER, TYPE "K" SOFT COPPER TUBING, MUNICIPEX POLY TUBING, OR APPROVED EQUIVALENT.

9.3 A MINIMUM HORIZONTAL SEPARATION OF 2.5m SHALL BE MAINTAINED BETWEEN WATER AND SEWER SERVICE LATERALS, UNLESS SHOWN OTHERWISE.

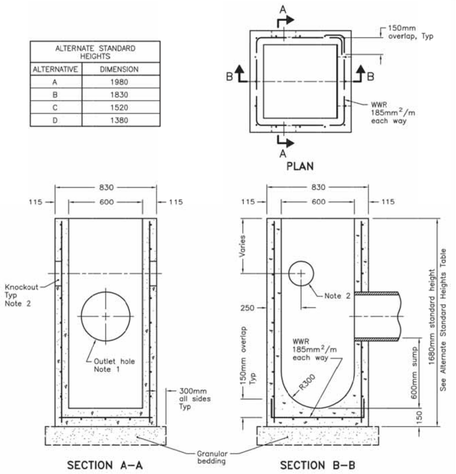
9.4 THE MINIMUM DEPTH OF COVER IS 1.7m.

9.5 WATER SERVICES SHALL BE INSTALLED TO AVOID DRIVEWAY APPROACHES.

9.6 SERVICE BOXES SHALL BE LOCATED ON THE STREET LINE IN RESIDENTIAL AREAS (REFER TO DETAIL ON SD-2)

9.7 NO COUPLINGS WILL BE ALLOWED BETWEEN THE CURB STOP AND MAIN STOP.

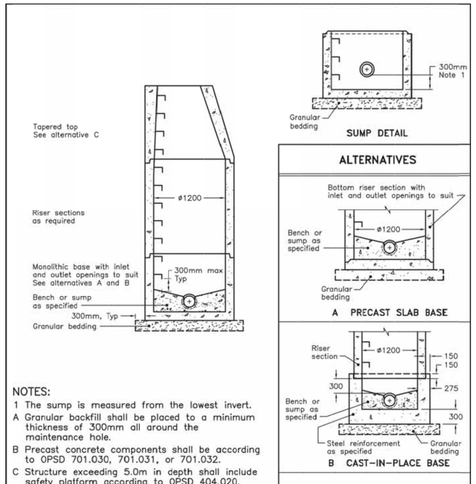
9.8 SERVICE TAPPINGS OFF AN EXISTING CHARGED WATERMAIN MAY ONLY BE DONE BY



NOTES:

1 Outlet hole size 525mm diameter maximum, location as required.
2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
A Centre reinforcing in base slab and walls ±20mm.
B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
D Pipe support shall be according to OPSD 708.020.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

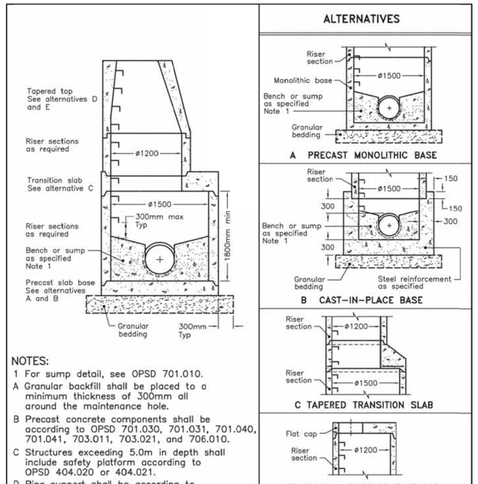
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE CATCH BASIN 600x600mm		OPSD 705.010



NOTES:

1 The sump is measured from the lowest invert.
A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
D Pipe support according to OPSD 708.020.
E For benching and pipe opening details, see OPSD 701.021.
F For adjustment unit and frame installation, see OPSD 704.010.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

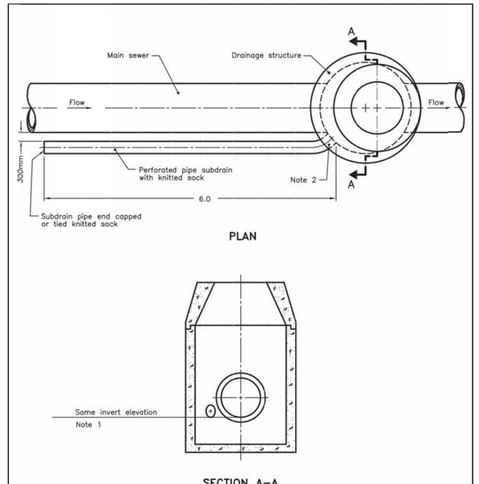
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER		OPSD 701.010



NOTES:

1 For sump detail, see OPSD 701.010.
A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B Precast concrete components shall be according to OPSD 701.030, 701.031, 701.040, 701.041, 703.011, 703.021, and 706.010.
C Structures exceeding 5.0m in depth shall include safety platform according to OPSD 404.020 or 404.021.
D Pipe support shall be according to OPSD 708.020.
E For benching and pipe opening details, see OPSD 701.021.
F For adjustment unit and frame installation, see OPSD 704.010.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

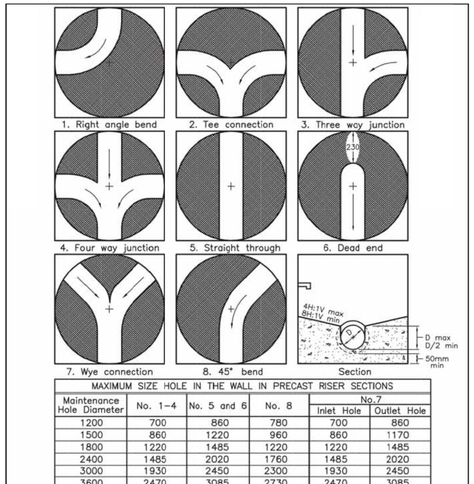
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1500mm DIAMETER		OPSD 701.011



NOTES:

1 Where concrete bedding is used for the main sewer, the pipe subdrain shall be placed 150mm above the top of such bedding.
2 Subdrain pipe shall be cored into maintenance hole.
A Maintenance hole benching shall accommodate pipe subdrain, as required.
B All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
PERFORATED PIPE SUBDRAIN IN GRANULAR TRENCH MAIN STORM SEWER CONNECTION TO DRAINAGE STRUCTURE		OPSD 809.010



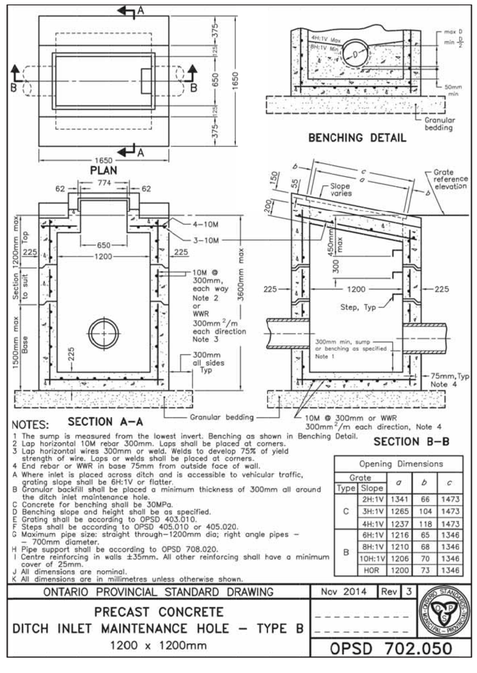
MAXIMUM SIZE HOLE IN THE WALL IN PRECAST RISER SECTIONS

Maintenance Hole Diameter	No. 1–4	No. 5 and 6	No. 8	No.7	
				Inlet Hole	Outlet Hole
1200	700	860	780	700	860
1500	860	1220	960	860	1170
1800	1220	1485	1220	1220	1485
2400	1485	2020	1760	1485	2020
3000	1930	2450	2300	1930	2450
3600	2470	3085	2730	2470	3085

NOTES:

1 Slopes shall be maintained from the outlet hole opening for top of benching.
A Concrete for benching shall be 30MPa.
B When benching is hand–finished, it shall be given wood float finish, channel shall be given steel trowel finish.
C Benching slope and height shall be as specified.
D When specified, maintenance holes that are 1200mm in diameter with a uniform channel for 200 or 250mm pipe may be prebenched at the manufacturer with standardized benching slope and channel orientation.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 4
MAINTENANCE HOLE BENCHING AND PIPE OPENING ALTERNATIVES		OPSD 701.021

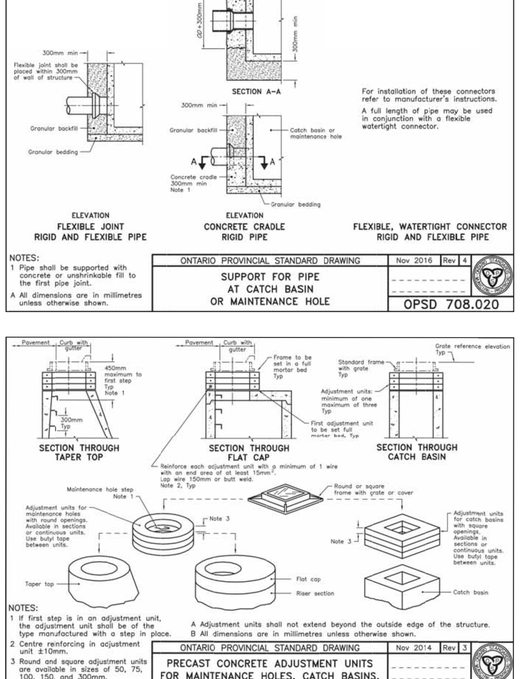


NOTES:

1 The sump is measured from the lowest invert. Benching as shown in Benching Detail.
2 Lap horizontal 10M rebar 300mm. Laps shall be placed at corners.
3 Lap horizontal wires 300mm or weld. Welds to develop 75% of yield strength of wire. Laps or welds shall be placed at corners.
4 End rebar or WWR in base 75mm from outside face of wall.
A Where inlet is placed across ditch and is accessible to vehicular traffic, grating slope shall be 6H:1V or flatter.
B Granular backfill shall be placed a minimum thickness of 300mm all around the ditch inlet maintenance hole.
C Concrete for benching shall be 30MPa.
D Benching slope and height shall be as specified.
E Grating shall be according to OPSD 403.010.
F Steps shall be according to OPSD 405.010 or 405.020.
G Maximum pipe size: straight through–1200mm dia; right angle pipes – – 700mm diameter.
H Pipe support shall be according to OPSD 708.020.
I Centre reinforcing in walls ±35mm. All other reinforcing shall have a minimum cover of 25mm.
J All dimensions are nominal.
K All dimensions are in millimetres unless otherwise shown.

Opening Dimensions				
Grate Type	Grate Slope	a	b	c
C	2H:1V	1341	66	1473
	3H:1V	1265	104	1473
	4H:1V	1237	118	1473
	6H:1V	1216	65	1346
B	8H:1V	1210	68	1346
	10H:1V	1206	70	1346
	HOR	1200	73	1346

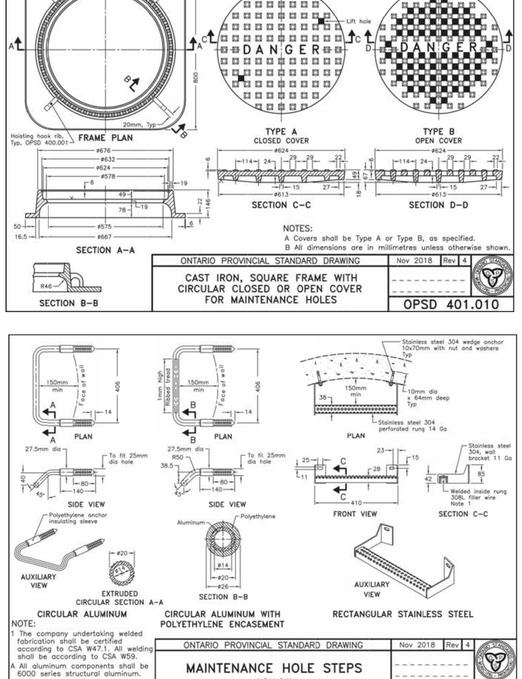
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
PRECAST CONCRETE DITCH INLET MAINTENANCE HOLE – TYPE B 1200 x 1200mm		OPSD 702.050



NOTES:

1 Pipe shall be supported with concrete or unshrinkable fill to the first pipe joint.
A All dimensions are in millimetres unless otherwise shown.

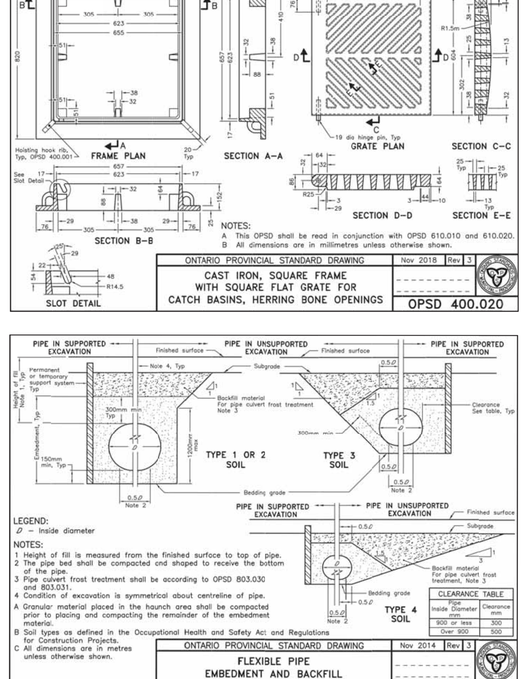
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2016	Rev 4
SUPPORT FOR PIPE AT CATCH BASIN OR MAINTENANCE HOLE		OPSD 708.020



NOTES:

A Covers shall be Type A or Type B, as specified.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
CAST IRON, SQUARE FRAME WITH CIRCULAR CLOSED OR OPEN COVER FOR MAINTENANCE HOLES		OPSD 401.010



NOTES:

A This OPSD shall be read in conjunction with OPSD 610.010 and 610.020.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
CAST IRON, SQUARE FRAME WITH SQUARE FLAT GRATE FOR CATCH BASINS, HERRING BONE OPENINGS		OPSD 400.020

NOTES:

1 If first step is in an adjustment unit, the adjustment unit shall be of the type manufactured with a step in place.
2 Centre reinforcing in adjustment unit ±10mm.
3 Round and square adjustment units are available in sizes of 50, 75, 100, 150, and 300mm.
A Adjustment units shall not extend beyond the outside edge of the structure.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
PRECAST CONCRETE ADJUSTMENT UNITS FOR MAINTENANCE HOLES, CATCH BASINS, AND VALVE CHAMBERS		OPSD 704.010

NOTE:

1 The company undertaking welded fabrication shall be certified according to CSA W47.1. All welding shall be according to CSA W59.
A All aluminum components shall be 6000 series structural aluminum.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
MAINTENANCE HOLE STEPS HOLLOW		OPSD 405.010

NOTES:

1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		OPSD 802.010

NO.	REVISION NOTE	DATE	BY

BENCHMARK

LICENSED PROFESSIONAL ENGINEER
G. M. PEARSON
100061886
11/12/20
PROVINCE OF ONTARIO

COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

NOTES AND DETAILS 2 OF 4

PEARSON ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # ND–2
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0

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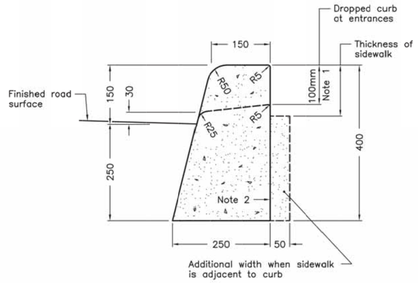
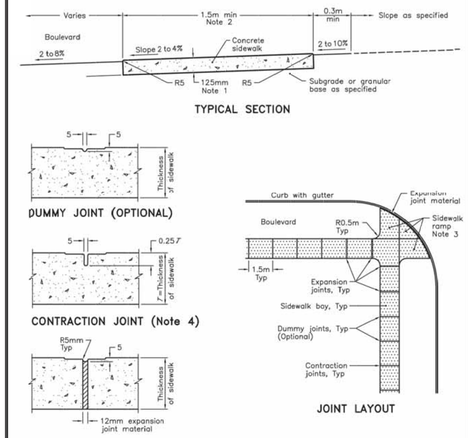


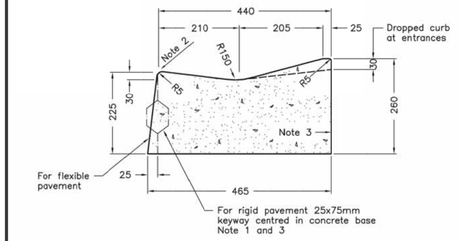
NOTES:
1 When sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.
2 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB		OPSD 600.110



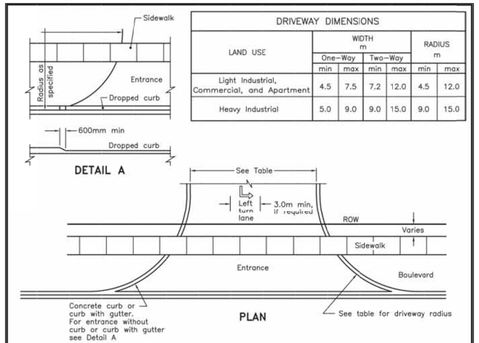
NOTES:
1 Sidewalk thickness at residential driveways and adjacent to curb shall be 150mm. At commercial and industrial driveways, the thickness shall be 200mm.
2 Sidewalk width shall be wider when specified.
3 This OPSD shall be read in conjunction with OPSD 310.030, 310.031, 310.033, and 310.039.
4 Contraction Joint may be tooled or sawcut.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 3
CONCRETE SIDEWALK		OPSD 310.010

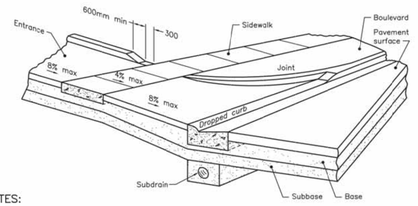


NOTES:
1 When curb and gutter is adjacent to concrete pavement or base, this drawing shall be used in conjunction with OPSD 552.010 and 552.020.
2 Flexible and composite pavement shall be placed 5mm above the adjacent edge of gutter.
3 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE MOUNTABLE CURB WITH NARROW GUTTER		OPSD 600.100

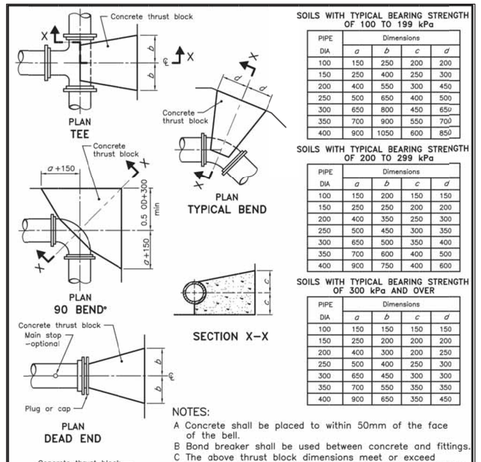


DRIVEWAY DIMENSIONS						
LAND USE	WIDTH m				RADIUS m	
	One-Way		Two-Way			
	min	max	min	max	min	max
Light Industrial, Commercial, and Apartment	4.5	7.5	7.2	12.0	4.5	12.0
Heavy Industrial	5.0	9.0	9.0	15.0	9.0	15.0



NOTES:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 2
URBAN INDUSTRIAL, COMMERCIAL, AND APARTMENT ENTRANCES		OPSD 350.010



SOILS WITH TYPICAL BEARING STRENGTH OF 100 TO 199 kPa

PIPE DIA	Dimensions a	b	c	d
100	150	250	200	200
150	250	400	250	300
200	400	550	300	450
250	500	650	400	500
300	650	800	450	650
350	700	900	550	700
400	900	1050	600	850

SOILS WITH TYPICAL BEARING STRENGTH OF 200 TO 299 kPa

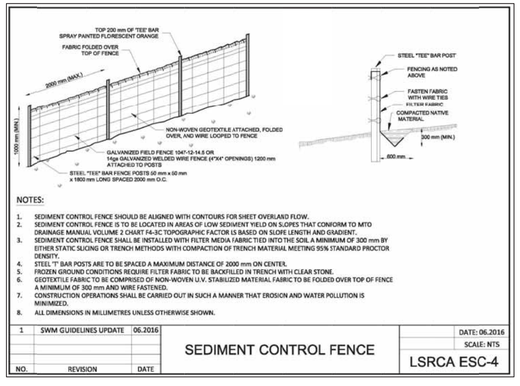
PIPE DIA	Dimensions a	b	c	d
100	150	200	150	150
150	250	250	200	200
200	400	350	250	300
250	500	450	300	350
300	650	500	350	400
350	700	600	400	500
400	900	750	400	600

SOILS WITH TYPICAL BEARING STRENGTH OF 300 kPa AND OVER

PIPE DIA	Dimensions a	b	c	d
100	150	150	150	150
150	250	200	200	200
200	400	300	200	250
250	500	400	250	300
300	650	450	300	300
350	700	550	350	350
400	900	650	350	450

NOTES:
A Concrete shall be placed to within 50mm of the face of the bell.
B Bond breaker shall be used between concrete and fittings.
C The above thrust block dimensions meet or exceed the MECP Watermain Design Criteria for Future Alterations Authorized Under a Drinking Water Works Permit.
D The assumptions made for the above calculations are:
– Maximum operating pressure of 690 kPa,
– Maximum surge pressure with a flow velocity change of 0.6 m/s of 790 kPa for Class 52 DI pipe and 240 kPa for PVC pipe.
E The tables apply to both ductile iron and PVC pipe. When one length exceeded the other, the longer length was used.
F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
CONCRETE THRUST BLOCKS FOR TEES, PLUGS, AND HORIZONTAL BENDS		OPSD 1103.010

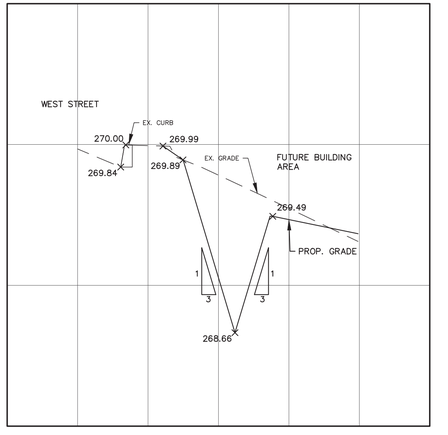


NOTES:
1. SEDIMENT CONTROL FENCE SHOULD BE ALIGNED WITH CONTOURS FOR SHEET OVERLAND FLOW.
2. SEDIMENT CONTROL FENCE IS TO BE LOCATED IN AREAS OF LOW SEDIMENT YIELD ON SLOPES THAT CONFORM TO MTO DRAINAGE MANUAL VOLUME 2 CHART F4-SC TOPOGRAPHIC FACTOR LS BASED ON SLOPE LENGTH AND GRADIENT.
3. SEDIMENT CONTROL FENCE SHALL BE INSTALLED WITH FILTER MEDIA FABRIC TIED INTO THE SOIL A MINIMUM OF 300 mm BY EITHER STATIC SLICING OR TRENCH METHODS WITH COMPACTION OF TRENCH MATERIAL MEETING 95% STANDARD PROCTOR DENSITY.
4. STEEL "T" BAR POSTS ARE TO BE SPACED A MAXIMUM DISTANCE OF 2000 mm ON CENTER.
5. FROZEN GROUND CONDITIONS REQUIRE FILTER FABRIC TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
6. GEOTEXTILE FABRIC TO BE COMPRISED OF NON-WOVEN U.V. STABILIZED MATERIAL FABRIC TO BE FOLDED OVER TOP OF FENCE A MINIMUM OF 300 mm AND WIRE FASTENED.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
8. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.

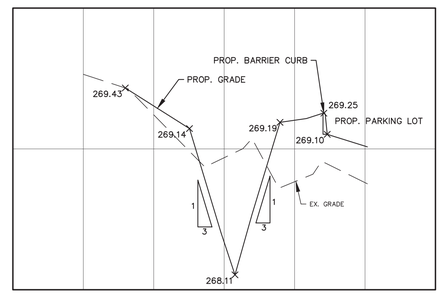
NO.	REVISION	DATE
1	SWM GUIDELINES UPDATE	06.2016

SEDIMENT CONTROL FENCE

DATE: 06.2016
SCALE: NTS
LSRCA ESC-4



SECTION C–C: MAJOR EXTERNAL OVERLAND SWALE
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:20



SECTION D–D: MAJOR EXTERNAL OVERLAND SWALE
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:20

NO.	REVISION NOTE	DATE	BY

BENCHMARK

G. M. PEARSON 100061986 PROVINCE OF ONTARIO LICENSED PROFESSIONAL ENGINEER 11/12/20

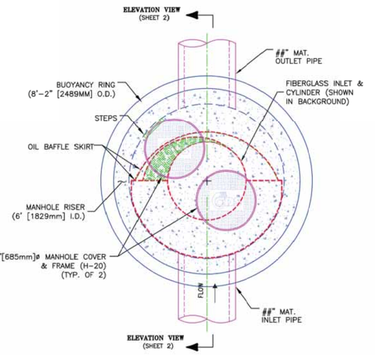
COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

NOTES AND DETAILS 3 OF 4

PEARSON ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # ND–3
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0

PLAN VIEW

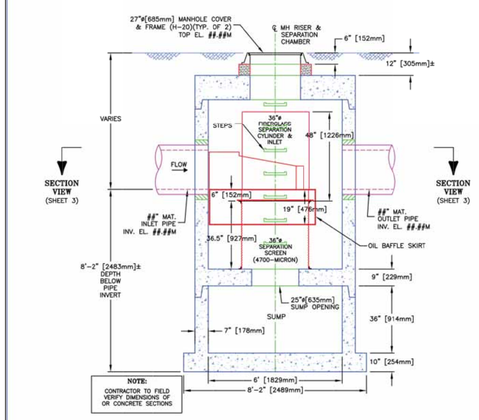


CDS MODEL PMSU30_30m, 85 L/s TREATMENT CAPACITY
STORM WATER TREATMENT UNIT

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# CAN-##-###	SCALE 1" = 3'
		DATE ##/##/##	SHEET 1
		DRAWN INITIALS	
		APPROV.	

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948-0000 Fax: (905) 948-0577
CONTECH Stormwater Solutions Inc. 930 Woodcock Road, Suite 101, Orlando, Florida 32803 Tel: (800) 848-9555

ELEVATION VIEW



CDS MODEL PMSU30_30m, 85 L/s TREATMENT CAPACITY
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CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# CAN-##-###	SCALE 1" = 3'
		DATE ##/##/##	SHEET 2
		DRAWN INITIALS	
		APPROV.	

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948-0000 Fax: (905) 948-0577
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StormTech ADS

STORMTECH SC-740 CHAMBER

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

STORMTECH SC-740 CHAMBER
(not to scale)

Nominal Chamber Specifications

Size (L x W x H)
85.4" x 51" x 30"
2,170 mm x 1,295 mm x 762 mm

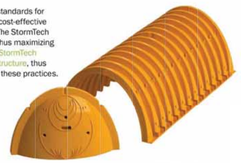
Chamber Storage
45.9 ft³ (1.30 m³)

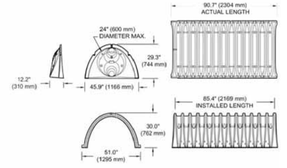
Min. Installed Storage*
74.9 ft³ (2.12 m³)

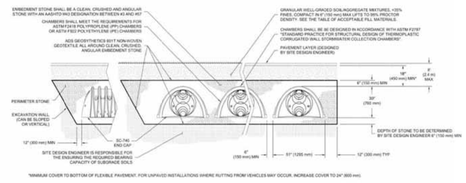
Weight
74.0 lbs (33.6 kg)

Shipping
30 chambers/pallet
60 end caps/pallet
12 pallets/truck

*Assumes 6" (150 mm) stone above, below and between chambers and 40% stone porosity.







StormTech ADS

SC-740 CUMULATIVE STORAGE VOLUMES PER CHAMBER

Assumes 40% Stone Porosity. Calculations are Based Upon a 6" (150 mm) Stone Base Under Chambers.

Depth of Water in System Inches (mm)		Cumulative Chamber Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
42 (1067)		45.90 (1.300)	74.90 (2.121)
41 (1041)		45.90 (1.300)	73.77 (2.089)
40 (1016)	Stone	45.90 (1.300)	72.64 (2.057)
39 (991)	Cover	45.90 (1.300)	71.52 (2.025)
38 (965)		45.90 (1.300)	70.39 (1.993)
37 (940)		45.90 (1.300)	69.26 (1.961)
36 (914)		45.90 (1.300)	68.14 (1.929)
35 (889)		45.85 (1.298)	66.98 (1.897)
34 (864)		43.69 (1.237)	65.73 (1.862)
33 (838)		45.41 (1.286)	64.46 (1.825)
32 (813)		44.81 (1.269)	62.97 (1.783)
31 (787)		44.01 (1.246)	61.36 (1.737)
30 (762)		43.06 (1.219)	59.66 (1.689)
29 (737)		41.98 (1.189)	57.89 (1.639)
28 (711)		40.80 (1.155)	56.05 (1.587)
27 (686)		39.54 (1.120)	54.17 (1.534)
26 (660)		38.16 (1.081)	52.23 (1.479)
25 (635)		36.74 (1.040)	50.23 (1.422)
24 (610)		35.22 (0.977)	48.19 (1.365)
23 (584)		33.64 (0.953)	46.11 (1.306)
22 (559)		31.99 (0.906)	44.00 (1.246)
21 (533)		30.29 (0.858)	1.85 (1.185)
20 (508)		28.54 (0.808)	39.67 (1.123)
19 (483)		26.74 (0.757)	37.47 (1.061)
18 (457)		24.89 (0.705)	35.23 (0.997)
17 (432)		23.00 (0.651)	32.96 (0.939)
16 (406)		21.05 (0.596)	30.68 (0.869)
15 (381)		19.09 (0.541)	28.36 (0.803)
14 (356)		17.09 (0.484)	26.03 (0.737)
13 (330)		15.04 (0.426)	23.68 (0.670)
12 (305)		12.97 (0.367)	21.31 (0.608)
11 (279)		10.87 (0.309)	18.92 (0.535)
10 (254)		8.74 (0.247)	16.51 (0.468)
9 (229)		6.58 (0.186)	14.09 (0.399)
8 (203)		4.41 (0.125)	11.66 (0.330)
7 (178)		2.21 (0.063)	9.21 (0.264)
6 (152)		0 (0)	6.76 (0.191)
5 (127)		0 (0)	5.63 (0.160)
4 (102)	Stone Foundation	0 (0)	4.51 (0.128)
3 (76)		0 (0)	3.38 (0.096)
2 (51)		0 (0)	2.25 (0.064)
1 (25)		0 (0)	1.13 (0.032)

Note: Add 1.13 ft³ (0.032 m³) of storage for each additional inch (25 mm) of stone foundation.

STORAGE VOLUME PER CHAMBER FT³ (M³)

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)		
		6 (150)	12 (300)	18 (450)
SC-740 Chamber	45.9 (1.3)	74.9 (2.1)	81.7 (2.3)	88.4 (2.5)

Note: Assumes 6" (150 mm) stone above chambers, 6" (150 mm) row spacing and 40% stone porosity.

AMOUNT OF STONE PER CHAMBER

	Stone Foundation Depth		
ENGLISH TONS (yds³)	6"	12"	18"
SC-740	3.8 (2.8)	4.6 (3.3)	5.5 (3.9)
METRIC KILOGRAMS (m³)	150 mm	300 mm	450 mm
SC-740	3,450 (2.1)	4,170 (2.5)	4,490 (3.0)

Note: Assumes 6" (150 mm) of stone above and between chambers.

VOLUME EXCAVATION PER CHAMBER YD³ (M³)

	Stone Foundation Depth		
	6 (150)	12 (300)	18 (450)
SC-740	5.5 (4.2)	6.2 (4.7)	6.8 (5.2)

Note: Assumes 6" (150 mm) of row separation and 18" (450 mm) of cover. The volume of excavation will vary as depth of cover increases.

Working on a project?
Visit us at www.stormtech.com and utilize the StormTech Design Tool

For more information on the StormTech SC-740 Chamber and other ADS products, please contact our Customer Service Representatives at 1-800-821-6710

THE MOST ADVANCED NAME IN WATER MANAGEMENT SOLUTIONS™

Advanced Drainage Systems, Inc.
4640 Truemun Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

NO.	REVISION NOTE	DATE	BY

BENCHMARK

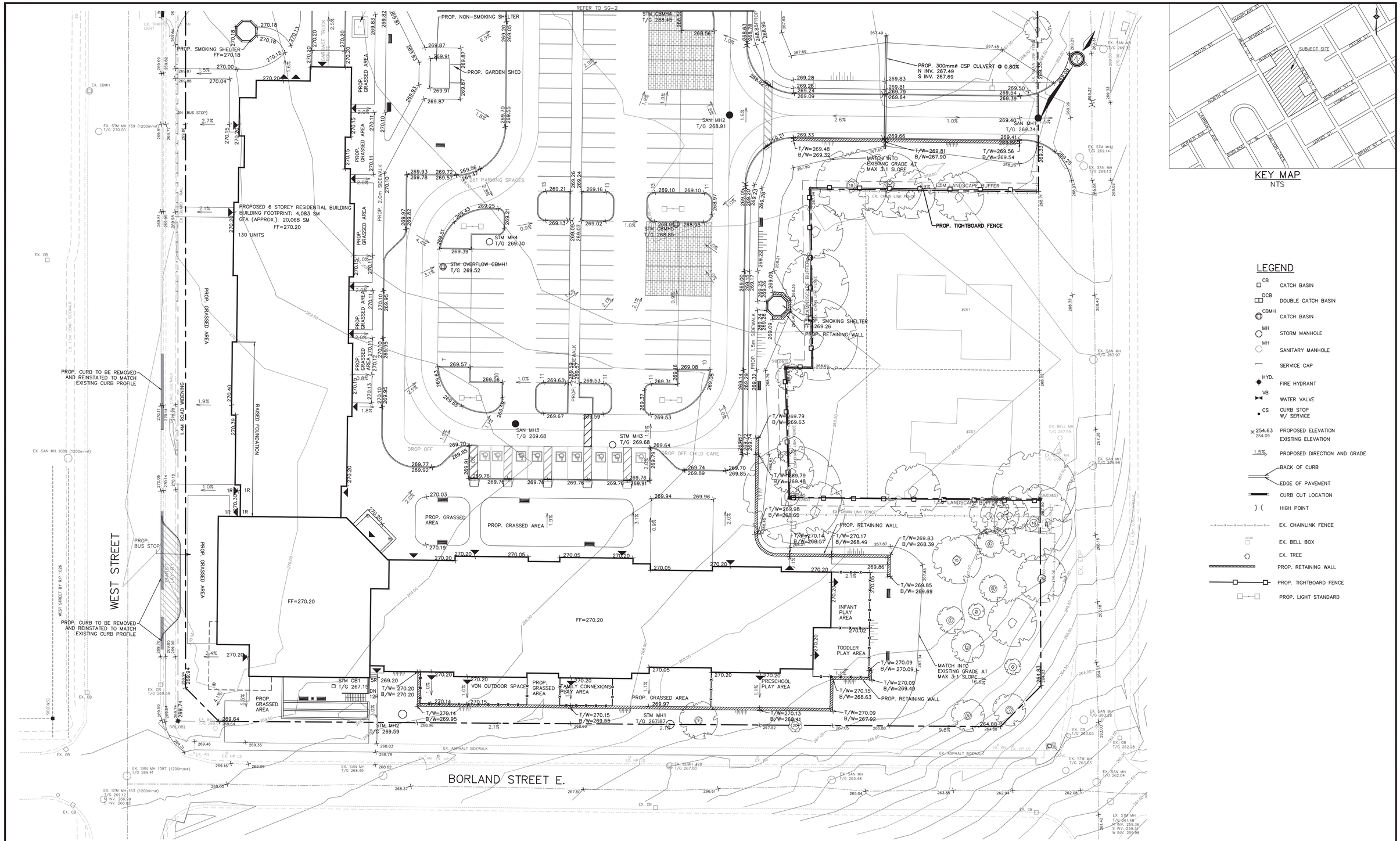
LICENSED PROFESSIONAL ENGINEER
G. M. PEARSON
100061986
PROVINCE OF ONTARIO
NOV 12 '20

COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

NOTES AND DETAILS 4 OF 4

PEARSON ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # ND-4
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0



LEGEND

- CB — CATCH BASIN
- DCB — DOUBLE CATCH BASIN
- CBMH — CATCH BASIN
- MH — STORM MANHOLE
- MH — SANITARY MANHOLE
- SERVICE CAP
- HYD. — FIRE HYDRANT
- VB — WATER VALVE
- CS — CURB STOP W/ SERVICE
- 254.63 / 254.09 — PROPOSED ELEVATION / EXISTING ELEVATION
- 1.5% — PROPOSED DIRECTION AND GRADE
- BACK OF CURB
- EDGE OF PAVEMENT
- CURB CUT LOCATION
-) (— HIGH POINT
- EX. CHAINLINK FENCE
- EX. BELL BOX
- EX. TREE
- PROP. RETAINING WALL
- PROP. TIGHTBOARD FENCE
- PROP. LIGHT STANDARD

BENCHMARK

NO.	REVISION NOTE	DATE	BY

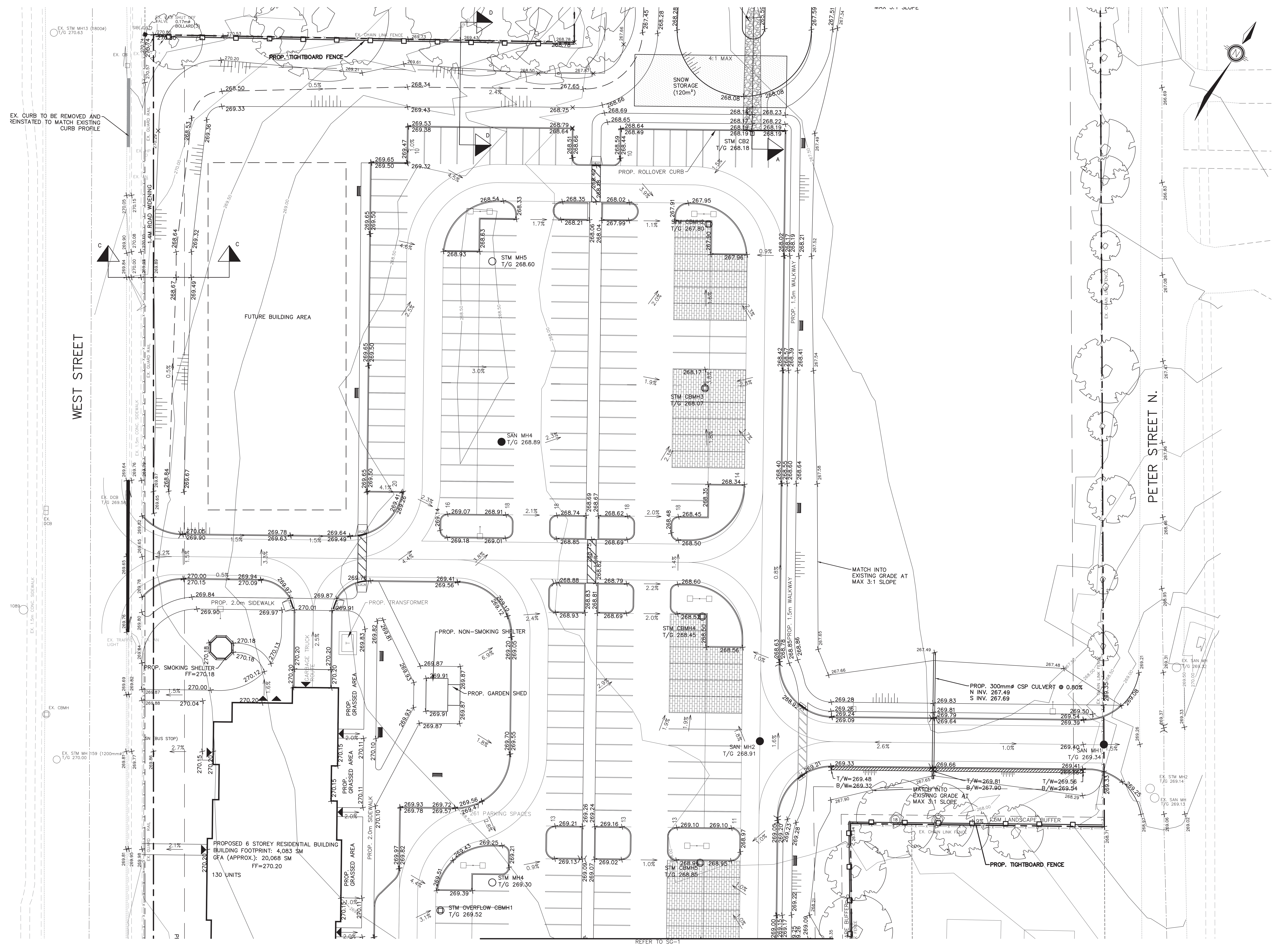
G. M. PEARSON 100061986 — LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — 12/20

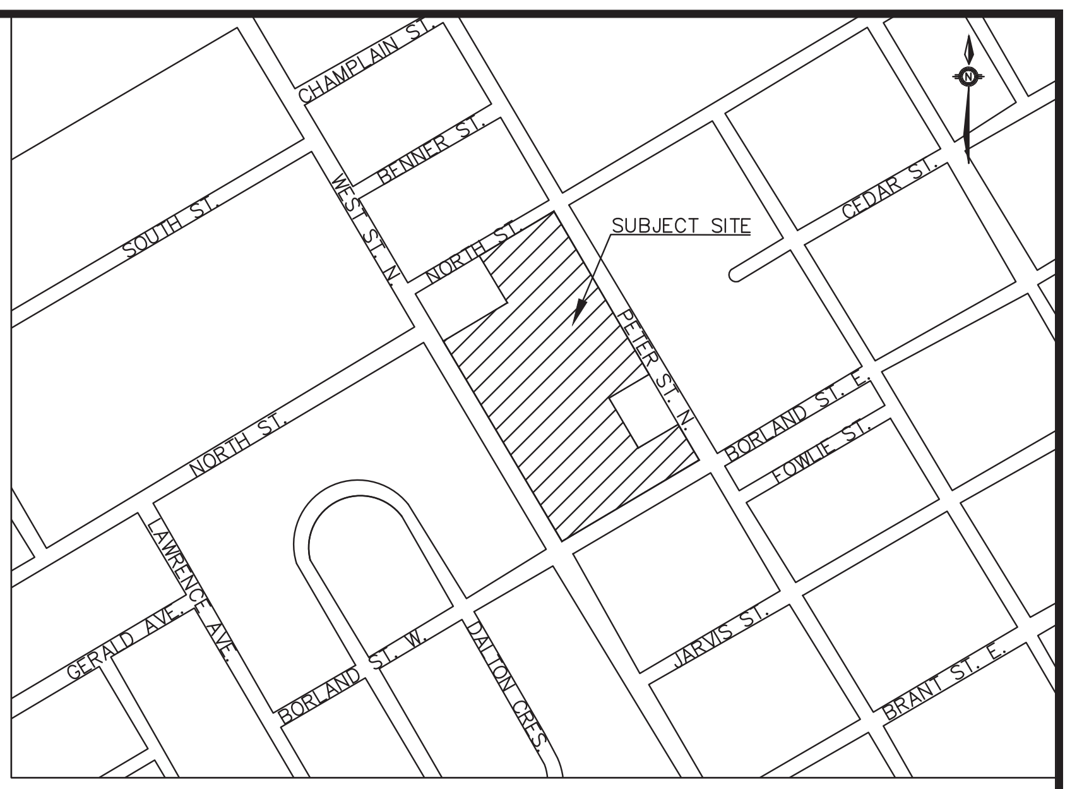
COUNTY OF SIMCOE AFFORDABLE HOUSING ORILLIA, 2 BORLAND STREET EAST

SITE GRADING PLAN 1 OF 3

PEARSON ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE 1: 300	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # SG-1
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0





KEY MAP

NTS

LEGEND

□ CB	CATCH BASIN
□□ DCB	DOUBLE CATCH BASIN
⊡ CBMH	CATCH BASIN
○ MH	STORM MANHOLE
○ MH	SANITARY MANHOLE
⌐	SERVICE CAP
● HYD.	FIRE HYDRANT
⋈ VB	WATER VALVE
• CS	CURB STOP W/ SERVICE
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1.5% →	PROPOSED DIRECTION AND GRADE
═	BACK OF CURB EDGE OF PAVEMENT
▬	CURB CUT LOCATION
) (	HIGH POINT
—x—x—x—	EX. CHAINLINK FENCE
□ EX.BB	EX. BELL BOX
✿	EX. TREE
▨	PROP. RETAINING WALL
—□—□—	PROP. TIGHTBOARD FENCE
□-□	PROP. LIGHT STANDARD

NO.	REVISION NOTE	DATE	BY

BENCHMARK

LICENSED PROFESSIONAL ENGINEER
G. M. PEARSON
100061986
11/12/20
PROVINCE OF ONTARIO

COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

SITE GRADING PLAN
2 OF 3

PEARSON
ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE	1:300	PROJECT #	20002
DRAWN BY	AA	VERT SCALE		DRAWING #	SG–2
CHECKED BY	MWD	DATE	NOVEMBER 2020	REVISION #	0

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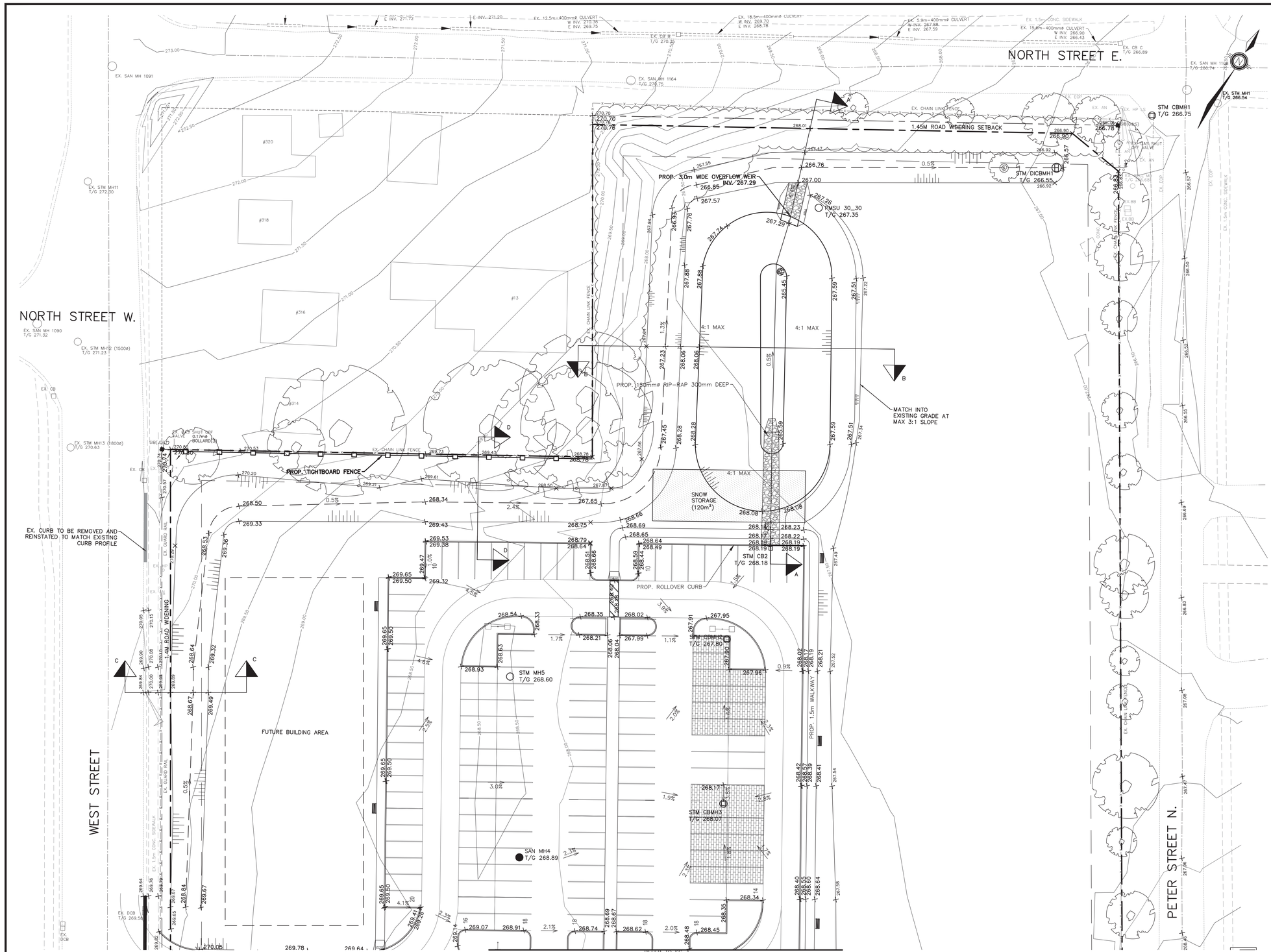

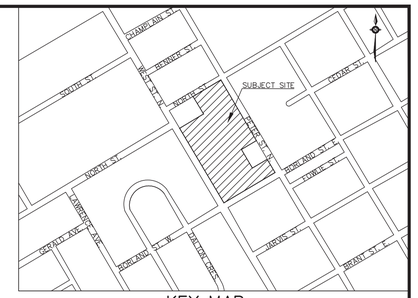

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BENCHMARK

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G. M. PEARSON
100061986
11/12/20
PROVINCE OF ONTARIO

COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

SITE GRADING PLAN
3 OF 3

PEARSON ENGINEERING LTD.
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DESIGNED BY	AA	HORIZ SCALE 1:300	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # SG-3
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0

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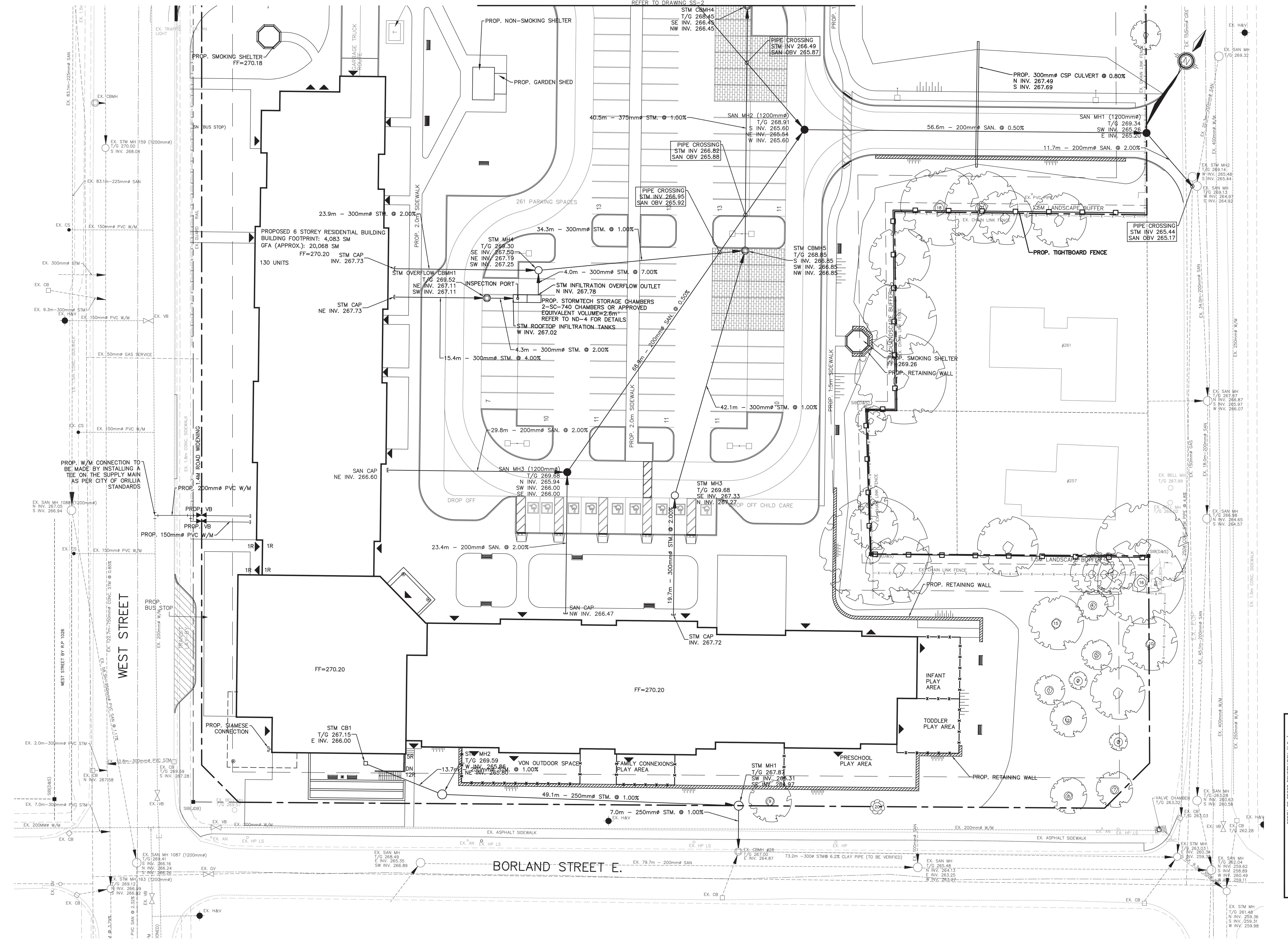

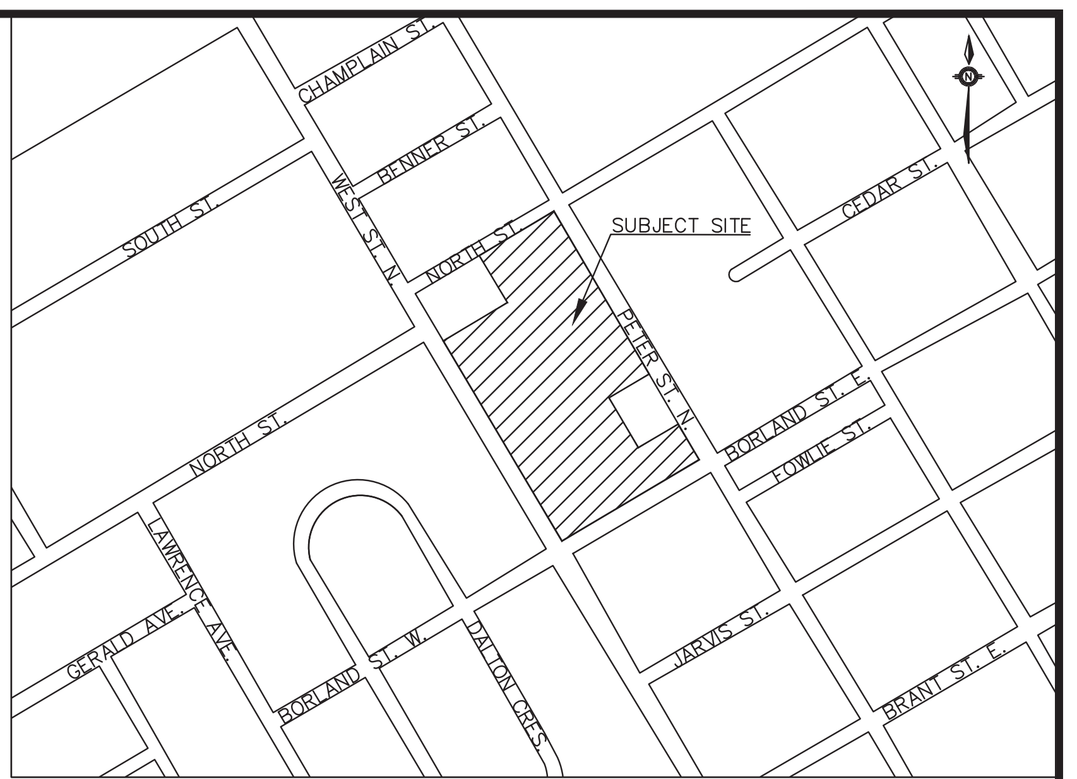

KEY MAP
NTS

LEGEND

CB □	CATCH BASIN
DCB ◫	DOUBLE CATCH BASIN
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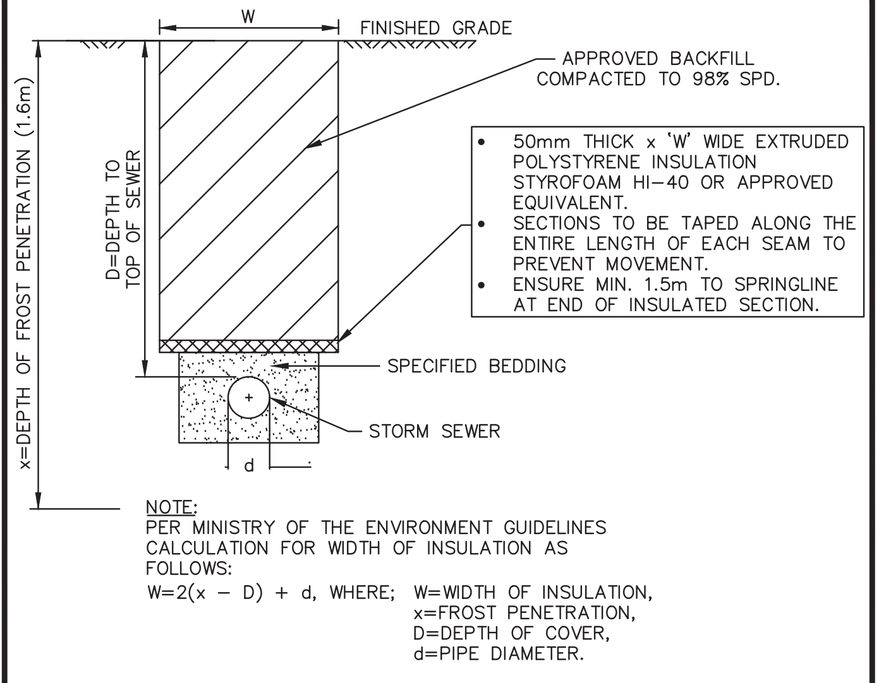

- 50mm THICK x 'W' WIDE EXTRUDED POLYSTYRENE INSULATION STYROFOAM HI-40 OR APPROVED EQUIVALENT.
- SECTIONS TO BE TAPED ALONG THE ENTIRE LENGTH OF EACH SEAM TO PREVENT MOVEMENT.
- ENSURE MIN. 1.5m TO SPRINGLINE AT END OF INSULATED SECTION.

NOTE:
PER MINISTRY OF THE ENVIRONMENT GUIDELINES CALCULATION FOR WIDTH OF INSULATION AS FOLLOWS:
$W=2(x - D) + d$, WHERE; W=WIDTH OF INSULATION,
x=FROST PENETRATION,
D=DEPTH OF COVER,
d=PIPE DIAMETER.

PIPE INSULATION DETAIL
(N.T.S.)

NO.	REVISION NOTE	DATE	BY

BENCHMARK

LICENSED PROFESSIONAL ENGINEER
G. M. PEARSON
100061986
11/12/20
PROVINCE OF ONTARIO

COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

SITE SERVICING PLAN
1 OF 3

PEARSON
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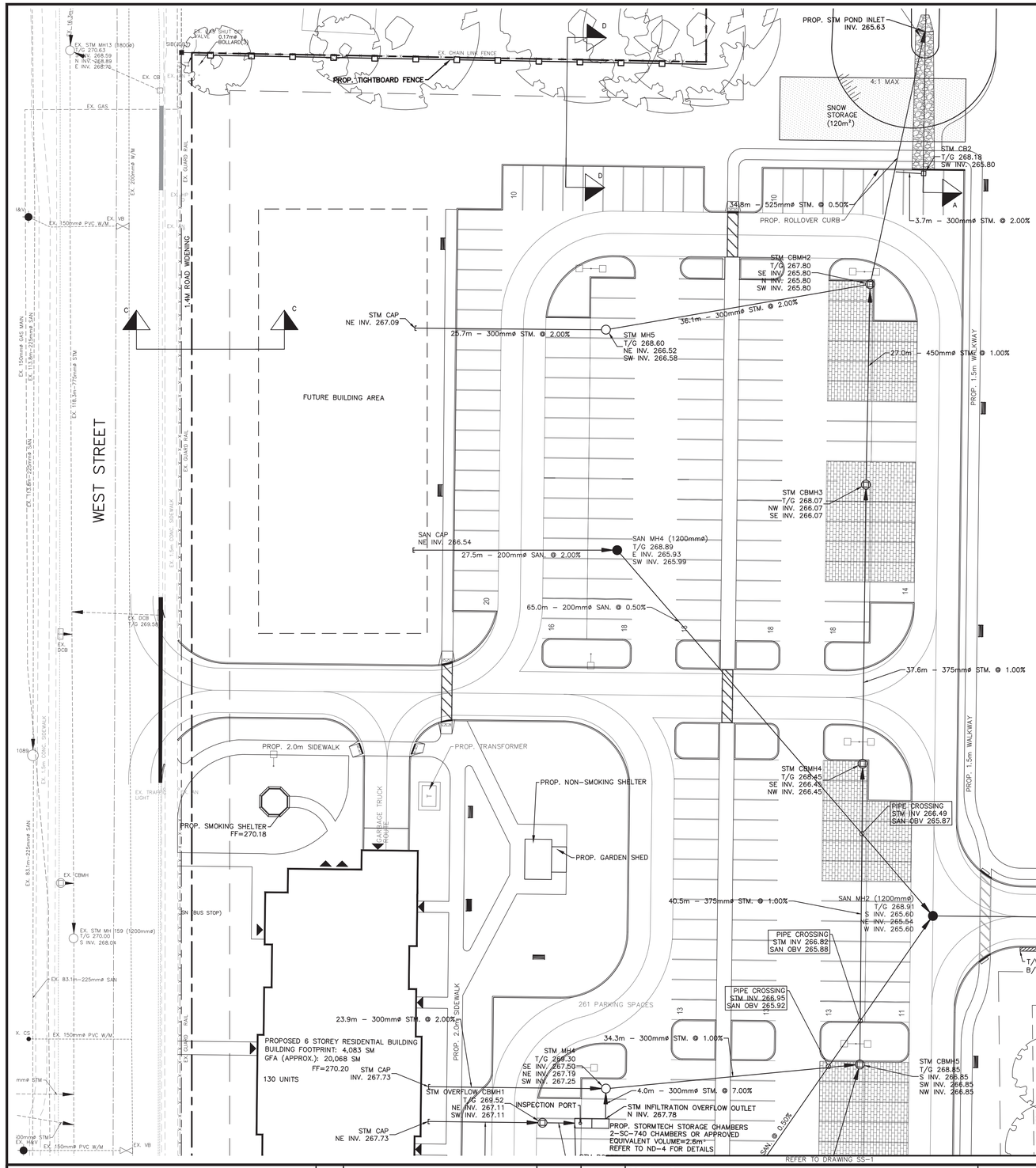
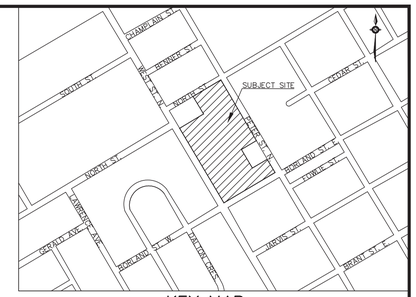
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY AA	HORIZ SCALE 1:300	PROJECT #	20002
DRAWN BY AA	VERT SCALE	DRAWING #	SS-1
CHECKED BY MWD	DATE NOVEMBER 2020	REVISION #	0





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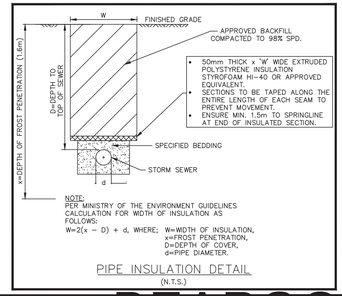

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PIPE INSULATION DETAIL
(N.T.S.)

NO.	REVISION NOTE	DATE	BY

BENCHMARK

G. M. PEARSON
100061986
31/12/20
PROVINCE OF ONTARIO

COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

SITE SERVICING PLAN
2 OF 3

PEARSON ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE 1:300	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # SS–2
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0

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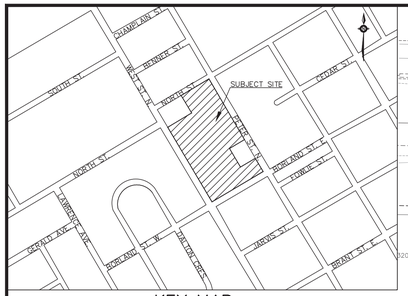
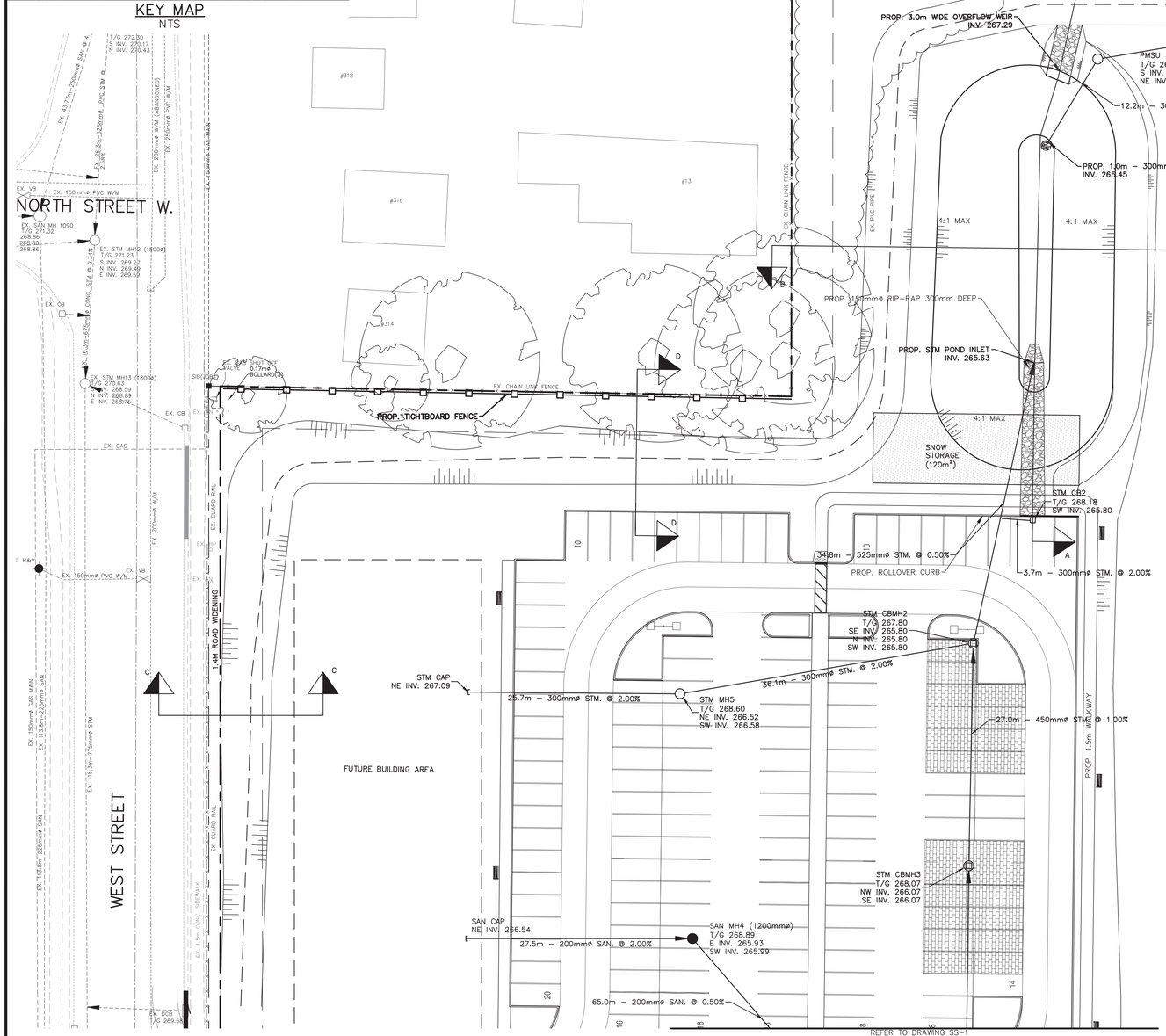


KEY MAP
NTS



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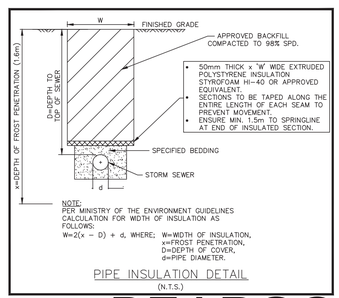


PIPE INSULATION DETAIL
(N.T.S.)

BENCHMARK

NO.	REVISION NOTE	DATE	BY

LICENSED PROFESSIONAL ENGINEER
G. M. PEARSON
100061986
11/12/20
PROVINCE OF ONTARIO

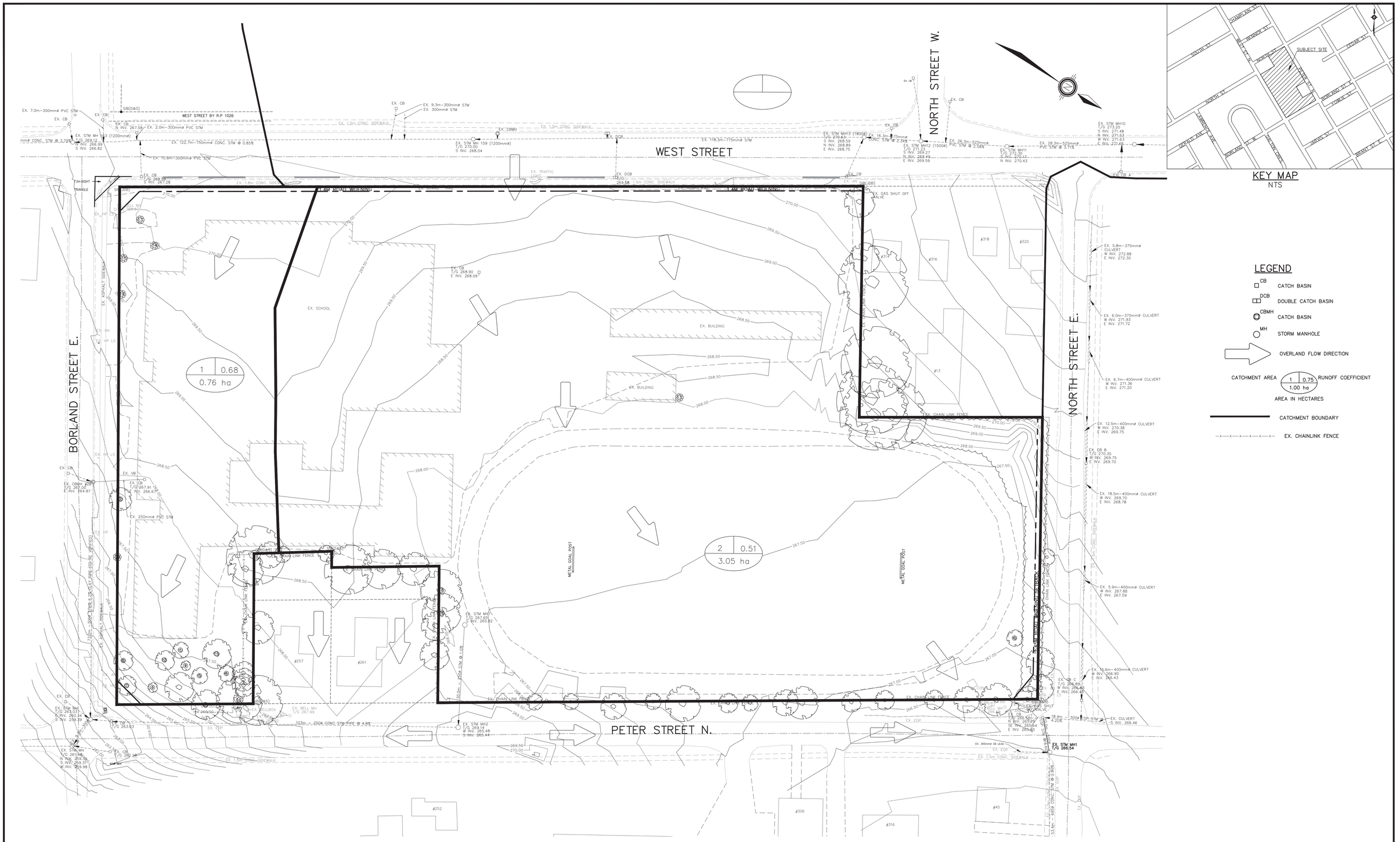
COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

SITE SERVICING PLAN
3 OF 3

PEARSON ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE 1:300	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # SS-3
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0

P:\Autodesk Vault\Working Folders\20002 - MCL, 2 Borland St. E., Orillia\Engineering\20002 - BASE.dwg, Layout: SS-3, Plotted: Nov 13, 2020 @ 10:54am by adiello @ PEARSON



KEY MAP
NTS

LEGEND

- CB — CATCH BASIN
- DCB — DOUBLE CATCH BASIN
- CBMH — CATCH BASIN
- MH — STORM MANHOLE
- OVERLAND FLOW DIRECTION
- CATCHMENT AREA (1 | 0.75 | 1.00 ha) — RUNOFF COEFFICIENT / AREA IN HECTARES
- CATCHMENT BOUNDARY
- EX. CHAINLINK FENCE

BENCHMARK

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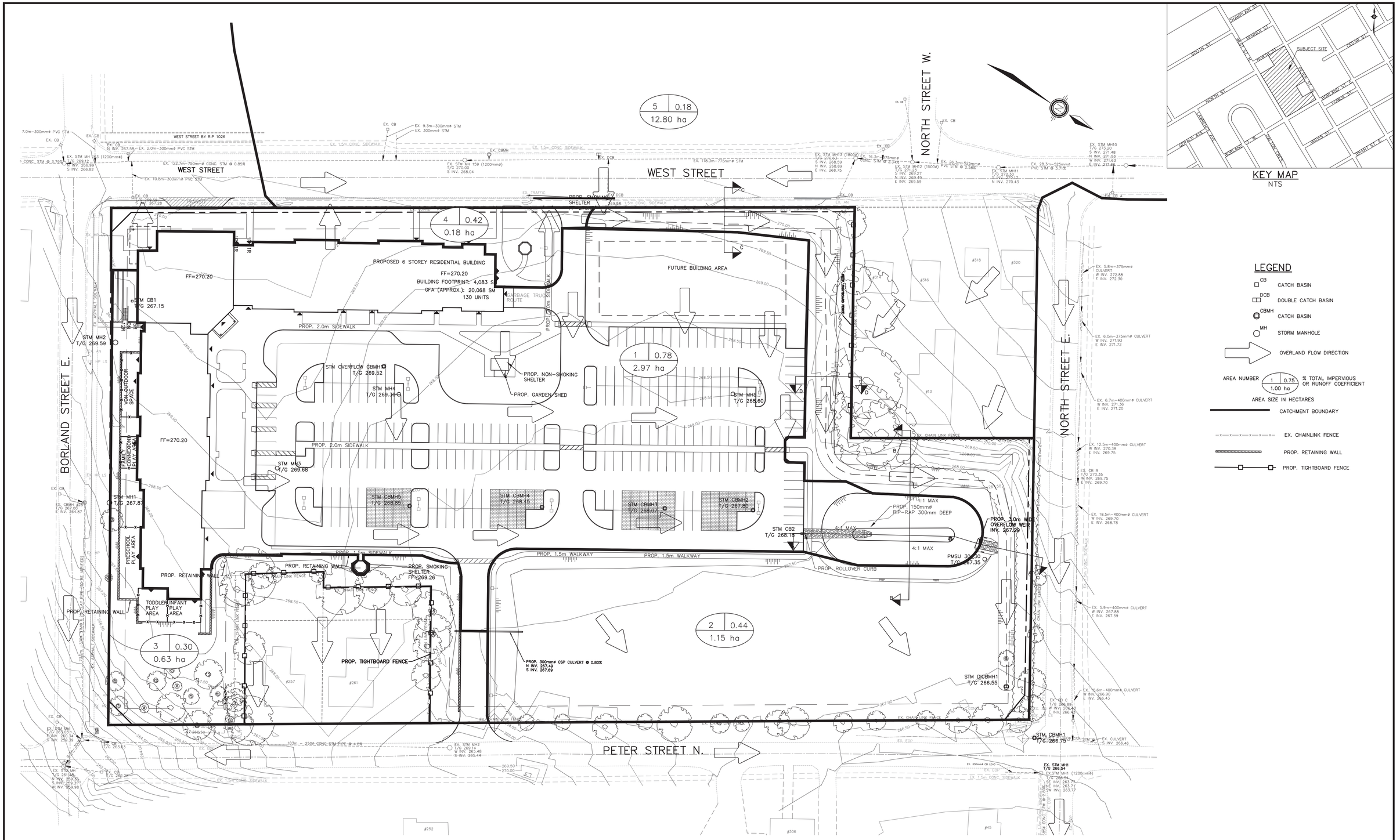
LICENSED PROFESSIONAL ENGINEER — G. M. PEARSON — 100061886 — 11/12/20 — PROVINCE OF ONTARIO

COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

PRE-DEVELOPMENT STORMWATER MANAGEMENT PLAN

PEARSON ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE 1:500	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # STM-1
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0



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G. M. PEARSON
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PEARSON ENGINEERING LTD.
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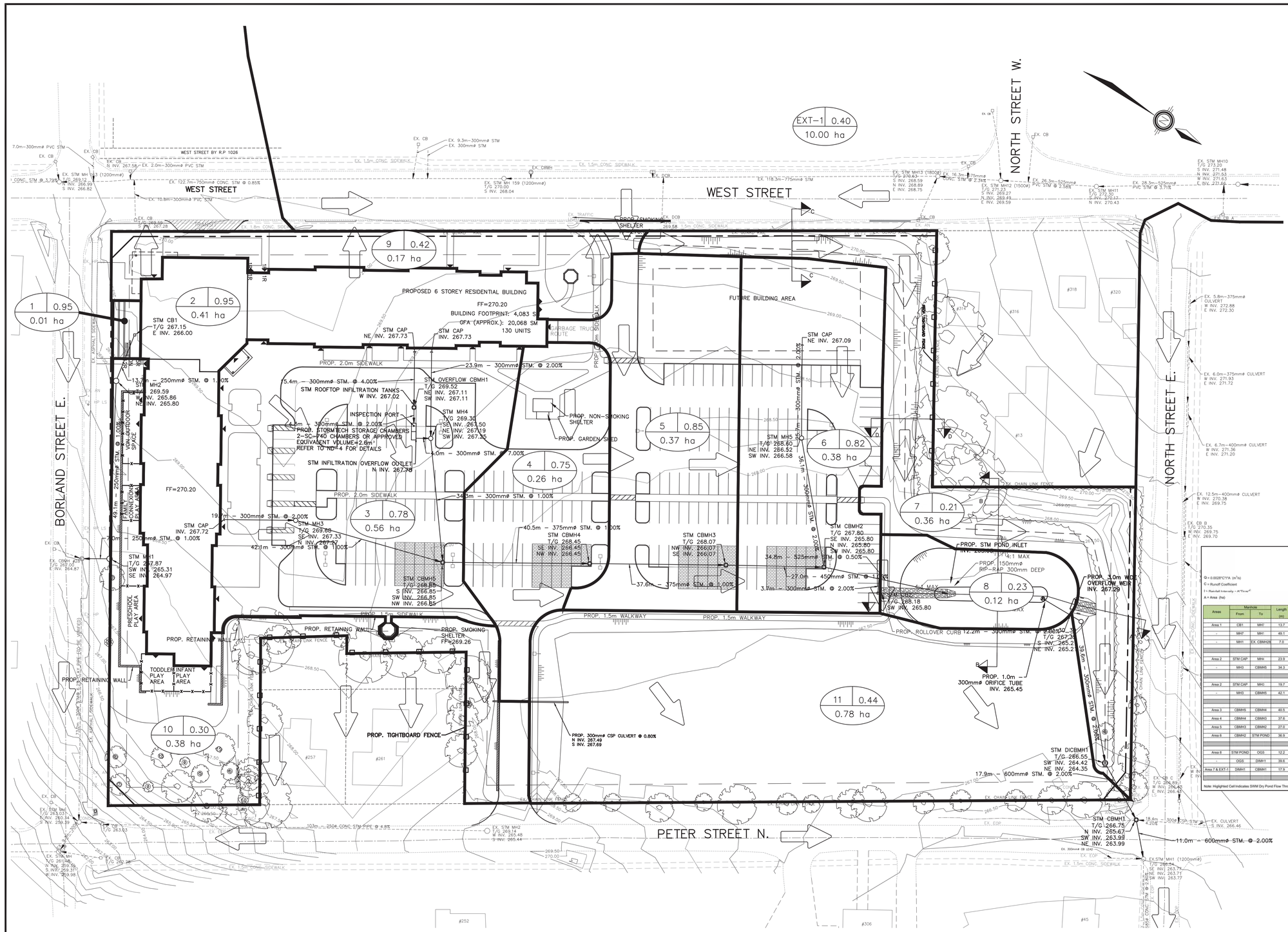
DESIGNED BY	AA	HORIZ SCALE 1:500	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # STM-2
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0


WEST STREET
WEST STREET BY R.P 1026
NORTH STREET W.
NORTH STREET E.
BORLAND STREET E.
PETER STREET N.
EXT-1 | 0.40 | 10.00 ha
1 | 0.95 | 0.01 ha
2 | 0.95 | 0.41 ha
3 | 0.78 | 0.56 ha
4 | 0.75 | 0.26 ha
5 | 0.85 | 0.37 ha
6 | 0.82 | 0.38 ha
7 | 0.21 | 0.36 ha
8 | 0.23 | 0.12 ha
9 | 0.42 | 0.17 ha
10 | 0.30 | 0.38 ha
11 | 0.44 | 0.78 ha
PROPOSED 6 STOREY RESIDENTIAL BUILDING
FF=270.20
BUILDING FOOTPRINT: 4,083 SM
GFA (APPROX.): 20,068 SM
130 UNITS
FUTURE BUILDING AREA
PROP. 2.0m SIDEWALK
PROP. 1.5m WALKWAY
PROP. 1.5m SIDEWALK
PROP. RETAINING WALL
PROP. SMOKING SHELTER
PROP. NON-SMOKING SHELTER
PROP. GARDEN SHED
PROP. TIGHTBOARD FENCE
PROP. ROLLOVER CURB
PROP. 1.0m WIDE OVERFLOW WEIR INV. 267.29
PROP. 1.0m 300mmø ORIFICE TUBE INV. 265.45
PROP. STM POND INLET
PROP. 300mmø CSP CULVERT @ 0.80%
N INV. 267.49
S INV. 267.69
PROP. 150mmø RIP-RAP 300mm DEEP
4:1 MAX
3:1 MAX
STM CB1
T/G 267.15
E INV. 266.00
STM MH2
T/G 269.59
W INV. 265.86
NE INV. 265.80
STM MH1
T/G 267.87
SW INV. 265.31
SE INV. 264.97
STM MH3
T/G 269.68
SE INV. 267.33
N INV. 267.67
STM MH4
T/G 269.30
SE INV. 267.50
NE INV. 267.19
SW INV. 267.25
STM OVERFLOW CBMH1
T/G 269.52
NE INV. 267.11
SW INV. 267.11
STM ROOFTOP INFILTRATION TANKS
W INV. 267.02
INSPECTION PORT
PROP. STORMTECH STORAGE CHAMBERS
2-SC-740 CHAMBERS OR APPROVED EQUIVALENT VOLUME=2.6m³
REFER TO ND-4 FOR DETAILS
STM INFILTRATION OVERFLOW OUTLET
N INV. 267.78
STM CAP
INV. 267.72
STM CAP
NE INV. 267.73
STM CAP
INV. 267.73
STM CAP
NE INV. 267.09
STM MH5
T/G 268.60
NE INV. 266.52
SW INV. 266.58
STM CBMH4
T/G 268.45
SE INV. 266.45
NW INV. 266.45
STM CBMH3
T/G 268.07
NW INV. 266.07
SE INV. 266.07
STM CBMH2
T/G 267.80
SE INV. 265.80
N INV. 265.80
SW INV. 265.80
STM CBMH5
T/G 268.89
S INV. 266.85
SW INV. 266.85
NW INV. 266.85
STM DICBMH1
T/G 268.55
SW INV. 264.42
NE INV. 264.35
STM CBMH1
T/G 266.75
N INV. 265.67
SW INV. 263.99
NE INV. 263.99
STM MH6
T/G 263.03
S INV. 260.34
S INV. 259.39
STM MH7
T/G 261.48
S INV. 259.56
S INV. 259.31
W INV. 259.98
STM MH8
T/G 269.12
S INV. 266.82
STM MH9
T/G 267.28
STM MH10
T/G 273.20
S INV. 271.48
N INV. 271.53
W INV. 271.63
E INV. 271.66
STM MH11
T/G 272.30
N INV. 270.43
STM MH12 (1500ø)
T/G 271.23
S INV. 269.27
N INV. 269.49
E INV. 269.59
STM MH13 (1800ø)
T/G 270.63
S INV. 268.59
N INV. 268.89
E INV. 268.75
EX. STM MH 159 (1200mmø)
T/G 270.00
S INV. 268.04
EX. STM MH 163 (1200mmø)
EX. 5.8m–375mmø CULVERT
W INV. 272.88
E INV. 272.30
EX. 6.0m–375mmø CULVERT
W INV. 271.93
E INV. 271.72
EX. 6.7m–400mmø CULVERT
W INV. 271.36
E INV. 271.20
EX. 12.5m–400mmø CULVERT
W INV. 270.38
E INV. 269.75
EX. CB B
T/G 270.35
E INV. 269.75
E INV. 269.70
EX. CB C
T/G 269.69
W INV. 266.40
E INV. 266.45
EX. CULVERT
S INV. 266.46
EX. STM MH1 (1200mmø)
T/G 266.75
SE INV. 263.77
NE INV. 263.71
SW INV. 263.77
EX. CB A
T/G 269.42
S INV. 267.28
EX. CBMH A
T/G 269.12
S INV. 264.87
EX. CB D
EX. CB E
EX. CB F
EX. CB G
EX. CB H
EX. CB I
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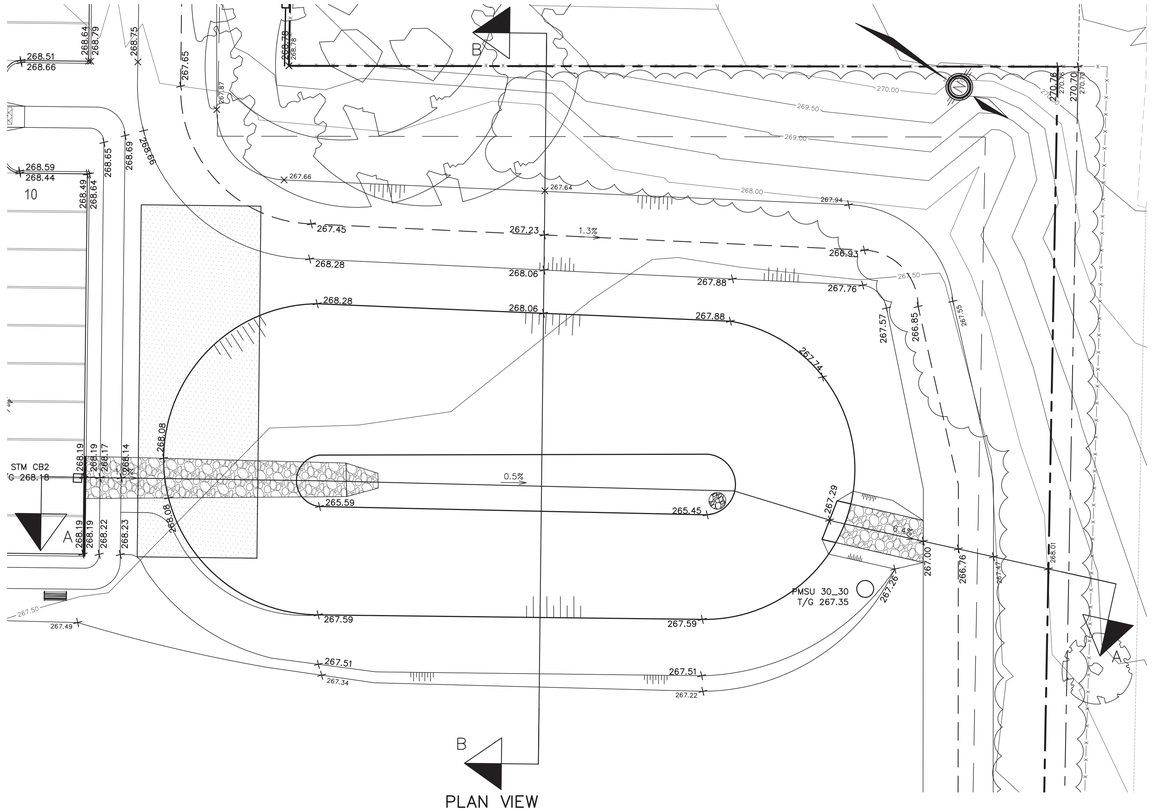

PLAN VIEW
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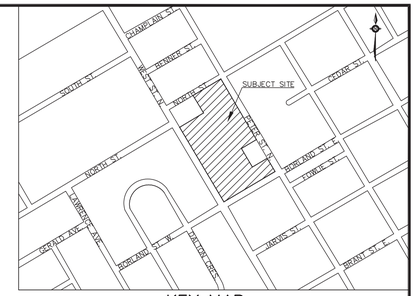
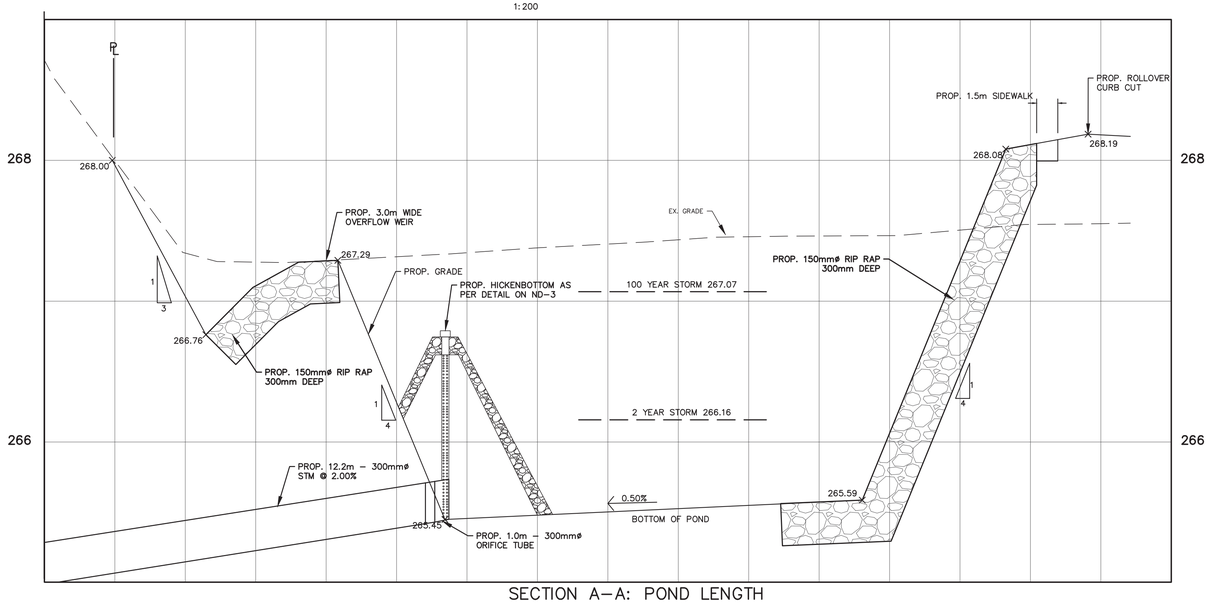


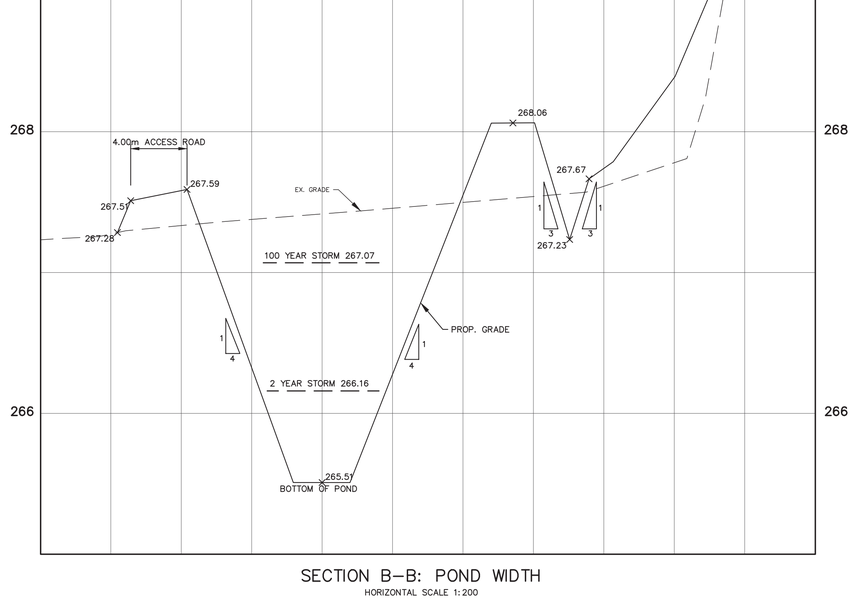
KEY MAP
NTS

Table 3: SWM Pond Stage-Storage-Discharge

	2 Year Storm	5 Year Storm	10 Year Storm	25 Year Storm	50 Year Storm	100 Year Storm
Total Flow (m^3/s)	0.19	0.22	0.23	0.26	0.29	0.30
Elevation (m)	266.16	266.35	266.47	266.71	266.91	267.07
Total Storage (m^3)	130	193	238	340	444	535



SECTION A–A: POND LENGTH
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:20



SECTION B–B: POND WIDTH
HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:20

NO.	REVISION NOTE	DATE	BY

BENCHMARK

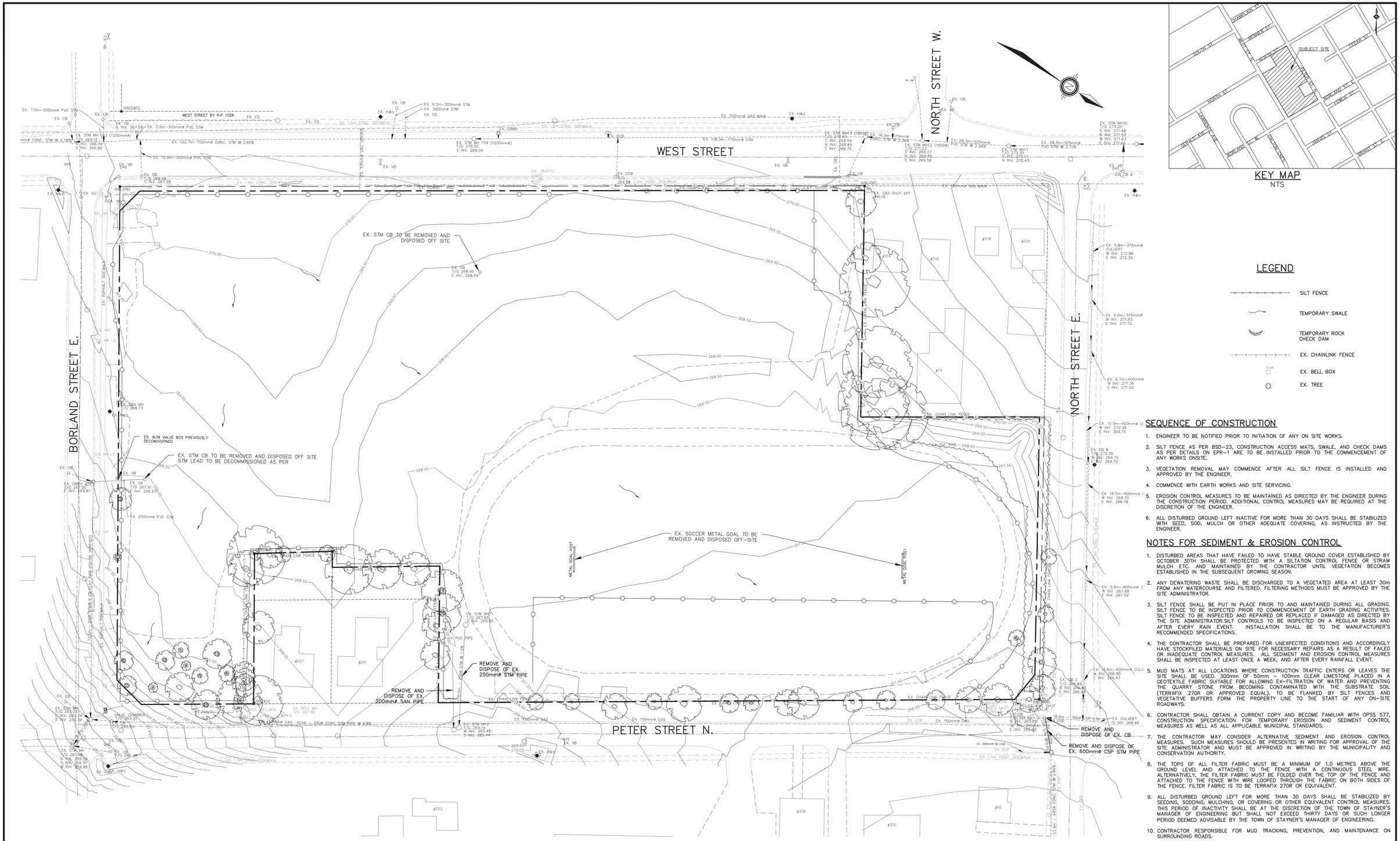
LICENSED PROFESSIONAL ENGINEER
G. M. PEARSON
100061986
11/12/20
PROVINCE OF ONTARIO

COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

STORMWATER MANAGEMENT
POND DETAIL

PEARSON ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE	1:200	PROJECT #	20002
DRAWN BY	AA	VERT SCALE	1:20	DRAWING #	PND-1
CHECKED BY	MWD	DATE	NOVEMBER 2020	REVISION #	0



KEY MAP
NTS

LEGEND

- SILT FENCE
- TEMPORARY SWALE
- TEMPORARY ROCK CHECK DAM
- EX. CHAINLINK FENCE
- EX. BELL BOX
- EX. TREE

SEQUENCE OF CONSTRUCTION

1. ENGINEER TO BE NOTIFIED PRIOR TO INITIATION OF ANY ON SITE WORKS.
2. SILT FENCE AS PER BSD-23, CONSTRUCTION ACCESS MATS, SWALE, AND CHECK DAMS AS PER DETAILS ON EPR-1 ARE TO BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORKS ONSITE.
3. VEGETATION REMOVAL MAY COMMENCE AFTER ALL SILT FENCE IS INSTALLED AND APPROVED BY THE ENGINEER.
4. COMMENCE WITH EARTH WORKS AND SITE SERVICING.
5. EROSION CONTROL MEASURES TO BE MAINTAINED AS DIRECTED BY THE ENGINEER DURING THE CONSTRUCTION PERIOD. ADDITIONAL CONTROL MEASURES MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
6. ALL DISTURBED GROUND LEFT INACTIVE FOR MORE THAN 30 DAYS SHALL BE STABILIZED WITH SEED, SOD, MULCH OR OTHER ADEQUATE COVERING, AS INSTRUCTED BY THE ENGINEER.

NOTES FOR SEDIMENT & EROSION CONTROL

1. DISTURBED AREAS THAT HAVE FAILED TO HAVE STABLE GROUND COVER ESTABLISHED BY OCTOBER 30TH SHALL BE PROTECTED WITH A SILTATION CONTROL FENCE OR STRAW MULCH ETC. AND MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION BECOMES ESTABLISHED IN THE SUBSEQUENT GROWING SEASON.
2. ANY DEWATERING WASTE SHALL BE DISCHARGED TO A VEGETATED AREA AT LEAST 30m FROM ANY WATERCOURSE AND FILTERED. FILTERING METHODS MUST BE APPROVED BY THE SITE ADMINISTRATOR.
3. SILT FENCE SHALL BE PUT IN PLACE PRIOR TO AND MAINTAINED DURING ALL GRADING. SILT FENCE TO BE INSPECTED PRIOR TO COMMENCEMENT OF EARTH GRADING ACTIVITIES. SILT FENCE TO BE INSPECTED AND REPAIRED OR REPLACED IF DAMAGED AS DIRECTED BY THE SITE ADMINISTRATOR.SILT CONTROLS TO BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY RAIN EVENT. INSTALLATION SHALL BE TO THE MANUFACTURER'S RECOMMENDED SPECIFICATIONS.
4. THE CONTRACTOR SHALL BE PREPARED FOR UNEXPECTED CONDITIONS AND ACCORDINGLY HAVE STOCKPILED MATERIALS ON SITE FOR NECESSARY REPAIRS AS A RESULT OF FAILED OR INADEQUATE CONTROL MEASURES. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK, AND AFTER EVERY RAINFALL EVENT.
5. MUD MATS AT ALL LOCATIONS WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES THE SITE SHALL BE USED. 300mm OF 50mm - 100mm CLEAR LIMESTONE PLACED IN A GEOTEXTILE FABRIC SUITABLE FOR ALLOWING EX-FILTRATION OF WATER AND PREVENTING THE QUARRY STONE FROM BECOMING CONTAMINATED WITH THE SUBSTRATE SOIL (TERRAFIX 270R OR APPROVED EQUAL). TO BE FLANKED BY SILT FENCES AND VEGETATIVE BUFFERS FORM THE PROPERTY LINE TO THE START OF ANY ON-SITE ROADWAYS.
6. CONTRACTOR SHALL OBTAIN A CURRENT COPY AND BECOME FAMILIAR WITH OPSS 577, CONSTRUCTION SPECIFICATION FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS WELL AS ALL APPLICABLE MUNICIPAL STANDARDS.
7. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES SHOULD BE PRESENTED IN WRITING FOR APPROVAL OF THE SITE ADMINISTRATOR AND MUST BE APPROVED IN WRITING BY THE MUNICIPALITY AND CONSERVATION AUTHORITY.
8. THE TOPS OF ALL FILTER FABRIC MUST BE A MINIMUM OF 1.0 METRES ABOVE THE GROUND LEVEL AND ATTACHED TO THE FENCE WITH A CONTINUOUS STEEL WIRE. ALTERNATIVELY, THE FILTER FABRIC MUST BE FOLDED OVER THE TOP OF THE FENCE AND ATTACHED TO THE FENCE WITH WIRE LOOPED THROUGH THE FABRIC ON BOTH SIDES OF THE FENCE. FILTER FABRIC IS TO BE TERRAFIX 270R OR EQUIVALENT.
9. ALL DISTURBED GROUND LEFT FOR MORE THAN 30 DAYS SHALL BE STABILIZED BY SEEDING, SODDING, MULCHING, OR COVERING OR OTHER EQUIVALENT CONTROL MEASURES. THIS PERIOD OF INACTIVITY SHALL BE AT THE DISCRETION OF THE TOWN OF STAYNER'S MANAGER OF ENGINEERING BUT SHALL NOT EXCEED THIRTY DAYS OR SUCH LONGER PERIOD DEEMED ADVISABLE BY THE TOWN OF STAYNER'S MANAGER OF ENGINEERING.
10. CONTRACTOR RESPONSIBLE FOR MUD TRACKING, PREVENTION, AND MAINTENANCE ON SURROUNDING ROADS.

NO.	REVISION NOTE	DATE	BY

BENCHMARK

LICENSED PROFESSIONAL ENGINEER
G.M. PEARSON
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11/12/20
PROVINCE OF ONTARIO

COUNTY OF SIMCOE
AFFORDABLE HOUSING
ORILLIA, 2 BORLAND STREET EAST

ENVIRONMENTAL PROTECTION AND REMOVALS PLAN

PEARSON ENGINEERING LTD.
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AA	HORIZ SCALE 1:500	PROJECT # 20002
DRAWN BY	AA	VERT SCALE	DRAWING # EPR-1
CHECKED BY	MWD	DATE NOVEMBER 2020	REVISION # 0