WEST HANTS REGIONAL MUNICIPALITY REPORT

Information ☑	Recommendation ☐	Decision Request ☐	Councillor Activity ☐

To: Council

Submitted by: Todd Richard, Director of Public Works

Date: November 25, 2025

Subject: Wentworth & Payzant Intersection Improvements

Property **X**	Public Opinion **X**	Environment **X**	Social ☐	Economic **X**	Councillor Activity ☐

LEGISLATIVE AUTHORITY

Nova Scotia Municipal Government, Section 65 authorizes Council to expend funds for municipal purposes.

PURPOSE

To provide Council with an update on the Wentworth Road and Payzant Drive intersection in Windsor including the Class D estimate for traffic lights at this intersection.

The report further provides a historic overview of the past discussions and direction from Council regarding the intersection improvements and the discussion between the options of a roundabout and traffic lights.

DECISION REQUEST OR RECOMMENDATION

N/A at this time.

BACKGROUND

The following is section helps to provide a timeline of the discussions by Council and the corresponding direction from Council to staff.

October 12, 2021 COTW -Request for Direction

Payzant Drive/ Wentworth Road Roundabout Design Recommendation Report

Discussion Points:

- Clarified that the design is for a traffic circle at Payzant and Wentworth, not a light.
- The budget change (increase)reflects the difference between allowing for a traffic circle vs a light. There is more engineering work for a traffic circle.

MOVED BY COUNCILLORS MURLEY AND IVEY THAT COMMITTEE OF THE WHOLE RECOMMEND COUNCIL APPROVE THE AWARD OF TENDER WWHPW-21-14 FOR ENGINEERING AND DESIGN WORK FOR THE PAYZANT DRIVE/WENTWORTH ROAD ROUNDABOUT TO THE LOW COMPLIANT BIDDER, DESIGN POINT, FOR THE TENDERED PRICE $67,214 PLUS APPLICABLE TAXES TO BE FUNDED THROUGH CAPITAL RESERVES. MOTION CARRIED.

October 26, 2021 Council

MOVED BY COUNCILLORS SMITH AND MURLEY THAT COUNCIL APPROVES THE AWARD OF TENDER WWHPW21-14 FOR ENGINEERING AND DESIGN WORK FOR THE PAYZANT DRIVE / WENTWORTH ROAD ROUNDABOUT DESIGN TO THE LOW COMPLIANT BIDDER, DESIGN POINT, FOR THE TENDERED PRICE OF $67,214, PLUS APPLICABLE TAXES, TO BE FUNDED THROUGH CAPITAL RESERVES. MOTION CARRIED

January 10, 2023 - Proposed Traffic Circle Presentation related to Payzant Drive – Wentworth Roundabout – Paul Burgess and Adam Sketchley from Design Point

Mr. Burgess and Mr. Sketchley provided a brief introduction. In 2013 the Garlands

Crossing/Windsor border Area study provided a long-term transportation strategy to accommodate the future growth in the rea. The study recommended traffic signals or a roundabout be installed at Wentworth Road/ Payzant Drive intersection.

Summary Points:

- In 2021 the Windsor Intersection Infrastructure Needs Assessments study confirmed the need for upgrades and recommended the intersection be upgraded to a roundabout.
- Traffic studies examined the impact growth would have at the Wentworth-Payzant intersection. 2030 design hour volumes for the am and pm peak hour period were created resulting in the belief that a single lane roundabout could accommodate the projected traffic volumes.
- Roundabout benefits include improved safety, reduced delays, reduced environmental impacts, improved aesthetics, and improved network considerations.
- Some challenges associated with roundabouts would include costs, land, utilities, and access.

- The costs associated with signals was $1.1 million and a roundabout was $1.815 million. The costs did not include potential property acquisition, easements costs, taxes and were reflective to 2022-dollar amounts. An additional right of way was required for the project.
- With respects to access, a commercial driveway was the fourth leg to the interception. The Canadian Roundabout Design Guidelines (CRDG) discourages allowing access to a driveway unless it met balanced flow criteria. This driveway did not meet the criteria. Alternatives were reviewed.
- Unsuitable materials would need to be removed with either the signal lights or a roundabout.

Discussion Points:

- Drivers have become accustomed to roundabouts and can navigate them quickly which resulted in the single lane recommendation.
- Roundabouts are generally more expensive due to occupying a larger footprint but there were additional benefits such as safety that helped offset the initial costs.
- The proposed roundabout had the capacity to handle the traffic needs until 2030.There was a lot of capacity.
- The Commercial driveway would need to be relocated.
- Roundabouts have the ability to control traffic better. There are no stoppages, and they promote more free flow.

The presentation concluded at 7:14 p.m.

April 09, 2024 - Payzant/Wentworth Tender award for Construction Recommendation Report

Discussion Points:

Based on the traffic engineer a roundabout was the best solution and also took into account for future needs.

- Based on discussion with the province, there were plans to upgrade the lights at Cole/Wentworth to a roundabout.
- Dexter's were the only proponents at the site meetings and the only bidder.
- Concern was raised about the high cost associated with a roundabout.
- One (1) piece of land was secured, and staff were continuing to work with legal on purchasing the second piece of property and the third piece was still in the negotiation phase. Appraisals were incorporated into the design phase costs.
- The "F" grade meant it was unacceptable for what the movement of traffic should be based on the industry standard.

- Staff were unaware of any provincial or federal funding opportunities to assist with costs.
- The tender deadline was June 3, 2024.

MOVED BY COUNCILLORS IVEY AND MURLEY THAT COMMITTEE OF THE WHOLE RECOMMEND COUNCIL APPROVE THE AWARD OF TENDER WHRMPW24-03 FOR CONSTRUCTION OF THE PAYZANT DRIVE/WENTWORTH ROAD ROUNDABOUT TO THE LOW COMPLIANT BIDDER, DEXTER CONSTRUCTION, FOR THE TENDERED PRICE OF $4,274,980.00 PLUS APPLICABLE TAXES AND, COUNCIL ALSO APPROVES A CONSTRUCTION CONTINGENCY OF 15% ($641,247) AND THE COST FOR OVERHEAD UTILITY RELOCATION, FOR A TOTAL CONSTRUCTION ESTIMATED COST OF $5,116,227 PLUS APPLICABLE TAXES.

MOVED BY COUNCILLORS MURLEY AND JANNASCH THAT COMMITTEE OF THE WHOLE RECOMMENDS COUNCIL DEFER DISCUSSIONS ON THE MATTER UNTIL THE MAY COUNCIL MEETING.

At 10:06 p.m. both the MOVER and SECONDER agreed to withdraw the second motion. This left the first motion remaining on the floor. At 10:07 p.m. the MOVER and SECONDER agreed to withdraw the first motion.

The consensus was the price was higher than expected.

MOVED BY COUNCILLORS IVEY AND SMITH THAT COMMITTEE OF THE WHOLE RECOMMENDS COUNCIL APPROVE THE AWARD OF TENDER WHRMPW24-03 FOR CONSTRUCTION OF THE PAYZANT DRIVE/WENTWORTH ROAD ROUNDABOUT TO THE LOW COMPLIANT BIDDER, DEXTER CONSTRUCTION, FOR THE TENDERED PRICE OF $4,274,980.00 PLUS APPLICABLE TAXES AND, COUNCIL ALSO APPROVES A CONSTRUCTION CONTINGENCY OF 15% ($641,247) AND THE COST FOR OVERHEAD UTILITY RELOCATION, FOR A TOTAL CONSTRUCTION ESTIMATED COST OF $5,116,227 PLUS APPLICABLE TAXES. MOTION DEFETAED. Nays: Jannasch, M. McLean, Hartt, B. Morton, Sherman, P. Morton, Smith, Murley and Ivey

MOVED BY COUNCILLORS B. MORTON AND HARTT THAT COMMITTEE OF THE WHOLE RECOMMENDS COUNCIL DIRECTS THE CAO TO DIRECT STAFF TO COME BACK WITH A CLASS D ESTIMATE ON INSTALLING STREETLIGHTS AT THE INTERSECTION OF WENTWORTH AND PAYZANT. MOTION CARRIED

April 24, 2024 Council Mtg - Payzant /Wentworth Roundabout

Discussion Points:

- Based on historical information it was likely that a three-way stop would not be functional in this location. The traffic study would need to be reviewed to conclude if a

stopped section was looked at. Based on the traffic engineer's perspective a roundabout or signalized intersection was explored with smart lights.

- Concern was raised that residents would cut through the Credit Union parking lot to avoid waiting for signal lights to change. If this became an issue it would be an enforcement issue.
- The intersection would have a left and right turn slip lane.

MOVED BY COUNCILLORS IVEY AND SHERMAN THAT COUNCIL DIRECTS THE CAO TO DIRECT STAFF TO COME BACK WITH A CLASS D ESTIMATE ON INSTALLING STREET LIGHTS AT THE INTERSECTION OF WENTWORTH AND PAYZANT. MOTION CARRIED UNAMIOUSLY

DISCUSSION

The follow up Class D estimate for traffic signals at this intersection is $3.04M. This year's 2025/26 capital budget line-item approved amount was $51,930 for traffic studies, design and any required land purchase. Within the five-year capital budget $5.7M has been allocated in 2026/27 to provide financial capacity for the installation of traffic lights and associated costs as well as capacity for a roundabout pending Council's discussions.

The following points remain priorities or conditions of the Payzant and Wentworth intersection.

- The intersection serves as the main point access to Hants Community Hospital, Avon View High School, and several residential areas.
- Recently completed Community Way gives an alternate route through Cole Drive and/or Underwood Drive.
- Congestion occurs during peak hours, particularly school start and dismissal times.
- Historical studies:
    - 2013 Garlands Crossing/Windsor Border Area Study recommended intersection upgrades to accommodate future growth.
    - 2021 Infrastructure Needs Assessment suggested a two-lane roundabout.
    - 2023–2024 consultant review (Design Point Engineering) recommended a single-lane roundabout with an eastbound right-turn lane as the preferred option for safety and capacity.
    - 2024-2025 – Detailed engineering and design for Payzant to King St Connection
    - 2025 – Traffic Lights review / Analysis Update – Wentworth Road Corridor – Design Point currently working on this analysis.
    - 2025 – Integrated Resource Plan (IRP) – part of the scope of this study will be to conduct a Transportation Analysis: Assessment of current and future traffic conditions, intersection capacity, and safety, with phased recommendations for improvements.

Current Situation

- Payzant Drive is a **collector road**.
- Traffic volumes have increased due to residential growth and institutional use.
- Council previously allocated $3 million in the 2023/24 capital budget for roundabout design and construction; recent tender results indicate a $5.3 million cost for construction.
- 2025/26 - Design and Tender documents are almost complete for lights / signalized intersection, waiting on land acquisition that is required before proceeding. Construction is anticipated in 2027 at this time.
- Engineering and design work along with tender documents are complete for the Payzant to King Street connection, proposed schedule is to tender this project in December for award in January / February for an early construction season start in 2026.

Timing of Project for Approval & Construction

The current schedule for construction as included in the 2025/26 five-year capital budget is to first complete and have in service the Payzant to King extension. Intersection improvements at Wentworth and Payzant are scheduled to follow this work. This will allow for monitoring of the new traffic flow patterns and impacts of having the new connection, as this will then provide multiple ways in and out of Payzant Drive. Having the connection to King Street completed in advance would help lessen the impact of traffic congestion on Payzant during the project as this area experiences a high volume of traffic throughout the day and larger peaks during the morning, lunchtime and afternoon.

FINANCIAL IMPLICATIONS

- This year's 2025/26 capital budget line-item approved amount was $51,930 for traffic studies, design and any required land purchase.
- Five Year Capital Budget / Year 2026/27 – A $5.7 M allocation for "Wentworth @ Payzant Traffic Control".
- Based on the current Class D estimate for traffic signals at 3.04M, it is lower than the $5.7M for a roundabout, a difference of $2.66M however this does not consider the longer-term higher life cycle costs of the Traffic Signals compared to the lower life cycle costs of a roundabout. It is also important to note that the $3.04M Class D estimate is not a tendered cost as the $5.7M for a roundabout is.
- Tendered prices at time of tender bidding may vary compared to the current Class D estimate.

ALTERNATIVES

The following section summarizes the two primary intersection improvement options for the intersection.

Options

A. Traffic Signals

- Pros:
  - Lower initial cost ($2.66M estimate includes water and storm water system replacement where necessary).
  - Traditional intersection improvement method.
  - Familiar to drivers.
- Cons:
  - Higher long-term maintenance and repair costs.
  - System Failure – The reliance on power and proper function means that signal failure due to power outages or technical defects can cause significant confusion and safety problems for road users.
  - Damage to Traffic Lights – We have experienced several vehicle collisions to the traffic lights posts resulting in costly repairs and signals being out of service.
  - Short-term measure - not a longer-term sustainable improvement / solution.
  - Increased risk of severe collisions compared to roundabouts – Traffic signals significantly increase the frequency of rear end collisions as drivers may have to stop abruptly or decide whether to run a yellow light or not.
  - Increased Delay – Traffic signals often increase overall intersection and specific movement delays, particularly in low-traffic situations where drivers could otherwise proceed without stopping.
  - Inefficient Flow – They inherently guarantee that some traffic is stopped, even when no cross-traffic is present, leading to idling and inefficient traffic flow.
  - Does not benefit the Centennial Drive intersection and could further create long backups at this intersection and create unsafe conditions.
  - Does not align with the proposed future intersection improvements at Cole Drive.
  - Pedestrian & Cyclist Issues – Traffic signals often prioritize motor vehicles over pedestrians and cyclists, and long signal cycles can discourage walking or create unsafe crossing conditions.
  - Some property acquisition required

B. Single-Lane Roundabout

- Pros:

    - Nova Scotia Transportation and Halifax municipal guidelines favor roundabouts for high-volume intersections due to safety and efficiency benefits.
    - Reduced collision severity and improve traffic flow compared to signalized intersections.
    - Improved Safety – lower speeds and simplified Decision Making. Reduced right angle and head on collisions and fewer conflict points.
    - Reduced Environmental Impact – Keeping traffic moving at consistent lower speeds reduces idling, emissions and fuel consumption
    - Reduced delays.
    - Lower lifecycle maintenance costs.
    - Incorporates the Centennial Drive Intersection via making it a right turn only on exit.
    - Future roundabout planned for Cole Drive intersection.
    - Current and future development along Wentworth Road, roundabout will allow for efficient traffic flows without backups lessening congestion.
    - Improved aesthetics for visual appeal at prominent locations.
    - Ability to function during power outages
- Cons:
    - Highest upfront cost $5.3M estimated based on 2024 tender pricing.
    - Requires property adjustments and greater design complexity.

Other Options / Considerations

1. Expedite this project schedule without waiting for the new Payzant to King connector to be constructed and in service. This would not be the recommendation of staff.
2. Remove the planned replacement of water main and storm water infrastructure to reduce cost and scope of project. This would not be recommended due to high risk of watermain failure / breaks and having to tear up new pavement and road structure.
3. Delay the project and not proceed with infrastructure improvements within the 5-year capital plan.

ATTACHMENTS

- Cole Drive Intersection showing proposed roundabout.
- Class D Cost Estimate Jan 2025– Traffic Signals
- IFT Drawings – Traffic Signals
- IFT Drawings – Roundabout
- Construction Estimate / Tender Bid- Roundabout
- Windsor Intersection Needs Assessment
- Design Point Traffic Engineer PP Presentation January 10, 2023
- April 9, 2024, Payzant Drive / Wentworth Road Roundabout Tender Award Recommendation Report
- Dalhousie Roundtable Presentation – April 2025

CHIEF ADMINISTRATIVE OFFICER REVIEW

The report provides an update and staff continue to finalize the traffic light option and tender documents for this project.

I urge Council and staff to continue to monitor and envision the full build out of the Wentworth Rd network including 101 Highway access and egress, Cole Drive developments, Payzant extension and development, The Crossing and its ongoing development and Windsor Business Park / Exhibition Grounds and Sports Complex activities. The presentation prepared for the Dalhousie Roundtable exercise held in April of 2025 helps to display the highlighted projects and potential developments in this area.

Having the traffic light option finalized for Councils' consideration will provide for two thoroughly reviewed options for Council's consideration when the project enters its construction year, noting traffic lights is the preferred at this time by Council.

Report Prepared by: _____
Todd Richard, Director of Public Works

Report Reviewed by: _____
Tim Bouter, Project Engineer

Report Reviewed by: _____
Troy Burgess, Traffic Authority

Report Approved by: _____
Mark Phillips, Chief Administrative Officer

WINDSOR EXHIBITION GROUNDS DEVELOPMENT PLAN

0 40 80m

Scale = 1:1000

April 2019

Extend Ramp to Roundabout

Roundabout and Boulevard

0 100 200 300

metres

ekistics plan+design

ESTIMATE OF PROBABLE COST

Payzant Drive Signals - Payzant Drive & Wentworth Road

Water System Only

Project Number: 24-380

Date: January 24, 2025

Drawings: Sheets 1-8, Revision 4, IFT, January 15, 2025

DESIGNPOINT
engineering • surveying • solutions

Note: This estimate is based on unit rates obtained from previous tenders of similar work and represents a budget only. The actual construction cost will be subject to various factors that are not known at the time of estimate preparation, including market conditions, industry workload, and changes to the design through the approval process. The actual cost cannot be known until the project is tendered and a contract is awarded. This estimate should be used with caution if using for budgeting purposes.

No.		Unit Description	Unit	Quantity	Unit Rate	Estimated Cost
		EARTHWORK				
1		Clearing	L.S.	1	$ 10,000.00	$ 10,000.00
2		Grubbing	L.S.	1	$ 10,000.00	$ 10,000.00
6		Borrow (Provisional)	m^3	50	$ 100.00	$ 5,000.00
10		Karst Topography Cavern Infill (Provisional)				
	.1	Less than or equal to 5 cubic metres	m^3	3	$ 1,500.00	$ 4,500.00
	.1	Greater than 5 cubic metres	m^3	20	$ 800.00	$ 16,000.00
					SUBTOTAL EARTHWORK	**$ 45,500.00**
		WATER MAIN				
11		Pipe				
	.1	150mm PVC Bionax - Payzant 0+170	m	11	$ 1,600.00	$ 17,600.00
	.2	250mm PVC Bionax - Payzant Drive	m	174	$ 1,800.00	$ 313,200.00
	.3	250mm PVC Bionax - Wentworth Road	m	104	$ 1,800.00	$ 187,200.00
12		Fire Hydrants				
	.1	Fire Hydrant (incl tee, valve, lead, supply & install)	each	2	$ 12,000.00	$ 24,000.00
14		Direct Buried Valvees				
	.1	150mm Gate Valve	each	1	$ 4,000.00	$ 4,000.00
	.2	250mm Gate Valve	each	5	$ 5,000.00	$ 25,000.00
15		Services				
	.1	Set of Fittings	each	1	$ 500.00	$ 500.00
	.2	19 mm Municipex	m	15	$ 400.00	$ 6,000.00
16		Connection to Existing Main				
	.1	250mm, Payzant Drive 0+012	each	1	$ 7,500.00	$ 7,500.00
	.2	250mm, Payzant Drive 0+182	each	1	$ 7,500.00	$ 7,500.00
	.3	150mm, Payzant Drive 0+160 - Service Lateral	each	1	$ 7,500.00	$ 7,500.00
	.4	200mm, Wentworth Road 0+905	each	1	$ 7,500.00	$ 7,500.00
	.5	Service lateral, Wentworth Civic 141	each	1	$ 5,000.00	$ 5,000.00
18		Temporary Water	L.S.	1	$ 50,000.00	$ 50,000.00
19		Sleeve	m	6	$ 100.00	$ 600.00
20		Abandonment / Removal of Existing Water				
	.1	250mm, Payzant Drive 0+018 - Cap & Abandon in place	L.S.	1	$ 6,000.00	$ 6,000.00
	.2	250mm, Payzant Drive 0+134 - Cap & Abandon in place	L.S.	1	$ 6,000.00	$ 6,000.00
	.3	250mm, Wentworth Road 0+908 - Cap & Abandon in place	L.S.	1	$ 6,000.00	$ 6,000.00
	.4	250mm, Wentworth Road 1+009 - Cap & Abandon in place	L.S.	1	$ 6,000.00	$ 6,000.00
	.5	250mm, Payzant Drive 0+133 to 0+175 - Remove	m	42	$ 200.00	$ 8,400.00
	.6	250mm, Wentworth Road 0+905 to 1+005 - Remove	m	100	$ 250.00	$ 25,000.00
	.7	Fire Hydrant, Payzant Drive 0+160 - Remove	each	1	$ 1,500.00	$ 1,500.00
					SUBTOTAL WATER MAIN	**$ 722,000.00**

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Note: This estimate is based on unit rates obtained from previous tenders of similar work and represents a budget only. The actual construction cost will be subject to various factors that are not known at the time of estimate preparation, including market conditions, industry workload, and changes to the design through the approval process. The actual cost cannot be known until the project is tendered and a contract is awarded. This estimate should be used with caution if using for budgeting purposes.

No.		Unit Description	Unit	Quantity	Unit Rate	Estimated Cost
		STORM SEWER				
33		Catch Basins				
	.1	1050 mm dia Concrete	ea	1	$ 6,000.00	$ 6,000.00
34		Catch Basin Leads				
	.1	250 mm dia DR18 PVC	m	15	$ 800.00	$ 12,000.00
36		Connections to Existing Main				
	.1	250 mm to existing catch basin	ea	1	$ 5,000.00	$ 5,000.00
37		Culverts				
	.1	450 mm, 65D Concrete	m	16	$ 1,000.00	$ 16,000.00
39		Headwalls				
	.1	450 mm, Precast Headwall	ea	2	$ 4,000.00	$ 8,000.00
40a		Removal of Existing Structures				
	.1	Catch Basin	ea	1	$ 2,500.00	$ 2,500.00
40b		Swale	m	40	$ 100.00	$ 4,000.00
					SUBTOTAL STORM SEWER	**$ 53,500.00**
		STREET CONSTRUCTION				
41		Gravels				
	.1	Type 1 - 150 mm	m^2	815	$ 22.00	$ 17,930.00
	.2	Type 2 - 500 mm	m^2	815	$ 45.00	$ 36,675.00
43		Asphalt Concrete				
	.1	Type C-HF - 50 mm	m^2	2424	$ 35.00	$ 84,840.00
	.2	Type B-HF - 100 mm	m^2	815	$ 100.00	$ 81,500.00
	.3	Cold Planing - 50 mm	m^2	2424	$ 10.00	$ 24,240.00
44		Curb	m	307	$ 160.00	$ 49,120.00
45		Sidewalk				
	.1	Concrete - 100 mm	m^2	506	$ 135.00	$ 68,310.00
	.2	Concrete - 150 mm	m^2	20	$ 180.00	$ 3,600.00
46		Tactile Walking Surface Indicators	each	26	$ 500.00	$ 13,000.00
50		Adjustment to Existing				
		Manhole Frames and Covers	each	1	$ 2,000.00	$ 2,000.00
51		Adjustment to Existing				
		Catch Basin Fromes and Covers	each	2	$ 2,000.00	$ 4,000.00
52		Segmental Retaining Wall				
	.1	Redi-Rock	m^2	66	$ 750.00	$ 49,500.00
					SUBTOTAL STREET CONSTRUCTION	**$ 434,715.00**
		LANDSCAPING				
61		Topsoil and Sod - 150 mm	m^2	440	$ 25.00	$ 11,000.00
64		Handrail (on top of retaining wall)	m	65	$ 200.00	$ 13,000.00
					SUBTOTAL LANDSCAPING	**$ 24,000.00**

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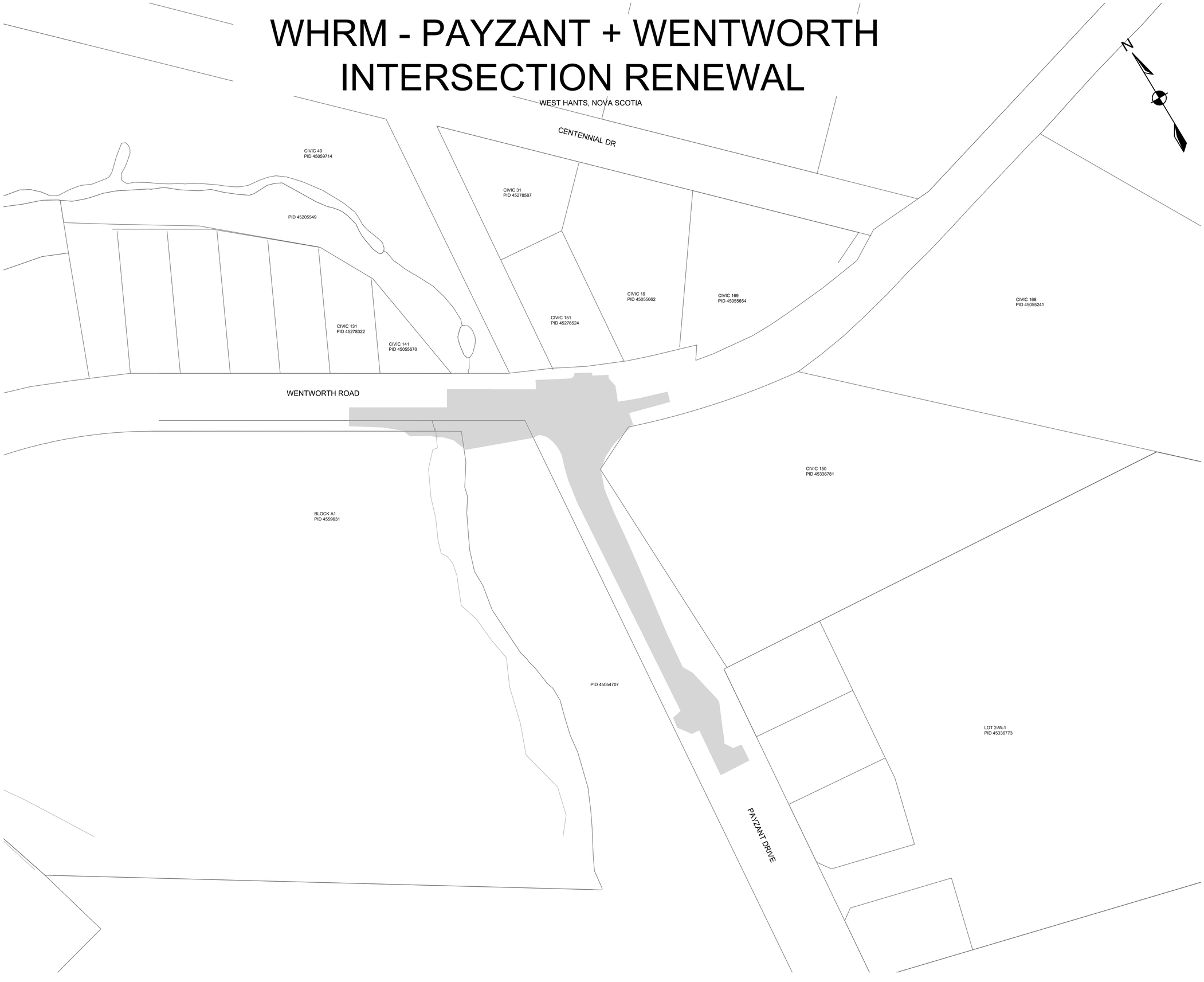
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No.		Unit Description	Unit	Quantity	Unit Rate	Estimated Cost
		ADDITIONAL ITEMS				
73		Replacement of Unsutiable Material w/ Surge Rock (Provsional)	m^3	360	$ 100.00	$ 36,000.00
76		Removal Guard Rail	m	25	$ 300.00	$ 7,500.00
77		Pavement Markings	L.S.	1	$ 5,000.00	$ 5,000.00
					SUBTOTAL ADDITIONAL ITEMS	**$ 48,500.00**
		ENVIRONMENTAL PROTECTION				
90		Environmental Protection	L.S.	1	$ 12,000.00	$ 12,000.00
					SUBTOTAL ENVIRONMENTAL PROTECTION	**$ 12,000.00**
		ELECTRICAL				
91		Direct Buried Conduit				
	.1	2-38 mm dia	m	7	$ 200.00	$ 1,400.00
	.2	2-50 mm dia, 2-38 mm dia	m	100	$ 300.00	$ 30,000.00
92		Traffic Concrete Bases				
	.1	Type 1	ea	3	$ 7,000.00	$ 21,000.00
	.2	Type 2	ea	3	$ 8,000.00	$ 24,000.00
	.3	Controller Pad	ea	1	$ 7,000.00	$ 7,000.00
93		Wireless Detection	L.S.	1	$ 5,000.00	$ 5,000.00
94		Traffic Signal Installation				
	.1	Materials	L.S.	1	$ 510,000.00	$ 510,000.00
	.2	Labour	L.S.	1	$ 360,000.00	$ 360,000.00
					SUBTOTAL ELECTRICAL	**$ 958,400.00**

Total	**$ 2,298,615.00**
Contingency (15%)	**$ 344,792.25**
Total	**$ 2,643,407.25**
Total with HST (15%)	**$ 3,039,918.34**

WHRM - PAYZANT + WENTWORTH INTERSECTION RENEWAL

WEST HANTS, NOVA SCOTIA





KEYPLAN 1:20 000

LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES
15 0 30 45
1:750

ISSUE	DATE	DESCRIPTION	INT.
4	JAN. 23, 2025	ISSUED FOR TENDER	S.L.
3	DEC. 16, 2024	ISSUED FOR REVIEW	S.L.
2	SEP. 9, 2024	ADDED WATER MAIN RELOCATION	J.D.
1	JUN. 24, 2024	ISSUED FOR REVIEW	

CONSULTANT

DESIGNPOINT
engineering • surveying • solutions
902.832.5597
designpoint.ca

REGISTERED PROFESSIONAL ENGINEER
DATE: JAN 23, 2025
A. J. SKETCHLEY
11560
PROVINCE OF NOVA SCOTIA

CLIENT

West Hants
something inspiring awaits

PROJECT DESCRIPTION

PAYZANT + WENTWORTH INTERSECTION RENEWAL

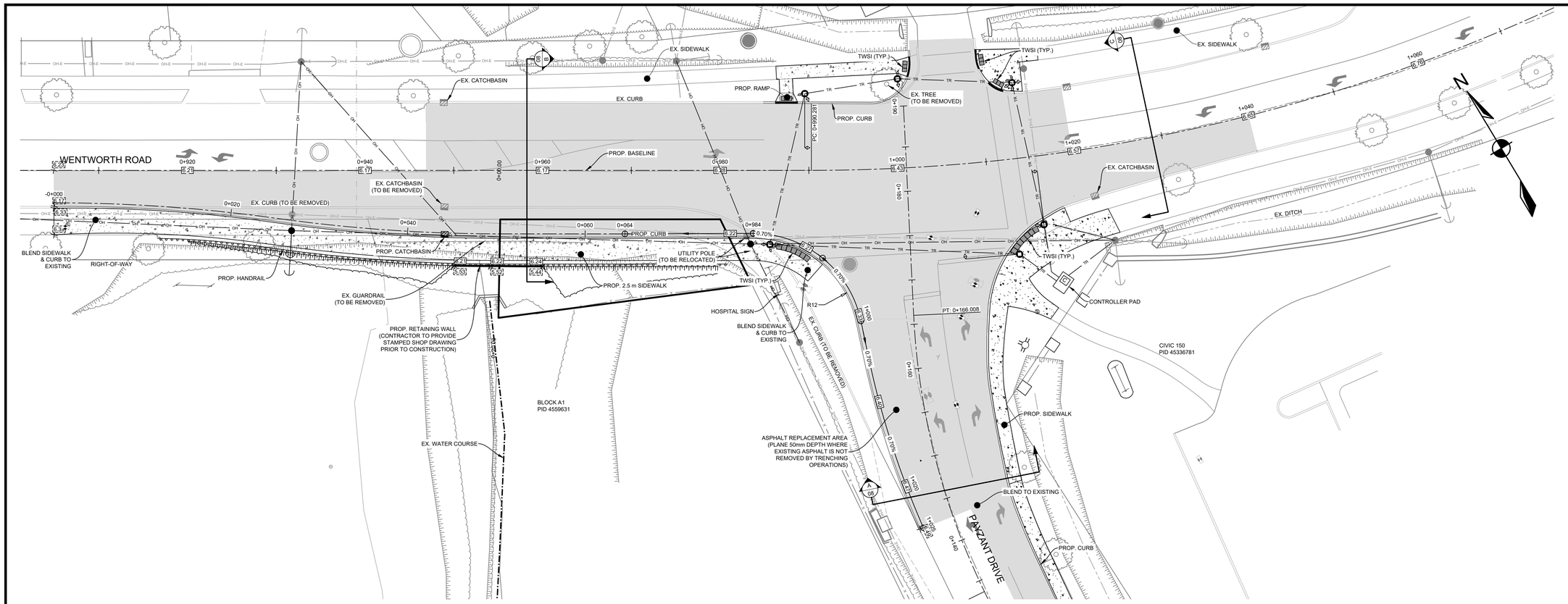
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

COVER SHEET

Drawn	Engineer	Project No.	Drawing No.
S. LOPES	P. BURGESS	24-380	C-01
Scale	Filename		01 of 08
1:750 H, 1:50 V	24-380_TR01.dwg		

P:\2024\24-380 - WHRM - Payzant Signals\01 - Drawings\Eng Design\24-380_TR01.dwg, Plot Date: 2025-Jan-23, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Sofia Lopes





LEGEND

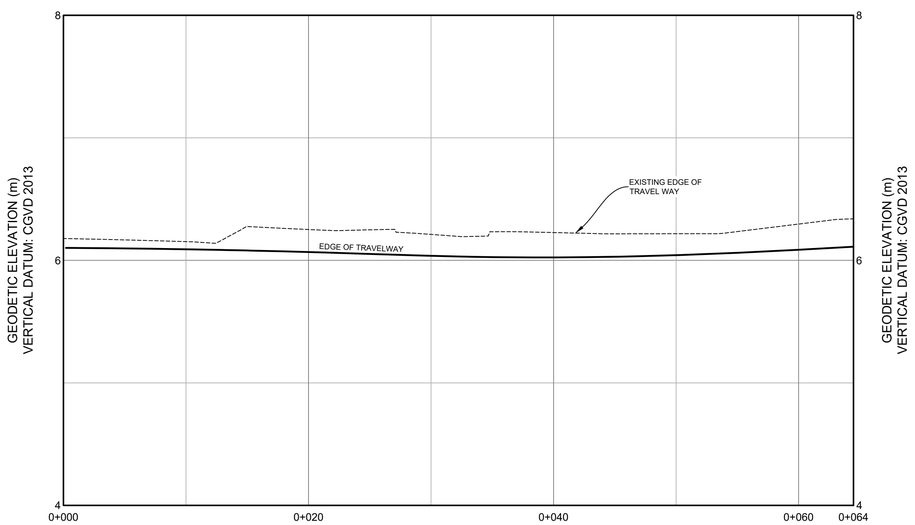
EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES
5 0 10 15
1:250

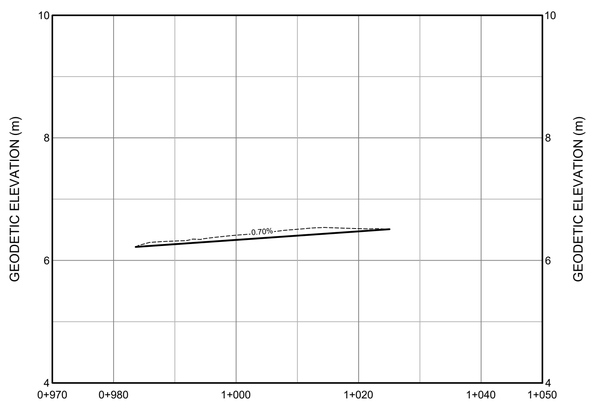
WENTWORTH CURB PROFILE

SCALE 1:250



SW CURB RETURN PROFILE

SCALE 1:500



ISSUE	DATE	DESCRIPTION	INT.
4	JAN. 23, 2025	ISSUED FOR TENDER	S.L.
3	DEC. 16, 2024	ISSUED FOR REVIEW	S.L.
2	SEP. 9, 2024	ADDED WATER MAIN RELOCATION	J.D.
1	JUN. 24, 2024	ISSUED FOR REVIEW	

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REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF NOVA SCOTIA
DATE: JAN 23, 2025
A. J. SKETCHLEY
11560

CLIENT

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PROJECT DESCRIPTION

PAYZANT + WENTWORTH INTERSECTION RENEWAL

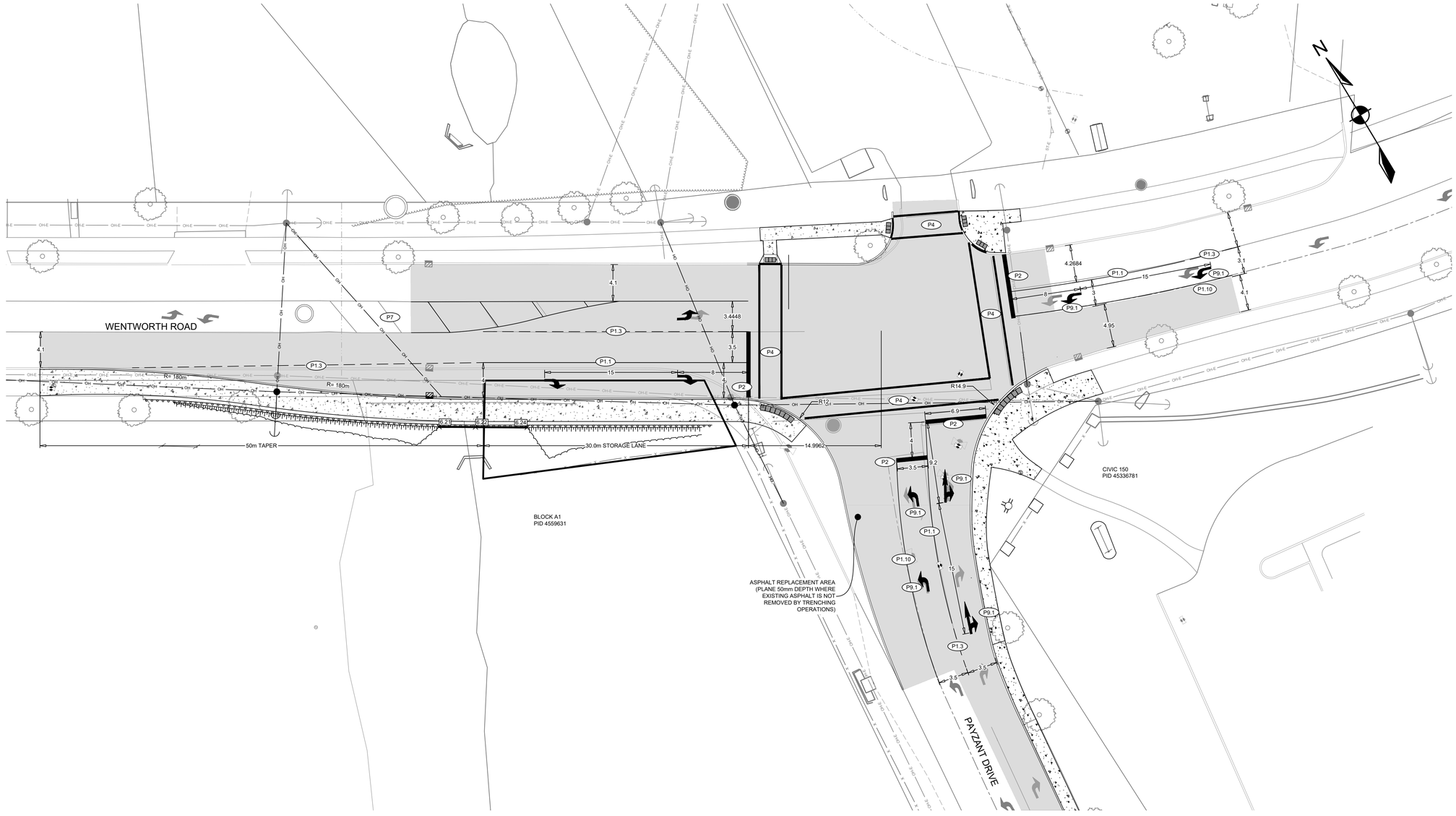
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

GRADING PLAN

Drawn	Engineer	Project No.	Drawing No.
S. LOPES	P. BURGESS	24-380	C-02
Scale	Filename		02 OF 08
1:250 H, 1:50 V	24-380_TR01.dwg		

P:\2024\24-380 - WHRM - Payzant Signals\01 - Drawings\Eng Design\24-380_TR01.dwg, Plot Date: 2025-Jan-23, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Sofia Lopes



SIGNAGE AND PAVEMENT MARKING NOTES:

1. ALL LANE MARKINGS SHALL BE ACCORDING TO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA (MUTCDC) USING SIGNS APPROVED FOR USE IN NOVA SCOTIA.
2. ALL SIGNS ARE TAC UNLESS OTHERWISE INDICATED
3. LANE LINES ARE TO BE 100 mm WIDE EXCEPT WHERE OTHERWISE INDICATED. CROSSWALK LINES ARE TO BE 200 mm WIDE, STOP BARS ARE TO BE 450 mm WIDE.
4. CENTERLINES AND CROSS HATCHING TO BE YELLOW, ALL OTHER PAVEMENT MARKINGS TO BE WHITE.
5. PEDESTRIAN CURB CUTS AND RAMPS TO BE PROVIDED AT BOTH ENDS OF ALL CROSSWALKS, SEE HRM DETAIL 49.
6. REMOVE ALL EXISTING PAVEMENT MARKINGS AT INTERSECTIONS AND APPROACHES AND RE-PAINT AS SHOWN, UNLESS OTHERWISE NOTED.
7. ALL MARKINGS DIMENSIONED TO CENTER OF LINES.
8. REMOVED SIGNS AND POSTS ARE TO BE RETURNED TO THE MUNICIPALITY

PAVEMENT MARKING TABLE

ID	MATERIAL	ITEM	SIZE/WIDTH	COLOUR	QUANTITY
P1.1	PAINT	SINGLE LINE-SOLID	100 mm	WHITE	70 m
P1.3	PAINT	SINGLE LINE-BROKEN	100 mm (3 m LINE, 3 m SPACING)	WHITE	83 m
P1.10	PAINT	SINGLE LINE-SOLID	100 mm	YELLOW	50 m
P2	PAINT	STOP BAR	450 mm	WHITE	24 m
P4	PAINT	CROSSWALK	2 x 200 mm	WHITE	60 m
P7	PAINT	HATCHING	100 mm LANE LINES, 450 mm HATCH LINES, 6.0 m SPACING	YELLOW	80 m²
P9.1	PAINT	ARROW	3/4 TAC SIZE	WHITE	9 EA.



KEYPLAN 1:20 000

LEGEND

EXISTING		PROPOSED
	EASEMENT	
P-E P-E	UNDERGROUND POWER	P P
C-E C-E	UNDERGROUND COMM.	C C
TR-E	TRAFFIC CONDUIT	TR TR
OH-E	OVERHEAD LINE	OH OH
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			HYDRANT		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
PRECAST HEADWALL			SIGNAL POLE		
CATCHBASIN			SIGNAL HEAD		
			PEDESTRIAN HEAD		

METRES
5 0 10 15
1:250

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PROVINCE OF NOVA SCOTIA
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6041

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PROJECT DESCRIPTION

PAYZANT + WENTWORTH INTERSECTION RENEWAL

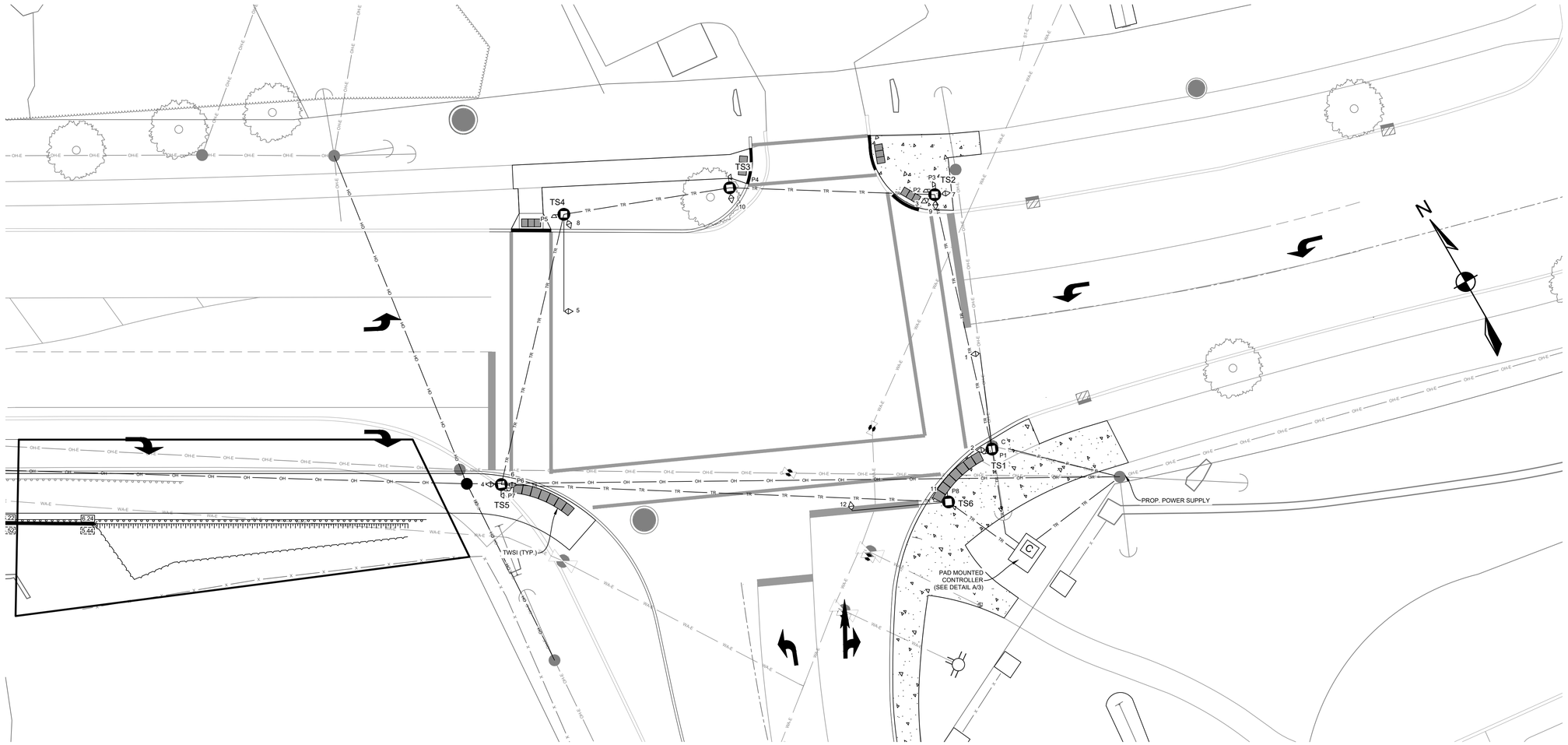
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

PAVMENT MARKING PLAN

Drawn	Engineer	Project No.	Drawing No.
S. LOPES	P. BURGESS	24-380	C-03
Scale	Filename		03 of 08
1:250	24-380_TR01.dwg		

P:\2024\24-380 - WHRM - Payzant Signals\01 - Drawings\Eng Design\24-380_TR01.dwg, Plot Date: 2025-Jan-23, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Sofia Lopes





LEGEND

EXISTING		PROPOSED
	EASEMENT	
P-E P-E	UNDERGROUND POWER	P P
C-E C-E	UNDERGROUND COMM.	C C
TR-E	TRAFFIC CONDUIT	TR TR
OH-E	OVERHEAD LINE	OH OH
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
X X	FENCELINE	X X

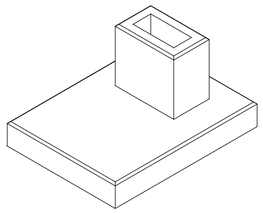
	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			HYDRANT		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
PRECAST HEADWALL			SIGNAL POLE		
CATCHBASIN			SIGNAL HEAD		
			PEDESTRIAN HEAD		

METRES 3 0 6 9

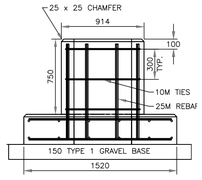
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BASE MOUNTED TRAFFIC SIGNAL CONTROLLER CABINET A/3

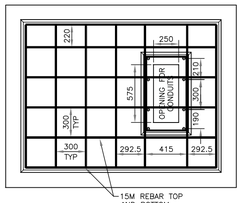
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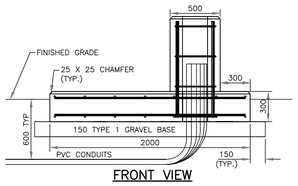
ISOMETRIC VIEW



SIDE VIEW



TOP VIEW



FRONT VIEW

NOTES:

1. ALL CONCRETE SHALL BE 35 MPa.
2. PROVIDE MIN. 50 COVER FOR ALL REBAR.
3. PROVIDE GROUNDING FOR CABINET.
4. IN ADDITION TO CONDUIT SPECIFIED ON DRAWINGS, PROVIDE 2–50 mm DIA. PVC CONDUIT AND STUB OUTSIDE OF BASE.
5. ALL CONDUIT AND FITTINGS SHALL BE TO CANADIAN ELECTRICAL CODE.
6. PROVIDE 20 mm x 100 mm STAINLESS STEEL THREADED RODS TO CONNECT CONTROLLER CABINET.
7. ALL DIMENSIONS IN MILLIMETRES.
8. TYPE 1 GRAVEL BASE SHALL EXTEND MIN. 150 mm BEYOND EDGE OF BASE PAD.

TRAFFIC SIGNAL CONDUIT SCHEDULE

CONDUIT RUN	APPROXIMATE LENGTH OF RUN (m)	CONDUIT NUMBERS AND SIZES (mm)	CONTENTS OF CONDUIT
POWER SUPPLY - CONTROLLER	7	2 - 38	POWER, SPARE
CONTROLLER - TS.1	9	2 - 50	TRAFFIC SIGNAL, SPARE
		2 - 38	VEHICLE DETECTION, SPARE
TS.1- TS.2	15	2 - 50	TRAFFIC SIGNAL, SPARE
		2 - 38	VEHICLE DETECTION, SPARE
TS.2 - TS.3	12	2 - 50	TRAFFIC SIGNAL, SPARE
		2 - 38	VEHICLE DETECTION, SPARE
TS.3 - TS.4	12	2 - 50	TRAFFIC SIGNAL, SPARE
		2 - 38	VEHICLE DETECTION, SPARE
TS.4 - TS.5	17	2 - 50	TRAFFIC SIGNAL, SPARE
		2 - 38	VEHICLE DETECTION, SPARE
TS.5-TS.6	26	2 - 50	TRAFFIC SIGNAL, SPARE
		2 - 38	VEHICLE DETECTION, SPARE
TS.6 - CONTROLLER	7	2 - 50	TRAFFIC SIGNAL, SPARE
		2 - 38	VEHICLE DETECTION, SPARE

TRAFFIC SIGNAL HEAD SCHEDULE

POLE	SIGNAL HEAD	SIGNAL CONFIGURATION	SIGNAL MOUNTING
TS.1	1	300R, 300A, 300G	HORIZONTAL ON MAST ARM USING ASTRO BRACKETS
	2	300R, 300A, 300G	SIDE MOUNTED
	P1		SIDE MOUNTED-LED COUNTDOWN MODULE
TS.2	3	300R, 300A, 300G	SIDE MOUNTED
	7	300R, 300A, 300G	SIDE MOUNTED
	9	300R, 300A, 300G	SIDE MOUNTED
	P2	PEDESTRIAN HEAD	SIDE MOUNTED - LED COUNTDOWN SIGNAL MODULE
	P3	PEDESTRIAN HEAD	SIDE MOUNTED - LED COUNTDOWN SIGNAL MODULE
TS.3	7	300R, 300A, 300G	SIDE MOUNTED
	P4	PEDESTRIAN HEAD	SIDE MOUNTED - LED COUNTDOWN SIGNAL MODULE
TS.4	5	300R, 300A, 300GA, 300G	HORIZONTAL ON MAST ARM USING ASTRO BRACKETS
	8	300R, 300A, 300G	SIDE MOUNTED
	P5	PEDESTRIAN HEAD	SIDE MOUNTED - LED COUNTDOWN SIGNAL MODULE
TS.5	4	300R, 300A, 300G	SIDE MOUNTED
	6	300R, 300A, 300G, 300GA	SIDE MOUNTED
	P6	PEDESTRIAN HEAD	SIDE MOUNTED - LED COUNTDOWN SIGNAL MODULE
	P7	PEDESTRIAN HEAD	SIDE MOUNTED - LED COUNTDOWN SIGNAL MODULE
TS.6	11	300R, 300A, 300G	HORIZONTAL ON MAST ARM USING ASTRO BRACKETS
	12	300R, 300A, 300G	SIDE MOUNTED
	P8	PEDESTRIAN HEAD	SIDE MOUNTED - LED COUNTDOWN SIGNAL MODULE

TRAFFIC SIGNAL POLE NOTES:

1. LAYOUT SHOWN FOR NEW POLES IS APPROXIMATE ONLY. ALL POLE BASES ARE TO BE APPROVED IN FIELD BY ENGINEER PRIOR TO INSTALLATION.
2. POLE ELEVATION VIEWS SHOWN REPRESENT NEW SIGNAL REQUIREMENTS ONLY AND DO NOT NECESSARILY REFLECT ACCURATE EXISTING CONFIGURATIONS. CONTRACTOR TO CONFIRM SIGNAL MOUNTING CONFIGURATION REQUIREMENTS PRIOR TO CONSTRUCTION.
3. ALL ALUMINUM POLES ARE MOUNTED ON TRANSFORMER BASES. TRANSFORMER BASE DOOR SHALL FACE THE SIDEWALK.
4. SHOP DRAWINGS OF ALL EQUIPMENT MUST BE APPROVED BY ENGINEER PRIOR TO ORDERING.
5. WHRM TO TEST AND PROGRAM CONTROLLER AND TIMER PRIOR TO COMMISSIONING.
6. FINAL CONNECTIONS TO THE CONTROLLER UNIT AND TESTING TO BE PERFORMED IN THE PRESENCE OF WHRM TRAFFIC PERSONNEL.
7. ALL WORK IS TO BE PERFORMED ACCORDING TO WHRM SPECIFICATIONS.
8. STREET NAME SIGNS ON SIGNAL ARMS TO BE SUPPLIED BY WHRM AND INSTALLED BY CONTRACTOR.
9. CONCRETE SHALL BE PLACED UP TO THE BASE OF ALL POLES WITH PEDESTRIAN PUSH BUTTONS.
10. MS SEDCO TO BE INSTALLED AS PER MANUFACTURERS RECOMMENDATIONS.
11. MS SEDCO LOCATIONS ARE PRELIMINARY ONLY. FINAL LOCATIONS TO BE CONFIRMED IN FIELD. LOCATIONS TO BE FIELD TESTED AND ADJUSTED TO PROVIDE RELIABLE DETECTION TO THE SATISFACTION OF HRM.
12. MOUNTING HEIGHT OF SIGNALS AND PUSH BUTTONS ABOVE GROUND:
    - VEHICLE SIGNALS ON ARM - 5.0m TO 6.0m;
    - VEHICLE SIGNALS ON POLE - 3.0m TO BOTTOM OF SECTION;
    - PEDESTRIAN SIGNALS - 2.6m TO BOTTOM OF SECTION;
    - PEDESTRIAN PUSH BUTTONS - 1.1m

TRAFFIC SIGNAL POLE AND BASE SCHEDULE

POLE	BASE STANDARD DWG. NO.*	BC DIA.	TRANSFORMER BASE (430 mm)	POLE HEIGHT	POLE DIA.	MAST ARM LENGTH	POLE TYPE	COMMENTS
TS.1	TYPE 2	375 mm	YES	5.49m	254 mm	6.1m	ALUM	INSTALL POLES, MAST ARMS +SIGNAL EQUIPMENT
TS.2	TYPE 1	375 mm	YES	4.57m	200 mm	N/A	ALUM	INSTALL POLES, SIGNAL EQUIPMENT
TS.3	TYPE 1	375 mm	YES	4.57 m	200 mm	N/A	ALUM	INSTALL POLES + SIGNAL EQUIPMENT
TS.4	TYPE 2	375 mm	YES	5.49 m	254 mm	6.1 m	ALUM	INSTALL POLES, MAST ARMS + SIGNAL EQUIPMENT
TS.5	TYPE 1	375 mm	YES	4.57 m	200 mm	N/A	ALUM	INSTALL POLES + SIGNAL EQUIPMENT
TS.6	TYPE 2	375 mm	YES	5.49 m	254 mm	6.1 m	ALUM	INSTALL POLES, MAST ARMS + SIGNAL EQUIPMENT

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REGISTERED PROFESSIONAL ENGINEER
DATE JAN 23, 2025
P.V. BURGESS
6041
PROVINCE OF NOVA SCOTIA

CLIENT

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PROJECT DESCRIPTION

PAYZANT + WENTWORTH INTERSECTION RENEWAL

WEST HANTS, NOVA SCOTIA

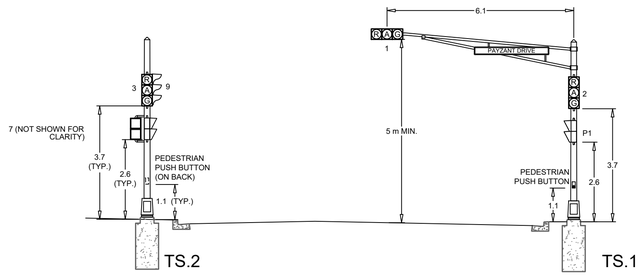
SHEET DESCRIPTION

TRAFFIC SIGNAL PLAN

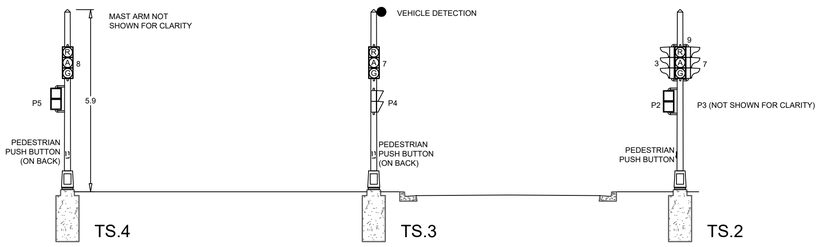
Drawn	Engineer	Project No.	Drawing No.
S. LOPES	P. BURGESS	24-380	C-04
Scale	Filename		04 OF 08
1:150	24-380_TR01.dwg		

P:\2024\24-380 - WHRM - Payzant Signals\01 - Drawings\Eng Design\24-380_TR01.dwg, Plot Date: 2025-Jan-23, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Sofia Lopes

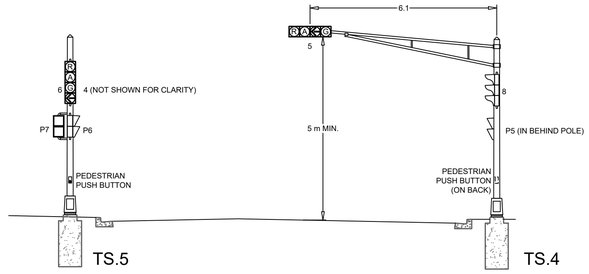
WENTWORTH ROAD AT PAYZANT DRIVE



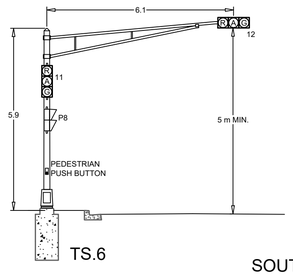
EASTBOUND APPROACH



NORTHBOUND APPROACH



WESTBOUND APPROACH

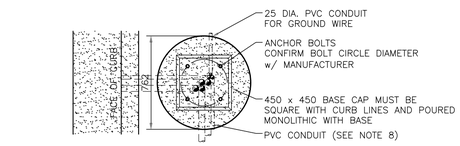


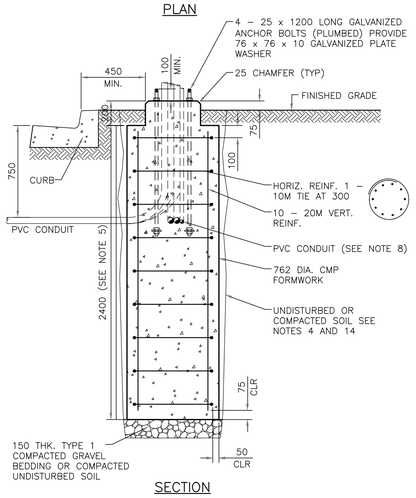
SOUTHBOUND APPROACH

TRAFFIC SIGNAL BASE - TYPE 1

N.T.S.

A 05





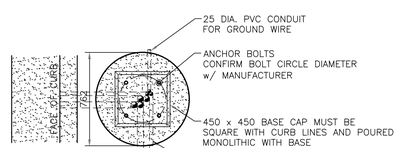
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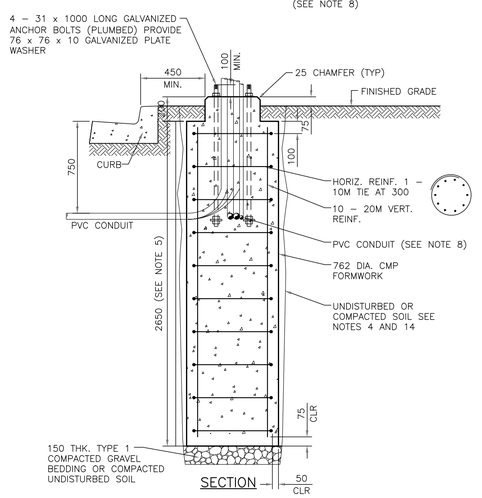
1. DIMENSIONS ARE IN MILLIMETRES.

TRAFFIC SIGNAL BASE - TYPE 2

N.T.S.

B 05





NOTES:

1. DIMENSIONS ARE IN MILLIMETRES.



LEGEND

EXISTING		PROPOSED
	EASEMENT	
P-E P-E	UNDERGROUND POWER	P P
C-E C-E	UNDERGROUND COMM.	C C
TR-E	TRAFFIC CONDUIT	TR TR
OH-E	OVERHEAD LINE	OH OH
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			HYDRANT		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
PRECAST HEADWALL			SIGNAL POLE		
CATCHBASIN			SIGNAL HEAD		
			PEDESTRIAN HEAD		



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PROJECT DESCRIPTION

PAYZANT + WENTWORTH INTERSECTION RENEWAL

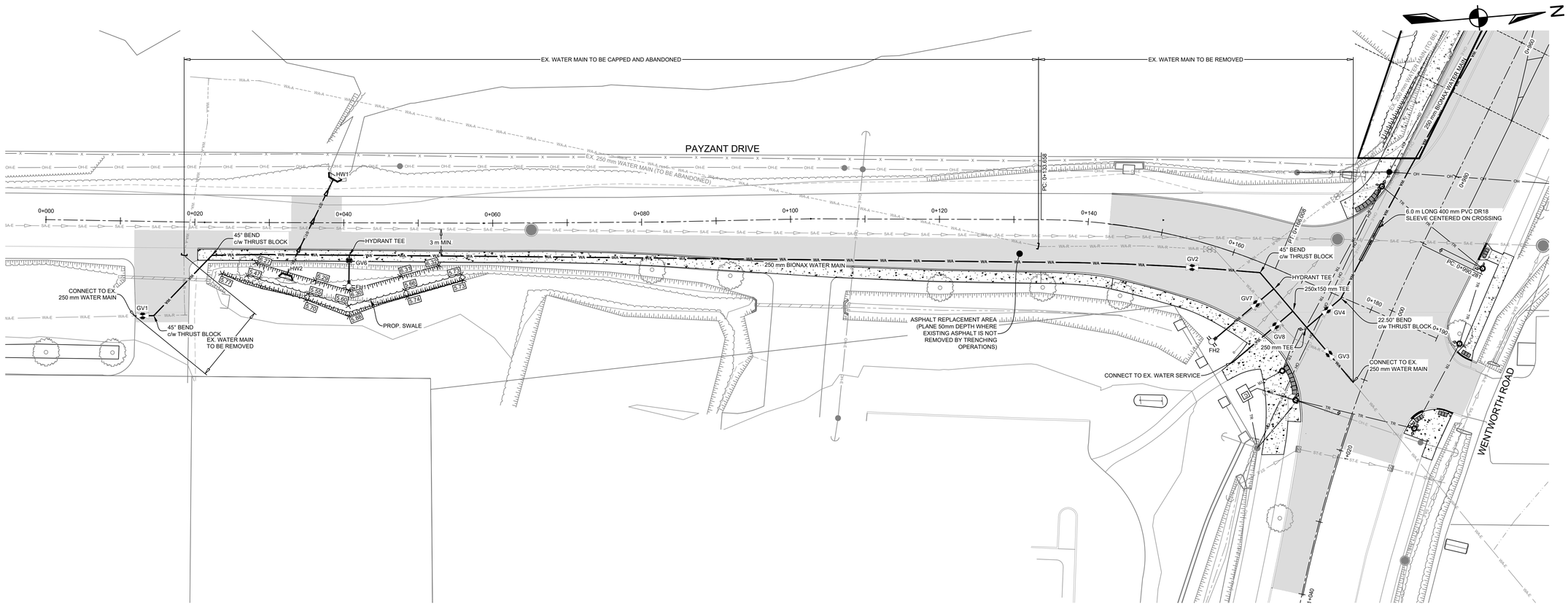
WEST HANTS, NOVA SCOTIA

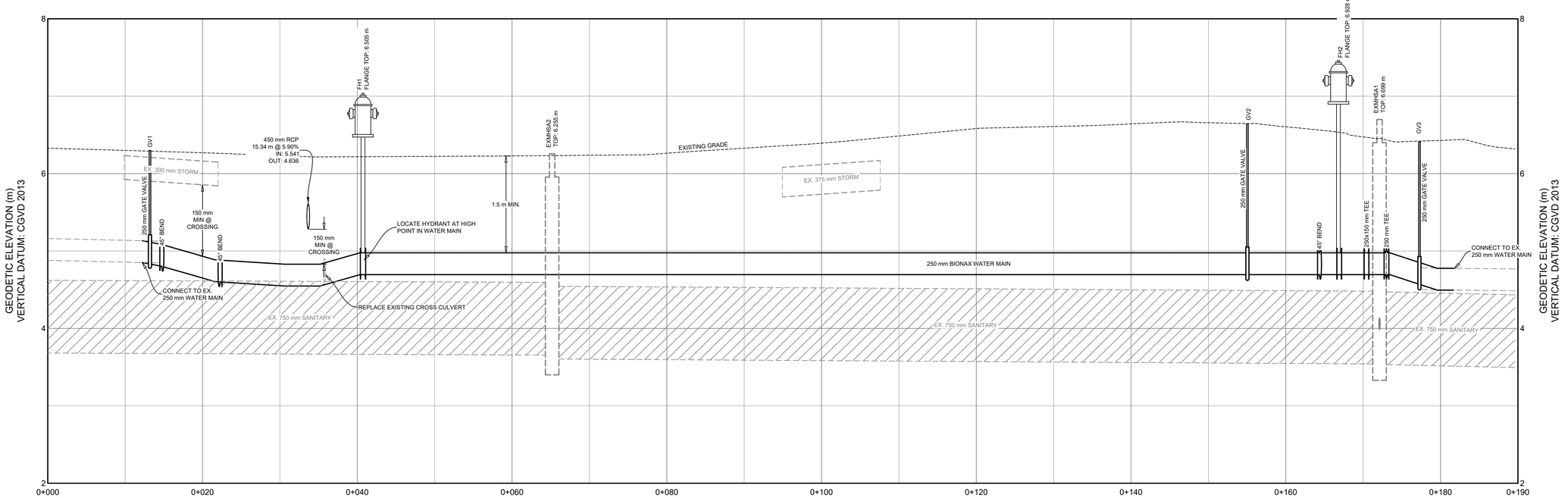
SHEET DESCRIPTION

TRAFFIC SIGNAL DETAILS

Drawn	Engineer	Project No.	Drawing No.
S. LOPES	P. BURGESS	24-380	C-05
Scale	Filename		05 of 08
1:100	24-380_TR01.dwg		

P:\2024\24-380 - WHRM - Payzant Signals\01 - Drawings\Eng Design\24-380_TR01.dwg, Plot Date: 2025-Jan-23, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Sofia Lopes







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES
10 0 10 20
1:300

ISSUE	DATE	DESCRIPTION	INT.
4	JAN. 23, 2025	ISSUED FOR TENDER	S.L.
3	DEC. 16, 2024	ISSUED FOR REVIEW	S.L.
2	SEP. 9, 2024	ADDED WATER MAIN RELOCATION	J.D.
1	JUN. 24, 2024	ISSUED FOR REVIEW	

CONSULTANT

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REGISTERED PROFESSIONAL ENGINEER
DATE JAN 23, 2025
A. J. SKETCHLEY
11560
PROVINCE OF NOVA SCOTIA

CLIENT

West Hants
something inspiring awaits

PROJECT DESCRIPTION

PAYZANT + WENTWORTH INTERSECTION RENEWAL

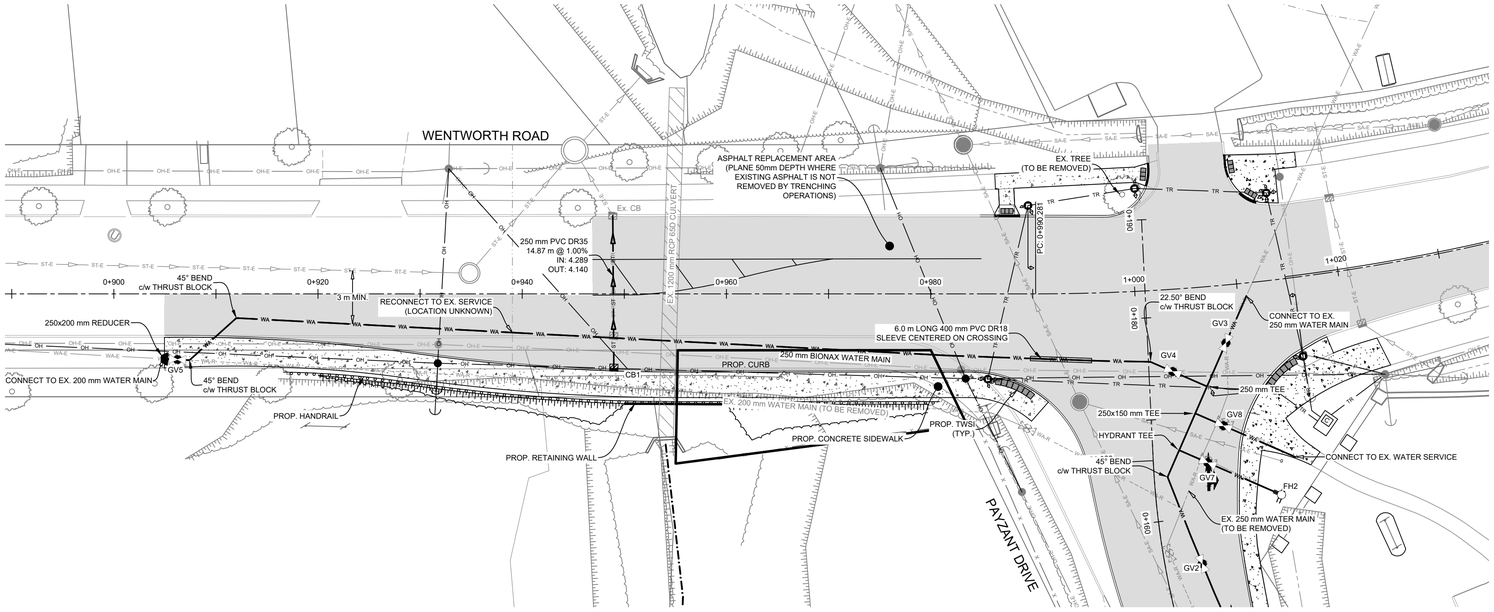
WEST HANTS, NOVA SCOTIA

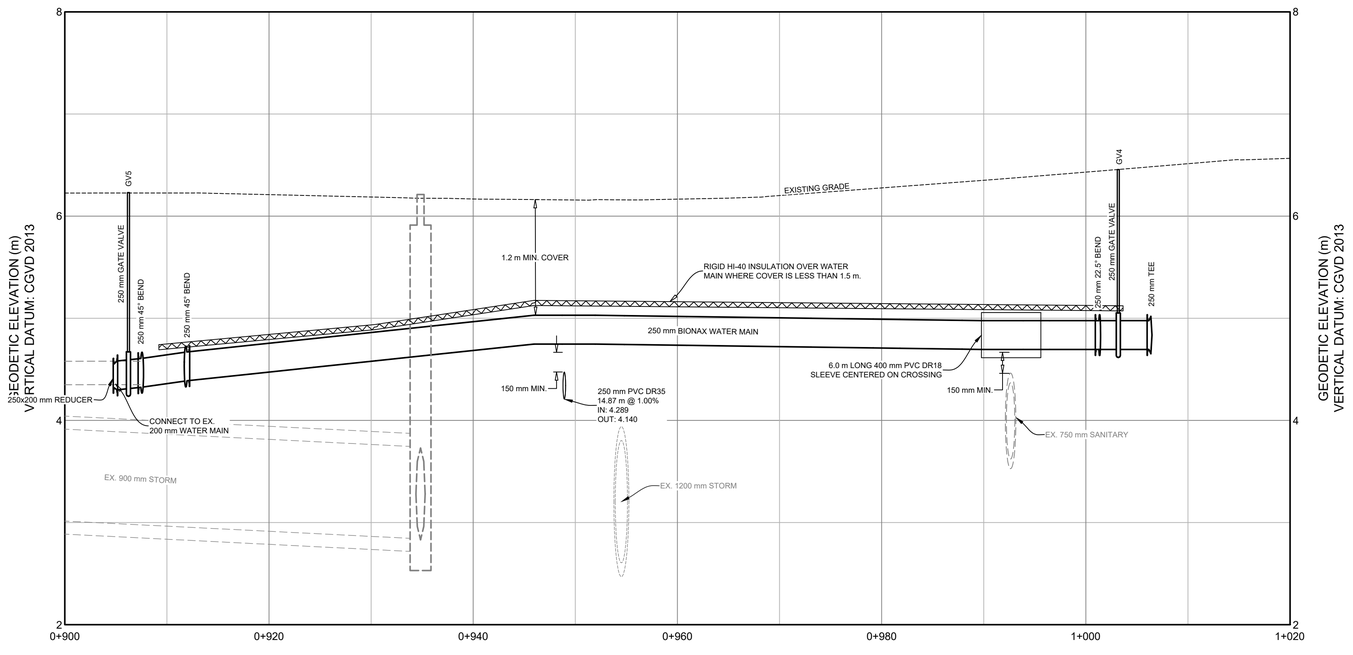
SHEET DESCRIPTION

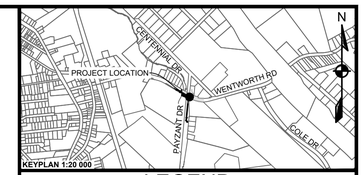
PLAN & PROFILE
PAYZANT DRIVE WATER MAIN
STA. 0+000 TO 0+190

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	A. SKETCHLEY	24-380	C-06
Scale	Filename		06 of 08
1:300 H, 1:30 V	24-380_Water.dwg		

P:\2024\24-380 - WHRM - Payzant Signals\01 - Drawings\Eng Design\24-380_Water.dwg, Plot Date: 2025-Jan-23, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Sofia Lopes







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES
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DATE: JAN 23, 2025
A. J. SKETCHLEY
11560

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PROJECT DESCRIPTION

PAYZANT + WENTWORTH INTERSECTION RENEWAL

WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

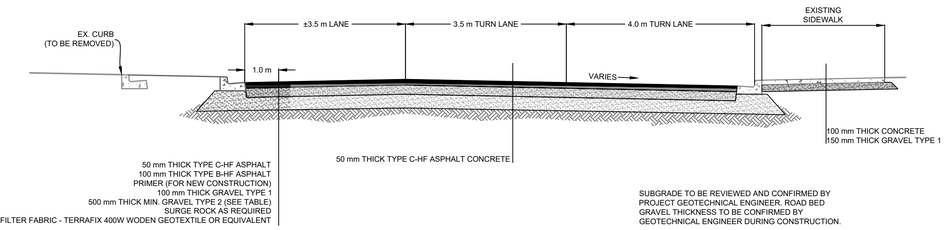
PLAN & PROFILE
WENTWORTH ROAD WATER MAIN
STA. 0+900 TO 1+020

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	A. SKETCHLEY	24-380	C-07
Scale	Filename		07 of 08
1:300 H, 1:30 V	24-380_Water.dwg		

P:\2024\24-380 - WHRM - Payzant Signals\01 - Drawings\Eng Design\24-380_Water.dwg, Plot Date: 2025-Jan-23, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Sofia Lopes

PAYZANT DRIVE CROSS SECTION — A/05

N.T.S.

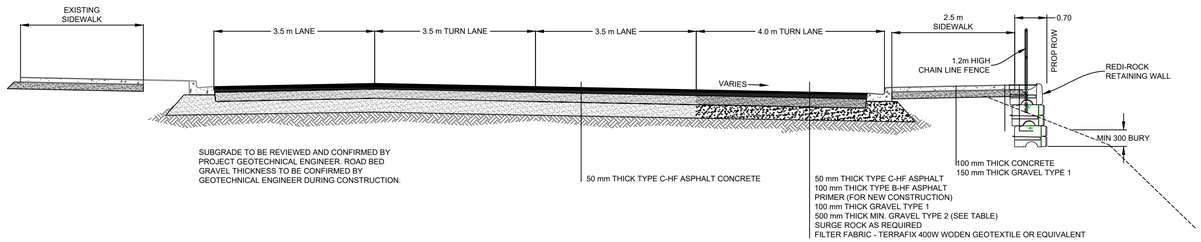


SUBGRADE TO BE REVIEWED AND CONFIRMED BY PROJECT GEOTECHNICAL ENGINEER. ROAD BED GRAVEL THICKNESS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER DURING CONSTRUCTION.

ROADBED GRAVELS		
SUBGRADE	TYPE 2	SURGE ROCK
SILT/CLAY 1	650	0
SILT/CLAY 2	450	500
GRANULAR TILL	500	0
ROCK FILL	300	0

WENTWORTH ROAD CROSS SECTION — B/05

N.T.S.

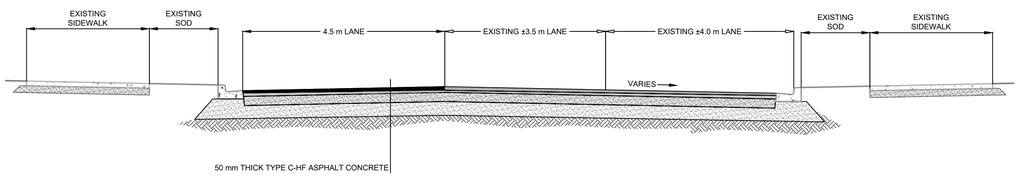


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ROADBED GRAVELS		
SUBGRADE	TYPE 2	SURGE ROCK
SILT/CLAY 1	650	0
SILT/CLAY 2	450	500
GRANULAR TILL	500	0
ROCK FILL	300	0

WENTWORTH ROAD CROSS SECTION — C/08

N.T.S.

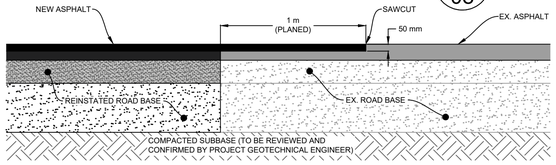


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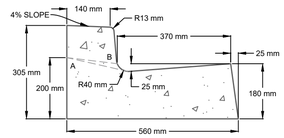
PAVEMENT REINSTATEMENT DETAIL — D/08

N.T.S



TYPICAL CURB DETAIL — E/08

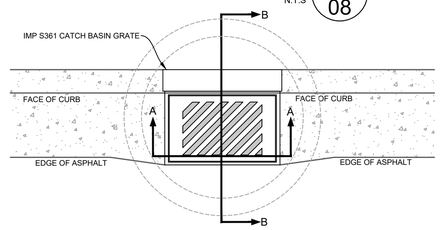
N.T.S



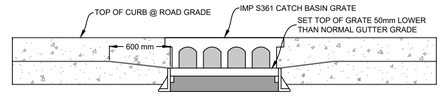
NOTES:
LINE A INDICATES CURB AT PEDESTRIAN RAMPS.
LINE B INDICATES CURB AT DRIVEWAYS

TYP. CATCH BASIN — F/08

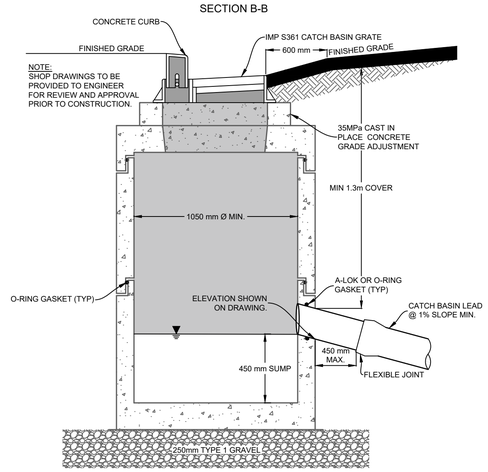
N.T.S



SECTION A-A



SECTION B-B



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3. ALL WORKS TO BE IN ACCORDANCE WITH THE "STANDARD SPECIFICATION FOR MUNICIPAL SERVICES" PREPARED JOINTLY BY THE NOVA SCOTIA ROADBUILDERS ASSOCIATION AND THE CONSULTING ENGINEERS OF NOVA SCOTIA (CURRENT EDITION).
4. ALL WORKS TO BE IN ACCORDANCE WITH REQUIREMENTS OF ALL PERMITS AND REGULATIONS AS ISSUED BY THE NOVA SCOTIA DEPARTMENT OF ENVIRONMENT.
5. CONTRACTOR TO NOTIFY DESIGNPOINT AND WEST HANTS REGARDING CONSTRUCTION SCHEDULING 2 WEEKS PRIOR TO COMMENCING CONSTRUCTION.
6. CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF NATURAL WATERCOURSES FROM DAMAGE DUE TO SILT LADEN RUNOFF FROM THE CONSTRUCTION SITE. ACCEPTABLE CONSTRUCTION PROCEDURES MAY BE OBTAINED FROM 'EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION SITES" (CURRENT EDITION), BY THE NOVA SCOTIA DEPARTMENT OF ENVIRONMENT.
7. ALL DISTURBED AREAS NOT STABILIZED BY GRAVEL, ASPHALT, CONCRETE, OR SOD ARE TO BE STABILIZED WITH 100mm TOPSOIL AND HYDROSEEDED. HYDROSEEDED AREAS TO BE COVERED WITH HAY MULCH (MIN. 3500 kg/Ha). HYDROSEEDED AREAS THAT DO NOT SHOW ACTIVE GROWTH WITHIN THE FIRST GROWING SEASON TO BE RE-STABILIZED.
8. MATERIALS SHALL NOT BE SUBSTITUTED UNLESS PRIOR APPROVAL IS PROVIDED BY THE ENGINEER.
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10. CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS REQUIRED TO PERFORM WORKS AND TO COMPLY WITH ALL PERMIT REQUIREMENTS AND CONDITIONS.
11. LOCATIONS OF EXISTING INFRASTRUCTURE IS BASED ON BEST AVAILABLE INFORMATION, INCLUDING RECORD INFORMATION. CONTRACTOR TO CONFIRM LOCATIONS OF EXISTING INFRASTRUCTURE AND NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY. CONTRACTOR TO ALLOW A 1 WEEK REVIEW PERIOD BY THE ENGINEER.
12. CONTRACTOR TO VERIFY ALL EXISTING UTILITY LOCATIONS, SUCH AS HERITAGE GAS, NOVA SCOTIA POWER, BELL ALIANT, AND EASTLINK. CONTRACTOR TO VISIT CLICKBEFOREYOUDIG.COM TO REQUEST LOCATES PRIOR TO COMPLETING ANY EXCAVATION. CONTRACTOR SHALL ADHERE TO ALL OCCUPATIONAL HEALTH AND SAFETY REGULATIONS FOR WORKING AROUND LIVE GAS MAINS.
13. ALL POWER AND COMMUNICATION INFRASTRUCTURE TO BE INSTALLED AS PER NSPI AND COMMUNICATION PROVIDER (I.E. BELL) SPECIFICATIONS. CONTRACTOR TO CONFIRM AND COORDINATE WITH UTILITIES AS REQUIRED.
14. PERMISSION FROM LANDOWNER(S) REQUIRED TO WORK ON PRIVATE PROPERTY.
15. CONTRACTOR TO NOTIFY PROPERTY OWNERS WHO WILL EXPERIENCE DISRUPTION DURING THE WORK (PROPERTY ACCESS, MUNICIPAL SERVICE LOSS, POWER/COMMUNICATION LOSS, ETC.) AT LEAST 48 HOURS PRIOR TO THE DISRUPTION.
16. ALL ELEVATIONS ARE METRIC AND GEODETIC. TOPOGRAPHICAL SURVEY COMPLETED BY DESIGNPOINT IN NOV, 2021. CONTRACTOR TO CONTACT DESIGNPOINT FOR CONSTRUCTION LAYOUT CONTROL INFORMATION 2 WEEKS PRIOR TO CONSTRUCTION.
17. ALL EARTHWORK (INCLUDING SUBGRADE), TRENCH WORK, PIPE BEDDING, AND SURFACE TREATMENT (INCLUDING GRAVELS, ASPHALT, AND CONCRETE) TO BE REVIEWED AND CERTIFIED BY PROJECT GEOTECHNICAL ENGINEER.
18. DRAWINGS SUBJECT TO CONSTRUCTION APPROVAL BY THE APPLICABLE APPROVAL AGENCIES (e.g. WEST HANTS AND NOVA SCOTIA DEPARTMENT OF ENVIRONMENT) PRIOR TO CONSTRUCTION.
19. CONTRACTOR RESPONSIBLE FOR ALL TRAFFIC CONTROL MEASURES REQUIRED FOR THE PROJECT. ALL TEMPORARY TRAFFIC CONTROL MEASURES TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NOVA SCOTIA TRANSPORTATION AND INFRASTRUCTURE RENEWAL TEMPORARY WORKPLACE TRAFFIC CONTROL MANUAL AND THE LATEST EDITION OF THE TRANSPORTATION ASSOCIATION OF CANADA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA.
20. INSULATION TO BE 50mm THICK HI40 RIGID STYROFOAM (ROAD AND TRAFFIC RATED).
21. CONTRACTOR MAY REQUEST GRADE ADJUSTMENTS SUBJECT TO REVIEW AND APPROVAL BY ENGINEER AND APPLICABLE APPROVAL AGENCIES. CONTRACTOR RESPONSIBLE FOR COSTS ASSOCIATED WITH DRAWING REVISIONS AND APPROVALS.
22. ALL TEMPORARY ROAD CLOSURES WILL REQUIRE A ROAD CLOSURES PERMIT.
23. AT THE COMPLETION OF CONSTRUCTION, THE CONTRACTOR IS TO COMPLETE AND PROVIDE A COPY OF A CCTV INSPECTION AND REPORT TO THE ENGINEER FOR REVIEW OF ALL GRAVITY SEWERS 150 mm Ø OR LARGER.
24. ALL TESTING OF SEWERS TO BE IN ACCORDANCE WITH WEST HANTS SPECIFICATIONS, INCLUDING MANHOLE VACUUM TEST. PRESSURE TEST TO BE COMPLETED FOR ENTIRE PIPE LENGTH. TEMPORARY END CAPS TO BE INSTALLED AS REQUIRED TO FACILITATE TESTING.
25. ALL TESTING OF WATER MAINS TO BE IN ACCORDANCE WITH WEST HANTS SPECIFICATIONS, INCLUDING PRESSURE TEST AND CHLORINATION FOR ALL SERVICE LATERALS 100 mm Ø AND LARGER. BASE LIFT OF GRAVEL TO BE PLACED OVER WATER MAINS AND SERVICES PRIOR TO TESTING (PUBLIC AND PRIVATE INFRASTRUCTURE).
26. ANY FIELD MANHOLE CONNECTIONS (IF REQUIRED) TO BE MADE USING CORE DRILL AND KOR-N-SEAL (SUBJECT TO APPROVAL BY UTILITY AND ENGINEER).
27. ALL GRAVITY PIPE TO BE INSTALLED IN AN UPSTREAM DIRECTION. CONTRACTOR TO BEGIN PIPE INSTALLATION AT THE MOST DOWNSTREAM LOCATION. INSTALLING TEMPORARILY ORPHANED PIPE SECTIONS IS NOT ACCEPTABLE (UNLESS APPROVED BY THE UTILITY AND THE ENGINEER).
28. CONTRACTOR TO PROVIDE 24 HOURS NOTICE TO WEST HANTS AND THE ENGINEER OF PIPE AND MANHOLE TESTING, INCLUDING CCTV INSPECTION AND DEFLECTION TESTING.

ISSUE	DATE	DESCRIPTION	INT.
4	JAN. 23, 2025	ISSUED FOR TENDER	S.L.
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DATE JAN 23, 2025
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11560

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PROJECT DESCRIPTION

PAYZANT + WENTWORTH INTERSECTION RENEWAL

WEST HANTS, NOVA SCOTIA

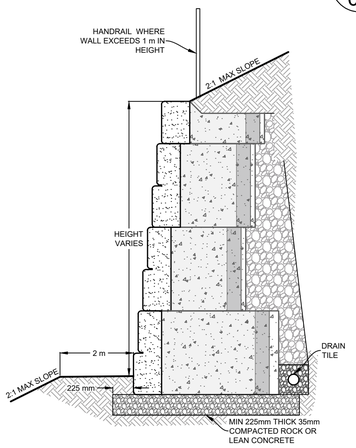
SHEET DESCRIPTION

CONSTRUCTION DETAILS 1

Drawn	Engineer	Project No.	Drawing No.
S. LOPES	P. BURGESS	24-380	C-08
Scale	Filename		08 OF 08
N.T.S.	24-380_TR01.dwg		

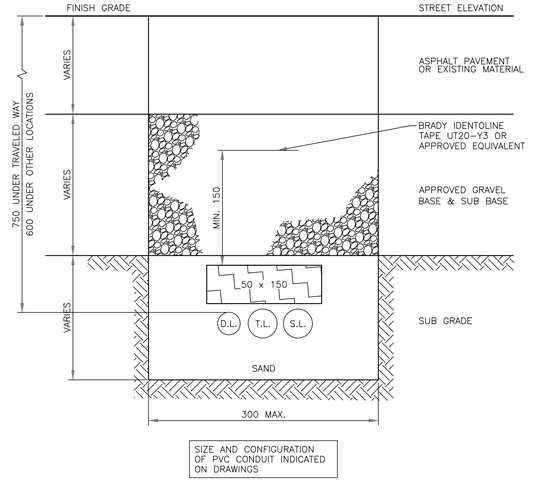
TYPICAL BLOCK RETAINING WALL SECTION — A / 09

N.T.S.



UNDERGROUND CONDUIT — B / 09

N.T.S.



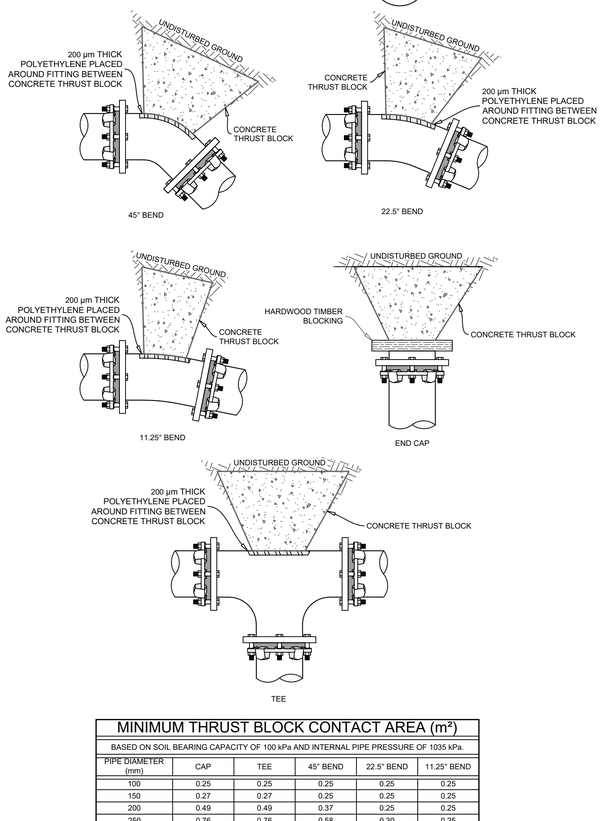
SIZE AND CONFIGURATION OF PVC CONDUIT INDICATED ON DRAWINGS

NOTES:

1. 50 mm x 150 mm WOOD PLANK TO BE PRESSURE TREATED WOOD.
2. "CAUTION BURIED ELECTRICAL LINE" TAPE TO BE PLACED OVER CONDUIT 150 mm TO 250 mm BELOW FINISHED GRADE.
3. SURROUND SAND WITH GEOTEXTILE SEPARATOR IN AREAS OF HIGH GROUNDWATER MOVEMENT (PERVIOUS SUB GRADE).

THRUST BLOCK DETAILS — C / 09

N.T.S



MINIMUM THRUST BLOCK CONTACT AREA (m²)

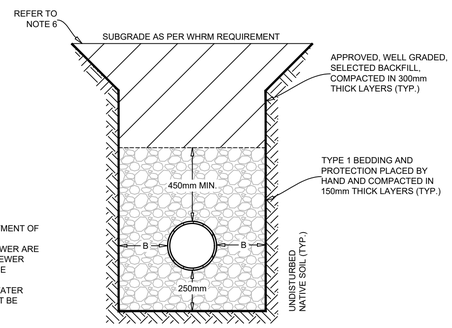
BASED ON SOIL BEARING CAPACITY OF 100 kPa AND INTERNAL PIPE PRESSURE OF 1035 kPa.

PIPE DIAMETER (mm)	CAP	TEE	45° BEND	22.5° BEND	11.25° BEND
100	0.25	0.25	0.25	0.25	0.25
150	0.27	0.27	0.25	0.25	0.25
200	0.49	0.49	0.37	0.25	0.25
250	0.76	0.76	0.58	0.30	0.25
300	1.10	1.10	0.84	0.43	0.25
350	1.49	1.49	1.14	0.58	0.29
400	1.95	1.95	1.49	0.76	0.38
500	3.04	3.04	2.32	1.19	0.59
600	4.39	4.39	3.36	1.71	0.86

TRENCH AND BACKFILL CROSS SECTIONS — D / 09

N.T.S.

PIPE SIZE NOM. DIA.	DIMENSIONS (mm)
	B
UP TO 375 mm	300
376 TO 500 mm	300
501 TO 750 mm	400
751 TO 1200 mm	400
BEDDING REQUIREMENTS SHALL BE 250 mm AS PER SECTIONS.	



NOTES

1. SIDES OF TRENCHES TO REQUIREMENTS OF DEPARTMENT OF LABOUR.
2. IF CROWNS OF STORMWATER AND WASTEWATER SEWER ARE NOT MATCHED, THE INVERT OF THE STORMWATER SEWER MUST BE AT LEAST 100mm BELOW THE INVERT OF THE WASTEWATER SEWER.
3. WHEN CONCRETE PIPE IS SPECIFIED FOR A WASTEWATER SEWER, A GEOTECHNICAL REPORT BY A P.ENG. MUST BE UNDERTAKEN TO ENSURE STABILITY OF SUBBASE.
4. MINIMUM GRAVEL COVER OVER WASTEWATER AND STORMWATER SEWERS IS TO BE 300mm.

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16. ALL ELEVATIONS ARE METRIC AND GEODETIC. TOPOGRAPHICAL SURVEY COMPLETED BY DESIGNPOINT IN NOV, 2021. CONTRACTOR TO CONTACT DESIGNPOINT FOR CONSTRUCTION LAYOUT CONTROL INFORMATION 2 WEEKS PRIOR TO CONSTRUCTION.
17. ALL EARTHWORK (INCLUDING SUBGRADE), TRENCH WORK, PIPE BEDDING, AND SURFACE TREATMENT (INCLUDING GRAVELS, ASPHALT, AND CONCRETE) TO BE REVIEWED AND CERTIFIED BY PROJECT GEOTECHNICAL ENGINEER.
18. DRAWINGS SUBJECT TO CONSTRUCTION APPROVAL BY THE APPLICABLE APPROVAL AGENCIES (e.g. WEST HANTS AND NOVA SCOTIA DEPARTMENT OF ENVIRONMENT) PRIOR TO CONSTRUCTION.
19. CONTRACTOR RESPONSIBLE FOR ALL TRAFFIC CONTROL MEASURES REQUIRED FOR THE PROJECT. ALL TEMPORARY TRAFFIC CONTROL MEASURES TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NOVA SCOTIA TRANSPORTATION AND INFRASTRUCTURE RENEWAL TEMPORARY WORKPLACE TRAFFIC CONTROL MANUAL AND THE LATEST EDITION OF THE TRANSPORTATION ASSOCIATION OF CANADA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA.
20. INSULATION TO BE 50mm THICK HI40 RIGID STYROFOAM (ROAD AND TRAFFIC RATED).
21. CONTRACTOR MAY REQUEST GRADE ADJUSTMENTS SUBJECT TO REVIEW AND APPROVAL BY ENGINEER AND APPLICABLE APPROVAL AGENCIES. CONTRACTOR RESPONSIBLE FOR COSTS ASSOCIATED WITH DRAWING REVISIONS AND APPROVALS.
22. ALL TEMPORARY ROAD CLOSURES WILL REQUIRE A ROAD CLOSURES PERMIT.
23. AT THE COMPLETION OF CONSTRUCTION, THE CONTRACTOR IS TO COMPLETE AND PROVIDE A COPY OF A CCTV INSPECTION AND REPORT TO THE ENGINEER FOR REVIEW OF ALL GRAVITY SEWERS 150 mm Ø OR LARGER.
24. ALL TESTING OF SEWERS TO BE IN ACCORDANCE WITH WEST HANTS SPECIFICATIONS, INCLUDING MANHOLE VACUUM TEST. PRESSURE TEST TO BE COMPLETED FOR ENTIRE PIPE LENGTH. TEMPORARY END CAPS TO BE INSTALLED AS REQUIRED TO FACILITATE TESTING.
25. ALL TESTING OF WATER MAINS TO BE IN ACCORDANCE WITH WEST HANTS SPECIFICATIONS, INCLUDING PRESSURE TEST AND CHLORINATION FOR ALL SERVICE LATERALS 100 mm Ø AND LARGER. BASE LIFT OF GRAVEL TO BE PLACED OVER WATER MAINS AND SERVICES PRIOR TO TESTING (PUBLIC AND PRIVATE INFRASTRUCTURE).
26. ANY FIELD MANHOLE CONNECTIONS (IF REQUIRED) TO BE MADE USING CORE DRILL AND KOR-N-SEAL (SUBJECT TO APPROVAL BY UTILITY AND ENGINEER).
27. ALL GRAVITY PIPE TO BE INSTALLED IN AN UPSTREAM DIRECTION. CONTRACTOR TO BEGIN PIPE INSTALLATION AT THE MOST DOWNSTREAM LOCATION. INSTALLING TEMPORARILY ORPHANED PIPE SECTIONS IS NOT ACCEPTABLE (UNLESS APPROVED BY THE UTILITY AND THE ENGINEER).
28. CONTRACTOR TO PROVIDE 24 HOURS NOTICE TO WEST HANTS AND THE ENGINEER OF PIPE AND MANHOLE TESTING, INCLUDING CCTV INSPECTION AND DEFLECTION TESTING.

ISSUE	DATE	DESCRIPTION	INT.
4	JAN. 23, 2025	ISSUED FOR TENDER	S.L.
3	DEC. 16, 2024	ISSUED FOR REVIEW	S.L.
2	SEP. 9, 2024	ADDED WATER MAIN RELOCATION	J.D.
1	JUN. 24, 2024	ISSUED FOR REVIEW	

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REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE: JAN 23, 2025 — A. J. SKETCHLEY — 11560

CLIENT

West Hants
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PROJECT DESCRIPTION

PAYZANT + WENTWORTH INTERSECTION RENEWAL

WEST HANTS, NOVA SCOTIA

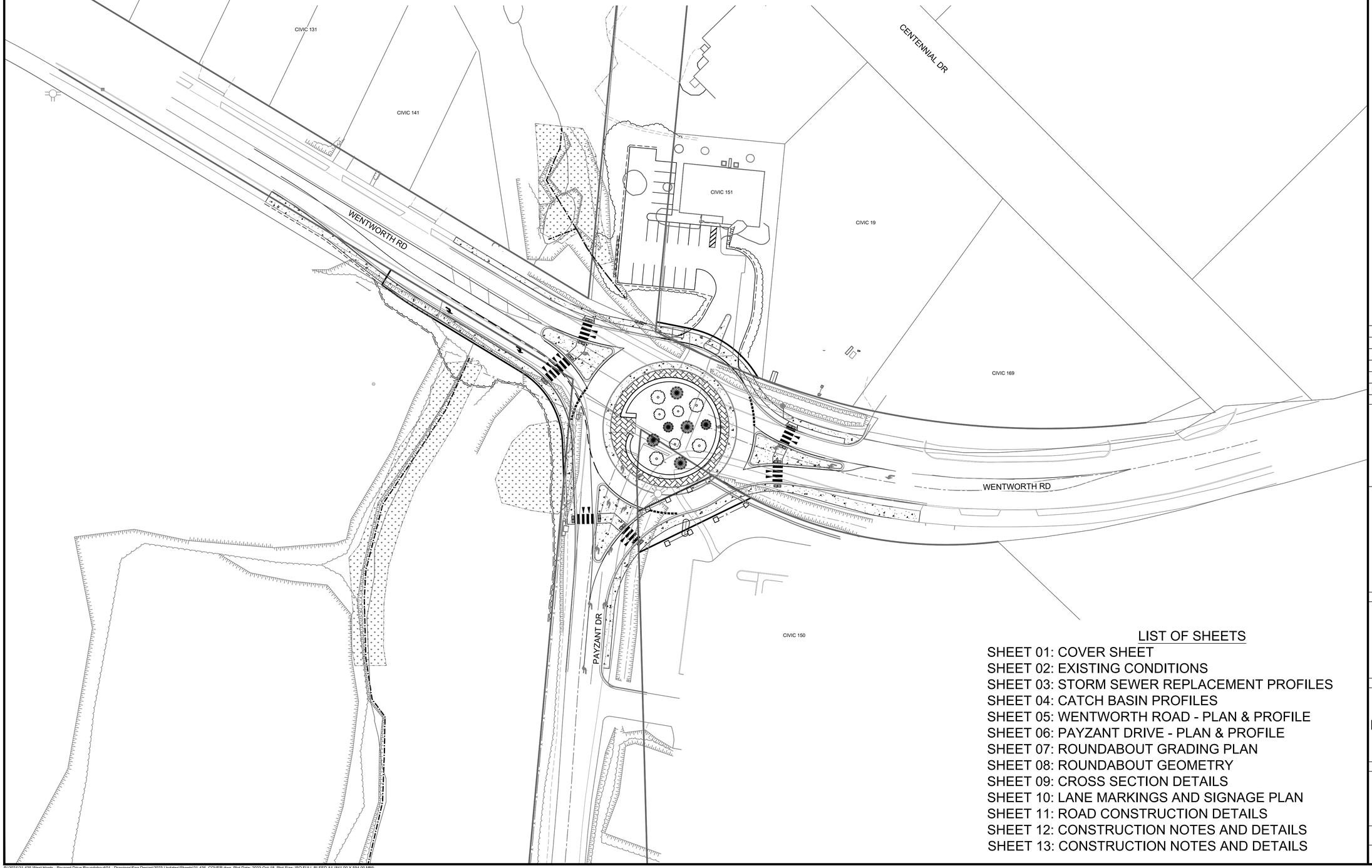
SHEET DESCRIPTION

CONSTRUCTION DETAILS 2

Drawn	Engineer	Project No.	Drawing No.
S. LOPES	P. BURGESS	24-380	C-09
Scale	Filename		09 OF 08
N.T.S.	24-380_TR01.dwg		

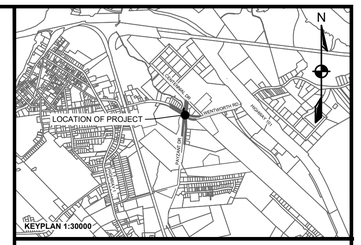
PAYZANT DRIVE ROUNDABOUT
WINDSOR, NOVA SCOTIA

REV. 4: ISSUED FOR TENDER
DRAFT



LIST OF SHEETS

SHEET 01: COVER SHEET
SHEET 02: EXISTING CONDITIONS
SHEET 03: STORM SEWER REPLACEMENT PROFILES
SHEET 04: CATCH BASIN PROFILES
SHEET 05: WENTWORTH ROAD - PLAN & PROFILE
SHEET 06: PAYZANT DRIVE - PLAN & PROFILE
SHEET 07: ROUNDABOUT GRADING PLAN
SHEET 08: ROUNDABOUT GEOMETRY
SHEET 09: CROSS SECTION DETAILS
SHEET 10: LANE MARKINGS AND SIGNAGE PLAN
SHEET 11: ROAD CONSTRUCTION DETAILS
SHEET 12: CONSTRUCTION NOTES AND DETAILS
SHEET 13: CONSTRUCTION NOTES AND DETAILS



DRAFT
NOT FOR CONSTRUCTION

METRES 10 0 20 30
1:500

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

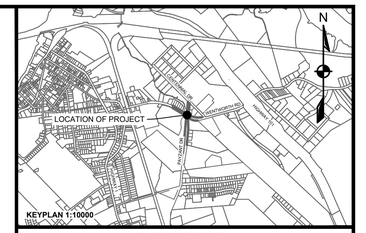
SHEET DESCRIPTION

COVER SHEET

Drawn	Engineer	Project No.	Drawing No.
M. WHITEHOUSE	P. BURGESS	21-435	C-T01
Scale 1:500	Filename 21-435_COVER.dwg		01 of 13

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_COVER.dwg, Plot Date: 2023-Oct-18, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

DRAFT
NOT FOR CONSTRUCTION

METRES 5 0 10 15

1:250

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

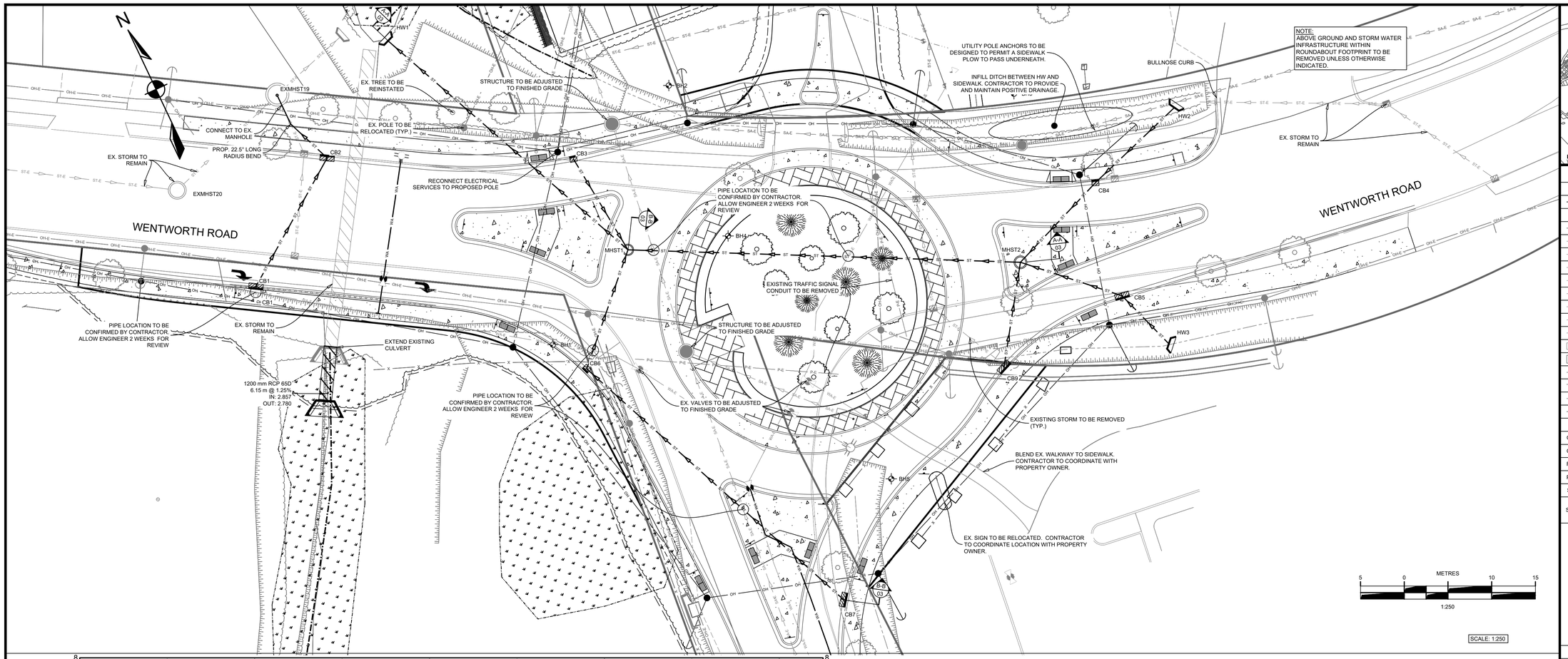
PAYZANT DRIVE ROUNDABOUT

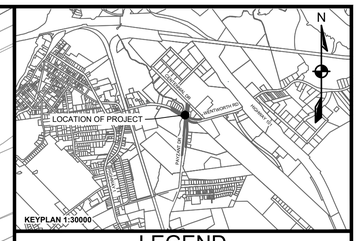
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

EXISTING CONDITIONS

Drawn	Engineer	Project No.	Drawing No.
M. WHITEHOUSE	P. BURGESS	21-435	C-TR02
Scale	Filename		02 of 13
1:250	21-435_TR01_EXISTING CONDITIONS.dwg		





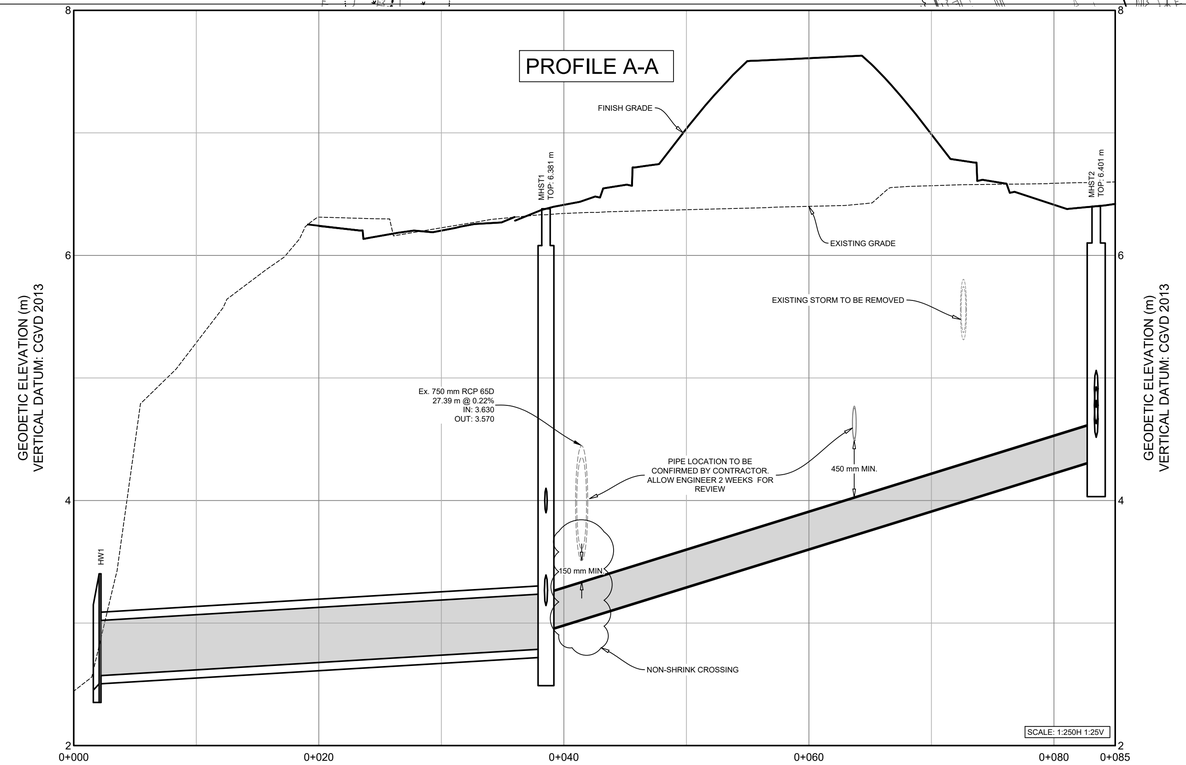
LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

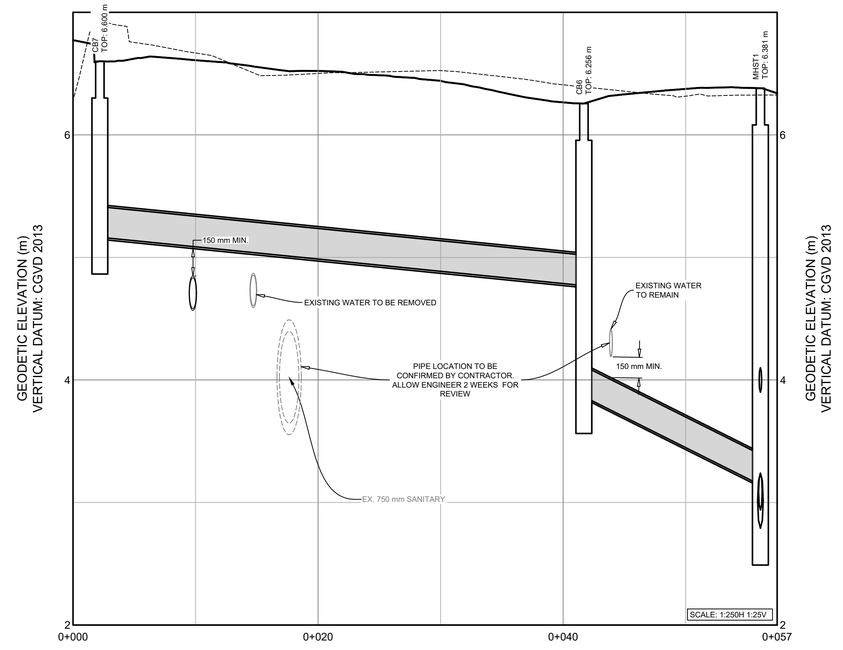
	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

DRAFT
NOT FOR CONSTRUCTION

PROFILE A-A



PROFILE B-B



STORM SEWER							
2.571	450 mm RCP 65D @ 0.60% 36.32 m±	2.789	2.039	300 mm PVC DR35 @ 3.10% 44.91 m±	4.331		

STORM SEWER							
5.164	250 mm PVC DR18 @ 1.00% 39.50 m±	4.769	3.963	250 mm PVC DR18 @ 5.00% 14.41 m±	3.143		

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

STORM SEWER REPLACEMENT PROFILES

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	C-PP03
Scale	Filename		03 OF 13
AS SHOWN	21-435_PP02_STORM PROFILES 1.dwg		

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_PP02_STORM PROFILES 1.dwg, Plot Date: 2023-Oct-18, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)

NOTE:
ABOVE GROUND AND STORM WATER INFRASTRUCTURE WITHIN ROUNDABOUT FOOTPRINT TO BE REMOVED UNLESS OTHERWISE INDICATED.

WENTWORTH ROAD

EXISTING STORM TO REMAIN

EXISTING STORM TO BE REMOVED

CONNECT TO EX. MANHOLE

PROP. 22.5° LONG RADIUS BEND

PIPE LOCATION TO BE CONFIRMED BY CONTRACTOR. ALLOW ENGINEER 2 WEEKS FOR REVIEW

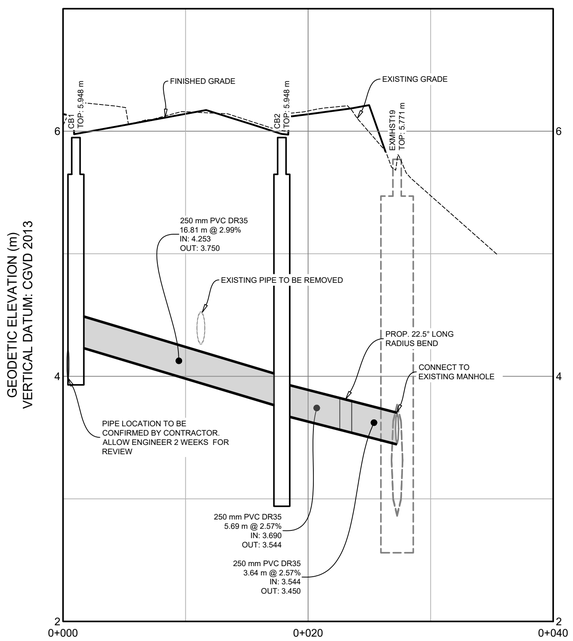
EXTEND EXISTING CULVERT

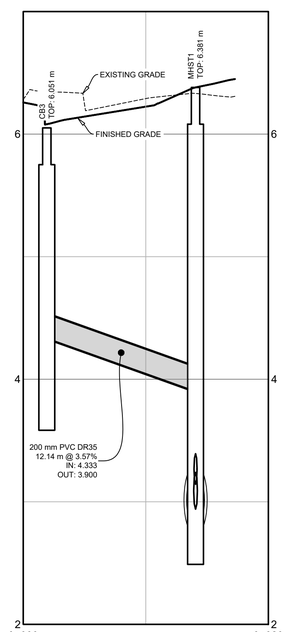
PROFILE C-C

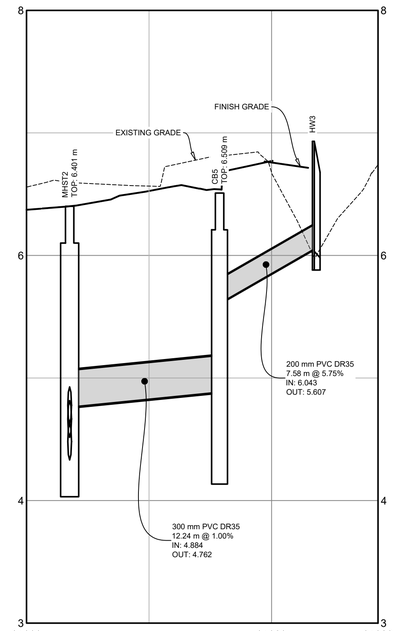
PROFILE D-D

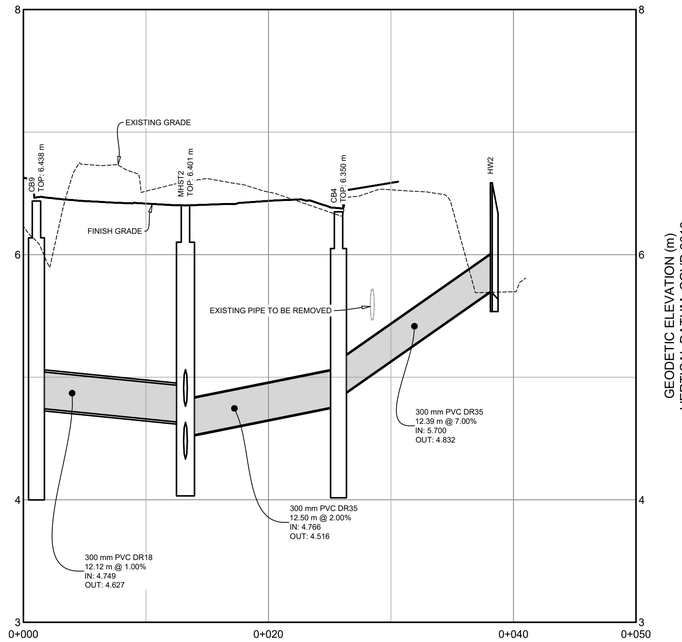
PROFILE E-E

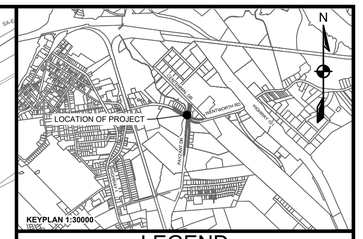
PROFILE F-F











LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

DRAFT
NOT FOR CONSTRUCTION

METRES 5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

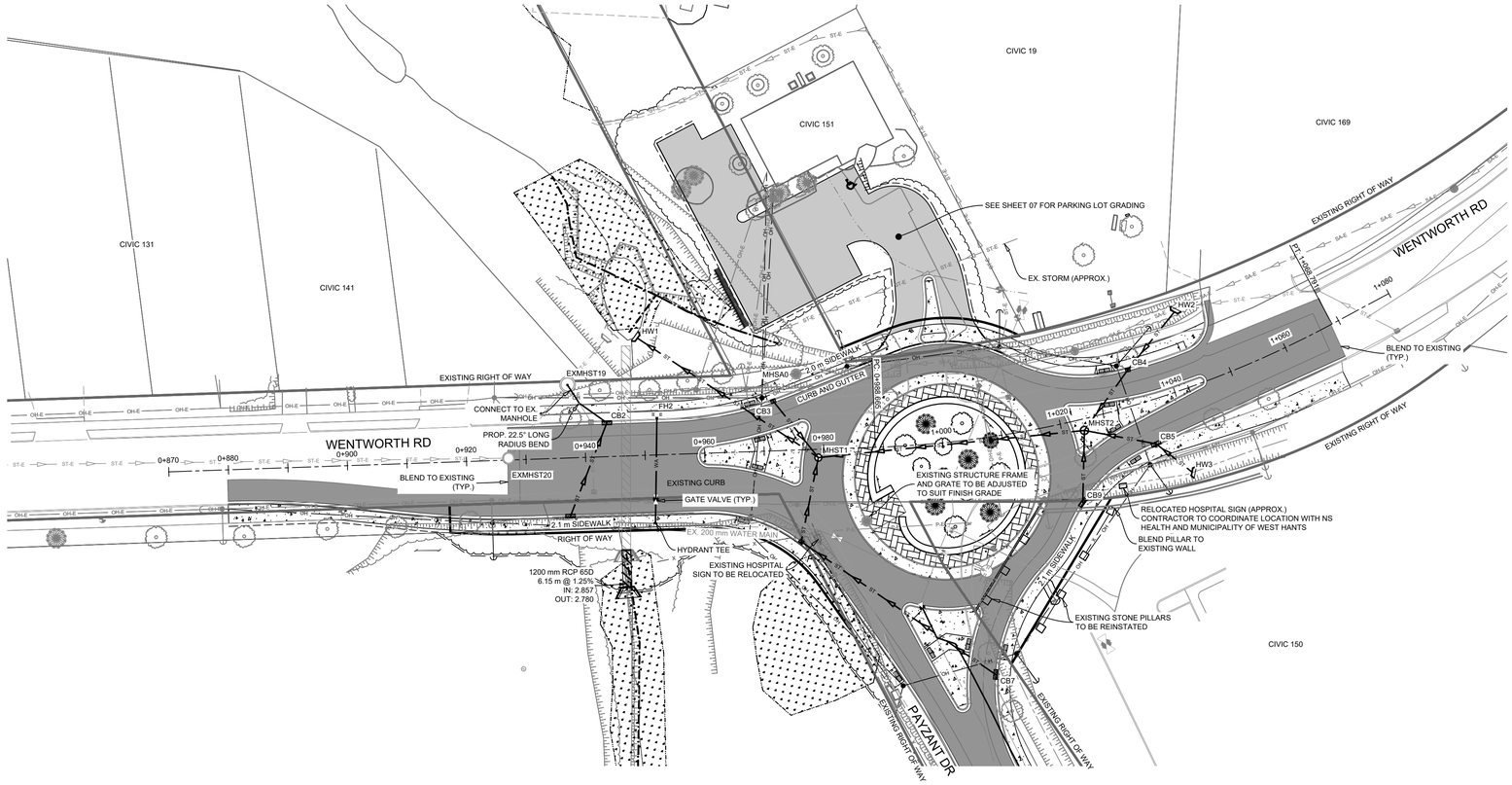
PAYZANT DRIVE ROUNDABOUT

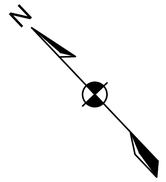
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

CATCH BASIN PROFILES

Drawn: J. GALLANT	Engineer: A. SKETCHLEY	Project No.: 21-435	Drawing No.: C-PP04
Scale: 1:250 H; 1:25V	Filename: 21-435_PP03_STORM PROFILES 2.dwg		04 of 13





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
x x	FENCELINE	x x

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

DRAFT
NOT FOR CONSTRUCTION

METRES
10 0 20 30
1:500

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

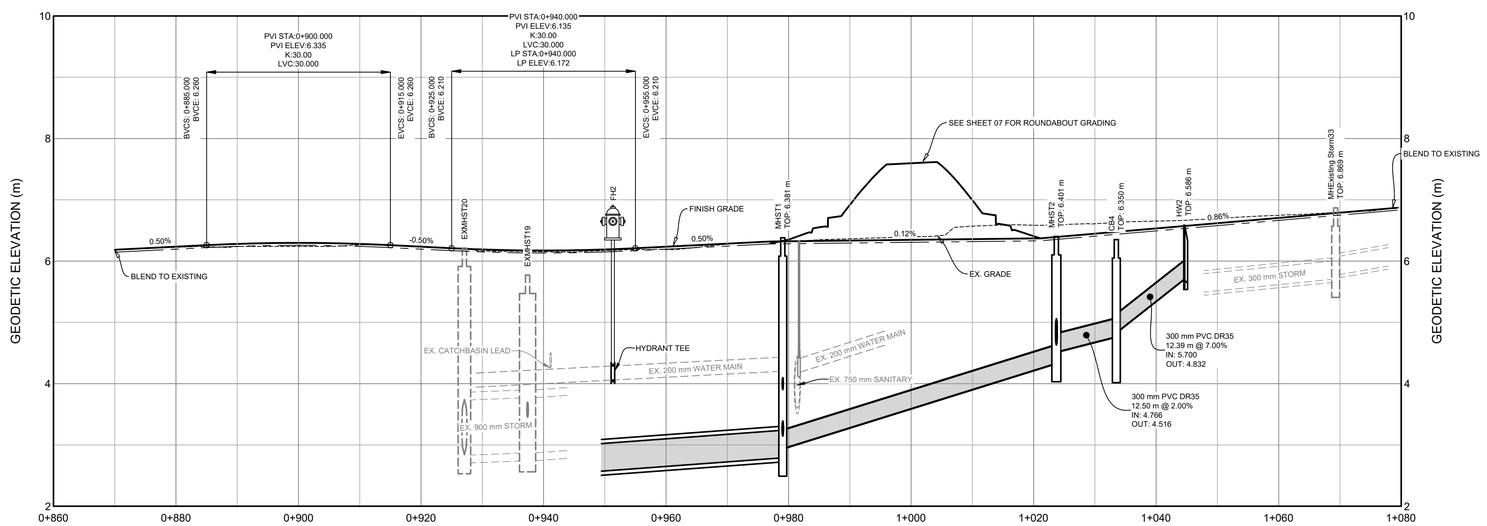
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

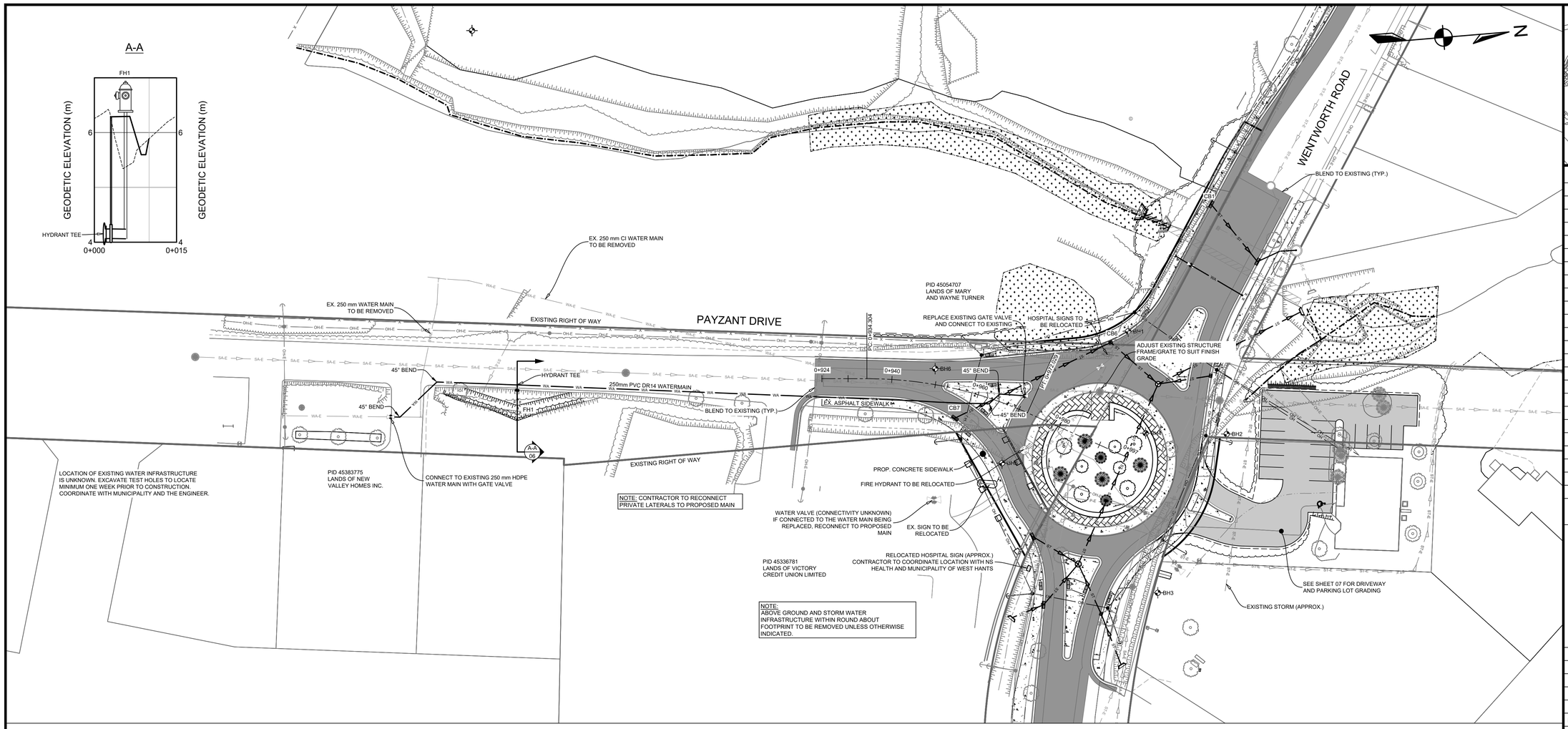
WENTWORTH ROAD - PLAN & PROFILE

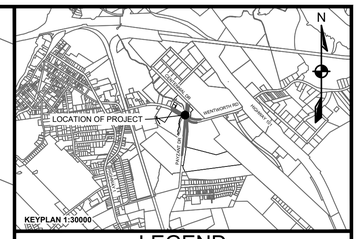
Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	TR05
Scale	Filename		05 of 13
1:500 H, 1:50 V	21-435_TR02_INT-WENTWORTH.dwg		

WENTWORTH RD PROFILE



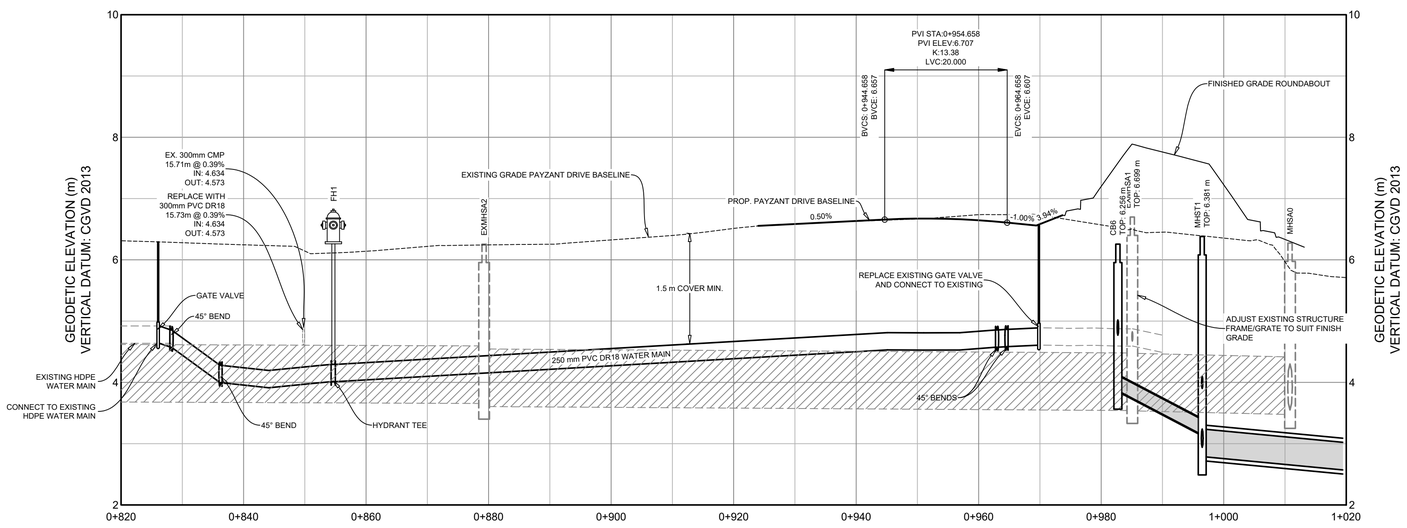
STORM SEWER									
	2.571	450 mm RCP 65D @ 0.60% 36.32 m	2.789	2.569	300 mm PVC DR35 @ 3.10% 44.91 m	4.331			





NOTE:
LOCATION OF EXISTING INFRASTRUCTURE IS BASED ON BEST AVAILABLE INFORMATION, INCLUDING RECORD INFORMATION, AND IS APPROXIMATE. CONTRACTOR TO VERIFY SIZE AND LOCATION IN FIELD PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES TO THE ENGINEER. ALLOW ONE WEEK FOR REVIEW.

PAYZANT BASELINE PROFILE



STORM SEWER		250 mm PVC DR18 @ 5.00% 14.41 m±	450 mm RCP 65D @ 0.60% 36.32 m±
		3.963 — 3.143	2.789 — 2.571

LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

DRAFT
NOT FOR CONSTRUCTION

METRES
10 0 20 30
1:500

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

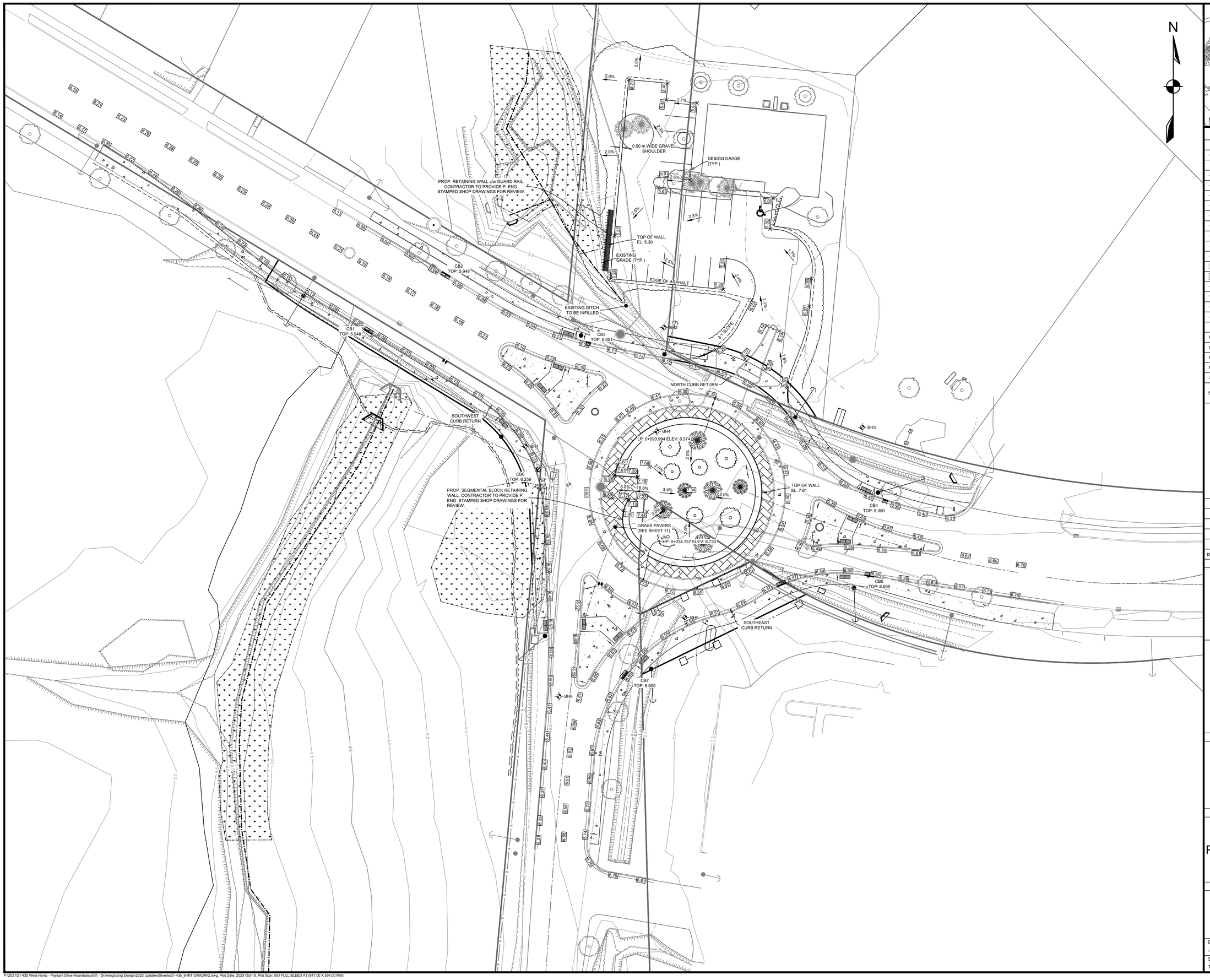
PAYZANT DRIVE ROUNDABOUT

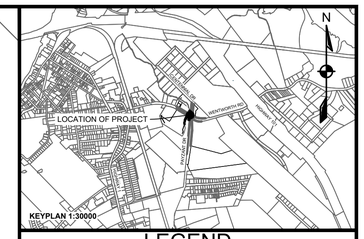
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

PAYZANT DRIVE PLAN AND PROFILE

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	TR06
Scale	Filename		06 of 13
1:500 H; 1:50 V	21-435_3-PP01_PAYZANT.dwg		





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

DRAFT
NOT FOR CONSTRUCTION

METRES
10 0 10 20
1:300

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

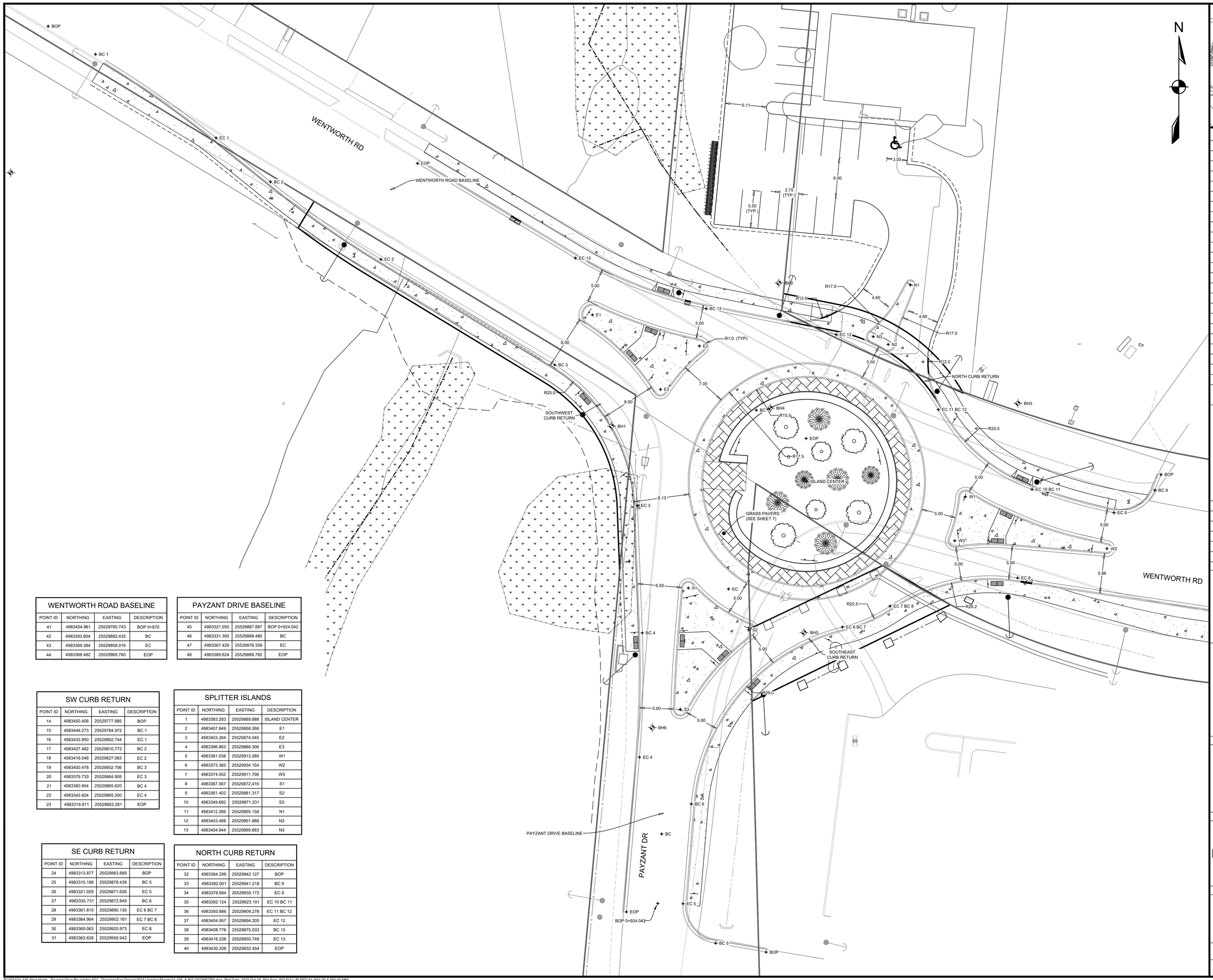
PAYZANT DRIVE ROUNDABOUT

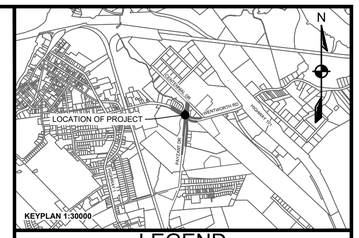
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

ROUNDABOUT GRADING PLAN

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	TR07
Scale	Filename		07 of 13
1:300	21-435_9-INT-GRADING.dwg		





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

DRAFT
NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WINDSOR, NOVA SCOTIA

SHEET DESCRIPTION

ROUNDABOUT GEOMETRY

Drawn	Engineer	Project No.	Drawing No.
P.BURGESS	P.BURGESS	21-435	TR-08
Scale	Filename		08 of 13
1:250	21-435_8-INT-GEOMETRY.dwg		

WENTWORTH ROAD BASELINE

POINT ID	NORTHING	EASTING	DESCRIPTION
41	4983454.961	25529780.743	BOP 0+870
42	4983393.804	25529882.435	BC
43	4983369.384	25529958.016	EC
44	4983368.482	25529968.780	EOP

PAYZANT DRIVE BASELINE

POINT ID	NORTHING	EASTING	DESCRIPTION
45	4983321.055	25529867.897	BOP 0+924.042
46	4983331.300	25529868.480	BC
47	4983367.429	25529878.339	EC
48	4983389.624	25529889.782	EOP

SW CURB RETURN

POINT ID	NORTHING	EASTING	DESCRIPTION
14	4983450.408	25529777.985	BOP
15	4983446.273	25529784.972	BC 1
16	4983433.950	25529802.744	EC 1
17	4983427.482	25529810.772	BC 2
18	4983416.048	25529827.063	EC 2
19	4983400.478	25529852.706	BC 3
20	4983379.733	25529864.905	EC 3
21	4983360.954	25529865.620	BC 4
22	4983342.624	25529865.200	EC 4
23	4983319.811	25529863.281	EOP

SPLITTER ISLANDS

POINT ID	NORTHING	EASTING	DESCRIPTION
1	4983383.283	25529889.888	ISLAND CENTER
2	4983407.849	25529858.268	E1
3	4983403.264	25529874.045	E2
4	4983396.863	25529868.306	E3
5	4983381.038	25529913.280	W1
6	4983373.383	25529934.154	W2
7	4983374.552	25529911.706	W3
8	4983367.567	25529872.416	S1
9	4983361.402	25529881.317	S2
10	4983349.692	25529871.231	S3
11	4983412.266	25529905.158	N1
12	4983403.488	25529901.888	N2
13	4983404.644	25529899.683	N3

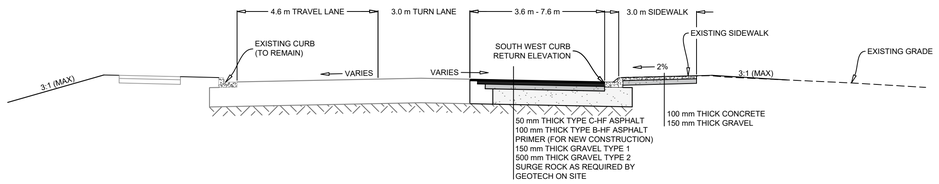
SE CURB RETURN

POINT ID	NORTHING	EASTING	DESCRIPTION
24	4983313.877	25529883.889	BOP
25	4983315.198	25529876.439	BC 5
26	4983321.029	25529871.626	EC 5
27	4983335.731	25529872.849	BC 6
28	4983361.815	25529895.135	EC 6 BC 7
29	4983364.904	25529902.161	EC 7 BC 8
30	4983369.063	25529920.973	EC 8
31	4983363.638	25529956.942	EOP

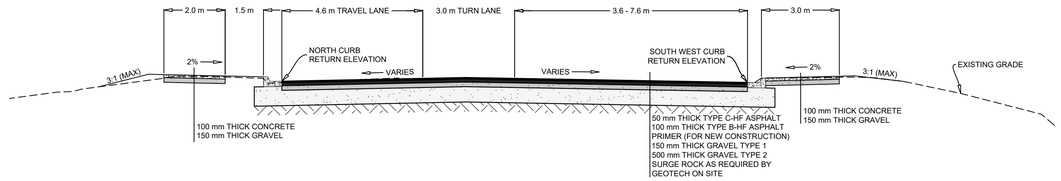
NORTH CURB RETURN

POINT ID	NORTHING	EASTING	DESCRIPTION
32	4983384.299	25529942.127	BOP
33	4983382.001	25529941.218	BC 9
34	4983378.684	25529935.172	EC 9
35	4983382.124	25529923.101	EC 10 BC 11
36	4983393.886	25529909.278	EC 11 BC 12
37	4983404.957	25529894.205	EC 12
38	4983408.776	25529875.033	BC 13
39	4983416.226	25529855.748	EC 13
40	4983430.208	25529832.454	EOP

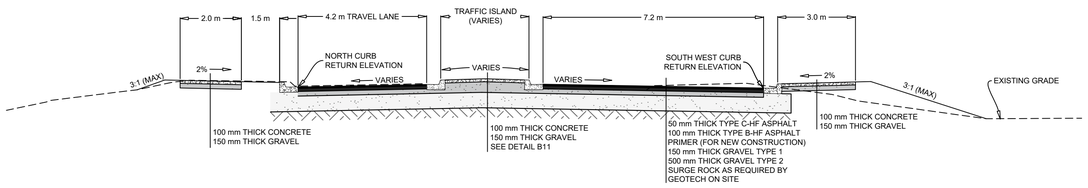
A 09 WENTWORTH RD TYPICAL PROPOSED CROSS SECTION 0+870 TO 0+925
N.T.S.



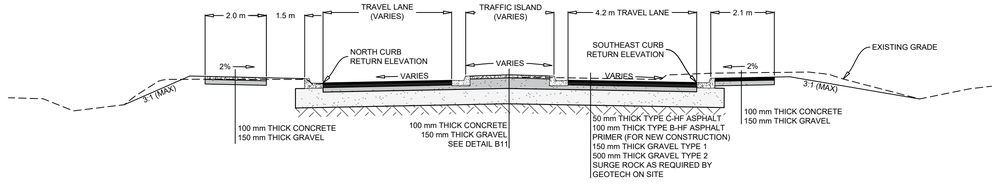
B 09 WENTWORTH RD TYPICAL PROPOSED CROSS SECTION 0+925 TO 0+960
N.T.S.



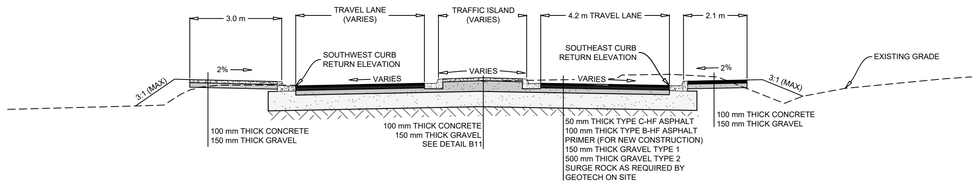
C 09 WENTWORTH RD TYPICAL PROPOSED CROSS SECTION 0+960 TO 0+975
N.T.S.



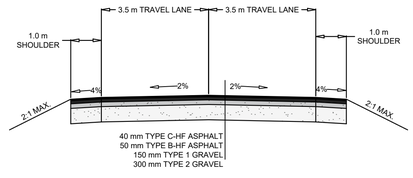
D 09 WENTWORTH RD TYPICAL PROPOSED CROSS SECTION 1+020 TO 1+045
N.T.S.



E 09 PAYZANT DR TYPICAL PROPOSED CROSS SECTION 0+950 TO 0+970
N.T.S.



F 09 DRIVEWAY TYPICAL PROPOSED CROSS SECTION
N.T.S.



DRAFT
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ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

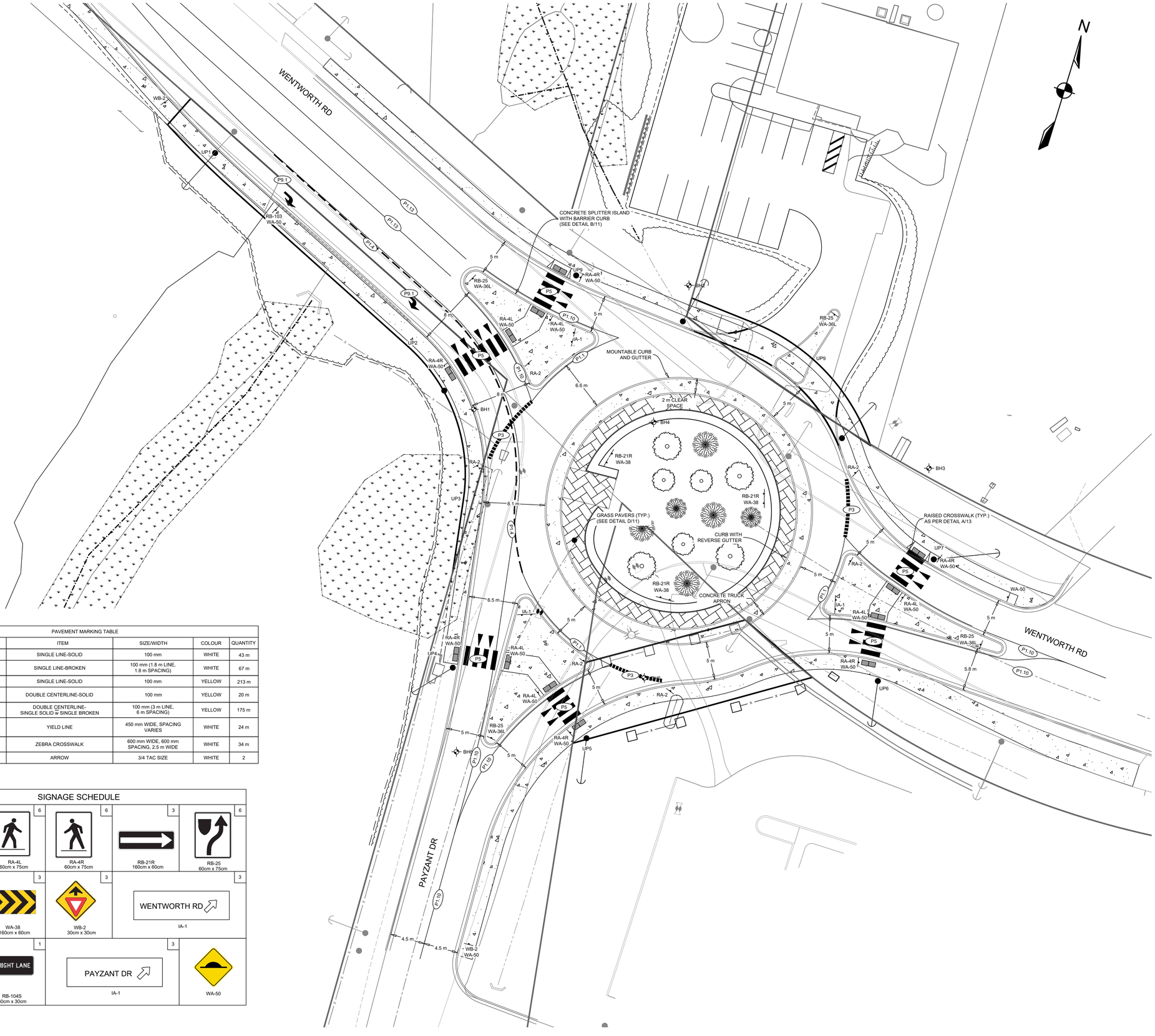
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

CROSS SECTION DETAILS

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	TR09
Scale: N.T.S.	Filename: 21-435_TR05_INT-WENTWORTH XS.dwg		09 of 13

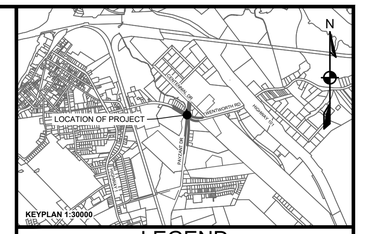
P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_TR05_INT-WENTWORTH XS.dwg, Plot Date: 2023-Oct-18, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)



PAVEMENT MARKING TABLE					
ID	MATERIAL	ITEM	SIZE/WIDTH	COLOUR	QUANTITY
P1.1	PAINT	SINGLE LINE-SOLID	100 mm	WHITE	43 m
P1.4	PAINT	SINGLE LINE-BROKEN	100 mm (1.8 m LINE, 1.8 m SPACING)	WHITE	67 m
P1.10	PAINT	SINGLE LINE-SOLID	100 mm	YELLOW	213 m
P1.12	PAINT	DOUBLE CENTERLINE-SOLID	100 mm	YELLOW	20 m
P1.13	PAINT	DOUBLE CENTERLINE-SINGLE SOLID w SINGLE BROKEN	100 mm (3 m LINE, 6 m SPACING)	YELLOW	175 m
P3	PAINT	YIELD LINE	450 mm WIDE, SPACING VARIES	WHITE	24 m
P5	PAINT	ZEBRA CROSSWALK	600 mm WIDE, 600 mm SPACING, 2.5 m WIDE	WHITE	34 m
P9.1	PAINT	ARROW	3/4 TAC SIZE	WHITE	2

SIGNAGE SCHEDULE

6 RA-2 75 cm SIDES	6 RA-4L 60cm x 75cm	6 RA-4R 60cm x 75cm	3 RB-21R 160cm x 60cm	6 RB-25 60cm x 75cm
3 WA-36L	3 WA-38 160cm x 60cm	3 WB-2 30cm x 30cm	3 WENTWORTH RD IA-1	
1 RB-103 60cm x 75cm	1 RIGHT LANE RB-104S 60cm x 30cm	3 PAYZANT DR IA-1	WA-50	



LEGEND

EXISTING		PROPOSED
	EASEMENT	
P-E P-E	UNDERGROUND POWER	P P
C-E C-E	UNDERGROUND COMM.	C C
TR-E	TRAFFIC CONDUIT	TR TR
OH-E	OVERHEAD LINE	OH OH
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			HYDRANT		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
PRECAST HEADWALL			SIGNAL POLE		
CATCHBASIN			SIGNAL HEAD		
			PEDESTRIAN HEAD		

SIGNAGE NOTES:

1. WHRM TO INDICATE EXACT LOCATION OF NEW SIGN INSTALLATIONS ON SITE.
2. ALL SIGNS ARE TAC UNLESS OTHERWISE INDICATED ON SIGNAGE SCHEDULE.
3. REMOVED SIGNS AND POSTS TO BE RETURNED TO WHRM.

PAVEMENT MARKING NOTES:

1. ALL LANE MARKINGS SHALL BE ACCORDING TO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA (MUTCDC) USING SIGNS APPROVED FOR USE IN NOVA SCOTIA.
2. LANE LINES ARE TO BE 100 mm WIDE EXCEPT WHERE OTHERWISE INDICATED. CROSSWALK LINES ARE TO BE 200 mm WIDE, STOP BARS ARE TO BE 450 mm WIDE.
3. CENTERLINES AND CROSS HATCHING TO BE YELLOW, ALL OTHER PAVEMENT MARKINGS TO BE WHITE.
4. PEDESTRIAN CURB CUTS AND RAMPS TO BE PROVIDED AT BOTH ENDS OF ALL CROSSWALKS.
5. REMOVE ALL EXISTING PAVEMENT MARKINGS AT INTERSECTIONS AND APPROACHES AND RE-PAINT AS SHOWN, UNLESS OTHERWISE NOTED.
6. ALL MARKINGS DIMENSIONED TO CENTER OF LINES.

DRAFT
NOT FOR CONSTRUCTION

REVIEWED AND APPROVED FOR TRAFFIC SIGNALS AND PAVEMENT MARKINGS

Appr'd for TRAFFIC AUTHORITY

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

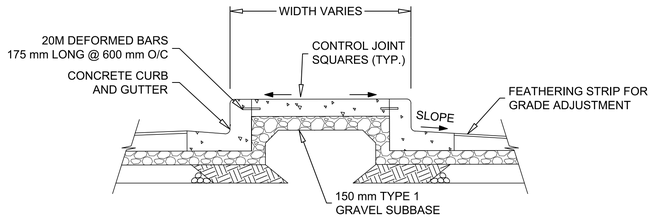
SHEET DESCRIPTION

LANE MARKINGS AND SIGNAGE PLAN

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	C-TR10
Scale 1:250	Filename 21-435_10-INT-TRAFFIC.dwg		10 of 13

TYPICAL CONCRETE TRAFFIC ISLAND DETAIL — A/11

(N.T.S.)

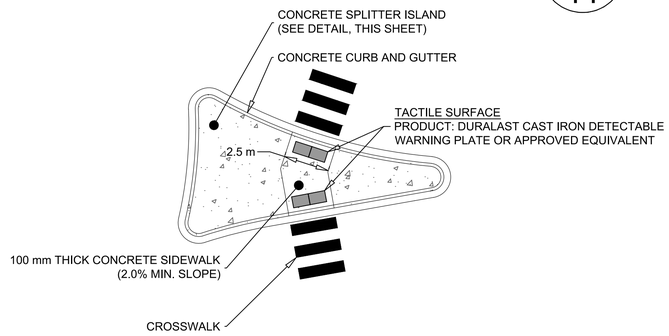


NOTES:

1. MAXIMUM SPACING FOR CONTROL JOINTS IS TO BE 2.5 m.
2. SLOPE SLAB TO FACILITATE DRAINAGE.
3. SLOPE GUTTER TO MATCH STREET CROSS SECTION.
4. ENDS AND CORNERS OF TRAFFIC ISLANDS TO HAVE HIGH BACK CONCRETE CURB AND GUTTER.
5. GEOMETRIC DESIGN OF CONCRETE ISLANDS TO BE AS PER THE TAC GEOMETRIC DESIGN GUIDE.

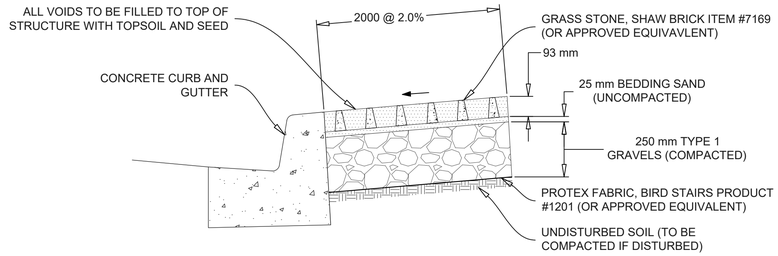
TYPICAL DROPPED SIDEWALK DETAIL — B/11

(N.T.S.)



GRASS PAVER TYPICAL DETAIL — D/11

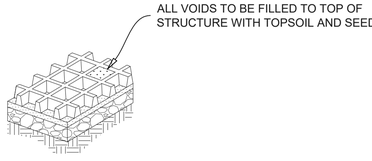
(N.T.S.)



NOTES:

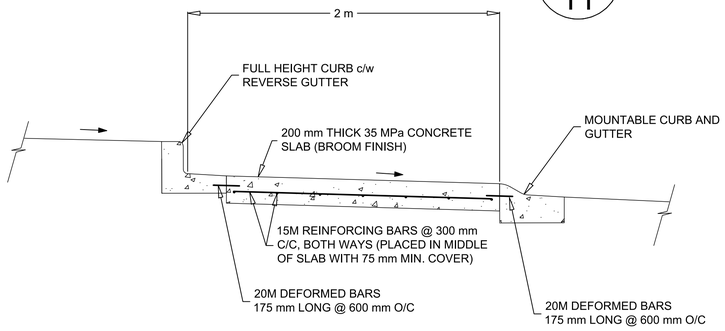
1. PRODUCTS TO BE INSTALLED AS PER MANUFACTURERS SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

GRASS PAVER ISOMETRIC VIEW



TYPICAL TRUCK APRON DETAIL — C/11

(N.T.S.)



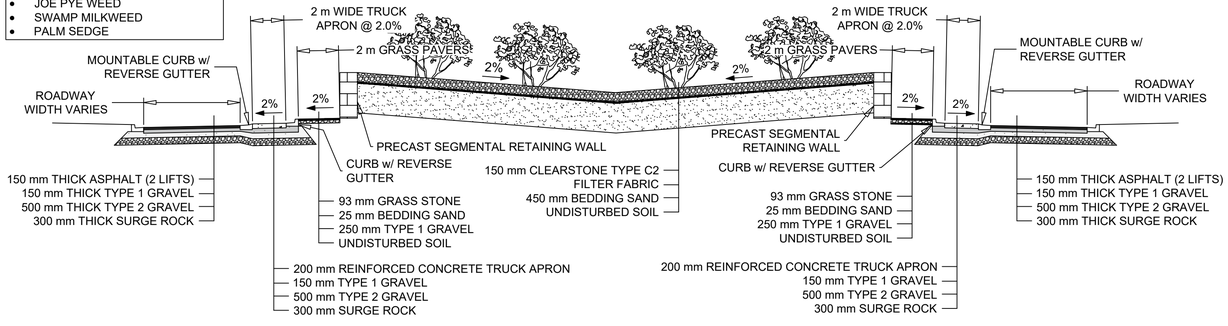
TYPICAL ROUNDABOUT CROSS-SECTION — E/11

(N.T.S.)

NOTE: CENTER ISLAND VEGETATION TO CONSIST OF THE FOLLOWING:

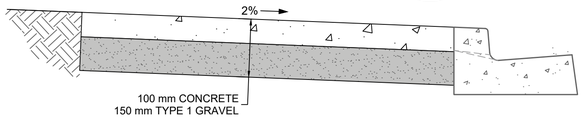
- WINTERBERRY
- DOGWOOD
- FRAGRANT SUMAC
- JOE PYE WEED
- SWAMP MILKWEED
- PALM SEDGE

NOTE: FOR PRECAST SEGMENTAL RETAINING WALL, CONTRACTOR TO PROVIDE P.ENG STAMPED SHOP DRAWINGS FOR REVIEW.



SIDEWALK STRUCTURE — F/11

N.T.S.



DRAFT
NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

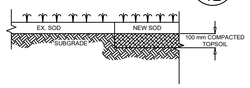
ROAD CONSTRUCTION DETAILS

Drawn	Engineer	Project No.	Drawing No.
M. WHITEHOUSE	P. BURGESS	21-435	C-D11
Scale	Filename		11 of 13
N.T.S.	21-435_D01_INT-DETAILS.dwg		

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_D01_INT-DETAILS.dwg, Plot Date: 2023-Oct-18, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)

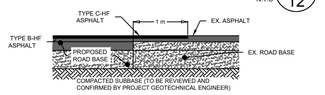
LANDSCAPING REINSTATEMENT (A 12)

N.T.S



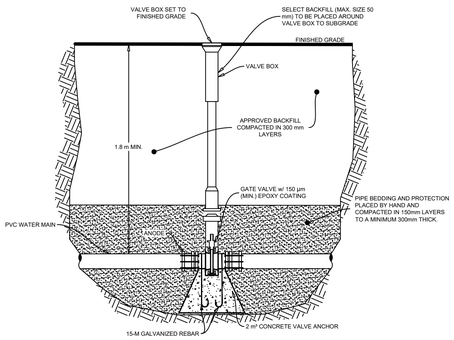
BLEND TO EX. PAVEMENT DETAIL (B 12)

N.T.S



STANDARD GATE VALVE CONNECTION (C 12)

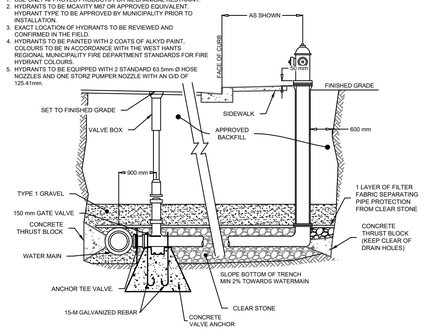
N.T.S



TYPICAL FIRE HYDRANT DETAIL (D 12)

N.T.S

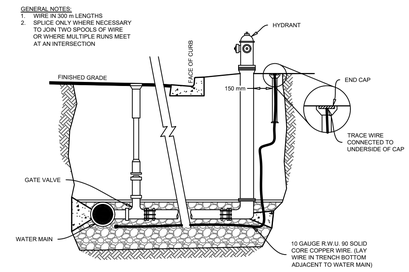
NOTES:
1. USE ONLY APPROVED PRODUCTS FOR MECHANICAL RESTRAINT.
2. HYDRANTS TO BE MCAVITY M67 OR APPROVED EQUIVALENT. HYDRANT TYPE TO BE APPROVED BY MUNICIPALITY PRIOR TO INSTALLATION.
3. EXACT LOCATION OF HYDRANTS TO BE REVIEWED AND CONFIRMED IN THE FIELD.
4. HYDRANTS TO BE PAINTED WITH 2 COATS OF ALKYD PAINT. COLOURS TO BE IN ACCORDANCE WITH THE WEST HANTS REGIONAL MUNICIPALITY FIRE DEPARTMENT STANDARDS FOR FIRE HYDRANT COLOURS.
5. HYDRANTS TO BE EQUIPPED WITH 2 STANDARD 63.5mm Ø HOSE NOZZLES AND ONE STORZ PUMPER NOZZLE WITH AN O/D OF 125.41mm.



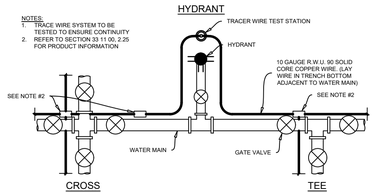
STANDARD TRACE WIRE DETAIL (FOR PVC WATER MAIN) (E 12)

N.T.S.

GENERAL NOTES:
1. WIRE IN 300 m LENGTHS
2. SPLICE ONLY WHERE NECESSARY TO JOIN TWO SPOOLS OF WIRE OR WHERE MULTIPLE RUNS MEET AT AN INTERSECTION

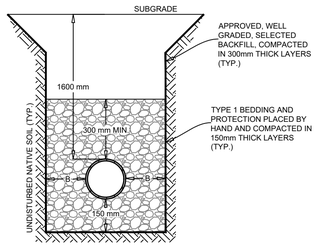


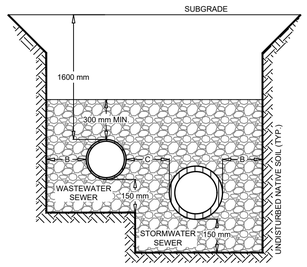
NOTES:
1. TRACE WIRE SYSTEM TO BE TESTED TO ENSURE CONTINUITY
2. REFER TO SECTION 33 11 00, 2.25 FOR PRODUCT INFORMATION



TRENCHING AND BACKFILL DETAIL (F 12)

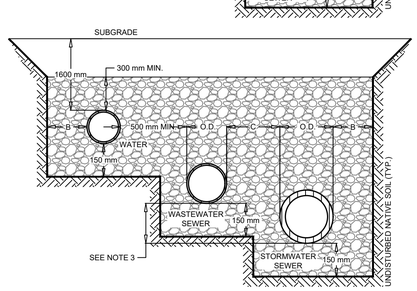
N.T.S





PIPE SIZE NOM. DIA.	DIMENSIONS (mm)	
	B	C
UP TO 375 mm	300	250
376 TO 500 mm	300	300
501 TO 750 mm	400	300
751 TO 1200 mm	400	400

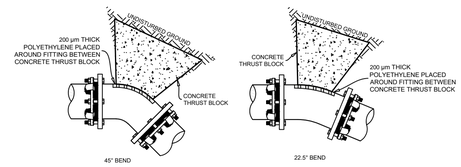
NOTES
1. DIMENSION "C" IS GOVERNED BY THE LARGER PIPE DIAMETER.
2. SIDES OF TRENCHES TO REQUIREMENTS OF NOVA SCOTIA OCCUPATIONAL HEALTH AND SAFETY ACT.
3. IF CROWNS OF STORMWATER AND WASTEWATER SEWER ARE NOT MATCHED, THE INVERT OF THE STORMWATER SEWER MUST BE AT LEAST 100 mm BELOW THE INVERT OF THE WASTEWATER SEWER.
4. MINIMUM GRAVEL COVER OVER WASTEWATER AND STORMWATER SEWERS IS TO BE 300 mm.

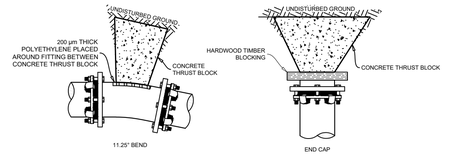


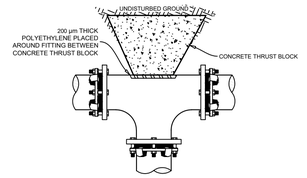
THRUST BLOCK DETAILS (G 12)

N.T.S

DUCTILE IRON CL52 MECHANICAL JOINT FITTINGS







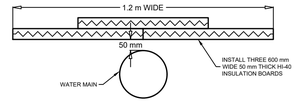
MINIMUM THRUST BLOCK CONTACT AREA (m²)

BASED ON SOIL BEARING CAPACITY OF 100 kPa AND INTERNAL PIPE PRESSURE OF 1035 kPa.

PIPE DIAMETER (mm)	CAP	TEE	45° BEND	22.5° BEND	11.25° BEND
100	0.25	0.25	0.20	0.16	0.16
150	0.48	0.48	0.40	0.24	0.16
200	0.80	0.80	0.64	0.32	0.16
250	1.28	1.28	0.99	0.48	0.24
300	1.76	1.76	1.44	0.72	0.40
350	2.40	2.40	1.96	0.98	0.54
400	3.13	3.13	2.56	1.28	0.71

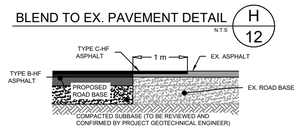
WATER MAIN INSULATION DETAIL (G 12)

N.T.S



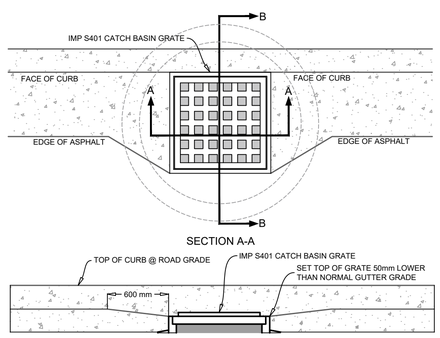
BLEND TO EX. PAVEMENT DETAIL (H 12)

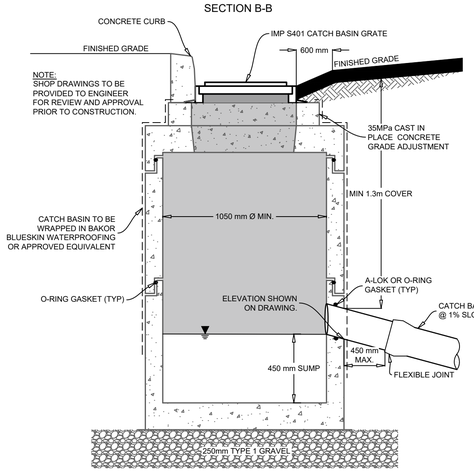
N.T.S



TYP. CATCH BASIN (I 12)

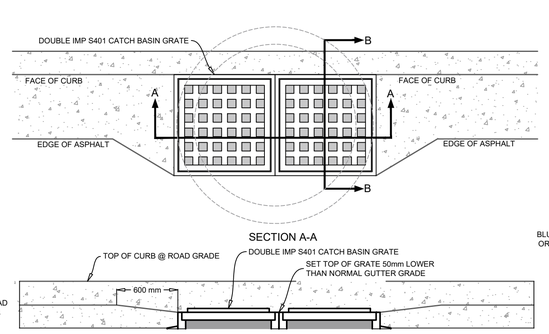
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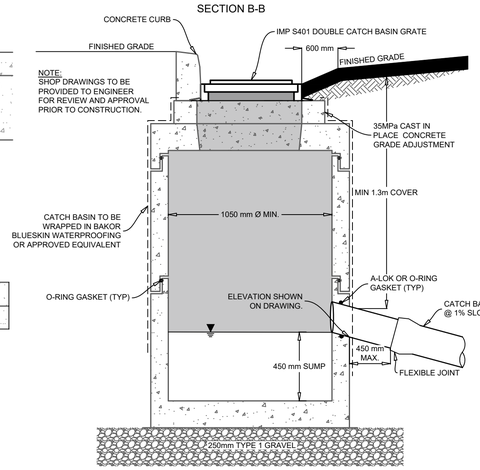




TYP. DOUBLE CATCH BASIN (J 12)

N.T.S





GENERAL CONSTRUCTION NOTES:

1. **SAFETY IS PARAMOUNT AND THE CONTRACTOR MUST USE SAFE WORK PRACTICES IN ACCORDANCE WITH THE NOVA SCOTIA OCCUPATIONAL HEALTH AND SAFETY ACT.**
2. ALL WORKS TO BE IN ACCORDANCE WITH MUNICIPAL SERVICES SPECIFICATION MANUAL (CURRENT EDITIONS).
3. ALL WORKS TO BE IN ACCORDANCE WITH THE "STANDARD SPECIFICATION FOR MUNICIPAL SERVICES" PREPARED JOINTLY BY THE NOVA SCOTIA ROADBUILDERS ASSOCIATION AND THE CONSULTING ENGINEERS OF NOVA SCOTIA (CURRENT EDITION).
4. ALL WORKS TO BE IN ACCORDANCE WITH REQUIREMENTS OF ALL PERMITS AND REGULATIONS AS ISSUED BY THE NOVA SCOTIA DEPARTMENT OF ENVIRONMENT.
5. CONTRACTOR TO NOTIFY DESIGNPOINT AND WEST HANTS REGARDING CONSTRUCTION SCHEDULING 2 WEEKS PRIOR TO COMMENCING CONSTRUCTION.
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7. ALL DISTURBED AREAS NOT STABILIZED BY GRAVEL, ASPHALT, CONCRETE, OR SOD ARE TO BE STABILIZED WITH 100mm TOPSOIL AND HYDROSEEDED. HYDROSEEDED AREAS TO BE COVERED WITH HAY MULCH (MIN. 3500 kg/Ha). HYDROSEEDED AREAS THAT DO NOT SHOW ACTIVE GROWTH WITHIN THE FIRST GROWING SEASON TO BE RE-STABILIZED.
8. MATERIALS SHALL NOT BE SUBSTITUTED UNLESS PRIOR APPROVAL IS PROVIDED BY THE ENGINEER.
9. SHOP DRAWINGS TO BE PROVIDED FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION.
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14. PERMISSION FROM LANDOWNER(S) REQUIRED TO WORK ON PRIVATE PROPERTY.
15. CONTRACTOR TO NOTIFY PROPERTY OWNERS WHO WILL EXPERIENCE DISRUPTION DURING THE WORK (PROPERTY ACCESS, MUNICIPAL SERVICE LOSS, POWER/COMMUNICATION LOSS, ETC.) AT LEAST 48 HOURS PRIOR TO THE DISRUPTION.
16. ALL ELEVATIONS ARE METRIC AND GEODETIC. TOPOGRAPHICAL SURVEY COMPLETED BY DESIGNPOINT IN NOV, 2021. CONTRACTOR TO CONTACT DESIGNPOINT FOR CONSTRUCTION LAYOUT CONTROL INFORMATION 2 WEEKS PRIOR TO CONSTRUCTION.
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26. ANY FIELD MANHOLE CONNECTIONS (IF REQUIRED) TO BE MADE USING CORE DRILL AND KOR-N-SEAL (SUBJECT TO APPROVAL BY UTILITY AND ENGINEER).
27. ALL GRAVITY PIPE TO BE INSTALLED IN AN UPSTREAM DIRECTION. CONTRACTOR TO BEGIN PIPE INSTALLATION AT THE MOST DOWNSTREAM LOCATION. INSTALLING TEMPORARILY ORPHANED PIPE SECTIONS IS NOT ACCEPTABLE (UNLESS APPROVED BY THE UTILITY AND THE ENGINEER).
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29. ALL PRECAST MANHOLES AND CATCH BASINS TO BE WRAPPED IN BAKOR BLUESKIN OR APPROVED EQUIVALENT.

DRAFT
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ISSUE	DATE	DESCRIPTION
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

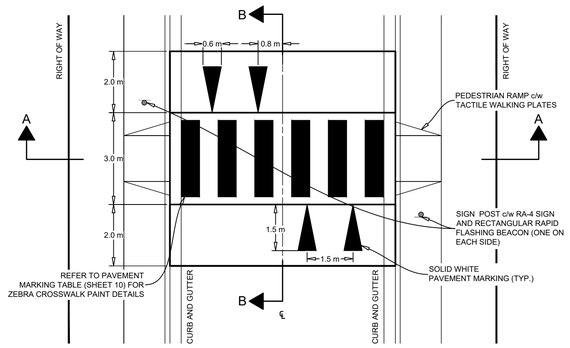
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

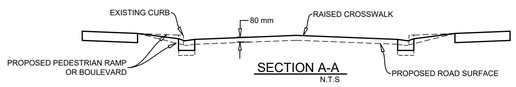
CONSTRUCTION NOTES AND DETAILS

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	C-D12
Scale	Filename		12 of 13
N.T.S	21-435_D01_INT-DETAILS.dwg		

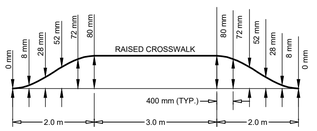
TYP. RAISED CROSSWALK (A 13)
N.T.S



NOTES:
1. THE EXISTING ASPHALT SURFACE TO BE MILLED TO A DEPTH OF 40 mm WHEN RETROFITTING
2. CATCH BASINS ARE REQUIRED ON THE UPHILL SIDE OF THE RAISED CROSSWALK AS INDICATION ON PLANS.
3. POSITIVE DRAINAGE TO NEAREST CATCHBASIN TO BE CONFIRMED BY THE ENGINEER AND ADJUSTED AS REQUIRED
4. RAISED CROSSWALKS TO BE CONSTRUCTED USING TYPE D-HF ASPHALT (UNLESS OTHERWISE APPROVED BY THE WHRM)
5. ALL DIMENSIONS ARE IN METERS UNLESS INDICATED OTHERWISE

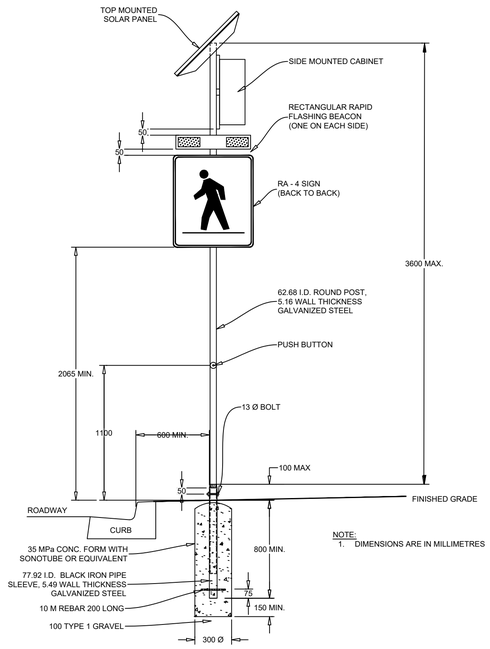


SECTION A-A
N.T.S



SECTION B-B
N.T.S

RECTANGULAR RAPID-FLASHING BEACON SIGNAL CONFIGURATION (SOLAR PANEL) (B 13)
N.T.S



NOTE:
1. DIMENSIONS ARE IN MILLIMETRES

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NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION
4	DRAFT	ISSUED FOR TENDER
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

CONSTRUCTION NOTES AND DETAILS

Drawn	Engineer	Project No.	Drawing No.
T.MILLS	A. SKETCHLEY	21-435	C-D13
Scale: N.T.S	Filename: 21-435_D01_INT-DETAILS.dwg		13 of 13

WINDSOR INTERSECTION INFRASTRUCTURE NEEDS ASSESSMENT



PREPARED FOR:
WEST HANTS REGIONAL MUNICIPALITY

Project No. 201-11983

SEPTEMBER 2021

wsp

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1 INTRODUCTION

Background

Plans are currently being prepared for modifications to the regional transportation network in Windsor, Nova Scotia. The Nova Scotia Department of Transportation and Active Transit (NSTAT) is considering re-aligning the Highway 101 Eastbound Exit 5A Ramp at Industrial Drive. With the realignment of the Exit 5A Ramp, the Hants County Exhibition entrance will be required to be relocated along Wentworth Road. Since the main access to the Hants County Exhibition will be relocated, the Windsor Agricultural Society is planning to expand the site to accommodate additional commercial development and a new access location on Wentworth Road. Among the future changes to the road network, the West Hants Regional Municipality (WHRM) is also considering extending Payzant Drive to the west to connect with Centennial Drive. WSP Canada Inc. was retained to complete a Traffic Impact Study (TIS) for the proposed Exhibition Expansion with respect to several future road network scenarios, which followed the March 31st, 2021 Scoping Document reviewed by NSTAT.

In addition to the changes resulting from the realignment if the Highway 101 Eastbound Exit 5A Ramp and the Hants County Exhibition Expansion, the WHRM is considering an extension of Payzant Drive to the east to connect with King Street.

The potential changes to the road network will have an impact on traffic volumes on Wentworth Road and King Street. WSP Canada Inc. has been retained to assess the impact of these changes at a series of key intersections and provide recommendations to mitigate the infrastructure impacts of the changes to the regional transportation system. A summary of the potential changes to the transportation network is provided in Figure 1.

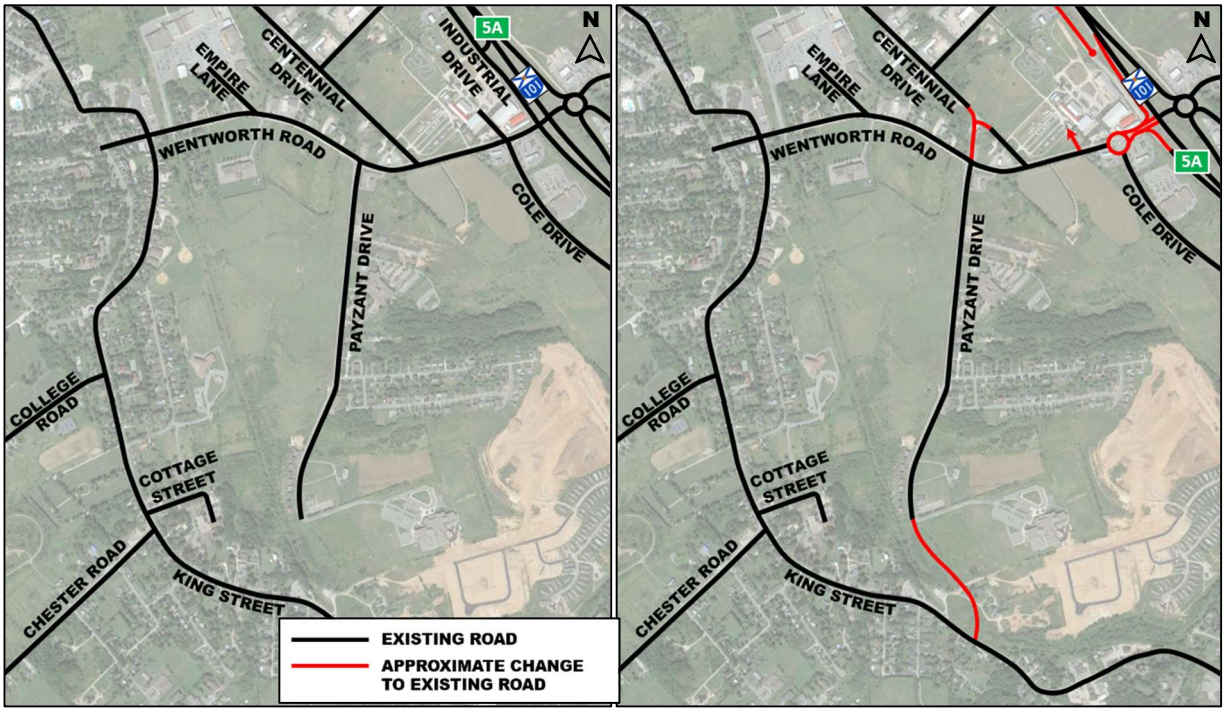


Figure 1 – Summary of Potential Changes to the Road Network

Study Objectives

1. Establishing existing traffic conditions in the Study Area with input from the studied traffic volume changes at the Hants County Exhibition;
2. Determining the future growth based on municipality approach and future developments;
3. Preparing the Design Hourly Volumes for analysis;
4. Completing warrant analyses and operational analyses at the Study Intersections for existing and future growth scenarios;
5. Determining improvements to the Study Intersections to mitigate future growth and traffic volume redistribution; and,
6. Preparing intersection concept drawings with planning level cost estimates for implementation.

Descriptions of Major Study Area Roads

Wentworth Road is an arterial roadway, generally aligned north-south for the purposes of this study. Wentworth Road provides a key link between the Town of Windsor and Highway 101. Wentworth Road generally consists of one lane in each direction with an alternating left-turning lane and concrete sidewalk on both sides. The posted speed limit is 50 km/h.

King Street is an arterial roadway, generally aligned north-south for the purposes of this study. King Street provides a major link between the Avon River in Downtown Windsor and the Curry's Corner / Garlands Crossing neighbourhoods. In the Study Area, King Street generally consists of one lane in each direction and has an asphalt sidewalk on the north side of the street. The posted speed limit is 50 km/h.

Payzant Drive is a collector roadway, generally aligned east-west for the purposes of this study, that runs approximately 1.4 kms between Wentworth Road and the Avon View High School. Payzant Drive is the only road access the Avon View High School and the Hants Community Hospital. Payzant Drive generally consists of one lane in each direction and the posted speed limit is 50 km/h.

Study Intersections

This study will focus on four (4) existing intersections and one (1) future intersection, as shown in Figure 2. The existing conditions and future changes anticipated at each Study Intersection are described in detail in Section 4.

#1 – Wentworth Road at Payzant Drive
#2 – Wentworth Road at Empire Lane
#3 – King Street at College Road
#4 – King Street at Chester Road
#5 – King Street at Payzant Drive

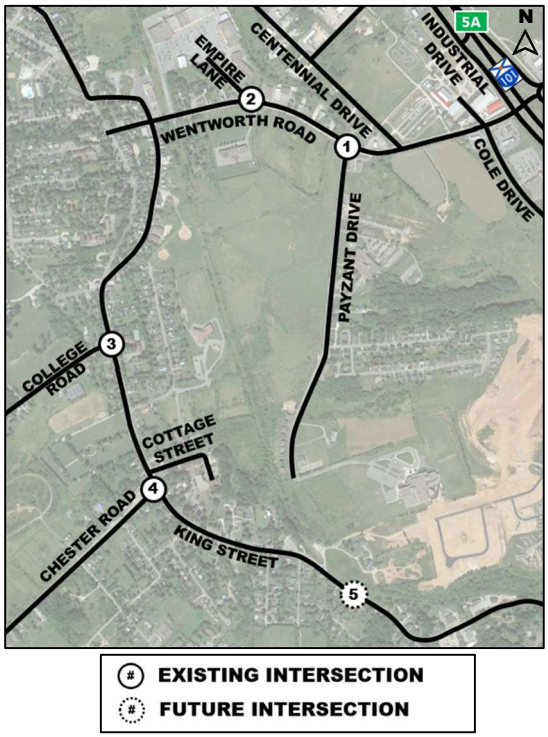


Figure 2 – Study Intersections

2 BACKGROUND TRAFFIC

Turning Movement Counts

Turning movement volumes were collected by WSP between Tuesday, January 19th and Thursday, January 21st, 2021 at the existing Study Intersections. Traffic volumes were collected during the morning (7:00-9:00AM), midday (11:30AM-1:30PM) and afternoon (3:30-5:30PM) peak periods. Intersection counts have been tabulated in 15-minute intervals with peak hours indicated by shaded areas. Turning movement volumes are provided in Tables A-1 to A-4, Appendix A.

Seasonal Adjustment Factor

NSTAT completes traffic counts on various roads and highways throughout the year. In order to normalize the collected traffic counts completed for different types of roads and to account for seasonal variation in traffic volumes, NSTAT develops average traffic count group factors. There is a factor determined for each week of the year for each road class.

Road classes consider the type of traffic use carried on a particular road section. A road section that primarily carries commuter traffic in an urban area does not see as much variation in volumes as a rural road in a tourist area would experience.

With respect to traffic volumes collected in the third week of January, the associated NSTAT seasonal adjustment factor for a 'A' class roadway (Wentworth Road and King Street) is 1.17 factor, as shown in Table A-5, Appendix A.

Covid-19 Adjustment Factor

It should be noted that the traffic volume data was collected amidst the Covid-19 pandemic. Since traffic volumes in the WHRM appear to be similar to pre-pandemic conditions, volumes will be increased by 5% to account for potentially reduced travel patterns to be conservative.

Background Traffic from the Existing West Hants Sports Complex and Exhibition

Since traffic volume data was collected amidst the Covid-19 pandemic, typical weekday traffic generated by the existing West Hants Sports Complex and Hants County Exhibition would not have been captured in the turning movement volumes collected at the Study Intersections.

The distribution of trips at Study Intersection #1 from the existing West Hants Sports Complex and Hants County Exhibition were extracted from the *Hants County Exhibition Expansion Traffic Impact Study (WSP, May 2021)*. Based on trips at the Wentworth / Payzant Drive intersection, trips were then distributed through the study area network.

Traffic from the existing West Hants Sports Complex and Hants County Exhibition is considered in 2021 volume projections, which is carried through to the 2030 volume projections.

Future Background Traffic from developments within WHRM

There are ongoing developments in WHRM that are being constructed or plan to be constructed between the years 2021 and 2030 and will be considered in the 2030 volume projections. These developments include:

- Payzant Drive Area: 258 single family units, 250 apartment units with a community centre (10,000 sq. ft.).
- College Road Area: 88 units of Senior housing, 128 beds Long-term care, 42 units of assisted living, 10 units with disability requirements, 44 units of independent living with a commercial (medical centre/pharmacy)/café (8,000 sq.ft.) development and community centre (11,000 sq.ft.).
- Empire Lane Area: 27 apartment units
- The Crossing Area: 60 single family dwelling units

The above developments have been added to the 2030 volume projections and distributed onto the study network using the existing travel patterns.

Traffic Growth Rate

Historical data was unavailable for Wentworth Road or King Street within the Study Area, therefore, historical traffic volume data on Highway 101, near Exit 5, 5A and 6, was utilized for background growth.

The available traffic data for Highway 101 Section 60 (between Exit 5 and 5A) was reviewed and found a 1.76% growth rate, as shown in Figure 3. Similarly, the available data for Highway 101 Section 65 (between Exit 5A and 6) was reviewed and found a 1.74% growth rate, as shown in Figure 4.

To account for future annual growth of the unknown developments, an annual growth rate of 1.5% will be applied to the background volumes between 2021 and 2030 for this study.

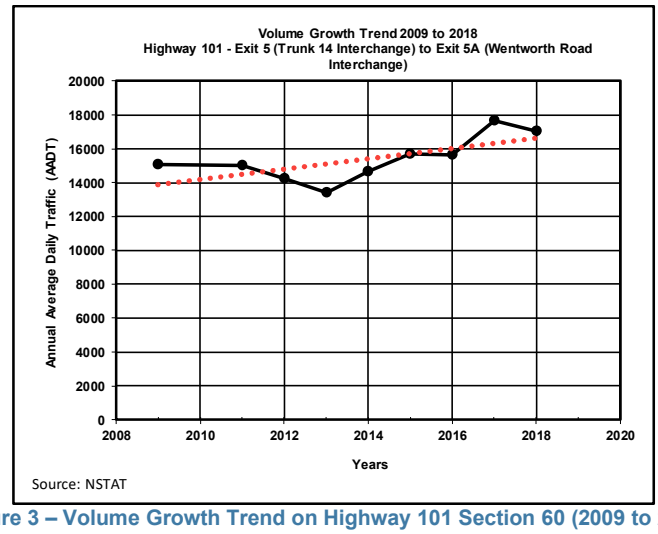


Figure 3 – Volume Growth Trend on Highway 101 Section 60 (2009 to 2018)

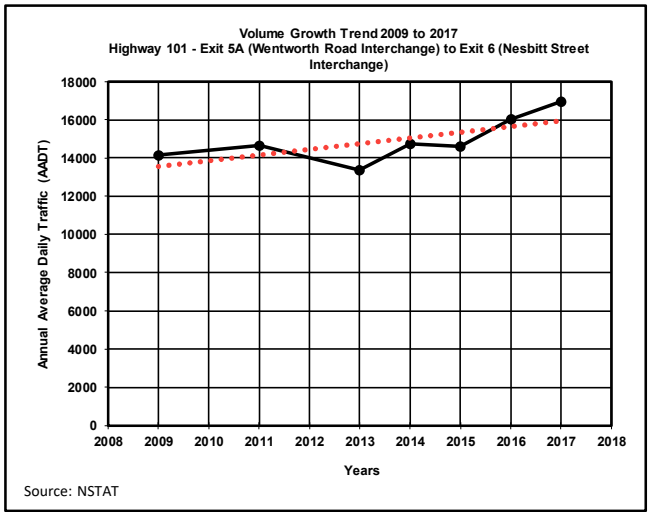


Figure 4 – Volume Growth Trend on Highway 101 Section 65 (2009 to 2017)

Future Traffic from the Hants County Exhibition Expansion

The expansion of the Hants County Exhibition is expected to include approximately 35,000 ft^2 of commercial development, consisting of office space, retail establishments and restaurants. The distribution of trips at Study Intersection #1 from the Hants County Exhibition Expansion were extracted from the *Hants County Exhibition Expansion Traffic Impact Study (WSP, May 2021)*.

Traffic from the Hants County Exhibition Expansion is only considered in 2030 volume projections.

3 ANALYSIS SCENARIOS

Analysis Scenarios Considered

WSP considered the following analysis scenarios at the Study Intersections:

1. 2021 Existing Conditions;
2. 2030 ***without*** Payzant Drive connection; and,
3. 2030 ***with*** Payzant Drive connection.

The scenarios are described in more detail in the following subsections. It should be noted that the scenarios do not apply to all Study Intersections. Study Intersections will be evaluated based on appropriate scenarios. Similarly, there may be additional scenarios considered that reflect slightly modified scenarios, depending on the intersection being considered.

It should be noted that the 2030 scenarios assume the following:

- Highway 101 Exit 5A Eastbound Ramp is re-aligned with Wentworth Road;
- Full build-out of the expansion to the Hants County Exhibition; and,
- Payzant Drive is extended west and connects with Centennial Drive.

3.1 SCENARIO 1: 2021 EXISTING CONDITIONS

Projected 2021 Volumes

Projected 2021 AM and PM peak hour volumes consider:

- 1.17 Seasonal Adjustment Factor
- 1.05 Covid-19 Adjustment Factor
- Trips generated by the West Hants Sports Complex on a typical weekday
- Trips generated by the existing Hants County Exhibition on a typical weekday

Study Intersections reviewed based on traffic volumes in Scenario 1 will be evaluated with respect to the existing traffic control and lane configurations.

3.2 SCENARIO 2: 2030 WITHOUT PAYZANT DRIVE CONNECTION

Projected 2030 Volumes without Payzant Drive connection

Projected 2030 AM and PM peak hour background volumes ***without*** the Payzant Drive connection consider:

- 2021 Volumes
- Future Background Developments
- 1.5% Annual Growth between 2021-2030
- Trips generated by the Hants County Exhibition Expansion on a typical weekday

3.3 SCENARIO 3: 2030 WITH PAYZANT DRIVE CONNECTION

Projected 2030 Volumes with Payzant Drive connection

Projected 2030 AM and PM peak hour background volumes ***with*** the Payzant Drive connection consider:

- 2021 Volumes
- Future Background Developments
- 1.5% Annual Growth between 2021-2030
- Trips generated by the Hants County Exhibition Expansion on a typical weekday
- Estimation of Redistributed Trips with the Payzant Drive connection open

4 INTERSECTION OPERATIONAL ANALYSIS

Intersection Level of Service (LOS) Analysis was completed to estimate how intersections may be expected to operate into the future without and with site generated trips. This section of the report addresses how left-turn lane warrants and traffic signal warrants were conducted and how each intersection was evaluated. The following subsections identify each study intersection and summarize the results of the operational analysis.

Left-Turn Lane Warrant Analysis

Left-turn movements on a two-lane street may cause both operational and safety problems. Operational problems result as a vehicle stopped waiting for an opportunity to turn across 'heavy' opposing traffic causes a queue of stopped vehicles to form. Safety problems result from rear end collisions when a stopped left-turning vehicle is struck by an advancing vehicle, or from head-on or right-angle collisions when a left-turning vehicle is struck by an opposing vehicle.

The *Geometric Design Standards for Ontario Highways Manual* contains nomographs for left-turn lane analysis for two lane streets at unsignalized intersections. The analysis method, which is normally used by WSP Atlantic to evaluate the need for left-turn lanes, uses a series of nomographs that consider speed, advancing volumes, left-turns as a percentage of advancing volumes, and opposing volumes. A point, based on 'opposing' and 'advancing' volumes, plotted to the right of the 'warrant line' of the appropriate '% left-turns' and 'approach speed' nomograph, indicates that a left-turn lane is warranted for the conditions used in the analysis. Similarly, a point that is plotted to the left of the warrant line indicates that a left-turn lane is not warranted.

Left-turn lane warrant analyses are included in Appendix B.

Traffic Signal Warrant Analysis

A signal warrant analysis is completed to determine if the installation of traffic signals at an intersection will provide a positive impact on total intersection operation. That is, the benefits in time saved and improved safety that will accrue to vehicles entering from a side street will exceed the impact that signals will have in time lost and potential additional collisions for vehicles approaching the intersection on the main street.

The *Canadian Traffic Signal Warrant Matrix Analysis (Transportation Association of Canada (TAC), 2005)* considers 100 warrant points as an indication that traffic signals will provide a positive impact. Signal warrant analysis uses vehicular and pedestrian volumes, and intersection, roadway and study area characteristics to calculate a warrant point value.

Traffic signal warrant analyses are included in Appendix B.

Intersection Capacity Analysis Results

Synchro 11.0 / *Arcady 9* software have been used for performance evaluation of the Study Intersections Summaries of the results are provided in the following sub-sections and detailed results of the analyses are included in Appendix C.

Intersection Level of Service Analysis

The level or quality of performance of an intersection in terms of traffic movement is determined by a level of service (LOS) analysis. LOS for intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and increased travel time.

LOS criteria, as shown in Table 1 are stated in terms of average control delay per vehicle which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Table 1 – Level of Service Criteria for Intersections

LOS	Signalized Intersections Control Delay (Seconds per Vehicle)	LOS Description	Roundabouts *and* Two Way Stop Controlled (TWSC) Intersections Control Delay (Seconds per Vehicle)
A	Less than 10.0	Very low delay; most vehicles do not stop **(Excellent)**	Less than 10.0
B	Between 10.0 and 20.0	Higher delay; most vehicles stop **(Very Good)**	Between 10.0 and 15.0
C	Between 20.0 and 35.0	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping **(Good)**	Between 15.0 and 25.0
D	Between 35.0 and 55.0	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop **(Satisfactory)**	Between 25.0 and 35.0
E	Between 55.0 and 80.0	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of **acceptable** delay	Between 35.0 and 50.0
F	Greater than 80.0	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection **(Unacceptable)**	Greater than 50.0

4.1 INTERSECTION #1: WENTWORTH ROAD AT PAYZANT DRIVE

Existing / Future Intersection Description

The existing intersection of ***Wentworth Road at Payzant Drive / Commercial Driveway*** is a 4-leg intersection with stop-control on the Payzant Drive and Commercial Driveway approaches, as shown in Photo 1. The Wentworth Road and Payzant Drive approaches are supplemented with a left-turn lane. There are painted crosswalks on the east and west legs and there is an enhanced crosswalk on the north leg.

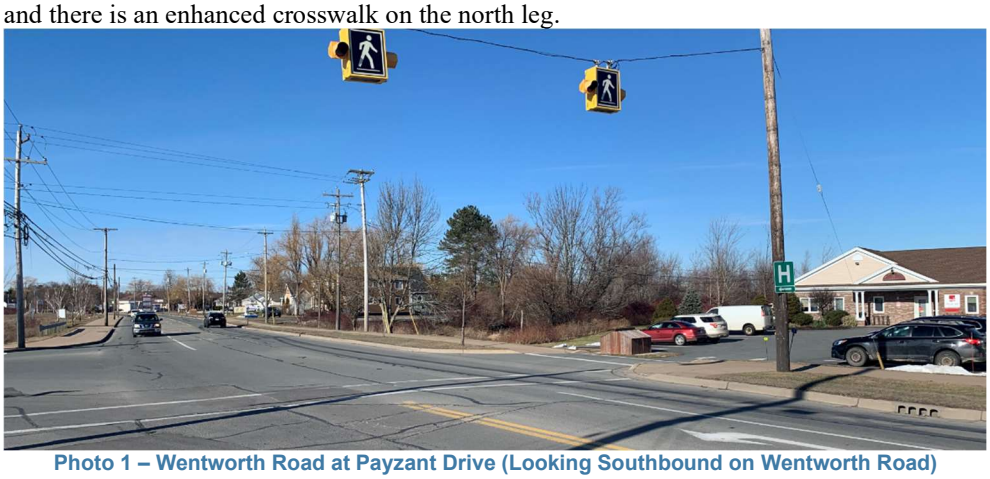


Photo 1 – Wentworth Road at Payzant Drive (Looking Southbound on Wentworth Road)

With full build-out of the Hants County Exhibition Expansion, there are future plans to reconfigure this intersection. In Scenario 1, the west leg of this intersection is considered to be the existing commercial driveway. In Scenarios 2 and 3, the west leg of the intersection is considered an extension to Payzant Drive, as illustrated in Figure 5. It should be noted that this particular intersection is being considered for traffic signals or a roundabout as a result of the expansion to the Hants County Exhibition. Since there is some uncertainty of the future traffic control at this time, an operational analysis of a signalized and roundabout intersection was completed in Scenarios 2 and 3.

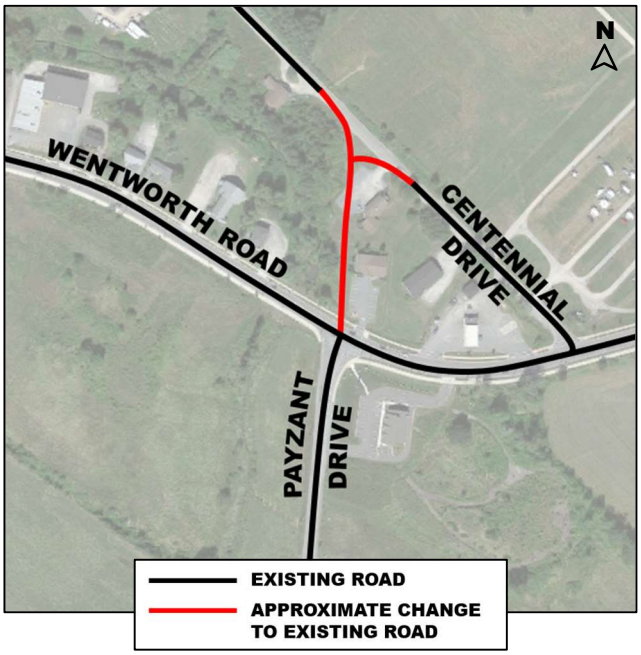


Figure 5 – Future Intersection Configuration

Another option for the intersection of Wentworth Road at Payzant Drive is to remain as a three-legged intersection with turning restrictions at the Centennial Drive/Wentworth Road intersection. This option may be reviewed during the detailed design of the project, however, was not considered in the analysis.

Projected Traffic Volumes

Traffic volume figures were prepared for existing conditions and future traffic volumes without and with the Payzant Drive connection. Table 2 provides a summary of the volume figures prepared and the location of the figure in Appendix A.

Table 2 – Summary of Traffic Volume Figures: Wentworth Road at Payzant Drive

	Description	Volume Figure
Scenario 1	Stop-control	Figure A-1 (Boxes A & B)
Scenario 2	Traffic Signals	Figure A-1 (Boxes C & D)
	Roundabout	Figure A-1 (Boxes E & F)
Scenario 3	Traffic Signals	Figure A-2 (Boxes A & B)
	Roundabout	Figure A-2 (Boxes C & D)

Warrant Summary

Based on the existing traffic control and lane configurations, traffic signal warrants were completed, and no turning lane warrants were completed. It was determined that:

- Traffic signals are not warranted with respect to Scenario 1 (**82 Warrant Points**, Table B-1, Appendix B).
- Traffic signals are warranted with respect to Scenario 2[1] (**229 Warrant Points**, Table B-2, Appendix B).
- Traffic signals are warranted with respect to Scenario 3[2] (**145 Warrant Points**, Table B-3, Appendix B).

Intersection Operational Analysis Results

Operational performance results for this intersection are provided in Table 4 (AM peak hour) and Table 5 (PM peak hour).

The signalized alternative in Scenarios 2 and 3 was evaluated with a northbound channelized right-turn from Wentworth Road to Payzant Drive and the eastbound approach consists of a lane for right-turn movements and a lane for shared left-turn and through movements. It should be noted that no changes were made to the traffic signal timing plan or lane configurations between Scenario 2 and 3 for comparison purposes. Without the Payzant Drive connection, all movements are expected to operate at a LOS 'E' or better and a v/c ratio of 0.99 or better.

The roundabout configuration evaluated in Scenarios 2 and 3 is provided on Page C-5 and C-8, Appendix C. No changes were made to the intersection geometry or lane configurations between Scenario 2 and 3 for comparison purposes.

Key Takeaways:

- The existing intersection is operating at a poor LOS.
- **Traffic signals are warranted** based on existing traffic volumes and are expected to **remain warranted** for future scenarios.
- The intersection performs better as a roundabout compared to traffic signals.
- Traffic signals are expected to provide an acceptable level of service at this intersection.
- Some **traffic is diverted from the intersection with the Payzant Drive connection open**, which slightly improves the operational performance of the intersection.
- **Minimal changes in the operational performance of this intersection are expected with the Payzant Drive connection.**

[1] Traffic signal warrant was completed based on traffic volumes in Figure A-1 (Boxes C & D)
[2] Traffic signal warrant was completed based on traffic volumes in Figure A-2 (Boxes A & B)

Without the Payzant Drive connection and with the roundabout option, all movements are expected to operate at a LOS 'B' and a v/c ratio of 0.65 or better.

In general, the operational performance of the intersection is expected to improve slightly with the Payzant Drive connection, regardless of the selected traffic control.

Intersection Recommendations & Planning Cost Estimate

Based on findings from this study, in conjunction with the *Hants County Exhibition Expansion Traffic Impact Study (WSP, May 2021)*, it is recommended that plans be prepared to upgrade this intersection to a roundabout. The general configuration of roundabout is provided in Figure 6[3] and schematic image to show lane configuration. It is recommended that the roundabout include:

- Right-turn lane on the northbound approach;
- Left-turn lane on the southbound approach;
- Single lane on the eastbound and westbound approaches;
- Pedestrian crosswalks consisting of zebra markings and side-mounted signage (RA-4) as appropriate;
- Yield signage on all approaches; and,
- Sidewalk connections to crosswalks.

A planning cost estimate for these items is provided in Table 3. It is estimated that these intersection modifications would be in the range of approximately $2,400,000 plus HST.

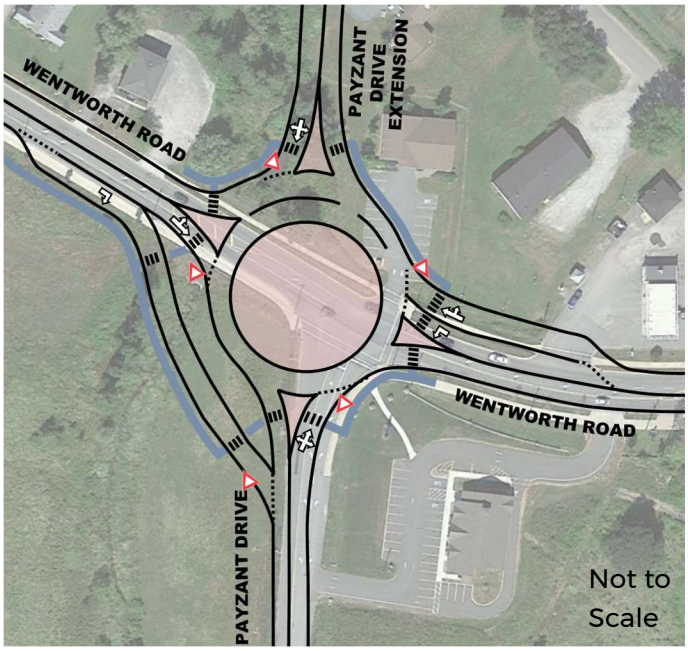


Figure 6 – Recommended Intersection Configuration: Wentworth Road at Payzant Drive[3]

Table 3 – Planning Cost Estimate: Wentworth Road at Payzant Drive

Item	Cost (HST Excluded)
Roundabout	$1,600,000
50% Contingency	$800,000
Total	**$2,400,000**

[3] The rendering is not to scale and is intended for conceptual purposes only.

Table 4 – Intersection Capacity Analysis: Wentworth Road at Payzant Drive (AM Peak)

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement								Overall Intersection	
	Driveway		Payzant Drive		Wentworth Road					
	EB-LTR		WB-L	WB-TR	NB-L	NB-TR	SB-L	SB-TR	Delay	LOS
Scenario 1 - 2021 AM Peak Hour **with Existing** Conditions - ***Stop Control*** (Page C-1)										
Delay	71.7		345.9	16.4	8.3	0.0	11.1	0.0	18.2	C
LOS	F		F	C	A	A	B	A		
v/c	0.05		1.30	0.37	0.00	0.40	0.35	0.27		
Queue	1.3		50.3	13.6	0.0	0.0	12.9	0.0		
LOS Criteria	**Payzant Drive**				**Wentworth Road**				**Overall Intersection**	
	EB-L	**EB-TR**	**WB-L**	**WB-TR**	**NB-L**	**NB-TR**	**SB-L**	**SB-TR**	**Delay**	**LOS**
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***Traffic Signals*** (Page C-3)										
Delay	48.6	17.1	52.6	7.5	20.3	57.6	73.3	10.1	40.9	D
LOS	D	B	D	A	C	E	E	B		
v/c	0.3	0.22	0.78	0.53	0.17	0.99	0.99	0.43		
Queue	48.6	17.1	52.6	7.5	20.3	57.6	73.3	10.1		
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***Roundabout*** (Page C-5)										
Delay	7.8		9.9		10.1		3.9		7.4	A
LOS	A		A		B		A			
v/c	0.15		0.55		0.59		0.51			
Queue	3.5		19.6		17.5		10.5			
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Traffic Signals*** (Page C-6)										
Delay	42.8	18.6	33.6	7.9	17.8	36.3	27.6	9.7	23.5	C
LOS	D	B	C	A	B	D	C	A		
v/c	0.22	0.20	0.40	0.48	0.16	0.88	0.76	0.44		
Queue	16.5	13.4	37.7	20.9	17.2	190.7	74.8	75.4		
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Roundabout*** (Page C-8)										
Delay	6.4		7.0		8.7		3.3		6.0	A
LOS	A		A		A		A			
v/c	0.13		0.38		0.54		0.44			
Queue	3.5		19.6		15.4		14.0			

Table 5 – Intersection Capacity Analysis: Wentworth Road at Payzant Drive (PM Peak)

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement								Overall Intersection	
	Driveway		Payzant Drive		Wentworth Road					
	EB-LTR		WB-L	WB-TR	NB-L	NB-TR	SB-L	SB-TR	Delay	LOS
Scenario 1 - 2021 PM Peak Hour **with Existing** Conditions - ***Stop Control*** (Page C-2)										
Delay	39.6		134.2	17.2	8.5	0.0	9.1	0.0	13.3	B
LOS	E		F	C	A	A	A	A		
v/c	0.10		0.95	0.38	0.00	0.35	0.09	0.32		
Queue	2.5		50.8	14.3	0.1	0.0	2.4	0.0		
LOS Criteria	**Payzant Drive**				**Wentworth Road**				**Overall Intersection**	
	EB-L	**EB-TR**	**WB-L**	**WB-TR**	**NB-L**	**NB-TR**	**SB-L**	**SB-TR**	**Delay**	**LOS**
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection - ***Traffic Signals*** (Page C-4)										
Delay	60.5	13.6	46.3	7.0	16.3	45.0	33.4	12.5	30.5	C
LOS	E	B	D	A	B	D	C	B		
v/c	0.61	0.30	0.72	0.45	0.14	0.94	0.70	0.51		
Queue	36.5	14.7	70.2	20.8	14.9	255.1	53.1	97.6		
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection - ***Roundabout*** (Page C-5)										
Delay	8.6		18.0		12.8		3.5		10.3	B
LOS	A		C		B		A			
v/c	0.29		0.72		0.70		0.45			
Queue	11.2		79.8		56.0		13.3			
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection - ***Traffic Signals*** (Page C-7)										
Delay	49.6	15.3	30.4	7.8	15.6	33.8	9.7	11.4	22	C
LOS	D	B	C	A	B	C	A	B		
v/c	0.51	0.28	0.32	0.43	0.14	0.87	0.35	0.50		
Queue	35.3	16.6	32.4	20.9	13.3	172.6	16.3	87.5		
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection - ***Roundabout*** (Page C-8)										
Delay	6.8		9.3		10.9		2.9		7.3	A
LOS	A		A		B		A			
v/c	0.25		0.47		0.65		0.39			
Queue	9.8		22.4		31.5		18.9			

4.2 INTERSECTION #2: WENTWORTH ROAD AT EMPIRE LANE

Existing Intersection Description

The existing intersection of ***Wentworth Road at Empire Lane*** is a 3-leg intersection with stop-control on the Empire Lane approach, as shown in Photo 2. The existing intersection was constructed with underground conduit in preparation for future potential signalization of the intersection. Empire Lane provides the primary vehicle access to the Fort Edward Mall, a shopping plaza consisting of major retail destinations in the area. The Empire Lane approach consists of a right-turn and left-turn lane separated by a splitter island. In addition, two-way vehicle movements on Empire Lane are separated by a median. The northbound approach on Wentworth Road is supplemented with a left-turn lane to the shopping plaza. There are painted crosswalks on the west leg and there is an enhanced crosswalk on the north leg.



Photo 2 – Wentworth Road at Empire Lane (Looking Southbound on Wentworth Road)

Projected Traffic Volumes

Traffic volume figures were prepared for existing conditions and future traffic volumes without and with Payzant Drive connection open. Table 6 provides a summary of the volume figures prepared and the location of the figure in Appendix A.

Table 6 – Summary of Traffic Volume Figures: Wentworth Road at Empire Lane

	Volume Figure
Scenario 1	Figure A-3 (Boxes A & B)
Scenario 2	Figure A-3 (Boxes C & D)
Scenario 3	Figure A-3 (Boxes E & F)

Warrant Summary

Based on the existing traffic control and lane configurations, traffic signal warrants were completed, and no turning lane warrants were completed. It was determined that:

- Traffic signals are not warranted with respect to Scenario 1 (**37 Warrant Points**, Table B-4, Appendix B).
- Traffic signals are not warranted with respect to Scenario 2 (**62 Warrant Points**, Table B-5, Appendix B).
- Traffic signals are not warranted with respect to Scenario 3 (**50 Warrant Points**, Table B-6, Appendix B).

Intersection Operational Analysis Results

Operational performance results for this intersection are provided in Table 7.

The existing intersection is operating well during the morning and afternoon peak hours. This intersection was evaluated in Scenarios 2 and 3 with the existing intersection geometry and lane configurations.

In 2030 without the Payzant Drive connection, movements on the Wentworth Road approaches are expected to operate at LOS 'B' or better. Left turning traffic from the Fort Edward Mall is expected to experience the largest delay at LOS 'D' during the PM peak.

In 2030 with the Payzant Drive connection, all movements are expected to operate at a LOS 'C' or better and a v/c ratio of 0.45 or better. In general, with the Payzant Drive connection, the operational performance of the intersection is expected to improve slightly.

Key Takeaways:

- The existing intersection is operating well.
- **Traffic signals are not warranted** based on existing traffic volumes and are expected to **remain unwarranted** for all future scenarios.
- Implementing traffic signals at this intersection is expected to introduce an unnecessary delay to the Wentworth Road approaches.
- Some **traffic is diverted from the intersection with the Payzant Drive connection open**, which slightly improves the operational performance of the intersection.
- **Minimal changes in the operational performance of this intersection are expected with the Payzant Drive connection.**

Intersection Recommendations

Since the existing intersection is currently operating well and is expected to continue to operate well in 2030 without and with the Payzant Drive connection, no major changes to the intersection geometry, traffic control or lane configurations are proposed. It is recommended that the intersection be monitored for future signalization.

Table 7 – Intersection Capacity Analysis: Wentworth Road at Empire Lane

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement					Overall Intersection	
	Empire Lane		Wentworth Road				
	EB-L	EB-R	NB-L	NB-T	SB-TR	Delay	LOS
Scenario 1 - 2021 AM Peak Hour **with Existing** Conditions - ***Stop Control*** (Page C-9)							
Delay	15.3	11.4	8.6	0.0	0.0	1.0	A
LOS	C	B	A	A	A		
v/c	0.09	0.05	0.05	0.40	0.30		
Queue	2.3	1.2	1.2	0.0	0.0		
Scenario 1 - 2021 PM Peak Hour **with Existing** Conditions - ***Stop Control*** (Page C-10)							
Delay	23.0	18.4	10.6	0.0	0.0	3.6	A
LOS	C	C	B	A	A		
v/c	0.40	0.23	0.09	0.28	0.42		
Queue	14.7	7.1	2.4	0.0	0.0		
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***Stop Control*** (Page C-11)							
Delay	19.2	14.1	9.5	0.0	0.0	1.1	A
LOS	C	B	A	A	A		
v/c	0.14	0.09	0.07	0.49	0.44		
Queue	3.7	2.3	1.7	0.0	0.0		
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection - ***Stop Control*** (Page C-12)							
Delay	32.7	18.9	10.5	0.0	0.0	3.8	A
LOS	D	C	B	A	A		
v/c	0.54	0.27	0.11	0.43	0.55		
Queue	24	8.7	3.0	0.0	0.0		
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Stop Control*** (Page C-13)							
Delay	16.8	12.5	9.0	0.0	0.0	1.1	A
LOS	C	B	A	A	A		
v/c	0.12	0.07	0.06	0.42	0.36		
Queue	3.1	1.9	1.5	0.0	0.0		
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection - ***Stop Control*** (Page C-14)							
Delay	24.5	15.4	9.7	0.0	0.0	3.5	A
LOS	C	C	A	A	A		
v/c	0.45	0.22	0.10	0.36	0.45		
Queue	17.9	6.5	2.6	0.0	0.0		

4.3 INTERSECTION #3: KING STREET AT COLLEGE ROAD

Existing Intersection Description

The existing intersection of ***King Street at College Road*** is a 3-leg intersection with stop-control on the College Road approach, as shown in Photo 3. All approaches consist of one lane and there is a pedestrian crosswalk offset from the south leg (approximately 10 m). There is a painted dashed yellow line present indicating the vehicle path for left turning vehicles. Since College Road consists of an uphill grade approaching King Street, and the STOP bar present on College Road is offset from the intersection, available sightlines from the STOP bar on College Road are restricted and are represented in Photo 4.



Photo 3 – King Street at College Road (Looking Southbound on King Street)



Photo 4 - College Road Approach

Projected Traffic Volumes

Traffic volume figures were prepared for existing conditions and future traffic volumes without and with Payzant Drive connection open. Table 8 provides a summary of the volume figures prepared and the location of the figure in Appendix A.

Table 8 – Summary of Traffic Volume Figures: King Street at College Road

	Volume Figure
Scenario 1	Figure A-4 (Boxes A & B)
Scenario 2	Figure A-4 (Boxes C & D)
Scenario 3	Figure A-4 (Boxes E & F)

Warrant Summary

Based on the existing traffic control and lane configurations, traffic signal and left-turn lane warrants were completed. It was determined that:

- A northbound left-turn lane is currently warranted and is expected to remain warranted in Scenarios 2 and 3 (Figure B-1, Appendix B).
- Traffic signals are not warranted with respect to Scenario 2 (**29 Warrant Points with less than 75 vph average side street volumes**, Table B-8, Appendix B).

The largest traffic volumes expected at this intersection are projected in 2030 without the Payzant Drive connection (Scenario 2). Since traffic signals are not warranted in Scenario 2, traffic signals are not expected to be warranted in Scenario 3.

Intersection Operational Analysis Results

Operational performance results for this intersection are provided in Table 10.

It should be noted that this intersection was initially modelled with a northbound left-turn lane on King Street, however, minimal improvements to the operational performance of this intersection were observed. Since there is little benefit to the operational performance of this intersection and available space is limited, a left-turn lane was not considered in the analysis.

The existing intersection is operating well during the morning and afternoon peak hours.

In 2030 without the Payzant Drive connection (Scenario 2), King Street approaches are expected to operate at LOS 'A'. Left turning traffic from College Road is expected to experience the largest delay at LOS 'E' during the PM peak.

In 2030 with the Payzant Drive connection (Scenario 3), all movements are expected to operate at a LOS 'D' or better and a v/c ratio of 0.35 or better. In general, with the Payzant Drive connection, the operational performance of the intersection is expected to improve minimally.

Key Takeaways:

- The existing intersection is operating well.
- **Traffic signals are not warranted** based on Scenario 2 volumes and are expected to **remain unwarranted** for all future scenarios.
- A northbound left-turn lane is currently warranted and is expected to remain warranted in Scenarios 2 and 3.
- Negligible changes in the operational performance are expected with the introduction of a northbound left-turn.
- A northbound left-turn lane can be incorporated when future road work takes place.
- Some **traffic is diverted from the intersection with the Payzant Drive connection open**, which slightly improves the operational performance of the intersection.
- **Minimal changes in the operational performance of this intersection are expected with the Payzant Drive connection.**

Since the existing intersection is currently operating well and is expected to continue to operate well in 2030 without and with the Payzant Drive connection, minor changes to the intersection geometry are proposed. These are provided in Figure 7[4]. It is recommended that the intersection include the following:

- Complete a sightline review on King Street to determine the location for the crosswalk, as there is a crest on King Street;
- Provide curb extensions to reduce crossing distance for pedestrians, lower vehicle turning speeds and improve sightlines;
- Update pedestrian crosswalk on King Street to include zebra markings, side-mounted signage (RA-4);
- Relocate the stop bar on College Road approximately 5 m east to improve sightlines;
- Provide pedestrian crossing on College Road consisting of parallel bars;
- Update pavement markings;
- Remove existing yellow dashed line; and,
- Cut back vegetation to improve sightlines.

It is recommended that consideration be given to incorporating the construction of a northbound left-turn lane with future planned rehabilitation on King Street and the re-location of the crosswalk.

A planning cost estimate for these changes to the intersection are provided in Table 9. It is estimated that these intersection modifications would be in the range of approximately $15,000 plus HST.

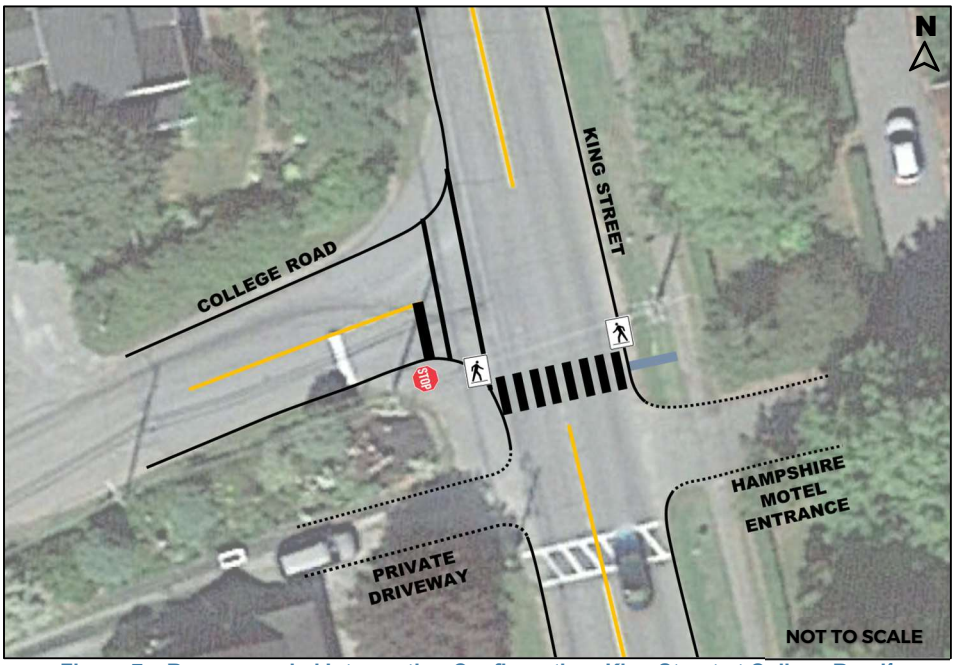


Figure 7 – Recommended Intersection Configuration: King Street at College Road[4]

[4] The rendering is not to scale and is intended for conceptual purposes only.

Table 9 – Planning Cost Estimate: King Street at College Road

Item	Cost (HST Excluded)
Intersection Modifications	$10,000
50% Contingency	$5,000
Total	**$15,000**

Table 10 - Intersection Capacity Analysis: King Street at College Road

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement			Overall Intersection	
	College Road	King Street			
	EB-LR	NB-LT	SB-TR	Delay	LOS
Scenario 1 - 2021 AM Peak Hour **with Existing** Conditions - ***Stop Control*** (Page C-15)					
Delay	13.7	1.3	0.0	1.7	A
LOS	B	A	A		
v/c	0.13	0.04	0.17		
Queue	3.5	1.1	0.0		
Scenario 1 - 2021 PM Peak Hour **with Existing** Conditions - ***Stop Control*** (Page C-16)					
Delay	18.5	1.1	0.0	1.4	A
LOS	C	A	A		
v/c	0.17	0.04	0.34		
Queue	4.8	1.0	0.0		
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***Stop Control*** (Page C-17					
Delay	18.8	1.5	0.0	2.3	A
LOS	C	A	A		
v/c	0.24	0.06	0.25		
Queue	7.5	1.5	0.0		
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection **- *Stop Control*** (Page C-18					
Delay	35.7	1.5	0.0	2.9	A
LOS	E	A	A		
v/c	0.45	0.06	0.43		
Queue	16.9	1.7	0.0		
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Stop Control*** (Page C-19)					
Delay	15	1.5	0.0	2.3	A
LOS	C	A	A		
v/c	0.19	0.05	0.18		
Queue	5.5	1.3	0.0		
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection - ***Stop Control*** (Page C-20)					
Delay	25.1	1.3	0.0	2.5	A
LOS	D	A	A		
v/c	0.35	0.05	0.35		
Queue	11.8	1.3	0.0		

4.4 INTERSECTION #4: KING STREET AT CHESTER ROAD

Existing / Future Intersection Description

The existing intersection of ***King Street at Chester Road*** is a 3-leg intersection with stop-control on the Chester Road approach, as shown in Photo 5. All approaches consist of one lane. There are painted crosswalks on the west and north legs. In addition, there is a painted dashed line indicating the vehicle path for northbound left-turning vehicles. It should be noted that the exit driveway for the Clockmaker's Inn is within 5 m of the intersection to the south on King Street.



Photo 5 – King Street at Chester Road (Looking Northbound on King Street)

In addition, there is an unoccupied lot adjacent to the intersection and there is no curb present in this area, resulting in an empty asphalt area with no delineation between the lot and King Street and Chester Road, as shown in Photo 6 and Photo 7. Currently there are no treatments to discourage vehicles from cutting through the site to bypass the intersection.



Photo 6 – Unoccupied Lot Fronting King Street



Photo 7 – Unoccupied Lot Fronting Chester Road

Consideration is currently being given to realigning this intersection to include Cottage Street as a fourth leg. Implications of this realignment are considered in the following subsections of this report (Sections 4.4.1 & 4.4.2). This section of the report specifically focus on King Street and Chester Road as a 3-leg intersection.

Projected Traffic Volumes

Traffic volume figures were prepared for existing conditions and future traffic volumes without and with Payzant Drive connection open. Table 11 provides a summary of the volume figures prepared and the location of the figure in Appendix A.

Table 11 – Summary of Traffic Volume Figures: King Street at Chester Road

	Volume Figure
Scenario 1	Figure A-5 (Boxes A & B)
Scenario 2	Figure A-5 (Boxes C & D)
Scenario 3	Figure A-5 (Boxes E & F)

Warrant Summary

Based on the existing traffic control and lane configurations, traffic signal and left-turn lane warrants were completed. It was determined that:

- A northbound left-turn lane is **currently warranted** and is **expected to remain warranted** in Scenarios 2 and 3 (Figure B-2, Appendix B).
- Volumes are approaching the warrant threshold for traffic signals with respect to Scenario 2 (**83 Warrant Points**, Table B-10, Appendix B).
- Traffic signals are not warranted with respect to Scenario 3 (**67 Warrant Points**, Table B-11, Appendix B).

Since projected traffic volumes are approaching the warrant threshold with respect to Scenarios 2 and 3, traffic signals are expected to be warranted at this location in the future.

Operational performance results for this intersection are provided in Table 12 (AM peak hours) and Table 13 (PM peak hours).

The existing intersection is operating at a poor LOS during the afternoon peak, which is largely due to significantly delays on Chester Road. The Chester Road approach is currently operating near capacity during the afternoon peak (v/c = 0.87).

This intersection was initially evaluated with stop-control on Chester Road, including northbound and eastbound left-turn lanes. Based on Scenario 2 volume projections, left-turning vehicles from Chester Road are expected to operate above capacity and at LOS 'F' during both peak periods. Similarly, left-turning vehicles were operating at LOS 'F' in Scenario 3.

Since this intersection approaches the warrant threshold in future Scenario 2, the intersection was evaluated with traffic signals and as a roundabout for comparison. It should be noted that the signalized alternatives also include a southbound right-turn channel in order to reduce delays introduced to through traffic on King Street. With traffic signals in Scenario 2, all movements are expected to operate at LOS 'C' or better with a v/c ratio of 0.70 or better. Similarly, in Scenario 3, all movements are expected to operate at LOS 'C' or better with a v/c ratio of 0.69 or better. For comparative purposes, no changes were made to the lane configurations or the traffic signal timing plans between Scenarios 2 and 3.

Key Takeaways:

- The existing Chester Road approach is operating at a poor LOS.
- This intersection **approaches the traffic signal warrant threshold** in Scenario 2.
- In 2030, to achieve an acceptable LOS for left-turning vehicles from Chester Road, traffic signals are recommended.
- Traffic signals are expected to provide an acceptable level of service at this intersection without and with the Payzant Drive connection.
- The 3-leg roundabout is expected to operate well with a LOS 'B' or better for both AM and PM peak hours.
- Some **traffic is diverted from the intersection with the Payzant Drive connection open**, which slightly improves the operational performance of the intersection.
- **Minimal changes in the operational performance of this intersection are expected with the Payzant Drive connection.**

The intersection was modelled as a 3-leg roundabout for Scenario 2 and all movements are expected to operate at LOS 'B' or better with a v/c ratio of 0.64 or better. Addition details regarding the roundabout configuration are provided on Page C-46, Appendix C.

Table 12 – Intersection Capacity Analysis: King Street at Chester Road (AM Peak)

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement						Overall Intersection	
	Chester Road		King Street					
	EB-L	EB-R	NB-L	NB-T	SB-T	SB-R	Delay	LOS
Scenario 1 - 2021 AM Peak Hour **with Existing** Conditions - ***Stop Control*** (Page C-21)								
Delay	27.6		2.2		C		8.9	A
LOS	D		A		A			
v/c	0.64		0.07		0.15			
Queue	34.5		1.7		0.0			
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***Stop Control*** (Page C-23)								
Delay	67.0	10.7	8.4	0.0	0.0		14.8	B
LOS	F	B	A	A	A			
v/c	0.87	0.09	0.08	0.23	0.22			
Queue	59.6	2.5	2.2	0.0	0.0			
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***Traffic Signals*** (Page C-25)								
Delay	22.7	6.3	6.6	9.7	19.4	6.8	14.1	B
LOS	C	A	A	A	B	A		
v/c	0.52	0.14	0.17	0.42	0.49	0.15		
Queue	43.8	7.8	11.2	45.2	51.7	9.8		
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Stop Control*** (Page C-27)								
Delay	31.6	10.3	8.1	0.0	0.0		7.4	A
LOS	D	B	A	A	A			
v/c	0.57	0.16	0.09	0.22	0.15			
Queue	26.7	4.4	2.4	0.0	0.0			
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Traffic Signals*** (Page C-29)								
Delay	20	5.9	6.0	8.6	18.0	6.1	11.5	B
LOS	C	A	A	A	B	A		
v/c	0.44	0.28	0.18	0.39	0.38	0.13		
Queue	30.4	10.4	11.1	35.7	33.1	7.3		
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***Roundabout*** (Page C-46)								
Delay	5.2		7.1		4.7		6.0	A
LOS	A		A		A			
v/c	0.31		0.49		0.25			
Queue	13.3		14.0		9.8			

Table 13 – Intersection Capacity Analysis: King Street at Chester Road (PM Peak)

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement						Overall Intersection	
	Chester Road		King Street					
	EB-L	EB-R	NB-L	NB-T	SB-T	SB-R	Delay	LOS
Scenario 1 - 2021 PM Peak Hour **with Existing** Condition - ***Stop Control*** (Page C-22)								
Delay	67.8		4.5		0.0		13.8	B
LOS	F		A		A			
v/c	0.87		0.16		0.35			
Queue	58.8		4.6		0.0			
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection - ***Stop Control*** (Page C-24)								
Delay	268.5	13.9	10.3	0.0	0.0		30.7	C
LOS	F	B	B	A	A			
v/c	1.36	0.19	0.21	0.24	0.44			
Queue	90.4	5.4	6.3	0.0	0.0			
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection - ***Traffic Signals*** (Page C-26)								
Delay	27.8	7.8	6.5	7.6	23.2	8.1	14.2	B
LOS	C	A	A	A	C	A		
v/c	0.47	0.23	0.33	0.38	0.70	0.44		
Queue	41.2	11.2	16.7	43.1	81.6	26.4		
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection - ***Stop Control*** (Page C-28)								
Delay	193	13.4	10.1	0.0	0.0		18.8	C
LOS	F	B	B	A	A			
v/c	1.12	0.24	0.26	0.23	0.36			
Queue	61.7	7.6	8.5	0.0	0.0			
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection - ***Traffic Signals*** (Page C-30)								
Delay	28	8.4	6.1	6.4	25.0	8.1	13.4	B
LOS	C	A	A	A	C	A		
v/c	0.42	0.36	0.39	0.35	0.69	0.37		
Queue	31.4	13.8	20.2	35.5	72.7	20.6		
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection - ***Roundabout*** (Page C-46)								
Delay	5.8		9.7		10.4		9.3	A
LOS	A		A		B			
v/c	0.30		0.64		0.64			
Queue	12.6		20.3		24.5			

It is recommended that the King Street / Chester Road intersection be upgraded to a signalized intersection or a single lane roundabout. For the signalized intersection option, the recommendations proposed are provided in Figure 8[5]. It is recommended that the intersection include the following:

- Upgrade traffic control device to traffic signals;
- Provide a southbound channelized right-turn lane;
- Provide a northbound left-turn lane;
- Provide an eastbound left-turn lane;
- Provide corner curb extensions to reduce crossing distance for pedestrians, lower vehicle turning speeds and improve sightlines;
- Provide pedestrian crossings on all approaches consisting of parallel bars;
- Updated pavement markings; and
- Remove existing yellow dashed line.

A planning cost estimate for these items is provided in Table 14. It is estimated that these intersection modifications would be in the range of approximately $450,000 plus HST.

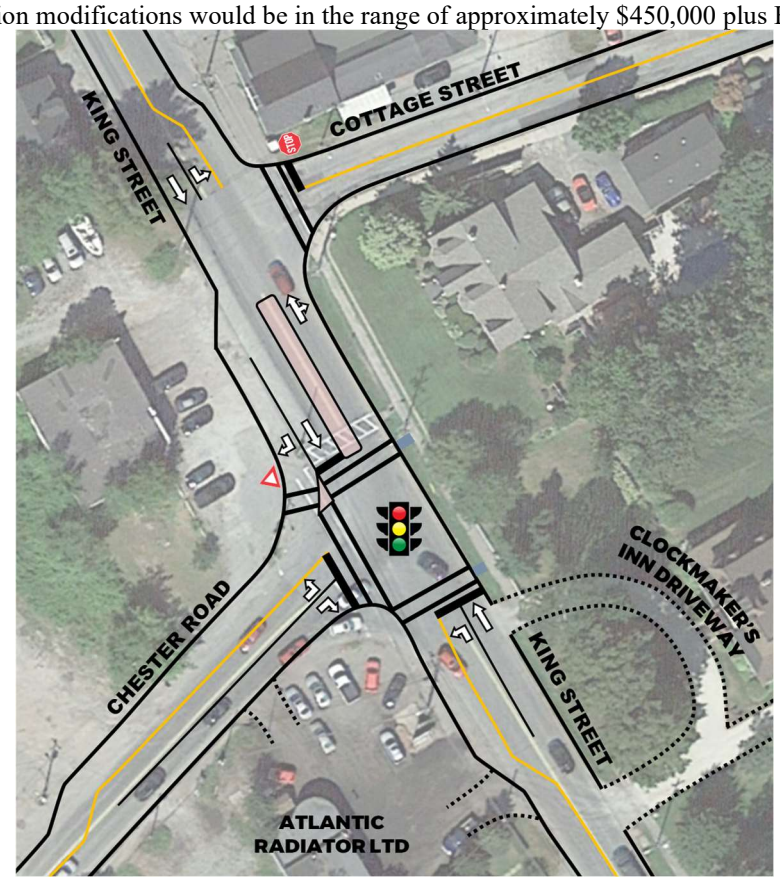


Figure 8 – Recommended Intersection Configuration: King Street at Chester Road[5]

Table 14 – Planning Cost Estimate: King Street at Chester Road

Item	Cost (HST Excluded)
Intersection Modifications with Traffic Signals	$300,000
50% Contingency	$150,000
Total	**$450,000**

[5] The rendering is not to sale and is intended for conceptual purposes only.

For the roundabout option, the recommended layout is shown in Figure 9, which illustrates a single lane roundabout.

A planning cost estimate for these items is provided in Table 15. It is estimated that these intersection modifications would be in the range of approximately $1,875,000 plus HST.

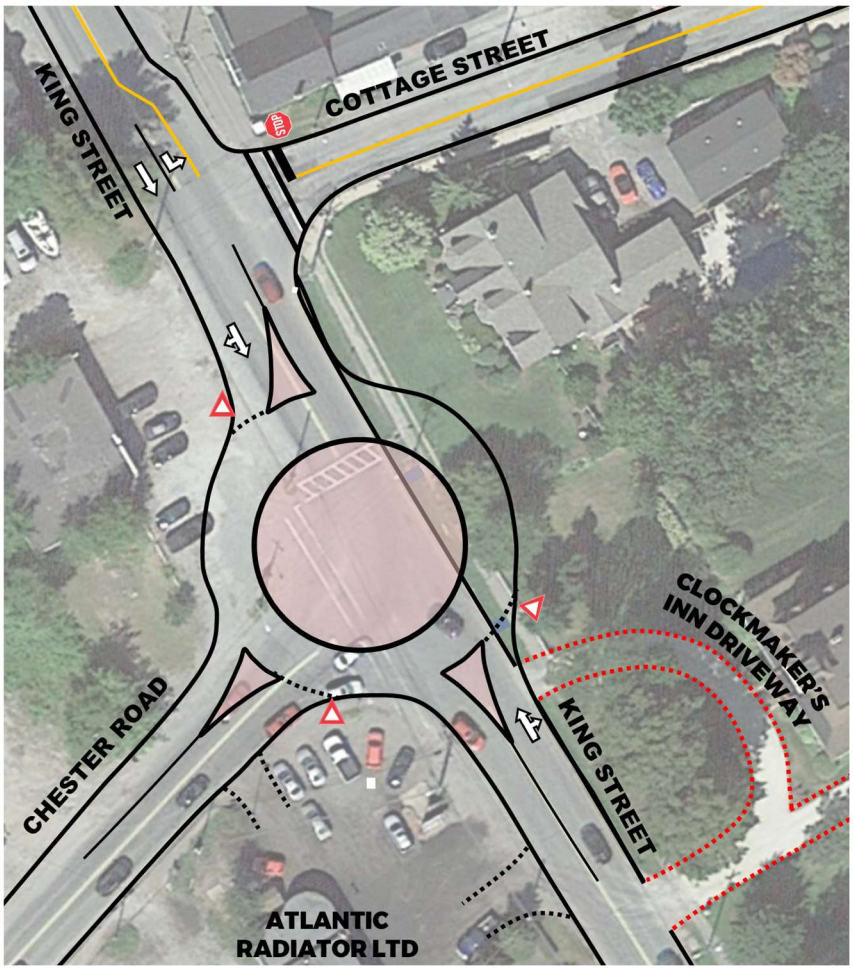


Figure 9 – Recommended Intersection Configuration: King Street at Chester Road[5]

Table 15 – Planning Cost Estimate: King Street at Chester Road

Item	Cost (HST Excluded)
Intersection Modifications with Roundabout	$1,250,000
50% Contingency	$625,000
Total	**$1,875,000**

4.4.1 KING STREET AT COTTAGE STREET

Existing / Future Intersection Description

As previously mentioned, consideration is being given to assessing the implications of realigning Cottage Street with the King Street / Chester Road intersection. The existing intersection of ***King Street at Cottage Street*** is a 3-leg intersection with stop-control on the Cottage Street approach, as shown in Photo 8. All approaches consist of one lane and there is a painted crosswalk on the east leg. This intersection is located approximately 25 m north of the King Street / Chester Road intersection.



Photo 8 – Existing King Street at Cottage Street Intersection

Intersection Operational Analysis Results:
3 Leg Intersection

In order to compare the impacts of realigning Cottage Street with the King Street / Chester Road intersection, analyses were completed to determine the operational performance of King Street / Cottage Street with respect to Scenario 2 volumes (the largest traffic volumes expected at this intersection).

To better understand the implications of introducing traffic signals downstream, this analysis was completed once with stop-control at the King Street / Chester Road intersection and once with traffic signals. In general, slight improvements to the operational performance of this intersection were observed with traffic signals at the King Street / Chester Road intersection. Operational performance results for the 3-leg intersection are provided in Table 16.

In general, the King Street / Cottage Street intersection is expected to perform well in 2030 without the Payzant Drive connection. The King Street approaches are expected to operate at LOS ‘A’ and the Cottage Street approach is expected to operate at LOS ‘C’ or better during the morning and afternoon peak hours.

Table 16 – Intersection Capacity Analysis: King Street at Cottage Street (3-Leg Intersection)

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement			Overall Intersection	
	Cottage Street	King Street			
	WB-LR	NB-TR	SB-LT	Delay	LOS
Modelled with Stop Control at King Street / Chester Road					
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - **Stop Control** (Page C-31)					
Delay	14.6	0.0	0.9	0.6	A
LOS	B	A	A		
v/c	0.05	0.37	0.03		
Queue	1.3	0.0	0.7		
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection **- Stop Control** (Page C-32)					
Delay	23.4	0.0	0.3	1.3	A
LOS	C	A	A		
v/c	0.25	0.34	0.01		
Queue	7.8	0.0	0.3		
Modelled with Traffic Signals at King Street / Chester Road					
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***SIGNALS at King/Chester*** (Page C-33)					
Delay	14.6	0.0	0.9	0.6	A
LOS	B	A	A		
v/c	0.05	0.37	0.03		
Queue	1.3	0.0	0.7		
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection - ***SIGNALS at King/Chester*** (Page C-34)					
Delay	21.8	0.0	0.3	1.0	A
LOS	C	A	A		
v/c	0.20	0.34	0.01		
Queue	6.0	0.0	0.3		

4.4.2 KING STREET AT CHESTER ROAD / COTTAGE STREET

Projected Traffic Volumes:
4-Leg Intersection

Traffic volume projections were prepared to estimate turning movement counts at the potential 4-leg intersection without and with Payzant Drive connection. Table 17 provides a summary of the volume figures prepared and the location of the figure in Appendix A.

Table 17 – Summary of Traffic Volume Figures: King Street at Chester Road / Cottage Street

	Volume Figure
Scenario 2	Figure A-6 (Boxes A & B)
Scenario 3	Figure A-6 (Boxes C & D)

Warrant Summary:
4-Leg Intersection

Based on the existing traffic control and lane configurations, traffic signal and left-turn lane warrants were completed. It was determined that:

- A southbound left-turn lane is **warranted** and in Scenarios 2 and 3 (Figure B-2, Appendix B).
- Volumes are approaching the warrant threshold for traffic signals with respect to Scenario 2 (**91 Warrant Points**, Table B-12, Appendix B).
- Traffic signals are not warranted with respect to Scenario 3 (**75 Warrant Points**, Table B-13, Appendix B).

Intersection Operational Analysis Results:
4-Leg Intersection

Operational performance results for the 4-leg intersection are provided in Table 18.

In addition to the lane configuration recommendations for the future King Street / Chester Road intersection (northbound and eastbound left-turn lanes and a channelized southbound right-turn lane), the intersection was evaluated with the realignment of Chester Street approach to Cottage Street.

In Scenario 2, traffic signals are nearing the warrant threshold (91 warrant points). It should be noted that no changes were made to the lane configurations or the traffic signal timing plans between Scenarios 2 and 3 for comparative purposes.

With traffic signals in Scenario 2, all movements are expected to operate at LOS 'D' or better with a v/c ratio of 0.87 or better. Similarly, in Scenario 3, all movements are expected to operate at LOS 'D' or better with a v/c ratio of 0.84 or better.

A roundabout analysis was completed at the 4-leg intersection with the realigned approach of Chester Street. The roundabout is expected to operate with a LOS 'B' or better with a v/c ratio of 0.64 or better. Addition details regarding the roundabout configuration are provided on Page C-47, Appendix C.

Key Takeaways:

- This intersection approaches the traffic signal warrant threshold in Scenario 2.
- Traffic signals are expected to provide an acceptable level of service at this intersection without and with the Payzant Drive connection.
- The 4-leg roundabout is expected to operate at an acceptable level of service.
- Some **traffic is diverted from the intersection with the Payzant Drive connection open**, which slightly improves the operational performance of the intersection.
- **Minimal changes in the operational performance of this intersection are expected with the Payzant Drive connection.**

Table 18 – Intersection Capacity Analysis: King Street at Chester Road / Cottage Street (4-Leg Alternative)

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement							Overall Intersection	
	Chester Road		Cottage Street	King Street					
	EB-L	EB-TR	WB-LTR	NB-L	NB-TR	SB-L	SB-TR	Delay	LOS
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***Traffic Signals*** (Page C-35)									
Delay	26.5	6.6	10.6	8.2	11.1	15.9	21.6	16.9	B
LOS	C	A	B	A	B	B	C		
v/c	0.60	0.14	0.05	0.20	0.42	0.05	0.61		
Queue	50.2	8.9	5.4	13.6	53.5	5.6	69.8		
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection - ***Traffic Signals*** (Page C-36)									
Delay	43.1	9.2	20.4	10.6	7.5	11.1	29.2	21.6	C
LOS	D	A	C	B	A	B	C		
v/c	0.64	0.24	0.19	0.50	0.35	0.02	0.87		
Queue	54.9	13.1	16.5	19.8	47.3	3.7	149.6		
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Traffic Signals*** (Page C-37)									
Delay	23.6	6.0	10.3	6.6	9.1	15.6	17.6	12.9	B
LOS	C	A	B	A	A	B	B		
v/c	0.50	0.27	0.06	0.19	0.38	0.05	0.44		
Queue	33.2	11.1	5.0	12.9	39.8	5.3	41.9		
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection **-** ***Traffic Signals*** (Page C-38)									
Delay	36.9	8.8	20.0	9.3	6.6	13.5	29.5	18.7	B
LOS	D	A	B	A	A	B	C		
v/c	0.51	0.34	0.21	0.51	0.33	0.03	0.84		
Queue	39.1	15.5	15.8	27.1	40.1	4.1	117.0		
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection - ***Roundabout*** (Page C-47)									
Delay	5.4		4.9	7.1		4.8		6.0	A
LOS	A		A	A		A			
v/c	0.32		0.03	0.49		0.26			
Queue	14.0		3.5	14.7		7.7			
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection - ***Roundabout*** (Page C-47)									
Delay	5.9		5.7	9.8		10.5		9.2	A
LOS	A		A	A		B			
v/c	0.30		0.09	0.64		0.64			
Queue	12.6		3.5	21.7		23.1			

Table 19 – Intersection Capacity Analysis: King Street at Cottage Street with Southbound Left-Turn Lane

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement				Overall Intersection	
	Cottage Street	King Street				
	WB-LR	NB-TR	SB-L	SB-T	Delay	LOS
Traffic Signals at King Street / Chester Road & Southbound Left-Turn Lane on King Street at Cottage Street						
Scenario 2 - 2030 AM Peak Hour **without** Payzant Drive Connection (Page C-39)						
Delay	14.6	0.0	9.0	0.0	0.5	A
LOS	B	A	A	A		
v/c	0.05	0.37	0.03	0.22		
Queue	1.3	0.0	0.7	0.0		
Scenario 2 - 2030 PM Peak Hour **without** Payzant Drive Connection (Page C-40)						
Delay	21.8	0.0	8.8	0.0	0.9	A
LOS	C	A	A	A		
v/c	0.20	0.34	0.01	0.43		
Queue	6.0	0.0	0.3	0.0		

Conclusions & Recommendations for Realigning Cottage Street with King Street / Chester Road Intersection

A review was completed to position a roundabout at Cottage Street with a realigned Chester Road at King Street. This roundabout option would have significant land impacts north and east of the intersection, along with significant construction costs. Due to these challenges the realigned option focused on a signalized intersection and is shown in Figure 10.

A planning cost estimate for re-alignment of Cottage Street and the addition of traffic signals is provided in Table 20. It is estimated that these intersection modifications would be in the range of approximately $900,000 plus HST.

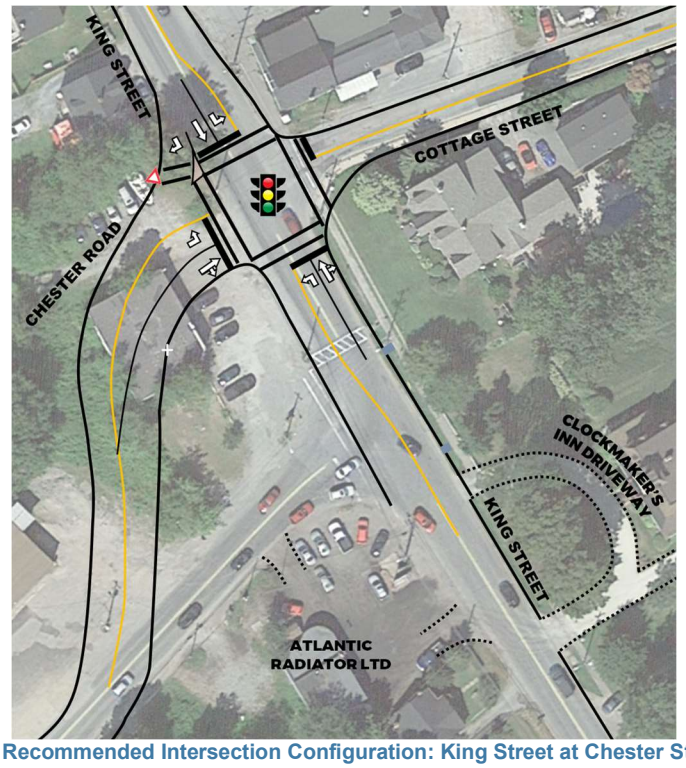


Figure 10 – Recommended Intersection Configuration: King Street at Chester St/Cottage St

Table 20 – Planning Cost Estimate: King Street at Chester St/Cottage St

Item	Cost (HST Excluded)
Traffic Signals and Re-alignment of Chester Street	$600,000
50% Contingency	$300,000
Total	**$900,000**

4.5 INTERSECTION #5: KING STREET AT PAYZANT DRIVE

Existing / Future Intersection Description

Unlike Study Intersections #1-4, this intersection only exists in Scenario 3 when Payzant Drive connections with King Street. King Street, in the approximate area that Payzant Drive is expected to connect to, consists of one lane in each direction with a posted speed limit of 50 km/h.

Projected Traffic Volumes

Traffic volume projections were prepared for Scenario 3 based on an estimated redistribution of future traffic volumes expected. Traffic volume figures for Scenario 3 are provided in Figure A-7, Appendix A.

Warrant Summary

A traffic signal warrant and a left turning lane warrant were completed. It was determined that:

- A southbound left-turn lane is warranted (Figure B-3, Appendix B).
- Traffic signals are not warranted (**60 Warrant Points**, Table B-15, Appendix B).

It was determined that the future intersection of King Street / Payzant Drive would not warrant traffic signals in 2030. Similarly, the resulting 2030 traffic volumes do not necessarily warrant a higher level of traffic beyond stop-control. Despite the warranted traffic control, this intersection was evaluated with stop-control, traffic signals and as a roundabout in order to better understand the potential for a future major intersection.

Intersection Operational Analysis Results

Operational performance results for this intersection are provided in Table 23.

The stop-control alternative was examined with southbound and westbound left-turn lanes. With stop-control on Payzant Drive and free flow on King Street, the intersection is expected to operate at an acceptable level of service. King Street movements are expected to operate at LOS 'A' with a v/c ratio of 0.40 or better. Left-turning traffic from Payzant Drive is expected to operate over capacity at LOS 'E' and 'F' during the morning and afternoon peak periods, respectively.

The signalized intersection alternative was examined with the same lane configuration as the stop-control option. With traffic signals, the performance of the Payzant Drive approach is expected to improve, however, additional delays are introduced to the King Street approaches. With traffic signals, the intersection is expected to operate at LOS 'B' or better during morning and afternoon peak periods.

Key Takeaways:

- Traffic signals are not expected to be warranted in 2030 with the Payzant Drive connection open. **However, with the delay expected for left-turn traffic, a higher level of traffic control is recommended.**

The roundabout alternative was evaluated with single lane approaches. Addition details regarding the roundabout configuration are provided on Page C-45, Appendix C. With the roundabout, all approaches are expected to operate at LOS 'A' with a v/c ratio of 0.67 or better.

With the left-turn from Payzant Drive operating at a LOS 'E' and 'F' during the AM and PM peak hours, respectively, a higher level of traffic control is recommended for this intersection. Since acceptable performance results are achievable with a signalized intersection or a roundabout, it is recommended that the King Street / Payzant Drive intersection be designed with either traffic control.

If WHRM would like to proceed with the installation of traffic signals, it is recommended that intersection include the following (shown in Figure 11[6]):

- Provide stop-control on Payzant Drive approach;
- Provide a westbound left-turn lane on Payzant Drive;
- Provide a southbound left-turn lane on King Street;
- Install underground conduit during construction of this intersection to prepare for future signalization; and,
- Monitor intersection for future signalization.

A planning cost estimate for these items is provided in Table 21. It is estimated that these intersection modifications would be in the range of approximately $90,000 plus HST. It should be noted that the planning cost estimate assumes that the Payzant Drive connection has been constructed and conduit has been run for future signalization. The planning cost estimate reflects the costs associated with providing an eastbound left-turn lane on Payzant Drive and a southbound left-turn lane on King Street. These budgets may vary based on the requirements for the railway crossing.



Figure 11 – Recommended Intersection Configuration: King Street at Payzant Drive[6]

Table 21 – Planning Cost Estimate: King Street at Payzant Drive - Signalization

Item	Cost (HST Excluded)
STOP Controlled Intersection with Left-Turn Lane & underground conduit for future signalization	$60,000
50% Contingency	$30,000
Total	**$90,000**

[6] The rendering is not to scale and is intended for conceptual purposes only.

If WHRM would like to proceed with the installation of a roundabout, it is recommended that the intersection be a single lane roundabout.

A planning cost estimate for these items is provided in Table 22. It is estimated that these intersection modifications would be in the range of approximately $1,875,000 plus HST. It should be noted that the planning cost estimate assumes that the Payzant Drive connection has been constructed. These budgets may vary based on the requirements for the railway crossing.

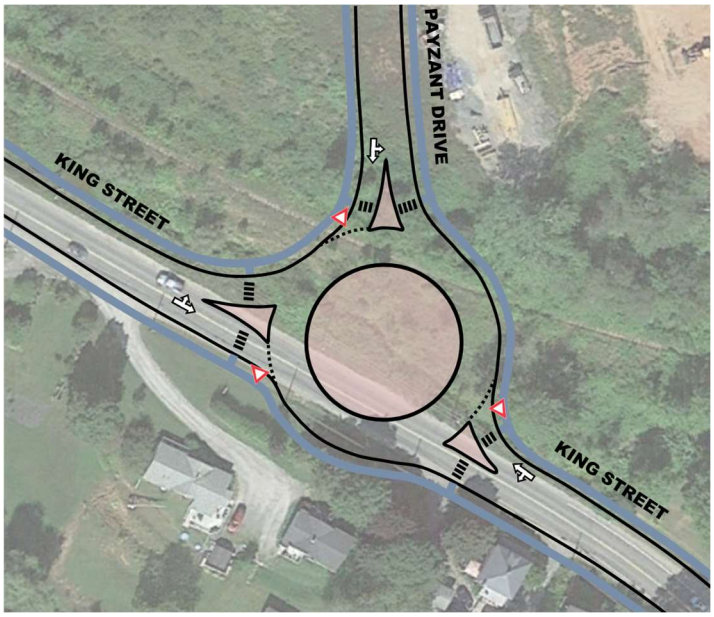


Figure 12 – Recommended Roundabout Configuration: King Street at Payzant Dr[6]

Table 22 – Planning Cost Estimate: King Street at Payzant Drive - Roundabout

Item	Cost (HST Excluded)
Single lane Roundabout	$1,250,000
50% Contingency	$625,000
Total	**$1,875,000**

Table 23 – Intersection Capacity Analysis: King Street at Payzant Drive

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement					Overall Intersection	
	Payzant Drive Connector		King Street				
	WB-L	WB-R	NB-TR	SB-L	SB-T	Delay	LOS
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Stop Control*** (Page C-41)							
Delay	37.1	12.8	0.0	9.1	0.0	5.2	A
LOS	E	B	A	A	A		
v/c	0.50	0.16	0.34	0.12	0.17		
Queue	20.0	4.4	0.0	3.4	0.0		
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection - ***Stop Control*** (Page C-42)							
Delay	62.8	15.4	0.0	9.5	0.0	5.8	A
LOS	F	C	A	A	A		
v/c	0.61	0.28	0.40	0.12	0.29		
Queue	26.0	9.0	0.0	3.4	0.0		
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Traffic Signals*** (Page C-43							
Delay	15.1	5.9	10.2	9.7	7.4	9.5	A
LOS	B	A	B	A	A		
v/c	0.21	0.18	0.56	0.31	0.27		
Queue	16.8	8.5	53.9	14.3	23.2		
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection - ***Traffic Signals*** (Page C-44							
Delay	18.1	6.4	13.0	12.4	9.5	11.6	B
LOS	B	A	B	B	A		
v/c	0.25	0.29	0.71	0.42	0.51		
Queue	19.9	11.4	70.4	15.6	44.7		
Scenario 3 - 2030 AM Peak Hour **with** Payzant Drive Connection - ***Roundabout*** (Page C-45)							
Delay	5.4		5.7	8.2		6.9	A
LOS	A		A	A			
v/c	0.21		0.40	0.57			
Queue	8.4		18.9	10.5			
Scenario 3 - 2030 PM Peak Hour **with** Payzant Drive Connection - ***Roundabout*** (Page C-45)							
Delay	6.5		8.5	10.5		9.1	A
LOS	A		A	B			
v/c	0.29		0.59	0.67			
Queue	11.2		11.9	0.0			

5 SUMMARY, RECOMMENDATIONS & CONCLUSIONS

5.1 SUMMARY

Background	1.	WHRM is preparing for potential changes to the road network that will have an impact on traffic volumes on Wentworth Road and King Street. Consideration is being given to re-aligning the Highway 101 Eastbound Exit 5A Ramp at Industrial Drive by NSTAT. With this realignment, the existing entrance to the Hants County Exhibition will be required to be relocated along Wentworth Road. In addition, the WHRM is considering extending Payzant Drive to the east to connect with King Street.
Study Objective	2.	WSP Canada Inc. has been retained to determine the impact of these changes at a series of key intersections and provide recommendations to mitigate the impacts of the changes to the regional transportation system.
Study Intersections	3.	This study focused on four (4) existing intersections and one (1) future intersection: #1 – Wentworth Road at Payzant Drive #2 – Wentworth Road at Empire Lane #3 – King Street at College Road #4 – King Street at Chester Road #5 – King Street at Payzant Drive *(future intersection)*
Turning Movement Counts	4.	Turning movement volumes were collected by WSP between Tuesday, January 19th and Thursday, January 21st, 2021 at the existing Study Intersections.
Analysis Scenarios Considered	5.	WSP considered the following analysis scenarios ***Scenario 1*** – 2021 Existing Conditions ***Scenario 2*** – 2030 ***without*** Payzant Drive connection ***Scenario 3*** – 2030 ***with*** Payzant Drive connection ***Scenario 1:*** Projected 2021 AM and PM peak hour volumes consider: • 1.17 Seasonal Adjustment Factor • 1.05 Covid-19 Adjustment Factor • Trips generated by the West Hants Sports Complex on a typical weekday • Trips generated by the existing Hants County Exhibition on a typical weekday ***Scenario 2:*** Projected 2030 AM and PM peak hour background volumes ***without*** the Payzant Drive connection consider: • Projected 2021 Volumes • 1.5% Annual Growth between 2021-2030 • Trips generated by the Hants County Exhibition Expansion on a typical weekday ***Scenario 3:*** Projected 2030 AM and PM peak hour background volumes ***with*** the Payzant Drive connection consider: • Projected 2021 Volumes • 1.5% Annual Growth between 2021-2030 • Trips generated by the Hants County Exhibition Expansion on a typical weekday Estimation of Redistributed Trips with the Payzant Drive connection open

Upgrade Warrant Analysis	6.	Warrant analyses were completed for left-turn lanes and traffic signals for different scenarios at the different Study Intersections, as required. Warranted intersection upgrades are included in the intersection analysis, as appropriate.
Summary – Intersection Capacity Analysis	7.	Intersection performance analysis was completed using *Synchro 11.0* and/or *Arcady 9* at the Study Intersections.

5.2 RECOMMENDATIONS

Intersection #1	8.	***Wentworth Road at Payzant Drive*** – Based on findings from this study, in conjunction with the *Hants County Exhibition Expansion Traffic Impact Study (WSP, May 2021)*, it is recommended that plans be prepared to enhance this intersection to a roundabout. The planning cost estimate indicates that these modifications will be in the range of approximately $2,400,000 plus HST.
Intersection #2	9.	***Wentworth Road at Empire Lane*** – It is recommended that this intersection be monitored for future signalization.
Intersection #3	10.	***King Street at College Road*** – Minor recommendations for this intersection include curb extensions, relocating/upgrading the pedestrian crosswalk on King Street, relocating the stop bar on College Road, providing a crosswalk on College Road consisting of parallel bars, updating pavement markings, removing the existing yellow dashed line and cutting back vegetation. The planning cost estimate indicates that these modifications will be in the range of approximately $15,000 plus HST.
Intersection #4	11.	***King Street at Chester Road*** – It is recommended that this intersection be signalized with a southbound right-turn channel, a northbound left-turn lane and an eastbound left-turn lane. Pedestrian crosswalks consisting of parallel bars are recommended on all approaches. In addition, a southbound left-turn lane is recommended on King Street at Cottage Street. The planning cost estimate indicates that the modifications to King Street / Chester Road will be in the range of approximately $450,000 plus HST. If WHRM completes the realignment of Chester Road with Cottage Street at King Street, it is recommended that the 4-leg intersection be signalized with a southbound right-turn channel, northbound left-turn lane and eastbound left-turn lane. The planning cost estimate indicates that the modifications to King Street / Chester Road & Cottage Road intersection will be in the range of approximately $900,000 plus HST.
Intersection #5	12.	***King Street at Payzant Drive*** – It is recommended that this future intersection consist of stop-control on the Payzant Drive approach with a southbound left-turn lane and an eastbound left-turn lane and plan for future signalization with underground conduit. The planning cost estimate indicates that this new intersection will be in the range of approximately $90,000 plus HST.

5.3 CONCLUSIONS

Conclusion

13. With the recommended upgrades, the Study Intersections are expected to operate within the outlined performance guidelines.

14. Some traffic is expected to divert from King Street and Wentworth Road when the Payzant Drive connection is open. The operational performance of all Study Intersections is projected to improve slightly with diverted through traffic on King Street and Wentworth Road.

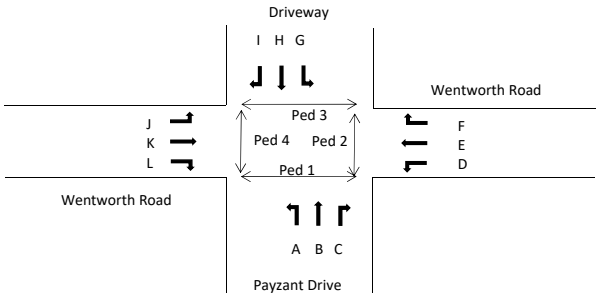
APPENDIX

A TRAFFIC VOLUME DATA

Table A-1

Wentworth Road
@
Payzant Drive / Commercial Driveway

Windsor, Nova Scotia
Tuesday, January 19, 2021



AM Peak Period Volume Data

Time		Payzant Drive Westbound Approach			Wentworth Road Southbound Approach			Commercial Driveway Eastbound Approach			Wentworth Road Northbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:00	07:15	4	0	16	13	28	0	0	0	0	0	35	9	105
07:15	07:30	6	0	12	13	38	0	0	0	0	3	49	8	129
07:30	07:45	6	0	9	21	37	1	0	0	0	3	60	10	147
07:45	08:00	4	0	8	36	68	0	0	0	2	2	73	17	210
08:00	08:15	12	0	13	34	84	1	0	0	0	0	87	23	254
08:15	08:30	14	0	24	48	77	0	0	0	0	1	71	36	271
08:30	08:45	15	0	43	68	82	0	0	0	0	0	68	63	339
08:45	09:00	14	0	59	91	94	2	2	0	0	1	87	65	415
AM Peak Hour		**55**	**0**	**139**	**241**	**337**	**3**	**2**	**0**	**0**	**2**	**313**	**187**	**1279**
07:00	**08:00**	**20**	**0**	**45**	**83**	**171**	**1**	**0**	**0**	**2**	**8**	**217**	**44**	**591**
08:00	**09:00**	**55**	**0**	**139**	**241**	**337**	**3**	**2**	**0**	**0**	**2**	**313**	**187**	**1279**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
07:00	**08:00**	**4**			**0**			**1**			**0**			**5**
08:00	**09:00**	**5**			**3**			**5**			**0**			**13**

Midday Peak Period Volume Data

Time		Payzant Drive Westbound Approach			Wentworth Road Southbound Approach			Commercial Driveway Eastbound Approach			Wentworth Road Northbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
11:30	11:45	20	0	38	18	103	0	1	0	1	0	89	26	296
11:45	12:00	21	0	24	29	105	0	1	0	0	0	93	22	295
12:00	12:15	12	0	22	22	109	0	1	0	1	2	114	16	299
12:15	12:30	19	0	20	20	91	0	2	2	1	0	109	14	278
12:30	12:45	17	0	15	13	110	0	0	0	1	1	104	18	279
12:45	13:00	20	0	12	18	85	0	0	0	1	1	101	14	252
13:00	13:15	17	0	16	22	87	0	0	0	1	1	92	21	257
13:15	13:30	35	0	67	23	102	0	0	0	0	1	117	15	360
Midday Peak Hour		**72**	**0**	**104**	**89**	**408**	**0**	**5**	**2**	**3**	**2**	**405**	**78**	**1168**
11:30	**12:30**	**72**	**0**	**104**	**89**	**408**	**0**	**5**	**2**	**3**	**2**	**405**	**78**	**1168**
12:30	**13:30**	**89**	**0**	**110**	**76**	**384**	**0**	**0**	**0**	**3**	**4**	**414**	**68**	**1148**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
11:30	**12:30**	**4**			**1**			**6**			**0**			**11**
12:30	**13:30**	**3**			**1**			**3**			**0**			**7**

PM Peak Period Volume Data

Time		Payzant Drive Westbound Approach			Wentworth Road Southbound Approach			Commercial Driveway Eastbound Approach			Wentworth Road Northbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
15:30	15:45	34	0	51	22	90	1	0	0	1	0	95	9	303
15:45	16:00	21	0	32	16	85	0	0	0	1	0	99	12	266
16:00	16:15	14	0	31	14	123	0	0	0	0	0	107	14	303
16:15	16:30	20	1	22	13	91	0	1	0	2	1	94	10	255
16:30	16:45	6	0	14	15	113	0	1	0	2	0	95	18	264
16:45	17:00	22	0	15	12	105	0	0	0	4	0	94	11	263
17:00	17:15	17	0	19	14	107	0	0	0	0	0	95	6	258
17:15	17:30	9	0	13	12	81	0	0	0	0	0	72	11	198
PM Peak Hour		**89**	**1**	**136**	**65**	**389**	**1**	**1**	**0**	**4**	**1**	**395**	**45**	**1127**
15:30	**16:30**	**89**	**1**	**136**	**65**	**389**	**1**	**1**	**0**	**4**	**1**	**395**	**45**	**1127**
16:30	**17:30**	**54**	**0**	**61**	**53**	**406**	**0**	**1**	**0**	**6**	**0**	**356**	**46**	**983**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
15:30	**16:30**	**2**			**5**			**5**			**0**			**12**
16:30	**17:30**	**1**			**0**			**2**			**0**			**3**

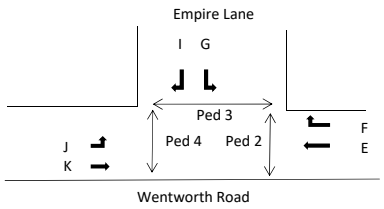
* Count completed by WSP

Table A-2

Wentworth Road @ Empire Lane

Windsor, Nova Scotia

Tuesday, January 19, 2021



AM Peak Period Volume Data

Time		Wentworth Road Southbound Approach		Empire Lane Eastbound Approach		Wentworth Road Northbound Approach		Total Vehicles
		E	F	G	I	J	K	
07:00	07:15	26	4	2	1	1	43	77
07:15	07:30	35	4	0	0	2	60	101
07:30	07:45	31	6	2	1	3	73	116
07:45	08:00	57	21	3	2	5	89	177
08:00	08:15	74	16	5	7	8	104	214
08:15	08:30	78	15	8	5	9	108	223
08:30	08:45	81	10	5	6	6	133	241
08:45	09:00	79	23	7	3	13	154	279
AM Peak Hour		**312**	**64**	**25**	**21**	**36**	**499**	**957**
07:00	**08:00**	**149**	**35**	**7**	**4**	**11**	**265**	**471**
08:00	**09:00**	**312**	**64**	**25**	**21**	**36**	**499**	**957**
		Ped 2		**Ped 3**		**Ped 4**		**Total Peds**
07:00	**08:00**	**0**		**1**		**0**		**1**
08:00	**09:00**	**0**		**4**		**0**		**4**

Midday Peak Period Volume Data

Time		Wentworth Road Southbound Approach		Empire Lane Eastbound Approach		Wentworth Road Northbound Approach		Total Vehicles
		E	F	G	I	J	K	
11:30	11:45	90	39	19	18	8	96	270
11:45	12:00	94	25	26	13	9	95	262
12:00	12:15	97	33	29	11	14	102	286
12:15	12:30	83	33	28	16	10	95	265
12:30	12:45	101	27	28	17	15	90	278
12:45	13:00	85	21	26	11	14	97	254
13:00	13:15	78	25	25	12	16	94	250
13:15	13:30	109	28	31	16	15	103	302
Midday Peak Hour		**375**	**118**	**111**	**57**	**48**	**382**	**1091**
11:30	**12:30**	**364**	**130**	**102**	**58**	**41**	**388**	**1083**
12:30	**13:30**	**373**	**101**	**110**	**56**	**60**	**384**	**1084**
		Ped 2		**Ped 3**		**Ped 4**		**Total Peds**
11:30	**12:30**	**0**		**5**		**0**		**5**
12:30	**13:30**	**0**		**4**		**0**		**4**

PM Peak Period Volume Data

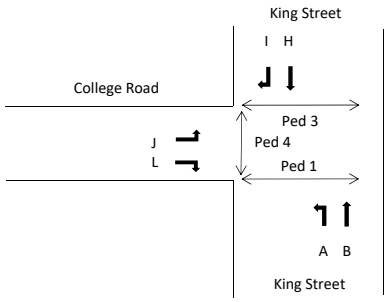
Time		Wentworth Road Southbound Approach		Empire Lane Eastbound Approach		Wentworth Road Northbound Approach		Total Vehicles
		E	F	G	I	J	K	
15:30	15:45	107	31	28	12	12	72	262
15:45	16:00	87	19	17	21	9	97	250
16:00	16:15	115	28	23	16	9	103	294
16:15	16:30	98	21	23	19	15	81	257
16:30	16:45	96	26	31	15	16	78	262
16:45	17:00	115	21	23	13	10	83	265
17:00	17:15	111	15	19	8	6	78	237
17:15	17:30	84	14	16	16	10	62	202
PM Peak Hour		**424**	**96**	**100**	**63**	**50**	**345**	**1078**
15:30	**16:30**	**407**	**99**	**91**	**68**	**45**	**353**	**1063**
16:30	**17:30**	**406**	**76**	**89**	**52**	**42**	**301**	**966**
		Ped 2		**Ped 3**		**Ped 4**		**Total Peds**
15:30	**16:30**	**0**		**6**		**0**		**6**
16:30	**17:30**	**1**		**1**		**0**		**2**

* Count completed by WSP

Table A-3

King Street (Trunk 1)
@
College Road

Windsor, Nova Scotia
Thursday, January 21, 2021



AM Peak Period Volume Data

Time		King Street Northbound Approach		King Street Southbound Approach		College Road Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
07:00	07:15	1	48	22	2	1	2	76
07:15	07:30	4	46	23	1	5	3	82
07:30	07:45	4	47	45	1	3	0	100
07:45	08:00	15	74	64	5	4	7	169
08:00	08:15	9	80	51	6	6	8	160
08:15	08:30	13	102	43	4	3	9	174
08:30	08:45	4	78	38	3	9	2	134
08:45	09:00	3	96	51	3	5	1	159
AM Peak Hour		**41**	**334**	**196**	**18**	**22**	**26**	**637**
07:00	**08:00**	**24**	**215**	**154**	**9**	**13**	**12**	**427**
08:00	**09:00**	**29**	**356**	**183**	**16**	**23**	**20**	**627**
		Ped 1		**Ped 3**		**Ped 4**		**Total Peds**
07:00	**08:00**	**0**		**0**		**0**		**0**
08:00	**09:00**	**1**		**0**		**0**		**1**

Midday Peak Period Volume Data

Time		King Street Northbound Approach		King Street Southbound Approach		College Road Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
11:30	11:45	2	65	80	4	4	2	157
11:45	12:00	5	93	76	5	8	3	190
12:00	12:15	1	87	85	9	4	4	190
12:15	12:30	5	57	80	2	6	1	151
12:30	12:45	3	72	64	5	8	4	156
12:45	13:00	2	95	72	4	7	4	184
13:00	13:15	4	74	64	3	8	5	158
13:15	13:30	3	64	74	4	4	4	153
Midday Peak Hour		**13**	**302**	**321**	**20**	**22**	**10**	**688**
11:30	**12:30**	**13**	**302**	**321**	**20**	**22**	**10**	**688**
12:30	**13:30**	**12**	**305**	**274**	**16**	**27**	**17**	**651**
		Ped 1		**Ped 3**		**Ped 4**		**Total Peds**
11:30	**12:30**	**3**		**0**		**0**		**3**
12:30	**13:30**	**1**		**0**		**0**		**1**

PM Peak Period Volume Data

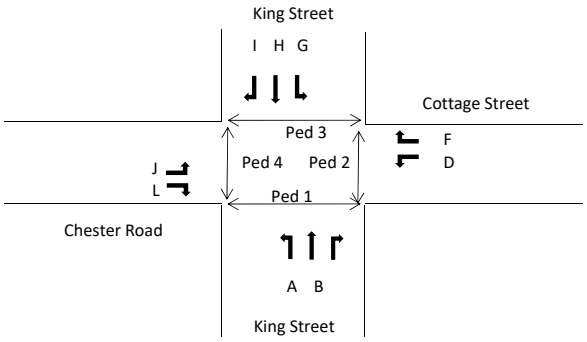
Time		King Street Northbound Approach		King Street Southbound Approach		College Road Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
15:30	15:45	8	88	104	7	5	6	218
15:45	16:00	5	80	97	12	4	5	203
16:00	16:15	3	100	105	3	4	6	221
16:15	16:30	12	66	98	7	7	3	193
16:30	16:45	3	76	104	4	6	11	204
16:45	17:00	2	71	108	4	2	3	190
17:00	17:15	7	79	98	5	4	5	198
17:15	17:30	4	54	78	9	3	8	156
PM Peak Hour		**28**	**334**	**404**	**29**	**20**	**20**	**835**
15:30	**16:30**	**28**	**334**	**404**	**29**	**20**	**20**	**835**
16:30	**17:30**	**16**	**280**	**388**	**22**	**15**	**27**	**748**
		Ped 1		**Ped 3**		**Ped 4**		**Total Peds**
15:30	**16:30**	**2**		**0**		**0**		**2**
16:30	**17:30**	**1**		**0**		**0**		**1**

* Count completed by WSP

Table A-4

King Street (Trunk 1)
@
Chester Road / Cottage Street

Windsor, Nova Scotia
Thursday, January 21, 2021



AM Peak Period Volume Data

Time		King Street Northbound Approach			Cottage Street Westbound Approach		King Street Southbound Approach			Chester Road Eastbound Approach		Total Vehicles
		A	B	C	D	F	G	H	I	J	L	
07:00	07:15	5	31	1	3	5	2	18	8	19	5	97
07:15	07:30	10	36	0	0	1	1	24	7	21	15	115
07:30	07:45	8	25	2	2	1	4	24	15	31	11	123
07:45	08:00	8	52	5	1	2	9	37	12	34	6	166
08:00	08:15	11	60	5	1	2	2	45	10	32	8	176
08:15	08:30	17	71	1	1	0	2	32	15	44	14	197
08:30	08:45	17	45	1	0	0	8	20	14	37	13	155
08:45	09:00	20	61	8	1	9	2	43	13	42	12	211
AM Peak Hour		**65**	**237**	**15**	**3**	**11**	**14**	**140**	**52**	**155**	**47**	**739**
07:00	**08:00**	**31**	**144**	**8**	**6**	**9**	**16**	**103**	**42**	**105**	**37**	**501**
08:00	**09:00**	**65**	**237**	**15**	**3**	**11**	**14**	**140**	**52**	**155**	**47**	**739**
		Ped 1			**Ped 2**		**Ped 3**			**Ped 4**		**Total Peds**
07:00	**08:00**	**0**			**1**		**0**			**0**		**1**
08:00	**09:00**	**0**			**3**		**0**			**0**		**3**

Midday Peak Period Volume Data

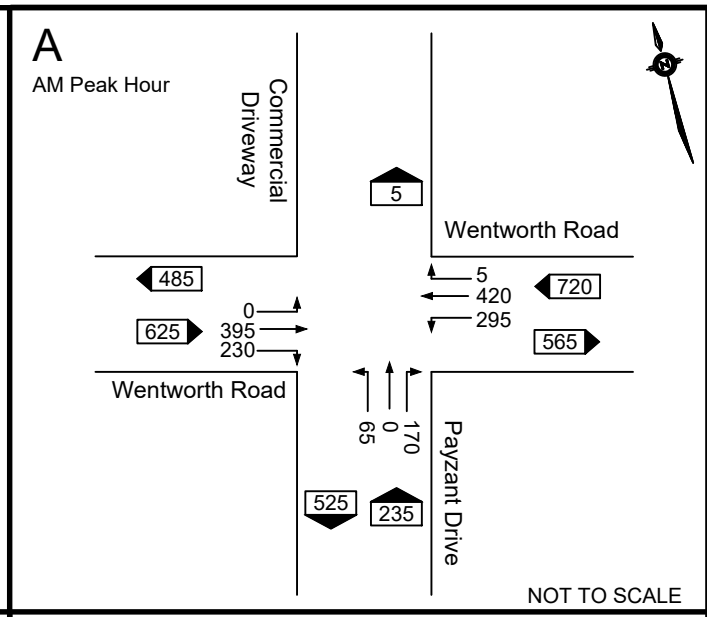
Time		King Street Northbound Approach			Cottage Street Westbound Approach		King Street Southbound Approach			Chester Road Eastbound Approach		Total Vehicles
		A	B	C	D	F	G	H	I	J	L	
11:30	11:45	14	46	0	1	1	5	48	28	22	12	177
11:45	12:00	11	49	5	6	5	1	48	33	37	14	209
12:00	12:15	16	64	1	3	4	1	44	41	25	10	209
12:15	12:30	10	39	0	4	2	1	56	25	20	17	174
12:30	12:45	10	51	0	0	1	5	49	20	26	17	179
12:45	13:00	11	59	1	1	2	1	47	24	34	16	196
13:00	13:15	8	48	2	1	2	0	44	27	26	21	179
13:15	13:30	11	44	1	0	0	1	49	30	28	15	179
Midday Peak Hour		**47**	**203**	**6**	**13**	**12**	**8**	**197**	**119**	**108**	**58**	**771**
11:30	**12:30**	**51**	**198**	**6**	**14**	**12**	**8**	**196**	**127**	**104**	**53**	**769**
12:30	**13:30**	**40**	**202**	**4**	**2**	**5**	**7**	**189**	**101**	**114**	**69**	**733**
		Ped 1			**Ped 2**		**Ped 3**			**Ped 4**		**Total Peds**
11:30	**12:30**	**0**			**4**		**1**			**0**		**5**
12:30	**13:30**	**0**			**0**		**0**			**0**		**0**

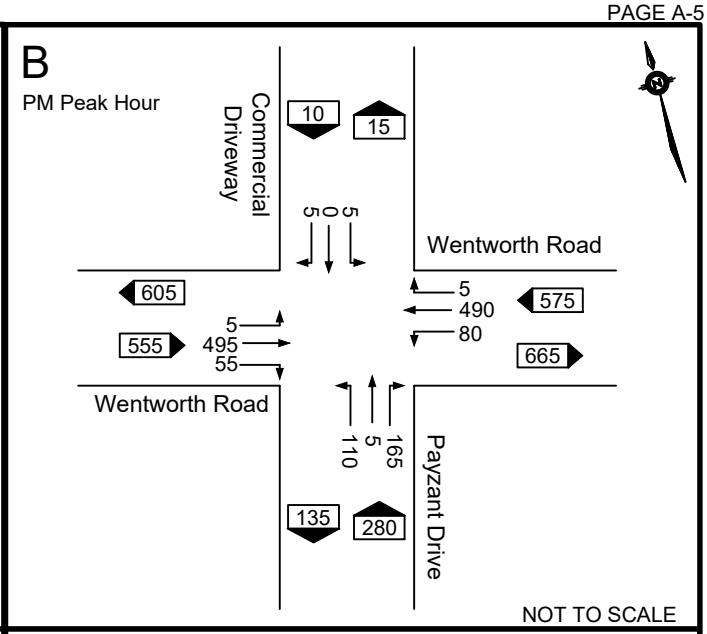
PM Peak Period Volume Data

Time		King Street Northbound Approach			Cottage Street Westbound Approach		King Street Southbound Approach			Chester Road Eastbound Approach		Total Vehicles
		A	B	C	D	F	G	H	I	J	L	
15:30	15:45	24	66	1	2	5	1	74	41	27	17	258
15:45	16:00	28	49	2	2	0	2	57	44	38	11	233
16:00	16:15	23	61	1	8	11	2	63	40	29	19	257
16:15	16:30	32	54	0	3	1	1	57	47	19	9	223
16:30	16:45	31	52	1	1	4	2	66	51	30	14	252
16:45	17:00	33	48	3	6	2	2	68	53	29	18	262
17:00	17:15	28	58	0	1	0	1	56	42	24	17	227
17:15	17:30	24	44	0	0	2	1	51	33	13	9	177
PM Peak Hour		**119**	**215**	**5**	**18**	**18**	**7**	**254**	**191**	**107**	**60**	**994**
15:30	**16:30**	**107**	**230**	**4**	**15**	**17**	**6**	**251**	**172**	**113**	**56**	**971**
16:30	**17:30**	**116**	**202**	**4**	**8**	**8**	**6**	**241**	**179**	**96**	**58**	**918**
		Ped 1			**Ped 2**		**Ped 3**			**Ped 4**		**Total Peds**
15:30	**16:30**	**1**			**5**		**1**			**0**		**7**
16:30	**17:30**	**0**			**5**		**5**			**0**		**10**

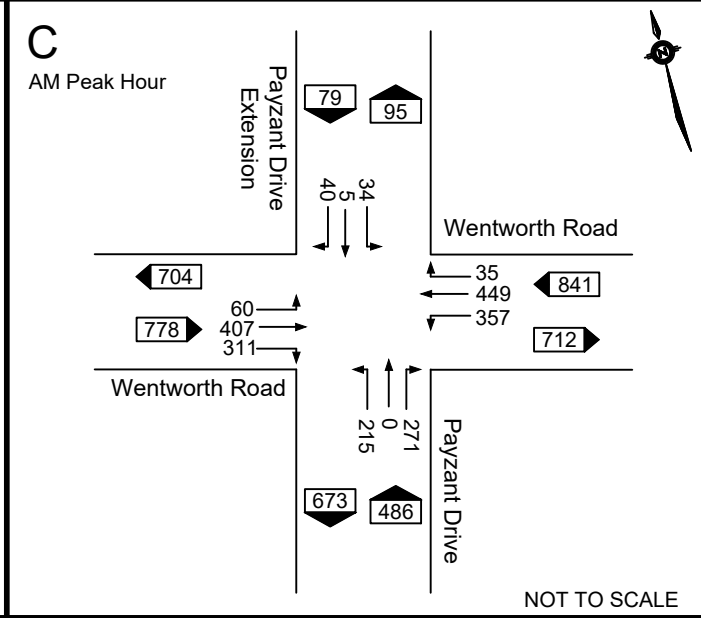
* Count completed by WSP

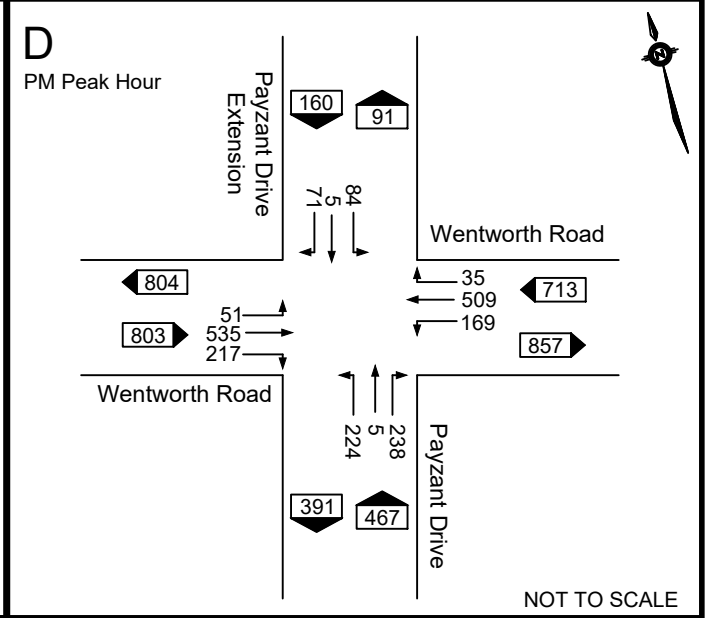
Scenario 1:
Estimated 2021 Design Hourly Volumes



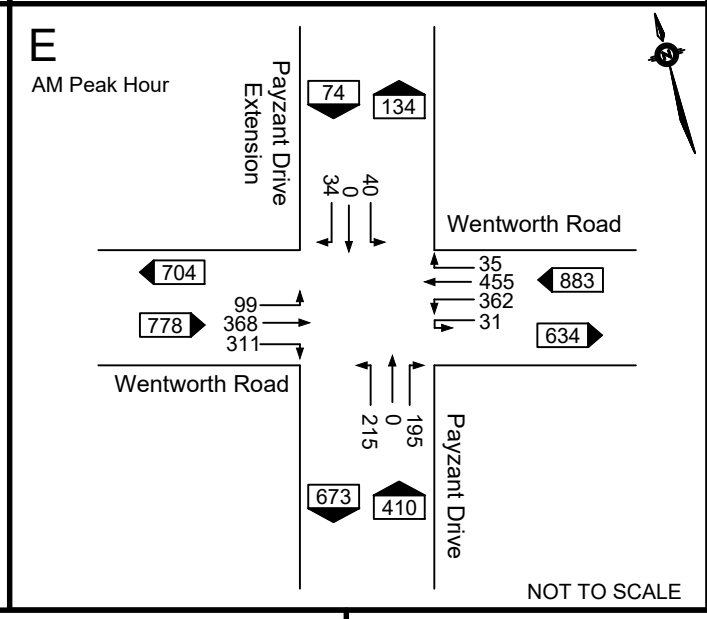


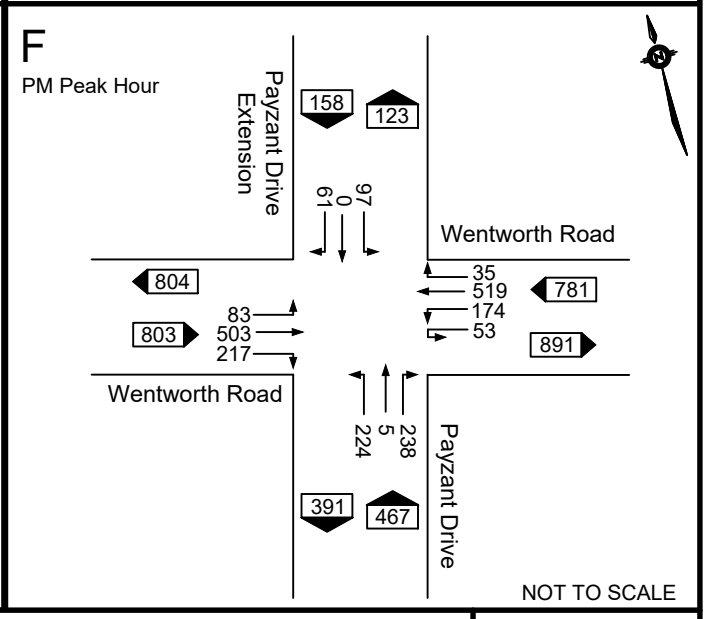
Scenario 2 **(Signals)**:
Projected 2030 Design Hourly Volumes
without Payzant Drive Connector





Scenario 2 **(Roundabout)**:
Projected 2030 Design Hourly Volumes
without Payzant Drive Connector





WSP

Intersection Infrastructure Needs Assessment
Windsor, Nova Scotia

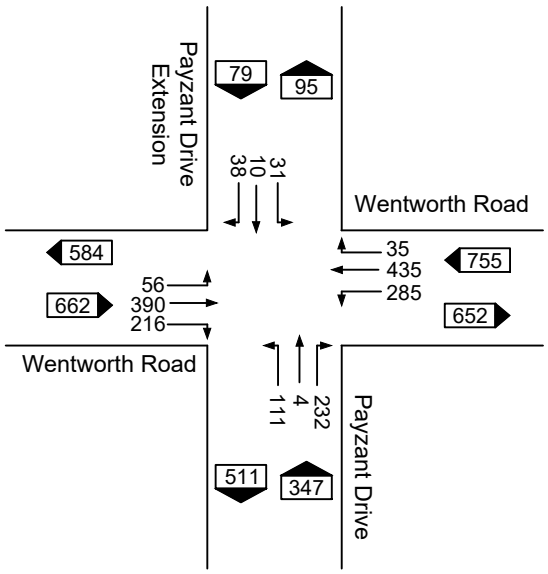
Figure A-1

Intersection #1: Wentworth Road at Payzant Drive
Scenario 1 & 2 Weekday AM and PM Peak Hours

August 2021

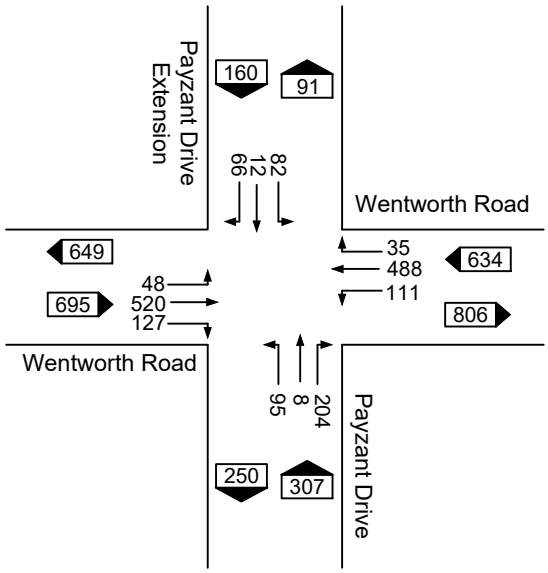
Scenario 3 **(Signals)**:
Projected 2030 Design Hourly Volumes *with* Payzant Drive Connector

A
AM Peak Hour



NOT TO SCALE

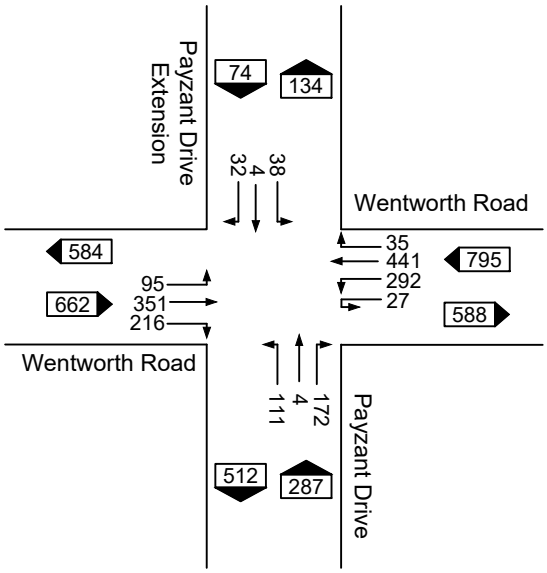
B
PM Peak Hour



NOT TO SCALE

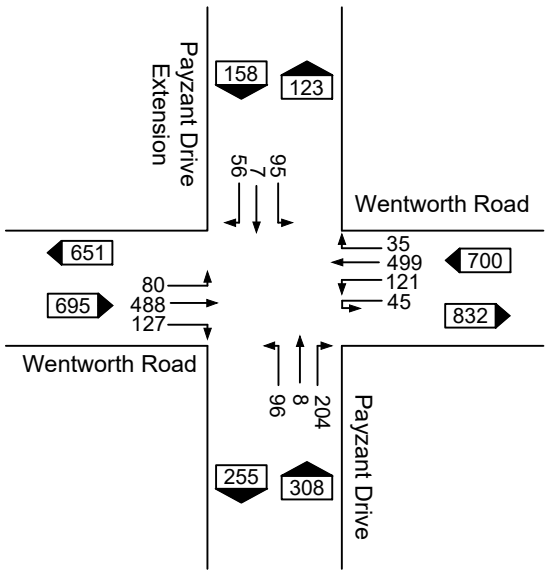
Scenario 3 **(Roundabout)**:
Projected 2030 Design Hourly Volumes *with* Payzant Drive Connector

C
AM Peak Hour



NOT TO SCALE

D
PM Peak Hour

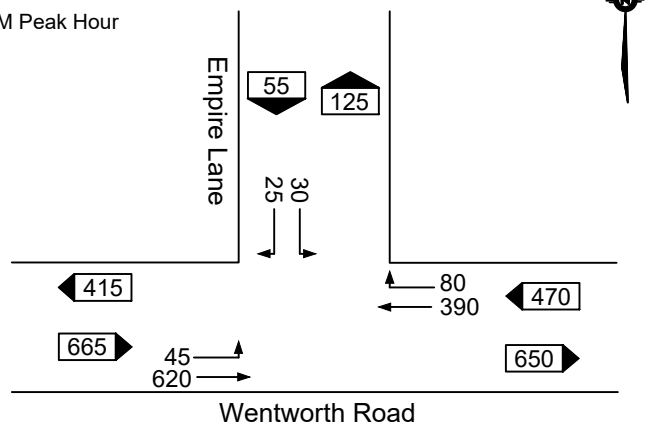


NOT TO SCALE

wsp	Intersection Infrastructure Needs Assessment Windsor, Nova Scotia	Figure A-2
	Intersection #1: Wentworth Road at Payzant Drive Scenario 3 Weekday AM and PM Peak Hours	August 2021

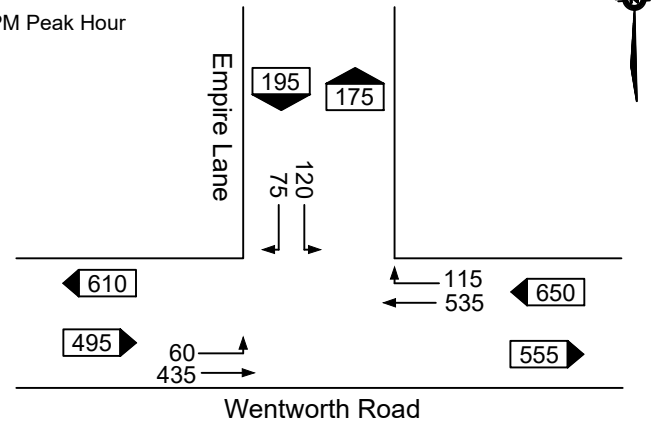
Scenario 1:
Estimated 2021 Design Hourly Volumes

A
AM Peak Hour



NOT TO SCALE

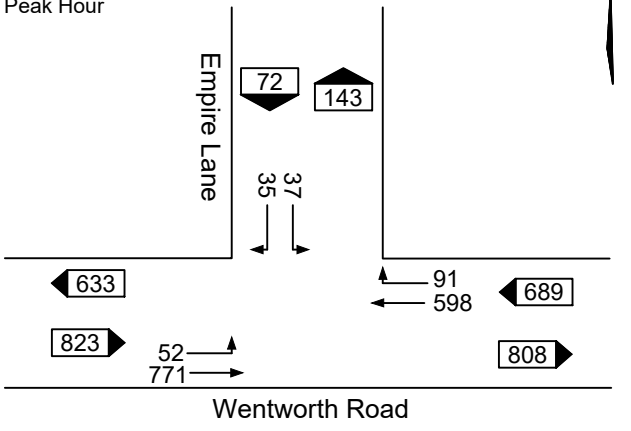
B
PM Peak Hour



NOT TO SCALE

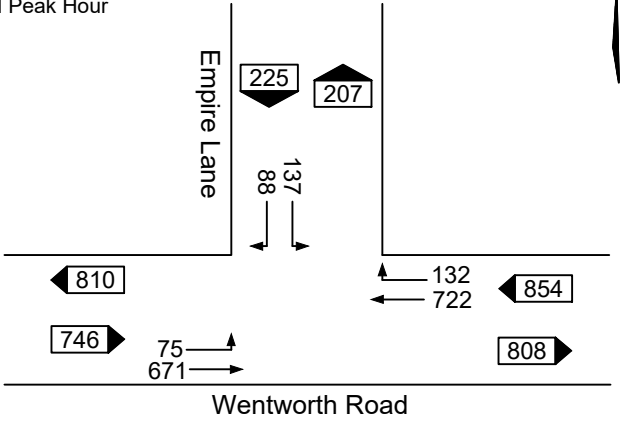
Scenario 2:
Projected 2030 Design Hourly Volumes
without Payzant Drive Connector

C
AM Peak Hour



NOT TO SCALE

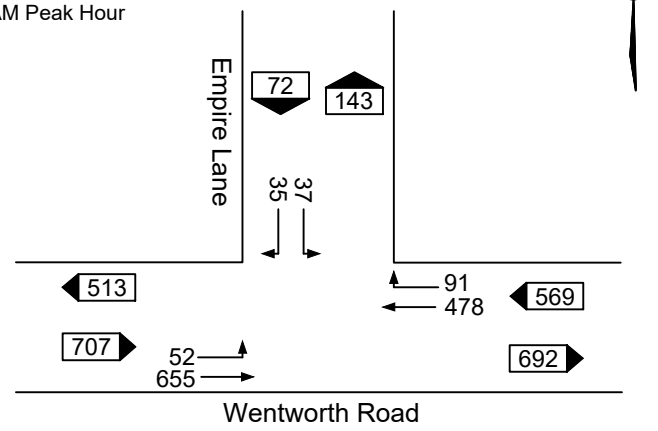
D
PM Peak Hour



NOT TO SCALE

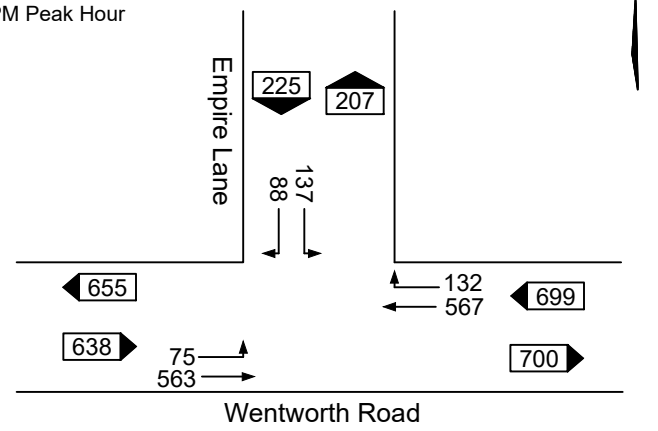
Scenario 3:
Projected 2030 Design Hourly Volumes
with Payzant Drive Connector

E
AM Peak Hour



NOT TO SCALE

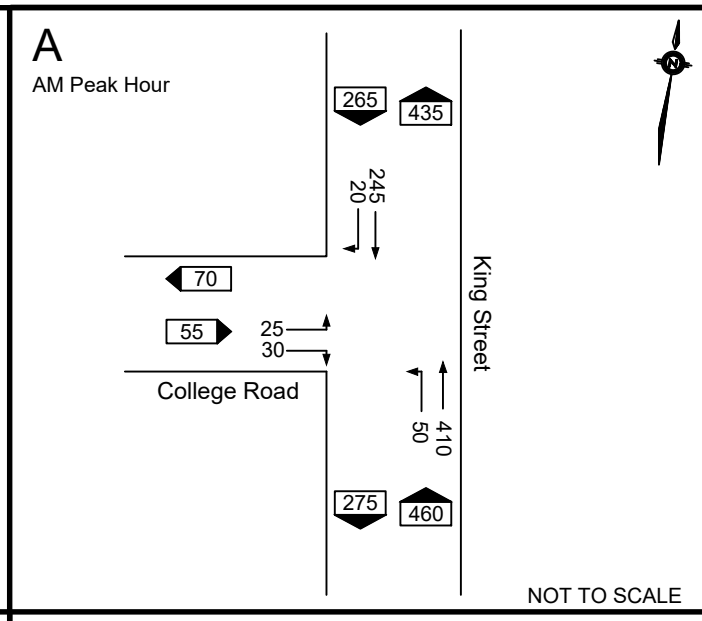
F
PM Peak Hour

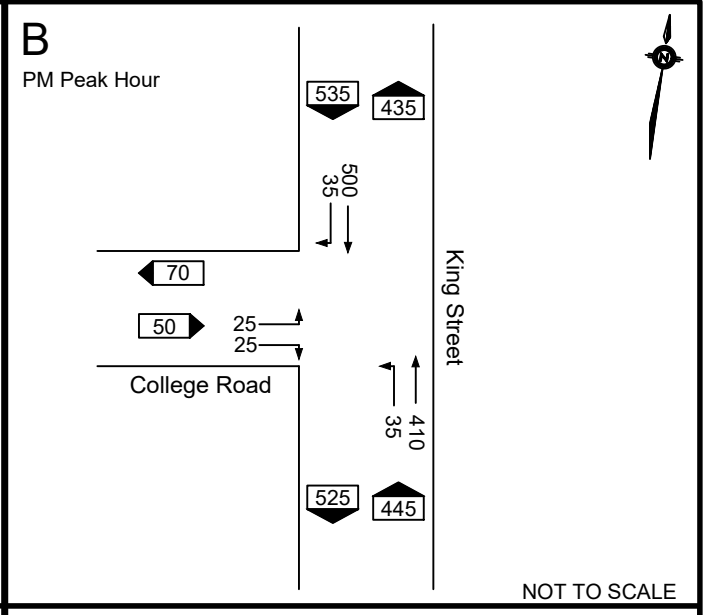


NOT TO SCALE

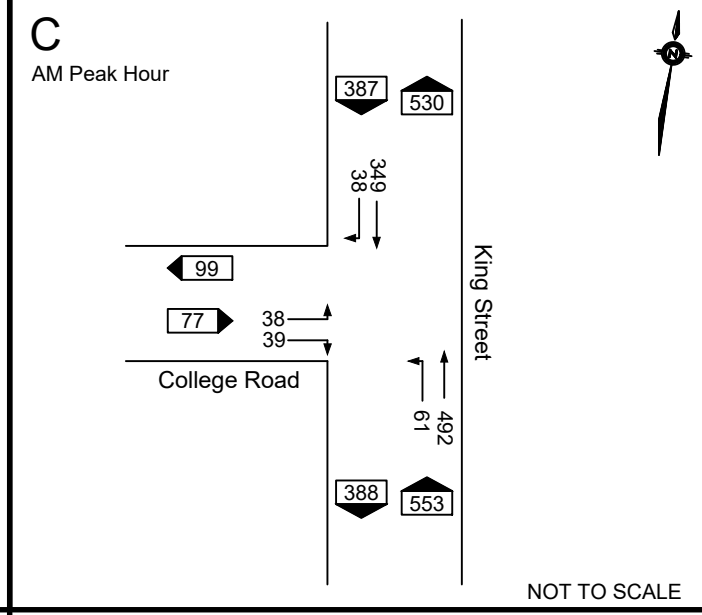
WSP	Intersection Infrastructure Needs Assessment Windsor, Nova Scotia	Figure A-3
	Intersection #2: Wentworth Road at Empire Lane Scenario 1, 2 & 3 Weekday AM and PM Peak Hours	August 2021

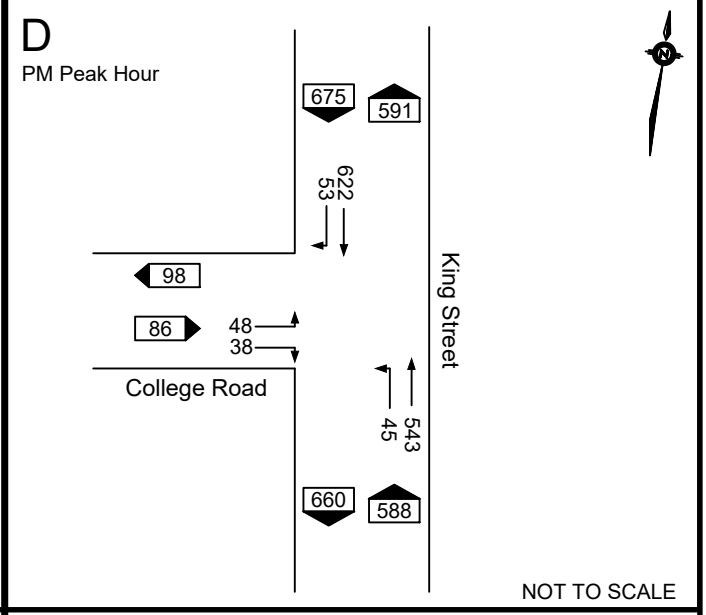
Scenario 1:
Estimated 2021 Design Hourly Volumes



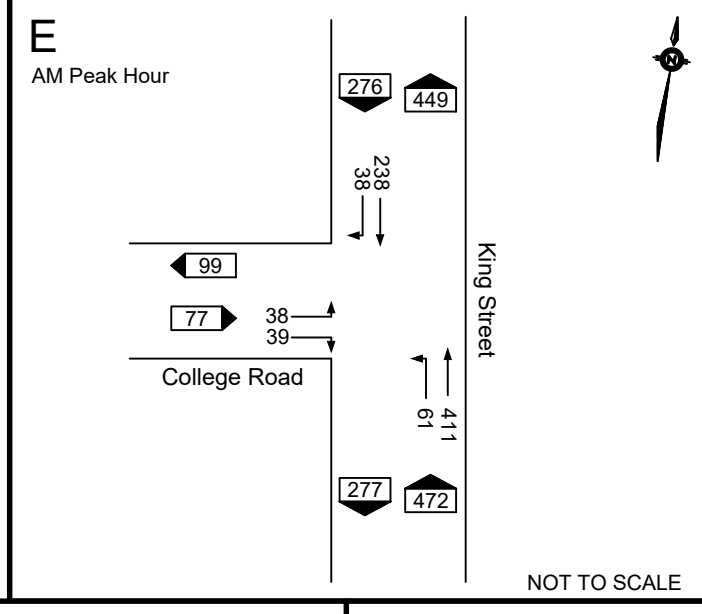


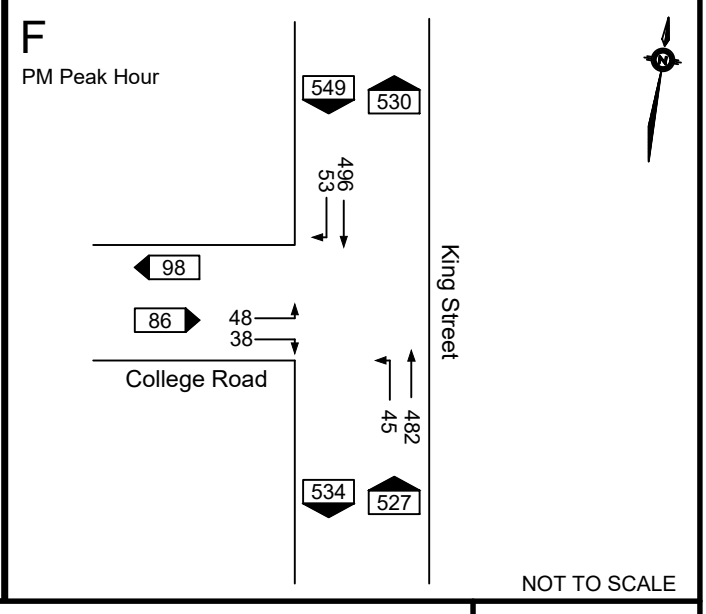
Scenario 2:
Projected 2030 Design Hourly Volumes
without Payzant Drive Connector





Scenario 3:
Projected 2030 Design Hourly Volumes
with Payzant Drive Connector





wsp

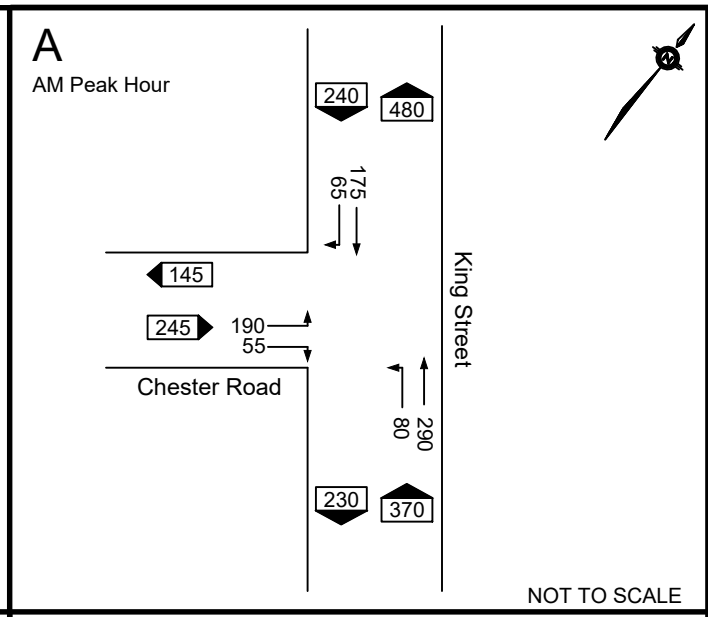
Intersection Infrastructure Needs Assessment
Windsor, Nova Scotia

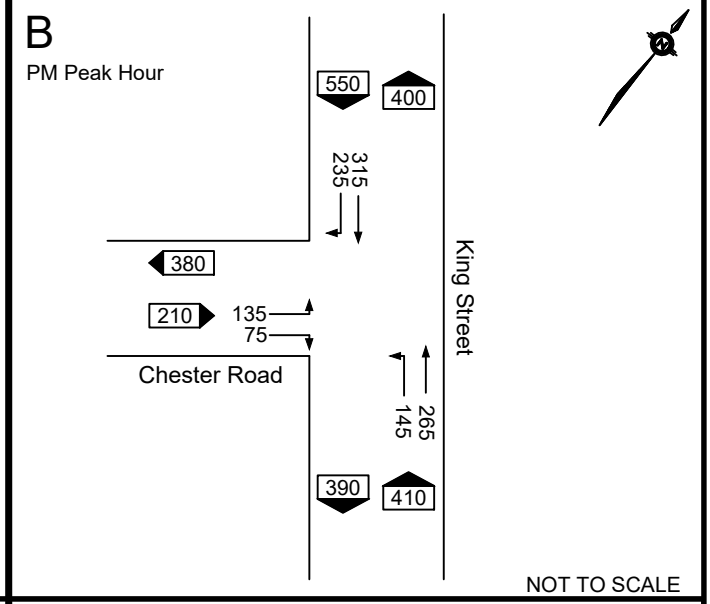
Figure A-4

Intersection #3: King Street at College Road
Scenario 1, 2 & 3 Weekday AM and PM Peak Hours

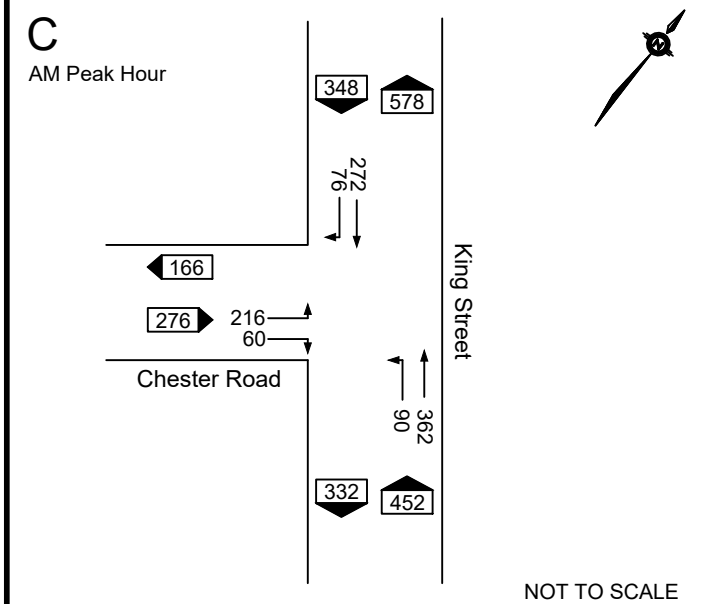
August 2021

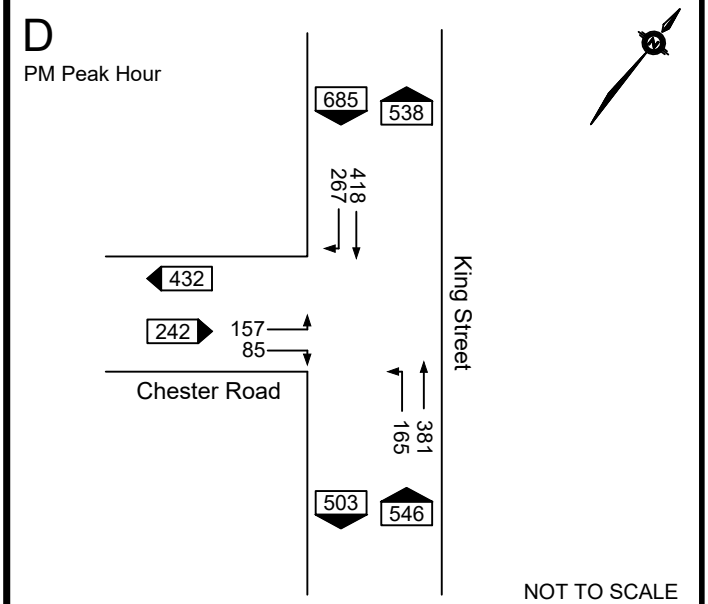
Scenario 1:
Estimated 2021 Design Hourly Volumes



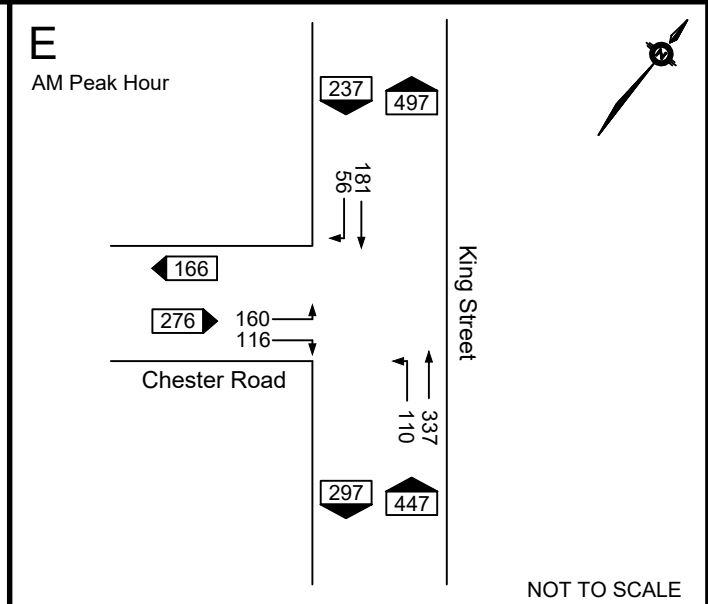


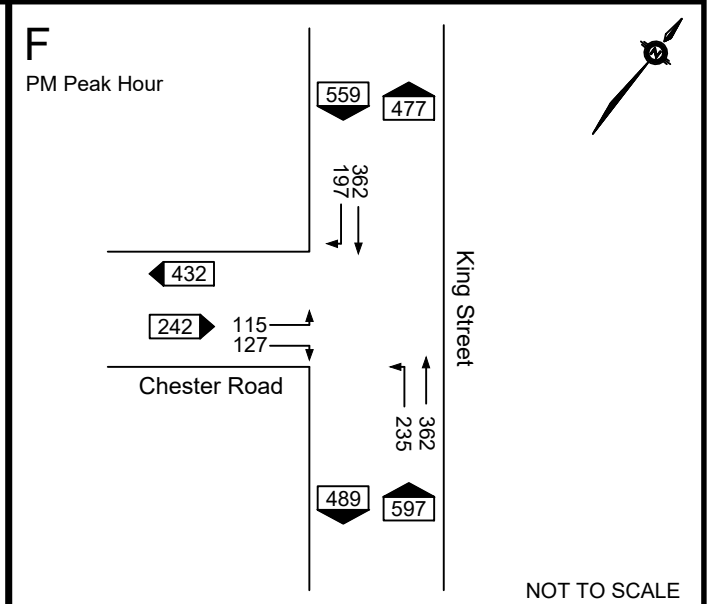
Scenario 2:
Projected 2030 Design Hourly Volumes
without Payzant Drive Connector





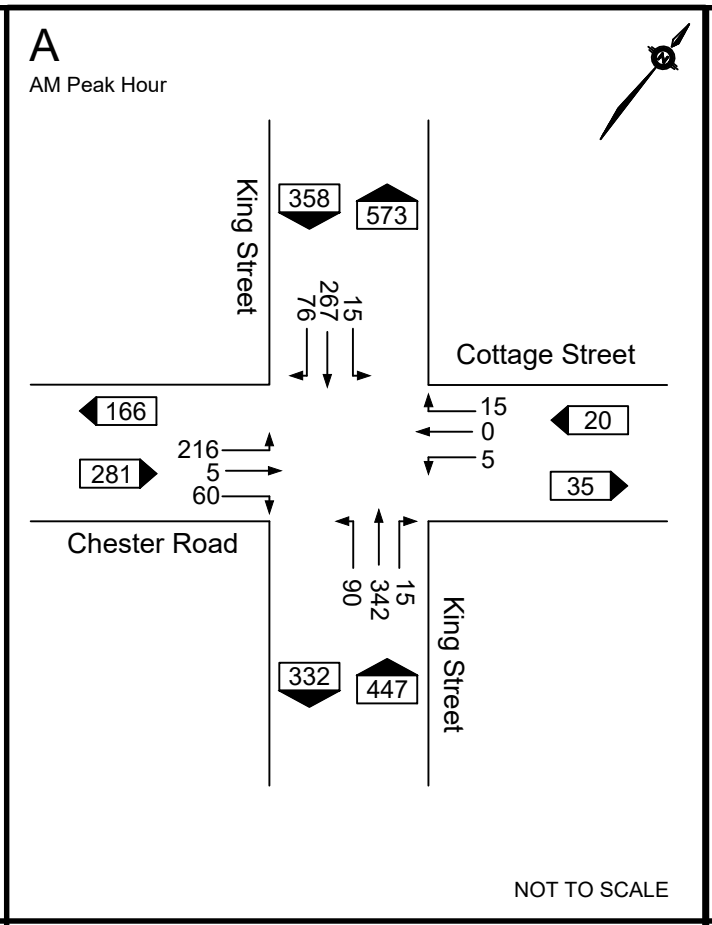
Scenario 3:
Projected 2030 Design Hourly Volumes
with Payzant Drive Connector

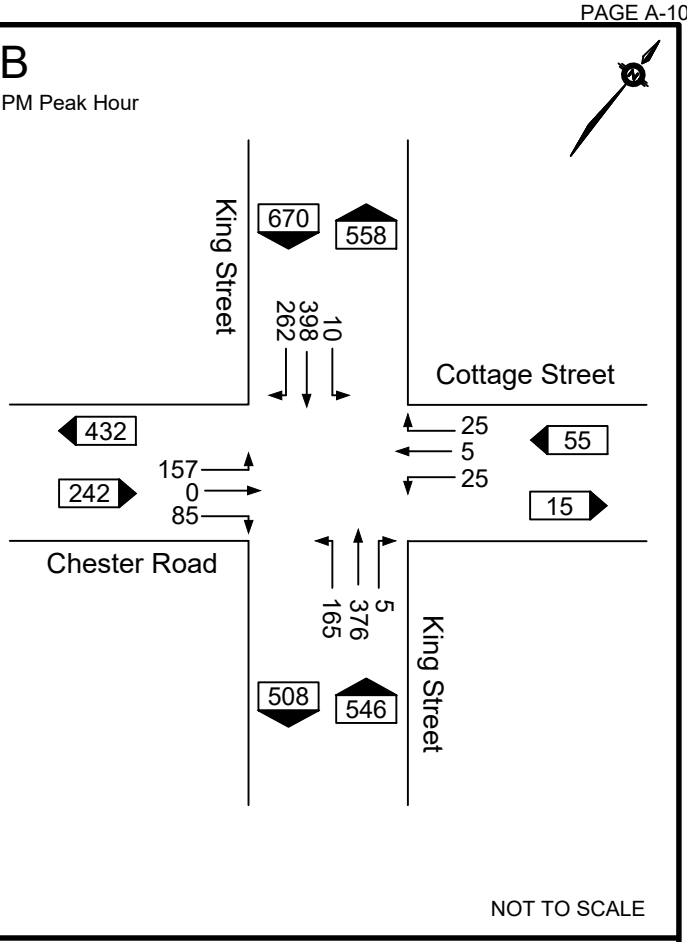




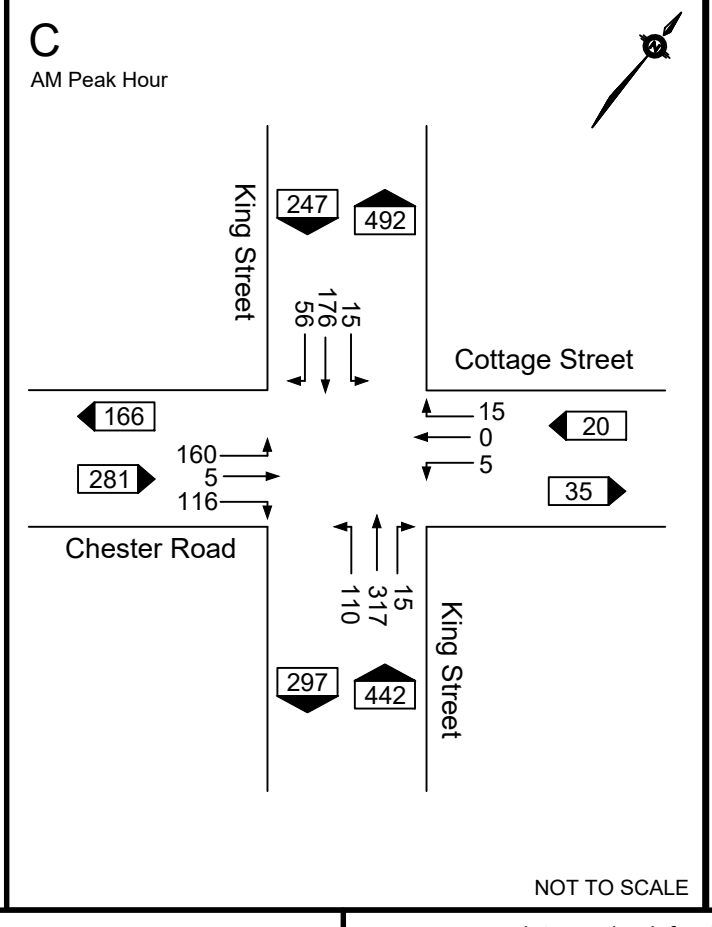
WSP	Intersection Infrastructure Needs Assessment Windsor, Nova Scotia	Figure A-5
	Intersection #4: King Street at Chester Road Scenario 1, 2 & 3 Weekday AM and PM Peak Hours	August 2021

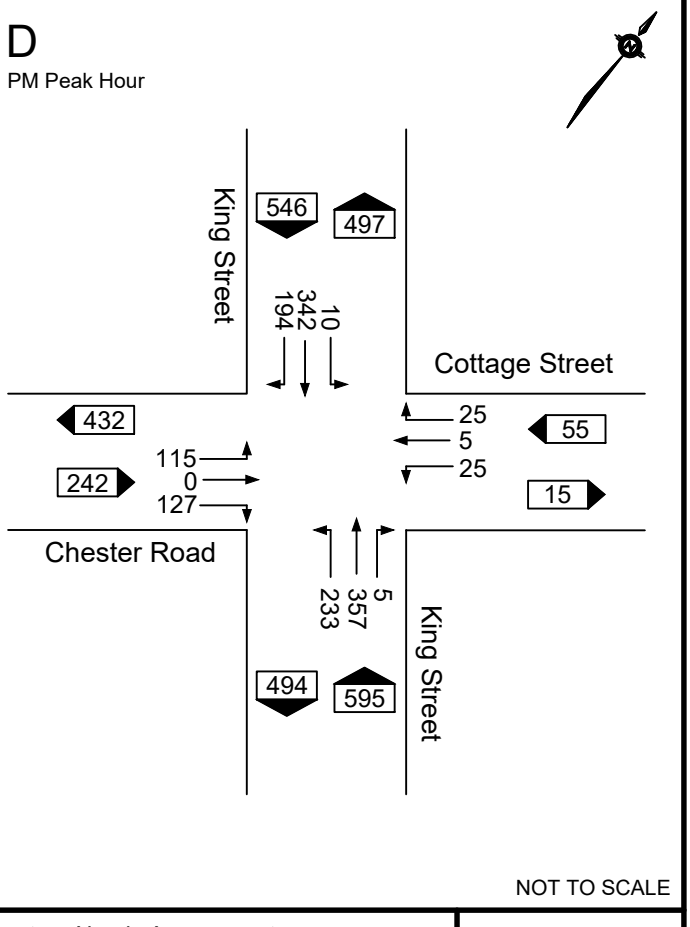
Scenario 2:
Projected 2030 Design Hourly Volumes
without Payzant Drive Connector





Scenario 3:
Projected 2030 Design Hourly Volumes
with Payzant Drive Connector





wsp

Intersection Infrastructure Needs Assessment
Windsor, Nova Scotia

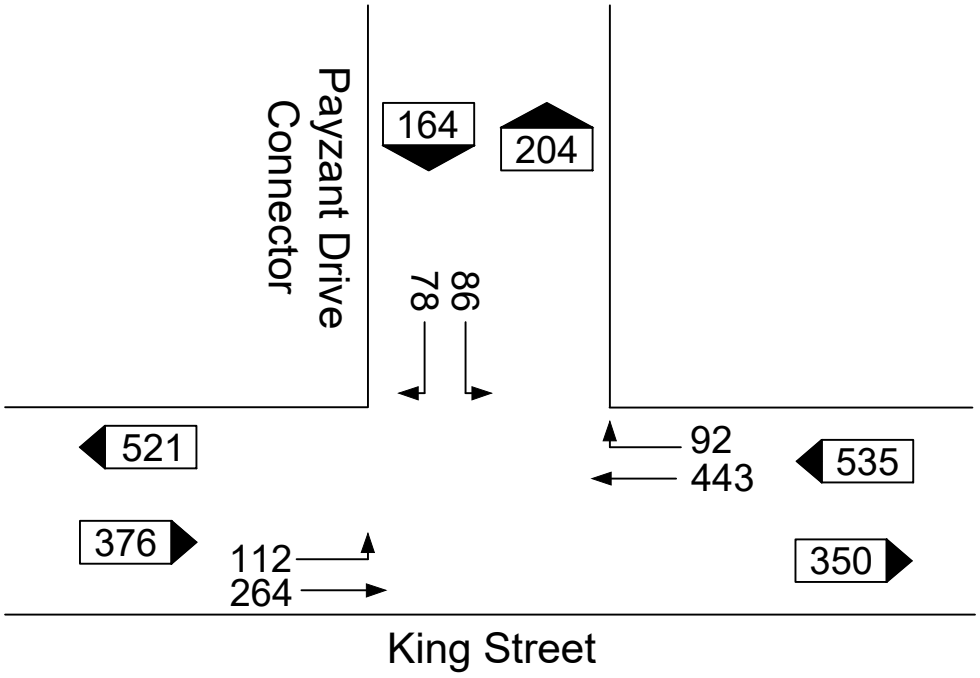
Figure A-6

Intersection #4: King Street at Chester Road & Cottage Street
Scenario 2 & 3 Weekday AM and PM Peak Hours

August 2021

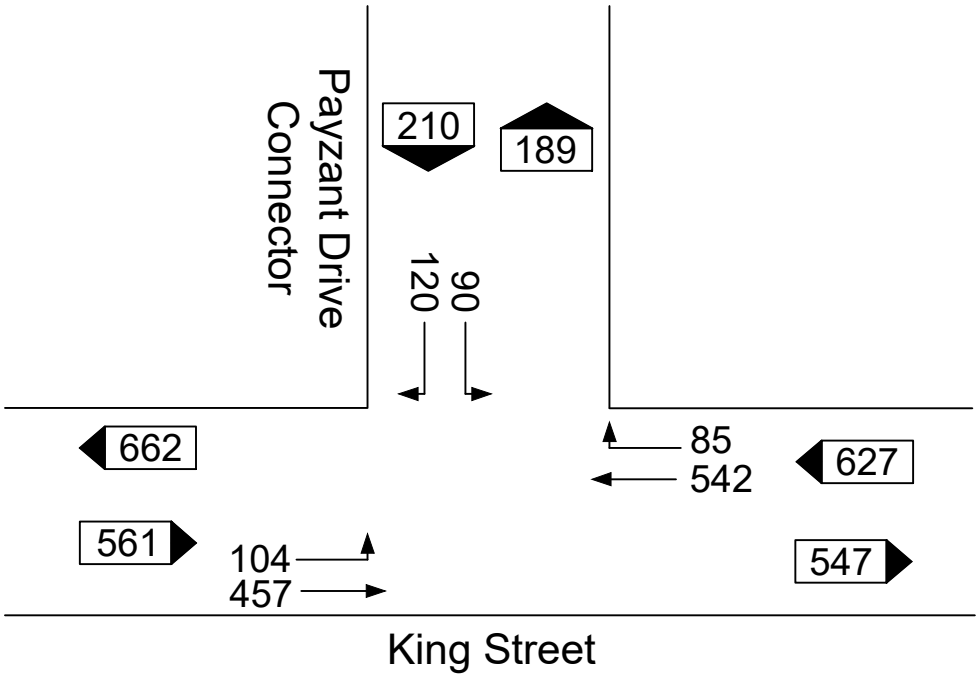
Scenario 3: Projected 2030 Design Hourly Volumes *with* Payzant Drive Connector

A
AM Peak Hour



NOT TO SCALE

B
PM Peak Hour



NOT TO SCALE

wsp	Intersection Infrastructure Needs Assessment Windsor, Nova Scotia	Figure A-7
	Intersection #5: King Street at Payzant Drive Connection Scenario 3 Weekday AM and PM Peak Hours	August 2021

Table A-5

2020 COUNT PROGRAM

Average Group Factors (2010 to 2019)

G:/im/Asset.sys/censustm/counts/factors/fac10-19.xlw

Week Number	2020 Starting Date	AA Week Factor	A Week Factor	B Week Factor	C Week Factor	D Week Factor	E Week Factor	F Week Factor	G Week Factor	H Week Factor
1	30-Dec	1.27	1.60	1.79	1.62	1.83	2.44	2.57	3.19	3.74
2	06-Jan	1.03	1.16	1.34	1.37	1.47	1.60	1.79	2.22	2.82
3	13-Jan	1.04	1.17	1.36	1.40	1.45	1.59	1.75	2.42	2.91
4	20-Jan	1.02	1.13	1.31	1.34	1.44	1.52	1.77	2.36	2.85
5	27-Jan	1.02	1.20	1.34	1.36	1.52	1.59	1.86	2.39	2.91
6	03-Feb	1.06	1.19	1.31	1.36	1.45	1.60	1.86	2.56	2.97
7	10-Feb	0.99	1.16	1.27	1.33	1.41	1.53	1.74	2.26	2.78
8	17-Feb	1.00	1.19	1.33	1.32	1.52	1.52	1.73	2.32	3.10
9	24-Feb	1.01	1.11	1.22	1.25	1.31	1.43	1.62	2.09	2.65
10	02-Mar	1.00	1.16	1.24	1.26	1.41	1.55	1.67	2.25	2.57
11	09-Mar	1.00	1.11	1.14	1.21	1.17	1.42	1.49	1.99	2.53
12	16-Mar	0.98	1.11	1.20	1.24	1.16	1.55	1.61	2.15	2.63
13	23-Mar	1.02	1.12	1.20	1.24	1.28	1.54	1.65	2.11	2.47
14	30-Mar	1.00	1.08	1.15	1.23	1.24	1.53	1.65	2.23	2.34
15	06-Apr	1.01	1.08	1.10	1.31	1.11	1.42	1.50	2.01	2.11
16	13-Apr	0.99	1.03	1.06	1.12	1.06	1.30	1.42	1.87	1.94
17	20-Apr	1.00	1.01	1.04	1.15	1.04	1.25	1.35	1.78	1.72
18	27-Apr	1.00	0.98	1.02	1.08	1.03	1.18	1.24	1.59	1.24
19	04-May	0.98	0.96	1.00	1.05	1.01	1.12	1.20	1.44	0.97
20	11-May	0.99	0.96	0.97	0.99	0.97	0.97	1.10	1.25	0.92
21	18-May	1.00	0.96	0.98	0.96	0.93	0.97	0.98	1.10	0.87
22	25-May	1.01	0.93	0.94	0.94	0.92	0.95	0.97	1.09	0.87
23	01-Jun	0.99	0.93	0.94	0.94	0.92	0.94	0.98	1.07	0.86
24	08-Jun	0.98	0.93	0.93	0.93	0.93	0.93	0.90	0.90	0.78
25	15-Jun	0.98	0.92	0.90	0.89	0.90	0.84	0.82	0.81	0.72
26	22-Jun	0.99	0.92	0.90	0.87	0.87	0.79	0.77	0.72	0.65
27	29-Jun	1.02	0.89	0.88	0.81	0.81	0.70	0.66	0.61	0.53
28	06-Jul	0.99	0.89	0.84	0.77	0.77	0.66	0.64	0.54	0.50
29	13-Jul	1.00	0.87	0.84	0.75	0.74	0.67	0.60	0.51	0.50
30	20-Jul	1.00	0.89	0.83	0.74	0.71	0.62	0.58	0.48	0.47
31	27-Jul	1.01	0.89	0.81	0.71	0.69	0.58	0.55	0.43	0.46
32	03-Aug	1.04	0.88	0.79	0.69	0.71	0.57	0.52	0.41	0.43
33	10-Aug	1.01	0.87	0.78	0.72	0.73	0.61	0.55	0.44	0.45
34	17-Aug	0.99	0.84	0.77	0.74	0.74	0.63	0.56	0.46	0.47
35	24-Aug	1.00	0.88	0.80	0.74	0.74	0.66	0.62	0.51	0.51
36	31-Aug	1.02	0.90	0.85	0.80	0.80	0.73	0.68	0.60	0.61
37	07-Sep	1.00	0.95	0.89	0.87	0.87	0.80	0.75	0.69	0.64
38	14-Sep	0.98	0.94	0.89	0.89	0.93	0.85	0.79	0.67	0.65
39	21-Sep	0.98	0.93	0.89	0.89	0.93	0.87	0.78	0.72	0.71
40	28-Sep	0.99	0.94	0.91	0.91	0.98	0.89	0.80	0.75	0.83
41	05-Oct	1.00	0.93	0.89	0.85	0.92	0.91	0.73	0.64	0.86
42	12-Oct	1.00	0.97	0.93	0.91	0.94	0.96	0.76	0.72	0.99
43	19-Oct	0.97	0.96	0.95	0.97	1.02	1.04	1.00	1.05	1.19
44	26-Oct	0.97	1.00	1.00	1.03	1.05	1.11	1.17	1.36	1.34
45	02-Nov	0.96	1.04	1.03	1.09	1.09	1.17	1.30	1.57	1.40
46	09-Nov	1.00	1.08	1.04	1.10	1.09	1.27	1.36	1.70	1.41
47	16-Nov	0.97	1.04	1.04	1.09	1.11	1.26	1.35	1.72	1.51
48	23-Nov	0.98	1.05	1.07	1.15	1.15	1.31	1.40	1.77	1.61
49	30-Nov	0.97	1.07	1.08	1.18	1.09	1.30	1.42	1.85	1.65
50	07-Dec	0.99	1.04	1.10	1.17	1.14	1.33	1.47	1.88	1.68
51	14-Dec	1.00	1.06	1.16	1.21	1.19	1.36	1.51	1.91	1.92
52	21-Dec	1.25	1.16	1.24	1.21	1.11	1.60	1.71	2.07	2.54
53	28-Dec	1.35	1.79	1.65	1.88	1.35	1.64	1.90	3.32	3.17

APPENDIX

B WARRANT ANALYSIS

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-1 - Wentworth Road at Payzant Drive / Driveway

Scenario 1 - 2021 Existing Conditions

Main Street (name)	Wentworth Road	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Payzant Drive	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Wentworth Road	NB	1			1		450	1	
Wentworth Road	SB	1			1		680	1	
Payzant Drive	WB	1			1				
Driveway	EB			1					

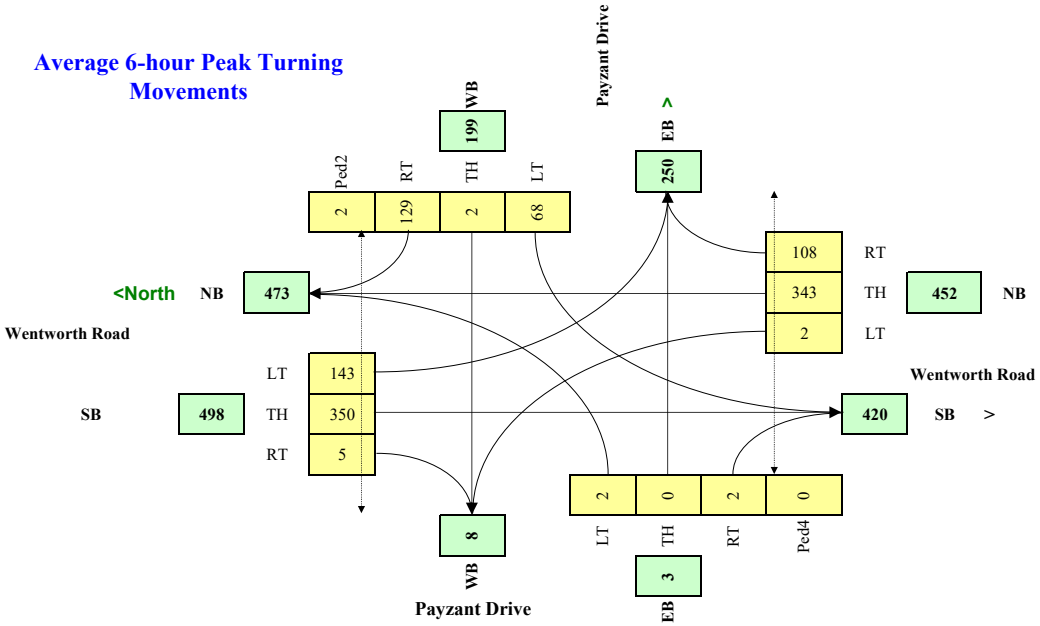
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Wentworth Road	NS	50	2.0%	n	0.0
Payzant Drive	EW	50	2.0%	n	

	Ped3 NS W Side	Ped1 NS E Side	Ped2 EW N Side	Ped4 EW S side
7:00 - 8:00	1	4	0	0
8:00 - 9:00	5	5	3	0
11:30 - 12:30	6	4	1	0
12:30 - 13:30	3	3	1	0
15:30 - 16:30	5	2	5	0
16:30 - 17:30	2	1	0	0
Total (6-hour peak)	**22**	**19**	**10**	**0**
Average (6-hour peak)	**4**	**3**	**2**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	0	395	230	295	420	5	65	0	170	0	0	0
8:00 - 9:00	0	295	175	220	315	5	50	0	130	0	0	0
11:30 - 12:30	0	225	70	95	230	5	45	0	85	0	0	0
12:30 - 13:30	0	225	70	95	230	5	45	0	85	0	0	0
15:30 - 16:30	5	420	45	70	415	5	95	5	140	5	0	5
16:30 - 17:30	5	495	55	80	490	5	110	5	165	5	0	5
Total (6-hour peak)	**10**	**2,055**	**645**	**855**	**2,100**	**30**	**410**	**10**	**775**	**10**	**0**	**10**
Average (6-hour peak)	**2**	**343**	**108**	**143**	**350**	**5**	**68**	**2**	**129**	**2**	**0**	**2**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	82	81	1
		Veh	*Ped*

NOT Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-2 - Wentworth Road at Payzant Drive

Scenario 2 - 2030 Without Payzant Drive Connector Open

Main Street (name)	Wentworth Road	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Payzant Drive	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Wentworth Road	NB	1			1		450	1	
Wentworth Road	SB	1			1		680	1	
Payzant Drive	WB	1			1				
Payzant Drive	EB	1			1				

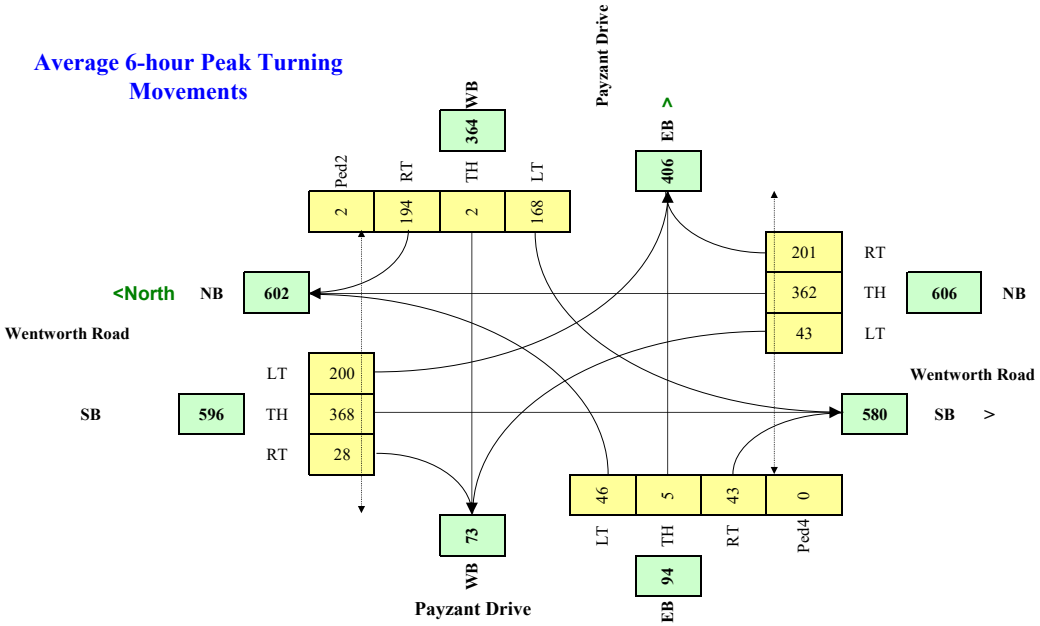
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Wentworth Road	NS	50	2.0%	n	0.0
Payzant Drive	EW	50	2.0%	n	

	Ped3	Ped1	Ped2	Ped4
	NS	NS	EW	EW
	W Side	E Side	N Side	S side
7:00 - 8:00	1	4	0	0
8:00 - 9:00	5	5	3	0
11:30 - 12:30	6	4	1	0
12:30 - 13:30	3	3	1	0
15:30 - 16:30	5	2	5	0
16:30 - 17:30	2	1	0	0
Total (6-hour peak)	**22**	**19**	**10**	**0**
Average (6-hour peak)	**4**	**3**	**2**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	60	405	310	355	450	35	215	0	270	35	5	40
8:00 - 9:00	45	305	235	270	335	25	160	0	205	25	5	30
11:30 - 12:30	30	235	130	130	240	20	110	0	125	30	5	30
12:30 - 13:30	30	235	130	130	240	20	110	0	125	30	5	30
15:30 - 16:30	45	455	185	145	435	30	190	5	200	70	5	60
16:30 - 17:30	50	535	215	170	510	35	225	5	240	85	5	70
Total (6-hour peak)	**260**	**2,170**	**1,205**	**1,200**	**2,210**	**165**	**1,010**	**10**	**1,165**	**275**	**30**	**260**
Average (6-hour peak)	**43**	**362**	**201**	**200**	**368**	**28**	**168**	**2**	**194**	**46**	**5**	**43**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	229	227	2
		Veh	*Ped*

Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-3 - Wentworth Road at Payzant Drive

Scenario 3 - 2030 With Payzant Drive Connector Open

Main Street (name)	Wentworth Road	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Payzant Drive	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Wentworth Road	NB	1			1		450	1	
Wentworth Road	SB	1			1		680	1	
Payzant Drive	WB	1			1				
Payzant Drive	EB	1			1				

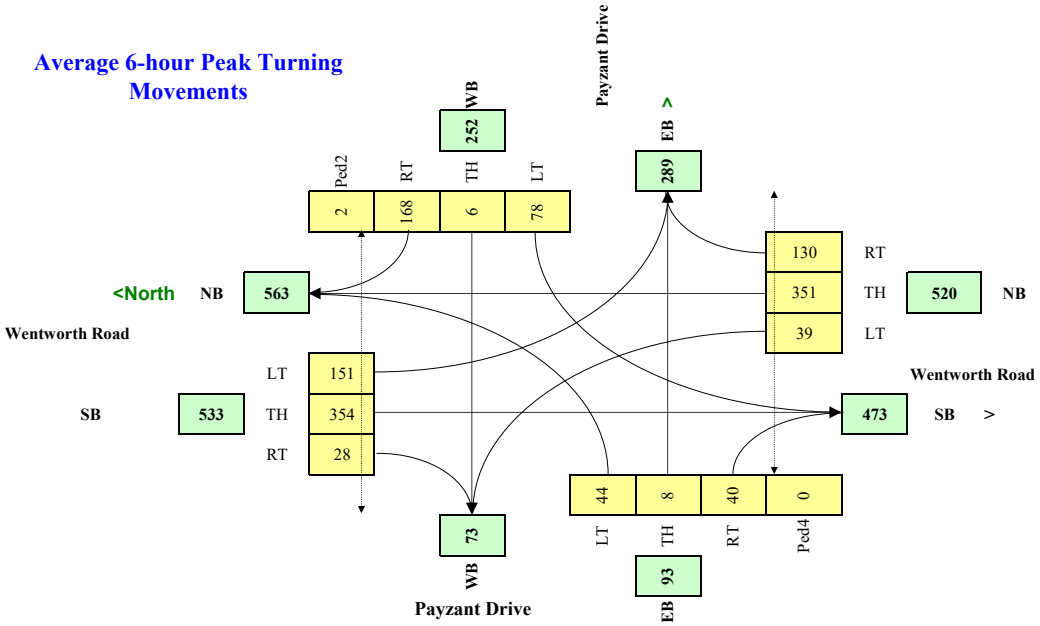
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Wentworth Road	NS	50	2.0%	n	0.0
Payzant Drive	EW	50	2.0%	n	

	Ped3	Ped1	Ped2	Ped4
	NS	NS	EW	EW
	W Side	E Side	N Side	S side
7:00 - 8:00	1	4	0	0
8:00 - 9:00	5	5	3	0
11:30 - 12:30	6	4	1	0
12:30 - 13:30	3	3	1	0
15:30 - 16:30	5	2	5	0
16:30 - 17:30	2	1	0	0
Total (6-hour peak)	**22**	**19**	**10**	**0**
Average (6-hour peak)	**4**	**3**	**2**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	55	390	215	285	435	35	110	5	230	30	10	40
8:00 - 9:00	40	295	160	215	325	25	85	5	175	25	10	30
11:30 - 12:30	25	230	85	100	230	20	50	5	110	30	5	25
12:30 - 13:30	25	230	85	100	230	20	50	5	110	30	5	25
15:30 - 16:30	40	440	110	95	415	30	80	5	175	70	10	55
16:30 - 17:30	50	520	125	110	490	35	95	10	205	80	10	65
Total (6-hour peak)	**235**	**2,105**	**780**	**905**	**2,125**	**165**	**470**	**35**	**1,005**	**265**	**50**	**240**
Average (6-hour peak)	**39**	**351**	**130**	**151**	**354**	**28**	**78**	**6**	**168**	**44**	**8**	**40**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	145	143	2
		Veh	*Ped*

Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-4 - Wentworth Road at Empire Lane

Scenario 1 - 2021 Existing Conditions

Main Street (name)	Wentworth Road	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Empire Lane	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Wentworth Road	NB	1		1			850	1	
Wentworth Road	SB				1		300	1	
	WB								
Empire Lane	EB	1				1			

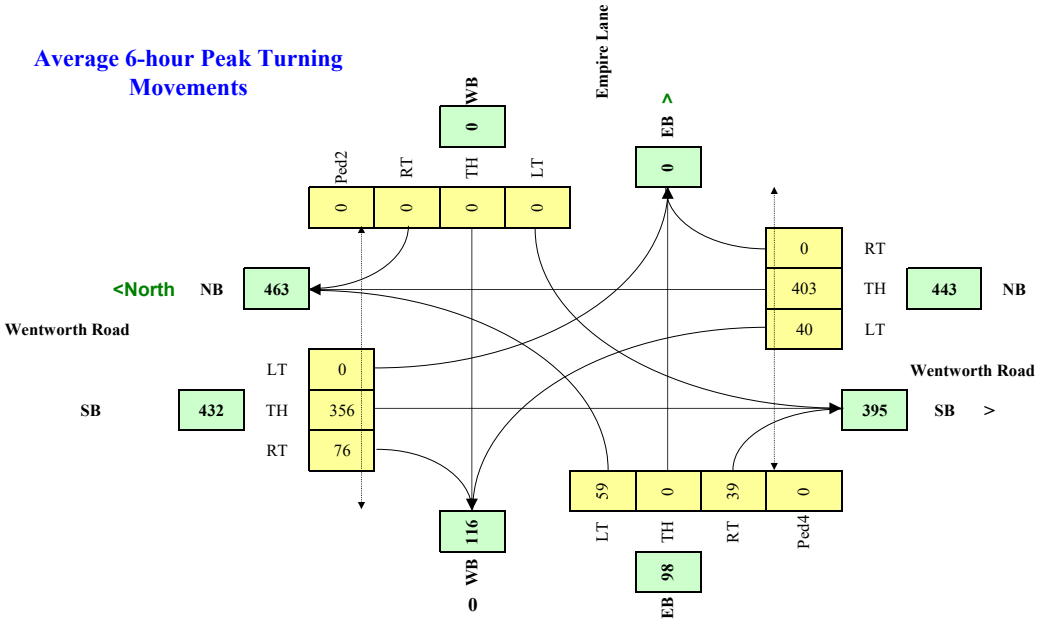
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Wentworth Road	NS	50	2.0%	n	0.0
Empire Lane	EW	50	2.0%	n	

	Ped3	Ped1	Ped2	Ped4
	NS	NS	EW	EW
	W Side	E Side	N Side	S side
7:00 - 8:00	1	0	0	0
8:00 - 9:00	4	0	0	0
11:30 - 12:30	5	0	0	0
12:30 - 13:30	4	0	0	0
15:30 - 16:30	6	0	0	0
16:30 - 17:30	1	0	1	0
Total (6-hour peak)	**21**	**0**	**1**	**0**
Average (6-hour peak)	**4**	**0**	**0**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	45	620	0	0	390	80	0	0	0	30	0	25
8:00 - 9:00	35	465	0	0	295	60	0	0	0	25	0	20
11:30 - 12:30	25	265	0	0	230	50	0	0	0	40	0	25
12:30 - 13:30	25	265	0	0	230	50	0	0	0	40	0	25
15:30 - 16:30	50	370	0	0	455	100	0	0	0	100	0	65
16:30 - 17:30	60	435	0	0	535	115	0	0	0	120	0	75
Total (6-hour peak)	**240**	**2,420**	**0**	**0**	**2,135**	**455**	**0**	**0**	**0**	**355**	**0**	**235**
Average (6-hour peak)	**40**	**403**	**0**	**0**	**356**	**76**	**0**	**0**	**0**	**59**	**0**	**39**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	37	37	0
		Veh	*Ped*

NOT Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-5 - Wentworth Road at Empire Lane

Scenario 2 - 2030 Without Payzant Drive Connector Open

Main Street (name)	Wentworth Road	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Empire Lane	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Wentworth Road	NB	1		1			850	1	
Wentworth Road	SB				1		300	1	
	WB								
Empire Lane	EB	1				1			

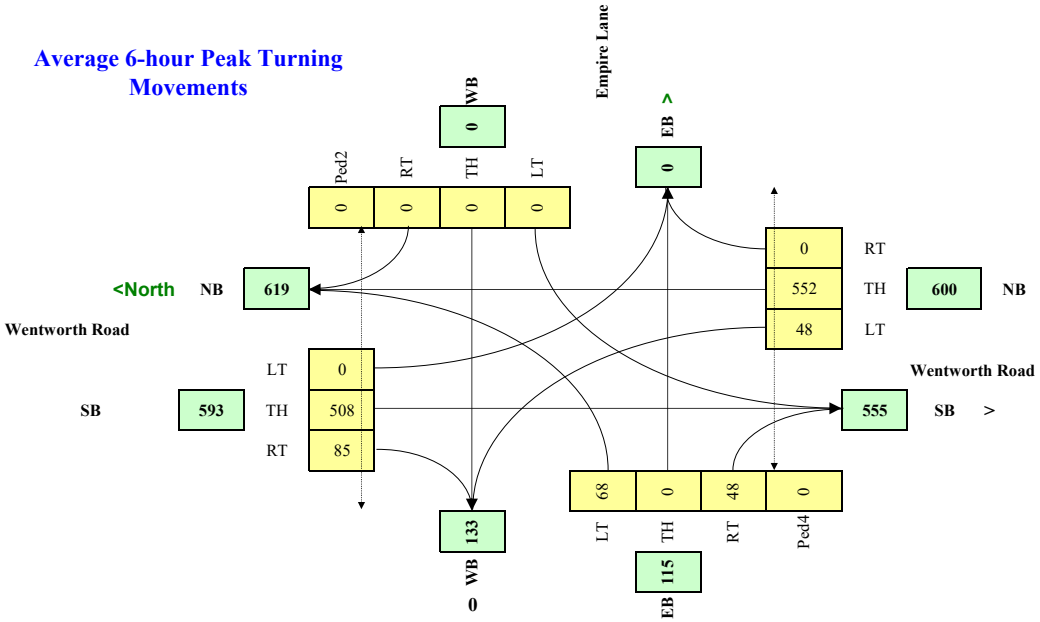
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Wentworth Road	NS	50	2.0%	n	0.0
Empire Lane	EW	50	2.0%	n	

	Ped3	Ped1	Ped2	Ped4
	NS	NS	EW	EW
	W Side	E Side	N Side	S side
7:00 - 8:00	1	0	0	0
8:00 - 9:00	4	0	0	0
11:30 - 12:30	5	0	0	0
12:30 - 13:30	4	0	0	0
15:30 - 16:30	6	0	0	0
16:30 - 17:30	1	0	1	0
Total (6-hour peak)	**21**	**0**	**1**	**0**
Average (6-hour peak)	**4**	**0**	**0**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	50	770	0	0	600	90	0	0	0	35	0	35
8:00 - 9:00	40	580	0	0	450	70	0	0	0	30	0	25
11:30 - 12:30	30	360	0	0	330	55	0	0	0	45	0	30
12:30 - 13:30	30	360	0	0	330	55	0	0	0	45	0	30
15:30 - 16:30	65	570	0	0	615	110	0	0	0	115	0	75
16:30 - 17:30	75	670	0	0	720	130	0	0	0	135	0	90
Total (6-hour peak)	**290**	**3,310**	**0**	**0**	**3,045**	**510**	**0**	**0**	**0**	**405**	**0**	**285**
Average (6-hour peak)	**48**	**552**	**0**	**0**	**508**	**85**	**0**	**0**	**0**	**68**	**0**	**48**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	62	62	0
		Veh	*Ped*

NOT Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-6 - Wentworth Road at Empire Lane

Scenario 3 - 2030 With Payzant Drive Connector Open

Main Street (name)	Wentworth Road	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Empire Lane	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Wentworth Road	NB	1		1			850	1	
Wentworth Road	SB				1		300	1	
	WB								
Empire Lane	EB	1				1			

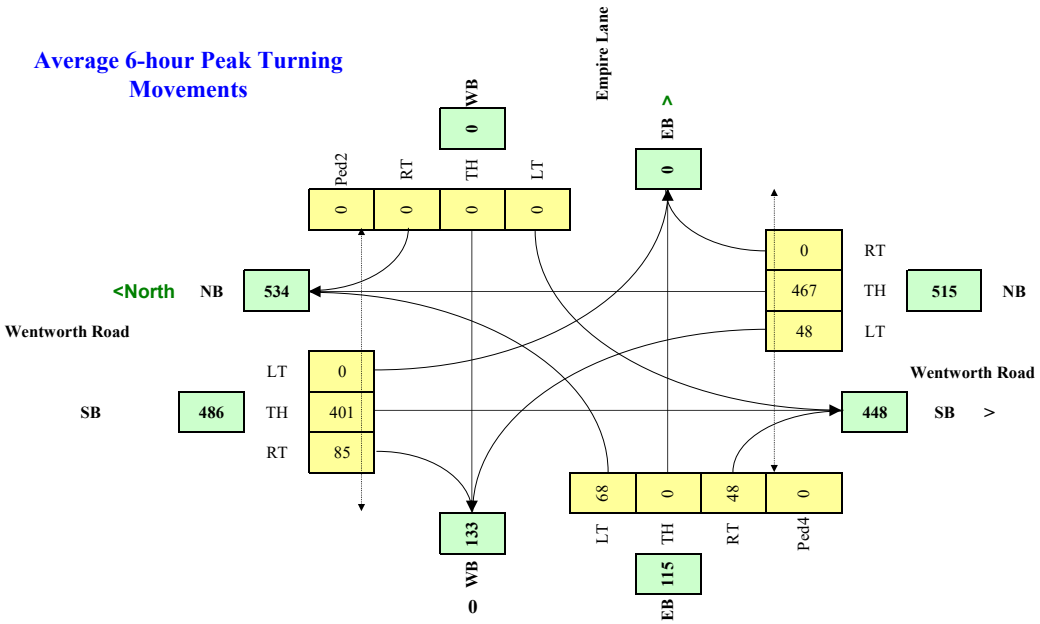
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Wentworth Road	NS	50	2.0%	n	0.0
Empire Lane	EW	50	2.0%	n	

	Ped3	Ped1	Ped2	Ped4
	NS	NS	EW	EW
	W Side	E Side	N Side	S side
7:00 - 8:00	1	0	0	0
8:00 - 9:00	4	0	0	0
11:30 - 12:30	5	0	0	0
12:30 - 13:30	4	0	0	0
15:30 - 16:30	6	0	0	0
16:30 - 17:30	1	0	1	0
Total (6-hour peak)	**21**	**0**	**1**	**0**
Average (6-hour peak)	**4**	**0**	**0**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	50	655	0	0	480	90	0	0	0	35	0	35
8:00 - 9:00	40	490	0	0	360	70	0	0	0	30	0	25
11:30 - 12:30	30	305	0	0	260	55	0	0	0	45	0	30
12:30 - 13:30	30	305	0	0	260	55	0	0	0	45	0	30
15:30 - 16:30	65	480	0	0	480	110	0	0	0	115	0	75
16:30 - 17:30	75	565	0	0	565	130	0	0	0	135	0	90
Total (6-hour peak)	**290**	**2,800**	**0**	**0**	**2,405**	**510**	**0**	**0**	**0**	**405**	**0**	**285**
Average (6-hour peak)	**48**	**467**	**0**	**0**	**401**	**85**	**0**	**0**	**0**	**68**	**0**	**48**

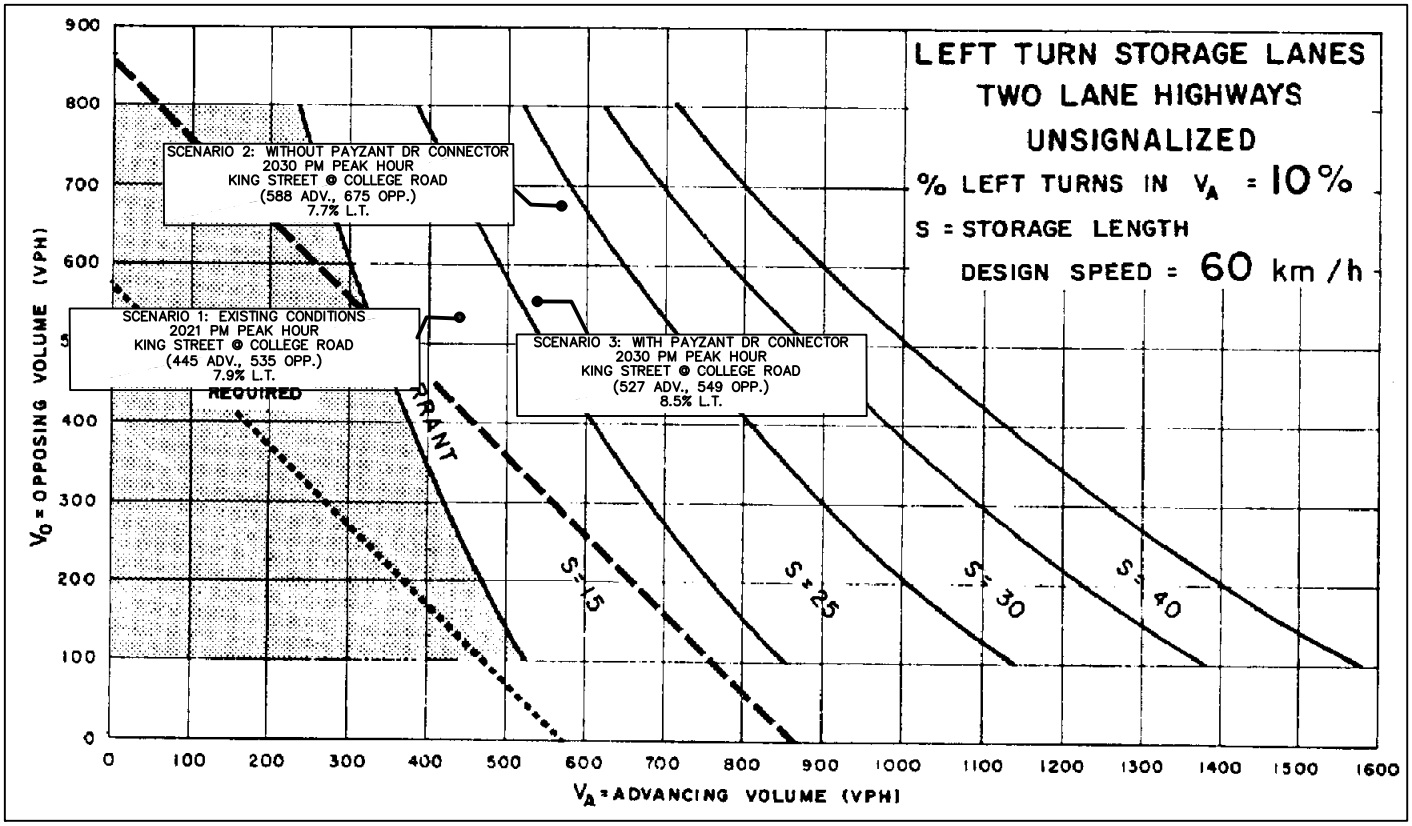
Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	50	50	0
		Veh	*Ped*

NOT Warranted



WSP	Intersection Infrastructure Needs Assessment Windsor, NS	Figure B-1
	Left Turn Lane Warrants Intersection #3: King Street at College Road AM and PM Peak Hours	August 2021

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-8 - King Street at College Road

Scenario 2 - 2030 Without Payzant Drive Connector Open

Main Street (name)	King Street	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	College Road	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
King Street	NB	1		1			999	1	
King Street	SB				1		999	1	
	WB								
College Road	EB			1					

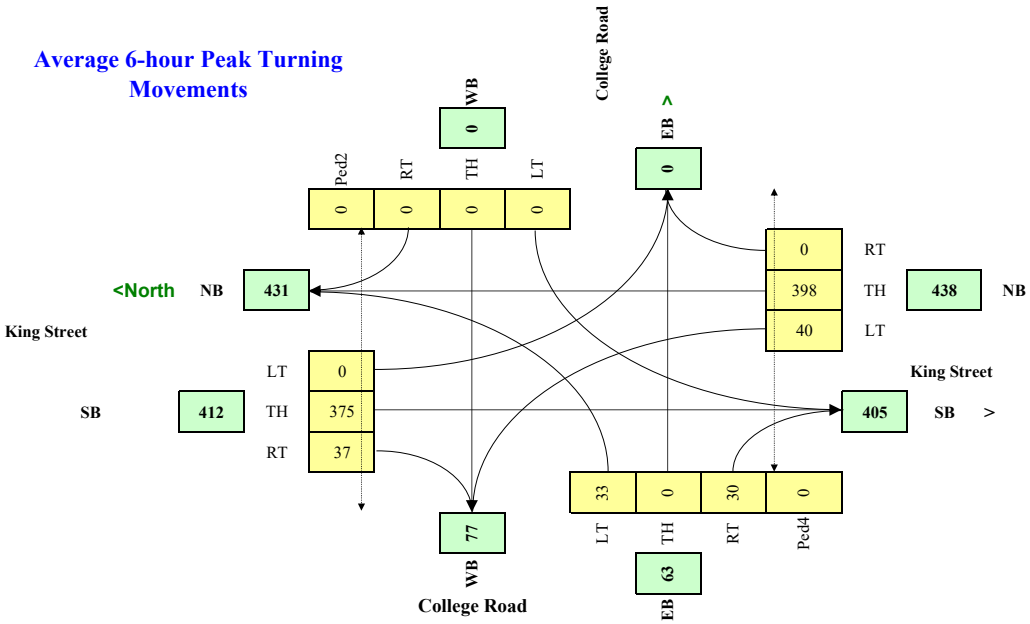
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
King Street	NS	50	2.0%	n	0.0
College Road	EW	50	2.0%	n	

	Ped3 NS W Side	Ped1 NS E Side	Ped2 EW N Side	Ped4 EW S side
7:00 - 8:00	0	0	0	0
8:00 - 9:00	0	1	0	0
11:30 - 12:30	0	3	0	0
12:30 - 13:30	0	1	0	0
15:30 - 16:30	0	2	0	0
16:30 - 17:30	0	1	0	0
Total (6-hour peak)	**0**	**8**	**0**	**0**
Average (6-hour peak)	**0**	**1**	**0**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	60	490	0	0	350	40	0	0	0	40	0	40
8:00 - 9:00	45	370	0	0	260	30	0	0	0	30	0	30
11:30 - 12:30	25	260	0	0	245	25	0	0	0	20	0	20
12:30 - 13:30	25	260	0	0	245	25	0	0	0	20	0	20
15:30 - 16:30	40	460	0	0	530	45	0	0	0	40	0	30
16:30 - 17:30	45	545	0	0	620	55	0	0	0	50	0	40
Total (6-hour peak)	**240**	**2,385**	**0**	**0**	**2,250**	**220**	**0**	**0**	**0**	**200**	**0**	**180**
Average (6-hour peak)	**40**	**398**	**0**	**0**	**375**	**37**	**0**	**0**	**0**	**33**	**0**	**30**

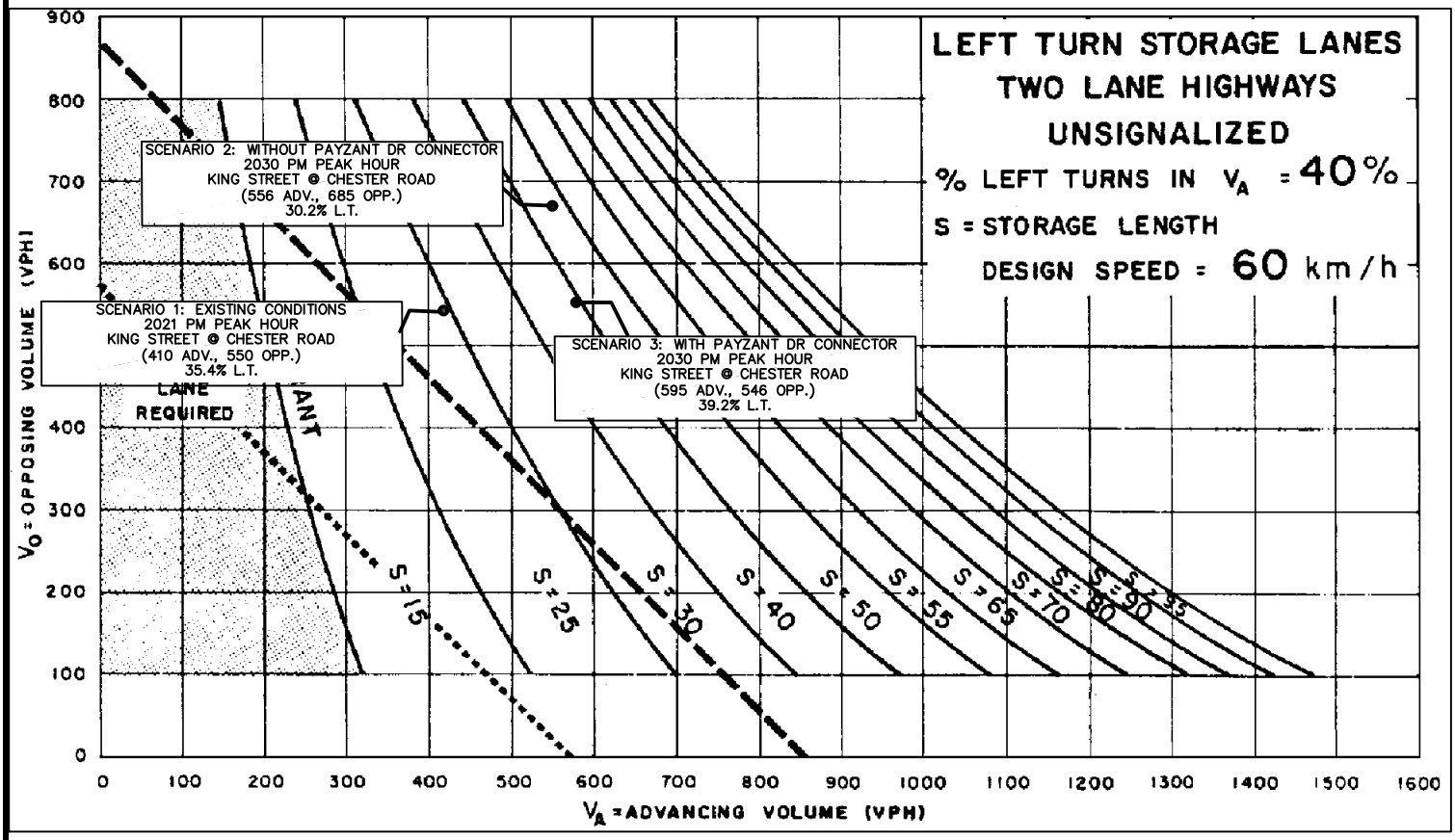
Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	29	29	0
		Veh	*Ped*

Not Warranted - Vs<75



4-LEG INTERSECTION

WSP	Intersection Infrastructure Needs Assessment Windsor, NS	Figure B-2
	Left Turn Lane Warrants Intersection #4: King Street at Chester Road AM and PM Peak Hours	August 2021

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-10 - King Street at Chester Road

Scenario 2 - 2030 Without Payzant Drive Connector Open

Main Street (name)	King Street	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Chester Road	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
King Street	NB	1		1			999	1	
King Street	SB				1		999	1	
	WB								
Chester Road	EB		1			1			

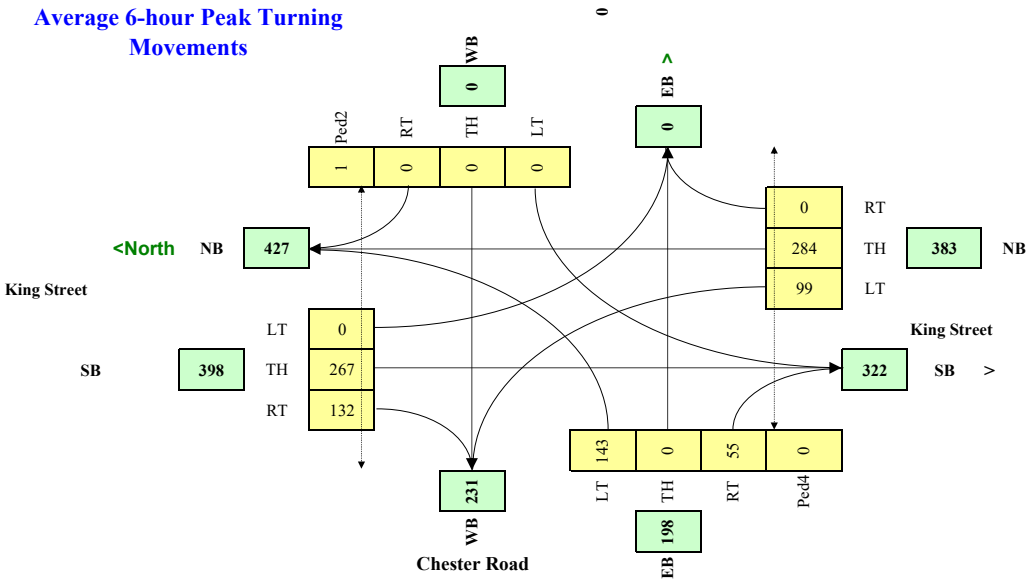
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
King Street	NS	50	2.0%	n	0.0
Chester Road	EW	50	2.0%	n	

	Ped3 NS W Side	Ped1 NS E Side	Ped2 EW N Side	Ped4 EW S side
7:00 - 8:00	0	0	0	0
8:00 - 9:00	0	0	0	0
11:30 - 12:30	0	0	1	0
12:30 - 13:30	0	0	0	0
15:30 - 16:30	0	0	1	0
16:30 - 17:30	0	0	5	0
Total (6-hour peak)	**0**	**0**	**7**	**0**
Average (6-hour peak)	**0**	**0**	**1**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	90	360	0	0	270	75	0	0	0	215	0	60
8:00 - 9:00	70	270	0	0	205	55	0	0	0	160	0	45
11:30 - 12:30	65	185	0	0	175	85	0	0	0	95	0	35
12:30 - 13:30	65	185	0	0	175	85	0	0	0	95	0	35
15:30 - 16:30	140	325	0	0	355	225	0	0	0	135	0	70
16:30 - 17:30	165	380	0	0	420	265	0	0	0	155	0	85
Total (6-hour peak)	**595**	**1,705**	**0**	**0**	**1,600**	**790**	**0**	**0**	**0**	**855**	**0**	**330**
Average (6-hour peak)	**99**	**284**	**0**	**0**	**267**	**132**	**0**	**0**	**0**	**143**	**0**	**55**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	83	82	1
		Veh	*Ped*

NOT Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-11 - King Street at Chester Road

Scenario 3 - 2030 With Payzant Drive Connector Open

Main Street (name)	King Street	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Chester Road	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
King Street	NB	1		1			999	1	
King Street	SB				1		999	1	
	WB								
Chester Road	EB	1			1				

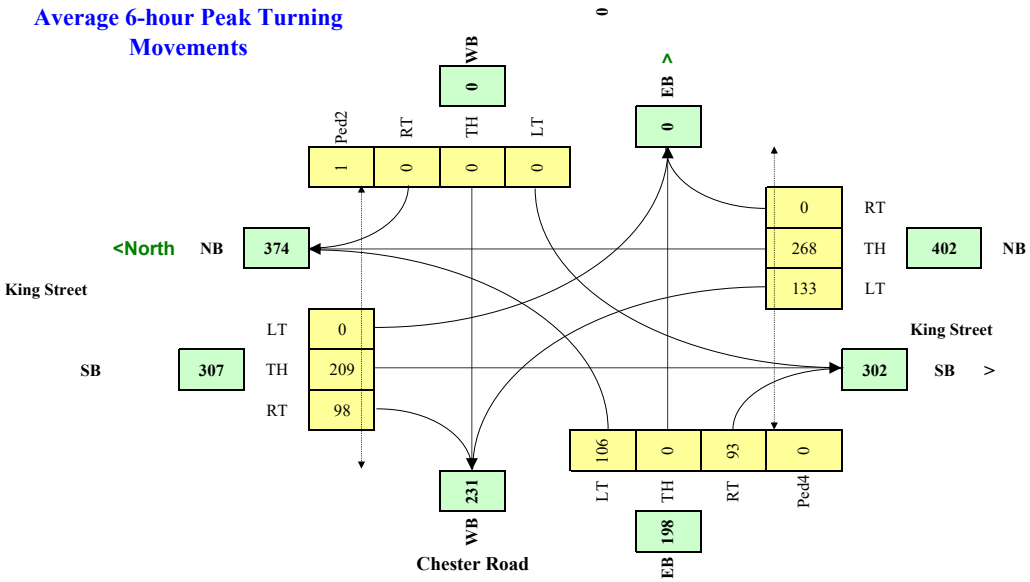
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
King Street	NS	50	2.0%	n	0.0
Chester Road	EW	50	2.0%	n	

	Ped3 NS W Side	Ped1 NS E Side	Ped2 EW N Side	Ped4 EW S side
7:00 - 8:00	0	0	0	0
8:00 - 9:00	0	0	0	0
11:30 - 12:30	0	0	1	0
12:30 - 13:30	0	0	0	0
15:30 - 16:30	0	0	1	0
16:30 - 17:30	0	0	5	0
Total (6-hour peak)	**0**	**0**	**7**	**0**
Average (6-hour peak)	**0**	**0**	**1**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	110	335	0	0	180	55	0	0	0	160	0	115
8:00 - 9:00	85	255	0	0	135	40	0	0	0	120	0	85
11:30 - 12:30	85	175	0	0	135	65	0	0	0	70	0	60
12:30 - 13:30	85	175	0	0	135	65	0	0	0	70	0	60
15:30 - 16:30	200	310	0	0	310	165	0	0	0	100	0	110
16:30 - 17:30	235	360	0	0	360	195	0	0	0	115	0	125
Total (6-hour peak)	**800**	**1,610**	**0**	**0**	**1,255**	**585**	**0**	**0**	**0**	**635**	**0**	**555**
Average (6-hour peak)	**133**	**268**	**0**	**0**	**209**	**98**	**0**	**0**	**0**	**106**	**0**	**93**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	67	66	1
		Veh	*Ped*

NOT Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-12 - King Street at Chester Road / Cottage Street

Scenario 2 - 2030 Without Payzant Drive Connector Open

Main Street (name)	King Street	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Chester Road	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
King Street	NB	1		1			999	1	
King Street	SB	1		1		1	999	1	
Cottage Road	WB			1					
Chester Road	EB	1			1				

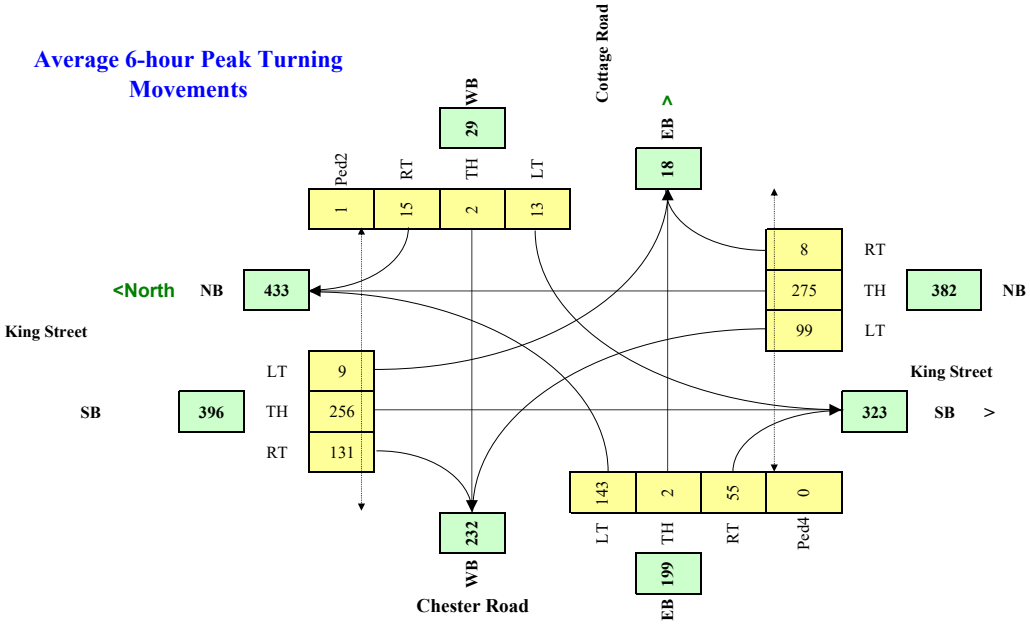
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
King Street	NS	50	2.0%	n	0.0
Chester Road	EW	50	2.0%	n	

	Ped3 NS W Side	Ped1 NS E Side	Ped2 EW N Side	Ped4 EW S side
7:00 - 8:00	0	0	0	0
8:00 - 9:00	0	0	0	0
11:30 - 12:30	0	0	1	0
12:30 - 13:30	0	0	0	0
15:30 - 16:30	0	0	1	0
16:30 - 17:30	0	0	5	0
Total (6-hour peak)	**0**	**0**	**7**	**0**
Average (6-hour peak)	**0**	**0**	**1**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	90	340	15	15	265	75	5	0	15	215	5	60
8:00 - 9:00	70	255	10	10	200	55	5	0	10	160	5	45
11:30 - 12:30	65	180	5	5	165	85	10	0	10	95	0	35
12:30 - 13:30	65	180	5	5	165	85	10	0	10	95	0	35
15:30 - 16:30	140	320	5	10	340	225	20	5	20	135	0	70
16:30 - 17:30	165	375	5	10	400	260	25	5	25	155	0	85
Total (6-hour peak)	**595**	**1,650**	**45**	**55**	**1,535**	**785**	**75**	**10**	**90**	**855**	**10**	**330**
Average (6-hour peak)	**99**	**275**	**8**	**9**	**256**	**131**	**13**	**2**	**15**	**143**	**2**	**55**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	91	90	1
		Veh	*Ped*

NOT Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-13 - King Street at Chester Road / Cottage Street

Scenario 3 - 2030 With Payzant Drive Connector Open

Main Street (name)	King Street	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Chester Road	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
King Street	NB	1		1			999	1	
King Street	SB	1		1		1	999	1	
Cottage Road	WB			1					
Chester Road	EB	1				1			

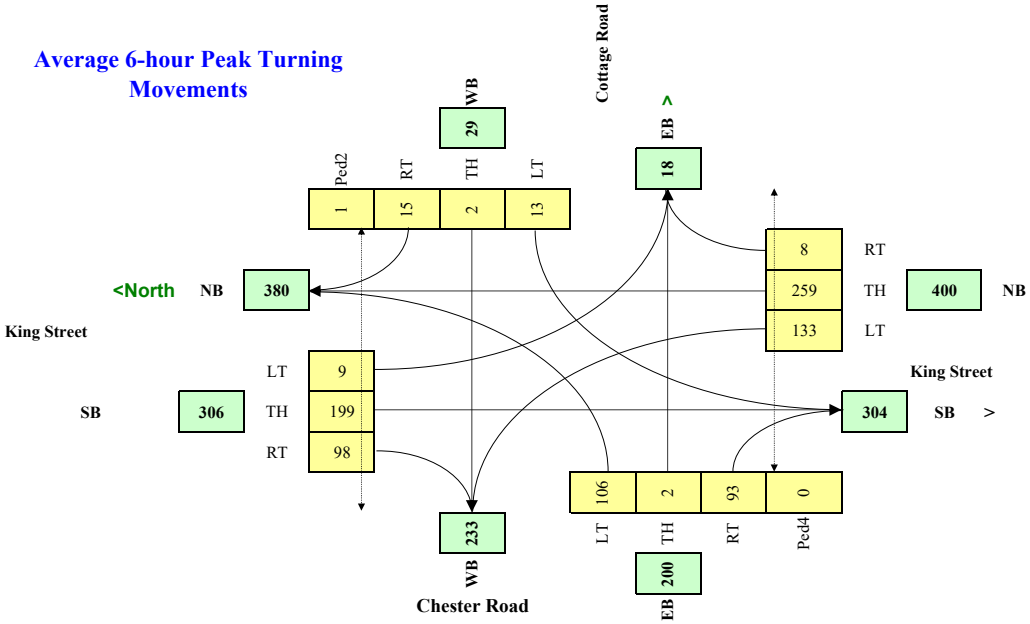
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
King Street	NS	50	2.0%	n	0.0
Chester Road	EW	50	2.0%	n	

	Ped3 NS W Side	Ped1 NS E Side	Ped2 EW N Side	Ped4 EW S side
7:00 - 8:00	0	0	0	0
8:00 - 9:00	0	0	0	0
11:30 - 12:30	0	0	1	0
12:30 - 13:30	0	0	0	0
15:30 - 16:30	0	0	1	0
16:30 - 17:30	0	0	5	0
Total (6-hour peak)	**0**	**0**	**7**	**0**
Average (6-hour peak)	**0**	**0**	**1**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	110	315	15	15	175	55	5	0	15	160	5	115
8:00 - 9:00	85	240	10	10	130	40	5	0	10	120	5	85
11:30 - 12:30	85	170	5	5	130	65	10	0	10	70	0	60
12:30 - 13:30	85	170	5	5	130	65	10	0	10	70	0	60
15:30 - 16:30	200	305	5	10	290	165	20	5	20	100	0	110
16:30 - 17:30	235	355	5	10	340	195	25	5	25	115	0	125
Total (6-hour peak)	**800**	**1,555**	**45**	**55**	**1,195**	**585**	**75**	**10**	**90**	**635**	**10**	**555**
Average (6-hour peak)	**133**	**259**	**8**	**9**	**199**	**98**	**13**	**2**	**15**	**106**	**2**	**93**

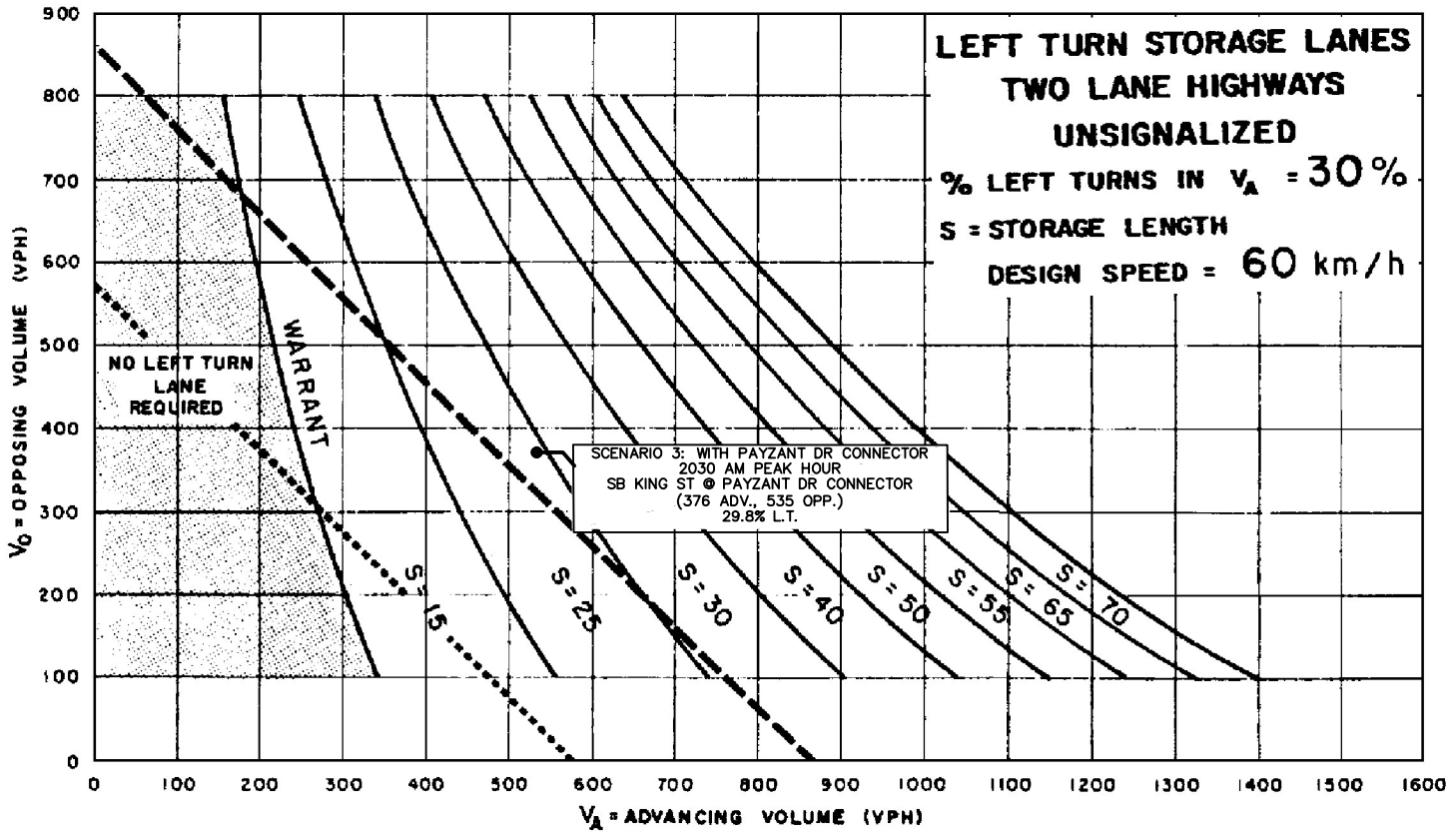
Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	75	74	1
		Veh	*Ped*

NOT Warranted



WSP	Intersection Infrastructure Needs Assessment Windsor, NS	Figure B-3
	Left Turn Lane Warrant Intersection #5: King Street at Payzant Drive Connector AM and PM Peak Hours	August 2021

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-15 - King Street at Payzant Drive Connector

Scenario 3 - 2030 With Payzant Drive Connector Open

Main Street (name)	King Street	Direction (EW or NS)	NS	Date:	August 2021
Side Street (name)	Payzant Drive	Direction (EW or NS)	EW	City:	Windsor, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
King Street	NB			1			999	1	
King Street	SB	1		1			999	1	
Payzant Drive	WB			1					
	EB								

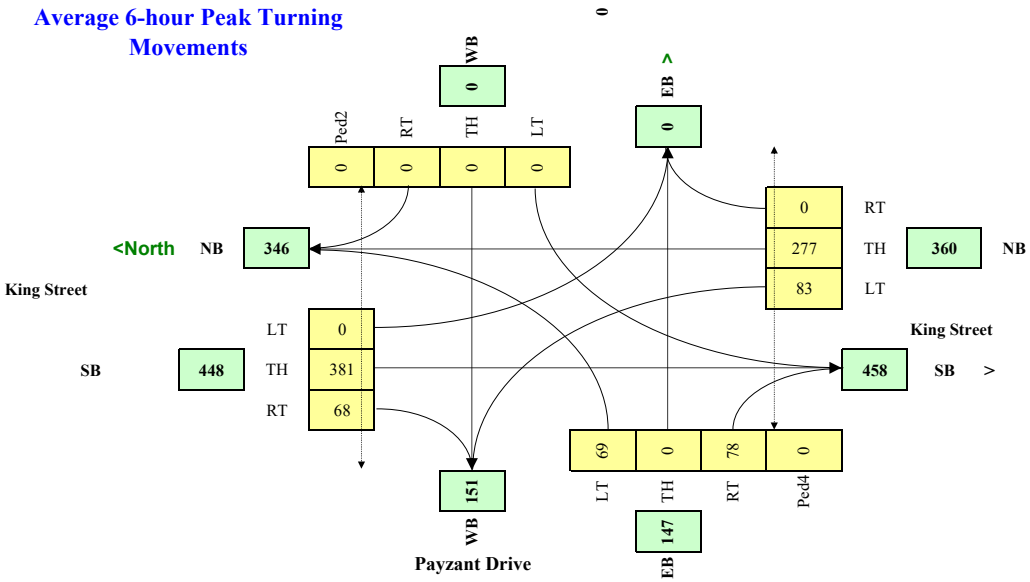
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
King Street	NS	50	2.0%	n	0.0
Payzant Drive	EW	50	2.0%	n	

	Ped3 NS W Side	Ped1 NS E Side	Ped2 EW N Side	Ped4 EW S side
7:00 - 8:00	0	0	0	0
8:00 - 9:00	0	0	0	0
11:30 - 12:30	0	0	0	0
12:30 - 13:30	0	0	0	0
15:30 - 16:30	0	0	0	0
16:30 - 17:30	0	0	0	0
Total (6-hour peak)	**0**	**0**	**0**	**0**
Average (6-hour peak)	**0**	**0**	**0**	**0**

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	16,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	110	265	0	0	450	90	0	0	0	100	0	80
8:00 - 9:00	85	200	0	0	335	70	0	0	0	75	0	60
11:30 - 12:30	55	180	0	0	250	45	0	0	0	45	0	50
12:30 - 13:30	55	180	0	0	250	45	0	0	0	45	0	50
15:30 - 16:30	90	385	0	0	460	70	0	0	0	70	0	105
16:30 - 17:30	105	450	0	0	540	85	0	0	0	80	0	120
Total (6-hour peak)	**500**	**1,660**	**0**	**0**	**2,285**	**405**	**0**	**0**	**0**	**415**	**0**	**465**
Average (6-hour peak)	**83**	**277**	**0**	**0**	**381**	**68**	**0**	**0**	**0**	**69**	**0**	**78**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F(X_{v\text{-}p}) L) / K_2] \times C_i$$

W =	60	60	0
		Veh	*Ped*

NOT Warranted

APPENDIX

C

INTERSECTION PERFORMANCE ANALYSIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	65	1	170	1	395	230	295	420	5
Future Volume (Veh/h)	1	1	1	65	1	170	1	395	230	295	420	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	1	71	1	185	1	429	250	321	457	5
Pedestrians		5			5						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1728	1792	464	1662	1670	564	467			684		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1728	1792	464	1662	1670	564	467			684		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	100	0	98	64	100			65		
cM capacity (veh/h)	32	52	595	55	61	521	1090			905		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	3	71	186	1	679	321	462
Volume Left	1	71	0	1	0	321	0
Volume Right	1	0	185	0	250	0	5
cSH	57	55	501	1090	1700	905	1700
Volume to Capacity	0.05	1.30	0.37	0.00	0.40	0.35	0.27
Queue Length 95th (m)	1.3	50.3	13.6	0.0	0.0	12.9	0.0
Control Delay (s)	71.7	345.9	16.4	8.3	0.0	11.1	0.0
Lane LOS	F	F	C	A		B	
Approach Delay (s)	71.7	107.4		0.0		4.6	
Approach LOS	F	F					

Intersection Summary				
Average Delay	18.2			
Intersection Capacity Utilization	72.8%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	5	110	5	165	5	495	55	80	490	5
Future Volume (Veh/h)	5	1	5	110	5	165	5	495	55	80	490	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	5	120	5	179	5	538	60	87	533	5
Pedestrians		5			5						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1449	1328	540	1296	1300	578	543			603		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1449	1328	540	1296	1300	578	543			603		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	99	99	5	97	65	100			91		
cM capacity (veh/h)	63	139	539	126	145	511	1022			971		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	11	120	184	5	598	87	538
Volume Left	5	120	0	5	0	87	0
Volume Right	5	0	179	0	60	0	5
cSH	115	126	478	1022	1700	971	1700
Volume to Capacity	0.10	0.95	0.38	0.00	0.35	0.09	0.32
Queue Length 95th (m)	2.5	50.8	14.3	0.1	0.0	2.4	0.0
Control Delay (s)	39.6	134.2	17.2	8.5	0.0	9.1	0.0
Lane LOS	E	F	C	A		A	
Approach Delay (s)	39.6	63.4		0.1		1.3	
Approach LOS	E	F					

Intersection Summary

Average Delay	13.3		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	5	40	215	1	271	60	407	311	357	449	35
Future Volume (vph)	34	5	40	215	1	271	60	407	311	357	449	35
Satd. Flow (prot)	1770	1563	0	1770	1530	0	1770	1715	0	1770	1838	0
Flt Permitted	0.579			0.507			0.469			0.081		
Satd. Flow (perm)	1079	1563	0	944	1530	0	874	1715	0	151	1838	0
Satd. Flow (RTOR)		43			295			42			7	
Lane Group Flow (vph)	37	48	0	234	296	0	65	780	0	388	526	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Total Split (s)	24.0	24.0		13.0	37.0		51.0	51.0		22.0	73.0	
Total Lost Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		4.0	6.0	
Act Effct Green (s)	11.6	11.6		23.7	21.7		45.2	45.2		69.3	67.3	
Actuated g/C Ratio	0.11	0.11		0.23	0.21		0.45	0.45		0.69	0.67	
v/c Ratio	0.30	0.22		0.78	0.53		0.17	0.99		0.99	0.43	
Control Delay	48.6	17.1		52.6	7.5		20.3	57.6		73.3	10.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	48.6	17.1		52.6	7.5		20.3	57.6		73.3	10.1	
LOS	D	B		D	A		C	E		E	B	
Approach Delay		30.8			27.4			54.7			36.9	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	7.3	1.0		42.6	0.2		8.0	152.3		~64.4	46.7	
Queue Length 95th (m)	17.7	11.7		66.5	20.6		19.5	#267.2		#142.7	85.2	
Internal Link Dist (m)		208.9			175.7			168.9			157.6	
Turn Bay Length (m)	40.0			75.0			30.0			85.0		
Base Capacity (vph)	193	314		301	675		390	790		392	1226	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.15		0.78	0.44		0.17	0.99		0.99	0.43	

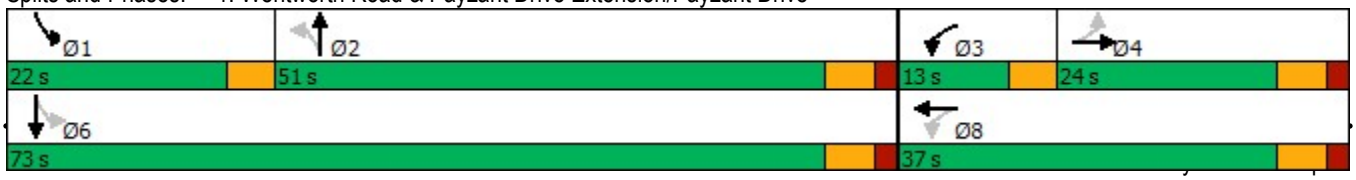
Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 101.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 40.9 — Intersection LOS: D
Intersection Capacity Utilization 102.0% — ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Wentworth Road & Payzant Drive Extension/Payzant Drive

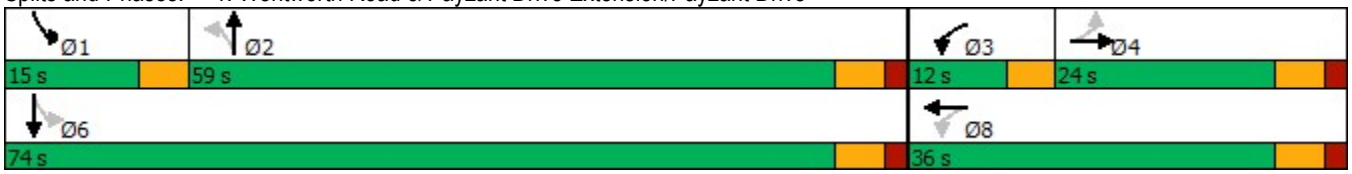


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	5	71	224	5	238	51	535	217	169	509	35
Future Volume (vph)	84	5	71	224	5	238	51	535	217	169	509	35
Satd. Flow (prot)	1770	1548	0	1770	1534	0	1770	1765	0	1770	1840	0
Flt Permitted	0.596			0.546			0.441			0.079		
Satd. Flow (perm)	1110	1548	0	1017	1534	0	821	1765	0	147	1840	0
Satd. Flow (RTOR)		77			259			26			6	
Lane Group Flow (vph)	91	82	0	243	264	0	55	818	0	184	591	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Total Split (s)	24.0	24.0		12.0	36.0		59.0	59.0		15.0	74.0	
Total Lost Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		4.0	6.0	
Act Effct Green (s)	13.8	13.8		27.9	25.9		49.4	49.4		66.1	64.1	
Actuated g/C Ratio	0.14	0.14		0.27	0.25		0.48	0.48		0.65	0.63	
v/c Ratio	0.61	0.30		0.72	0.45		0.14	0.94		0.70	0.51	
Control Delay	60.5	13.6		46.3	7.0		16.3	45.0		33.4	12.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	60.5	13.6		46.3	7.0		16.3	45.0		33.4	12.5	
LOS	E	B		D	A		B	D		C	B	
Approach Delay		38.3			25.9			43.2			17.4	
Approach LOS		D			C			D			B	
Queue Length 50th (m)	19.0	1.0		45.1	0.8		6.2	153.4		19.1	61.0	
Queue Length 95th (m)	36.5	14.7		#70.2	20.8		14.9	#255.1		#53.1	97.6	
Internal Link Dist (m)		208.9			175.7			168.9			157.6	
Turn Bay Length (m)	45.0			75.0			30.0			85.0		
Base Capacity (vph)	197	338		337	636		429	935		271	1237	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.46	0.24		0.72	0.42		0.13	0.87		0.68	0.48	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 102.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 93.1% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

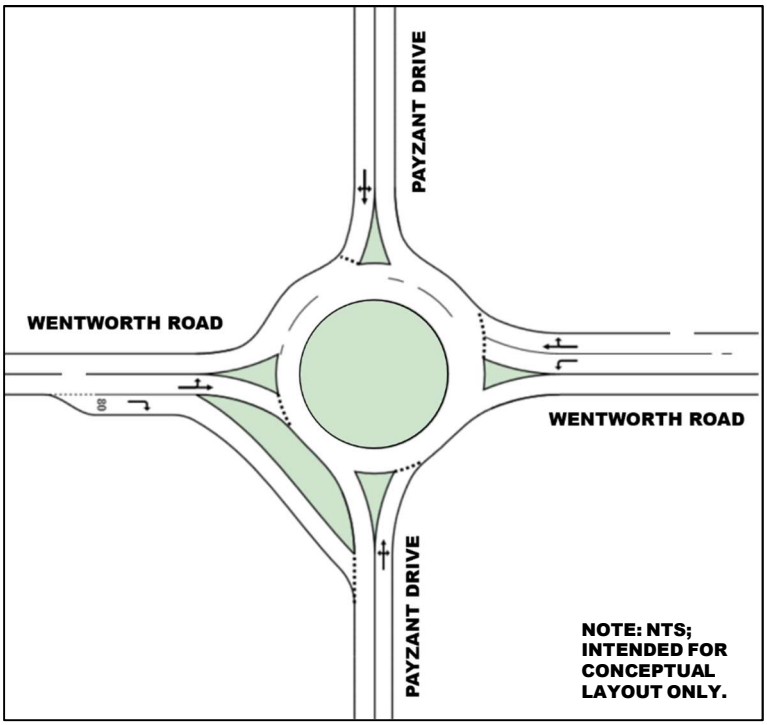
Splits and Phases: 1: Wentworth Road & Payzant Drive Extension/Payzant Drive



ARCADY ANALYSIS – 2030 AM & PM PEAK HOUR

Scenario 2

Wentworth Road at Payzant Drive *Without* Payzant Drive Connector



Arm	V- Approach Road half-width (m)	E-Entry Width (m)	l'- Effective flare length (m)	R – Entry Radius (m)	D – Inscribed circle diameter (m)	PHI – Conflict (entry) angle (deg)
Wentworth Rd SB	3.5	7.5	60	30	60	20
Wentworth Rd NB	3.5	3.5	0	30	60	20
Payzant Dr WB	3.5	3.5	0	30	60	20
Payzant Dr EB	3.5	3.5	0	30	60	20

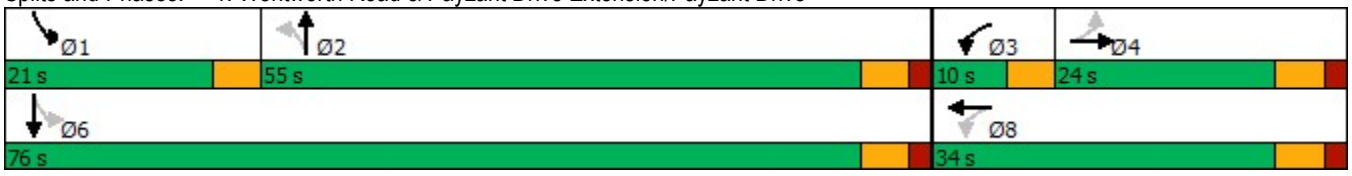
LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement				Overall Intersection	
	Payzant Drive		Wentworth Road			
	EB	WB	NB	SB	Delay	LOS
Scenario 2 - 2030 AM Peak Hour ***without*** Payzant Drive Connection						
Delay	7.8	9.9	10.1	3.9	7.4	A
LOS	A	A	B	A		
v/c	0.15	0.55	0.59	0.51		
Queue	3.5	19.6	17.5	10.5		
Scenario 2 - 2030 PM Peak Hour ***without*** Payzant Drive Connection						
Delay	8.6	18.0	12.8	3.5	10.3	B
LOS	A	C	B	A		
v/c	0.29	0.72	0.70	0.45		
Queue	11.2	79.8	56.0	13.3		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	10	38	111	4	232	56	390	216	285	435	35
Future Volume (vph)	31	10	38	111	4	232	56	390	216	285	435	35
Satd. Flow (prot)	1770	1598	0	1770	1532	0	1770	1742	0	1770	1837	0
Flt Permitted	0.601			0.540			0.475			0.140		
Satd. Flow (perm)	1120	1598	0	1006	1532	0	885	1742	0	261	1837	0
Satd. Flow (RTOR)		41			252			33			7	
Lane Group Flow (vph)	34	52	0	121	256	0	61	659	0	310	511	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Total Split (s)	24.0	24.0		10.0	34.0		55.0	55.0		21.0	76.0	
Total Lost Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		4.0	6.0	
Act Effct Green (s)	11.8	11.8		21.4	19.3		36.3	36.3		56.2	54.1	
Actuated g/C Ratio	0.14	0.14		0.25	0.22		0.42	0.42		0.65	0.63	
v/c Ratio	0.22	0.20		0.40	0.48		0.16	0.88		0.76	0.44	
Control Delay	42.8	18.6		33.6	7.9		17.8	36.3		27.6	9.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	42.8	18.6		33.6	7.9		17.8	36.3		27.6	9.7	
LOS	D	B		C	A		B	D		C	A	
Approach Delay		28.2			16.1			34.7			16.5	
Approach LOS		C			B			C			B	
Queue Length 50th (m)	5.6	1.8		17.2	0.6		6.3	95.6		26.0	40.2	
Queue Length 95th (m)	16.5	13.4		37.7	20.9		17.2	#190.7		#74.8	75.4	
Internal Link Dist (m)		208.9			175.7			168.9			157.6	
Turn Bay Length (m)	40.0			75.0			30.0			85.0		
Base Capacity (vph)	247	384		306	691		531	1060		485	1486	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.14		0.40	0.37		0.11	0.62		0.64	0.34	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 86.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 23.5 Intersection LOS: C
Intersection Capacity Utilization 88.8% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Wentworth Road & Payzant Drive Extension/Payzant Drive

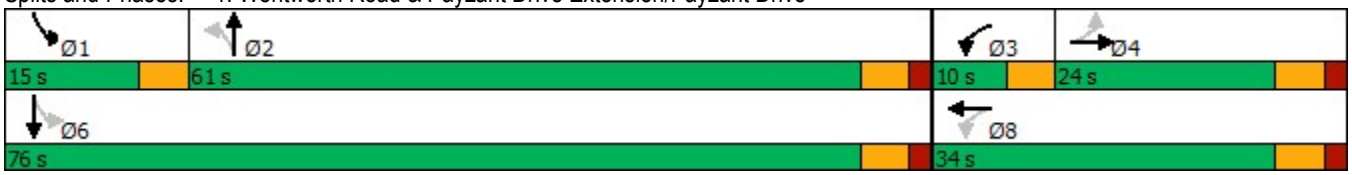


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	12	66	95	8	204	48	520	127	111	488	35
Future Volume (vph)	82	12	66	95	8	204	48	520	127	111	488	35
Satd. Flow (prot)	1770	1578	0	1770	1541	0	1770	1796	0	1770	1840	0
Flt Permitted	0.615			0.538			0.451			0.131		
Satd. Flow (perm)	1146	1578	0	1002	1541	0	840	1796	0	244	1840	0
Satd. Flow (RTOR)		72			222			16			6	
Lane Group Flow (vph)	89	85	0	103	231	0	52	703	0	121	568	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Total Split (s)	24.0	24.0		10.0	34.0		61.0	61.0		15.0	76.0	
Total Lost Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		4.0	6.0	
Act Effct Green (s)	13.1	13.1		22.8	20.7		38.7	38.7		55.5	53.4	
Actuated g/C Ratio	0.15	0.15		0.26	0.24		0.45	0.45		0.64	0.62	
v/c Ratio	0.51	0.28		0.32	0.43		0.14	0.87		0.35	0.50	
Control Delay	49.6	15.3		30.4	7.8		15.6	33.8		9.7	11.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	49.6	15.3		30.4	7.8		15.6	33.8		9.7	11.4	
LOS	D	B		C	A		B	C		A	B	
Approach Delay		32.8			14.8			32.5			11.1	
Approach LOS		C			B			C			B	
Queue Length 50th (m)	14.8	2.0		13.9	1.2		5.2	105.8		7.6	51.0	
Queue Length 95th (m)	35.3	16.6		32.4	20.9		13.3	172.6		16.3	87.5	
Internal Link Dist (m)		208.9			175.7			168.9			157.6	
Turn Bay Length (m)	45.0			75.0			30.0			85.0		
Base Capacity (vph)	248	399		319	667		557	1196		358	1493	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.21		0.32	0.35		0.09	0.59		0.34	0.38	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 86.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 22.0
Intersection LOS: C
Intersection Capacity Utilization 84.0%
ICU Level of Service E
Analysis Period (min) 15

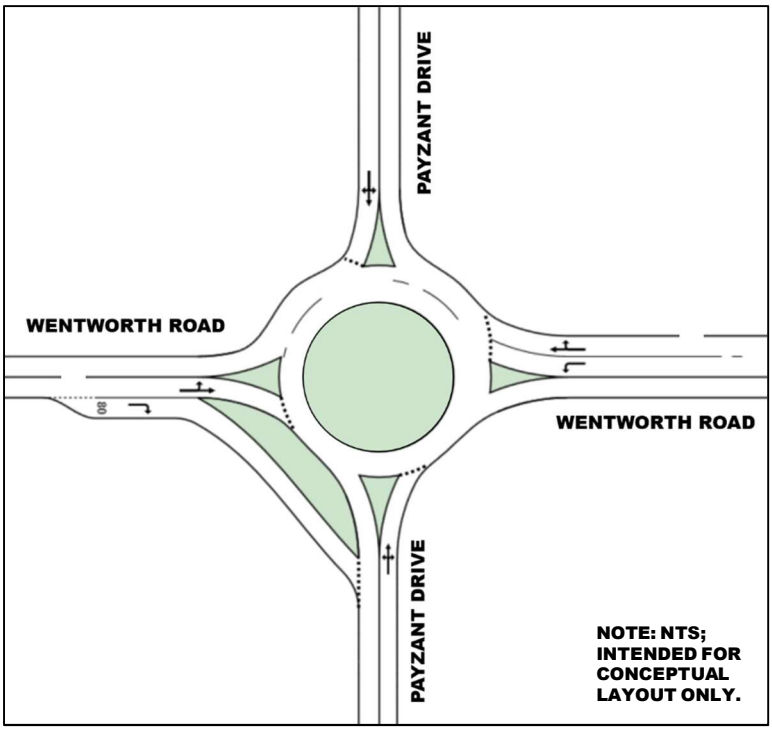
Splits and Phases: 1: Wentworth Road & Payzant Drive Extension/Payzant Drive



ARCADY ANALYSIS – 2030 AM & PM PEAK HOUR

Scenario 3

Wentworth Road at Payzant Drive *With* Payzant Drive Connector



Arm	V- Approach Road half-width (m)	E-Entry Width (m)	l'- Effective flare length (m)	R – Entry Radius (m)	D – Inscribed circle diameter (m)	PHI – Conflict (entry) angle (deg)
Wentworth Rd SB	3.5	7.5	60	30	60	20
Wentworth Rd NB	3.5	3.5	0	30	60	20
Payzant Dr WB	3.5	3.5	0	30	60	20
Payzant Dr EB	3.5	3.5	0	30	60	20

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement				Overall Intersection	
	Payzant Drive		Wentworth Road			
	EB	WB	NB	SB	Delay	LOS
Scenario 3 - 2030 AM Peak Hour ***with*** Payzant Drive Connection						
Delay	6.4	7.0	8.7	3.3	6.0	A
LOS	A	A	A	A		
v/c	0.13	0.38	0.54	0.44		
Queue	3.5	19.6	15.4	14.0		
Scenario 3 - 2030 PM Peak Hour ***with*** Payzant Drive Connection						
Delay	6.8	9.3	10.9	2.9	7.3	A
LOS	A	A	B	A		
v/c	0.25	0.47	0.65	0.39		
Queue	9.8	22.4	31.5	18.9		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	25	45	620	390	80
Future Volume (Veh/h)	30	25	45	620	390	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	27	49	674	424	87
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				327		
pX, platoon unblocked						
vC, conflicting volume	1244	472	516			
vC1, stage 1 conf vol	472					
vC2, stage 2 conf vol	772					
vCu, unblocked vol	1244	472	516			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	95	95			
cM capacity (veh/h)	382	589	1045			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	33	27	49	674	511
Volume Left	33	0	49	0	0
Volume Right	0	27	0	0	87
cSH	382	589	1045	1700	1700
Volume to Capacity	0.09	0.05	0.05	0.40	0.30
Queue Length 95th (m)	2.3	1.2	1.2	0.0	0.0
Control Delay (s)	15.3	11.4	8.6	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	13.6		0.6		0.0
Approach LOS	B				

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	120	75	60	435	535	115
Future Volume (Veh/h)	120	75	60	435	535	115
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	82	65	473	582	125
Pedestrians	135					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	11					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				327		
pX, platoon unblocked						
vC, conflicting volume	1382	780	842			
vC1, stage 1 conf vol	780					
vC2, stage 2 conf vol	603					
vCu, unblocked vol	1382	780	842			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	60	77	91			
cM capacity (veh/h)	327	351	704			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	130	82	65	473	707
Volume Left	130	0	65	0	0
Volume Right	0	82	0	0	125
cSH	327	351	704	1700	1700
Volume to Capacity	0.40	0.23	0.09	0.28	0.42
Queue Length 95th (m)	14.7	7.1	2.4	0.0	0.0
Control Delay (s)	23.0	18.4	10.6	0.0	0.0
Lane LOS	C	C	B		
Approach Delay (s)	21.2		1.3		0.0
Approach LOS	C				

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	35	52	771	598	91
Future Volume (Veh/h)	37	35	52	771	598	91
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	38	57	838	650	99
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				327		
pX, platoon unblocked						
vC, conflicting volume	1656	704	754			
vC1, stage 1 conf vol	704					
vC2, stage 2 conf vol	952					
vCu, unblocked vol	1656	704	754			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	91	93			
cM capacity (veh/h)	292	435	853			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	40	38	57	838	749
Volume Left	40	0	57	0	0
Volume Right	0	38	0	0	99
cSH	292	435	853	1700	1700
Volume to Capacity	0.14	0.09	0.07	0.49	0.44
Queue Length 95th (m)	3.7	2.3	1.7	0.0	0.0
Control Delay (s)	19.2	14.1	9.5	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	16.7		0.6		0.0
Approach LOS	C				

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	137	88	75	671	722	132
Future Volume (Veh/h)	137	88	75	671	722	132
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	149	96	82	729	785	143
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				327		
pX, platoon unblocked						
vC, conflicting volume	1754	862	933			
vC1, stage 1 conf vol	862					
vC2, stage 2 conf vol	893					
vCu, unblocked vol	1754	862	933			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	46	73	89			
cM capacity (veh/h)	274	353	731			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	149	96	82	729	928
Volume Left	149	0	82	0	0
Volume Right	0	96	0	0	143
cSH	274	353	731	1700	1700
Volume to Capacity	0.54	0.27	0.11	0.43	0.55
Queue Length 95th (m)	24.0	8.7	3.0	0.0	0.0
Control Delay (s)	32.7	18.9	10.5	0.0	0.0
Lane LOS	D	C	B		
Approach Delay (s)	27.3		1.1		0.0
Approach LOS	D				

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	35	52	655	478	91
Future Volume (Veh/h)	37	35	52	655	478	91
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	38	57	712	520	99
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				327		
pX, platoon unblocked						
vC, conflicting volume	1400	574	624			
vC1, stage 1 conf vol	574					
vC2, stage 2 conf vol	826					
vCu, unblocked vol	1400	574	624			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	93	94			
cM capacity (veh/h)	346	516	953			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	40	38	57	712	619
Volume Left	40	0	57	0	0
Volume Right	0	38	0	0	99
cSH	346	516	953	1700	1700
Volume to Capacity	0.12	0.07	0.06	0.42	0.36
Queue Length 95th (m)	3.1	1.9	1.5	0.0	0.0
Control Delay (s)	16.8	12.5	9.0	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	14.7		0.7		0.0
Approach LOS	B				

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	137	88	75	563	567	132
Future Volume (Veh/h)	137	88	75	563	567	132
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	149	96	82	612	616	143
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				327		
pX, platoon unblocked						
vC, conflicting volume	1468	692	764			
vC1, stage 1 conf vol	692					
vC2, stage 2 conf vol	776					
vCu, unblocked vol	1468	692	764			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	55	78	90			
cM capacity (veh/h)	331	442	845			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	149	96	82	612	759
Volume Left	149	0	82	0	0
Volume Right	0	96	0	0	143
cSH	331	442	845	1700	1700
Volume to Capacity	0.45	0.22	0.10	0.36	0.45
Queue Length 95th (m)	17.9	6.5	2.6	0.0	0.0
Control Delay (s)	24.5	15.4	9.7	0.0	0.0
Lane LOS	C	C	A		
Approach Delay (s)	20.9		1.1		0.0
Approach LOS	C				

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	30	50	410	245	20
Future Volume (Veh/h)	25	30	50	410	245	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	33	54	446	266	22
Pedestrians				5		
Lane Width (m)				3.6		
Walking Speed (m/s)				1.2		
Percent Blockage				0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	831	282	288			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	831	282	288			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	96	96			
cM capacity (veh/h)	325	754	1274			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	500	288
Volume Left	27	54	0
Volume Right	33	0	22
cSH	473	1274	1700
Volume to Capacity	0.13	0.04	0.17
Queue Length 95th (m)	3.5	1.1	0.0
Control Delay (s)	13.7	1.3	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	1.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	25	35	410	500	35
Future Volume (Veh/h)	25	25	35	410	500	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	27	38	446	543	38
Pedestrians				5		
Lane Width (m)				3.6		
Walking Speed (m/s)				1.2		
Percent Blockage				0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1084	567	581			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1084	567	581			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	95	96			
cM capacity (veh/h)	231	521	993			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	54	484	581
Volume Left	27	38	0
Volume Right	27	0	38
cSH	320	993	1700
Volume to Capacity	0.17	0.04	0.34
Queue Length 95th (m)	4.8	1.0	0.0
Control Delay (s)	18.5	1.1	0.0
Lane LOS	C	A	
Approach Delay (s)	18.5	1.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	39	61	492	349	38
Future Volume (Veh/h)	38	39	61	492	349	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	42	66	535	379	41
Pedestrians				5		
Lane Width (m)				3.6		
Walking Speed (m/s)				1.2		
Percent Blockage				0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1066	404	420			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1066	404	420			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	93	94			
cM capacity (veh/h)	232	643	1139			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	83	601	420
Volume Left	41	66	0
Volume Right	42	0	41
cSH	343	1139	1700
Volume to Capacity	0.24	0.06	0.25
Queue Length 95th (m)	7.5	1.5	0.0
Control Delay (s)	18.8	1.5	0.0
Lane LOS	C	A	
Approach Delay (s)	18.8	1.5	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	48	38	45	543	622	53
Future Volume (Veh/h)	48	38	45	543	622	53
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	41	49	590	676	58
Pedestrians				5		
Lane Width (m)				3.6		
Walking Speed (m/s)				1.2		
Percent Blockage				0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1393	710	734			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1393	710	734			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	91	94			
cM capacity (veh/h)	147	432	871			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	93	639	734
Volume Left	52	49	0
Volume Right	41	0	58
cSH	208	871	1700
Volume to Capacity	0.45	0.06	0.43
Queue Length 95th (m)	16.9	1.4	0.0
Control Delay (s)	35.7	1.5	0.0
Lane LOS	E	A	
Approach Delay (s)	35.7	1.5	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	39	61	411	238	38
Future Volume (Veh/h)	38	39	61	411	238	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	42	66	447	259	41
Pedestrians				5		
Lane Width (m)				3.6		
Walking Speed (m/s)				1.2		
Percent Blockage				0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	858	284	300			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	858	284	300			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	94	95			
cM capacity (veh/h)	310	751	1261			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	83	513	300
Volume Left	41	66	0
Volume Right	42	0	41
cSH	441	1261	1700
Volume to Capacity	0.19	0.05	0.18
Queue Length 95th (m)	5.5	1.3	0.0
Control Delay (s)	15.0	1.5	0.0
Lane LOS	C	A	
Approach Delay (s)	15.0	1.5	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	48	38	45	482	496	53
Future Volume (Veh/h)	48	38	45	482	496	53
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	41	49	524	539	58
Pedestrians				5		
Lane Width (m)				3.6		
Walking Speed (m/s)				1.2		
Percent Blockage				0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1190	573	597			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1190	573	597			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	92	95			
cM capacity (veh/h)	197	517	980			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	93	573	597
Volume Left	52	49	0
Volume Right	41	0	58
cSH	271	980	1700
Volume to Capacity	0.34	0.05	0.35
Queue Length 95th (m)	11.8	1.3	0.0
Control Delay (s)	25.1	1.3	0.0
Lane LOS	D	A	
Approach Delay (s)	25.1	1.3	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	190	55	80	290	175	65
Future Volume (Veh/h)	190	55	80	290	175	65
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	207	60	87	315	190	71
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	720	230	266			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	720	230	266			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	44	93	93			
cM capacity (veh/h)	367	805	1292			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	267	402	261
Volume Left	207	87	0
Volume Right	60	0	71
cSH	418	1292	1700
Volume to Capacity	0.64	0.07	0.15
Queue Length 95th (m)	34.5	1.7	0.0
Control Delay (s)	27.6	2.2	0.0
Lane LOS	D	A	
Approach Delay (s)	27.6	2.2	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	8.9		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	135	75	145	265	315	235
Future Volume (Veh/h)	135	75	145	265	315	235
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	147	82	158	288	342	255
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1078	474	602			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1078	474	602			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	27	86	84			
cM capacity (veh/h)	202	588	971			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	229	446	597
Volume Left	147	158	0
Volume Right	82	0	255
cSH	264	971	1700
Volume to Capacity	0.87	0.16	0.35
Queue Length 95th (m)	58.8	4.6	0.0
Control Delay (s)	67.8	4.5	0.0
Lane LOS	F	A	
Approach Delay (s)	67.8	4.5	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	13.8		
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	216	60	90	362	272	76
Future Volume (Veh/h)	216	60	90	362	272	76
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	235	65	98	393	296	83
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	932	342	384			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	932	342	384			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	13	91	92			
cM capacity (veh/h)	270	697	1170			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	235	65	98	393	379
Volume Left	235	0	98	0	0
Volume Right	0	65	0	0	83
cSH	270	697	1170	1700	1700
Volume to Capacity	0.87	0.09	0.08	0.23	0.22
Queue Length 95th (m)	59.6	2.5	2.2	0.0	0.0
Control Delay (s)	67.0	10.7	8.4	0.0	0.0
Lane LOS	F	B	A		
Approach Delay (s)	54.8		1.7		0.0
Approach LOS	F				

Intersection Summary			
Average Delay	14.8		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	157	85	165	381	418	267
Future Volume (Veh/h)	157	85	165	381	418	267
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	171	92	179	414	454	290
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1376	604	749			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1376	604	749			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	81	79			
cM capacity (veh/h)	126	496	856			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	171	92	179	414	744
Volume Left	171	0	179	0	0
Volume Right	0	92	0	0	290
cSH	126	496	856	1700	1700
Volume to Capacity	1.36	0.19	0.21	0.24	0.44
Queue Length 95th (m)	90.4	5.4	6.3	0.0	0.0
Control Delay (s)	268.5	13.9	10.3	0.0	0.0
Lane LOS	F	B	B		
Approach Delay (s)	179.4		3.1		0.0
Approach LOS	F				

Intersection Summary			
Average Delay	30.7		
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	216	60	90	362	272	76
Future Volume (vph)	216	60	90	362	272	76
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.440			
Satd. Flow (perm)	1770	1583	820	1863	1863	1542
Satd. Flow (RTOR)		65				69
Lane Group Flow (vph)	235	65	98	393	296	83
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Total Split (s)	40.0	40.0	14.0	60.0	46.0	46.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	13.0	13.0	28.0	25.9	16.6	16.6
Actuated g/C Ratio	0.25	0.25	0.54	0.50	0.32	0.32
v/c Ratio	0.52	0.14	0.17	0.42	0.49	0.15
Control Delay	22.7	6.3	6.6	9.7	19.4	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	6.3	6.6	9.7	19.4	6.8
LOS	C	A	A	A	B	A
Approach Delay	19.1			9.1	16.6	
Approach LOS	B			A	B	
Queue Length 50th (m)	19.8	0.0	3.7	20.1	23.5	1.0
Queue Length 95th (m)	43.8	7.8	11.2	45.2	51.7	9.8
Internal Link Dist (m)	419.3			270.6	481.7	
Turn Bay Length (m)	45.0		25.0			25.0
Base Capacity (vph)	1212	1104	638	1788	1471	1232
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.06	0.15	0.22	0.20	0.07

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 51.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 14.1
Intersection LOS: B
Intersection Capacity Utilization 44.6%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: King Street & Chester Road

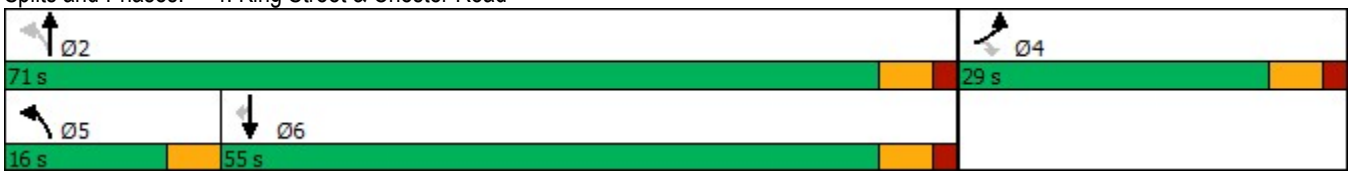


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	157	85	165	381	418	267
Future Volume (vph)	157	85	165	381	418	267
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.283			
Satd. Flow (perm)	1770	1583	527	1863	1863	1544
Satd. Flow (RTOR)		92				186
Lane Group Flow (vph)	171	92	179	414	454	290
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Total Split (s)	29.0	29.0	16.0	71.0	55.0	55.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	12.2	12.2	37.1	35.0	20.9	20.9
Actuated g/C Ratio	0.20	0.20	0.62	0.59	0.35	0.35
v/c Ratio	0.47	0.23	0.33	0.38	0.70	0.44
Control Delay	27.8	7.8	6.5	7.6	23.2	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	7.8	6.5	7.6	23.2	8.1
LOS	C	A	A	A	C	A
Approach Delay	20.8			7.3	17.3	
Approach LOS	C			A	B	
Queue Length 50th (m)	17.1	0.0	6.6	20.0	42.0	7.8
Queue Length 95th (m)	41.2	11.2	16.7	43.1	81.6	26.4
Internal Link Dist (m)	419.3			270.6	28.3	
Turn Bay Length (m)	45.0		25.0			25.0
Base Capacity (vph)	704	685	586	1803	1571	1331
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.13	0.31	0.23	0.29	0.22

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 59.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 14.2
Intersection LOS: B
Intersection Capacity Utilization 53.2%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: King Street & Chester Road



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	160	116	110	337	181	56
Future Volume (Veh/h)	160	116	110	337	181	56
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	126	120	366	197	61
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	838	232	263			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	838	232	263			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	43	84	91			
cM capacity (veh/h)	304	803	1296			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	174	126	120	366	258
Volume Left	174	0	120	0	0
Volume Right	0	126	0	0	61
cSH	304	803	1296	1700	1700
Volume to Capacity	0.57	0.16	0.09	0.22	0.15
Queue Length 95th (m)	26.7	4.4	2.4	0.0	0.0
Control Delay (s)	31.6	10.3	8.1	0.0	0.0
Lane LOS	D	B	A		
Approach Delay (s)	22.7		2.0		0.0
Approach LOS	C				

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	115	127	235	362	362	197
Future Volume (Veh/h)	115	127	235	362	362	197
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	125	138	255	393	393	214
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1408	505	612			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1408	505	612			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	76	74			
cM capacity (veh/h)	112	565	963			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	125	138	255	393	607
Volume Left	125	0	255	0	0
Volume Right	0	138	0	0	214
cSH	112	565	963	1700	1700
Volume to Capacity	1.12	0.24	0.26	0.23	0.36
Queue Length 95th (m)	61.7	7.6	8.5	0.0	0.0
Control Delay (s)	193.0	13.4	10.1	0.0	0.0
Lane LOS	F	B	B		
Approach Delay (s)	98.8		4.0		0.0
Approach LOS	F				

Intersection Summary			
Average Delay	18.8		
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	160	116	110	337	181	56
Future Volume (vph)	160	116	110	337	181	56
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.481			
Satd. Flow (perm)	1770	1583	896	1863	1863	1542
Satd. Flow (RTOR)		126				61
Lane Group Flow (vph)	174	126	120	366	197	61
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Total Split (s)	39.0	39.0	16.0	61.0	45.0	45.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	10.0	10.0	24.4	22.4	12.6	12.6
Actuated g/C Ratio	0.22	0.22	0.55	0.50	0.28	0.28
v/c Ratio	0.44	0.28	0.18	0.39	0.38	0.13
Control Delay	20.0	5.9	6.0	8.6	18.0	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	5.9	6.0	8.6	18.0	6.1
LOS	C	A	A	A	B	A
Approach Delay	14.1			7.9	15.2	
Approach LOS	B			A	B	
Queue Length 50th (m)	12.2	0.0	4.0	16.1	13.7	0.0
Queue Length 95th (m)	30.4	10.4	11.1	35.7	33.1	7.3
Internal Link Dist (m)	419.3			270.6	481.7	
Turn Bay Length (m)	35.0		55.0			25.0
Base Capacity (vph)	1343	1232	730	1856	1621	1349
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.10	0.16	0.20	0.12	0.05

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 44.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.44
Intersection Signal Delay: 11.5
Intersection LOS: B
Intersection Capacity Utilization 37.8%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: King Street & Chester Road

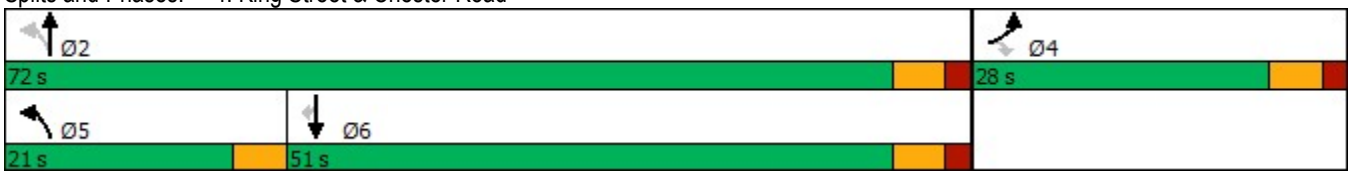


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	115	127	235	362	362	197
Future Volume (vph)	115	127	235	362	362	197
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.314			
Satd. Flow (perm)	1770	1583	585	1863	1863	1543
Satd. Flow (RTOR)		138				147
Lane Group Flow (vph)	125	138	255	393	393	214
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Total Split (s)	28.0	28.0	21.0	72.0	51.0	51.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	9.6	9.6	36.3	34.2	17.2	17.2
Actuated g/C Ratio	0.17	0.17	0.64	0.61	0.31	0.31
v/c Ratio	0.42	0.36	0.39	0.35	0.69	0.37
Control Delay	28.0	8.4	6.1	6.4	25.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	8.4	6.1	6.4	25.0	8.1
LOS	C	A	A	A	C	A
Approach Delay	17.7			6.3	19.1	
Approach LOS	B			A	B	
Queue Length 50th (m)	11.8	0.0	8.8	16.9	35.8	5.0
Queue Length 95th (m)	31.4	13.8	20.2	35.5	72.7	20.6
Internal Link Dist (m)	419.3			270.6	481.7	
Turn Bay Length (m)	45.0		25.0			25.0
Base Capacity (vph)	721	726	750	1824	1517	1284
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.19	0.34	0.22	0.26	0.17

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 56.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 13.4
Intersection LOS: B
Intersection Capacity Utilization 51.8%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: King Street & Chester Road



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	15	558	20	25	348
Future Volume (Veh/h)	5	15	558	20	25	348
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	16	607	22	27	378
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1050	618			629	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1050	618			629	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	97			97	
cM capacity (veh/h)	244	489			953	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	21	629	405
Volume Left	5	0	27
Volume Right	16	22	0
cSH	395	1700	953
Volume to Capacity	0.05	0.37	0.03
Queue Length 95th (m)	1.3	0.0	0.7
Control Delay (s)	14.6	0.0	0.9
Lane LOS	B		A
Approach Delay (s)	14.6	0.0	0.9
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	30	533	5	10	645
Future Volume (Veh/h)	30	30	533	5	10	645
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	33	579	5	11	701
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1304	582			584	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1304	582			584	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	94			99	
cM capacity (veh/h)	175	513			991	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	66	584	712
Volume Left	33	0	11
Volume Right	33	5	0
cSH	261	1700	991
Volume to Capacity	0.25	0.34	0.01
Queue Length 95th (m)	7.8	0.0	0.3
Control Delay (s)	23.4	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	23.4	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	15	558	20	25	343
Future Volume (Veh/h)	5	15	558	20	25	343
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	16	607	22	27	373
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			52			
pX, platoon unblocked	0.87	0.87			0.87	
vC, conflicting volume	1045	618			629	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	977	485			498	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	97			97	
cM capacity (veh/h)	235	506			927	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	21	629	400
Volume Left	5	0	27
Volume Right	16	22	0
cSH	397	1700	927
Volume to Capacity	0.05	0.37	0.03
Queue Length 95th (m)	1.3	0.0	0.7
Control Delay (s)	14.6	0.0	0.9
Lane LOS	B		A
Approach Delay (s)	14.6	0.0	0.9
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	30	533	5	10	665
Future Volume (Veh/h)	20	30	533	5	10	665
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	33	579	5	11	723
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			52			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1326	582			584	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1303	456			458	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	94			99	
cM capacity (veh/h)	154	532			970	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	55	584	734
Volume Left	22	0	11
Volume Right	33	5	0
cSH	269	1700	970
Volume to Capacity	0.20	0.34	0.01
Queue Length 95th (m)	6.0	0.0	0.3
Control Delay (s)	21.8	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	21.8	0.0	0.3
Approach LOS	C		

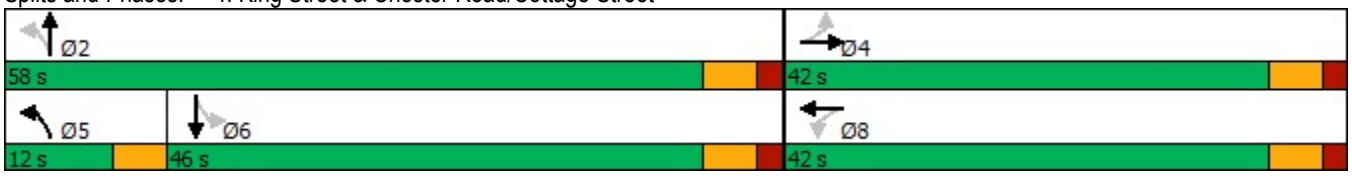
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	5	60	5	1	15	90	342	15	15	267	76
Future Volume (vph)	216	5	60	5	1	15	90	342	15	15	267	76
Satd. Flow (prot)	1770	1604	0	0	1662	0	1770	1852	0	1770	1791	0
Flt Permitted	0.743				0.947		0.356			0.532		
Satd. Flow (perm)	1384	1604	0	0	1591	0	663	1852	0	991	1791	0
Satd. Flow (RTOR)		65			16			3			17	
Lane Group Flow (vph)	235	70	0	0	22	0	98	388	0	16	373	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	42.0	42.0		42.0	42.0		12.0	58.0		46.0	46.0	
Total Lost Time (s)	6.0	6.0			6.0		4.0	6.0		6.0	6.0	
Act Effct Green (s)	15.9	15.9			15.9		30.0	27.9		19.1	19.1	
Actuated g/C Ratio	0.28	0.28			0.28		0.53	0.49		0.34	0.34	
v/c Ratio	0.60	0.14			0.05		0.20	0.42		0.05	0.61	
Control Delay	26.5	6.6			10.6		8.2	11.1		15.9	21.6	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	26.5	6.6			10.6		8.2	11.1		15.9	21.6	
LOS	C	A			B		A	B		B	C	
Approach Delay		22.0			10.6			10.5			21.4	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	22.0	0.4			0.5		4.4	22.9		1.2	32.9	
Queue Length 95th (m)	50.2	8.9			5.4		13.6	53.5		5.6	69.8	
Internal Link Dist (m)		419.3			114.8			270.6			481.7	
Turn Bay Length (m)	45.0						35.0			15.0		
Base Capacity (vph)	933	1103			1078		518	1642		727	1318	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.25	0.06			0.02		0.19	0.24		0.02	0.28	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 56.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 16.9
Intersection LOS: B
Intersection Capacity Utilization 65.0%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: King Street & Chester Road/Cottage Street

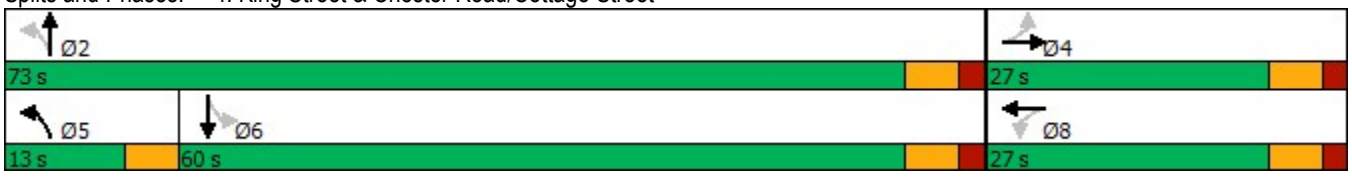


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	1	85	25	5	25	165	376	5	10	398	262
Future Volume (vph)	157	1	85	25	5	25	165	376	5	10	398	262
Satd. Flow (prot)	1770	1587	0	0	1709	0	1770	1859	0	1770	1734	0
Flt Permitted	0.719				0.838		0.146			0.520		
Satd. Flow (perm)	1339	1587	0	0	1464	0	272	1859	0	969	1734	0
Satd. Flow (RTOR)		92			27			1			52	
Lane Group Flow (vph)	171	93	0	0	59	0	179	414	0	11	718	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	27.0	27.0		27.0	27.0		13.0	73.0		60.0	60.0	
Total Lost Time (s)	6.0	6.0			6.0		4.0	6.0		6.0	6.0	
Act Effct Green (s)	15.2	15.2			15.2		50.4	48.3		35.1	35.1	
Actuated g/C Ratio	0.20	0.20			0.20		0.66	0.63		0.46	0.46	
v/c Ratio	0.64	0.24			0.19		0.50	0.35		0.02	0.87	
Control Delay	43.1	9.2			20.4		10.6	7.5		11.1	29.2	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	43.1	9.2			20.4		10.6	7.5		11.1	29.2	
LOS	D	A			C		B	A		B	C	
Approach Delay		31.2			20.4			8.4			28.9	
Approach LOS		C			C			A			C	
Queue Length 50th (m)	23.9	0.1			4.0		8.5	24.9		0.9	85.0	
Queue Length 95th (m)	54.9	13.1			16.5		19.8	47.3		3.7	149.6	
Internal Link Dist (m)		419.3			114.8			270.6			481.7	
Turn Bay Length (m)	45.0						35.0			15.0		
Base Capacity (vph)	389	526			445		366	1599		717	1297	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.44	0.18			0.13		0.49	0.26		0.02	0.55	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 76.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 21.6
Intersection LOS: C
Intersection Capacity Utilization 75.0%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: King Street & Chester Road/Cottage Street

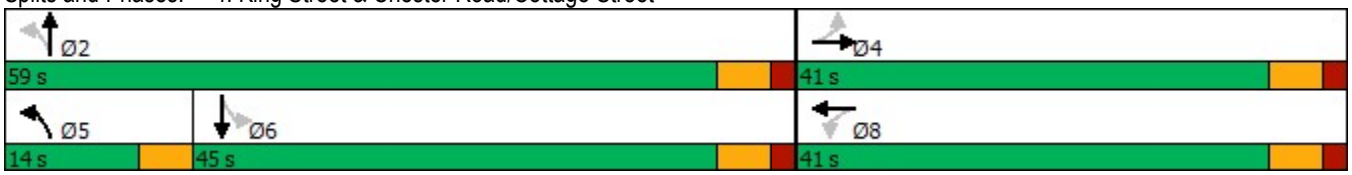


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	5	116	5	1	15	110	317	15	15	176	56
Future Volume (vph)	160	5	116	5	1	15	110	317	15	15	176	56
Satd. Flow (prot)	1770	1595	0	0	1662	0	1770	1850	0	1770	1784	0
Flt Permitted	0.743				0.927		0.482			0.546		
Satd. Flow (perm)	1384	1595	0	0	1558	0	898	1850	0	1017	1784	0
Satd. Flow (RTOR)		126			16			4			19	
Lane Group Flow (vph)	174	131	0	0	22	0	120	361	0	16	252	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	41.0	41.0		41.0	41.0		14.0	59.0		45.0	45.0	
Total Lost Time (s)	6.0	6.0			6.0		4.0	6.0		6.0	6.0	
Act Effct Green (s)	12.6	12.6			12.6		27.6	25.6		16.0	16.0	
Actuated g/C Ratio	0.25	0.25			0.25		0.55	0.51		0.32	0.32	
v/c Ratio	0.50	0.27			0.06		0.19	0.38		0.05	0.44	
Control Delay	23.6	6.0			10.3		6.6	9.1		15.6	17.6	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	23.6	6.0			10.3		6.6	9.1		15.6	17.6	
LOS	C	A			B		A	A		B	B	
Approach Delay		16.0			10.3			8.5			17.5	
Approach LOS		B			B			A			B	
Queue Length 50th (m)	14.7	0.4			0.5		4.4	17.3		1.1	17.8	
Queue Length 95th (m)	33.2	11.1			5.0		12.9	39.8		5.3	41.9	
Internal Link Dist (m)		419.3			114.8			270.6			481.7	
Turn Bay Length (m)	45.0						35.0			15.0		
Base Capacity (vph)	987	1174			1116		668	1785		797	1403	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.18	0.11			0.02		0.18	0.20		0.02	0.18	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 50.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.50
Intersection Signal Delay: 12.9
Intersection LOS: B
Intersection Capacity Utilization 60.6%
ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: King Street & Chester Road/Cottage Street

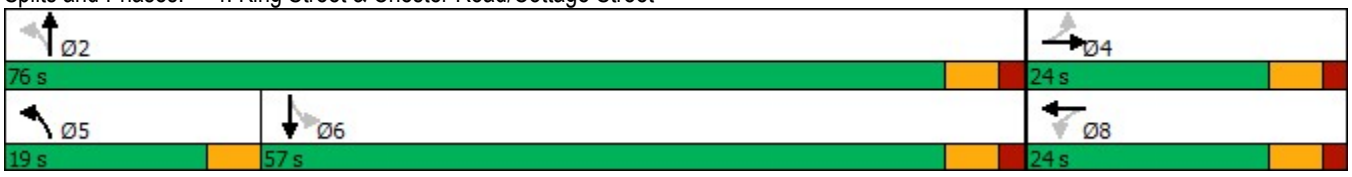


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	1	127	25	5	25	233	357	5	10	342	194
Future Volume (vph)	115	1	127	25	5	25	233	357	5	10	342	194
Satd. Flow (prot)	1770	1585	0	0	1709	0	1770	1859	0	1770	1746	0
Flt Permitted	0.719				0.807		0.186			0.530		
Satd. Flow (perm)	1339	1585	0	0	1410	0	346	1859	0	987	1746	0
Satd. Flow (RTOR)		138			27			2			42	
Lane Group Flow (vph)	125	139	0	0	59	0	253	393	0	11	583	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	24.0	24.0		24.0	24.0		19.0	76.0		57.0	57.0	
Total Lost Time (s)	6.0	6.0			6.0		4.0	6.0		6.0	6.0	
Act Effct Green (s)	12.7	12.7			12.7		45.6	43.5		26.5	26.5	
Actuated g/C Ratio	0.18	0.18			0.18		0.66	0.63		0.39	0.39	
v/c Ratio	0.51	0.34			0.21		0.51	0.33		0.03	0.84	
Control Delay	36.9	8.8			20.0		9.3	6.6		13.5	29.5	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	36.9	8.8			20.0		9.3	6.6		13.5	29.5	
LOS	D	A			B		A	A		B	C	
Approach Delay		22.1			20.0			7.6			29.2	
Approach LOS		C			B			A			C	
Queue Length 50th (m)	15.2	0.1			3.6		10.1	19.2		0.9	63.4	
Queue Length 95th (m)	39.1	15.5			15.8		27.1	40.1		4.1	117.0	
Internal Link Dist (m)		419.3			114.8			270.6			481.7	
Turn Bay Length (m)	45.0						35.0			15.0		
Base Capacity (vph)	367	535			406		555	1730		761	1356	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.34	0.26			0.15		0.46	0.23		0.01	0.43	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 68.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 18.7
Intersection LOS: B
Intersection Capacity Utilization 77.9%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: King Street & Chester Road/Cottage Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	15	558	20	25	343
Future Volume (Veh/h)	5	15	558	20	25	343
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	16	607	22	27	373
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			52			
pX, platoon unblocked	0.87	0.87			0.87	
vC, conflicting volume	1045	618			629	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	977	485			498	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	97			97	
cM capacity (veh/h)	235	506			927	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	21	629	27	373
Volume Left	5	0	27	0
Volume Right	16	22	0	0
cSH	397	1700	927	1700
Volume to Capacity	0.05	0.37	0.03	0.22
Queue Length 95th (m)	1.3	0.0	0.7	0.0
Control Delay (s)	14.6	0.0	9.0	0.0
Lane LOS	B		A	
Approach Delay (s)	14.6	0.0	0.6	
Approach LOS	B			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	30	533	5	10	665
Future Volume (Veh/h)	20	30	533	5	10	665
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	33	579	5	11	723
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			52			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1326	582			584	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1303	456			458	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	94			99	
cM capacity (veh/h)	154	532			970	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	55	584	11	723
Volume Left	22	0	11	0
Volume Right	33	5	0	0
cSH	269	1700	970	1700
Volume to Capacity	0.20	0.34	0.01	0.43
Queue Length 95th (m)	6.0	0.0	0.3	0.0
Control Delay (s)	21.8	0.0	8.8	0.0
Lane LOS	C		A	
Approach Delay (s)	21.8	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	98	78	448	90	112	264
Future Volume (Veh/h)	98	78	448	90	112	264
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	107	85	487	98	122	287
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1067	536			585	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1067	536			585	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	50	84			88	
cM capacity (veh/h)	215	545			990	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	107	85	585	122	287
Volume Left	107	0	0	122	0
Volume Right	0	85	98	0	0
cSH	215	545	1700	990	1700
Volume to Capacity	0.50	0.16	0.34	0.12	0.17
Queue Length 95th (m)	20.0	4.4	0.0	3.4	0.0
Control Delay (s)	37.1	12.8	0.0	9.1	0.0
Lane LOS	E	B		A	
Approach Delay (s)	26.4		0.0	2.7	
Approach LOS	D				

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	82	122	542	83	104	452
Future Volume (Veh/h)	82	122	542	83	104	452
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	133	589	90	113	491
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1351	634			679	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1351	634			679	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	39	72			88	
cM capacity (veh/h)	145	479			913	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	89	133	679	113	491
Volume Left	89	0	0	113	0
Volume Right	0	133	90	0	0
cSH	145	479	1700	913	1700
Volume to Capacity	0.61	0.28	0.40	0.12	0.29
Queue Length 95th (m)	26.0	9.0	0.0	3.4	0.0
Control Delay (s)	62.8	15.4	0.0	9.5	0.0
Lane LOS	F	C		A	
Approach Delay (s)	34.4		0.0	1.8	
Approach LOS	D				

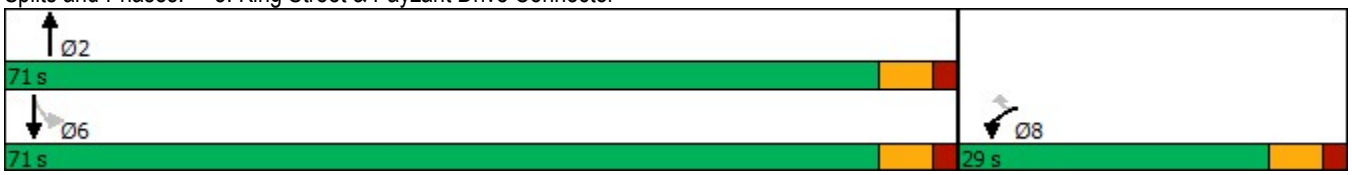
Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	86	78	443	92	112	264
Future Volume (vph)	86	78	443	92	112	264
Satd. Flow (prot)	1770	1583	1820	0	1770	1863
Flt Permitted	0.950				0.373	
Satd. Flow (perm)	1770	1583	1820	0	695	1863
Satd. Flow (RTOR)		85	21			
Lane Group Flow (vph)	93	85	582	0	122	287
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Total Split (s)	29.0	29.0	71.0		71.0	71.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Act Effct Green (s)	10.2	10.2	23.0		23.0	23.0
Actuated g/C Ratio	0.25	0.25	0.57		0.57	0.57
v/c Ratio	0.21	0.18	0.56		0.31	0.27
Control Delay	15.1	5.9	10.2		9.7	7.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	15.1	5.9	10.2		9.7	7.4
LOS	B	A	B		A	A
Approach Delay	10.7		10.2			8.1
Approach LOS	B		B			A
Queue Length 50th (m)	4.9	0.0	28.9		5.3	12.1
Queue Length 95th (m)	16.8	8.5	53.9		14.3	23.2
Internal Link Dist (m)	175.3		96.2			92.2
Turn Bay Length (m)	15.0				25.0	
Base Capacity (vph)	1019	947	1820		695	1863
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.09	0.09	0.32		0.18	0.15

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 40.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 9.5
Intersection LOS: A
Intersection Capacity Utilization 64.7%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: King Street & Payzant Drive Connector

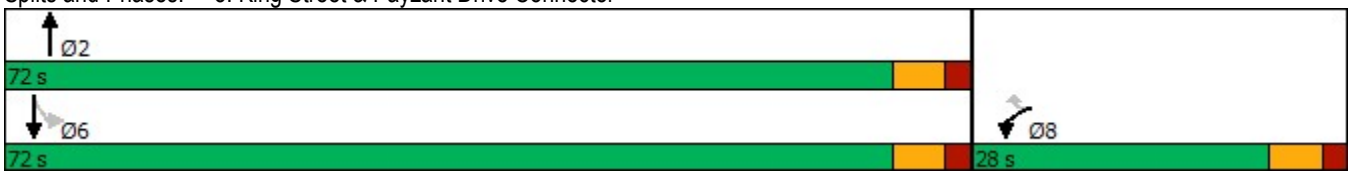


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	120	542	85	104	457
Future Volume (vph)	90	120	542	85	104	457
Satd. Flow (prot)	1770	1583	1829	0	1770	1863
Flt Permitted	0.950				0.281	
Satd. Flow (perm)	1770	1583	1829	0	523	1863
Satd. Flow (RTOR)		130	17			
Lane Group Flow (vph)	98	130	681	0	113	497
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Total Split (s)	28.0	28.0	72.0		72.0	72.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Act Effct Green (s)	10.4	10.4	24.7		24.7	24.7
Actuated g/C Ratio	0.22	0.22	0.52		0.52	0.52
v/c Ratio	0.25	0.29	0.71		0.42	0.51
Control Delay	18.1	6.4	13.0		12.4	9.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	18.1	6.4	13.0		12.4	9.5
LOS	B	A	B		B	A
Approach Delay	11.4		13.0			10.0
Approach LOS	B		B			A
Queue Length 50th (m)	6.2	0.0	37.4		5.1	24.1
Queue Length 95th (m)	19.9	11.4	70.4		15.6	44.7
Internal Link Dist (m)	175.3		96.2			92.2
Turn Bay Length (m)	15.0				25.0	
Base Capacity (vph)	836	816	1829		523	1863
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.12	0.16	0.37		0.22	0.27

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 47.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 11.6 Intersection LOS: B
Intersection Capacity Utilization 69.5% ICU Level of Service C
Analysis Period (min) 15

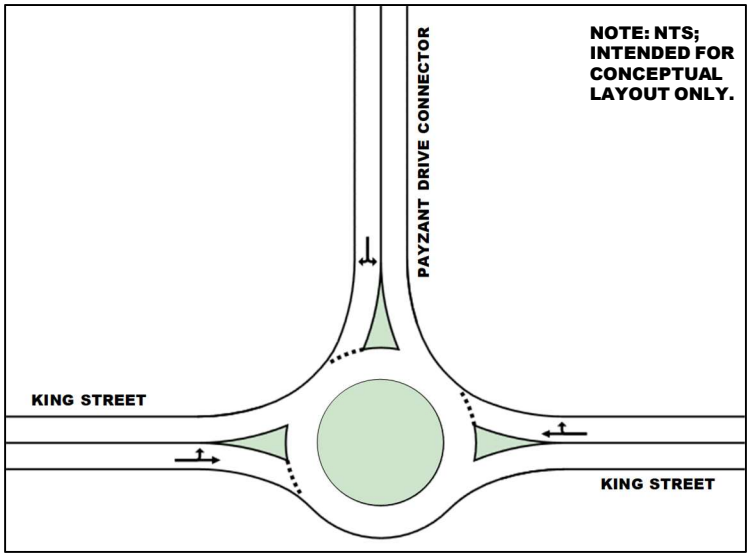
Splits and Phases: 5: King Street & Payzant Drive Connector



ARCADY ANALYSIS – 2030 AM & PM PEAK HOUR

Scenario 3

King Street at Payzant Drive



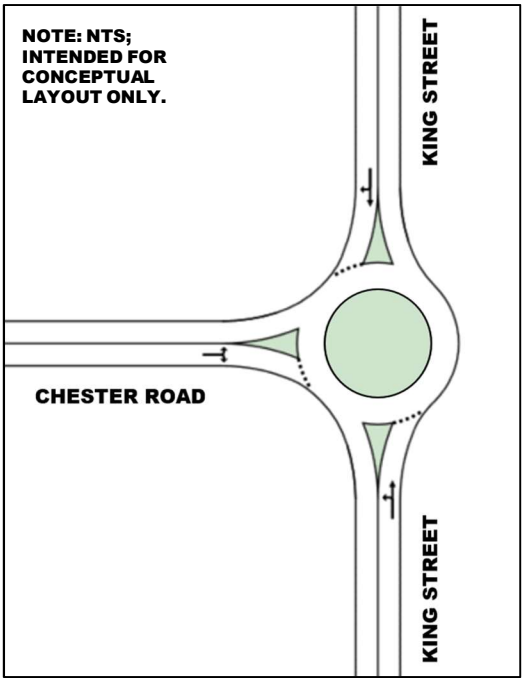
Arm	V- Approach Road half-width (m)	E-Entry Width (m)	l'- Effective flare length (m)	R – Entry Radius (m)	D – Inscribed circle diameter (m)	PHI – Conflict (entry) angle (deg)
King Street SB	3.5	3.5	0	30	50	20
King Street NB	3.5	3.5	0	30	50	20
Payzant Drive EB	3.5	3.5	0	30	50	20

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement			Overall Intersection	
	Payzant Drive Connector	King Street			
	EB	NB	SB	Delay	LOS
Scenario 3 - 2030 AM Peak Hour ***with*** Payzant Drive Connection					
Delay	5.4	5.7	8.2	6.9	A
LOS	A	A	A		
v/c	0.21	0.40	0.57		
Queue	8.4	18.9	10.5		
Scenario 3 - 2030 PM Peak Hour ***with*** Payzant Drive Connection					
Delay	6.5	8.5	10.5	9.1	A
LOS	A	A	B		
v/c	0.29	0.59	0.67		
Queue	11.2	11.9	33.6		

ARCADY ANALYSIS – 2030 AM & PM PEAK HOUR

Scenario 2

King Street at Chester Road



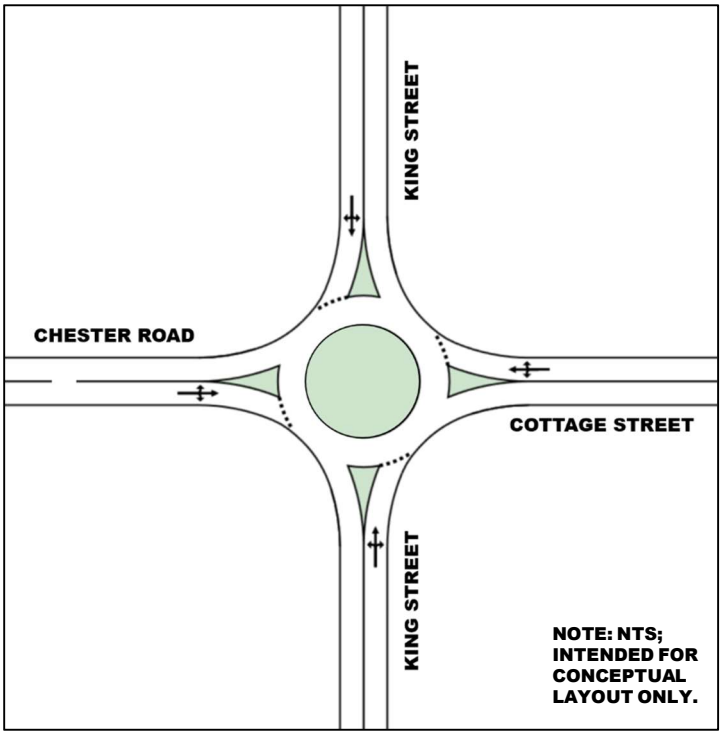
Arm	V- Approach Road half-width (m)	E-Entry Width (m)	l'- Effective flare length (m)	R – Entry Radius (m)	D – Inscribed circle diameter (m)	PHI – Conflict (entry) angle (deg)
King Street SB	3.5	3.5	0	30	50	20
King Street NB	3.5	3.5	0	30	50	20
Payzant Drive EB	3.5	3.5	0	30	50	20

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement			Overall Intersection	
	Chester Road	King Street			
	EB	NB	SB	Delay	LOS
Scenario 2 - 2030 AM Peak Hour ***without*** *Payzant Drive Connection*					
Delay	5.2	7.1	4.7	6.0	A
LOS	A	A	A		
v/c	0.31	0.49	0.25		
Queue	13.3	14.0	9.8		
Scenario 2 - 2030 PM Peak Hour ***without*** *Payzant Drive Connection*					
Delay	5.8	9.7	10.4	9.3	A
LOS	A	A	B		
v/c	0.30	0.64	0.64		
Queue	12.6	20.3	24.5		

ARCADY ANALYSIS – 2030 AM & PM PEAK HOUR

Scenario 2

King Street at Chester Road/ Cottage Street *Without* Payzant Drive Connector



Arm	V- Approach Road half-width (m)	E-Entry Width (m)	l'- Effective flare length (m)	R – Entry Radius (m)	D – Inscribed circle diameter (m)	PHI – Conflict (entry) angle (deg)
Wentworth Rd SB	3.5	3.5	0	30	50	20
Wentworth Rd NB	3.5	3.5	0	30	50	20
Payzant Dr WB	3.5	3.5	0	30	50	20
Payzant Dr EB	3.5	3.5	0	30	50	20

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement				Overall Intersection	
	Chester Road	Cottage Street	King Street			
	EB	WB	NB	SB	Delay	LOS
Scenario 2 - 2030 AM Peak Hour ***without*** Payzant Drive Connection						
Delay	5.4	4.9	7.1	4.8	6.0	A
LOS	A	A	A	A		
v/c	0.32	0.03	0.49	0.26		
Queue	14.0	3.5	14.7	7.7		
Scenario 2 - 2030 PM Peak Hour ***without*** Payzant Drive Connection						
Delay	5.9	5.7	9.8	10.5	9.2	A
LOS	A	A	A	B		
v/c	0.30	0.09	0.64	0.64		
Queue	12.6	3.5	21.7	23.1		

Payzant Drive – Wentworth Road Roundabout

West Hants Municipality

Committee of the Whole

January 10, 2023

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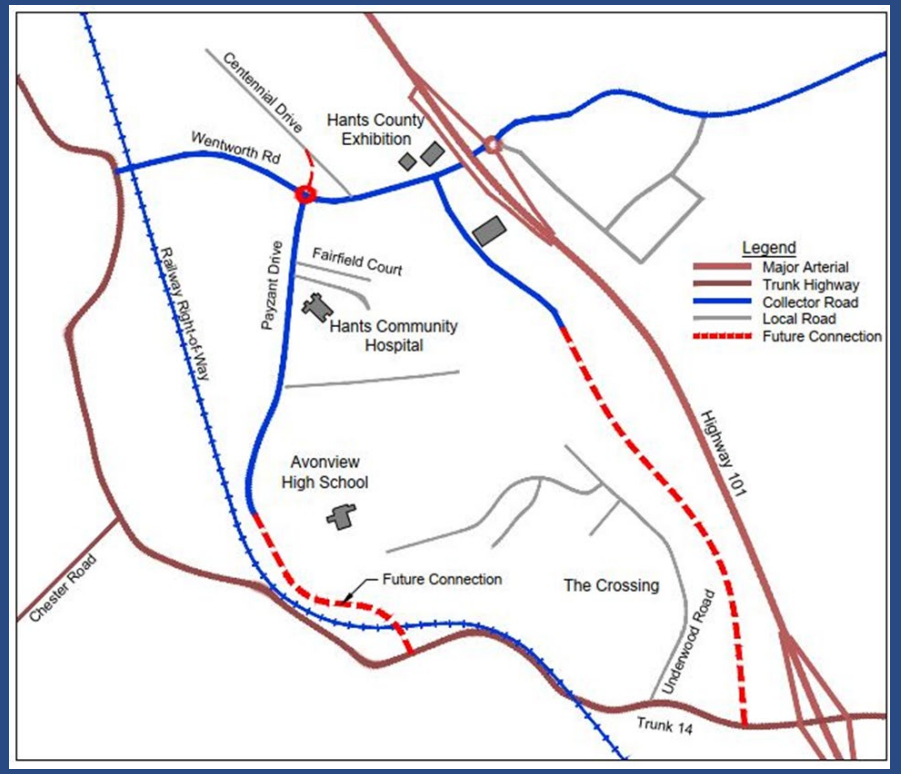
Payzant-Wentworth Roundabout

- Background
- Traffic Review
- Benefits
- Challenges
- Summary

Background

- The Garlands Crossing / Windsor Border Area study (Griffin 2013) provided a long-term transportation strategy to accommodate future growth (1000+ residential units) in the area.

- The study recommended traffic signals, or a roundabout be installed at the Wentworth Road-Payzant Drive intersection.

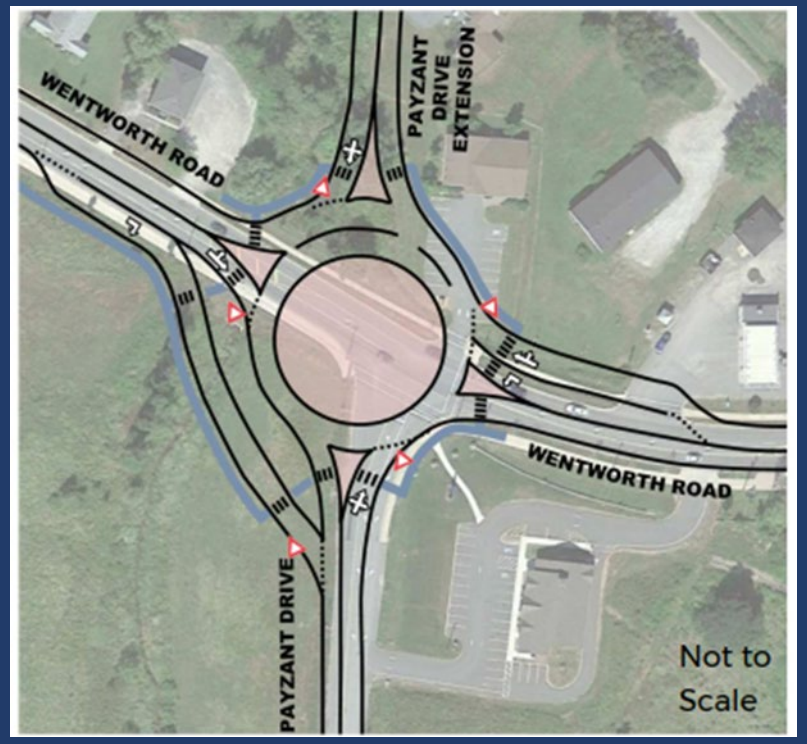


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Background

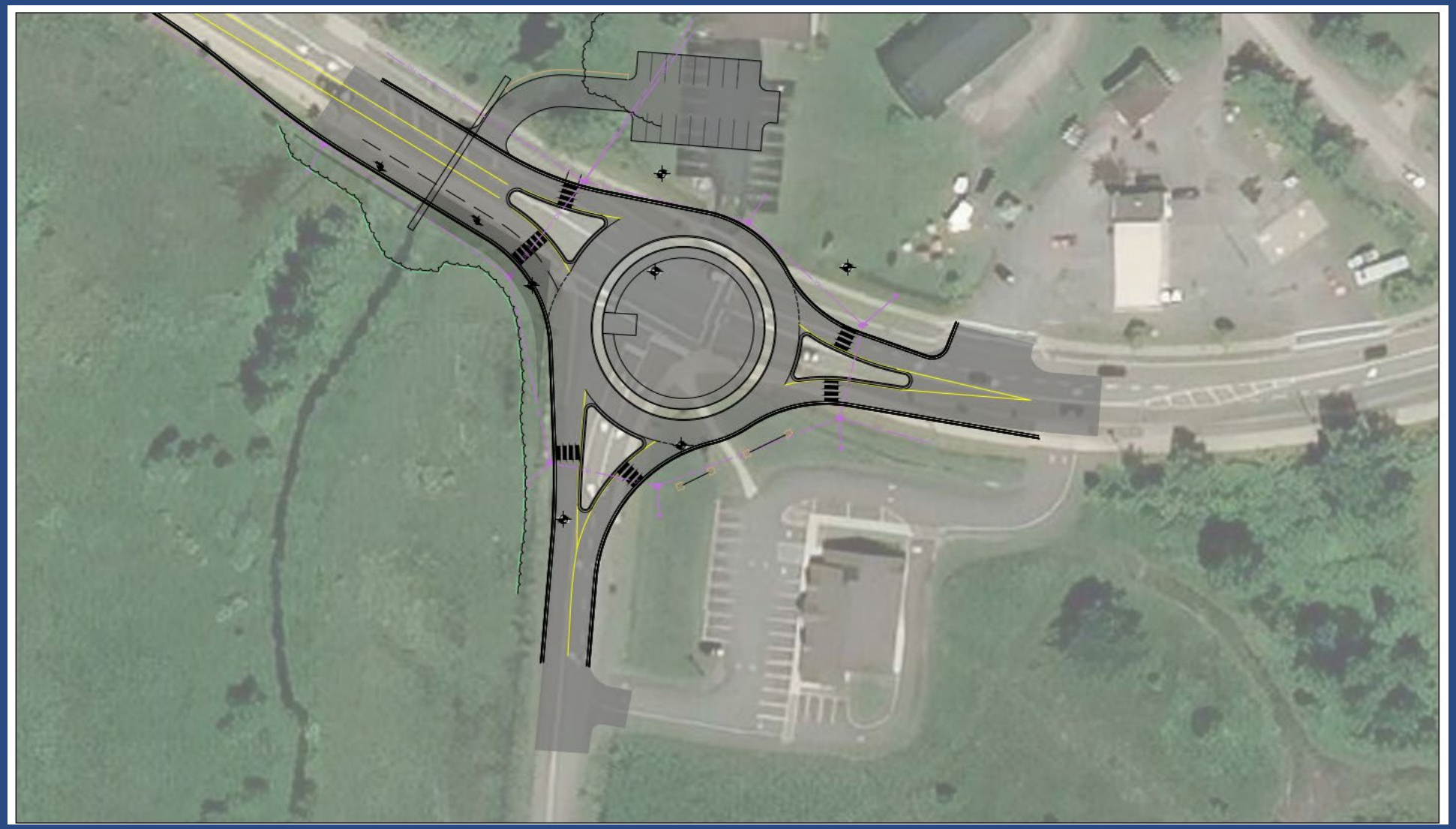
- The Windsor Intersection Infrastructure Needs Assessment study (WSP 2021) confirmed the need for upgrades and recommended that the intersection be upgraded to a roundabout.

- The WSP recommended configuration is shown to the right. It includes an eastbound right turn slip lane, a two-lane westbound approach, and a connection to Centennial Drive.



Traffic Review

- DesignPoint reviewed four traffic studies that have examined the impact growth would have at the Wentworth-Payzant intersection.
- Based on this review, we created 2030 design hour volumes for the AM and PM peak hour periods.
- We believe that a single-lane roundabout with an eastbound right turn lane can accommodate the projected traffic volumes.



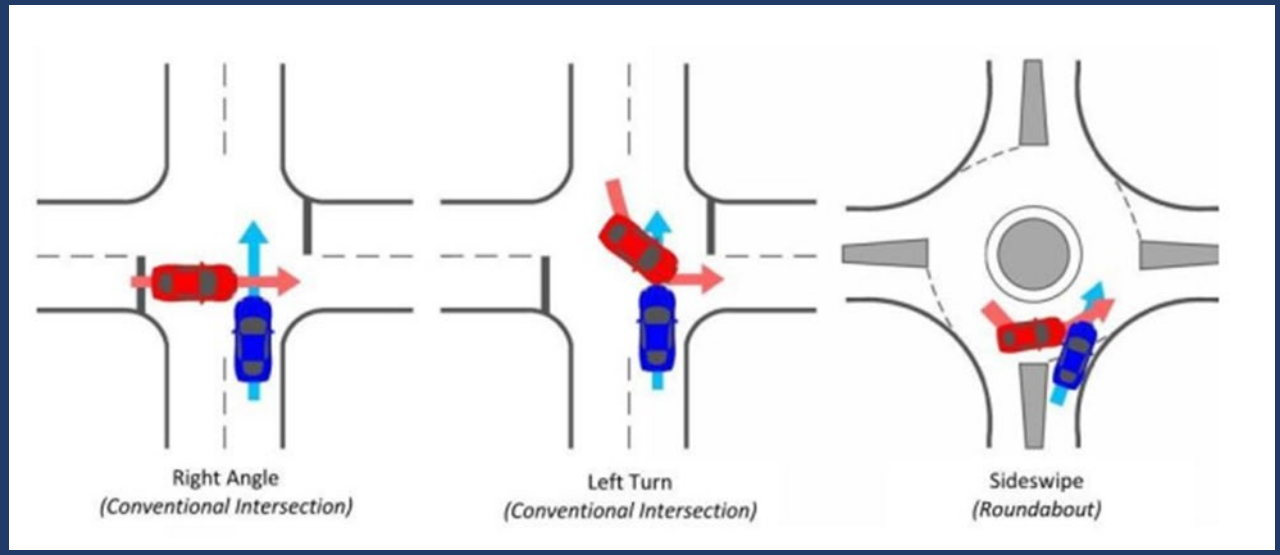
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Benefits

- Improved Safety
- Reduced Delay
- Reduced Environmental Impact
- Improved Aesthetics
- Network Considerations

Improved Safety

- Lower Speeds
- Simplified Decision Making
- Reduced Right-Angle, Head - on Collisions
- Fewer Conflict Points



Reduced Delay

Average Intersection Delay – 2030 Payzant-Wentworth Intersection		
	AM Peak	PM Peak
Signals	21s	19s
4 leg - Roundabout	9s	8s
3 leg - Roundabout	8s	7s

Notes:
1. Synchro 11 Model – HCM 6 Method

Reduced Environmental Impact

- Keeping traffic moving at more consistent lower speeds reduces idling, emissions and fuel consumption.

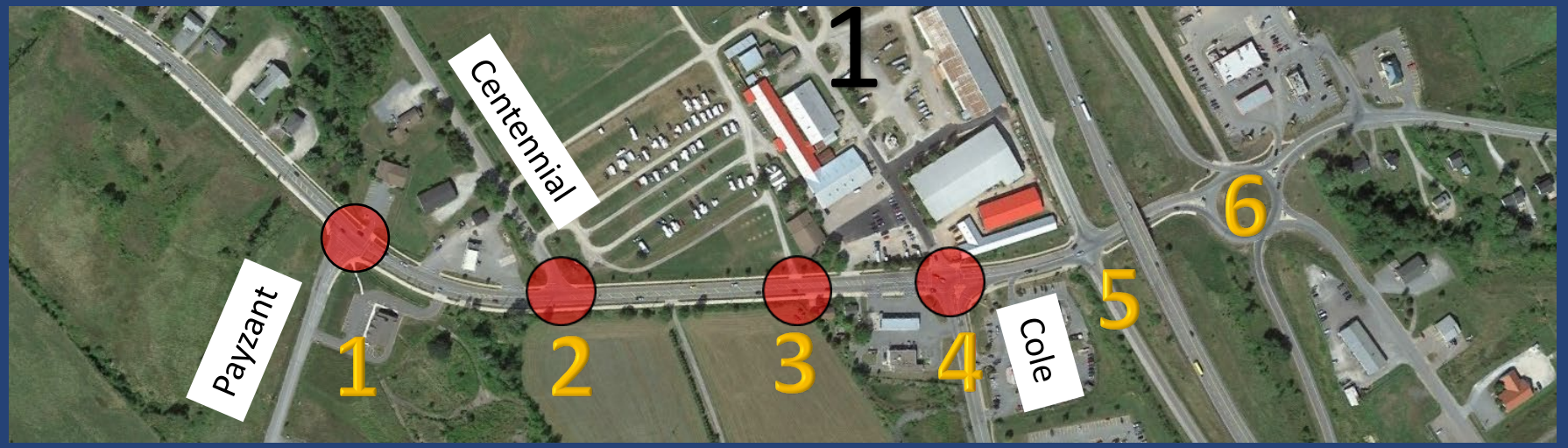


Improved Aesthetics



Network Considerations

- Can be used as part of an access management strategy to facilitate safer and more efficient turning movements at intersections and driveways
- Provide U-Turn opportunities eliminating the need for mid-block left turns and the number of full movement access points along the Wentworth corridor



Challenges

- Costs
- Land
- Utilities
- Access

Estimated Costs		
	Signals	Roundabout
Water and Storm Services	$230,000	$230,000
Excavation and Roadway Construction	$650,000	$1,000,000
Property Reinstatement	$50,000	$300,000
Subtotal (Construction)	$930,000	$1,530,000
Engineering (8%)	$70,000	$120,000
Total	$1,000,000	$1,650,000
Contingency (10%)	$100,000	$165,000
Grand Total	**$1,100,000**	**$1,815,000**

Notes
1. Does not include property acquisition or easement costs
2. Does not include taxes
3. 2022 Dollars

Cost

- Estimated Roundabout Cost= $1.8 million [1]
- Estimated Traffic Signal Installation= $1.1 million[2]

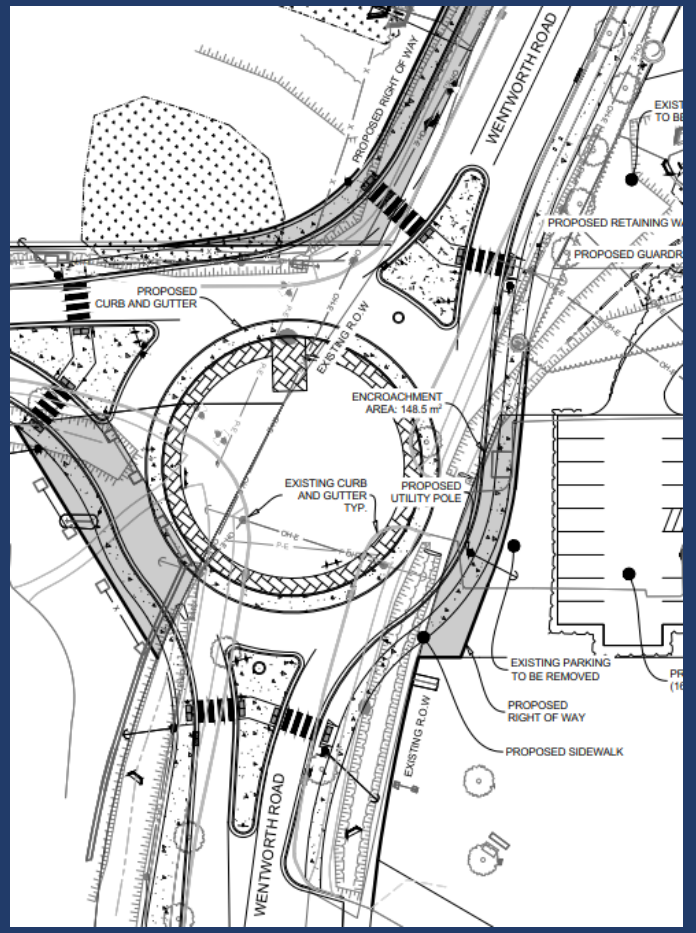
- Increased Safety = Lower health care costs
- Reduced Delay = Lower GHG costs
- Reduced Travel Time = Lower cost of commuters' time



Notes
1. Does not include property, easement costs, or taxes
2. Includes EB right turn lane
3. 2022 Dollars

Land Costs

- Roundabout will require additional right-of-way



Utilities

- Roundabout geometry will require additional poles and street lighting.
- Anchor easements will be required.



Access

- Commercial driveway is the fourth leg to the existing stop-controlled intersection.
- The Canadian Roundabout Design Guidelines (CRDG) discourages allowing access to a driveway unless the driveway meets a balanced flow criteria . The existing commercial property does not meet this criteria.



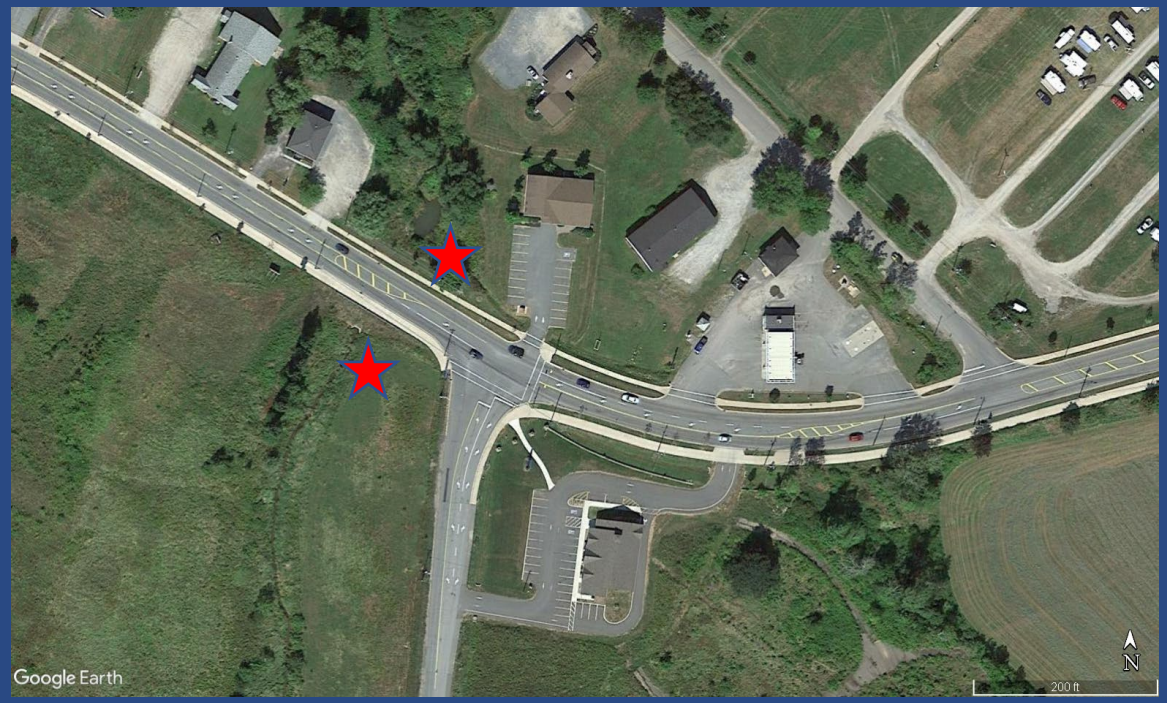
Driveway Access

- Driveway would need to be relocated upstream or downstream of the roundabout circle.

- One alternative would be to relocate the driveway to Centennial Drive.

Unsuitable Material

- Roundabout would require removal of unsuitable material



Summary

- Previous traffic studies have identified the need for a roundabout at the Wentworth Road at Payzant Drive intersection.
- The estimated cost for a roundabout is $1.8 million compared to $1.1 million for signals and a turning lane.
- Benefits include improved safety, reduced delay, reduced speeds, and improved access for mid-block intersections.
- Challenges include construction cost, land acquisition, and driveway access.



Questions ?

West Hants
something inspiring awaits

WEST HANTS REGIONAL MUNICIPALITY REPORT

Information ☐	Recommendation ☑	Decision Request ☐	Councillor Activity ☐

To: Committee of the Whole

Submitted by: _____
Todd Richard

Date: April 9, 2024

Subject: Payzant Drive / Wentworth Road Roundabout Design

LEGISLATIVE AUTHORITY

Nova Scotia Municipal Government Act, Section 65 authorizes Council to expend funds for municipal purposes.

RECOMMENDATION or DECISION REQUEST

It is recommended for Committee of the Whole to recommend to Council that:

Council approve the award of tender WHRMPW24-03 for Construction of the Payzant Drive/Wentworth Road Roundabout to the low compliant bidder, Dexter Construction, for the tendered price of $4,274,980.00 plus applicable taxes. And, council also approves a construction contingency of 15% ($641,247) and the cost for overhead utility relocation, for a total construction estimated cost of $5,116,227 plus applicable taxes.

BACKGROUND

Property ☐	Public Opinion ☐	Environment ☐	Social ☑	Economic ☐	Councillor Activity ☐

The intersection of Payzant Drive and Wentworth Road has proven to be extremely busy over the years, especially during peak times. Solutions have been researched, studied, and discussed extensively and experts agree the best solution needs to provide efficiency, longevity, sustainability and be most suitable for the area.

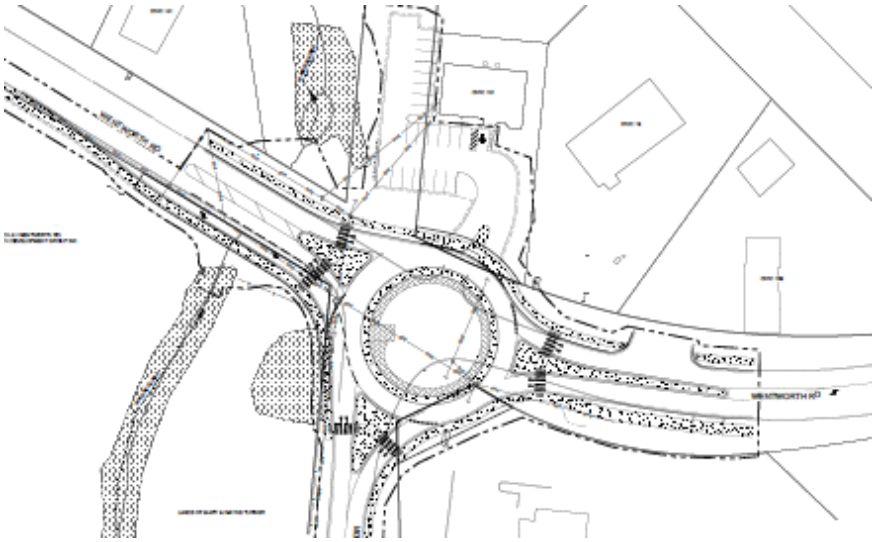
In August 2021 an Intersection Infrastructure Needs Assessment for this proposed project was completed by WSP. Based on findings from this study, in conjunction with the Hants County Exhibition Expansion Traffic Impact Study (WSP, May 2021), it was recommended that plans be prepared to upgrade this intersection to a roundabout.

In September 2021, Public Works requested proposals from pre-qualified engineering consultants to support this project from design through final construction. In October 2021, Public Works recommended Design Point, the low compliant bidder, be awarded the Engineering and Design work.

In January of 2023, Design Point presented at Committee of the Whole – "Proposed Traffic Circle Presentation".

The Municipality is focused on providing optimal long-term solutions for the residents of West Hants Regional Municipality. A Roundabout at The Payzant/Wentworth Intersection will provide this solution with many benefits including:

- Improved Safety – lower speeds and simplified Decision Making. Reduced right angle and head on collisions and fewer conflict points.
- Reduced Delay
- Reduced Environmental Impact – Keeping traffic moving at consistent lower speeds reduces idling, emissions and fuel consumption
- Improved Aesthetics for visual appeal at prominent locations
- Network considerations – allow for safer and more efficient traffic management strategies for surrounding area
- Ability to function during power outages



Proposed Payant/Wentworth Roundabout

DISCUSSION



The Construction tender was issued on the Nova Scotia Procurement website on March 8, 2024. There was a non-mandatory site meeting on March 21, 2024 and the only attendee was Dexter Construction. The tender closed on April 4, 2024 at 2pm. Results were reviewed by Public Works Staff and Design Point Engineering.

Tender Results:

Dexter Construction ***$4,274,980.00 plus applicable taxes.***

There was a water main component of this tender. It should be noted that this will need to be replaced at some time in the future, regardless of the work performed at the intersection of Payzant Drive and Wentworth Road. The Dexter amount for this portion was $620,855.00 and was over the amount originally budgeted was $430,425.00.

Dexter Construction would be an excellent contractor to complete a project of this complexity. Their experience and expertise in road work, services, knowledge of the area, construction scheduling and ability to coordinate simultaneous activities will help limit traffic interruptions and delays.

It is expected that a portion of the work will be in this construction season. There is a lot of NS Power and Bell work to be completed and Dexter is well versed to coordinate with them to provide the best schedule and coordination for the project. It is anticipated that Dexter will be able to complete portions of the work while allowing the utilities to complete their work in an effort to move construction along efficiently. For this reason, we are expecting the work to be carried out over two seasons and be completed by Fall of 2025.

NEXT STEPS

Pending approval of Council; staff will award formal contract to Dexter to proceed with engineering and design work in accordance with their proposal.

FINANCIAL IMPLICATIONS

Tendering Timeline:

Posted to Procurement	March 21, 2024
Closing Date	April 4, 2024
Price Expiry Date	June 3, 2024
Days Remaining	56 Days

2023-24 Capital Budget – Traffic Control Wentworth Road @ Payzant Drive

Tender Pricing	$5,116,227.00
Non-Recoverable Tax *(4.29%)*	$219,486.14
Tender Total	**$5,335,713.14**
2023-24 Budget Value	$2,725,000.00
Variance (over budget)	($2,610,713.14)

Within the 2023-24 Capital Budget, the traffic control project on Wentworth Road at Payzant Drive was scheduled to be funded primarily through long-term debt, with $500,000 to be funded evenly between the former Windsor Infrastructure Reserve and the WHRM Road Infrastructure Reserve. In addition, $100,000 in 2023-24 budgeted for the water main replacement.

The water main accounts for $774,613.13 of the total tender costs. To be funded through long-term borrowing for the water utility. The debt servicing for this will not show up in the water utility budget till the project is completed.

The estimated debt servicing in 2023-24 was $113,040. With the new project total, less the 2023-24 budgeted debt servicing and water utility portion, the estimated debt servicing will increase to $242,168.58. Pending Council decision, the updated figures will be captured in the 2024-25 Capital and Operating Budget.

ALTERNATIVES

1. Council may choose to award this project to an alternative proponent.
2. Council may choose to not to proceed with this capital project.

ATTACHMENTS

Tender Documents and Drawings. Addendum Number one and addendum Number two.

CHIEF ADMINISTRATIVE OFFICER REVIEW

The report provides highlights to the history of the project, it's forecasted benefits and past budget projections (2023/24 $2,610,713.14). It is unfortunate to have one bidder on the project despite the tender being in the public forum. With the forecasted price and not having the debt to service ratio impacts for 2024/25, when considering such a large project, or the overall 2024/25 capital budget reviewed or approved by Council it is advisable that the project be forwarded to budget deliberations for a more thorough review by Council.

It is noted in the report that the tender price will be held until June 3,2024. With date in mind budget deliberations will have started well in advance of that date.

Report Prepared by: _____

Erin Amirault P.Eng. Project Engineer

Report Reviewed by: _____

Todd Richard, Director of Public Works

Report Approved by: _____

Mark Phillips, Chief Administrative Officer



Tender #WHRMPW24-03

Construction

Payzant Drive Roundabout

Issued: March 8, 2024
Closing: March 28, 2024

Contact:
Erin Amirault, P.Eng.
Project Engineer
EAmirault@westhants.ca
902-798-8391 Ext.126

SECTION	TITLE	Pages
00 20 00	Overview	1
00 21 00	Information to Tenderers	3
00 41 43	Tender Form	7
00 43 00	Supplementary Tender Information	7
00 53 43	Form of Agreement	5
00 74 00	Supplementary Specifications	16

Appendices

- Geotechnical Report prepared by DesignPoint Engineering & Surveying Ltd., dated March 7, 2022.
- Drawings: Payzant Drive Roundabout / Feb. 22, 2024 / Issued for Tender

END OF SECTION

This document is a Supplementary Specification to *The Standard Specifications for Municipal Services* as published by the Joint Committee on Contract Documents in association with Nova Scotia Road Builders Association, Consulting Engineers of Nova Scotia and Landscape Nova Scotia.

The West Hants Regional Municipality has decided to use the Standard Specifications in an effort to regulate their specification practices, simplify the review and approval process, and standardize the specifications written by their consultants.

These project documents have been prepared for use with and require being read in conjunction with *The Standard Specifications for Municipal Services* as published by the Joint Committee on Contract Documents. Copies of The Standard Specification are available from the Joint Committee on Contract Documents, c/o Spectech Limited, 18 Laurier Street, Dartmouth, NS, B3A 2G7; telephone: (902) 233-9362; e-mail: nsmunicipalservices@gmail.com; or visit: www.standardspec.ca.

END OF SECTION

Payzant Drive Roundabout
Windsor, Nova Scotia

Owner: West Hants Regional Municipality, 100 King Street, Windsor, NS, B0N 2T0
Engineer: DesignPoint Engineering & Surveying Ltd., 90 Western Parkway, Suite 500, Bedford, NS, B4B 2J3

1.1 Tender Submission

.1 Submit completed tender documents for above project in sealed envelope marked as follows:

TENDER

Payzant Drive Roundabout
Tender #WHRMPW24-03

Closing up to 2:00 p.m., local time, on March 28, 2024 and delivered to:

West Hants Regional Municipality
Public Works Department
100 King St.
PO Box 3000
Windsor, NS, B0N 2T0

.2 Electronic (email) submissions will only be accepted if all the following criteria are met:

- .1 The entire bid document is presented and issued in Adobe PDF format.
- .2 The PDF documents are emailed to WHRM Document Control (documentcontrol@westhants.ca) by no later than 2:00 p.m. Atlantic Daylight Time, of the stated closing date.
- .3 Emails must contain both of the following:
  - .1 A subject line which reads "Electronic Bid #WHRMPW24-03: Payzant Drive Roundabout" and
  - .2 The "Read Receipt" must be turned on, which will be acknowledged by staff upon opening of the email submission.

All PDF documents received will remain unopened until 2:15 p.m. on the stated closing date. At which time, they will be opened by municipal staff along with any hard-copy bids received by letter/courier mail.

.3 Any questions can be directed by email to:

Erin Amirault, P.Eng.
Project Engineer, West Hants Regional Municipality
EAmirault@westhants.ca

1.2 Post Tender Submission

.1 Submit post-tender submission documents no later than two (2) working days after tender closing. Failure to provide such documents may constitute grounds for forfeiture of tender security.

.2 Safety Certification

.1 Submit a copy of tenderer's current and valid safety accreditation issued by Nova Scotia Workers' Compensation Board or Certificate of Recognition (COR) issued by Construction Safety Nova Scotia.

.2 Out-of-province tenderers with a current and valid COR from a Canadian Federation of Construction Safety Associations member shall obtain and submit a current and valid Letter of Good Standing from Construction Safety Nova Scotia.

.3 Workers' Compensation

.1 Submit a copy of tenderer's current and valid clearance letter issued by the Workers' Compensation Board of Nova Scotia.

.2 Out-of-province tenderers shall submit a current and valid clearance letter from a government workers' compensation board but must register with the Nova Scotia Workers' Compensation Board prior to being awarded the Contract.

1.3 Tender Opening

.1 Tenders will be opened at 2:15 p.m. local time on March 28, 2024, after Tender close at the offices of West Hants Regional Municipality, 100 King Street, Windsor. Opening will be public.

.2 Tender amendments will be disclosed at public openings.

1.4 Accuracy of Referencing

.1 Indexing and cross-referencing are for convenience only.

1.5 Conditions of Tendering

.1 Take full cognizance of content of all Contract Documents in preparation of tender. Refer to Section 00 41 43 – Tender Form, Subsection 1.3.8 for a complete list of Contract Documents.

1.6 Tenderers to Investigate

.1 Tenderers will be deemed to have familiarized themselves with existing site and working conditions and all other conditions which may affect performance of the Contract. No plea of ignorance of such conditions as a result of failure to make all necessary examinations will be accepted as a basis for any claims for extra compensation or an extension of time.

1.7 Clarification and Addenda

.1 Notify Engineer not less than two (2) Working Days before tender closing of omissions, errors, or ambiguities found in Contract Documents. If Engineer considers that correction, explanation, or interpretation is necessary, a written addendum will be issued. All addenda will form part of Contract Documents.

.2 Confirm in the tender form that all addenda have been received. Tenderers are solely responsible to obtain and acknowledge the receipt of addenda at time of tender closing.

1.8 Preparation of Tender

.1 Legibly complete tender form provided with Project Documents. Tender all items and fill in all blanks. Have corrections initialed by person signing tender.

1.9 Taxes

.1 Include all taxes in prices except Harmonized Sales Tax (HST) in tender unit prices.

1.10 Tender Security

.1 Provide tender security in the minimum amount of ten percent (10%) of total price including HST. Provide security with tender in the form of a certified cheque or money order payable to the Owner, a bid bond on CCDC Form 220, or other Owner-approved form.

1.11 Contract Security

.1 Refer to Section 00 72 45 – General Conditions, subsection GC11.2 – CONTRACT SECURITY for form of contract security. Refer to Project Documents for amount of contract security and alternate type of contract security, if applicable.

1.12 Insurance

.1 Refer to Section 00 72 45, General Conditions, subsection GC11.1 - INSURANCE, Section 00 74 00 – SUPPLEMENTARY SPECIFICATIONS, and CCDC 41 for insurance requirements.

1.13 Form of Agreement

.1 Form of Agreement is attached for information purposes only until execution of the Contract.

1.14 Return of Tender Security

.1 Tender security will be returned to:

.1 All except the three lowest acceptable tenderers within seven (7) days of tender opening.

.2 Two (2) remaining unsuccessful tenderers within fourteen (14) days of date of award.

.3 Successful tenderer following receipt by Owner of executed agreement, specified contract security, and insurance documents.

1.15 Amendment or Withdrawal of Tender

.1 Tenders may be amended or withdrawn by post or email.

.2 Amendment of individual Unit Prices is the only acceptable price amendment. Amendments shall not disclose either original or revised total price.

.3 Head amendment or withdrawal as follows: "[Amendment/Withdrawal] of tender for Payzant Drive Roundabout, Tender # WHRMPW24-03 ". Sign as required for tender and submit to the address given for receipt of tenders. In order to be considered, submissions shall be received prior to time of tender closing.

1.16 Offer, Acceptance, Rejection

.1 The Municipality reserves the right to reject all or any tenders, and to not necessarily accept the lowest tender. The Municipality may accept any tender or any portion of any tender that may be considered in the best interests of the Municipality. The Municipality also reserves the right to waive formality, informality, or technicality in any tender. This includes the right to accept a tender that is not strictly compliant with the instructions in the tender documents.

1.17 Scope of Work

.1 The Work described in the Project Documents will be carried out in full or in part subject to available funding.

1.18 Site Meeting

.1 A formal site meeting is scheduled for March 21, 2024 at 10:30am. Meetup location at the West Hants Sports Complex Parking lot., 16 Centennial Drive, Windsor NS. Tenderers may make site visits as they deem appropriate, no prior permission is required for site visits.

1.19 Subsurface Investigation

.1 A subsurface investigation has been carried out at the site of the works. Subsurface investigation was carried out to determine the character of the sub-soil for design purposes. The report is being provided for information only and the owner assumes no responsibility for this information. The report can be found in the appendices.

1.20 Disruption to Existing Water Services

.1 Tenderers are advised that disruption to existing water services will have certain restrictions, and scheduling and sequencing requirements.

END OF SECTION

1.1 SALUTATION:

.1 To: West Hants Regional Municipality
100 King Street, PO Box 3000
Windsor, NS, B0N 2T0

.2 For: Tender # WHRMPW24-03
Payzant Drive Roundabout
Windsor, Nova Scotia

.3 From: _____

1.2 TENDERER DECLARES:

.1 That this tender was made without collusion or fraud.

.2 That the proposed work was carefully examined.

.3 That the tenderer was familiar with local conditions.

.4 That Contract Documents and Addenda No. __ to __ inclusive were carefully examined.

.5 That all the above were taken into consideration in preparation of this tender.

1.3 TENDERER AGREES:

.1 To enter into a contract to supply all labour, material and equipment and to do all work necessary to construct the Work as described and specified herein for the unit prices stated in Subsection 1.4 hereunder, Schedule of Quantities and Unit Prices.

.2 That the estimated Contract Price shall be the sum of the products of the tendered unit prices multiplied by the estimated quantities in Subsection 1.4 hereunder excluding Harmonized Sales Tax (HST).

.3 That this tender is valid for acceptance for sixty (60) days from tender closing.

.4 That measurement and payment for items listed in Subsection 1.4 hereunder shall be in accordance with corresponding items in Section 01 22 00 Measurement and Payment.

.5 To provide evidence of ability and experience within five (5) working days of request, including: experience in similar work, work currently under contract, senior supervisory staff available for the project, equipment available for use on the Work, and financial resources.

.6 To execute in triplicate the Form of Agreement and forward same together with the specified contract security and insurance documents to the Owner within ten (10) Working Days of written notice of award.

.7 That failure to provide post-tender submission documents or failure to enter into a formal contract and provide specified insurance documents and contract security within time required will constitute grounds for forfeiture of tender security.

.8 That if tender security is forfeited, Owner will retain difference in money between amount of tender and amount for which Owner legally contracts with another party to perform the Work and will refund balance, if any, to tenderer.

.9 That Contract Documents include:

.1 West Hants Regional Municipality's Municipal Services Specifications Manual Revision 3 (October 24, 2023).

.2 Standard Specification for Municipal Services listed in Table of Contents Page Dated January 2023.

.3 Overview

.4 Information to Tenderers

.5 Tender Form

.6 Supplementary Tender Information

.7 Form of Agreement

.8 Supplementary Specifications

.1 Section 00 74 00 – Supplementary Specifications

.9 Drawings

Sheet 1 / Cover Sheet / Feb. 22, 2024/ Issued for Tender
Sheet 2 / Existing Conditions / Feb. 22, 2024/ Issued for Tender
Sheet 3 / Storm Sewer Replacement Profiles / Feb. 22, 2024/ Issued for Tender
Sheet 4 / Catch Basin Profiles / Feb. 22, 2024/ Issued for Tender
Sheet 5 / Wentworth Road - Plan & Profile / Feb. 22, 2024/ Issued for Tender
Sheet 6 / Payzant Drive - Plan & Profile / Feb. 22, 2024/ Issued for Tender
Sheet 7 / Roundabout Grading Plan / Feb. 22, 2024/ Issued for Tender
Sheet 8 / Roundabout Geometry/ Feb. 22, 2024/ Issued for Tender
Sheet 9 / Cross Section Details / Feb. 22, 2024/ Issued for Tender
Sheet 10 / Lane Markings and Signage Plan / Feb. 22, 2024/ Issued for Tender
Sheet 11 / Utility Pole Plan / Feb. 22, 2024/ Issued for Tender
Sheet 12 / Road Construction Details / Feb. 22, 2024/ Issued for Tender
Sheet 13 / Construction Notes and Details 1/ Feb. 22, 2024/ Issued for Tender
Sheet 14 / Construction Notes and Details 2/ Feb. 22, 2024/ Issued for Tender

.10 Nova Scotia Environmental Regulations.

.11 Geotechnical Report prepared by DesignPoint Engineering & Surveying Ltd., dated March 7, 2022.

.12 All addenda as issued and confirmed in subsection 2.4 of this section.

1.4 SCHEDULE OF QUANTITIES AND UNIT PRICES

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
EARTHWORK					
2.	Grubbing	m^2	800		
8.	Exploratory Digs	ea	5		
10.	Karst Topography Cavern Infill (Provisional)				
	.1 Less than or equal to 5 cubic metres	ea	3		
	.2 Greater than 5 cubic metres	m^3	20		
			SUBTOTAL EARTHWORK:	$	
WATER MAIN					
11.	Pipe				
	.1 250mm PVC BIONAX	m	192		
	.2 200mm PVC BIONAX	m	135		
12.	Fire Hydrants				
	.1 Installation	ea	2		
	.2 Relocation	ea	1		
14.	Direct Buried Valves				
	.1 250mm Gate Valve	ea	3		
	.1 200mm Gate Valve	ea	2		
16.	Connections to Existing Main				
	.1 250mm, Payzant Drive 0+826	ea	1		
	.2 250mm, Payzant Drive 1+018	ea	1		
	.3 200mm, Wentworth Road 0+874	ea	1		
18.	Temporary Water	L.S.	1		
19.	Cap and Abandonment of Existing Main				
	.1 250mm, Payzant Drive 0+834	ea	1		
	.2 250mm, Payzant Drive 0+890	ea	1		
			SUBTOTAL WATER MAIN:	$	

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
STORM SEWER					
31.	Pipe				
.1	300mm PVC DR18	m	48		
.2	450mm RCP 65D	m	33.5		
32.	Manholes				
.1	1050mm	ea	1		
.2	1200mm	ea	1		
33.	Catch Basins				
.1	1050mm, Single	ea	5		
.2	1050mm, Double	ea	5		
34.	Catch Basin Leads				
.1	200mm PVC DR35	m	15		
.2	250mm PVC DR35	m	38		
.3	250mm PVC DR18	m	40		
.4	300mm PVC DR35	m	102		
.5	300mm PVC DR18	m	30		
36.	Connections to Existing				
.1	Existing Manhole	ea	1		
.1	Wentworth Road Culvert	ea	1		
37.	Culverts				
.1	1200mm RCP 65D	m	6.5		
39.	Precast Headwall				
.1	Up to 600mm Pipe	m	5		
.2	1200mm Pipe	m	1		
			SUBTOTAL STORM SEWER:	$	
STREET CONSTRUCTION					
41.	Gravels				
.1	Type 1 (150mm thick)	m^2	3750		
.2	Type 2 (500mm thick)	m^2	3750		
.3	Type 1 (Dentist Parking Lot) (150mm thick)	m^2	1110		
.4	Type 2 (Dentist Parking) (300 mm thick)	m^2	1110		
43.	Asphalt Concrete				
.1	Type C-HF (50 mm thick)	m^2	3750		
.2	Type B-HF (100 mm thick)	m^2	3750		
.3	Type C-HF (Dentist Parking Lot) (40mm thick)	m^2	980		
.4	Type B-HF (Dentist Parking) (50 mm thick)	m^2	980		

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
44.	Curb				
.1	Concrete	m	960		
45.	Concrete Sidewalk				
.1	Sidewalk/ Traffic Island (100mm)	m^2	1185		
.2	Truck Apron (200mm)	m^2	275		
46.	Tactile Walking Surface Indicators	ea	28		
50.	Adjust Existing Manhole Frames and Covers	ea	4		
52.	Segmental Retaining Wall				
.1	Center Island	m^2	98		
.2	Civic 151 Parking Lot	m^2	15		
53.	Street Signs and Bases	ea	38		
54.	Stone Pillar Reinstatement	L.S.	1		
55.	Sign Relocation				
.1	Credit Union	L.S.	1		
.2	Hospital	L.S.	1		
56.	Raised Crosswalks	ea	6		

SUBTOTAL STREET CONSTRUCTION: $_____

LANDSCAPING

61.	Topsoil and Sod	m^2	1050		
62.	Topsoil and Seed	m^2	530		
66.	Grass Pavers	m^2	205		
67.	Center Island Landscaping	L.S.	1		

SUBTOTAL LANDSCAPING: $_____

ADDITIONAL ITEMS

73.	Replacement of Unsuitable Material w/ Surge Rock	m^3	1900		
76.	Infrastructure Removal	L.S.	1		

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
77.	Trench Excavation – Contaminated Material (Provisional)	m^3	50		

SUBTOTAL ADDITIONAL ITEMS: $_____

ENVIRONMENTAL PROTECTION

90.	Environmental Measures	L.S.	1		

SUBTOTAL ENVIRONMENTAL PROTECTION: $_____

SUBTOTAL EARTHWORK $_____

SUBTOTAL WATER MAIN $_____

SUBTOTAL STORM SEWER $_____

SUBTOTAL STREET CONSTRUCTION $_____

SUBTOTAL LANDSCAPING $_____

SUBTOTAL ADDITIONAL ITEMS $_____

SUBTOTAL ENVIRONMENTAL PROTECTION $_____

ESTIMATED CONTRACT PRICE (EXCLUDING HST) $_____ (A)

ADD HARMONIZED SALES TAX (15% of Estimated Contract Price) $_____ (B)

TOTAL PRICE (A + B) $_____

TENDERER'S HST REGISTRATION NO. _____

1.5 GENERAL REQUIREMENTS

.1 Refer to Supplementary Specifications and the Tender Drawings for general requirements to complete the work that shall be included in the Tenderer's total price (i.e. erosion & sediment control measures, traffic control, disposal of existing services, coordination with utility owners during construction, pavement markings, etc.).

1.6 COMPLETION TIME

.1 Tenderer agrees to complete the Work during the 2024 and 2025 construction seasons. Substantial completion of the Work to be achieved on or before November 30th, 2025.

1.7 SIGNATURES*

DATED THIS _____ DAY OF_____ , 20_____.

_____
Name of Tenderer

_____ _____
Witness Signature of Signing Officer

_____
Name and Title (Printed)

_____ _____
Witness Signature of Signing Officer

_____
Name and Title (Printed)

*NOTE: Tenders submitted by or on behalf of any Corporation must be signed in the name of such Corporation by a duly authorized officer(s) or agent(s).

END OF SECTION

1. This Section is required to be completed and submitted at the time of tendering with all information requested completed in full. Failure to submit the information requested in this Section may be cause for the West Hants Regional Municipality to treat your Tender as non-compliant.

2. Submit with Tender the following:

   .1 Name and address of the chartered Canadian bank or reputable financial institutions to vouch for firm's financial status.

   .2 Name and address of the company who has agreed to underwrite the bonds for Performance and for Labour and Material Payment.

   .3 Name and address of the company who will underwrite the contract insurance required.

   .4 Particulars of recent contracts successfully completed or progressing towards completion.

   .5 A list of equipment to be used.

   .6 A list of project personnel.

   .7 A list of subcontractors.

   .8 A program of the work.

3. Submittals

   .1 Confirmation of Tenderer's financial status.

   Name _____

   _____

   Address _____

   _____

   Contact Person _____ Telephone _____

.2 Name and address of company who has agreed to underwrite the bonds for Performance and for Labour and Material Payment. These bonds shall be issued by a duly licensed surety company authorized to transact the business of suretyship in the Province of Nova Scotia.

Name _____

_____

Address _____

_____

Contact Person _____ Telephone _____

.3 Name and address of company who has agreed to underwrite insurance, the type and amount. This insurance shall be issued by a company having insurance adjusting representation in Nova Scotia.

Name _____

_____

Address _____

_____

Contact Person _____ Telephone _____

Type of Insurance	Amount
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

.4 Particulars of recent contracts. Furnish particulars of a minimum of three contracts successfully carried out or in the process of being constructed. Projects listed shall be approximate in nature to the work being tendered for and be comparable or greater in size.

Customer	Description	Date	Contract Value
_____	_____	from _____ to _____	$_____
_____	_____	from _____ to _____	$_____
_____	_____	from _____ to _____	$_____
_____	_____	from _____ to _____	$_____

.5 List of equipment to be used on this project.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

.6 List of project personnel.

Include below the names, qualifications and previous experience of those employees who will be directly involved with this project.

Name	Title/Role	Related Experience

.7 List of Subcontractors

Enter the name and address of each Subcontractor used in making up this Tender. Only name one Subcontractor for each part of the Work to be sublet.

Upon acceptance of a Tender by the Municipality of the District of West Hants, the Contractor shall not substitute another Subcontractor in place of the one named without the written approval from the Municipality of the District of West Hants.

Subtrade	Subcontractor Name and Address	Extent of Work	Value of Work

.8 Program of the Works

Insert a brief description of the proposed method of operation and phasing to ensure completion in the period set forth in Section – 00 74 00 – Supplementary Specifications, Subsection 3 – Scheduling and Coordination.

_____

_____

_____

_____

_____

_____

_____

_____

.9 References

Bidders shall supply two (2) references from past projects similar in nature to the Payzant Drive Roundabout project. Each reference shall include a brief description of the project, estimated construction cost, name and contact information for the Owner/Client. The Owner reserves the right to review and evaluate the reference information provided by Bidders as part of the Tender Selection process. The lowest price will not necessarily be selected for award.

Reference 1

Project Name & Location:	
Year Completed:	
Construction Value:	$
Owner Name:	
Project Contact Name:	
Project Contact Phone:	
Project Contact Email:	
Project Description:	

Reference 2

Project Name & Location:	
Year Completed:	
Construction Value:	$
Owner Name:	
Project Contact Name:	
Project Contact Phone:	
Project Contact Email:	
Project Description:	

END OF SECTION

This Agreement made on the __ day of ____ in the year___.

BY AND BETWEEN

West Hants Regional Municipality

hereinafter called the "Owner"

and

hereinafter called the "Contractor"

The Owner and the Contractor agree as follows:

ARTICLE A1 - THE WORK

.1 The Contractor shall:

.1 Perform the Work required by the Contract Documents for

Payzant Drive Roundabout Tender # WHRMPW24-03

located at Windsor, Nova Scotia

for which the Agreement has been signed by the parties, and for which

DesignPoint Engineering & Surveying Ltd.

is acting as and is hereinafter called the “Engineer”

and

.2 do and fulfill everything indicated by this Agreement, and

.3 attain Substantial Performance of the work as certified by the Engineer by the 30th day of November in the Year 2025.

ARTICLE A2 – AGREEMENTS AND AMENDMENTS

.1 This Contract supersedes all prior negotiations, representations or agreements, either written or oral, relating in any manner to the work, including the bidding documents that are not expressly listed in Article A3 of the Agreement.

ARTICLE A3 - CONTRACT DOCUMENTS

.1 The following is an exact list of the Contract Documents referred to in Article A1.1 of this Agreement and as defined in subsection 6 of Section 00 71 00 DEFINITIONS. This list is subject to subsequent amendments in accordance with the provisions of the Contract Documents.

.1 STANDARD SPECIFICATION FOR MUNICIPAL SERVICES.
Table of Contents Dated January 2023.

.2 Overview

.3 Information to Tenderers

.4 Tender Form

.5 Supplementary Tender Information

.6 Form of Agreement

.7 Supplementary Specifications

.1 Section 00 74 00 – Supplementary Specifications

.8 Drawings:

Sheet 1 / Cover Sheet / Feb. 22, 2024/ Issued for Tender
Sheet 2 / Existing Conditions / Feb. 22, 2024/ Issued for Tender
Sheet 3 / Storm Sewer Replacement Profiles / Feb. 22, 2024/ Issued for Tender
Sheet 4 / Catch Basin Profiles / Feb. 22, 2024/ Issued for Tender
Sheet 5 / Wentworth Road - Plan & Profile / Feb. 22, 2024/ Issued for Tender
Sheet 6 / Payzant Drive - Plan & Profile / Feb. 22, 2024/ Issued for Tender
Sheet 7 / Roundabout Grading Plan / Feb. 22, 2024/ Issued for Tender
Sheet 8 / Roundabout Geometry/ Feb. 22, 2024/ Issued for Tender
Sheet 9 / Cross Section Details / Feb. 22, 2024/ Issued for Tender
Sheet 10 / Lane Markings and Signage Plan / Feb. 22, 2024/ Issued for Tender
Sheet 11 / Utility Pole Plan / Feb. 22, 2024/ Issued for Tender
Sheet 12 / Road Construction Details / Feb. 22, 2024/ Issued for Tender
Sheet 13 / Construction Notes and Details 1/ Feb. 22, 2024/ Issued for Tender
Sheet 14 / Construction Notes and Details 2/ Feb. 22, 2024/ Issued for Tender

.9 West Hants Regional Municipality's Municipal Services Specifications Manual (October 24, 2023).

.10 Nova Scotia Environmental Regulations.

.11 Geotechnical Report prepared by DesignPoint Engineering & Surveying Ltd., dated March 7, 2022.

.12 Addenda as issued and as confirmed in subsection 2.4 of Section 00 41 43.

ARTICLE A4 - CONTRACT PRICE

.1 The estimated Contract Price is the sum of the products of the estimated quantities multiplied by the appropriate Unit Prices in the tender form excluding the amount of Harmonized Sales Tax.

.2 The estimated Contract Price is $ _____

.3 All amounts shall be in Canadian funds.

.4 The amounts shall be subject to adjustment as provided in the Contract Documents.

ARTICLE A5 - PAYMENT

.1 The Owner shall pay the Contractor in Canadian funds for the performance of the Contract. The Contractor's invoice format is to be submitted for review and approval by the West Hants Regional Municipality prior to issuing the first invoice.

.2 The Owner shall make monthly payments on account to the Contractor for the Work performed, as certified by the Engineer, subject to a 10% holdback.

.3 The amount of the monthly payments shall be calculated as follows:

- .1 The quantity for each pay item on which actual work has been performed shall be measured.
- .2 For each Unit Price item this quantity shall be multiplied by the applicable Unit Price as provided in the Tender Form.
- .3 For each lump sum item, multiply the percent complete by the value of the lump sum item.
- .4 The total value of work completed for the payment period shall be calculated by adding the total of the products for all pay items from 3.2 and 3.3 of this Article.
- .5 The amount of the monthly payment shall be determined by deducting the 10% holdback and the total of all previous payments from the total value of such completed work as determined under 3.4 of this Article.
- .6 To the amount calculated above, the Harmonized Tax shall be added.

.4 The last day of the payment period shall be the last working day of the month.

.5 Upon Substantial Performance of the Work as certified by the Engineer the Owner shall pay to the Contractor the holdback monies then due in accordance with the provisions of Section 00 72 45 - General Conditions, subsection GC5.8 – PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK.

.6 Upon the issuance of the final certificate for payment as certified by the Engineer, the Owner shall pay to the Contractor the balance of monies then due in accordance with the provision of Section 00 72 45 - General Conditions, subsection GC5.10 – FINAL PAYMENT.

.7 In the event of loss or damage occurring where payment becomes due under the property and boiler insurance policies, payment shall be made to the Contractor in accordance with the provisions of Section 00 72 45 - General Conditions, subsection GC11.1 - INSURANCE.

.8 If the Owner fails to make payment to the Contractor as it becomes due under the terms of the Contract, interest shall be payable as follows:

- .1 The annual interest rate applicable to the contract is 5% compounded monthly.
- .2 Interest shall be calculated on the overdue balance from the due date.

.9 The owner shall pay invoices no later than **30** days from date of receipt.

ARTICLE A6 - RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING

.1 Notices in writing shall be addressed to the recipient at the address set out below.

.2 The delivery of a notice in writing shall be by hand, courier, prepaid first class mail, or electronic communication during the transmission of which no indication of failure of receipt is communicated to the sender.

.3 A notice in writing delivered by one party in accordance with this Contract shall be deemed to have been received by the other party on the date of delivery if delivered by hand or courier, or if sent by

mail it shall be deemed to have been received five (5) Working Days after the date on which it was mailed.

.4 A notice in writing sent by a form of electronic communication shall be deemed to have been received on the date of its transmission provided that if such day is not a Working Day or if it is received after the end of normal business hours on the date of its transmission at the place of receipt, then it shall be deemed to have been received at the opening of business at the place of receipt on the first Working Day following the transmission thereof.

.5 An address for a party may be changed by notice in writing setting out the new address delivered to the other party in accordance with this Article.

.1 The Owner at West Hants Regional Municipality, 100 King Street, PO Box 3000 Windsor, NS, B0N 2T0

.2 The Contractor at _____

.3 The Engineer at DesignPoint Engineering & Surveying Ltd., 90 Western Parkway Suite 500, Bedford, NS, B4B 2J3

ARTICLE A7 - QUANTITIES AND MEASUREMENT

.1 The quantities shown in Section 00 41 43 Tender Form - Schedule of Quantities and Unit Prices are estimated.

.2 Measurement for the actual quantities used to determine payments and Contract Price shall be in accordance with Section 01 22 00 - Measurement and Payment.

ARTICLE A8 - SUCCESSION

.1 The aforesaid Contract Documents are to be read into and form part of the Agreement and the whole shall constitute the Contract between the parties and subject to law and the provisions of the Contract Documents shall inure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successors and assigns.

ARTICLE A9 - RIGHTS AND REMEDIES

.1 No action or failure to act by the Owner, Engineer, or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

ARTICLE A10 - TIME

.1 Time shall be construed as being of the essence of the Contract.

In witness whereof the parties hereto have executed this Agreement and by the hands of their duly authorized representatives.

SIGNED AND DELIVERED
In the presence of:

OWNER

Name of Owner

Witness

Signature

Name and Title of Person Signing

Witness

Signature

Name and Title of Person Signing

CONTRACTOR

Name of Contractor

Witness

Signature

Name and Title of Person Signing

Witness

Signature

Name and Title of Person Signing

N.B. Where legal jurisdiction, local practice or Owner or Contractor requirements calls for (a) proof of authority to execute this document, attach such proof of authority in the form of a certified copy of a resolution naming the representative(s) authorized to sign the Agreement for and on behalf of the corporation or partnership; or (b) affixing of a corporate seal, this Agreement should be properly sealed.

END OF SECTION

INTENT

.1 Construct the Work of this Contract in accordance with the Standard Specifications for Municipal Services as developed by the Nova Scotia Road Builders Association and the Consulting Engineers of Nova Scotia Joint Committee on Contract Documents, except as modified herein.

.2 These Supplementary Specifications modify the specification sections to which they refer.

.3 The Supplementary Specifications take precedence over the Standard Specification to which they refer.

SECTION 00 72 45: GENERAL CONDITIONS

GC5.4 BASIS OF PAYMENT FOR COST PLUS WORK

Delete clause 5.4.1 and replace with the following:

.1 Payment for cost plus work shall be based on the cost of such work, as provided in paragraph 5.4.2, plus a fee calculated as a percentage of the cost of such work, for the Contractor's overhead and profit. The percentage amount shall be 10% for work done by the Contractor's own forces and 10% for work done by Subcontractors. The percentage shall not be applied to the cost of Construction Equipment when such cost is based on rates which already include the Contractor's overhead and profit. Equipment rates shall be as per Nova Scotia Roadbuilders rental rates.

GC 5.8 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE

Add Clause GC 5.8.6 as follows:

.6 If, within sixty (60) days after the issue by the Engineer of the Certificate of Substantial Performance, the Contractor has not corrected all the deficiencies, the Owner shall retain sufficient money to cover the cost of completing the said deficiencies, as determined by the Engineer, in addition to holding monies retained in accordance with the Contract and subject to appropriate legislation of Nova Scotia.

GC 6.5 – DELAYS

Add the following subsections:

.6 Notwithstanding the above subsections, time shall be construed as being of the essence of the Contract. The date of expiring of the time allowed in accordance with the Contract for substantial performance of the Work shall be termed the Date for Completion. Should the Contractor fail to substantially perform the Work by the Date for Completion, the period of time from the Date for Completion to the date of Substantial Performance of the Work as determined by the Engineer, shall be termed the Period of Delay.

.7 In the event of there being a Period of Delay caused by the Contractor, the Contractor shall be liable for and shall pay to the Owner the cost of continuance of supervision during the Period of Delay, and all additional fees, disbursements and costs incurred by the Owner by reason of there being such a period of delay. The said sum or sums in view of the difficulty of ascertaining the losses which the Owner may suffer by reason of delay in the Performance of the said Works, is hereby agreed upon, fixed and determined by the parties hereto as liquidated damages that the Owner will suffer by reason of said delay and default and not as a penalty. The value of the liquidated damages shall be $1000.00 per day for the duration of the Period of Delay. The Owner may deduct the amount of such liquated damaged from any monies payable to the Contractor under the contract.

Delete Subsection GC 6.7 – Quantity Variations and replace with the following:

GC 6.7 QUANTITY VARIATIONS

.1 The Work may be completed in full or in part subject to funding which may lead to substantial quantity adjustments. Due to the variability of the scope of work, Unit Prices issued at the time of Tender close will be final and will not be subject to adjustment upon quantity variation.

GC 11.1 – INSURANCE

Make the following changes to Section GC11.1:

GC11.1.1.1 Replace "$2,000,000 per occurrence with a property damage deductible not exceeding $2,500" with "$10,000,000 per occurrence with a property damage deductible not exceeding $25,000"

Add:
This policy shall include but not be limited to:

a) Name the Municipality of the District of West Hants as an additional insured
b) Cross-liability and severability of interest
c) Blanket Contractual
d) Products and Completed Operations
e) Premises and Operations Liability
f) Personal Injury Liability
g) Contingent Employers Liability
h) Municipality of the District of West Hants and Proponents Protective
i) Broad Form Property Damage
j) Firefighting Expenses
k) Elevator and Hoist Liability
l) Attached Machinery – while loading & unloading

The following may apply:

a. If applicable to the construction project described in the Agreement, coverage shall include shoring, blasting, excavation, underpinning, demolition, pile driving, caisson work and work below ground surface including tunneling and grading.
b. If the work involves asbestos removal, the policy shall either provide coverage for this exposure or coverage shall be provided through a Professional Liability Policy.
c. To achieve the desired limits, umbrella or excess liability insurance may be used.

GC11.1.1.2 Replace "limits of not less than $2,000,000 per occurrence" with "limits of not less than $5,000,000 per occurrence"

GC11.1.1.3 Replace all instances of "$2,000,000" with "$5,000,000".

Add Clause GC 11.1.1.6 as follows:

.6 The Contractor shall carry a Contractor's Pollution Liability Policy, underwritten by an insurer licensed to conduct business in the Province of Nova Scotia for a limit of not less than $10,000,000. Coverage shall include bodily injury, property damage, clean-up, and remediation costs.

Delete Subsection GC 11.2 – Contract Security and replace with the following:

GC 11.2 CONTRACT SECURITY

. 1 The Contractor shall provide to the owner within fourteen (14) days of acceptance of the Tender a Performance Bond and a Labour and Materials Bond each in the amount of 50% of the Estimated Contract Price.

GC 12.3 WARRANTY

Add the following sections:

.7 The Contract requires an operational combination of several components comprising the Work which are customarily guaranteed by their suppliers. Under the terms of this Contract, the Contractor shall provide a guarantee of the Works for a period of one (1) year following the date of Substantial Performance of Work. The terms of the guarantee shall be as follows:

1 Where failure or incipient failure of the material is apparent, the Contractor shall actively commence repair or other remedy not more than twenty-four (24) hours after receiving due notice.

2 If the Contractor on being notified does not for any reason commence repairs within twenty-four (24) hours, the Owner shall have the right to have repairs made by others as necessary to restore, complete, or continue service. The cost of such repairs by others is to be borne by the Contractor. The Owner shall at all times inform or attempt to inform the Contractor before hiring others to affect any repairs and it shall be at all times the Contractor's right to be informed as soon as possible of difficulties and proposed remedial action by others and to make or where practical to complete such repairs at any other time of the guarantee period in preference to others.

3 The employment of some other person or persons for reasons set out shall in no way affect the Contractor's obligations or liability hereunder or relieve him of the performance and fulfilment of any or all of his covenants, undertakings, obligations or duties under the Contract.

4 After the acceptance by the Owner and during the guarantee period, the burden of maintenance shall fall upon the Owner. In the event of damage, failure or incipient failure of any part or parts directly attributable to inadequate or improper maintenance, the Contractor shall be responsible for remedial action, but the cost of such repairs will be reimbursed by the Owner.

5 If the Contractor arranges that the manufacturer of some component or some other party approved by the Owner provide the guarantee on a sub-contract basis, he may designate the direct implementer of the guarantee as his agent under the Contract in which case due notice to the agent will be taken as due notice to the Contractor. This will be a matter for Contractor's convenience only, and shall in no way affect the Contractor's obligations and liabilities hereunder or relieve him from the performance and fulfilment of any or all of his covenants, undertakings, or duties under this contract.

6 In emergency situations, the Owner reserves the right to make appropriate repairs at the Contractor's expense.

SECTION 01 10 00: GENERAL REQUIREMENTS

Delete Subsection 2 – SUMMARY OF WORK and replace with the following:

2. SUMMARY OF WORK

.1 The work includes, but is not limited to, the following:

a. The construction of a roundabout at the intersection of Payzant Drive and Wentworth Road, as shown in the project documents.
b. Lay out of proposed cut and fill slope limits and review with Municipality staff prior to construction.
c. Installation and testing of municipal water and stormwater drainage infrastructure as shown in the project documents. Contractor to use extreme caution when working near existing water mains, sewer mains, and service laterals.
d. Removal of existing buried water and sewer infrastructure located within the project area as indicated on the project drawings.
e. Street construction for the roundabout including but not limited to subgrade, gravels, asphalt, curb, sidewalks, concrete medians, grass pavers, center island landscaping, street signs and bases, raised crosswalks, rectangular rapid flashing beacons, and traffic markings.
f. Installation of retaining walls and relocation of concrete pillars and signs as shown in the project documents.
g. Locate all existing infrastructure prior to construction and provide two week for review by the Engineer and the Municipality.
h. Provision of temporary water supply to all customers connected to the affected water mains, as required.
i. Removal and disposal of the existing road structure as required to complete the work.
j. Removal, disposal, and replacement of all sidewalks, curbs, asphalt, and landscaping within the construction limits, as indicated on the project drawings.
k. Provision of environmental protection for the duration of the project, including one year following project substantial completion.
l. Obtaining all necessary approvals and permits from the appropriate regulatory bodies as well as any associated costs.
m. Testing of services in accordance with Standard Specifications for Municipal Services, dated January 2023.
n. Dewatering of any and all excavations, erosion and sediment control including silt fences, flow checks, ground covers, water treatment, and all other environmental controls required during the course of the Work.
o. All traffic control and detours as per the Municipality of the District of West Hants and Nova Scotia Department of Public Works (NSDPW) Temporary Workplace Traffic Control Manual.
p. Removal, disposal, relocation and replacement of street signs as indicated.
q. Shoring of utility poles, as needed.
r. Clearing, grubbing (disposed of off-site), excavation of common, removal and off-site disposal of surplus material, and importing of fill.
s. Coordination with utilities for location of any existing infrastructure and alteration of this infrastructure. Contractor to notify Engineer of any discrepancies and to allow 2 weeks for review.
t. Coordinate construction with adjacent property owners. Maintain safe access to driveways and properties for the duration of the project. Provision of temporary access to all residents affected by the work, as required and directed by the Municipality.
u. Reinstatement of all disturbed areas to pre-construction condition or better.
v. All incidental items and costs associated with completing the work.

Add the following to Subsection 3 – SCHEDULING AND COORDINATION:

3. SCHEDULING AND COORDINATION

.5 The Contractor is to schedule the work such that the works are completed by November 30th, 2024, unless agreed otherwise with the Municipality.

.6 Contractor is to be familiar with Spring Weight Restrictions and plan accordingly.

Delete subsection 8 – RECORD DRAWINGS and replace with the following:

8. RECORD DRAWINGS

.1 The Contractor shall maintain project Record Drawings and accurately record significant deviations from Contract Drawings caused by site conditions and changes ordered by the Engineer.

.2 Mark changes and deviations in red on one set of whiteprints.

.3 Record the following significant deviations:

.1 Depths of various elements of works in relation to geodetic elevation.

.2 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface such as foundation corners, etc. to the satisfaction of the Engineer.

.3 Field changes of dimensions.

.4 Other significant deviations which are concealed in construction and cannot be identified by visual inspection.

.4 At completion of the project and prior to final inspection, neatly transfer records to second set of whiteprints using fine, red marker. Neatly print lettering and number in size to match original. Line may be drawn free hand but shall be neat and accurate. Add at each Drawing Title Block Note: As- Built.

.5 Submit this set of Record Drawings to the Municipality along with a digital copy of all survey points.

.6 In the event that record drawings are not provided by the Contractor, the Value of the record drawings is agreed to be the cost incurred by the Owner to collect the data and produce the drawings and is agreed to be valued at $5000.00 + HST; such costs being removed from the final payment if the drawings are not properly provided.

Delete subsection 10 – TEMPORARY SITE FACILITIES and replace with the following:

10. TEMPORARY SITE FACILITIES

.1 Temporary Site Facilities are not required for this project.

Add the following to Subsection 12 – TRAFFIC CONTROL:

12. TRAFFIC CONTROL

.6 Provide access to all properties during work.

.7 Provide detour plans as required in consultation with the West Hants Regional Municipality and Nova Scotia Department of Public Works.

.8 Signs to be placed as directed by the Municipality indicating that the area is under construction and use is limited to local traffic only.

.9 Provide at minimum one lane of traffic flow at all times, unless approved by the West Hants Regional Municipality traffic authority.

.10 Coordinate all traffic disruptions with the Nova Scotia Health Authority and maintain access for emergency services.

Add the following subsections:

17. UTILITIES

.1 Contractor is responsible for obtaining permits from all utilities such as a Safe Clearance Report from Nova Scotia Power for Work near utilities.

.2 The existence, location, and elevation of underground utilities, utility poles, guy wires, and signs are not guaranteed, and notwithstanding any provision in the Contract Documents, the Contractor shall be responsible for determining the location and elevation of all sewer, water, or other such structures or utilities. The contractor shall coordinate and include in the contract price any required service supplied by any utility, company or provincial department.

.3 Unless designated for removal under this Contract, sustain in place and protect from damage any and all piping, conduits, cables, and all other structures in the approximate locations of buried services or structures, carefully excavate by hand, or similar means to expose these buried services or structures. Any utilities which cross an excavation must be properly supported or shored to prevent settlement. Where trenching is to be done under existing utilities, such utilities shall be shored before excavation commences and shoring is to be left in place. Notify the owners of such utilities or services prior to excavation.

.4 Repair immediately all piping conduits, cables, and all other structures damaged by the Contractor's operations. Provide a letter from the utility stating that any services damaged during construction have been repaired to the utility company's approval. Replace all signs as near as possible to their original location.

.5 The work includes coordination with underground and overhead utility owners to allow excavation in close proximity to their utilities. The contractor shall allow for all incidental costs arising from excavations near existing utility poles, underground utilities, and overhead utilities. Coordination with utilities will also be required during the work as the overhead utilities and poles within the work site may require shoring during the course of construction. No claim of delay will be accepted based on coordination activities between the contractor and the utilities.

18. FLOATATION AND FLOODING

.1 Prevent floatation and flooding during construction of the Work. Make good any damage to pipes or structures caused by floatation and flooding at no extra cost to the Contract.

.2 De-water all excavations and remove accumulations of water prior to backfilling.

.3 Dispose of water drained or pumped such that the Work and adjacent properties are not damaged.

.4 Temporary caps must be placed on all pipe ends when not actively being worked on.

19. DAMAGE AND INJURY

.1 Immediately inform the Engineer of any damage or injury to any persons, property, services, or materials.

.2 Reinstate survey markers, monuments, and survey pins disturbed or covered during construction under the direction of a qualified provincial land surveyor. Include costs in Contract Price.

.3 Any Nova Scotia Department of Public Works or Nova Scotia Power infrastructure that is moved or damaged, shall be reinstated to their specifications and standards.

Section 01 22 00: MEASUREMENT AND PAYMENT

GENERAL

Delete subsection 2 and 3 and replace with the following:

2. For each item include all of the following as required where individual quantities are not provided in the Tender Form: project sign, mobilization, demobilization, traffic control including preparation of traffic control plan, assistance to the Engineer, coordination with all utilities, locating existing infrastructure (including but not limited to service laterals, crossings, and connection points), coordination with home owners, NSPI or other utility charges when working under transmission lines on in the proximity of power or communication infrastructure, environmental protection, protection of existing trees, clearing and grubbing, common and rock excavation,

shoring, dewatering, protection and shoring of existing pipes and infrastructure, utility pole shoring, bedding, backfilling, compaction, removal and disposal of surplus material, removal and disposal of unsuitable material, importation and placement of material, joint restraints and thrust blocks, sleeving, insulation, removal and disposal of existing infrastructure (as required), connections to existing laterals, protective coatings, flushing, pressure testing, vacuum and mandrel testing, disinfection, dechlorination, corrosion protection, cleaning, video inspection prior to Substantial Performance of the Work and at the end of the Warranty Period, marker stakes, tracer wire and test stations, all electrical wiring, reinstatement, shop drawings, manhole and catchbasin frames and covers, rocklining, valve covers, grade adjustment rings, contingency plan and materials to address an existing watermain break, waterproofing membrane, all incidentals, and any other work and materials shown on the drawings.

EARTHWORK

Delete subsection 2 and replace with the following:

2. Grubbing

Unit of Measurement: square metre (m^2)

Method of Measurement: plane measure of indicated area.

This item includes: removal and disposal of all stumps, roots, downed timber, embedded logs, rootmat, humus, and topsoil from areas indicated.

Add new subsections as follows:

8. Exploratory Digs

Unit of Measurement: each (ea)

This item includes: excavation to confirm the horizontal and vertical locations of the existing water and sewer infrastructure, coordination with the Owner, and reinstatement of all disturbed areas. Locations to be provided to the Municipality and Engineer for review. Allow two weeks for review.

10. Karst Topography Cavern Infill (Provisional)

This is a provisional item in the event that during excavation, voids or caverns in gypsum bedrock (Karst Topography) are encountered. No payment will be made under this item unless authorized by the Engineer.

.1 Less than or equal to 5 cubic metres

Unit of Measurement: each (ea)

This item includes: cleaning off and washing down gypsum so that the void or cavern is accessible, pump or place non-shrink fill, and supply of all materials, labour, equipment, and incidentals to complete this work. Reinstatement to be reviewed and certified by project geotechnical engineer.

.2 Greater than 5 cubic metres

Unit of Measurement: cubic metre (m^3)

This item includes: cleaning off and washing down gypsum so that the void or cavern is accessible, pump or place non-shrink fill, and supply of all materials, labour, equipment, and incidentals to complete this work. Reinstatement to be reviewed and certified by project geotechnical engineer.

WATER SYSTEM

Delete subsection 11 and replace with the following:

11. Pipe

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through fittings, valves, and valve chambers.

This item includes: supply and installation of pipe complete with all fittings and thrust restraints, insulation, tracer wire and test stations, anodes, common excavation, removal and disposal of surplus material, import of material, location of and connection to existing services, bedding and pipe protection gravels, backfilling, testing, test stations, chlorination and de-chlorination, flushing, disinfection, dewatering, trench support, stabilization, and any other associated work or materials shown on the drawings not included in any other pay item.

Delete subsection 12 and replace with the following:

12. Fire Hydrants

.1 Installation

Unit of Measurement: each (ea)

This item includes: supply and installation of hydrant complete with lead, anchor tee, gate valve, valve box, anodes, thrust blocks, insulation, bedding and pipe protection gravels, geosynthetic fabric, tracer wire and test stations, common excavation, backfilling, dewatering, trench support, stabilization, and any other associated work or materials shown on the drawings not included in any other pay item.

.2 Relocation

Unit of Measurement: each (ea)

This item includes: relocation of existing hydrant, supply and installation of lead, anchor tee, gate valve, valve box, anodes, thrust blocks, insulation, bedding and pipe protection gravels, geosynthetic fabric, tracer wire and test stations, common excavation, backfilling, dewatering, trench support, stabilization, and any other associated work or materials shown on the drawings not included in any other pay item.

Delete subsection 14 and replace with the following:

14. Direct Buried Valves

Unit of Measurement: each (ea)

This item includes: supply and installation of direct buried valves complete with valve box, appurtenances, anodes, common excavation, backfilling, finished grade adjustment, and any other associated work or materials shown on the drawings not included in any other pay item.

Delete subsection 16 and replace with the following:

16. Connections to Existing Main

Unit of Measurement: each (ea)

This item includes: locating existing main, and supply and installation of pipe, nipples, reducers, fittings, common excavation, backfilling, and any other associated work or materials shown on the drawings not included in any other pay item. This item also includes producing and distributing temporary shutdown notices to affected customers.

Delete subsection 18 and replace with the following:

18. Temporary Water

Unit of Measurement: Lump Sum (L.S)

This item includes, but is not limited to: the supply of all labour, material and equipment required for installation, maintenance and removal of a temporary main line and service laterals complete with pipe, valves, backflow prevention device (sized to match temporary main line diameter), vacuum breakers at the connection to customers, insulation and protection from freezing, chlorination/ de-chlorination of line, testing (including bacteria and pressure), coordination with property owners, temporary laterals, and all fittings and incidentals necessary for a complete installation. Coordinate temporary lateral connections with property owners. Limits of temporary water service may extend outside limits of construction. Submit a proposed plan 2 weeks prior to installation for review by the Owner and Engineer. This item also includes installation of approved vehicle and pedestrian crossing protective measures. This item also includes producing and distributing temporary shutdown notices to affected customers.

Add new subsections as follows:

19. Cap and Abandonment of Existing Main

Unit of Measurement: each (ea)

This item includes: locating existing main, and supply and installation of fittings, grout, common excavation, backfilling, and any other associated work or materials shown on the drawings not included in any other pay item.

STORM SEWER

Delete subsection 31 and replace with the following:

31. Pipe

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through manholes.

This item includes: supply and installation of pipe complete with all fittings, insulation, sleeves, common excavation, removal and disposal of surplus material, import of material, bedding and pipe protection gravels, backfill, testing, flushing, video inspection, and any other associated work or materials shown on the drawings not included in any other pay item.

Delete subsection 32 and replace with the following:

32. Manholes

Unit of Measurement: each (ea)

This item includes: supply and installation of manhole, frame, cover, waterproofing membrane (such as Blueskin,

full manhole to be covered with waterproofing, including sides, bottom, and top of manhole), grout, adjustment to finished grade, common excavation, backfilling, bedding gravels, and any other associated work or materials shown on the drawings not included in any other pay item.

Delete subsection 33 and replace with the following:

33. Catch Basins

Unit of Measurement: each (ea)

This item includes: supply and installation of catch basins, frames and grates, waterproofing membrane (such as Blueskin, full structure to be covered with waterproofing, including sides, bottom, and top of structure), grout, grade adjustment (minimum 300mm), common excavation, backfilling, bedding gravels, and any other associated work or materials shown on the drawings not included in any other pay item.

Delete subsection 34 and replace with the following:

34. Catch Basin Leads

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through catch basins and manholes.

This item includes: supply and installation of pipe complete with all fittings, insulation, sleeves, common excavation, removal and disposal of surplus material, import of material, bedding and pipe protection gravels, backfill, and any other associated work or materials shown on the drawings not included in any other pay item.

Delete subsection 36 and replace with the following:

36. Connections to Existing

Unit of Measurement: each (ea)

This item includes: locating existing structure, supply and installation of all fittings, core drilling and sealing as indicated, common excavation, disposal of surplus material, bedding and pipe protection gravels, backfilling, and any other associated work or materials shown on the drawings not included in any other pay item.

Delete subsection 37 and replace with the following:

37. Culverts

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe.

This item includes: supply and installation of culvert complete with all fittings, common excavation, removal and disposal of surplus material, pipe bedding, backfilling, and reinstatement of all disturbed areas not covered by other items (including, but not limited to, gravels, asphalt, sidewalk, and landscaped areas).

Delete subsection 39 and replace with the following:

39. Precast Headwall

Unit of Measurement: each (ea)

This item includes: supply and installation of headwall including common excavation, backfilling, bedding and grate as indicated.

STREET CONSTRUCTION

Delete subsection 41 and replace with the following:

41. Gravels

Unit of Measurement: square metre (m^2)

Method of Measurement: slope measure of indicated area at specified thickness.

This item includes: supply, placement, and compaction of gravel as indicated.

Delete subsection 43 and replace with the following:

43. Asphalt Concrete

Unit of Measurement: square metre (m^2)

Method of Measurement: slope measure of indicated area at specified thickness.

This item includes: cleaning, supply, placement, and compaction of asphaltic concrete as indicated including dry sweeping milled surfaces prior to tacking, tack coat, temporary pavement markings, adjustments to the top of castings, line painting, traffic markings, adjustments, and saw cutting as necessary. This item also includes supply, placement and compaction of asphalt concrete ramps installed at all limits including side streets and pedestrian ramps using hot mix asphalt (or approved equivalent) and a bond separator. Asphalt ramps are to be installed before work is completed for the day, and before the area is opened to live traffic. Asphalt ramps to be constructed to at least a 20 to 1 horizontal to vertical ratio.

Delete subsection 44 and replace with the following:

44. Curb

Unit of Measurement: metre (m)

Method of Measurement: along top face of curb.

This item includes: supply and installation of concrete curb and base gravels, including supply and placement of backfill as indicated, and removal and disposal of surplus material.

Delete subsection 45 and replace with the following:

45. Concrete Sidewalk

Unit of Measurement: square metre (m^2)

Method of Measurement: slope measure of indicated area at specified thickness.

This item includes: supply and installation of concrete, wire mesh where required, reinforcing as indicated on the project drawings, base gravels, backfill, removal and disposal of surplus material, and reinstatement of all disturbed areas not covered by other items (including, but not limited to, gravels, asphalt, sidewalk, and landscaped areas).

Delete subsection 46 and replace with the following:

46. Tactile Walking Surface Indicators

Unit of Measurement: each (ea)

This item includes: supply and installation of Duralast Cast Iron Detectable Warning Plate tactile walking surface indicators as per manufacturer's instructions and as indicated on the project drawings. This item also includes any TWSI wedges or incidentals as required.

Delete subsection 50 and replace with the following:

50. Adjust Existing Manhole Frames and Covers

Unit of Measurement: each (ea)

This item includes: common excavation and backfill, supply and installation of grade rings and grout, raising and lowering existing frames and covers to grades as indicated on the project drawings, removal and disposal of all debris accumulated during construction, and reinstatement of all disturbed areas not covered by other items (including, but not limited to, gravels, asphalt, sidewalk, and landscaped areas).

Delete subsection 52 and replace with the following:

52. Segmental Retaining Wall

Unit of Measurement: square metre (m^2)

Method of Measurement: total area of wall face.

This item includes: common excavation, removal and disposal of surplus material, importation of material, installation of foundation preparation and bedding, supply and installation of modular wall units, geotextile, guards, gravel, infill soil, backfilling, drainage, design, and shop drawings stamped by a Professional Engineer (licensed to practice in Nova Scotia). In addition to normal wall design, design to consider global stability and handrail placement. Only the top exposed faces of retaining walls are required to be aesthetic in nature. Buried sections may have simple/irregular finishes as long as they maintain their structural integrity.

Add new subsections as follows:

53. Street Signs and Bases

Unit of Measure: each (ea)

This item includes: supply and installation of retroreflective street signs conforming to the Manual on Uniform Traffic Control Devices, concrete bases (including provision of shop drawings for approval by the Municipality), galvanized posts and hardware (Telespar), common excavation, infill soil, removal and disposal of existing sign, post, base, and surface reinstatement. Exact locations and sign details to be determined by the Municipality at the time of construction.

54. Stone Pillar Reinstatement

Unit of Measurement: Lump Sum (L.S.)

This item includes: relocation and reinstatement of existing stone pillars, supply and installation of new stone pillars matching the aesthetics of the existing pillars, common excavation, removal and disposal of surplus material, importation of material, bedding, backfilling, and reinstatement of all disturbed areas not covered by other items (including, but not limited to, gravels, asphalt, sidewalk, and landscaped areas). This item also includes blending the reinstated pillars into the existing wall as indicated on the project drawings, and coordination with the property owner.

55. Sign Relocation

Unit of Measurement: Lump Sum (L.S.)

This item includes: removal and relocation of existing signs as indicated on the project drawings, and reinstatement of all disturbed areas not covered by other items (including, but not limited to, gravels, asphalt, sidewalk, and landscaped areas). Relocation of signs to be coordinated with the sign owner and Municipality.

56. Raised Crosswalk

Unit of Measurement: each (ea)

This item includes: supply and installation of raised crosswalks as per the project drawings. Cross sections of every constructed raised crosswalk are to be surveyed per details provided on the project drawings to verify that raised crosswalk has been constructed as intended and falls within required tolerance range. Contractor to provide survey information to the Engineer for review. Raised crosswalk will be acceptable only if it forms a shape relative to the design curve within the tolerance limits. Contractor shall be responsible to take steps necessary to correct any deficiencies that fall outside of required tolerance range. Include the supply and installation of two (2) Rectangular Rapid Flashing Beacons (RRFB) as per the project drawings, including all appurtenances and incidentals required for a complete and functioning installation and any other associated work or materials shown on the drawings not included in any other pay item.

LANDSCAPING

Delete subsection 61 and replace with the following:

61. Topsoil and Sod

Unit of Measurement: square metre (m^2)

Method of Measurement: slope measure.

This item includes: excavation, scarification of the existing soil, supply, placement and compaction of 100 mm topsoil, lime, fertilizer, sod, required accessories, and maintenance.

Delete subsection 62 and replace with the following:

62. Topsoil and Seed

Unit of Measurement: square metre (m^2)

Method of Measurement: slope measure.

This item includes: excavation, scarification of the existing soil, supply, placement and compaction of 100 mm topsoil, lime, fertilizer, mulch, erosion control agent, seed, and maintenance.

Add new subsections as follows:

66. Grass Pavers

Unit of Measurement: square metre (m^2)

Method of Measurement: slope measure of indicated area.

This item includes: excavation, bedding material, and supply and placement of GrassStone (Shaw Brick Item #7169) grass pavers (or approved equivalent) complete with topsoil and sod as per manufacturer's instructions and as indicated on the project drawings.

67. Center Island Landscaping

Unit of Measurement: Lump Sum (L.S.)

This item includes: preparation of subgrade, supply and placement of clearstone, filter fabric, and bedding sand as indicated on the project drawings, supply and placement of vegetation, lime and fertilizer, accessories and maintenance, common excavation, import of material, and infill soil. Placement and quantity of vegetation as directed by the Municipality. Vegetation species to include (unless otherwise directed by the Municipality):

- Winterberry
- Dogwood
- Fragrant Sumac
- Joe Pye Weed
- Swamp Milkweed
- Palm Sedge.

ADDITIONAL ITEMS

Add new subsection as follows:

Delete subsection 73 and replace with the following:

73. Replacement of Unsuitable Material w/ Surge Rock (Provisional)

Unit of Measurement: cubic metre (m^3)

Method of Measurement: surface-to-surface volume method between topographical survey taken before and after the placement and compaction of replacement material.

This item includes: supply, placement, and compaction of surge rock as directed by the Engineer. No payment will be made under this item unless authorized by the Engineer. This item also includes the supply and placement of filter fabric.

Add new subsection as follows:

76. Infrastructure Removal

Unit of Measurement: Lump Sum (L.S.)

This item includes: locating existing infrastructure to be removed, common excavation, removal and disposal of existing infrastructure in the project area as indicated on the project drawings, replacement of required volume with select material as required and backfilling as required. This item includes, but is not limited to, existing asphalt, road gravels, curbing, sidewalk, water infrastructure, and stormwater infrastructure. Dispose of infrastructure at locations approved for the relevant material.

77. Trench Excavation – Contaminated Material

Unit of Measurement: cubic metre (m^3)

Method of Measurement: average end area method for volume of contaminated material based on theoretical trench volume.

This item includes: all excavation, removal, and disposal of contaminated material exceeding Tier 1 RBSL's and CCME commercial guidelines as indicated in Section 39 00 00 – Standard Detail 01 22 00 – 01 and disposal as per requirements of NSE. Written authorization of Engineer required.

ENVIRONMENTAL PROTECTION

Add new subsection as follows:

90. Environmental Measures

Unit of Measurement: Lump Sum (L.S.)

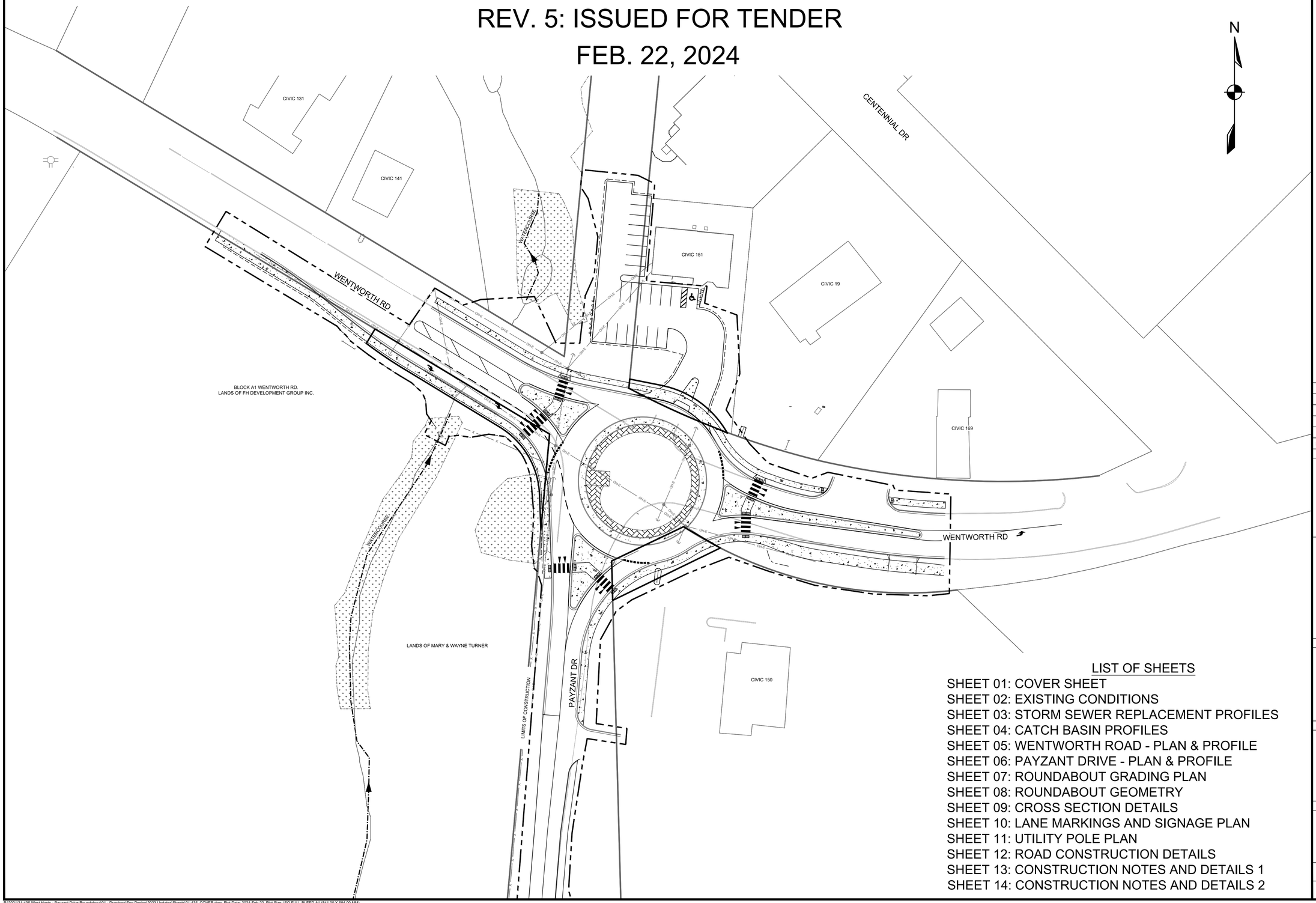
This item includes: supply and installation of all environmental protection measures required to complete the project works, including all erosion and sedimentation control measures. Erosion and sedimentation control measures shall be in accordance with the Erosion and Sedimentation Control Handbook for Construction Sites by Nova Scotia Environment, most recent edition.

END OF SECTION

PAYZANT DRIVE ROUNDABOUT
WINDSOR, NOVA SCOTIA

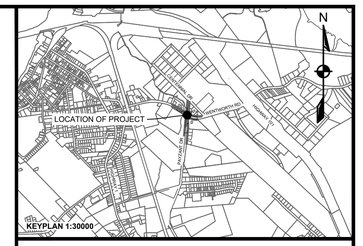
REV. 5: ISSUED FOR TENDER

FEB. 22, 2024



LIST OF SHEETS

SHEET 01: COVER SHEET
SHEET 02: EXISTING CONDITIONS
SHEET 03: STORM SEWER REPLACEMENT PROFILES
SHEET 04: CATCH BASIN PROFILES
SHEET 05: WENTWORTH ROAD - PLAN & PROFILE
SHEET 06: PAYZANT DRIVE - PLAN & PROFILE
SHEET 07: ROUNDABOUT GRADING PLAN
SHEET 08: ROUNDABOUT GEOMETRY
SHEET 09: CROSS SECTION DETAILS
SHEET 10: LANE MARKINGS AND SIGNAGE PLAN
SHEET 11: UTILITY POLE PLAN
SHEET 12: ROAD CONSTRUCTION DETAILS
SHEET 13: CONSTRUCTION NOTES AND DETAILS 1
SHEET 14: CONSTRUCTION NOTES AND DETAILS 2



METRES
10 0 20 30
1:500

ISSUE	DATE	DESCRIPTION
5	FEB. 22, 2024	ISSUED FOR TENDER
4	FEB. 15, 2024	ISSUED FOR REVIEW
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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REGISTERED PROFESSIONAL ENGINEER
DATE 22/02/2024
A. J. SKETCHLEY
11560
PROVINCE OF NOVA SCOTIA

REGISTERED PROFESSIONAL ENGINEER
DATE 22/02/2024
A. T. LEAHY
20200013
PROVINCE OF NOVA SCOTIA

CLIENT

West Hants
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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

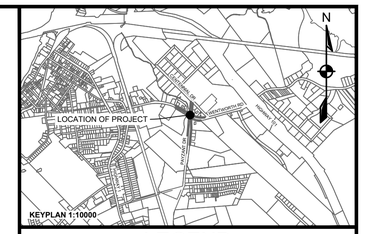
SHEET DESCRIPTION

COVER SHEET

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	P. BURGESS	21-435	C-T01
Scale	Filename		01 of 14
1:500	21-435_COVER.dwg		

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_COVER.dwg, Plot Date: 2024-Feb-22, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE	AV	AV
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
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1	JUL. 13, 2022	DRAFT

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REGISTERED PROFESSIONAL ENGINEER — DATE 22/02/2024 — A. J. SKETCHLEY — 11560 — PROVINCE OF NOVA SCOTIA

REGISTERED PROFESSIONAL ENGINEER — DATE 22/02/2024 — A. T. LEAHY — 20200013 — PROVINCE OF NOVA SCOTIA

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PROJECT DESCRIPTION

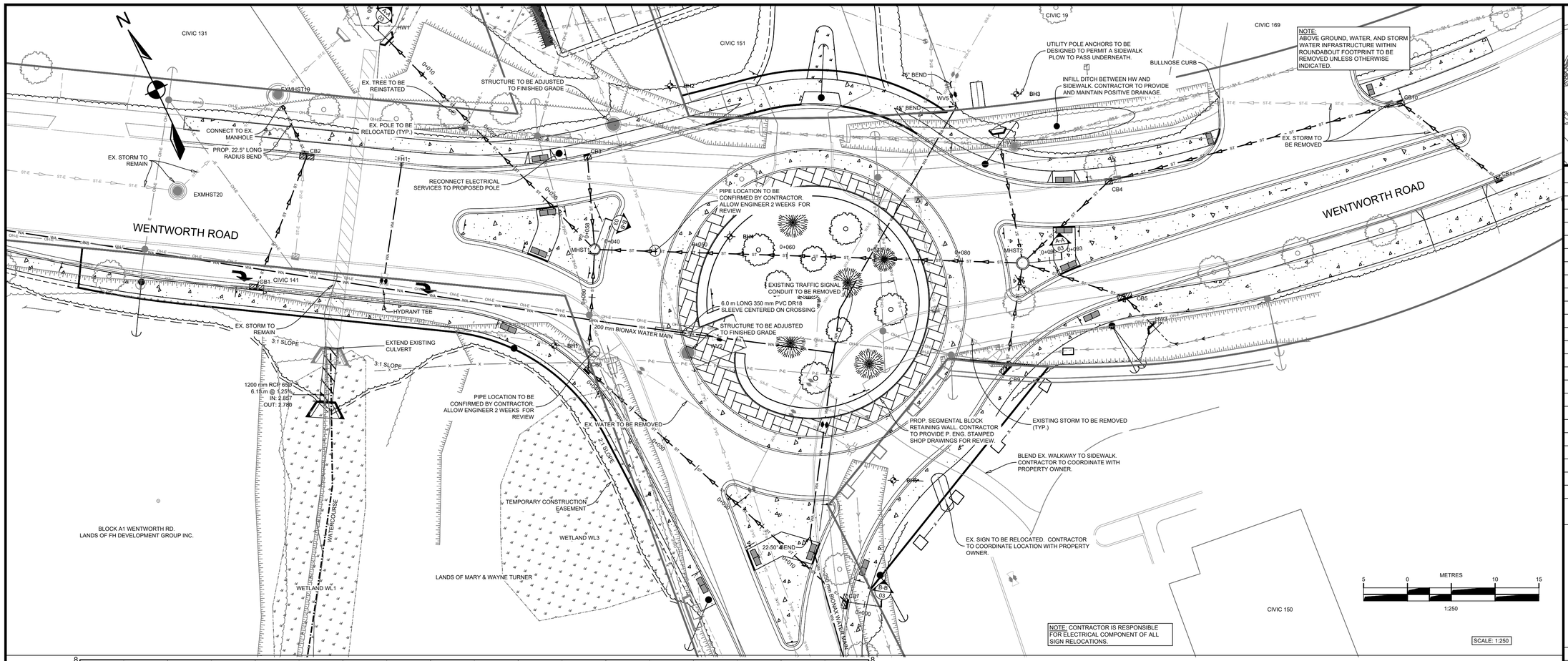
PAYZANT DRIVE ROUNDABOUT

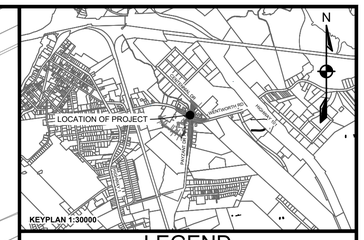
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

EXISTING CONDITIONS

Drawn	Engineer	Project No.	Drawing No.
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Scale 1:250	Filename 21-435_TR01_EXISTING CONDITIONS.dwg		02 of 14



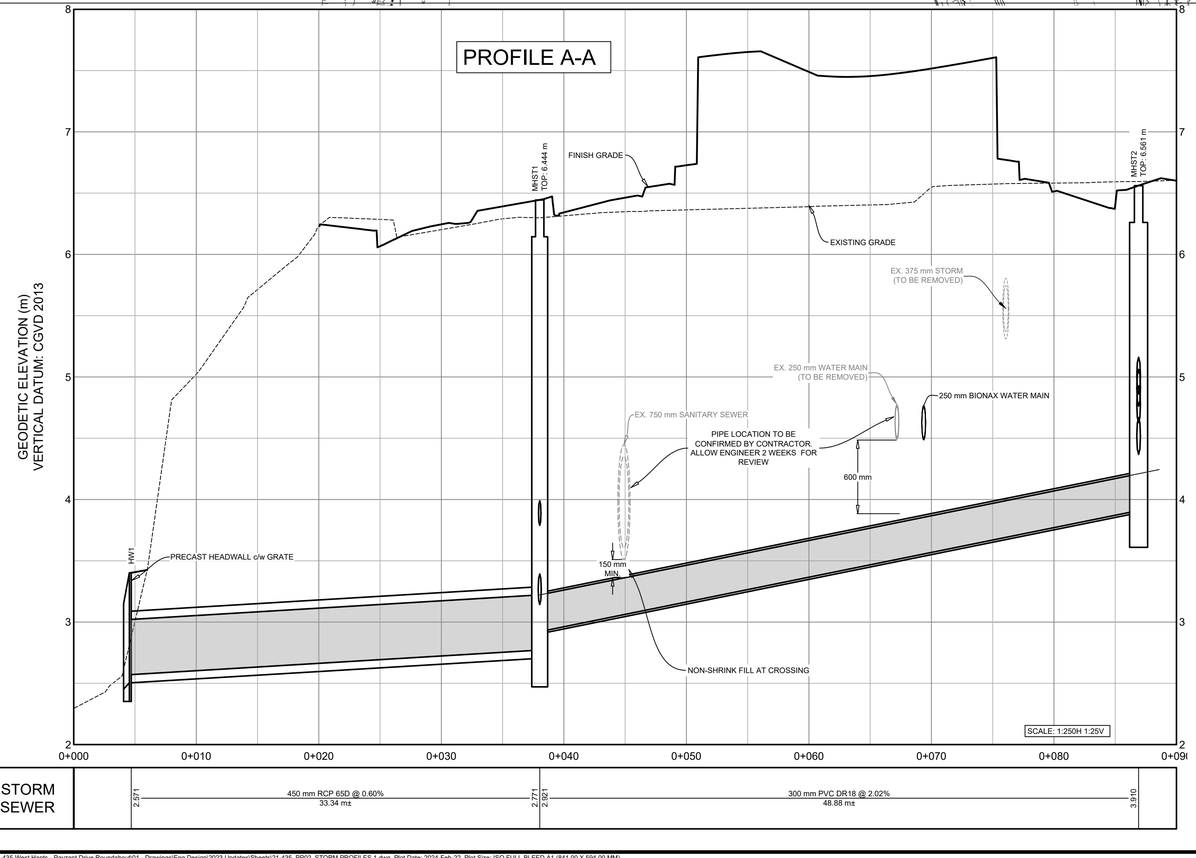


LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

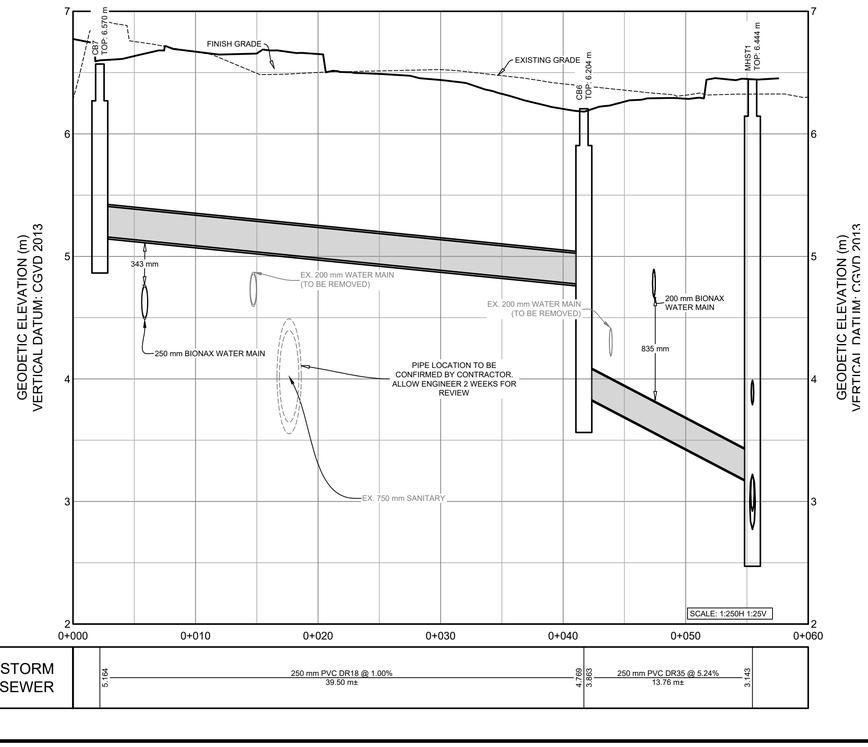
	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

PROFILE A-A



STORM SEWER			
2.571	450 mm RCP 65D @ 0.60% 33.34 m±	2.771	2.021	300 mm PVC DR18 @ 2.02% 48.88 m±	3.910

PROFILE B-B



STORM SEWER					
5.164	250 mm PVC DR18 @ 1.00% 39.50 m±	4.769	3.953	250 mm PVC DR35 @ 5.24% 13.76 m±	3.143

ISSUE	DATE	DESCRIPTION
5	FEB. 22, 2024	ISSUED FOR TENDER
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2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA
DATE: 22/02/2024
A. J. SKETCHLEY
11560

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA
DATE: 22/02/2024
A. T. LEAHY
20200013

CLIENT

West Hants
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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

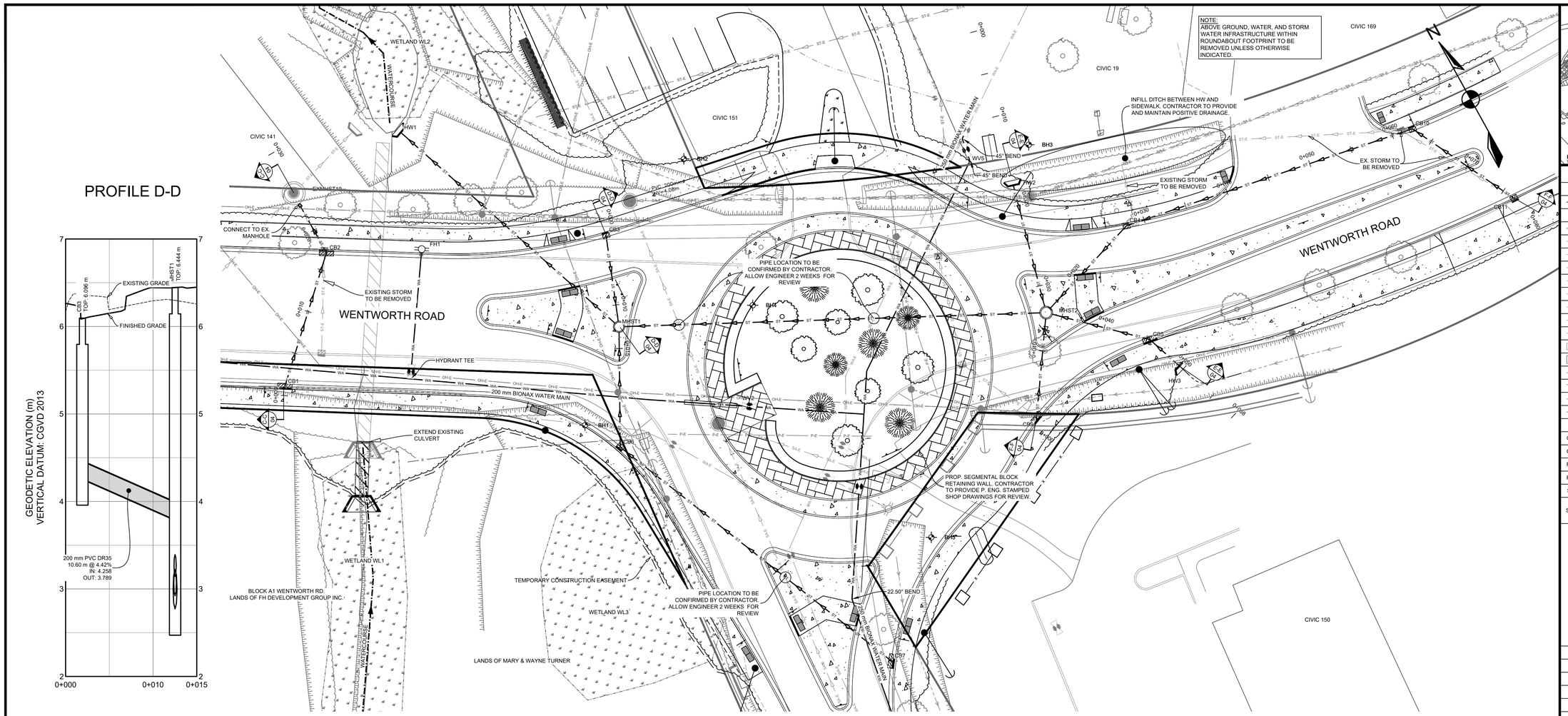
WEST HANTS, NOVA SCOTIA

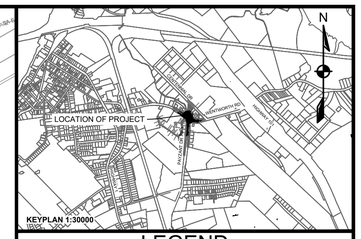
SHEET DESCRIPTION

STORM SEWER REPLACEMENT PROFILES

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	C-PP03
Scale	Filename		03 of 14
AS SHOWN	21-435_PP02_STORM PROFILES 1.dwg		

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_PP02_STORM PROFILES 1.dwg, Plot Date: 2024-Feb-22, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES 5 0 10 15

1:250

ISSUE	DATE	DESCRIPTION
5	FEB. 22, 2024	ISSUED FOR TENDER
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REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE: 22/02/2024 — A. J. SKETCHLEY — 11560

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE: 22/02/2024 — A. T. LEAHY — 20200013

CLIENT

West Hants
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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

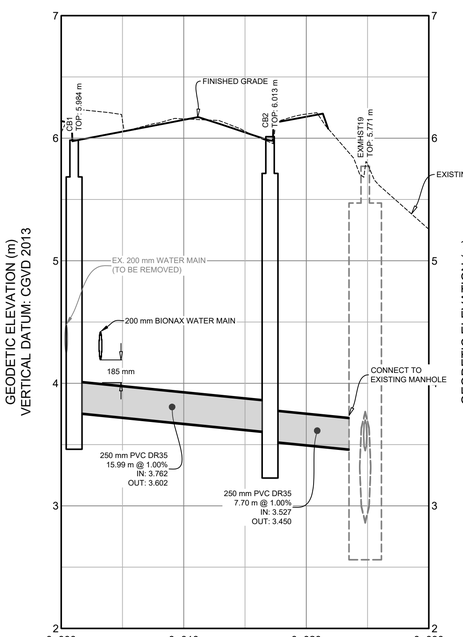
SHEET DESCRIPTION

CATCH BASIN PROFILES

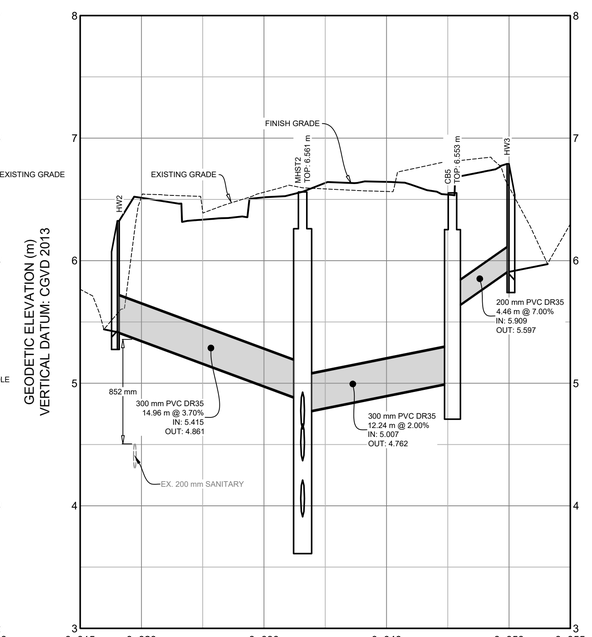
Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	C-PP04
Scale	Filename		04 of 14
1:250 H; 1:25V	21-435_PP03_STORM PROFILES 2.dwg		

PROFILE D-D

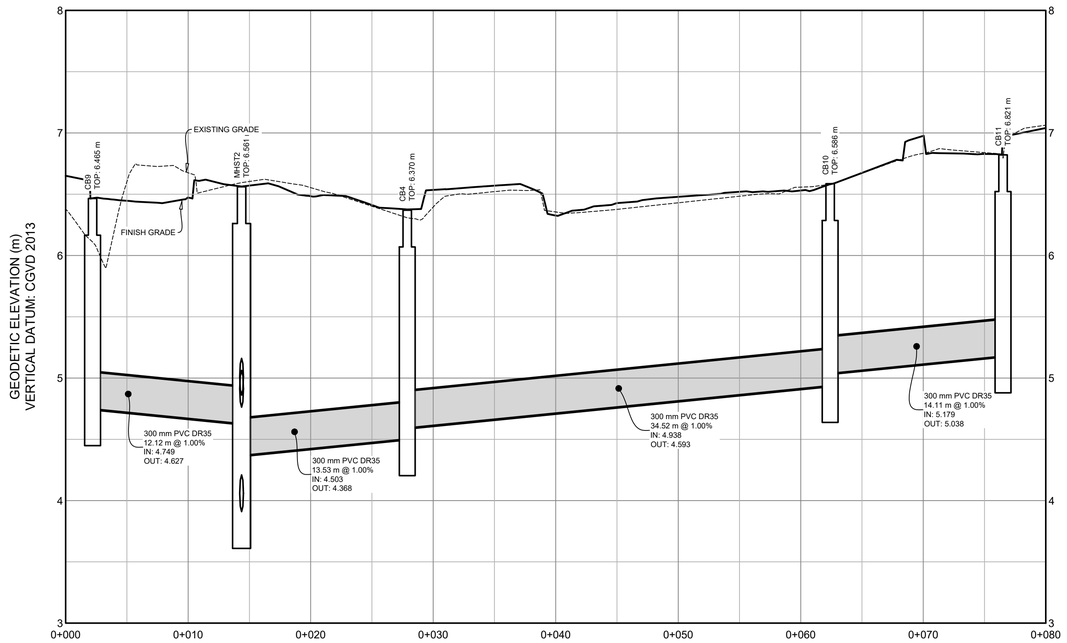
PROFILE C-C

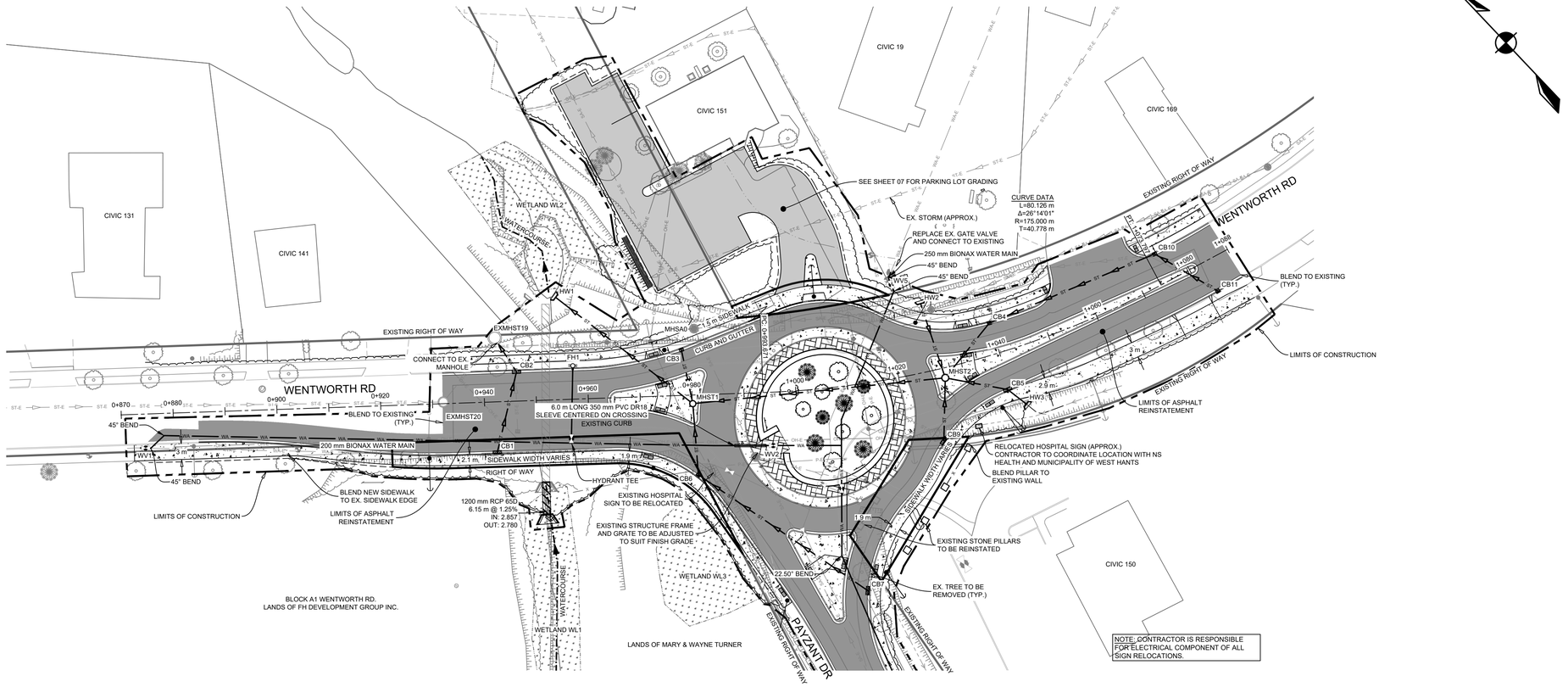


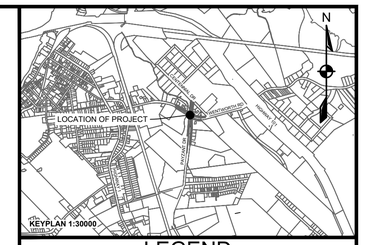
PROFILE E-E



PROFILE F-F







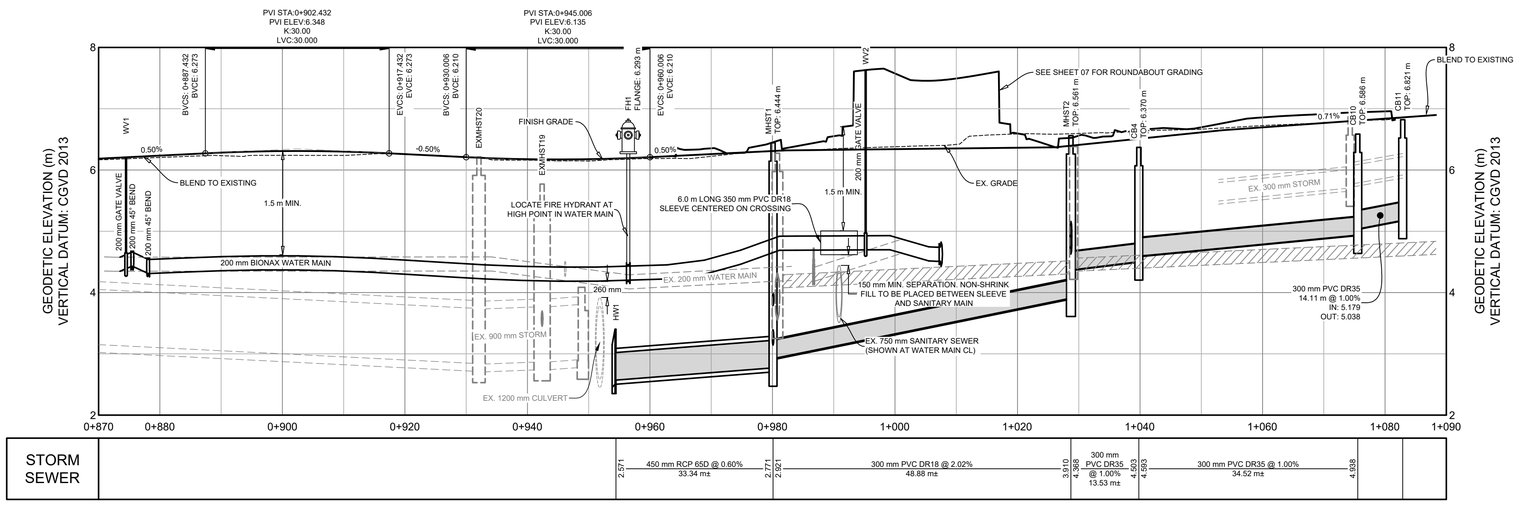
LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
x	FENCELINE	x

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES
10 0 20 30
1:500

ISSUE	DATE	DESCRIPTION
5	FEB. 22, 2024	ISSUED FOR TENDER
4	FEB. 15, 2024	ISSUED FOR REVIEW
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT



STORM SEWER																	
2.571	450 mm RCP 65D @ 0.60% 33.34 m±	2.771	2.921	300 mm PVC DR18 @ 2.02% 48.88 m±	3.910	4.060	300 mm PVC DR35 @ 1.00% 13.53 m±	4.063	4.563	300 mm PVC DR35 @ 1.00% 34.52 m±	4.638						

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REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 22/02/2024 — A. J. SKETCHLEY — 11560

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 22/02/2024 — A. T. LEAHY — 20200013

CLIENT

West Hants
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PROJECT DESCRIPTION

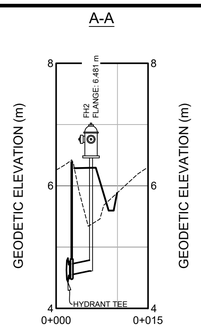
PAYZANT DRIVE ROUNDABOUT

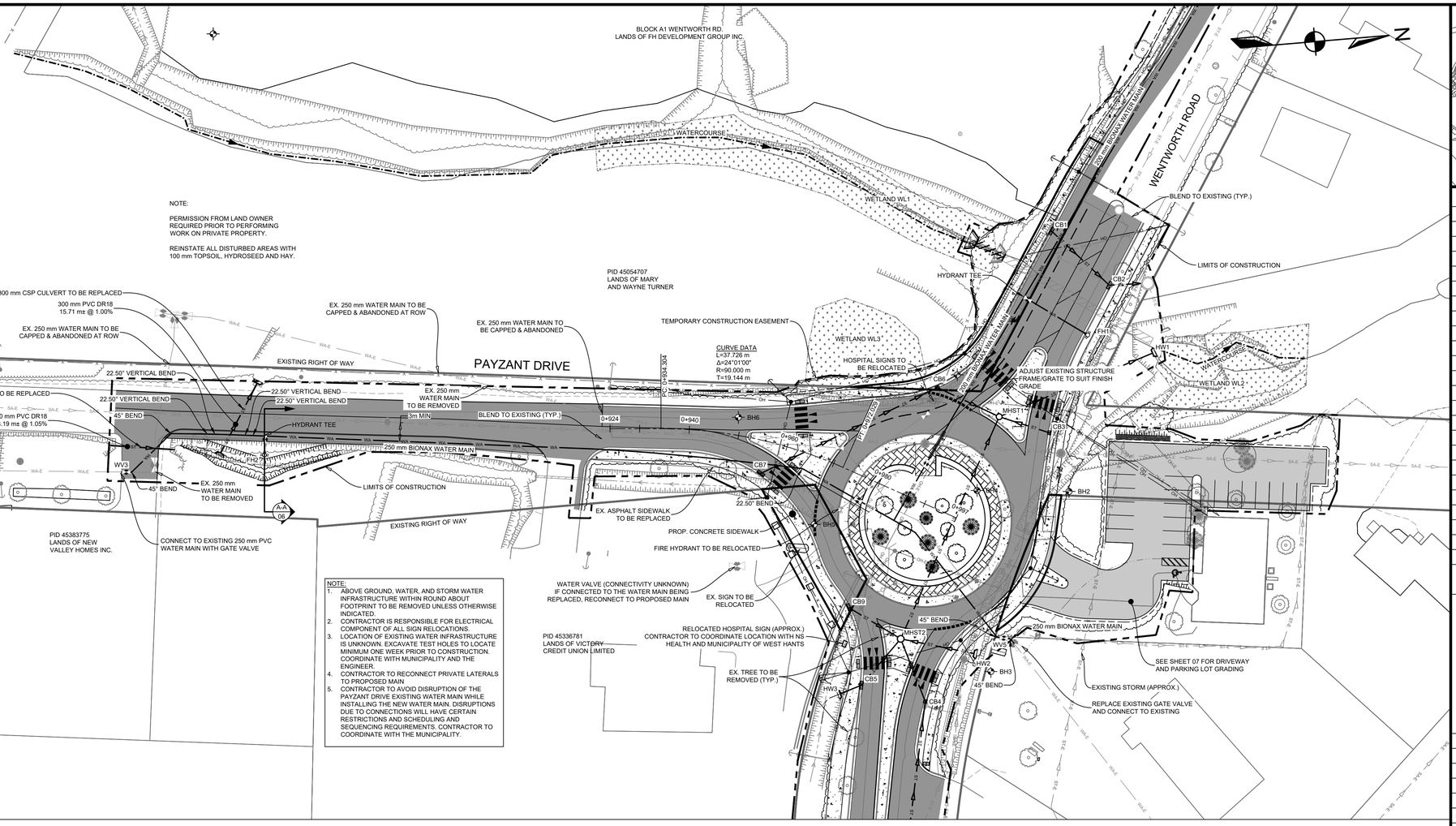
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

WENTWORTH ROAD - PLAN & PROFILE

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	TR05
Scale	Filename		05 of 14
1:500 H, 1:50 V	21-435_TR02_INT-WENTWORTH.dwg		



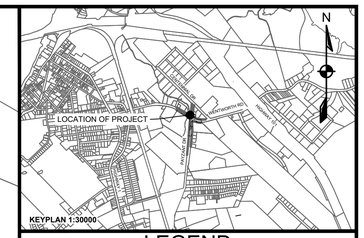


NOTE:

PERMISSION FROM LAND OWNER
REQUIRED PRIOR TO PERFORMING
WORK ON PRIVATE PROPERTY.

REINSTATE ALL DISTURBED AREAS WITH
100 mm TOPSOIL, HYDROSEED AND HAY.

NOTE:
1. ABOVE GROUND, WATER, AND STORM WATER INFRASTRUCTURE WITHIN ROUND ABOUT FOOTPRINT TO BE REMOVED UNLESS OTHERWISE INDICATED.
2. CONTRACTOR IS RESPONSIBLE FOR ELECTRICAL COMPONENT OF ALL SIGN RELOCATIONS.
3. LOCATION OF EXISTING WATER INFRASTRUCTURE IS UNKNOWN. EXCAVATE TEST HOLES TO LOCATE MINIMUM ONE WEEK PRIOR TO CONSTRUCTION. COORDINATE WITH MUNICIPALITY AND THE ENGINEER.
4. CONTRACTOR TO RECONNECT PRIVATE LATERALS TO PROPOSED MAIN
5. CONTRACTOR TO AVOID DISRUPTION OF THE PAYZANT DRIVE EXISTING WATER MAIN WHILE INSTALLING THE NEW WATER MAIN. DISRUPTIONS DUE TO CONNECTIONS WILL HAVE CERTAIN RESTRICTIONS AND SCHEDULING AND SEQUENCING REQUIREMENTS. CONTRACTOR TO COORDINATE WITH THE MUNICIPALITY.



LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

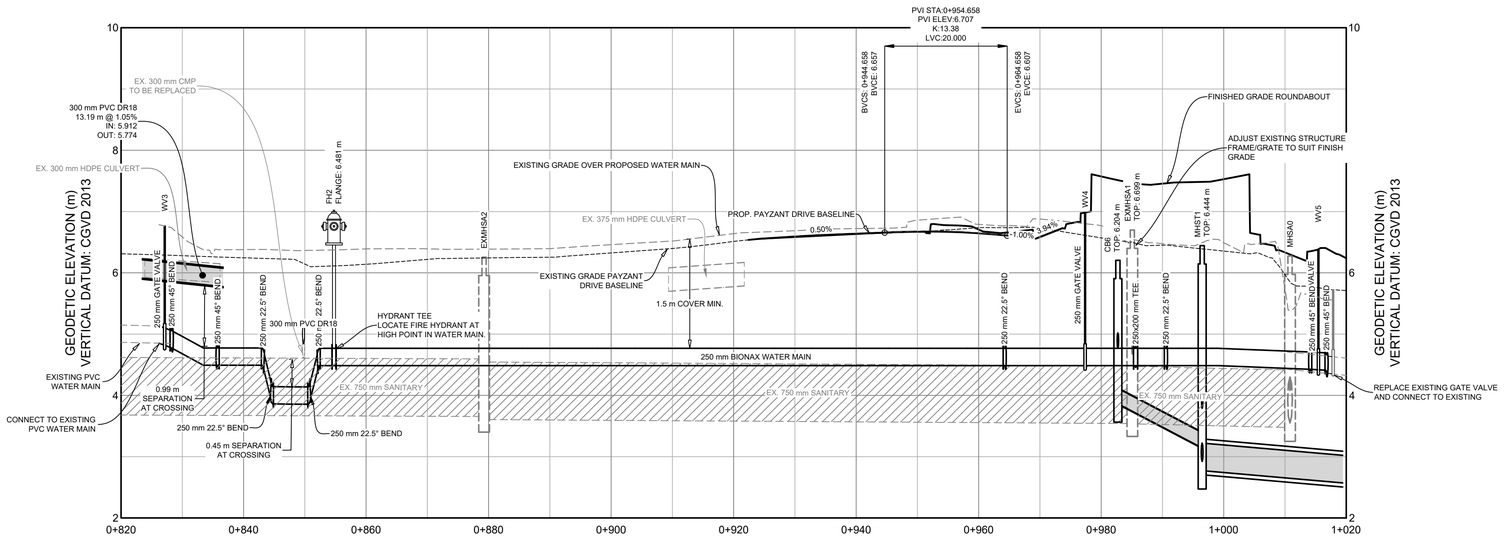
	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE	AV	AV
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES
10 0 20 30
1:500

ISSUE	DATE	DESCRIPTION
5	FEB. 22, 2024	ISSUED FOR TENDER
4	FEB. 15, 2024	ISSUED FOR REVIEW
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

NOTE:
LOCATION OF EXISTING INFRASTRUCTURE IS BASED ON BEST AVAILABLE INFORMATION, INCLUDING RECORD INFORMATION, AND IS APPROXIMATE. CONTRACTOR TO VERIFY SIZE AND LOCATION IN FIELD PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES TO THE ENGINEER. ALLOW ONE WEEK FOR REVIEW.

PAYZANT BASELINE PROFILE



STORM SEWER									
							3.963	250 mm PVC DR35 @ 5.24% 13.76 m±	3.243
							2.771	450 mm RCP 65D @ 0.60% 33.34 m±	2.571

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REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF NOVA SCOTIA
DATE 22/02/2024
A. J. SKETCHLEY
11560

REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF NOVA SCOTIA
DATE 22/02/2024
A. T. LEAHY
20200013

CLIENT

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PROJECT DESCRIPTION

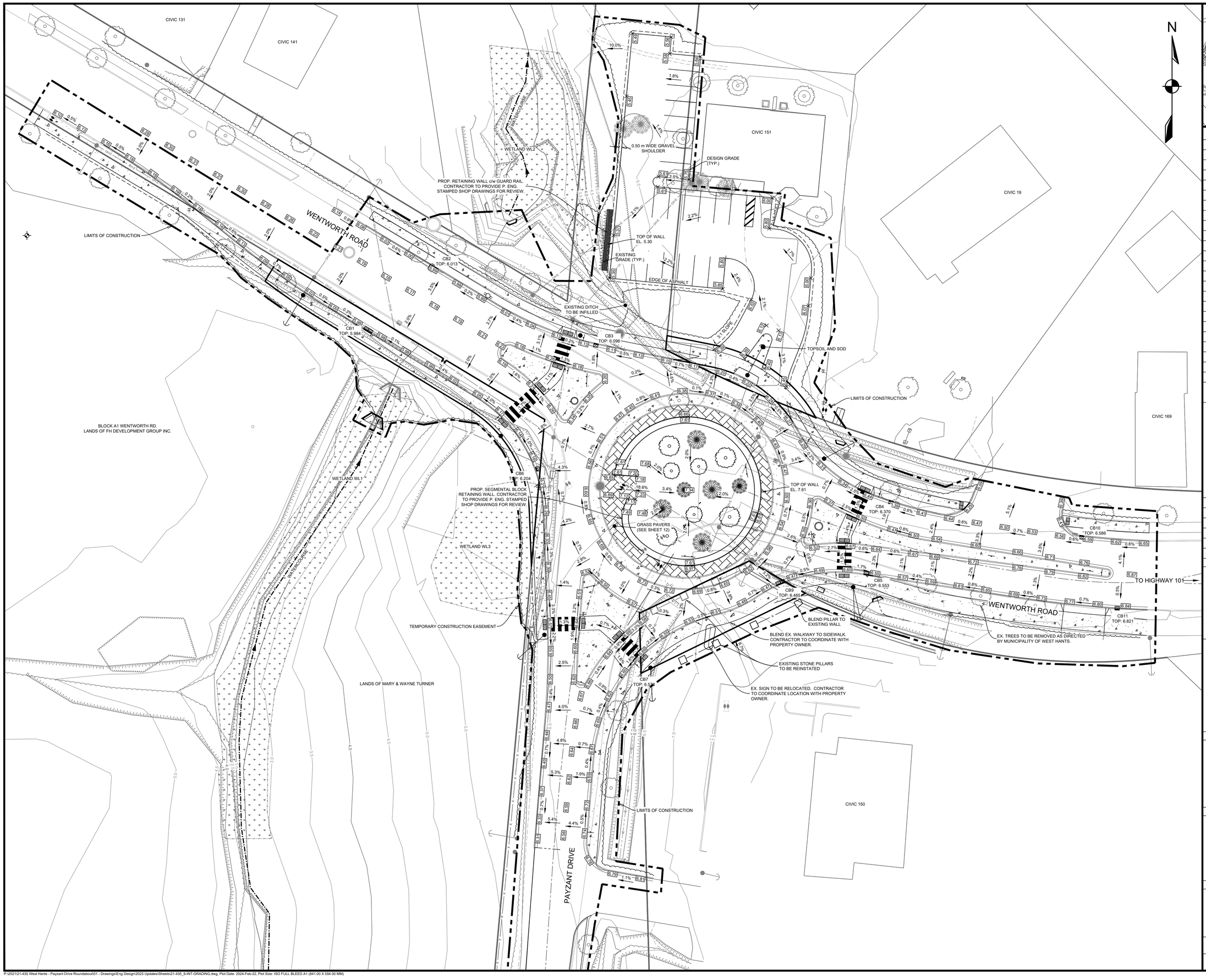
PAYZANT DRIVE ROUNDABOUT

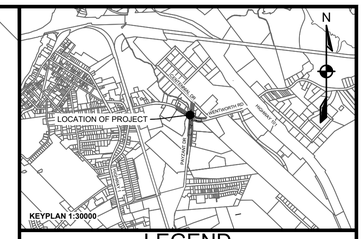
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

PAYZANT DRIVE PLAN AND PROFILE

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	TR06
Scale	Filename		06 of 14
1:500 H; 1:50 V	21-435_3-PP01_PAYZANT.dwg		





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES
10 0 10 20
1:300

ISSUE	DATE	DESCRIPTION
5	FEB. 22, 2024	ISSUED FOR TENDER
4	FEB. 15, 2024	ISSUED FOR REVIEW
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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REGISTERED PROFESSIONAL ENGINEER — DATE 22/02/2024 — A. J. SKETCHLEY — 11560 — PROVINCE OF NOVA SCOTIA

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

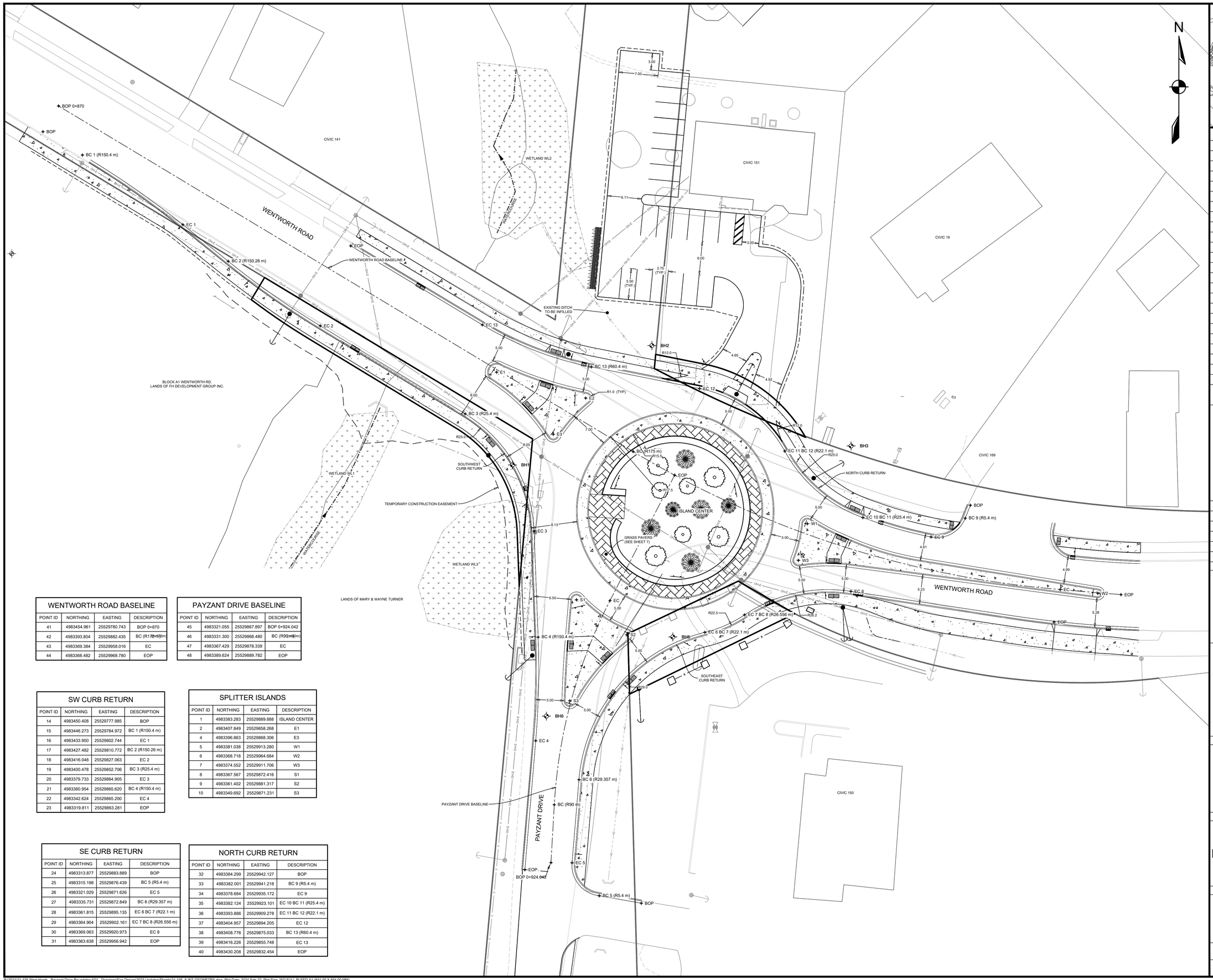
WEST HANTS, NOVA SCOTIA

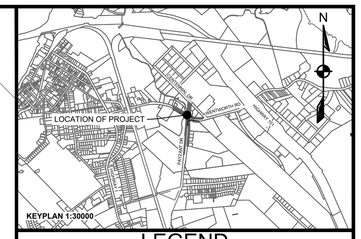
SHEET DESCRIPTION

ROUNDABOUT GRADING PLAN

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	TR07
Scale	Filename		07 of 14
1:300	21-435_9-INT-GRADING.dwg		

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_9-INT-GRADING.dwg, Plot Date: 2024-Feb-22, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

METRES
10 0 10 20
1:300

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1	JUL. 13, 2022	DRAFT

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REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF NOVA SCOTIA
DATE 22/02/2024
P.V. BURGESS
6041

CLIENT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WINDSOR, NOVA SCOTIA

SHEET DESCRIPTION

ROUNDABOUT GEOMETRY

Drawn P.BURGESS	Engineer P.BURGESS	Project No. 21-435	Drawing No. TR-08
Scale 1:300	Filename 21-435_8-INT-GEOMETRY.dwg		08 of 14

WENTWORTH ROAD BASELINE

POINT ID	NORTHING	EASTING	DESCRIPTION
41	4983454.961	25529780.743	BOP 0+870
42	4983393.804	25529882.435	BC (R175 m)
43	4983369.384	25529958.016	EC
44	4983368.482	25529968.780	EOP

PAYZANT DRIVE BASELINE

POINT ID	NORTHING	EASTING	DESCRIPTION
45	4983321.055	25529867.897	BOP 0+924.042
46	4983331.300	25529868.480	BC (R90 m)
47	4983367.429	25529878.339	EC
48	4983389.624	25529889.782	EOP

SW CURB RETURN

POINT ID	NORTHING	EASTING	DESCRIPTION
14	4983450.408	25529777.985	BOP
15	4983446.273	25529784.972	BC 1 (R150.4 m)
16	4983433.950	25529802.744	EC 1
17	4983427.482	25529810.772	BC 2 (R150.26 m)
18	4983416.048	25529827.063	EC 2
19	4983400.478	25529852.706	BC 3 (R25.4 m)
20	4983379.733	25529864.905	EC 3
21	4983360.954	25529865.620	BC 4 (R150.4 m)
22	4983342.624	25529865.200	EC 4
23	4983319.811	25529863.281	EOP

SPLITTER ISLANDS

POINT ID	NORTHING	EASTING	DESCRIPTION
1	4983383.283	25529889.888	ISLAND CENTER
2	4983407.849	25529858.268	E1
4	4983396.863	25529868.306	E3
5	4983381.038	25529913.280	W1
6	4983368.718	25529964.684	W2
7	4983374.552	25529911.706	W3
8	4983367.567	25529872.416	S1
9	4983361.402	25529881.317	S2
10	4983349.692	25529871.231	S3

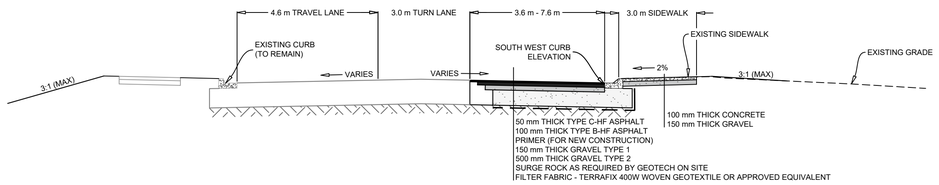
SE CURB RETURN

POINT ID	NORTHING	EASTING	DESCRIPTION
24	4983313.877	25529883.889	BOP
25	4983315.198	25529876.439	BC 5 (R5.4 m)
26	4983321.029	25529871.626	EC 5
27	4983335.731	25529872.849	BC 6 (R29.357 m)
28	4983361.815	25529895.135	EC 6 BC 7 (R22.1 m)
29	4983364.904	25529902.161	EC 7 BC 8 (R26.556 m)
30	4983369.063	25529920.973	EC 8
31	4983363.638	25529956.942	EOP

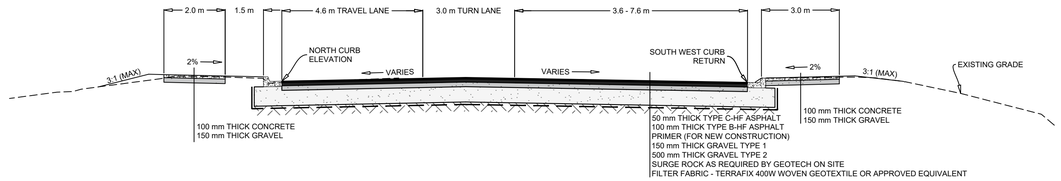
NORTH CURB RETURN

POINT ID	NORTHING	EASTING	DESCRIPTION
32	4983384.299	25529942.127	BOP
33	4983382.001	25529941.218	BC 9 (R5.4 m)
34	4983378.684	25529935.172	EC 9
35	4983382.124	25529923.101	EC 10 BC 11 (R25.4 m)
36	4983393.886	25529909.278	EC 11 BC 12 (R22.1 m)
37	4983404.957	25529894.205	EC 12
38	4983408.776	25529875.033	BC 13 (R60.4 m)
39	4983416.226	25529855.748	EC 13
40	4983430.208	25529832.454	EOP

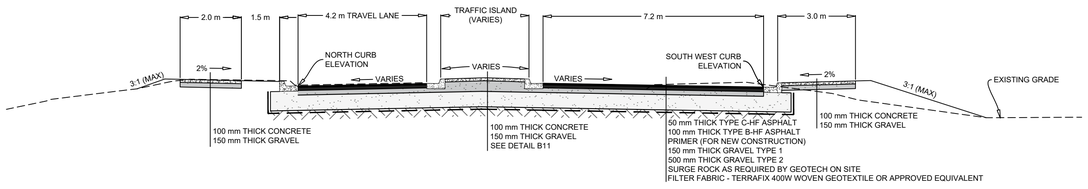
A 09 WENTWORTH RD TYPICAL PROPOSED CROSS SECTION 0+870 TO 0+925
N.T.S.



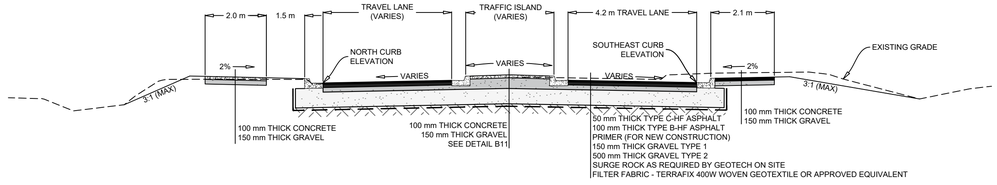
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N.T.S.



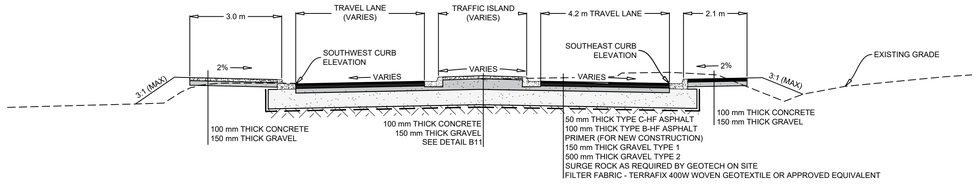
C 09 WENTWORTH RD TYPICAL PROPOSED CROSS SECTION 0+960 TO 0+975
N.T.S.



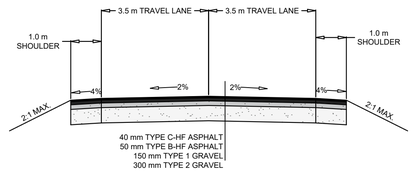
D 09 WENTWORTH RD TYPICAL PROPOSED CROSS SECTION 1+030 TO 1+045
N.T.S.



E 09 PAYZANT DR TYPICAL PROPOSED CROSS SECTION 0+950 TO 0+970
N.T.S.



F 09 DRIVEWAY TYPICAL PROPOSED CROSS SECTION
N.T.S.



ISSUE	DATE	DESCRIPTION
5	FEB. 22, 2024	ISSUED FOR TENDER
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REGISTERED PROFESSIONAL ENGINEER — DATE 22/02/2024 — A. T. LEAHY — 20200013 — PROVINCE OF NOVA SCOTIA

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PROJECT DESCRIPTION

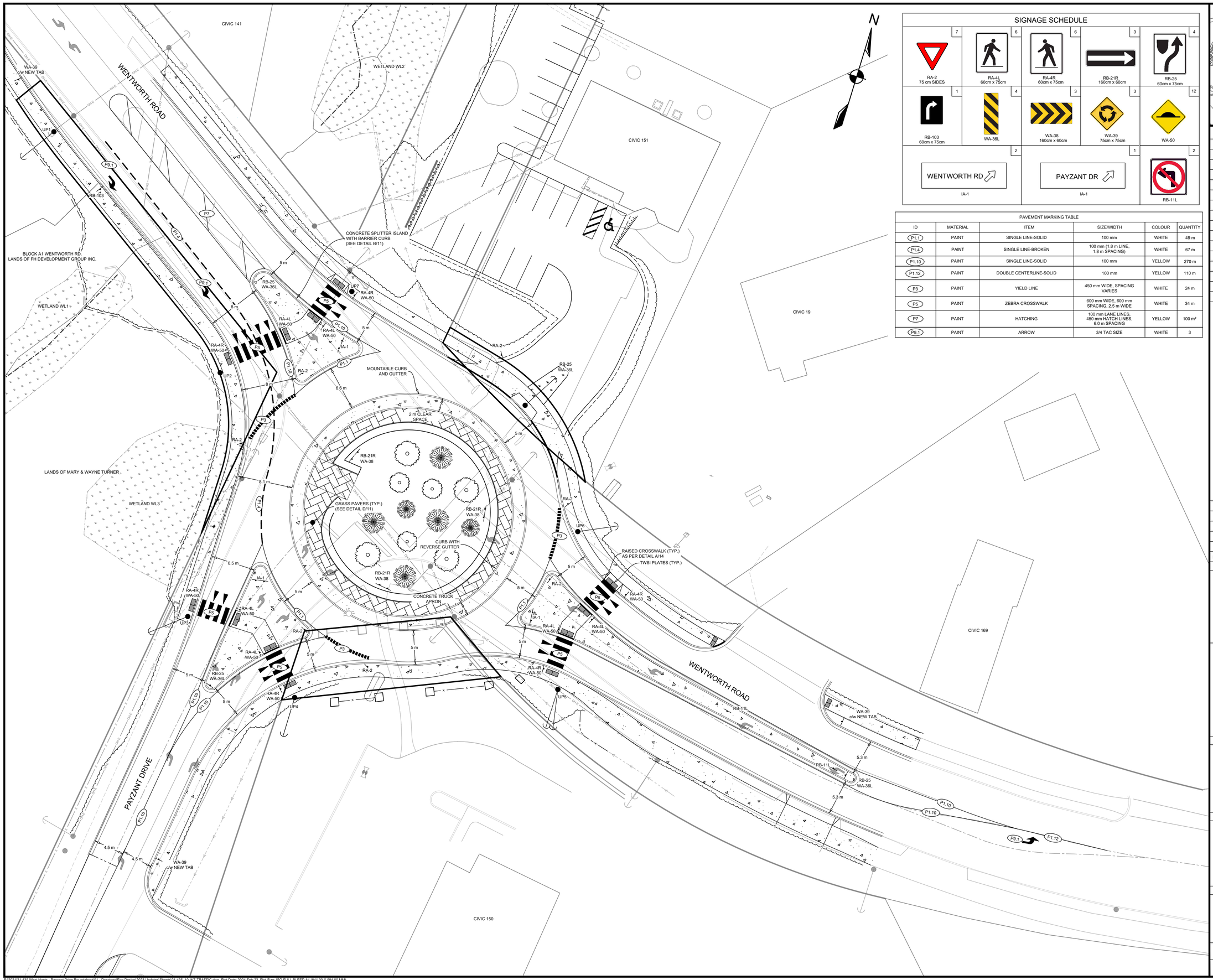
PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

CROSS SECTION DETAILS

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	TR09
Scale: N.T.S.	Filename: 21-435_TR05_INT-WENTWORTH XS.dwg		09 of 14

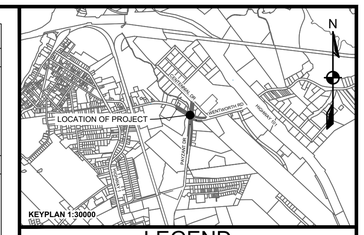


SIGNAGE SCHEDULE

7 RA-2 75 cm SIDES	6 RA-4L 60cm x 75cm	6 RA-4R 60cm x 75cm	3 RB-21R 160cm x 60cm	4 RB-25 60cm x 75cm
1 RB-103 60cm x 75cm	4 WA-36L	3 WA-38 160cm x 60cm	3 WA-39 75cm x 75cm	12 WA-50
2 WENTWORTH RD IA-1		1 PAYZANT DR IA-1		2 RB-11L

PAVEMENT MARKING TABLE

ID	MATERIAL	ITEM	SIZE/WIDTH	COLOUR	QUANTITY
P1.1	PAINT	SINGLE LINE-SOLID	100 mm	WHITE	49 m
P1.4	PAINT	SINGLE LINE-BROKEN	100 mm (1.8 m LINE, 1.8 m SPACING)	WHITE	67 m
P1.10	PAINT	SINGLE LINE-SOLID	100 mm	YELLOW	270 m
P1.12	PAINT	DOUBLE CENTERLINE-SOLID	100 mm	YELLOW	110 m
P3	PAINT	YIELD LINE	450 mm WIDE, SPACING VARIES	WHITE	24 m
P5	PAINT	ZEBRA CROSSWALK	600 mm WIDE, 600 mm SPACING, 2.5 m WIDE	WHITE	34 m
P7	PAINT	HATCHING	100 mm LANE LINES, 450 mm HATCH LINES, 6.0 m SPACING	YELLOW	100 m²
P9.1	PAINT	ARROW	3/4 TAC SIZE	WHITE	3



LEGEND

EXISTING		PROPOSED
	EASEMENT	
P/E P/E	UNDERGROUND POWER	P P
C/E C/E	UNDERGROUND COMM.	C C
TR/E	TRAFFIC CONDUIT	TR TR
OH/E	OVERHEAD LINE	OH OH
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			HYDRANT		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
PRECAST HEADWALL			SIGNAL POLE		
CATCHBASIN			SIGNAL HEAD		
			PEDESTRIAN HEAD		

SIGNAGE NOTES:

1. WHRM TO INDICATE EXACT LOCATION OF NEW SIGN INSTALLATIONS ON SITE.
2. ALL SIGNS ARE TAC UNLESS OTHERWISE INDICATED ON SIGNAGE SCHEDULE.
3. REMOVED SIGNS AND POSTS TO BE RETURNED TO WHRM.

PAVEMENT MARKING NOTES:

1. ALL LANE MARKINGS SHALL BE ACCORDING TO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA (MUTCDC) USING SIGNS APPROVED FOR USE IN NOVA SCOTIA.
2. LANE LINES ARE TO BE 100 mm WIDE EXCEPT WHERE OTHERWISE INDICATED. CROSSWALK LINES ARE TO BE 200 mm WIDE, STOP BARS ARE TO BE 450 mm WIDE.
3. CENTERLINES AND CROSS HATCHING TO BE YELLOW, ALL OTHER PAVEMENT MARKINGS TO BE WHITE.
4. PEDESTRIAN CURB CUTS AND RAMPS TO BE PROVIDED AT BOTH ENDS OF ALL CROSSWALKS.
5. REMOVE ALL EXISTING PAVEMENT MARKINGS AT INTERSECTIONS AND APPROACHES AND RE-PAINT AS SHOWN, UNLESS OTHERWISE NOTED.
6. ALL MARKINGS DIMENSIONED TO CENTER OF LINES.

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
5	FEB. 22, 2024	ISSUED FOR TENDER
4	FEB. 15, 2024	ISSUED FOR REVIEW
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

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REGISTERED PROFESSIONAL ENGINEER
DATE 22/02/2024
P.V. BURGESS
6041
PROVINCE OF NOVA SCOTIA

CLIENT

West Hants
something inspiring awaits

PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

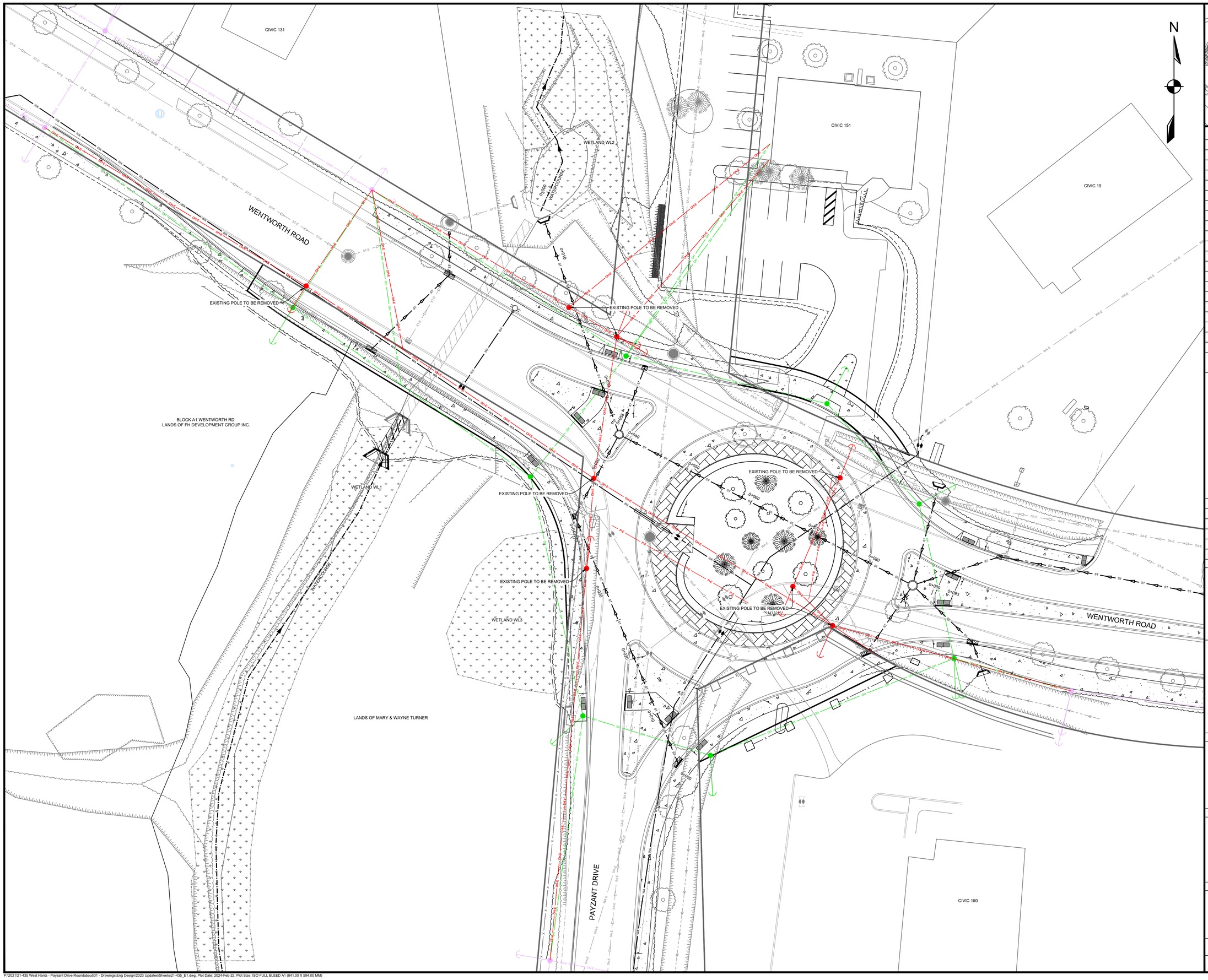
WEST HANTS, NOVA SCOTIA

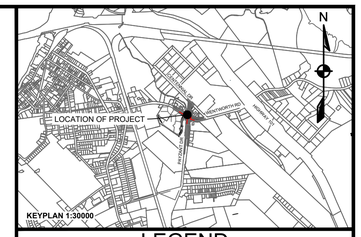
SHEET DESCRIPTION

LANE MARKINGS AND SIGNAGE PLAN

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	P. BURGESS	21-435	C-TR10
Scale	Filename		10 of 14
1:250	21-435_10-INT-TRAFFIC.dwg		

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_10-INT-TRAFFIC.dwg, Plot Date: 2024-Feb-22, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
P-E	UNDERGROUND POWER	P
C-E	UNDERGROUND COMM.	C
	POWER SERVICE	
	COMMUNICATIONS SERVICE	
OH	OVERHEAD LINE	OH
OH-E	OVERHEAD LINE (TO BE REMOVED)	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
			UTILITY POLE (TO BE REMOVED)		
STREET TREE			GLB		
			URD		

METRES
5 0 10 15
1:250

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REGISTERED PROFESSIONAL ENGINEER
DATE 22/02/2024
A. J. SKETCHLEY
11560
PROVINCE OF NOVA SCOTIA

REGISTERED PROFESSIONAL ENGINEER
DATE 22/02/2024
A. T. LEAHY
20200013
PROVINCE OF NOVA SCOTIA

CLIENT

West Hants
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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

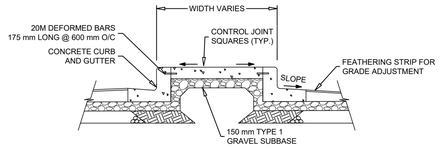
UTILITY POLE PLAN

Drawn	Engineer	Project No.	Drawing No.
A. LEAHY	A. SKETCHLEY	21-435	C-E11
Scale	Filename		11 of 14
1:250	21-435_E1.dwg		

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_E1.dwg, Plot Date: 2024-Feb-22, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)

TYPICAL CONCRETE TRAFFIC ISLAND DETAIL — A / 12

(N.T.S.)

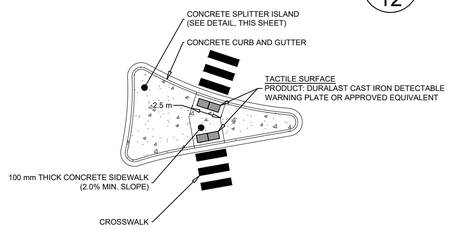


NOTES:

1. MAXIMUM SPACING FOR CONTROL JOINTS IS TO BE 2.5 m.
2. SLOPE SLAB TO FACILITATE DRAINAGE.
3. SLOPE GUTTER TO MATCH STREET CROSS SECTION.
4. ENDS AND CORNERS OF TRAFFIC ISLANDS TO HAVE HIGH BACK CONCRETE CURB AND GUTTER.
5. GEOMETRIC DESIGN OF CONCRETE ISLANDS TO BE AS PER THE TAC GEOMETRIC DESIGN GUIDE.

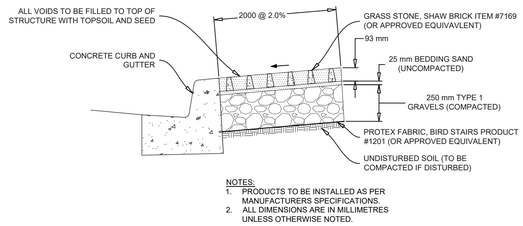
TYPICAL DROPPED SIDEWALK DETAIL — B / 12

(N.T.S.)



GRASS PAVER TYPICAL DETAIL — D / 12

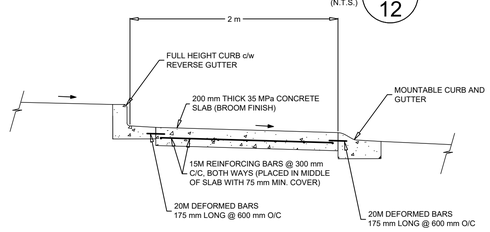
(N.T.S.)



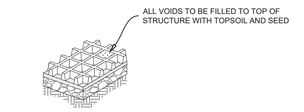
NOTES:
1. PRODUCTS TO BE INSTALLED AS PER MANUFACTURERS SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

TYPICAL TRUCK APRON DETAIL — C / 12

(N.T.S.)



GRASS PAVER ISOMETRIC VIEW

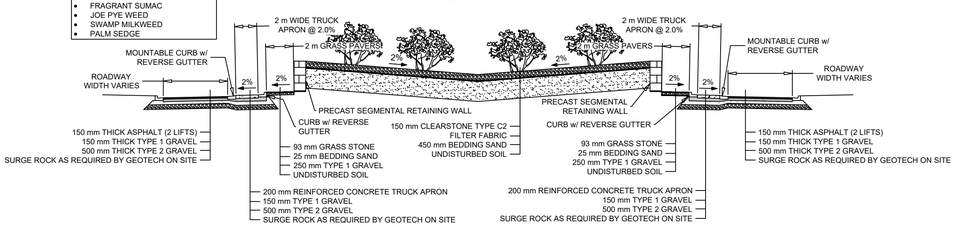


TYPICAL ROUNDABOUT CROSS-SECTION — E / 07

(N.T.S.)

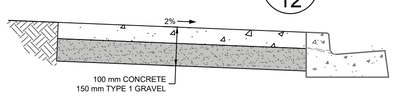
NOTE: CENTER ISLAND VEGETATION TO CONSIST OF THE FOLLOWING:
- WINTERBERRY
- DOGWOOD
- FRAGRANT SUMAC
- JOE PYE WEED
- SWAMP MILKWEED
- PALM SEDGE

NOTE: FOR PRECAST SEGMENTAL RETAINING WALL, CONTRACTOR TO PROVIDE P.ENG STAMPED SHOP DRAWINGS FOR REVIEW.



SIDEWALK STRUCTURE — F / 12

N.T.S.



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REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 22/02/2024 — A. J. SKETCHLEY — 11560

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 22/02/2024 — A. T. LEAHY — 20200013

CLIENT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

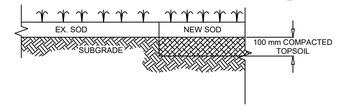
SHEET DESCRIPTION

ROAD CONSTRUCTION DETAILS

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	P. BURGESS	21-435	C-D12
Scale: N.T.S.	Filename: 21-435_D01_INT-DETAILS.dwg		12 of 14

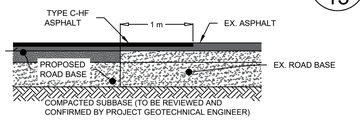
LANDSCAPING REINSTATEMENT (A 13)

N.T.S.



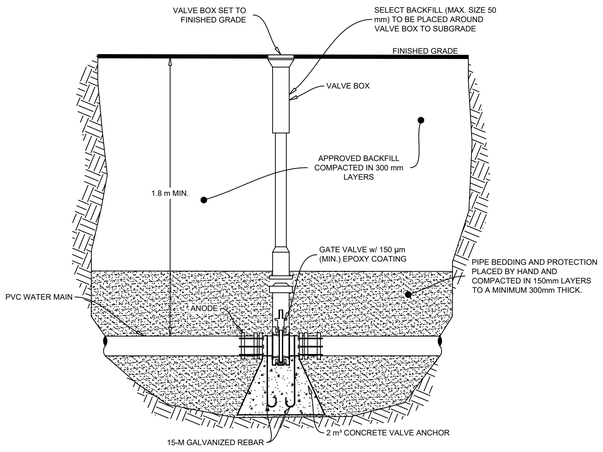
BLEND TO EX. PAVEMENT DETAIL (B 13)

N.T.S



STANDARD GATE VALVE CONNECTION (C 13)

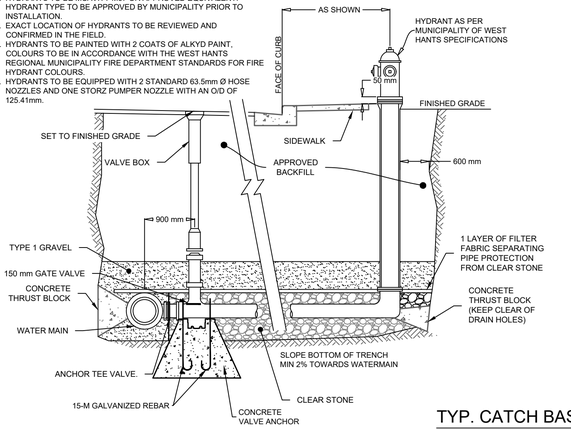
N.T.S.



TYPICAL FIRE HYDRANT DETAIL (D 13)

N.T.S.

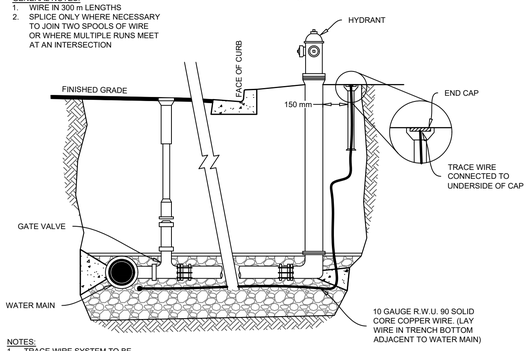
NOTES:
1. USE ONLY APPROVED PRODUCTS FOR MECHANICAL RESTRAINT.
2. HYDRANTS TO BE MCAVITY M67 OR APPROVED EQUIVALENT. HYDRANT TYPE TO BE APPROVED BY MUNICIPALITY PRIOR TO INSTALLATION.
3. EXACT LOCATION OF HYDRANTS TO BE REVIEWED AND CONFIRMED IN THE FIELD.
4. HYDRANTS TO BE PAINTED WITH 2 COATS OF ALKYD PAINT, COLOURS TO BE IN ACCORDANCE WITH THE WEST HANTS REGIONAL MUNICIPALITY FIRE DEPARTMENT STANDARDS FOR FIRE HYDRANT COLOURS.
5. HYDRANTS TO BE EQUIPPED WITH 2 STANDARD 63.5mm Ø HOSE NOZZLES AND ONE STORZ PUMPER NOZZLE WITH AN O/D OF 125.41mm.



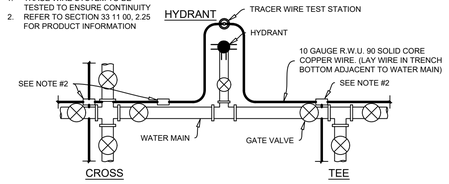
STANDARD TRACE WIRE DETAIL (FOR PVC WATER MAIN) (E 13)

N.T.S.

GENERAL NOTES:
1. WIRE IN 300 m LENGTHS
2. SPLICE ONLY WHERE NECESSARY TO JOIN TWO SPOOLS OF WIRE OR WHERE MULTIPLE RUNS MEET AT AN INTERSECTION

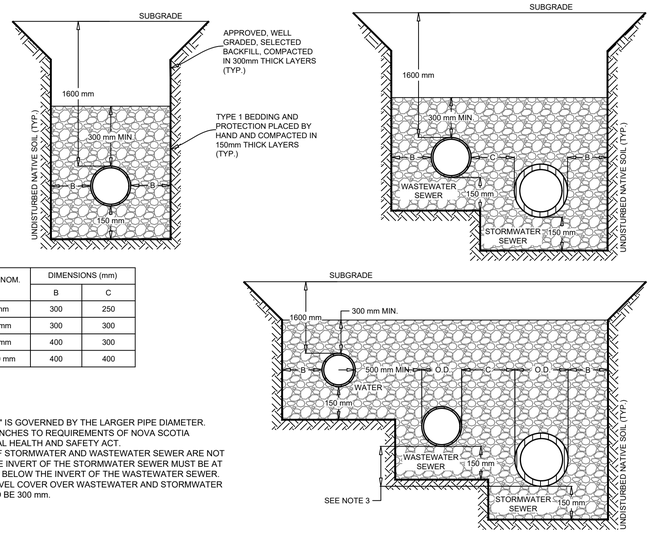


NOTES:
1. TRACE WIRE SYSTEM TO BE TESTED TO ENSURE CONTINUITY
2. REFER TO SECTION 33 11 00, 2.25 FOR PRODUCT INFORMATION



TRENCHING AND BACKFILL DETAIL (F 13)

N.T.S



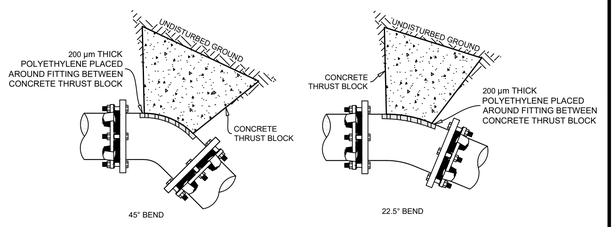
PIPE SIZE NOM. DIA.	DIMENSIONS (mm)	
	B	C
UP TO 375 mm	300	250
376 TO 500 mm	300	300
501 TO 750 mm	400	300
751 TO 1200 mm	400	400

NOTES
1. DIMENSION "C" IS GOVERNED BY THE LARGER PIPE DIAMETER.
2. SIDES OF TRENCHES TO REQUIREMENTS OF NOVA SCOTIA OCCUPATIONAL HEALTH AND SAFETY ACT.
3. IF CROWNS OF STORMWATER AND WASTEWATER SEWER ARE NOT MATCHED, THE INVERT OF THE STORMWATER SEWER MUST BE AT LEAST 100 mm BELOW THE INVERT OF THE WASTEWATER SEWER.
4. MINIMUM GRAVEL COVER OVER WASTEWATER AND STORMWATER SEWERS IS TO BE 300 mm.

THRUST BLOCK DETAILS (G 13)

N.T.S

DUCTILE IRON CL52 MECHANICAL JOINT FITTINGS



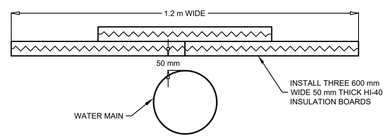
MINIMUM THRUST BLOCK CONTACT AREA (m²)

BASED ON SOIL BEARING CAPACITY OF 100 kPa AND INTERNAL PIPE PRESSURE OF 1035 kPa.

PIPE DIAMETER (mm)	CAP	TEE	45° BEND	22.5° BEND	11.25° BEND
100	0.25	0.25	0.20	0.16	0.16
150	0.48	0.48	0.40	0.24	0.16
200	0.80	0.80	0.64	0.32	0.16
250	1.28	1.28	0.96	0.48	0.24
300	1.76	1.76	1.44	0.72	0.40
350	2.40	2.40	1.96	0.98	0.54
400	3.13	3.13	2.56	1.28	0.71

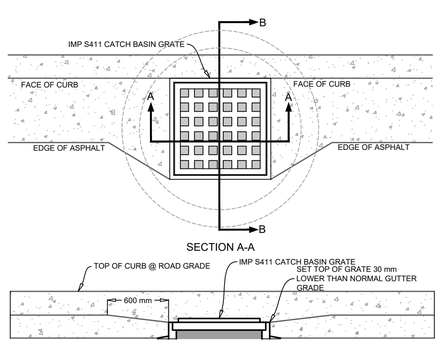
WATER MAIN INSULATION DETAIL (G 13)

N.T.S

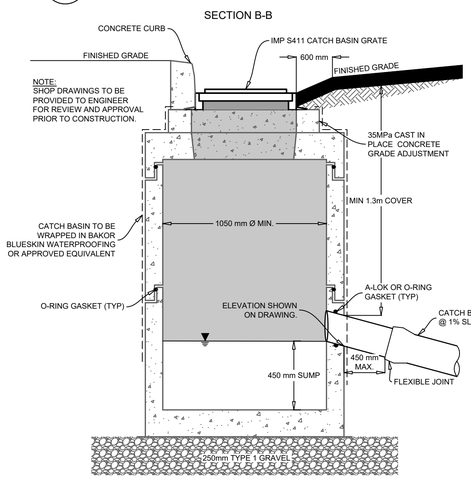


TYP. CATCH BASIN (I 13)

N.T.S

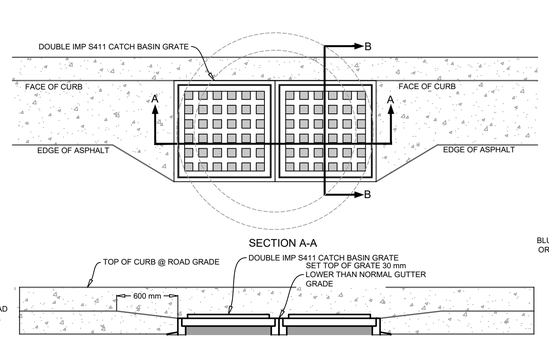


SECTION B-B

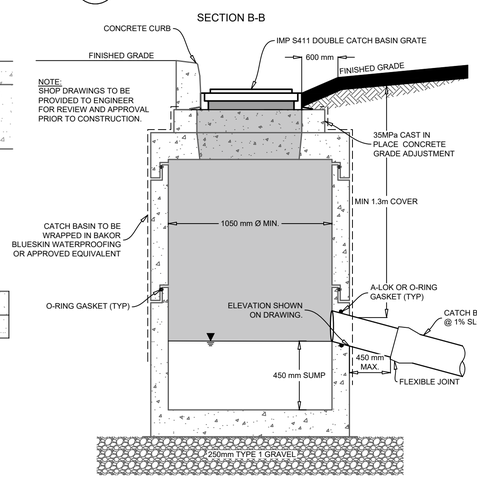


TYP. DOUBLE CATCH BASIN (J 13)

N.T.S



SECTION B-B



GENERAL CONSTRUCTION NOTES:

1. **SAFETY IS PARAMOUNT AND THE CONTRACTOR MUST USE SAFE WORK PRACTICES IN ACCORDANCE WITH THE NOVA SCOTIA OCCUPATIONAL HEALTH AND SAFETY ACT.**
2. ALL WORKS TO BE IN ACCORDANCE WITH MUNICIPAL SERVICES SPECIFICATION MANUAL (CURRENT EDITIONS).
3. ALL WORKS TO BE IN ACCORDANCE WITH THE "STANDARD SPECIFICATION FOR MUNICIPAL SERVICES" PREPARED JOINTLY BY THE NOVA SCOTIA ROADBUILDERS ASSOCIATION AND THE CONSULTING ENGINEERS OF NOVA SCOTIA (CURRENT EDITION).
4. ALL WORKS TO BE IN ACCORDANCE WITH REQUIREMENTS OF ALL PERMITS AND REGULATIONS AS ISSUED BY THE NOVA SCOTIA DEPARTMENT OF ENVIRONMENT.
5. CONTRACTOR TO NOTIFY DESIGNPOINT AND WEST HANTS REGARDING CONSTRUCTION SCHEDULING 2 WEEKS PRIOR TO COMMENCING CONSTRUCTION.
6. CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF NATURAL WATERCOURSES FROM DAMAGE DUE TO SILT-LADEN RUNOFF FROM THE CONSTRUCTION SITE. ACCEPTABLE CONSTRUCTION PROCEDURES MAY BE OBTAINED FROM 'EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION SITES" (CURRENT EDITION), BY THE NOVA SCOTIA DEPARTMENT OF ENVIRONMENT.
7. ALL DISTURBED AREAS NOT STABILIZED BY GRAVEL, ASPHALT, CONCRETE, OR SOD ARE TO BE STABILIZED WITH 100mm TOPSOIL AND HYDROSEEDED. HYDROSEEDED AREAS TO BE COVERED WITH HAY MULCH (MIN. 3500 kg/Ha). HYDROSEEDED AREAS THAT DO NOT SHOW ACTIVE GROWTH WITHIN THE FIRST GROWING SEASON TO BE RE-STABILIZED.
8. MATERIALS SHALL NOT BE SUBSTITUTED UNLESS PRIOR APPROVAL IS PROVIDED BY THE ENGINEER.
9. SHOP DRAWINGS TO BE PROVIDED FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION.
10. CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS REQUIRED TO PERFORM WORKS AND TO COMPLY WITH ALL PERMIT REQUIREMENTS AND CONDITIONS.
11. LOCATIONS OF EXISTING INFRASTRUCTURE IS BASED ON BEST AVAILABLE INFORMATION, INCLUDING RECORD INFORMATION. CONTRACTOR TO CONFIRM LOCATIONS OF EXISTING INFRASTRUCTURE AND NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY. CONTRACTOR TO ALLOW A 1 WEEK REVIEW PERIOD BY THE ENGINEER.
12. CONTRACTOR TO VERIFY ALL EXISTING UTILITY LOCATIONS, SUCH AS HERITAGE GAS, NOVA SCOTIA POWER, BELL ALIANT, AND EASTLINK. CONTRACTOR TO VISIT CLICKBEFOREYOUDIG.COM TO REQUEST LOCATES PRIOR TO COMPLETING ANY EXCAVATION. CONTRACTOR SHALL ADHERE TO ALL OCCUPATIONAL HEALTH AND SAFETY REGULATIONS FOR WORKING AROUND LIVE GAS MAINS.
13. ALL POWER AND COMMUNICATION INFRASTRUCTURE TO BE INSTALLED AS PER NSPI AND COMMUNICATION PROVIDER (I.E. BELL) SPECIFICATIONS. CONTRACTOR TO CONFIRM AND COORDINATE WITH UTILITIES AS REQUIRED.
14. PERMISSION FROM LANDOWNER(S) REQUIRED TO WORK ON PRIVATE PROPERTY.
15. CONTRACTOR TO NOTIFY PROPERTY OWNERS WHO WILL EXPERIENCE DISRUPTION DURING THE WORK (PROPERTY ACCESS, MUNICIPAL SERVICE LOSS, POWER/COMMUNICATION LOSS, ETC.) AT LEAST 48 HOURS PRIOR TO THE DISRUPTION.
16. ALL ELEVATIONS ARE METRIC AND GEODETIC. TOPOGRAPHICAL SURVEY COMPLETED BY DESIGNPOINT IN NOV, 2021. CONTRACTOR TO CONTACT DESIGNPOINT FOR CONSTRUCTION LAYOUT CONTROL INFORMATION 2 WEEKS PRIOR TO CONSTRUCTION.
17. ALL EART ORK (INCLUDING SUBGRADE), TRENCH WORK, PIPE BEDDING, AND SURFACE TREATMENT (INCLUDING GRAVELS, ASPHALT, AND CONCRETE) TO BE REVIEWED AND CERTIFIED BY PROJECT GEOTECHNICAL ENGINEER.
18. DRAWINGS SUBJECT TO CONSTRUCTION APPROVAL BY THE APPLICABLE APPROVAL AGENCIES (e.g. WEST HANTS AND NOVA SCOTIA DEPARTMENT OF ENVIRONMENT) PRIOR TO CONSTRUCTION.
19. CONTRACTOR RESPONSIBLE FOR ALL TRAFFIC CONTROL MEASURES REQUIRED FOR THE PROJECT. ALL TEMPORARY TRAFFIC CONTROL MEASURES TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NOVA SCOTIA TRANSPORTATION AND INFRASTRUCTURE RENEWAL TEMPORARY WORKPLACE TRAFFIC CONTROL MANUAL AND THE LATEST EDITION OF THE TRANSPORTATION ASSOCIATION OF CANADA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA.
20. INSULATION TO BE 50mm THICK HI40 RIGID STYROFOAM (ROAD AND TRAFFIC RATED).
21. CONTRACTOR MAY REQUEST GRADE ADJUSTMENTS SUBJECT TO REVIEW AND APPROVAL BY ENGINEER AND APPLICABLE APPROVAL AGENCIES. CONTRACTOR RESPONSIBLE FOR COSTS ASSOCIATED WITH DRAWING REVISIONS AND APPROVALS.
22. ALL TEMPORARY ROAD CLOSURES WILL REQUIRE A ROAD CLOSURES PERMIT.
23. AT THE COMPLETION OF CONSTRUCTION, THE CONTRACTOR IS TO COMPLETE AND PROVIDE A COPY OF A CCTV INSPECTION AND REPORT TO THE ENGINEER FOR REVIEW OF ALL GRAVITY SEWERS 150 mm Ø OR LARGER.
24. ALL TESTING OF SEWERS TO BE IN ACCORDANCE WITH WEST HANTS SPECIFICATIONS, INCLUDING MANHOLE VACUUM TEST. PRESSURE TEST TO BE COMPLETED FOR ENTIRE PIPE LENGTH. TEMPORARY END CAPS TO BE INSTALLED AS REQUIRED TO FACILITATE TESTING.
25. ALL TESTING OF WATER MAINS TO BE IN ACCORDANCE WITH WEST HANTS SPECIFICATIONS, INCLUDING PRESSURE TEST AND CHLORINATION FOR ALL SERVICE LATERALS 100 mm Ø AND LARGER. BASE LIFT OF GRAVEL TO BE PLACED OVER WATER MAINS AND SERVICES PRIOR TO TESTING (PUBLIC AND PRIVATE INFRASTRUCTURE).
26. ANY FIELD MANHOLE CONNECTIONS (IF REQUIRED) TO BE MADE USING CORE DRILL AND KOR-N-SEAL (SUBJECT TO APPROVAL BY UTILITY AND ENGINEER).
27. ALL GRAVITY PIPE TO BE INSTALLED IN AN UPSTREAM DIRECTION. CONTRACTOR TO BEGIN PIPE INSTALLATION AT THE MOST DOWNSTREAM LOCATION. INSTALLING TEMPORARILY ORPHANED PIPE SECTIONS IS NOT ACCEPTABLE (UNLESS APPROVED BY THE UTILITY AND THE ENGINEER).
28. CONTRACTOR TO PROVIDE 24 HOURS NOTICE TO WEST HANTS AND THE ENGINEER OF PIPE AND MANHOLE TESTING, INCLUDING CCTV INSPECTION AND DEFLECTION TESTING.
29. ALL PRECAST MANHOLES AND CATCH BASINS TO BE WRAPPED IN BAKOR BLUESKIN OR APPROVED EQUIVALENT.

ISSUE	DATE	DESCRIPTION
1	JUL. 13, 2022	DRAFT

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REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 22/02/2024 — A. J. SKETCHLEY — 11560

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 22/02/2024 — A. T. LEAHY — 20200013

CLIENT

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something inspiring awaits

PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

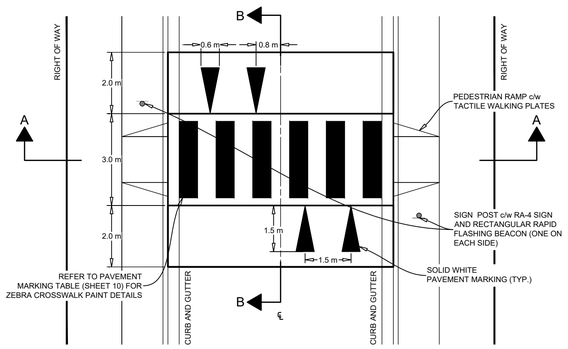
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

CONSTRUCTION NOTES AND DETAILS 1

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	A. SKETCHLEY	21-435	C-D13
Scale	Filename		13 of 14
N.T.S	21-435_D01_INT-DETAILS.dwg		

TYP. RAISED CROSSWALK (A) 14
N.T.S

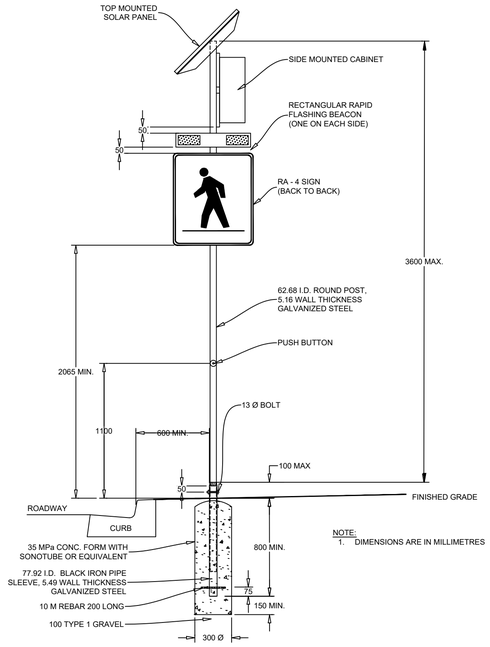


NOTES:
1. THE EXISTING ASPHALT SURFACE TO BE MILLED TO A DEPTH OF 40 mm WHEN RETROFITTING
2. CATCH BASINS ARE REQUIRED ON THE UPHILL SIDE OF THE RAISED CROSSWALK AS INDICATION ON PLANS.
3. POSITIVE DRAINAGE TO NEAREST CATCHBASIN TO BE CONFIRMED BY THE ENGINEER AND ADJUSTED AS REQUIRED
4. RAISED CROSSWALKS TO BE CONSTRUCTED USING TYPE D-HF ASPHALT (UNLESS OTHERWISE APPROVED BY THE W)
5. ALL DIMENSIONS ARE IN METERS UNLESS INDICATED OTHERWISE

SECTION A-A
N.T.S

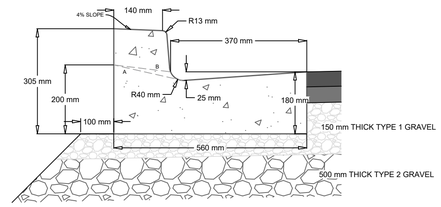
SECTION B-B
N.T.S

RECTANGULAR RAPID-FLASHING BEACON SIGNAL CONFIGURATION (SOLAR PANEL) (B) 14
N.T.S



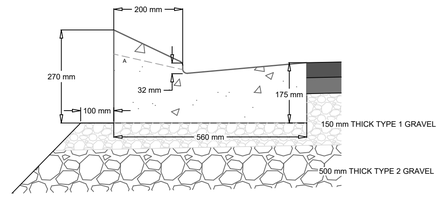
NOTE:
1. DIMENSIONS ARE IN MILLIMETRES

TYPICAL CURB DETAIL (C) 14
N.T.S.



NOTES:
LINE A INDICATES CURB AT PEDESTRIAN RAMPS.
LINE B INDICATES CURB AT DRIVEWAYS

MOUNTABLE CURB DETAIL (D) 14
N.T.S.



ISSUE	DATE	DESCRIPTION
5	FEB. 22, 2024	ISSUED FOR TENDER
4	FEB. 15, 2024	ISSUED FOR REVIEW
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	REVISED ROUNDABOUT ENTRANCE
1	JUL. 13, 2022	DRAFT

CONSULTANT

DESIGNPOINT
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902.832.5597
designpoint.ca

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 22/02/2024 — A. J. SKETCHLEY — 11560

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 22/02/2024 — A. T. LEAHY — 20200013

CLIENT

West Hants
something inspiring awaits

PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

CONSTRUCTION NOTES AND DETAILS 2

Drawn: T.MILLS	Engineer: A. SKETCHLEY	Project No.: 21-435	Drawing No.: C-D14
Scale: N.T.S	Filename: 21-435_D01_INT-DETAILS.dwg		14 of 14

Addendum #1

To All Bidders of WHRMPW24-03:

Please note: the following addendum applies to WHRMPW24-03 and shall be taken into consideration when preparing bid documents.

Replace drawings: C-TR02 Sheet 2 of 14, Rev 5, dated February 22, 2024
C-D12 Sheet 12 of 14, Rev 5, dated February 22, 2024
C-D14 Sheet 14 of 14, Rev 5, dated February 22, 2024

With the following: C-TR02 Sheet 2 of 14, Rev 6, dated March 27, 2024
C-D12 Sheet 12 of 14, Rev 6, dated March 27, 2024
C-D14 Sheet 14 of 14, Rev 6, dated March 27, 2024

Add the following schematic:

Services Removal Plan	TSK-01	Sheet 1 of 1, dated March 27, 2024
Infill Surcharging Sketch	TSK-02	Sheet 1 of 1, dated March 28, 2024

Addendum #1

Replace Section 00 41 43 – Tender Form, Section 1.4 Schedule Of Quantities And Unit Prices:

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
EARTHWORK					
2.	Grubbing	m^2	800		
6.	Borrow	m^3	550		
8.	Exploratory Digs	ea	5		
9.	Infill Surcharging	L.S.	1		
10.	Karst Topography Cavern Infill (Provisional)				
.1	Less than or equal to 5 cubic metres	ea	3		
.2	Greater than 5 cubic metres	m^3	20		
			SUBTOTAL EARTHWORK:	$	
WATER MAIN					
11.	Pipe				
.1	250mm PVC BIONAX	m	192		
.2	200mm PVC BIONAX	m	135		
12.	Fire Hydrants				
.1	Installation	ea	2		
.2	Relocation	ea	1		
14.	Direct Buried Valves				
.1	250mm Gate Valve	ea	3		
.1	200mm Gate Valve	ea	2		
16.	Connections to Existing Main				
.1	250mm, Payzant Drive 0+826	ea	1		
.2	250mm, Payzant Drive 1+018	ea	1		
.3	200mm, Wentworth Road 0+874	ea	1		
18.	Temporary Water	L.S.	1		
19.	Cap and Abandonment of Existing Main				
.1	250mm, Payzant Drive 0+834	ea	1		
.2	250mm, Payzant Drive 0+890	ea	1		
			SUBTOTAL WATER MAIN:	$	

Addendum #1

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
STORM SEWER					
31.	Pipe				
.1	300mm PVC DR18	m	48		
.2	450mm RCP 65D	m	33.5		
32.	Manholes				
.1	1050mm	ea	1		
.2	1200mm	ea	1		
33.	Catch Basins				
.1	1050mm, Single	ea	5		
.2	1050mm, Double	ea	5		
34.	Catch Basin Leads				
.1	200mm PVC DR35	m	15		
.2	250mm PVC DR35	m	38		
.3	250mm PVC DR18	m	40		
.4	300mm PVC DR35	m	102		
.5	300mm PVC DR18	m	30		
36.	Connections to Existing				
.1	Existing Manhole	ea	1		
.1	Wentworth Road Culvert	ea	1		
37.	Culverts				
.1	1200mm RCP 65D	m	6.5		
39.	Precast Headwall				
.1	Up to 600mm Pipe	m	5		
.2	1200mm Pipe	m	1		
			SUBTOTAL STORM SEWER:	$	
STREET CONSTRUCTION					
41.	Gravels				
.1	Type 1 (150mm thick)	m^2	3750		
.2	Type 2 (500mm thick)	m^2	3750		
.3	Type 1 (Dentist Parking Lot) (150mm thick)	m^2	1110		
.4	Type 2 (Dentist Parking) (300 mm thick)	m^2	1110		
43.	Asphalt Concrete				
.1	Type C-HF (50 mm thick)	m^2	3750		
.2	Type B-HF (100 mm thick)	m^2	3750		

Addendum #1

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
	.3 Type C-HF (Dentist Parking Lot) (40mm thick)	m^2	980		
	.4 Type B-HF (Dentist Parking) (50 mm thick)	m^2	980		
44.	Curb				
	.1 Curb and Gutter - Concrete	m	550		
	.2 Curb only - Concrete	m	430		
45.	Concrete Sidewalk				
	.1 Sidewalk/ Traffic Island (100mm)	m^2	1185		
	.2 Truck Apron (200mm)	m^2	275		
46.	Tactile Walking Surface Indicators	ea	28		
48.	Guardrail				
	.1 Rail for Civic 151 wall	m	12		
50.	Adjust Existing Manhole Frames and Covers	ea	4		
52.	Segmental Retaining Wall				
	.1 Center Island	m^2	98		
	.2 Civic 151 Parking Lot	m^2	15		
53.	Street Signs and Bases	ea	38		
54.	Stone Pillar Reinstatement	L.S.	1		
55.	Sign Relocation				
	.1 Credit Union	L.S.	1		
	.2 Hospital	L.S.	1		
56.	Raised Crosswalks	ea	6		
57.	Temporary Asphalt Reinstatement (Provisional)	m^2	3000		

SUBTOTAL STREET CONSTRUCTION: $_____

LANDSCAPING

61.	Topsoil and Sod	m^2	1050		
62.	Topsoil and Seed	m^2	530		

Addendum #1

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
66.	Grass Pavers	m^2	205		
67.	Center Island Landscaping	L.S.	1		

SUBTOTAL LANDSCAPING: $_____

ADDITIONAL ITEMS

73.	Replacement of Unsuitable Material w/ Surge Rock (Provisional)	m^3	1900		
76.	Infrastructure Removal	L.S.	1		
77.	Trench Excavation – Contaminated Material (Provisional)	m^3	50		

SUBTOTAL ADDITIONAL ITEMS: $_____

ENVIRONMENTAL PROTECTION

90.	Environmental Measures	L.S.	1		

SUBTOTAL ENVIRONMENTAL PROTECTION: $_____

SUBTOTAL EARTHWORK $_____

SUBTOTAL WATER MAIN $_____

SUBTOTAL STORM SEWER $_____

SUBTOTAL STREET CONSTRUCTION $_____

SUBTOTAL LANDSCAPING $_____

SUBTOTAL ADDITIONAL ITEMS $_____

SUBTOTAL ENVIRONMENTAL PROTECTION $_____

ESTIMATED CONTRACT PRICE (EXCLUDING HST) $_____ (A)

ADD HARMONIZED SALES TAX (15% of Estimated Contract Price) $_____ (B)

TOTAL PRICE (A + B) $_____

TENDERER'S HST REGISTRATION NO. _____

Add Section 01 22 00 – Measurement and Payment, Item 57. Temporary Asphalt Reinstatement:

9. Infill Surcharging

Unit of Measurement: Lump Sum

This item includes: supply, placement and compaction of borrow material to a thickness that is double the required fill thickness (grubbed grade to finished grade). Excavation and shaping of the placed material to occur in the following year to facilitate roadway construction. No payment additional payments will be made under pay item 6 for the imported borrow in these areas.

Replace Section 01 22 00 – Measurement and Payment, Item 48. Guardrail with the following:

48. Guardrail

Unit of Measurement: metre (m)

Method of Measurement: along the top of rail through posts.

This item includes: common excavation, importation of material, bedding, backfill, supply and placing posts, rail and accessories. This item also includes all coordination with retaining wall installation and any accessories required.

Replace Section 01 22 00 – Measurement and Payment, Item 52. Segmental Retaining Wall with the following:

52. Segmental Retaining Wall

Unit of Measurement: square metre (m2)

Method of Measurement: total area of wall face.

This item includes: common excavation, removal and disposal of surplus material, importation of material, installation of foundation preparation and bedding, supply and installation of modular Stone Strong wall units, geotextile, guards, gravel, infill soil, backfilling, drainage, design, and shop drawings stamped by a Professional Engineer (licensed to practice in Nova

Scotia). In addition to normal wall design, design to consider global stability and guardrail placement. Only the top exposed faces of retaining walls are required to be aesthetic in nature. Buried sections may have simple/irregular finishes as long as they maintain their structural integrity.

Add Section 01 22 00 – Measurement and Payment, Item 57. Temporary Asphalt Reinstatement:

57. Temporary Asphalt Reinstatement:

Unit of Measurement: square metre (m2)

Method of Measurement: slope measure.

This item includes: common excavation, removal and disposal of surplus material, supply and placement of gravel, asphalt and line painting as directed by the Engineer. No payment will be made under this item unless authorized by the Engineer.

Replace Section 01 22 00 – Measurement and Payment, Item 73. Replacement of Unsuitable Material w/ Surge Rock (Provisional) with the following:

73. Replacement of Unsuitable Material w/ Surge Rock (Provisional)

Unit of Measurement: cubic metre (m^3)

Method of Measurement: surface-to-surface volume method between topographical survey taken before and after the placement and compaction of replacement material.

This item includes: all excavation, removal, and disposal of unsuitable material. As well as the supply, placement, and compaction of surge rock as directed by the Engineer. No payment will be made under this item unless authorized by the Engineer. This item also includes the supply and placement of filter fabric.

The following questions have been asked and the answers are provided for clarification:

Addendum #1

Question 1: The new road structure details (detail A-E) shown on drawing TR09 indicates prime is required on top of the Type 1 gravel. As discussed at the site meeting, this is atypical for projects like this and would be difficult to apply as traffic will be traveling over the gravels prior to paving. Can you please confirm that prime won't be required?

Answer 1: **Primer will not be required on top of the Type 1 gravel.**

Question 2: The new road structure details (detail A-E) shown on drawing TR09 indicate geotextile is required under the new road structure on top of the subgrade. There isn't a pay item for this on the tender form. Could you please provide a pay item for this work?

Answer 2: **Geotextile is only required when placing surge rock on subgrade and has been added to the description of surge rock.**

Question 3: There is mention in the Geotechnical report under grade increases/settlement that preload/surcharge may be required for fill areas. As discussed at the site meeting and indicated in the geotechnical report, if this was required it would have had to be completed long before the project was tendered. Can you please confirm this won't be applicable for this project?

Answer 3: **See the attached Infill Surcharging sketch and pay item 9.**

Question 4: Further to the question we had submitted previously, it was discussed at the site meeting that pay items would be provided for mass excavation/earthwork scope required for this project. Can you please provide unit price items for Common Excavation and Disposal Offsite, Supply and Placement of Imported Borrow Material in Fill Areas, and Common Excavation and Re-Use in Landscape Areas on site.

Answer 4: **See the updated pay line items and schedule of quantities. Excavation, placement, and disposal are all included in General Item 2 in Measurement and Payment and apply to all items. A quantity has been added for borrow.**

Question 5: The existing conditions plan provides no existing grading information. The grading plan provides very minimal existing grading information but is insufficient for use to calculate volumes. Can you please provide more detailed existing grading information?

Answer 5: **See the updated existing conditions plan.**

Question 6: It was mentioned onsite that a specific type and color of retaining wall was wanted for the roundabout and the retaining wall at the dentist office parking lot. There was no design or specification provided with the tender documents and the tender drawings say the contractor is to provide a design and shop drawing for the retaining walls. Please provide details for retaining walls so that we can ensure we're allowing for the type and color of block that the municipality would like.

Answer 6: Stone Strong walls are to be used for both the roundabout and dentist office retaining walls.

Question 7: There are no details provided for headwalls. Please provide details for headwalls for pipe diameters up to 600mm and for the larger headwall required for the 1200mm pipe extension as well as details for any grates or rails that may be required.

Answer 7: See the updated detail sheet 14.

Question 8: The new water main on Payzant drive runs under the existing sidewalk from the optometrist to the credit union. There is a section of sidewalk and asphalt curb between the optometrist and credit union driveway entrances that appears to be shown as new asphalt sidewalk and curb but no notes or pay items to confirm this. Is the intent to replace this with new asphalt sidewalk or should this be concrete sidewalk like all of the other new sidewalk on the project? If the intent is to use asphalt sidewalk, please provide a detail and associated pay items. If this section is being replaced with concrete sidewalk, please confirm that this will be paid under item 45.1. Also, the existing curb in this area is asphalt. Please confirm if you require asphalt or concrete curb here and, if asphalt, provide a detail.

Answer 8: The existing curb and sidewalk are to be replaced with concrete curb and gutter and concrete sidewalk.

Question 9: After further review of the drawings and discussions at the site meeting, we would ask for some of the curb types to be changed. As discussed at the site meeting, we would ask that the curb around the inner circle of the roundabout be changed to standard NSDPW Type E High Back curb as the truck apron in front of this curb is graded away which makes gutter here redundant. Reverse gutter is also difficult to work with from a grading perspective. We would also ask that the curbed islands be changed to NSDPW Type E High Back Curb. There are no catch basins in the curbed islands and the adjacent asphalt is sloping away from the curb which also

makes gutter here redundant and will likely lead to water being trapped in the gutter. The Curb around the outermost edges of the roundabout island is currently designed as mountable curb with reverse gutter. We would also ask for this to be changed to remove the gutter as the grade on the adjacent asphalt is running away from the curb which makes gutter redundant and will also be much easier to match into with asphalt. We've attached a copy of a standard NSDPW detail that has been being used for this purpose on other roundabouts in the area. Please confirm if this will be acceptable.

Answer 9: Traffic island curb and gutter may be replaced with curb only. Refer to detail C-12 for roundabout curb detailing

Question 10: Detail A on drawing C-D12 has a note pointing to the asphalt in front of the curb that says feathering strip for grading adjustments. please clarify what is meant by this note?

Answer 10: Disregard that note. Note removed in revised detail sheet.

Question 11: It was mentioned at the site meeting that the existing buried infrastructure requires removal only in locations where it interferes with new buried infrastructure. On the drawings, it says to remove all buried infrastructure within the limits of construction. Please confirm we are only required to remove the existing buried infrastructure if it interferes with the new infrastructure. Also, further to the question we had submitted previously, please provide a separate removals plan so that removals can be accurately quantified.

Answer 11: See the attached removal plan.

Question 12: It was discussed at the site meeting that temporary asphalt reinstatement may be required over pipe trenches to keep traffic flowing safely given that the project will span the 2024 and 2025 construction seasons. Can you please provide a unit price pay item for temporary reinstatement of asphalt?

Answer 11: See the updated pay line items.

Question 13: What will be required for backfill material of pipe trenches between bedding material as shown on detail F/13 and the bottom of the proposed road and sidewalk structure? Will this need to be imported granular material or will excavated site material be acceptable for this?

Answer 13: Refer to section 5.2 of the geotechnical report.

Question 14: As discussed at the site meeting, we request an extension to the tender closing of one week to allow time for consultants to respond to questions and for the contractor to process their response.

Answer 14: Extension already posted on NS Procurement Site. April 4th, 2024 at 2pm.

Question 15: Pay item 76 for Infrastructure Removal has been provided on the tender form and is noted to include all removal of existing infrastructure. There is a note indicating that all water, storm, and surface infrastructure within the project footprint is to be removed unless otherwise noted; however, the level of detail on the drawings make it difficult to fully quantify the full scope of removals required for the project. As this is a lump sum item, we want to make sure we're able to capture all of the cost related to this scope of work under this item. Can you please revise the existing conditions plan (Drawing C-TR02) to clearly indicate all of the removals required for the project so they can be accurately quantified by all bidders?

Answer 16: See answer 11.

Question 16: Further to question 1 above, Pay item 76 also notes that common excavation and replacement of required volume with select material is to be included in this item. We'd like to request that separate unit price pay items be provided for these two items.

Answer 16: This pay item will remain as is.

Question 17: Pay item 18 for temporary water is provided as a lump sum item which will requires the bidder to quantify time and materials required for this scope of work. Can you please provide a plan showing the extents to which the existing water main in this area can be isolated so that we can determine the number of customers affected and the level of effort required to provide temporary water service to affected customers? Can we assume that temporary water can be provided by way of connection to existing hose bibs?

Answer 17: The following sequencing is suggested. The contractor will be responsible for the final temporary water plan and execution.

1. Payzant Drive – install new water main short of connections to existing so that existing water main may remain in service.

2. If disturbance of the lateral for 150 Wentworth Rd. is required, relocate around the new water main or provide temporary service.
3. Retap existing services to the 151 Wentworth Rd. and 19 Centennial Dr. north of water tie in point.
4. Test new Payzant water main.
5. Make connections to the existing water main at either end with a short-duration shut down.
6. Connect 150 Wentworth Rd. to new water main if existing service is still connected to existing main.
7. Wentworth Road – Install valve at Sta. 0+875 and a length of pipe so that the valve can be closed, leaving the existing main pressurized with a temporary shut down.
8. Provide service to 141 Wentworth Rd. from Civic 131 Wentworth Rd.

Question 18: Can excess excavated site material be disposed of at the Windsor public works yard?

Answer 18: **The excess excavated material can be disposed of at the dump site located on Colonial Road. Material shall be placed and leveled as directed by WHRM Staff.**

Question 19: Can you please confirm that coordination with Nova Scotia Power and any cost related to moving of poles and overhead wires will be the responsibility of the owner?

Answer 19: **These costs will be the responsibility of WHRM. The contractor will still be required to pay for any bracing/shoring required for existing or future poles and will need to coordinate with NSPI.**

Question 20: Pay item 73 for replacement of unsuitable material with surge notes that it includes supply, placement, and compaction of surge as directed by the engineer but doesn't note that excavation of unsuitable material is to be included under this item. Please clarify.

Answer 20: **Excavation is included in General Item 2 in Measurement and Payment and has been added to Item 73.**

Question 21: Pay item 52.2 has been provided for a segmental retaining wall at civic 151 with a tender quantity of 15m2. This particular wall requires a handrail on the top of it. As the actual quantity may vary somewhat from the tender quantity, can you please add a separate pay item for this handrail?

Answer 21: A pay item has been added for this guardrail.

Question 22: Please confirm whether the costs associated with electrical works as per drawing C-E11 are NOT included in the tender scope

Answer 22: See answer 19.

Question 23: In the Supplementary Specs for pay item number 8 for Exploratory Digs, it is noted that this item includes reinstatement of all disturbed areas. Is the intent for us to include asphalt reinstatement at the surface if located in an existing asphalt area? Please clarify. A previous question that we submitted requested a pay item for temporary asphalt. If this item is provided, can we assume that we will be paid under that new item for this? If located in a landscape area, can we assume that landscape reinstatement will be paid under the pay items for topsoil and sod or topsoil and seed?

Answer 22: Any and all reinstatement that is required as a result of exploratory digs/investigations are to be included in the pay item 8.

Question 24: The tender quantity for pay item 45.1 (concrete truck apron) is 275m2. The measured quantity from the drawing is approximately 195m2. We've requested pricing from our rebar supplier based on the tender quantity; however, if the actual quantity is significantly lower, this will significantly impact our lump sum price for rebar and will skew our bid cost for this item. Can you please adjust the tender quantity to reflect the quantity shown on the drawings?

Answer 24: The quantity has been updated in the revised schedule of quantities and prices above.

Question 25: Tender quantities for pay items 41.1 and 41.2 (Type 1 and Type 2 gravels) matches the tender quantity for pay items 43.1 and 43.2 (Type B and C asphalt). The cross sections on drawing TR09 show the road structure gravels beginning behind the curb and carrying through the curbed islands to behind the curb on the other side of the road as well as under the truck apron (detail E/07 on C-D12) which would make the actual quantity for pay items 41.1 and 41.2 higher than the quantities for 43.1 and 43.2. I realize that the supplementary specs for curb and sidewalk note that gravel is included in those items; however, in reality this gravel would be placed at the same time as the road structure gravel as it is the same type and thickness. Can we assume that placement of 500mm Type 2 and

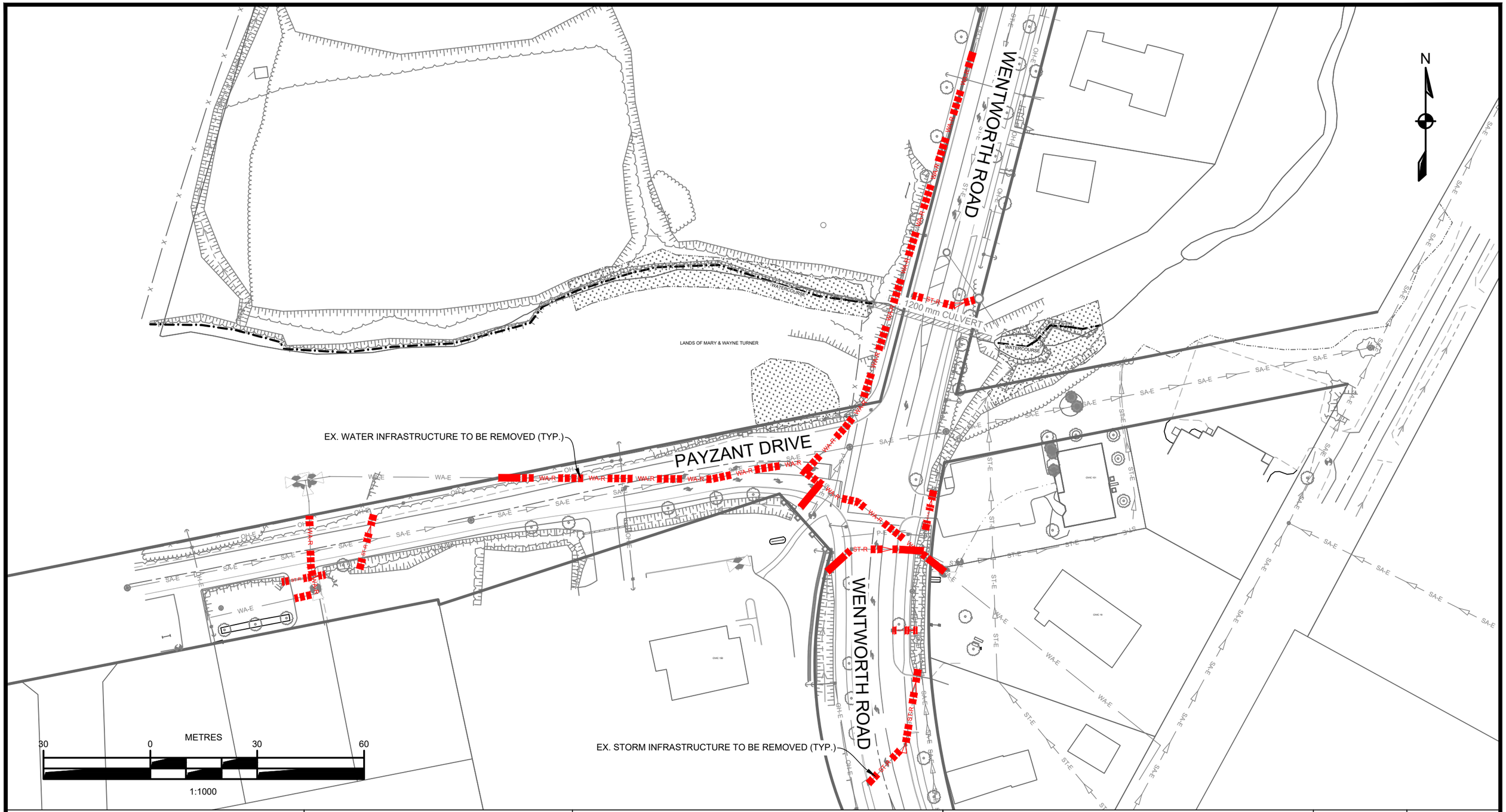
150mm Type 1 in these areas will be paid under items 41.1 and 41.2 with any additional gravel between this elevation and the bottom of concrete in the islands included with concrete sidewalk pay items? If so, can you please adjust tender quantities to accommodate this?

Answer 25: **These pay items will remain as they are. Items 41.1 and 41.2 are for road gravels only. Gravels associated with concrete works are to be included in the pay items for those works.**

Question 26: The roundabout cross section detail (E/07 on dwg C-D12) shows asphalt at 150mm thick in two lifts. Cross sections on TR09 and pay items of course show this as 100mm of Type B and 50mm of Type C. However, the 100mm of Type B should be placed in two lifts as 100mm would be too thick too be placed in one lift and still achieve adequate compaction. Can you please confirm that the intent is to place 100mm Type B asphalt in two lifts to ensure that all bidders are on the same page?

Answer 26: **Please disregard the asphalt thickness shown in detail E-07 on sheet 12. Type B-HF asphalt should be placed in two 50 mm lifts.**

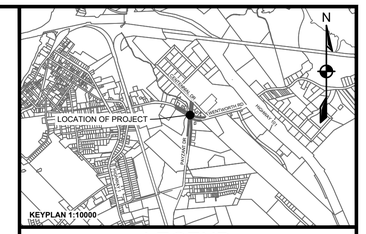
*******End of Addendum #1*******



CONSULTANT	CLIENT	PROJECT DESCRIPTION	SHEET DESCRIPTION		
DESIGNPOINT engineering • surveying • solutions 902.832.5597 designpoint.ca	West Hants something inspiring awaits	PAYZANT DRIVE ROUNDABOUT WINDSOR, NOVA SCOTIA	SERVICES REMOVAL PLAN	Engineer A.Leahy	Drawn A.Leahy
				Scale 1:1000	Date Mar. 27, 2024
				Project No. 21-435	Drawing No. TSK-01
				Filename	1 OF 1

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_TR01_EXISTING CONDITIONS.dwg, Plot Date: 2024-Mar-27, Plot Size: ANSI full bleed B (11.00 x 17.00 Inches), Plotted By: Adam Leahy





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

EXISTING GRADE CONTOURS ARE SHOWN AT A 0.5 m INTERVAL

METRES 5 0 10 15

1:250

ISSUE	DATE	DESCRIPTION
6	MAR. 26, 2024	ISSUED FOR ADDENDUM 1
5	FEB. 22, 2024	ISSUED FOR TENDER
4	FEB. 15, 2024	ISSUED FOR REVIEW
3	AUG. 16, 2023	REVISED CROSSWALKS
2	JUN. 16, 2023	DRAFT

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REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 27/03/2024 — A. J. SKETCHLEY — 11560

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 27/03/2024 — A. T. LEAHY — 20200013

CLIENT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

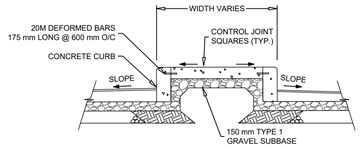
SHEET DESCRIPTION

EXISTING CONDITIONS

Drawn: J. DWYER	Engineer: P. BURGESS	Project No.: 21-435	Drawing No.: C-TR02
Scale: 1:250	Filename: 21-435_TR01_EXISTING CONDITIONS.dwg		02 of 14

TYPICAL CONCRETE TRAFFIC ISLAND DETAIL — A / 12

(N.T.S.)

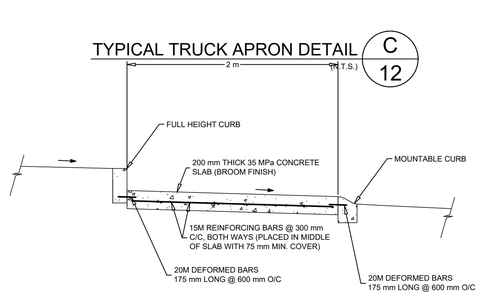


NOTES:

1. MAXIMUM SPACING FOR CONTROL JOINTS IS TO BE 2.5 m.
2. SLOPE SLAB TO FACILITATE DRAINAGE.
3. ENDS AND CORNERS OF TRAFFIC ISLANDS TO HAVE HIGH BACK CONCRETE CURB GEOMETRIC DESIGN OF CONCRETE ISLANDS TO BE AS PER THE TAC GEOMETRIC DESIGN GUIDE.

TYPICAL TRUCK APRON DETAIL — C / 12

(N.T.S.)



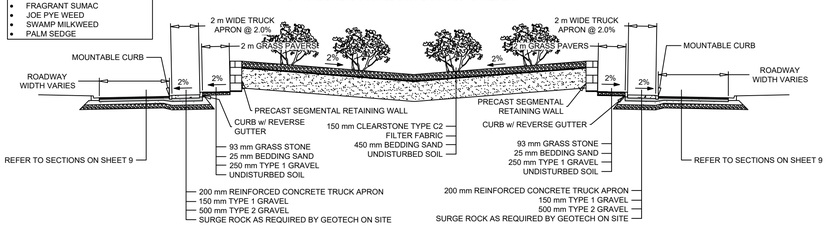
TYPICAL ROUNDABOUT CROSS-SECTION — E / 07

(N.T.S.)

NOTE: CENTER ISLAND VEGETATION TO CONSIST OF THE FOLLOWING:

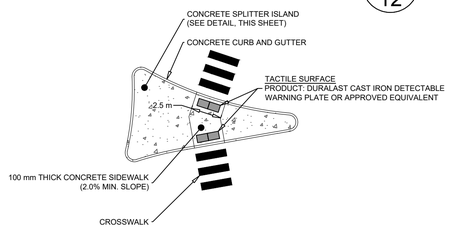
- WINTERBERRY
- DOGWOOD
- FRAGRANT SUMAC
- JOE PYE WEED
- SWAMP MILKWEED
- PALM SEDGE

NOTE: FOR PRECAST SEGMENTAL RETAINING WALL, CONTRACTOR TO PROVIDE P.ENG STAMPED SHOP DRAWINGS FOR REVIEW.



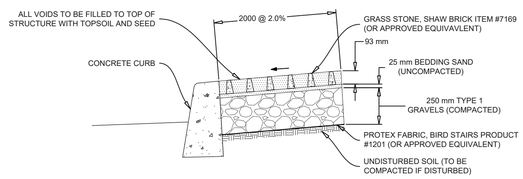
TYPICAL DROPPED SIDEWALK DETAIL — B / 12

(N.T.S.)



GRASS PAVER TYPICAL DETAIL — D / 12

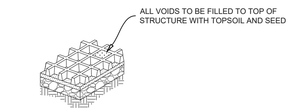
(N.T.S.)



NOTES:

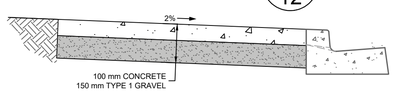
1. PRODUCTS TO BE INSTALLED AS PER MANUFACTURERS SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

GRASS PAVER ISOMETRIC VIEW



SIDEWALK STRUCTURE — F / 12

N.T.S.



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REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA — DATE 27/03/2024 — A. T. LEAHY — 20200013

CLIENT

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PROJECT DESCRIPTION

PAYZANT DRIVE ROUNDABOUT

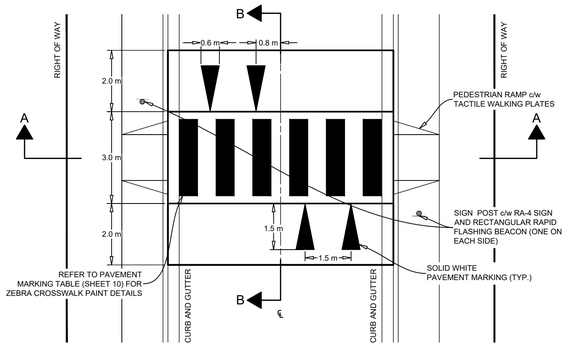
WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

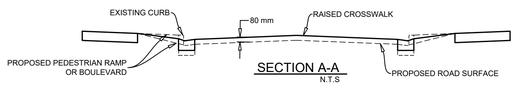
ROAD CONSTRUCTION DETAILS

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	P. BURGESS	21-435	C-D12
Scale	Filename		12 of 14
N.T.S.	21-435_D01_INT-DETAILS.dwg		

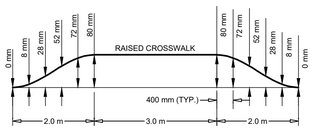
TYP. RAISED CROSSWALK (A / 14)
N.T.S



NOTES:
1. THE EXISTING ASPHALT SURFACE TO BE MILLED TO A DEPTH OF 40 mm WHEN RETROFITTING
2. CATCH BASINS ARE REQUIRED ON THE UPHILL SIDE OF THE RAISED CROSSWALK AS INDICATION ON PLANS.
3. POSITIVE DRAINAGE TO NEAREST CATCHBASIN TO BE CONFIRMED BY THE ENGINEER AND ADJUSTED AS REQUIRED
4. RAISED CROSSWALKS TO BE CONSTRUCTED USING TYPE D-HF ASPHALT (UNLESS OTHERWISE APPROVED BY THE W)
5. ALL DIMENSIONS ARE IN METERS UNLESS INDICATED OTHERWISE

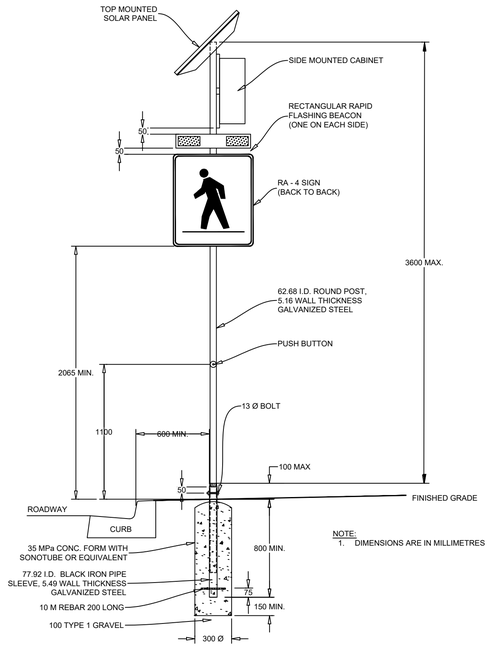


SECTION A-A
N.T.S



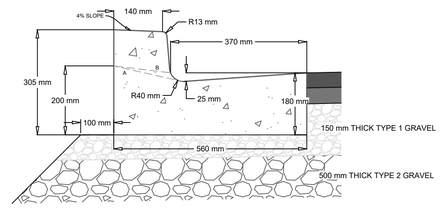
SECTION B-B
N.T.S

RECTANGULAR RAPID-FLASHING BEACON SIGNAL CONFIGURATION (SOLAR PANEL) (B / 14)
N.T.S



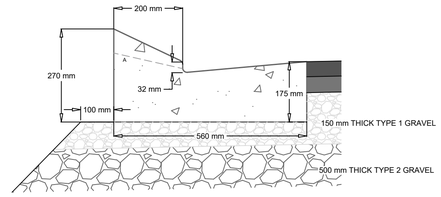
NOTE:
1. DIMENSIONS ARE IN MILLIMETRES

TYPICAL CURB AND GUTTER DETAIL (C / 14)
N.T.S.

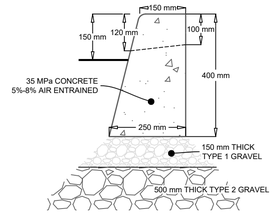


NOTES:
LINE A INDICATES CURB AT PEDESTRIAN RAMPS.
LINE B INDICATES CURB AT DRIVEWAYS

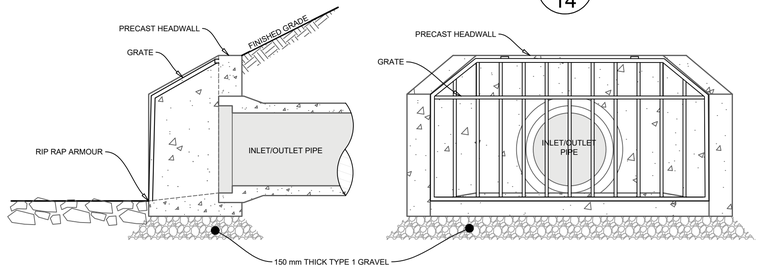
MOUNTABLE CURB AND GUTTER DETAIL (D / 14)
N.T.S.



TYPICAL CURB DETAIL (E / 14)
N.T.S



TYPICAL HEADWALL DETAIL (F / 14)
N.T.S.



NOTES:
1. ANY PIPE SYSTEMS OR CULVERTS LONGER THAN 30 m TO HAVE HEADWALL GRATES ON INLETS.
2. BARS TO BE VERTICAL ON INLET GRATES. GRATES ARE NOT PERMITTED ON OUTLETS.
3. AREA OF HEADWALL GRATE (WHERE REQUIRED) TO BE MINIMUM 6 TIME LARGER THAN PIPE CROSS SECTIONAL AREA.
4. GRATES TO BE GALVANIZED STEEL.
5. HEADWALL TO BE SIZED BASED ON PIPE SIZE AS PER PRECAST MANUFACTURERS RECOMMENDATION.

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REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA
DATE 27/03/2024
A. J. SKETCHLEY
11560

REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF NOVA SCOTIA
DATE 27/03/2024
A. T. LEAHY
20200013

CLIENT

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PROJECT DESCRIPTION

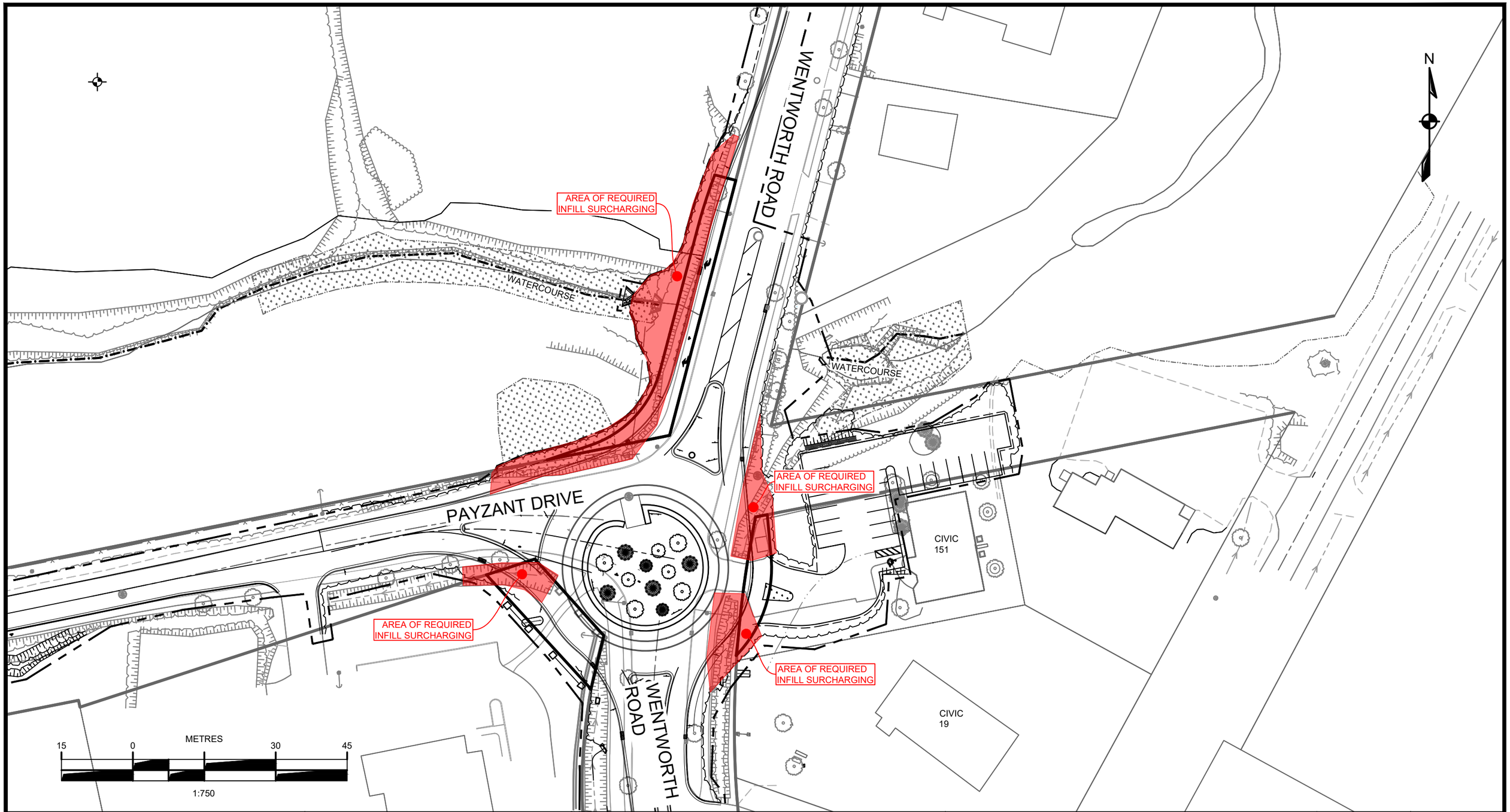
PAYZANT DRIVE ROUNDABOUT

WEST HANTS, NOVA SCOTIA

SHEET DESCRIPTION

CONSTRUCTION NOTES AND DETAILS 2

Drawn	Engineer	Project No.	Drawing No.
T.MILLS	A. SKETCHLEY	21-435	C-D14
Scale	Filename		14 of 14
N.T.S	21-435_D01_INT-DETAILS.dwg		



CONSULTANT	CLIENT	PROJECT DESCRIPTION	SHEET DESCRIPTION		
DESIGNPOINT engineering • surveying • solutions 902.832.5597 designpoint.ca	West Hants something inspiring awaits	PAYZANT DRIVE ROUNDABOUT WINDSOR, NOVA SCOTIA	INFILL SURCHARGING SKETCH	Engineer A.Leahy	Drawn A.Leahy
				Scale 1:750	Date Mar. 28, 2024
				Project No. 21-435	Drawing No. TSK-02
				Filename 21-435_3-PP01_PAYZANT.dwg	REV 00

P:\2021\21-435 West Hants - Payzant Drive Roundabout\01 - Drawings\Eng Design\2023 Updates\Sheets\21-435_3-PP01_PAYZANT.dwg, Plot Date: 2024-Mar-28, Plot Size: ANSI full bleed B (11.00 x 17.00 Inches), Plotted By: Adam Leahy

Addendum #2

To All Bidders of WHRMPW24-03:

Please note: the following addendum applies to WHRMPW24-03 and shall be taken into consideration when preparing bid documents.

Replace Section 01 22 00 – Measurement and Payment, Item 57. Temporary Asphalt Reinstatement:

57. Temporary Asphalt Reinstatement:

Unit of Measurement: square metre (m2)

Method of Measurement: slope measure.

This item includes: common excavation, removal and disposal of surplus material, supply and placement of gravel, asphalt pavement, asphalt sidewalk and line painting as directed by the Engineer. Reinstatement extents to be confirm with engineer prior to placement. No payment will be made under this item unless authorized by the Engineer.

Replace Section 00 41 43 – Tender Form, Section 1.4 Schedule Of Quantities And Unit Prices:

Addendum #2

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
EARTHWORK					
2.	Grubbing	m^2	800		
6.	Borrow	m^3	550		
8.	Exploratory Digs	ea	5		
9.	Infill Surcharging	L.S.	1		
10.	Karst Topography Cavern Infill (Provisional)				
	.1 Less than or equal to 5 cubic metres	ea	3		
	.2 Greater than 5 cubic metres	m^3	20		
			SUBTOTAL EARTHWORK: $		
WATER MAIN					
11.	Pipe				
	.1 250mm PVC BIONAX	m	192		
	.2 200mm PVC BIONAX	m	135		
12.	Fire Hydrants				
	.1 Installation	ea	2		
	.2 Relocation	ea	1		
14.	Direct Buried Valves				
	.1 250mm Gate Valve	ea	3		
	.1 200mm Gate Valve	ea	2		
16.	Connections to Existing Main				
	.1 250mm, Payzant Drive 0+826	ea	1		
	.2 250mm, Payzant Drive 1+018	ea	1		
	.3 200mm, Wentworth Road 0+874	ea	1		
18.	Temporary Water	L.S.	1		
19.	Cap and Abandonment of Existing Main				
	.1 250mm, Payzant Drive 0+834	ea	1		
	.2 250mm, Payzant Drive 0+890	ea	1		
			SUBTOTAL WATER MAIN: $		

Addendum #2

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
	STORM SEWER				
31.	Pipe				
.1	300mm PVC DR18	m	48		
.2	450mm RCP 65D	m	33.5		
32.	Manholes				
.1	1050mm	ea	1		
.2	1200mm	ea	1		
33.	Catch Basins				
.1	1050mm, Single	ea	5		
.2	1050mm, Double	ea	5		
34.	Catch Basin Leads				
.1	200mm PVC DR35	m	15		
.2	250mm PVC DR35	m	38		
.3	250mm PVC DR18	m	40		
.4	300mm PVC DR35	m	102		
.5	300mm PVC DR18	m	30		
36.	Connections to Existing				
.1	Existing Manhole	ea	1		
.1	Wentworth Road Culvert	ea	1		
37.	Culverts				
.1	1200mm RCP 65D	m	6.5		
39.	Precast Headwall				
.1	Up to 600mm Pipe	m	5		
.2	1200mm Pipe	m	1		
			SUBTOTAL STORM SEWER:	$	
	STREET CONSTRUCTION				
41.	Gravels				
.1	Type 1 (150mm thick)	m^2	3750		
.2	Type 2 (500mm thick)	m^2	3750		
.3	Type 1 (Dentist Parking Lot) (150mm thick)	m^2	1110		
.4	Type 2 (Dentist Parking) (300 mm thick)	m^2	1110		
43.	Asphalt Concrete				
.1	Type C-HF (50 mm thick)	m^2	3750		
.2	Type B-HF (100 mm thick)	m^2	3750		

Addendum #2

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
	.3 Type C-HF (Dentist Parking Lot) (40mm thick)	m^2	980		
	.4 Type B-HF (Dentist Parking) (50 mm thick)	m^2	980		
44.	Curb				
	.1 Curb and Gutter - Concrete	m	550		
	.2 Curb only - Concrete	m	430		
45.	Concrete Sidewalk				
	.1 Sidewalk (100mm)	m^2	965		
	.2 Truck Apron (200mm)	m^2	190		
	.3 Traffic Island (100mm)	m^2	355		
46.	Tactile Walking Surface Indicators	ea	28		
48.	Guardrail				
	.1 Rail for Civic 151 wall	m	12		
50.	Adjust Existing Manhole Frames and Covers	ea	4		
52.	Segmental Retaining Wall				
	.1 Center Island	m^2	98		
	.2 Civic 151 Parking Lot	m^2	15		
53.	Street Signs and Bases	ea	38		
54.	Stone Pillar Reinstatement	L.S.	1		
55.	Sign Relocation				
	.1 Credit Union	L.S.	1		
	.2 Hospital	L.S.	1		
56.	Raised Crosswalks	ea	6		
57.	Temporary Asphalt Reinstatement (Provisional)	m^2	1500		

SUBTOTAL STREET CONSTRUCTION: $_____

LANDSCAPING

61.	Topsoil and Sod	m^2	1050		
62.	Topsoil and Seed	m^2	530		

Addendum #2

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price	Item Total
66.	Grass Pavers	m^2	205		
67.	Center Island Landscaping	L.S.	1		

SUBTOTAL LANDSCAPING: $_____

ADDITIONAL ITEMS

73.	Replacement of Unsuitable Material w/ Surge Rock (Provisional)	m^3	1900		
76.	Infrastructure Removal	L.S.	1		
77.	Trench Excavation – Contaminated Material (Provisional)	m^3	50		

SUBTOTAL ADDITIONAL ITEMS: $_____

ENVIRONMENTAL PROTECTION

90.	Environmental Measures	L.S.	1		

SUBTOTAL ENVIRONMENTAL PROTECTION: $_____

SUBTOTAL EARTHWORK $_____

SUBTOTAL WATER MAIN $_____

SUBTOTAL STORM SEWER $_____

SUBTOTAL STREET CONSTRUCTION $_____

SUBTOTAL LANDSCAPING $_____

SUBTOTAL ADDITIONAL ITEMS $_____

SUBTOTAL ENVIRONMENTAL PROTECTION $_____

ESTIMATED CONTRACT PRICE (EXCLUDING HST) $_____ (A)

ADD HARMONIZED SALES TAX (15% of Estimated Contract Price) $_____ (B)

TOTAL PRICE (A + B) $_____

TENDERER'S HST REGISTRATION NO. _____

Addendum #2

The following questions have been asked and the answers are provided for clarification:

Question 1: A pay item, sketch, and associated supplementary spec was provided for infill surcharging. If I understand correctly, it appears that the intent is to grub the noted areas and supply and place twice the required imported borrow material as what is required to establish design subgrade in 2024 then remove half of that material and establish actual design subgrade in 2025.

The supplementary spec also notes that no additional payment for imported borrow will be made under pay item 6 in these areas. We're just wondering if you could clarify this. Pay item 6 for imported borrow was just added with this addendum. We would expect that the intent with this item would be for payment of any imported borrow material required to establish subgrade. Will any borrow required in surcharge areas up to design subgrade be paid under pay item 6 with the extra quantity above this to be part of the lump sum pay item 9? Or is the intent that all borrow material in surcharge areas including what is required to get to design subgrade as well as the additional material above this be included in the lump sum pay item for infill surcharging?

Answer 1: **The assumed intent is correct. Borrow required to fill areas up to subgrade will be paid under pay item 6, the additional material required for surcharging shall be included as part of pay item 9.**

Question 2: A provisional item was added for temporary asphalt as part of addendum 1 with a tender quantity of 3,000m2. It was our understanding from the site meeting that the intent with this item would be that it would be used for temporary reinstatement of trench cuts; however, where the tender quantity is quite high, we just wanted to confirm what the Municipality's intent is with this item. Is this just intended for temporary patching of trench cuts or is the intent to use this item to pave and temporary roadways/driveways?

Answer 2: **The temporary asphalt item is intended for trench cuts within the roadways, driveways, and sidewalks only. The quantity of this pay item has been reduced.**

Addendum #2

Question 3: As per Q&A item number 25 in addendum 1, all gravels associated with concrete works will be included in pay items for those works. Curb details show the same structure (500mm Type 2, 150mm Type 1) as under the asphalt areas which is also in keeping with cross sections on drawing TR09. Truck apron gravel structure is shown in cross section E/07 to be the same as what is under asphalt and curb.
However, there are conflicting details for gravels under concrete surfacing in curbed traffic islands and, if gravels for these areas are to be included with sidewalk items, we'll need clarification on which is correct. Cross sections on drawing TR09 show the same road structure carried under the curbed traffic islands. However, details A/12 and F/12 both indicate only 150mm of Type 1 under concrete sidewalk and traffic island. Both concrete traffic island and concrete sidewalk are paid under pay item 45 for concrete sidewalk. Can you please confirm which is correct?

Answer 3: **The pay item 45.1 has been split into two separate pay items (45.1 and 45.3). Concrete traffic islands shall include; 100 mm concrete, 150 mm Type 1 gravels, and 500 mm Type 2 gravels. Concrete sidewalk shall include; 100 mm concrete, and 150 mm Type 1 gravels.**

Question 4: Q&A item #24 in the addendum noted that the tender quantity for the truck apron was corrected but it looks like the revised tender form is still showing the same original quantity of 275m2.

Answer 4: **See the revised Schedule of Quantities and Unit Prices table.**

*******End of Addendum #2*******



West Hants

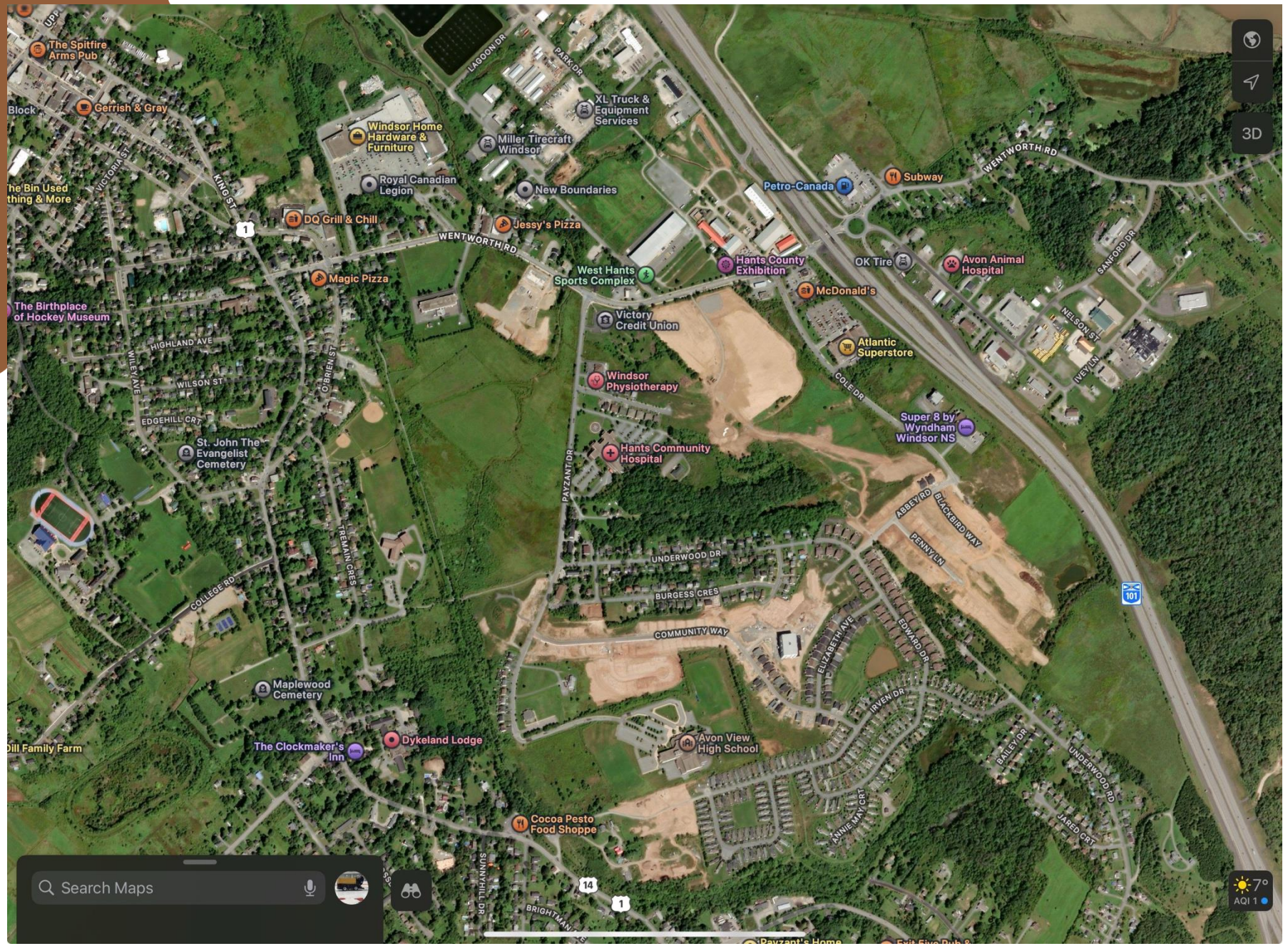
something inspiring awaits

Community Development Roundtable

Wentworth Rd Developments

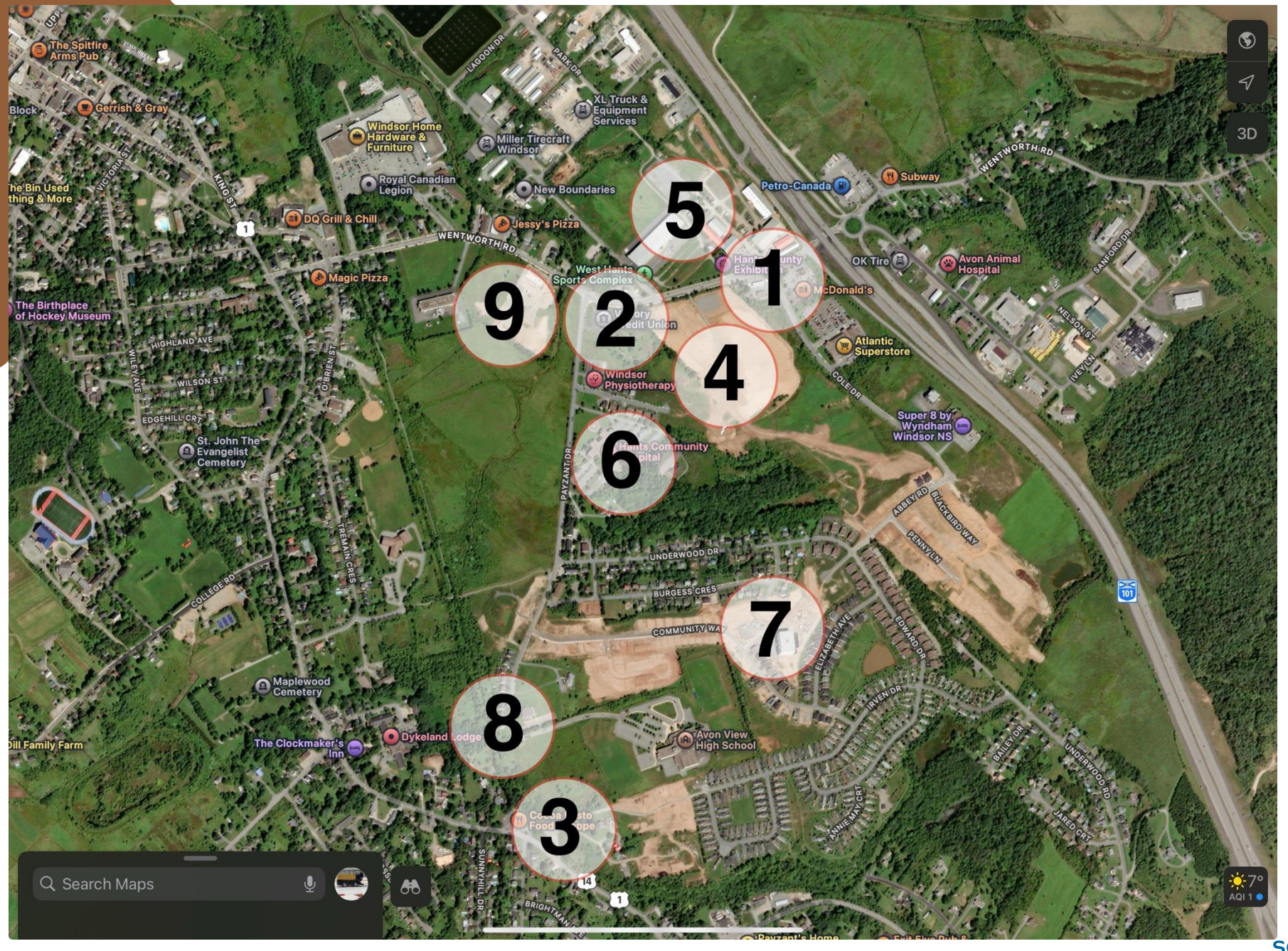
DALHOUSIE UNIVERSITY

something inspiring awaits



Wentworth Road Area

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Topics

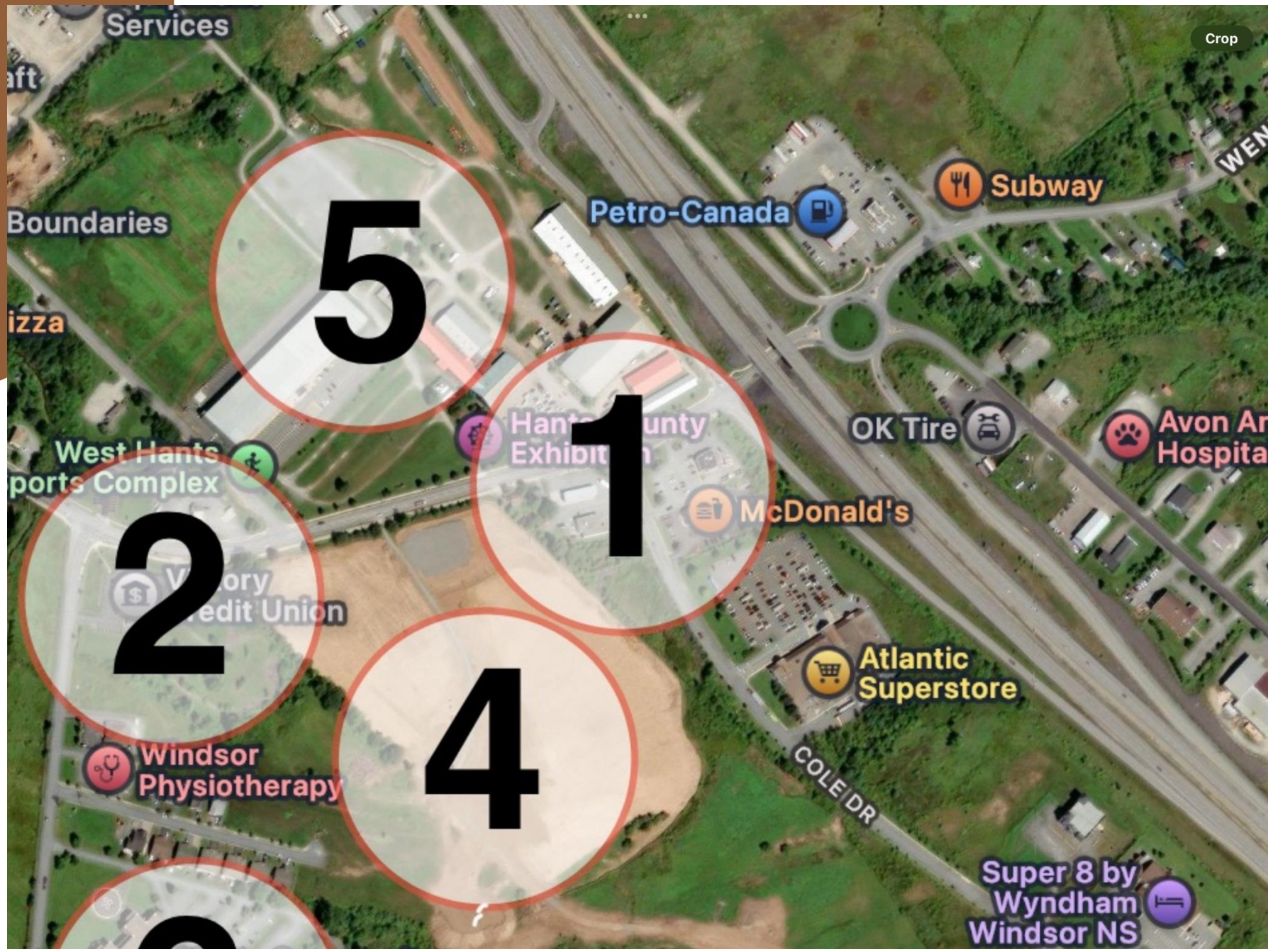
Transportation #1, #2 and #3

Commercial Developments #4

Hants Exhibition Park #5

Hants Community Hospital #6

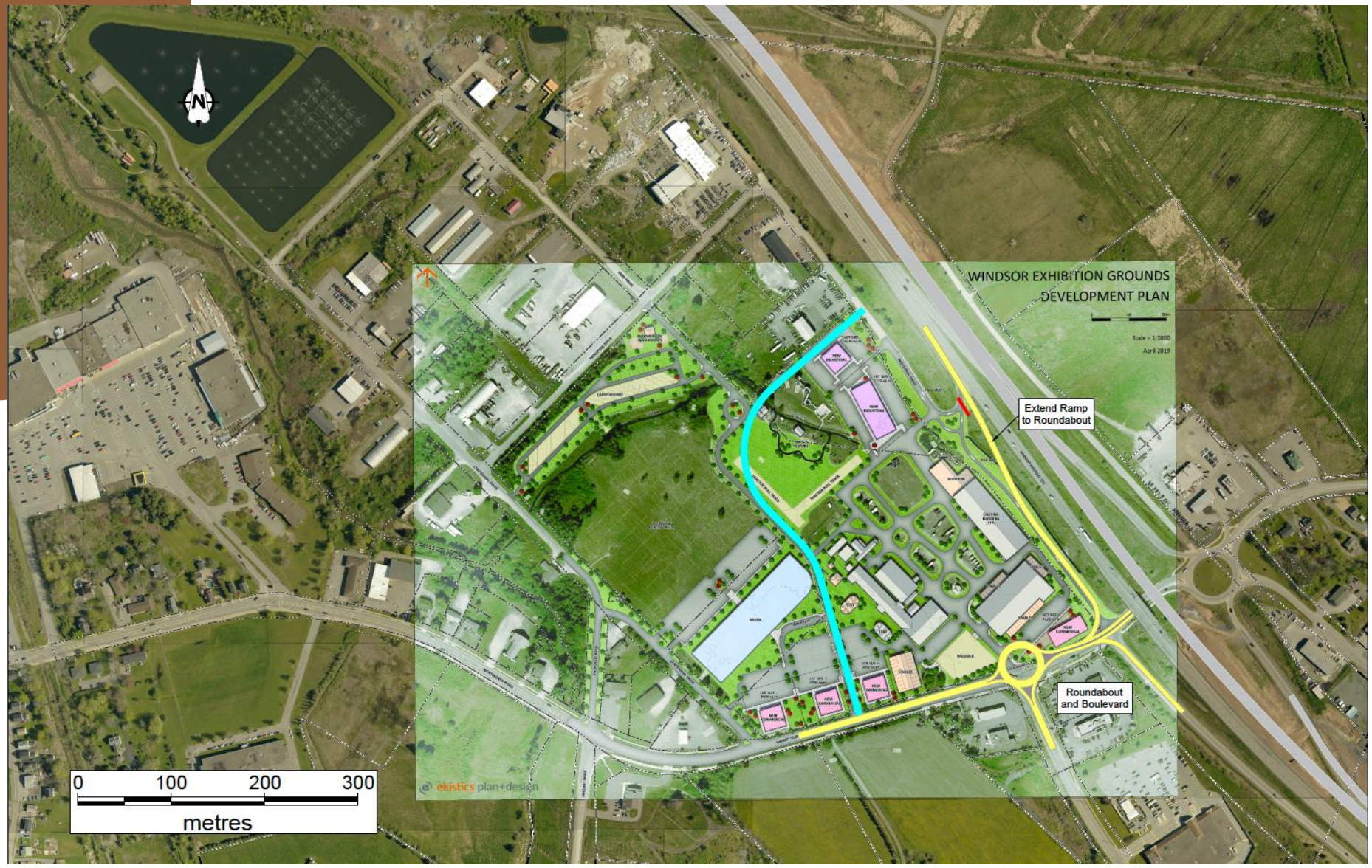
Residential Developments #7, # 8 and #9



Transportation #1

Highway 101
Exit 5A East Bound
Nova Scotia Public Works

something inspiring awaits



Transportation #1

Highway 101
Exit 5A East Bound
Nova Scotia Public Works

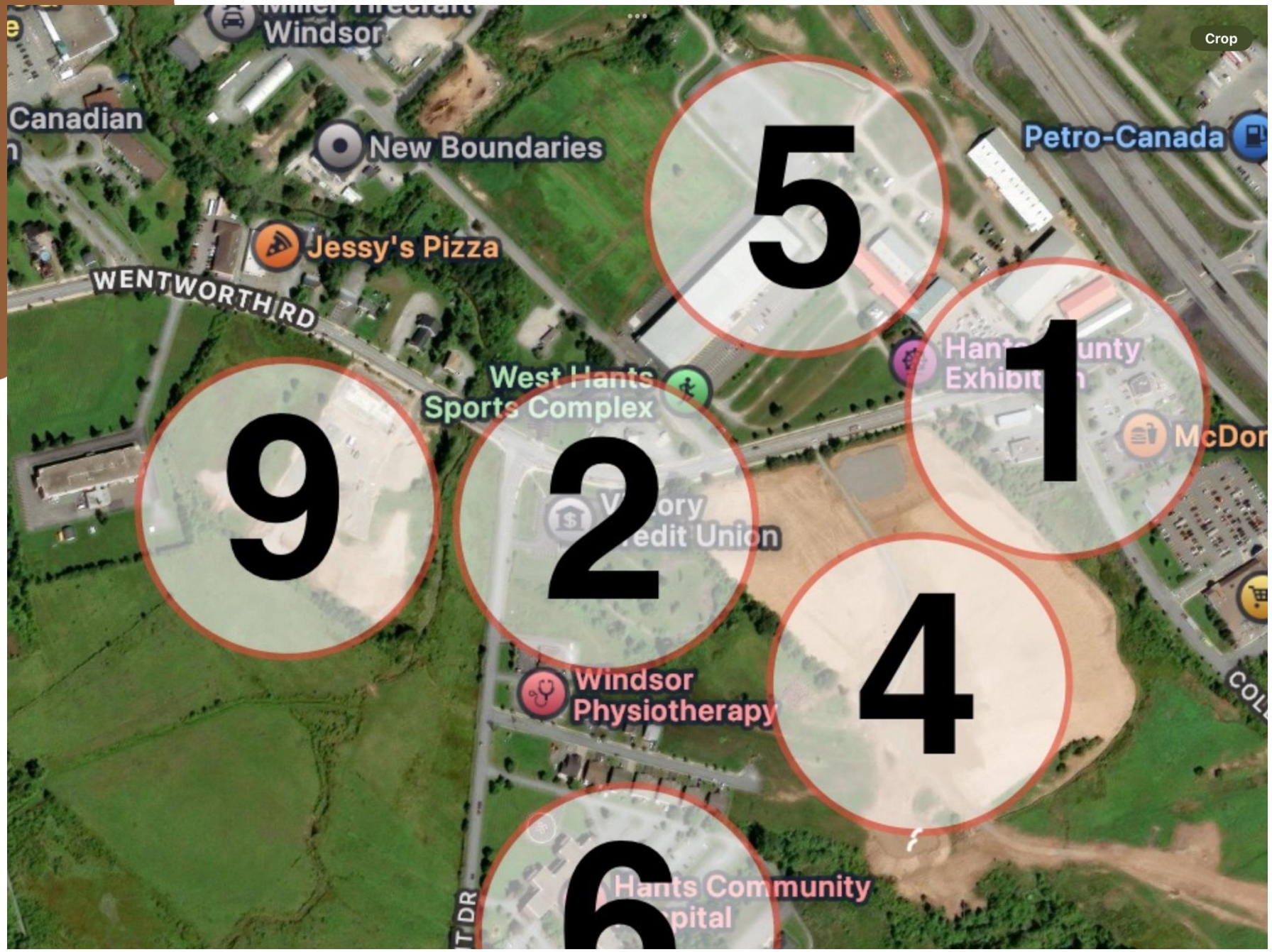
One Way Exit 5 A
And
Cole Drive Roundabout



Transportation #1

Highway 101
Exit 5A East Bound
Nova Scotia Public Works

One Way Exit 5 A
And
Cole Drive Roundabout

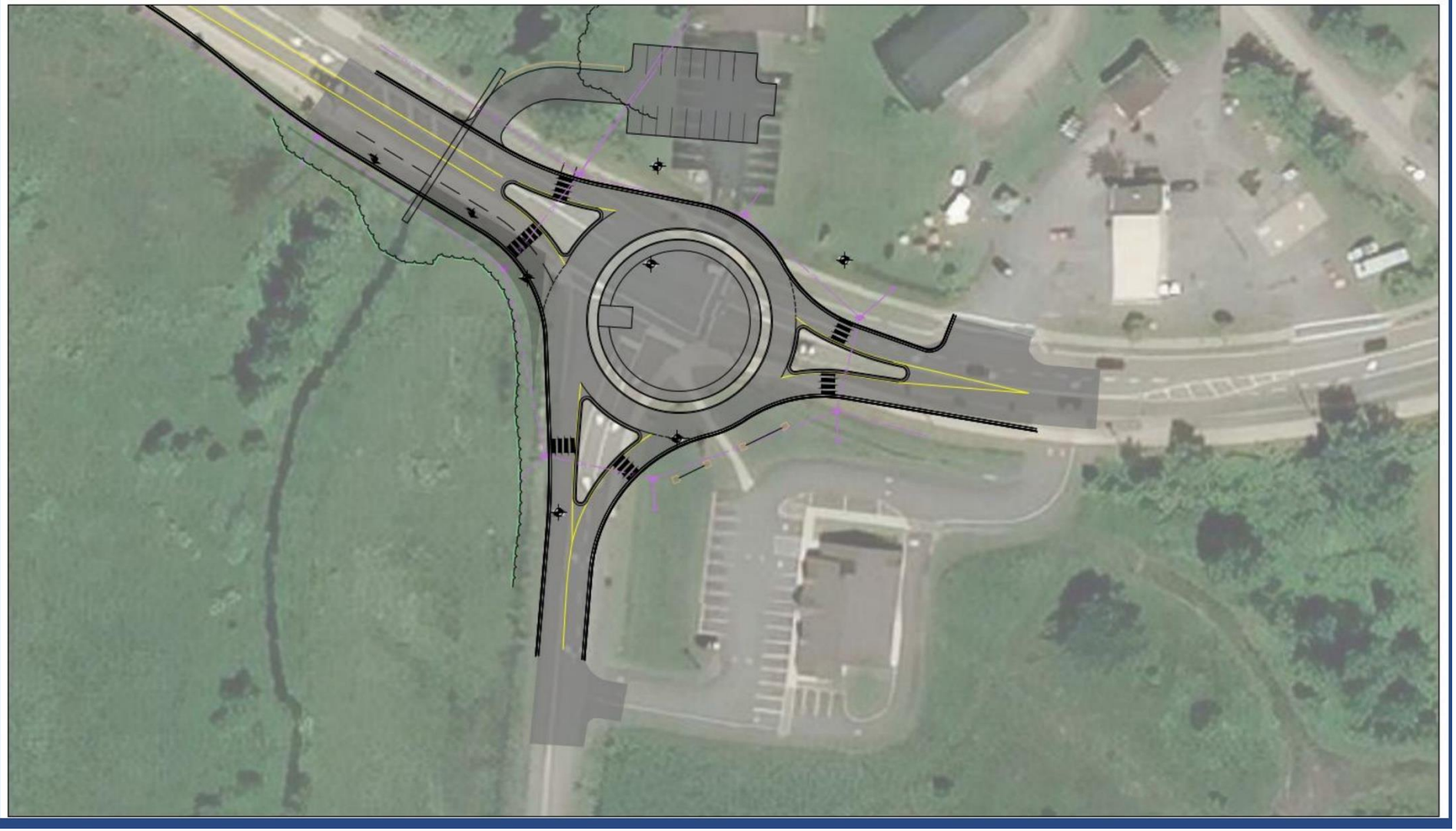


Transportation #2

Payzant and Wentworth Rd

West Hants Regional Municipality

something inspiring awaits



Transportation #2

Payzant and Wentworth Rd Intersection

West Hants Regional Municipality

ROUNDABOUT Option

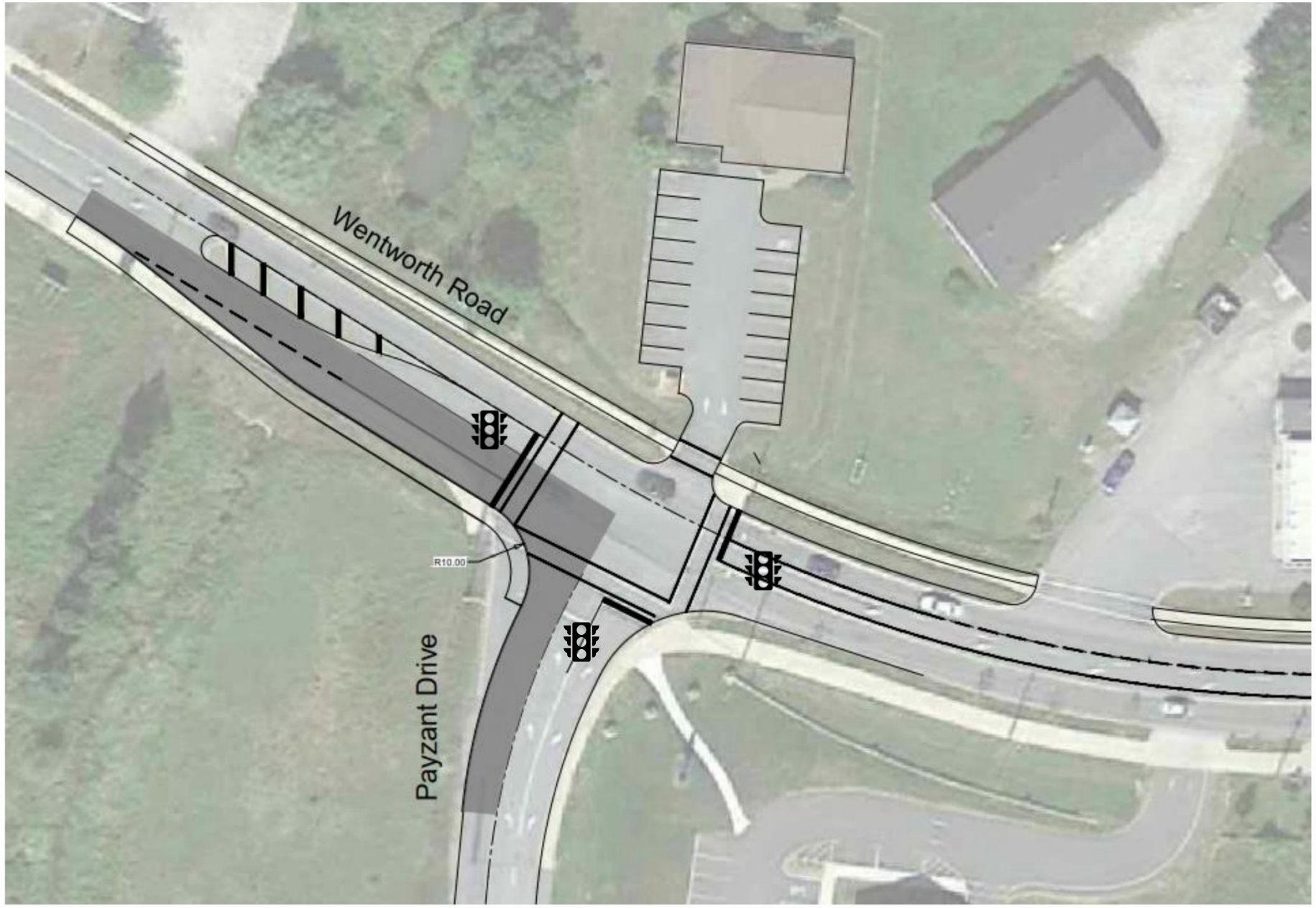


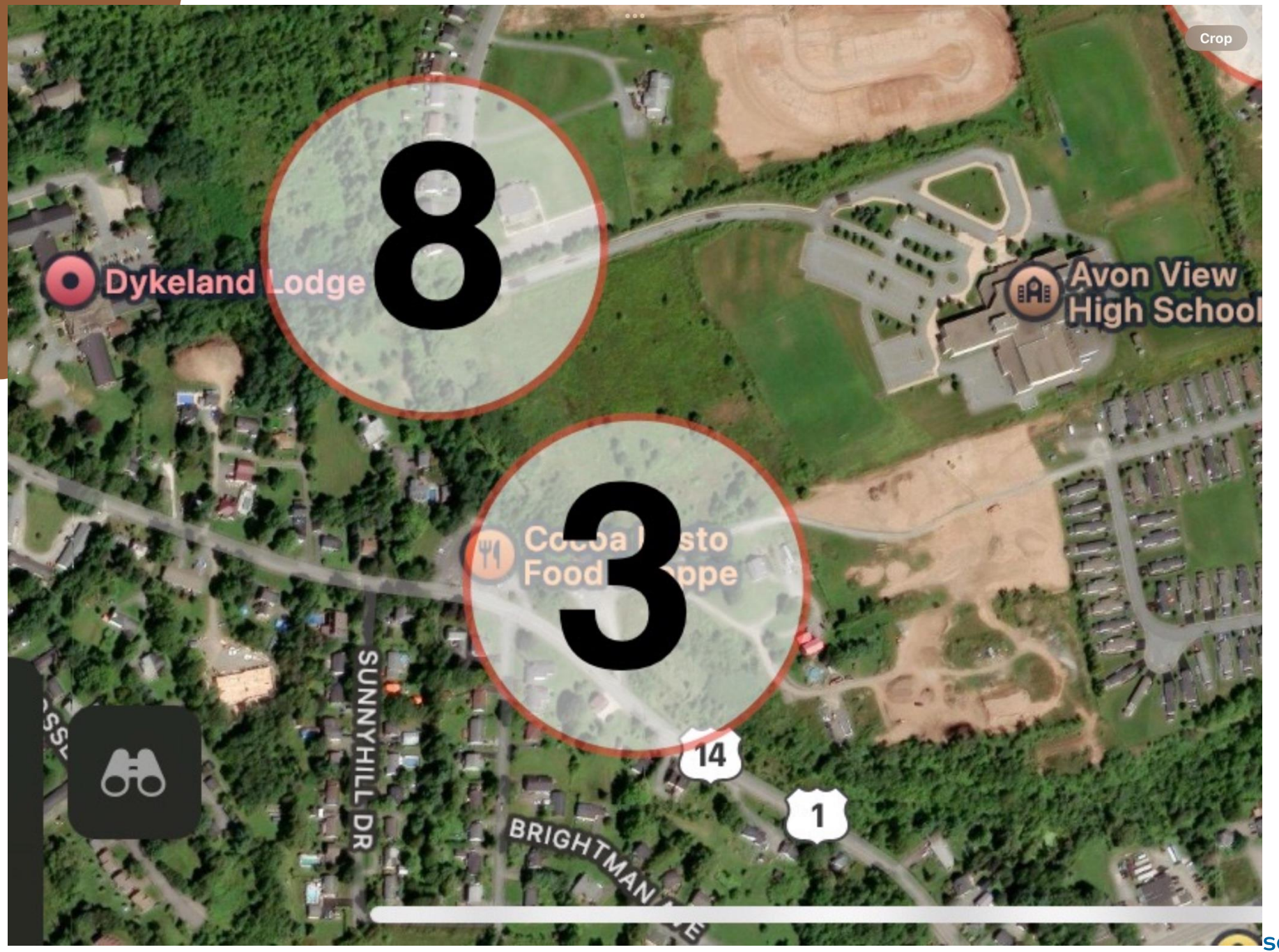
Figure 12 - Traffic Signal Installation

Transportation #2

Payzant and Wentworth Rd Intersection

West Hants Regional Municipality

TRAFFIC Signal Option



Transportation #3

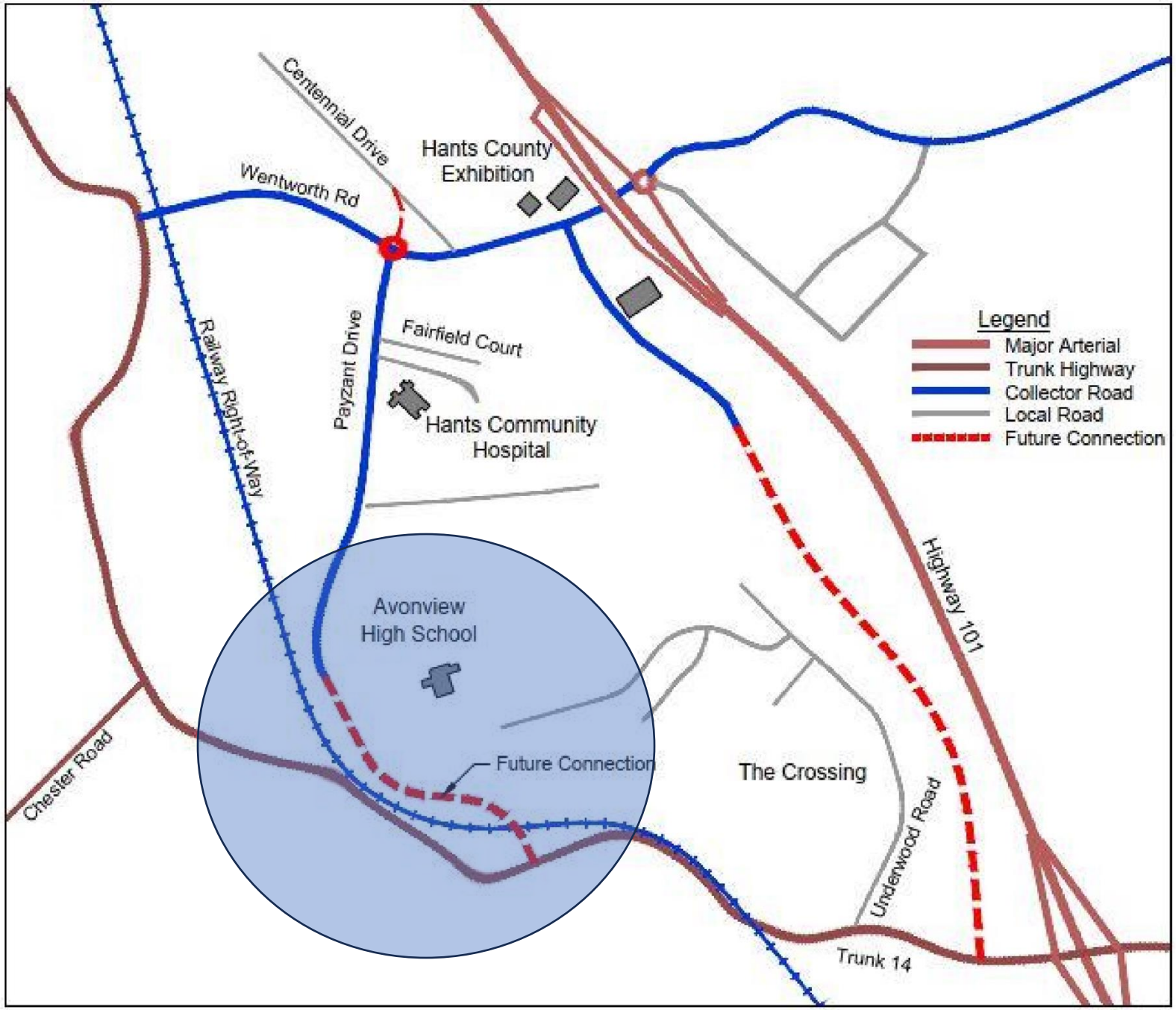
Payzant Drive Extension and Connection to King

West Hants Regional Municipality

And

Parson Green Developments Inc

something inspiring awaits



Transportation #3

Payzant Drive Extension and Connection to King

West Hants Regional Municipality

And

Parson Green Developments Inc

something inspiring awaits



Transportation #3

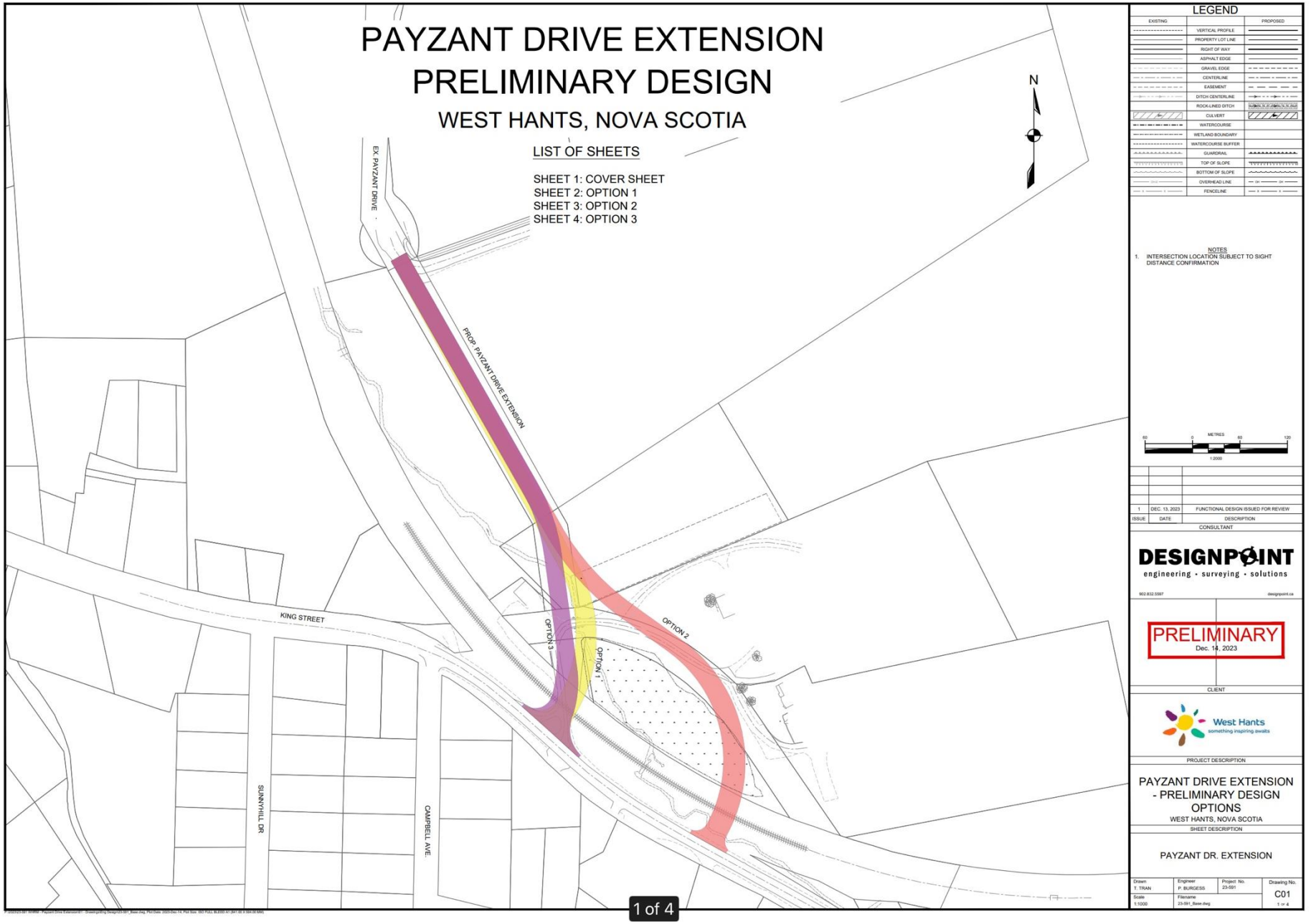
Payzant Drive Extension and Connection to King

West Hants Regional Municipality

And

Parson Green Developments Inc

something inspiring awaits



Transportation #3

Payzant Drive Extension and Connection to King

West Hants Regional Municipality

And

Parson Green Developments Inc

something inspiring awaits



Commercial Development #4

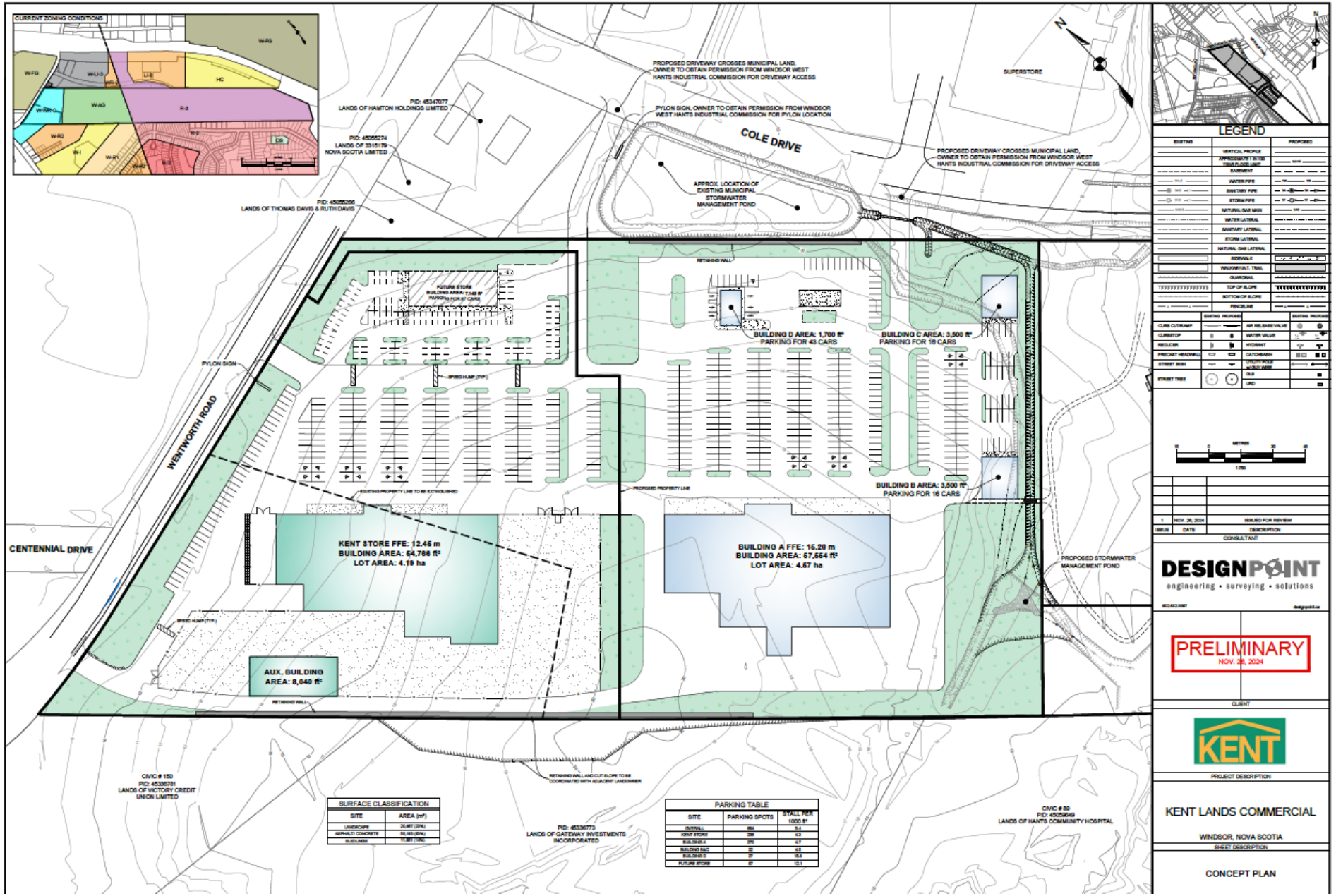
JD Irving Limited

Kent Building Supplies

and

Second Large Commercial Space

something inspiring awaits



Commercial Development #4

JD Irving Limited

Kent Building Supplies

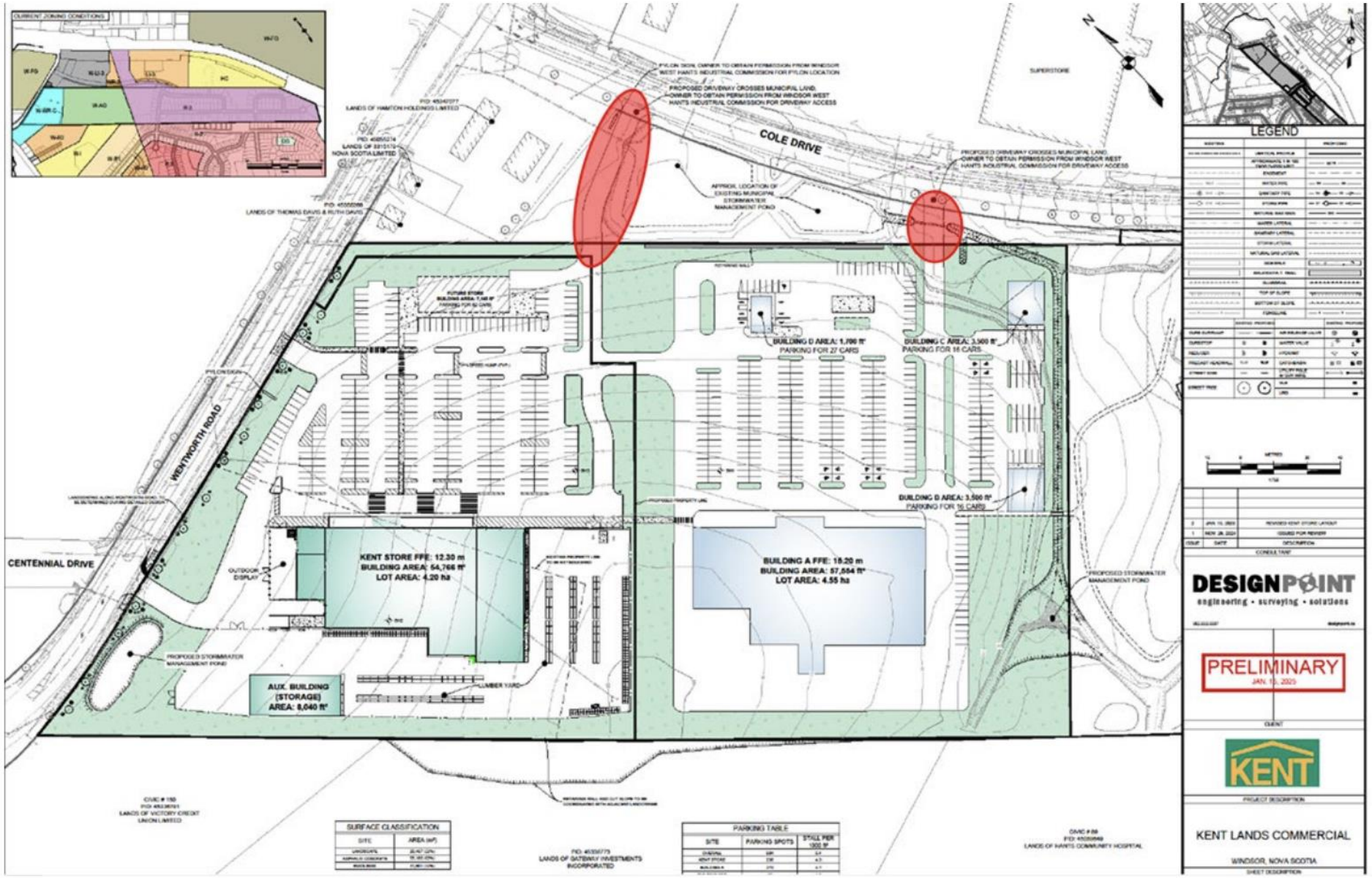
Second Large Commercial Space

$1M at WCTR = $38,500

Superstore, Windsor
Value: $4.6 million

Taxation Value: $177K

something inspiring awaits



Commercial Development #4

JD Irving Limited

Kent Building Supplies

and

Second Large Commercial Space

something inspiring awaits

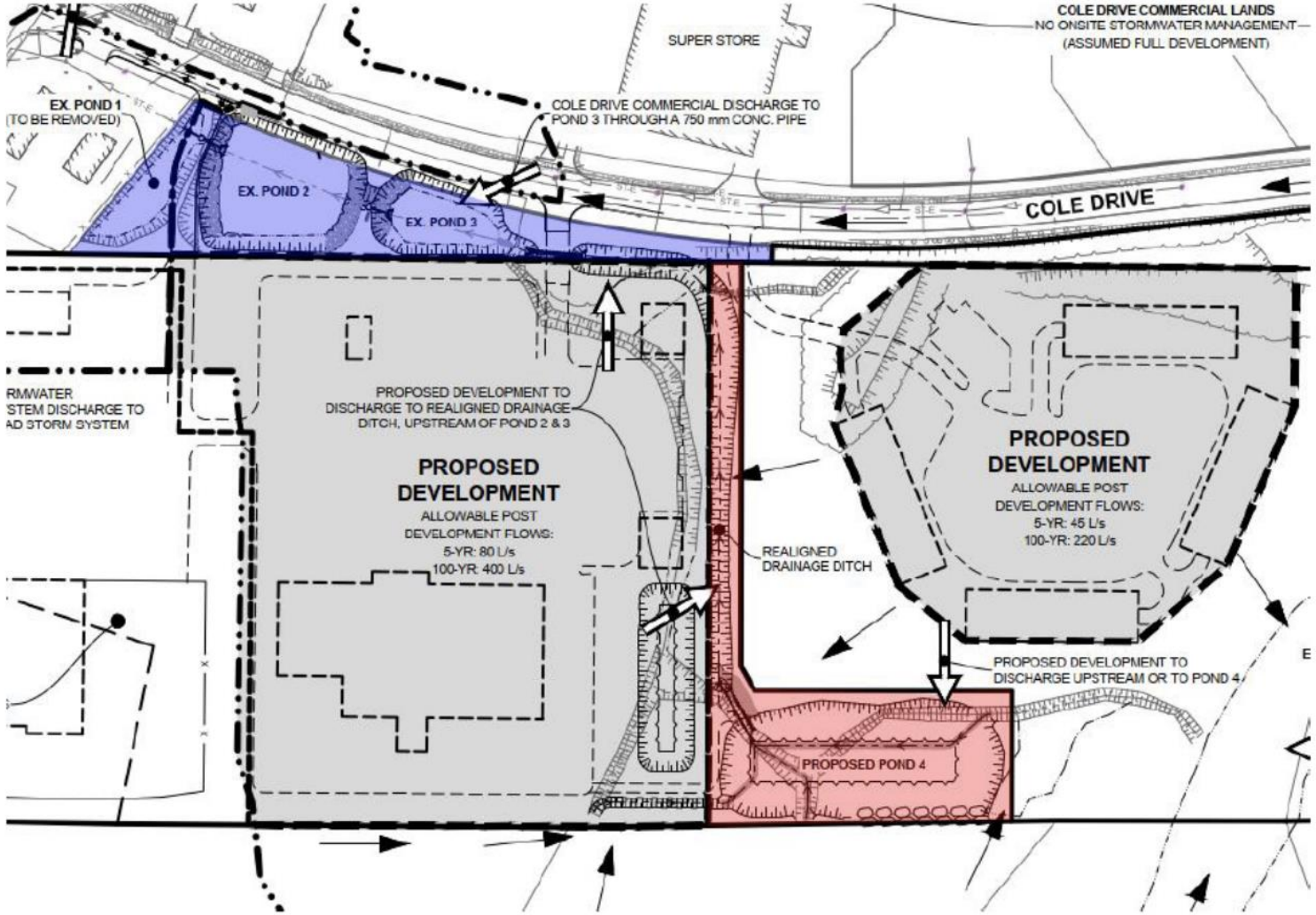


Figure 3: Approximate Location of Proposed Public Stormwater Parcel (RED) to be Conveyed to the Municipality, existing Public Stormwater Parcel in BLUE

Commercial Development #4

JD Irving Limited

Kent Building Supplies

and

Second Large Commercial Space

something inspiring awaits



Hants County Exhibition Park #5

Windsor Agricultural Society

something inspiring awaits



Business and Concept Plan for the Hants County Exhibition Site

July 2019

GROUP ATN CONSULTING INC

Group ATN Consulting Inc.

4th Floor, Collins Bank Building1883
Upper Water St. Halifax, NS B3J 1S9
www.groupatn.ca

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Hants County Exhibition Park #5

Windsor Agricultural Society

something inspiring awaits

1 Purpose



Study Purpose

The Windsor Agricultural Society (WAS) commissioned the development of a sustainable site plan for the Hants County Exhibition Park property, building on the historic agricultural strength of the site and the region.

The Society is seeking to explore the opportunity for a mixed-use plan and partnerships to sustain core activity, provide an agricultural and recreational site for the community and attract visitors as a catalyst for economic growth for the Park specifically and the region broadly.

The Study examines how the Park's strategic location at the "Gateway to the Annapolis Valley" can be further leveraged to celebrate local food, food preparation, animal husbandry and animal shows and contests, demonstration and celebration of local wine and spirits.

This study helps inform the Windsor Agricultural Society's next steps in advancing this important initiative.

Hants County Exhibition Park #5

Windsor Agricultural Society



Hants County Exhibition Park #5

Windsor Agricultural Society

something inspiring awaits



Hants County Exhibition Park #5

Windsor Agricultural Society

900 existing
985 Potential

something inspiring awaits



Hants County Exhibition Park #5

Windsor Agricultural Society

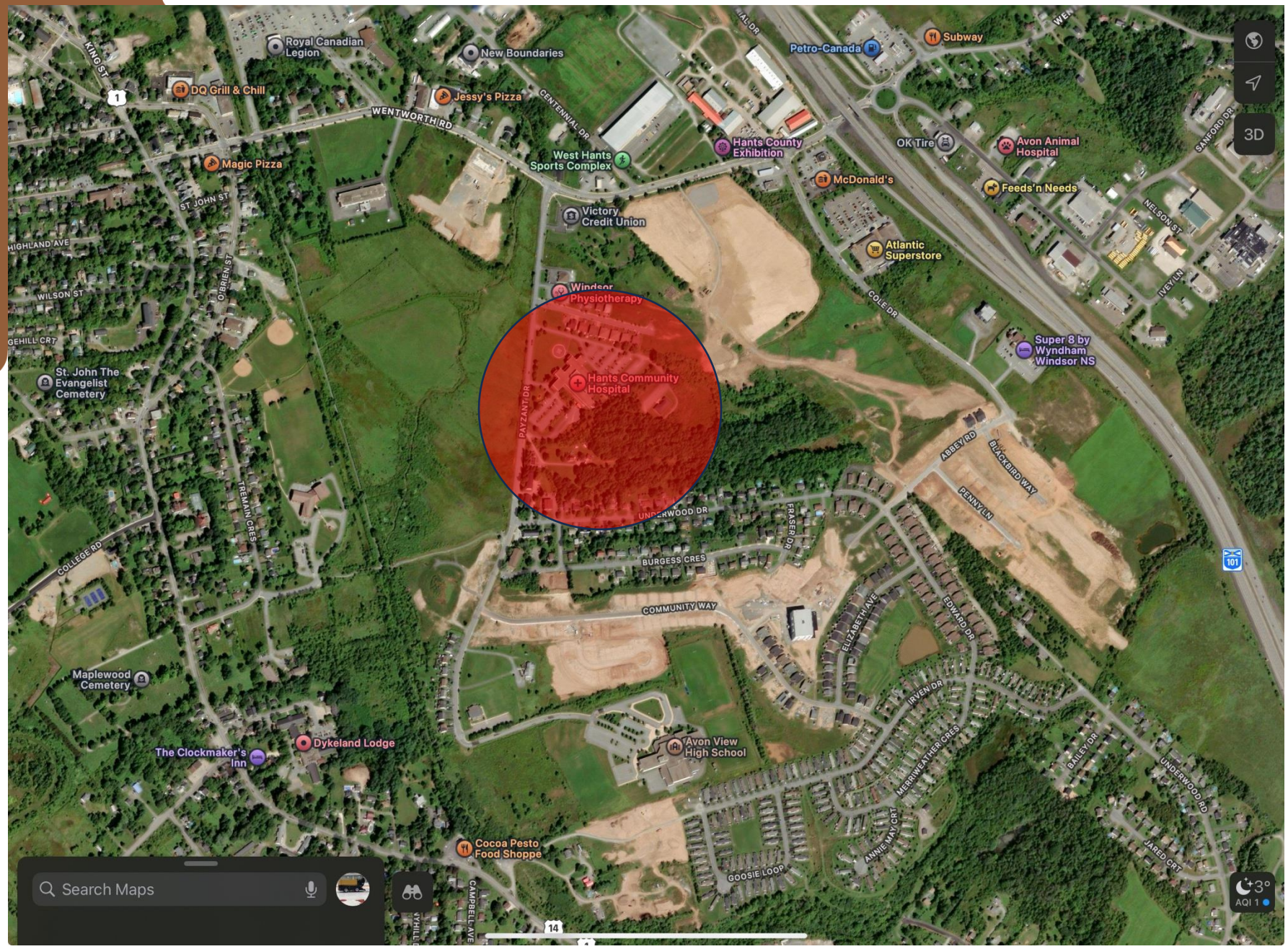
something inspiring awaits



Hants Community Hospital #6

Nova Scotia Health
Central Zone

something inspiring awaits



Hants Community Hospital #6

Nova Scotia Health
Central Zone

something inspiring awaits



Hants Community Hospital #6

Nova Scotia Health
Central Zone

something inspiring awaits



Hants Community Hospital #6

Nova Scotia Health
Central Zone

something inspiring awaits

Development

As-of-Right

171 new units in 2022; 236 new units in 2023 so far.

Multi-Unit Buildings

In addition to the typical development patterns and uses permitted as-of-right, Council has approved or is in the process of considering the following developments by development agreement:

Location	Request
Community Way, Windsor	83 units
O'Brien St., Windsor	112 units
College Rd., Windsor	Long-term care facility plus 126 units
Wentworth Rd., Windsor	240 units
Community Way, Windsor	176 units
4190 Hwy 1, Garlands Crossing	21 units
Burgess Cresc., Windsor	28 units
Payzant Dr., Windsor	90 units
35 William St., Hantsport	40 units
MacLeod Crt., Three Mile Plains	27 units (plus subdivision)
Cole Drive, Windsor	84 units
8 Water St., Windsor	95 units
411 King St., Windsor	18 units (potential for phase 2)
Payzant Dr. extension, Windsor	298 units
Total	**1438 units**

Major Subdivisions (as-of-right development) in-process or upcoming

MacLeod Crt., Three Mile Plains	50 units
Cole Dr. extension, Windsor	232 units
Community Way, Windsor	63 units
The Meadows development, Falmouth	85 completed to date; 30 units to come
Total	**460 units**

Potential Upcoming

Nesbitt St. / Colonial Dr., Windsor	164 units
Bog Rd., Hantsport/Hants Border	233 units
Windsor Back Rd., Three Mile Plains	87 units
411 King St., Windsor (phase 2)	108 units
Total	**592 units**

Residential Development

WHRM

Housing / Unit Readiness

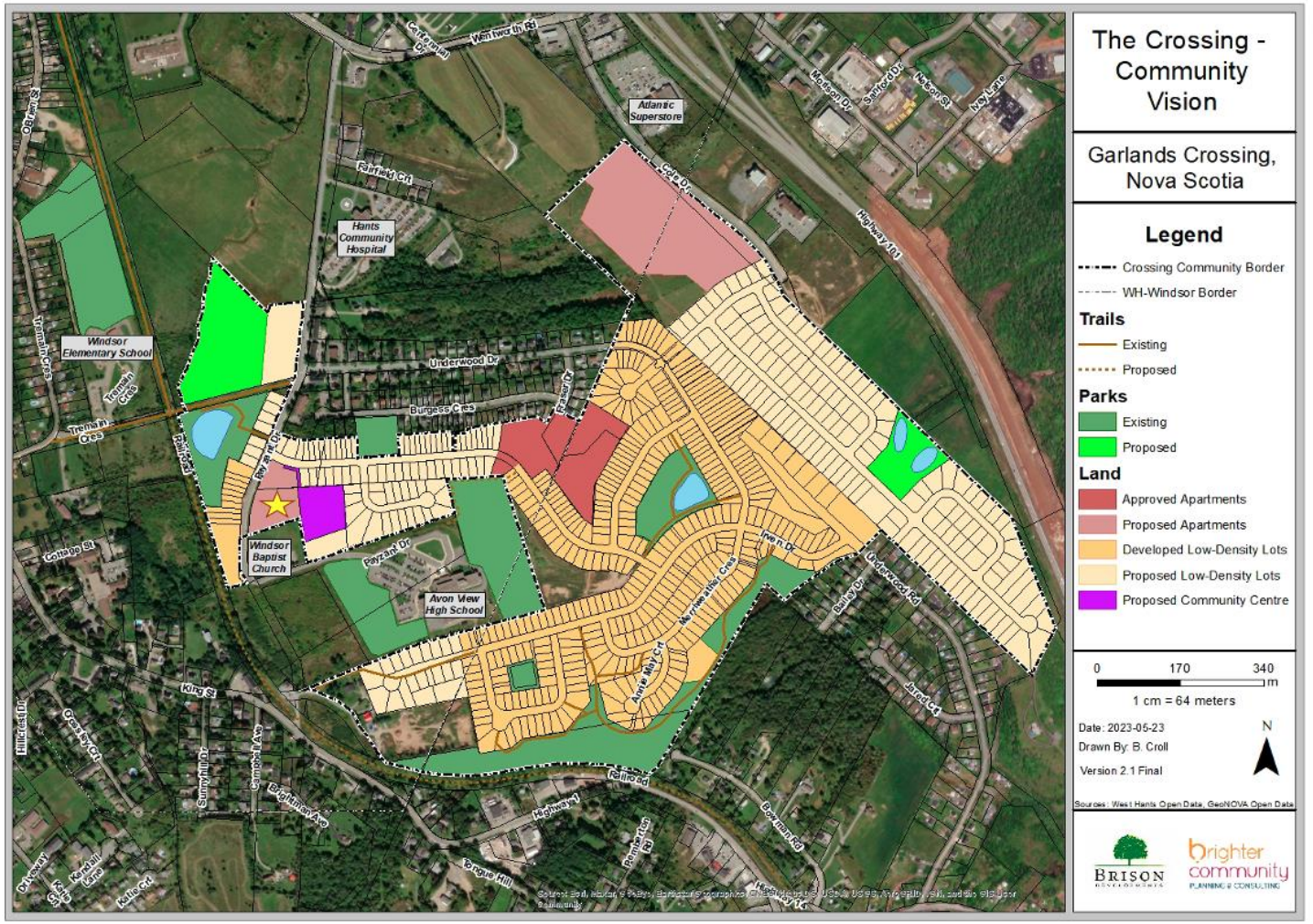


Brison Developments #7

Mitch Brison

something inspiring awaits

The Big Picture



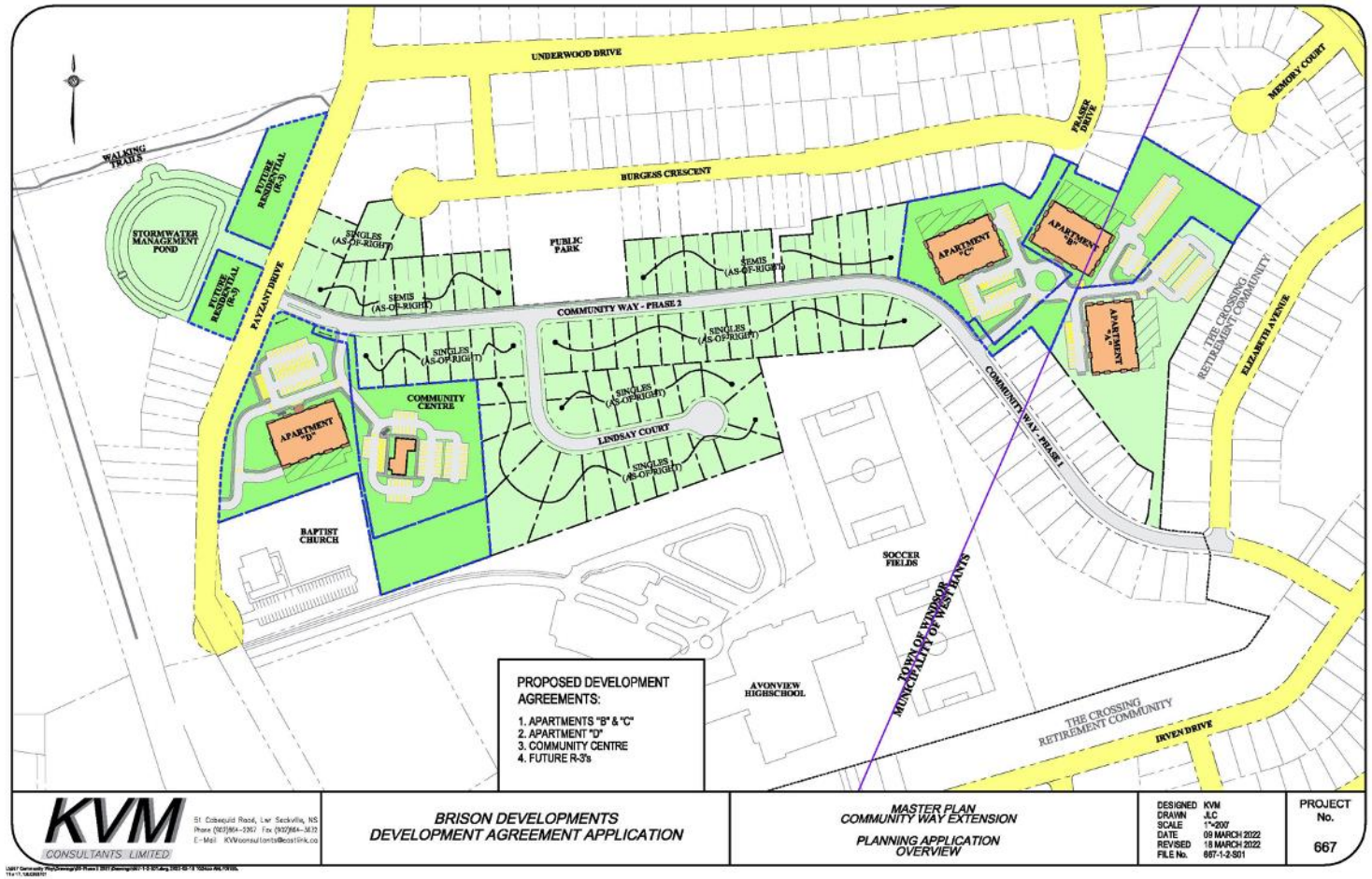
Brison Developments #7

Mitch Brison

something inspiring awaits

Brison Developments #7

Mitch Brison



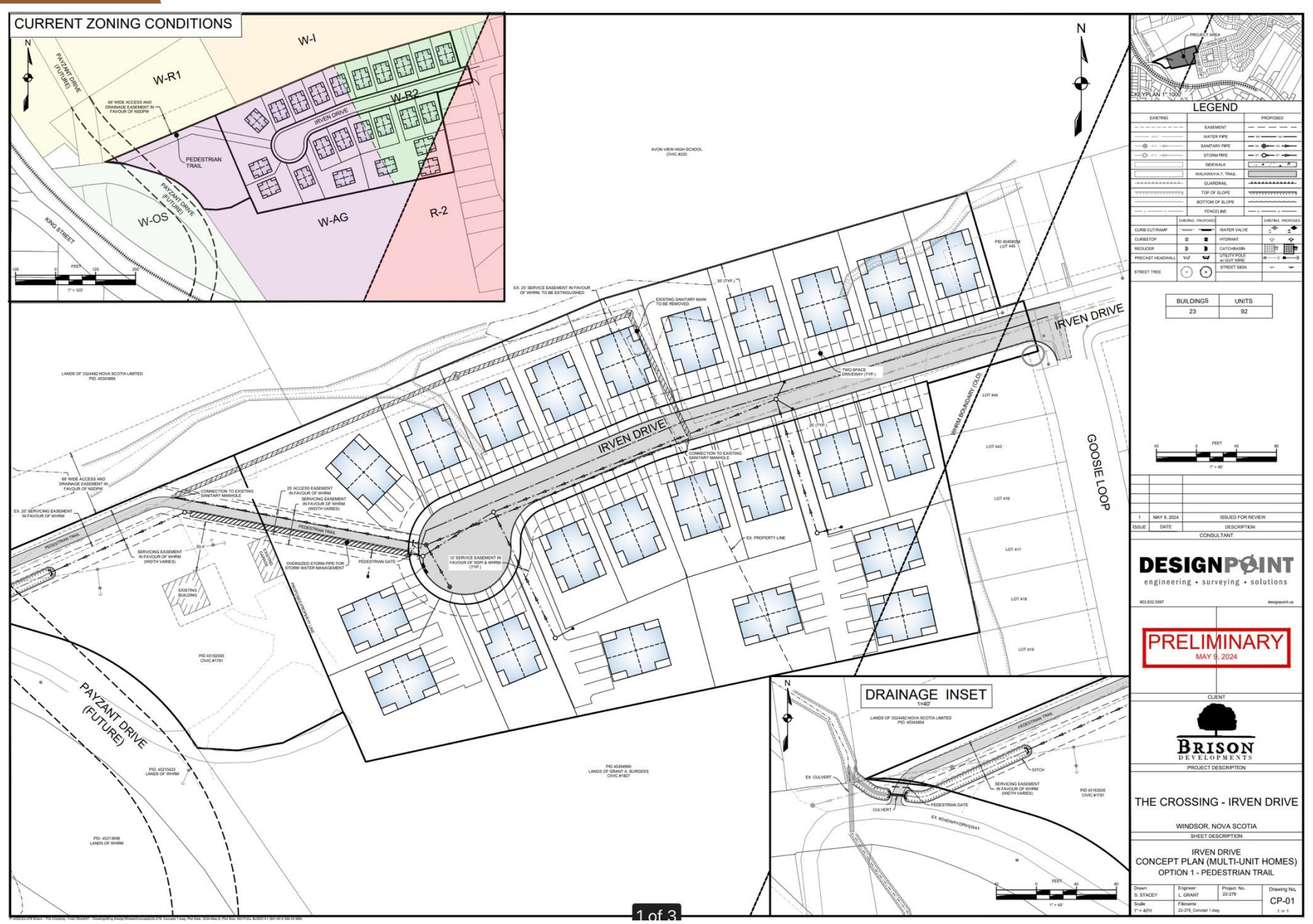
something inspiring awaits



Brison Developments #7

Mitch Brison

something inspiring awaits



Brison Developments #7

Mitch Brison

something inspiring awaits



Brison Developments #7

Mitch Brison

Thank You Mitch !

something inspiring awaits



Parsons Green Developments Inc #8

Noel Taiani

something inspiring awaits



Parsons Green Developments Inc #8

Noel Taiani

something inspiring awaits



Figure 1 - Proposed Development

Parsons Green Developments Inc #8

Noel Taiani

something inspiring awaits



Parsons Green Developments Inc #8

Noel Taiani

something inspiring awaits

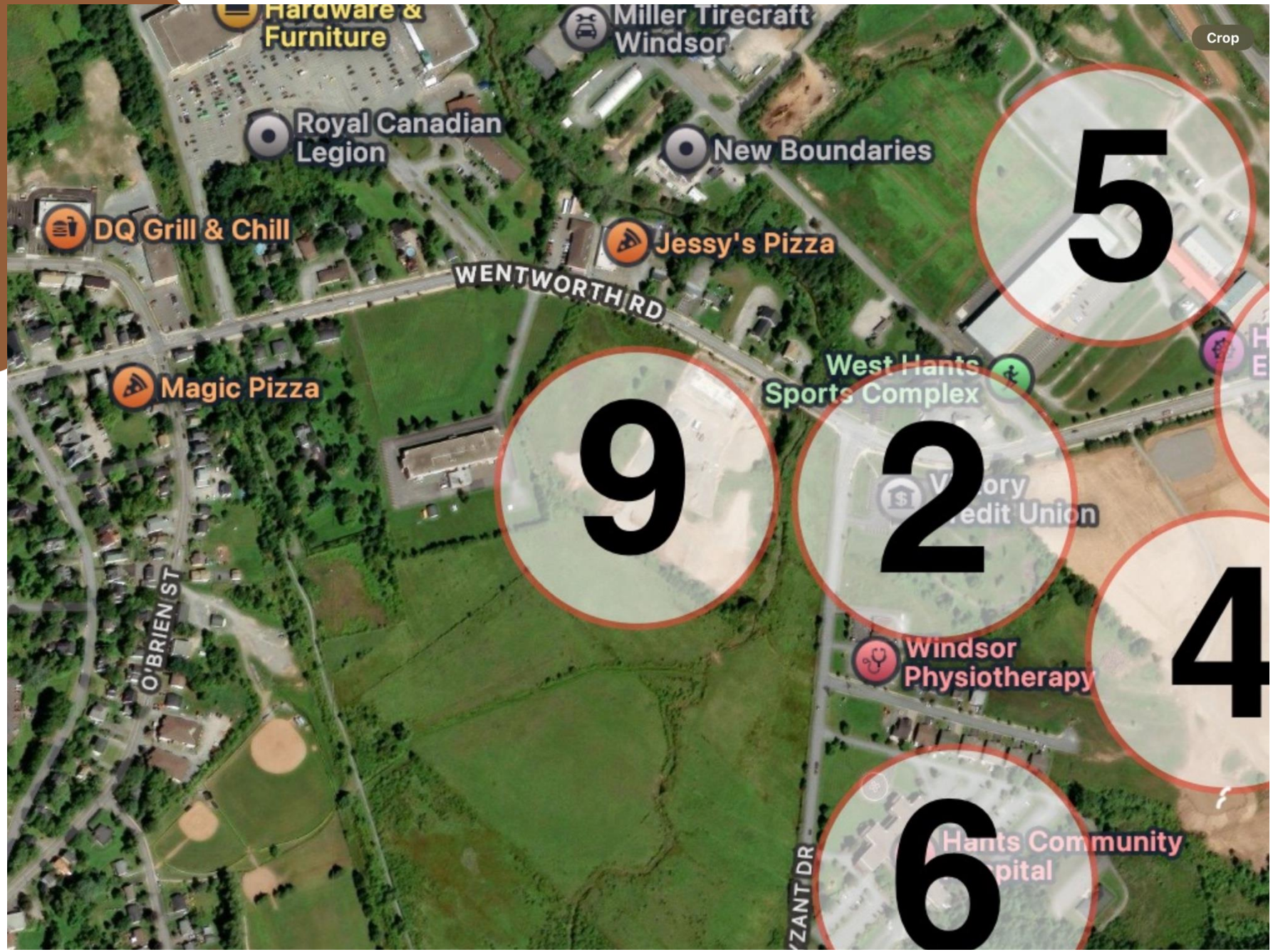


Parsons Green Developments Inc #8

Noel Taiani

Thank You Noel !

something inspiring awaits



FH Developments # 9

Faisal Al-Hammadi

something inspiring awaits

FH Developments # 9

Faisal Al-Hammadi

UNITS:

5000 GSF COMMERIAL
3 3BR TOWNHOUSES
14 2BR STACKED TOWNHOUSES

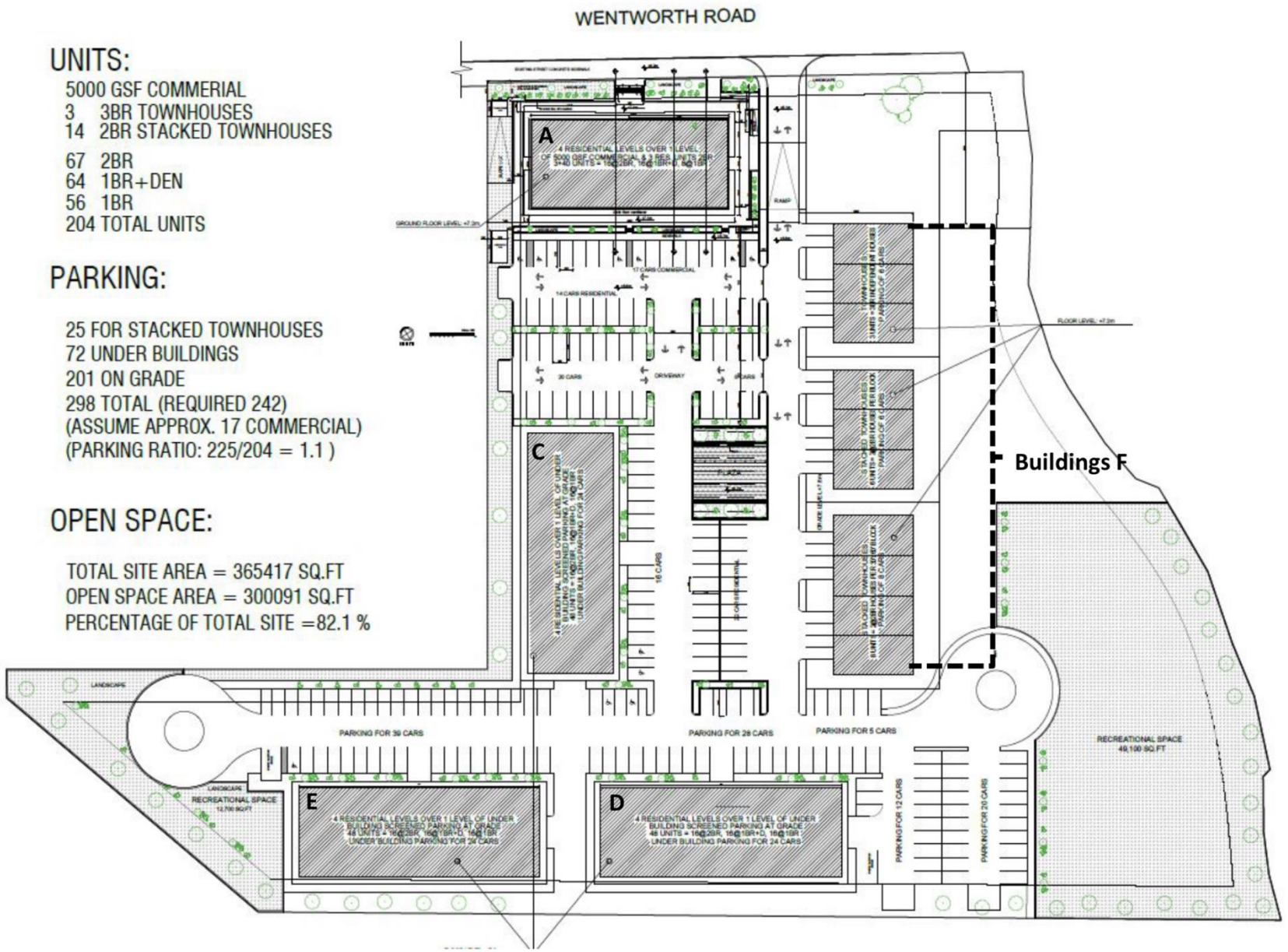
67 2BR
64 1BR+DEN
56 1BR
204 TOTAL UNITS

PARKING:

25 FOR STACKED TOWNHOUSES
72 UNDER BUILDINGS
201 ON GRADE
298 TOTAL (REQUIRED 242)
(ASSUME APPROX. 17 COMMERCIAL)
(PARKING RATIO: 225/204 = 1.1)

OPEN SPACE:

TOTAL SITE AREA = 365417 SQ.FT
OPEN SPACE AREA = 300091 SQ.FT
PERCENTAGE OF TOTAL SITE =82.1 %



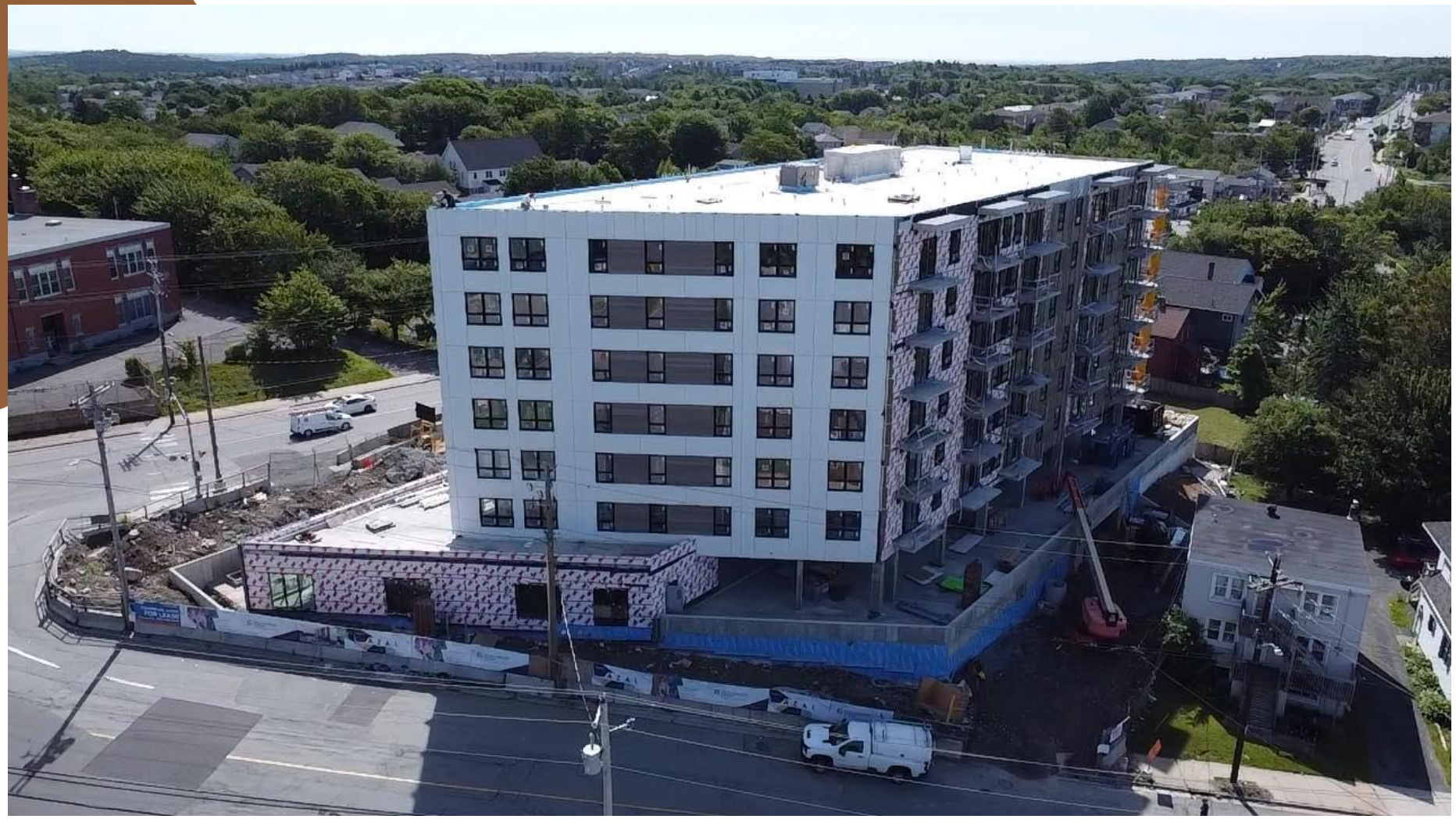
omething inspiring awaits



FH Developments # 9

Faisal Al-Hammadi

something inspiring awaits



FH Developments # 9

Faisal Al-Hammadi

something inspiring awaits

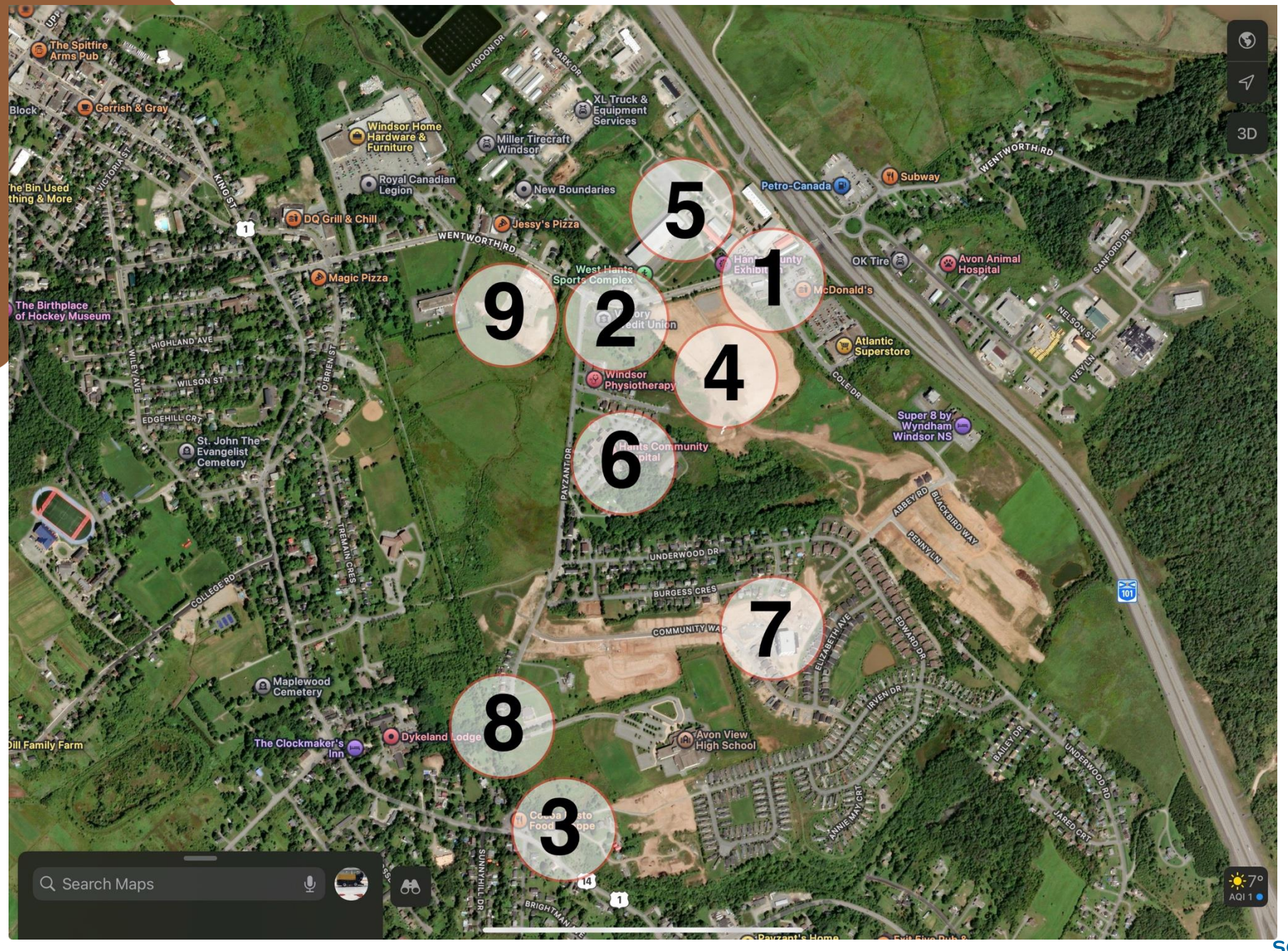


FH Developments # 9

Faisal Al-Hammadi

Thank You Faisal !

something inspiring awaits



Topics

Transportation #1, #2 and #3

Commercial Developments #4

Hants Exhibition Grounds #5

Hants Community Hospital #6

Residential Developments #7, # 8 and #9

something inspiring awaits

West Hants

something inspiring awaits

Thank You !