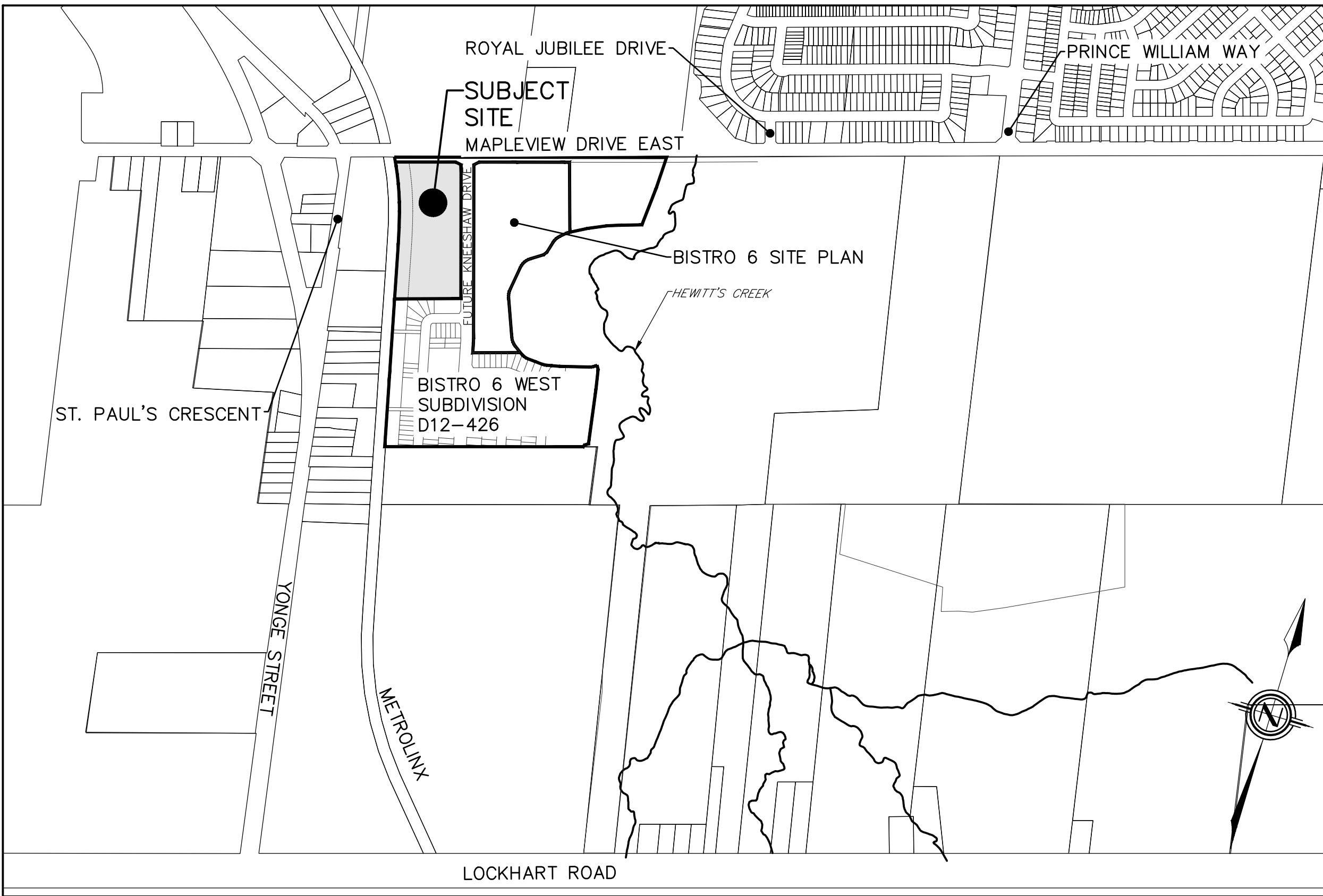


ELEMENTS SITE PLAN

CITY OF BARRIE

DRAWING LEGEND

N-1	GENERAL NOTES
ESC-1	EROSION AND SEDIMENT CONTROL PLAN
ESC-2	EROSION AND SEDIMENT CONTROL DETAILS
SG-1	SITE GRADING PLAN WITH EXISTING CONDITIONS
SG-2	SITE GRADING PLAN WITH PROPOSED CONDITIONS
SG-3	RAILWAY BERM SECTIONS
SG-4	RAILWAY BERM SECTIONS
SS-1	SITE SERVICING PLAN
SS-2	SEWER DESIGN SHEETS AND PIPE CLEARANCE TABLE
SWM-1	STORMWATER MANAGEMENT PLAN PRE-DEVELOPMENT CONDITIONS
SWM-2	STORMWATER MANAGEMENT PLAN POST-DEVELOPMENT CONDITIONS LID MODEL CATCHMENT AREAS
LID-1	RAIN GARDENS, LID SECTIONS & DETAILS
STM-1	STORM DRAINAGE PLAN
SAN-1	SANITARY DRAINAGE PLAN
WM-1	WATERMAIN SWABBING PLAN
PM-1	PAVEMENT MARKING AND SIGNAGE PLAN
CUP-1	COMPOSITE UTILITY PLAN REFER TO RUNGE ENGINEERING UTILITY DESIGN
DET-1	STANDARD DETAILS
DET-2	STANDARD DETAILS
DET-3	STANDARD DETAILS
DET-4	STANDARD DETAILS
DET-5	STANDARD DETAILS



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G:\Eng_3D\PRA-19078\Production DWG\PRA-19078-Detailed.dwg Layout\NOTES Plotted Feb 26, 2022 @ 2:26pm by keshu@ The Jones Consulting Group Ltd.

1. GRADE AND CROSSFALL ADJUSTMENT OF MAINTENANCE HOLE AND CATCH-BASIN FRAMES WILL BE MADE USING PRODUCTS SPECIFICALLY MANUFACTURED FOR THAT PURPOSE.			
2. ADJUSTMENT UNITS MUST BE CERTIFIED TO MEET ALL PERTINENT OPS, CSA, ASTM AND ISO-MSM LISTS, OR OTHER INDUSTRY GUIDELINES FOR MATERIALS, PERFORMANCE AND USE AS APPLICABLE.			
3. ADJUSTMENT UNITS AND JOINTS WILL BE SEALED AND OR PARGED IN COMPLIANCE WITH MANUFACTURERS SPECIFICATIONS AND GUIDELINES			
4. MORTAR IS USED FOR LEVELING OF PRECAST UNITS ONLY. THE THICKNESS OF MORTAR WILL BE 10mm TO FILL ALL VOIDS CREATED BY IRREGULARITIES IN THE PRECAST UNITS TO ENSURE AN EVEN SURFACE ONLY.			

 STANDARD DETAIL	GENERAL NOTES ROADWORKS	REV No. 1	DATE: OCT 2017	APPROVED DATE: <i>Oct 28/17</i>  DIRECTOR OF ENGINEERING
		SCALE: N.T.S.		
		BSD-N2		

GENERAL NOTES – SANITARY SEWER			
SANITARY SEWERS			
A. SANITARY SEWER TO BE LOCATED AT THE CENTRELINE OF THE ROAD.			
B. SEWERS SHALL BE CONSTRUCTED WITH BEDDINGS AS PER OPSD–802.010, (GRAN. 'A' EMBEDMENT MATERIAL) FOR FLEXIBLE PIPES AND OPSD–802.030 OR 802.031 CLASS B (GRAN. 'A' BEDDING MATERIAL) FOR RIGID PIPE UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF ENGINEERING.			
C. MAXIMUM DEFLECTION FROM COMBINED LIVE AND DEAD LOADING SHALL NOT EXCEED ANY C.S.A., O.P.S. OR MANUFACTURERS RECOMMENDED SPECIFICATIONS.			
D. PVC, CONCRETE AND PROFILE WALL PVC SEWERS SHALL HAVE RUBBER GASKET TYPE JOINTS AND SHALL BE CERTIFIED TO CONFORM TO ALL APPLICABLE CURRENT C.S.A. SPECIFICATIONS.			
E. CONCRETE SANITARY SEWERS SHALL HAVE A MINIMUM STRENGTH OF 50 N/m ² /mm CONFORMING TO CSA STANDARD A257.2–1982, CLASS 50–D (PREVIOUSLY C.S.A. STANDARD A257.2–1974, CLASS II).			
F. MAINTENANCE HOLE TOPS (FRAMES) ARE TO BE SET TO BASE COURSE ASPHALT GRADE AND THEN ADJUSTED TO FINAL GRADE WHEN THE TOP LIFT OF ASPHALT IS PLACE. ALL ADJUSTMENT WILL BE ACCORDANCE WITH BSD–N2.			
G. ALL CONNECTIONS TO NEW SANITARY MAINS SHALL BE PRE–MANUFACTURED, FABRICATED TEES, CONNECTIONS TO EXISTING SANITARY SEWER SHALL BE MADE WITH APPROVED FACTORY MADE TEES OR INSERT-A-TEES IN STRICT ACCORDANCE TO MANUFACTURERS GUIDELINES.			

CITY OF BARRIE STANDARD				4.	NOTE 'B' – "ENGINEERING"	B.R.	2002.10.28	APPR'D	R.G.N.	DATE	92.05.15
				3.	NOTE 'B' OPSD NUMBER REVISION	K.C.	2000.03.16	DRAWN	L.A.J.	SCALE	N.T.S.
				2.	NOTE 'F' CHANGED	K.C.	98.03.30				
				1.	CHANGES TO B. TO G.	K.C.	95.04.24				
GENERAL NOTES SANITARY SEWERS				NO.	REVISION	APPR'D	DATE	BSD-N3			

GENERAL NOTES – SANITARY SEWER			
SANITARY SERVICE LATERALS			
A. SANITARY LATERAL CONNECTION TO BE LOCATED AT THE CENTRELINE OF THE LOT AND CAPPED.			
B. LOCATION OF LATERAL TO BE MARKED 2.0m PAST PROPERTY LINE WITH A 50 x 100mm WOOD MARKER, PAINTED GREEN, EXTENDING FROM SERVICE INVERT TO 300mm ABOVE GROUND LEVEL.			
C. PIPE TO BE MINIMUM 100 mm DIA. PVC SDR28, RUBBER GASKET TYPE JOINTS AND SHALL CONFORM TO C.S.A. (B–182.2.3.4) (COLOURED) FOR A RESIDENTIAL HOUSE AND 150mm MINIMUM DIA. PVC SDR28 FOR INDUSTRIAL/COMMERCIAL DEVELOPMENT.			
D. MINIMUM DEPTH OF LATERAL AT PROPERTY LINE SHALL BE 2.4m MEASURED FROM THE SEWER OVERTURN TO FINISHED GROUND SURFACE ELEVATION UNLESS NOTED OTHERWISE.			
E. ALL CONNECTIONS TO NEW SANITARY MAINS SHALL BE PRE–MANUFACTURED, FABRICATED TEES, CONNECTIONS TO EXISTING SANITARY SEWER SHALL BE MADE WITH APPROVED FACTORY MADE TEES OR INSERT-A-TEES IN STRICT ACCORDANCE TO MANUFACTURERS GUIDELINES.			
F. MINIMUM PIPE SLOPE TO BE 2.0%, MAXIMUM 8.0% (SEE OPSD–1006.010, 1006.020).			

CITY OF BARRIE STANDARD								APPR'D	R.G.N.	DATE	92.05.15
GENERAL NOTES SANITARY SEWERS	2.	OPSD NUMBERS REVISED	K.C.	2000.08.17	DRAWN	L.A.J.	SCALE	N.T.S.			
	1.	CHANGES TO B. TO G.	K.C.	95.04.24							
	NO.	REVISION	APPR'D DATE		BSD-N4						

GENERAL NOTES – STORM SEWER			
STORM SEWER			
A. STORM SEWER TO BE PROVIDED ON ALL ROADS WITH CURB AND GUTTER.			
B. PLACE ALL CATCH BASIN LATERALS AT 2% GRADE UNLESS OTHERWISE NOTED.			
PIPE SIZE MINIMUM 250mm DIA. SINGLE, 300mm DIA. DOUBLE.			
C. STORM SEWERS SHALL BE CONSTRUCTED WITH BEDDING AS PER OPSD–802.010 (GRAN. 'A' EMBEDMENT MATERIAL) FOR FLEXIBLE PIPES AND OPSD–802.030 OR 802.031 CLASS B (GRAN. 'A' BEDDING MATERIAL) FOR RIGID PIPE UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF ENGINEERING.			
D. MAINTENANCE HOLE TOPS (FRAMES) AND CATCH BASIN (FRAMES) ARE TO BE SET TO BASE COURSE ASPHALT GRADE AND THEN ADJUSTED TO FINAL GRADE WHEN THE TOP LIFT OF ASPHALT IS PLACED. ALL ADJUSTMENT WILL BE ACCORDANCE WITH BSD–N2.			
E. STORM SEWER TO BE LOCATED OFFSET 3.0m SOUTH OR EAST OF CENTRELINE UNLESS OTHERWISE SPECIFIED.			
F. ALL CONNECTIONS TO THE STORM MAIN SHALL BE MADE WITH A STORM MANHOLE OR APPROVED FACTORY TEE CONNECTION AS PER OPSD–708.01 OR 708.03.			
G. PIPE MATERIAL TO BE REINFORCED CONCRETE WITH A MINIMUM STRENGTH OF 50 N/m ² /mm CERTIFIED TO C.S.A. STANDARD A247.2–1982, CLASS 50–D (PREVIOUSLY C.S.A. STANDARD A257.2–1974, CLASS II) OR PVC CERTIFIED TO C.S.A. STANDARDS 182.2 AND 182.4.			
H. STORM SEWER TO BE MINIMUM 300mm DIAMETER WITH JOINTS CONFORMING TO C.S.A. STANDARD A257.3.			
I. ALL PIPE BEDDING MUST CONFORM TO OPSD, MAXIMUM COVER TABLE. NO FLEXIBLE PIPE SEWERS WILL BE INSTALLED WITH A DEPTH OF COVER GREATER THAN 6 METRES UNLESS SPECIFICALLY APPROVED BY THE DIRECTOR OF ENGINEERING.			
J. ALL PIPE HANDLING INSTALLATIONS MUST BE IN STRICT COMPLIANCE WITH MANUFACTURERS INSTALLATION GUIDES AND THE C.S.A. OR UNSELL GUIDELINES.			
K. SUMP PUMP DISCHARGE PIPING IN BOULEVARD: IN THE EVENT OF OPERATIVE SUMP PUMP ACTIVITY, A 150mm DIAMETER PVC DR–28 SEWER MAY BE INSTALLED, WHEN SO DIRECTED BY THE DIRECTOR OF ENGINEERING, ALONG THE FRONTSIDES OF DESIGNATED LOTS, WITH AN OFFSET OF 0.6m FROM BACK OF CURB. THIS SEWER IS TO BE CAPPED AT THE UPSTREAM END AND IS TO OUTLET INTO THE NEAREST CATCHBASIN DOWNSTREAM. DEPTH OF SEWER IS TO BE EQUAL TO SUBDRAIN DEPTH, NOT TO BE DIRECTLY CONNECTED TO FOUNDATION DRAINS.			

CITY OF BARRIE STANDARD				4.	NOTE 'X' – SUMP PUMP DISCHARGE PIPING	B.R.	2003.01.07	APPR'D	R.G.N.	DATE	92.05.15
				3.	NOTE 'Y' & 'C' – "TORECTOR OF ENGINEERING"	B.R.	2002.10.28				
				2.	NOTE 'C' OPSD NUMBER REVISION	K.C.	2000.03.16	DRAWN	L.A.J.	SCALE	N.T.S.
				1.	NOTE 'D' CHANGED	K.C.	98.03.30				
GENERAL NOTES STORM SEWERS				NO.	REVISION	APPR'D	DATE	BSD-N5			

GENERAL NOTES			
1. DRAWINGS			
A. ALL DRAWINGS SHALL BE PRODUCED IN ACCORDANCE WITH CURRENT CITY OF BARRIE STANDARDS & SYMBOLS FOR PLAN & PROFILE DRAWINGS, GENERAL SERVICE PLANS AND LOT GRADING PLANS.			
2. MEASUREMENTS			
A. ALL DIMENSIONS ARE IN METRES, EXCEPT PIPE DIAMETERS, WHICH ARE IN MILLIMETRES, UNLESS SPECIFIED OTHERWISE.			
3. GENERAL			
A. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT CITY OF BARRIE STANDARD DRAWINGS (BSD) AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).			
B. ORDER OF PRECEDENCE OF STANDARD DRAWINGS IS FIRSTLY CITY OF BARRIE STANDARD DRAWINGS (BSD) AND SECONDLY ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).			
C. LOCATION OF EXISTING SERVICES ARE NOT GUARANTEED. THE CONTRACTOR IS REQUIRED TO NOTIFY THE VARIOUS UTILITY COMPANIES 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK.			
D. A ROAD OCCUPANCY PERMIT IS REQUIRED FROM THE ROADS AND PARKS OPERATIONS BRANCH PRIOR TO THE COMMENCEMENT OF WORK WITHIN ANY CITY RIGHT–OF–WAY.			
E. A SITE ALTERATION PERMIT IS REQUIRED FROM THE ENGINEERING DEPARTMENT PRIOR TO THE COMMENCEMENT OF ANY EARTH WORKS ON THE SITE.			
F. NATIVE MATERIAL, SUITABLE FOR BACKFILL, SHALL BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.			
G. GRANULAR MATERIAL, USED FOR BACKFILL, SHALL BE PLACED IN LAYERS 150mm IN DEPTH MAXIMUM AND COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY.			
H. ALL DISTURBED AREAS ARE TO BE RESTORED TO THEIR ORIGINAL CONDITION OR BETTER, AS DETERMINED BY THE CITY ENGINEERING DEPARTMENT.			
I. 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 CLOSURE AND THE GRASS HAS ESTABLISHED GROWTH, SUBJECT TO APPROVAL BY THE CITY ENGINEERING DEPARTMENT.			

CITY OF BARRIE STANDARD				3.	NOTE: 3.E. REVISED & 3.I. ADDED	J.S.	05.01.10	APPR'D	R.G.N.	DATE	92.05.15
				2.	3.D. – "ENGINEERING DEPARTMENT"	B.R.	02.10.28	DRAWN	L.A.J.	SCALE	N.T.S.
				1.	3.E. TOPSOIL PERMIT	K.C.	01.12.06				
GENERAL NOTES				NO.	REVISION	APPR'D	DATE	BSD-N6			

GENERAL NOTES – WATERMAIN			
1. CONTRACTORS SHALL INFORM THE CITY OF BARRIE WATER OPERATIONS DEPARTMENT A MINIMUM OF 48 HOURS IN ADVANCE OF THEIR INTENTIONS TO PERFORM WORK ON WATER INFRASTRUCTURE.			
2. OPERATION OF HYDRANTS AND VALVES ON THE POTABLE WATER SYSTEM BY OTHER THAN QUALIFIED WATER OPERATIONS STAFF IS PROHIBITED BY CURRENT BY-LAW. CITY SERVICE FEES ARE FOR THE CURRENT FEES BY-LAW. THE CITY'S WATER OPERATIONS STAFF WILL SWAB, PRESSURE TEST, CHLORINATE AND LUBRICATE ALL NEW WATERMANS.			
3. MINIMUM COVER OVER WATERMAIN SHALL BE 1.7m. THE MINIMUM HORIZONTAL SEPARATION BETWEEN WATERMAIN AND SEWERS SHALL BE 2.5m WHERE WATERMAIN CONFLICTS WITH SEWER PIPES, DEFLECT WATERMAIN HORIZONTALLY OR VERTICALLY WHILE PROVIDING A MINIMUM OF 0.5m CLEARANCE BETWEEN WATERMAIN AND SEWERS. MAINTAIN MINIMUM DEPTH OF COVER AT ALL TIMES.			
4. WATERMAIN SHALL BE INSTALLED IN BEDDING AS PER OPSD 802.010 (GRANULAR 'A' EMBEDMENT MATERIAL) FOR FLEXIBLE PIPES AND OPSD 802.030 OR 802.031 CLASS 'B' (GRANULAR 'A' BEDDING MATERIAL, GRANULAR 'A' OR SELECT NATIVE COVER MATERIAL FOR RIGID PIPE UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF WATER OPERATIONS. ALTERNATIVE EMBEDMENT MATERIAL, SAND MEETING GRADING REQUIREMENTS OF OPSD 1004.05.07 COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY IS PERMISSIBLE WHERE NOTED IN STANDARD DETAILS. GEOTECHNICAL CERTIFICATION OF MATERIAL AND COMPACTION TESTING MUST BE PROVIDED EVERY 10 METRES. THE COMPACTION TESTING MUST INCLUDE THE ENTIRE EMBEDMENT ENVELOPE (HAUNCHES, BEDDING, TOP OF PIPE AND COVER).			
5. COPPER WATER MAINS AND SERVICES 25mm TO 50mm IN DIAMETER SHALL BE EMBEDDED IN SAND 100mm ABOVE AND BELOW TO CONFORM TO OPSD MIN 1004.05.07.			
6. RESTRAINING WILL BE REQUIRED ON ALL HYDRANTS, THRUST BLOCKS, AS PER OPSD 1103.010 AND 1103.020. RESTRAINING DEVICES MAY BE REQUIRED IN ADDITION TO STANDARD CONCRETE THRUST BLOCKING WHERE SOIL CONDITIONS WARRANT AT THE CITY'S DISCRETION.			
7. NEW WATERMANS TO BE PVC DR18 CL150 MINIMUM, DUCTILE IRON CL45 AS PER THE APPROVED MANUFACTURERS PRODUCTS FOR LINEAR WATER SYSTEMS LIST.			
8. TRACING WIRE SHALL BE #12 AWG HIGH STRENGTH COPPER CLAD (HSCS) AND SHALL BE INSTALLED ON THE TOTAL LENGTH OF ALL WATERMAIN AND BROUGHT UP AT EACH HYDRANT AND CONNECTED TO PLANE BOLT. ALL SPLICES TO UTILIZE CONNECTORS AS PER THE APPROVED MANUFACTURERS PRODUCTS FOR LINEAR WATER SYSTEMS LIST.			
9. ALL WATER SERVICES SHALL BE MINIMUM 25mm TYPE 'K' COPPER OR 25mm CROSS-LINKED POLYETHYLENE UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF WATER OPERATIONS. WATER SERVICE SADDLES SHALL BE USED WHEN TAPPING INTO PVC WATERMAIN.			
10. SERVICE TAPPINGS SHALL BE PLACED AT A MINIMUM SEPARATION OF 1.0m AND A MINIMUM OF 0.6m FROM JOINTS. (ENDS OF PIPE)			
11. RISER PIPES ARE TO BE INSTALLED AS PER BSD-010, AND REMOVED AS DIRECTED. SWABBING SCHEDULE TO BE SUPPLIED BY A WATER OPERATIONS FIELD REPRESENTATIVE. ALL RISERS ARE TO BE RESTRAINED OR THRUST BLOCKED.			
12. ALL NEW CURB STOPS AND BOXES TO BE LOCATED AT PROPERTY LINE AND OUT OF DRIVEWAYS AND SIDEWALKS.			

City of BARRIE STANDARD DETAIL	GENERAL NOTES - WATERMAIN	REV No.	DATE: MAY 2015	APPROVED DATE: <i>May 29/15</i> <i>Amundson</i> DIRECTOR OF ENGINEERING
		2	SCALE: N.T.S.	
		BSD-500		

EROSION CONTROL NOTES

- ALL TEMPORARY SILT CONTROL AND EROSION PROTECTION DEVICES (I.E. SILT FENCING, DRAINAGE SWALES, ROCK CHECK DAMS, SEDIMENT TRAPS, GRAVEL ACCESS PAD, ETC.) SHALL BE CONSTRUCTED PRIOR TO COMMENCEMENT OF SITE WORKS 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 ENGINEERING DEPARTMENT.
- ALL SEDIMENTATION CONTROL MEASURES ARE TO BE INSPECTED REGULARLY (MINIMUM WEEKLY), AS WELL AS AFTER EVERY RAINFALL EVENT AND ANY DAMAGED SILT CONTROL AND EROSION PROTECTION DEVICES SHALL BE PROMPTLY REPAIRED OR REPLACED BY THE CONTRACTOR.
- THE CONTRACTOR SHALL BE PREPARED FOR UNEXPECTED CONDITIONS AND ACCORDINGLY HAVE STOCKPILED MATERIALS ON SITE FOR NECESSARY REPAIRS TO ANY FAILED OR INADQUATE CONTROL MEASURES.
- AREAS WITHOUT STABLE GROUND COVER SHALL BE PROTECTED WITH SILTATION CONTROL FENCING, STRAW MULCH, ETC. AND MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION HAS BECOME ESTABLISHED IN THE SUBSEQUENT GROWING SEASON.
- ALL DISTURBED GROUND LEFT INACTIVE FOR MORE THAN 30 DAYS SHALL BE STABILIZED BY SEEDING. (IF SEEDING IS APPROPRIATE DURING CURRENT SEASON).
- ALL SITE DRAINAGE IS TO BE DIRECTED TO THE TEMPORARY SEDIMENT TRAPS AND OTHER CHECK DAMS VIA SHEET DRAINAGE, BERMS OR SWALES (AS NECESSARY) TO FACILITATE THE COMPLETION OF GRADING WORKS. THE CONTRACTOR SHALL CONSTRUCT ANY ADDITIONAL SWALES OR BERMS THAT MAY BE NECESSARY TO DIRECT RUN-OFF TO THE SEDIMENT TRAPS.
- ALL CONSTRUCTION VEHICLES SHALL ENTER AND EXIT THE SITE FROM PROPOSED CONSTRUCTION ACCESS VIA THE GRAVEL ACCESS PAD.
- 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 INSPECTOR.
- THE CONTRACTOR SHALL OBTAIN A CURRENT COPY AND BECOME FAMILIAR WITH OPSD 805, CONSTRUCTION SPECIFICATION FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, AS WELL AS APPLICABLE MUNICIPAL STANDARDS AND/OR APPROVAL AGENCY STANDARDS.
- THE CONTRACTOR MUST CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES, SUCH MEASURES MUST BE PRESENTED IN WRITING FOR APPROVAL BY THE CONTRACT ADMINISTRATOR AND MUST BE APPROVED IN WRITING BY THE APPLICABLE APPROVAL AGENCIES.

GRADING NOTES

- ALL DISTURBED AREAS TO BE RESTORED TO EXISTING CONDITIONS OR BETTER WITH A MIN. 200mm DEPTH OF TOPSOIL AND SOD IMMEDIATELY FOLLOWING COMPLETION OF GRADING.
- ALL SLOPES SHALL BE RESTORED WITH A MIN. 200mm DEPTH OF TOPSOIL AND SOD IMMEDIATELY FOLLOWING COMPLETION OF GRADING.
- ALL SLOPES ALONG BERMS AND DITCHES TO BE MAXIMUM SLOPES OF 3:1.

WATER SERVICING NOTES, AS REQUIRED BY THE CITY OF BARRIE

GENERAL

- ALL REQUIRED PERMITS SHALL BE IN PLACE PRIOR TO INSTALLATION OF WATERMAIN AND SERVICES.
- A ROAD OCCUPANCY PERMIT IS REQUIRED, AND CAN BE OBTAINED AT THE OPERATION CENTRE.
- MINIMUM COVER OVER WATER MAIN TO BE 1.7m. THE MINIMUM HORIZONTAL SEPARATION BETWEEN WATER MAIN AND SEWER TO BE 2.5m WHERE WATER MAIN CONFLICTS WITH SEWER PIPE. DEFLECT WATER MAIN HORIZONTALLY OR VERTICALLY WHILE PROVIDING A MINIMUM OF 0.5m CLEARANCE BETWEEN WATER MAIN AND SEWERS, MAINTAIN MINIMUM DEPTH OF COVER AT ALL TIMES.
- ALL BENDS AND TEES SHALL BE RESTRAINED IN ADDITION TO THRUST BLOCKS.
- ALL DOMESTIC AND FIRE WATER SERVICES ENTERING EACH BUILDING SHALL BE INSTALLED AS PER BSD–505.
- SERVICES INSTALLED UNDER FLOORS SHALL BE FULLY RESTRAINED.
- HYDRANTS SHALL BE INSTALLED AS PER BSD–507. ON SITE HYDRANTS SHALL BE CONSIDERED PRIVATE (PAINTED RED), AND ARE TO BE MAINTAINED BY THE OWNER.
- ALL FIRE SERVICES SHALL CONFORM TO THE MOST CURRENT BUILDING CODE AND NATIONAL FIRE PROTECTION ACT. THE REQUIREMENT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER. INFORMATION MAY BE OBTAINED FROM THE INSURANCE UNDERWRITER, CITY OF BARRIE PLANNING AND DEVELOPMENT AND THE CITY OF BARRIE FIRE DEPARTMENT.
- ALL NEW CURB STOPS AND BOXES TO BE LOCATED OUT OF DRIVEWAYS AND SIDEWALKS.
- COPPER WATER SERVICES 19mm TO 50mm IN DIAMETER SHALL BE EMBEDDED IN SAND 100mm ABOVE AND BELOW.
- ALL COPPER WATER SERVICE FITTINGS SHALL BE COMPRESSION STYLE. IF A CONDITION ARISES WHERE A COPPER SERVICE MUST BE JOINED UNDER THE FLOOR, THE COPPER SHALL BE JOINED BY SILVER SOLDER CONNECTION ONLY.
- CONTRACTOR SHALL INFORM THE CITY OF BARRIE OPERATIONS DEPARTMENT A MINIMUM OF 48 HOURS IN ADVANCE OF THEIR INTENTIONS TO WORK.
- THE CITY WILL FLUSH THE NEW SERVICE AND CONTRACTOR WILL PERFORM PRESSURE TEST WITNESSED BY THE WATER FIELD COORDINATOR.
- WATER WILL NOT BE AVAILABLE UNTIL SERVICES HAVE BEEN SAMPLED AND PASSES FOR BACTERIOLOGICAL COMPLIANCE, A CHECK VALVE SHALL BE INSTALLED FOR TEMPORARY WATER.
- REFER TO DRAWING MW-1, F. WATERMAIN TESTING AND DISINFECTION NOTES.
- A FLAT RATE CONNECTION FEE (\$2600.00) WILL BE REQUIRED FOR EACH OF THE 300mm WATER SERVICE CONNECTIONS.
- AN ANNUAL CHARGE FOR EACH PRIVATE CONNECTION MADE TO THE MUNICIPAL WATER DISTRIBUTION SYSTEM WILL APPLY.
- AN ANNUAL CHARGE FOR EACH PRIVATE FIRE HYDRANT SUPPLIED WITH WATER FROM THE MUNICIPAL WATER DISTRIBUTION SYSTEM WILL APPLY.
- WATER SERVICES TO BE MECHANICALLY RESTRAINED. WATERMAIN TO BE MECHANICALLY RESTRAINED IN AREAS OF FILL.
- FIRE FLOW REQUIREMENTS ARE OULINED IN THE INFOWATER MODELING BRIEF WATER SUPPLY SCHEME FOR BISTRO 6 WEST SITE (BLOCK 598) BY SCHAEFFERS CONSULTING ENGINEERS, DATED FEBRUARY 8, 2021. BUILDING DESIGN PARAMETERS RELATED TO FIRE FLOW REQUIREMENTS TO BE STRINGENTLY ADHERED TO.

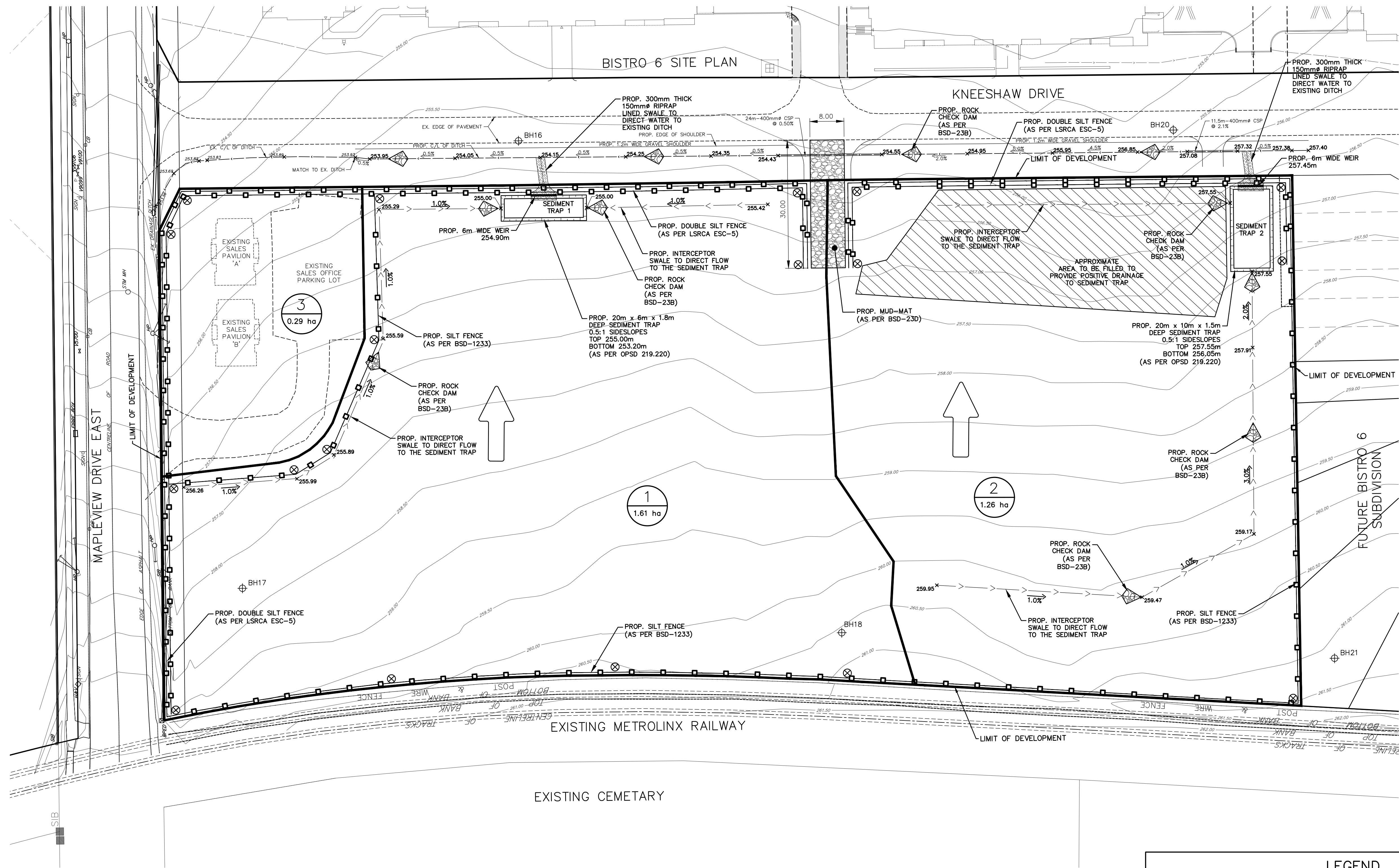
100mm DOMESTIC AND 150mm FIRE SERVICES - BUILDINGS A, B, AND C

- DOMESTIC AND FIRE SERVICE VALVES SHALL BE LOCATED IN THE BOULEVARD, UNLESS OTHERWISE NOTED.
- DOMESTIC AND FIRE SERVICES SHALL BE MECHANICALLY RESTRAINED FROM THE TEE TO THE BUILDINGS.
- DOMESTIC AND FIRE WATER RISERS ENTERING EACH BUILDING SHALL BE INSTALLED AS PER BSD–505.
- DOMESTIC AND FIRE SERVICE TO BE HAND SWABBED OR A SWAB IS TO BE PLACED IN SERVICE AND REMOVED FROM RISERS.
- THE 100mm DOMESTIC WATER SERVICE WILL REQUIRE A 100mm WATER METER (SUPPLIED AND INSTALLED BY THE OWNER) COMPLETE WITH A BYPASS ASSEMBLY AS PER BSD–533 AND SHALL BE LOCATED IN AN APPROPRIATELY SIZED MECHANICAL ROOM.
- BACKFLOW PREVENTION SHALL BE PROVIDED ON ALL DOMESTIC AND FIRE SERVICES AS PER CITY OF BARRIE BYLAW 2017–121.

ENGINEERING NOTES

UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE FOLLOWING REQUIREMENTS SHALL APPLY TO THE WORKS.

- ALL MEASUREMENTS FOR THIS PROJECT ARE IN METERS, EXCEPT PIPE DIAMETERS WHICH IS IN MILLIMETRES, UNLESS OTHERWISE NOTED. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF ANY CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
- ALL MECHANICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES, STANDARDS, RULES AND REGULATIONS, TO MEET THE REQUIREMENTS OF ALL AUTHORITY HAVING JURISDICTION AND TO MEET THE DESIGN INTENT.
- ALL WORK AND MATERIALS WITHIN THE PROPERTY BOUNDARIES SHALL CONFORM TO THE LATEST EDITION OF THE ONTARIO BUILDING CODE, WHERE THERE IS A CONFLICT BETWEEN THE FOLLOWING NOTES AND SPECIFICATIONS AND THE ONTARIO BUILDING CODE, THE DECISION OF THE CHIEF BUILDING OFFICIAL WILL GOVERN.
- INFORMATION ON EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY UTILITY LOCATES PRIOR TO COMMENCING CONSTRUCTION.
- ALL CORRUGATED STEEL PIPE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND AS PER O.P.S.D. 801.010. ALL CSP TO BE 2.0mm THICKNESS GALVALUME.
- CONTRACTOR SHALL INFORM THE SITE (PROJECT) MANAGER A MINIMUM 24 HOURS IN ADVANCE OF HIS INTENTION TO COMMENCE WORK. CONTRACTOR SHALL AT ALL TIMES, PROVIDE SUITABLE BARRICADES AND FLAGGING PROTECTION IN ACCORDANCE WITH THE MINISTRY OF LABOUR PRACTICES, AND OCCUPATIONAL HEALTH AND SAFETY ACT.
- THESE NOTES ARE GENERAL IN NATURE; FOR SPECIFIC DETAILS REFER TO CITY OF BARRIE AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
- SEWER PIPE MATERIAL (IF APPLICABLE): –POLYVINYL CHLORIDE PIPE SHALL CONFORM TO CSA–B–182.1 AND CSA–B–182.2 WITH BELL AND SPIGOT RUBBER GASKETED JOINTS COMPLYING WITH CSA–B182.2 AND CSA–B182.3. SANITARY PIPE SHALL BE SDR–35 AND ALL SANITARY SERVICE LATERALS TO BE SDR–28.
- SEWER BEDDING WILL CONFORM TO O.P.S.D. 802.030 FOR RIGID PIPE INSTALLATION AND O.P.S.D. 802.010 FOR FLEXIBLE PIPE INSTALLATION. NATIVE MATERIAL USED FOR BACKFILL SHALL BE APPROVED BY A GEOTECHNICAL ENGINEER.
- ALL TRENCHES ARE TO BE BACKFILLED WITH NATIVE MATERIAL AND COMPACTED TO AT LEAST 95% STANDARD PROCTOR DENSITY OR AS PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. IN ADDITION, ALL STRUCTURES WITHIN TRAVELLED PORTION OF THE ROAD & PARKING AREAS SHALL HAVE NATIVE 4:1 TAPERED FROM FROST LINE TO SUBGRADE.
- MAINTENANCE HOLES:
–STEPS SHALL BE ALUMINUM ALLOY O.P.S.D. 405.010 SOLID CIRCULAR ALUMINUM OR APPROVED EQUAL.
–FRAMES AND COVERS SHALL BE DOMINION WHEEL FOUNDRIES DESIGN STD. 579 OR APPROVED EQUAL AND SELF LEVELLING FRAME AND GRATE/COVER SHALL BE USED FOR ALL NEW MAINTENANCE HOLES WITHIN ASPHALT ROADWAYS AS PER BSD–41 (OCTOBER 2017) O.P.S.D. 401.010 TYPE 'A'.
–SANITARY MAINTENANCE HOLES ARE TO HAVE CORE AND SEAL GASKETS ON ALL PIPE CONNECTIONS. 1200 DIAMETER MAINTENANCE HOLES – O.P.S.D. 701.010
–STORM MAINTENANCE HOLES TO BE 1200mm DIAMETER PER OPSD 701.010 UNLESS OTHERWISE NOTED. 1800mm DIAMETER MAINTENANCE HOLES – O.P.S.D. 701.012
–MAINTENANCE HOLE BENCHING SHALL EXTEND TO PIPE OVERT AND SHALL BE IN ACCORDANCE WITH DETAILS SHOWN AS PER OPSD 701.021.
- TEMPORARY ACCESS ROAD MAKE–UP: (REFER TO GEOTECHNICAL INVESTIGATION REPORT)
–70mm HLB BINDER ASPHALT
–150mm OPSD GRANULAR "A"
–400mm OPSD GRANULAR "B"
INTERNAL, ROAD & PARKING MAKE–UP:
–40mm HLB BINDER ASPHALT
–70mm HLB BINDER ASPHALT
–150mm OPSD GRANULAR "A"
–450mm OPSD GRANULAR "B"
- BARRIER CURB TO COMPLY WITH OPSD 600.010.
- CATCHBASIN STRUCTURES LOCATED IN THE VICINITY OF THE SNOW STORAGE AREAS TO HAVE MIN. 900mm SUMP DEPTH PER OPSD 705.010 AND BE FITTED WITH CATCHBASIN



LEGEND	
	EX. BUSH LINE
	EX. BORE HOLE
	DIRECTION OF SURFACE DRAINAGE
	PROP. SILTATION CONTROL FENCE AS PER BSD-1233
	EXISTING CONTOUR LINES
	PROP. CEDAR POST
	PROP. ROCK CHECK DAM AS PER BSD-23B DRAINAGE BOUNDARY
	MUD MAT (AS PER BSD-23D)
	PROP. CUT-OFF SWALE (MIN 0.5m DEPTH)
	AREA NO.
	AREA IN HECTARE
	EXTERNAL WORKS BY OTHERS

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I HAVE REVIEWED THE PLANS FOR THE CONSTRUCTION OF PART OF THE PROPOSED HEWITT'S GATE SUBDIVISION SITE LOCATED AT 793 MAPLEVIEW DRIVE EAST AND HAVE PREPARED THIS PLAN TO INDICATE THE COMPATIBILITY OF THE PROPOSAL TO EXISTING ADJACENT PROPERTIES AND MUNICIPAL SERVICES. IT IS MY BELIEF THAT ADHERENCE TO THE PROPOSED GRADES AS SHOWN WILL PRODUCE ADEQUATE SURFACE DRAINAGE AND PROPER FACILITY OF MUNICIPAL SERVICES WITHOUT ANY DETRIMENTAL EFFECT TO THE EXISTING DRAINAGE PATTERNS OR ADJACENT PROPERTIES.	BENCHMARK: BENCHMARK NO. 01019885454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE OVER LOVELL'S CREEK, 0.854M EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 18CM TOP OF CORING. N4910788.589 E807284.100 ELEV 241.661 BENCHMARK NO. 03120030029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL MONUMENT IS SET PLUSH IN CONCRETE FLAGPOLE BASE 4.7M SOUTH FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND TABLET IS ON THE SOUTHWEST SIDE OF THE FLAGPOLE BASE. N4911810 E807799 ELEV 230.559 BENCHMARK NO. 03120080094 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910878.122 E807801.062 ELEV 248.996 BENCHMARK NO. 03120110013 LOCATED ON LOUGHART ROAD ON THE NORTH SIDE OF THE BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION. N4909870.257 E808733.580 ELEV 232.807	5	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR		PRATT HANSEN GROUP INC. ELEMENTS SITE PLAN CITY OF BARRIE EROSION AND SEDIMENT CONTROL PLAN	 JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS 229 Mapleview Dr. E. Unit 1 Barrie, ON L4N 0W6 P. 705.734.2538 F. 705.734.1056	DESIGN MF	SCALE: 1:500	DATE FEB. 2021
	4	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF	DRAWN KS				PROJECT	DWG. NO	
	3	ISSUED FOR SAP APPLICATION	21-09-09	MF	CHECKED DR				PRA-19078	ESC-1	
	2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF							
	1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF							
	NO.	REVISIONS	DATE	INITIAL							

1. THE ACCOMPANYING PLANS SET OUT THE MEASURES THAT WILL BE TAKEN BY THE DEVELOPER AND ITS CONTRACTORS TO CONTROL DOWNSTREAM SEDIMENT TO THE LOWEST LEVEL PRACTICALLY ACHIEVABLE. THE CONDITIONS AND TECHNIQUES SET OUT ARE TO BE FOLLOWED UNLESS APPROVED OTHERWISE BY THE CONTRACT ADMINISTRATOR, CONSERVATION AUTHORITY AND/OR MUNICIPALITY.
2. ALL TEMPORARY SILT CONTROL AND EROSION PROTECTION DEVICES (I.E. SILT FENCING, DRAINAGE SWALES, ROCK CHECK DAMS, SEDIMENT TRAPS, GRAVEL ACCESS PAD, ETC.) SHALL BE CONSTRUCTED PRIOR TO COMMENCEMENT OF SITE WORKS AND SHALL BE MAINTAINED IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL CONSTRUCTION IS COMPLETE AND THE GRASS HAS ESTABLISHED GROWTH, SUBJECT TO APPROVAL BY THE CITY ENGINEERING DEPARTMENT.
3. ALL SEDIMENTATION CONTROL MEASURES ARE TO BE INSPECTED REGULARLY (MINIMUM WEEKLY), AS WELL AS AFTER EVERY RAINFALL EVENT AND ANY DAMAGED SILT CONTROL AND EROSION PROTECTION DEVICES SHALL BE PROMPTLY REPAIRED OR REPLACED BY THE CONTRACTOR.
4. THE CONTRACTOR MUST USE MATERIALS, CONSTRUCTION PRACTICES, AND MITIGATION TECHNIQUES IN ORDER TO PREVENT THE UNAUTHORIZED HARMFUL ALTERATION, DISRUPTION OR DESTRUCTION OF VEGETATION OR THE IMPAIRMENT OF WATER QUALITY.
5. 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.
6. AREAS WITHOUT STABLE GROUND COVER SHALL BE PROTECTED WITH SILTATION CONTROL FENCING, STRAW MULCH, ETC. AND MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION HAS BECOME ESTABLISHED IN THE SUBSEQUENT GROWING SEASON.
7. ALL EXPOSED SOIL MUST BE GRADED TO A STABLE SLOPE AND TREATED AS QUICKLY AS POSSIBLE TO PREVENT EROSION AND SEDIMENT FROM LEAVING THE SITE. ALL AREA SLOPED OF VEGETATIVE COVER FOR LONGER THAN 30 DAYS SHALL BE TOPSOILED AND SEEDED AT THE DIRECTION OF THE ENGINEER.
8. ALL SITE DRAINAGE TO BE DIRECTED TO THE TEMPORARY SEDIMENT TRAPS AND OTHER CHECK DAMS VIA SHEET DRAINAGE, BERMS OR SWALES (AS NECESSARY) TO FACILITATE THE COMPLETION OF GRADING WORKS. THE CONTRACTOR SHALL CONSTRUCT ANY ADDITIONAL SWALES OR BERMS THAT MAY BE NECESSARY TO DIRECT RUN-OFF IN A CONTROLLED MANNER OF SUITABLE QUALITY.
9. ALL CONSTRUCTION VEHICLES SHALL ENTER AND EXIT THE SITE FROM PROPOSED CONSTRUCTION ACCESS VIA THE GRAVEL ACCESS PAD.
10. ANY DETERIORATING WASTE SHALL BE DISCHARGED TO A VEGETATED AREA AT LEAST 30m FROM ANY WATERCOURSE AND FILTERED. FILTERING METHODS MUST BE APPROVED BY THE SITE INSPECTOR.
11. TECHNIQUES FOR EROSION AND SEDIMENT CONTROLS ARE TO ADHERE TO ACCEPTED ENGINEERING PRACTICE AND MUNICIPAL, CONSERVATION AUTHORITY AND ONTARIO PROVINCIAL STANDARD SPECIFICATIONS AND DRAWINGS. THE CONTRACTOR SHALL OBTAIN A CURRENT COPY AND BECOME FAMILIAR WITH OPSS 805; CONSTRUCTION SPECIFICATION FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, AS WELL AS APPLICABLE MUNICIPAL STANDARDS AND/OR APPROVAL AGENCY STANDARDS.
12. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES, SUCH MEASURES MUST BE PRESENTED

THE FOLLOWING CONSTRUCTION SEQUENCE IS PROVIDED FOR CONTRACTOR GUIDANCE:

1. CONSTRUCT ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES INCLUDING SILT FENCE, TREE PRESERVATION FENCE, MUD MATS, CHECK DAMS, SWALES/BERMS, ETC.
2. CONSTRUCT TEMPORARY SEDIMENT TRAPS. STRIPPING AND REMOVAL OF TOPSOIL. TOPSOIL TO BE REMOVED FROM SITE.
3. PROCEED WITH EARTH EXCAVATION AND PRE-GRADING. PROCEED WITH SEEDING OF RESTORATION OF ALL DISTURBED AREAS AS DIRECTED BY ENGINEER. ALL AREAS STRIPPED OF VEGETATIVE COVER FOR LONGER THAN 15 DAYS SHALL BE HYDROSEED AT THE DIRECTION OF THE ENGINEER. HYDROSEED WITH FIBREKAT AT 100KG/HA. HYDROSEED MIXTURE OF 48% ANNUAL RYE GRASS, 48% FALL RYE, 4% RED CLOVER WILL NEED TO BE APPLIED TO ANY EXPOSED AREAS FOLLOWING TOPSOIL STRIPPING.
4. PROCEED WITH SITE WORKS I.E. SITE SERVICING AND SURFACE WORKS INSTALLATIONS.
5. REMOVE TEMPORARY SEDIMENT TRAPS. CONSTRUCT RETAINING WALLS AND LID MEASURES AT EAST PROPERTY LIMIT.
6. RESTORATION OF DISTURBED AREAS.
7. REMOVAL OF REMAINING SEDIMENT AND EROSION CONTROLS.

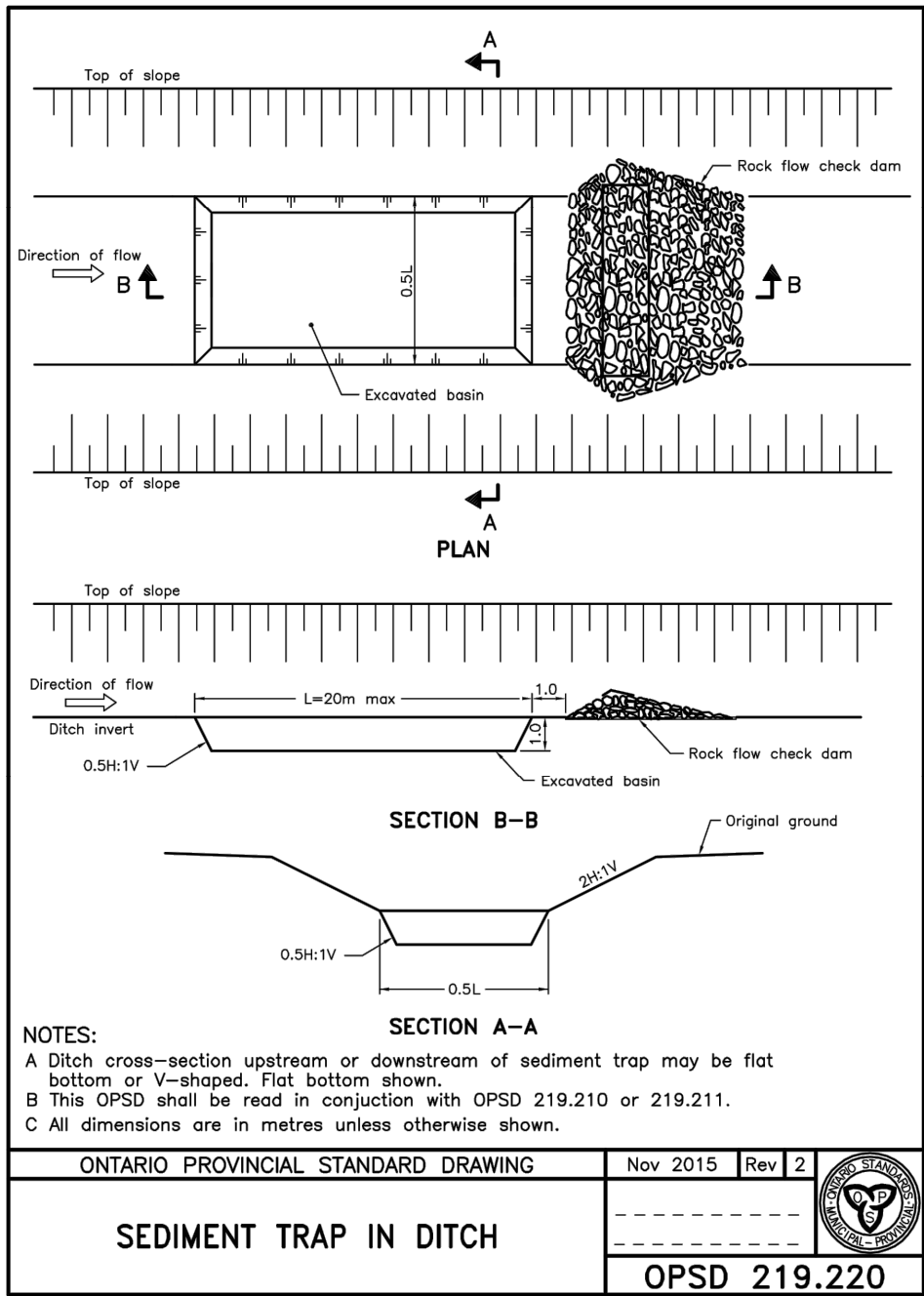
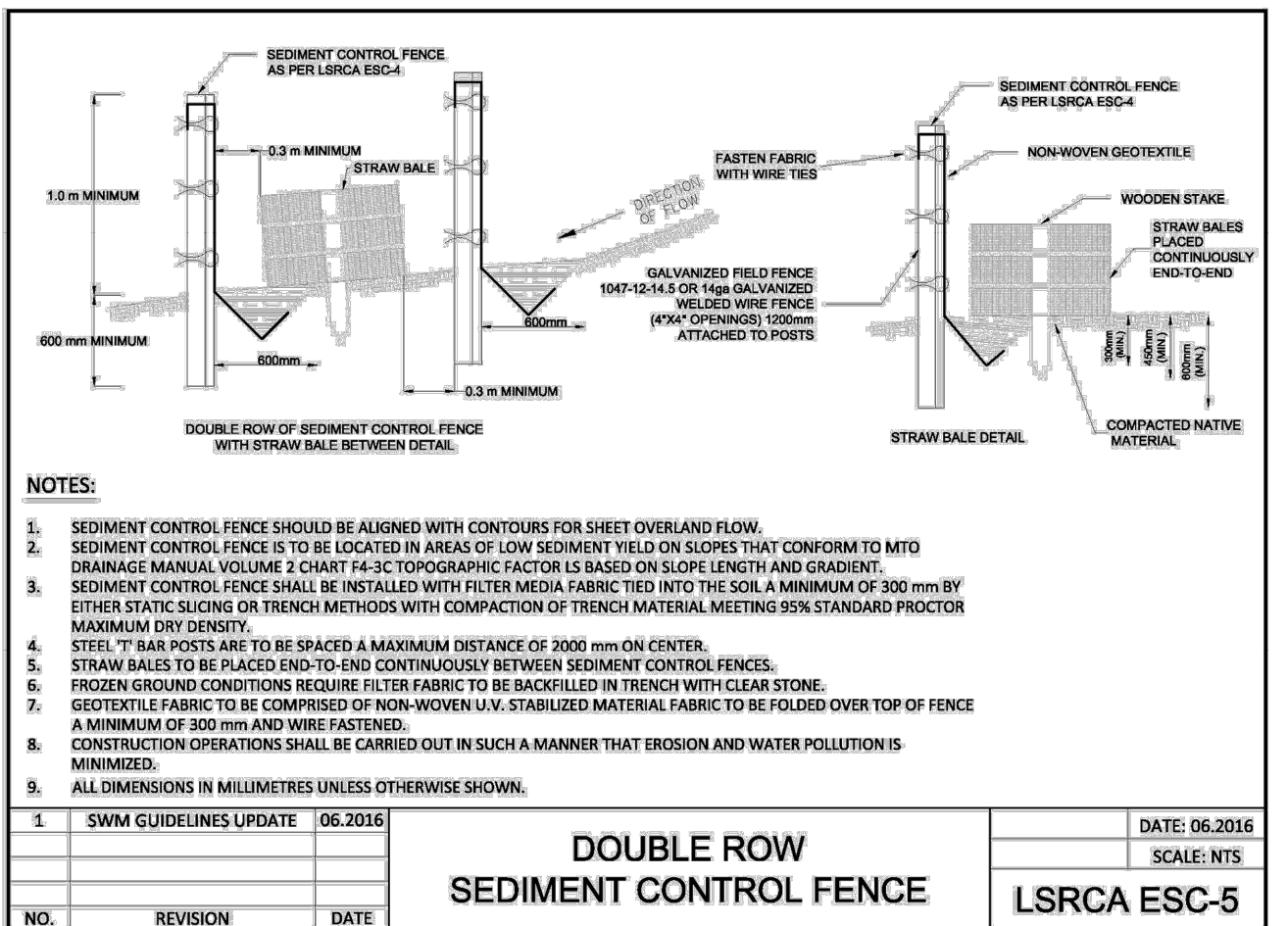
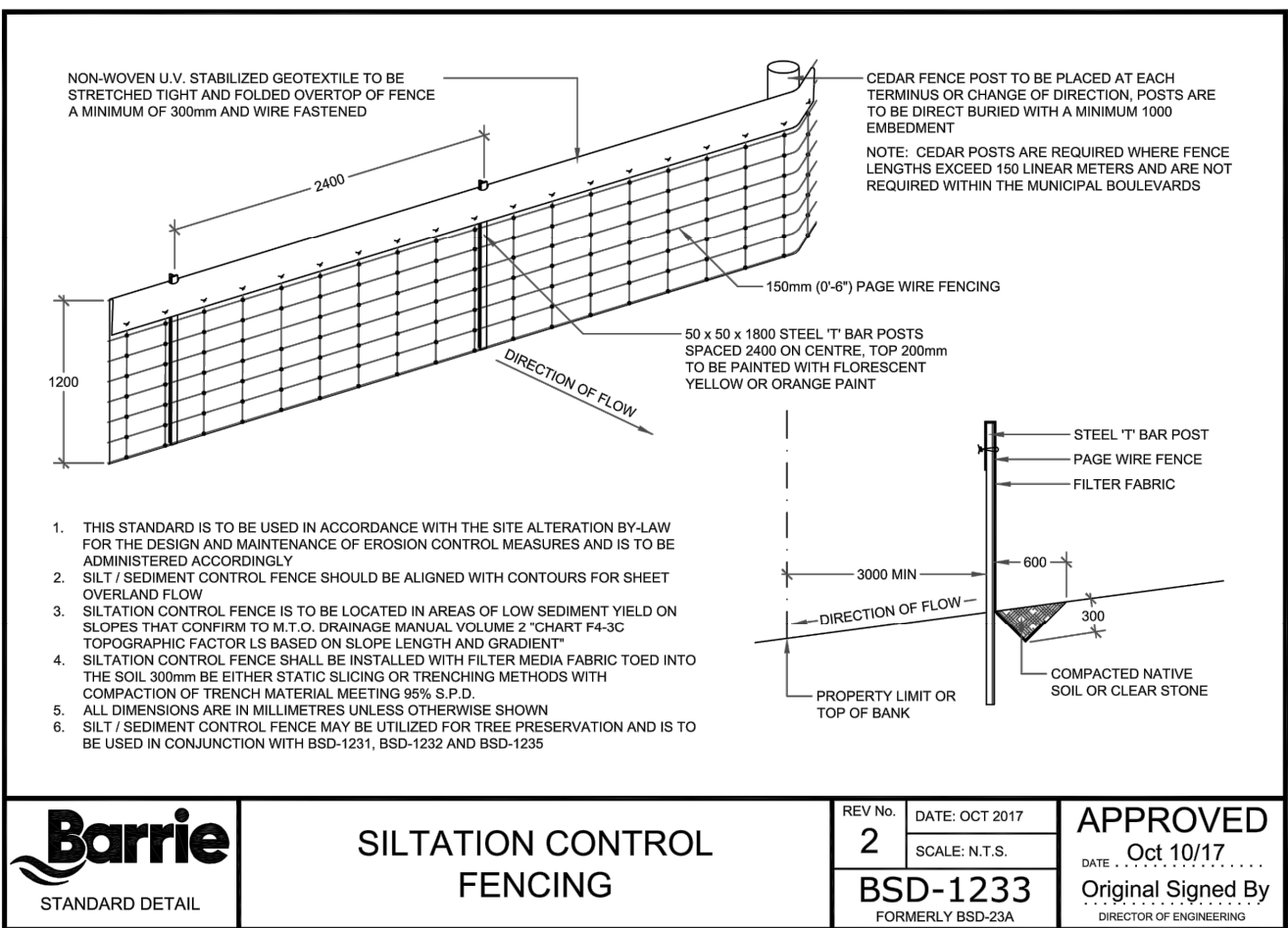
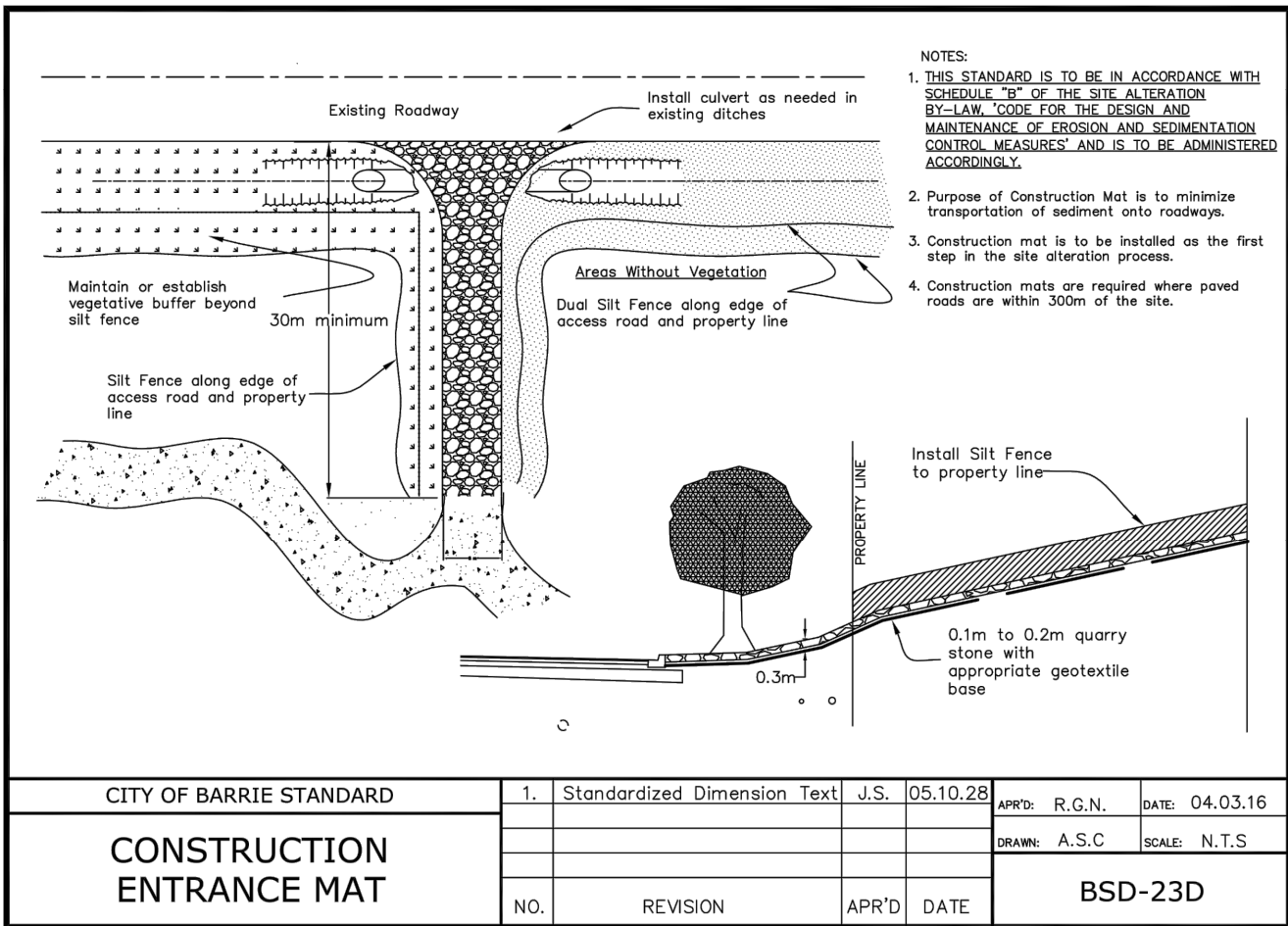
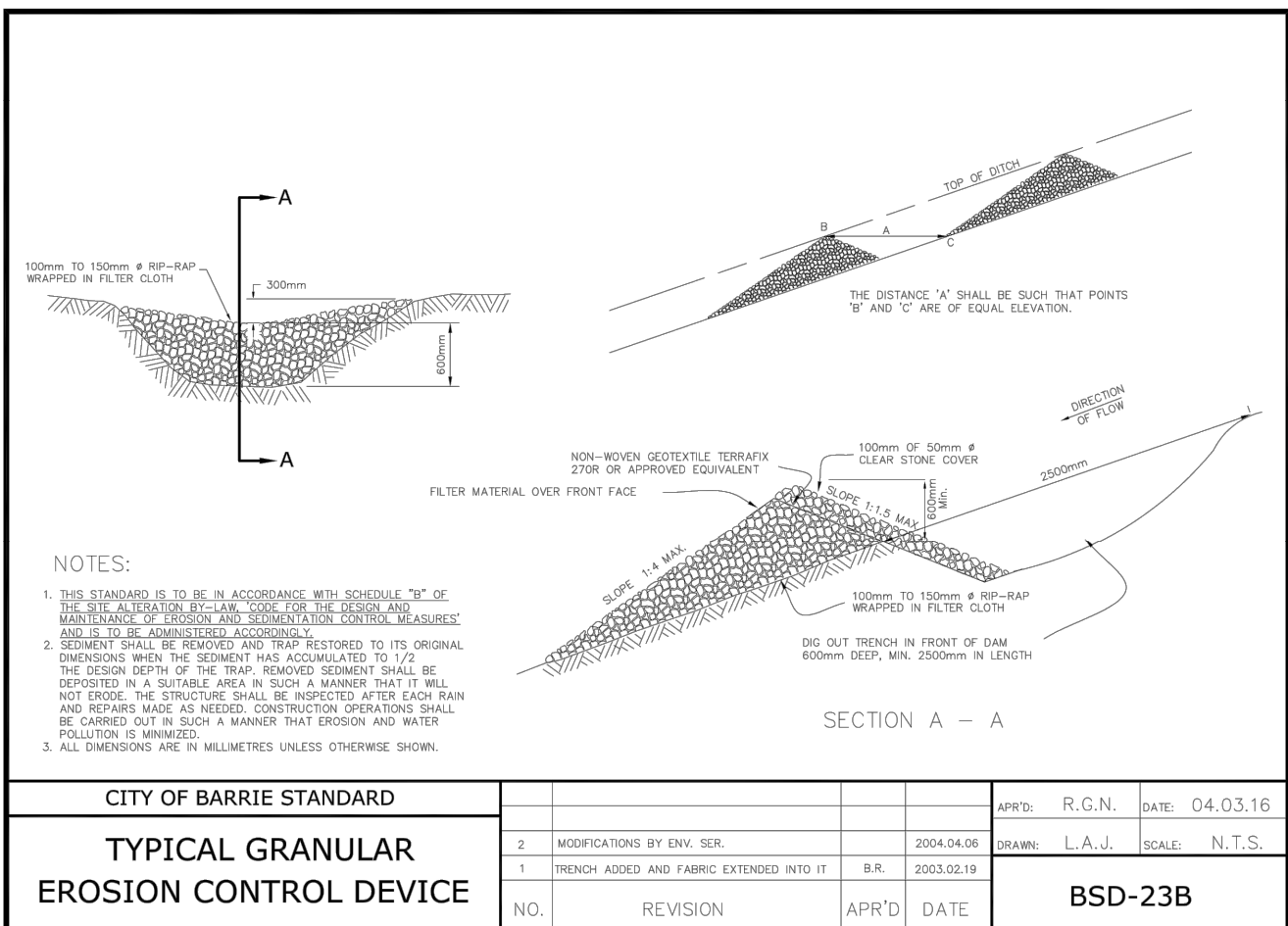
****NOTE**** SILTATION AND EROSION CONTROL MEASURES ARE TO BE MONITORED AND MAINTAINED THROUGHOUT CONSTRUCTION AND NECESSARY REPAIRS TO BE PROMPTLY COMPLETED AS REQUIRED.

IF UNFORESEEN EVENTS CHAOSSE THESE STRATEGIES SET OUT IN THIS PLAN TO BE INSUFFICIENT OR INAPPROPRIATE TO MEET THE OBJECTIVE, THE CONTRACTOR IS EXPECTED TO RESPOND IN A TIMELY MANNER WITH ALL REASONABLE MEASURES CONSISTENT WITH SAFETY, TO PREVENT, CONTRAUCT OR REMEDY DOWNSTREAM SEDIMENTATION AND EROSION.

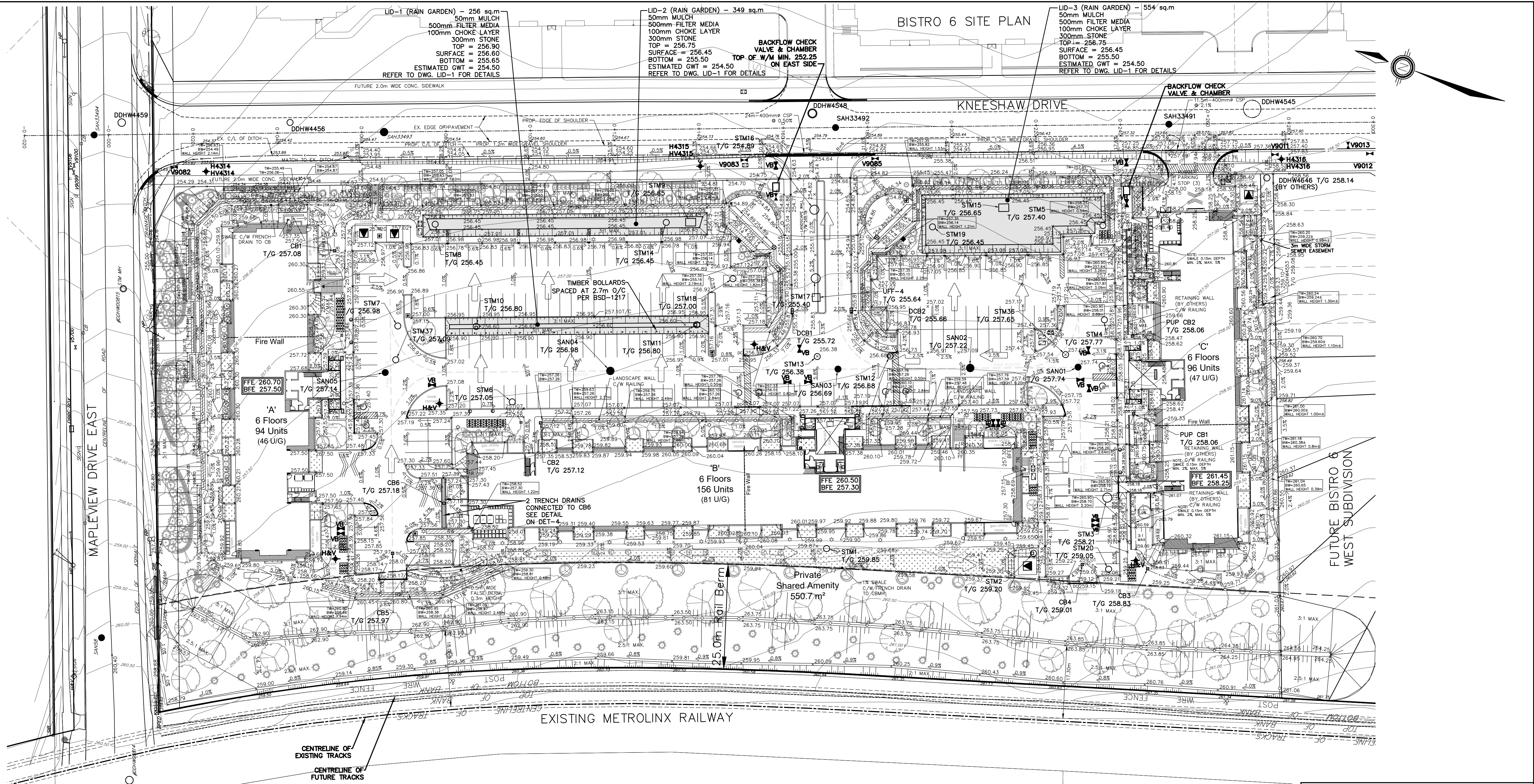
IF A SPILL OCCURS IT SHALL BE REPORTED TO THE MINISTRY OF ENVIRONMENT & CLIMATE CHANGE & THE MINISTRY OF NATURAL RESOURCES AND FORESTRY. THE ON CALL CITY OF BARRIE ENVIRONMENTAL OFFICER SHOULD ALSO BE NOTIFIED VIA CELL PHONE (705) 725-3374.

IF APPROVAL AGENCIES DETERMINE THAT LONG TERM DAMAGE TO THE NATURAL ENVIRONMENT HAS OCCURRED DUE TO FAILURE OF THIS PLAN TO CONTROL SEDIMENTS, A RESTORATION PLAN WILL BE DEVELOPED BY THE CONTRACTOR IN CONSULTATION WITH AND APPROVAL FROM THE APPROPRIATE AGENCIES FOR IMPLEMENTATION BY THE CONTRACTOR.

GENERAL NOTES			
1. DRAWINGS			
A. ALL DRAWINGS SHALL BE PRODUCED IN ACCORDANCE WITH CURRENT CITY OF BARRIE STANDARDS & SYMBOLS FOR PLAN & PROFILE DRAWINGS, GENERAL SERVICE PLANS AND LOT GRADING PLANS.			
2. MEASUREMENTS			
A. ALL DIMENSIONS ARE IN METRES, EXCEPT PIPE DIAMETERS, WHICH ARE IN MILLIMETRES, UNLESS SPECIFIED OTHERWISE.			
3. GENERAL			
A. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT CITY OF BARRIE STANDARD DRAWINGS (BSD) AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).			
B. ORDER OF PRECEDENCE OF STANDARD DRAWINGS IS FIRSTLY CITY OF BARRIE STANDARD DRAWINGS (BSD) AND SECONDLY ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).			
C. LOCATION OF EXISTING SERVICES ARE NOT GUARANTEED. THE CONTRACTOR IS REQUIRED TO NOTIFY THE VARIOUS UTILITY COMPANIES 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK.			
D. A ROAD OCCUPANCY PERMIT IS REQUIRED FROM THE ROADS AND PARKS OPERATIONS BRANCH PRIOR TO THE COMMENCEMENT OF WORK WITHIN ANY CITY RIGHT-OF-WAY.			
E. A SITE ALTERATION PERMIT IS REQUIRED FROM THE ENGINEERING DEPARTMENT PRIOR TO THE COMMENCEMENT OF ANY EARTH WORKS ON THE SITE.			
F. NATIVE MATERIAL, SUITABLE FOR BACKFILL, SHALL BE COMPACTED TO 90% STANDARD PROCTOR MAXIMUM DRY DENSITY.			
G. GRANULAR MATERIAL, USED FOR BACKFILL, SHALL BE PLACED IN LAYERS 150mm IN DEPTH MAXIMUM AND COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY.			
H. ALL DISTURBED AREAS ARE TO BE RESTORED TO THEIR ORIGINAL CONDITION OR BETTER, AS DETERMINED BY THE CITY ENGINEERING DEPARTMENT.			
I. 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 ENGINEERING DEPARTMENT.			
CITY OF BARRIE STANDARD			
3.	3.1. NOTE: 3.1. REVISED & 3.1. ADDED	05.09.10	APPRO. R.G.N.
2.	3.0. - "ENGINEERING DEPARTMENT"	08.10.08	DATE: L.A.-J.
1.	3.E. TPOISOL PERMIT	01.12.06	DATE: N.T.S.
NO. REVISION		APPRO. DATE	BSD-N6

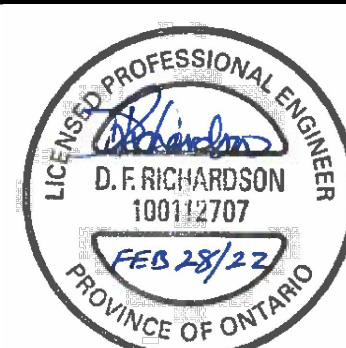


I HAVE REVIEWED THE PLANS FOR THE CONSTRUCTION OF PART OF THE PROPOSED HEWITT'S GATE SUBDIVISION SITE LOCATED AT 793 ELEVATION DRIVE EAST AND HAVE PREPARED THIS PLAN TO INDICATED THE COMPATIBILITY OF THE PROPOSAL TO EXISTING ADJACENT PROPERTIES AND MUNICIPAL SERVICES. IT IS MY BELIEF THAT ADHERENCE TO THE PROPOSED GRADES AS SHOWN WILL PRODUCE ADEQUATE SURFACE DRAINAGE AND PROPER FACILITY OF MUNICIPAL SERVICES WITHOUT ANY DETRIMENTAL EFFECT TO THE EXISTING DRAINAGE PATTERNS OR ADJACENT PROPERTIES.	BENCHMARK:		5	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR		PRATT HANSEN GROUP INC. ELEMENTS' SITE PLAN CITY OF BARRIE	 JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS	229 Maplevue Dr. E. Unit 1 Barrie, ON L4N 0W5 P: 705.734.2558 F: 705.734.1058
	BENCHMARK NO: 01016805454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE E OVER LOVER'S CREEK, 0.60KM EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE 3.4KM NORTH OF CENTRELINE OF ROAD. WEST OF THE NORTHEAST END OF BRIDGE, 19CM TOP OF CORNER. N4910768.889 E607284.100 ELEV 241.861		4	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF				
	BENCHMARK NO: 03120200029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 SOUTH DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE FLAGSTONE BASE 4.7m EITHER FROM THE SOUTHWEST CORNER OF THE MAIN DRIVE AND TABLET IS ON THE SOUTHSIDE OF THE FLAGSTONE BASE. N4911610 E607799 ELEV 235.508		3	ISSUED FOR SAP APPLICATION	21-09-09	MF				
	BENCHMARK NO: 03120200004 THE FACILITY OF THE 180 SOUTH DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910576.122 E607601.062 ELEV 248.996		2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF				
	BENCHMARK NO: 03120110013 LOCATED ON LOGCHART ROAD ON THE NORTH SIDE OF THE BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION N49009870.227 E608733.590 ELEV 252.807		1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF				
	NO.	REVISIONS	DATE	INITIAL						



LEGEND	
	PROPOSED GROUND ELEVATION
	EXISTING GROUND ELEVATION
	PROPOSED GRADIENT AND DIRECTION
	PROPOSED 3:1 SLOPE (MAX.)
	PROPOSED STORM MAINTENANCE HOLE
	PROPOSED CATCHBASIN MAINTENANCE HOLE
	PROPOSED CATCHBASIN
	PROPOSED DOUBLE CATCHBASIN
	PROPOSED SANITARY MAINTENANCE HOLE
	PROPOSED HYDRANT
	PROPOSED VALVE BOX
	PROPOSED CURB STOP
	PROPOSED LIGHT STANDARD
	PROPOSED BELL PEDESTAL/HANDHOLES
	PROPOSED BELL DUCT
	PROPOSED BELL VAULT
	PROPOSED ROGERS VAULT
	PROPOSED HYDRO TRANSFORMER
	PROPOSED EV CHARGER STATION
	PROPOSED EMERGENCY OVERLAND FLOW ROUTE

BENCHMARK:			
BENCHMARK NO. 01019805454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE OVER LOWERY'S CREEK, 0.85M EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 19CM TOP OF CORING. N4910786.889 E507284.100 ELEV 241.861			
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NO.	REVISIONS	DATE	INITIAL
4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
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1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF

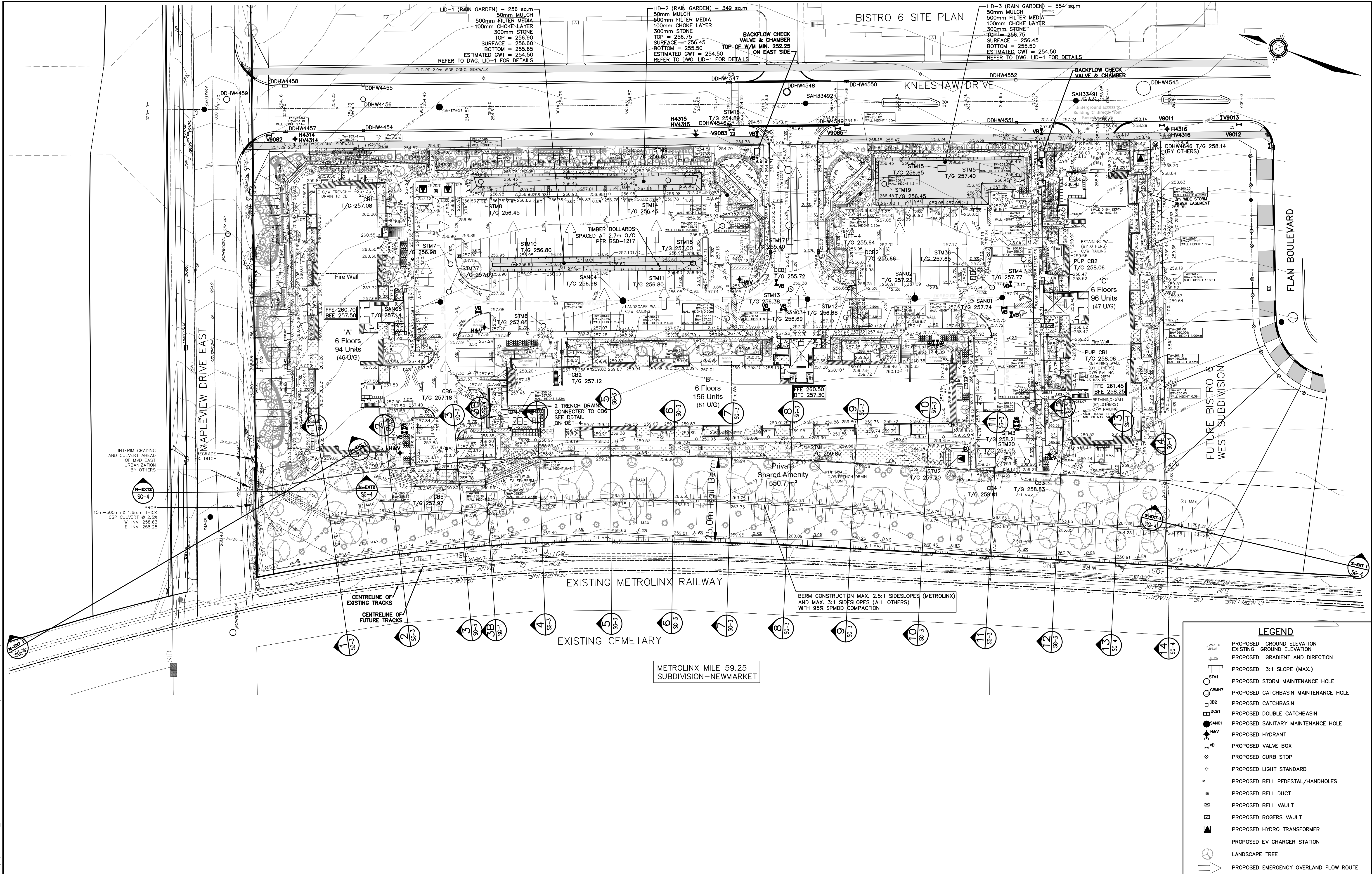


PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE
SITE GRADING PLAN
WITH EXISTING CONDITIONS



DESIGN MF	SCALE: 1:500	DATE JANUARY 2021
DRAWN KS	PROJECT	DWG. NO
CHECKED DR	PRA-19078	SG-1

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LEGEND	
	PROPOSED GROUND ELEVATION
	EXISTING GROUND ELEVATION
	PROPOSED GRADIENT AND DIRECTION
	PROPOSED 3:1 SLOPE (MAX.)
	PROPOSED STORM MAINTENANCE HOLE
	PROPOSED CATCHBASIN MAINTENANCE HOLE
	PROPOSED CATCHBASIN
	PROPOSED DOUBLE CATCHBASIN
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	PROPOSED HYDRO TRANSFORMER
	PROPOSED EV CHARGER STATION
	LANDSCAPE TREE
	PROPOSED EMERGENCY OVERLAND FLOW ROUTE

REVISIONS			
NO.	REVISIONS	DATE	INITIAL
4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF



PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE
SITE GRADING PLAN
WITH PROPOSED CONDITIONS

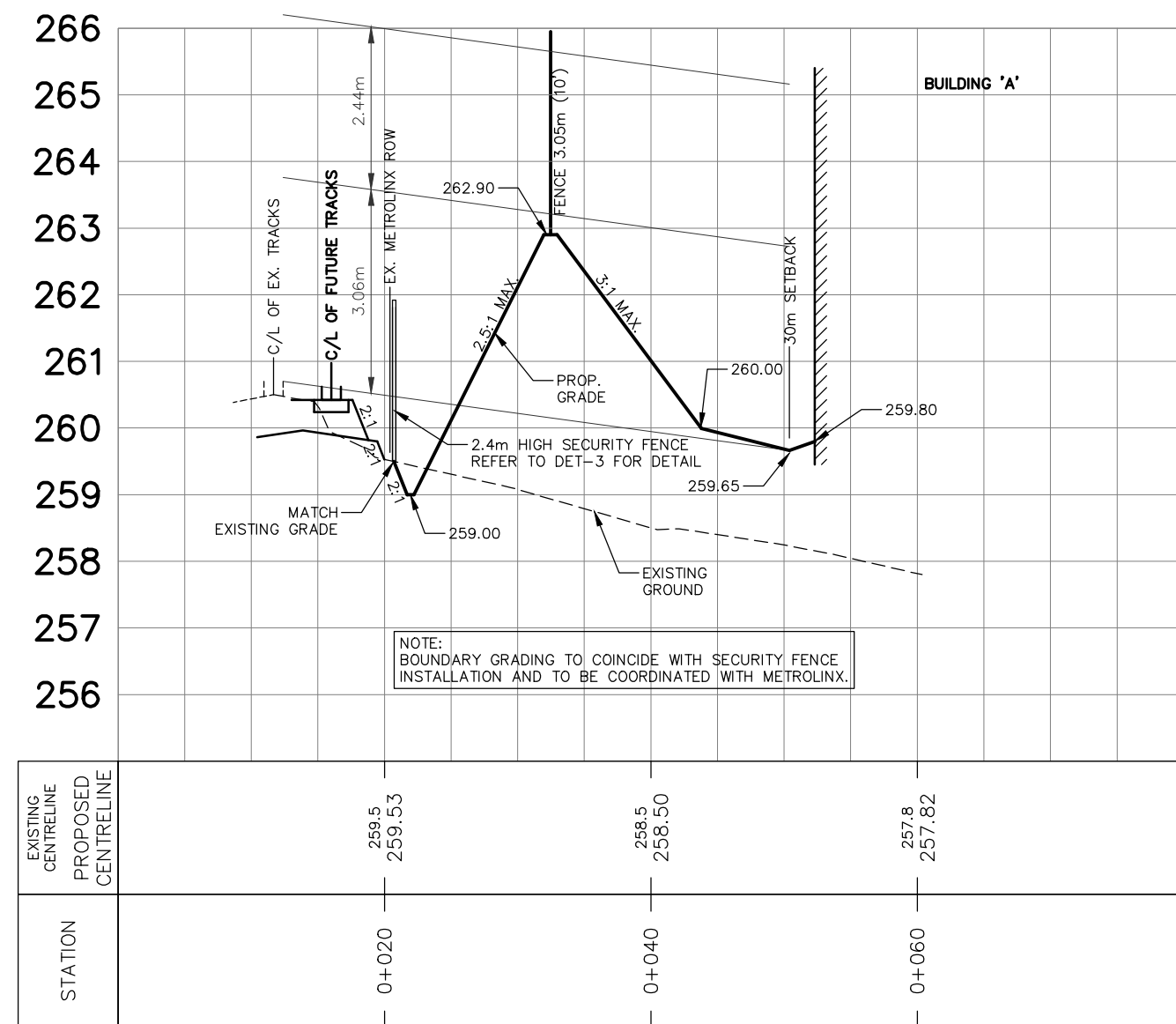
JONES
CONSULTING GROUP LTD.
PLANNERS & ENGINEERS

229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W6
P. 705.734.2538
F. 705.734.1056

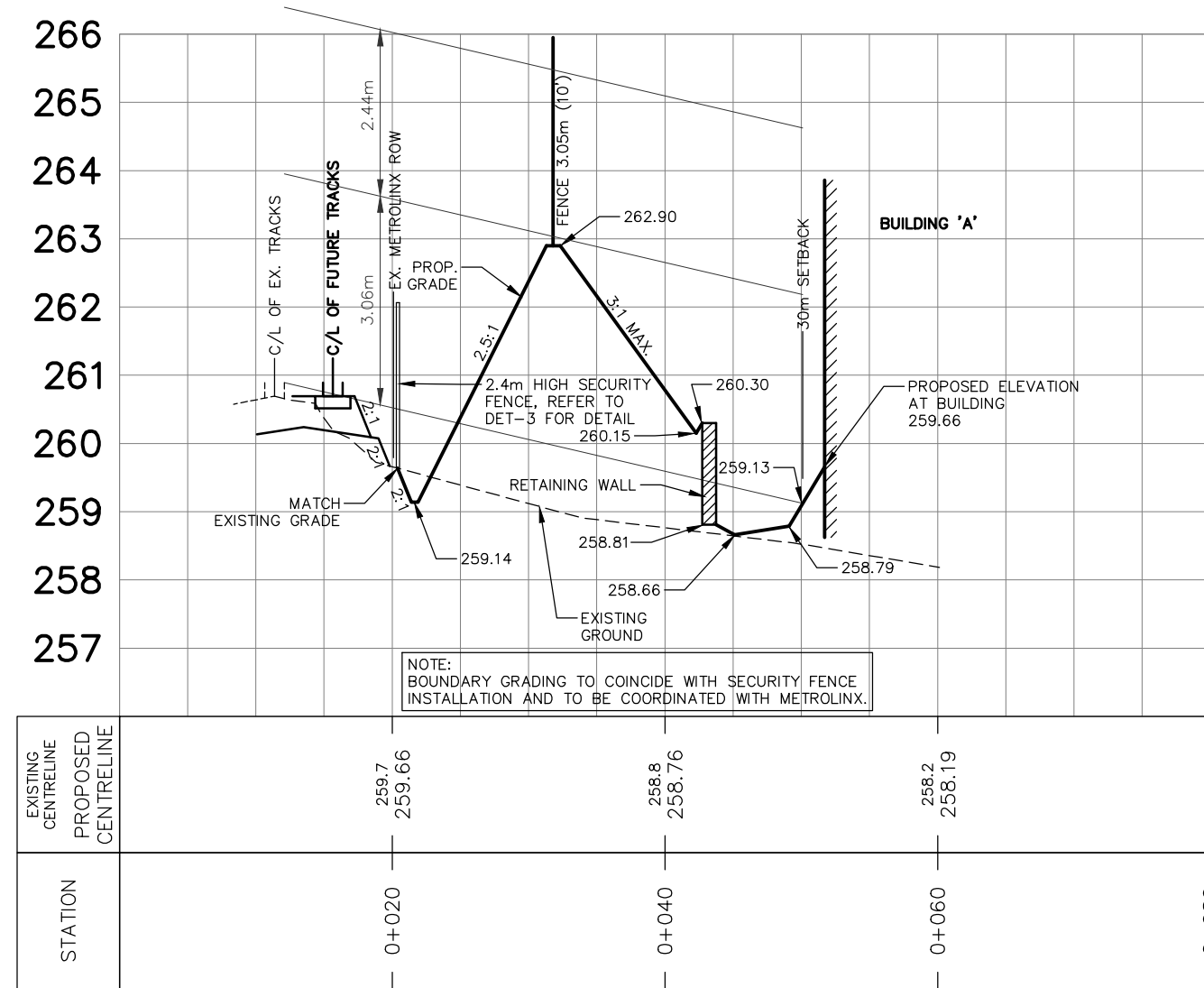
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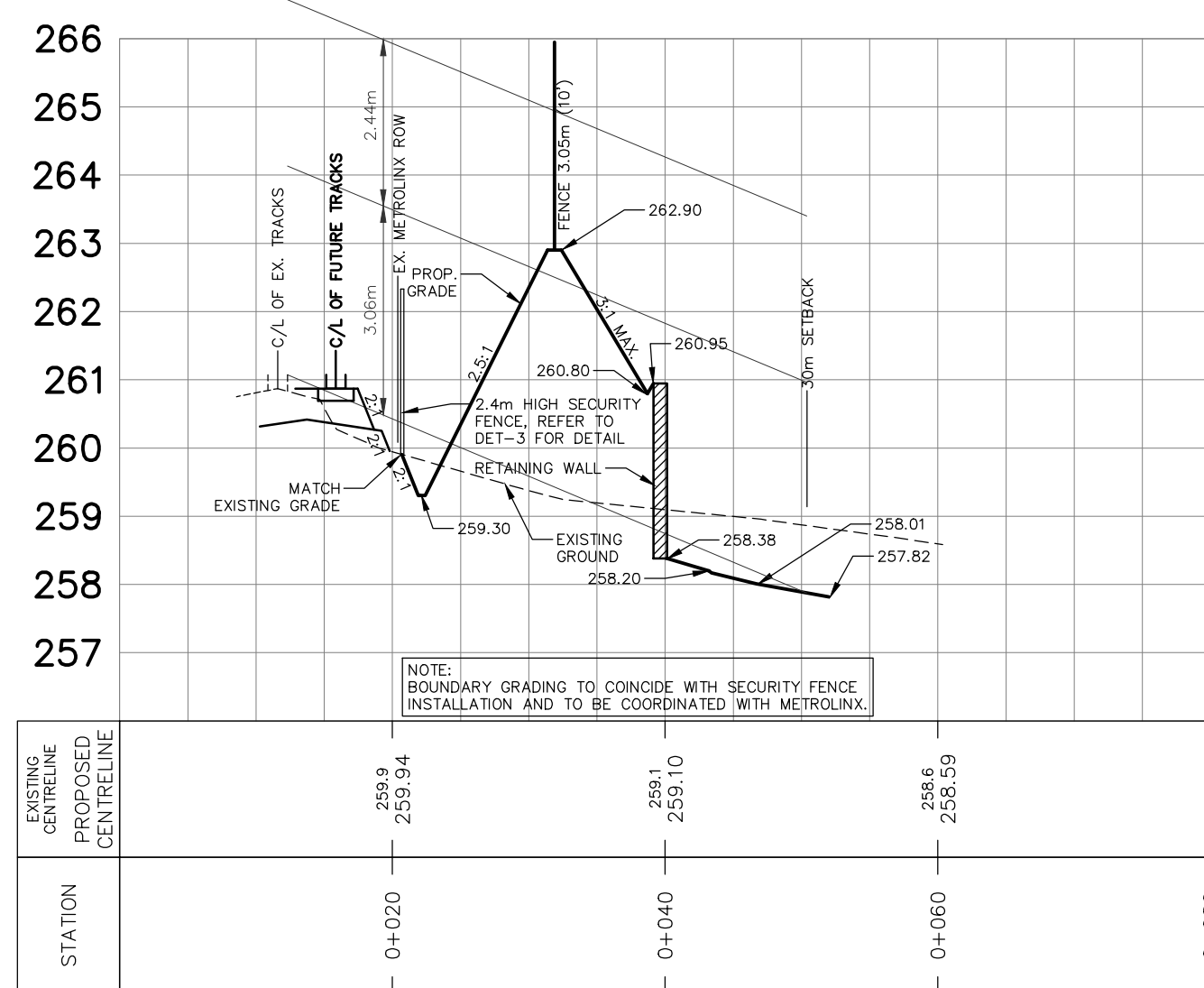
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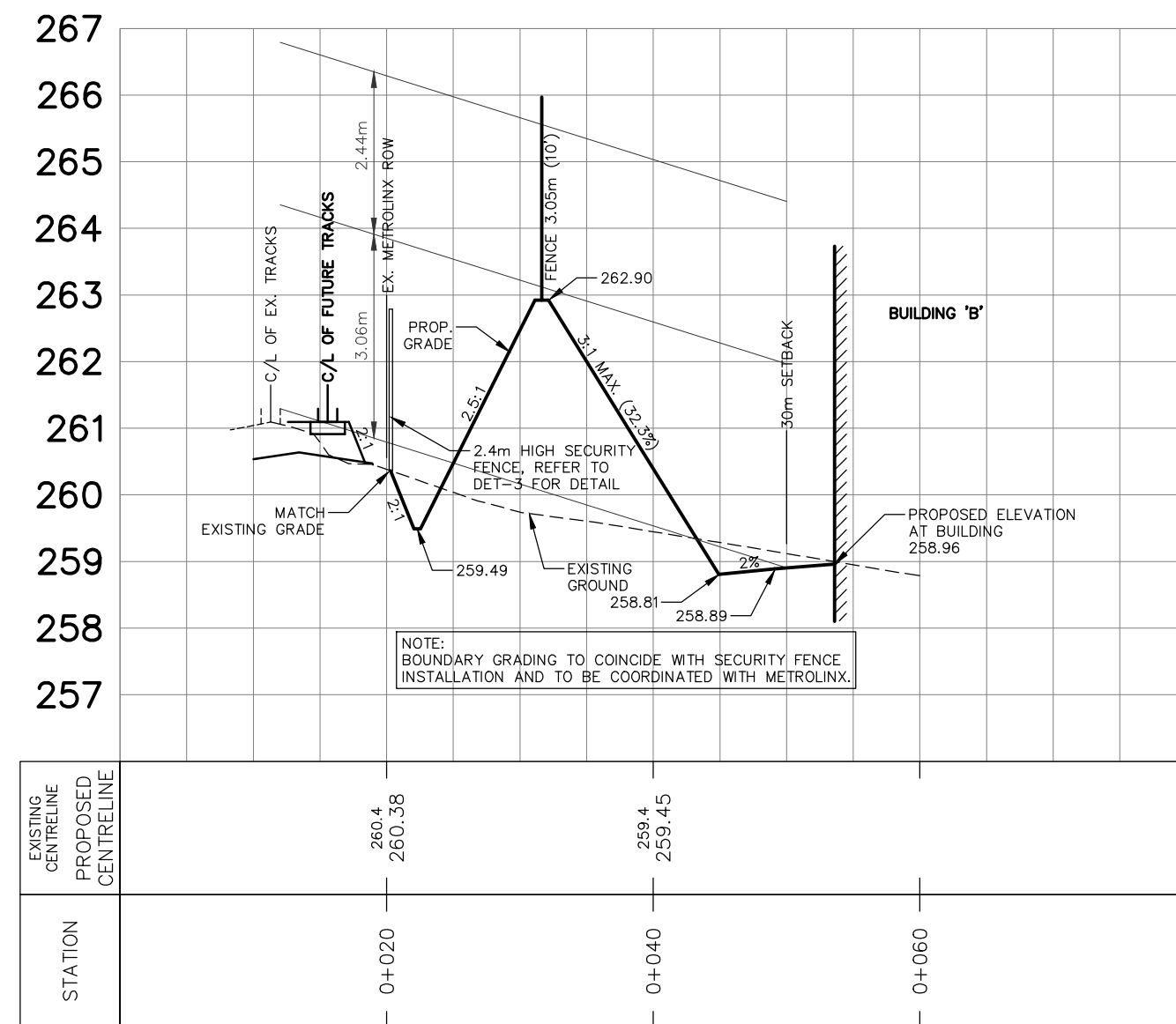
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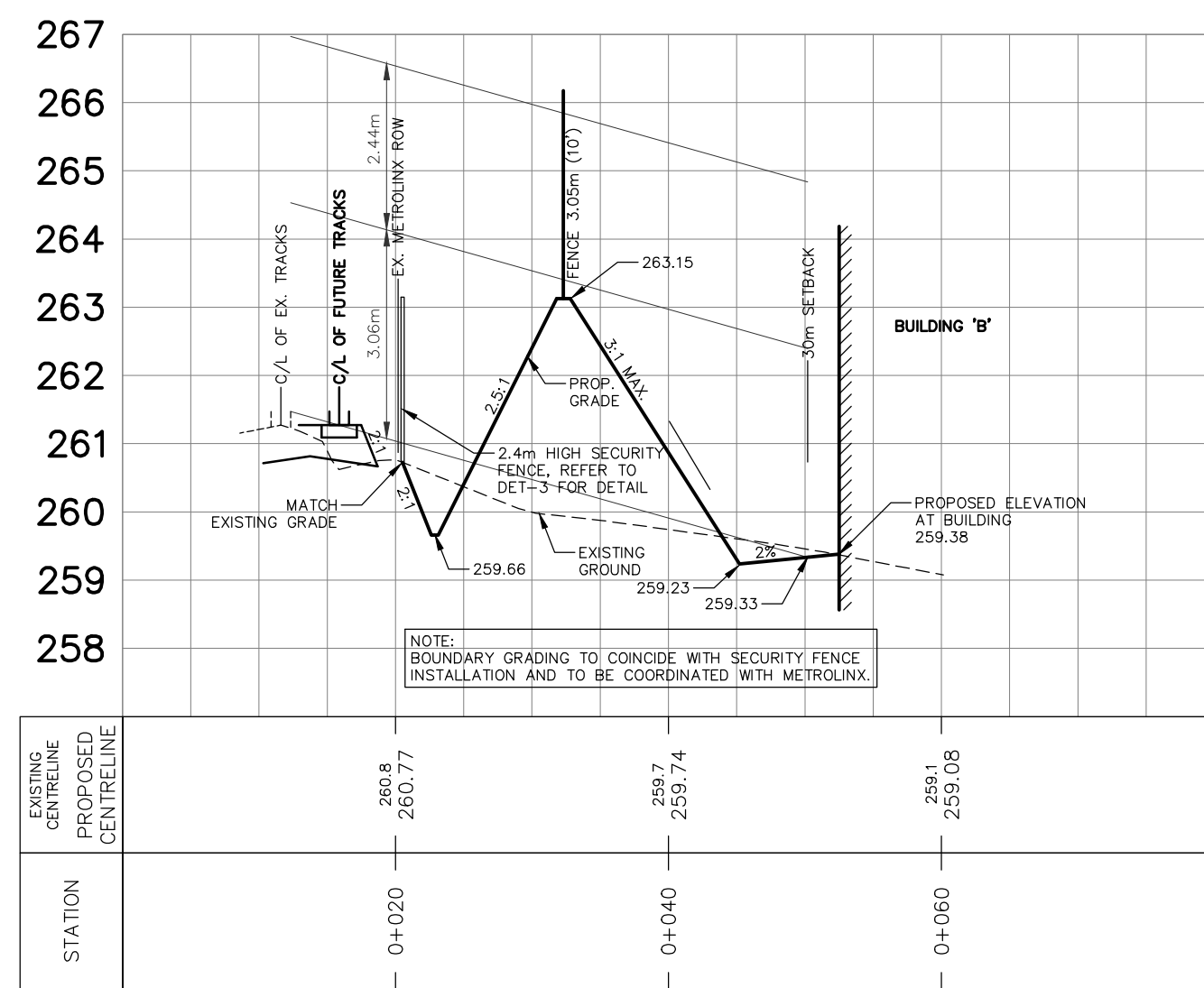
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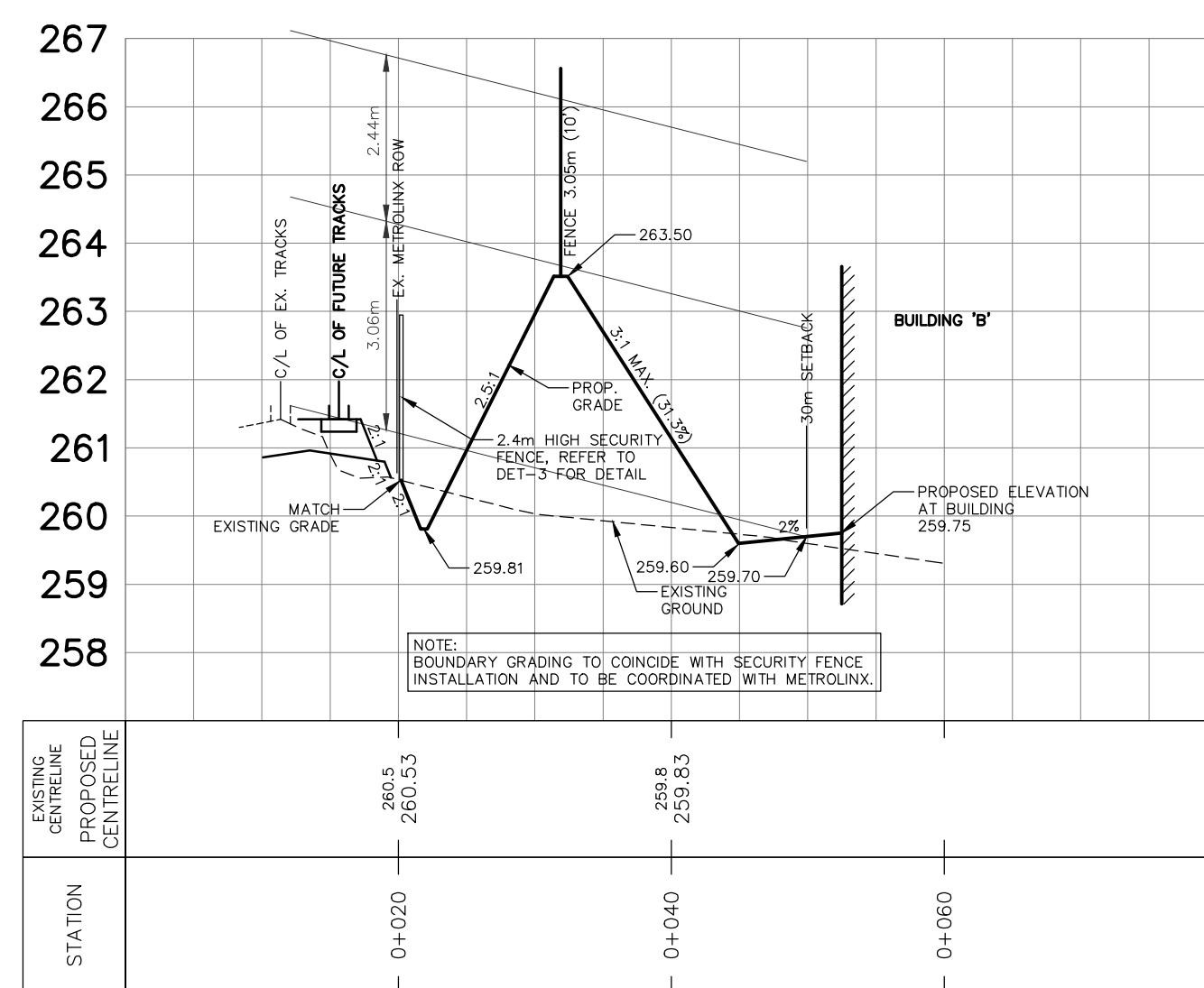
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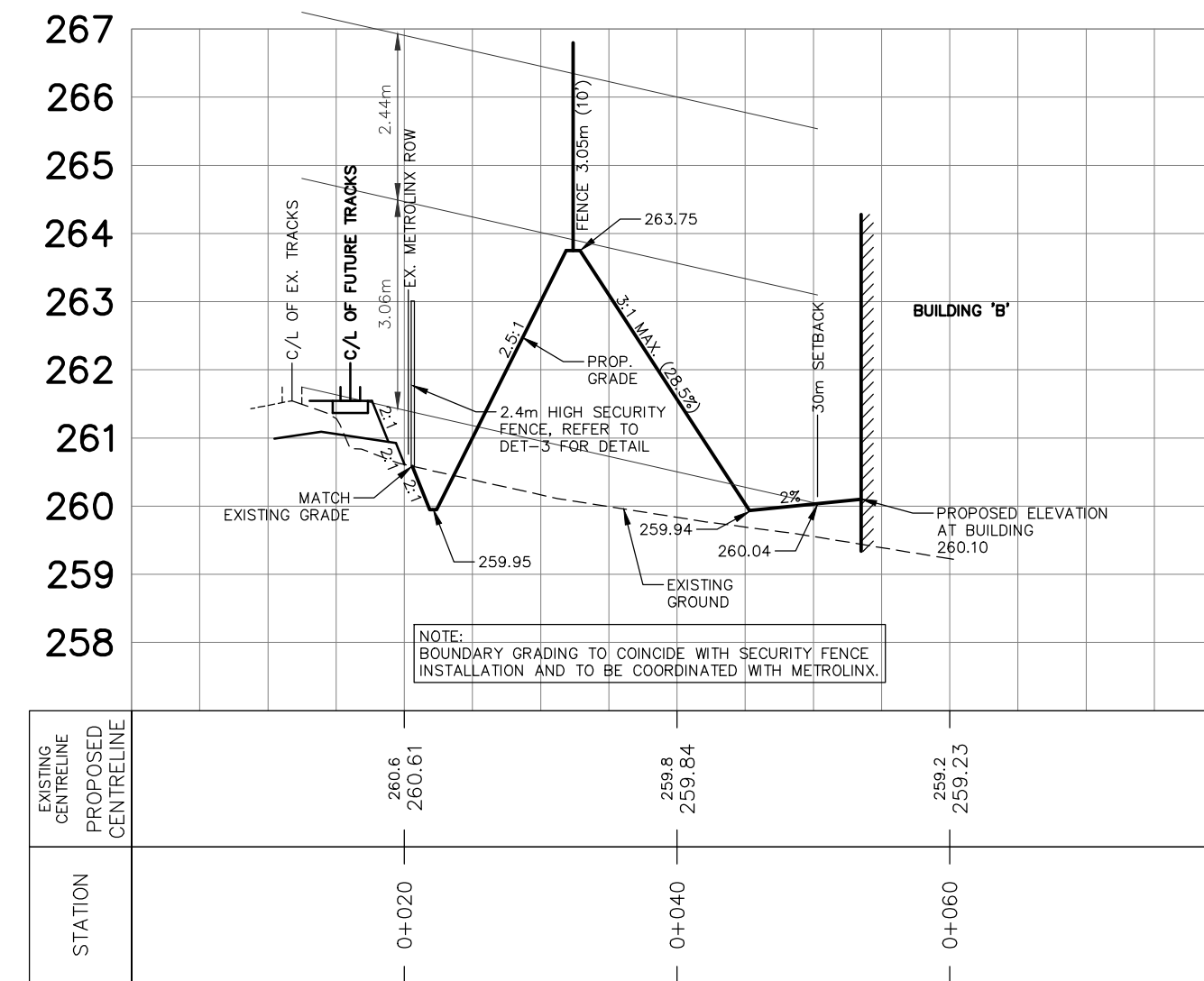
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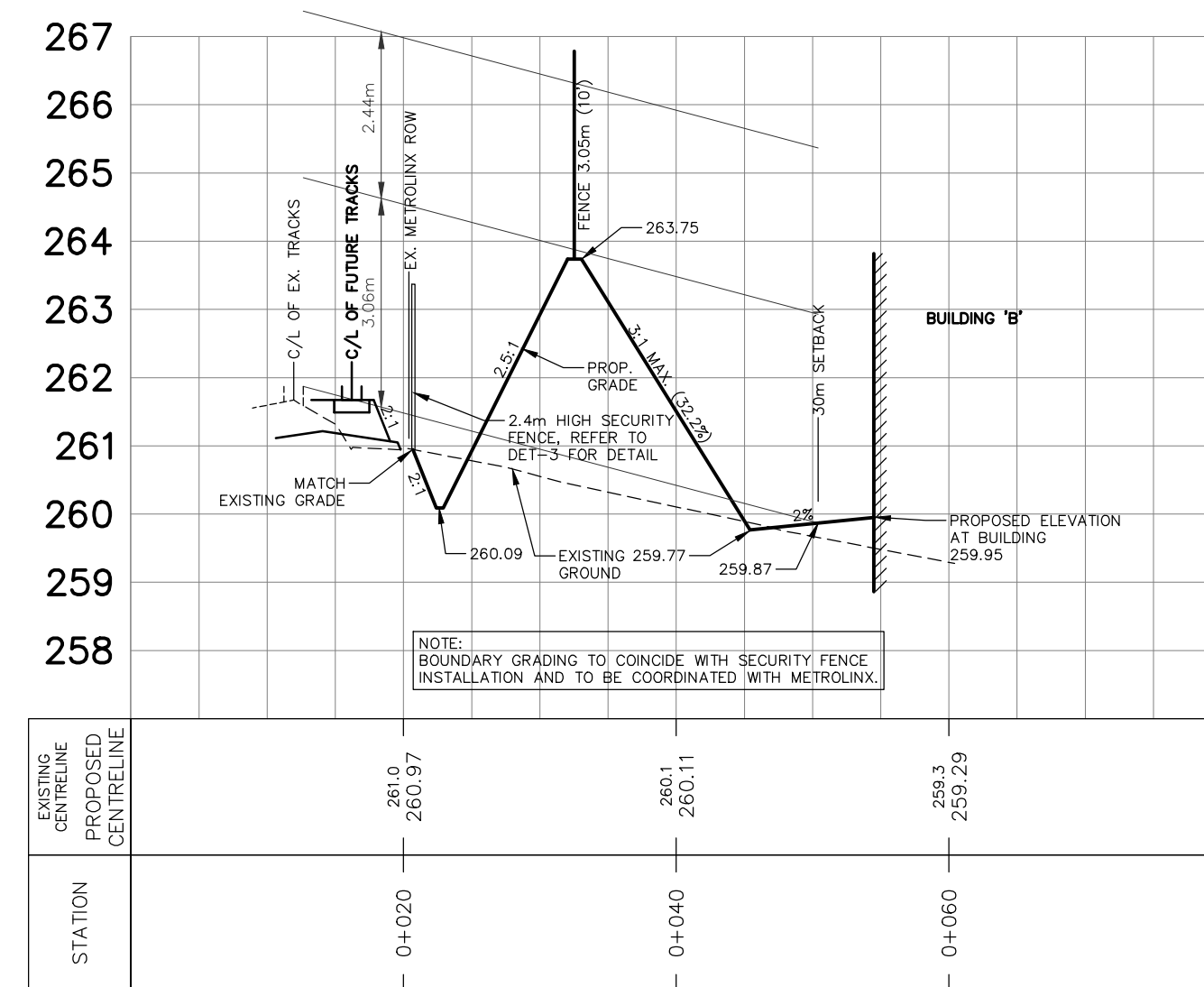
BERM XS 6



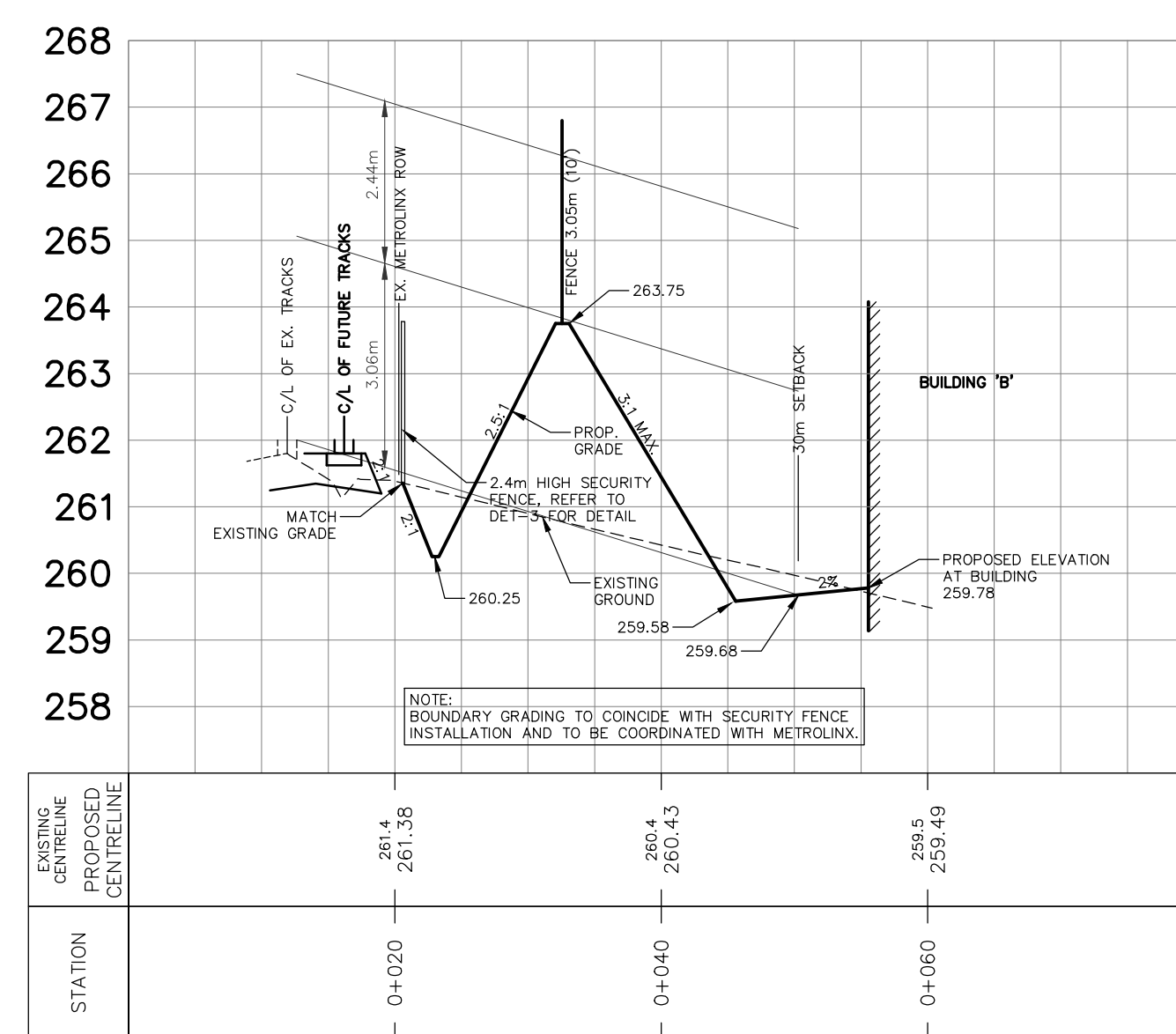
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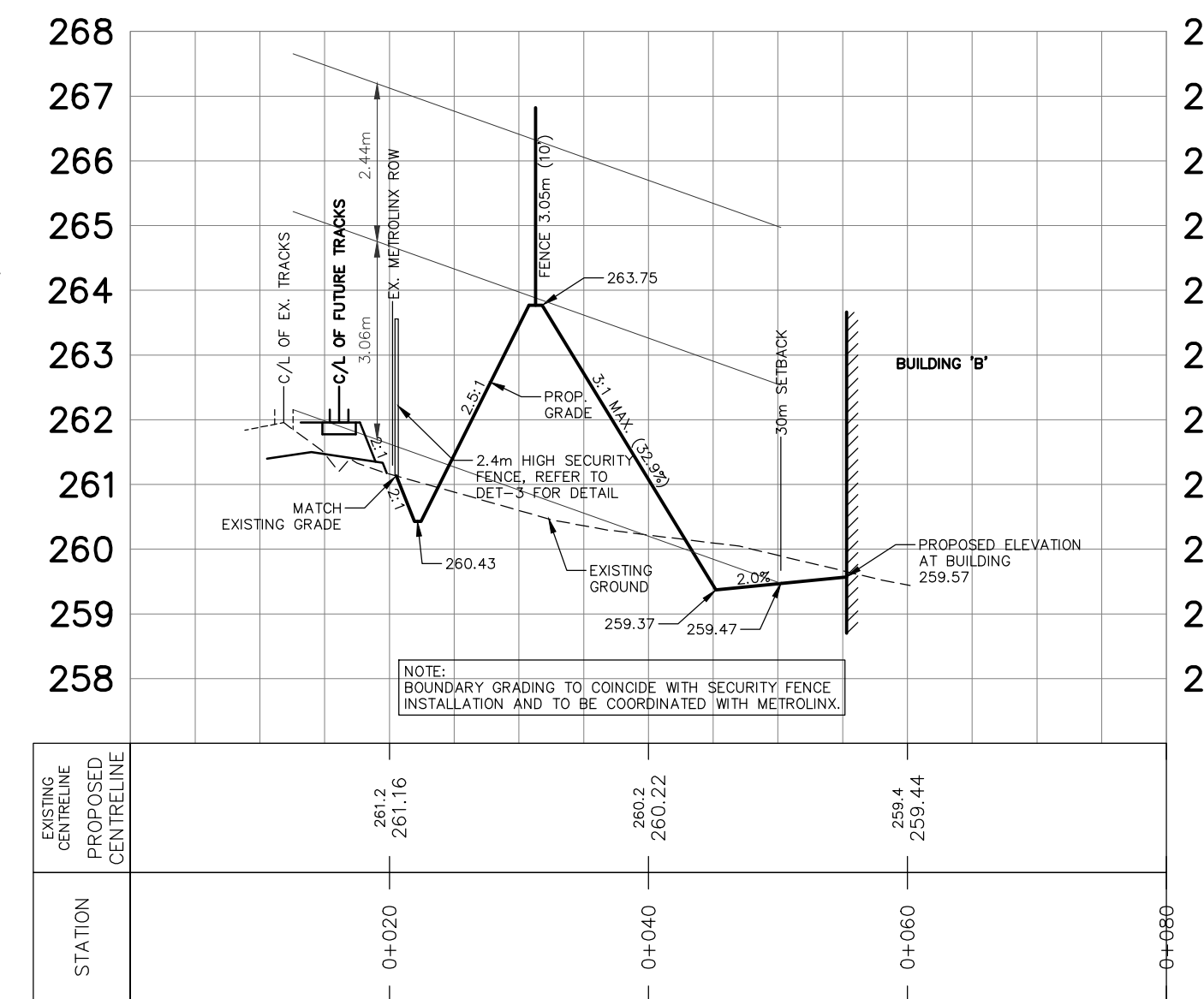
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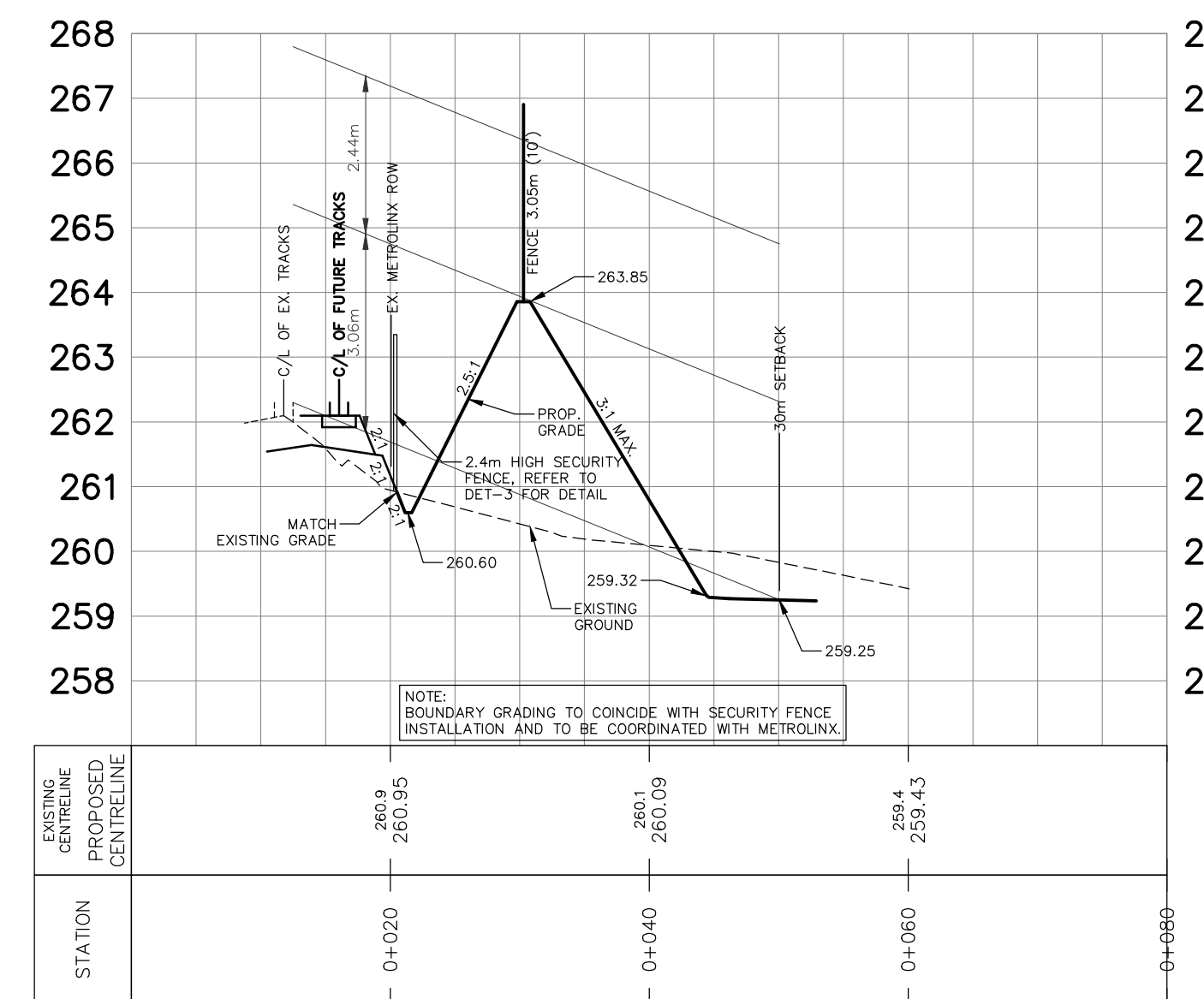
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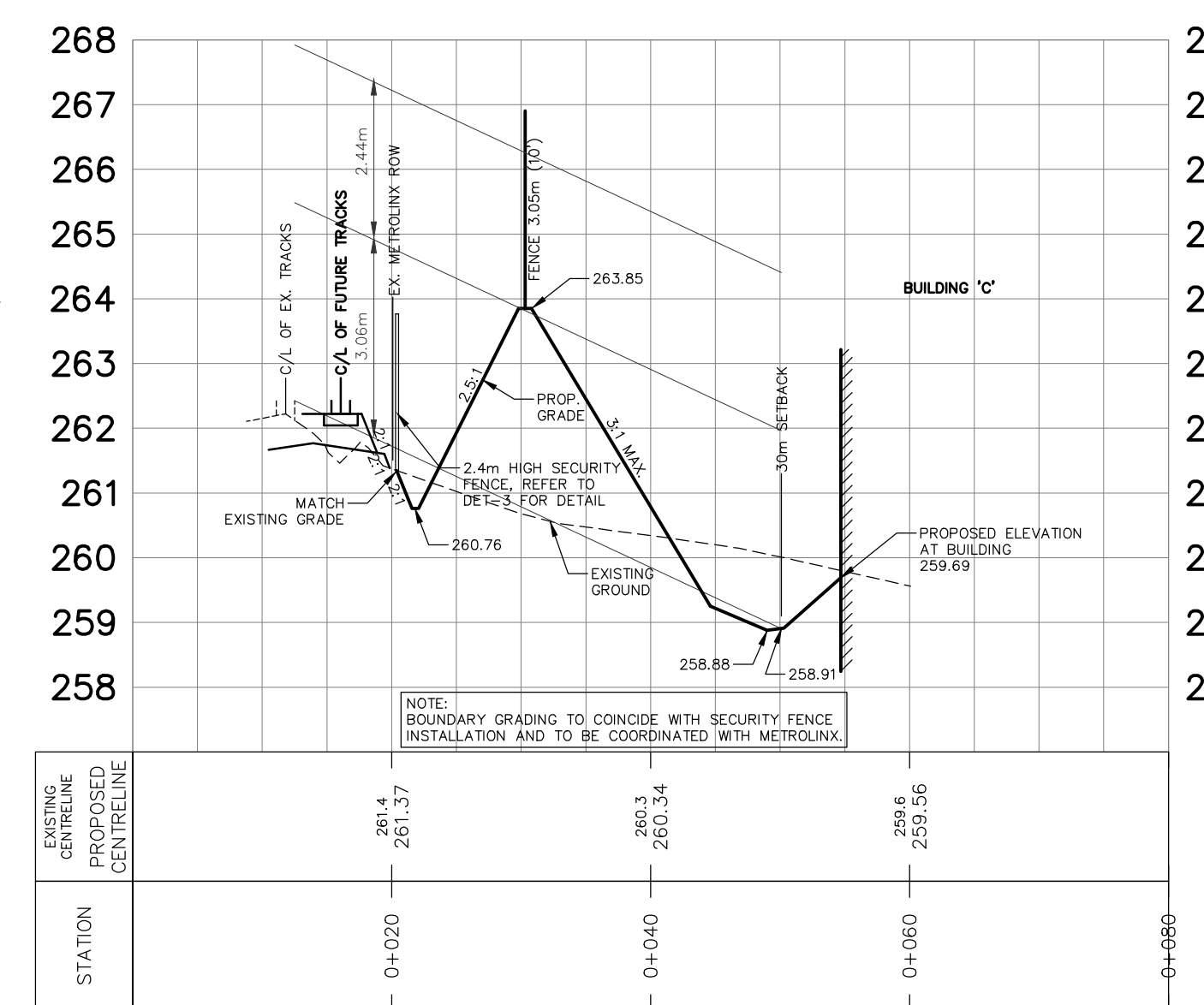
BERM XS 10



BERM XS 11



BERM XS 12



BENCHMARK:

BENCHMARK NO. 01019805454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE OVER LOWER'S CREEK, 0.82KM EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 19CM TOP OF CORNER. N491078.889 E507294.100 ELEV 241.661

BENCHMARK NO. 03120030029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180' ESTHER DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE FLAGPOLE BASE 4.76' SOUTH FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND TABLET IS ON THE SOUTHWEST SIDE OF THE FLAGPOLE BASE. N4911610 E607799 ELEV 230.509

BENCHMARK NO. 03100000004 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD, N4910678.122 E607601.062 ELEV 248.996

BENCHMARK NO. 03120110013 LOCATED ON LOCKHART ROAD ON THE NORTH SIDE OF THE BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION. N4909870.257 E606733.580 ELEV 232.807

5	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
4	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
3	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
2	ISSUED FOR METROLINX REVIEW	21-06-14	DR
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF
NO.	REVISIONS	DATE	INITIAL



PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE

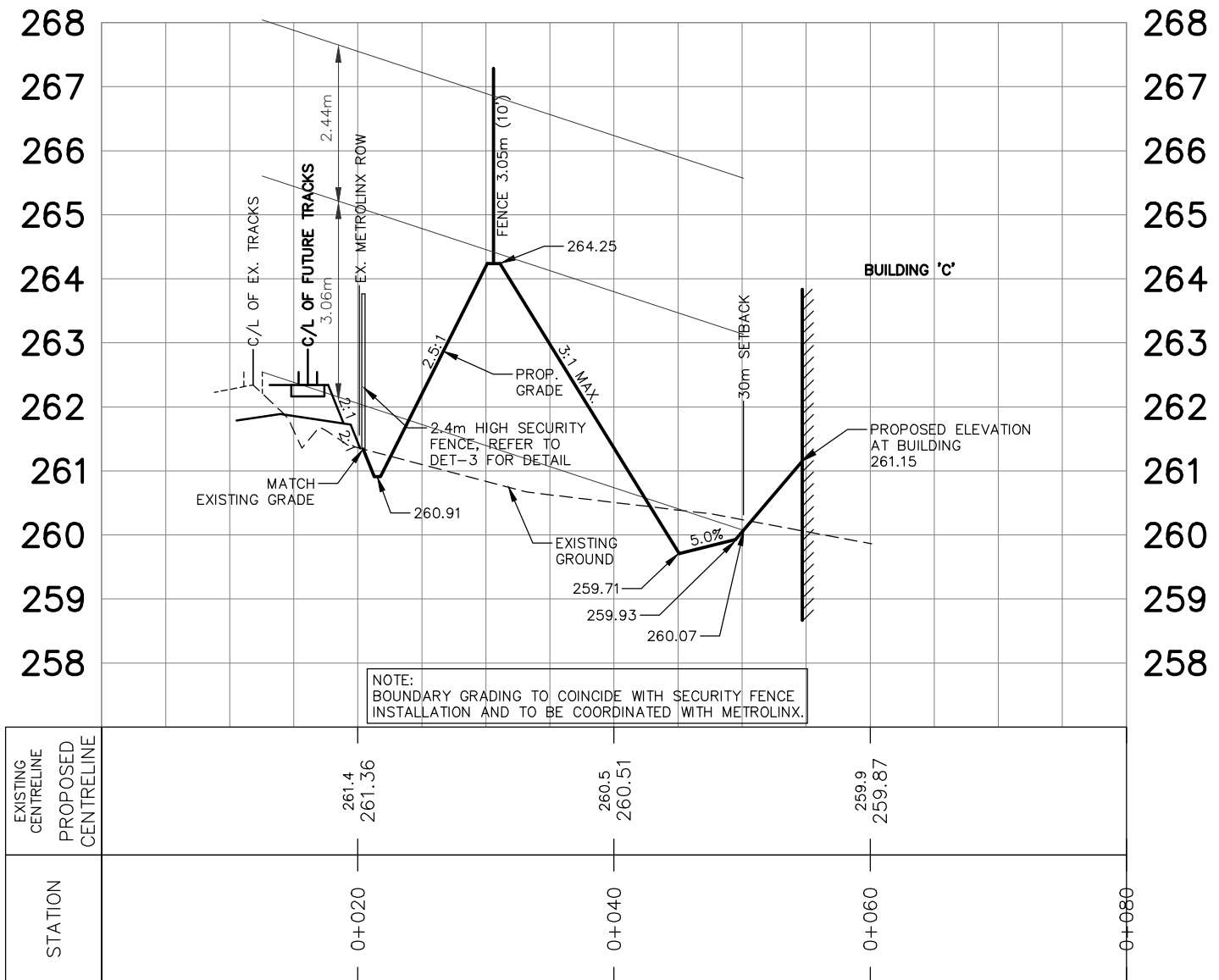
RAILWAY BERM SECTIONS



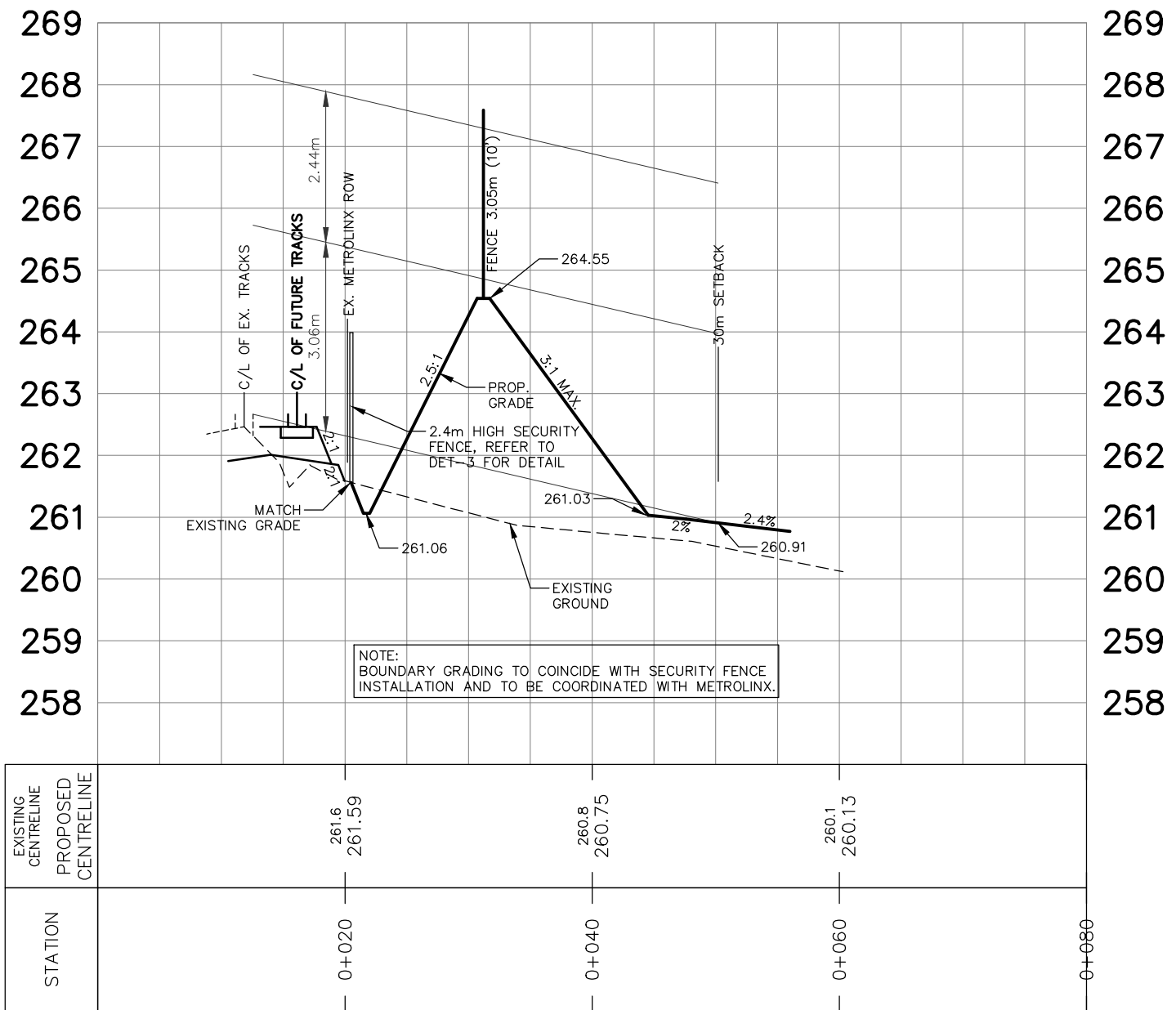
DESIGN	MF	SCALE: H:1:500 V:1:100	DATE	JANUARY 2021
DRAWN	KS	PROJECT	DWG. NO	
CHECKED	DR	PRA-19078	SG-3	

229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W6
P. 705.734.2538
F. 705.734.1056

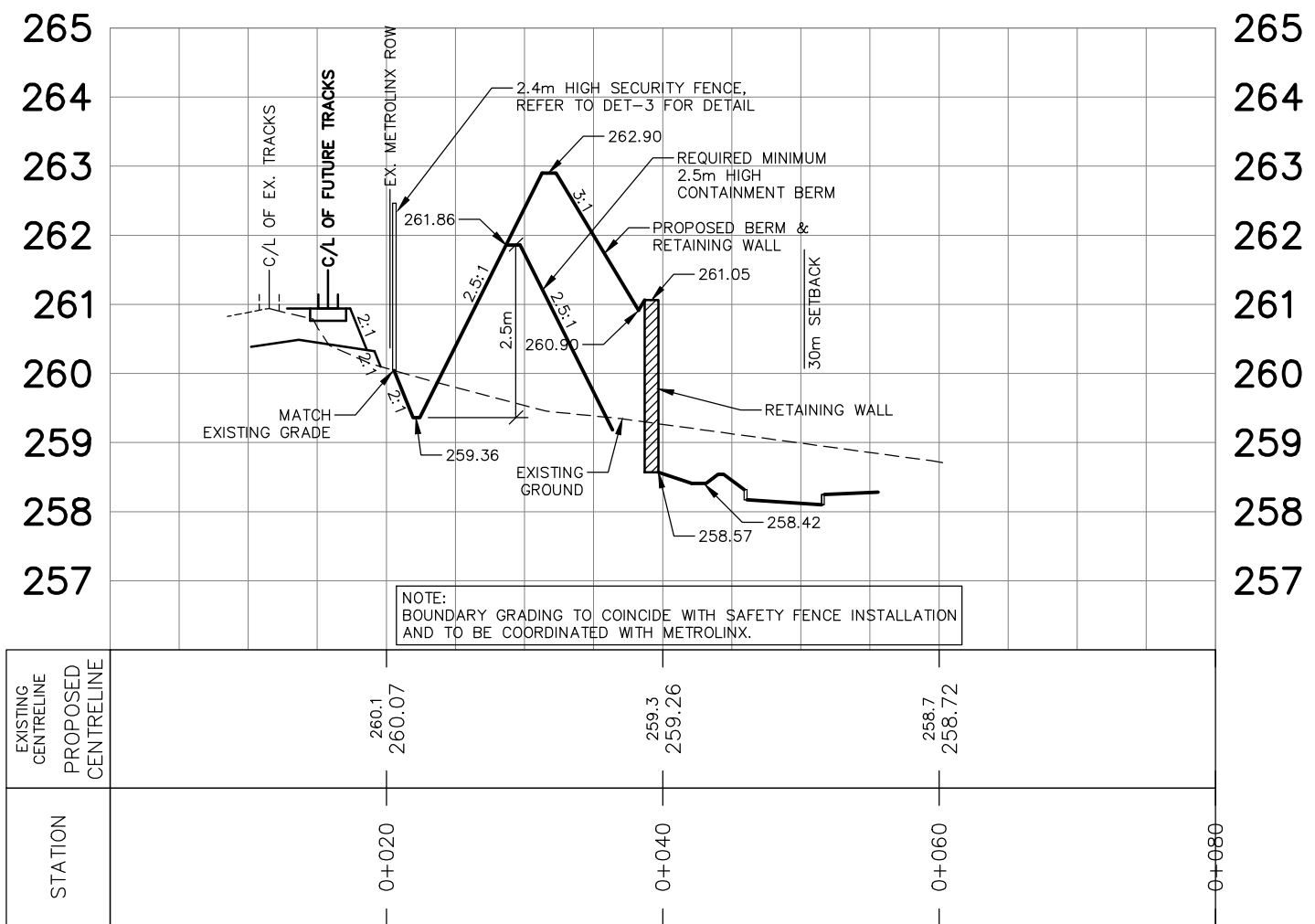
BERM XS 13



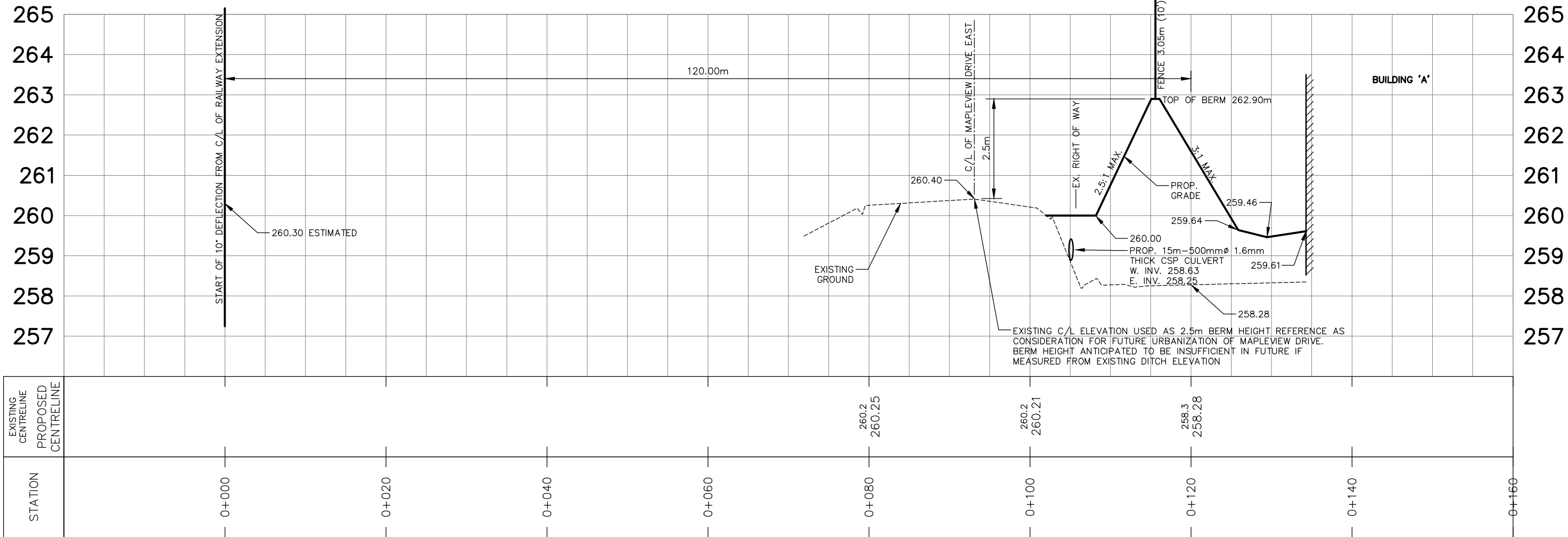
BERM XS 14



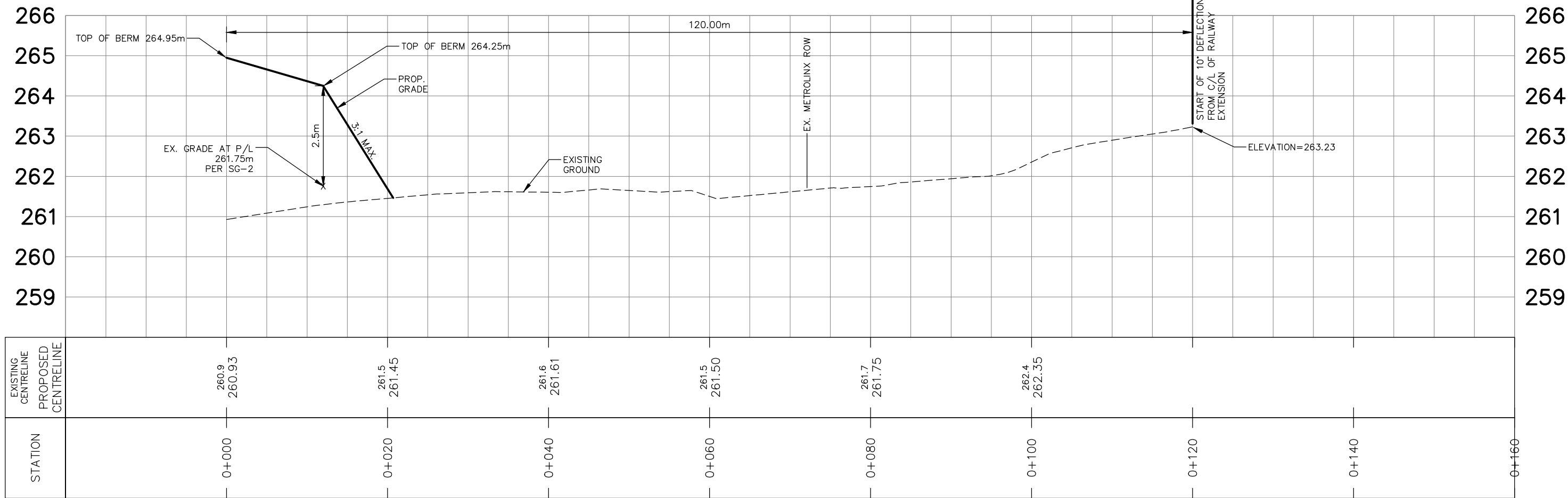
BERM XS 3B



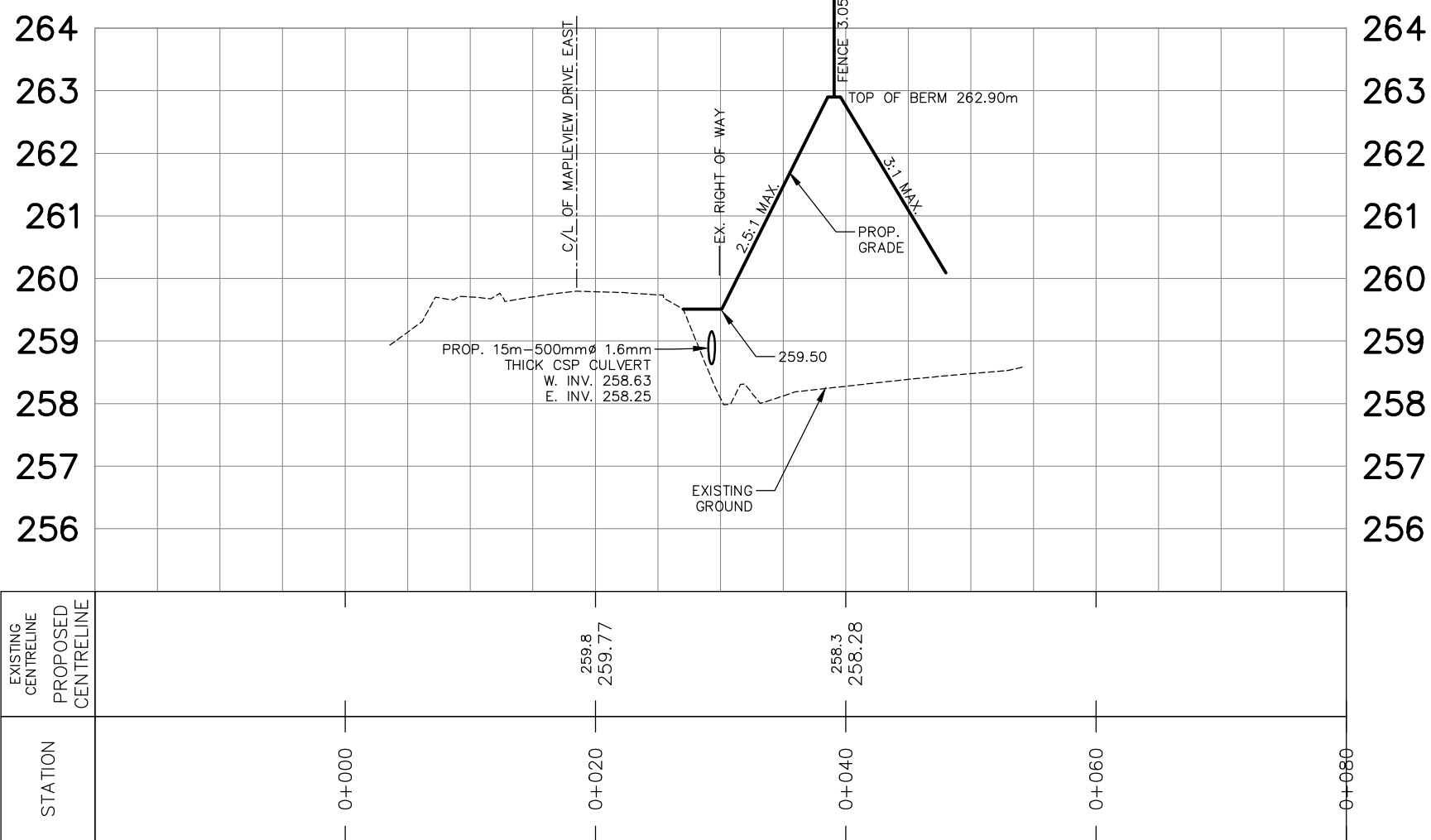
N-EXT 1



S-EXT 1



N-EXT2



BENCHMARK:

BENCHMARK NO: 01019805454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE E OVER LOWERY CREEK, 0.82KM EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 19CM TOP OF CORING. N4910786.889 E807284.100 ELEV 241.861

BENCHMARK NO: 031202002029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE METROLINK MONUMENT IS SET FLUSH IN CONCRETE FLAGPOLE BASE 4.7M SOUTH FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND TABLET IS ON THE SOUTHWEST CORNER OF THE FLAGPOLE BASE. N4911610 E807799 ELEV 250.509

BENCHMARK NO: 031008000004 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910878.122 E807801.082 ELEV 248.996

BENCHMARK NO: 03120110013 LOCATED ON LOCKHART ROAD ON THE NORTH SIDE OF THE BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION. N4900870.257 E806733.580 ELEV 252.807

5	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
4	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
3	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
2	ISSUED FOR METROLINK REVIEW	21-06-14	DR
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF
NO.	REVISIONS	DATE	INITIAL



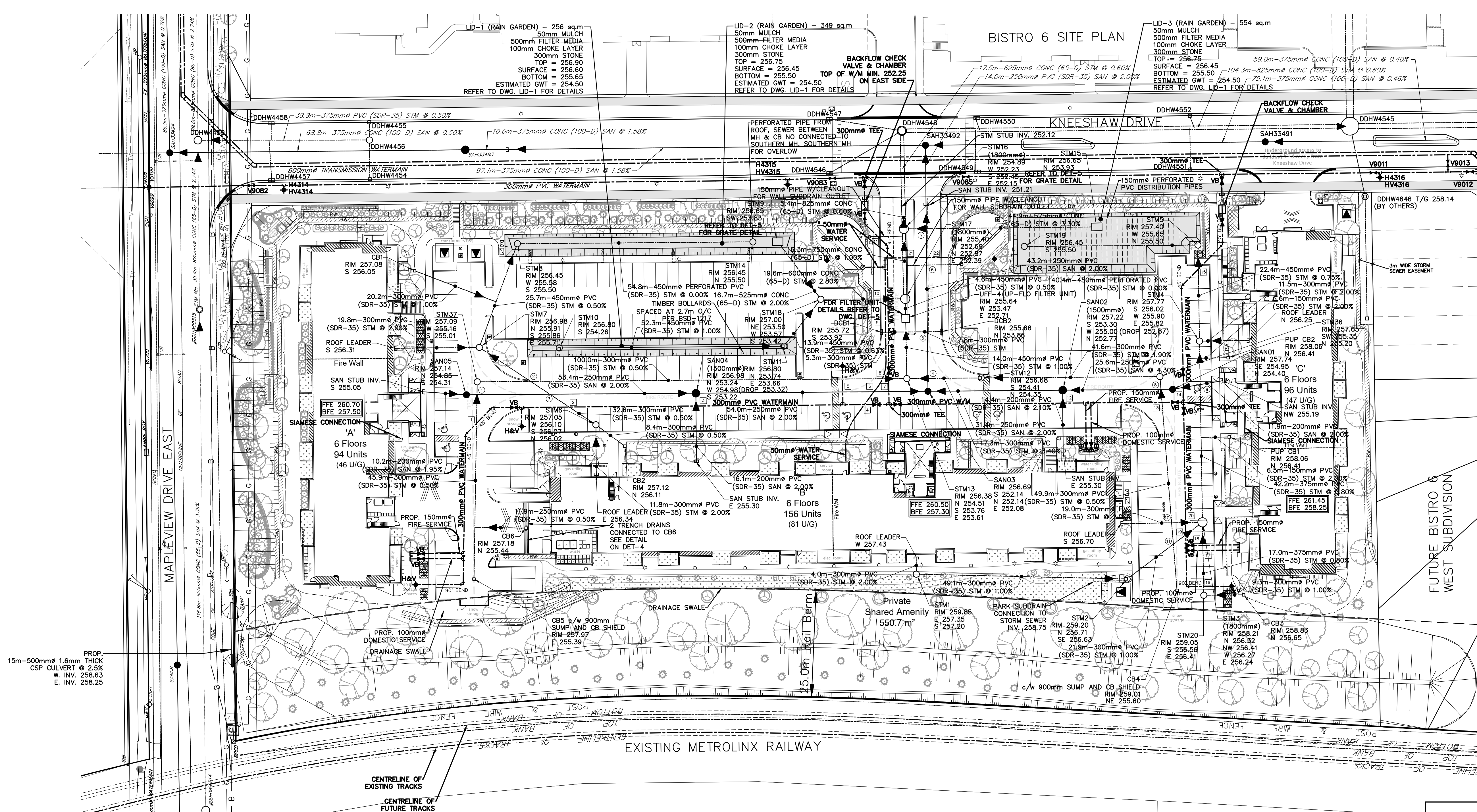
PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE

RAILWAY BERM SECTIONS



229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	MF	SCALE: H:1:500 V:1:100	DATE	JANUARY 2021
DRAWN	KS	PROJECT	DWG. NO	
CHECKED	DR	PRA-19078	SG-4	



NOTE
REFER TO PIPE INTERFERENCE TABLES ON DWG. SS-2
① STORM AND SANITARY PIPE CLEARANCE LABEL
② WATERMAIN AND STORM OR SANITARY PIPE CLEARANCE LABEL

- NOTE**
1. DOMESTIC AND FIRE SERVICE VALVES SHALL BE LOCATED IN THE BOULEVARD, UNLESS OTHERWISE NOTED.
 2. DOMESTIC AND FIRE SERVICES SHALL BE MECHANICALLY RESTRAINED FROM THE TEE TO THE BUILDINGS.
 3. DOMESTIC AND FIRE SERVICE RISERS ENTERING EACH BUILDING SHALL BE INSTALLED AS PER BSD-505.
 4. DOMESTIC AND FIRE SERVICE TO BE HAND SWABBED OR A SWAB IS TO BE PLACED IN SERVICE AND REMOVED FROM RISERS.
 5. THE 100mm DOMESTIC WATER SERVICE WILL REQUIRE A 100mm WATER METER (SUPPLIED AND INSTALLED BY THE OWNER) COMPLETE WITH A BYPASS ASSEMBLY AS PER BSD-533 AND SHALL BE LOCATED IN AN APPROPRIATELY SIZED MECHANICAL ROOM.
 6. BACKFLOW PREVENTION SHALL BE PROVIDED ON ALL DOMESTIC AND FIRE SERVICES AS PER CITY OF BARRIE BYLAW 2017-121.

- LEGEND**
- STM1 PROPOSED STORM MAINTENANCE HOLE
 - STM12 PROPOSED CATCHBASIN MAINTENANCE HOLE
 - CB1 PROPOSED CATCHBASIN
 - DCB1 PROPOSED DOUBLE CATCHBASIN
 - SAN01 PROPOSED SANITARY MAINTENANCE HOLE
 - ▲ H&V PROPOSED HYDRANT
 - VB PROPOSED VALVE BOX
 - ⊙ PROPOSED CURB STOP
 - ☆ PROPOSED LIGHT STANDARD
 - PROPOSED BELL PEDESTAL/HANDHOLES
 - PROPOSED BELL DUCT
 - PROPOSED BELL VAULT
 - PROPOSED ROGERS VAULT
 - ▲ PROPOSED HYDRO TRANSFORMER
 - PROPOSED EV CHARGER STATION
 - LANDSCAPE TREE

BENCHMARK:

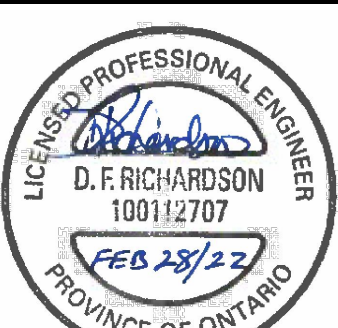
BENCHMARK NO. 01019805454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE
E OVER LOWERY'S CREEK, 0.82KM EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY
IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE
NORTHEAST END OF BRIDGE, 19CM TOP OF CORING. N4910786.889 E507284.100
ELEV 241.861

BENCHMARK NO. 03120030229 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180' ESTHER
DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE FLAGPOLE BASE 4.7M SOUTH
FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL, AND TABLET IS ON
THE SOUTHWEST SIDE OF THE FLAGPOLE BASE. N4911610 E507799 ELEV 230.509

BENCHMARK NO. 03120080094 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST
APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910678.122 E507601.062 ELEV 248.996

BENCHMARK NO. 03120110013 LOCATED ON LOOKHART ROAD ON THE NORTH SIDE OF THE
BOULEVARD, APPROXIMATELY 1.02KM WEST OF THE YONGE STREET AND HURONIA ROAD
INTERSECTION. N49106870.257 E506733.580 ELEV 232.807

NO.	REVISIONS	DATE	INITIAL
4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF



PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE

SITE SERVICING PLAN



DESIGN MF	SCALE: 1:500	DATE JANUARY 2021
DRAWN KS	PROJECT PRA-19078	DWG. NO DWG. SS-1
CHECKED DR		

Elements Condominium
100-Year Storm Sewer Design Sheet

CLIENT: Pratt Hansen Group Inc.

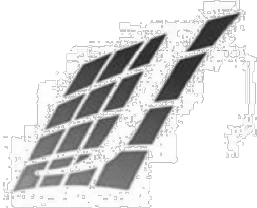
PROJECT: Elements Condominium Site Plan

FILE: PRA-19078 (50)

DATE: February 2022

DESIGN: MG

CHECKED: DR



100-Year Storm Sewer Design Sheet																	
AREAS	MANHOLE		LENGTH (m)	INCREMENT			TOTAL CA	FLOW TIME (min)		I (mm/h)	TOTAL Q (cms)	S (%)	D (mm)	Q FULL (cms)	V FULL (m/s)	% FULL	
	FROM	TO		C	A	CA		TO	IN								
Storm water directed to LID-1																	
401				0.99	0.26	0.25	0.25										
	STM10	STM11	52.3			0.00	0.25	10.00	0.49	180	0.126	1.00		0.285	1.8	44.3	
	STM11*	STM18	13.9			0.00	0.26	10.49	0.16	176	0.1251	0.63	450	0.226	1.4	55.3	
Storm water directed to LID-2																	
402	CB2	STM6	8.4	0.39	0.04	0.01	0.01	10.00	0.14	180	0.007	0.50	300	0.068	1.0	10.2	
403	STUB	STM6	11.8	1.00	0.09	0.09	0.09	10.00	0.10	180	0.045	2.00	300	0.137	1.9	32.9	
	STM6	STM7	32.6			0.00	0.10	10.14	0.56	179	0.052	0.50	300	0.068	1.0	75.4	
404	STUB	STM7	19.8	1.00	0.17	0.17	0.17	10.00	0.17	180	0.086	2.00	300	0.137	1.9	62.6	
405	CB1	TEE	20.2	0.30	0.05	0.01	0.01	10.00	0.25	180	0.007	1.00	300	0.097	1.4	7.1	
	STM7	STM8	25.7			0.00	0.29	10.71	0.34	174	0.140	0.50	450	0.202	1.3	69.2	
406	STM9**	STM18	16.7	0.93	0.32	0.30	0.92	11.04	0.10	171	0.4399	2.00	525	0.608	2.8	72.3	
Storm Water Directed to LID-3																	
407	STUB	STM1	4.0	1.00	0.10	0.10	0.10	10.00	0.03	180	0.050	2.00	300	0.137	1.9	36.6	
408	STM1	STM2	49.1			0.00	0.10	10.03	0.60	180	0.050	1.00	300	0.097	1.4	51.6	
	STM2	STM3	21.9	0.34	0.16	0.05	0.15	10.63	0.27	175	0.075	1.00	300	0.097	1.4	77.6	
409	STUB	STM3	19.0	1.00	0.08	0.08	0.08	10.00	0.16	180	0.042	2.00	300	0.137	1.9	30.6	
410	CB3	STM20	9.3	0.24	0.11	0.03	0.03	10.00	0.11	180	0.013	1.00	300	0.097	1.4	13.5	
	STM20	STM3	17.0			0.00	0.03	10.11	0.20	179	0.013	0.80	375	0.157	1.4	8.3	
411	PUP CB1	TEE	6.5	0.38	0.01	0.00	0.00	10.00	0.09	180	0.002	2.00	150	0.022	1.2	11.3	
	PUP CB2	TEE	6.6	0.49	0.01	0.01	0.01	10.00	0.09	180	0.003	2.00	150	0.022	1.2	13.8	
	STM3	STM4	42.2			0.00	0.28	10.90	0.50	172	0.132	0.80	375	0.157	1.4	84.0	
413	STUB	STM4	11.5	1.00	0.17	0.17	0.17	10.00	0.10	180	0.084	2.00	300	0.137	1.9	61.7	
	STM4	STM5	22.4			0.00	0.44	11.39	0.24	169	0.208	0.75	450	0.247	1.6	84.2	
414	STM15***	STM16	44.9	0.93	0.37	0.34	1.03	11.64	0.21	167	0.4781	3.30	525	0.781	3.6	61.2	
Storm Water Directed to 100-Year Trunk Storm Sewer																	
	UFF-4	STM17	4.6				0.00	0.26	12.64	0.06	96	0.068	0.50	450	0.202	1.3	33.8
	STM18****	STM17	19.6				0.00	1.18	11.14	0.09	171	0.559	2.80	600	1.027	3.6	54.4
	STM17****	STM16	16.3				0.00	1.44	12.70	0.11	159	0.635	1.00	750	1.113	2.5	57.0
	STM16****	DDHW4548	22.9				0.00	2.47	12.81	0.18	158	1.086	0.60	825	1.112	2.1	97.7
Note: All runoff coefficients for sizing the 100-year storm sewer have been increased by 25% in accordance with Table 3.3 of the City of Barrie Storm Drainage and Stormwater Management Policies and Design Guidelines.																	
*Total CA has been adjusted so the flow matches the peak flow release rate experienced during the governing 100yr 6hr SCS LID PCSWMM model for LID-1. Qp = 0.1251 m³/s																	
** Total CA has been adjusted so the flow matches the peak flow release rate experienced during the governing 100yr 4hr Chicago LID PCSWMM model for LID-2. Qp = 0.4399 m³/s																	
***Total CA has been adjusted so the flow matches the peak flow release rate experienced during the governing 100yr 4hr Chicago LID PCSWMM model for LID-3. Qp = 0.4781 m³/s																	
****Adjusted total CA values from LIDs have been carried forward through the design sheet.																	
Q= 0.0028*C**A (cms) C=RUNOFF COEFFICIENT; I=RAINFALL INTENSITY (100-Year) =1426.408(I.C. + 5.273) ^ 0.759; A=AREA (ha)																	

Elements Condominium
5-Year Storm Sewer Design Sheet

CLIENT: Pratt Hansen Group Inc.

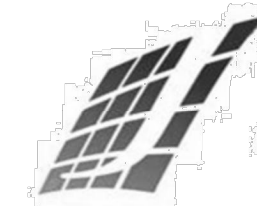
PROJECT: Elements Condominium Site Plan

FILE: PRA-19078 (50)

DATE: February 2022

DESIGN: MG

CHECKED: DR



5-Year Storm Sewer Design Sheet																
AREAS	MANHOLE		LENGTH (m)	INCREMENT			TOTAL CA	FLOW TIME (min)		I (mm/h)	TOTAL Q (cms)	S (%)	D (mm)	Q FULL (cms)	V FULL (m/s)	% FULL
	FROM	TO		C	A	CA		TO	IN							
	Storm water directed to UFF-4 bypassing all LIDs															
501	CB5	STM37	45.9	0.35	0.31	0.11	0.11	10.00	0.79	109	0.033	0.50	300	0.068	1.0	48.0
	STM37	STM13	100.0			0.00	0.11	10.79	1.72	105	0.032	0.50	300	0.068	1.0	46.1
502	CB4	STM36	49.9	0.25	0.04	0.01	0.01	10.00	0.86	109	0.003	0.50	300	0.068	1.0	4.1
	STM36	STM12	41.6			0.00	0.01	10.86	0.72	104	0.003	0.50	300	0.068	1.0	4.0
503	STM12	STM13	17.3	0.78	0.05	0.04	0.05	11.58	0.11	101	0.015	3.40	300	0.178	2.5	8.2
504	STM13	UFF-4	14.0	0.86	0.11	0.09	0.26	12.51	0.13	97	0.068	1.00	450	0.285	1.8	24.0
	UFF-4	STM17	4.6			0.00	0.26	12.64	0.06	96	0.068	0.50	450	0.202	1.3	33.8
Q= 0.0028*C**A (cms); C=RUNOFF COEFFICIENT; I=RAINFALL INTENSITY (5-Year) =853.608(I.C. + 4.699) ^ 0.766; A=AREA (ha)																



SANITARY SEWER DESIGN - LOCAL SEWER

Development Details Basis

DESIGN SHEET 1 of 1

FILE NO PRA-19078

CONTRACT / PROJECT Elements Condominium Plan - Pratt Hansen Group Inc.

n ≥ 0.013

M = 5/P*0.2 Babbitt

M=1+14/(4+P*0.5)] Harmon

Qp = P*q*M/86.4

Qe = I*A

Qtot = Qp + Qe

Numbers in blue or text in red are equations

(Harmon or Babbitt peaking factor where; M ≥ 2), the greater of the two is used in the spreadsheet. Please refer to Section 3.3.1.1 of the Barrie Sanitary Design Guidelines for additional guidance on which peaking factor to use.

(Peak population flow where; q = 225 L/day/person; P = population in thousands)

225 litres/person/day

(Peak extraneous flow; I= 0.1L/s/ha over development area)

(Total peak flow as the sum of peak population flow and peak extraneous flow)

STREET / AREA	MAINTENANCE HOLE		DWELL UNITS	DWELL (ACC) UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR BABBITT	M PEAKING FACTOR HARMON	Max PEAKING FACTOR	Qp (l/s)	AREA (ha)	AREA (ACC) (ha)	Qe (l/s)	Qtot (l/s)	L (m)	D (mm)	S (%)	Qf FULL (l/s)	d/D ⁽²⁾	d/D ⁽³⁾ >0.5 or >0.7	Velocity FULL (m/s)	Velocity Partial ⁽⁴⁾ (m/s)	Velocity ⁽⁴⁾ > 0.6 (m/s)
	FROM	TO																						
Area 1 - Building C	BUILDING C	SAN01	96	96	1.67	160	160	7.211	4.182	7.211	3.010	0.17	0.17	0.017	3.027	11.9	200	2.00%	46.384	0.173	Ok	1.476	0.829	Ok
Area 2	SAN01	SAN02	0	96	0	0	160	7.211	4.182	7.211	3.010	0.16	0.33	0.033	3.044	25.6	250	4.30%	123.314	0.108	Ok	2.512	1.052	Ok
Area 3 - Building B (southern half)	BUILDING B	SAN02	78	78	1.67	130	130	7.516	4.210	7.516	2.550	0.14	0.14	0.014	2.564	14.4	200	2.10%	47.529	0.157	Ok	1.513	0.804	Ok
Area 4	SAN02	SAN03	0	174	0	0	291	6.402	4.084	6.402	4.845	0.09	0.56	0.056	4.901	31.4	250	2.00%	84.100	0.163	Ok	1.713	0.928	Ok
Area 5 - Building A	BUILDING A	SAN05	94	94	1.67	157	157	7.241	4.185	7.241	2.960	0.17	0.17	0.017	2.977	10.2	200	1.95%	45.801	0.172	Ok	1.458	0.819	Ok
Area 6	SAN05	SAN04	0	94	0	0	157	7.241	4.185	7.241	2.960	0.17	0.34	0.034	2.994	53.4	250	2.00%	84.100	0.129	Ok	1.713	0.803	Ok
Area 7 - Building B (northern half)	BUILDING B	SAN04	78	78	1.67	130	130	7.516	4.210	7.516	2.550	0.13	0.13	0.013	2.563	16.1	200	2.00%	46.384	0.159	Ok	1.476	0.791	Ok
Area 8	SAN04	SAN03	0	172	0	0	287	6.417	4.086	6.417	4.800	0.09	0.56	0.056	4.856	54.0	250	2.00%	84.100	0.163	Ok	1.713	0.928	Ok
Area 9	SAN03	SAH33492	0	346	0	0	578	5.580	3.941	5.580	8.396	0.13	1.25	0.125	8.521	57.2	250	2.00%	84.100	0.214	Ok	1.713	1.094	Ok

DATE: February 28th, 2022

CALCULATED BY: MG

CHECKED BY: MF

* For sizing of the 375mm Trunk Sewer on Kneeshaw Drive, refer to Sanitary Sewer Design - Trunk Sewer worksheet.

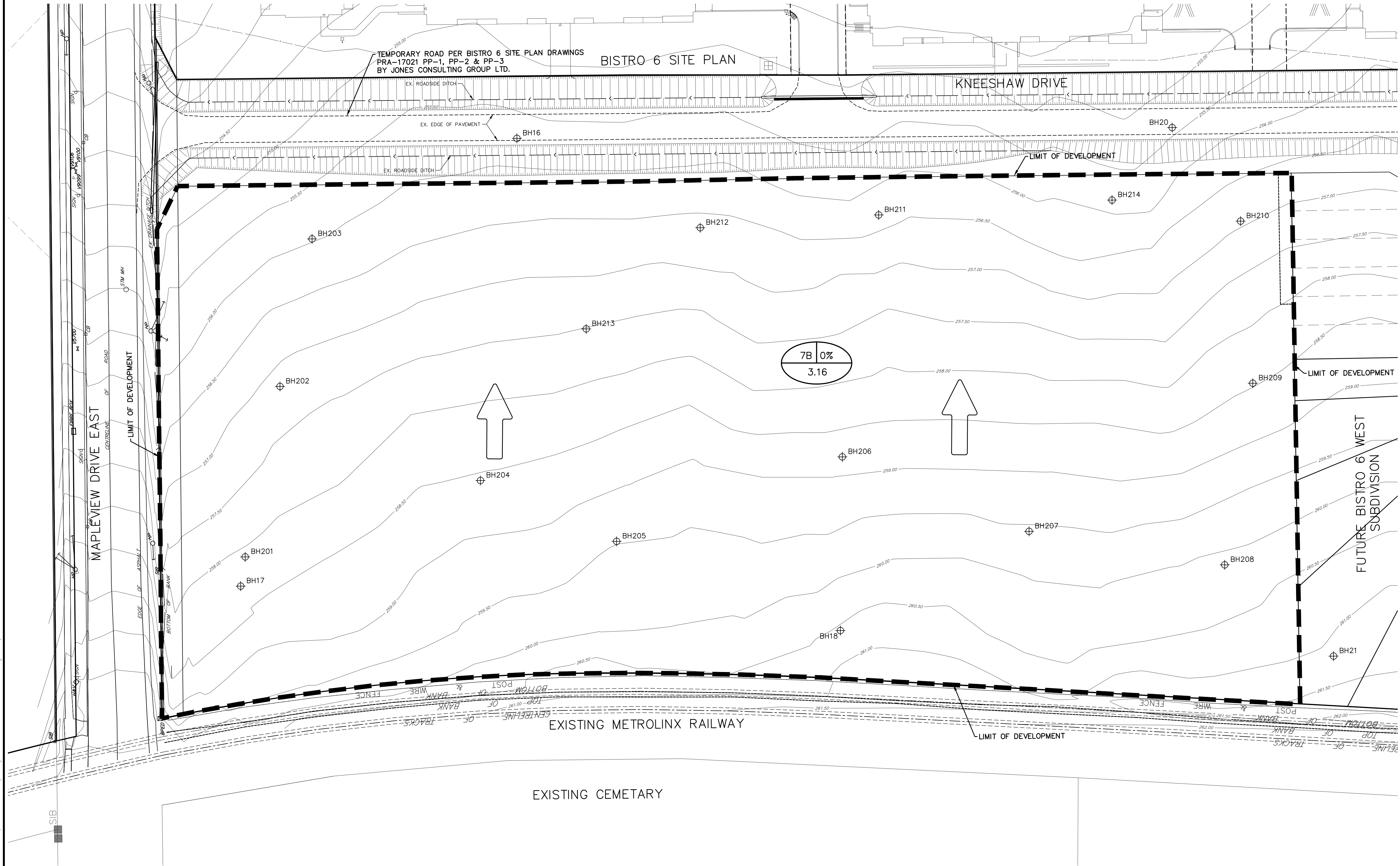
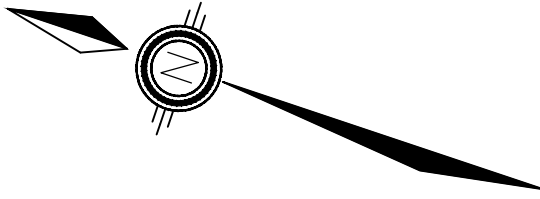
(1) without extraneous flow

(2) with extraneous flow

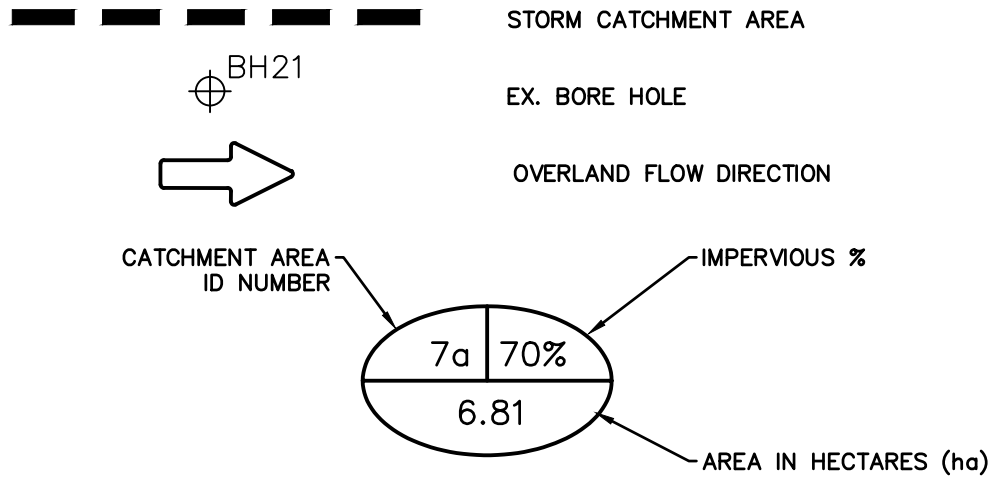
(3) d/D>0.5 for pipes 375 and less, d/D>0.85 for pipes greater than 375

(4) Velocity check based on the lesser of full flow or partial velocity

Watermain Interference Table			
Crossing No.	PIPE 1	PIPE 1	Clearance
1	WM Top 254.71	STM Bottom 255.21	0.50m
2	WM Top 254.60	STM Bottom 255.98	1.38m
3	WM Top 254.40	SAN Bottom 255.03	0.63m
4	50mmø WM Bottom 255.00	300mmø WM Top 254.20	0.80m
5	WM Bottom 253.29	SAN Top 252.79	0.50m



LEGEND



BENCHMARK:

BENCHMARK NO. 01019885494 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE
E OVER LOVELL'S CREEK, 0.85KM EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY
IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE
NORTHEAST END OF BRIDGE, 19CM TOP OF COPING. N4910788.589 E807284.100
ELEV 241.661

BENCHMARK NO. 03120030029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER
DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE FLAGPOLE BASE, 4.7M SOUTH
FROM THE SOUTHEAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND TABLET IS ON
THE SOUTHWEST SIDE OF THE FLAGPOLE BASE. N4911810 E807799 ELEV 230.509

BENCHMARK NO. 03120080004 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST
APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910878.122 E807801.062 ELEV 248.996

BENCHMARK NO. 03120110013 LOCATED ON LOCHART ROAD ON THE NORTH SIDE OF THE
BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD
INTERSECTION. N4909870.257 E806733.580 ELEV 232.807

4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF
NO.	REVISIONS	DATE	INITIAL



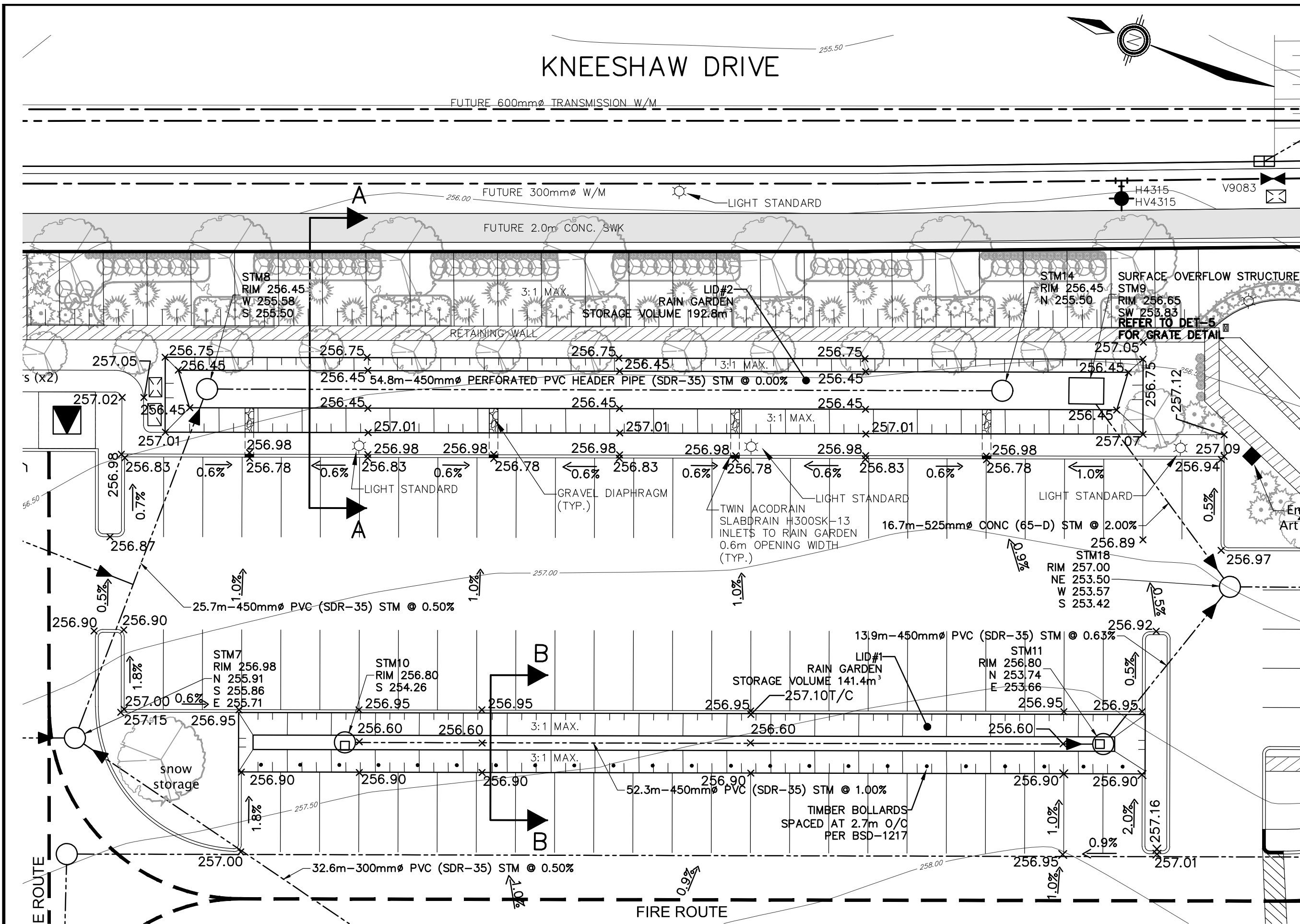
PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE

STORMWATER MANAGEMENT PLAN
PRE-DEVELOPMENT CONDITIONS

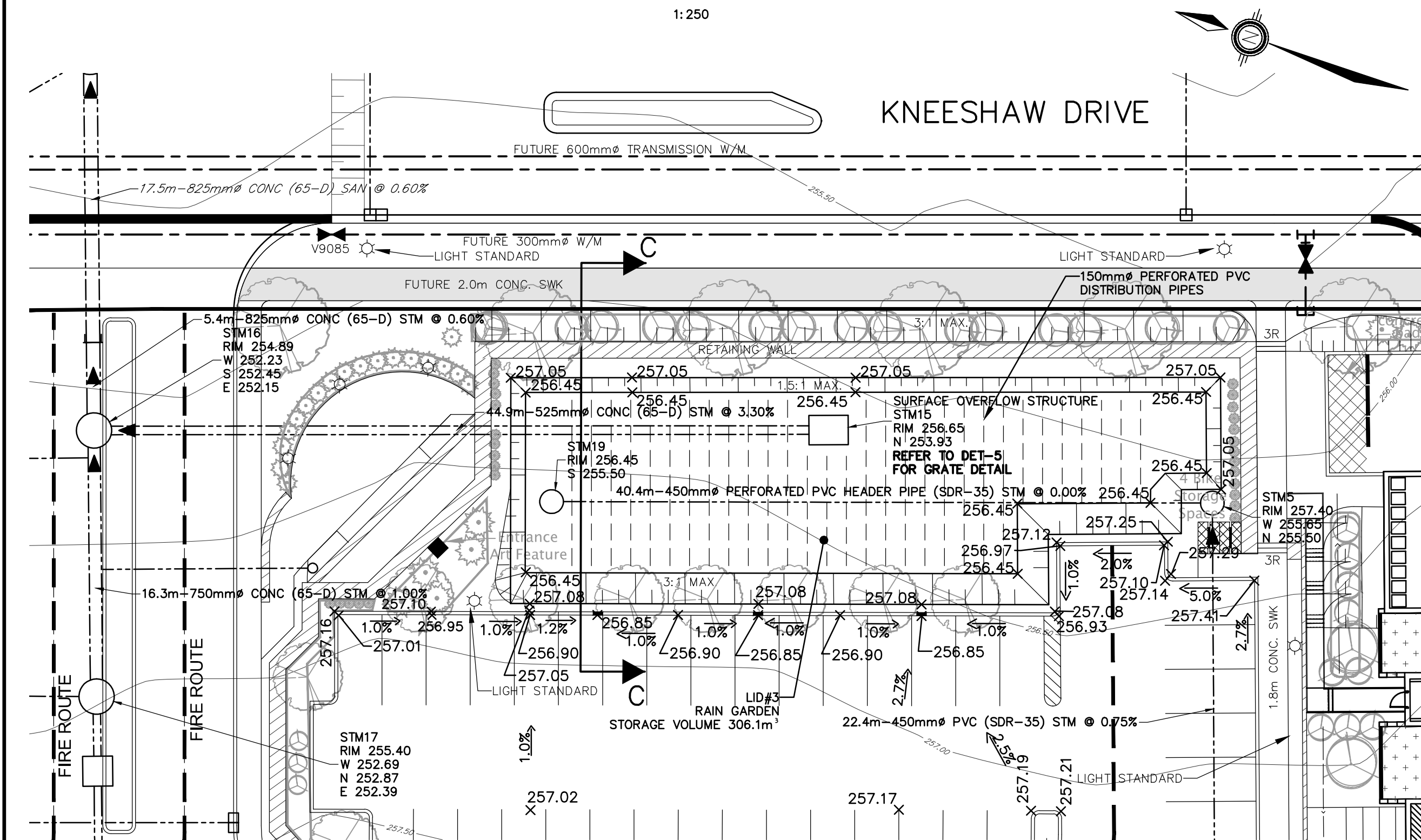


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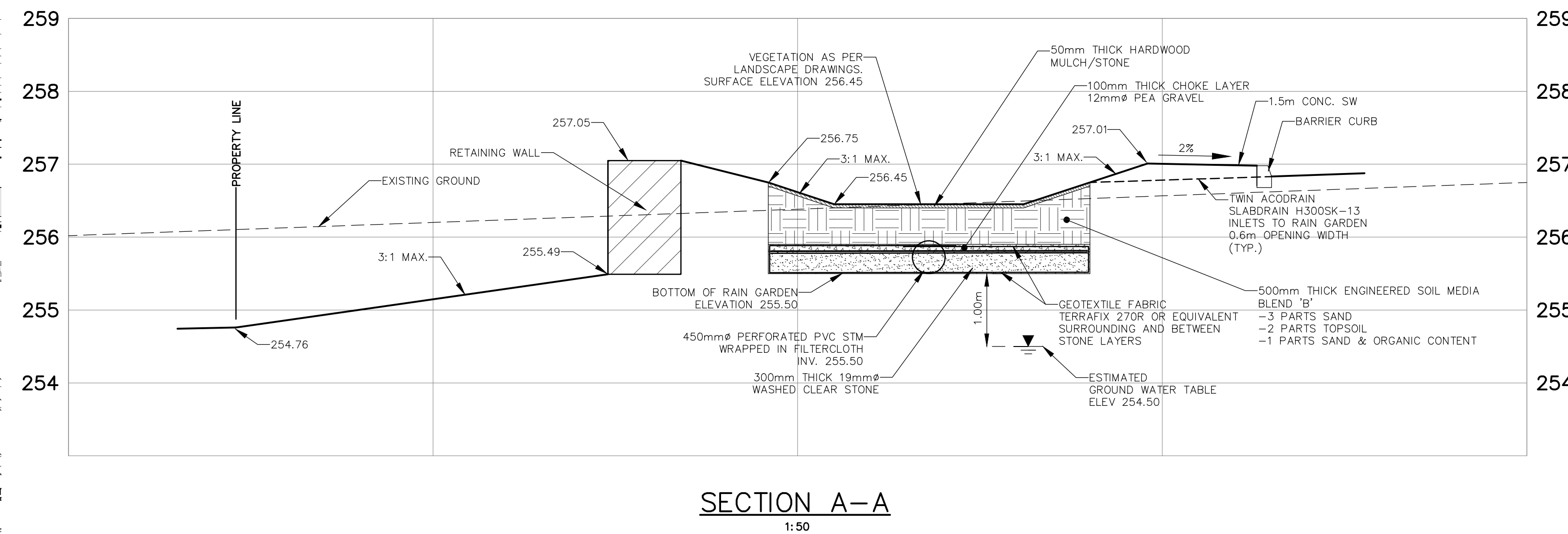
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DRAWN	KS	PROJECT	DWG. NO	
CHECKED	DR	PRA-19078	SWM-1	



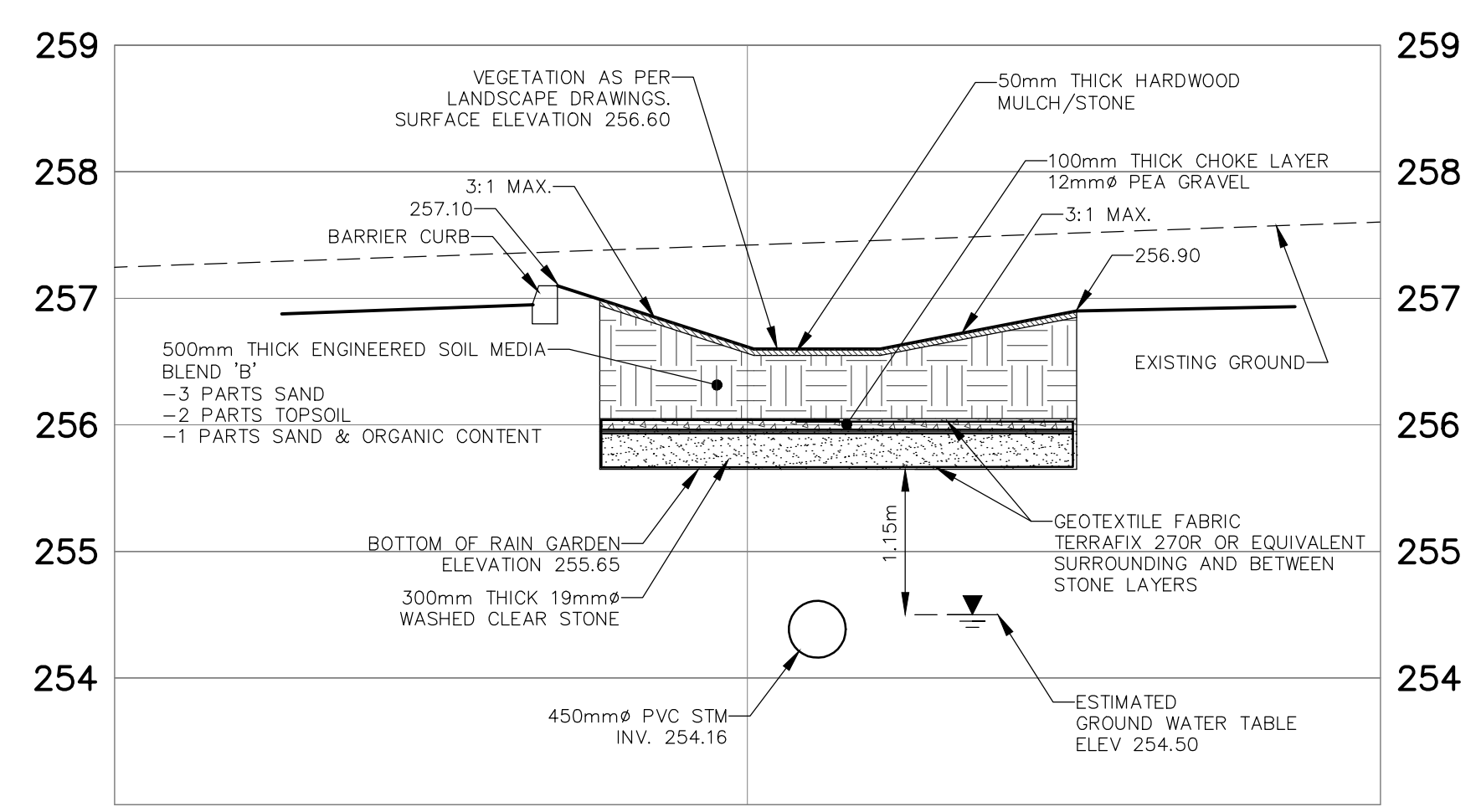
LID#1 & LID#2 RAIN GARDENS
PLAN VIEW
1:250



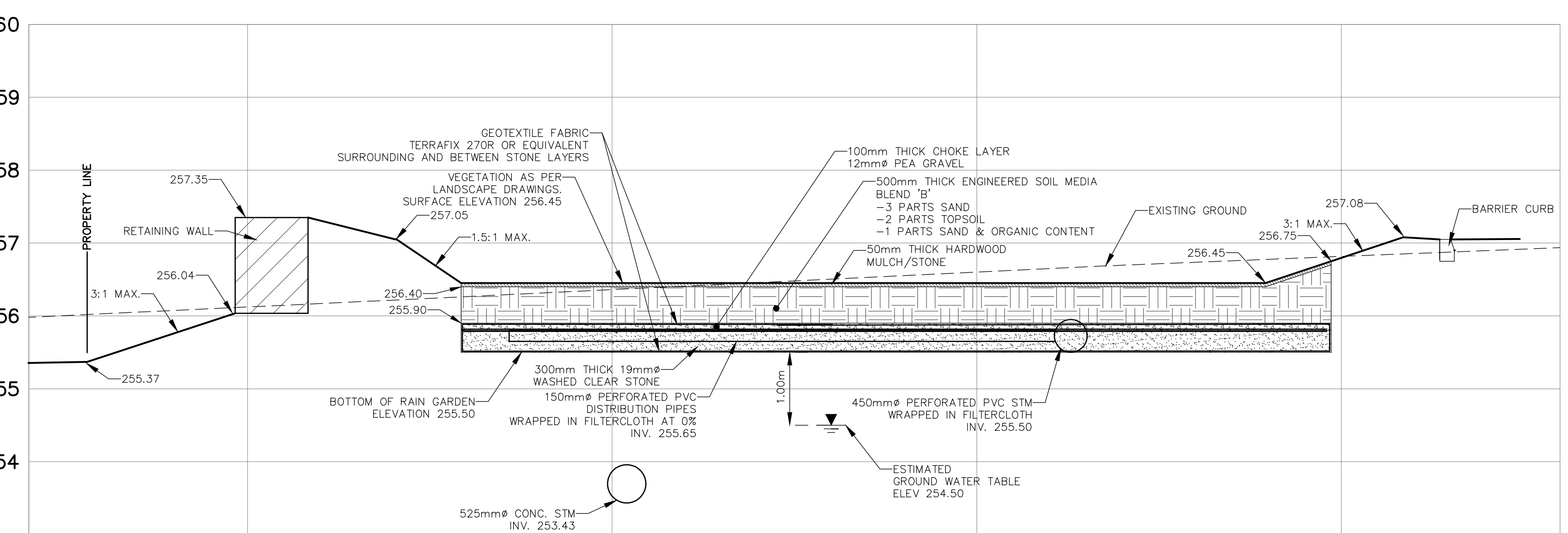
LID#3 RAIN GARDEN
PLAN VIEW
1:250



SECTION A-A
1:50



SECTION B-B
1:50



SECTION C-C
1:50

BENCHMARK:

BENCHMARK NO: 01019885454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE
E OVER LOVER'S CREEK, 0.65M EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY
IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE
NORTHEAST END OF BRIDGE, 10CM TOP OF CORNER. NAD83/88 ELEV 241.861

BENCHMARK NO: 03120030029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER
DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE SLABPILE BASE 4.7M SOUTH
FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL, AND TABLET IS ON
THE SOUTHWEST CORNER OF THE SLABPILE BASE. NAD83/88 ELEV 250.508

BENCHMARK NO: 03120080054 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST
APPROXIMATELY 1KM EAST OF HURONIA ROAD. NAD83/88 ELEV 248.996

BENCHMARK NO: 0312010013 LOCATED ON LOCKHART ROAD ON THE NORTH SIDE OF THE
BOULEVARD, APPROXIMATELY 1.02M WEST OF THE YONGE STREET AND HURONIA ROAD
INTERSECTION. NAD83/88 ELEV 252.807

NO.	REVISIONS	DATE	INITIAL
4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF

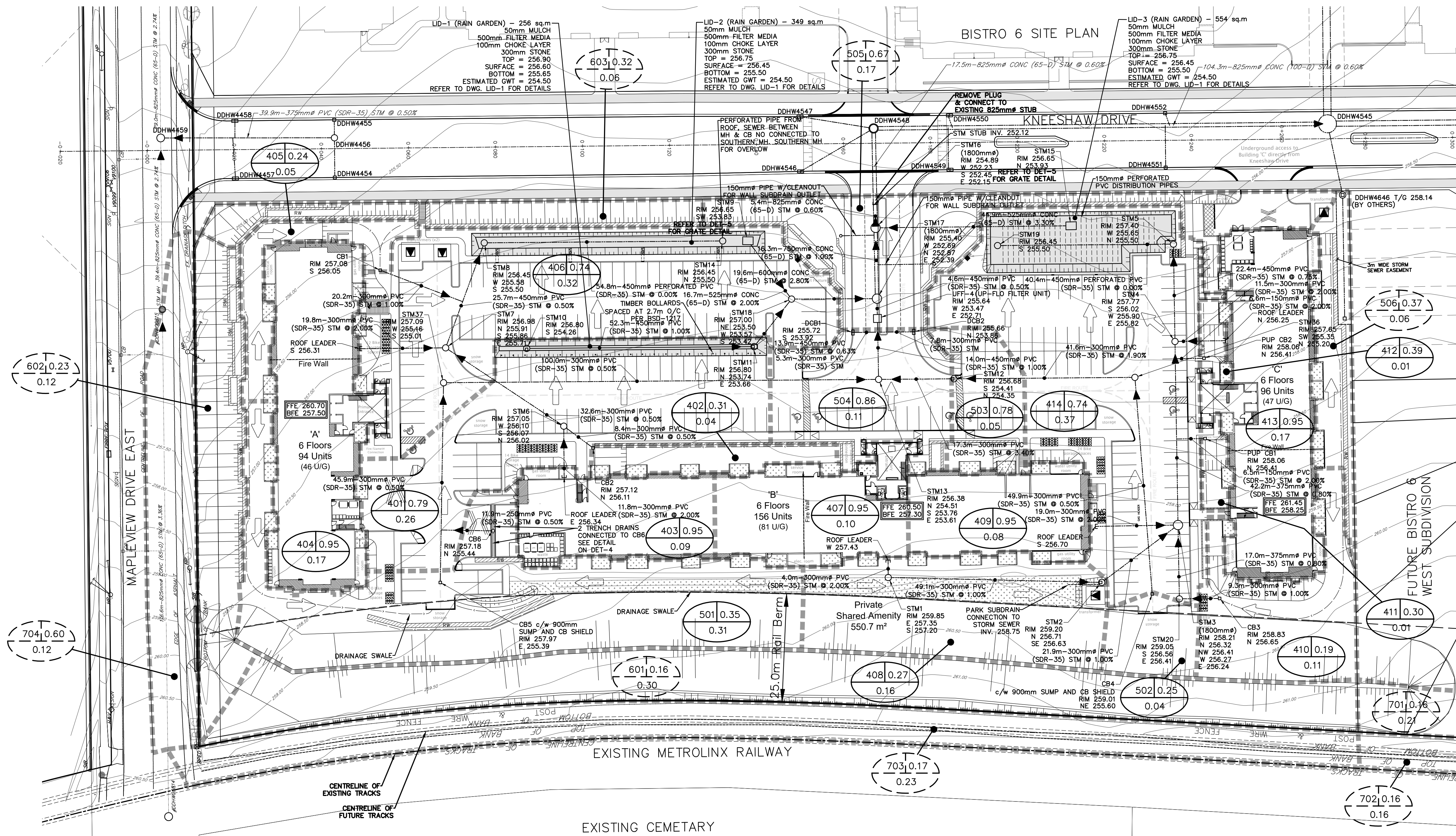


PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE
RAIN GARDENS
LID SECTIONS & DETAILS



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DESIGN	MF	SCALE: AS NOTED	DATE	FEB. 2021
DRAWN	KS	PROJECT	PRA-19078	DWG. NO LID-1
CHECKED	DR			



LEGEND

- PROPOSED STORM DRAINAGE BOUNDARY
- PROPOSED OVERLAND DRAINAGE FLOW DIRECTION
- INTERNAL CATCHMENT AREA NUMBER
- EXTERNAL CATCHMENT AREA NUMBER
- PROPOSED STORM MAINTENANCE HOLE
- PROPOSED CATCHBASIN MAINTENANCE HOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED STORM SEWER INSULATION PER DETAIL ON DWG. DET-1

RUNOFF COEFFICIENT

INTERNAL CATCHMENT AREA NUMBER: 401, 0.15

EXTERNAL CATCHMENT AREA NUMBER: 502, 0.32

AREA (ha)

REFER TO DESIGN SHEET ON DRAWING SS-2

BENCHMARK:

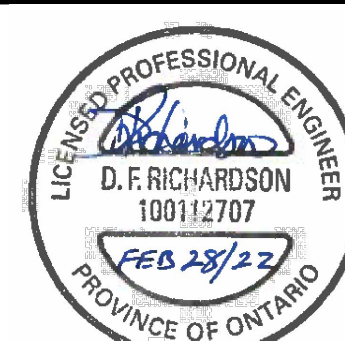
BENCHMARK NO. 0101885454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE E OVER LORRY'S CREEK, 0.85M EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 19CM TOP OF CORING. N4910786.889 E807284.100 ELEV 241.861

BENCHMARK NO. 0312003029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE PLAPOLE BASE 4.7M SOUTH FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL, AND TABLET IS ON THE SOUTHWEST CORNER OF THE PLAPOLE BASE. N4911810 E807799 ELEV 250.509

BENCHMARK NO. 0312008004 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD, N4910878.122 E807801.082 ELEV 248.896

BENCHMARK NO. 0312011013 LOCATED ON LOCKHART ROAD ON THE NORTH SIDE OF THE BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION. N4909870.257 E808733.580 ELEV 252.807

NO.	REVISIONS	DATE	INITIAL
4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF



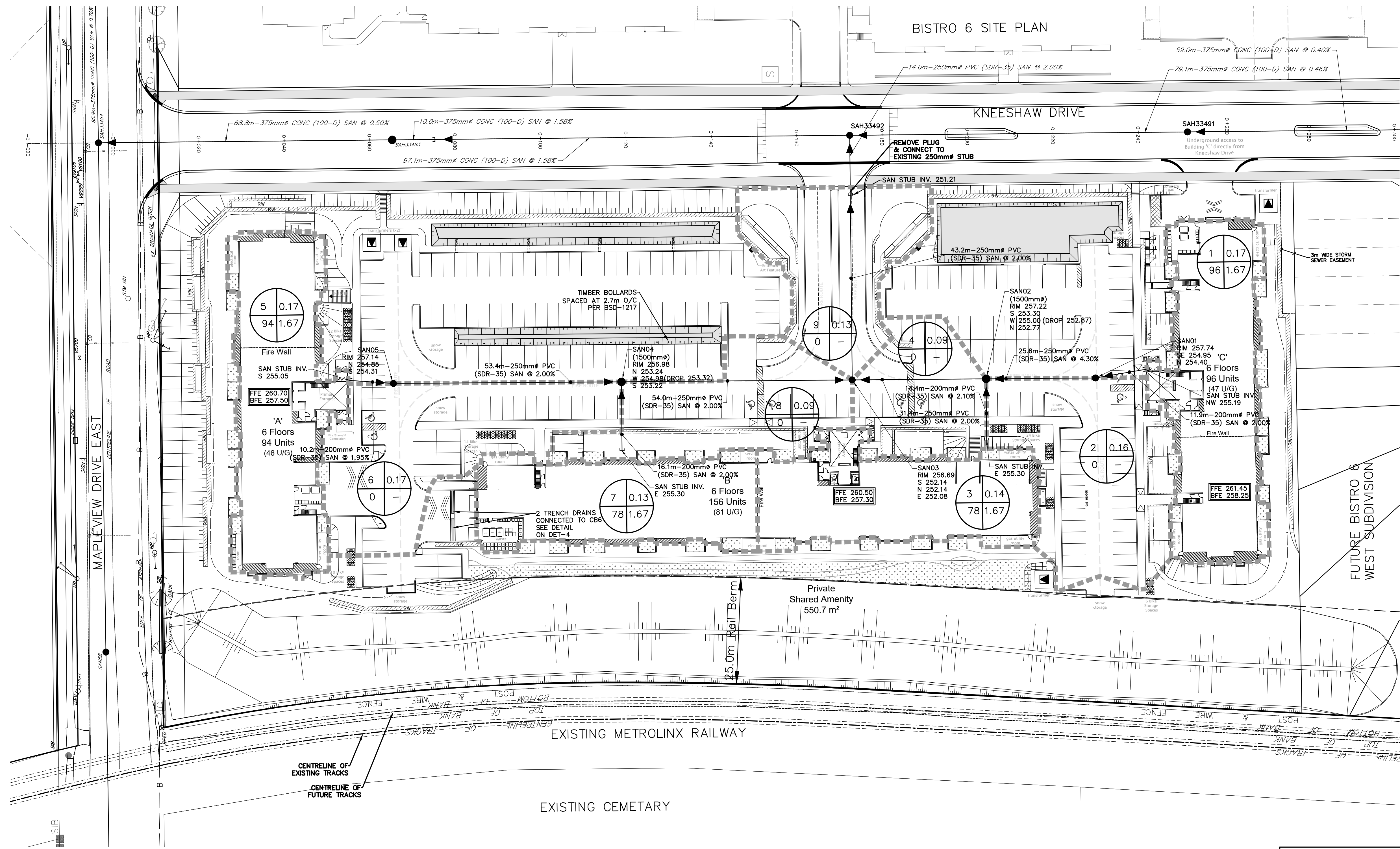
PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE

STORM DRAINAGE PLAN



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DESIGN MF	SCALE: 1:500	DATE JANUARY 2021
DRAWN KS	PROJECT PRA-19078	DWG. NO. STM-1
CHECKED DR		



LEGEND

PROPOSED SANITARY DRAINAGE BOUNDARY

PROPOSED SANITARY DRAINAGE DIRECTION

SANITARY CATCHMENT
AREA ID No.

NO. OF UNITS

2010.32

23.13

AREA (ha)

PERSONS PER UNIT

SAN01

PROPOSED SANITARY MAINTENANCE HOLE

REFER TO DESIGN SHEET ON DRAWING SS-2

BENCHMARK:

BENCHMARK NO. 0101980454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE
E OVER LOVELL'S CREEK, 0.85M EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY
IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE
NORTHEAST END OF BRIDGE, 19CM TOP OF CORING. N4910786.889 E807284.100
ELEV 241.661

BENCHMARK NO. 03120030229 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER
DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE FLAGPOLE BASE, 4.7M SOUTH
FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL, AND TABLET IS ON
THE SOUTHWEST SIDE OF THE FLAGPOLE BASE. N4911810 E807799 ELEV 230.509

BENCHMARK NO. 03120080094 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST
APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910878.122 E807801.082 ELEV 248.996

BENCHMARK NO. 03120110013 LOCATED ON LOCKHART ROAD ON THE NORTH SIDE OF THE
BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD
INTERSECTION. N4900870.257 E808733.580 ELEV 232.807

4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
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2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF
NO.	REVISIONS	DATE	INITIAL



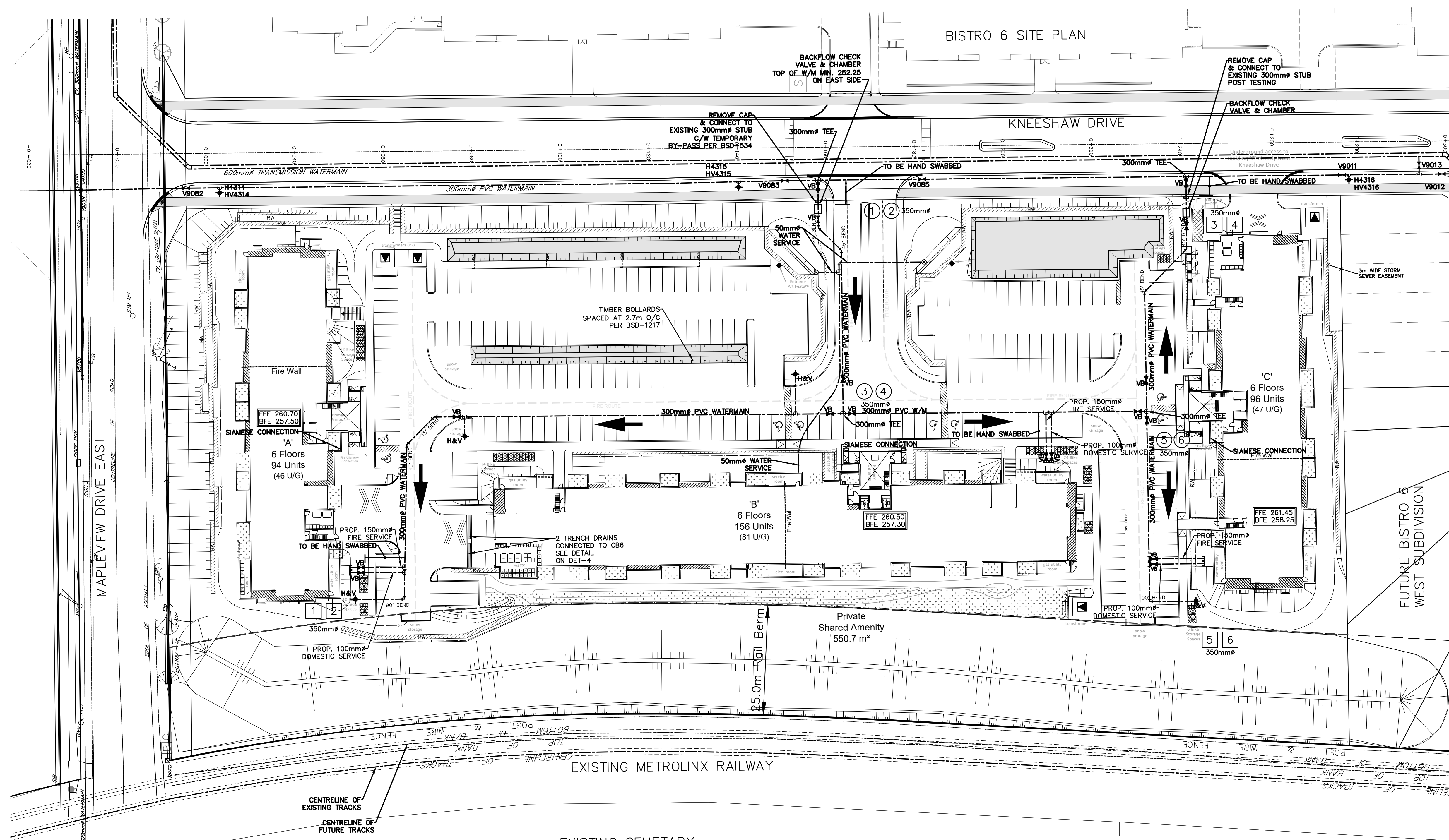
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ELEMENTS SITE PLAN
CITY OF BARRIE

SANITARY DRAINAGE PLAN



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DESIGN MF	SCALE: 1:500	DATE JANUARY 2021
DRAWN KS	PROJECT PRA-19078	DWG. NO DWG. NO
CHECKED DR		SAN-1

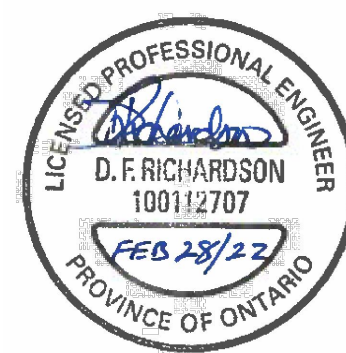


- WATERMAIN TESTING AND DISINFECTION NOTES**
1. THE FOLLOWING SEQUENCE WILL BE UTILIZED IN THE COMMISSIONING OF THE WATER SYSTEM: SWAB AND CHARGE THE WATERMAIN, PRESSURE TEST, CHLORINATE, FLUSHING AND SAMPLING.
 2. ALL PROCEDURES ARE TO BE COMPLETED THROUGH A BYPASS CONNECTION TO THE EXISTING WATERMAIN, c/w BACKFLOW PREVENTION VALVE.
 3. THE VALVES ARE TO BE OPERATED BY CITY REPRESENTATIVES ONLY.
 4. THE FINAL CONNECTION TO THE EXISTING SYSTEM WILL NOT BE PERMITTED UNTIL ALL COMPONENTS OF THE TESTING AND DISINFECTION PROCEDURE HAVE BEEN COMPLETED TO THE SATISFACTION OF THE CITY.
 5. HYDROSTATIC TESTING SHALL BE PERFORMED ON THE COMPLETED DISTRIBUTION SYSTEM IN SECTIONS NOT EXCEEDING 500 METRES IN LENGTH IN ACCORDANCE WITH AWWA C600. FOR POLYETHYLENE PIPE THE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 701. TESTING OF SECTIONS THAT CONSIST OF VARYING PIPE MATERIALS WILL NOT BE PERMITTED. ALL SECONDARY MAIN VALVES MUST BE OPEN DURING TESTING WITH THE EXCEPTION OF THOSE BEING USED TO DIVIDE THE SYSTEM INTO SECTIONS FOR THE PURPOSE OF TESTING.
 6. THE SYSTEM SHALL BE DISINFECTED USING THE "CONTINUOUS FEED" METHOD IN ACCORDANCE WITH AWWA C651. FOLLOWING THE REQUIRED 24 HOUR CONTACT TIME, THE SYSTEM IS TO BE FLUSHED. THE CHLORINATED WATER MUST BE NEUTRALIZED USING AN APPROPRIATE CHEMICAL SUCH AS SODIUM THIOSULPHATE. THE DISCHARGED WATER WILL DRAIN TO THE ON-SITE STORM SEWER.
 7. SAMPLES FOR BACTERIOLOGICAL TESTING SHALL BE COLLECTED BY THE CITY A MINIMUM OF 24 HOURS AFTER FLUSHING IS COMPLETED IN ACCORDANCE WITH AWWA C651. SAMPLES SHALL BE COLLECTED FROM EVERY 350 METRES OF NEW WATERMAIN PLUS ONE SAMPLE FROM THE END OF EACH OF THE LINES AND AT LEAST ONE SAMPLE FROM EACH BRANCH (OPSS 441.07.25). FOLLOWING THE RECEIPT OF TWO CONSECUTIVE SETS OF ACCEPTABLE TEST RESULTS THE CITY WILL PROVIDE WRITTEN NOTIFICATION THAT A FINAL CONNECTION CAN BE MADE TO THE EXISTING DISTRIBUTION SYSTEM.
 8. A CONTINUITY TEST OF THE TRACER WIRE SHALL BE COMPLETED WITH POINT TO POINT READINGS RECORDED AND APPROVED BY THE CITY.
 9. THE FINAL CONNECTION SHALL NOT BE MADE UNTIL ALL OF THE ABOVE TESTING REQUIREMENTS HAVE BEEN SATISFACTORILY COMPLETED AND THE CITY HAS PROVIDED WRITTEN NOTIFICATION TO PROCEED. THE LENGTH OF PIPE REQUIRED TO CONNECT THE NEW WATER SYSTEM TO THE EXISTING DISTRIBUTION SYSTEM SHALL NOT EXCEED 5.5 METRES AND SHALL BE DISINFECTED PRIOR TO INSTALLATION IN ACCORDANCE WITH AWWA C651.

- NOTE**
1. DOMESTIC AND FIRE SERVICE VALVES SHALL BE LOCATED IN THE BOULEVARD, UNLESS OTHERWISE NOTED.
 2. DOMESTIC AND FIRE SERVICES SHALL BE MECHANICALLY RESTRAINED FROM THE TEE TO THE BUILDINGS.
 3. DOMESTIC AND FIRE SERVICE RISERS ENTERING EACH BUILDING SHALL BE INSTALLED AS PER BSD-505.
 4. DOMESTIC AND FIRE SERVICE TO BE HAND SWABBED OR A SWAB IS TO BE PLACED IN SERVICE AND REMOVED FROM RISERS.
 5. THE 100mm DOMESTIC WATER SERVICE WILL REQUIRE A 100mm WATER METER (SUPPLIED AND INSTALLED BY THE OWNER) COMPLETE WITH A BYPASS ASSEMBLY AS PER BSD-533 AND SHALL BE LOCATED IN AN APPROPRIATELY SIZED MECHANICAL ROOM.
 6. BACKFLOW PREVENTION SHALL BE PROVIDED ON ALL DOMESTIC AND FIRE SERVICES AS PER CITY OF BARRIE BYLAW 2017-121.

- LEGEND**
- PROPOSED HYDRANT
 - PROPOSED VALVE BOX
 - PROPOSED CURB STOP
 - SWAB NUMBER, INSERTION LOCATION & SIZE
 - SWAB NUMBER, REMOVAL LOCATION & SIZE
 - SWAB TRAVEL DIRECTION

BENCHMARK:			
BENCHMARK NO. 01019805454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE E OVER LORRY'S CREEK, 0.80M EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 19CM TOP OF CORING. N4910786.889 E807284.100 ELEV 241.661			
BENCHMARK NO. 03120030029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE FLAGPOLE BASE 4.7M SOUTH FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND TABLET IS ON THE SOUTHWEST SIDE OF THE FLAGPOLE BASE. N4911610 E807799 ELEV 250.509			
BENCHMARK NO. 03120080004 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910878.122 E807801.062 ELEV 248.996			
BENCHMARK NO. 03120110013 LOCATED ON LOCKHART ROAD ON THE NORTH SIDE OF THE BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION. N4900870.257 E806733.580 ELEV 252.807			
NO.	REVISIONS	DATE	INITIAL
4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF



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ELEMENTS SITE PLAN
CITY OF BARRIE

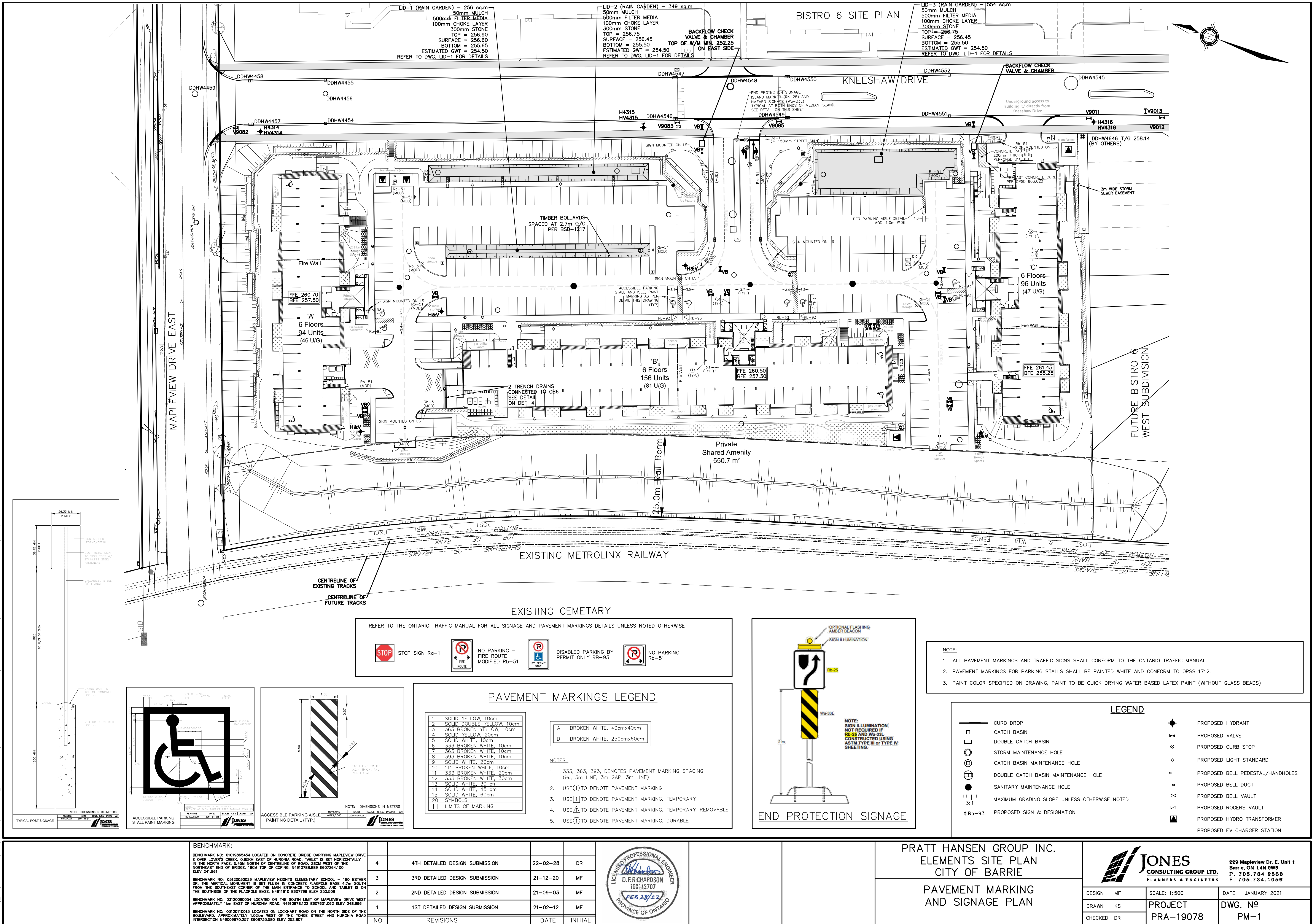
WATERMAIN SWABBING PLAN

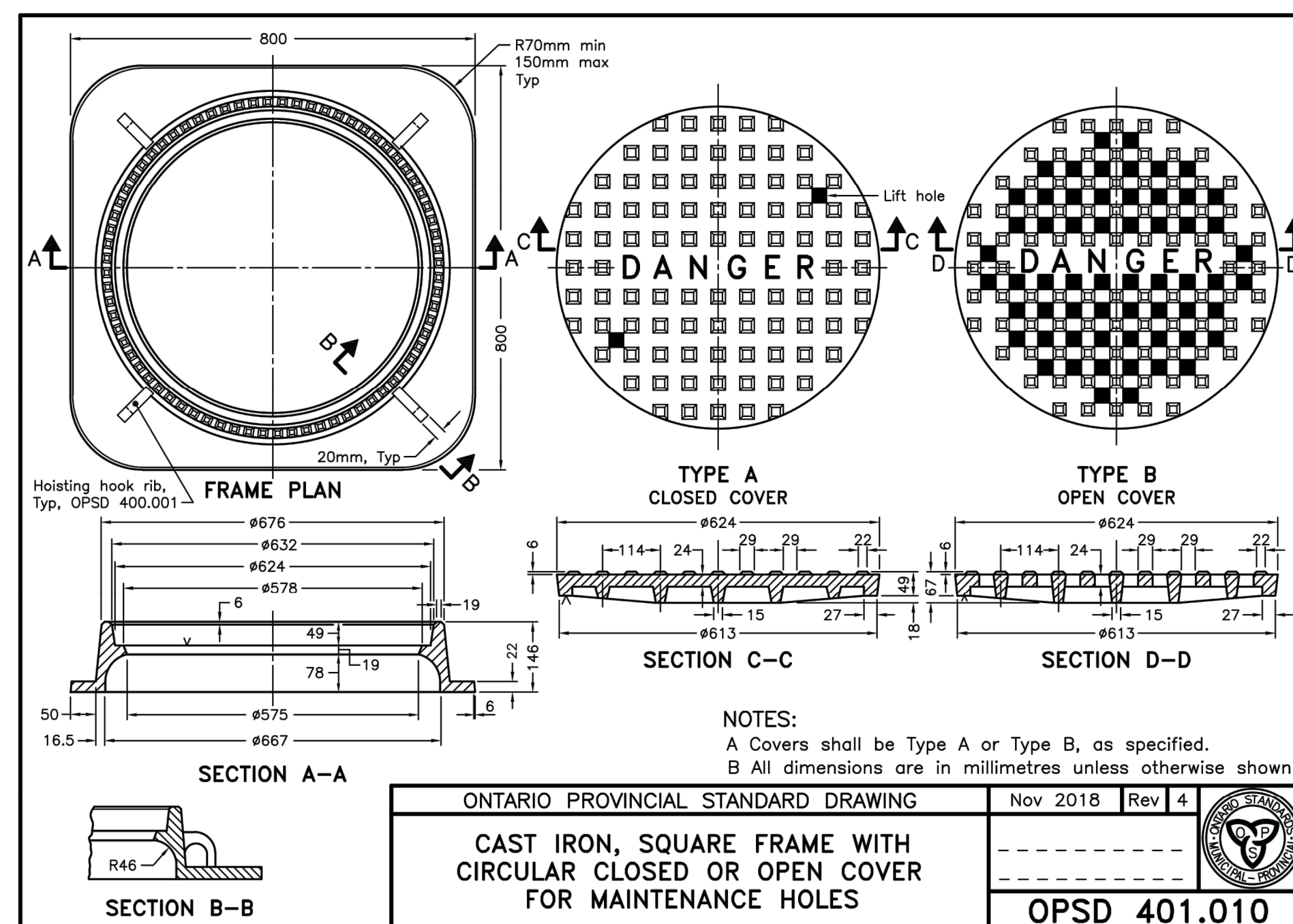
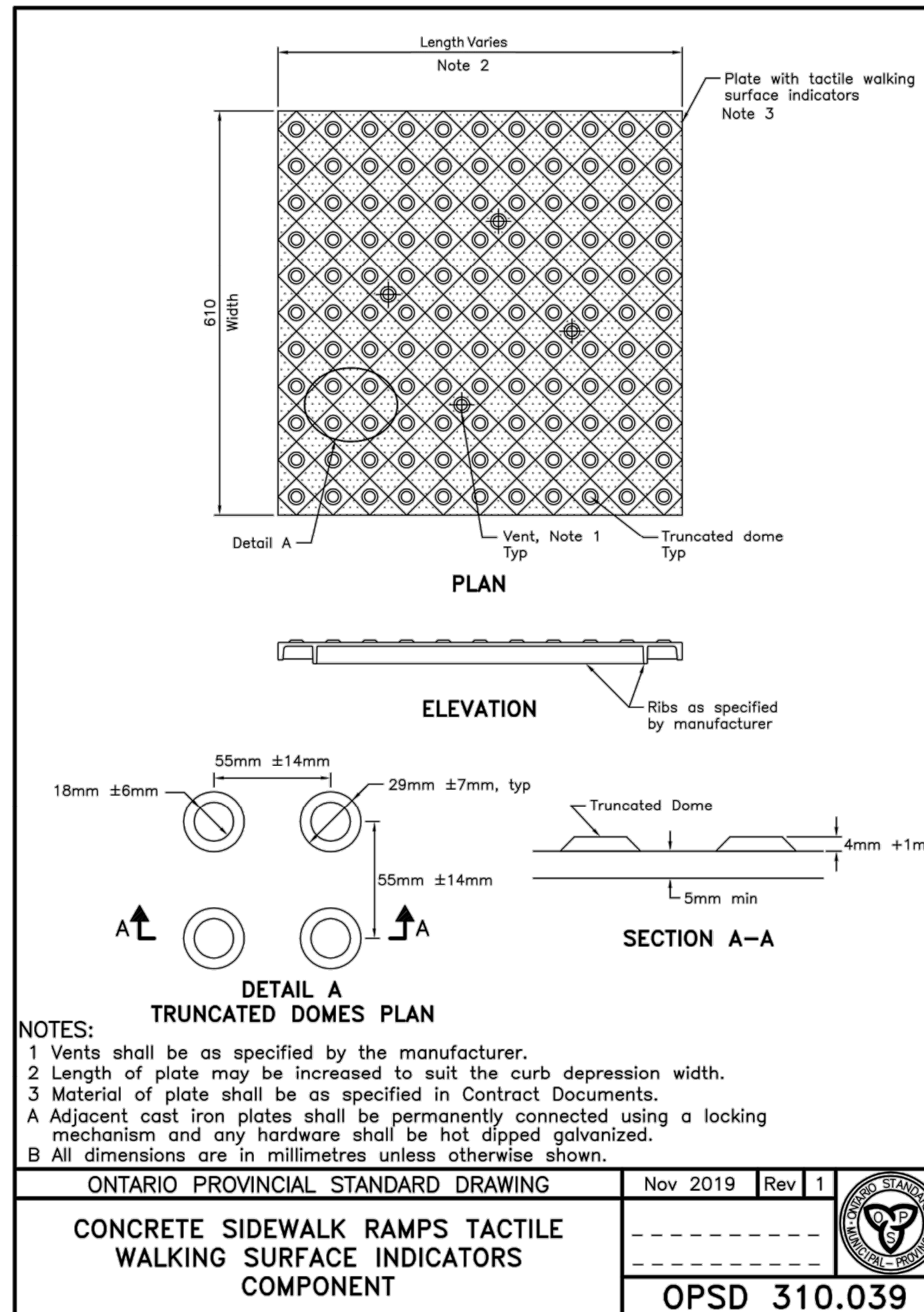
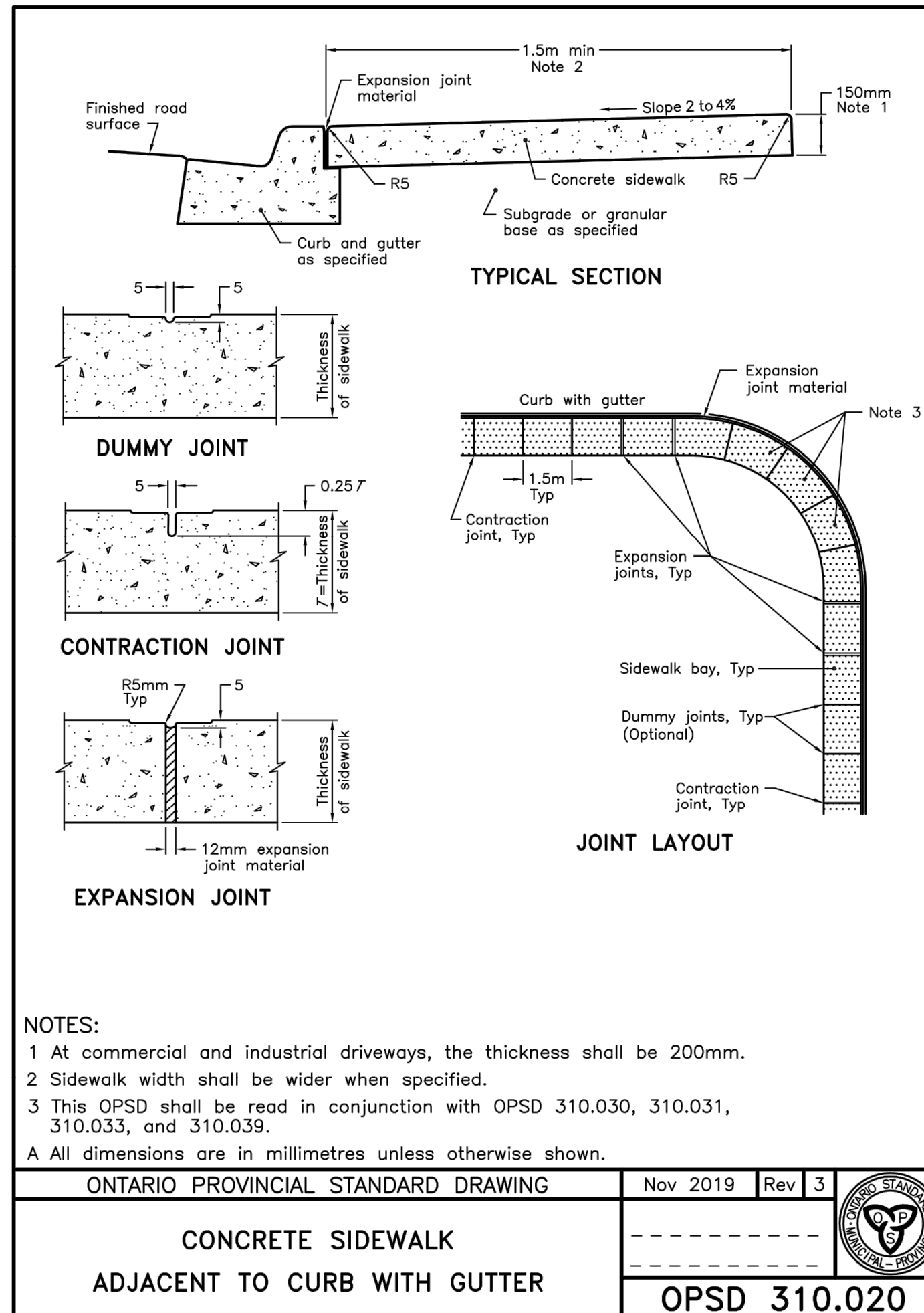


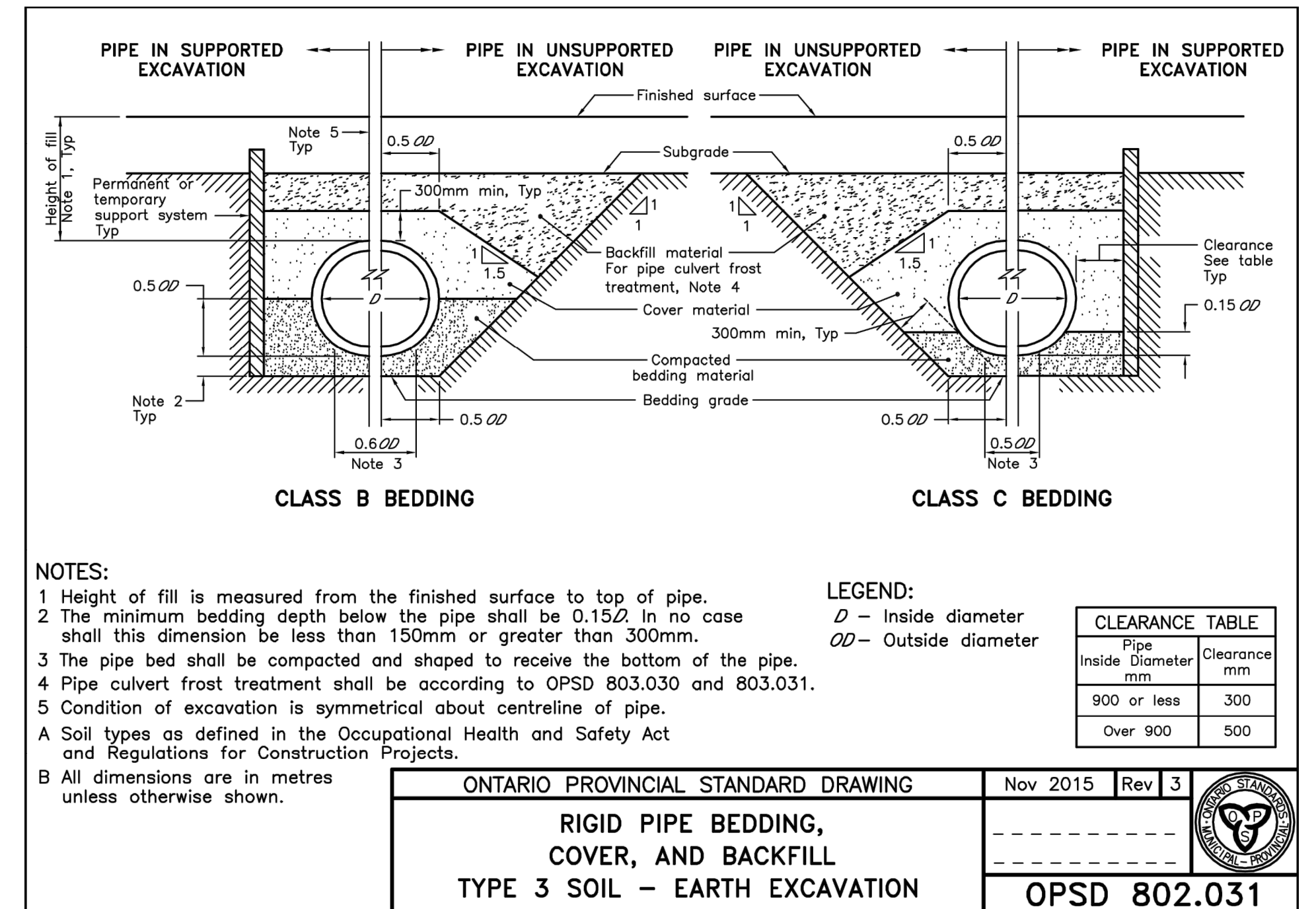
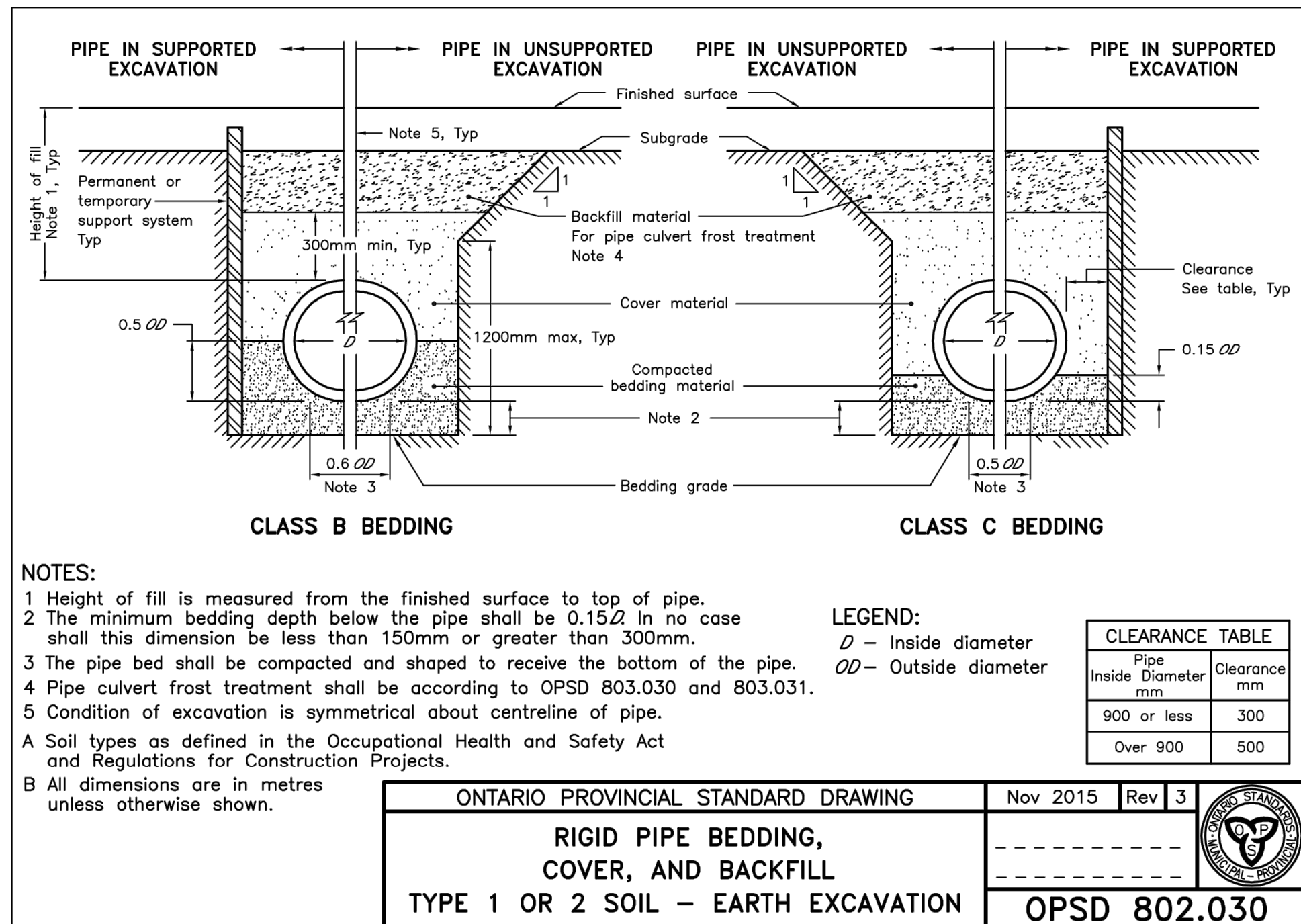
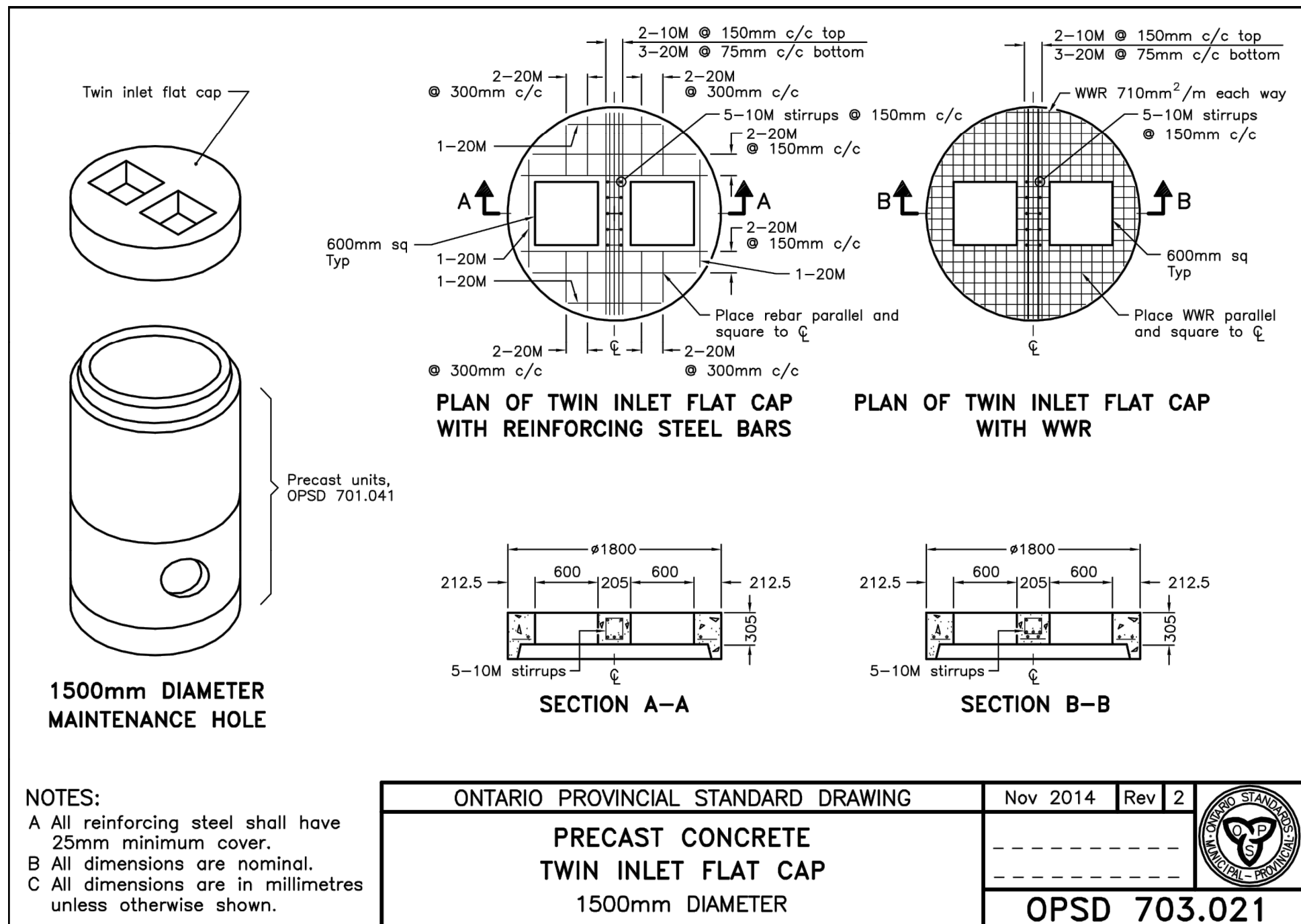
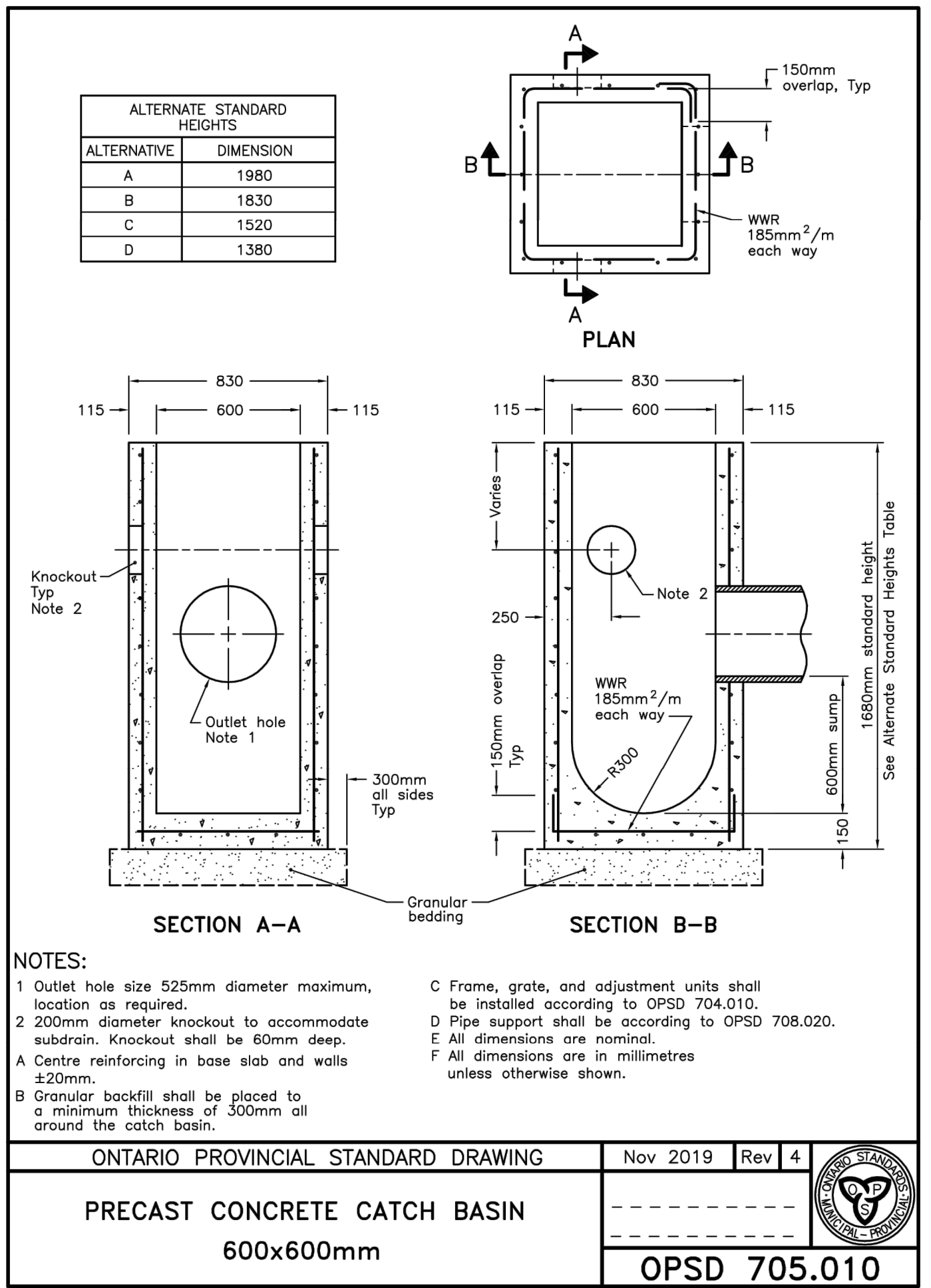
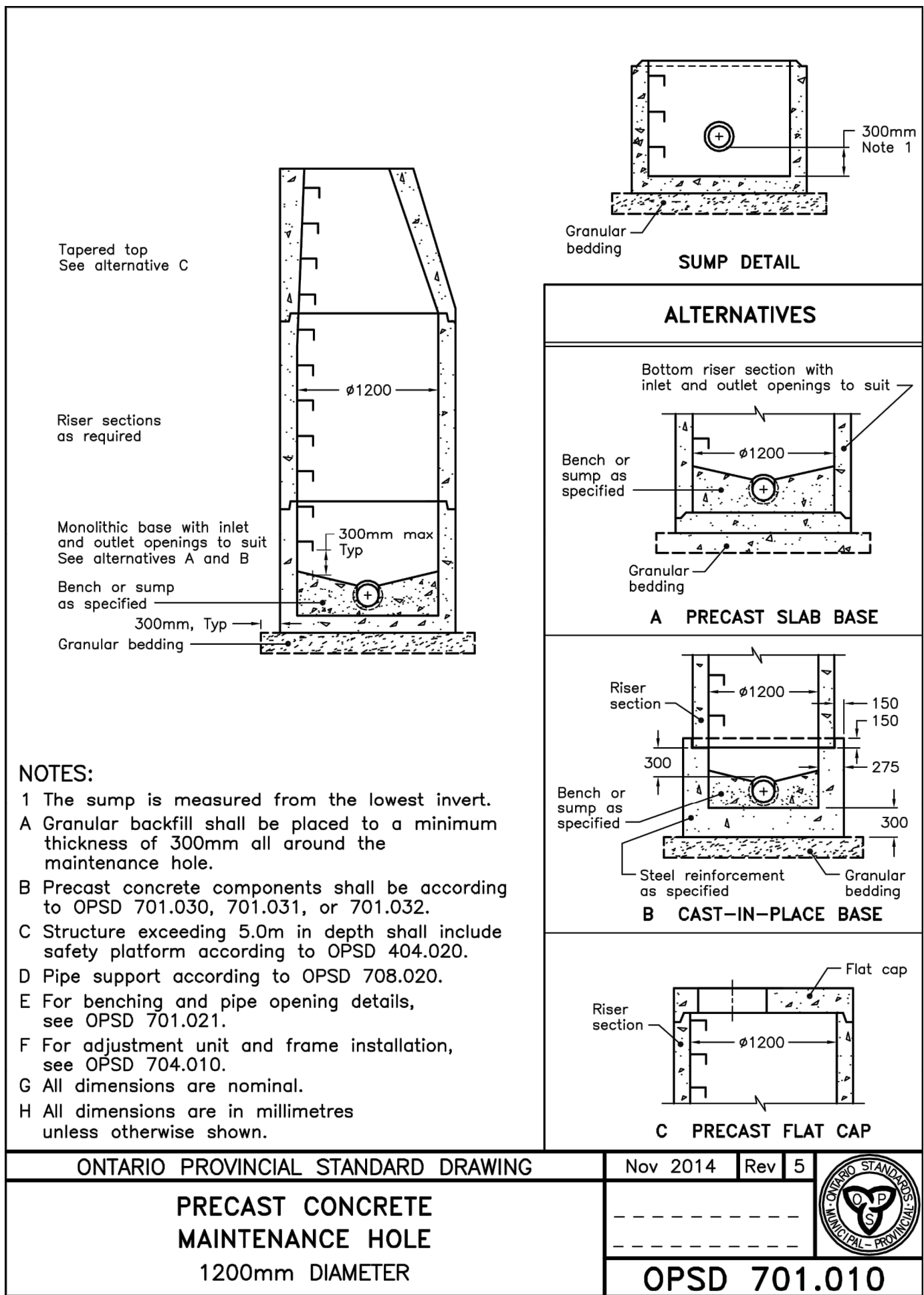
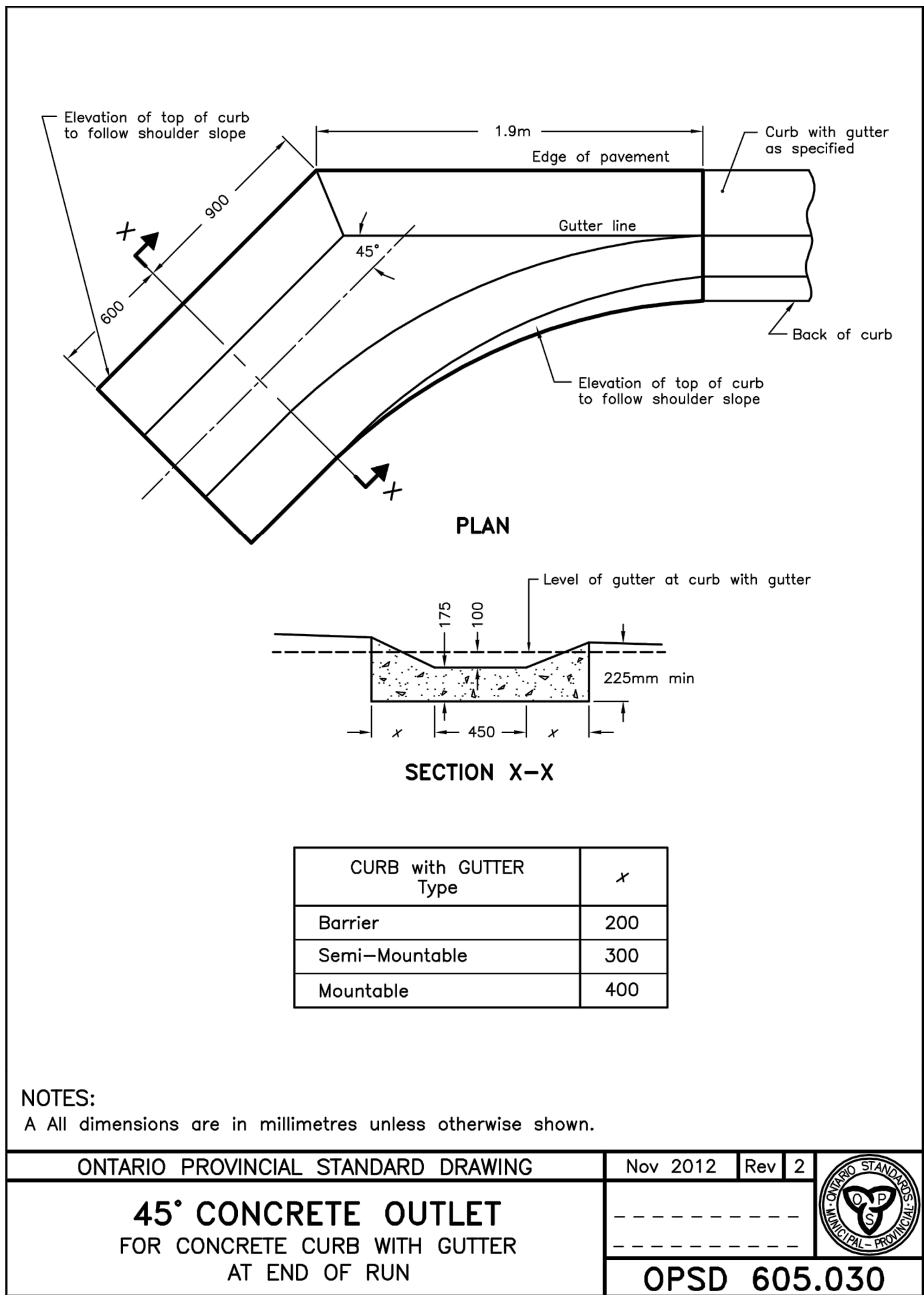
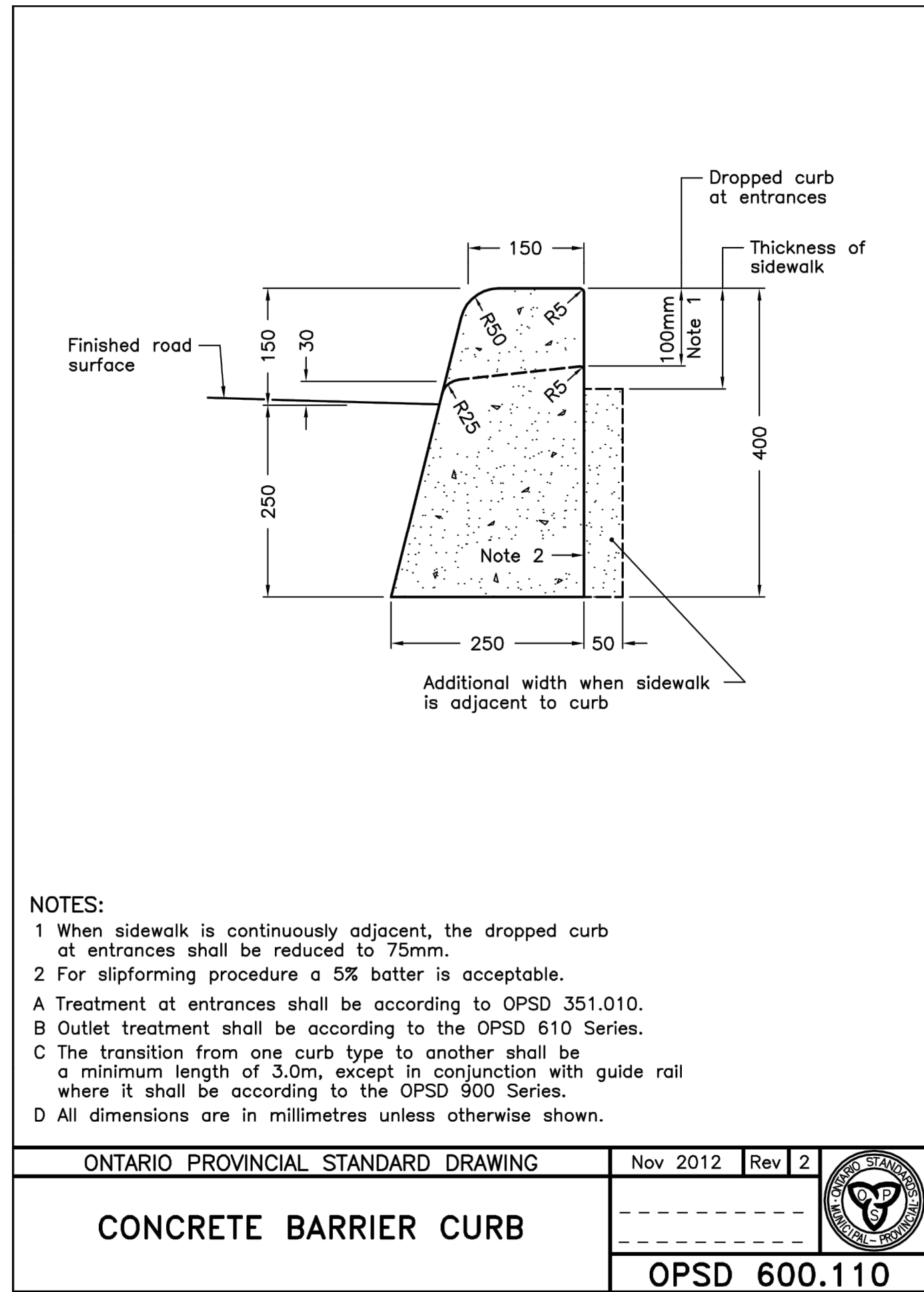
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F. 705.734.1056

DESIGN MF	SCALE: 1:500	DATE JANUARY 2021
DRAWN KS	PROJECT PRA-19078	DWG. NO WM-1
CHECKED DR		

G:\Eng_3D\PR-19078\Design\Drawings\PR-19078-DESIGN\PR-19078-DESIGN.dwg Layout:PM-1 Plotted Mar 01, 2022 @ 8:10am by kschulz The Jones Consulting Group Ltd.







G:\Eng_3D\19078\Production\DWG\19078-Details.dwg Layout:DET-2 Plotted Feb. 28, 2022 @ 4:16pm by kschulz The Jones Consulting Group Ltd.

BENCHMARK:

BENCHMARK NO. 01019885494 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE E OVER LOVELL CREEK, 0.85KM EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 18cm TOP OF CORING. N4910788.589 E807284.100 ELEV 241.661	4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
BENCHMARK NO. 03120030029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL MONUMENT IS SET PLUSH IN CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND TABLET IS ON THE SOUTHWEST SIDE OF THE FLAGPOLE BASE. N4911610 E807799 ELEV 250.509	3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
BENCHMARK NO. 03100800094 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910678.122 E807801.062 ELEV 248.996	2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
BENCHMARK NO. 03120110013 LOCATED ON LOOCHART ROAD ON THE NORTH SIDE OF THE BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION. N4900870.257 E806733.580 ELEV 232.807	1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF
NO.	REVISIONS		DATE	INITIAL



PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE

STANDARD DETAILS



DESIGN	MF	SCALE: N/A	DATE	JANUARY 2021
DRAWN	KS	PROJECT	PRA-19078	DWG. NO
CHECKED	DR			DET-2

High Security Fencing

The high security fence height above ground shall be 2.4 m.

The panel mesh shall consist of a minimum 4mm diameter high tensile wire, with aperture sizes (openings) 76.2mm x 12.7mm on centre or smaller fastened to suitable posts that allow for a minimum foundation depth of 1200 mm. The fence panels shall be strengthened with factory formed undulations within each mesh panel. Mechanical Fasteners shall be tamper proof and factory galvanized. Fastening hardware shall be concealed from the face of each panel and post. The mesh, posts, clamps and associated hardware are to be galvanized with an exterior finish coating capable of withstanding repeat climate variances within Southern Ontario.

1.1 High Security Fence

(a) When directed by Metrolinx the Contractor shall install high security fencing at ROW limits, at layover yards and at other locations instructed by Metrolinx. The manufacturer and product name of approved High Security fencing are listed below. Proposed equivalents recommended by the contractor will be subject to approval by Metrolinx prior to installation.

(i) Cochrane-ClearVu

(ii) BETA FENCE- Securifor 3D

(iii) CLD- Securis Profiled

(iv) Bear Mountain - Bear Securi Mesh Barrier

(b) The high security fence height above ground shall be 2.4 m.

(c) The panel mesh shall consist of a minimum 4mm diameter high tensile wire, with aperture sizes (openings) 76.2 x 12.7 mm centers or smaller fastened to suitable posts that allow for a minimum foundation depth of 1200 mm.

(d) The fence panels shall be strengthened with factory formed undulations within each mesh panel. Mechanical Fasteners - Shall be tamper proof and mechanically galvanized. Fastening Hardware shall be concealed from the non-rail side of each panel and post.

(e) Mesh to be galvanized with an exterior finish coating capable of withstanding typical climate variances within Southern Ontario.

(f) Specification sheets and breach testing results for any proposed alternate products and materials shall be submitted to Metrolinx staff for approval.

FRENCH DRAIN DETAIL

200mm TOPSOIL & SOD

19mm-50mm CLEAR STONE IN FILTER MATERIAL

150mm PERFORATED SUBDRAIN C/W FILTER SOCK

150mm

150mm

150mm

REVISIONS	DATE	SCALE	N.T.S.

JONES CONSULTING GROUP LTD.

229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

PIPE IN SUPPORTED EXCAVATION

PIPE IN UNSUPPORTED EXCAVATION

CLASS B BEDDING

PIPE IN UNSUPPORTED EXCAVATION

PIPE IN SUPPORTED EXCAVATION

CLASS C BEDDING

CLEARANCE TABLE

PIPE INSIDE DIAMETER	CLEARANCE
900 or less	300
Over 900	500

LEGEND:

ϕ - Inside diameter

$\oslash$ - Outside diameter

NOTES:

1 Height of fill is measured from the finished surface to top of pipe.

2 The minimum bedding depth below the pipe shall be 0.15 ϕ . In no case shall this dimension be less than 150mm or greater than 300mm.

3 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.

4 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.

5 Condition of excavation is symmetrical about centreline of pipe.

A Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.

B All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

RIGID PIPE BEDDING, COVER, AND BACKFILL

TYPE 4 SOIL - EARTH EXCAVATION

Nov 2015 Rev 3

OPSD 802.032

PEDESTRIAN BARRICADE INSTALLATION

SECTION A-A

SECTION B-B

JOINT DETAIL

PEDESTRIAN BARRICADE INSTALLATION

OPSD 980.101

STORM SEWER INSULATION DETAIL

(N.T.S.)

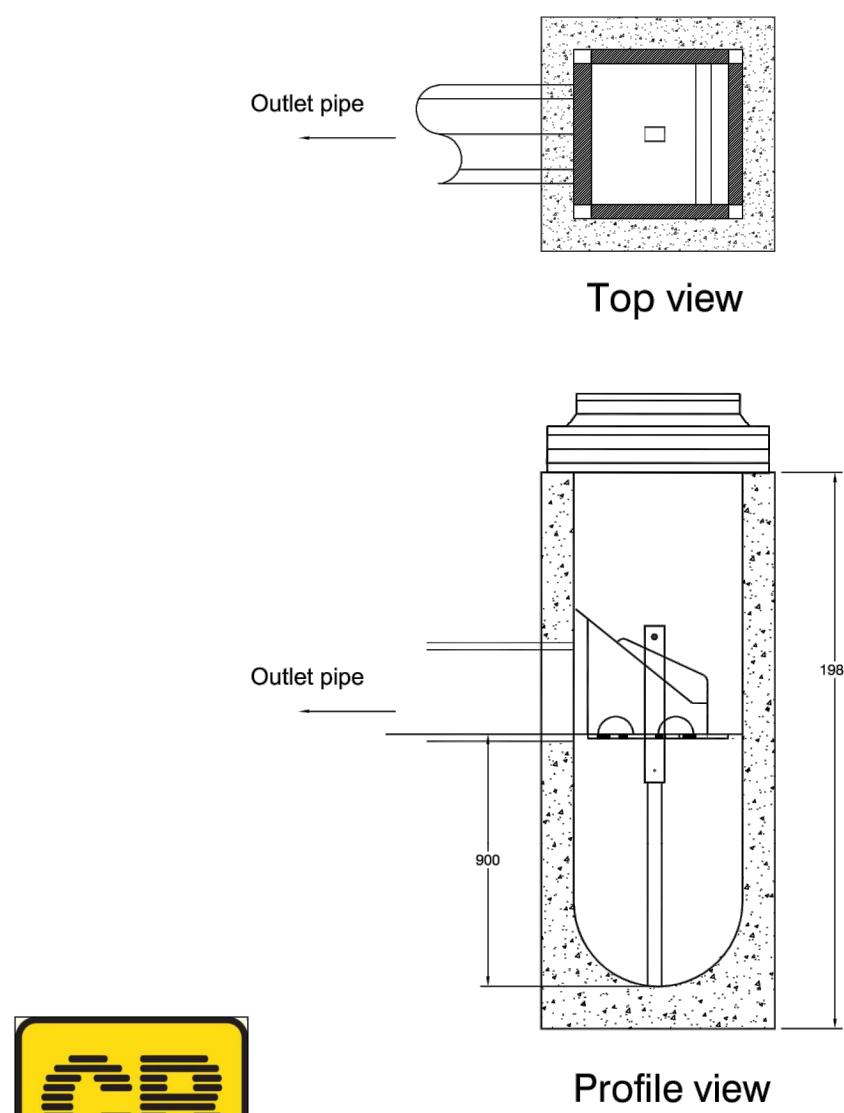
100mm THICK x W WIDE (1 SECTION) HI-40 EXTRUDED POLYSTYRENE INSULATION STYROFOAM SM OR APPROVED EQUIVALENT. SECTIONS TO BE TAPED ALONG THE ENTIRE LENGTH OF EACH SEAM TO PREVENT MOVEMENT. BEDDING TO BE PLACED TO APPROX. 50mm ABOVE TOP OF SEWER ACROSS ENTIRE WIDTH OF TRENCH BEFORE PLACING INSULATION. ENSURE MIN 1.5m COVER AT EACH END OF INSULATED SECTION.

NOTE:

PER MINISTRY OF THE ENVIRONMENT GUIDELINES CALCULATION FOR WIDTH OF INSULATION AS FOLLOWS:

$W = 2(x + D) + d$ WHERE x = FROST PENETRATION, D = DEPTH OF COVER, d = PIPE DIA.

- Notes**
1. CB Shield can be installed at any time. In a non frozen condition.
 2. The frame and cover **MUST BE well aligned** with the catchbasin for proper installation.
 3. The catchbasin sump must be clean before installation
 4. The grate should be at the same level as the standing water in the sump.



CB Shield (900mm Sump)

Detail #1

Notes:

1. To be interpreted in conjunction with the current Water Transmission and Distribution Policies and Design Guidelines, the Approved Manufacturers Products for Linear Water Systems list and BSD-515 for tracer wire detail.
2. See Detail #1 for PVC push-on joint.
3. All concrete thrust blocks to be poured against undisturbed ground.
4. Polyethylene bond breaker to be used between concrete and fittings.
5. Bolts for buried flange connections are to be stainless steel.
6. Hydrant lead shall be restrained from wetmain to hydrant boot.

Standard Hydrant and Valve Installation

REV No. 2

DATE: April 2019

SCALE: N.T.S.

BSD-507

ALTERNATIVES

A CAST-IN-PLACE BASE

B TAPERED TRANSITION SLAB

C 1200mm PRECAST FLAT CAP

D 1800mm PRECAST FLAT CAP

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2014 Rev 5

PRECAST CONCRETE MAINTENANCE HOLE

1800mm DIAMETER

OPSD 701.012

PLAN

BEAM DETAIL

SECTION A-A

SECTION B-B

NOTES:

- 1 Outlet hole size 525mm diameter maximum, location as required.
- 2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
- 3 Minimum clearance between beam recess and hole for pipe shall be 300mm or minimum clearance can be 150mm with addition of two 15M size rebar on 45 degree diagonal.
- 4 Centre reinforcing in base slab and walls ± 20 mm.
- 5 Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
- 6 Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
- 7 Pipe support shall be according to OPSD 708.020.
- 8 All dimensions are nominal.
- 9 All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2019 Rev 4

PRECAST CONCRETE TWIN INLET CATCH BASIN

600 x 1450mm

OPSD 705.020

BENCHMARK:

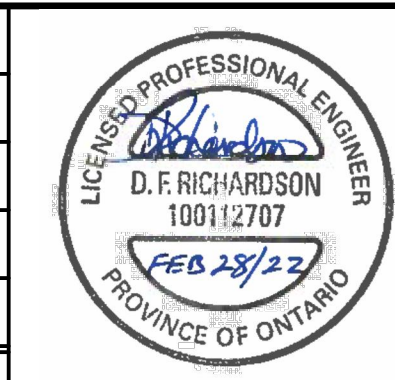
BENCHMARK NO: 01019805454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE E OVER LOVELL CREEK, 0.85km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTHEAST CORNER OF BRIDGE, 18cm TOP OF CORNER. N4910788.589 E807284.100 ELEV 241.661

BENCHMARK NO: 03120030029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL, AND TABLET IS ON THE SOUTHWEST SIDE OF THE FLAGPOLE BASE. N4911010 E807799 ELEV 250.509

BENCHMARK NO: 03100100004 LOCATED ON THE SOUTH LINE OF MAPLEVIEW DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910878.122 E807801.062 ELEV 248.996

BENCHMARK NO: 03120110013 LOCATED ON LOCHART ROAD ON THE NORTH SIDE OF THE BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION. N4900870.257 E806733.580 ELEV 252.807

NO.	REVISIONS	DATE	INITIAL
4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF

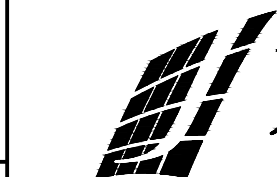


PRATT HANSEN GROUP INC.

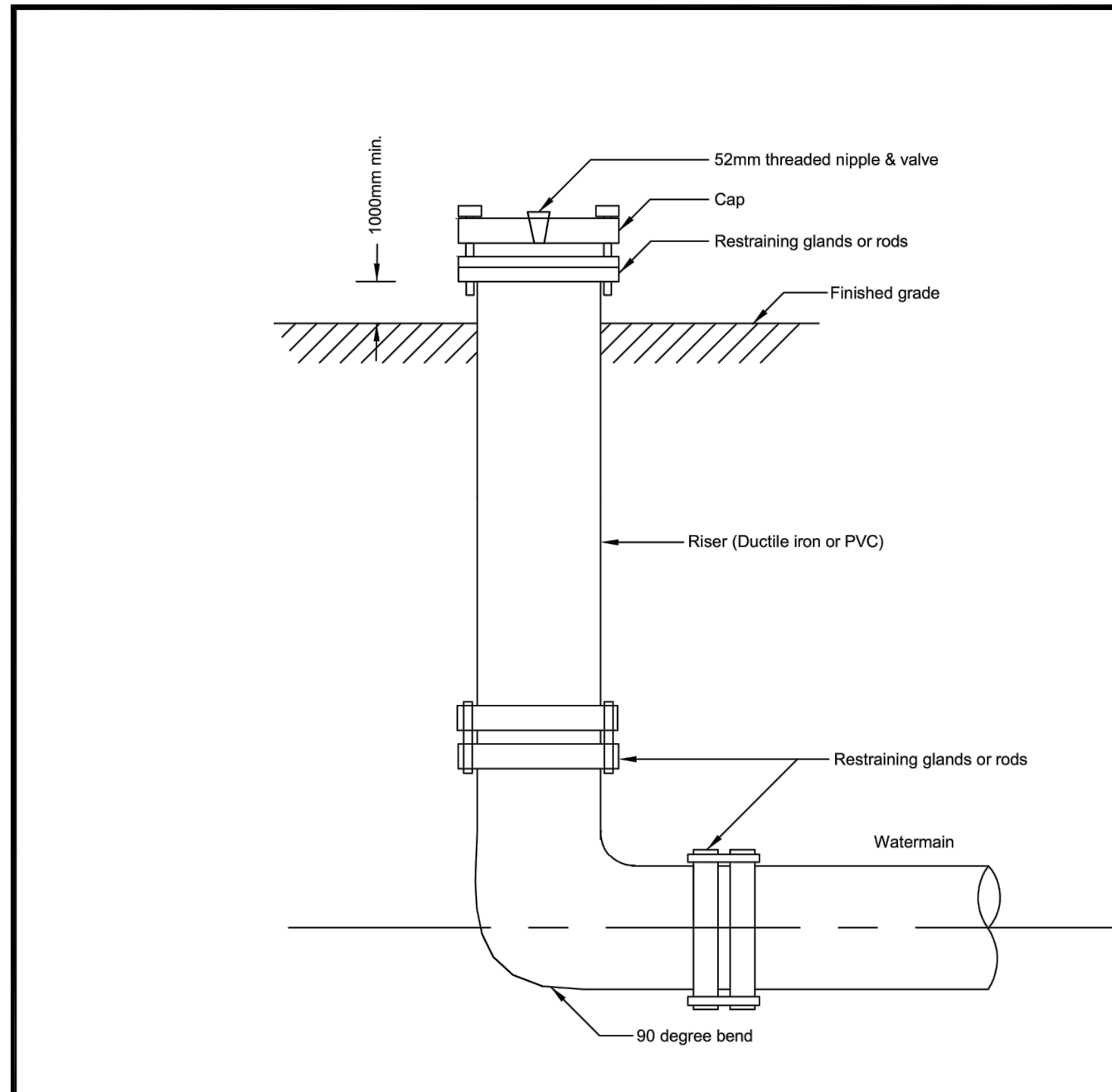
ELEMENTS SITE PLAN

CITY OF BARRIE

STANDARD DETAILS



DESIGN	MF	SCALE: N/A	DATE: JANUARY 2021
DRAWN	KS	PROJECT	DWG. NO
CHECKED	DR	PRA-19078	DET-3

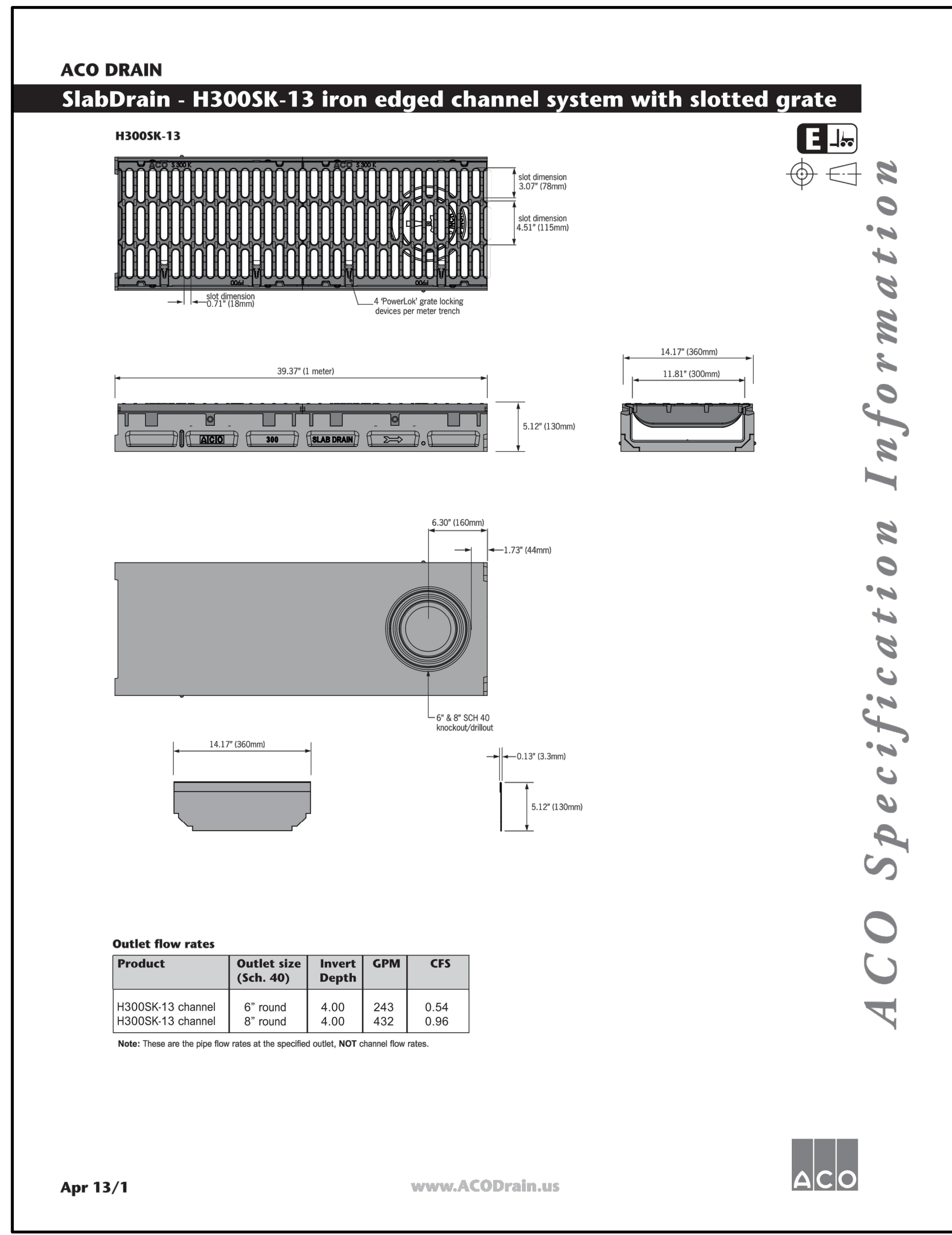
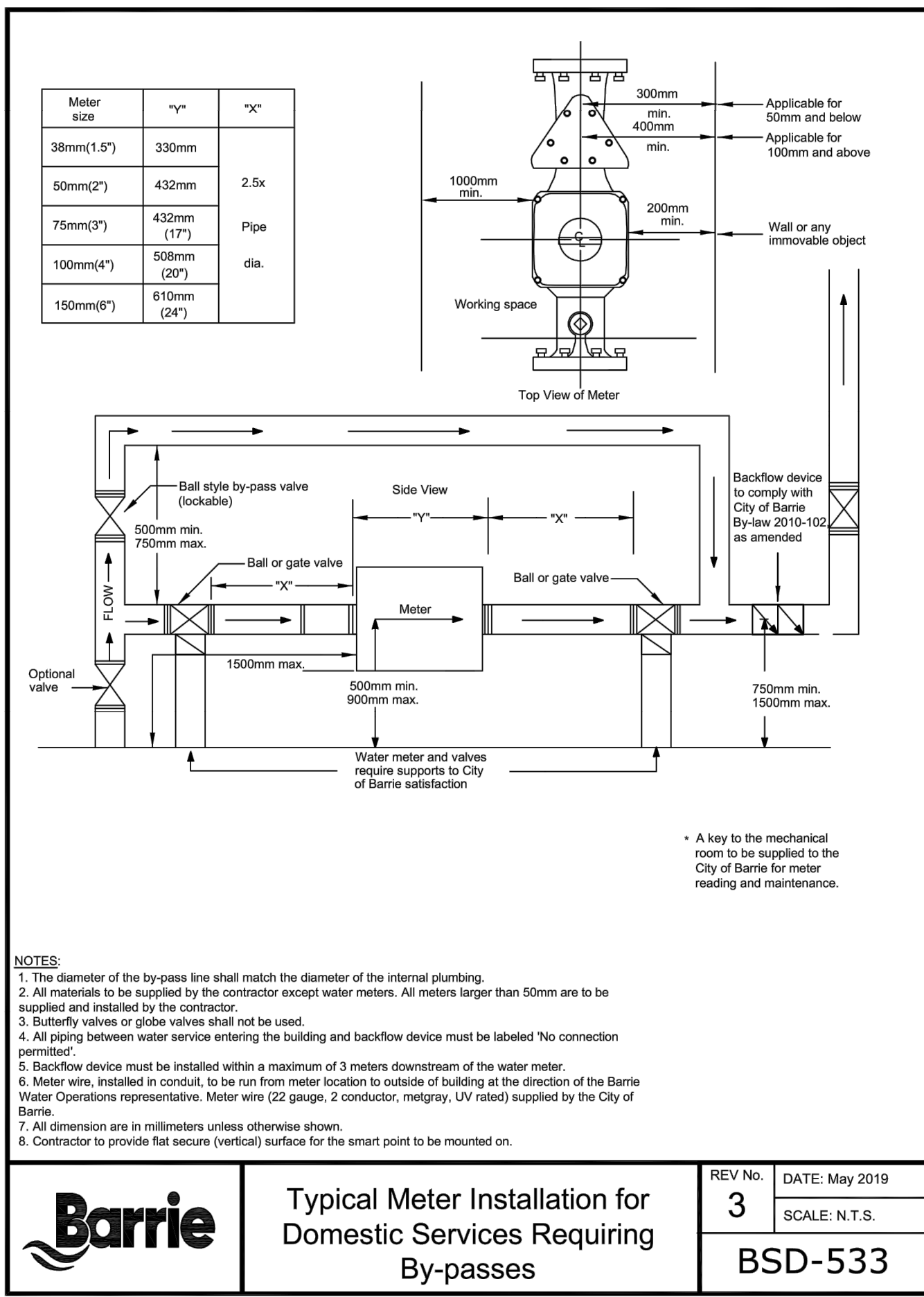
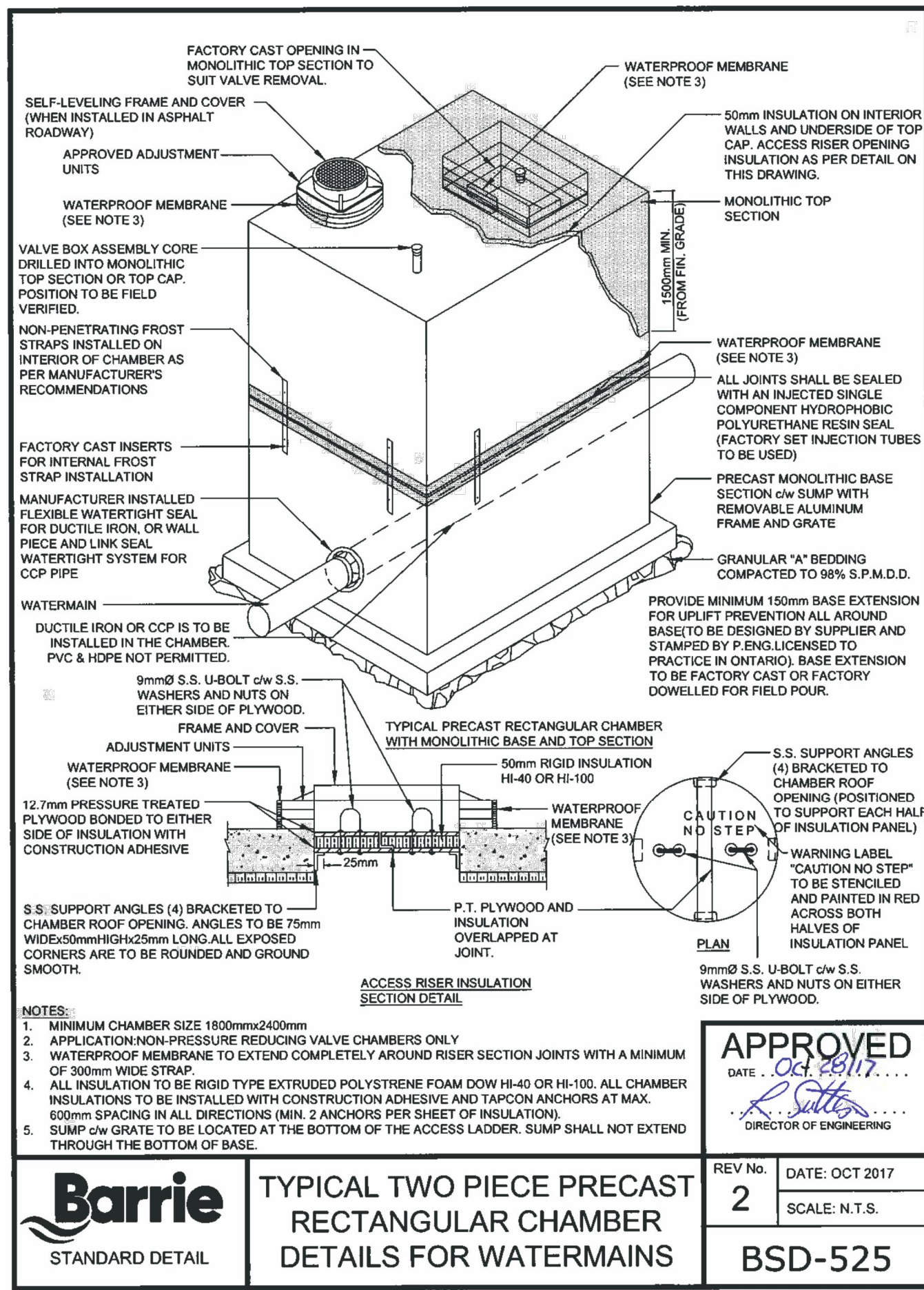
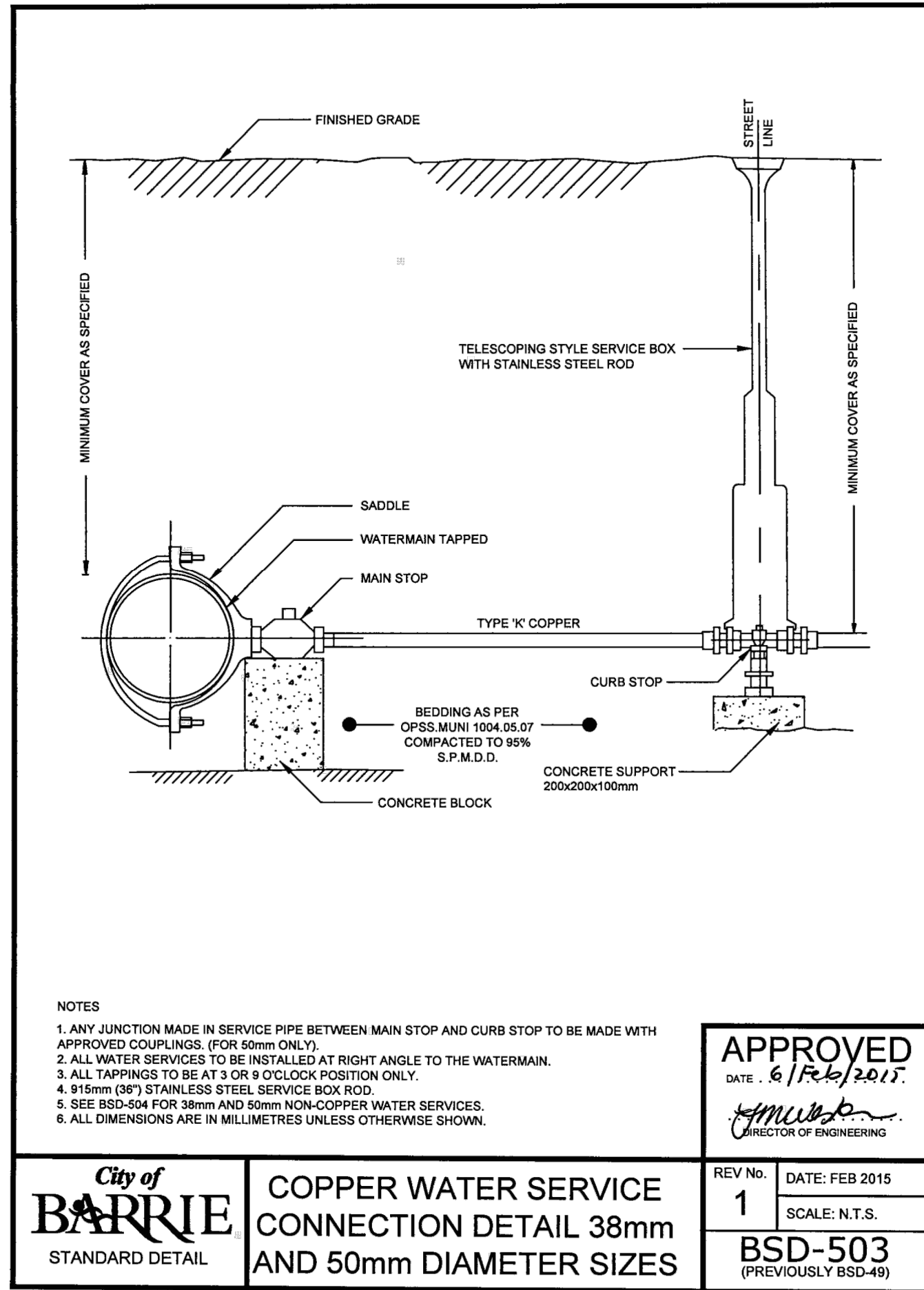
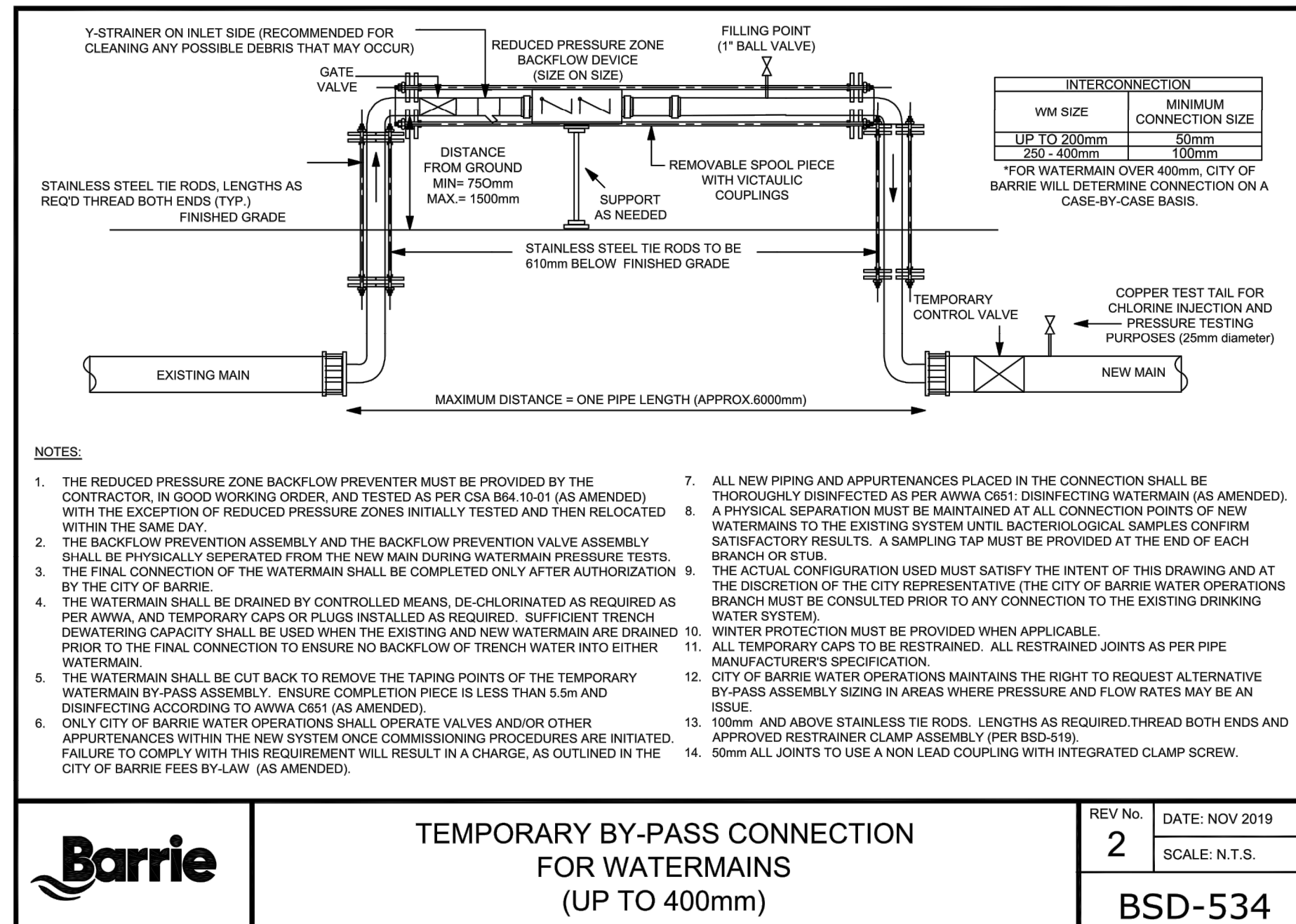
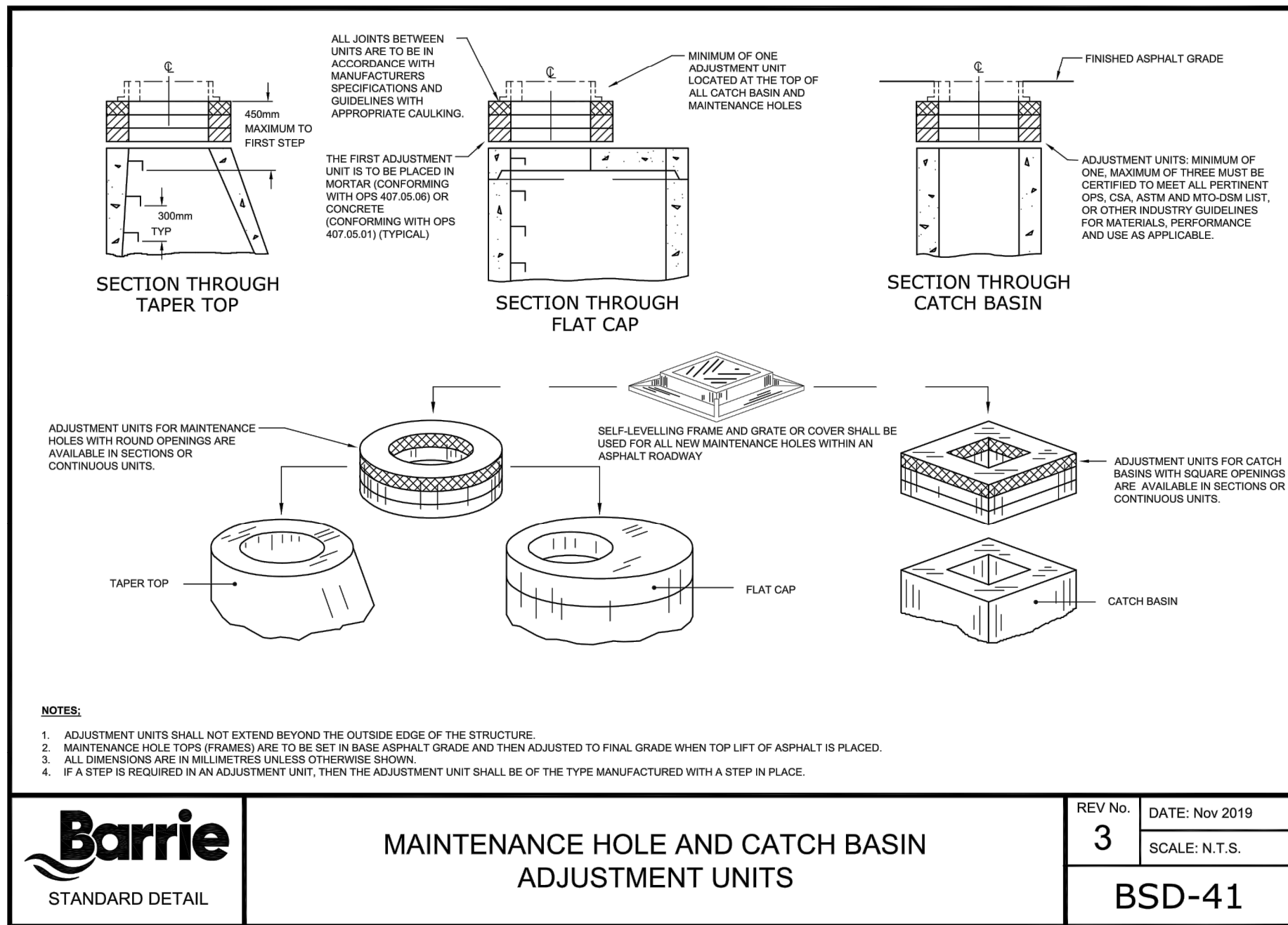


- NOTES:
1. All dimensions are in millimeters unless otherwise shown.
 2. Restraining glands or rods to be used for restraint.



Temporary Riser Installation

REV No.	2	DATE: May 2019
SCALE: N.T.S.		
BSD-510		



BENCHMARK:

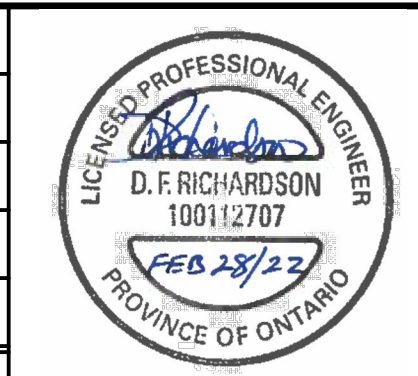
BENCHMARK NO: 0101985454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE E OVER LOVER'S CREEK, 0.85KM EAST OF HURONIA ROAD. TABLET IS SET HORIZONTAL IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 19cm TOP OF CORNER. N4910788.589 E807284.100 ELEV 241.661

BENCHMARK NO: 03120030229 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE FLAGPOLE BASE SOUTH FROM THE SOUTHWEST CORNER OF THE MAIN ENTRANCE TO SCHOOL, AND TABLET IS ON THE SOUTHWEST SIDE OF THE FLAGPOLE BASE. N4911810 E807799 ELEV 230.559

BENCHMARK NO: 03120000034 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910878.122 E807601.062 ELEV 248.996

BENCHMARK NO: 03120110013 LOCATED ON LOOCHART ROAD ON THE NORTH SIDE OF THE BOULEVARD, APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION. N4909870.257 E808733.500 ELEV 232.807

NO.	REVISIONS	DATE	INITIAL
4	4TH DETAILED DESIGN SUBMISSION	22-02-28	DR
3	3RD DETAILED DESIGN SUBMISSION	21-12-20	MF
2	2ND DETAILED DESIGN SUBMISSION	21-09-03	MF
1	1ST DETAILED DESIGN SUBMISSION	21-02-12	MF



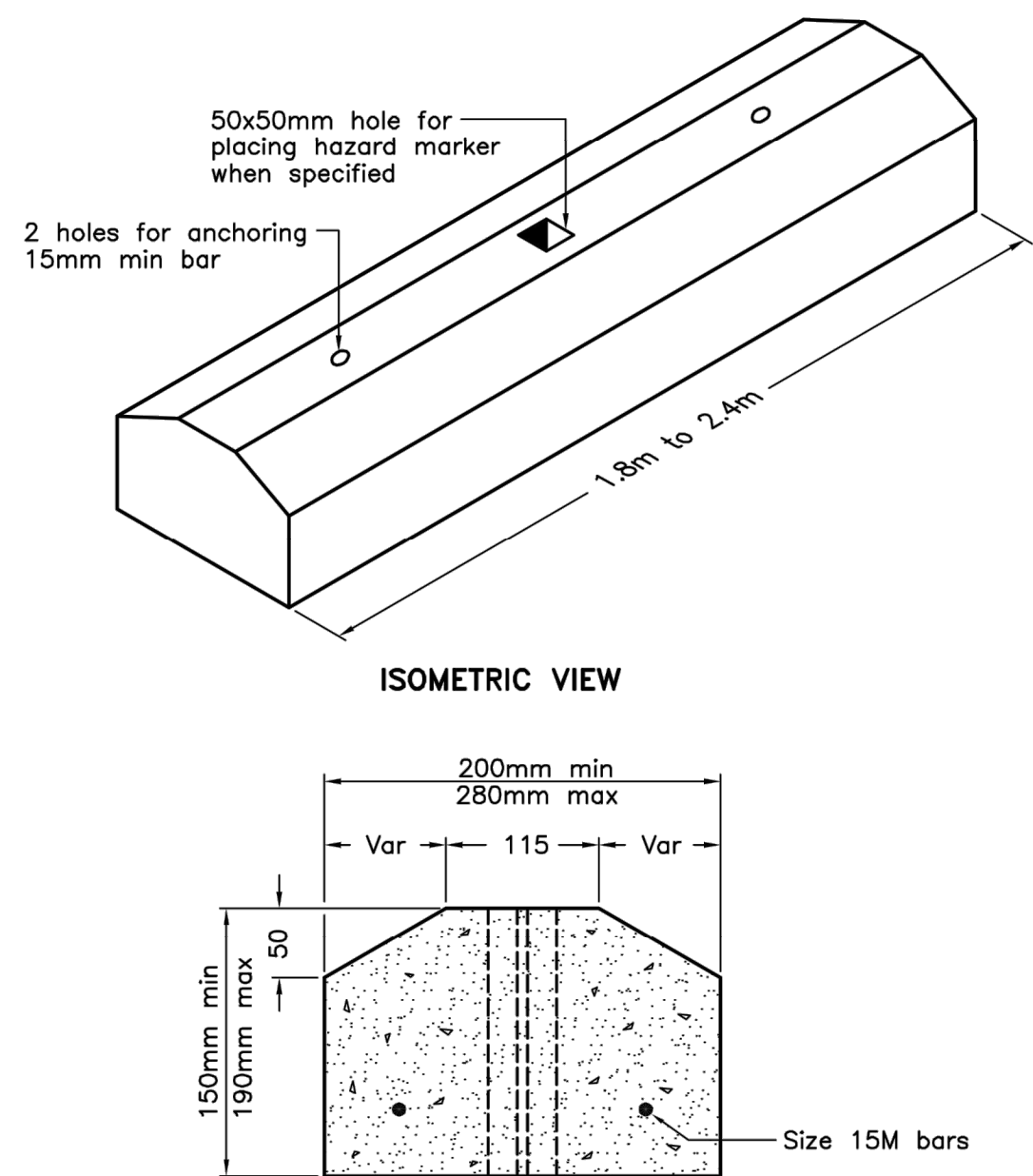
PRATT HANSEN GROUP INC.
ELEMENTS SITE PLAN
CITY OF BARRIE

STANDARD DETAILS



DESIGN	MF	SCALE: N/A	DATE: JANUARY 2021
DRAWN	KS	PROJECT: PRA-19078	DWG. NO: DWG. N9
CHECKED	DR		DET-4

229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W6
P. 705.734.2538
F. 705.734.1056



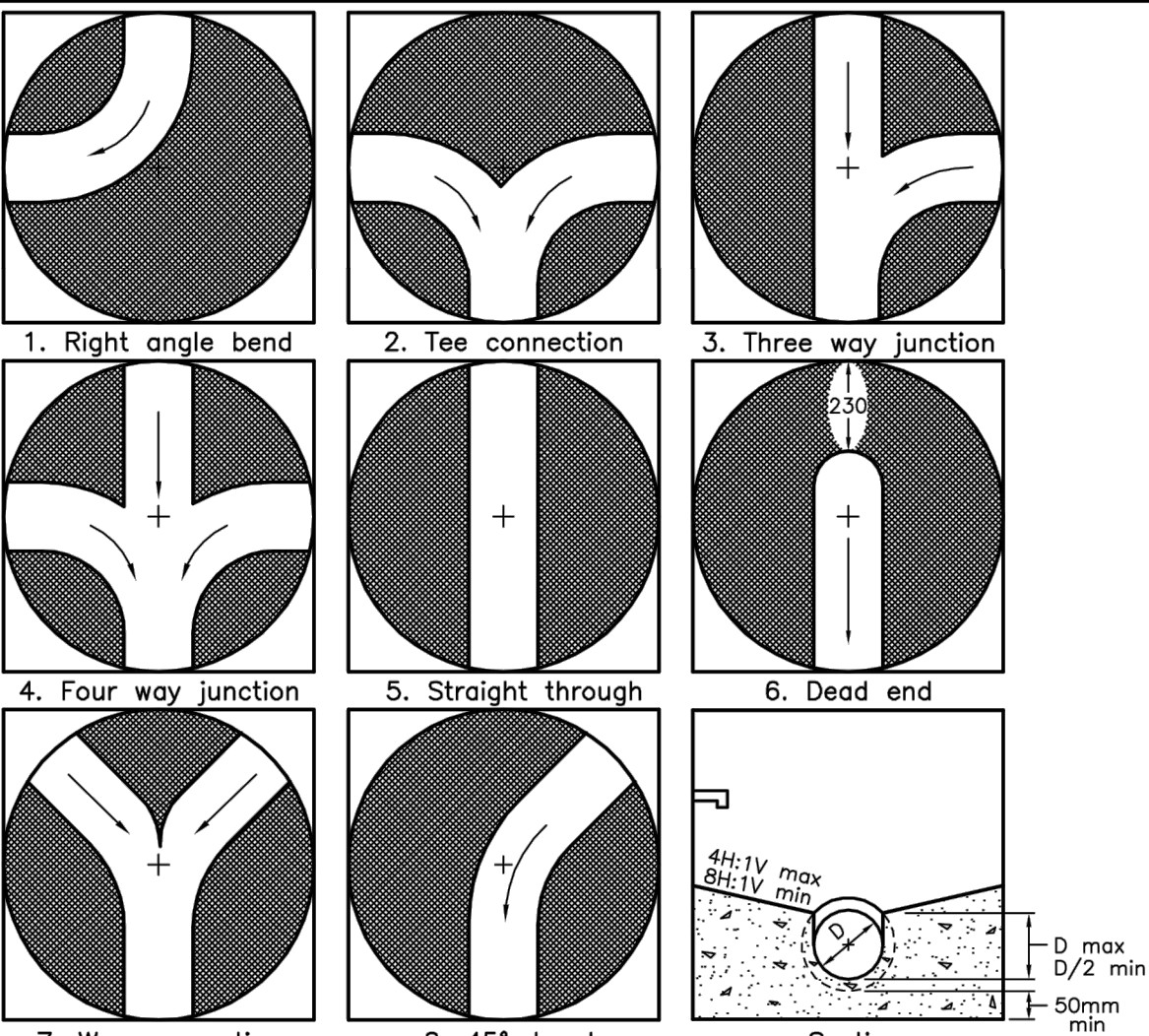
NOTES:
A Class of concrete shall be C2 according to CSA A23.1.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2012 Rev 2

PRECAST CONCRETE CURB

OPSD 603.020



MAXIMUM SIZE HOLE IN THE WALL IN PRECAST RISER SECTIONS					
Maintenance Hole Diameter	No. 1-4		No. 5 and 6		No. 7
	Inlet Hole	Outlet Hole	Inlet Hole	Outlet Hole	Inlet 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

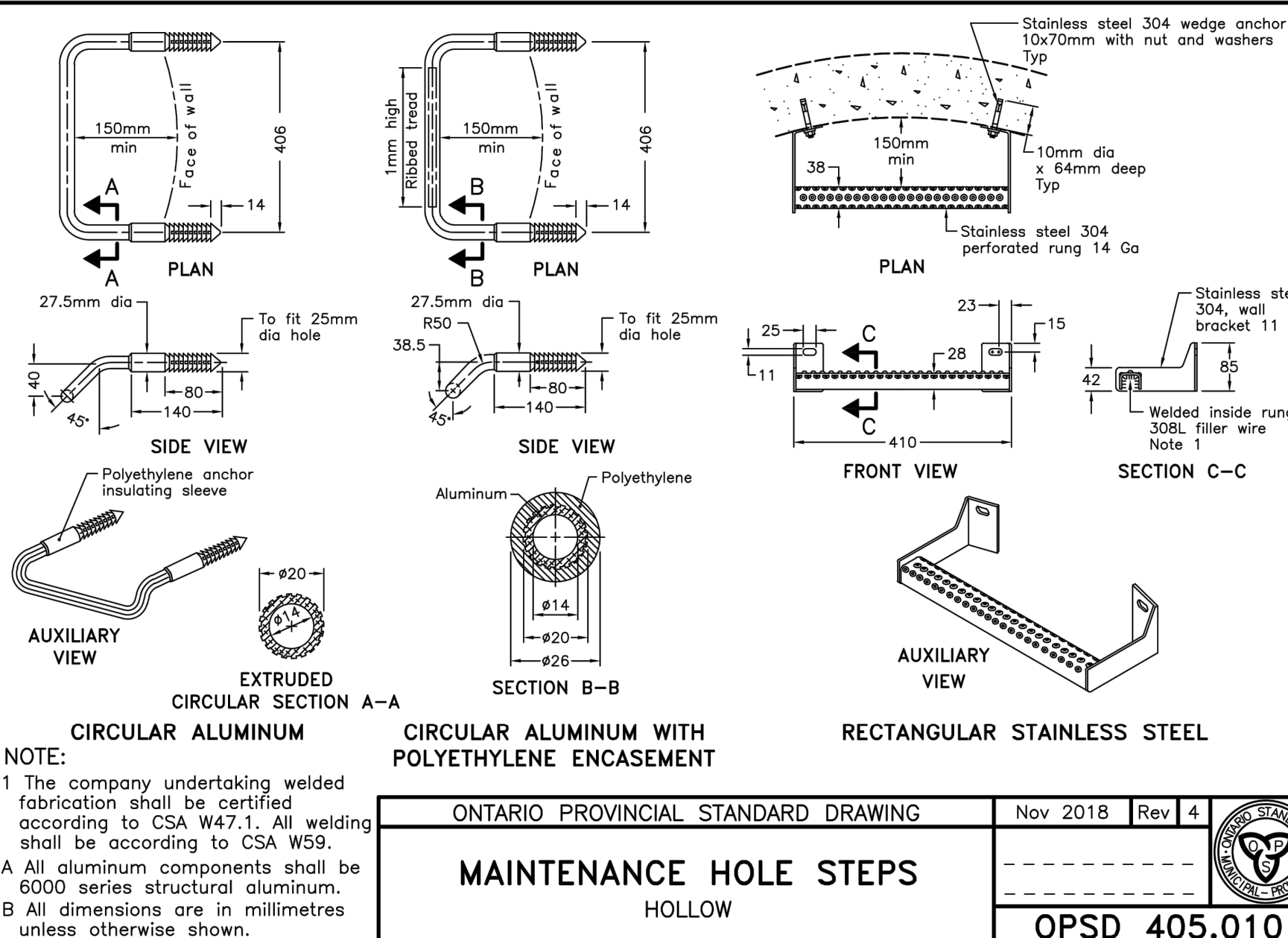
NOTES:
1 Slopes shall be maintained from the outlet hole opening for top of benching.
A Concrete for benching shall be 30MPa.
B When benching is hand-finished, it shall be given wood float finish, channel shall be given steel trowel finish.
C Benchings slope and height shall be as specified.
D When specified, maintenance holes that are 1200mm in diameter with a uniform channel for 200 or 250mm pipe may be prebent 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



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.

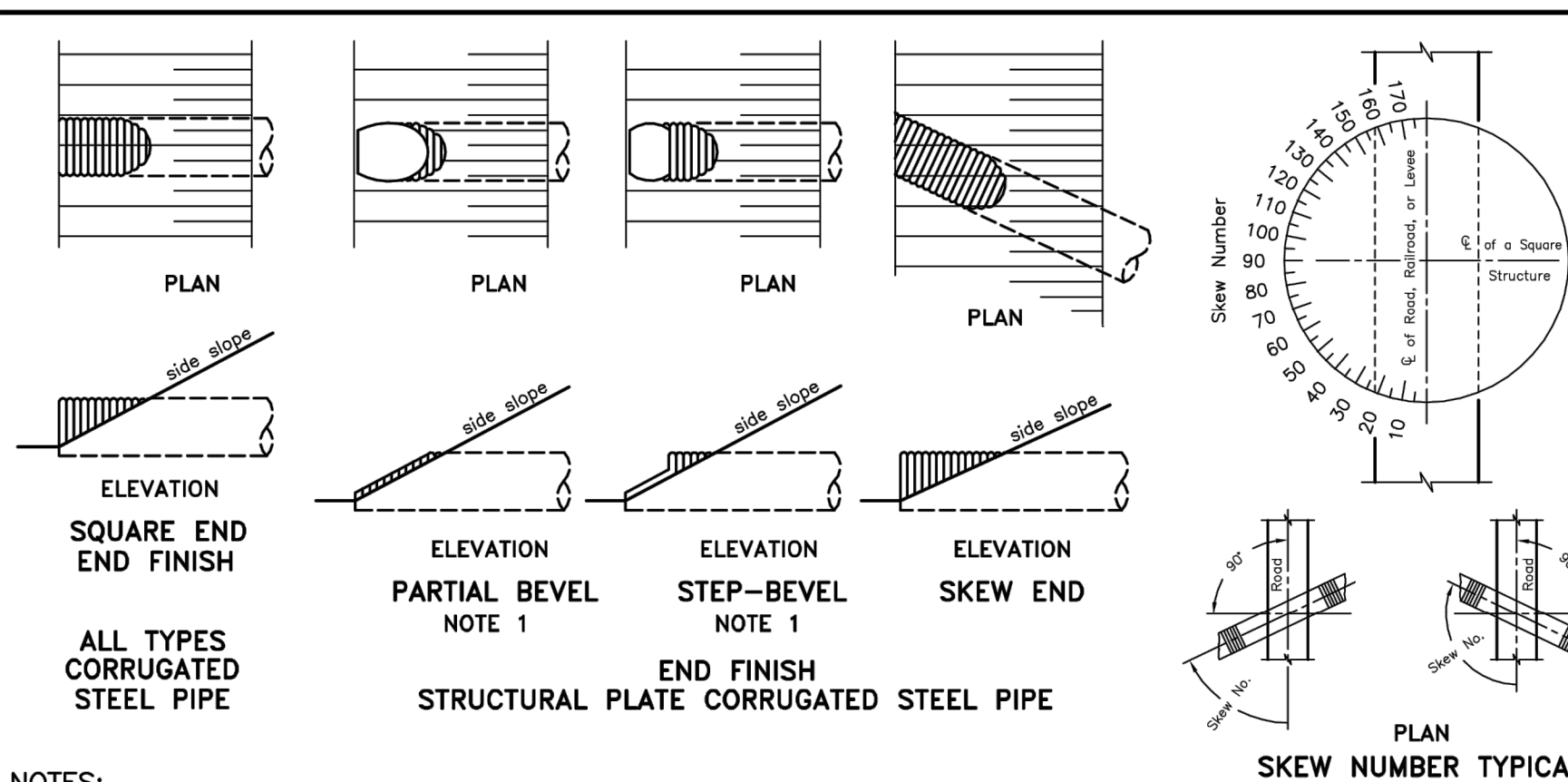
ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2018 Rev 4

MAINTENANCE HOLE STEPS

HOLLOW

OPSD 405.010



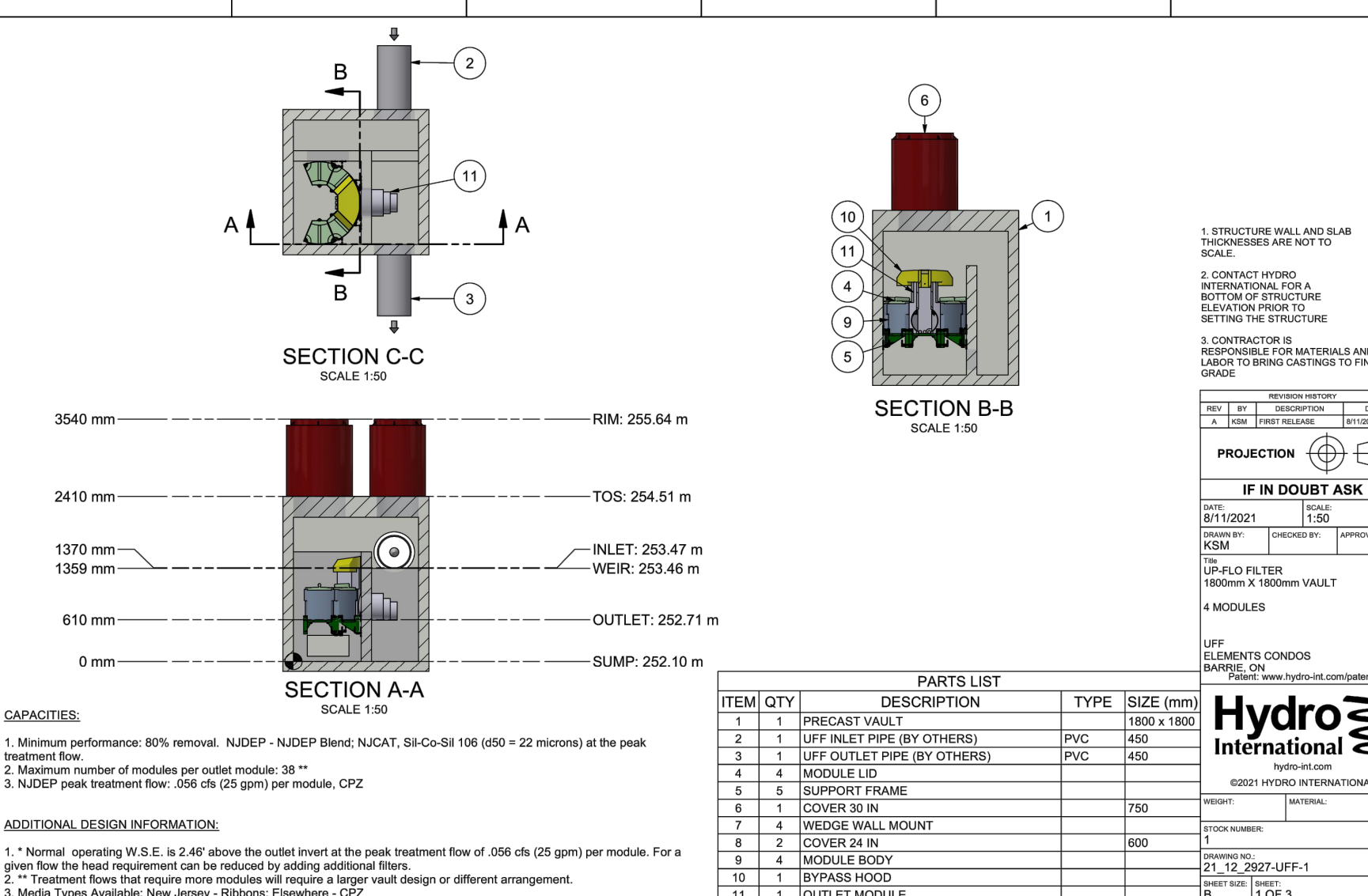
NOTES:
1 For a partial bevel or a step-bevel cut end finish, this OPSD shall be read in conjunction with OPSD 801.030.
A A skew end cut end finish shall not be combined with a partial bevel or a step-bevel cut end finish.
B Square end, partial bevel, or step-bevel cut end finish may be used on a culvert installed on a skew between skew numbers 60 and 120.
C A skew end cut end finish may be used on a culvert installed on a skew between skew numbers 50 and 130.
D Reinforcement of pipe ends or contour grading of embankment slope shall be as specified.
E Slope protection shall be as specified.
F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2017 Rev 3

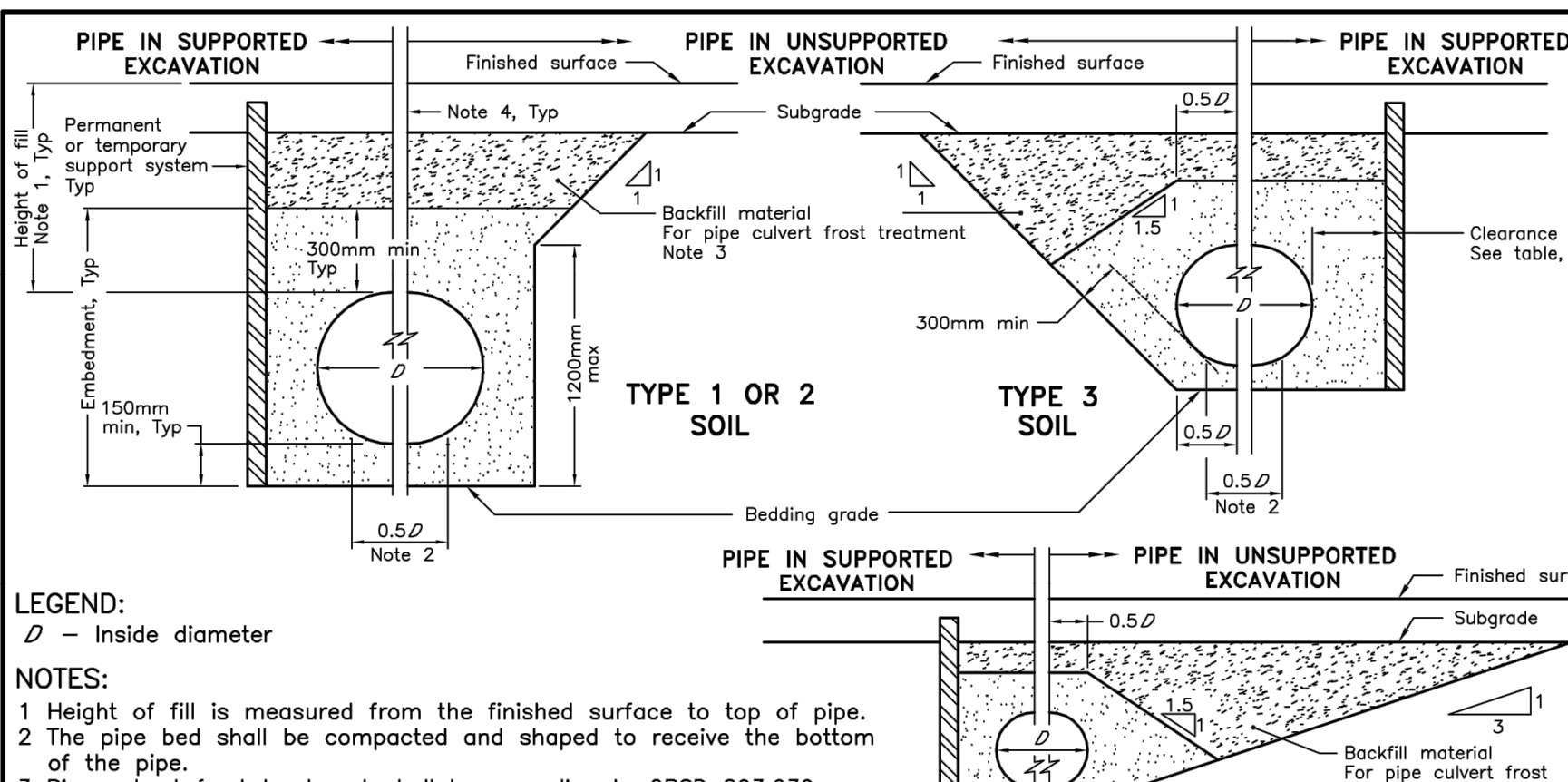
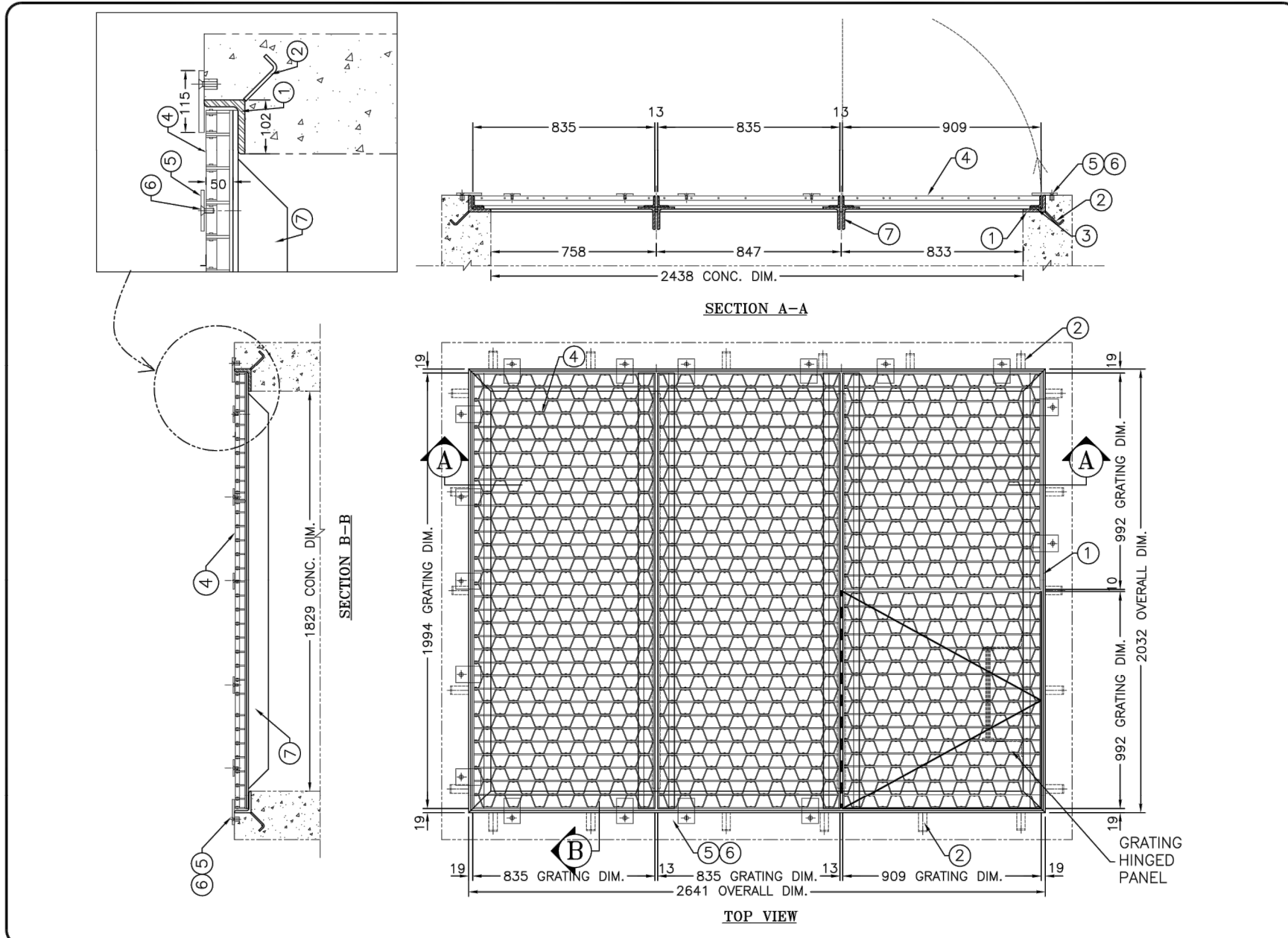
CUT END FINISH
CIRCULAR PIPE AND PIPE-ARCH
CORRUGATED STEEL PIPE

OPSD 801.010



NOTES:
1 Minimum performance: 80% removal. NDEP: NDEP Blend; NCAT: Si-Cu-Si 108 (59 + 22 microns) at the peak treatment flow.
2 Maximum number of modules per outlet module: 38.
3 NDEP peak treatment flow: .056 cfs (25 gpm) per module, CPZ.
ADDITIONAL DESIGN INFORMATION:
1. Normal operating W.S.E. is 2.40' above the outlet invert at the peak treatment flow of .056 cfs (25 gpm) per module. For a given flow the head requirement can be reduced by adding additional filters.
2. Treatment flows that require more modules will require a larger vault design or different arrangement.
3. Media Types Available: New Jersey - Ritecon; Elsewhere - CPZ.

ITEM	QTY	DESCRIPTION	TYPE	SIZE (mm)
1	1	PRECAST VAULT	PVC	1800 x 1800
2	1	UP INLET PIPE (BY OTHERS)	PVC	450
3	1	UP OUTLET PIPE (BY OTHERS)	PVC	450
4	4	MODULE LID		
5	5	SUPPORT FRAME		
6	1	COVER 30 IN	750	
7	4	WEDGE WALL MOUNT		
8	2	COVER 24 IN	600	
9	4	MODULE BODY		
10	1	BYPASS HOOD		
11	1	OUTLET MODULE		



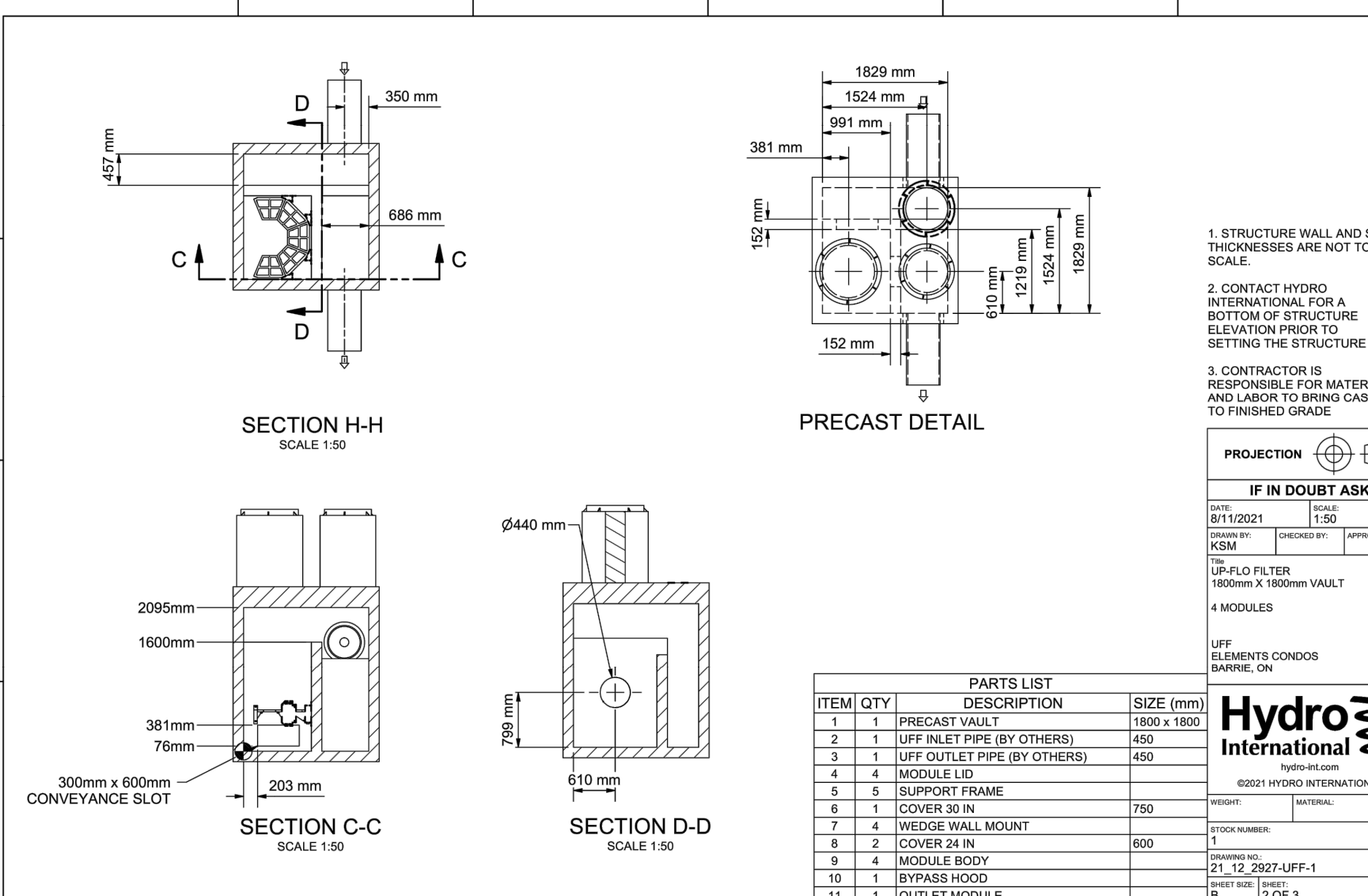
NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embankment 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



ITEM	QTY	DESCRIPTION	TYPE	SIZE (mm)
1	1	PRECAST VAULT	PVC	1800 x 1800
2	1	UP INLET PIPE (BY OTHERS)	PVC	450
3	1	UP OUTLET PIPE (BY OTHERS)	PVC	450
4	4	MODULE LID		
5	5	SUPPORT FRAME		
6	1	COVER 30 IN	750	
7	4	WEDGE WALL MOUNT		
8	2	COVER 24 IN	600	
9	4	MODULE BODY		
10	1	BYPASS HOOD		
11	1	OUTLET MODULE		

ITEM	QTY	DESCRIPTION	TYPE	SIZE (mm)
1	1	PRECAST VAULT	PVC	1800 x 1800
2	1	UP INLET PIPE (BY OTHERS)	PVC	450
3	1	UP OUTLET PIPE (BY OTHERS)	PVC	450
4	4	MODULE LID		
5	5	SUPPORT FRAME		
6	1	COVER 30 IN	750	
7	4	WEDGE WALL MOUNT		
8	2	COVER 24 IN	600	
9	4	MODULE BODY		
10	1	BYPASS HOOD		
11	1	OUTLET MODULE		

STEPCON		
2364 Balsam Rd., Unit 20-21 Mississauga, ONTARIO L4Y 1Y8 VOICE: (905) 897-6000 FAX: (905) 897-6001 Toll Free: 1-888-STEPCON		
#	QTY.	MATERIAL DESCRIPTION
1	1	GRAV. STEEL CSA 1520x1530mm (L20)
2	1	GRAV. STEEL CSA 1520x1530mm (L20)
3	1	GRAV. STEEL CSA 1520x1530mm (L20)
4	1	GRAV. STEEL CSA 1520x1530mm (L20)
5	1	GRAV. STEEL CSA 1520x1530mm (L20)
6	1	GRAV. STEEL CSA 1520x1530mm (L20)
7	1	GRAV. STEEL CSA 1520x1530mm (L20)
8	1	GRAV. STEEL CSA 1520x1530mm (L20)
9	1	GRAV. STEEL CSA 1520x1530mm (L20)
10	1	GRAV. STEEL CSA 1520x1530mm (L20)
11	1	GRAV. STEEL CSA 1520x1530mm (L20)
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98	1	GRAV. STEEL CSA 1520x1530mm (L20)
99	1	GRAV. STEEL CSA 1520x1530mm (L20)
100	1	GRAV. STEEL CSA 1520x1530mm (L20)

DITCH INLET		
GALVANIZED STEEL GRATING PANELS		
1	1	GRAV. STEEL CSA 1520x1530mm (L20)
2	1	GRAV. STEEL CSA 1520x1530mm (L20)
3	1	GRAV. STEEL CSA 1520x1530mm (L20)
4	1	GRAV. STEEL CSA 1520x1530mm (L20)
5	1	GRAV. STEEL CSA 1520x1530mm (L20)
6	1	GRAV. STEEL CSA 1520x1530mm (L20)
7	1	GRAV. STEEL CSA 1520x1530mm (L20)
8	1	GRAV. STEEL CSA 1520x1530mm (L20)
9	1	GRAV. STEEL CSA 1520x1530mm (L20)
10	1	GRAV. STEEL CSA 1520x1530mm (L20)
11	1	GRAV. STEEL CSA 1520x1530mm (L20)
12	1	GRAV. STEEL CSA 1520x1530mm (L20)
13	1	GRAV. STEEL CSA 1520x1530mm (L20)
14	1	GRAV. STEEL CSA 1520x1530mm (L20)
15	1	GRAV. STEEL CSA 1520x1530mm (L20)
16	1	GRAV. STEEL CSA 1520x1530mm (L20)
17	1	GRAV. STEEL CSA 1520x1530mm (L20)
18	1	GRAV. STEEL CSA 1520x1530mm (L20)
19	1	GRAV. STEEL CSA 1520x1530mm (L20)
20	1	GRAV. STEEL CSA 1520x1530mm (L20)
21	1	GRAV. STEEL CSA 1520x1530mm (L20)
22	1	GRAV. STEEL CSA 1520x1530mm (L20)
23	1	GRAV. STEEL CSA 1520x1530mm (L20)
24	1	GRAV. STEEL CSA 1520x1530mm (L20)
25	1	GRAV. STEEL CSA 1520x1530mm (L20)
26	1	GRAV. STEEL CSA 1520x1530mm (L20)
27	1	GRAV. STEEL CSA 1520x1530mm (L20)
28	1	GRAV. STEEL CSA 1520x1530mm (L20)
29	1	GRAV. STEEL CSA 1520x1530mm (L20)
30	1	GRAV. STEEL CSA 1520x1530mm (L20)
31	1	GRAV. STEEL CSA 1520x1530mm (L20)
32	1	GRAV. STEEL CSA 1520x1530mm (L20)
33	1	GRAV. STEEL CSA 1520x1530mm (L20)
34	1	GRAV. STEEL CSA 1520x1530mm (L20)
35	1	GRAV. STEEL CSA 1520x1530mm (L20)
36	1	GRAV. STEEL CSA 1520x1530mm (L20)
37	1	GRAV. STEEL CSA 1520x1530mm (L20)
38	1	GRAV. STEEL CSA 1520x1530mm (L20)
39	1	GRAV. STEEL CSA 1520x1530mm (L20)
40	1	GRAV. STEEL CSA 1520x1530mm (L20)
41	1	GRAV. STEEL CSA 1520x1530mm (L20)
42	1	GRAV. STEEL CSA 1520x1530mm (L20)
43	1	GRAV. STEEL CSA 1520x1530mm (L20)
44	1	GRAV. STEEL CSA 1520x1530mm (L20)
45	1	GRAV. STEEL CSA 1520x1530mm (L20)
46	1	GRAV. STEEL CSA 1520x1530mm (L20)
47	1	GRAV. STEEL CSA 1520x1530mm (L20)
48	1	GRAV. STEEL CSA 1520x1530mm (L20)
49	1	GRAV. STEEL CSA 1520x1530mm (L20)
50	1	GRAV. STEEL CSA 1520x1530mm (L20)
51	1	GRAV. STEEL CSA 1520x1530mm (L20)
52	1	GRAV. STEEL CSA 1520x1530mm (L20)
53	1	GRAV. STEEL CSA 1520x1530mm (L20)
54	1	GRAV. STEEL CSA 1520x1530mm (L20)
55	1	GRAV. STEEL CSA 1520x1530mm (L20)
56	1	GRAV. STEEL CSA 1520x1530mm (L20)
57	1	GRAV. STEEL CSA 1520x1530mm (L20)
58	1	GRAV. STEEL CSA 1520x1530mm (L20)
59	1	GRAV. STEEL CSA 1520x1530mm (L20)
60	1	GRAV. STEEL CSA 1520x1530mm (L20)
61	1	GRAV. STEEL CSA 1520x1530mm (L20)
62		