2023 Standard Tender Documents for Unit Price Contracts

Information Session

March 8th, 2023

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Our partners… Thank you!

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Opening Remarks

- Welcome
- Agenda
- Presenters
  - Harry Alvey - Standards and Quality Management
  - Eslam Maher - Standards and Quality Management
  - Sandra Majkic - Standards and Quality Management
  - Everett Paulin - Standards and Quality Management
  - Kunjan Ghimire - Neighbourhood Traffic Calming
  - Bill Harper - Surveys and Mapping
  - Chris Miller - Drinking Water Services

Agenda

1. Spec Update process
2. Access to specs (SharePoint)
3. Spec Updates
   1. OPS Updates and Master Item Listing
   2. GC update
   3. D series updates
   4. General working group
   5. Water/Sewer working group
   6. Transportation working group
   7. New NSSPs, use of NSSP library
   8. Parks detail drawings
   9. Material Specifications and approved products

Agenda

4. Messaging
    1. Deviation Process
    2. ROW Cross Sections
    3. Tender preparation
5. Work In Progress
    1. Sewer Design Guideline updates
    2. Accessibility during construction

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Agenda

6. Future Work
    1. Pedestrian Facility Design Guideline
    2. FUS Method
    3. R10 trench reinstatement policy
    4. Broadband backup alarms

Networking Break (30 minutes)

7. Invited Presentations
    1. Speed Humps and Speed Tables
    2. Drinking Water Services
    3. Surveys and Mapping

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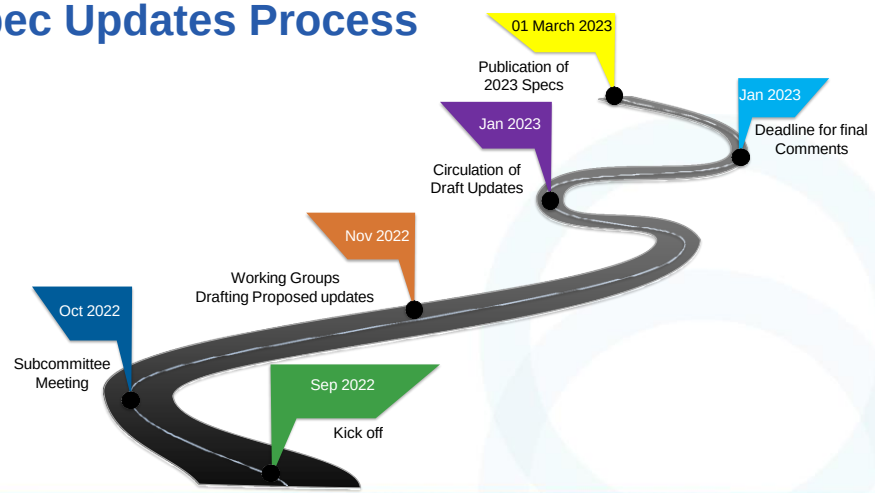
Spec Updates Process



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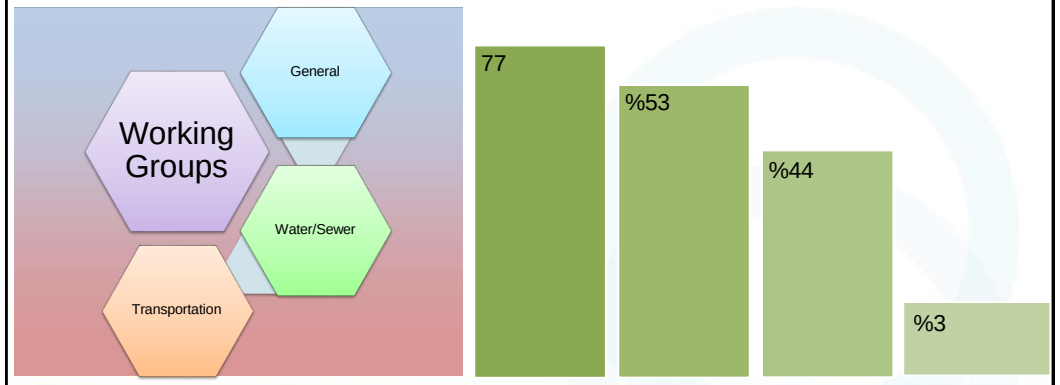
Working Groups / sub committees



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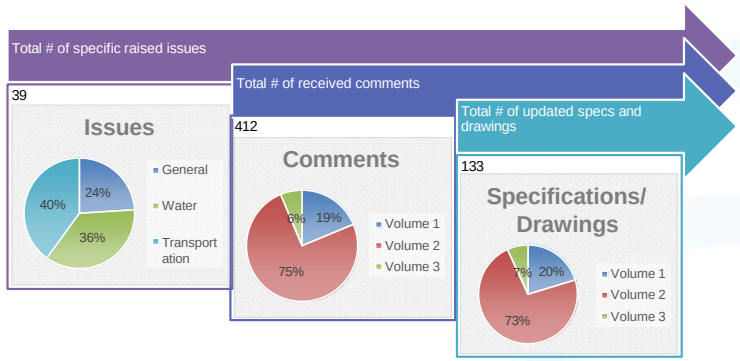

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Access to SharePoint

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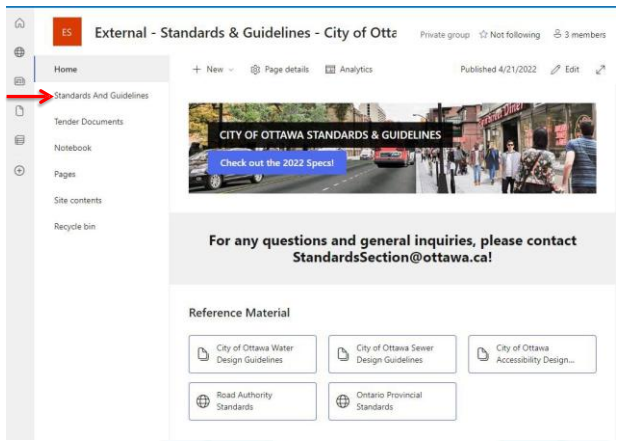
Access to Specs

Current access – SharePoint

Contact: StandardsSection@ottawa.ca



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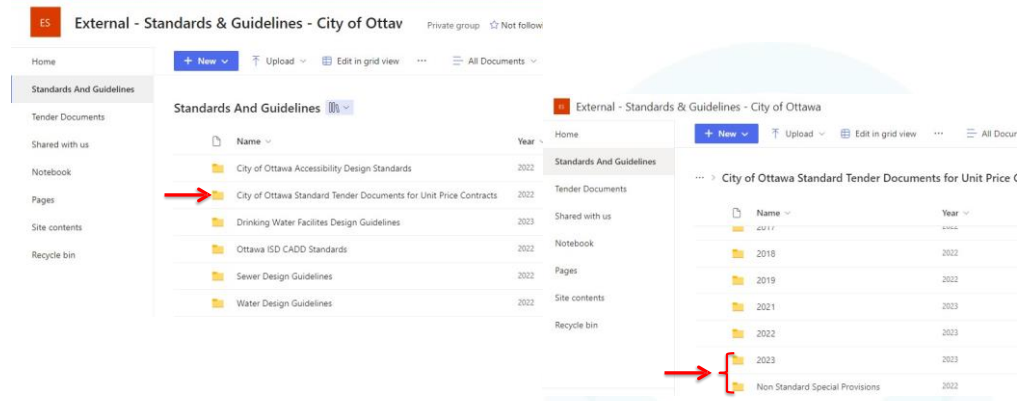
Access to Specs



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OPS Updates and Master Item Listing

- OPS Listing included revisions from Apr 2022 and Nov 2022
- Minor changes required
- April 2022: OPSS 220,771, 810, 1540, 2423
- November 2022: OPSS 202, 615, 773 (NEW), 811, 812, 908, 911, 1212,1504,1505, 2422

- Several new items added
  - OPS updates: Wildlife fencing, combination railing and inspector guard
  - City spec updates: speed hump/ table, directional TWSIs, concrete half height curb, delineator plates.

GC Updates

- Updated requirements for as-built drawings 3.02.08.

.08 Where Working Drawings are required by the Specifications, the Contractor shall, in all cases submit seven copies for review of which two copies shall be returned to the Contractor. The Working Drawings shall conform in size to the Contract Drawings. Subsequent to final review by the Contract Administrator and prior to Final Completion, the Contractor shall provide to the Owner one PDF of all Working Drawings for components permanently incorporated into the work. The PDF drawing shall include all revisions and shall reflect the as-built condition of the components.

a) Maintain an up to date copy of project "as-built", redline markups of Issued for construction drawings, onsite

b) Record Discrepancies and changes from contract documents caused by site conditions or by changes ordered by the Contract Administrator. Record deviations in red ink clearly and accurately, using industry standard drafting procedures consistent with quality and standards of Consultants documents.

c) Record all changes made during construction by any of the Contractor's forces or those of their subcontractor(s);

d) Record location of all existing and new underground utilities and services. Before commencing any backfilling, obtain accurate measurements and information concerning their location and depth.

e) All underground infrastructure be recorded to within 10 mm accuracy for vertical elevations, 10 cm for horizontal location and digitized approved drawings be uploaded as part of final sign off from the Contractor"

f) Update these drawings and make available for monthly review by the Contract Administrator. Drawings not maintained up-to-date will be considered as stipulated deductions for the purposes of progress payment certificates at an amount of $1000/drawing;

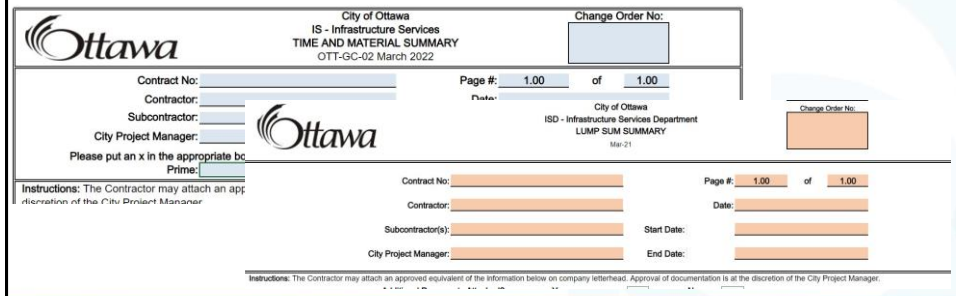
g) Certificate of Completion will not be issued until record drawings are complete and submitted to the Contract Administrator;

h) Submit the "Project Record Copy" Electronic copy with white prints of each drawing to the Contract Administrator at the time of Substantial Performance.

.09 The Contractor warrants that all Working Drawings submitted shall complement each other and allow for the proper co-ordination of the components of the Work.

OTT Forms

- OTT-GC-03 (Password protected)
- OTT-GC-02 (Updated formula to comply with GC section 8.02.05.08)
- OTT-9040-01 (Updated reference.)



City of Ottawa
IS - Infrastructure Services
TIME AND MATERIAL SUMMARY
OTT-GC-02 March 2022

Change Order No:

Contract No:
Contractor:
Subcontractor:
City Project Manager:
Please put an x in the appropriate bo
Prime:

Page #: 1.00 of 1.00

Instructions: The Contractor may attach an app
discretion of the City Project Manager.

City of Ottawa
ISD - Infrastructure Services Department
LUMP SUM SUMMARY
Mar-21

Change Order No:

Contract No:
Contractor:
Subcontractor(s):
City Project Manager:

Page #: 1.00 of 1.00
Date:
Start Date:
End Date:

Instructions: The Contractor may attach an approved equivalent of the information below on company letterhead. Approval of documentation is at the discretion of the City Project Manager.

D Series Updates

D-023-B Quality Verification Engineering Services

Experience requirements have been revised – the years of required experience is post receipt of licence. References for previous projects must be available on request.

D-032B Appendices A, B, and C – Protection of Species at Risk and Wildlife Protocol

Legal status of barn swallow has changed.

General Working Group

- Review of soil parameter and foundation requirements for noise walls
- Updates to various specifications and standard detail drawings to align with the new ROW cross sections
- Clarification to fuel price adjustment application
- Clarification to QVE requirements
- Review of flowable fill (cellular concrete) definition and requirements
- Updates to Parks detailed drawings and specifications
- Capturing as built information for underground cable ducting at and/or connecting to signalized intersections

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General Working Group

- F-1002 Fuel Price Adjustment
  - Adding Clarification to the Fuel price adjustment application to avoid compounding charges in next invoices
  - The description for item A080.01 within the master item list currently shows: “ADJUSTMENT TO FUEL PRICE INDEX”.

A payment adjustment will be calculated using monthly progress payment amounts (not including any previous fuel price adjustments) and the change between the fuel price index for the month of tender, and fuel price index when the work was completed. The Contractor shall submit the form contained in this specification when both the monthly progress payment amount and the monthly fuel index is known. Payment will be included on the next possible progress payment

Fuel Price Adjustment Calculation

A monthly progress payment adjustment will be made when the fuel index for the progress payment month differs by more or less than 15% from the fuel index for the month of the tender closing date. When the fuel index differential is less than 15%, there will be no pay adjustments made.

The progress payment amount will be calculated by multiplying the monthly progress amou (not including any previous fuel price adjustments) by the “impact percentage”, which is pr determined to be 7%, to establish the dollar amount of fuel in the tender. This amount is multiplied by percentage change in the fuel indexes after allowing for a 15% buffer.

WARRANT: On Contracts over $5,000,000 and all overlay Contracts.

Progress Payment Value must not include any previous fuel price adjustments.

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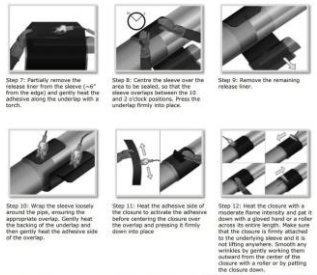
Water/Sewer Working Group

- No changes regarding rear yard drainage – consultation will continue.
- Minor change to R10 to clarify bedding requirements.
- HDPE profile wall culverts for private approaches only.
- HDPE culvert liners may have soil tight joints if they are subsequently heat-shrink wrapped.



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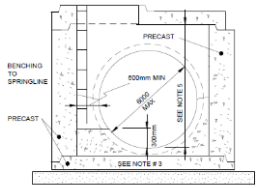
Water/Sewer Working Group

- Hydrant lead depth clarified as maximum 2.85 m.
- Clarified requirements for the supply of self-levelling frames and covers as part of the existing specification.
- Large diameter sewers are only required to be benched to the springline.



NEW MHs WITH NEW PIPE

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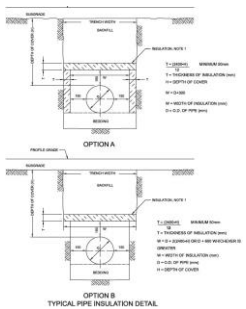
Water/Sewer Working Group

- New shallow sewer insulation detail.
- New MECP design criteria to be incorporated as part of the next update.



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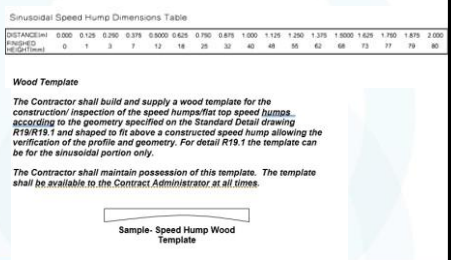
Speed Humps/Tables and Raised Crosswalks

- Guidance provided in TAC and City's *Traffic Calming Guide* as well as *Local Residential Streets 30km/h Design Toolbox*
- Standards available for
  - Speed Hump: R19 (2006)
  - Speed (~~Flat Top~~)Table: R19.1 (2016)
  - Concrete raised crosswalk R15 (2001)
- Height (80mm) and sinusoidal profile in accordance with national guidelines and standards

Transportation Working Group

Speed Humps/Tables and Raised Crosswalks

- Project observations:
  - "Don't appear to be raised"
  - "Too high", "cars bottoming out"
  - "No impact on speed"
- Past updates included:
  - Speed humps:
    - sinusoidal profile requirements detailed
    - tolerance +/-13mm added
    - developed a NSSP
  - Raised crosswalk
    - Reinforcement requirements
    - Asphalt crosswalks



Sinusoidal Speed Hump Dimensions Table

DISTANCE(m)	0.000	0.125	0.250	0.375	0.5000	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.5000	1.625	1.750	1.875	2.000
FINISHED HEIGHT(mm)	0	1	3	7	12	18	25	32	40	48	55	62	68	73	77	79	80

Wood Template

The Contractor shall build and supply a wood template for the construction/ inspection of the speed humps/flat top speed humps according to the geometry specified on the Standard Detail drawing R19/R19.1 and shaped to fit above a constructed speed hump allowing the verification of the profile and geometry. For detail R19.1 the template can be for the sinusoidal portion only.

The Contractor shall maintain possession of this template. The template shall be available to the Contract Administrator at all times.

Sample- Speed Hump Wood Template

Transportation Working Group

Speed Humps/Tables and Raised Crosswalks

- Latest best practices:
  - Design: Context very important; not considered a "silver bullet" for speed reduction
  - Height: "Sweet spot" between 70mm and 90mm
  - Construction: Hard to construct; different methods can be used to achieve desired profile and height; different measurement and after construction survey methods available and suggested to confirm requirements of the final product.
- 2023 Updates for Speed Hump/~~(Flat Top)~~Table (revised R19 and R19.1)
  - Finished height 80-90mm
  - NEW F-3701 for speed humps and speed tables to indicate that both height and sinusoidal profile shall be achieved during construction
    - New items L355.01 and L355.02
    - For QA, indicate that **template shall be used** to verify both, height and profile.
- Updates Raised Crosswalk
  - Finished height 80-90mm (R15.1)
  - NEW R15.3 (plan view)

Transportation Working Group

Speed Humps/Tables and Raised Crosswalks

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Transportation Working Group

- City's *Protected Intersection Design Guide* (2021) contact Emmett.Proulx@ottawa.ca
- Protected intersections are designed to make it safer for vulnerable road users in the approach and when crossing intersection.
- Safety for all users and universal design
  - Detectable delineation between sidewalks and cycle tracks
  - More attention TWSIs
  - Directional TWSIs (single or double wide)
  - Gutter curb (transition from MUPs)= additional cane detectable delineation

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Transportation Working Group

- Ambitious task ⟹ bridges, bus stops, driveways and private accesses, ride-over and cycle friendly bulb-outs, parking bays as well as boulevards, streetscaping and frontage zones.
- 16 NEW 2023 standard detail drawings
  - existing standards and design elements (i.e., read in conjunction) used wherever possible to reduce the need for novel design/construction and minimize cost impacts

...but be warned that new details…

- do not cover all possible road classifications, contexts, or design priorities that may be pertinent and different to each project
- are intended to give a place to start in the design process to assist in developing cross sections and costing estimate

- NOTE: where shown, traffic control devices such as accessible pedestrian pushbuttons (APS), pavement markings, symbols, green thermoplastic, or signage are illustrative to assist in conveying the intent; typical circulation, review process, signal design and or pavement marking review and approvals by City staff still required.

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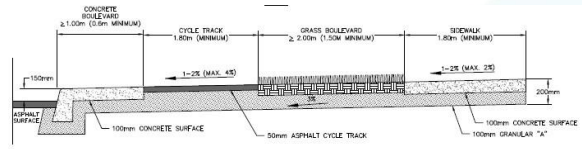
Delineation between sidewalk and cycle track



NEW SC 41.1 Typical Cycle Track and Sidewalk With Immediate Boulevards

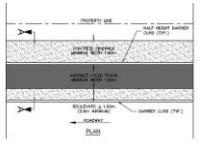
- Where an intermediate landscaped boulevard can be provided between the cycling facility and the sidewalk, this would constitute adequate separation for accessibility.

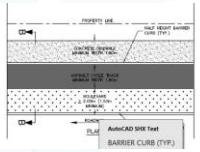
Transportation Working Group

… but, what if cycle track and sidewalk are adjacent

– Focus on implementation of the half heigh curb 60+/-10mm

NEW SC 41 Typical Cycle Track and Sidewalk with Half-Heigh Curb





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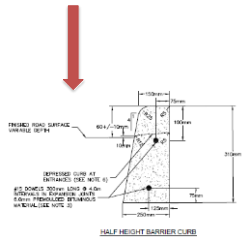
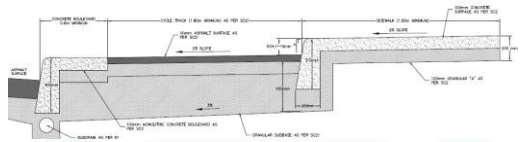
- NEW SC33 Half Height Curb and Monolithic Sidewalk
- F-3531 updated
- New item L260.08- Concrete half height curb





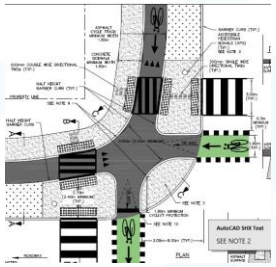
Monolithic construction whenever possible

Transportation Working Group

- Implementation as per guiding principles for accessibility considerations within the typical geometry of a protected intersection:
  - STRAIGHT PATH OF TRAVEL
  - Half height curb separation
- Storage space for queued cyclists
- Pedestrian storage between roadways and cycle tracks
- Reduced corner radii and crossride offset

NEW SC31-Typical Standard Protected Corner at Signalized Intersection

- Apply accessibility lenses
- Directional TWSIs should be limited where straightest path of travel is not intuitive



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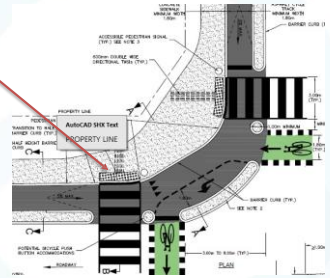
- NEW SC31.1. Typical One Stage Protected Corner at Signalized Intersection
  - When pedestrians' storage area cannot be accommodated
  - Increases pedestrian crossing distances
- Use standard protected corner whenever possible
- Maintain consistency with protected intersection quadrants



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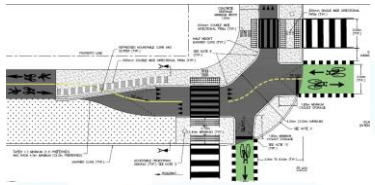
- NEW SC31.2. Typical Multi-Use Pathway at Standard Protected Corner (SI)
  - Double-wide directional TWSIs
  - Gutter curb for separation



… and there are more NEW details:

- SC32. Typical Sidewalk and Cycle Track (UI)
- SC36.and SC36.1 for private entrances (constrained and unconstrained conditions)
- SC37, SC37.1 and SC37.2 for commercial entrances
- SC38and SC38.1 for transition from bicycle lane to cycle track
- SC39 and SC39.1 for transitions between cycle tracks and bicycle lanes
- R29.2 Ride–Over Bulb-Out at Intersection

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Main goal: Consistent implementation of delineation between cycle tracks and sidewalks

- Planning and design challenges
  - Cost impact
  - Site constraints, property acquisition, utilities impact
- Additional guidance

- Construction challenges
  - Grading implications
  - Elevation points, finished elevations to match
  - More details may need to be provided, project teams working closely during construction
  - Check, check, check!!!

Transportation Working Group

We have not resolved it all ☹ → ~~bridges~~, ~~bus stops~~, driveways and private accesses, ride-over and cycle friendly bulb-outs, ~~parking bays~~ as well as boulevards, ~~streetscaping and frontage zones~~.

- Structures (pending)
- Drainage and catch basin
  - Avoid negative drainage wherever possible, if not consult with Standards Unit
- Interaction zones at bus stops – Consult OC Transpo (daniel.richardson1@ottawa.ca)

Work continues and your input is important!

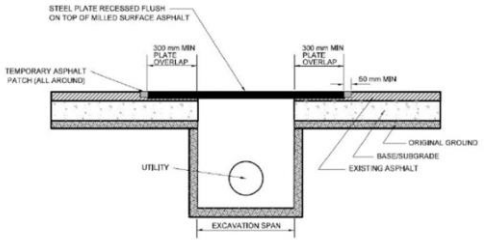
Transportation Working Group

F-1021 Steel Plates Over Open Excavations – New specification

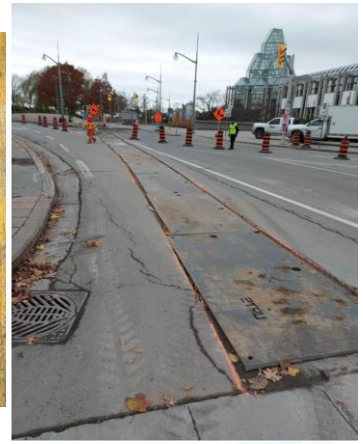
Transportation Working Group

There is a requirement that all road plates now have a minimum coefficient of friction of 0.35.

This is the minimal requirement for the installation of Steel Road Plate over excavations if plates are to be left in place for 72 hours or longer.



Gripsur Coating



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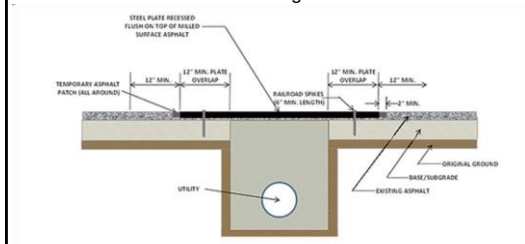
This is the preferred method of installing Steel Road Plate over excavations when the plates are to be installed for 72 hours or longer.



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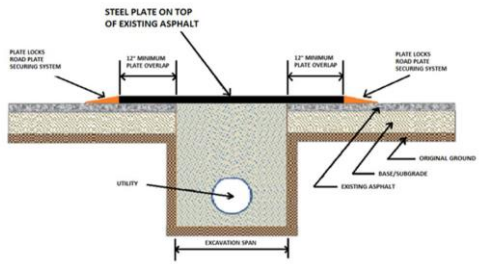
For long term installations (>= 72 hours) there is an alternate method for installing steel road plate over excavations using Plate Locks.



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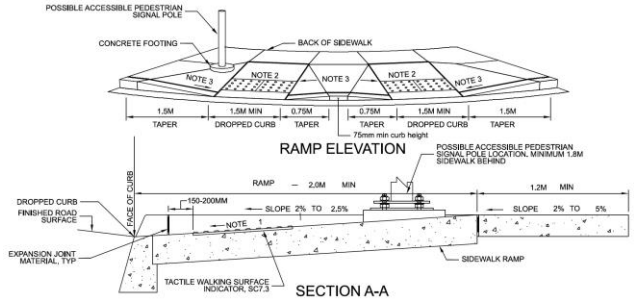
New detail drawing – SC7.5 Concrete Sidewalk Ramps at Signalized Intersections.



Pilot project ongoing since 2019. This is considered more a more accessible approach in certain situations.

NSSPs

This year we are implementing a new Master Specification Format.

We have revised one Non Standard Special Provisional (NSSP) that has been revised for clarity.

- Noise Barrier

There are two new NSSP specifications we are providing this year.

- Material Specification for Flowable Fill
- Construction Specification for Hot Mix Asphalt Safety Tapered Edges

Noise Barrier

- The revision is to the formatting and to the subsection titled Soil Parameters.
  - The previous wording was:

S.P. No: F-XXXX
Date: XXX. 2023
Page 1 of 1

MASTER SPECIFICATION FORMAT

TABLE OF CONTENTS

Soil Parameters

The soil design parameters for the design of footings can be found in _____. Geotechnical Investigation Report No. _____, name_____ dated _____ __, 20__.

The Geotechnical Report is available for the designer.

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NSSPs

This has been revised to:

04.01 Soil Parameters

The soil design parameters for the design of footings shall meet the following requirements:

Soil Design Parameters

	Soil Design Parameters		
		Bearing Pressure	
Location/Station	Ø	SLS (kPa)	ULS (kPa)

The Geotechnical Report by _____ titled _____ dated _____ is available for reference upon request.

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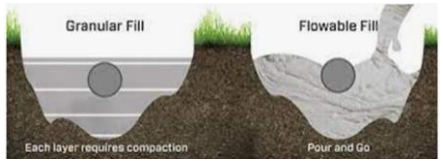
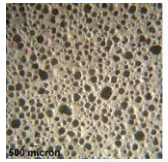
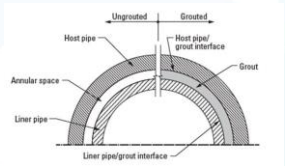
NSSPs

Material Specification for Flowable Fill

- This material is known by many names such as Controlled Low Strength Material (CLSM), Lightweight Cellular Concrete (LCC), Grout, Flowing Concrete, Self Leveling Concrete, U-Fill, and Unshrinkable Fill/Backfill.
- Cured compressive strength of flowable fill shall range from 0.40MPa to 1.75MPa depending on the application.
- This does not include cement mixtures that include Polystyrene, ISOFILL™ or other insulating materials use to replace aggregate and make the concrete lightweight or provide thermal properties.
- The intent is to use flowable fill for utility trench back filles when the native soil is clay, for filling annular space in jack and bore installations, and in place utility abandonment.
- This is being issued as a NSSP this year with the hope of turning it into a Special Provision specification next rollout.







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NSSPs

Construction Specification for Hot Mix Asphalt Safety Tapered Edges

- This specification is being rolled out to increase safety along rural roads. It is to be used on any rural road cross-section unless one of the following conditions is present:
  - There is guard rail adjacent to the pavement edge such that vehicles would not leave the pavement;
  - There are curbs installed;
  - Or there is sufficient paved shoulder that a vehicle can safely pull off the adjacent drive lane with out driving on a gravel shoulder.
- There are several studies that show this increase the ability of a driver to safely recover their vehicle if they drive off the edge of the pavement.

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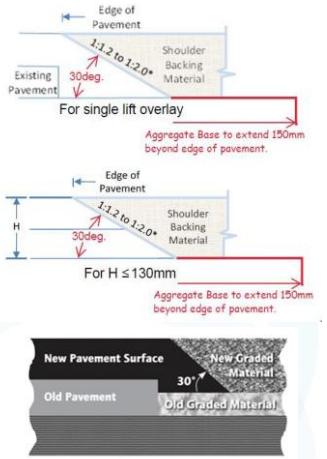
NSSPs

Construction Specification for Hot Mix Asphalt Safety Tapered Edges

- The intent is to have a pavement edge constructed so that it has a 30-degree surface from the horizontal projection of the pavement surface.



NSSPs

Construction Specification for Hot Mix Asphalt Safety Tapered Edges

- The cost of providing the Safety Tapered Edge has been found to be less than 1% of the total asphalt cost.
- The 30-degree angle can be achieved easily with the purchase of off-the-shelf paving shoes (less than $8,000 for a pair installed).

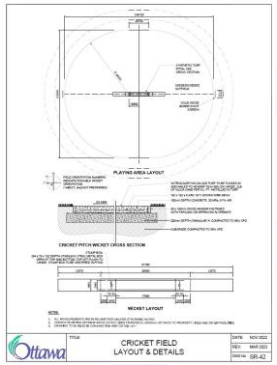

(right side mounted Ramp Champ)

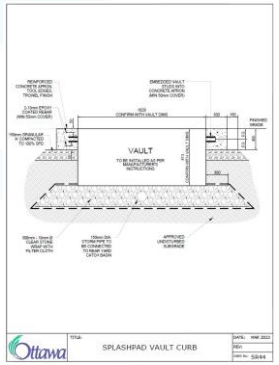

(left side mounted RC)

- This is being issued as a NSSP this year with the hope of turning it into a Special Provision specification next rollout.

Park Standard Detail Drawings

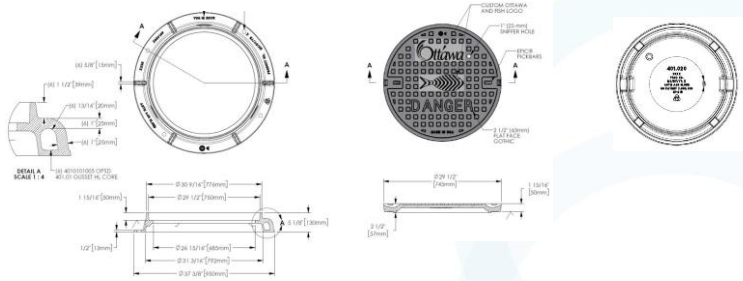
- There are several Park Standard Detail Drawings that have been revised this year.
- These details are F13, F14, PA01, PE01, PE03, SI11, SI12, SI13, SI14, SI17, SR1, SR2, SR3, SR7, SR27, SR28, SR29, SR36, and W31.1.
- There are two new Park Standard Detail Drawing - SR42 and SR44.





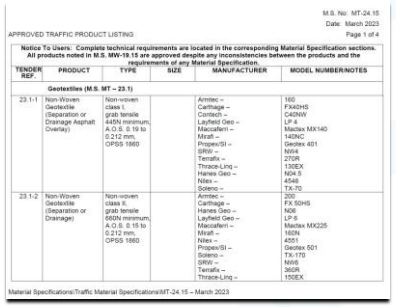
Material Specifications

- New reduced weight frames and covers – must be interchangeable with current design.



Material Specifications

- HDPE pipe for lateral pipe bursting.
- Traffic items now part of the new Traffic Approved Product Listing.



M.S. No: MT-24.15
Date: March 2023
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APPROVED TRAFFIC PRODUCT LISTING

Notice To Users: Complete technical requirements are located in the corresponding Material Specification sections. All products noted in M.S. MW-19.15 are approved despite any inconsistencies between the products and the requirements of any Material Specification.

TENDER REF.	PRODUCT	TYPE	SIZE	MANUFACTURER	MODEL NUMBER/NOTES
	Geotextiles (M.S. MT – 23.1)				
23.1-1	Non-Woven Geotextile (Separation or Drainage Asphalt Overlay)	Non-woven class I, grab tensile 445N minimum, A.O.S. ≤ 150 to 0.212 mm, OPSS 1860		Armtec – Carthage – Contech – Layfield Geo – Maccaferri – Mirafi – Propex/SI – SRW – Terrafix – Thrace-Linq – Hanes Geo – Nilex – Solenc –	160 FX40HS C40NW LP 4 Mactex MX140 140NC Geotex 401 NW4 270R 130EX NO4.5 4548 TX-70
23.1-2	Non-Woven Geotextile (Separation or Drainage)	Non-woven class II, grab tensile 660N minimum, A.O.S. ≤ 150 to 0.212 mm, OPSS 1860		Armtec – Carthage – Hanes Geo – Layfield Geo – Maccaferri – Mirafi – Nilex – Propex/SI – Solenc – SRW – Terrafix – Thrace-Linq –	200 FX 50HS NO6 LP 6 Mactex MX225 160N 4551 Geotex 501 TX-170 NW6 360R 150EX

Material Specifications\Traffic Material Specifications\MT-24.15 – March 2023

Material Specifications

- TWSI requirements updated – new directional TWSIs and delineator plates.
- AWWA C515 DI (reduced wall) valves approved, C509 valves will be allowed in 2023 only.
- Main stops shall be ball type only, plug type no longer approved.

KEY MESSAGES

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Deviation Process

- Existing process remains in place, based on directive and Water Design Guidelines/Sewer Design Guidelines.
- Where an alternative method, technology or product is proposed, Director level sign off is required.
- Proponent to work with City PM (Infrastructure Services or Development Review), who will contact the Standards Unit.
- A report is required detailing proposal, location, and long-term impacts.
- Following circulation, the PM will seek approval from the Director.
- Decisions are made without precedent and do not cover subsequent requests.
- Recurring issues may be referred to spec updates for further discussion.
- Future revisions to the process are being considered, especially regarding ROW cross sections.

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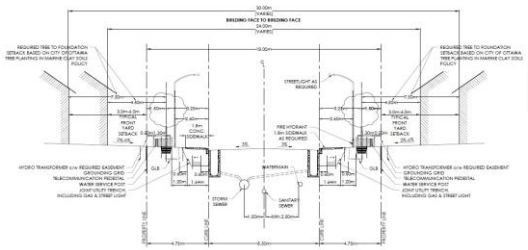
ROW Cross Sections

- Updates occurred in 2022 as part of IWSTB-2022-01.
- New 14.75, 18 and 20 m sections, all other drawings depreciated.
- Old details, such as the laneway detail, may still be used. Please consult with Development Review.



Tender Preparation

Time is of essence!

- Process detailed in Tender Outline (Section A_B)
- Review your package in detail before sending to program clerks
- Check the current version of the Standard Tender Documents is used/dates on specifications important
- Notification of stimulus funds is provided (if applicable)
- PM's required to prepare addendums
- Check NSSP library

ADDENDUM No.1

CPXXXXX- Project Title

Date:

The Following modifications and clarifications are to be made and taken into consideration for the above referenced project and shall become a part of any resulting contract.

Instructions:

Clarification:

Questions & Answers:

For further information, please contact XXXX, Procurement Officer, Supply Services

End of Addendum #1

Work In Progress

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Sewer Design Guidelines

- Committee formed in January 2020.
- Feedback received from Ottawa-area consultants and City staff.
- Ongoing meetings to discuss issues and find solutions.
- Assignment to completely revise Chapter 7 Stormwater Facilities in progress, to be complete this fall.
- Consultation period expected in December 2023.
- Publication planned March 2024.

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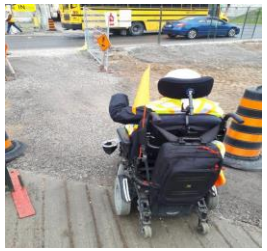
Accessibility During Construction

- Accessibility requirements F-1013
- **Construction Site Pedestrian Control Plan** –safe and accessible path of travel through and/or at construction site at all times
- Accessibility assessments continue this construction season



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Future Work

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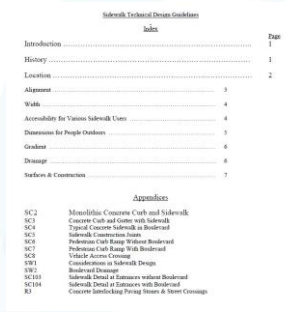
Pedestrian Facility Design Guidelines

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



Sidewalk Technical Design Guidelines

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Appendices

FUS Method

- The City's approach to fire protection for rural properties was clarified as part of ISTB-2021-03.

Fire Demand Calculation Method

Replace section 4.2.11 in its entirety with the following:

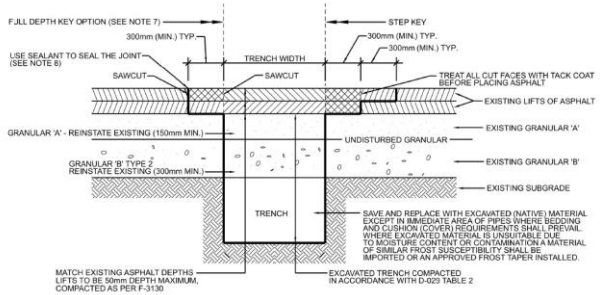
When calculating the fire flow requirements and affected pipe sizing, designers shall use the method developed by the Fire Underwriters Survey and follow the protocol for application of the method as provided in Appendix H: Protocol to Clarify the Application of the Fire Flow calculation method Published by Fire Underwriters Survey (FUS).

The requirements for levels of fire protection on private property in urban areas are covered in Section 7.2.11 of the Ontario Building code. If this approach yields a fire flow greater than 9,000 L/min then the Fire Underwriters Survey method shall be used to determine these requirements instead. The requirements for levels of fire protection on private property in rural areas are based on the FUS method in all cases.

- Discussions are ongoing about this approach with members of the design community.

Road Cut Reinstatement and R10 Review

Currently reviewing existing road cut reinstatement process, policies and our R10 standard detail.
This is ongoing work with the intention of putting out new reinstatement policy with possible revision to R10.



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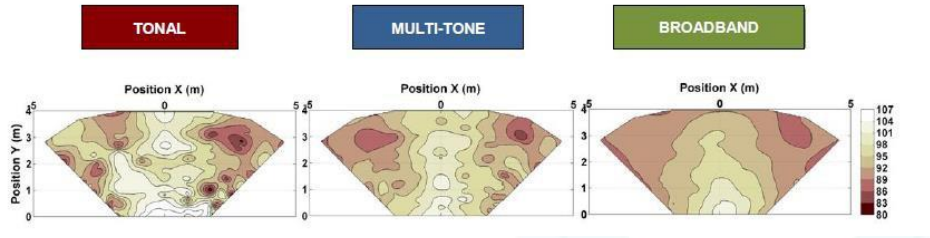
Broadband Backup Alarms

- We have a Pilot Project in progress currently performing a desktop study of reports, and studies on the effeteness of broadband backup alarms compared to tonal alarms.
- The intent is to see if the City should move to a requirement for the use of broadband backup alarms to increase onsite safety, reduce noise pollution and residential noise complaints.



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Networking Break

(30 min)

Invited presentations to follow.

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Speed Humps and Speed Tables

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Drinking Water Services

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Surveys and Mapping

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Closing Remarks

Thank you for your attendance today and your participation in the 2023 spec update process.

We look forward to working with you as part of the 2024 spec updates!

Contact: Standardssection@ottawa.ca