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SPECIFICATIONS FOR TRAFFIC CONTROL

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SPECIFICATIONS FOR TRAFFIC CONTROL

200. 1. SCOPE

These Specifications **and the Work Zone Traffic Control Manual** govern operations pertaining to the regulation and guidance of traffic safely through or around the work.

200. 2. DEFINITIONS

2.1 Work Zone Traffic Control Manual

A manual developed by the Department's Traffic Engineering Branch intended to provide a single source for traffic control standards for use on Manitoba's highways. All references in this Specification to signs, sign schedules and drawings shall be interpreted to mean those shown in the Work Zone Traffic Control Manual.

2.2 Work Zone (Work Area)

A **work zone (work area)** is any portion of the highway on which the Contractor's men and equipment are performing work. Two or more work areas separated by less than one kilometre will be considered as a single work area.

2.3 Hazardous Areas

A hazardous area is any portion of the highway where a condition exists which could be dangerous to road users or workers.

2.4 Traffic Control Device

A traffic control device is any gateway assembly, sign, barricade, channelization device or other approved device placed upon, over or adjacent to a roadway, which is intended to regulate, warn, or guide road users.

2.5 Traffic Control Level

A traffic control level will specify the type and application of traffic control devices and workforce necessary to regulate traffic having regard to traffic volume, geometrics and type of work on the project.

Traffic control required on the project will be determined by the Engineer and identified in the bid items as Level I, II, III, IV or V.

200. 3. GENERAL

3.1 Interference with Traffic

The Contractor shall not close the highway or reduce the width or number of traffic lanes available for traffic except as specified in the Contract or approved by the Engineer.

The Contractor shall at all times carry on the work in a manner that will create the least interference with traffic, consistent with the performance of the work.

Construction equipment shall not be parked in such a manner as to obscure or in any way block the road users' view of traffic control devices. Employees vehicles may only be parked on the roadway if they are being used in the performance of the work.

The Contractor shall keep the travelled way free of foreign objects such as spilled earth, rock, timber and other items that may fall from his transporting vehicles. Materials spilled by

or dropped along or across any public travelled roadway, both within and outside the contract limits, shall be removed immediately.

200. 3.1 Interference with Traffic (Cont'd)

The Contractor shall provide and maintain reasonable access to property fronting or in the vicinity of the work. Where temporary disruption of access is authorized by the Engineer, the Contractor shall make adequate arrangements with the affected property owners.

3.2 Placement of Traffic Control Devices

Non-portable sign and other fixed traffic control devices shall be installed prior to commencing work.

Portable signs and other temporary traffic control devices shall be positioned prior to commencing work in each work area and they shall be moved and maintained as the work progresses.

Portable signs and other temporary traffic control devices shall be positioned at each hazardous area, and shall not be removed until the hazard has been eliminated.

3.3 Sequence for Erecting Signs

Traffic shall be advised of work areas and hazardous areas by a sequence of signs from the four classifications outlined in the **Sign Schedule**, generally in the following order;

- a) one sign from Group 1, when required,
- b) at least one sign from Group 2,
- c) at least one sign from Group 3,
- d) one sign from Group 4 when applicable.

The signs shall be used in conjunction with other traffic control devices.

3.4 Maintenance of Traffic Control Devices

When the Contractor ceases operations due to darkness, weekends or weather conditions, or changes his method or sequence of operation, traffic control devices shall be checked and only those necessary to protect road users shall remain in place. During periods when they are not applicable, portable devices shall be removed from the roadway; non-portable devices shall be covered or removed.

Traffic control devices shall be monitored to ensure proper location, legibility and condition, and if necessary, shall immediately be properly repositioned, repaired or replaced.

3.5 Reflectivity

Signs, barricades and channelization devices shall be reflectorized to show the same color and shape by night as by day. The reflective surfaces shall be cleaned or replaced as frequently as necessary to provide full reflectivity. Reflectorized signs will be acceptable if they are clearly visible when illuminated with normal vehicle lights on high beam from a distance of 150 metres.

Beginning January 1, 2005, reflectivity must meet or exceed Level 1 reflectivity standard described in The Canadian Government Standards Board Specification 62-GP-11M. Materials meeting this requirement are commonly referred to as High Intensity.

200. 3.6 Department Traffic Control Devices

Standard traffic control devices existing on the project prior to construction may have to be moved to facilitate the work. The Contractor, on instruction from the Engineer, shall remove the devices and stockpile them carefully at an approved site.

Traffic control devices, when supplied to the Contractor by the Department, shall be returned in good condition when the work is completed.

The replacement cost of any traffic control device owned by the Department and which has been damaged or lost during handling by the Contractor shall be deducted from amounts payable to the Contractor.

200. 4. TRAFFIC CONTROL DEVICES

4.1 Gateway Assembly

Each end of the project shall be identified by a gateway assembly which shall be supplied, installed and maintained by the Contractor. The location of each gateway assembly will be specified by the Engineer.

Unless otherwise directed, the Contractor shall remove the gateway assembly if work is discontinued for the winter.

4.2 Signs

The Contractor shall provide signs as shown on the **Sign Schedule**. **All signs used shall be in accordance with the Work Zone Traffic Control Manual of Uniform Traffic Control or Provincial Regulations.**

Department construction and maintenance projects will include the use of bilingual highway construction signs (English/French) on all Provincial Trunk Highways and Provincial Roads that lie within the "Bilingual Signing Area" in Manitoba. Generally, all highway construction signs with verbal messages will be affected. Where applicable, bilingual signing requirements will be identified in the Special Provisions of the tender document.

Portable signs shall be placed on the roadway clear of normal vehicular traffic, stand vertically and be pinned or anchored so that wind gusts will not topple the sign. The bottom of the sign shall be at least 600 mm above the surface of the road.

The bottom of non-portable signs shall be at least 1500 mm above the surface of the road. With the exception of Gateway Assemblies, the edge of signs shall be clear of the highway shoulder line by at least one metre, and shall be clear of the edge of curbed roadways by at least 300 mm in urban areas and 600 mm in rural areas.

Non-portable sign posts shall be wooden, capable of supporting the sign firmly at the required height and shall have a minimum nominal size of 100 mm x 100 mm.

In general, signs shall be positioned on the righthand side of the road. When two or more adjacent lanes accommodate traffic travelling in the same direction, both non-portable and portable signs shall be positioned on both sides of the roadway.

Where bilingual signing is a requirement, the French sign shall be installed behind the English sign at a distance of approximately 30 m.

200. 4.2.1 Construction Area Sign

The Construction Area sign forms part of the Gateway Assembly. A Construction Area sign or other Group I sign shall be used in advance of work areas which are separated by more than 5 km from the Gateway Assembly or from other work areas.

For all projects with traffic control level II, III, IV, or V, Construction Area signs are to be installed at the intersection of every Provincial Trunk Highway or Provincial Road that enters onto the project.

4.2.2 Temporary Sign Stands

Temporary sign stands, when required, shall be supplied by the Contractor from the following recommended group:

- Flexmast Model PCC3648
- Quadra Flex Model QFVR
- Windmaster Model 4818
- Stellmaster Model 505M

Other acceptable equivalent sign stands will be permitted providing they meet the Specifications and are approved by the Safety Training Facilitator in the Region in consultation with the Department's Traffic Engineering Branch.

4.3 Barricades

A barricade shall consist of one or more similar barricade assemblies placed end to end. When required, barricades shall be reflectorized on both sides.

Class "A" Barricade Assemblies will generally be used to effect a lane or roadway closure and to signify the direction of the detour.

Class "B" Barricade Assemblies will generally be used to effect a complete lane or roadway closure.

Class "C" Barricade Assemblies will generally be used to taper a lane closure and to maintain a lane closure.

4.4 Channelization Devices

Channelization devices, when directed or approved by the Engineer, shall be used when the traffic flow is impeded as a result of obstructions, work areas, or a reduction in the effective width of the roadway. They shall be used to supplement signs and barricades.

All channelization devices will be approved by the Department. They shall be designed to yield if struck by an errant vehicle, and shall conform with the specifications described herein in terms of size, shape, color and reflectivity. Unless otherwise directed, only those delineators and channelizers specified in the Department's Work Zone Traffic Control Manual may be installed in a work zone.

4.4.1 Construction Markers

Construction markers shall be used to delineate obstructions above the ground, such as gravel windrows, and to delineate excavation areas below the ground level, such as bench cuts.

They shall be mounted on suitable supports, with the bottom of the marker being approximately 900 mm above the road surface. They shall be spaced at intervals of not more than 150 m on tangents and 50 m on curves.

200. 4.4.2 Delineators

Delineators shall be installed on the righthand side of the road to mark a hazard that is parallel to the road, such as a pavement dropoff. They shall be spaced at intervals of not more than 100 m on tangents and 50 m on curves.

4.4.3 Polyposts

Polyposts may be used for separating opposing lanes of traffic or for protecting a hazard that is parallel to the road, such as a pavement edge dropoff. They shall be spaced at intervals as outlined in the Department’s Work Zone Traffic Control Manual.

4.4.4 Drums

Reflectorized plastic drums, when required by the Engineer, will be used to maintain a lane closure and will be supplied to the Contractor by the Department. When the work has been completed, the Contractor shall return all acceptable drums to the Department. Drums damaged beyond acceptance or drums lost will be assessed against the Contractor’s progress payments at current replacement cost.

The Contractor shall provide ballast to prevent movement of the drums by the wind. Drums shall be spaced at intervals specified by the Engineer.

4.4.5 Traffic Cones

Traffic cones, when approved by the Engineer, may be used during daylight hours to guide or channel traffic through a work area or a temporary hazardous condition. Cones shall be spaced at the following intervals unless otherwise specified by the Engineer.

POSTED SPEED LIMIT	MINIMUM * TAPER LENGTH (m)	MAXIMUM CONE SPACING (m)
100	250	20
80 or 90	200	15
60 or 70	150	12
50 or less	50	10

* Taper length is for one lane closed. Double the taper length for 2 lanes closed.

4.4.6 Sequential Flashers

A sequential flashing control device may be used in conjunction with other control devices to assist in channelling traffic. If the Contractor decides to use one or more sequential flashers the type of flasher and its application will be subject to approval by the Engineer.

Sequential flashers may be rented from the Department if available, or may be obtained from other sources providing they are equivalent in size, portability and visibility to the sequential flashers used by the Department. If the Contract states that sequential flashers must be used, the Department will supply them.

In the event that a sequential flasher becomes inoperative, the Contractor shall ensure that adequate traffic control is maintained.

Sequential flashers rented from the Department will be charged for at the Department's standard rental rate, and the rental will be deducted from progress payments.

The Contractor shall place, move, maintain and fuel sequential flashers supplied by or rented from the Department in accordance with written instructions obtained with each unit.

200. 4.4.7 Rigid Channelization Devices

Rigid channelization devices such as concrete median barriers and Triton Barriers may be required by the Engineer to channelize or separate traffic. When these types of devices are required, they will be supplied by the Department.

4.4.8 Installing and Removing "Triton" Barriers

"Installing and Removing "Triton" Barriers" will be paid on a linear metre basis of "Triton" barrier installed. This will be payment in full for loading, transporting, unloading, positioning, pinning together, filling with water and emptying the "Triton" Barriers as directed by the Engineer. When the barriers are no longer required, the Contractor shall return the barriers to their original location.

When "Triton" barriers are required to be in use during freezing temperatures, they shall be filled with a brine mixture (normally a 20% sodium chloride (salt), 80% water mixture). Where a brine mixture is required, the Department will supply the sodium chloride.

The Contractor shall notify the Engineer 48 hours in advance of the intended pick-up and delivery time of the "Triton" barriers.

4.4.9 Installing and Removing Concrete Median Barriers

"Installing and Removing Concrete Median Barriers" will be paid on a linear metre basis of barrier installed. This will be payment in full for loading, transporting, unloading positioning and pinning together as directed by the Engineer. When the barriers are no longer required, the Contractor shall return the barriers to their original location.

The Contractor shall notify the Engineer 48 hours in advance of the intended pick-up and delivery time of the barriers.

4.5 Other Devices

4.5.1 Equipment Warning Lights

Equipment warning lights shall be installed on construction equipment and vehicles required to work or stop on the roadway, including service vehicles. Trucks hauling aggregate and earth moving equipment are exempted from this requirement.

Warning lights shall be mounted on the vehicle roof or in an elevated position so as to be visible to traffic and shall be operating when the construction equipment or vehicle is working or stopped on the roadway.

Warning lights shall consist of an electrically driven revolving sealed beam within a weather tight amber enclosure or other approved device producing a similar result. The flash shall be visible in daylight under normal atmospheric conditions for a distance of one kilometre. The light shall flash between 50 and 70 times per minute.

No direct payment will be made for providing equipment warning lights as the cost will be considered as being included in Contract bid items.

4.5.2 Pavement Markers

Flexible vertical tabs called "temporary overlay markers" shall be used to delineate lanes of fresh pavement. The tabs shall be applied 100 mm from centreline, at the following intervals;

- | | | |
|----|---------------------|------|
| a) | Other than top lift | 30 m |
| b) | On top lift | 20 m |
| | -tangents | |
| | -curves | 10 m |

200. 4.5.2 Pavement Markers (Cont'd)

The markers shall be applied accurately with reference to a stringline or other suitable offset line, and always on the same side of centreline on top lift.

The markers shall be applied by the Contractor immediately after final rolling.

Markers shall be removed by the Contractor in advance of placing a new lift of pavement thereon. The markers shall be removed, collected and disposed of in a manner approved by the Engineer.

Markers may be obtained at the Departments' Warehouse stores, at cost. **If obtained elsewhere, the markers will be pre-approved by the Department prior to use.**

4.5.3 Pilot Vehicles

Pilot Vehicles, when listed as a bid item, shall be supplied by the Contractor.

Signs identifying the pilot vehicle shall be mounted above the roof of the vehicle, at least two metres above the ground, and clearly visible by road users from both the front and the back. The signs shall be illuminated during hours of darkness.

At least one revolving equipment warning light shall be mounted to be clearly visible from all directions. It shall be in operation at all times that the vehicle is on duty.

Pilot vehicles shall be operated in conjunction with four flagmen, two stationed at each end of the restricted area. Pilot vehicles shall be operated only at times and locations permitted by the Engineer.

4.5.4 Traffic Signals

Highways restricted to single lane traffic may be controlled by traffic signals when the restriction will be in effect for an extended period.

Traffic signal systems shall not be installed without the approval of the Engineer. When traffic signals have been requested, are available and their use is approved, the Department will supply and install all necessary equipment.

When the signals have been installed at the request of the Contractor, a standard rental rate will be charged, as well as installation, maintenance and removal costs. These charges will be deducted from progress payments.

4.5.5 Flashing Beacons

A flashing beacon shall consist of an electrically powered signal light having a yellow lens of not less than 175 mm in diameter.

Flashing beacons when approved by the Engineer, may be used at locations where it is desirable to attract the driver's attention.

No direct payment will be made for flashing beacons as they will be considered incidental to lump sum price for traffic control.

200. 5. WORK FORCE

5.1 Watchman

The Contractor shall supply a watchman who shall be available after traffic control devices have been positioned. When equipment is working the Contractor shall delegate one person to assume the duties of the watchman. When the equipment is shut down the watchman shall periodically patrol the work to ensure that traffic control devices are properly positioned, in good condition and that the roadway is in a safe condition for road users.

In the event that the watchman cannot physically repair the unsafe condition, he shall immediately make arrangements to correct the situation.

The Contractor shall register, with the local police force, the name and phone number of the watchmen who can be contacted in the event of an emergency situation.

5.2 Flagmen

On Level I and Level II, flagmen are not required at each end of work areas. Flagmen may be necessary due to the manner in which the Contractor conducts his operations, and when so provided will not be paid for directly but will be considered to be included in the Contractor's lump sum price for the applicable Level of Traffic Control.

On Level II, flagmen required while installing or removing through grade culverts and flagmen stationed at earth bridges shall be provided by the Contractor under the lump sum price for Traffic Control, Level II.

On Levels III to Level V the Contractor shall have at least one flagman on duty at each end of each work area. **Flagmen may also be required at hazardous areas, or areas which, in the opinion of the Engineer, are not adequately protected by traffic control devices.**

Flagmen shall generally be located 150 to 500 metres in advance of the work area. The Contractor shall provide each flagman with a standard flagman's manual, supplied by the Department. Flagmen shall wear the standard regalia required by the Department and shall be trained to direct traffic in accordance with the manual.

Substitute flagmen shall be provided at mealtimes and when necessary to give the regular flagmen a break.

Flagmen, in addition to those listed above and as detailed under sections 200.5.6, 200.5.7 and 200.5.8, will be paid for at the unit price for "Flagperson". Where no unit price exists, flagmen will be paid for on the basis of "Extra Work".

5.2.1 Flagman Ahead Sign

A Flagman Ahead sign (WD-A45) shall be placed in advance of any stationary flagperson (flagman).

The back of the Flagman Ahead sign shall be visible to the flagperson at all times and should not be more than 500 metres from the flagperson.

200. 5.3 Coordinator

On Traffic Control, Levels IV and V, the Contractor shall supply a Coordinator who shall not be assigned to duties other than Traffic Control. The Coordinator shall be a competent individual responsible for:

- training flagmen,
- organizing and supervising the movement and relief of flagmen,
- ensuring that flagmen are properly informed with regard to road conditions and are relaying the proper information,
- installing and positioning traffic control devices, and moving or removing them as conditions change,
- maintaining traffic control devices and ensuring that their reflective surfaces are clean, planning traffic control with the Engineer.

The Contractor shall have on site at least one vehicle containing a complete set of extra signs, wooden posts, a posthole auger and other necessary tools and supplies to enable the Coordinator to carry out these duties.

The Contractor shall provide mobile communication between the Coordinator's vehicle and a station or vehicle designated by the Engineer.

5.4 Relief Flagmen

The Contractor shall provide trained relief flagmen on Level V Traffic Control to ensure that no flagman remains on traffic control for longer than three hours without a break. The break from flagging duties shall be at least one hour.

5.5 Standard Work Regalia

Every worker exposed to the hazard of vehicular traffic on a project site on a street, highway, or other roadway, shall:

- wear fluorescent "blaze" outer clothing during daylight, and
- wear suitably reflectorized outer clothing during periods of low visibility and darkness.

5.6 Temporary Overlay Marker Installation

A worker installing temporary overlay markers (TOMS) on a roadway open to vehicular traffic must be accompanied by at least one flagperson, unless the activity is already being controlled by existing flagpeople.

When required the flagperson should, at all times, be within 10 metres of the person installing the TOMS.

No additional payment will be made for providing the temporary overlay marker flagmen, as this will be considered incidental to the work performed.

200. 5.7 Stringline Installer

A worker installing a stringline on a roadway open to vehicular traffic shall be accompanied by at least one flagperson.

The flagperson should, at all times, be within 10 metres of the person installing the stringline.

No additional payment will be made for providing the stringline installer or flagmen, as this will be considered incidental to the work performed.

5.8 Flagging Adjacent to Paving Operations

The Contractor shall provide a flagperson to accompany any self-propelled paver when it is operating on a roadway open to vehicular traffic. The flagperson shall at all times be within 10 metres of the paver.

No additional payment will be made for providing this flagperson, as this will be considered incidental to the work being performed.

200. 6. DETOURS

6.1 General

On all detours the Contractor shall supply, erect and maintain Class "B" barricades, and when required "Barricade Ahead" signs.

If the Contractor requests and the Engineer approves the construction of a detour which is not specifically required by the Contract, all costs involved in constructing, signing, maintaining and removing the detour shall be at the expense of the Contractor.

The Contractor shall not move or remove any traffic control device relating to detours without the permission of the Engineer. The Contractor shall supply flagmen as required until traffic control devices moved or removed by the Contractor have been restored.

6.2 Roadside Detours

Roadside detours around bridge projects will be constructed and traffic control devices will be installed by the Department prior to the Bridge Contractor commencing work. The Contractor shall maintain all traffic control devices for the duration of the Contract. The Department will maintain the road surface.

When the Contract requires a roadside detour it shall be constructed at applicable unit prices. The Contractor shall maintain it. Traffic control devices shall be supplied, installed and maintained by the Contractor. The removal of the detour, if required, will be paid for as Extra Work.

6.3 Route Detours

The Department will maintain traffic control devices which it has installed on route detours.

The portion of the highway included within the construction limits shall be closed to traffic except that the Contractor shall provide safe and adequate means of access to adjacent property. The Contractor shall maintain devices which he has installed.

200. 7. LEVELS OF TRAFFIC CONTROL

The bid item for Traffic Control will specify which of the following five Levels is applicable:

Level I

The Department will supply necessary traffic control devices and install non-portable signs. The Contractor shall erect portable signs, maintain all traffic control devices and provide;

- equipment warning lights
- a watchman

When detours are associated with the work, the Contractor shall barricade the area, as specified in Section 6.1.

Level II

The Contractor shall supply, install and maintain applicable signs, barricades and channelization devices at each work area and hazardous area, and provide;

- gateway assemblies
- equipment warning lights
- a watchman

Level III

The Contractor shall supply, install and maintain applicable signs, barricades and channelization devices at each work area and hazardous area, and provide;

- flagmen **(one flagman at each end of each work area)**.
- gateway assemblies
- equipment warning lights
- a watchman

Level IV

The Contractor shall supply, install and maintain applicable signs, barricades and channelization devices at each work area and hazardous area, and provide;

- coordinator
- flagmen **(one flagman at each end of each work area)**.
- gateway assemblies
- equipment warning lights
- a watchman

Level V

The Contractor shall supply, install and maintain the applicable signs, barricades and channelization devices at each work area and hazardous area, and provide;

- relief flagmen
- coordinator
- flagmen **(one flagman at each end of each work area)**.
- gateway assemblies
- equipment warning lights
- a watchman

200. 8. ENFORCEMENT

The Contractor shall provide for the safe passage and control of traffic within the limits of the project.

If the Contractor fails to provide for the safe passage and control of traffic or fails to correct forthwith an unsatisfactory condition upon being so directed, the Engineer will suspend the work immediately. The Contractor shall not resume work until the Engineer is satisfied that the situation has been rectified and is safe for the road user.

If immediate action is required, the Engineer may correct the unsatisfactory condition and take such other action as he deems necessary to provide for the safe passage and control of traffic.

The Department will deduct, from progress payments, any cost or expense incurred by the Department as a result of taking corrective action. No act, or failure to act on the part of the Engineer, shall relieve the Contractor from his responsibilities.

200. 11. BASIS OF PAYMENT

11.1 Traffic Control

The lump sum price for providing the required level of traffic control will be compensation in full for performing all work and providing all items necessary or incidental thereto **(including bilingual signage where necessary)**.

Forty percent of the lump sum price for Traffic Control will be paid on the first progress payment; thereafter payments will be made in increments of twenty percent when 50%, 75% and 100% of the contract work has been performed.

Traffic control devices or workforce required by the Engineer, in addition to those prescribed in the specific Level of Traffic Control, will be paid for on the basis of Extra Work.

11.2 Pavement Markers

The unit price for each "Temporary Overlay Marker" will be payment in full for supplying and installing each marker and performing all work necessary or incidental thereto.

11.3 Pilot Vehicle

The unit price for "Pilot Vehicle" will be the total amount paid to the Contractor for each hour a vehicle is operated and shall include the cost of supplying the vehicle, providing operators and flagmen, and supplying fuel, oil, grease and repairs necessary to keep the pilot vehicles operating in a safe and efficient manner.

11.4 Flagperson

The unit price per hour for "Flagperson" will be payment in full for providing each flagperson when requested by the Engineer, including regalia, training, all wages (including work breaks and other like employee benefits and payroll costs) and all operations necessary or incidental thereto for directing traffic safely through a hazardous area.