



COUNCIL REPORT
Engineering and Public Works Division
For the August 13, 2019 Council Meeting

DATE: August 6, 2019 File: 5400-13-01
TO: Paul Gipps, CAO
FROM: Kyle Reese, Roads and Drainage Supervisor
RE: Road Maintenance Policies and Procedures Update

RECOMMENDED MOTION:

THAT Council repeal the “Winter Roadway Maintenance Policy” (October 2014) and the “Snow Clearing Policy for Sidewalks, Walkways and Stairways” (October 2014); and

THAT Council adopt the City of West Kelowna Road Maintenance Policy and Procedures (August 13, 2019)

RATIONALE:

Staff have developed a Policies and Procedures manual to guide the delivery of all roadway maintenance activities in West Kelowna. These policies and procedures are intended to work together to ensure consistent delivery of these core services. These policies and procedures have been developed for flexibility should Council decide to increase or decrease service levels through the annual budget process. The Municipal Insurance Association of British Columbia (MIABC) has also provided feedback on these policies and staff have made revisions accordingly which are reflected in the attached Road Maintenance Policies and Procedures Manual.

BACKGROUND:

At the June 25, 2019 Council meeting, staff presented Council with an initial draft of proposed road maintenance policies to obtain feedback early in the process of developing and/or updating these documents.

At the June 25 Council meeting, staff proposed all road and drainage maintenance activities be incorporated into maintenance policies in the following format:

1. Council adopted Policy which would include high level policy statements and guidelines
2. Operational procedures manual

These two documents would work in conjunction to guide the delivery of West Kelowna’s road and drainage maintenance activities. The proposed policies would cover six categories and include 28 core maintenance activities delivered by the department. This is an increase in the number of policies for the department as currently only snow and ice control is covered within an adopted policy.

When developing the policies and procedures the following key items were considered:

- Ensure that the high-level policies clearly outline the intended outcomes but avoided the operational details found in the performance measures for each individual activity.
- Ensure that policies align with strategic priorities.
- Ensure that procedures and corresponding performance measures could be used for all services regardless of the delivery method (i.e. in-house vs contract).
- Ensure that the policies were defensible.
- Ensure that operational procedures were flexible in the event resourcing and corresponding levels of service were either increased or decreased, at the discretion of Council, through the budget process.

Staff determined that these items could be satisfied by separating policies and procedures into two documents that work together to guide maintenance activities. This is a similar approach to the current Purchasing Policy which is made up of separate Policy and Procedures documents adopted by Council in February 2019. The overarching draft road maintenance policies were presented to Council on June 25, 2019 and have now been revised based on Council's feedback and a review by the City's insurer.

MIABC Review

As noted, staff have referred to the City's insurer MIABC to obtain feedback on the broad policies previously presented to Council. Staff requested feedback and advice on whether the broad overarching policies separated from a procedures manual was a suitable approach or if having specific pieces in one document or the other is better from a liability standpoint.

MIABC's policy review comments included:

- A high level commitment from Council with a more detailed service level outlined in a supporting procedures manual would provide a defensible policy.
- The phrase "all work will be completed as resources permit" was a concern. It would be far more defensible to have the broad Council policy delegate authority to senior staff to set the service level in the procedure manual by stating, "All work will be completed in accordance with the service levels and procedures outlined in the road maintenance procedures manual".
- This approach gives Council and staff the flexibility to change and adapt the service levels according to the resources available and what can be reasonably achieved, by making changes to the procedures manual without having to go back before Council to change the policy. Council will ostensibly set the service level each year when they approve the departmental budget.

Based on the feedback received from the June 25 Council meeting and a review by the City's insurer (MIABC), staff have now combined these items into one document that includes both the Road Maintenance Policies and Procedures. A draft of this document is found attached to this report. Under this proposed framework, Council would adopt the policies and establish the levels of service annually through the budget approval process and the CAO would have the authority to set the procedures accordingly. Any Council approved increases or decreases in service levels may trigger a need to revise procedures, at the discretion of the CAO, but would not necessarily require a policy revision.

COUNCIL REPORT/RESOLUTION HISTORY:

Date	Report Topic/Resolution	Resolution No.
June 5, 2019	Draft Road Maintenance Policies and Project Status Update	N/A

FINANCIAL IMPLICATIONS:

At this point, there is no additional financial implication for 2019. Pending Council feedback and eventual procurement results, it should be noted that there may be a possibility of additional funding required for the main road maintenance contract, services delivered by separate contracts, or to support increased services done in-house for 2020 and beyond.

ALTERNATE MOTION:


THAT Council defer the adoption of the Road Maintenance Procedures Manual and maintain the existing "Winter Roadway Maintenance Policy" and the "Snow Clearing Policy for Sidewalks Walkways and Stairways"

Road Maintenance activities would continued to be provided without clear direction in the form of policies and procedures.

Respectfully submitted,



Kyle Reese
Roads and Drainage Supervisor

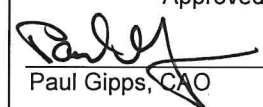


Allen Fillion
GM of Engineering and Public Works



Chris Anderson
Public Works Manager

Powerpoint: Yes X No

Approved for Agenda

Paul Gipps, CAO
AUG. 7, 2019
Date

Attachments:

1. Existing winter roadway maintenance policy
2. Existing snow clearing policy for sidewalks walkways and stairways
3. Proposed Road Maintenance Policy and Procedures Manual



DISTRICT OF WEST KELOWNA COUNCIL POLICY MANUAL

Approval Date: October 14, 2014

SUBJECT: Winter Roadway Maintenance Policy

Policy Statement:

To ensure that the District of West Kelowna's roadway system is maintained in an effective manner during winter conditions to optimize road user safety and mobility.

The District of West Kelowna currently delivers its winter roadway maintenance through a 5 year contract with an external service provider. As such this policy should be reviewed and amended as required concurrently with any new contract.

Purpose:

To set reasonable and affordable winter maintenance service levels to support a safe, economical, and reliable roadway system for all road users.

Definitions:

- Accumulation* means the vertical amount of snow that builds up during a snow event;
- Arterial Road* means a high mobility road that moves traffic around the District at higher speeds;
- Collector Road* means a medium mobility road that connects local roads to arterial roads;
- Cycling Time* means the time it takes plows to complete a complete circuit of the District's roadway network;
- Freezing Event* means freezing rain or sleet;
- Local Road* means a low speed road that provides access to the land;
- Roadside* means the shoulder and ditch portions of the roadway; and
- Snow Event* means a snowfall.

Policy:

The District of West Kelowna will remove loose snow, slush, compact snow and ice from roadways and sidewalks to protect roadway users from situations that are unsafe, and to ensure that the resources required to perform the maintenance services are available and deployed in a manner which anticipates and responds in advance of adverse winter driving conditions.

Loose snow, slush, and ice will be removed on the full width of the travelled lanes, ensuring that accumulations remain below the Maximum Allowable Accumulations shown in the table below:

Plowing Requirement	Maximum Allowable Accumulations (cm)			
	Arterial Roads	Collector Roads	Local Roads	Rural Roads (Gravel)
One lane in each direction	6	10	15	25
All other lanes	16	20	n/a	n/a

Regardless of the Maximum Allowable Accumulation, plow cycle times will continue to meet the following timeframes during a snow event:

Plowing Requirement	Maximum Allowable Cycle Times (Hours)			
	Arterial Roads	Collector Roads	Local Roads	Rural Roads (Gravel)
Snow and broken compact snow	2	6	8	n/a

Complete removal of slush from roadway surfaces on all travelled lanes within 2 days of the end of the last measurable snowfall.

Should extended periods of extreme cold make it impossible to comply with the Maximum Allowable Cycle Times for compact snow and ice, the District will ensure that unsafe conditions are remedied, including but not limited to, alleviating roughness and slippery surfaces using abrasives and de-icing materials. Snow and ice will be pushed beyond the shoulder edge according to the times in the following table, which establishes the allowable time from the end of the last snow or freezing event:

Plowing Requirement	Maximum Allowable Cycle Times (Days)		
	Arterial Roads	Collector Roads	Local Roads
Extreme cold conditions	6	10	24

The District will apply winter abrasives and/or chemicals to minimize the development of slippery surface conditions on roadways and to facilitate the removal of snow, compact snow and ice, as appropriate for the location. The time to restore traction, from the time the deficiency is detected by or reported to the District, will be per the following table:

Condition	By Roadway Classification in Hours			
	Arterial Roads	Collector Roads	Local Roads	Rural Roads (Gravel)
From beginning and or during snowfall event on hills over 5% gradient (one lane each direction)	1.5	2	4	n/a
From beginning and or during snowfall event on curves under 60 kilometres per hour	1.5	2	4	n/a
From beginning and or during snowfall event in school zones & intersections	2	3	6	n/a
From beginning and or during snowfall event in all other locations	3	4	8	n/a
Freezing rain at all locations	3	5	6	n/a
Black ice at all locations	3	5	6	n/a
After snowfall on all hills	8	24	48	n/a
After snowfall on all curves	8	24	48	n/a
After snowfall on all other locations	36	72	As required	n/a
When slippery surfaces are encountered during patrol at all locations	Immediate	Immediate	Immediate	n/a

Previous Revision/s: N/A



DISTRICT OF WEST KELOWNA

COUNCIL POLICY MANUAL

Pages: 1 of 2

Approval Date: October 14, 2014

SUBJECT: SNOW CLEARING POLICY FOR SIDEWALKS, WALKWAYS, AND STAIRWAYS

Policy Statement:

This Policy addresses snow clearing for sidewalks, walkways, and stairways. In accordance with the Good Neighbour Bylaw, residences and businesses shall be responsible for clearing snow from sidewalks and walkways bordering their property within 24 hours of any accumulation of snow and/or ice. The District will be responsible for maintaining the exempted sidewalks listed in the Good Neighbour Bylaw.

On an annual basis, the sidewalk, walkway, and stairway priority classification shall be reassessed by staff, and revisions made where warranted. Following the street priority classification review, a map will be prepared reflecting the revised priorities.

Purpose:

To address the snow accumulation hazard for pedestrian traffic on sidewalks, walkways and stairways.

Procedure:

Emphasis on snow clearing operations shall generally be in order of the assigned classifications priority as noted below. When necessary, the order of priority for the service may be altered.

- Priority 1:** Sidewalks/Walkways/Stairways surrounding District owned property, Good Neighbour Bylaw exempt sidewalks on arterial and collector roads, Rapidbus transit exchanges.
- Priority 2:** Selected District Sidewalks/Walkways/Stairways, Good Neighbour Bylaw exempt sidewalks on local roads, transit shelters.
- Priority 3:** Other District Sidewalks/Walkways/Stairways and transit bus stops.

Should any walkways or staircases be deemed hazardous to pedestrian use, staff reserves the right to close them for the season or as needed until such a time that the hazard has passed.

Notwithstanding the snow removal requirements of the Good Neighbour Bylaw for residences and businesses, staff may provide an in-kind service to clean sidewalks fronting residences or businesses after a snowfall event. Such in-kind service will only be provided if the District has the resources available to do the work, and under the condition that there is no expectation created that the District is obligated to provide the service during future snowfall events. Sidewalks may not necessarily be plowed to bare concrete.

All inquiries will be will be handled by staff during normal working hours and a call-in number will be provided for after hours, weekends, and holidays.

Complaints of an emergent nature are to be transmitted to appropriate field personnel for action.

Road Maintenance Policy and Procedures Manual



DRAFT

July 2019

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1 INTRODUCTION

INTRODUCTION

This Road Maintenance Policy and Procedures Manual is to establish defined methodology for the implementation of maintenance to provide a safe roadway network that support Council's Strategic Priorities.

ROLES & RESPONSIBILITIES

The roles and responsibilities at the City regarding the maintenance of the roadway network infrastructure shall be as follows:

City Council	<ul style="list-style-type: none">• Adopt Road Maintenance Policies:<ul style="list-style-type: none">○ Winter Road Maintenance○ Drainage Road Maintenance○ Surface Maintenance○ Roadside Maintenance○ Traffic Maintenance○ Network Management Maintenance• Set annual budgets and corresponding levels of service the Road and Drainage operational programs must fall within.• Confirm Authorizations, approval limits, and processes to be followed in the policy.• Establish overall direction, philosophies and values that the City of West Kelowna will follow within the policy.
CAO	<ul style="list-style-type: none">• Set the procedures to be followed for all road and drainage maintenance programs, in accordance with the policies set by Council.• Changes or revisions to the road and drainage maintenance procedures at the sole discretion of the CAO.
GM, Department Managers and Supervisors	<ul style="list-style-type: none">• Responsible for oversight and administration of the Road Maintenance Policy and Procedures Manual.• Delivering annual road and drainage maintenance within the levels of service and budgets set by Council.• Managing and administering all contracts in the department used to deliver these services• Monitoring and reporting on adherence to the performance measures found within the Policy and Procedures Manual.

DEFINITIONS

The terms used in this document are intended to be defined in the following context:

- a) **Classification** means the roadway classification as identified by the City of West Kelowna

Priority	Road Description
1	Higher volume, commuter routes, steep hills
2	Intermediate volume, transit routes, hills
3	Low volume, typically local residential roadways

As shown on the City of West Kelowna Snow Removal Map. Appendix A

- b)
c)
d)

REFERENCE DOCUMENTS

Refer to the current version of the following documents which are referenced in this manual however not reproduced herein.

Title:	Produced By:

2 ROAD MAINTENANCE POLICIES



CITY OF WEST KELOWNA

COUNCIL POLICY MANUAL

Pages: 1 of 1
Date: 31 July 2019
Adoption Date:

SUBJECT: Winter Road Maintenance

Purpose:

To guide the winter road maintenance level of service during the winter months on the City of West Kelowna's road network.

Policy:

The City of West Kelowna shall ensure the provision of snow removal, snow and ice bonding prevention, and traction control on our roads and sidewalks. The outcome of our service will optimize road user safety, provide reliable mobility, and will strive to deliver excellent customer/citizen service. This Winter Road Maintenance Policy shall deliver this service in accordance with the roadway priorities and shall comply with the performance measures contained in the City of West Kelowna Road Maintenance Procedures Manual.

1.1. Guidelines

This policy applies to the entire City of West Kelowna road and pedestrian network. All work will be completed in accordance with the operating budgets and levels of service set by Council and the maintenance procedures set by the CAO.

a. Roadway Snow Removal

To proactively monitor, anticipate, manage and respond to winter precipitation accumulations including the initial weather event, and developing compact snow and ice conditions to facilitate the safe and orderly flow of traffic.

b. Snow and Ice Bonding Prevention and Control

To proactively monitor, anticipate, manage and minimize the development of slippery conditions and restore traction.

c. Other Snow Removal and Ice Control

To remove winter accumulations from roadside, overhead, and pedestrian accessed infrastructure and restore traction.



CITY OF WEST KELOWNA

COUNCIL POLICY MANUAL

Pages: 1 of 1
Date: 31 July 2019
Adoption Date:

SUBJECT: Drainage Maintenance

Purpose:

To ensure all surface drainage is conveyed away from the travelled surface of the City of West Kelowna's road network.

Policy:

The City of West Kelowna shall ensure the provision of drainage maintenance services on all roadways, roadsides, bridges, and other municipal infrastructure under our control and management. These services shall result in unobstructed, channeled or contained drainage such that risk of damage to roads, bridges, critical infrastructure and adjacent property is minimized. This Drainage Maintenance Policy shall comply with the performance measures contained in the City of West Kelowna Road Maintenance Procedures Manual.

1.1. Guidelines

This policy applies to the entire City of West Kelowna road and pedestrian network. All work will be completed in accordance with the operating budgets and levels of service set by Council and the maintenance procedures set by the CAO.

- a. Ditches
To provide unobstructed drainage for all roadways.
- b. Drainage Appliances
To maintain roadways that are efficiently drained, and water is channeled or contained to prevent erosion. This includes for example, culverts and trash racks.
- c. Roadside Catchment Appurtenances
To protect roadway users and roadway infrastructure. This includes, for example catch basins.
- d. Structures Drainage
To provide effective drainage for structures.
- e. Storm Retention Ponds
To proactively monitor the functionality of the existing storm retention ponds and anticipate seasonal changes.



CITY OF WEST KELOWNA

COUNCIL POLICY MANUAL

Pages: 1 of 1
Date: 31 July 2019
Adoption Date:

SUBJECT: Surface Maintenance

Purpose:

To provide oversight and guidance on the level of service for the surface maintenance of the City of West Kelowna's entire road and pedestrian network.

Policy:

The City of West Kelowna shall ensure the provision of surface maintenance services on all roadways, bridges, and other municipal infrastructure under its control and management. These services shall result in smooth, even, and stable hard surface, dirt, and gravel roadways along with all bridge decks to ensure consistency with the proper alignment and cross-section for the given classification of roadway. The additional result of surface maintenance services is an impermeable surface that resists water penetration and structural damage and promotes the efficient movement of goods and services on the transportation network contributing to a healthy, expanding economy.

The City of West Kelowna shall ensure that the roadway and bridge surfaces are kept in a clean and unobstructed condition resulting in safe travel surfaces where loose material and debris are removed from the travel surface within the appropriate response times for the given classification of roadway. The frequency of these services shall take into consideration the multi-purpose of our municipal infrastructure to accommodate varied events throughout the year. This Surface Maintenance Policy shall comply with the performance measures contained in the City of West Kelowna Road Maintenance Procedures Manual.

1.1. Guidelines

This policy applies to the entire City of West Kelowna road and pedestrian network. All work will be completed in accordance with the operating budgets and levels of service set by Council and the maintenance procedures set by the CAO.

- a. Pot Hole Patching
To provide a smooth, stable, sealed surface on roadways and bicycle / pedestrian paths.
- b. Roadway and Shoulder Grading and Reshaping
To provide safe, smooth, stable, compacted and free draining dirt and gravel roadways and shoulders.

- c. Dust Control
To minimize the impact of dust for roadway users, adjacent properties, and watercourses on dirt and gravel roadways
- d. Roadway and Shoulder Graveling
To provide strengthened, uniform, smooth, compacted and free draining dirt and gravel roadways and shoulders.
- e. Roadway Surface Cleaning
To provide safe, clean surface conditions, and facilitate free drainage. This includes sweeping as an example.
- f. Debris Removal
To provide roadways free of debris.
- g. Bridge Decks
To provide safe, uniform, smooth, stable, free draining and durable surfaces on bridge decks.
- h. Structures Cleaning
To provide safe and clean structures.
- i. Cracksealing or Crack Filling
To provide for a stable and sealed asphalt surface.
- j. Pedestrian Sidewalks and Walkways
To provide and maintain accessibility for the pedestrian and roadway users.



CITY OF WEST KELOWNA

COUNCIL POLICY MANUAL

Pages: 1 of 1
Date: 31 July 2019
Adoption Date:

SUBJECT: Roadside Maintenance

Purpose:

To provide oversight and guidance on the level of service for the surface maintenance of the City of West Kelowna's roadway boulevards.

Policy:

The City of West Kelowna shall ensure the provision of roadside maintenance services for all roadways and bridges under its control and management. These services shall result in roadways and bridges that are clean and tidy and free of unsightliness and vandalism. These services shall also result in roadways and bridges that are free of vegetation that has the potential to impede visibility of the roadway user and restrict drainage.

The outcome of this service reflects our pride in the function, condition, and appearance of our transportation infrastructure. This Roadside Maintenance Policy shall comply with the performance measures contained in the City of West Kelowna Road Maintenance Procedures Manual.

1.1 Guidelines

This policy applies to road dedications, from the back of curb or edge of pavement to property line inclusive of raised medians. All work will be completed in accordance with the operating budgets and levels of service set by Council and the maintenance procedures set by the CAO.

- a. Litter Collection and Graffiti Removal
To keep roadways clean and tidy.
- b. Vegetation Control
To improve visibility and facilitate drainage.
- c. Brush, Tree, and Danger Tree Removal
To improve visibility, safety, facilitate drainage, and provide access to structures.



CITY OF WEST KELOWNA

COUNCIL POLICY MANUAL

Pages: 1 of 1
Date: 31 July 2019
Adoption Date:

SUBJECT: Traffic Maintenance

Purpose:

To provide oversight and guidance on the level of service required to maintain safety and traffic control on the City of West Kelowna's roadway network.

Policy:

The City of West Kelowna shall ensure the provision of traffic maintenance services resulting in the safe operation of the roadway network while maintaining the orderly flow of traffic. These traffic maintenance services shall also result in the protection of workers and road users during maintenance and repair activities and will protect road users from roadside hazards. This Traffic Maintenance Policy shall comply with the performance measures contained in the City of West Kelowna Road Maintenance Procedures Manual.

1.1 Guidelines

This policy applies to the entire City of West Kelowna road and pedestrian network. All work will be completed in accordance with the operating budgets and levels of service set by Council and the maintenance procedures set by the CAO.

- a. **Signage**
To regulate and facilitate the safe and orderly flow of traffic.
- b. **Traffic Management**
To keep roadway users safe, protect roadway workers and minimize traffic delays.
- c. **Pavement Markings and Eradication**
To facilitate the continuous, safe and orderly flow of traffic.
- d. **Roadside Barriers**
To protect roadway users from roadside hazards.
- e. **Street Light Illumination**
To provide safety for pedestrian and vehicle movement on roadways and maintain the existing inventory of City of West Kelowna owned street lights in a functioning manner of operation.



CITY OF WEST KELOWNA

COUNCIL POLICY MANUAL

Pages: 1 of 1
Date: 31 July 2019
Adoption Date:

SUBJECT: Network Management Maintenance

Purpose:

To guide the management of the road maintenance and communication of achievements, safety concerns, conditions and ongoing routine maintenance activities within the City of West Kelowna's road network system. Provide fiscal assurance that the road network budgets are achieving optimal performance and service levels.

Policy:

The City of West Kelowna shall ensure the provision of network management services resulting in the protection of the public from traffic incidents and other severe events. The City of West Kelowna shall ensure that roadways are inspected on a regular basis and any potential unsafe conditions are identified and corrective action is taken in a timely manner.

The City of West Kelowna shall ensure that procedures are established to ensure efficient and effective communication among the public, identified stakeholders, and the City of West Kelowna. All communication with the public and the stakeholders will enforce our commitment to a high quality of service to our customers/citizens thereby demonstrating our community dedication. This Network Management Policy shall comply with the performance measures contained in the City of West Kelowna Road Maintenance Procedures Manual.

1.1. Guidelines

This policy applies to the entire City of West Kelowna road and pedestrian network. All work will be completed in accordance with the operating budgets and levels of service set by Council and the maintenance procedures set by the CAO.

- a. Roadway Inspection and Safety Patrol
To monitor conditions and develop a comprehensive knowledge of roadway conditions to support a work identification and planning program.
- b. Communications
To communicate effectively and in a timely manner with the public, stakeholders, and the City of West Kelowna.

3 ROAD MAINTENANCE PROCEDURES



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Winter Road Maintenance	
Roadway Snow Removal and Ice Control	P1.1

Outcome:

To proactively monitor, anticipate, manage and respond to winter accumulations including the initial Weather Event, and to proactively monitor, anticipate, manage and minimize the development of slippery conditions and restore traction by the application of abrasives and/or chemicals.

Maintenance Services:

PM1.1-1 Remove winter accumulations from full width of travelled lanes during the Weather Event as follows:

Plowing Requirement	Maximum Allowable Accumulations by road priority (cm)		
	P1 Roads	P2 Roads	P3 Roads (incl. Gravel Roads)
a) One lane in each direction	6	10	15
b) All other lanes	16	20	N/A

PM1.1-2 Remove winter accumulations on full width of all travelled lanes within 48 hours of the end of the Weather Event.

Note: If within 48 hours of an initial Weather Event a separate Weather Event occurs, PM1.1-2 applies to the latter Weather Event.

PM1.1-3 Achieve bare lanes on all paved travelled lanes after the Weather Event as follows:

Plowing Requirement	Response by Roadway Priority (Days)		
	P1 Roads	P2 Roads	P3 Roads
Bare lanes when the pavement temperature is -9°C or warmer	3	7	21

Note: If extended periods of extreme cold make it impossible to achieve PM1.1-3, unsafe road conditions must be remedied by including but not limited to, alleviating slippery surfaces.



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PM1.1-4 Remove winter accumulations after the Weather Event as follows:

Plowing Requirement	Response by Roadway Priority (Days)		
	P1 Roads	P2 Roads	P3 Roads
a) Paved shoulders	6	10	24
b) To edge of curb	6	10	24
c) Pull-outs and parking areas at a minimum 2.5 metre pass width	1	1	N/A

PM1.1-5 Deploy resources at least 60 minutes in advance of a forecasted or anticipated Weather Event to pre-treat key locations (e.g. known frequent snowfall and/or blowing snow, black ice areas)

PM1.1-6 Restore and maintain traction on travelled lanes immediately when slippery conditions occur outside of a Weather Event or a non-forecast Weather Event.

PM1.1-7 Restore and maintain traction on travelled lanes with slippery conditions once the Weather Event commences as follows:

Condition	Response by Roadway Priority (Hours)		
	P1 Roads	P2 Roads	P3 Roads (incl. Gravel Roads)
Grades exceeding 5% (one lane each direction)	1.5	2	4
Curves under 60 kilometres per hour	1.5	2	4
School zones & intersections	2	3	6
All other locations	3	4	8
Freezing rain at all locations	3	5	6
Black ice at all locations	3	5	6
Snowfall on all hills	8	24	48
Snowfall on all curves	8	24	48
Snowfall on all other locations	36	72	As required
When slippery surfaces are encountered during patrol at all locations	Immediate	Immediate	Immediate

Materials and/or Procedures:

Weather Monitoring:

- a) Actively monitor and evaluate roadway surface temperatures and conditions using methods including but not limited to safety patrols, observations, weather forecasts and other



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methodologies / technologies, for example Road Weather Information System (RWIS) stations if possible, to anticipate impending Weather Events.

- b) Increase the frequency of monitoring and evaluating information including but not limited to forecasts, patrols, and other methodologies / technologies, for example RWIS stations if possible, when a Weather Event is anticipated to occur.
- c) Deploy sufficient resources in advance to respond to an anticipated Weather Event. Resources must be deployed to key areas (e.g. known frequent snowfall and/or blowing snow areas) prior to the anticipated Weather Event to minimize severe conditions in those areas.
- d) If available, use the provincial Road Temperature and Condition (RTC) forecasts and other available methodologies and technologies including but not limited to RWIS information and thermal mapping, to determine if a Weather Event is likely to develop slippery surface conditions.
- e) If available, use RTC forecasts and RWIS information or other alternative technologies when anti-icing and de-icing to determine and apply appropriate and sufficient chemical concentrations on the travelled lanes to: prevent re-freeze, minimize the development of slippery conditions, and achieve the performance criteria stipulated in PM1.1-3.

Winter Accumulation Removal:

- f) Ensure proactive service to local stakeholders including but not limited to, the City, emergency services and transit. The routes used by these stakeholders are to receive priority service, in the allocation of resources to their road priority classifications, and specific to their individual needs.
- g) Keep shoulders clear more frequently in areas of high-vulnerable user use, in consultation with local stakeholders.
- h) Remove winter accumulation from super elevations and other locations where the shoulder edge is higher than the travelled lanes, so that snowmelt does not drain onto or across the travelled lanes.
- i) Ensure the removal of surface gravel from the road structure is minimized during plowing activities on gravel surface roads.

Materials

- j) Anti-icing, de-icing and pre-wetting materials recognized on the Pacific Northwest Snowfighters (PNS) Qualified Products List or as accepted in writing by the City of West Kelowna.



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- k) Use materials in accordance with the maximum allowable particle size for winter abrasives and the mean gradation limits when tested according to ASTM Designations C136 and C117 and as follows:

Gradation Limits	By Roadway Priority		
	P1 Roads	P2 Roads	P3 Roads
Maximum particle size	12.5 mm	12.5 mm	16 mm
Metric screen size, 19 mm	N/A	N/A	100%
Metric screen size, 16 mm	N/A	N/A	100%
Metric screen size, 12.5 mm	100	100	N/A
Metric screen size, 9.5 mm	N/A	N/A	80 to 100%
Metric screen size, 4.75 mm	50 to 95%	50 to 95%	50 to 95%
Metric screen size, 2.36 mm	30 to 80%	30 to 80%	30 to 80%
Metric screen size, 0 to 0.6 mm	10 to 50%	10 to 50%	10 to 50%
Metric screen size, 0 to 0.3 mm	0 to 25%	0 to 25%	0 to 25%
Metric screen size, 0 to 0.075 mm	0 to 6%	0 to 6%	0 to 6%



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Winter Road Maintenance	
Other Snow Removal and Ice Control	P1.2

Outcome:

To remove winter accumulations from roadside, overhead, and pedestrian accessed infrastructure and restore traction.

Maintenance Services:

PM1.2-1 Remove winter accumulations and restore traction of all sidewalks and walkways within 1 day after the end of a Weather Event.

Note: Only sidewalks and walkways exempt from the City of West Kelowna Good Neighbour Bylaw require maintenance.

PM1.2-2 Remove winter accumulations and restore traction of pedestrian accessed areas after the end of a Weather Event as follows:

Location	Response by Roadway Priority (Days)		
	P1 Roads	P2 Roads	P3 Roads (incl. Gravel Roads)
a) Intersections and medians	1.5	1.5	3
b) Roadside barrier	3	8	12
c) Sight distance obstructions	5	8	12

Note: Where two roadways of different priority classification intersect, the higher priority shall be the designation.

PM1.2-3 Remove snow and ice when required from ditches and drainage appliances to restore drainage flow after detecting the deficiency as follows:

Condition	Response by Roadway Priority (Hours)		
	P1 Roads	P2 Roads	P3 Roads
Winter ditch maintenance	12	24	72

PM1.2-4 Remove winter accumulations and restore traction at all RapidBus pullouts within the following times after the end of a Weather Event:



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Criteria	Response time
a) Remove accumulations from entire roadway pull-out including inlet and outlet tapers	1 day
b) Restore and maintain traction of entire roadway pull-out including inlet and outlet tapers	3 hours
c) Remove accumulations from sidewalk, platform and shelter area, ensuring clear access to platform and shelter	1 day
d) Restore and maintain traction of sidewalk, platform and shelter area, ensuring safe access to platform and shelter	1 day

PM1.2-5 Remove winter accumulations and restore traction on all bicycle lanes.

PM1.2-6 Remove roadside snow and haul to designated snow dump locations as required by the City.

Materials and/or Procedures:

Weather Monitoring:

- a) Actively monitor and evaluate roadway surface temperatures and conditions using methods including but not limited to safety patrols, observations and weather forecasts and other methodologies / technologies, for example Road Weather Information System (RWIS) stations if possible, to anticipate impending Weather Events.
- b) Increase the frequency of monitoring and evaluating information including but not limited to forecasts, patrols, and other methodologies / technologies, for example RWIS stations if possible, when a Weather Event is anticipated to occur.
- c) If available, use the provincial Road Temperature and Condition (RTC) forecasts and other available methodologies and technologies including but not limited to RWIS information and thermal mapping, to determine if a Weather Event is likely to develop slippery surface conditions.
- d) If available, use RTC forecasts and RWIS information or other alternative technologies when anti-icing and de-icing to determine and apply appropriate and sufficient chemical concentrations on the travelled lanes to: prevent re-freeze, minimize the development of slippery conditions, and achieve the performance criteria stipulated in Roadway Snow Removal PM1.1-3.



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Winter Accumulation Removal:

- e) Remove snow accumulations and ice deposits more than 30 cm in depth from the top of roadside barriers and bridge railings.

Materials:

- f) Anti-icing, de-icing and pre-wetting materials recognized on the Pacific Northwest Snowfighters (PNS) Qualified Products List or as accepted in writing by the City of West Kelowna.
- g) Use materials in accordance with the maximum allowable particle size for winter abrasives and the mean gradation limits when tested according to ASTM Designations C136 and C117.



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Drainage Maintenance	
Ditches	P2.1

Outcome:

To provide unobstructed roadside drainage.

Maintenance Services:

PM2.1-1 Remove any obstructions where heavy equipment is not required and can be undertaken by handwork, within the following times from when the obstruction was identified:

Water Flows	Response time
During high-water flow	12 hours
At all other times	10 days

PM2.1-2 Remove debris and obstructions and re-establish existing ditches requiring heavy equipment, within 1 month from when the deficiency was identified.

PM2.1-3 Construct new ditches requiring heavy equipment as per annual prioritized list developed by the City.

Notes:

- 1) Restore the cross-section and grade of the ditch.
- 2) Widen and deepen ditches at culvert entrance locations or other drainage appliance locations to provide a collection area, preventing the culvert or other appliance from becoming obstructed, following BC 1 Call protocol.
- 3) Ensure the shoulder width of the adjacent road is not reduced.
- 4) Construct new ditches in accordance with the current version of the City of West Kelowna Works and Services Bylaw No. 0249, following BC 1 Call protocol and WorkSafe BC regulations.

Materials and/or Procedures:

- a) Actively monitor and evaluate all ditches and watercourses using regular safety patrols to ensure proper drainage and detect any deficiencies.
- b) Increase the frequency of monitoring and evaluating of ditches and watercourses during anticipated times of high-water flow.



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- c) Dispose of all hazardous and non-hazardous materials per regulatory agency requirements.
- d) Notify local stakeholders of any obstructions to water flow which threaten the integrity of the roadway.



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Drainage Maintenance	
Drainage Appliances	P2.2

Outcome:

To maintain roadways that are efficiently drained, and water is channeled or contained to prevent erosion. This includes for example, culverts, trash racks and catch basins.

Maintenance Services:

PM2.2-1 Remove obstructions affecting the water flow, such as sedimentation or debris, or maintain or repair drainage appliances where heavy equipment is not required and can be undertaken by handwork, within the following times from when the obstruction was identified:

Water Flows	Response time
During high-water flow	2 hours
≥ 50% reduction in water flow capacity or history of drainage problems	7 days
At all other times	2 months

PM2.2-2 Remove obstructions affecting the water flow, repair/replace existing drainage appliances, or install drainage appliances at new locations requiring heavy equipment, within the following times from when the deficiency was identified:

Water Flows	Response time
During high-water flow	4 hours
≥ 50% reduction in water flow capacity or history of drainage problems	7 days
At all other times	2 months

Notes:

- 1) Re-set or replace drainage appliances when correcting the ditch profile to ensure free flow.
- 2) Install rip-rap in accordance with Section 205 of BC MoTI Standard Specifications for Highway Construction, or other suitable material to fill scour and erosion of foundation material and to prevent future erosion at the inlet and/or outlet of the drainage appliance.

PM2.2-3 Remove any accumulated rock, unconsolidated sediment or organic debris from drainage appliance inlet areas, every 5 years as per the City of West Kelowna drainage appliance inspection zones.



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PM2.2-4 Maintain the effective drainage of all structures including but not limited to bridges, as follows:

Water Flows	Response time
Repair or replace any damaged rusted, separated or missing grates, drain pipes, Flumes or funnels that are unsafe or have the potential to become unsafe.	Immediately
Repair or replace any other damaged rusted, separated or missing grates, drain pipes, Flumes or funnels.	14 days
Clear any plugged grates drain pipes, flumes or funnels that cause ponding on travelled lanes.	1 hour
Clear any plugged grates drain pipes, flumes or funnels that do not cause ponding on travelled lanes.	14 days

Materials and/or Procedures:

- a) Actively monitor and evaluate all drainage appliances and structures using regular safety patrols to ensure proper drainage and detect any deficiencies.
- b) Increase the frequency of monitoring and evaluating of drainage appliances and structures during anticipated times of high-water flow.
- c) Dispose of all hazardous and non-hazardous materials per regulatory agency requirements.
- d) Notify local stakeholders of any obstructions to water flow which threaten the integrity of the roadway.
- e) Perform inspection of drainage appliances annually, following the five City of West Kelowna inspection zones on a 5-year rotating cycle.
- f) Refer to Appendix for City of West Kelowna Inspection Zone map.
- g) Where applicable, ensure bridge structure flumes carry water from drain pipes down fill slopes and away from bridge abutment fills and wing walls.



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Drainage Maintenance	
Storm Retention Ponds	P2.3

Outcome:

To proactively monitor the functionality of the existing storm retention ponds and anticipate seasonal changes.

Maintenance Services:

PM2.3-1 Inspect elements of storm water retention ponds once annually as follows:

Inspection Criteria
a) Submerged inlet and outlet structures
b) Culverts
c) Control manholes, sluice gates, orifices or weirs
d) Isolation chambers
e) Outfall structures, energy reducing walls, erosion control rip rap, gabion mats
f) Pond banks to identify visual deterioration

PM2.3-2 Perform the following maintenance activities once annually as per inspection:

Maintenance Criteria
a) Remove sediment and emergent plants growing in the sediment from inlets, outlets and culverts.
b) Remove debris from control manholes, sluice gates, orifices or weirs
c) Remove debris and/or sediment from outfall structure grating
d) Replace any loose rip-rap at the outfall structure or spillway

PM2.3-3 Perform any additional deficiency work as defined by the City following the inspection of the ponds.



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Surface Maintenance	
Pot Hole and Minor Patching	P3.1

Outcome:

To provide a smooth, stable, sealed surface on asphalt roadways and bicycle/pedestrian paths.

Maintenance Services:

PM3.1-1 Construct patches consistent with the profile and crossfall of the adjacent surface as follows:

Defect	Response time by road priority (days)		
	P1 Roads	P2 Roads	P3 Roads (asphalt)
Pothole with an area greater than 0.04m ² and depth greater than 50mm,	2	3	3
Minor patches as identified by the City	As required		

Materials and/or Procedures:

- a) Actively monitor and evaluate all roadways and bicycle/pedestrian paths using regular safety patrols to identify pot holes.
- b) Materials to be in accordance with Section 502 of the Standard Specifications for Highway Construction, or materials as approved in writing by the City.
- c) For patching occurring when asphalt plants are closed, temporary cold-mix or synthetic mix is acceptable.
- d) All temporary patching to be replaced with hot-mix when asphalt plants are open.
- e) Construct patches to the same thickness as the adjacent pavement structure with a minimum compacted depth of 100mm on P1 roads, and 50mm on P2 and P3 roads.
- f) The assessment of the condition of pavement surfaces shall conform to the most current version of the BCMoTI Pavement Surface Condition Rating Manual.



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Surface Maintenance	
Roadway and Shoulder Grading and Reshaping	P3.2

Outcome:

To provide safe, smooth, stable, compacted and free draining dirt and gravel roadways and shoulders.

Maintenance Services:

PM3.2-1 Perform annual grading and shoulder pulling of all dirt and gravel roadways by June 1st.

PM3.2-2 Grading or re-shaping of dirt and gravel roadways as follows:

Performance Criteria	Response time
a) Average of 1 or more pot-holes per 25 metres of roadway	7 days
b) Rutting, ponding or wash-boarding exceeding 3 cm in depth	7 days
c) Rocks greater than 100mm shall be removed	As detected
d) Soft areas due to apparent drainage block, remove blockage	14 days

Note: if no apparent cause of soft area, record and make note of the area.

PM3.2-3 Grading or re-shaping of shoulders as follows:

Performance Criteria	Response time
a) Washout measuring greater than or equal to 1.0m ² and 30cm deep	12 hours
b) Washout within 0.5 metre of pavement and greater than or equal to 0.5m ² and 30cm deep	12 hours
c) Washout less than 1.0m ² and greater than 1.0m from pavement	7 days
d) Drop-off greater than or equal to 75mm	12 hours
e) Drop-off with depth greater than 50mm for a length of at least 100m	7 days
f) Rocks greater than 100mm shall be removed	As detected
g) Rutting greater than 100mm in depth	14 days
h) Loss of crossfall	60 days
i) Gravel windrows/berms	Annually
j) Soft areas due to apparent drainage block, remove blockage	14 days

Note: if no apparent cause of soft area, record and make note of the area.



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Materials and/or Procedures:

- a) Actively monitor and evaluate all roadways using regular safety patrols and inspections to identify surface roadway and shoulder defects.
- b) Conduct a detailed inspection in late summer or early fall and compile a list of defects by November 1st for the next year's work plan.
- c) Conduct early spring inspections to identify additional defects not included in the November 1st list of defects.
- d) Record date, location and description of all repairs undertaken, with apparent causes noted.
- e) Ensure compaction following roadway and shoulder re-shaping or grading.
- f) Remove vegetation from the shoulder top, unless it is effective and necessary to prevent erosion and provide stability to the shoulder.



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Surface Maintenance	
Roadway and Shoulder Gravelling	P3.3

Outcome:

To provide strengthened, uniform, smooth, compacted and free draining dirt and gravel roadways and shoulders.

Maintenance Services:

PM3.3-1 Place gravel on deteriorated dirt and gravel highways within 2 days following surface preparation.

PM3.3-2 Place gravel on deficient shoulders as follows:

Performance Criteria	Response time
a) Pavement edge drop-off exceeding 5 cm in depth on inside curve	7 days
b) Pavement edge drop-off exceeding 5 cm in depth on all other shoulders	14 days
c) Settled and eroded localized areas exceeding 10 cm in depth	14 days
d) Loss of profile or crossfall affecting vehicle control	14 days
e) Loss of profile or crossfall not affecting vehicle control	1 year

Materials and/or Procedures:

- a) Actively monitor and evaluate all roadways using regular safety patrols and inspections to identify surface roadway and shoulder defects.
- b) City to provide advice on the application rate of gravel based on the condition of the gravel road.
- c) Base surface gravelling/repair shall be in accordance with Section 503 of the BC Standard Specifications for Highway Construction.
- d) Conduct a detailed inspection in late summer or early fall and compile a list of defects by November 1st for the next year’s work plan.
- e) Conduct early spring inspections to identify additional defects not included in the November 1st list of defects.



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- f) Record date, location and description of all repairs undertaken, with apparent causes noted.
- g) Ensure compaction following roadway and shoulder gravelling.
- h) Remove vegetation from the shoulder top, unless it is effective and necessary to prevent erosion and provide stability to the shoulder.



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Surface Maintenance	
Dust Control	P3.4

Outcome:

To minimize the impact of dust for roadway users, adjacent properties, and watercourses on dirt and gravel roadways.

Maintenance Services:

PM3.4-1 Apply dust control on all dirt and gravel roadways and shoulders by June 1st every year.

Materials and/or Procedures:

- a) Actively monitor and evaluate all roadways and shoulders using regular safety patrols and inspections to identify dusty conditions.
- b) Dust control material and application rates as follows:

	35% Calcium Chloride Liquid (L/m²)	30% Magnesium Chloride Liquid (L/m²)
Application Rate	1.5	1.5

- c) Pre-water in advance of dust control or base stabilization if insufficient moisture is present in the road base to allow the material to combine chemically with the fines.
- d) Apply additional dust control services at the direction of the City of West Kelowna.



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Surface Maintenance	
Roadway Surface Cleaning	P3.5

Outcome:

To provide safe, clean surface conditions, and facilitate free drainage. This includes sweeping as an example.

Maintenance Services:

PM3.5-1 Remove accumulations on paved roadway surfaces as follows:

Performance Criteria	Response time
a) Unsafe conditions or has the potential to become unsafe to users	immediately
b) Impaired free drainage adjacent to the curb or barrier	immediately
c) Obscures pavement marking visibility	7 days
d) Potential to obscure visibility of roadway users	7 days
e) Creates an air quality problem in accordance with local by-laws	7 days

PM3.5-2 Perform annual springtime sweep and wash of all paved roadways, removing all accumulations, commencing no later than March 15, weather permitting.

Note: Roadways shall be cleared of all accumulations from gutter line to gutter line or edge of pavement to edge of pavement, including median, quadrant islands and transit and RapidBus station pull-outs.

Materials and/or Procedures:

- a) Actively monitor and evaluate paved roadway surfaces using regular safety patrols for any accumulations.
- b) Surface sweeping and washing must be coordinated with pavement marking activities.



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Surface Maintenance	
Debris Removal	P3.6

Outcome:

To provide roadways free of debris.

Maintenance Services:

PM3.6-1 Remove debris, from roadway dedications as follows:

Performance Criteria	Response time (hours)
a) Debris exceeding 1000cm ³ on travelled lanes and sidewalks	2
b) Debris equal to or less than 1000cm ³ on travelled lanes and sidewalks	2
c) Debris exceeding 1000cm ³ on shoulders	10
d) Debris equal to or less than 1000cm ³ on shoulders	24
e) Dead animals on travelled lanes, shoulders and sidewalks	2
f) Dead animals on the roadway dedication excluding travelled lanes, shoulders and sidewalks	6

Note: If the debris is too large for immediate removal, secure the area in accordance with appropriate roadway traffic controls.

Materials and/or Procedures:

- a) Actively monitor and evaluate roadways using regular safety patrols for any debris or dead animals on travelled lanes, shoulders and roadsides.
- b) Increase patrols at a roadway area where debris over 1000 cm³ is detected more than once in a 24 hour period; and discontinue the patrols when the frequency of 1000 cm³ debris detection is less than 2 times in a 24 hour period.
- c) Dispose of all hazardous and non-hazardous materials per regulatory agency requirements.
- d) Dispose of dead animals in a manner acceptable to local regulatory agencies.



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Surface Maintenance	
Bridge Decks	P3.7

Outcome:

To provide safe, uniform, smooth, stable, free draining and durable surfaces on bridge decks.

Maintenance Services:

PM3.7-1 Complete the repair of a deficiency after detection as follows:

Performance Criteria	Response time by road priority
a) Pot-holes in deck travel lane	4 hours
b) Pot-holes in remainder of deck	2 days
c) Loose, broken or rotted timber planks in deck travel lane	4 hours
d) Loose, broken or rotted timber planks in remainder of deck	2 days

Materials and/or Procedures:

- a) Actively monitor and evaluate bridge structures using regular safety patrols for any defects.
- b) Asphalt materials to be in accordance with Section 502 of the Standard Specifications for Highway Construction, or materials as approved in writing by the City.
- c) Use Timber Deck materials in accordance with the following:
 - a. Cross-ties must be number 1 or better grade, S2S Douglas Fir, cross-ties must be a minimum of 150 mm X 150 mm (6 inch by 6 inch) by the full width the bridge deck. Size tolerance is plus or minus 3 mm and maximum Wane allowed must be 10 mm on any surface and cross-ties must be preservative-treated;
 - b. Laminated decking material must be preservative-treated;
 - c. Re-decking planks must be of number 1 grade and Wane free, SIS2E, heart-side surfaced, 100 mm X 250 mm (4 inch by 10 inch) Douglas Fir, in minimum 4.9 metre (16 foot) lengths laid heart-side down;
 - d. All fasteners must be hot-dip galvanized;
 - e. Timber end posts must be rough cut and 250 mm x 250 mm (10 inch x 10 inch), intermediate posts must be S2E 150 mm x 150 mm (6 inch x 6 inch);
 - f. Timber railing must be S4S 75 mm x 200 mm (3 inch x 8 inch x 16 feet) or as approved in writing by the City, fastened with 200 mm Galvanized nails;



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- g. Timber Wheelguards must be untreated, rough cut to and 200 mm x 200 mm x 4.9 metres (8 inch x 8 inch x 16 feet) or as otherwise approved by the City, and maximum Wane allowed on any surface must be 10 mm;
- h. Ekki Wood, where specified for use by the City, is normally ordered by actual dimensions and must be in accordance with the following requirements:
 - i. Minimum modulus of rupture in static bending must be 150 MPa;
 - ii. Minimum crushing strength will be 70 MPa;
 - iii. Timbers must be free of Heartwood, Sapwood, and Wane except members larger than 350 mm by 350 mm which may contain Boxed Heartwood;
 - iv. Sound, tight and well-spaced knots not larger than 50 mm are permitted at a maximum of one knot per linear metre of board length;
 - v. Maximum crook must be 25 mm. Surface checks and splits must have a maximum length of 150 mm. Slope of grain will be 1:10 maximum;
 - vi. Size tolerance must be plus or minus 3 mm; and
 - vii. Galvanized lag bolts must be used on Ekki wood decking.



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Surface Maintenance	
Structures Cleaning	P3.8

Outcome:

To provide safe and clean structures. This includes for example bridges and retaining walls.

Maintenance Services:

PM3.8-1 Remove accumulations on structure surfaces and adjacent sidewalks as follows:

Performance Criteria	Response time
a) Unsafe conditions or has the potential to become unsafe to users on all roadways	24 hours
b) Impaired free drainage of the surface or moisture retention	7 days
c) Urgent conditions such as accidents or storm events	Immediately

PM3.8-2 Perform annual wash of bridges, structures and associated components, removing all accumulations by no later than June 30.

Materials and/or Procedures:

- a) Actively monitor and evaluate bridge structures using regular safety patrols for any accumulations.
- b) Clean all surfaces (horizontal and vertical) on bridge, structures, and associated components.
- c) Clean railings and truss members to a minimum height of 3 metres above the deck surface.
- d) Cleaning must not be performed when temperatures are 0° C or less, or when such temperatures are forecasted.
- e) Dispose of all hazardous and non-hazardous materials per regulatory agency requirements.



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Surface Maintenance	
Crack Sealing or Crack Filling	P3.9

Outcome:

To provide a stable and sealed asphalt surface.

Maintenance Services:

PM3.9-1 Perform crack sealing or crack filling of roadways on annual prioritized list, as follows:

Performance Criteria
a) Crack sealing and filling program shall last a maximum of 4 weeks beginning June 1 st
b) All work must conform to MMCD Platinum Edition Sealing Pavement Cracks For Maintenance Purposes Section 32 01 17 6.
c) Cracks will not be routed
d) Replace MMCD Performance Standard sub section 3.2.1.3 with: <i>“Apply rubberized and elasticized asphalt sealants to cracks that have been cleaned of debris via hot air lancing. Ensure sealant overband uniform in width and not so thick that it will suffer snow plow damage or produce a noticeable bump when driven across.”</i>
e) Remove MMCD Performance Standard sub section 3.2.1.6 in its entirety
f) Remove MMCD Method sub section 3.3.1.1 in its entirety
g) Remove MMCD Method sub section 3.3.1.2 in its entirety

Materials and/or Procedures:

- a) Actively monitor and evaluate roadways for any pavement cracking.
- b) Asphalt materials to be in accordance with Section 32 01 17 6 of the MMCD Platinum Edition, or materials as approved in writing by the City.
- c) Evaluate severity and density in accordance with the most current version of the BCMoTI Pavement Surface Condition Rating Manual
- d) Traffic control shall be managed in accordance with the most current version of the BCMoTI Traffic Management Manual for Work on Roadways.



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Surface Maintenance	
Pedestrian Sidewalks and Walkways	P3.10

Outcome:

To provide and maintain accessibility for the pedestrian and roadway users.

Maintenance Services:

PM3.10-1 Remove accumulations on sidewalk and walkway surfaces, including transit stops and RapidBus stations as follows:

Performance Criteria	Response time
a) Unsafe conditions or has the potential to become unsafe to users	immediately
b) Impaired free drainage from the sidewalk or walkway surface	7 days

PM3.10-2 Perform annual springtime sweep and clean of all paved sidewalks and walkways, including transit stops and RapidBus stations, removing all accumulations, commencing no later than March 31, weather permitting.

Note: This activity to be coordinated with PM3.5-2.

PM3.10-3 Repair or address defects on sidewalk and walkway surfaces, including transit stops as follows:

Performance Criteria	Response
a) Major defect that causes sidewalk or walkway surface to be unserviceable	Repair immediately
b) Moderate defect that does not cause the sidewalk or walkway surface to be unserviceable	Monitor frequently
c) Minor defect that does not affect serviceability of sidewalk or walkway surface	Monitor

Materials and/or Procedures:

- a) Actively monitor and evaluate sidewalk and walkway surfaces using regular safety patrols for any accumulations.



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- b) Perform sidewalk and walkway inspections annually, following the City of West Kelowna Pedestrian Infrastructure Inspection and Maintenance Policy, and the five City of West Kelowna inspection zones on a 5-year rotating cycle.
- c) Refer to Appendix for City of West Kelowna Inspection Zone map.



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Roadside Maintenance	
Litter Collection and Graffiti Removal	P4.1

Outcome:

To keep roadways clean and tidy.

Maintenance Services:

PM4.1-1 Collect and dispose of litter from roadways, including transit stops and RapidBus stations, with a response or frequency time no longer than 3 days.

Note: During times of high transit usage, response times can increase at City's discretion.

PM4.1-2 Remove or cover graffiti on roadway infrastructure, including transit stops and RapidBus stations, and natural features within the roadway dedication within 7 days from when the graffiti was identified.

Note: Remove graffiti to return the marked surface to the original condition if possible. If not possible, graffiti is to be painted with an appropriate, matching colour to minimize the effect of the repair.

Materials and/or Procedures:

- a) Actively monitor and evaluate roadways using regular safety patrols to ensure no litter, debris or dead animals are present.
- b) Dispose of all hazardous and non-hazardous materials per regulatory agency requirements.
- c) Any large debris affecting the normal flow of traffic is to be made secure in accordance with the most current version of the BCMoTI Traffic Management Manual for Work on Roadways until it can be effectively removed.
- d) Report abandoned vehicles or equipment on the roadway dedication to the City and RCMP.



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Roadside Maintenance	
Vegetation Control	P4.2

Outcome:

To improve visibility, safety and facilitate drainage.

Maintenance Services:

PM4.2-1 Cut vegetation from the side slope to a width of 1.8 metres from the shoulder edge, back of curb, or back of sidewalk twice annually as per the City’s grass-cutting routes.

PM4.2-2 Cut vegetation that exceeds 10 centimetres in height on hard surfaced roadway infrastructure.

PM4.2-3 Partially or completely remove brush/trees within road dedication that cause sight distance obstructions, impede drainage or create shaded areas that are known to repeatedly cause black ice to form on the road surface.

Materials and/or Procedures:

- a) Actively monitor and evaluate roadway shoulders for vegetation and danger trees or brush.
- b) The 1.8m cutting swath for gravel roadways is to be measured from the outside edge of the travelled lane.
- c) During times of high wildfire risk, vegetation control activities may be suspended.
- d) Remove brush/trees to the lowest possible height considering uneven terrain.
- e) Refer to Schedule D of City of West Kelowna Traffic Bylaw No. 0092 for sightline obstruction specifications.
- f) Refer to Appendix for City of West Kelowna grass-cutting map.



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Roadside Maintenance	
Transit stop maintenance	P4.3

Outcome:

To improve visibility, safety and facilitate drainage.

Maintenance Services:

PM4.3-1 Perform monthly wash and clean of transit stops including RapidBus stations.

Note: Wash and clean duties include but are not limited to: wash of shelter and platform to remove accumulations, pressure washing stained areas, and removing adhered stickers, labels or substances from shelter, benches, or platform.

PM4.3-2 Complete repairs to damage on shelters, benches, screens, flag posts and rub strips within 7 days of identification of defect, unless specialized repair labour or long lead time parts are required.

Materials and/or Procedures:

- a) Actively monitor and evaluate transit stops for cleanliness and defects.



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Traffic Maintenance	
Sign Systems	P5.1

Outcome:

To regulate and facilitate the safe and orderly flow of traffic.

Maintenance Services:

PM5.1-1 Maintain sign systems so they are clean, repaired, legible, visible, erect, and properly placed within the following times after the defect is identified:

Sign Classification	Response time (days)
Regulatory and Warning	1
Pedestrian and School	1
Guide / Street blade	7
Information	7
Service and Attraction	7

PM5.1-2 Maintain sign systems within the following times after the defect is identified:

Requirement	Response
a) Temporarily repair regulatory and warning signs that are not flat (planar) or properly oriented or either 10 cm ² or 1% (whichever is greater) of the sign face area is defective, dented or vandalized	immediately
b) Place temporary signage for missing regulatory and warning signs	immediately
c) Install, remove and reinstall signs due to seasonal requirements	Annually
d) Remove illegal or unauthorized signs	In contradiction to the manual and as directed by the City



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PM5.1-3 Replace sign systems within the following times after the defect is identified:

Requirement	Response time by sign type	
	Regulatory, Warning, Pedestrian, School	Guide, Street blade, Service, Attraction and Other
a) Damaged signs beyond repair	1 day	8 weeks
b) The reduced retro-reflectivity overrides the ability of the sign text, colour or legend to be effectively presented to roadway users	1 day	8 weeks

PM5.1-4 Install or replace barrier and shoulder-mounted delineators within 10 days that are missing or no longer effective.

Materials and/or Procedures:

- a) Actively monitor all roadway signs using regular safety patrols to ensure proper signage.
- b) Store removed illegal or unauthorized signs until they are claimed by the owner or as directed by the City.
- c) Comply with the Manual of Standard Traffic Sign and Pavement Markings, Specifications for Standard Highway Sign Materials, Fabrication and Supply and Sign Blank Dimensions.
- d) Metal posts and battens to be Telespar sign posts or other material as approved by the City.
- e) All hardware is of non-corrosive material to avoid discolouration of sign faces, complete with tamper-resistant fasteners.
- f) The selection of the post type and quantity of posts required for each installation is to be based on the structural wind loading in the area.



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Traffic Maintenance	
Traffic Management	P5.2

Outcome:

To keep roadway users safe, protect roadway workers and minimize traffic delays.

Maintenance Services:

PM5.2-1 Respond immediately to unplanned events or incidents and take appropriate actions at direction of first responders to ensure the safety of roadway users until traffic management control measures can be deployed.

PM5.2-2 Provide traffic management during the delivery of all applicable roadway maintenance services.

PM5.2-3 Position traffic queues clear of areas that are unsafe or have the potential to become unsafe (including but not limited to rockfall/slide areas, blind corners, horizontal and vertical curves).

Materials and/or Procedures:

- a) Comply with the current version of the BC MoTI Traffic Management Manual for Work on Roadways.
- b) Planned lane closures are prohibited on statutory holidays, unless approved by the City.
- c) Calculate and document anticipated traffic delays prior to commencement of work for planned services, which exceeds 10 minutes.
- d) Remain at the site(s) until traffic flow in all lanes has been re-established or the traffic deficiency has been resolved and the site(s) are safe for roadway users.
- e) Automated flagger assistance devices may be used with an approved traffic management plan and prior approval from the City.
- f) Ensure appropriate temporary signage equipment is used, such as concrete bases and sign stands.
- g) Coordinate with BC MoTI as required in the event of an unplanned closure of MoTI roadways/lanes causing detours affecting City of West Kelowna roadways/lanes.



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Traffic Maintenance	
Pavement Markings and Eradication	P5.3

Outcome:

To facilitate the continuous, safe and orderly flow of traffic.

Maintenance Services:

PM5.3-1 Apply long line pavement markings annually as follows:

Criteria
a) Minimum paint application rate of 40L/km for yellow and white paint.
b) Minimum wet thickness of 16mm
c) Minimum width of 100mm and maximum width of 110mm for specified 100mm lines.
d) Minimum width of 200mm and maximum width of 210mm for specified 200mm lines.
e) Yellow paint to have retro reflectivity of 150 millicandela for at least 30 days after application and 70 millicandela at end of season.
f) White paint to have retro reflectivity of 200 millicandela for at least 30 days after application and 150 millicandela at end of season.
g) Glass bead to be applied immediately following paint application
h) Every reasonable step to be taken to prevent aesthetic faults of all painted lines such as tire tracking and splatter.

PM5.3-2 Apply symbol pavement markings as follows, prioritized based on annual City inspection:

Criteria
a) All markings to be thermoplastic
b) Minimum wet thickness of 16mm
c) Yellow markings to have retro reflectivity of 150 millicandela at end of season.
d) White markings to have retro reflectivity of 200 millicandela at end of season.
e) Every reasonable step to be taken to prevent aesthetic faults of all painted markings such as tire tracking and splatter.

Materials and/or Procedures:

- a) Long line paint shall be supplied from traffic paint products listed on the BC MoTI recognized products list.



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- b) Thermosplastic markings shall be Lafrentz-System 300 product or equivalent. Cold plastic markings shall be Lafrentz-System 400 product or equivalent.
- c) Installation of any large pre-form products shall be done with infrared heaters.
- d) Provide appropriate traffic control procedures during all activities in accordance with the BC MoTI Traffic Management Manual for Work on Roadways.
- e) Third party random testing shall be conducted to ensure specifications are met.
- f) Line painting vehicles shall be equipped with:
 - a. Dual pressure tanks
 - b. Pressurized bead system
 - c. Ability to paint two yellow lines at once
 - d. Ability to paint white/yellow lines with flow of traffic
 - e. Electronic stripe timer for dashed line spacing
 - f. Optical or laser guidance system
 - g. Permanent safety and warning devices
 - h. Digital Pavement Marking Measurement Instrument (DPMMI) capable of recording:
 - i. Date
 - ii. Time
 - iii. Location
 - iv. Road temperature
 - v. Air temperature
 - vi. Paint temperature
 - vii. Paint application thickness
 - viii. Glass bead application rate
 - ix. Vehicle speed
 - x. Distance painted
 - i. Audible back-up alarm



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Traffic Maintenance	
Roadside Barriers	P5.4

Outcome:

To protect roadway users from roadside hazards.

Maintenance Services:

PM5.4-1 Identify defects in concrete roadside barrier such as cracks, missing concrete, disconnections and misalignment that affect the integrity of the barrier system and document all defects on an inspection report and submit to the City quarterly.

PM5.4-2 Repair concrete surface defects such as spalling, scaling and cracking.

PM5.4-3 Replace concrete roadside barriers that have full length cracking front to back, and/or chipping greater than 1/6th of the surface area, and/or any broken connection hooks or angles.

PM5.4-4 Repair to standard or replace defective W-Beam guardrail barrier.

PM5.4-5 Remove all debris that prevents the natural drainage of water through or along the barrier system.

Materials and/or Procedures:

- a) Actively monitor all roadside barriers using regular safety patrols to ensure proper functionality.
- b) The repair of all roadside barriers shall be in accordance with Section 312 of BC MoTI Standard Specifications for Highway Construction.



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Traffic Maintenance	
Street Light Illumination	P5.5

Outcome:

To provide safety for pedestrian and vehicle movement on roadways and maintain the existing inventory of City of West Kelowna owned street lights in a functioning manner of operation.

Maintenance Services:

PM5.5-1 Perform streetlight maintenance as follows:

Criteria
a) Conduct routine repairs within 2 weeks of notification
b) Conduct urgent repairs that ensure the safety of the public, such as those caused by motor vehicle accidents, within 4 hours.

Materials and/or Procedures:

- a) Perform annual audit of all City of West Kelowna roadway street lighting to ensure proper function.
- b) Report to the City any non-working BC Hydro Leased streetlights.
- c) Dispose of all hazardous and non-hazardous materials per regulatory agency requirements.
- d) Replacement street lighting materials and equipment to be in accordance with the City of West Kelowna Works and Services Bylaw No. 0249 or to be consistent with materials and equipment being replaced.



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Network Management Maintenance	
Roadway Inspection and Safety Patrols	P6.1

Outcome:

To monitor conditions and develop a comprehensive knowledge of roadway conditions to support a work identification and planning program.

Maintenance Services:

PM6.1-1 Respond and inspect immediately any conditions reported to the City by others (including but not limited to the public, regulatory agencies and police authorities) that are considered to be unsafe or have the potential to become unsafe.

PM6.1-2 Increase safety patrols and inspections for any condition that is considered unsafe or has the potential to become unsafe until that condition is removed, to the following frequencies:

Requirement	Patrol / Inspection Frequency		
	P1 Roads	P2 Roads	P3 Roads (incl. Gravel Roads)
a) Any condition that is considered unsafe or has the potential to become unsafe	2 hours	4 hours	8 hours
b) During periods of heavy rainfall or snowfall, high water flow or rapid snowmelt	2 hours	4 hours	8 hours

PM6.1-3 Identify and document immediately to the Roads and Drainage Supervisor, conditions that are unsafe or have the potential to become unsafe and the actions taken.

PM6.1-4 Identify and document immediately to the Roads and Drainage Supervisor, conditions that have a performance criteria response time of 7 days or less.

PM6.1-5 Conduct and document safety patrols of roadways at the continuous frequencies as follows:

Patrol / Inspection Frequency by road priority		
P1 Roads	P2 Roads	P3 Roads (incl. Gravel Roads)
Weekly	Weekly	Monthly



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PM6.1-6 Formally inspect and document the condition of roadway infrastructure as follows:

Infrastructure	Frequency of Inspection
a) Retaining walls	Every 5 years
b) Drainage infrastructure (including drainage appliances and ditches)	Every 5 years
c) Rock cuts and slopes	Annually
d) Bridges	Annually

Materials and/or Procedures:

- a) Patrol vehicles are to be appropriately equipped to respond to conditions that are unsafe or have the potential to become unsafe.
- b) Conduct inspections using a qualified inspector as required.
- c) Use inspection results to support the development of annual work plans for roadway maintenance services.
- d) Report condition of infrastructure to other City management support systems, such as a Pavement Management System Inspection report (PMS) or Sidewalk and Walkway Trip Hazard Inspection Report.



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Network Management Maintenance	
Communications	P6.2

Outcome:

To communicate effectively and in a timely manner with the public, stakeholders and the City of West Kelowna.

Maintenance Services:

PM6.2-1 Communicate roadway conditions as follows:

Performance Criteria	Response
a) Engage with the City of West Kelowna Communications department to enhance communications to the public on road maintenance activities	As and when required
b) Report to the City any abandoned vehicles/equipment and provide assistance to RCMP if required	Immediately

PM6.2-2 Communicate with the public and stakeholders as follows:

Performance Criteria	Response
a) Monitor, receive, and address complaints, concerns and requests for service across various communications platforms or in person and document the result of those communications	24 hours
b) Solicit and monitor input regarding the delivery of services and work with the public, stakeholders and City when services are, or may be disruptive/contentious	Immediately

PM6.2-3 Provide a toll-free telephone public service, attended by sufficient personnel 24 hours a day, 7 days a week to process: complaints, comments, concerns, reports of conditions that are unsafe or have the potential to become unsafe; and reports of and requests for roadway conditions.



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Notes:

- 1) All calls fielded by the toll-free telephone public service shall be logged, documented, and summarized monthly to the City. Documentation to include:
 - a) Time and date of call
 - b) Caller name and contact information
 - c) Caller complaint, concern or comment
 - d) Brief description of the situation, and asset affected.
 - e) Actions to be taken to resolve complaint, concern or comment
 - f) Follow-up communications to the caller
- 2) Take action on all calls per the appropriate road maintenance Policy.
- 3) Where the complaint, comment or concern is outside the City's obligation, report to appropriate jurisdiction.

Materials and/or Procedures:

- a) Communications with the public and stakeholders are to be clear and concise.
- b) Notify the appropriate City of West Kelowna department of any road disruptions or closures due to a special event or unsafe condition, complete with traffic control plan and estimated time of closure and ensure the City of West Kelowna Communications department is engaged to inform the public as needed.

APPENDIX A

Snow Removal Priority Map

Sidewalk and Walkway Zone Map

Grass Cutting Map



Legend

- Snow Priority
- Snow Removal Priority
- Snow Removal Priority HIGHWAY - MOTI
- 1
- 2
- 3-Sleep Grades
- 3
- fire access
- WFN
- Strata



Sources: Esri, HERE, Garmin, iFC, OpenStreetMap contributors

Continue to Cattleguard

Continue to end

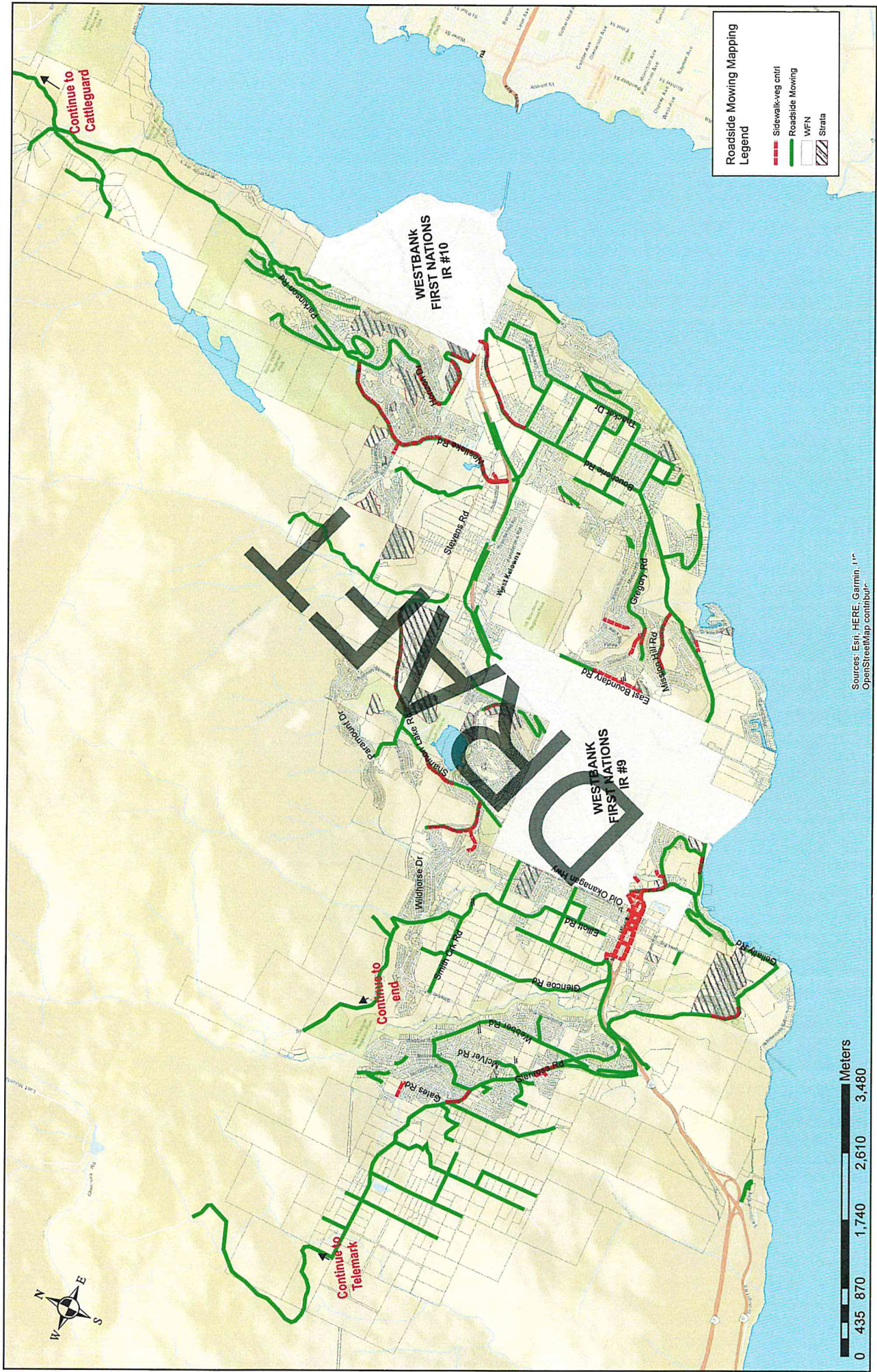
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WESTBANK FIRST NATIONS IR #10

WESTBANK FIRST NATIONS IR #9



Roadside Mowing Mapping Legend

- - - Screwdown-veg control
- Roadside Mowing
- WFN
- Strata

Sources: Esri, HERE, Garmin, TM
OpenStreetMap contributors

0 435 870 1,740 2,610 3,480 Meters



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