2025 Standard Tender Documents for Unit Price Contracts

Information Session

February 25th, 2025

Agenda

1. Introductions
2. 2025 Spec Updates Process
3. Summary of Changes
4. Reminders and Updates
5. Work in Progress and On the Radar
6. Q&A, then Coffee Break/Networking (30min)
7. City Key Messages
8. Sidewalks/Multi-Use Pathways on Structures
9. Consolidated Linear Infrastructure CLI-ECA
10. Turtle Fencing and Species at Risk
11. Canadian Spatial Referencing System (CSRS) Update
12. Closing Remarks

Thank you, our partners!

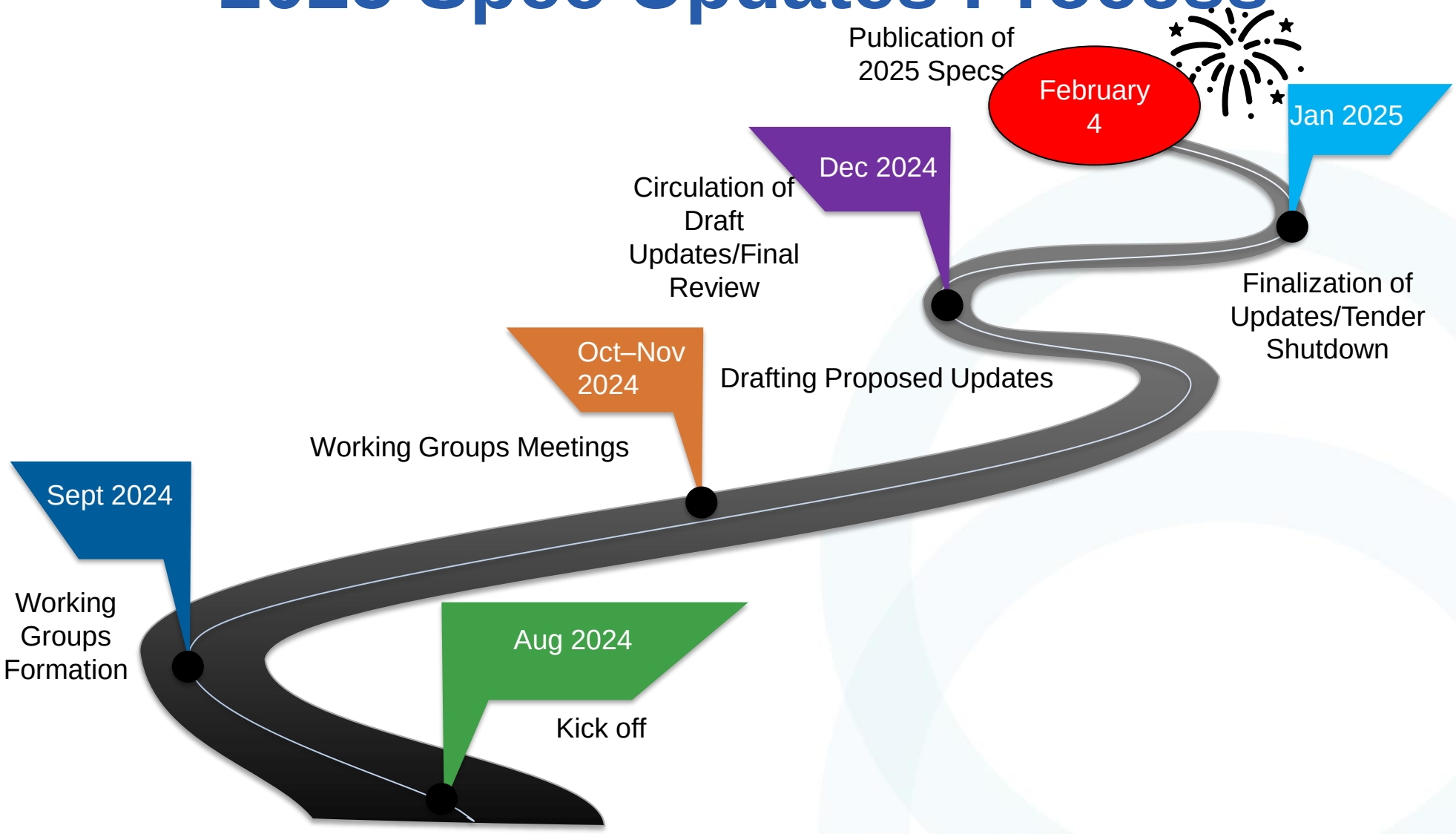
ASSOCIATION OF CONSULTING ENGINEERING COMPANIES ONTARIO

NCHCA
NATIONAL CAPITAL HEAVY CONSTRUCTION ASSOCIATION

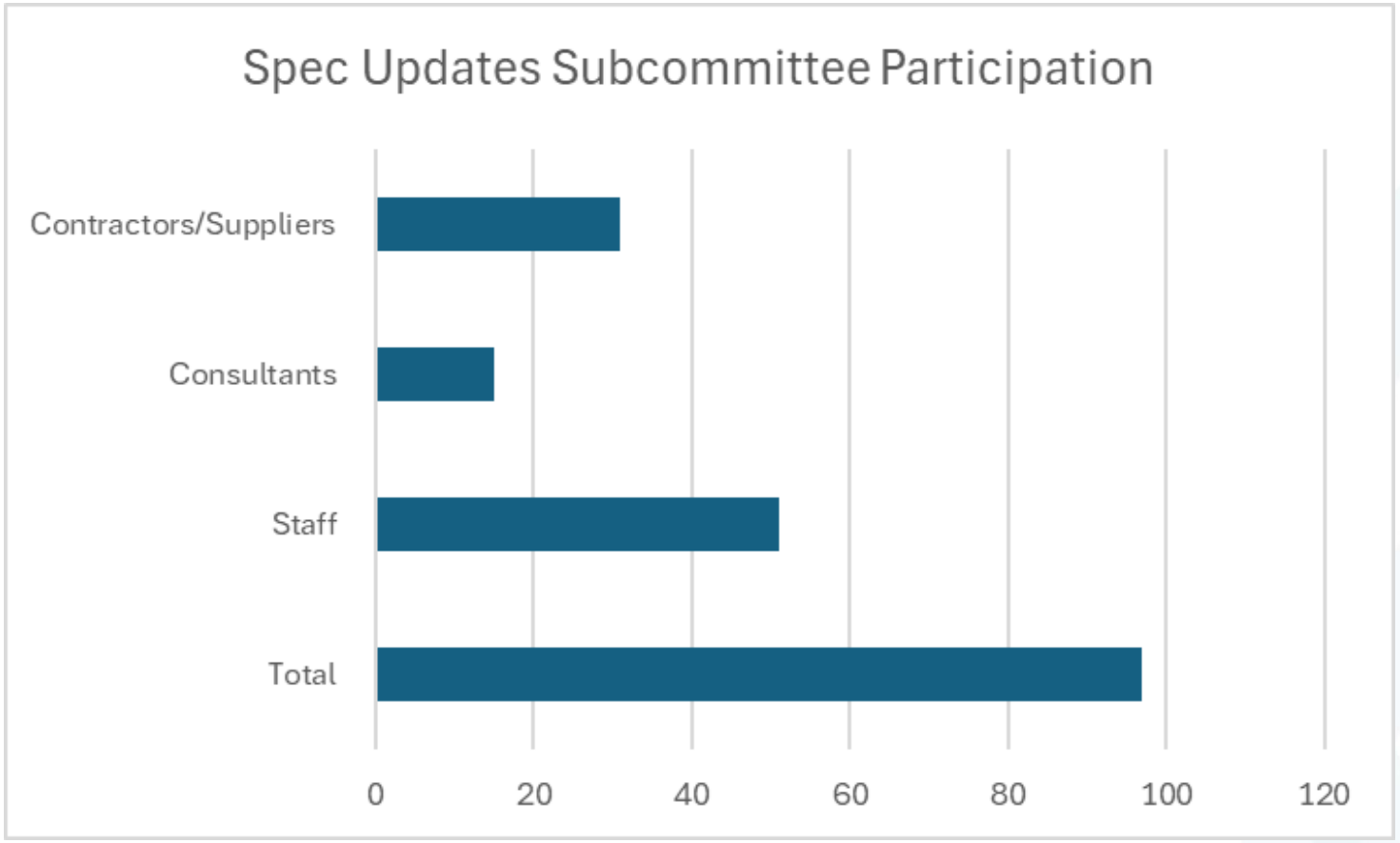
Ottawa

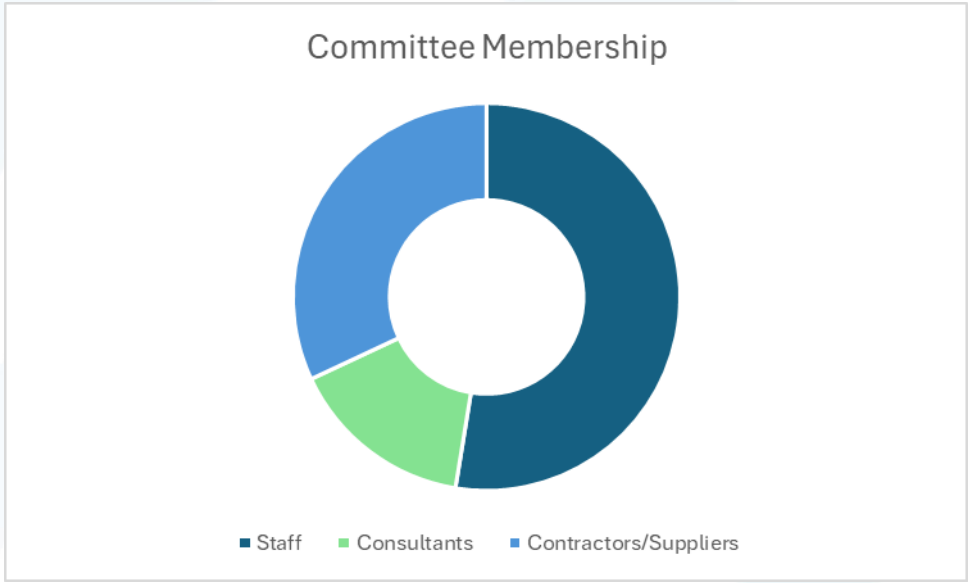

Land Acknowledgement

2025 Spec Updates Process

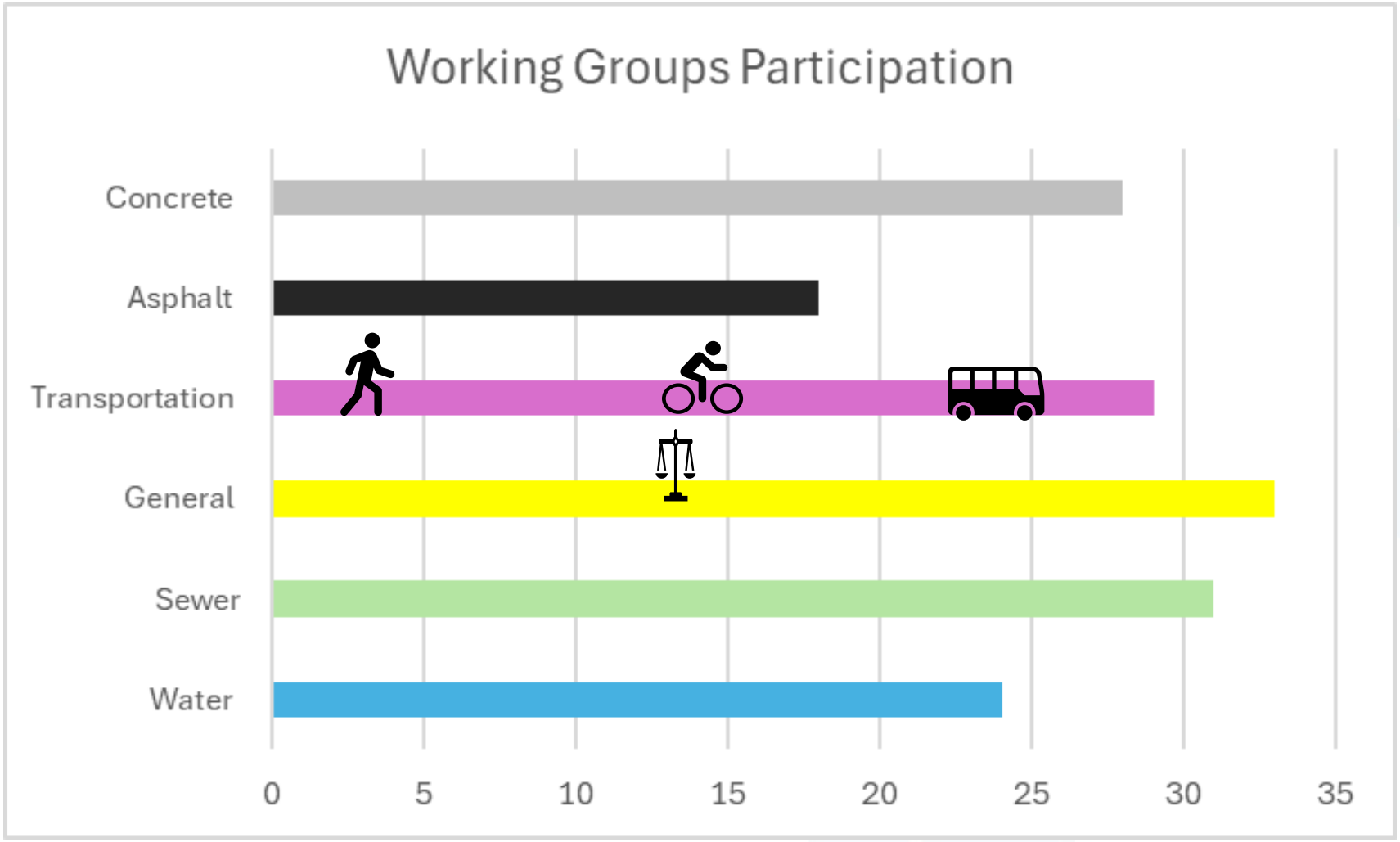


2025 Spec Updates Committee





2025 Spec Updates Committee



Summary of Changes

OPS and Master Item Listing Updates

OPS Updates (Section E)

- Listing included revisions from April, July and November 2024
- Minor changes required
- April 2024: OPSS 512,721; November 2024: OPSS, 401, 402, 578 (NEW), 603,732,1153,1351; OPSS 1312 and 1359 removed.

City of Ottawa Master Item Listing (Introduction)

- Unit price for police assistance at intersections A020.02 changed to $278.86/hr;
- Added new items for PVCO pipe (G031), turtle fencing (Q050.17, Q050.14), large diameter watermain
- draining (G210.08), and erosion and sediment control for sewer work (A040.04, A040.05).
- Reviewed the list of items designated as planned quantities (“P”); clarification on use of P items in Section 02.01 of the Tender Outline.

General Conditions

General Conditions

- Added a new section GC3.10.04 Price Agreement Form
- Updated:
  - GC3.13.05 Mediation -requirement for an independent third-party mediator to be based and work primarily out of Ottawa.
  - GC8.02.05.01 Definitions to properly list items that constitute actual payroll burden; clarified what constitutes administrative overheads and project overheads for mark-ups.
  - GC8.02.05.08 to clarify how mark-ups on work on time and material basis are applied; referenced OTT-GC-02.
  - GC8.02.06 to clarify requirement what costs are to be identified in an estimate for payment other than on a time and material basis; referenced OTT-GC-03.
- OTT-GC-02 revised to clarify mark-up calculations when multiple subcontractors engaged
- OTT-GC-03 minor updates
- NEW OTT-GC-04 (Daily Work Record), OTT-GC-05 (Price Agreement Details)

D-Series Specifications

D-023B Quality Verification Engineering Services (QVE)

- Requirement that the QVE witness on site all items before providing the Certificate of Conformance.

D-027 Standard Construction Forms

- Title and scope changed
- All OTT forms used under section GC8.02 are now listed; Notification Prior to Placement of Final Lift Asphalt provision and associated form moved to F-3130

D-028 Qualifications and Experience-General Contractor

- Updated to add specific requirements that would assist in consistently verifying contractor's qualification requirements when requested.
- Addresses project team staff replacement through project duration

D-024 Supplementals (catch it all!)

- Highlighted updates to Modified General Conditions

D-Series Specifications

D-032AB Wildlife Protocol for Road Construction and Rehabilitation Projects

- Amended requirements for Bank Swallow, Butternut, and the Black Ash

D-032B Protection of Species at Risk and Wildlife Protocol

- Clarified applicable Regulation under the *Endangered Species Act*

D-032B Appendix B Suggested Mitigation Measures

- Updated measure #1(Turtles), #14(Butternut Trees), #15, 16# (Bats), #21 (Birds)
- Added new measures #23 and #24 for Black Ash Trees

D-032B Appendix C Description of Contract Mitigation Measures

- Amended measures #13,#14 and #15; new mitigation measures #23 and #24 for fencing to protect Black Ash Trees.

Transportation Working Group

Typical Mid-Block Narrowing (R9)

- Both tangent and curved narrowing detail
- Added requirement for approval for application of pavers.
- Requirements for maximum 30^{o} angle (constraint), minimum tangent length 2.0m

Concrete Bench Pad Adjacent to Sidewalk or Multi-Use Pathway (SC11.2)

- New detail for pads adjacent to MUPs
- 1500mm clear width between face of bench and edge of pathway
- The length of the pad can be increased (beyond 5800mm) for additional storage space

Typical One-Stage Protected Corner at Signalized Intersection (SC31.1)

- Trailing edge median less than 1m wide can be painted or constructed flush to the asphalt surface

Transportation Working Group

New:

Typical Truck Apron at Protected Corner (SC31.3)

- Based upon guidance in the Protected Intersection Design Guidelines.
- Detail created to improve consistency in application of truck aprons.

Ride-Over Mid-Block Roadway Narrowing (R29.3)

- Limited use; proper drainage to be considered and detailed within the contract documents.

Typical Sidewalk and Cycle Track on Structures (SC34)

Typical Multi-Use Pathway on Structures (SC34.1)

- Accommodation of cyclists on structures; separation barriers requirements based on posted speed
- Details **must be used** in conjunction with the City of Ottawa Policy Memo for designing cycling facilities in bridges.

Asphalt and Concrete Working Groups

F-3130

- Referee testing costs updated. Table#11
- Notification of Final Lift Form OTT-D027-01 title changed to OTT-F-3130-09.

F-3147

- Referee testing costs updated. Table#9

SC1.1 SC1.2 SC1.3 SC1.4 SC1.5 SC2 SC3 , and SC13

- Requirement for dowels removed

SC9.1 SC9.2 , and SC9.3

- Requirement for dowels removed.
- Maximum depressed curb height for private approaches corrected to 13mm.

General Working Group (F-Specs)

F-1013 Construction Site Pedestrian Control Plan (Revised)

- Requirements for temporary pedestrian facilities now also apply to temporary ramps.
- Clear pedestrian facilities need to be maintained during project shutdowns.
- Boundary protection is required along vehicle paths of travel in compliance with the Occupational Health and Safety Act.

F-7723 Chain Link Fence for Turtle Fencing (New)

- New specification for the construction of chain link turtle fencing.

F-8021 Topsoil, Imported (Revised)

- Added reference to the Canadian Soil Information System.

General Working Group (F-Specs)

F-8906 Turtle Escape Ramp (New)

- New specification for the construction of turtle escape ramps.

F-8907 Wildlife Protection Sign (New)

- New specification for the construction of wildlife protection signs.

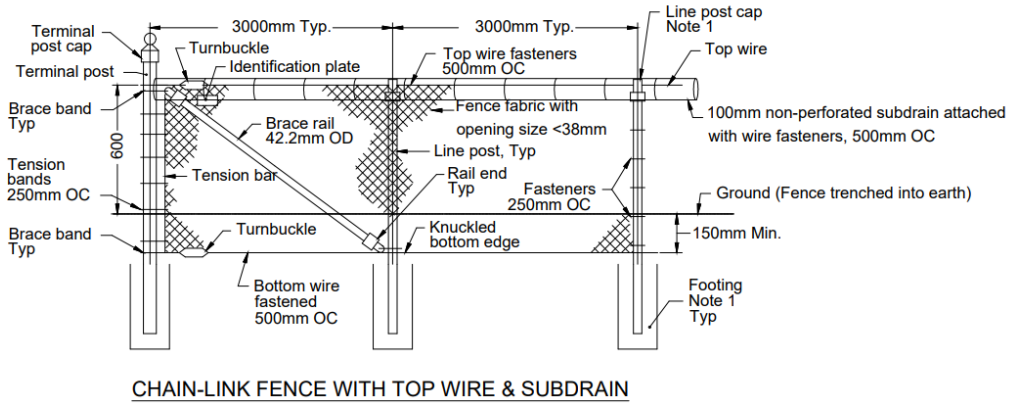
General Working Group (Detail Drawings)

F9.1 Chain Link Fence Footing and Tie Detail for Turtle Fence (New)

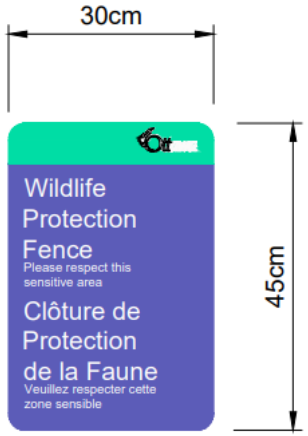
F9.2 Chain Link Fence Installation for Turtle Fence (New)

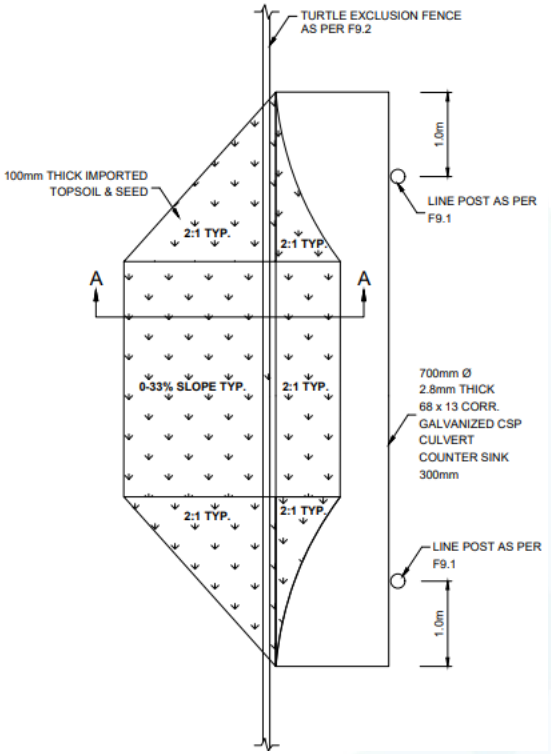
L24 Turtle Escape Ramp (New)

SI40 Turtle Fence Protection and Delineation Sign (New)



CHAIN-LINK FENCE WITH TOP WIRE & SUBDRAIN





MH Adjustments Working Group

Discussions with City staff and external partners occurred throughout 2024, with site meetings occurring summer 2024.

F-4080 was rewritten, with the following major changes:

- Adjustable frames and covers are allowed wherever designed.
- In-road adjustments are to use a maximum of 100 mm of plastic adjustment rings and the remainder being precast concrete rings.
- Rehab or replacement shall use a thin grout layer to avoid point loading.
- Poured concrete adjustments for ironworks in sidewalks or concrete panels, or softscaped areas.

Water – Section F

F-4411 Watermain Construction by Open Cut (Revised)

- OPSS references updated to reflect 2024 revisions. Contractors to supply materials for final connections.

F-4415 Extruded Polystyrene (XPS) Insulation for Water (Revised)

- Clarification that all insulation is to be included in measurement for payment (not just horizontal area).

F-4416 Temporary Services (Removed)

- Temporary water servicing to now be done with F-4930.

Water – Section F

F-4417 Relocations, Blankings and Connections to Existing Watermains (Revised)

- Addition of procedure to drain large diameter watermain by Contractor, including lump sum payment.

F-4491 Commissioning of Watermains (Revised)

- Addition in section 04.01 to provide detail on the discharge permitting process. Update to the testing procedure under section 4491.07.08 for clarity – hydrants not to be operated during the hydrostatic test and specific procedure added for visual leakage testing. Pressure indicating equipment must be calibrated.

F-4492 Thrust Restraint for Watermains and Fittings (Revised)

- Addition of the requirement that alternative designs shall be designed by a licensed engineering practitioner in section 4492.07.01. Curing requirements revised for all watermain sizes in section 4492.07.02.

Water – Section F

F-4411 Watermain Construction by Open Cut (Revised)

F-4417 Relocations, Blankings and Connections to Existing Watermains (Revised)

F-4418 Water Services (Revised)

F-4451 Watermain Cleaning and Structural Lining (Revised)

- Contractors to supply materials for connections to the water distribution system.

Water – Material Specifications

MW-13.10 (REVISION): Maintenance Holes and Catch Basins

Updated requirements for access port.

MW-19.30 (REVISION): Fittings, Couplings, and Test Tees

UNI-B-13 has been replaced with ASTM F1674

MW-19.15: Approved Water Product Listing

Approved this year:

- Westlake PVCO Aquamax pipe
- Hymax couplings
- ROMAC couplings

Water – Standard Detail Drawings

W3 (REMOVED): Circular Chamber Gate Valves

Detail obsolete

W10 (REVISED): Access, Air & Drain Valve Chamber R1 & R2

400mm flanged access increased to 500mm

W14.1 (REVISED): Construction Joint Waterproofing Details

Waterproof membrane increased to 600mm.

W18 (REVISED): Hydrant Location

Offset distances now measured from hydrant’s nozzle cap rather than barrel.

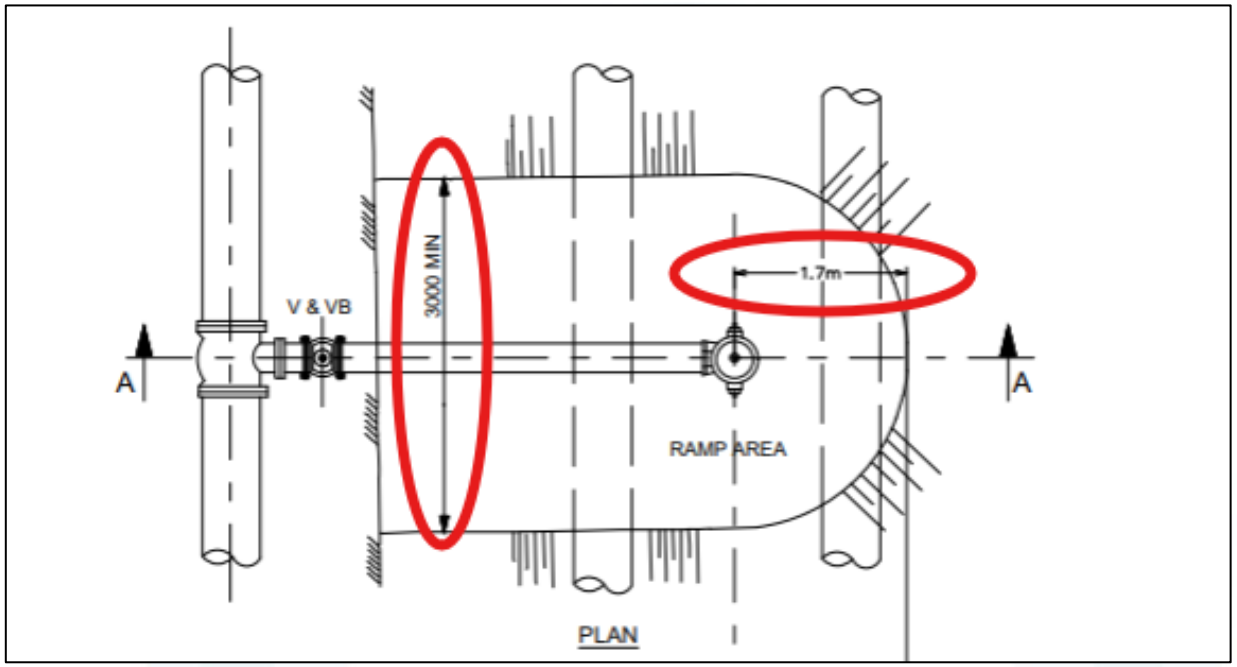
Water – Standard Detail Drawings

W20 (REVISED): Hydrants in Ditched Area

Dimensions for the hydrant area have been updated.

W31.1 (REVISED): Typical Park Water Meter Installation 50mm

Added requirement for ladder rungs, if adjustment sections are deep enough to have the first chamber rung lower than 450mm.



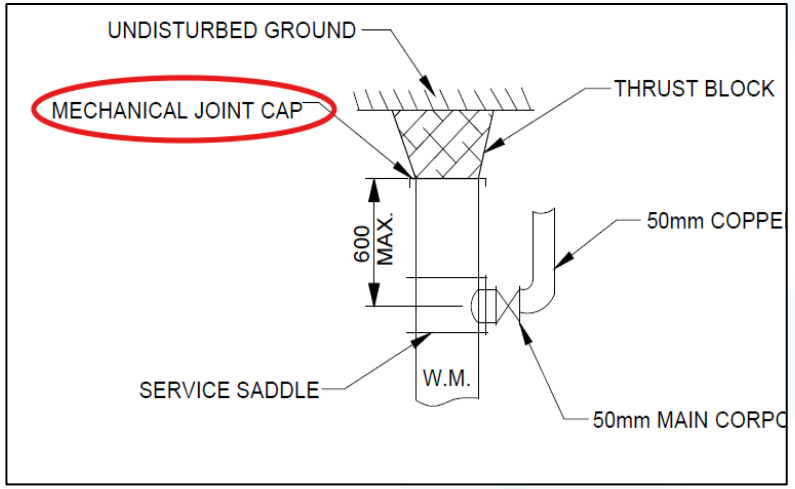
Water – Standard Detail Drawings

W34 (REVISED): Hydrostatic Test Gauge and Connector

All nozzles to be 50mm.

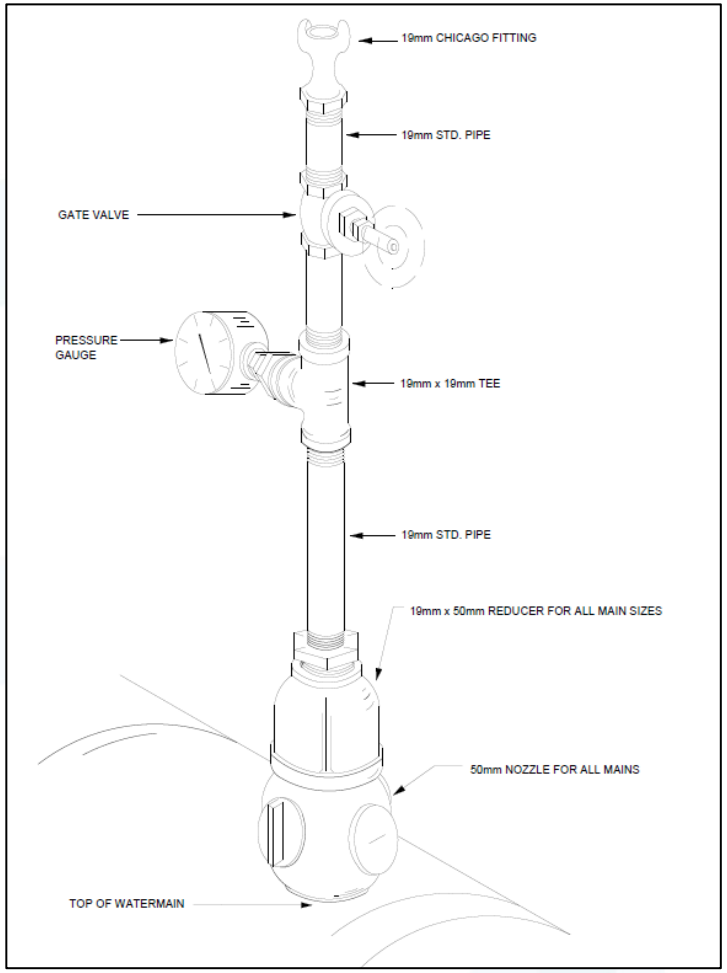
All pipes and fittings to be 19mm.

Bushings removed.



W37.2 (REVISED): Watermain Layout for Residential Dead-End Streets

Watermain cap is to be a mechanical joint cap.



Sewer – Construction Specifications

F-1007 (REVISION): Sewer Flow Management

Submersible pumps are to be explosion proof, when located in sanitary or combined sewers.

In-line work without bypass pumps is acceptable for storm sewers in dry conditions.

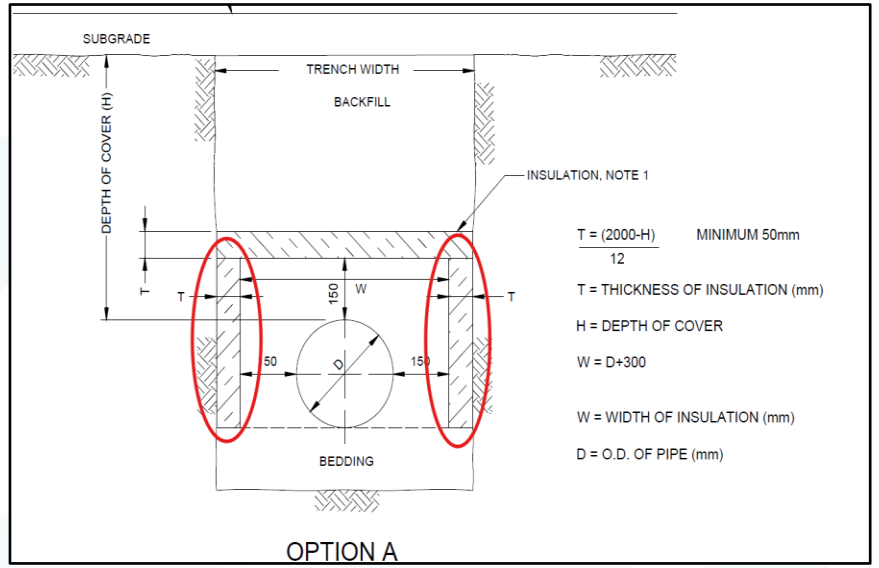
F-1008 (NEW): Erosion and Sediment Control for Sewer Work

New erosion and sediment control specification where sewer work is being undertaken

Sewer – Construction Specifications

F-4102 (REVISION): Extruded Polystyrene (XPS) Insulation for Sewers

Update to measurement for payment.



F-4120 (NEW): Forcemain Construction by Open Cut

New specification for the construction of forcemains with flexible pipe.

F-4129 (UPCOMING): Working Around Forcemains

Requirements for work that is occurring near/around forcemains.

Final details being resolved.

Sewer – Material Specifications

MS-13.10 (REVISION): Valve Boxes and Chambers

Updated benching requirements

MS-22.10 (REVISION): Maintenance Hole Adjustment Units

Addition of requirements for concrete adjustment units.

MS-22.15 (REVISION): Approved Sewer Product Listing

NAPCO is now Westlake

Approved this year:

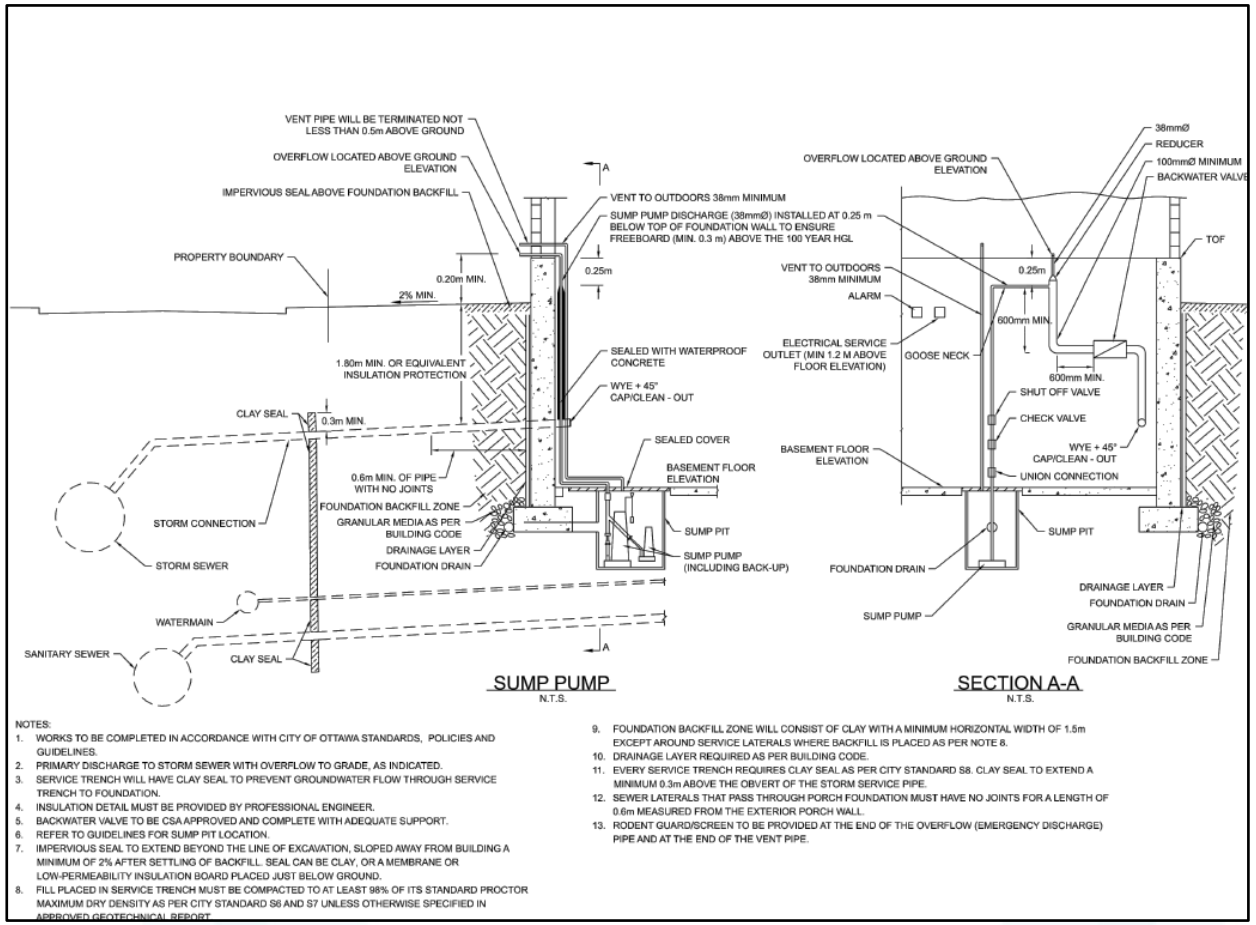
- FERNCO Hulk Couplings

Sewer – Standard Detail Drawings

S14.3 - Standard sump pump configuration for greenfield subdivisions with clay soils and full services

Sump pump detail P01 from ISTB 2018-04 has been turned into its own detail drawing.

No change in how its applied.



Parks Specifications & Details

Mechanical Seeding

Sports fields are to use 100% Kentucky Bluegrass for seeding.

Athletic & Play Equipment

Update to footing requirements for soccer goals.

Splash Pad

Clarification to the payment for subgrade inspections.

SR4 – Full Size and Mini-Field Soccer Goal

SR8 – Intermediate Soccer Goal

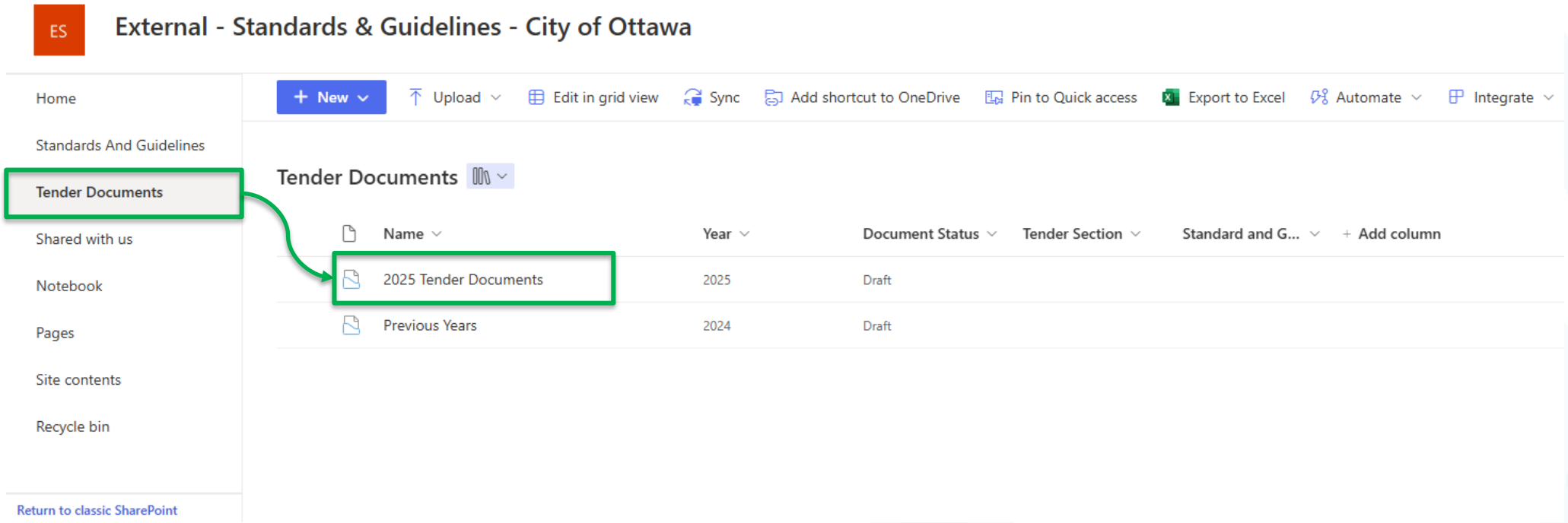
Addition of footing requirements in notes.

Reminders and Updates

Access to Standard Tender Documents

Documents are held and shared on SharePoint.

Please email StandardsSection@ottawa.ca if you need access. We will add you to the permissions list.



Access to Standard Tender Documents

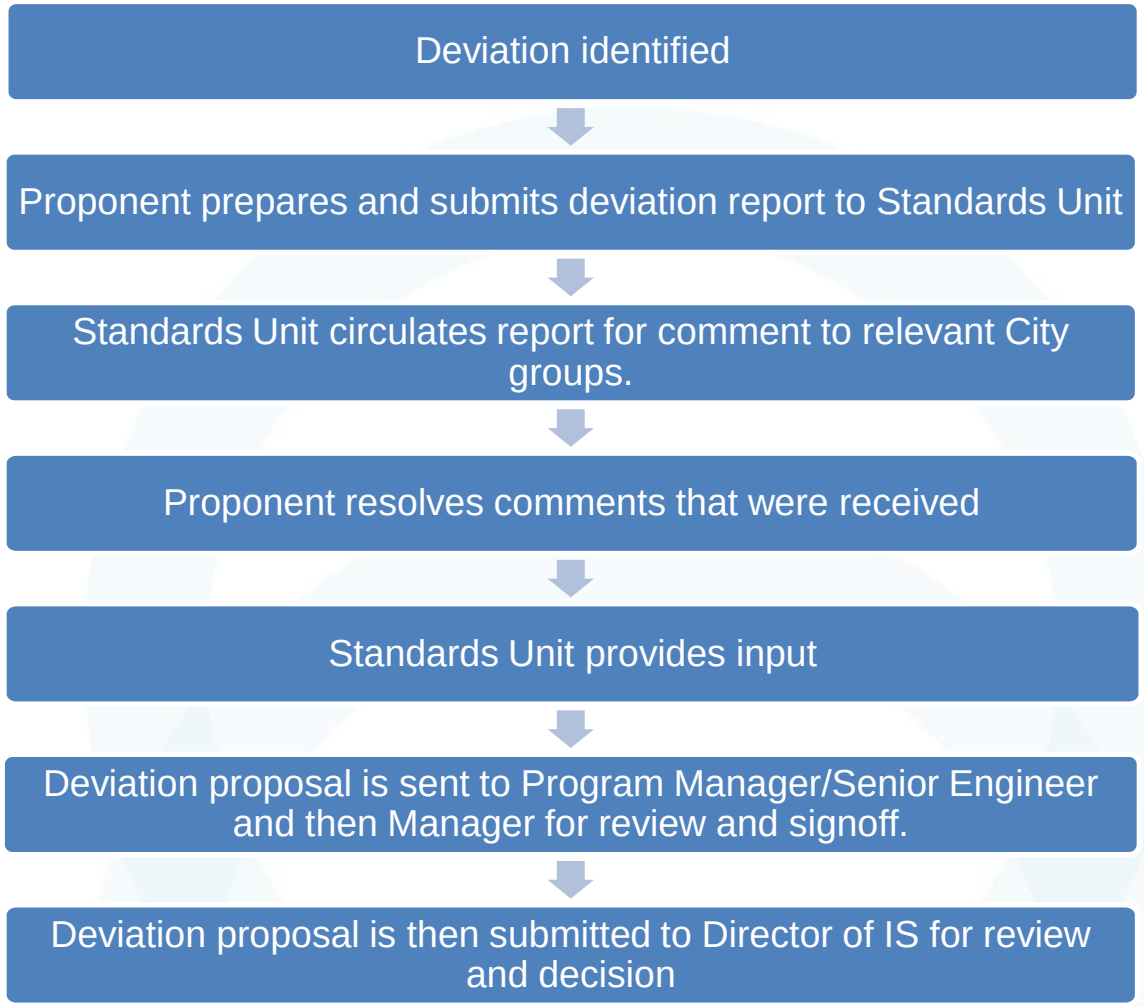
Infrastructure Deviation Process

What is the deviation process?

The design and construction of infrastructure that the City owns, operates, and maintains is governed by existing design guidelines, construction standards, and approved product lists.

If a designer proposes methods which differ from these documents, then a deviation proposal/report is required.

All infrastructure deviations must be approved by the Director of Infrastructure Services.



Asphalt and Concrete Quality Assurance

- EXP continue to be the primary materials testing lab for the City.
- Paterson continue to be providing conflict testing services.
- Nonstandard special provision for Security sealing of Hot Mix Asphalt Acceptance Samples (Road Resurfacing projects)

Contact info:

Materials Unit Sr. Engineer : Reza Bakhit reza.bakhit@ottawa.ca

QA section Inbox : qasectionisb@ottawa.ca

Tender Preparation

- Tender submissions through ISTenderintake@ottawa.ca
- Check the current version of the Standard Tender Documents; dates on specifications important
- Review your package in detail before sending
- Clearly mark in red changes required to finalize tender (SOP)
- Funding confirmation
- PM’s required to prepare addendums

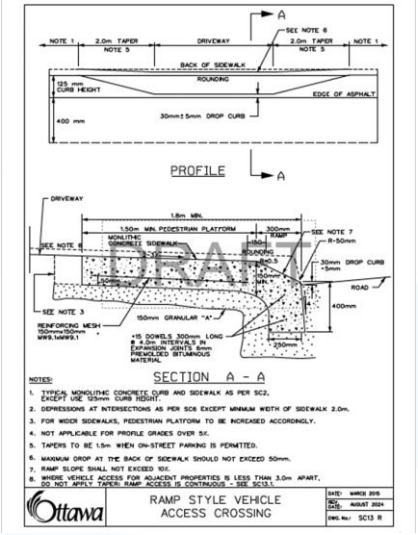
New construction season will begin soon…

- Health and safety are paramount!
- Accessibility during construction (F-1013);
- **Construction Site Pedestrian Control Plan** for safe and accessible path of travel through and/or at construction site at all times
- Innovations, pilots or site challenges

Pedestrian Facilities Design Guidelines

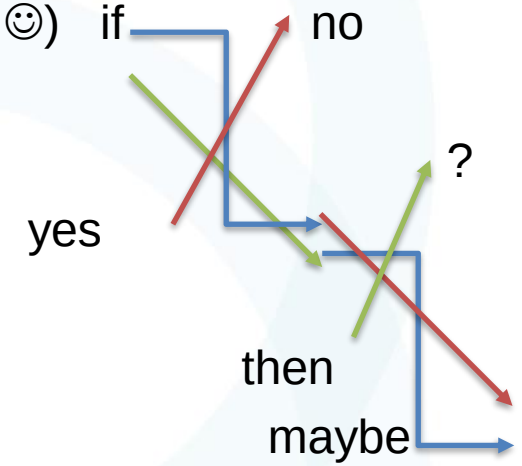
Scope:

- Update (Interim) *Sidewalk Technical Design Guide* (2005)
- Incorporate other relevant existing guidelines; expand to MUPs, ped crossings
- Accessibility requirements
- Review and revise relevant standards as required



Project Update

- Task 1: Sidewalk at vehicle accesses **toolbox** and standards (almost there…stay tuned ☺)
- Task 2: New guidelines and updated relevant detail drawings
- Guidelines publication and spec updates Q4 2025/Q1 2026.



Work in Progress and On the Radar

- Raised intersection standard detail drawings
- Tree protection during construction requirements
- Specification for working around forcemains
- Delineation treatment on bridges (pilot)
- Streamlined tender intake process

- City of Ottawa Accessibility Design Standards updates (Ontario Building Code)
- CCDC2 Specifications Update and Doc600 Review
- Roofing Guidelines and support for Water/Wastewater Facilities

- Value for Money – Road Resurfacing Audit Recommendations
- R10 Road Reinstatement Review

- Year-Round Working Groups - call for contributors coming soon

QUESTIONS?

Thank you for your attendance and
participation in the 2025 spec updates process.

We look forward to working with you as part of the 2026 spec updates!

Standardssection@ottawa.ca

NETWORKING AND COFFEE BREAK (30 minutes)

Presentations

Presenter	Topic
Bruce Kenny Manager, D&C (Municipal)	City Key Messages
Andrew Eagen Senior PM, Sustainable Transportation	Overview of the technical memo related to MUPs/sidewalks on structures
Charles Warnock Program Manager, OP Projects	Overview of Consolidated Linear Infrastructure Environmental Compliance Approval
Amy MacPherson Planner II, Strategic Initiatives	Turtle Fencing and Species-at-Risk
Bill Harper, Manager, Strategic Projects Saeid Sedaghatjahromi Interim City Surveyor	Update on Canadian Spatial Reference System and new technologies

City of Ottawa
2025 Key Messages

Presented By:

Bruce Kenny, P.Eng.
Manager, Municipal Design and Construction
Infrastructure Services, IWSD, City of Ottawa
bruceg.kenny@ottawa.ca

February 25th, 2025

Policy Memo Update: City of Ottawa Preferred Active Transportation Design on Bridges

Presented By:

Andrew Eagen, P.Eng.
Senior Project Manager, Sustainable Transportation (A)
Active Transportation Planning, PDBS, City of Ottawa
andrew.eagen@ottawa.ca

February 25th, 2025

Purpose for this Policy Update

- Old 2016 policy recommended crash rated barrier separation between active transportation and traffic on ALL bridges
  - Old policy did not consider site specific context or traffic speeds
  - Old policy did not identify alternative options or an approach to trade-offs
  - Active transportation facilities were not being considered/applied consistently on all bridge projects
- City's active transportation objectives are clear, however bridges pose unique challenges
  - Policies for walking and cycling facilities are identified in the City's Official Plan and 2023 Transportation Master Plan - Part 1
  - Updated policy does not eliminate the need for project specific review/discussion, but it outlines preferred designs and a general trade-off strategy when limited by constraints
- Updated policy supports new standard detail drawings for sidewalk and cycle track on structures (SC34) and multi-use pathway on structures (SC34.1)

Updated Policy Memo

MEMO / NOTE DE SERVICE

Subject / Objet: Technical Bulletin – City of Ottawa Preferred Active Transportation Design on Bridges

Date: February 2025

This memo identifies the City of Ottawa's preferred designs for active transportation facilities on bridges and supersedes the previous City policy memo on this topic dated July 19, 2016. This is consistent with the 2023 Transportation Master Plan Guiding Principle of reducing automobile dependence, Policy 6-2 *Improve and Expand the Pedestrian Network*, and Policy 7-2 *Improve and Expand the Cycling Network:*

> *"In line with the Official Plan, cycling facilities are to be provided on all new collector, major collector, and arterial streets within the Urban Area and Villages. Existing collectors, major collectors, and arterials (including bridge spans) are to be upgraded to include dedicated cycling facilities in both directions at the time of reconstruction and redevelopment, and where feasible during resurfacing, in line with the City's Complete Streets policy."*

Memo Applications

This memo applies to bridges with existing or planned dedicated walking or cycling facilities as defined by the City's Official Plan and Transportation Master Plan. Two categories of bridge projects are addressed separately:

- New and replacement bridge projects: designed and built for the preferred levels of service envisioned in the City's current Official Plan and Transportation Master Plan.
- Bridge rehabilitation, renewal, and retrofit projects: designed to restore the existing levels of service specified at the time of the bridge's original construction and where technically feasible to provide incremental improvements in-line with present-day standards.

This memo applies to new bridge designs, or during planned major rehabilitation projects, but does not trigger the need to rehabilitate an existing bridge which is not otherwise planned for rehabilitation or renewal. This memo does not apply to bridges where the existing active transportation facility on approach consists of road grade paved shoulders with no plans for the addition of dedicated walking or cycling facilities in the future. In these cases, efforts should be made to maintain a consistent shoulder width across the structure, in-kind with the roadway approaching the bridge. Finally, this memo may not apply where there is an existing alternative active transportation route with preferred connections in the immediate vicinity of the bridge. Consultation with the City's Active Transportation Planning Group is required to confirm.

New and Replacement Bridge Projects

Active transportation facilities on new or replacement bridges shall be built with appropriate separation treatments depending on the roadway's posted speed. The separation treatment[1] provided between traffic lanes and active transportation facilities shall be as follows:

- Posted speed ≥ 70km/hr: crash rated barrier separation
- Posted speed of 60km/hr: minimum 1.5m buffer separation
- Posted speed of 50km/hr: minimum 0.8m buffer separation
- Posted speed ≤ 40km/hr: no separation required for sidewalk or uni-directional cycling facility; minimum 0.8m buffer separation required for a bi-directional cycling facility or multi-use pathway

Depending on the context and nature of the project site, the project team should consider going beyond these minimum separation requirements to provide an enhanced, more comfortable active transportation facility. It is recognized that bridge separation barriers between the active transportation facilities and the roadway may result in operational constraints, winter clearing challenges, additional maintenance/construction costs, or challenges with deck drainage. As such, barrier separation should be applied only where other safety measures (such as reducing the posted speed limit or providing the minimum buffer separation) have been exhausted. A reduction in the posted speed limit should be accompanied by traffic calming measures where appropriate. This may include vertical deflection measures, automated speed enforcement (where possible), gateway features, transverse rumble strips/line painting, flex posts, and/or lane narrowing (in accordance with applicable guidelines).

The required active transportation facility separation treatment identified above shall be provided as per the applicable City of Ottawa Standard Detail Drawings. As is the case for all other bridge components, separation barriers (if required) shall be designed and built to the requirements of the current Canadian Highway Bridge Design Code.

Bridge Rehabilitation, Renewal, and Retrofit Projects

While no specific financial implications are provided herein, the implementation of this policy memo as it pertains to new and replacement bridges would have significant financial impacts on the costs and deliveries of bridge rehabilitation, renewal, and retrofit capital projects and maintenance. This would induce significant strain on the City's asset renewal program and could result in deferral/reduced level of service for other bridges across the City. As such, the minimum active transportation facility separation treatment for new and replacement bridge projects will not always be feasible to apply during rehabilitation, renewal, or retrofit projects.

The City's Comprehensive Asset Management Policy includes the following definitions for rehabilitation and renewal projects:

- Rehabilitation: Work to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. This generally involves repairing the asset to deliver its original level of service (e.g., slip-lining of sewer mains) without resorting to significant upgrading or renewal, using available techniques and standards.
- Renewal: Work to upgrade, refurbish, or replace existing assets or facilities with assets or facilities of equivalent capacity or performance capability.

Further to the definitions in the Comprehensive Asset Management Policy, retrofit projects are defined as work on an existing structure not planned for rehabilitation or renewal which will provide new or modified facilities without completing a full bridge replacement.

[1]Minimum separation treatments derived from OTM Book 18 Guidelines (2021) Tables 4.6 and 6.8. Buffer separation widths listed herein include curb width and can be a combination of road grade shoulder and min. 0.5m wide raised concrete buffer.

In line with best practices, the City's Asset Management Services (AMS) prioritizes rehabilitation/renewal needs of existing bridges based on their conditions, risk assessments, and annual Council-approved fundings. Requests for new or upgraded active transportation facilities shall be coordinated with AMS and based on their 10-year bridge renewal plans to establish needs for planned renewal projects in the budget cycles prior to the budget submittals. Such requests should be provided to AMS prior to their detailed condition assessments of the bridges planned for rehabilitation/renewal.

In constrained conditions, trade-offs may be required between lane widths, number of vehicular lanes, active transportation facility type/width, and forms of separation. It should be recognized that deck widenings to accommodate active transportation facilities on certain types of existing bridges (such as post-tensioned decks, large overhang decks, etc.) may be cost-prohibitive or technically not feasible. Therefore, AMS will determine, on a case-by-case basis, the feasibility of accommodating new active transportation requirements on existing bridges during rehabilitations, renewals, and retrofits. Each case will be considered individually and in the context of road safety, impacts to transit operations (and the potential for transit priority lanes), traffic operation, affordability, sustainability, and the remaining service life of the structure.

Where the desired active transportation facilities and appropriate separation treatment cannot be applied, a comprehensive options analysis which considers road safety analysis and multi-modal level of service (MMLOS) is required to review and compare the existing conditions and proposed design options. This may lead to the consideration of alternative options such as alternate routes, or a new parallel active transportation only bridge adjacent to the existing structure. Any proposed trade-offs shall be in accordance with applicable codes/guidelines for the posted speed and class of the roadway and developed in consultation with applicable stakeholders. Following the selection of a preferred design option, a Road Safety Audit (RSA) shall be completed for the proposed design to highlight potential safety concerns and associated risks for all road users. The project initiator shall secure funding for the comprehensive options analysis and RSA.

In cases where new or improved active transportation facilities are warranted but require extensive modifications to the existing bridge deck beyond the scope of the planned rehabilitation, renewal, or retrofit project, and no program is able to fund the changes (i.e. a clear path forward cannot be agreed upon at the project level) the decision on how to proceed shall be escalated to the General Manager level. The General Managers will determine if additional funding can be allocated to the project to build a separate active transportation only bridge or to increase the scope of the planned rehabilitation, renewal, or retrofit project as required. If additional funding for such modifications is not available in a timely manner, and if deferring the bridge renewal would pose a risk to public safety, AMS may proceed with the bridge rehabilitation without the preferred active transportation modifications.

Accessibility Requirements

For new/replacement bridge projects which have a dedicated pedestrian facility immediately adjacent to a cycling facility, cane detectable delineation and contrasting surface colours shall be provided between the two facilities. The recommended form of cane detectable delineation and surface treatment shall be as per applicable City of Ottawa Standard Detail Drawings. Where required, an alternative delineation method may be considered in consultation with the City's Standards and Quality Management Branch and AMS.

This requirement does not apply to bridge rehabilitation, renewal, and retrofit projects should a cane detectable delineation treatment be deemed infeasible to incorporate within the context of the existing structure.

Updated Policy Memo

Additional Considerations

- Sufficient buffer/shy space between a barrier and the adjacent traffic or active transportation facility shall be provided in accordance with applicable guidelines. End treatment devices shall be installed at the ends of separation barriers as per applicable codes/standards.
- All barriers immediately adjacent to cycling facilities shall be designed to have sufficient height to protect cyclists (exterior railings: minimum 1.37m high; interior separation barriers: 0.6m-1.37m high).
- When designing new active transportation facilities on bridges, consideration should be given to how the resulting cross-section accommodates and aligns with transit service along the facility, including potential for transit priority measures, to achieve the most benefit for the public from the available space across the facility. An options analysis should be completed to determine the best design treatments and use of available space.
- Consideration should be given to the interaction treatments between active transportation facilities and bus stops on or near bridge structures. Active transportation facilities should be designed in consideration of the City's bus stop design guidelines, including the interaction zone treatments for bus stops and off-road cycling facilities design guidelines, to ensure safe and accessible treatments are provided for cyclists and pedestrians.
- Drainage and structural impacts of a new traffic barrier or raised buffer, if warranted, shall be considered during the early stages of a project to confirm it is a viable separation treatment option given site-specific conditions and constraints.
- When two or more bridges are adjacent to one another along the same road, efforts shall be made to design the active transportation facilities and protection measures consistent across all of them, if feasible, at the time of their planned replacement, rehabilitation, renewal, or retrofit.
- Requesting modifications to bridges owned or managed by other jurisdictions (for example the MTO or NCC) will be the responsibility of the City's Transportation Planning group and will need to be coordinated with the applicable stakeholders during project scoping in advance of completing any design work.

Signed:

Jennifer Armstrong
Digitally signed by Jennifer Armstrong
Date: 2025.02.03 13:27:55 -05'00'
Jennifer Armstrong
Director, Transportation Planning
City of Ottawa

Susan Johns
Digitally signed by Susan Johns
Date: 2025.02.03 10:08:16 -05'00'
Susan Johns
Director, Asset Management Services
City of Ottawa

Matt Knight
Digitally signed by Matt Knight
Date: 2025.02.03 14:40:13 -05'00'
Carina Duclos
Director, Infrastructure Services
City of Ottawa

Krista Tanaka
Digitally signed by Krista Tanaka
Date: 2025.02.03 15:11:26 -05'00'
Krista Tanaka
Director, Traffic Services
City of Ottawa

Quentin Levesque
Digitally signed by Quentin Levesque
Date: 2025.02.03 10:44:04 -05'00'
Quentin Levesque
Director, Roads & Parking Services
City of Ottawa

Pat Scrimgeour
Digitally signed by Pat Scrimgeour
Date: 2025.02.03 10:56:11 -05'00'
Pat Scrimgeour
Director, Customer Systems & Planning, Transit Services
City of Ottawa

References:

1) Canadian Highway Bridge Design Code CSA S6-19 (2019)
2) City of Ottawa Comprehensive Asset Management Policy (May 26, 2021)
3) City of Ottawa Transportation Asset Management Plan (2022)
4) MTO Memo SCB-SO-2023-01 RE: Structural Considerations for Separation Barriers in Bridge Rehabilitations (July 7, 2023)
5) MTO Ontario Traffic Manual Book 18: Cycling Facilities (June 2021)
6) TAC Geometric Design Guide for Canadian Roads (May 10, 2017)

Updated Policy Key Points

- In-line with the City's Official Plan and Transportation Master Plan – Part 1
  - Applies to all collector and arterial streets within the Urban Area and Villages
  - Will help with addressing barriers in the City's active transportation network
- Applies to new construction, renewal, rehabilitation, and retrofit bridge projects
  - New and replacement bridge projects to be built with appropriate separation treatments
  - Renewal, rehabilitation, and retrofit bridge projects often have additional constraints/considerations which may require an alternative approach
- Focus is on separation requirements between active transportation and traffic
  - Vulnerable road users are often located in an uncomfortable place between traffic lanes and the outer barrier wall of a bridge
  - Other policies/guidelines already cover other design elements like facility type and width

Updated Policy Key Points

- Preferred separation treatment between active transportation and traffic as follows:
  - Posted speed **≥ 70km/hr**: crash rated **barrier** separation
  - Posted speed of **60km/hr**: minimum **1.5m buffer** separation
  - Posted speed of **50km/hr**: minimum **0.8m buffer** separation
  - Posted speed **≤ 40km/hr**: no separation required for sidewalk or uni-directional cycling facility; min. 0.8m buffer separation required for a bi-directional cycling facility or multi-use pathway
  - Buffer widths include curb width and can be a combination of road grade shoulder and min. 0.5m wide raised concrete buffer
- Consider going above and beyond where warranted
- A reduction in the posted speed limit should be accompanied by traffic calming measures where appropriate

Updated Policy Key Points

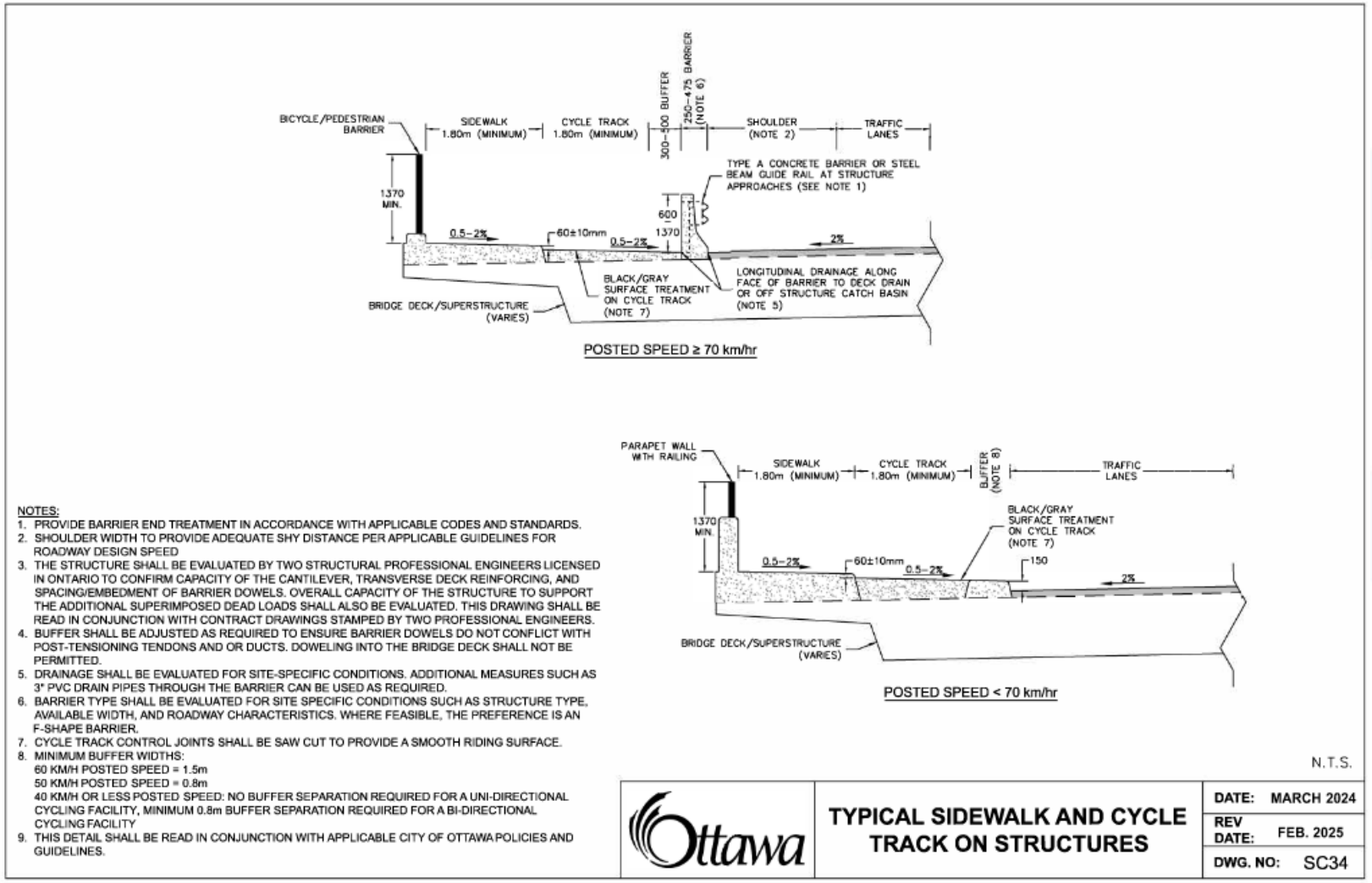
- Constraints may exist which prevent the appropriate treatment
  - Constraints need to be considered early and may include available width, structural capacity, location of post-tensioned strands, drainage considerations, available budget, etc.
  - Trade-offs may be required between lane widths, number of lanes, active transportation facility type/width, and forms of separation
  - Each case should be considered individually and in the context of road safety, transit/traffic operations, affordability, sustainability, and the remaining service life of the structure
- Where the appropriate treatment cannot be applied, a comprehensive options analysis is required
  - Consider road safety and multi-modal level of service (MMLOS) of the existing conditions and design options
  - If a clear path forward cannot be agreed upon at the project level, escalate to General Manager
  - Complete a Road Safety Audit for the selected design to highlight potential safety concerns and associated risks for all road users

Updated Policy Key Points

- When a pedestrian facility is immediately adjacent a cycling facility cane detectable delineation and contrasting surface colours are required
  - Half-height curb preferred as per standard detail drawing SC34
  - An alternative delineation method may be considered in consultation with the City's Standards and Quality Management Branch and Asset Management Services
- Barriers immediately adjacent cycling facilities to have sufficient height to protect cyclists
  - Exterior railings: minimum 1.37m high; interior separation barriers: 0.6m-1.37m high
- Attempt to apply a consistent treatment when there are two or more structures adjacent one another along the same road
- Policy memo approved by the Directors of the following City Service Units:

- Transportation Planning
- Traffic Services
- Asset Management Services
- Roads & Parking Services
- Infrastructure Services
- Customer Systems & Planning, Transit Services

Supporting Standard Detail Drawing SC34



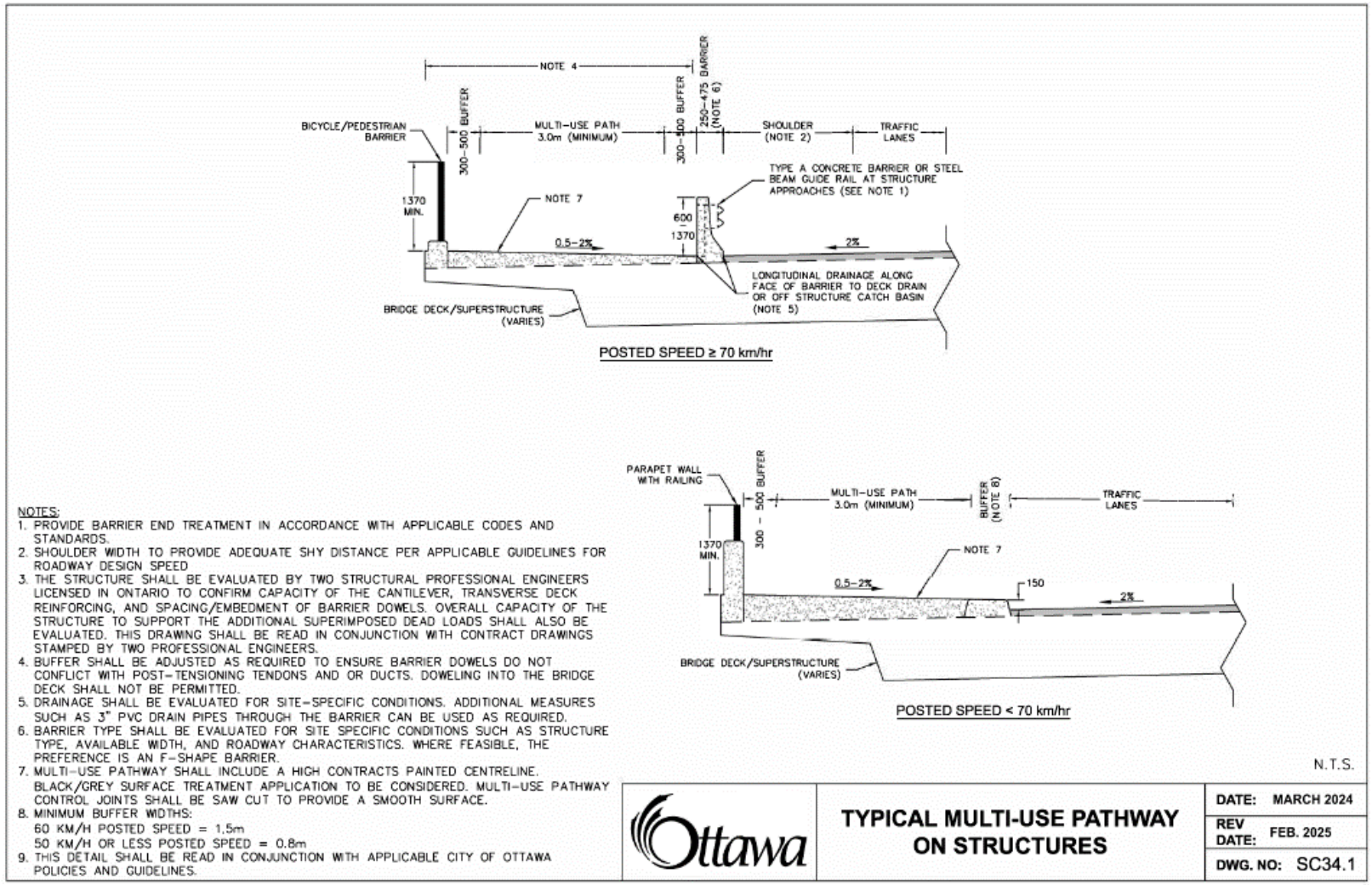
NOTES:

1. PROVIDE BARRIER END TREATMENT IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS.
2. SHOULDER WIDTH TO PROVIDE ADEQUATE SHY DISTANCE PER APPLICABLE GUIDELINES FOR ROADWAY DESIGN SPEED
3. THE STRUCTURE SHALL BE EVALUATED BY TWO STRUCTURAL PROFESSIONAL ENGINEERS LICENSED IN ONTARIO TO CONFIRM CAPACITY OF THE CANTILEVER, TRANSVERSE DECK REINFORCING, AND SPACING/EMBEDMENT OF BARRIER DOWELS. OVERALL CAPACITY OF THE STRUCTURE TO SUPPORT THE ADDITIONAL SUPERIMPOSED DEAD LOADS SHALL ALSO BE EVALUATED. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CONTRACT DRAWINGS STAMPED BY TWO PROFESSIONAL ENGINEERS.
4. BUFFER SHALL BE ADJUSTED AS REQUIRED TO ENSURE BARRIER DOWELS DO NOT CONFLICT WITH POST-TENSIONING TENDONS AND OR DUCTS. DOWELING INTO THE BRIDGE DECK SHALL NOT BE PERMITTED.
5. DRAINAGE SHALL BE EVALUATED FOR SITE-SPECIFIC CONDITIONS. ADDITIONAL MEASURES SUCH AS 3" PVC DRAIN PIPES THROUGH THE BARRIER CAN BE USED AS REQUIRED.
6. BARRIER TYPE SHALL BE EVALUATED FOR SITE SPECIFIC CONDITIONS SUCH AS STRUCTURE TYPE, AVAILABLE WIDTH, AND ROADWAY CHARACTERISTICS. WHERE FEASIBLE, THE PREFERENCE IS AN F-SHAPE BARRIER.
7. CYCLE TRACK CONTROL JOINTS SHALL BE SAW CUT TO PROVIDE A SMOOTH RIDING SURFACE.
8. MINIMUM BUFFER WIDTHS:
   60 KM/H POSTED SPEED = 1.5m
   50 KM/H POSTED SPEED = 0.8m
   40 KM/H OR LESS POSTED SPEED: NO BUFFER SEPARATION REQUIRED FOR A UNI-DIRECTIONAL CYCLING FACILITY, MINIMUM 0.8m BUFFER SEPARATION REQUIRED FOR A BI-DIRECTIONAL CYCLING FACILITY
9. THIS DETAIL SHALL BE READ IN CONJUNCTION WITH APPLICABLE CITY OF OTTAWA POLICIES AND GUIDELINES.

N.T.S.

Ottawa	TYPICAL SIDEWALK AND CYCLE TRACK ON STRUCTURES	DATE: MARCH 2024 REV DATE: FEB. 2025 DWG. NO: SC34

Supporting Standard Detail Drawing SC34.1



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5. DRAINAGE SHALL BE EVALUATED FOR SITE–SPECIFIC CONDITIONS. ADDITIONAL MEASURES SUCH AS 3" PVC DRAIN PIPES THROUGH THE BARRIER CAN BE USED AS REQUIRED.
6. BARRIER TYPE SHALL BE EVALUATED FOR SITE SPECIFIC CONDITIONS SUCH AS STRUCTURE TYPE, AVAILABLE WIDTH, AND ROADWAY CHARACTERISTICS. WHERE FEASIBLE, THE PREFERENCE IS AN F–SHAPE BARRIER.
7. MULTI–USE PATHWAY SHALL INCLUDE A HIGH CONTRACTS PAINTED CENTRELINE. BLACK/GREY SURFACE TREATMENT APPLICATION TO BE CONSIDERED. MULTI–USE PATHWAY CONTROL JOINTS SHALL BE SAW CUT TO PROVIDE A SMOOTH SURFACE.
8. MINIMUM BUFFER WIDTHS:
   60 KM/H POSTED SPEED = 1.5m
   50 KM/H OR LESS POSTED SPEED = 0.8m
9. THIS DETAIL SHALL BE READ IN CONJUNCTION WITH APPLICABLE CITY OF OTTAWA POLICIES AND GUIDELINES.

N.T.S.

TYPICAL MULTI-USE PATHWAY ON STRUCTURES

DATE:	MARCH 2024
REV DATE:	FEB. 2025
DWG. NO:	SC34.1

Examples of Bridges with Active Transportation

Bank St. Bridge
Over the Canal

Standherd Dr. Bridge over
Smiths Falls Rail Corridor

Portage Bridge
(Wellington St. over Ottawa River)

Ministry of the Environment and Climate Change

Environmental Compliance Approval

Charles Warnock Program Manager, Operational Projects - CLI-ECA

February 25th, 2025

What is a Consolidated Linear Infrastructure ECA?

- It's an Environmental Compliance Approval
- It covers the entire municipal sanitary or SWM system
- It resembles the Drinking Water Permit
- It consolidates all ECAs into one permit
- It revokes and replaces thousands of ECA's

Private sewage works, industrial, commercial, and higher risk sewage works will still require a separate sewage ECA.

City of Ottawa CLI-ECA:

Sanitary CLI-ECA was issued July 28, 2023, with a revised document issued September 11, 2024.

The SWM CLI-ECA was issued December 19, 2024.

What is in the CLI-ECA

Schedules of the CLI-ECA:

- Schedule A System Information
- Schedule B Municipal Stormwater Management System Description
- Schedule C List of Notices of Amendment to this ECA: Additional Approved Works
- Schedule D General
- Schedule E Operating Conditions
- Schedule F Residue Management
- Appendix A Stormwater Management Criteria

CLI-ECA forms:

- Sanitary – A1, CS1, SS1, SS2, and DN
- Stormwater – SW1, SW2, SW3, and DN

Do I need an ECA

- All development application or capital projects with sanitary or stormwater works should be considered for an approval by the MECP.
- Projects are either exempt as per O. Reg. 525/98 or require an ECA. If the works will be owned by the city, they can proceed under the CLI-ECA. If the municipal works proposed don't meet the preapproval criteria there must be an approval by the MECP (schedule C notice) through the Direct submission process.
- Private works can proceed under the existing Transfer of Review (ToR) agreement if they have written confirmation from the MECP that they can proceed under the ToR
- For municipal works, Parts 3 and 4 need to be signed on the applicable forms SW, A, CS, SS forms before any construction of sewage works can begin.
- For Private works no construction of sewage works can begin until the ECA is received from the MECP.

CLI-ECA work to date and next steps

Work to date:

- Project Charter: "*CLI-ECA Application and Internal Process Adaptation*"
- Working Group: includes Design, Construction, and Operations stakeholders
- Consultant for Project Management Assistance
- Implementation Plan
- Work with MECP to finalize CLI-ECA

Next steps:

- Communication plan
- Implement the implementation plan

Important items in the CLI-ECA to note:

- Provide consultants and contractors with CLI-ECA Information in DC external SharePoint folder
- Construction inspection will include new or expanded tasks
- Long-term ownership and operating of the system will include many new and expanded tasks
- Compliance with CLI-ECA requirements is critically important.
- Development conditions and agreements, as well as procurement documents (RFP, Tenders, etc.) need to be updated to ensure compliance with the CLI-ECA requirements.

Important items to note continued:

- When new infrastructure is discovered, it must be reported to MECP
- Erosion and Sediment Control requirements
- Signing authority for CLI-ECA Forms on an interim basis will follow existing ToR processes and sign-off procedures.
- Design criteria for Manufactured Treatment Device (MTD) requires conformance with the ISO 14034 Environmental Technology Verification (ETV) Standard (2016)
- CLI-ECA is a living document.

General information

- Read CLI-ECA
- CLI-ECA is a living document.
- Relevant forms, documentation are available at the MECP website.
- Any questions please contact Charles Warnock with your inquiries

Questions

Turtle Fences & SAR Updates

Amy MacPherson, Natural Systems Planner

February 25th, 2025

Overview

- Endangered Species Act updates
  - Black Ash processes
  - New SAR bats
  - Regulatory updates pending
- SAR in Ottawa updates
  - Contract documents D-032A/B
  - SAR Awareness Training for staff
- New turtle fencing standard
- Bird-Safe Design reminder

ESA Update: Black Ash

- Healthy black ash trees over 8 cm DBH (1.37m) are protected from harm or removal
- Habitat protection extends to 30 m radius around protected trees
- Health assessment guidelines
  - Need to document all impacted Ab
  - Qualified professional
  - June 1 – October 1 (leaf on)
  - Report must be submitted before starting work

ESA Update: Bats

- 7 species of bats now listed as endangered under the ESA (three new additions as of January 27)
  - Timing windows important for avoiding / mitigating impacts
  - None are likely to be encountered during the winter
  - Most prefer mature trees for summer roosting, although some will use buildings / structures

Eastern Red Bat

Hoary Bat

Silver-haired Bat

Photos courtesy of MECP

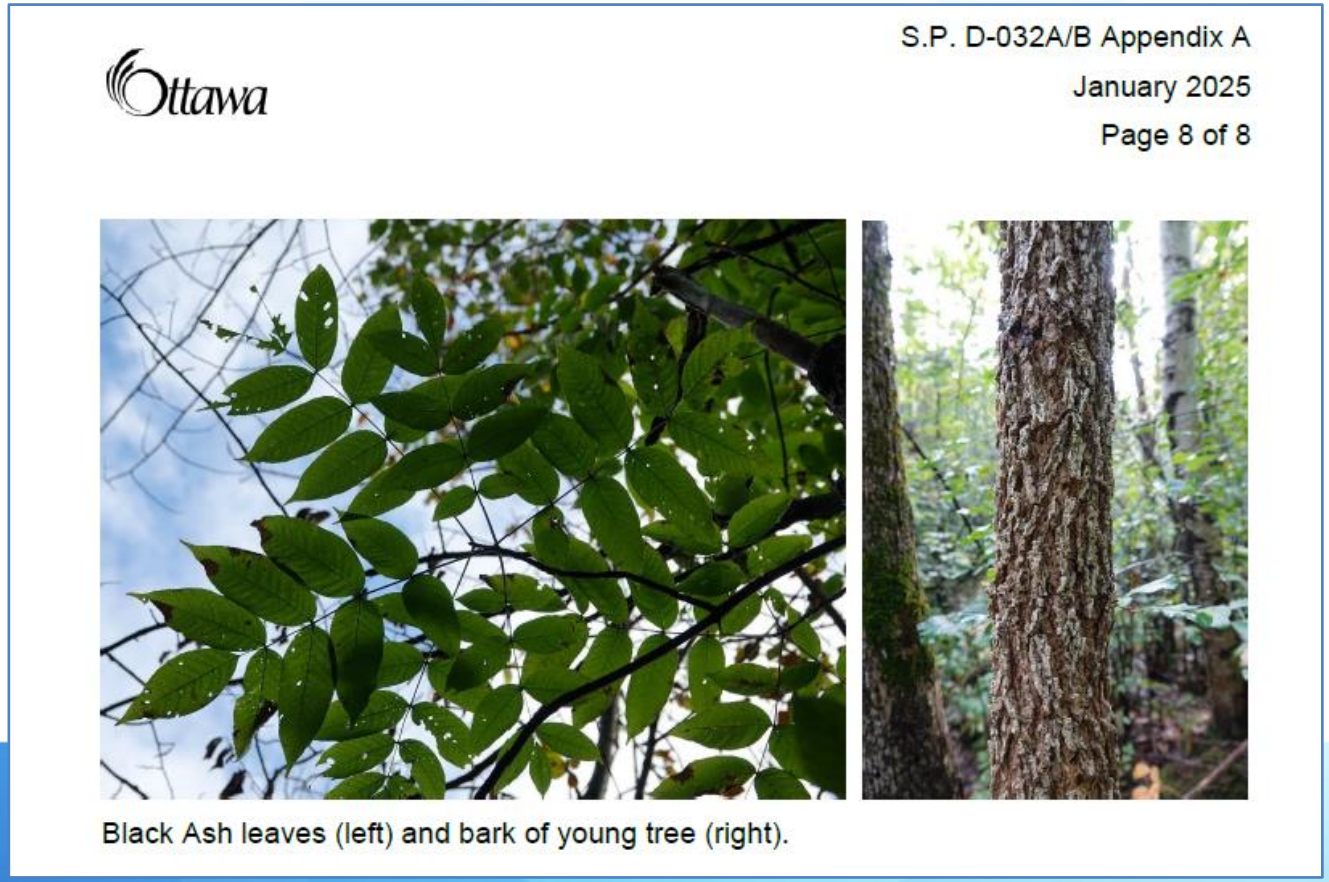
ESA Update: Regulatory changes

- Newly listed species from 2024-25 are proposed to be added to relevant conditional regulations under the ESA
  - Conditional regulations allow certain activities to proceed through registration instead of permits
  - Transitional rules may also apply for projects already approved under Planning Act or EA Act
- Whippoorwill has been downlisted, no longer need to register or pay compensation (but birds and nests still protected)
- Legislative amendments still in progress https://ero.ontario.ca/notice/019-9411

SAR in Ottawa Updates

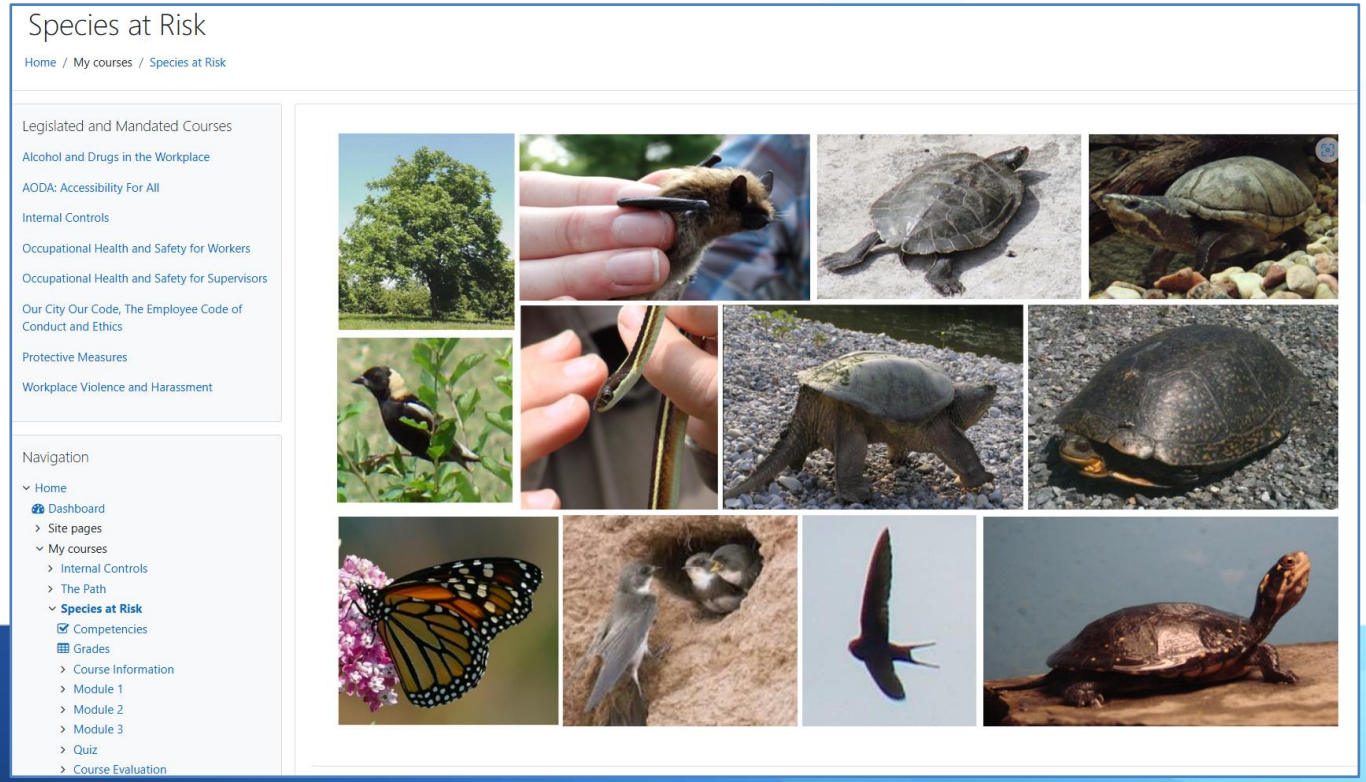
- Natural Systems staff continue to provide SAR in Ottawa updates and access to provincial data as needed

- Contract documents related to SAR (D-032A/B) have been reviewed and updated to ensure consistency with provincial requirements



SAR in Ottawa Updates

- Online SAR Awareness training for staff also updated
  - All staff with planning / operational responsibilities that could impact SAR should (re)take the training
  - https://learn.ottawa.ca/course/view.php?id=58



SAR in Ottawa Updates

- Species at Risk (SAR) on SharePoint

Species at Risk (SAR)

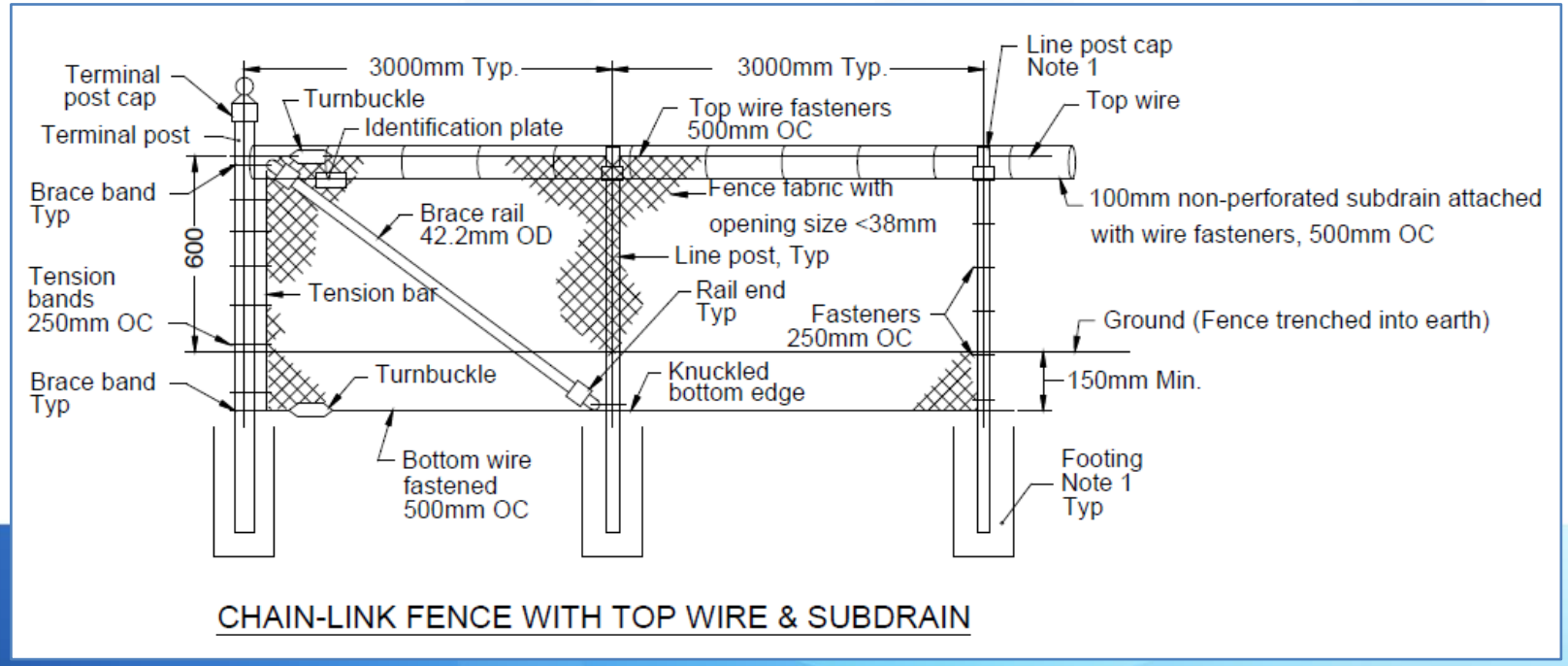
The City of Ottawa and its employees are responsible for ensuring that municipal projects and activities are carried out in compliance with legislative requirements. Several plants and animals that live in Ottawa are protected under provincial and/or federal legislation as "species at risk" (SAR). City employees need to be aware of the potential for species at risk to be affected by their activities, so that they can take appropriate measures to avoid or reduce any negative impacts. In some cases, permits or other authorizations may be required before commencing an activity.

The following information is available to help City staff in their work:

- What is a SAR?
- SAR Legislation
- Current list of SAR in Ottawa
- How to protect SAR
- Report SAR sightings
- Key Contacts
- SAR Awareness and Training
- PWES SAR Best Management Practices

Turtle Fencing

- New specifications and drawings developed to support ongoing need for fencing under ESA
  - Consultation included operational staff for maintenance insights
- See F-7723, F9.1 and F9.2 for fencing details
- F-8906 / L24 ramps
- F-8907 / SI40 signs
- Ecopassages not included



CHAIN-LINK FENCE WITH TOP WIRE & SUBDRAIN

Turtle Fencing

Reminder: Bird-Safe Design Guidelines

- Council-approved Nov. 2020; updated 2022
  - Please apply to all City projects (new / retrofit)
- Covers buildings and other structures, landscaping and lighting
- Major risk factors for birds:
  - **Glass**
  - Light pollution
  - Size (not height) of building

Recap / Q&A

- Endangered Species Act updates
  - Black Ash processes
  - New SAR bats
  - Regulatory updates pending
- SAR in Ottawa updates
  - Contract documents D-032A/B
  - SAR Awareness Training for staff
- New turtle fencing standard
- Bird-Safe Design reminder

Surveys and Mapping

Achievements, Current Status, and Future Outlook

New Horizontal and Vertical Control Datums for City Projects From Transit to Laser Scanning

Saeid Sedaghat, CLS(ret), OLS, P.Eng, PMP

Acting City Surveyor

February 25th, 2025

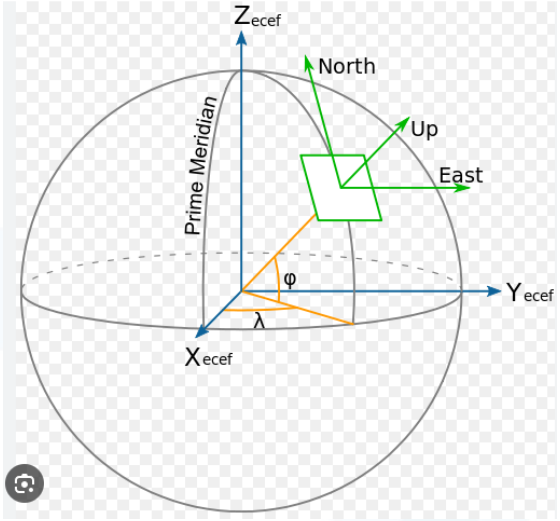
Introduction

- Bachelor’s degree in Civil-Surveying Engineering 2004
- Master’s degree in urban planning and design 2006
- Survey firms and consultants from 2014
- Joined City of Ottawa in 2020

Spatial Reference System

A "spatial reference system" is a set of parameters that defines how to precisely measure and represent locations on the Earth's surface using coordinates

- Spatial reference systems rarely change because it has a significant impacts on many users but as measuring techniques improve and the demand for more accurate data increases these reference systems do sometimes change.



- Components include:
- Geometric Reference system (e.g.,NAD83 (CSRS)) provides Lat, Long, ellipsoidal height
- Height reference systems (e.g., CGVD2013): provides orthometric Height
- Gravity Reference system

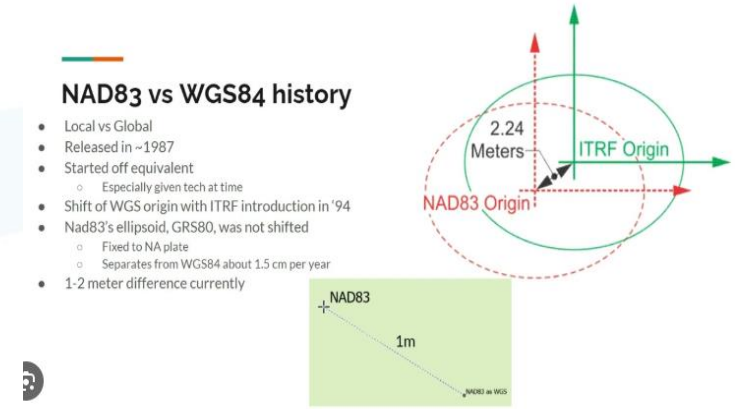
Overview of CSRS (Canadian Spatial Reference System)

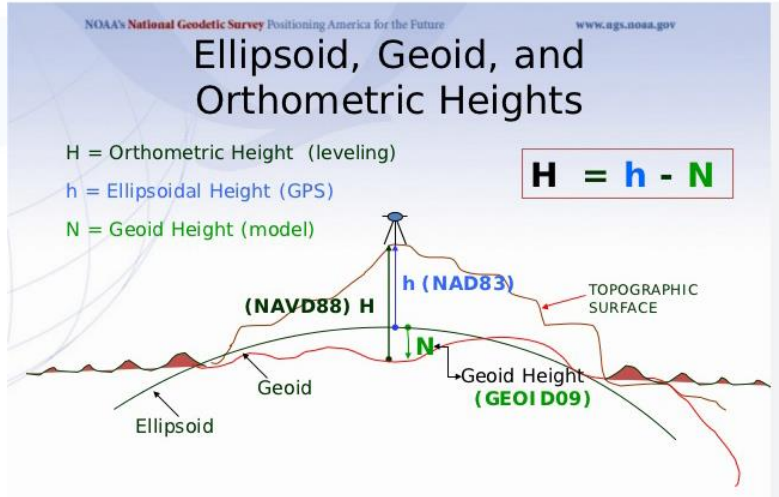
- In Canada, the official geometric reference system adopted in most jurisdictions is the NAD83(CSRS), which is compatible with GPS and has been endorsed by the Canadian Council of Geomatics. The Canadian Spatial Referencing System (CSRS) is based upon the NAD83 datum.
- NAD83(Original) is the predecessor datum to NAD83(CSRS).

- NAD83 has undergone several updates since it was first introduced in 1986. It has evolved from a traditional, ground-based horizontal control network, referred to as NAD83 (Original), to a space-based, dynamic 3D realization known as NAD83 (CSRS).
- There are several realizations of NAD83(CSRS) largely because of tectonic plate movement and an increasing number of active control stations used to determine the velocity field of the North American Plate. As the plates move over time, the position of survey monuments will change in a global coordinate system. For this reason, coordinates must be fully specified with a time stamp (“epoch”).

What are the benefits of NAD83(CSRS)?

- **1. GNSS (Global Navigation Satellite System) Compatibility**: The accuracy of NAD83(CSRS) is sufficient to support GNSS.
- **2. Absolute Accuracy**: The accuracy of coordinate data is uniform across the Province. There are no areas of the Province with high levels of distortion.
- **3. No Localization (site calibration) Required**: As a result of being GNSS compatible, it is not necessary to localize to a geographic area.
- **4. Exchangeable Data:** NAD83(CSRS) is easily transformed to other coordinate systems (e.g.,WGS84, ITRF) to facilitate integration with data sets from other organizations across the world.
- **5. Actively updated:** Because NAD83(CSRS) is based upon a network of Active Control Stations, data is constantly being collected to allow ongoing refinements to be made as necessary.





How can this conversion affect Surveyors, Designers, Constructors and Developers?

- Magnitude of Horizontal and Vertical change

The conversion from NAD83 original to NAD83 CSRS epoch 2010 is, on average, a shift of 0.3metres in the northing and 0.02 metres in the easting.

The vertical shift from CGVD28 to CGVD2013 is 0.30m (lower).

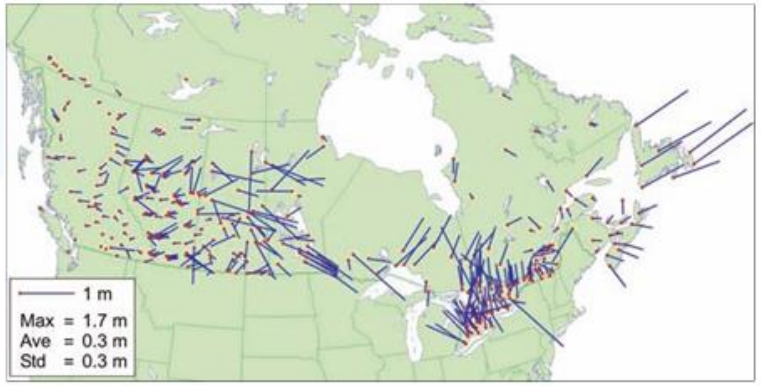
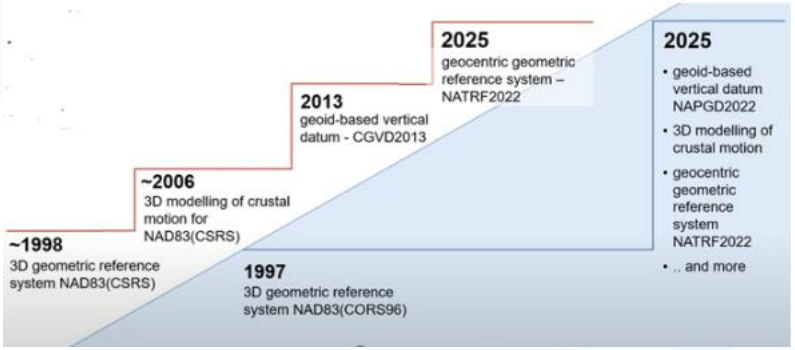


Figure 2: Errors in NAD83(Original) as revealed by high accuracy GPS observations in NAD83(CSRS).



Achievements, Current Status, and Future Outlook

- Pilot Mapping projects in CSRS initiated in 2023
- Those projects have been designed and are in construction phase

- Conventional mapping produced post-2023 in NAD 83 CSRS and CGVD 2013
- As part of our lessons learned, we have been requesting feedback from design consultants and contractors to update our technical bulletin.

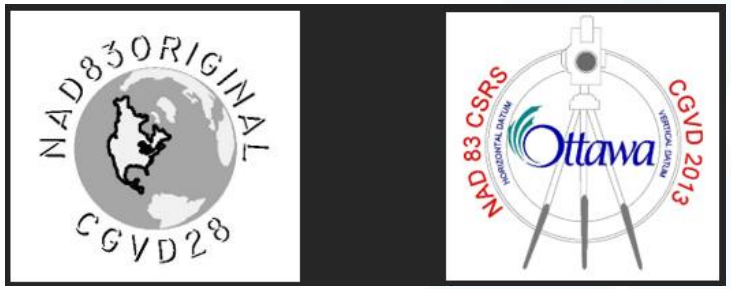
What Services do we provide?

- Legal Surveys and property boundary advice
- Mapping Services (terrestrial mapping and Laser scanning)
- Arial mapping has moved to Geospatial Analytics, Technology and Solutions (GATS)

How can we minimize this risk?

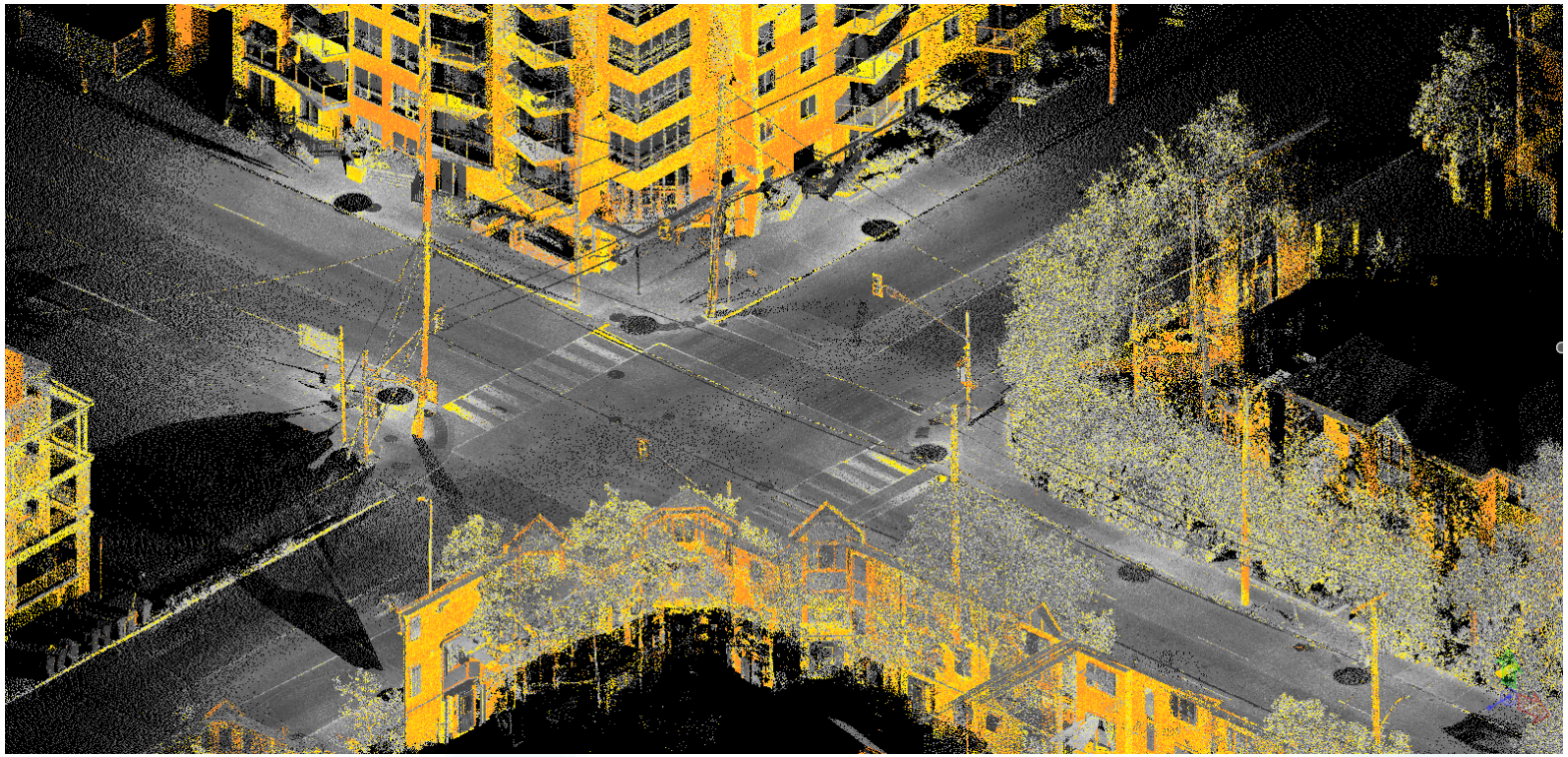
- Provide at least 3 control in 3 dimensions points delivered as part of project.
- Issue a technical bulletin along with mapping products.
- Include a banner as backdrop in the drawings stating the Datums.
- Name drawings in the new datum format (e.g., CSRS-CGVD2013-23612-M.dgn
- Audit mapping products delivered by consultants
- Review designs against property limits (ISD submission) before issuing to contractors.

- Auditing the survey monuments post construction



LiDAR (Light Detection and Ranging)

- Effective method of precisely measuring spatial data in a 3D space.
  - LiDAR Scanner shoots thousands of points per second onto objects in an area which are then reflected back to it.
  - Scanner is then able to compute these range measurements into a collection of 3D data points known as a point cloud.
  - Point cloud is highly accurate when combined with conventional surveying methods.



Example of LiDAR point cloud at the intersection of Kent and Somerset

LiDAR (Light Detection and Ranging)

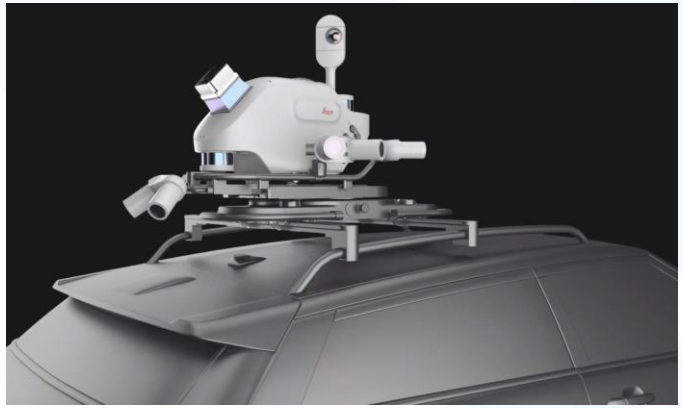
- **3 Main Methods:**
  1) **Airborne LiDAR Scanning (ALS)**
     - Aircraft or drone-based.
     - Can quickly cover large areas.

  2) **Terrestrial LiDAR Scanning (TLS)**
     - Ground-based, usually tripod mounted.
     - Scanner rotates 360 degrees to capture data.
     - Highest level of accuracy and point cloud density.

  3) **Mobile LiDAR Scanning (MLS)**
     - Captures LiDAR point cloud while in motion.
     - Scanner can be handheld or mounted on a vehicle or backpack.
     - Good combination of speed, accuracy, and point cloud density.

DJI Zenmuse Scanner Equipped on Matrice 350 Drone

Leica P40 Terrestrial Scanner

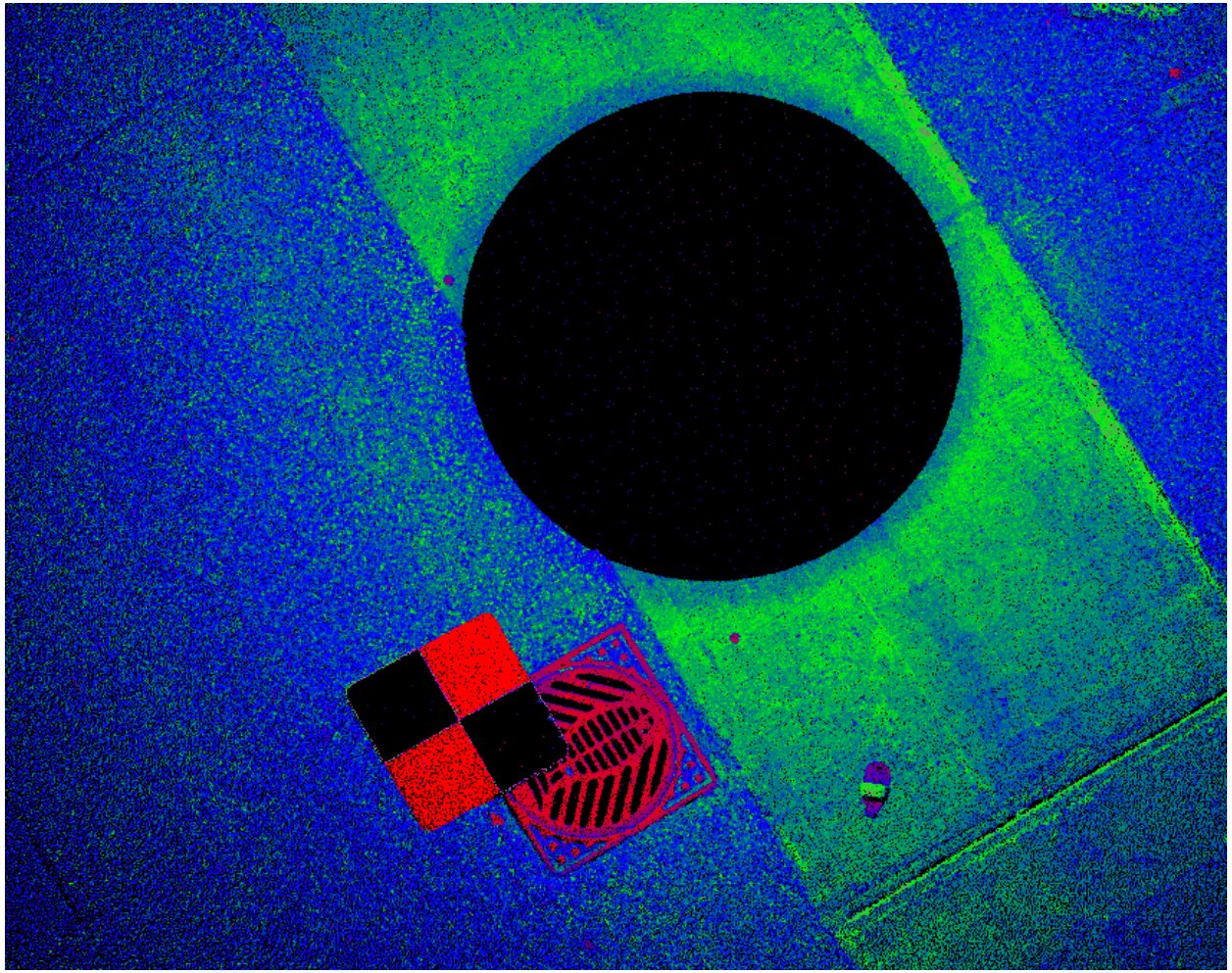


Leica Pegasus TRK Mobile Scanner (Vehicle Mounted)

LiDAR (Light Detection and Ranging)

LiDAR Scanning in the Surveying Industry:

- Allows a surveyor to measure and map large areas in significantly less time than conventional methods.
- Creates a safer working environment by allowing a surveyor to measure higher risk areas such as railways and busy roads from a distance.
- Less barriers to entry in recent years as cost of purchasing a scanner and associated software continues to decrease.
- Can be just as accurate as conventional surveying **if the point cloud is well calibrated to a survey control network.**

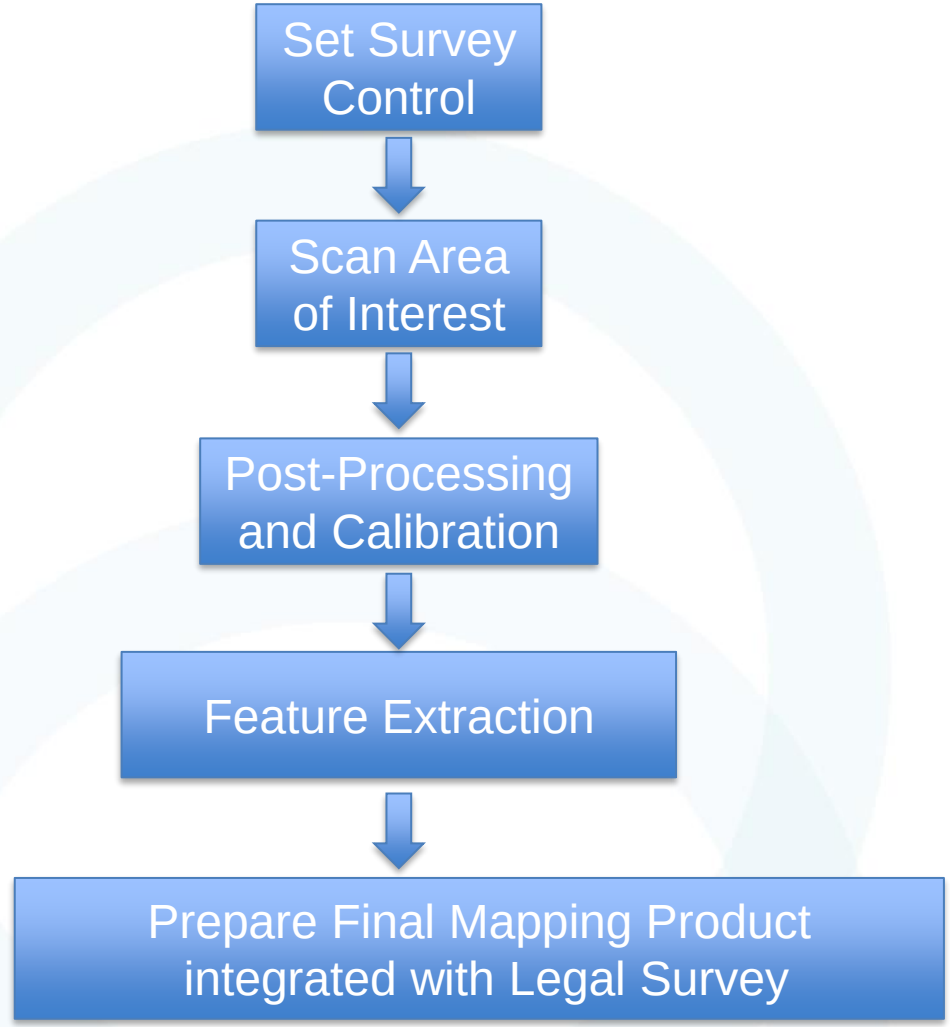


Terrestrial lidar scan next to a surveyed control point target.

LiDAR (Light Detection and Ranging)

- **Workflow:**

1) Set horizontal/vertical control points and survey with conventional methods. Black/white targets or painted chevrons allow control points to be seen in the point cloud.
2) LiDAR scan area of interest ensuring all required features and targets are captured.
3) Post process scanned area in the office to ensure accuracy and spatial alignment.
4) Extract features (survey points and lines) from point cloud using TopoDOT and CAD software.
5) QC completed CAD drawing, edit any errors, and integrate with boundary lines to prepare final mapping product.



LiDAR (Light Detection and Ranging)

Example of LiDAR point cloud on Booth Street and Gladstone Ave:

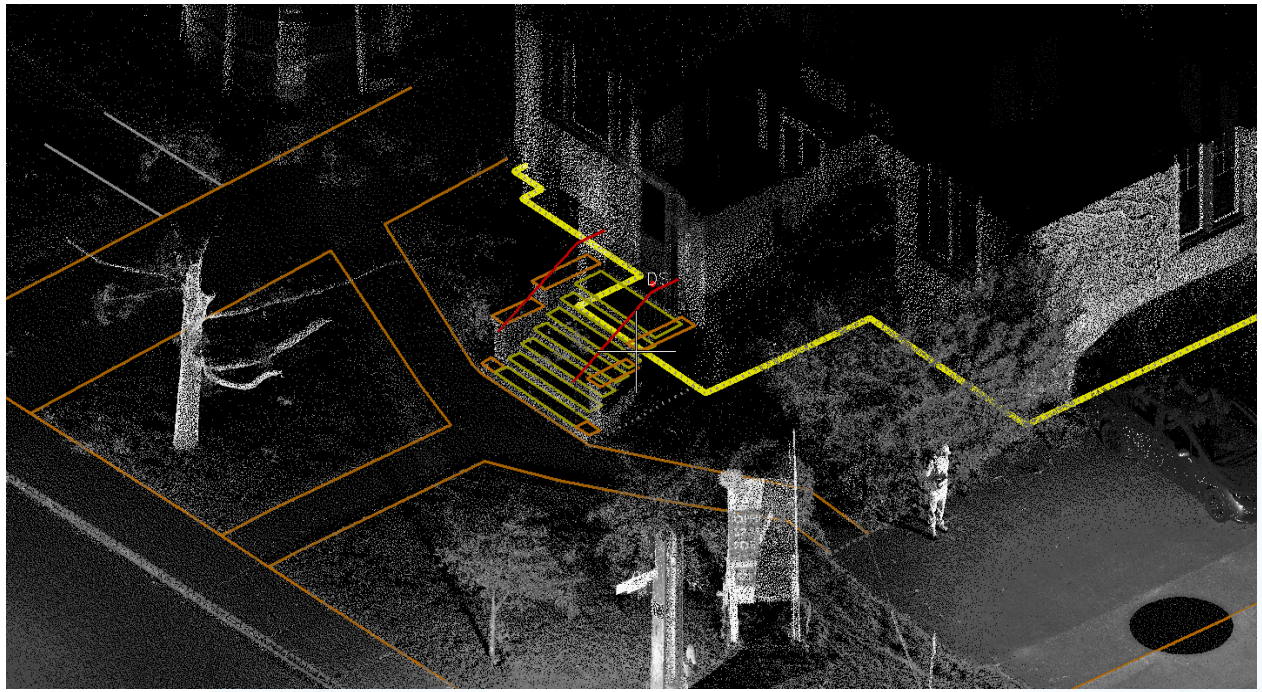
- Project was captured using a terrestrial LiDAR scanner in multiple areas and registered together using surveyed control points.
- LiDAR scanner was placed in strategic locations near the edge of the sidewalk to capture all areas of the road without needing to work within traffic lanes.
- Several photos were taken by the terrestrial scanner after the laser phase was complete. These photos were then automatically calibrated with the point cloud to colourize it.

LiDAR (Light Detection and Ranging)

Applications in Urban Planning and Construction:

- Existing infrastructure and topographic mapping to be used for pre-construction surveys for urban planning purposes.
- Maps and survey plans can be generated by surveying the point cloud in the office rather than in the field.
- Large areas of the city can be quickly scanned for asset management purposes.

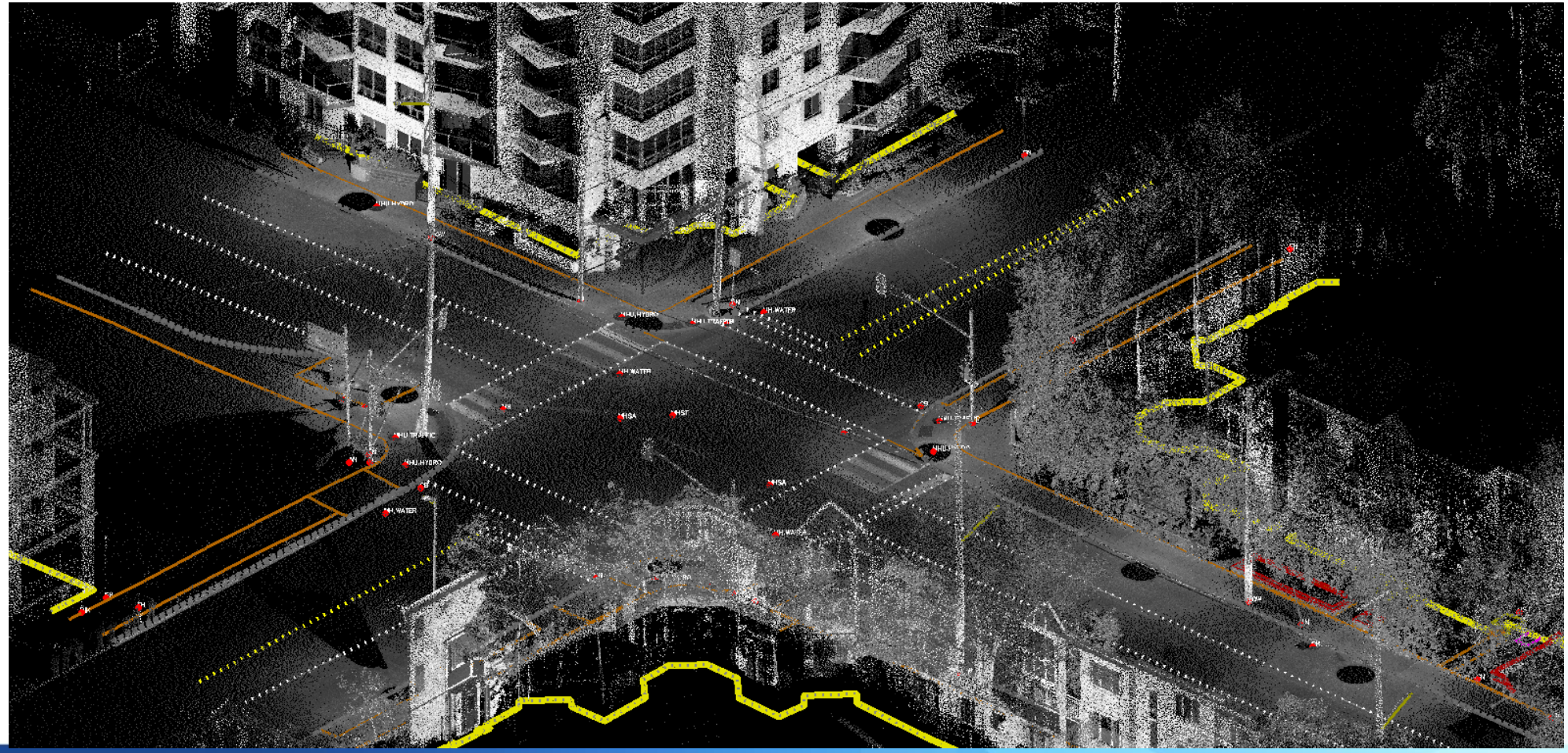
- Ability to Integrate/Audit with conventionally captured topographic and legal survey monuments.



Example of a surveyed building property using point cloud as a reference.

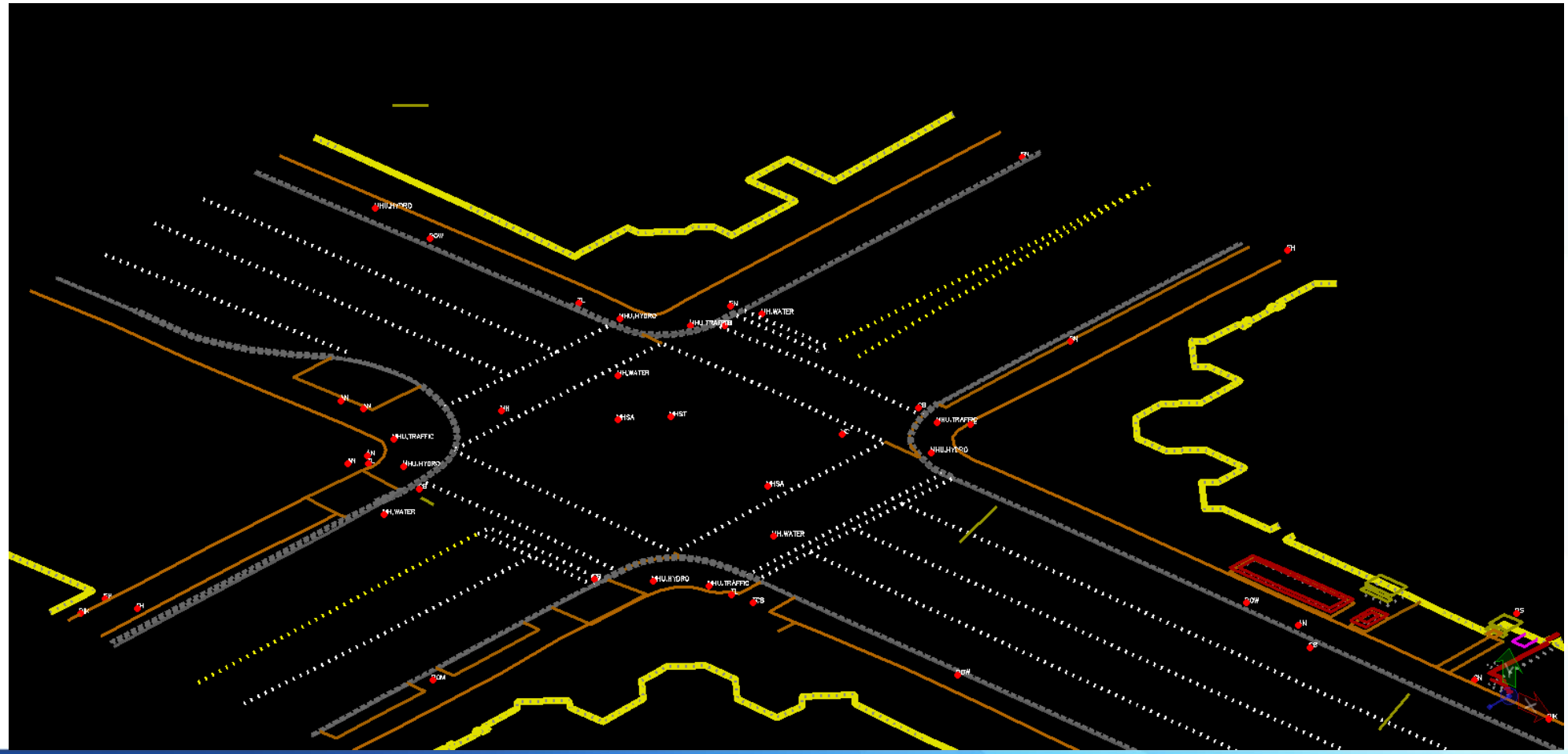
LiDAR (Light Detection and Ranging)

Example of Feature Extraction using TopoDOT



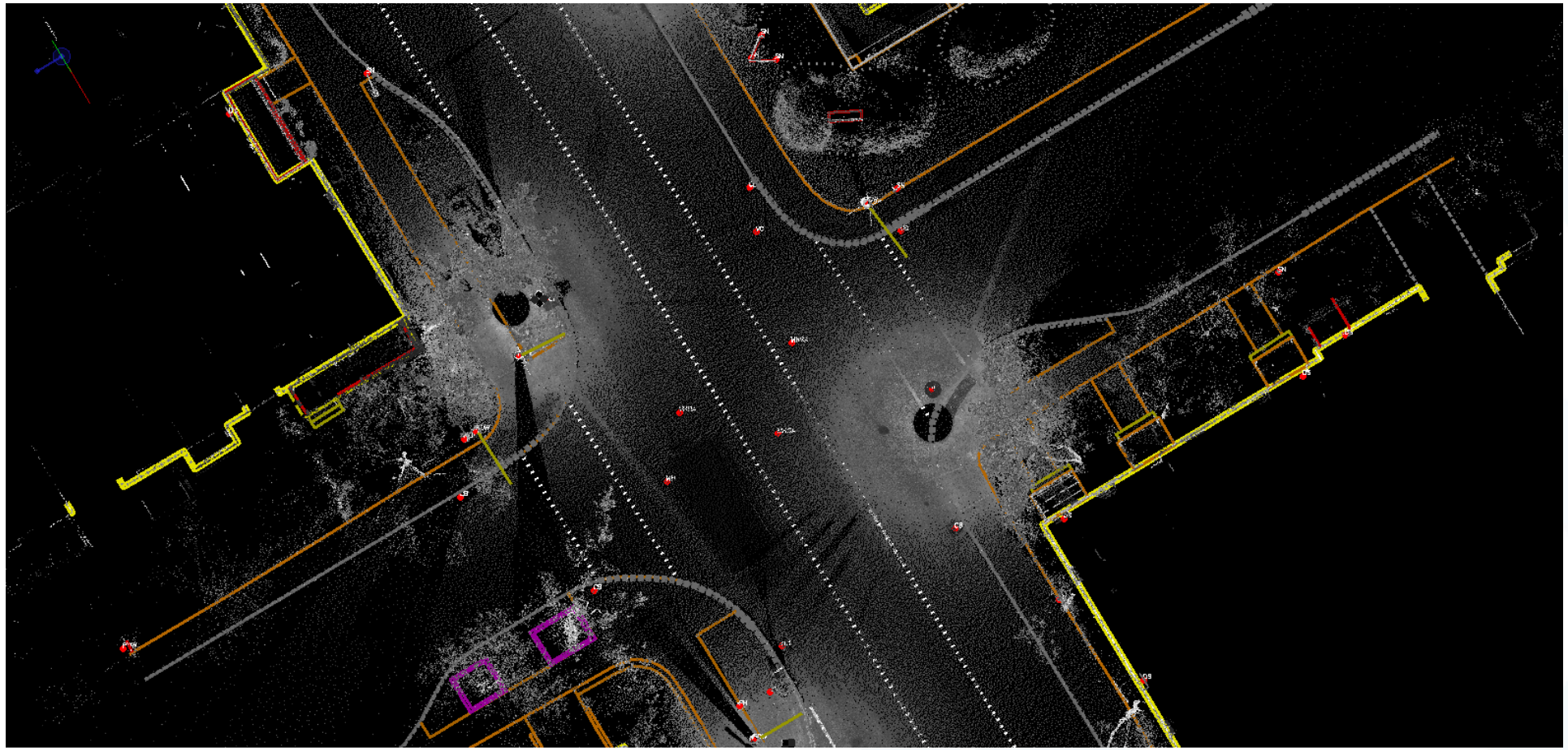
LiDAR (Light Detection and Ranging)

Example of Feature Extraction using TopoDOT



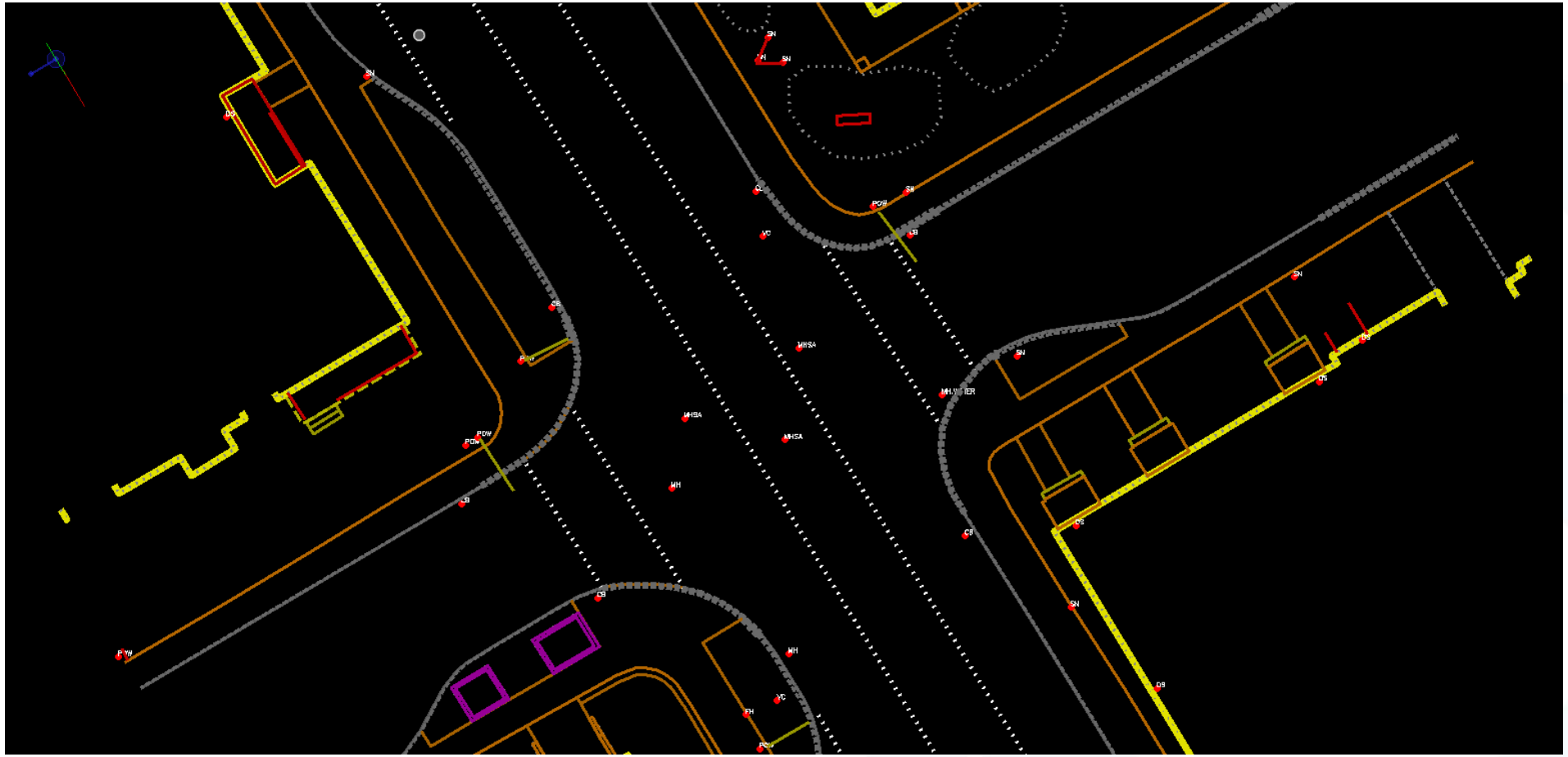
LiDAR (Light Detection and Ranging)

Example of Feature Extraction using TopoDOT



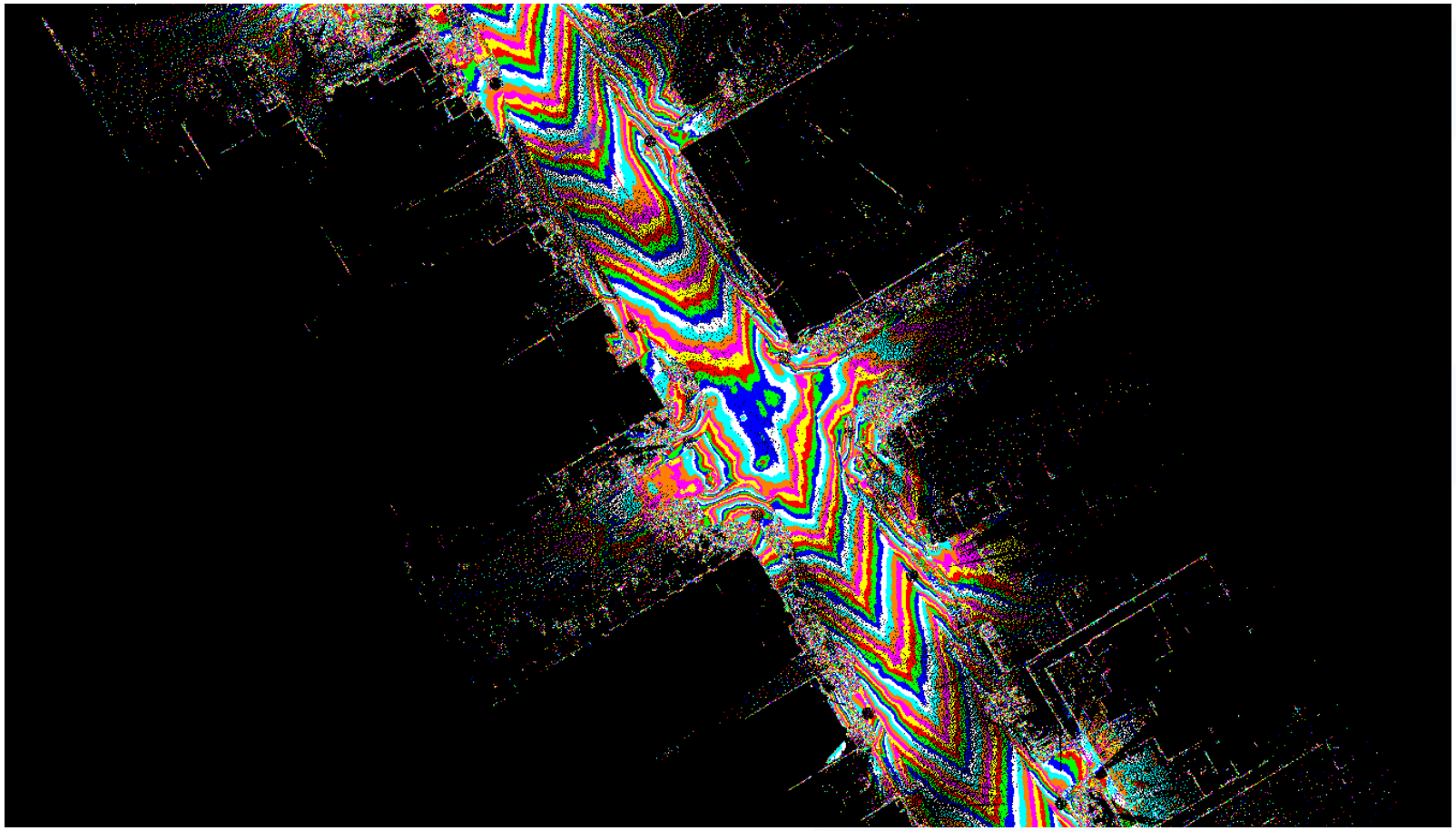
LiDAR (Light Detection and Ranging)

Example of Feature Extraction using TopoDOT



LiDAR (Light Detection and Ranging)

Point Cloud on Kent Street Showing Coloured Contours (1cm Elevations)



Most important thing to remember when working with topographic mapping is to …..

KNOW WHAT DATUM YOU ARE WORKING WITH.

Questions?

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References:
https://natural-resources.canada.ca/science-data/science-research/geomatics/geodetic-reference-systems/canadian-spatial-reference-system-csrs#csrs

https://webapp.csrs-scrs.nrcan-rncan.gc.ca/geod/tools-outils/nad83-docs.php

https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/geomatica.pdf

Thank you for your attendance and
participation in the 2025 spec updates process.

We look forward to working with you as part of the 2026 spec updates!

Standardssection@ottawa.ca