FUNCTIONAL SERVICING REPORT

SHAYNE AVENUE

Town of Fort Erie, Ontario

Prepared by: Quartek Group Inc. Engineers, Architects & Planners 89-91 St. Paul Street, Suite 100 St. Catharines, ON 905-984-8676 www.quartekgroup.com



QGI File: 22003

Aug 2022

Shayne Avenue Fort Erie, ON

Functional Servicing Report

Contents

1.0 Introduction	1
2.0 Background	1
3.0 Development Proposal	1
4.0 Water Supply and Distribution	3
5.0 Sanitary Drainage	3
6.0 Storm Drainage and Stormwater Management	4
7.0 Parking and Roadways	4
8.0 Utility Servicing	4
9.0 Service Locations	4

Attachments

Sanitary Design Sheet 22003-STM-1 Sanitary Drainage Areas Storm Design Sheet 22003-SAN-1 Storm Drainage Areas PP-01 PP-02 G-1 D-1

Functional Servicing Report Shayne Avenue, Fort Erie, ON 05 Aug 2022



1.0 Introduction

This functional servicing report (FSR) serves to demonstrate how servicing of the subject development can be appropriately achieved and to provide a basis for detailed engineering. This FSR will discuss the following key aspects of municipal design:

- Water Supply and Distribution
- Sanitary Sewerage
- Drainage and Stormwater Management
- Roadway
- Utility Servicing
- Servicing Locations

2.0 Background

This proposal contemplates new road construction in the untraveled right-of-way of Shayne Avenue and the reconstruction of Evelyn Avenue in the Crescent Park area of Fort Erie, immediately south of Garrison Road. An aerial map highlighting the subject property is shown in Figure 1.

Neighbouring properties are predominately low density residential.

3.0 Development Proposal

The current proposal is to construct the Shayne Avenue right-of-way (ROW) to a urban cross-section standard complete with barrier curb and standard width gutter. As a pre-requisite to development, the existing roadway of Evelyn Avenue, from Parkdale to Daytona is to be reconstructed to the same urban cross-section. The untraveled ROW of Shayne is currently grassed with some ditch drainage. The construction of Shayne Avenue will provide servicing for twenty two (22) single-detached residential lots.





Functional Servicing Report Shayne Avenue, Fort Erie, ON Page 2 of 4



4.0 Water Supply and Distribution

It is proposed to install 150mm diameter PVC (DR-18 CL235) watermain on Shayne between Orchard and Evelyn, and on Evelyn, between Daytona and Parkdale. No dead ends or loops are required as all new watermain will interconnect with existing municipal watermain.

Two new fire hydrants will be required to provide adequate coverage on Shayne Avenue. The hosepath distance to the farthest principal entrance (i.e. front door of Lot 13) would be less than the OBC maximum of 90m.

5.0 Sanitary Drainage

New 200mm diameter sanitary sewer is proposed for Shayne Avenue, draining to Evelyn Avenue, east of Shayne. The sewer would connect to the existing 300mmØ sanitary sewer on Daytona Drive. The attached sanitary design sheet and storm drainage area plan demonstrates anticipated design flows. The sanitary sewage collection system will cater for peak domestic flows and potential infiltration and inflow. Sanitary flows will be collected from each domicile through 100mm diameter service pipes per Town engineering standards.

The connection structure will be a new maintenance hole set on the existing sewer on the east side of Daytona.

Based on the grading plan, full depth basements will gravity sanitary service will be feasible, some exceeding 2.44m of clear height.

Based on the preceding analysis, it is expected that there are no impediments to connecting this this development to the existing municipal sewage works.



6.0 Storm Drainage and Stormwater Management

Urbanization of the Shayne Avenue right-of-way requires storm drainage to replace the overland and open channel conveyance as currently exists. Shayne Avenue lands currently receives some drainage from limited external areas to the north. This has been included as shown on drainage area plan 22003-STM-1 (attached).

A storm design sheet is attached demonstrating adequate conveyance without surcharge.

Grading design precludes road and lot runoff negatively impacting adjacent developments. Perimeter swales capture external runoff and runoff from new lot development.

The piping has been sized to meet the 2-year return-period design storm defined in the Fort Erie Municipal Standards.

A second engineering consultant is currently preparing design for stormwater conveyance and stormwater management works south of the Evelyn Avenue right-of-way. These works will provide the necessary quantity control and quality treatment to meet municipal and regional standards.

7.0 Parking and Roadways

The servicing and road construction drawings are based upon a Town of Fort Erie Urban 20m R.O.W. cross-section. Edge of pavement radii of 10.25m are used.

Proposed curbs within all areas are standard width curb and gutter per OPSD 600.040, 500mm in width. Driveways will be minimally 2%, maximally 5%. Gutter fall will vary between 0.40% and 0.55%.

8.0 Utility Servicing

Hydro, Enbridge Gas, Cogeco, and Bell services are all located in existing rights-of-way and rear yard easement. No impediments to service expansion for this proposal is anticipated.

In summary, there are no impediments to providing utility servicing for the proposed development.

9.0 Service Locations

Drawing PP-01, PP-02 are attached which identifies the location of all existing and proposed municipal services for the development.

Prepared by:

John Prinzen, EIT, B.Eng Project Designer

Functional Servicing Report Shayne Avenue, Fort Erie, ON Page 4 of 4

Eric Flora, P. EMg., CET Senior Civil Engineer





SANITARY SEWER DESIGN COMPUTATION SHEET

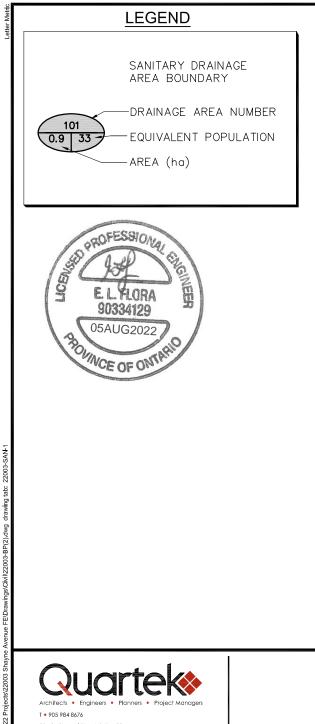
	SAN	IITARY SEWER D	DESIGN COMPUTATION SH	EET	
PROJECT: Shayne Avenue Subdivision	FILE	#: 20003 DA	ATE: 4-Aug-22 COMPUTED BY:	JRP CHECKED BY: EF	Quartek
DRAINAGE AREA PLAN: 22003-SAN-1	REV	t: A OUTF	FALL: ex. 300mm dia. PVC Sanitary Sewer on Daytona	Drive	
EQUIVALENT AREA FACTORS: INDUSTRIAL:	Persons/ha COMMERCIAL / INSTITUTIONA	L: Persons/ha	MANNING'S `n': 0.013		
POPULATION PER DWELLING: 2.15	AVERAGE PER CAPITA DESIGN FLOW:	20 L/capita/day	PEAKING FACTOR: Babbitt, M = 5/(Pop./1000)0.2	INFILTRATION RATE:	0.286 L/ha/s

										ALCULATION								DESIG	N		
LOCATION	AREA	FROM	то	AREA	(ha)	Land Use	# Dwelling	Equivalent F	Population	Ave. Domestic	Peaking	Peak Domestic	Peak Extraneous	Peak Design	PIPE Ø	SLOPE	CAP.	VEL.	LENGTH	INVERT E	LEVATION
				Incremental	Total	Lanu Ose	Units	Incremental	Total	Flow (L/s)	Factor	Flow (L/s)	Flow (L/s)	Flow (L/s)	(mm)	(%)	(L/s)	(m/s)	(m)	US	DS
Evelyn Ave	201	MH4A	MH5A	0.43	0.43	Residential	5	11	11	0.04	4.50	0.18	0.12	0.30	200	0.50	23.2	0.74	49.9	184.210	183.960
Shayne Ave (incl. 3 future units)	202	МНЗА	MH4A	0.83	1.26	Residential	12	26	37	0.14	4.50	0.61	0.36	0.97	200	0.40	20.7	0.66	100.0	183.960	183.560
Shayne Ave	203	MH2A	МНЗА	0.90	2.16	Residential	8	17	54	0.20	4.50	0.90	0.62	1.51	200	0.40	20.7	0.66	100.0	183.560	183.160
Shayne Ave	204	MH1A	MH2A	0.17	2.33	Residential	0	0	54	0.20	4.50	0.90	0.67	1.56	200	0.40	20.7	0.66	100.1	183.100	182.700
Totals				2.33			25	54						1.6	I				350		

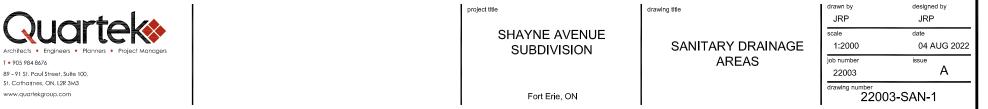
* Indicates that proposed pipe slope is greater than critical slope and pipe capacity and velocity are calculated using critical slope.

San Design Sheet_Aug2022









plotted by johnp on Aug 04, 2022 - 11.07pm

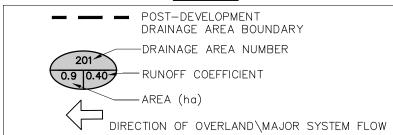
STORM SEWER DESIGN COMPUTATION SHEET

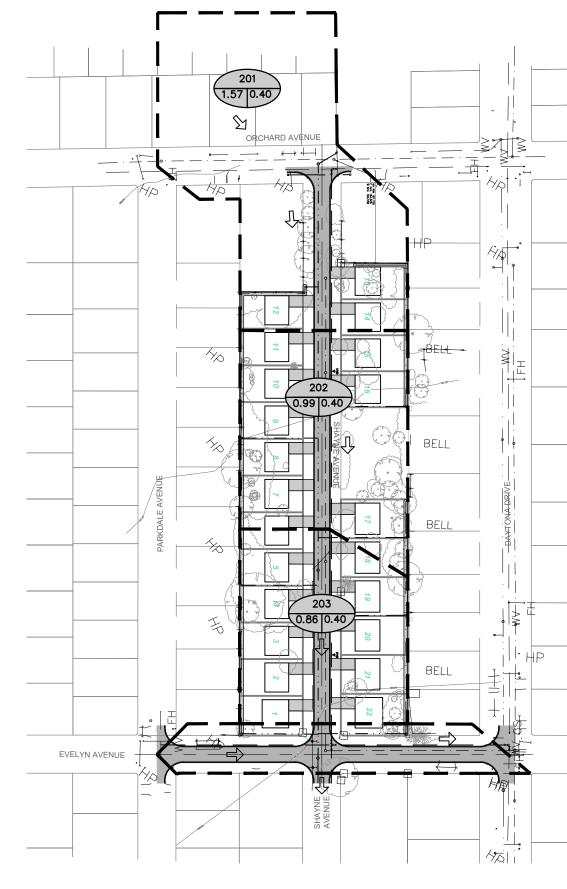
PROJECT:	Shayne Ave	enue Subdivi	ision			FILE #:	22003		DATE:	05 Aug 2022	2 COM	IPUTED BY:		CF	HECKED BY:	EF	
DRAINAGE AREA PLAN:	22003-STM-1					REV #:	A		OUTFALL:	Shayne Ave	nue						
RETURN PERIOD:	2	yr.	RAINFALL INTENS	SITY CURV	'E:	l = 628.05	/ (6.652 + t) ⁰	.796			MAN	INING'S `n':	0.013				
RUN-OFF COEFFICIENTS																	
PARK, OPEN SPACE:	0.	.20	SINGLE FAMILY F	ES.:	0.40		SEMI-DET/	ACH. RES.	: 0.50		TOWN HC	USING RES	S.:	0.65	HIGH DEN	SITY RES.:	0.70
ROAD RIGHT-OF-WAY:	0.	.55	INDUSTRIAL:		0.70		COMMERC	CIAL:	0.75		PARKING	LOTS, ROO	F AREAS:	0.90			
	DDAINAOE	50014	70	1054			RUN-OFF	T (0				01.005	0.45		DESIGN	70.45	5411
LOCATION	DRAINAGE AREA #	FROM	ТО	AREA (ha)	RUN-OFF COEFF.	A INCR.	x R ACCUM.	T of C (min)	l (mm/s)	FLOW (cms)	PIPE Ø (mm)	SLOPE (%)	CAP. (cms)	VEL. (m/s)	LENGTH (m)	TIME (min)	FALL (m)
	201	STM MH4	STM MH3	1.570	0.40	0.628	0.628	10.00	0.019	0.117	375	0.650	0.141	1.28	114.3	1.49	0.74
	202	STM MH3	STM MH2	0.930	0.40	0.372	1.000	11.49	0.017	0.174	525	0.400	0.272	1.26	100.6	1.34	0.40
	203	STM MH2	STM MH1	0.920	0.40	0.368	1.368	12.82	0.016	0.225	600	0.300	0.336	1.19	99.4	1.39	0.30
															and the second se	00000	_\ <
Totals				3.42		1.368					1				314		

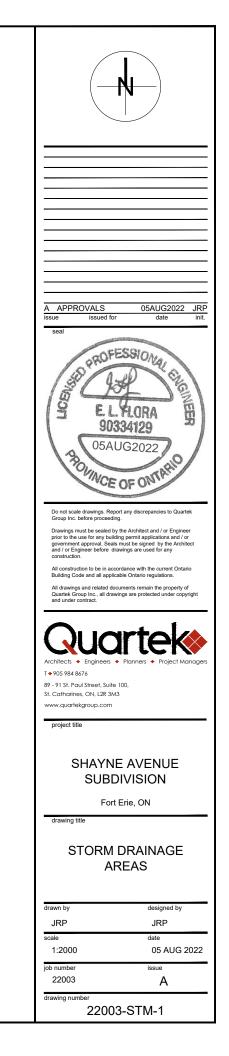
* Indicates that proposed pipe slope is greater than critical slope and pipe capacity and velocity are calculated using critical slope.

Storm Sewer Design Sheet.xls

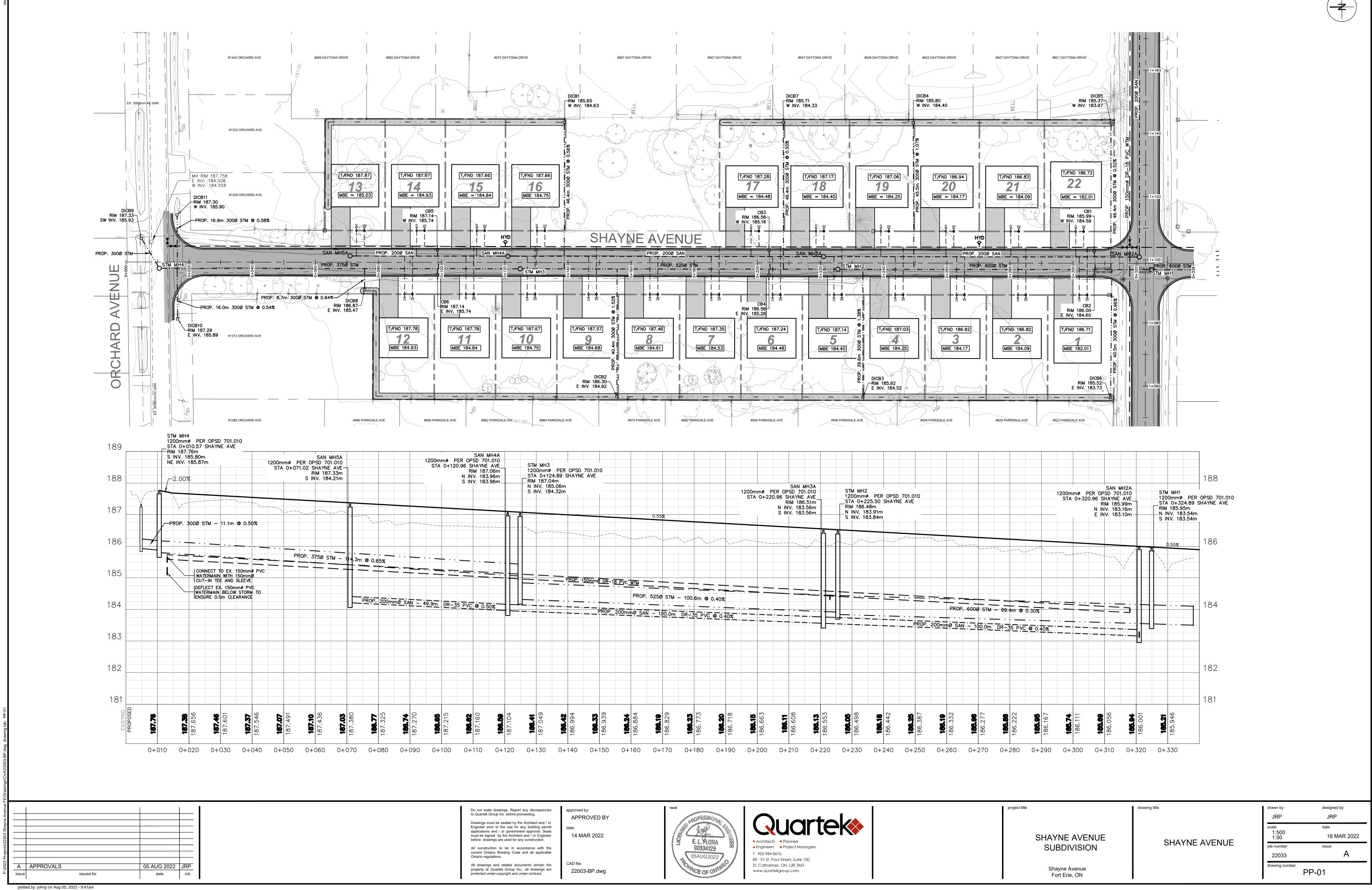
LEGEND



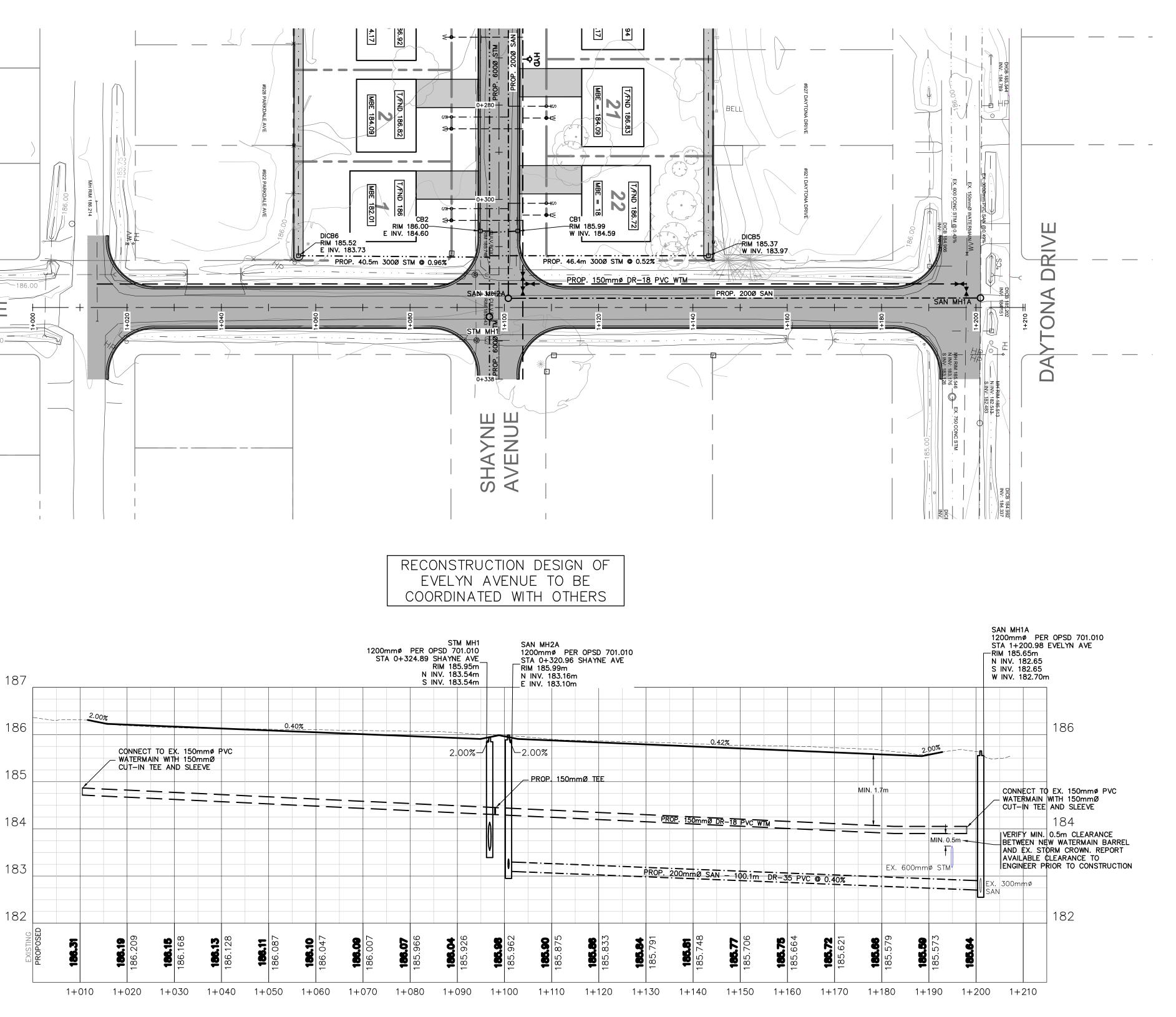


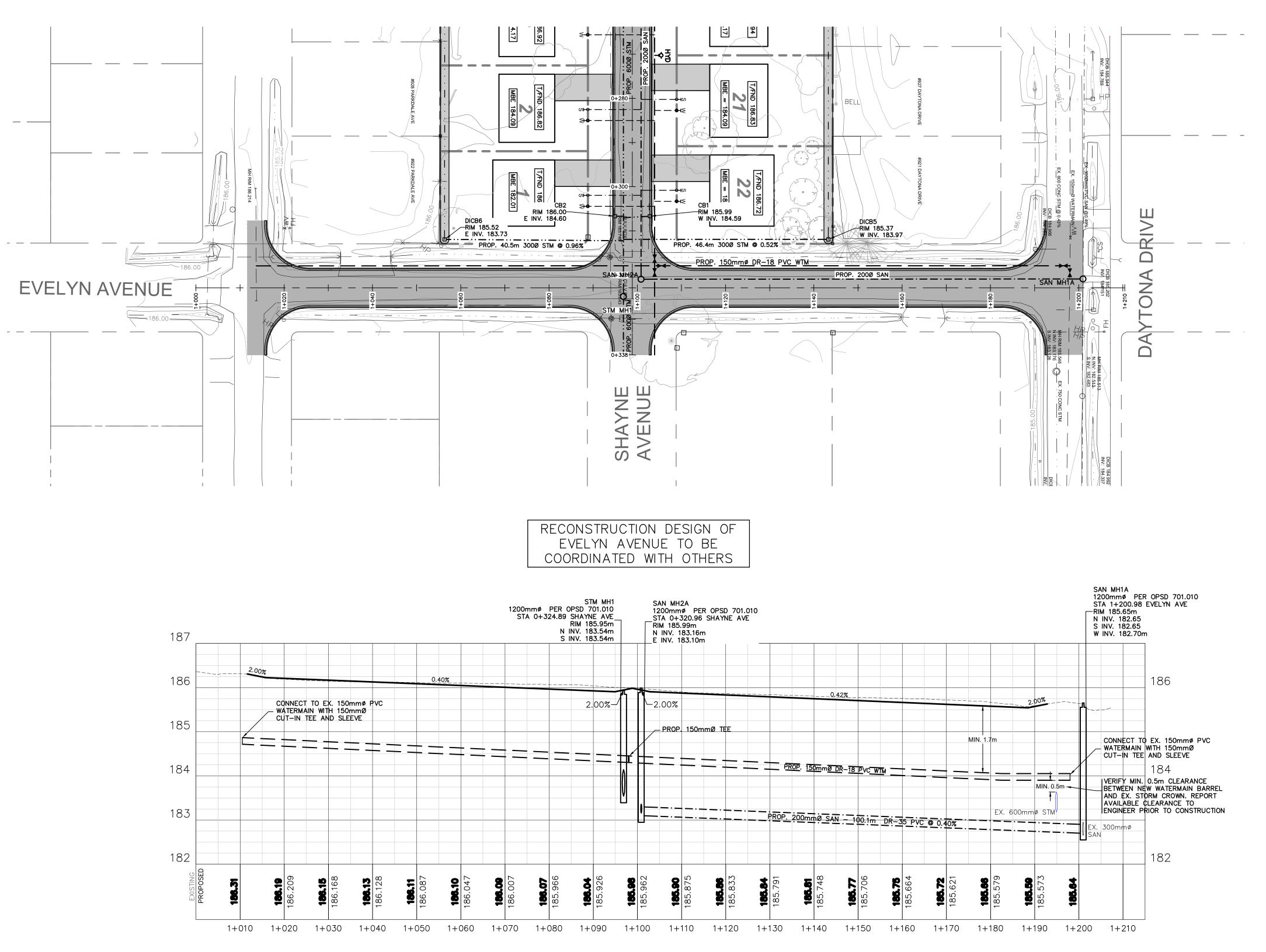


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А	APPROVALS	05 AUG 2022	JRP	
issue	issued for	date	init.	





Do not scale drawings. Report any discrepancies approved by: to Quartek Group Inc. before proceeding. Drawings must be sealed by the Architect and / or Engineer prior to the use for any building permit applications and / or government approval. Seals must be signed by the Architect and / or Engineer before drawings are used for any construction. All construction to be in accordance with the current Ontario Building Code and all applicable Ontario regulations. All drawings and related documents remain the property of Quartek Group Inc., all drawings are protected under copyright and under contract.

APPROVED BY date:

14 MAR 2022

CAD file: 22003-BP.dwg



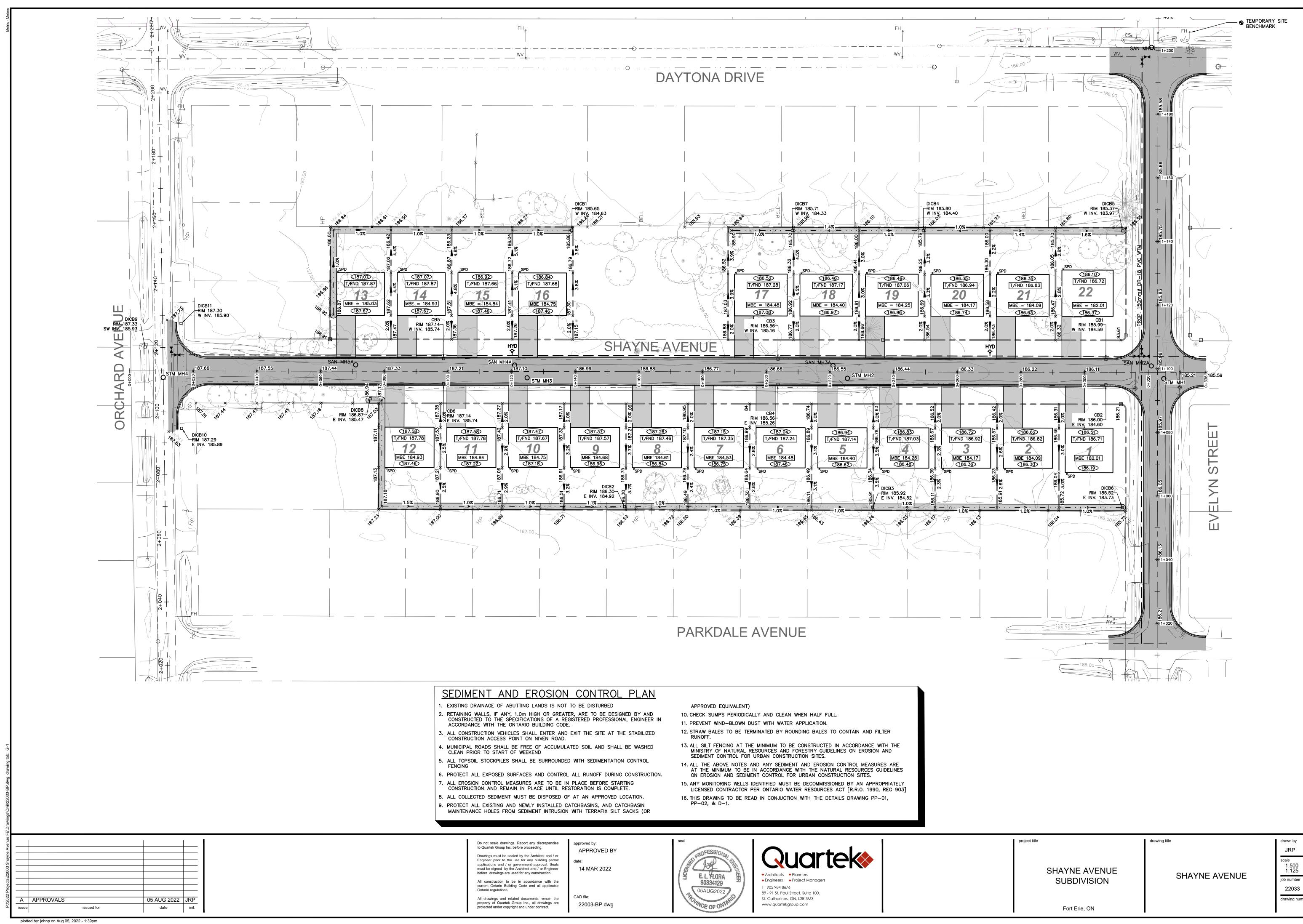
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St. Catharines, ON, L2R 3M3

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project title	drawing title	drawn by	designed by
		JRP	JRP
		scale	date
SHAYNE AVENUE	EVELYN AVENUE	1:500 1:50	18 MAR 2022
SUBDIVISION	RECONSTRUCTION	job number	issue
		22033	A
Shayne Avenue Fort Erie, ON		drawing number	PP-02





drawn by	designed by
JRP	JRP
scale	date
1:500 1:125	18 MAR 2022
job number	issue
22033	A
drawing number	G-1
	9-1

-Z

GENERAL

- THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVE GROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR MUST CONFIRM THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND MUST ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
- ALL AREAS DISTURBED BY THE CONTRACTOR DURING THE CONSTRUCTION OF THE WORKS HEREIN, MUST BE RESTORED TO ORIGINAL CONDITION OR BETTER AS DETERMINED BY THE ENGINEER. ALL GRASS AND VEGETATION COVERED AREAS MUST BE RESTORED BY PLACING A MINIMUM 100mm OF TOPSOIL AND SOD TO ESTABLISH A GRASS COVER TO THE SATISFACTION OF THE TOWN, UNLESS NOTED OTHERWISE.
- 3. ALL CONSTRUCTION SIGNAGE MUST CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA (MUTCDC).
- 4. ALL WORK MUST BE COMPLETED IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT". THE GENERAL CONTRACTOR MUST BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.
- 5. TOWN OF FORT ERIE STANDARD DRAWINGS AND O.P.S.D. MUST CONSTITUTE PART OF THE ENGINEERING DESIGN AND CONSTRUCTION CONTRACT.
- 6. GRANULAR BACKFILL AROUND MANHOLES AND CATCH BASINS MUST BE COMPACTED BY MECHANICAL MEANS TO A MINIMUM OF 95% S.P.D.
- ALL PROPOSED DWELLINGS IN THE SUBDIVISION BE EQUIPPED WITH INDIVIDUAL SUMP AND PUMP FOR THE FOUNDATION DRAINS TO DISCHARGE INTO THE STORM SERVICE LATERAL AND IN THE ABSENCE OF A STORM LATERAL, TO A SPLASH PAD DIRECTING THE FLOW AWAY FROM THE FOUNDATION WALL. DIRECT GRAVITY CONNECTIONS TO THE STORM SEWER ARE NOT PERMITTED.
- 8. ALL EXCAVATION IN EXISTING ROADWAYS OR OTHER PAVED SURFACES MUST BE BACKFILLED WITH GRANULAR 'A' COMPACTED TO 100% SPMDD. MINIMUM. ANY AREAS WITHIN THE FUTURE R.O.W. WHICH REQUIRE FILL IN EXCESS OF 0.30m ARE SUBJECT TO COMPACTION TESTS AND SUCH TESTS MUST SHOW A MINIMUM COMPACTION OF 98% S.P.D. AT ALL DEPTHS.
- 9. MANHOLE AND CATCH BASIN COVERS ARE TO BE SET FLUSH WITH BASE COURSE ASPHALT AND ADJUSTED TO FINAL GRADE PRIOR TO INSTALLING TOP LIFT OF ASPHALT.
- 10. EROSION AND SILTATION CONTROL WORKS MUST BE AS SHOWN ON THE SUBDIVISION GRADE CONTROL PLAN. SILTATION CONTROL MEASURES MUST BE IN PLACE PRIOR TO START OF CONSTRUCTION AND MAINTAINED FOR THE DURATION.
- 11. TRENCH BEDDING AND BACKFILL MUST IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED BY AMEC-FOSTER WHEELER.
- 12. ALL MEASUREMENTS ARE IN METRES UNLESS OTHERWISE NOTED.
- 13. ALL WORK MUST BE IN ACCORDANCE WITH THE RELEVANT SECTIONS OF THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS AND DRAWINGS. AND THE NIAGARA PENINSULA STANDARD CONTRACT DOCUMENT (NPSCD) UNLESS OTHERWISE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS.
- 14. COMPUTER DRAWING FILE CO-ORDINATES FOR THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION LAYOUT UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.
- 15. ALL GRANULAR MATERIAL MUST BE COMPACTED TO 100% SPMDD AND ALL NATIVE BACKFILL MUST BE COMPACTED TO 95% SPMDD UNLESS OTHERWISE NOTED. 16. ALL CONSTRUCTION MUST BE CARRIED OUT IN SUCH A WAY THAT SILTATION OR OTHER DAMAGE TO
- WATER COURSES DOES NOT OCCUR. THE REQUIREMENTS OF THE MINISTRY OF NATURAL RESOURCES AND FORESTRY ARE TO BE ADHERED TO IN THIS RESPECT. AT A MINIMUM, PROVIDE SILT FENCE AND STABILIZED CONSTRUCTION ACCESS AND MAINTAIN SAME FOR DURATION OF CONSTRUCTION.
- 17. EXISTING SIDEWALK TO BE KEPT FREE AND CLEAR AT ALL TIMES TO ENSURE SAFETY OF PEDESTRIAN TRAFFIC. PROVIDE SAFE RE-ROUTED WALKWAY AT CONSTRUCTION ACCESS AT ALL TIMES WHEN EXISTING SIDEWALK IS NOT USEABLE.
- 18. PROPOSED GRADES MUST NOT ADVERSELY AFFECT ADJACENT PROPERTIES.
- 19. REFER TO PP-01 AND PP-02 FOR SERVICING DESIGN, AND G-1 FOR GRADING.

WATER SUPPLY

- 20. CONNECTIONS TO EXISTING TOWN WATERMAINS TO BE BY TOWN FORCES.
- 21. WATERMAINS OF 150mmØ AND GREATER MUST BE A.W.W.A. C900 PVC CLASS 235 (DR 18) WITH GASKETED JOINTS, OR APPROVED EQUIVALENT IN ACCORDANCE WITH OPSS 701. 0.P.S.D. 1103.010, 1003.020 AND 1109.011 AND THE TOWN OF FORT ERIE MUNICIPAL STANDARDS. WATERMAINS OF 50mmØ MUST BE CROSS-LINKED POLYETHYLENE (MUNICIPEX® OR APPROVED EQUIVALENT).
- 22. ALL SERVICE CONNECTIONS MUST HAVE CURB STOPS (COMPRESSION TYPE FITTINGS) BOXES INSTALLED AT AN APPROVED LOCATION. ALL SERVICE TAPS MUST BE DONE WITH A SADDLE AT 22.5 DEGREE ANGLE ABOVE HORIZONTAL.
- 23. PROVIDE MINIMUM 0.15m VERTICAL CLEARANCE BETWEEN THE WATERMAIN AND INFRASTRUCTURE CROSSING THE TRENCH, WHERE THE WATERMAIN CROSSES SANITARY OR STORM SEWERS OR LATERALS, PROVIDE MINIMUM 0.50m VERTICAL CLEARANCE BETWEEN THE OUTSIDE OF WATERMAIN AND OUTSIDE OF SEWER LATERAL. A MINIMUM CLEAR HORIZONTAL SEPARATION OF 2.5m MUST BE MAINTAINED BETWEEN ANY SEWER & ANY PARALLEL WATERMAIN.
- 24. WHERE WATERMAIN BEND FITTINGS ARE NOT DENOTED, VERTICAL AND HORIZONTAL ALIGNMENT OF WATERMAIN TO BE ACHIEVED BY BENDING OF THE PIPE BARREL IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS.
- 25. WATERMAIN BEDDING MUST BE GRANULAR 'A' BEDDING AND COVER MATERIAL AS PER OPSD 802 SERIES, ALL BEDDING AND COVER MATERIAL TO BE COMPACTED TO 100% SPD. WITHIN SUBDIVISION DEVELOPMENT, BACKFILL MATERIAL TO BE SELECT NATIVE COMPACTED TO 95% SPD. WITH THE TOP 500mm OF MATERIAL COMPACTED TO 100% SPD. WITHIN EXISTING ROADWAY, BACKFILL TO BE GRANULAR 'A' COMPACTED TO 100% SPD.
- 26. HIGH GRADE ZINC SACRIFICIAL ANODES MUST BE INSTALLED ON ALL METALLIC FITTINGS, HYDRANTS, VALVES AND WATER SERVICES CONNECTIONS, PER TOWN STANDARDS. ALL METAL CROSSES, TEES, BENDS, VALVES AND OTHER FITTINGS MUST HAVE CATHODIC PROTECTION CONSISTING OF ZINC ANODE 550-12 (12# or 5.5kg). ALL HYDRANT ASSEMBLIES MUST HAVE CATHODIC PROTECTION CONSISTING OF ZINC ANODE 1100-24 (24# or 11kg).
- 27. MINIMUM DEPTH OF COVER OVER WATERMAIN AND SERVICES MUST BE 1.7m FROM THE TOP OF PIPE TO THE FINISHED GROUND ELEVATION.
- 28. THRUST BLOCKS MUST BE FORMED CONCRETE BRACED AGAINST A SUFFICIENT AREA OF UNDISTURBED EARTH AS PER OPSD 1103.010 & 1103.020 OR THEY MUST BE TIE TO THE PIPE WITH SUITABLE METAL TIE RODS OR RETAINING GLANDS AS APPROVED BY DIRECTOR OF PUBLIC WORKS.
- 29. A TRACER WIRE MUST BE INSTALLED WITH ALL NON-METALLIC PIPES FOR THE WATERMAIN. TRACER WIRE CONTINUITY OF ELECTRICAL CURRENT MUST BE TESTED AND VERIFIED BY THE CONTRACTOR. TRACER WIRE TO BE DIRECTLY CONNECTED TO EACH WATER SERVICE CONNECTION. 8-GAUGE 7-STRAND COPPER TRACING CSA RATED FOR DIRECT BURIAL MUST BE INSTALLED ALONG THE SPRING-LINE ALONG ITS ENTIRE LENGTH, ALONG HYDRANT LEAD AND EXTENDED ABOVE EXPOSED FLANGE AT HYDRANT.
- 30. HYDRANTS MUST BE IN ACCORDANCE WITH OPSD 1105.010 WITH A MINIMUM 150mmØ LEADS AND DRAIN HOLES PLUGGED BY MANUFACTURER.
- 31. HYDRANTS ACCEPTABLE TO THE TOWN OF FORT ERIE MUST BE CANADA VALVE CENTURY, MCAVITY M67, AMERICAN AVK, DARLING B50B WITH TWO 65mm HOSE NOZZLES & ONE 114mm PUMPER NOZZLE INCLUDING STORZ CONNECTION.
- 32. VALVES FOR WATERMAINS 300mmØ AND SMALLER MUST BE DIRECT-BURY GATE VALVES AND FOR WATERMAINS LARGER THAN 300mmØ MUST BE BUTTERFLY VALVES. ALL VALVES MUST CONFORM TO AWWA C-900. VALVES MUST OPEN LEFT-HANDED WITH 50mm SQUARE OPERATING NUT.
- 33. VALVES ACCEPTABLE TO THE TOWN OF FORT ERIE ARE MANUFACTURED BY CANADA VALVE CENTURY, MCAVITY, MUELLER, AMERICAN AVK OR BIBBY. VALVE BOXES MUST BE CAST IRON, SLIDE TYPE
- 34. HYDRANTS & VALVES MUST BE PROVIDED WITH ANODE PROTECTION, TYPE DZP 110-24 (SP-24) OR APPROVED EQUAL COMPLETE WITH BRASS OR STAINLESS STEEL CLAMP.
- 35. WATER SERVICES TO BE 20mmø (3) SOFT COPPER TYPE 'K'. ALL WATERMAINS 100mmø OR LARGER

MUST BE PVC, DR-18, CL235 OR GREATER, INSTALLED PER OPSS-701 WITH GRANULAR 'A' BEDDING & COVER PER OPSD-802.010. WATER SERVICE CONNECTIONS MUST BE 20mmø TYPE 'K' SOFT COPPER AS PER OPSD 1104.010 & TOWN OF FORT ERIE STANDARD DRAWING PW-301 FE. ALL DOMESTIC WATER SERVICE CONNECTIONS MUST HAVE MAINSTOPS (COMPRESSION TYPE FITTINGS) INSTALLED AT THE WATERMAIN EQUAL TO THE WATER SERVICE CONNECTION DIAMETER. AT EACH SERVICE SADDLE WATERMAIN PIPE MUST BE CORED $rac{3}{4}$ OR 20mm DIAMETER CUTTING TOOL.

36. ALL WATER SUPPLY PIPING MUST BE FLUSHED, PRESSURE TESTED & DISINFECTED IN ACCORDANCE WITH OPSS 701 & NPSCD SPC-D13 UNDER THE DIRECTION OF THE TOWN'S ENGINEERING PERSONNEL & TO THE SATISFACTION OF THE TOWN.

ROADS AND EARTHWORKS

- 37. FILL FOR ROADWAY AND PARKING AREAS TO BE CONSTRUCTED IN ACCORDANCE WITH OPSS 201 IN 200mm THICK LIFTS. USING SUITABLE NATIVE EXCAVATED OR IMPORTED MATERIAL APPROVED BY CONTRACT ADMINISTRATOR AND GEOTECHNICAL ENGINEER. THE SUBSOIL BELOW ANY ROADWAY OR PARKING AREA MUST BE PROOF ROLLED AND INSPECTED BY THE GEOTECHNICAL ENGINEER OR HIS DESIGNATE PRIOR TO THE PLACEMENT OF ANY GRANULAR MATERIAL. THE UPPER 0.6m BELOW ANY RIGID OR PAVED SURFACE MUST BE COMPACTED TO 98% SPD MIN.
- 38. CURB AND GUTTER IN STREET 'A' R.O.W MUST BE IN ACCORDANCE WITH O.P.S.D 600.040. IN EMERGENCY ACCESS ROAD AND SWM POND ACCESS ROAD, CURB MUST BE PER OPSD 600.110
- 39. ALL CURB MUST BE UNDERLAIN WITH 100mmØ PERFORATED HDPE PIPE WITH POLYESTER/NYLON FILTER SOCK PER OPSS 405 AND PER DETAIL THIS SHEET. GRANULAR 'A' SURROUND PER OPSD 216.021, UNWRAPPED TRENCH, OUTLETTING TO CATCHBASINS.
- 40. WHERE DISTURBED OR DAMAGED, REINSTATEMENT OF EXISTING ROADS MUST COMPLY WITH THE REQUIREMENT OF THE ROAD AUTHORITY. PAVEMENT REINSTATEMENT MUST COMPLY WITH OPSD 509.010 AND OPSS 310.
- 41. TURFSTONE SPECIFIED AREAS TO HAVE UNITS PLACED ON ENGINEERED FILL, COMPACTED TO 98% SPD, c/w VOIDS FILLED WITH TOPSOIL & SEEDED WITH STANDARD ROADSIDE MIX, ALL PER OPSS 802 &

42. MINIMUM ASPHALT AND GRANULAR THICKNESS FOR ROADWAY PER OPSS 310 & 314 AS FOLLOWS:

SURFACE COURSE	40mm HL3 HS
BINDER COURSE	50mm HL8 HS
GRANULAR BASE	450mm GRAN. 'A'
TOTAL THICKNESS	540mm

- 43. AREAS TO BE SODDED MUST INCLUDE MINIMUM 100mm TOPSOIL PER OPSS 801. SOD TO BE IN ACCORDANCE WITH OPSS 803. NATIVE BACKFILLED AREAS TO BE SODDED MUST BE FREE OF GRANULAR PARTICLES OR OTHER MATERIALS DELETERIOUS TO PLANT GROWTH.
- 44. ALL SWALES WITH LESS THAN 1% LONGITUDINAL GRADE TO BE UNDERLAIN WITH 100mmø SUBDRAIN PER DETAIL THIS PAGE, OUTLETTING TO CATCHBASINS.
- 45. ALL SIDEWALKS MUST CONFORM TO 0.P.S.D. 310.010 AND 310.020. ALL INTERSECTIONS ARE TO BE CONSTRUCTED WITH DEPRESSIONS IN ACCORDANCE WITH 0.P.S.D. 310.030 UNLESS OTHERWISE NOTED. SIDEWALK WIDTH TO BE 1.5m, 125mm THICK, 30 MPA CONCRETE, WITH COMPACTED 150mm GRANULAR 'A' BASE. SIDEWALK SECTIONS IN DRIVEWAYS AND ENTRANCES TO HAVE 4X4-W4.0xW4.0 WIRE MESH.

STORM SEWERS AND STORM DRAINAGE

- NO SUMP PUMP DISCHARGE MUST BE CONVEYED ACROSS DRIVEWAY AREAS.
- 47. STORM MANHOLES MUST BE IN ACCORDANCE WITH 0.P.S.D. 701.010, 701.011, 701.012 AND 701.013 AS APPLICABLE, WITH ADJUSTABLE FRAME & COVER, AND GRATE PER TOWN APPROVED TYPES.
- 48. WHERE FINISHED COVER OVER STORM SEWER IS LESS THAN 1.2m, 25mm SHEET INSULATION TO BE PROVIDED FOR EVERY 300mm OF DEFICIENCY. INSULATION TO BE INSTALLED AS PER DETAIL THIS SHEET. INSULATION MATERIAL TO BE XPS, EITHER DOW-DUPONT HI-LOAD 40 (OR GREATER) OR OWENS CORNING FOAMULAR 400 (OR GREATER). NO OTHER XPS INSULATION IS PERMITTED.
- 49. ALL STORM SEWERS AND CATCHBASIN LEADS TO BE EITHER CONCRETE, CLASS III PER CSA A257.1 WITH CLASS "B" BEDDING TO OPSD 802.030, OR, PVC DR-35 PER CSA 182.1 & 182.2 WITH GRANULAR 'A' EMBEDMENT TO OPSD 802.010 UNLESS OTHERWISE NOTED.
- 50. STORM SEWER PIPE MUST BE CONSTRUCTED OF CONCRETE PIPE OR POLYVINYL CHLORIDE PIPE AS DETAILED IN THE CONTRACT DOCUMENTS AND TO THE SPECIFICATIONS OUTLINED BELOW, AS APPLICABLE
- 50.1. CONCRETE SEWER PIPE 375mm IN DIAMETER AND SMALLER MUST CONFORM TO A.S.T.M. SPECIFICATIONS C14-68T, OR LATEST REVISION THEREOF, STANDARD STRENGTH OR EXTRA STRENGTH AS REQUIRED.
- 50.2. REINFORCED CONCRETE SEWER PIPE 300mm DIAMETER AND LARGER MUST BE STEEL REINFORCED AND MUST CONFORM TO A.S.T.M. SPECIFICATION C76-68T, OR LATEST REVISION THEREOF, CLASS 50-D, 65-D, 100-D OR 140-D, AS REQUIRED BY OPSD 807.030.
- 50.3. CORRUGATED STEEL PIPE MUST CONFORM TO A.A.S.H.O. SPECIFICATIONS M218, M136, M190 AND
- 50.4. POLYVINYL CHLORIDE PIPE SHOULD BE MANUFACTURED IN ACCORDANCE WITH THE LATEST REVISIONS OF C.S.A. B182.1 AND C.S.A. B182.2.
- 51. GENERALLY A MINIMUM CLEARANCE OF 225mm MUST BE PROVIDED BETWEEN THE OUTSIDE OF THE PIPE BARRELS AT THE POINT OF PIPE CROSSING FOR STORM SEWERS AND OTHER UTILITIES. FOR WATERMAIN CROSSING, SEE WATERMAIN NOTES. WHERE THE MINIMUM CLEARANCE OF 225mm CANNOT BE OBTAINED, THE PIPES AT THE CROSSING MUST BE CONCRETE ENCASED
- 52. STORM MANHOLE BENCHING MUST BE IN ACCORDANCE WITH O.P.S.D. 701.021. ALL BENCHING INSIDE MANHOLES MUST BE A MINIMUM OF 150mm IN WIDTH.
- 53. STORM SEWER BEDDING TO BE AS PER OPSD 802 SERIES, WITH FULL GRANULAR 'A' COVER. ALL BEDDING AND COVER MATERIAL TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY. BACKFILL MATERIAL TO BE SELECT NATIVE COMPACTED TO 95% STANDARD PROCTOR DENSITY. WITH THE TOP 500mm OF MATERIAL COMPACTED TO 100% SPD.
- 54. ROADWAY CATCH BASINS AND TWIN INLET CATCH BASINS MUST CONFORM TO 0.P.S.D. 705.010 AND 705.020, RESPECTIVELY. CATCH BASIN FRAME AND GRATE MUST MEET 0.P.S.D. 400.020. CATCH BASIN CONNECTIONS TO BE 200mmø. CATCH BASIN LEADS TO BE A.S.T.M. D 3034 PVC DR-35. STREET CATCH BASIN LEADS TO HAVE A MINIMUM SLOPE OF 0.5% UNLESS OTHERWISE NOTED.
- 55. FILTER FABRIC MUST BE PLACED UNDER THE GRATES IN ALL STREET AND REAR LOT CATCH BASINS TO TRAP SEDIMENT. SILT TRAPS MUST BE CLEANED REGULARLY BY THE OWNER AND MUST NOT BE REMOVED UNTIL SUCH TIME AS THE CURBS ARE CONSTRUCTED AND ALL TURF AREAS ARE GRADED AND SODDED. FILTER FABRIC FOR SILT CONTROL MUST BE TERRAFIX 270R OR APPROVED EQUIVALENT.
- 56. ALUMINUM MANHOLE STEPS ARE TO BE AS PER O.S.P.D. 405.020.
- 57. DROP STRUCTURES ARE TO BE AS PER 0.P.S.D. 1003.010 OR 1003.020 AS SHOWN ON THE DRAWINGS.
- 58. WITHIN PROPOSED SUBDIVISION, ALL STORM SEWERS, LEADS AND LATERALS MUST HAVE CLASS 'B' BEDDING PER OPSD 802.010, GRANULAR 'A' COVER MATERIAL AND SELECT NATIVE BACKFILL COMPACTED UNLESS OTHERWISE NOTED.
- 59. ALL DITCH-INLET CATCHBASINS (DICB) TO HAVE 300mm DIA. LEAD @ 0.50%; ALL DOUBLE CATCHBASINS (DCB) TO HAVE 250mm DIA. LEAD. @ 0.50% ALL SINGLE CATCHBASINS (CB) TO HAVE 200mm DIA. LEAD @ 0.50%.
- 60. SINGLE CATCHBASINS (CB) TO BE PER OPSD 702.040, DOUBLE CATCHBASINS (DCB) PER OPSD 702.050, DITCH INLET CATCHBASINS (DICB) PER OPSD 702.050 - TYPE 'B', REAR YARD CATCHBASINS (RYCB) PER OPSD 705.010 FRAME & GRATE AS PER O.P.S.D. 400.100.

Α	APPROVALS	05 AUG 2022	JRP
issue	issued for	date	init.

plotted by: johnp on Aug 05, 2022 - 9:45am

- 46. ALL SUMP PUMP DISCHARGE TO BE DIRECTED TO REAR YARD AS INDICATED ON DRAWING 14154-G.

- Do not scale drawings. Report any discrepancies to Quartek Group Inc. before proceeding. Drawings must be sealed by the Architect and / or Engineer prior to the use for any building permit applications and / or government approval. Seals must be signed by the Architect and / or Engineer before drawings are used for any construction. All construction to be in accordance with the current Ontario Building Code and all applicable Ontario regulations. All drawings and related documents remain the property of Quartek Group Inc., all drawings are protected under copyright and under contract.

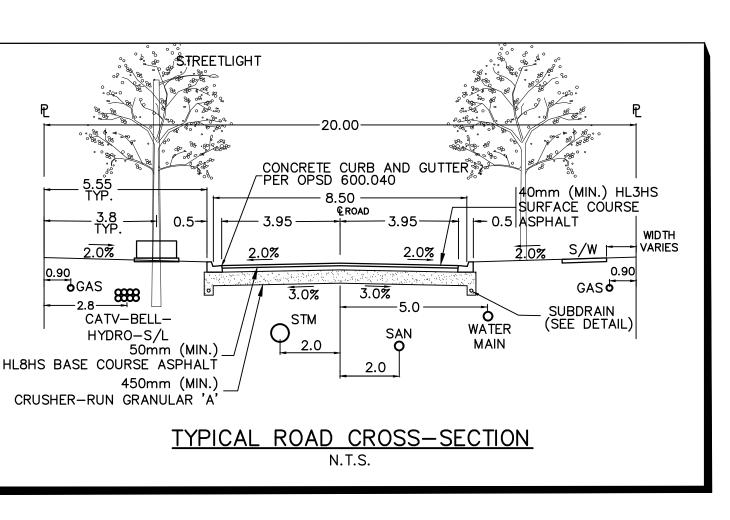
CAD file

- 61. COORDINATE CONNECTIONS TO EXISTING SEWERS WITH TOWN OF FORT ERIE PUBLIC WORKS STAFF AND QUARTEK GROUP INC.
- 62. WITHIN PROPOSED SUBDIVISION SITE, ALL SANITARY SEWERS, LEADS AND LATERALS MUST HAVE CLASS 'B' BEDDING PER OPSD 802.010, GRANULAR 'A' COVER MATERIAL AND SELECT NATIVE BACKFILL UNLESS OTHERWISE NOTED.
- 63. ALL SANITARY LATERALS TO BE 100mmø DR-28 PVC LAID AT 2.0% SLOPE AND CONNECT TO THE SEWER WITH FACTORY TEE AND CAPPED & STAKED AT THE STREETLINE. SANITARY SERVICE LATERALS MUST BE CONSTRUCTED WITH A 100mmØ PVC VERTICAL CLEANOUT CONNECTION AT THE PROPERTY LINE. ALL PROPOSED WYES AND BENDS TO BE OF 'SWEEP' OR 'LONG-RADIUS' TYPE.
- 64. CONTRACTOR TO SUBMIT RECORD OF ALL SANITARY LATERAL INVERTS ALONG STREETINE TO ENGINEER PRIOR TO GRANULAR ROAD BASE CONSTRUCTION.
- 65. SANITARY MANHOLES MUST CONFORM TO 0.P.S.D. 701.010, AS APPLICABLE. SANITARY MANHOLE BENCHING MUST CONFORM TO O.P.S.D. 701.021. ALL BENCHING WITHIN MANHOLES MUST BE A MINIMUM OF 150mm IN WIDTH.
- 66. SANITARY MANHOLE FRAMES AND COVERS MUST BE ADJUSTABLE PER TOWN APPROVED TYPES.
- 67. SANITARY SEWER PIPE MUST BE DR-35, CONSTRUCTED OF POLYVINYL CHLORIDE PIPE, (PVC) AND MUST BE MANUFACTURED IN ACCORDANCE WITH THE LATEST REVISION OF C.S.A. B182.1 AND B182.2. 68. THE BEDDING REQUIRED FOR PVC MAIN SEWER AND SERVICE CONNECTIONS MUST BE AS PER OPSD
- 69. SANITARY CONNECTIONS MUST GENERALLY BE LOCATED IN DRAWING 14154-01
- 70. ALUMINUM MANHOLE STEPS ARE TO BE AS PER O.P.S.D. 405.020.

SANITARY SEWERS

SERIES.

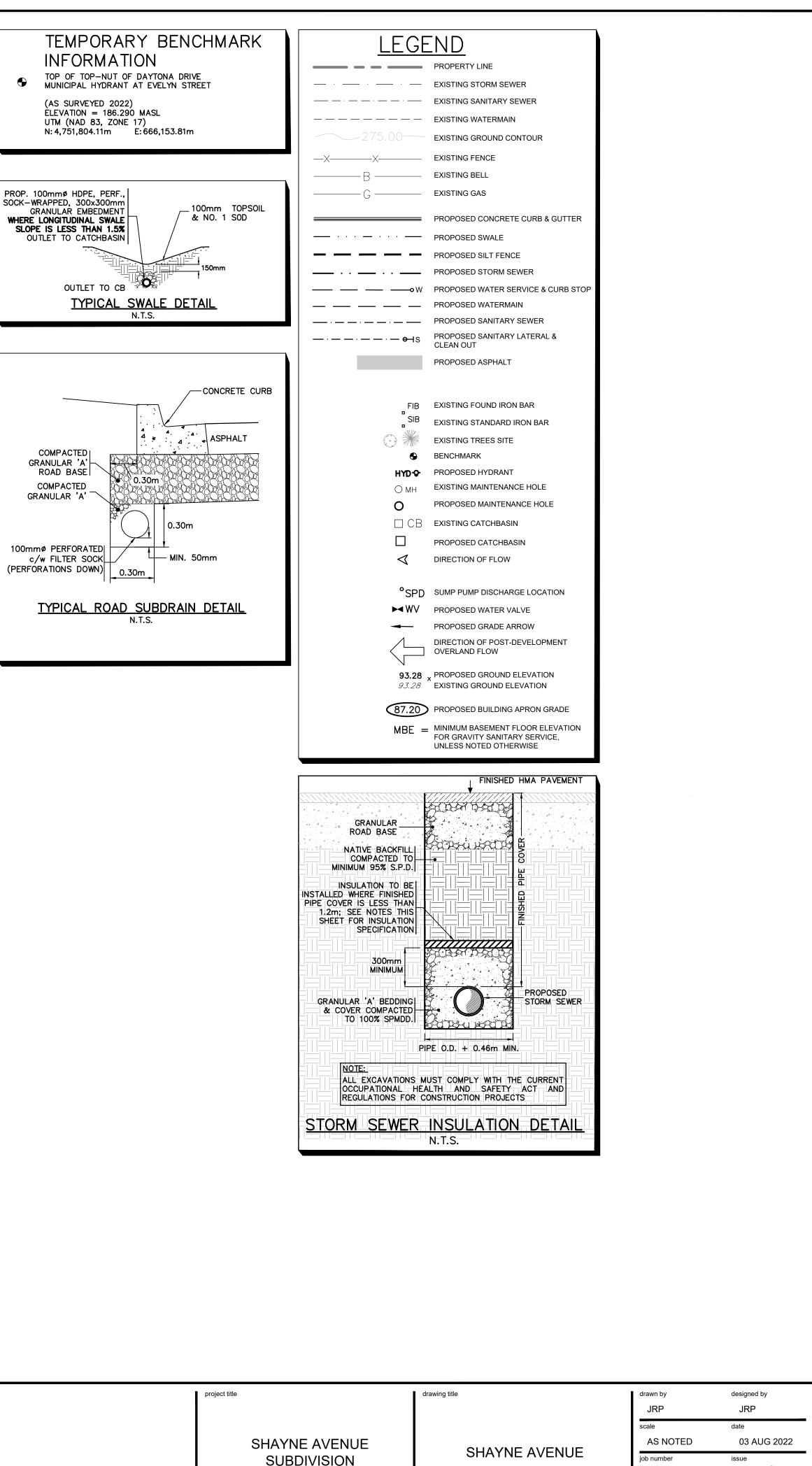
- 71. DROP STRUCTURES ARE TO BE AS PER O.P.S.D. 1003.010 OR O.P.S.D. 1003.020. AS SHOWN ON THE DRAWINGS.
- 72. NEW CONNECTIONS TO MANHOLE MUST BE WITH KOR-N-SEAL ADAPTOR.
- 73. SANITARY SEWER LATERALS CONNECTING TO EXISTING SANITARY SEWER MUST BE MADE WITH KOR-N-TEE ADAPTORS.
- 74. IN EXISTING ROADWAYS, SANITARY SEWER BEDDING TO BE AS PER OPSD 802 SERIES, WITH FULL GRANULAR 'A' COVER. ALL BEDDING AND COVER MATERIAL TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY. BACKFILL MATERIAL TO BE SELECT NATIVE COMPACTED TO 95% STANDARD PROCTOR DENSITY. WITH THE TOP 500mm OF MATERIAL COMPACTED TO 100% SPD.





PROP. 100mmø HDPE, PERF.

GRANULAR EMBEDMENT WHERE LONGITUDINAL SWALE SLOPE IS LESS THAN 1.5% OUTLET TO CATCHBASIN OUTLET TO CB



Fort Erie, ON

22033 wing numbe D-1