TRAFFIC ACCOMMODATION IN WORK ZONES

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SECTION 1 - INTRODUCTION TO TRAFFIC ACCOMMODATION

INTRODUCTION

When activities such as roadway/bridge work, utilities work, or materials testing and surveying are performed on or adjacent to public roadways in Parkland County, the person(s) performing the work must make suitable provisions to safely accommodate the travelling public while protecting the safety of the workers.

The purpose of this document is to provide a guide and minimum standards to the various parties working within Parkland County road allowances to follow, so that the accommodation of traffic is handled in a consistent, safe and effective manner. This document identifies the primary roles and responsibilities of each party for public safety, it outlines the general considerations for developing an effective traffic accommodation strategy and provides information when using various Traffic Control Devices on County roadways. This manual also includes a series of drawings detailing minimum standards for temporary signing in typical Work Zones. In the case of non-typical Work Zones, site specific traffic control measures are required to address the unique aspects of the project.

The contents of this document are not intended to modify or supersede any provisions of Parkland County contracts or agreements. In the event of a discrepancy between this document and the County County's contracts or agreements, the requirements of the contract or agreement shall govern.

Users of this manual should note that 6.0 Compliance with Contract Specifications and Traffic Accommodation Strategy pertains to the construction and maintenance projects. Due to the duration and nature of roadway maintenance and utility work, the process used to address incidents of non-compliance may differ for those types of projects.

DEFINITIONS

For the purposes of this manual, the following definitions apply:

ASDT Average Summer Daily Traffic (Traffic volume for an ASDT shall include traffic travelling in both directions at a given point.)

Buffer zone The area from the end of the transition area to the actual work space.

Clear zone The border area starting at the edge of the travel lane that should be clear of hazards and available for use by errant vehicles.

Consultant The person(s) retained by the County to design and/or administer a highway/bridge construction or maintenance contract.

Contractor Any person(s) performing work on Parkland County's road allowance or bridges.

County Representative or Supervisor The County official (Manager, Supervisor, Project Officer, Foreman) who liaises with the Contractor, Consultant or Utility Company, on behalf of the General Manager of Infrastructure Services.

Gazetted Speed The regulated vehicular speed authorized for travel.

Long Duration Projects Projects such as the construction of a new roadway or bridge, the reconstruction or resurfacing of an existing roadway and other similar types of work which last longer than a single day.

Mobile Work Zone Work Zones that involve work that is performed while moving continuously, usually at low speeds, or intermittently, with periodic stops which do not exceed a few minutes in duration.

Peak Traffic Normal peak traffic times are 6:30 – 8:00 and 16:00 – 18:00.

Rural Roadway Projects Any roadway under the jurisdiction of Parkland County outside the corporate boundaries of an urban municipality.

Short Duration Projects Projects which involve activities for which the traffic disruption lasts no more than a single day and is not undertaken during hours of darkness.

Traffic Accommodation Strategy (TAS) Plans and written procedures detailing the traffic accommodation activities for any work within the roadway right-of-way.

Traffic Control Devices (TCDs) Temporary signing, traffic control signals, arrow boards, pavement markings, delineators, message boards, etc., used for traffic accommodation in the Work Zone.

Utility Company The person(s) installing, adjusting, maintaining or relocating a utility within the highway right-of-way.

Work Area The area or location of the actual traffic disruption or hazard. There may be several Work Areas within the Work Zone.

Work Zone The area extending from the first advance warning sign to the last construction sign.

PRIMARY RESPONSIBILITIES

To ensure traffic accommodation is handled in a consistent, safe and effective manner by all parties conducting work within Parkland County road allowances that have received approval to carry out their work.

The primary responsibilities of the Contractor, Consultant, Utility Company, and the County for traffic accommodation are as follows:

COUNTY SUPERVISED PROJECTS

The County establishes standards for the specifications and drawings and ensures that public safety is a high priority on County construction projects, maintenance projects, contract projects and utility work. They will typically be administered by the County Representative or Supervisor. In addition, the County performs the following functions:

County Projects: (Supervised by County Employees)

- Develop a Traffic Accommodation Strategy prior to commencement of the work.
- Implement traffic accommodation measures in accordance with the Traffic Accommodation Strategy
- Review the Traffic Accommodation Strategy prior to commencement of the work to determine if it is appropriate for the site conditions anticipated.

- Monitor the Work Zone as the work progresses to determine if the Traffic Accommodation Strategy is suitable for each phase of the work throughout the duration of the project.
- Modify the Traffic Accommodation Strategy as necessary.
- Initiate meetings with staff to address any concerns regarding the performance of the Traffic Accommodation Strategy.
- Maintain all Traffic Control Devices.
- Submit the daily report of traffic accommodation details (location, date, time, signs, barricades, etc.) on a weekly basis.
- Report all third party vehicle accidents immediately. Provide a completed copy of the accident report within 72 hours to Legislative and Administrative Services, the Fleet Supervisor and Safety Coordinator.

County Projects: (Supervision of Contractors)

- Review the Traffic Accommodation Strategy prior to commencement of the work to determine if it is appropriate for the site conditions anticipated.
- Liaise with the person performing the work to address any concerns with the proposed Traffic Accommodation Strategy.
- Periodically monitor the Work Zone to ensure the person performing the work implements and maintains the Traffic Accommodation Strategy.
- Monitor the Work Zone as the County deems necessary and as the work progresses to determine if the Traffic Accommodation Strategy is suitable for each phase of the work throughout the duration of the project.
- Initiate any meetings required with the Contractor to address any concerns regarding the performance of the Traffic Accommodation Strategy.
- Advise the person performing the work of any deficiencies in his traffic accommodation measures and ensure that the Contractor takes appropriate and timely corrective action.
- Order the person performing the work to suspend work in cases of recognized imminent danger or where he fails to undertake appropriate and timely measures to accommodate traffic or fails to correct recurring deficiencies. Immediately notify the County Representatives in cases where such orders are issued.
- For any accidents, which involve a fatality, serious injury, or 3rd party property damage or as specified in the Alberta Traffic Safety Act, complete a Motor Vehicle Traffic Collisions Occurring in Work Zones Report within 72 hours of knowledge of the accident. (Report to include photos, details of site conditions, record of signs, etc.) . Provide a completed copy of the accident report within 72 hours to Legislative and Administrative Services, the Fleet Supervisor and Safety Coordinator.

County Projects: (Supervised by Consultants)

- At the design stage of the project, provide the Consultant with comments regarding the proposed traffic accommodation procedures and assist in the identification of issues that are unique to the project.
- Provide comments to the Consultant concerning the Contractor's proposed Traffic Accommodation Strategy.
- May periodically visit the Work Zone during such visits, advise the Consultant of any deficiencies noted in the traffic accommodation measures.

- Order the Contractor to suspend work in cases of recognized imminent danger or where the Contractor fails to take appropriate and timely measures to accommodate traffic. Typically, the County would only take on this responsibility during a "periodic visit" where the Consultant cannot be contacted to issue the order to suspend work.
- Review Motor Vehicle Traffic Collisions Occurring in Work Zones reports for completeness and report any traffic accommodation signing deficiencies noted to the Consultant so that they can be corrected immediately.

CONTRACTOR SUPERVISED PROJECTS

The following are the Contractor's primary responsibilities for traffic accommodation on County roadway/bridge construction and maintenance contracts.

On construction projects, any required submissions or reporting by the Contractor shall be directed to the County Representative or Consultant. On maintenance projects, any required submissions or reporting by the Contractor shall be directed to the County Representative. The Contractor must have accredited temporary traffic accommodation training.

- Develop a Traffic Accommodation Strategy and submit it for evaluation two weeks prior to commencement of the work.
- Implement traffic accommodation measures in accordance with the Traffic Accommodation Strategy.
- Ensure that all sub-contractors comply with the Traffic Accommodation Strategy.
- Monitor the Work Zone to ensure that the Traffic Accommodation Strategy is effective. This requirement is applicable during hours of daylight and darkness and regardless of whether or not work is being performed or the project is shut down.
- Maintain all Traffic Control Devices and daily log book.
- Modify the Traffic Accommodation Strategy as necessary.
- Take appropriate and timely action to correct any deficiencies identified by the Contractor, the Consultant or the County. In cases of imminent danger, corrective action must be immediate.
- Report all third party vehicle accidents immediately. Provide a copy of the completed accident report within 72 hours of the occurrence.
- On construction projects, submit completed daily reports of traffic accommodation details (location, date, time, signs, barricades, etc.) on a weekly basis.
- On construction projects, attend any meetings initiated by the County or their Consultant to address any concerns regarding the performance of the Traffic Accommodation Strategy.
- On construction projects, submit a timely and accurate schedule of the subcontractors' activities prior to commencement of the work.
- Provide a knowledgeable individual at the Work Zone to maintain the Traffic Control Devices and address any traffic accommodation issues which arise. On construction projects, the Contractor must identify this individual at the pre-construction meeting.

CONSULTANT SUPERVISED PROJECTS

The following are the Consultant's primary responsibilities for traffic accommodation when administering a County roadway or bridge construction contract.

When a Consultant performs work such as survey and materials testing within the roadway right-of-way which does not coincide with the Contractor's activities the primary responsibilities of the Contractor shall also apply to the Consultant.

- Identify in the special provisions of a construction contract, any unique situations that will require special traffic accommodation measures. Ensure the Contractor addresses these situations in the Traffic Accommodation Strategy (example; limiting the length of the Work Zone, establishing the posted speed for the Work Zone, etc.
- Where applicable, confirm "traffic counts" with the County Representative and include this information in the special provisions for the contract (several drawings contained in this document require additional Traffic Control Devices for certain traffic volumes).
- Where applicable, confirm requirements for overhead illumination and minimum speeds for the Work Zone (other than flag person stations) with the County Representative and include any requirements in the special provisions for the contract.
- Provide suitable traffic accommodation for the Consultant's activities and coordinate the positioning of the Consultant's Traffic Control Devices with the Contractor and/or Utility Company when necessary.
- Review the Contractor's Traffic Accommodation Strategy prior to commencement of the work to determine if it is appropriate for the site conditions anticipated.
- Provide a copy of the Contractor's Traffic Accommodation Strategy to the County Representative.
- Liaise with the Contractor to address any concerns with the proposed Traffic Accommodation Strategy.
- Notify the local RCMP of the proposed changes to traffic flow. Invite the RCMP to review traffic flows, signage and any other Traffic Control Devices upon commencement of the work.
- Where applicable, notify local fire County and ambulance service of the impending work and anticipated site conditions.
- Provide the County Representative with a completed "Order Fixing Maximum Speed Limits" prior to commencement of the work.
- Periodically monitor the Work Zone to ensure the Contractor implements and maintains the Traffic Accommodation Strategy.
- Monitor the Work Zone as the Consultant deems necessary and as the work progresses to determine if the Traffic Accommodation Strategy is suitable for each phase of the work and throughout the duration of the project.
- Initiate any meetings required with the Contractor to address any concerns regarding the performance of the Traffic Accommodation Strategy.
- Advise the Contractor of any deficiencies in his traffic accommodation measures and ensure that the Contractor takes appropriate and timely corrective action.
- Order the Contractor to suspend work in cases of recognized imminent danger or where the Contractor fails to undertake appropriate and timely measures to accommodate traffic or fails to correct recurring deficiencies. Immediately notify the County Representative in cases where such orders are issued.
- Immediately notify the County Representative of any accidents which involve a fatality, serious personal injury, or 3rd party property damage in excess of $1,000 or as specified in the Motor Vehicle Administration Act or any act or regulation that replaces the Motor Vehicle

Administration Act Provisions. Provide the County Representative with a Motor Vehicle Traffic Collisions Occurring in Work Zones Report within 72 hours of knowledge of the accident. (Report to include photos, details of site conditions, record of signs, etc.)

- Review all daily traffic reports received from the Contractor.

UTILITY SUPERVISED PROJECTS

- When performing work in conjunction with a County construction contract and inside the Contractor's Work Zone, provide suitable Traffic Control Devices for the utility work and co-ordinate the positioning of these devices with the Prime Contractor.
- When performing work which is not inside the Contractor's Work Zone, develop a Traffic Accommodation Strategy and submit it to the County Representative for evaluation at least 2 weeks prior to commencement of the work.
- Provide a knowledgeable individual at the utility Work Area to maintain the Traffic Control Devices and address any traffic issues which arise. Identify this individual to the County Representative prior to commencement of the work.
- Implement traffic accommodation measures in accordance with Traffic Accommodation Strategy.
- Monitor the utility Work Area to ensure the Traffic Accommodation Strategy is effective. Modify the Strategy when necessary and advise the County representative accordingly.
- Maintain all Traffic Control Devices.
- Take appropriate and timely action to correct any deficiencies.
- Ensure that all sub-contractors working for the Utility Company comply with the Traffic Accommodation Strategy.
- Report all third party vehicle accidents to the County Representative immediately. Provide a copy of the completed accident report within 72 hours of the occurrence.

PROVINCIAL HIGHWAY RIGHT OF WAYS

The following are the primary responsibilities for traffic accommodation when undertaking work within provincial highway right of ways.

- Develop a Traffic Accommodation Strategy and submit it to the County and Alberta Transportation Representative for evaluation two weeks prior to the commencement of work. The traffic accommodation strategy must comply with Alberta Transportations “Traffic Accommodation in Work Zones 2008” edition.
- Provide a knowledgeable individual at the work area to maintain the traffic control devices and address any traffic issues that may arise. Identify this individual to County and Alberta Transportation prior to commencing work.
- Implement traffic accommodation measures in accordance with the Traffic Accommodation Strategy.
- Monitor the work area to ensure the Traffic Accommodation Strategy is effective.
- Modify the strategy when necessary and advise the County representative accordingly, in writing.
- Maintain all traffic control devices.
- Take appropriate and timely action to correct any deficiencies.

- Ensure that all contractors working for the municipality comply with the Traffic Accommodation Strategy.
- Report all third party vehicle accidents to County and Alberta Transportation immediately.

TRAFFIC ACCOMMODATION

GENERAL CONSIDERATIONS

In addition to providing safe passage for traffic through the Work Zone, effective traffic accommodation involves minimizing inconvenience to traffic. To ensure traffic moves effectively through the Work Zone, it is critical that the Traffic Control Devices (TCDs) used to advise, warn and direct traffic are appropriate for the site conditions. Any TCDs which are not required must be removed or covered immediately.

FLAG PERSONS

In situations where the sole use of TCDs does not provide sufficient warning or direction to traffic, the use of flag persons may be required. The proper use of flag persons to control and direct the flow of traffic can mitigate problems inherent in congested Work Areas and in Work Areas involving reduced lane widths and lane closures. When traffic queues occur, additional flag persons and/or repositioning of the "Flag person ahead" sign may be necessary.

All flag persons must be certified and compliant with the Alberta occupational health and safety industry standards. Flag persons shall be dressed in coveralls which meet the Class 3 Level 2 requirements of CSA Z96-02, High Visibility Safety Apparel. Each pair of coveralls shall have a permanent label affixed certifying compliance with Class 3 Level 2 of CSA Z96-02.

The color of the coveralls shall be fluorescent yellow-green with silver retro reflective striping. The retro reflective striping shall be a minimum of 50mm wide, and shall be sewn onto a 1OOmm wide fluorescent red-orange background material. Flag person safety apparel shall be kept clean and in good condition at all times. Faded, torn and/or dirty coveralls, or coveralls without CSA certification labels, will not be acceptable, and shall be replaced.

Prior to commencement of the Work, the Contractor shall identify and assess existing and potential hazards at the project site. Where there is a foreseeable risk of injury to a worker's head, flag persons shall wear fluorescent orange protective hardhats meeting the requirements of CSA Standard Z94.1-92. Where no foreseeable risk of head injury exists, flag persons will be permitted to wear any type of fluorescent orange headgear.

During hours of darkness, flag persons shall be equipped with hand held red traffic signal wands of sufficient brightness to be clearly visible to approaching traffic. In addition, flagging stations shall be illuminated by overhead lighting; and signs indicating hazardous conditions and signs requiring increased attention shall be marked with flashers.

DETOURS

In situations where it is necessary to close the entire roadway, a detour must be provided. The scheduling, location and use of a detour requires prior approval of the County and/or other jurisdictions.

Where the conditions dictate that construction of a detour is necessary, the Contractor shall provide a detailed design approved by a transportation engineer.

TEMPORARY SPEED REDUCTIONS

When work is performed within the roadway right-of-way on County contracts or agreements, the County has the authority, under the Traffic Safety Act, to authorize temporary speed reductions in the Work Zones.

TRANSITIONAL SPEED REDUCTIONS

The standard drawings included in this document do not show incremental speed reductions in advance of the Work Zone. The distance between the "reduced speed" sign and the start of the work area will depend on the reduced speed posted. To be effective, the speed and distance used must allow traffic sufficient time to react without creating undue inconvenience (aggressive braking).

COORDINATION OF ACTIVITIES

On County construction projects, it is possible to have the Contractor, Consultant, and/or Utility Company simultaneously performing work within the Contractor's Work Zone. In these situations, it is the prime contractor's responsibility to coordinated efforts between all parties so that the positioning of Traffic Control Devices required for each activity is established prior to commencement of the work. The County representative will confirm the designation of prime contractor whenever such conflicts occur.

ACCOMMODATING PEDESTRIANS ON COUNTY ROADWAYS

Pedestrians shall be provided with safe passage through or around Work Areas on urban roadways. When passage is provided through the Work Area, suitable provisions shall be made to ensure pedestrians are physically separated from workers and equipment. When pedestrian traffic cannot be accommodated through the Work Area, an alternate route shall be made available.

TRAFFIC ACCOMMODATION STRATEGY

GENERAL

When activities are performed within the roadway right-of-way, a Traffic Accommodation Strategy is required. To be effective, the Traffic Accommodation Strategy must address the traffic accommodation issues relevant to the specific activity being performed, provide protection for workers and equipment within the Work Area and allow traffic to pass safely and with a minimum of inconvenience through or around the Work Zone.

For work performed by a Contractor on a County construction or roadway maintenance contract, the Traffic Accommodation Strategy shall be developed by the Contractor.

For work performed by a Utility Company (outside the limits of the Contractor's Work Zone), a Traffic Accommodation Strategy shall be developed by the Utility Company.

For work performed by a Consultant (outside the limits of the Contractor's Work Zone), a Traffic Accommodation Strategy shall be developed by the Consultant.

On construction contracts, the Contractor must submit the Traffic Accommodation Strategy to the County representative or their Consultant prior to commencement of the work. The County or Consultant will then review the Traffic Accommodation Strategy and address any concerns with the Contractor. The timelines for the submission and review of the Traffic Accommodation Strategy are detailed in the Specifications.

On roadway maintenance contracts, Traffic Accommodation Strategies for “planned" maintenance activities shall be submitted by the Contractor to the County Representative for review prior to commencement of the work.

For "non-planned" maintenance activities or emergency situations it may not be practical to develop a site-specific Traffic Accommodation Strategy. For these cases, typical or generic strategy(s) which generally cover the activities or situations anticipated may be used. These "generic" strategies must also be in place prior to commencement of the work and in accordance with the Specifications.

When a Traffic Accommodation Strategy for work performed by a Consultant or Utility Company is required, the Consultant, or Utility Company shall submit the strategy within the timelines established by the County Representative.

To achieve consistency in the accommodation of traffic on County projects, the information and standard drawings contained in this document must always be considered when developing or evaluating a Traffic Accommodation Strategy. The information and standard drawings contain minimum standards for typical conditions. However, the actual requirements for traffic accommodation may vary depending on the complexity of the work activity, traffic volumes, traffic speeds, night time conditions, highway geometries and other site specific conditions.

DETAILS FOR TRAFFIC ACCOMMODATIONS STRATEGY

(Note: For work performed by the County, the supervisor will develop the traffic accommodation strategy)

The objective of a Traffic Accommodation Strategy is to safely accommodate both the road users passing through the Work Zone and the workers performing activities within the Work Zone. The complexity of the Traffic Accommodation Strategy will vary depending upon a number of factors including traffic volumes and the nature of the activity being performed .Typically traffic accommodation measures required for Long Duration Projects will be more elaborate than those for Short Duration Projects.

Regardless of the nature of the activity, the following factors should be considered when developing the Traffic Accommodation Strategy (A check list is included in Section III Forms):

- Duration of work
- Traffic volumes (ASDT, peak hours, statutory holidays, special events and recreation traffic, etc.)
- Class of roadway (capacity, level of service, etc.)
- Available sight distance
- Intersections
- Grade line (steep hills create stopping problem)
- Type of roadway surface (gravel or paved)
- The use of only those Traffic Control Devices which are necessary to clearly warn, advise and control the traffic
- Speed limits must be appropriate for the conditions. When reductions in speed are necessary, the speed must be reduced over a reasonable distance.
- The provision of a buffer between traffic and workers whenever possible.

- Devices used to delineate the travel lanes must be appropriate for the intended purpose. Such devices must be visible to traffic and positioned and spaced in a manner which will optimize their effectiveness.
- Stabilizing Traffic Control Devices with weights when necessary.
- Closing only those lanes necessary to divert traffic around workers and/or equipment.
- The use of flags and/or flashers to increase the visibility or prominence of signs.
- The use of flag persons for traffic control.
- The effect of restricted traffic flow on "upstream" conditions (traffic congestion, etc.).
- Avoid scheduling operations during hours of peak traffic volumes.
- The requirements as illustrated on the standard drawings included in this document pertaining to the use and location of tapers and transitions.
- Weather conditions (dust, rain, fog or snow).
- Site specific safety issues.

ESTABLISHING THE TRAFFIC ACCOMMODATION STRATEGY

It is extremely important that all parties have a clear understanding of how traffic will be accommodated before work commences. This information must be detailed in the Traffic Accommodation Strategy.

The Traffic Accommodation Strategy must contain drawings detailing the configuration of temporary signing and any other Traffic Control Devices which will be used to accommodate traffic. For typical situations, the standard drawings contained in this document may be used. For non-typical situations, site specific or activity specific drawings must be developed by the person performing the work.

The Traffic Accommodation Strategy must also document procedures which will be used to address issues such as but not limited to the following:

- Installing, relocating and removing Traffic Control Devices.
- Accommodating over-dimensional vehicles.
- Accommodating vehicles around fresh tack coat.
- Night time and other periods of inactivity.
- Use of detours.
- Accommodating emergency vehicles.
- The use of non-typical lane widths.
- The on-site designate responsible for traffic accommodation.
- Any non-typical situations not covered by the standard drawings.

It is critical that all parties are in agreement on the procedures, signing configurations, and Traffic Control Devices to be used for the accommodation of traffic prior to commencement of the work. Once work commences, changes can be made as conditions dictate. Any change made to the Traffic Accommodation Strategy including the reasons or circumstances necessitating the change must be documented in writing.

MONITORING TRAFFIC ACCOMMODATION

To ensure traffic control measures are performing as intended, it is necessary to monitor and maintain the Traffic Control Devices on a regular basis. The person performing the work designates a specific individual to perform this function and ensure any issues arising are addressed in a consistent and

timely manner. To be effective in this role, such individuals must be knowledgeable in the processes and procedures for accommodating traffic including the use of all types of Traffic Control Devices.

DAILY RECORD OF TRAFFIC CONTROL DEVICES

The person performing the work must document specific information concerning the temporary construction signing and any other Traffic Control Devices used to accommodate traffic through the Work Zone. This information is recorded each day, from the date that work zone signs are installed until they are removed and as the work area changes. A sample form is included in this document.

As a minimum, all signing must be inspected and the information recorded at work day commencement, lunch break, and the end of work each day, as well as any other times throughout the day when signs are moved or changed. Recording this information does not relieve the person performing the work of his responsibility to ensure that the traffic accommodation activities comply with the Traffic Accommodation Strategy at all times during the project.

COMPLIANCE WITH CONTRACT SPECIFICATIONS AND TRAFFIC ACCOMMODATION STRATEGY ON COUNTY CONSTRUCTION CONTRACTS

It is the County's expectation that the Contractor complies with the Specifications for traffic accommodation and the Traffic Accommodation Strategy at all times throughout the duration of the project. In situations where the Contractor is not in compliance with these requirements, the County or its representative has the authority to order the Contractor to suspend work on the project. Although ordering the immediate suspension of work will ultimately achieve compliance with the Specifications, it may not be practical or desirable to take this course of action in all cases, good judgment must be exercised.

In a situation where there is recognized imminent danger to road users, the suspension of work must be immediate and must continue until the Contractor has rectified the deficiency to the satisfaction of the Consultant.

When an infraction or deficiency is considered to be minor and does not result in imminent danger, an escalating resolution process should be used.

In these cases, the County or its representative's first attempt to have the issue resolved should be through verbal communication with the Contractor. At this stage, it may be beneficial for the County or its representative to meet with the Contractor, identify or explain the nature of the deficiency, confirm expectations and discuss possible solutions to help prevent a reoccurrence of the deficiency.

If the infraction or some similar type of deficiency reoccurs, the County or its representative must issue a written warning, advising the Contractor that continued infractions will result in the issuance of an order to suspend work on the project. A copy of this written warning must be forwarded to the Contractor's head office and the County representative. At this point the Contractor should examine his existing methods or processes for accommodating traffic and consider making modifications which will prevent reoccurring infractions and ensure compliance with the Specifications. The nature of the methods or processes required to ensure compliance with the Specifications is totally the responsibility of the Contractor.

If after the issuance of a written warning infractions continue to occur, the County or its representative must issue the Contractor with a written order to suspend work on the project. At this point, the

County Representative must be notified of the conditions at the Work Zone and the Contractor's failure to comply with the contract requirements.

When a written order to suspend work is issued, the "order" may cover a specific phase of the work (being performed by a sub-contractor) or the entire project, as actual conditions dictate. In all cases, the Contractor is totally accountable for the performance of his sub-contractors.

The written order to suspend work remains in effect until the Contractor rectifies the deficiency. Further, when an order to suspend work has been issued, it is recommended that the Consultant arrange a meeting between himself, the County representative, and senior official of the Contractor to discuss the problems associated with traffic accommodation on the project and to establish measures which will prevent future occurrences of non-compliance.

It is the County's intent and expectation that in all cases, deficiencies in traffic accommodation are addressed in a prompt and effective manner. Therefore, this escalating resolution process may culminate over a period of days or within a single day, depending on the nature of the deficiency.

Repeated non-compliance by Contractors on previous County projects may require that alternative measures be used to ensure effective traffic accommodation. In these cases, the County representative should confirm expectations and the manner in which non-compliance will be handled with the Consultant and the Contractor prior to commencement of the work.

LONG DURATION PROJECTS

Due to the varying duration and site conditions and the complexity of these types of projects, a specific Traffic Accommodation Strategy is required in each instance. When developing a Traffic Accommodation Strategy for a Long Duration Project, the following additional factors must be considered:

- Type of activity (mobile versus stationary).
- Other work planned adjacent to or within the project limits.
- Railway crossings.
- Maintaining traffic control during periods of inactivity (off-hours, downtime, seasonal shutdowns, etc.).
- Bridge sites.
- Night time operations.

SHORT DURATION PROJECTS

Short Duration projects generally involve activities necessary to preserve or repair existing highways and bridges, to perform testing on existing roadway surfaces or to perform survey measurements within the highway right-of-way. Due to the nature of these activities, the work may be performed in accordance with a scheduled plan similar to Long Duration projects or, on an emergency (unscheduled) basis. Short Duration projects may have mobile or stationary Work Areas and may involve work on the roadway travel lanes, the roadway shoulders, in the roadway right-of-way and on or around drainage facilities.

TRAFFIC CONTROL DEVICES

GENERAL

To be effective, Traffic Control Devices must achieve the following:

AWARENESS AND IDENTIFICATION

- Advise road users of the type of activity and the potential hazards that they may encounter.
- Divert traffic from its normal path when necessary.
- Advise road users when it is safe to resume normal speed.

PROTECTION

Protect road users and workers from collisions by providing adequate warning and/or a barrier. Where access to a road is being denied to the public, barricades shall be installed across the entire surface of the roadway.

CHANGES IN TRAFFIC SPEEDS

Generally at locations where the work results in a change to the existing road conditions (i.e. lane transitions , reduced lane widths , detours, etc.), creates obstructions or requires the presence of workers/equipment in or adjacent to the normal path of travel, a reduced speed zone is warranted. Speeds shall be appropriate for accommodating traffic safely through or around the Work Zone with a minimum of inconvenience.

Generally, the reduced work zone speeds are as noted in the following tables.

TWO LANE ROADWAYS

Speed Limits			Description
50	80	Posted	
X			Traffic is controlled by flag persons or traffic lights The whole roadway is disrupted with construction or maintenance activities Working on the paved shoulder and encroaching on a travel lane Shoulder width less than 1m with an unprotected longitudinal drop off
	X		On paving projects with uneven mat up to 65 mm in thickness On paving projects where the center line has been spotted Shoulder width more than 1 m with an unprotected longitudinal drop off
		X	Very short duration work; e.g. sign replacement, "Splash and dash" patching, debris removal, etc. and equipment is parked entirely on the shoulder All work is outside of the paved shoulder; working from the ditch side (mowing, surveying, etc). No changes done to the driving lanes or paved shoulders

Note: If there are circumstances where the work zone speeds are different from those noted above, they will be dealt with in the Special Provisions or by the County Engineer.

LANE DELINEATION

Provide adequate transitions for the speed and volume of the traffic travelling through the Work Zone.

TEMPORARY SIGNING

The various types of temporary signing generally used include temporary warning signs, temporary regulatory signs and information signs. Temporary signs must conform to the specifications for shape,

color, reflectivity, message and size. The type configuration and number of temporary signs required for the Work Zone may vary depending on the nature of the activity and site conditions.

The following factors should be considered when establishing temporary signing:

- Changes to the Work Zone which temporarily or permanently affect signing requirements (covering or removing unnecessary signs, adding additional signs or moving signs).
- Positioning of the signs relative to the travel lane (distance from and height above the travel lane).
- Visibility of the signs (sight distance, vegetation, parked equipment, darkness, dust, etc., which may reduce effectiveness of the signs).
- Signing is required for both sides (in same direction) on multi-lane divided highways.
- Positioning of signs relative to the Work Area.
- Higher speeds require longer spacing between signs.
- The distance between the "reduced speed" sign and the start of the Work Area. This distance will depend on the reduced speed posted. To be effective, the speed and distance used must allow traffic sufficient time to react without creating undue inconvenience.
- The installation of signs on 2 lane highways with a message displayed to opposing traffic is not allowed.

Once all necessary temporary signs are in place and traffic is passing through the Work Zone, it is extremely important to monitor the Work Zone on a regular basis to ensure that:

- The signing is performing as intended.
- Maintenance of signs is completed in a timely fashion. (Replacing damaged signs, repositioning signs, cleaning signs, re-erecting fallen signs, etc.)
- The signing continues to reflect and address the current site conditions.

SIZE OF SIGNS ON URBAN AND RURAL HIGHWAYS

The sizes of the various signs are as shown on the Rural Sign Schedules included in this manual. On rural roadways, standard sized signs are normally sufficient.

TEMPORARY WARNING SIGNS

Temporary warning signs are used to notify road users of specific hazards that may be encountered in the Work Area. If road users are properly alerted to the changing conditions, they can react in sufficient time to pass safely through the Work Zone.

Some examples of temporary warning signs are:

- Road Work
- Flag person
- Survey Crew
- Uneven mat
- Begin Detour 300m

REGULATORY SIGNS

Regulatory signs impose legal obligations on all traffic. For example, temporary intersections or intersections having temporarily altered traffic patterns may require stop signs.

Some examples of temporary regulatory signs are:

- One-Way Traffic
- Two-Way Traffic
- Do Not Pass
- Maximum Speed Ahead

INFORMATION (GUIDE) SIGNS

In certain situations, it may be desirable to use information signs to supplement the warning and regulatory signs. For example, detour guide signs and route markers are used to direct traffic to alternate routes, even though the Work Zone is not closed to traffic.

INSTALLATION OF TEMPORARY SIGNS

Temporary signs must be erected such that the face of the sign is clearly visible to oncoming traffic. On 2-lane undivided highways, the signs must be located on the right hand side of the road.

Temporary signs may be mounted on posts or on portable stands. Generally, posts are used on Long Duration projects where the Work Area is stationary. The use of portable stands is better suited for situations where the Work Area is mobile or where the duration of work is relatively short. If traffic control is required overnight, signs shall be installed on posts or acceptable industry standard sign stands.

The position and height of all signs relative to the roadway surface must conform to the Specifications. On Long Duration Projects the height of the sign relative to the roadway is 1.5 meters. On Short Duration Projects a 0.3 meter height is necessary. The posts and portable stands on which the signs are installed and any objects used to stabilize the portable stands must be an accepted industry standard and must not present a hazard to traffic.

In situations where it is necessary to make specific temporary signs more prominent, attaching flags and/or flashers may be appropriate.

TYPICAL SIGN TYPES, SEQUENCE AND SPACING

For typical situations, the types and sequence of the signs used for traffic accommodation shall be as shown on the standard drawings included in this document. Additional signs may be required in non-typical situations.

The spacing between each sign must be of a sufficient distance to allow travelers to react to the sign message before reaching the next sign or traffic control device. The optimal sign spacing will vary depending on the posted speed for the Work Zone and will generally range from 25m to 150m.

Sign spacing for rural are identified on the standard drawings.

DELINEATORS

Delineators are used to outline lane transitions and indicate the intended path for road users passing through the Work Area and for separating the traffic lanes from the Work Areas. Effective delineation can be achieved through the use of chevrons, traffic barrels/drums, traffic cones (including tubular delineators) or other similar devices. Delineators are not to be used without the appropriate advance warning signage.

To be effective, delineators must be reflectorized and the proper size. When traffic cones are used, the size required is dependent on traffic speed. Where the speed in the Work Area is greater than 50 km/hr., traffic cones must be a minimum of 70 cm in height. Where the speed in the Work Area is 50 km/hr. or less, the height of the traffic cones may be a minimum of 45 cm.

Typical situations where delineators are used:

- Lane closure
- Lane closure tapers
- Shoulder closure tapers
- Downstream tapers
- To separate opposing lanes of traffic
- To identify temporary hazardous conditions (vertical cuts on roadway shoulders, etc.)
- Detours

TAPERS

On two-lane highways tapers shall be 5:1.

Tapers require delineation. On rural roadways glow posts, cones or traffic barrels/drums may be used. For two-lane bridge projects, glow posts, cones or traffic barrels/drums may be used.

The number and spacing required for devices delineating tapers and travel lanes is shown on the standard drawings.

SEQUENTIAL ARROWBOARDS AND VARIABLE MESSAGE BOARDS

Sequential arrow boards must always be used in conjunction with other Traffic Control Devices. Sequential arrow boards are very effective for:

- Providing traffic with positive guidance for passing to the left or right of the work area.
- Encouraging traffic to leave the closed lane well in advance of the work area.
- Providing additional advance warning.

Sequential arrow boards must not be used on roadways with opposing traffic.

The electronic variable message board should be strategically placed in advance of the Work Area to best advise motorists of detours, alternate routes or roadway conditions. This device should be positioned on the same shoulder as the lane closure. Where site conditions such as shoulder widths do not allow for such placement, the electronic variable message board may then be positioned on the opposite shoulder.

Sequential arrow boards and electronic variable message boards must conform with the specifications.

SPECIALIZED TRAFFIC CONTROL DEVICES

There are several other Traffic Control Devices that can be used to supplement standard traffic control measures. These devices are generally used in unique situations or for specific activities with extremely high traffic volumes, seal coat projects, etc.)Examples of Specialized Traffic Control Devices are:

- Rumble Strips (Rope or Mat Type)

- Special information signs developed for unique projects
- Pilot vehicles

OVERHEAD ILLUMINATION AND FLASHERS

Activities within the Work Zone often create conditions on or near the travel lane that are particularly hazardous at night when the road user's visibility is reduced. It is often necessary to supplement the reflectorized signs, barriers and channelizing devices with overhead lighting and/or barricade warning lights. Special attention must be taken to ensure that portable overhead lighting does not "blind" the road users.

Barricade warning lights are either steady-bum or flashing type units. Steady-burn lights are used for delineation and should be mounted on a series of barricades or channelizing devices. Flashing lights are used to draw attention to warning signs, obstructions or other hazards in the Work Zone.

The types and intended use of barricade warning lights are:

Type A Low Intensity Flashing Warning lights are most commonly mounted on barricades or advance warning signs, and are intended to warn motorists of an obstacle or other potential hazard.

Type C Steady Burn lights are used to delineate the edge of the travelled way on detour curves, lane changes and transitions.

PRECAST CONCRETE F SHAPED BARRIERS

Precast concrete F-shaped barriers shall be used on Long Duration Projects with stationary Work Areas where it is necessary to provide a protective barrier between the travel lane and the Work Area due to worksite hazards and/or the need to maintain higher speeds. Precast concrete F- shaped barriers must be interlocked as shown on the standard drawings in order to function properly. Screening may be required on the barriers in situations where a visual barrier is required for the Work Area or where headlight glare from approaching vehicles is a problem.

INTERLOCKING CRASH TESTED WATER FILLED BARRIERS

Water filled barriers, meeting the requirements of NCHRP 350 and the applicable Test Level, which are installed as an approved crash-tested system may be used where the design deflection room is available behind the barrier and where the work zone speed of the adjacent travel lanes is consistent with the crash test speed. For example, TL-4 and TL-3 systems are acceptable for operating speeds of 110 km/h and 100 km/h. TL-2 is acceptable for 70 km/h.

WATER FILLED BARRICADES

Water filled barricades can be used if the gazetted speed is 60 km/h or less and the drop off is less than 300 mm in height.

THE CLEAR ZONE CONCEPT IN WORK ZONES

GENERAL

The forgiving roadside concept should be applied to all work zones as appropriate for the type of work being done and the extent existing roadside conditions allow. This includes providing a clear recovery area for longer term projects and using traffic control devices and safety appurtenances that are crash-worthy or shielded.

Additionally, work zones should be developed to provide a safe environment for pedestrians, bicyclists, and highway workers. This could mean providing safe pathways where pedestrians and bicyclists are allowed to traverse the work zone by shielding adjacent excavations or other unsafe areas.

APPLICATION OF THE CLEAR ZONE CONCEPT IN WORK ZONES

The work-zone "clear zone" is an unobstructed relatively flat area in a work zone that extends outward from the edge of the travelled way. The location of the "travelled way" through a work zone may be different from the usual highway “travelled way" due to detours or lane closures. The extent of the clear zone provided is measured perpendicular from the edge of the travelled way to the face of the closest obstacle or hazard. Because of the limited horizontal clearance available and the heightened awareness of motorists through work zones, the clear zone requirements are less than the before-work conditions. The amount of available clear zone in a work zone affects the decision to delineate or shield exposed hazards such as concrete barrier ends, fixed objects, steep slopes or drop-offs.

Engineering judgment must be used in applying the "clear zone" to work zones. Depending on site restrictions, it may only be feasible to provide an operational clearance. Designers should determine the width of a work zone clear-zone on a project by project basis, considering traffic speeds, volumes, roadway geometries, available right-of-way, and duration of work.

Where roadside space is available, the clear zone provided in the work zone should generally comply with the values shown in Table 12.1.1. The location of collateral hazards such as parked equipment and material storage should be controlled and be subject to a greater clear zone distance if/when practical.

Generally, for ease of application of the clear zones, there is no adjustment made for horizontal curves.

TABLE 10.1.1 SUGGESTED CLEAR ZONE DISTANCES FOR WORK ZONES

Posted Speed in Work Zone (km/h)	Distance (m)
100-110	9
90	7
70-80	5
50-60	4

There is a factor that tends to balance the additional braking lengths for given truck speeds with those for passenger cars. The truck operator is able to see the vertical features of the obstruction form farther away because of the higher position of the truck seat. Separate stopping sight distances for trucks and passenger cars, therefore, are not used in highway design standards.

There are several situations that should be treated with caution. Every effort should be made to provide stopping sight distances greater than minimum design value when horizontal sight restrictions occur on downgrades, particularly at the ends of long downgrades. Even when the horizontal sight obstruction is a cut slope, the truck operator's greater height of eye is of little value on long downgrades.

Truck speeds may closely approach or exceed those of passenger cars. Although the average truck operator tends to be more experienced and quicker to recognize hazards than the average passenger

car operator, under conditions of restricted horizontal sight lines it is best to supply a stopping sight distance that exceeds the values in Table B.2.3.

Another situation where trucks may have difficulty stopping is in the vicinity of underpasses due to railway grade separations, interchanges, etc. The structure may restrict the sight lines for traffic (particularly trucks) on the lower elevation roadway. Additional sight distance should be provided where possible to avoid problems in these areas. Minimum vertical crest and sag curvatures, which satisfy stopping sight distance criteria, are given in Section B.4.4.

Table B.2.3 - Minimum Stopping Sight Distance (SSD)

Design Speed (km/h)	Assumed Running Speed (km/h)	Perception-Reaction		Friction Factor	Braking Distance (m)	Computed Value (m)	Min. SSD for Design (Rounded) (m)
		Time (s)	Distance (m)				
40	40	2.5	27.8	0.38	16.6	44.4	45
50	50	2.5	34.7	0.36	27.3	62.0	65
60	60	2.5	41.7	0.34	41.7	83.4	85
70	70	2.5	48.6	0.32	60.2	108.8	110
80	80	2.5	55.6	0.31	81.2	136.8	140
90	90	2.5	62.5	0.30	106.2	168.7	170
100	100	2.5	69.4	0.30	131.1	200.5	200
110	108	2.5	75.0	0.29	158.2	233.2	235
120	115	2.5	79.9	0.28	185.8	265.7	270
130	115	2.5	79.9	0.27	192.7	272.6	275

Minimum stopping sight distance (SSD):
SSD = perception / reaction distance + braking distance

$$= \frac{Vt}{3.6} + \frac{V^2}{254f}$$

Where V is the assumed running speed, (km/h)
t is the perception/reaction time (sec)
f is the coefficient of longitudinal friction

Braking distance is derived from the general expressions:

$u^2 = v^2 - 2ad$ and $a = gf$

Where u is the final speed
v is the initial speed
a is acceleration
d is distance travelled during acceleration
g is acceleration due to gravity

In this case u = 0, therefore:

$$0 = v^2 - 2gfd$$

$$d = \frac{v^2}{2gf} = \frac{v^2}{\left(\frac{3600}{1000}\right)^2 2(9.81)f} = \frac{v^2}{254f}$$

Where d is the braking distance (m)
v is the initial speed (km/h)
g is 9.81 m/s²

Taper Length / Buffer Space / Device Spacing

V (km /h)	A (m)	L (m)	B (m)	D (m)
50	50	30	35	8
60	50	40	45	12
70	75	60	50	15
80	100	80	60	15
90	100	105	65	18
100	125	125	70	18
110	125	145	75	20

Where:
V= Speed Limit
A= Spacing between Signs
L= Length of Taper (Merging Taper)
B= Length of Longitudinal Buffer Space
D= Spacing between Delineation Devices

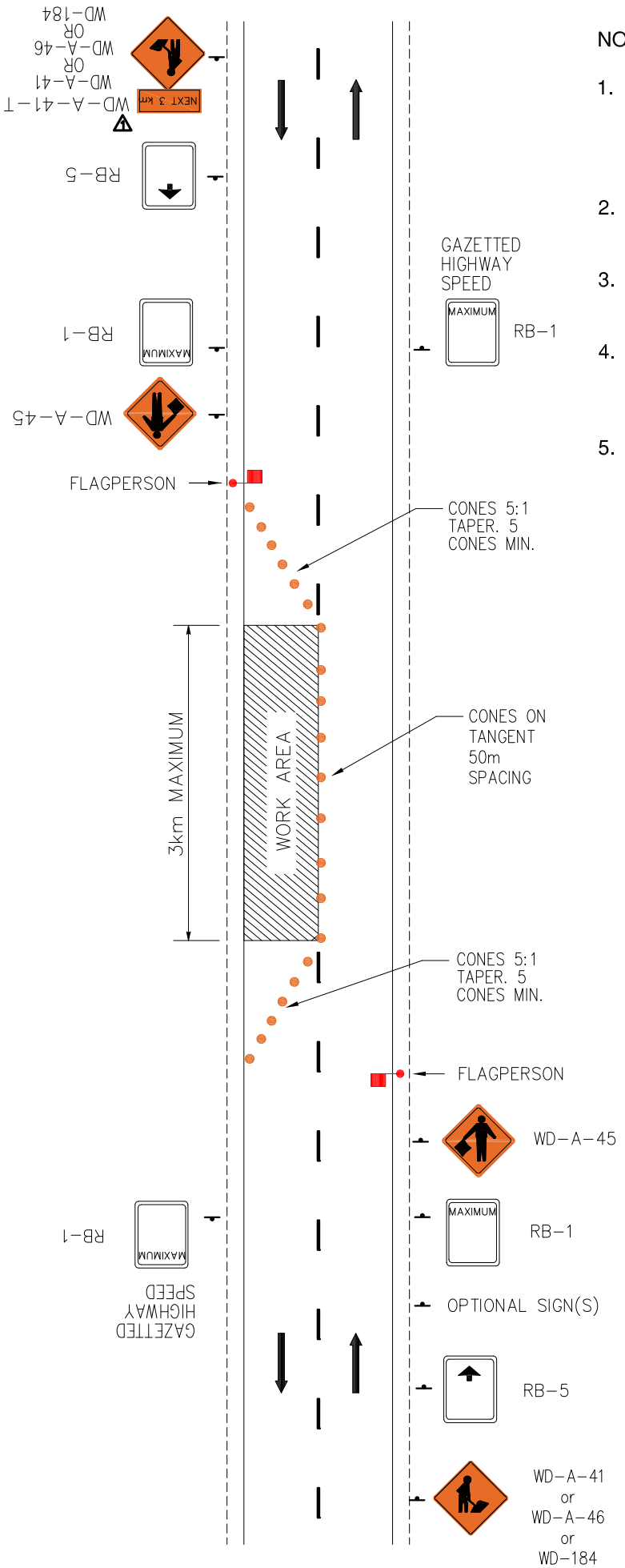
Ref: Manual of Uniform Traffic Control Devices for Canada, 4th Ed.

APPENDIX A

SECTION II
STANDARD DRAWINGS FOR TRAFFIC CONTROL ON RURAL ROADWAYS

SECTION III
FORMS

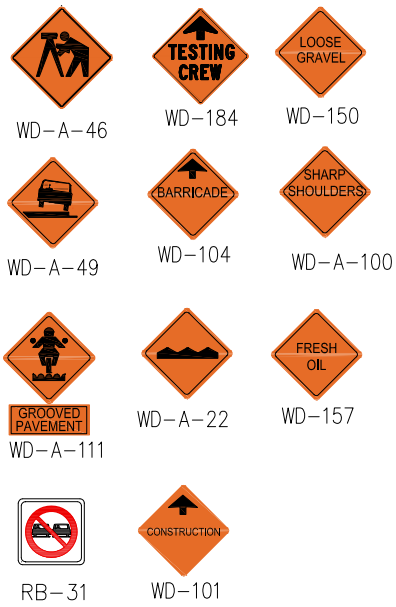
SECTION IV
SIGN SCHEDULE AND SHEETING REQUIREMENTS



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 100m-150m unless otherwise indicated.
3. For mobile operation, cones may not be required.
4. For mobile operation, WD-A-45 (Flagperson sign) shall be located less than 1.5 km from the Flagperson.
5. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-2.1A.

Optional Sign Schedule



No.	REVISIONS	BY	DATE
3			
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Approved:

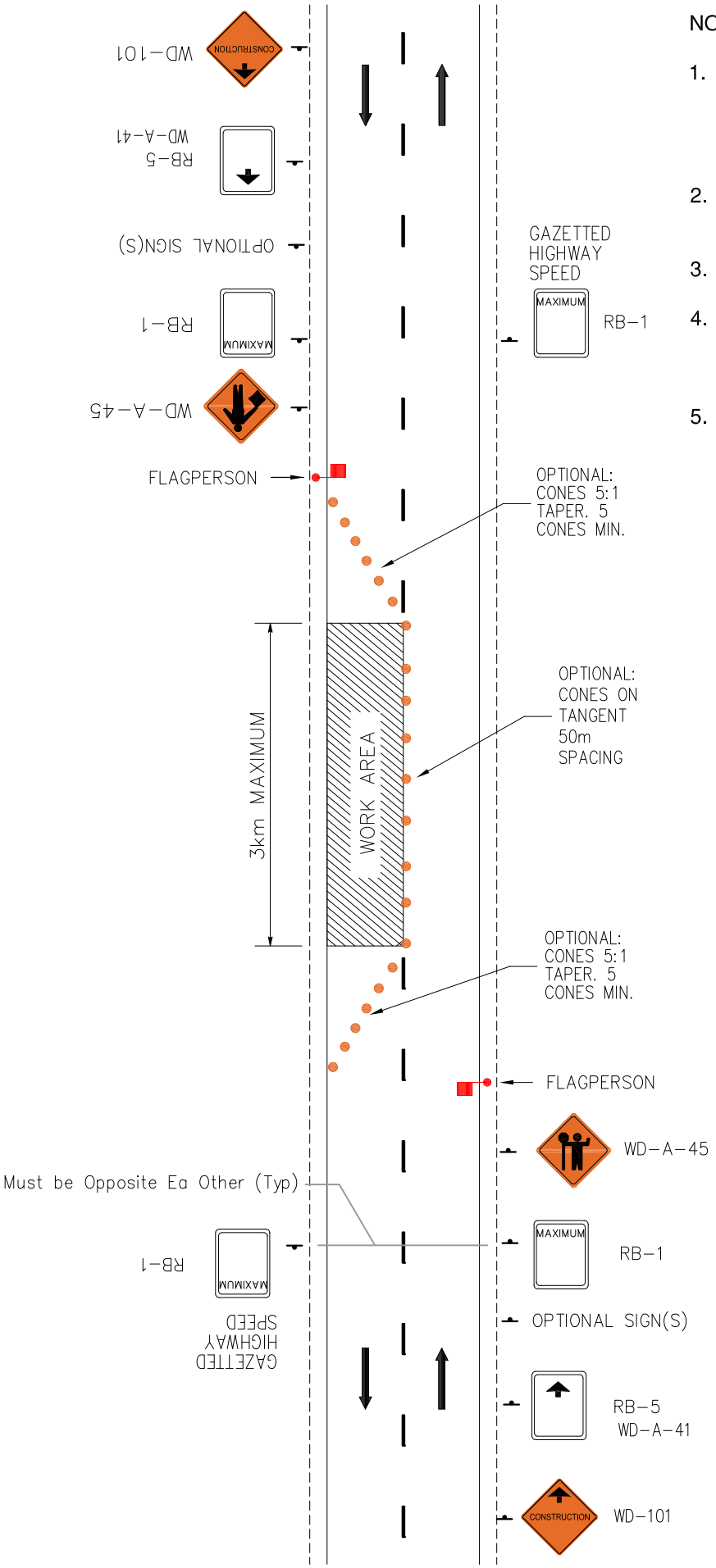
Manager,
Engineering Services

Date: Feb 2104

parkland county

ONE LANE CLOSURE
ONE LANE ALTERNATING TRAFFIC
TWO LANE UNDIVIDED ROADWAY

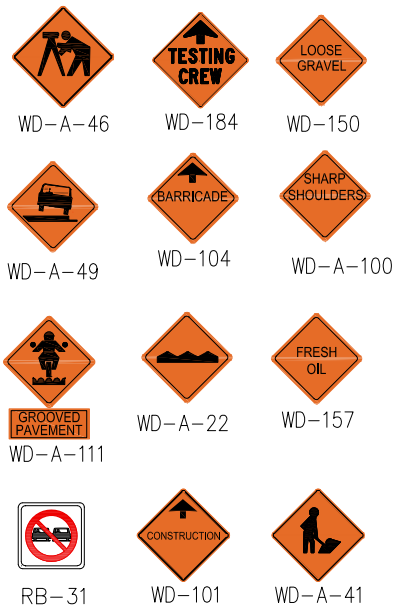
Prepared By:	Checked By:	Scale:	Dwg ID:
RdK	BR	N.T.S.	TAWZ 1



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 100m-150m unless otherwise indicated.
3. Cones are an optional control.
4. For mobile operation, WD-A-45 (Flagperson sign) shall be located less than 1.5 km from the Flagperson.
5. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-2.1A.

Optional Sign Schedule



No.	REVISIONS	BY	DATE
3			
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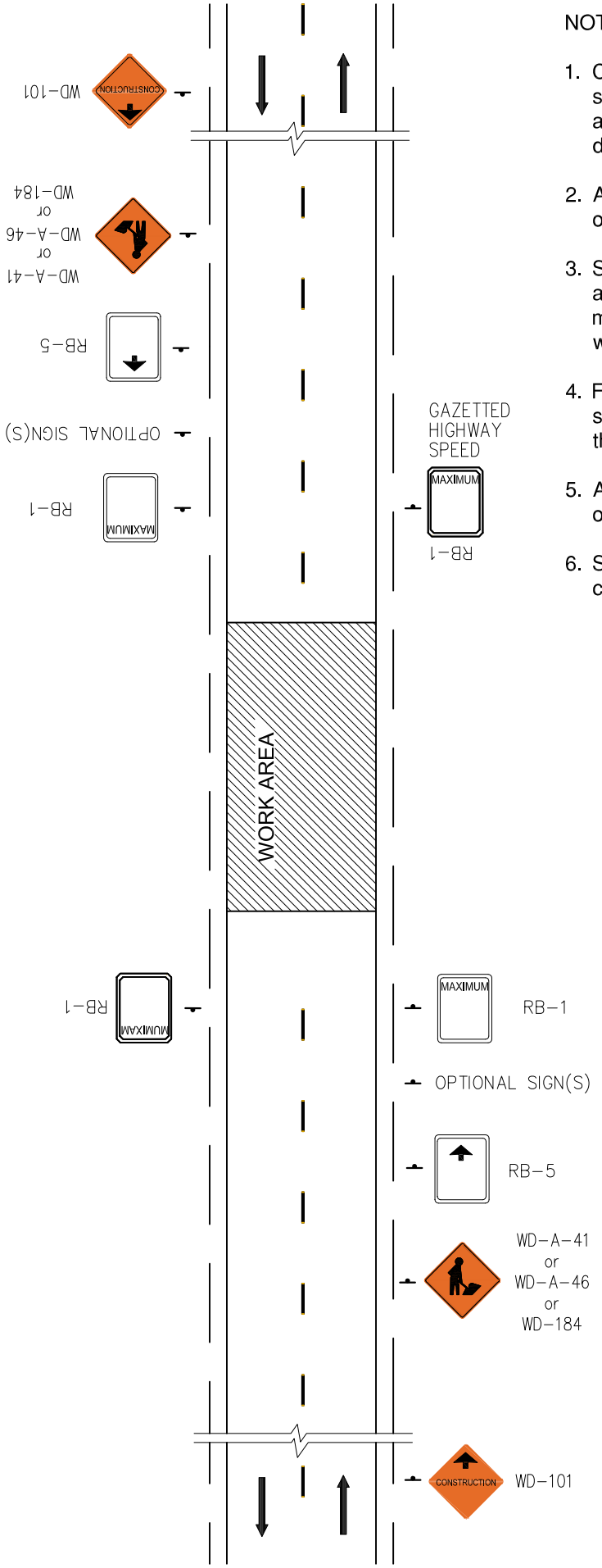
Manager, Engineering Services

Date: May 2015

parkland county

ONE LANE CLOSURE
ONE LANE ALTERNATING TRAFFIC
TWO LANE UNDIVIDED ROADWAY

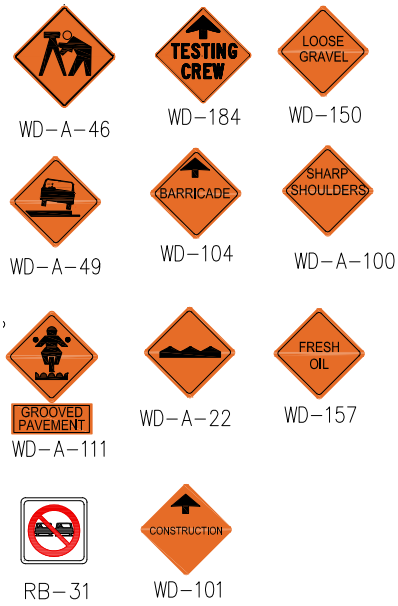
Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 1B



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 100m-150m unless otherwise indicated.
3. Speed limit and warning signs shall be placed after every intersecting roadway and shall be no more than 5km apart throughout the work area where there is a restricted speed zone.
4. For mobile operation, WD-A-45 (Flagperson sign) shall be located less than 1.5 km from the Flagperson.
5. Additional warning signs may be required per optional sign schedule.
6. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-1.2A.

Optional Sign Schedule



No.	REVISIONS	BY	DATE
3			
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Approved:

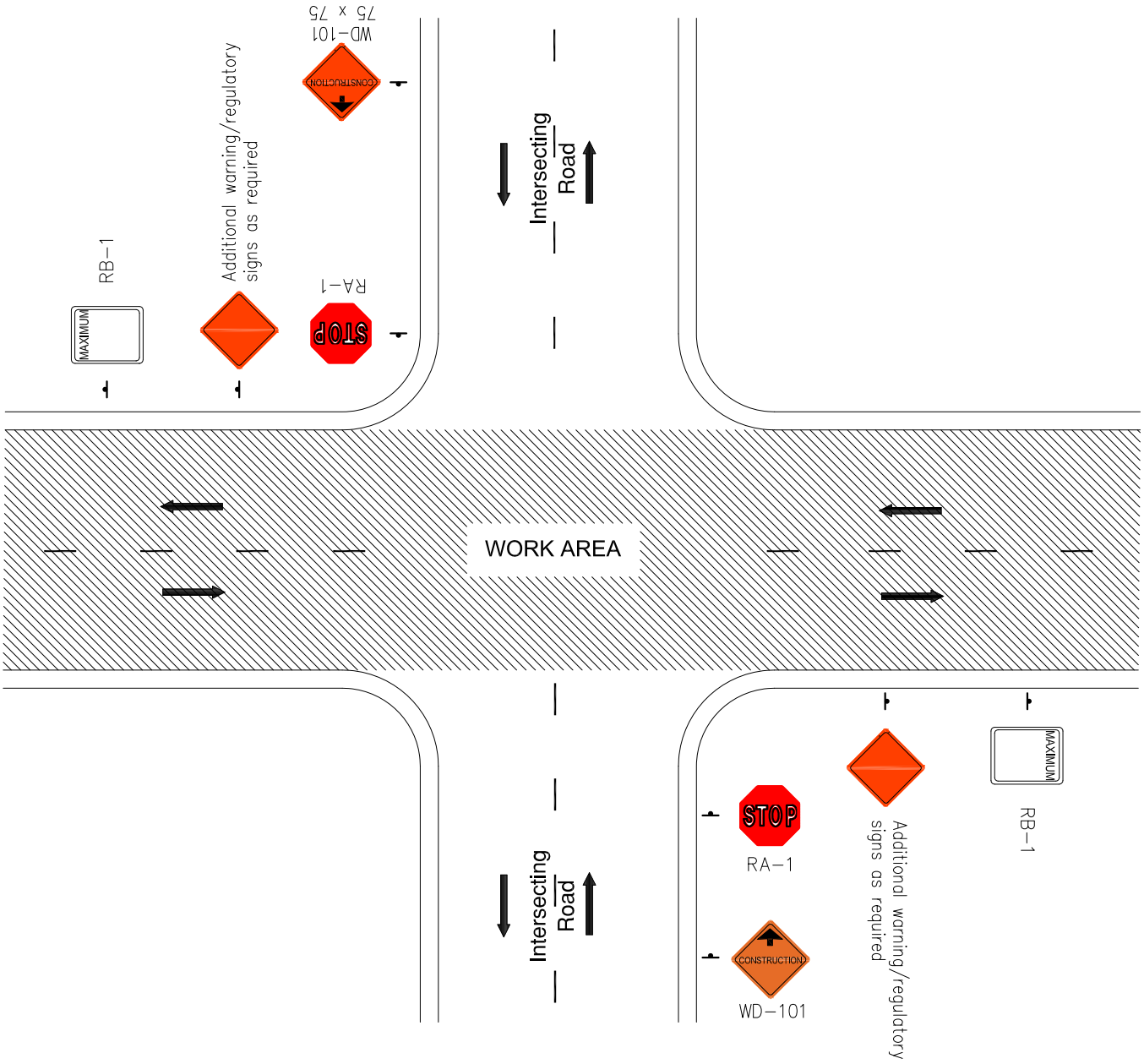
Engineering Services

Date: Feb 2104

parkland county

NO LANE CLOSURE
TWO LANE UNDIVIDED ROADWAY

Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 2



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work, night time conditions and other factors to ensure traffic control devices are adequate in each instance.

2. All sign spacing shall be 100m-150m unless otherwise indicated.

3. Additional warning signs may be required per optional sign schedule.

4. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-1.4A.

No.	REVISIONS	BY	DATE
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Approved:

Engineering Services

Date: Feb 2104

parkland county

TYPICAL SIGNING INTERSECTING ROADS FOUR LANE DIVIDED ROADWAY

Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 3

NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work, night time conditions and other factors to ensure traffic control devices are adequate in each instance.

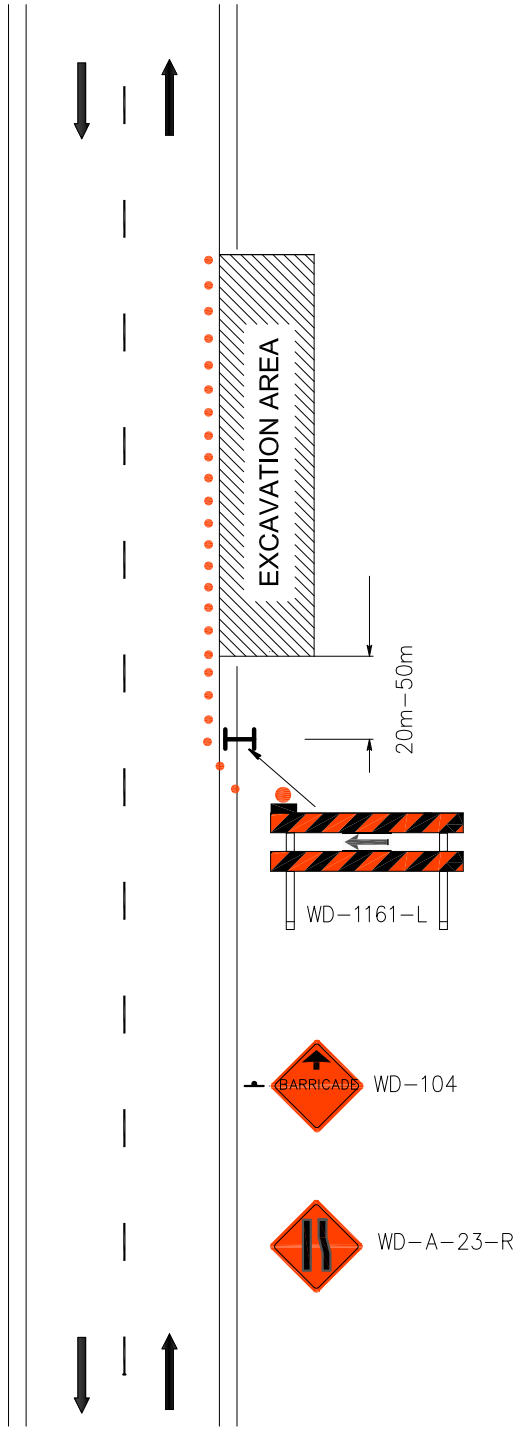
2. All sign spacing shall be 100m-150m unless otherwise indicated.

3. Additional warning signs may be required per optional sign schedule.

4. Delineators to be large base type at 20m spacing. Delineator post not required where drop-off slope is flatter that 3:1.

5. One type 'A' flashing light is required on top of barricades on the traffic side during darkness.

6. Sign plan is derived from Alberta Transportation construction sign plan TSC-B-1.9A.



No.	REVISIONS	BY	DATE
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Approved:

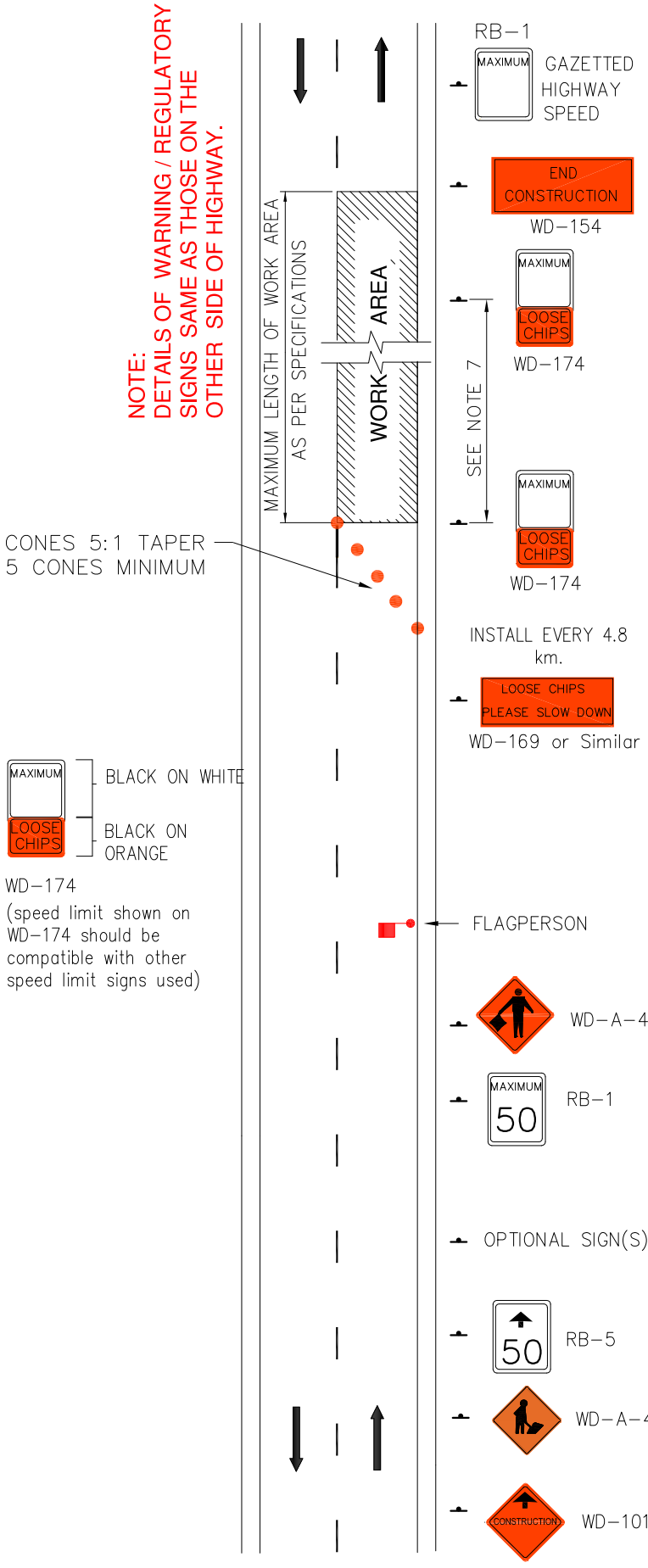
Engineering Services

Date: Feb 2104

parkland county

SIGNING OF SHOULDER DROP-OFF
(within work zone)
TWO LANE UNDIVIDED ROADWAY

Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 4



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work, night time conditions and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 100m-150m unless otherwise indicated.
3. Typical signing is required in both directions.
4. WD-192 shall be erected 2km in advance of the project. Distance tab to include project length plus setback from project limit.
5. Drawing TCS-B-1.7A applies when construction on the roadway has been completed but barrier lines have not yet been painted
6. Speed limit signs shall be placed after every intersecting roadway and shall be no more than 5km apart.
7. Conditions under which 'MAXIMUM 80km/hr' sign may be used are detailed in the double seal coating operations specifications.
8. Additional warning signs may be required per optional sign schedule.
9. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-1.18A.

Optional Sign Schedule

RB–31

ONE LANE TRAFFIC
WD–106

No.	REVISIONS	BY	DATE
3			
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Approved:

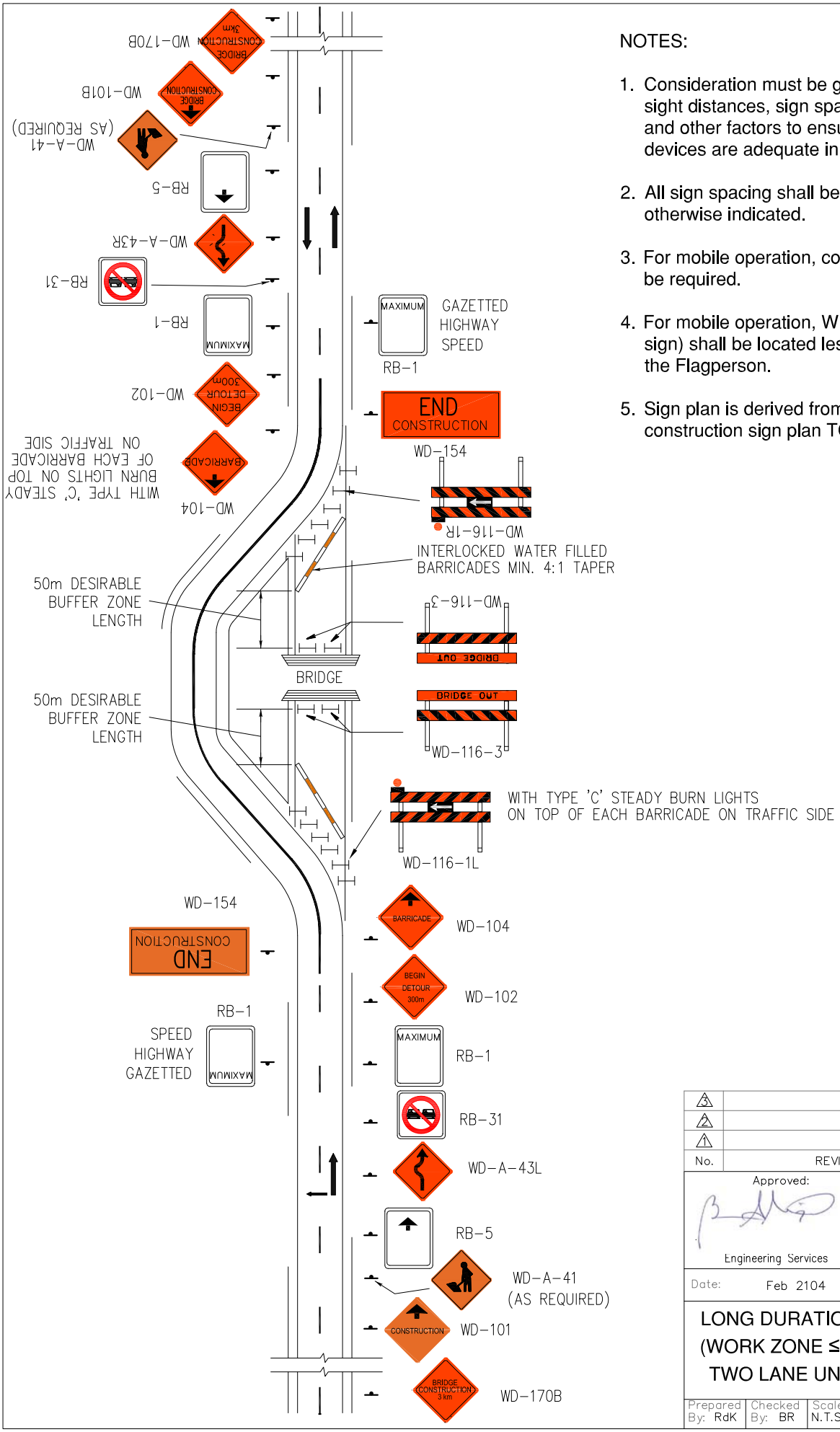
Engineering Services

Date: Feb 2104

parkland county

SIGNING DBL SEAL AND GRADED AGGR. SEAL COATING OPERATIONS TWO LANE UNDIVIDED ROADWAY

Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 5



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 100m-150m unless otherwise indicated.
3. For mobile operation, cones may not be required.
4. For mobile operation, WD-A-45 (Flagperson sign) shall be located less than 1.5 km from the Flagperson.
5. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-1.22A

No.	REVISIONS	BY	DATE
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Approved:

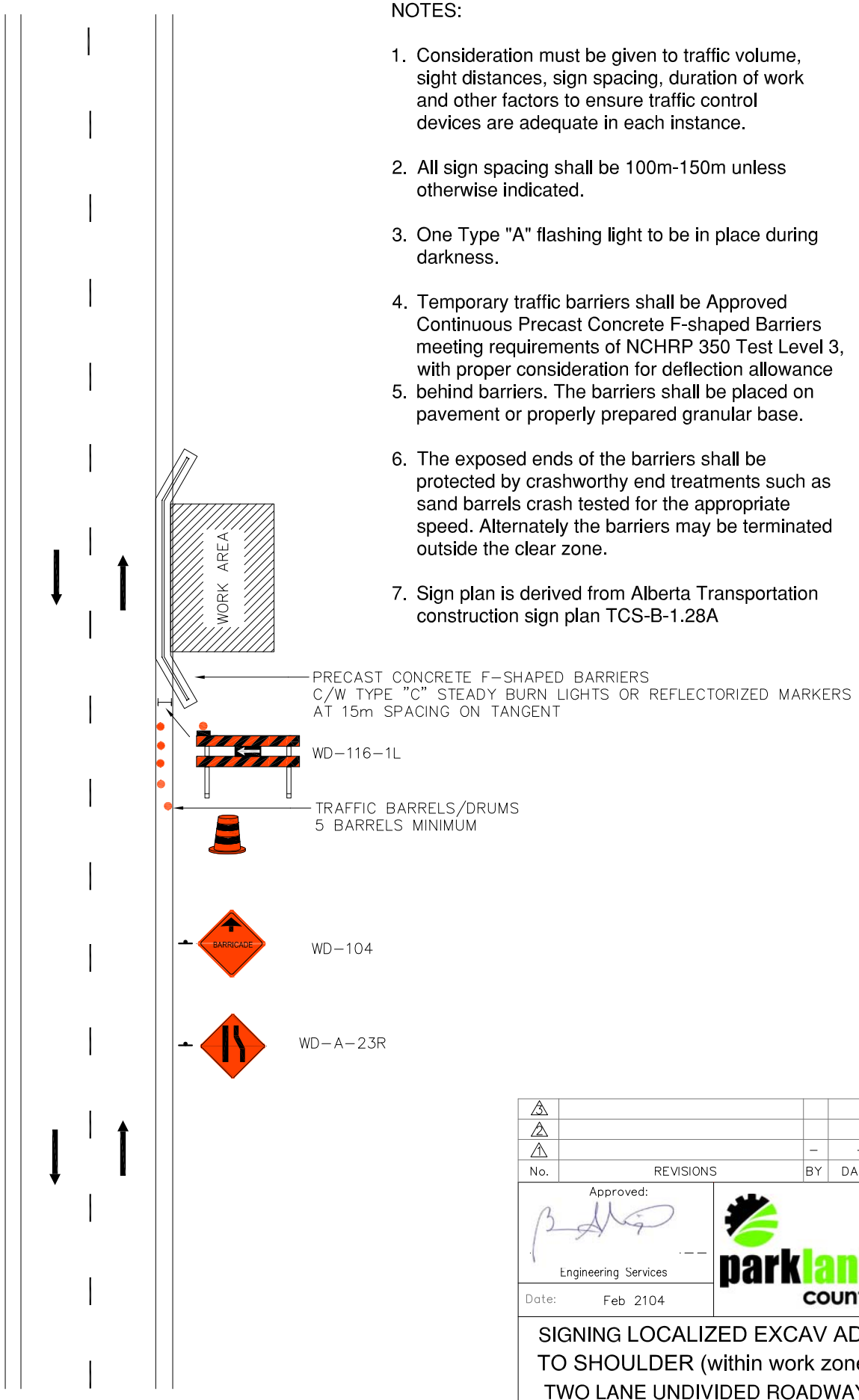
Engineering Services

Date: Feb 2104

parkland county

LONG DURATION DETOUR SIGNING (WORK ZONE ≤ 60km/h) TWO WAY TWO LANE UNDIVIDED ROADWAY

Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 6



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 100m-150m unless otherwise indicated.
3. One Type "A" flashing light to be in place during darkness.
4. Temporary traffic barriers shall be Approved Continuous Precast Concrete F-shaped Barriers meeting requirements of NCHRP 350 Test Level 3, with proper consideration for deflection allowance
5. behind barriers. The barriers shall be placed on pavement or properly prepared granular base.
6. The exposed ends of the barriers shall be protected by crashworthy end treatments such as sand barrels crash tested for the appropriate speed. Alternately the barriers may be terminated outside the clear zone.
7. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-1.28A

No.	REVISIONS	BY	DATE
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Approved:

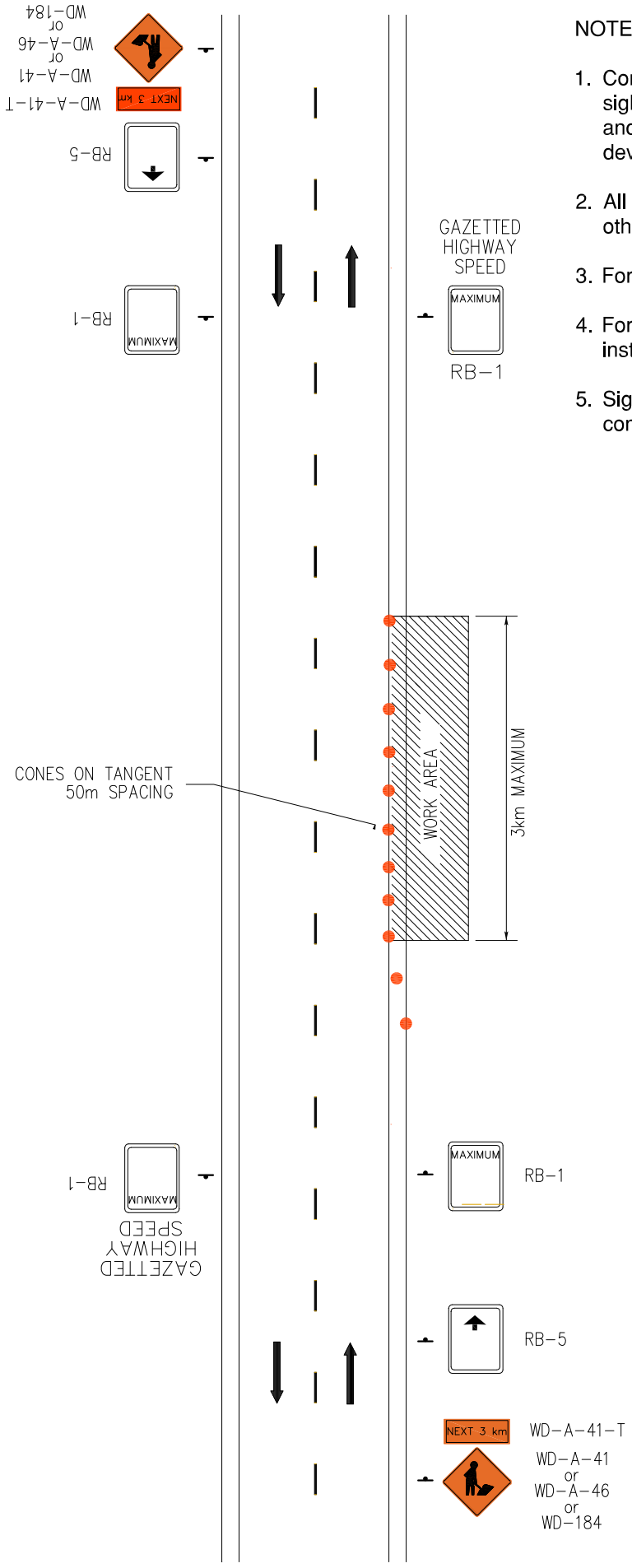
Engineering Services

Date: Feb 2104

parkland county

SIGNING LOCALIZED EXCAV ADJ TO SHOULDER (within work zone) TWO LANE UNDIVIDED ROADWAY

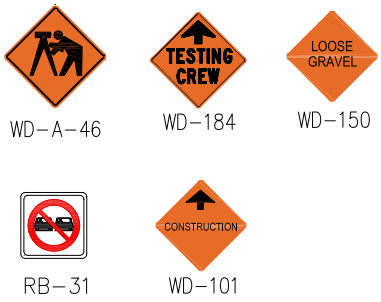
Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 7



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 100m-150m unless otherwise indicated.
3. For mobile operation cones may not be required.
4. For mobile operation the "NEXT 3Km" tab shall be installed on the first warning sign.
5. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-2.2A

Optional Sign Schedule



WD-A-46 WD-184 WD-150

RB-31 WD-101

No.	REVISIONS	BY	DATE
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Approved:

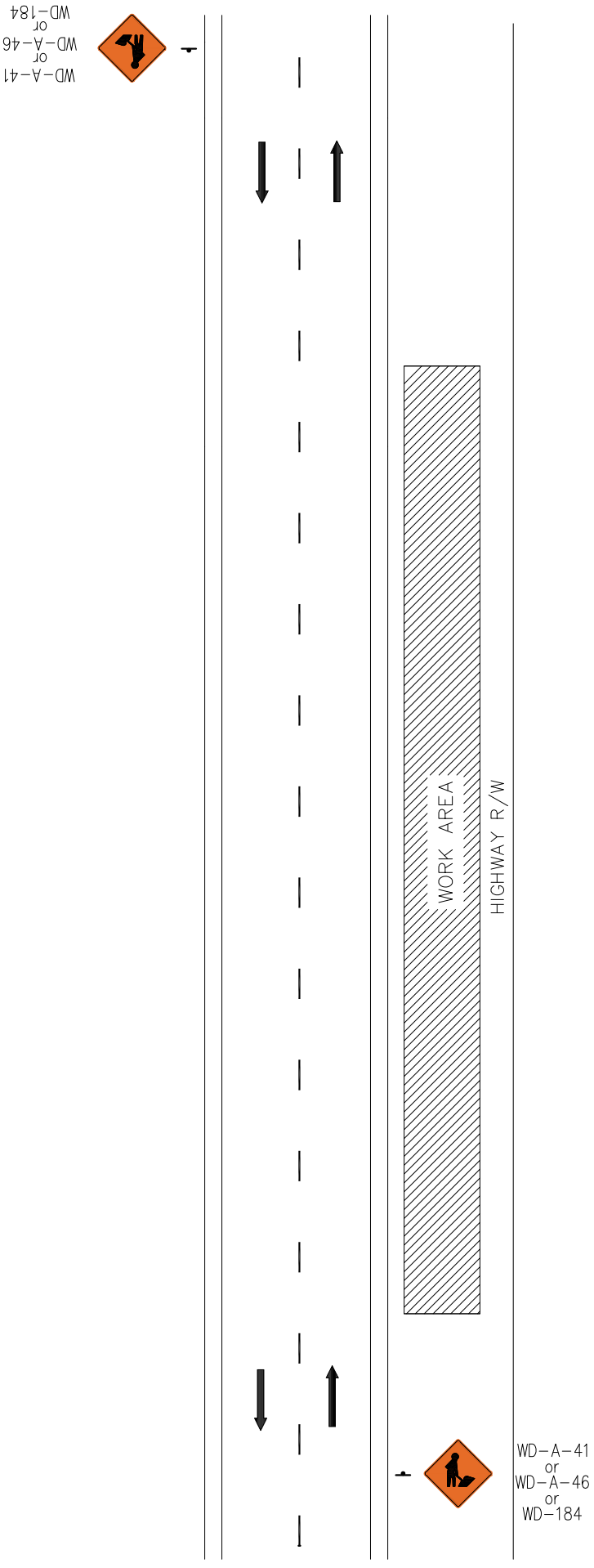
Engineering Services

Date: Feb 2104

parkland county

SIGNING
WORK ON SHOULDER
TWO LANE UNDIVIDED ROADWAY

Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 8



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each instance.
2. No vehicle shall be parked on the road surface.
3. When the work is entirely off the road surface signs may not be required.
4. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-2.3A

Optional Sign Schedule

WD-A-46

WD-184

WD-150

No.	REVISIONS	BY	DATE
3			
2			
1		–	–

Approved:

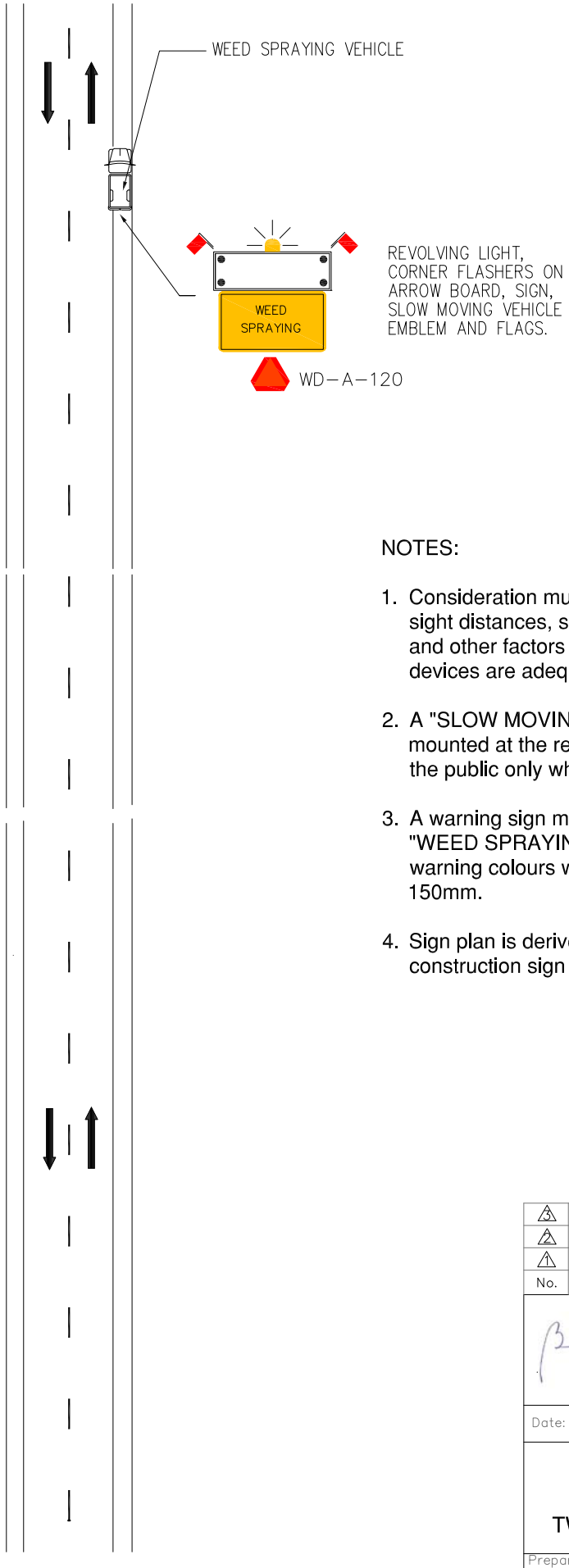
Engineering Services

Date: Feb 2104

parkland county

SIGNING
WORK OFF ROAD SURFACE
TWO LANE UNDIVIDED ROADWAY

Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 9



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each instance.

2. A "SLOW MOVING VEHICLE" sign shall be mounted at the rear of the vehicle and be visible to the public only when weed spraying is in progress.

3. A warning sign mounted at the rear of truck stating "WEED SPRAYING" shall have the standard warning colours with letters a minimum height of 150mm.

4. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-3.5A

No.	REVISIONS	BY	DATE
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Approved:

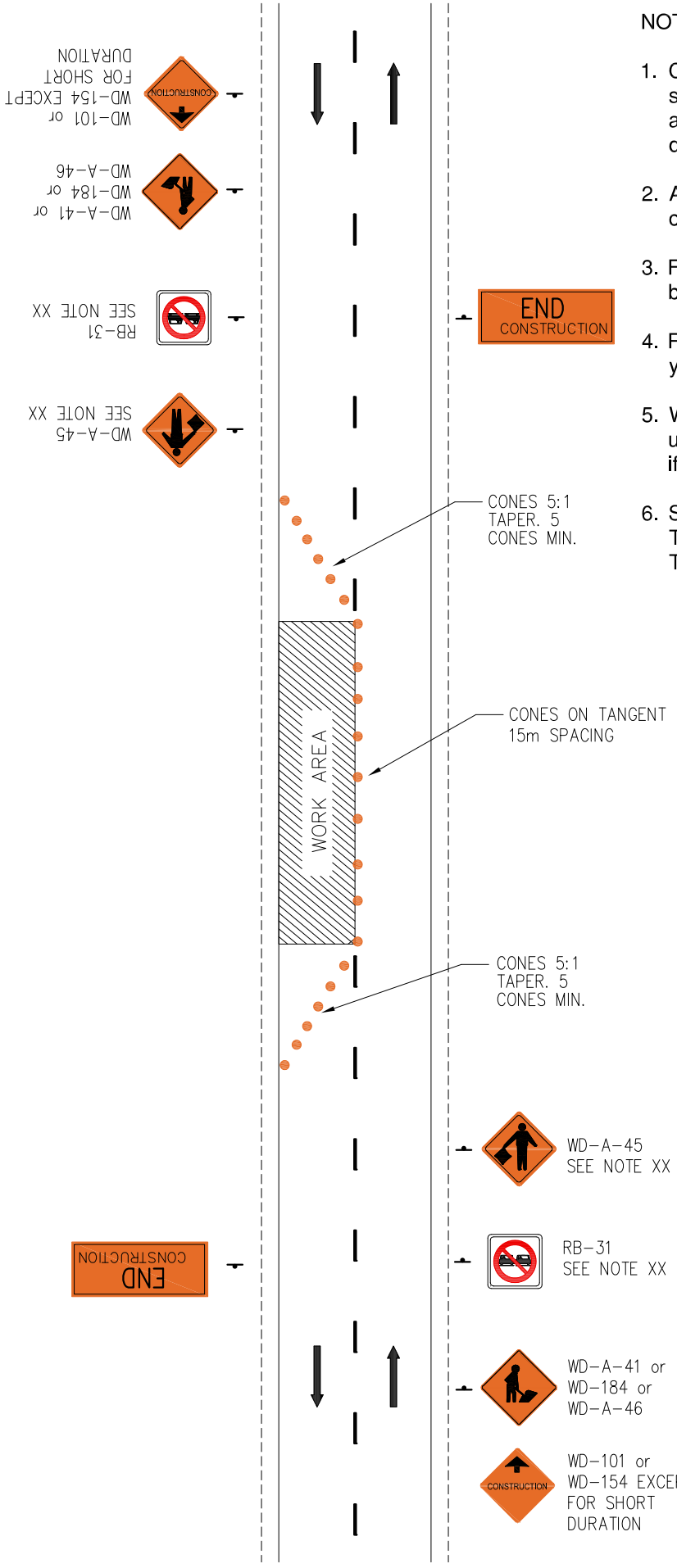
Engineering Services

Date: Feb 2104

parkland county

SHORT DURATION SIGNING
CHEMICAL VEG. CONTROL
TWO LANE UNDIVIDED ROADWAY

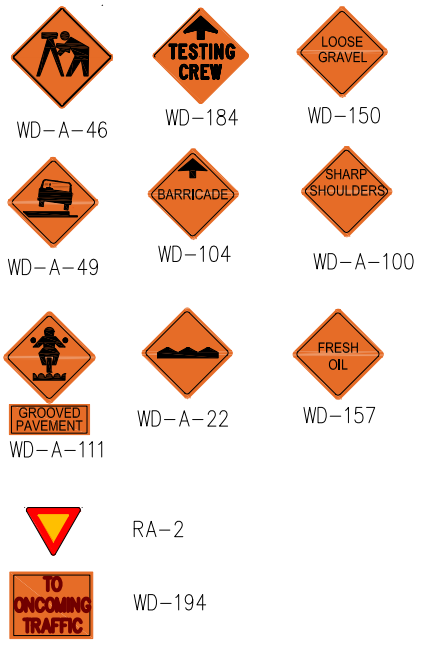
Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 10



NOTES:

1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 25m-100m unless otherwise indicated.
3. For mobile operation, cones may not be required.
4. RB-31 sign not required when existing solid yellow barrier line is in place.
5. WD-194 sign, together with RA-2 sign may be used instead of WD-A-45 sign and flagperson if sight distance is adequate.
6. Sign plan is derived from Alberta Transportation construction sign plan TCS-B-7.1A.

Optional Sign Schedule



No.	REVISIONS	BY	DATE
3			
2			
1		–	–

Approved:

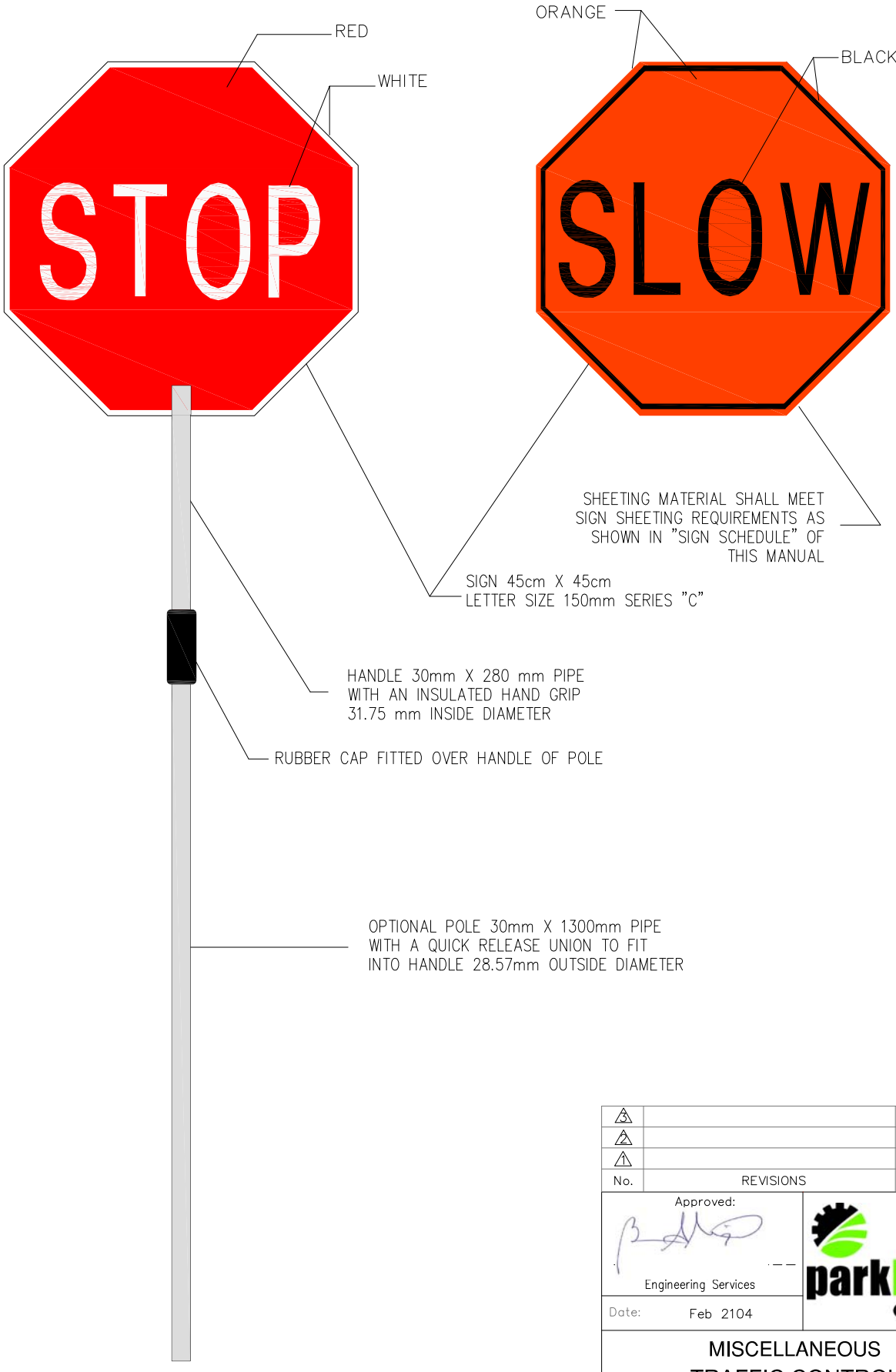
Engineering Services

Date: Feb 2104

parkland county

SIGNING FOR LOW SPEED LOW VOLUME URBAN AREAS ONE LANE ALTERNATING TRAFFIC

Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 11



No.	REVISIONS	BY	DATE
3			
2			
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Approved:

Engineering Services

Date: Feb 2104

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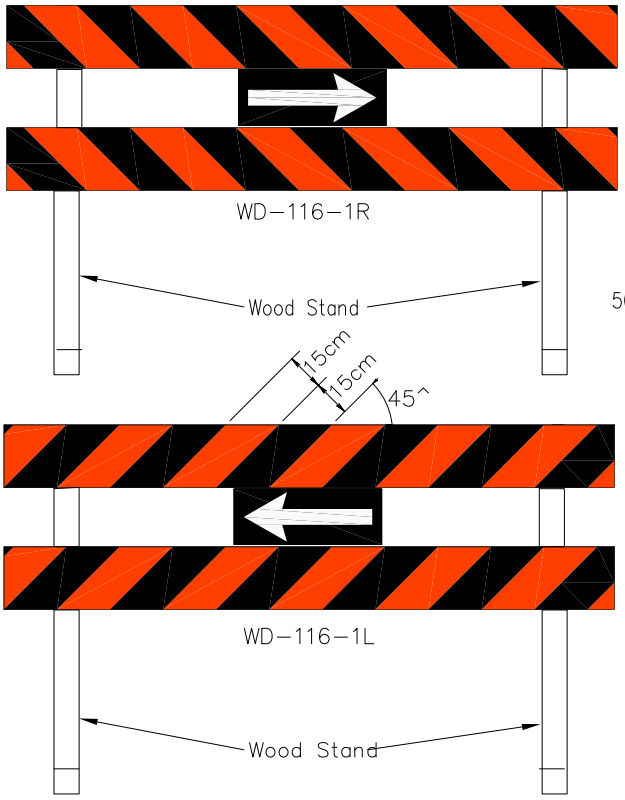
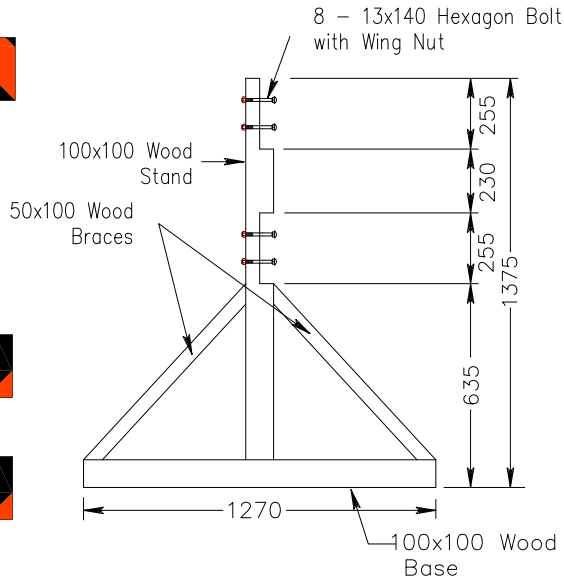
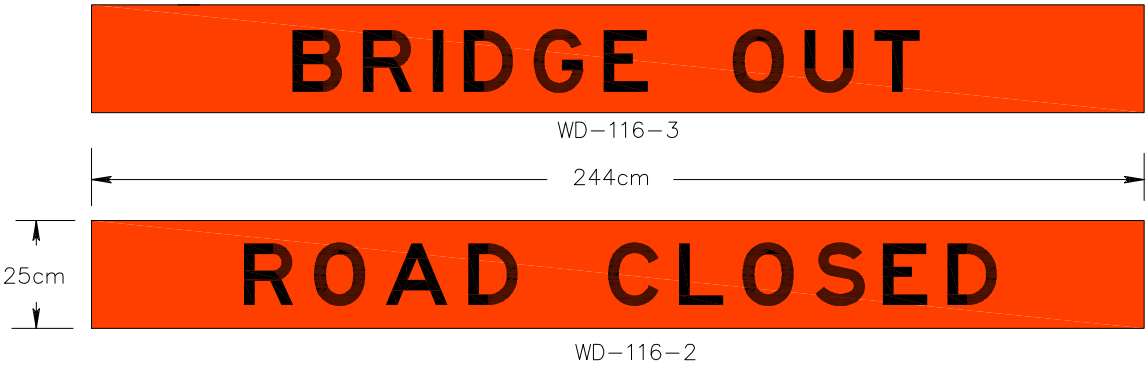
MISCELLANEOUS TRAFFIC CONTROL PADDLE

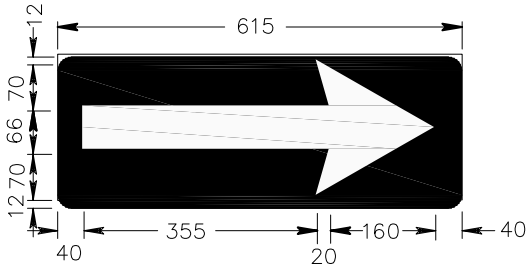
Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TCCZ 12







"BRIDGE OUT" and "ROAD CLOSED" boards may be used to replace one diagonal stripe board where appropriate.
All dimensions are in millimeters unless otherwise indicated.



ARROW
WD–116–5

Note: Arrow Sign may be installed on the wood stand on the traffic side.

No.	REVISIONS	BY	DATE
3			
2			
1		–	–

Approved:

Engineering Services

Date: Feb 2104

parkland county

MISCELLANEOUS STANDARD CONSTRUCTION BARRICADE

Prepared By: RdK	Checked By: BR	Scale: N.T.S.	Dwg ID: TAWZ 13

TRAFFIC ACCOMODATION STRATEGY
COMPONENT CHECKLIST

		Yes	No	N /A
1.	Is the Project identified? ➢ Contract number ➢ Roadway number ➢ Project limits to be shown	☐	☐	☐
2.	Is the Project "Scope of Work' Identified?	☐	☐	☐
3.	Is the Prime Contractor Identified?	☐	☐	☐
4.	Are Sub Contractors Identified? ➢ Contact names/phone numbers ➢ Assorted tasks	☐	☐	☐
5.	Is the Schedule Identified? ➢ Date of commencement/completion ➢ Milestone dates interim stage of completion	☐	☐	☐
6.	Is the Process for Sign Installation/Covering/Removal Identified? ➢ 2 lane roadways ➢ 4 land roadways	☐	☐	☐
7.	Will the Project be Pre-Signed? ➢ Strategy for covering/monitoring signs	☐	☐	☐
8.	Is the Type of Sign Supports Identified? ➢ Post/portables/wind master/etc.	☐	☐	☐
9.	Are the Sign Height Requirements Identified? ➢ Long duration signs ➢ Short duration signs	☐	☐	☐
10.	Are Responsibilities for TCS Identified? ➢ Name(s) of on-site designate and contact numbers ➢ Monitoring of TCD's during inactive periods	☐	☐	☐
11.	Are Day/Night Procedures Established?	☐	☐	☐
12.	Is Accommodating Vehicles around Tack Coat & Non-Standard Lane Widths Identified?	☐	☐	☐
13.	Are Special User Issues Identified? ➢ Over dimensional loads, emergency vehicles, etc.	☐	☐	☐
14.	Are Non Typical Conditions Identified? ➢ Did contractor address items from S.P.'s?	☐	☐	☐
15.	Is Working Staging Identified? ➢ Template for each stage ➢ No situation missing	☐	☐	☐
16.	Are Detour(s) Identified? ➢ Customized drawings	☐	☐	☐
17.	Are Drawings Submitted? ➢ All activities	☐	☐	☐
18.	Is the Parking of Vehicles/Equipment Identified? ➢ During working hours ➢ During non-working hours	☐	☐	☐
19.	Is the Requirements for Flag persons Identified? ➢ Certifying agency ➢ Protective clothing ➢ Certificate readily available	☐	☐	☐

20.	Is the Procedure for Centreline Spotting Identified? ➢ Strategy for the protection of workers	☐	☐	☐
21.	Speed Limits Identified? ➢ All activities ➢ Non active periods ➢ Distinct phase breaks	☐	☐	☐
22.	Is the Use of Pilot Vehicles Identified?	☐	☐	☐
23.	Is the Requirements for the Daily Sign Log Identified? ➢ Include timeline for submission of into to consultant	☐	☐	☐
24.	Is the Reporting of Incidents Identified?	☐	☐	☐
25.	Is the Haul Route(s) Identified?	☐	☐	☐
26.	Is the Process for Truck Turning Movements Within the Work Area/Zone Identified?	☐	☐	☐
27.	Emergency Response Strategy? ➢ Names/contact numbers ➢ Arrangement with emergency responders	☐	☐	☐

NOTES

Strategy must conform to the Traffic Accommodation in Work Zones Manual (current edition), not an all-inclusive list. Additional information may have to be considered and provided on a project by project basis.

SIGN SCHEDULE

NOTES:

1. Sign size, shape, symbol and colour are to be in accordance with the latest edition of the Uniform Traffic Control Devices for Canada Manual and applicable Alberta Transportation (AT) standards. Where there is any discrepancy between the UTCD Manual and the AT standards, the latter shall prevail.

2. For the initial WD-101 sign, 120 x 120 is used on the main alignment and 75 x 75 is used on intersecting roads.

2.0 SIGN SHEETING REQUIREMENTS

The orange portion of all signs, barricades and other Traffic Control Devices shall be fully reflectorized using High Brightness, Retroreflective, Non-Metalized, Prismatic Sheeting Material which incorporates durable, transparent, flourescent pigment and meets the following requirements:

BRIGHTNESS REQUIREMENTS (90° Rotation Angle)		
Observation Angle	Entrance Angle	Orange
0.2	-4	200
0.2	30	92
0.5	-4	80
0.5	30	50

A Minimum Coefficient of Retroreflection (RA) $cd/fc/ft^2$ $(cd \cdot lx^{-1} \cdot m^{-2})$

SIGN SCHEDULE

	SIGN NO.	MESSAGE OR DESCRIPTION	SIZE (cm x cm)			LETTER HEIGHT AND SERIES NO.	COLOUR	
			RURAL	URBAN			MESSAGE	BACK-GROUND
				High Speed/ High Volume	Low Speed/ Low Volume			
	IB-2	Alberta Route Marker	45 x 60	45 x 60	45 x 60	Pattern Available	Black	White
	IB-8L	Alberta Direction Tab (Left)	45 x 30	45 x 30	45 x 30	Symbol	Black	White
	IB-8R	Alberta Direction Tab (Right)	45 x 30	45 x 30	45 x 30	Symbol	Black	White
	ID-503	Speed Double Fines	60 x 60	60 x 60	60 x 60	Symbol	Black	White
	ID-503A	Double Fines Begins Tab	60 x 30	60 x 30	60 x 30	Symbol	White	Black
	ID-503B	Double Fines Ends Tab	60 x 30	60 x 30	60 x 30	Symbol	White	Black
	IF-205	Exit	145x120x 100	145x120x100	N/A		White	Green
	RA-1	Stop	60 x 60	90 x 90	60 x 60	255 mm "C"	White	Red
	RB-1	Maximum Speed Content Variable	60 x 75	75 x 90	60 x 75	#1 - 100 mm "C", #2 - 300 mm Variable	Black	White
	RB-5	Maximum Speed Ahead Content Variable	60 x 75	75 x 90	60 x 75	#1 - 100 mm "C", #2 - 300 mm Variable	Black	White
	RB-24	Two-Way Traffic	60 x 75	75 x 90	60 x 75	Symbol	Black	White
	RB-31	Do Not Pass	60 x 60	75 x 75	60 x 60	Symbol	Red, Black	White
	WA-9	Chevron Alignment	60 x 75	75 x 90	60 x 75		Black	Yellow
	WA-16L	Merging Traffic (Left)	90x90	90x90	90x90		Black	Yellow
	WA-16R	Merging Traffic (Right)	90x90	90x90	90x90		Black	Yellow

SIGN SCHEDULE

	SIGN NO.	MESSAGE OR DESCRIPTION	SIZE (cm x cm)			LETTER HEIGHT AND SERIES NO.	COLOUR	
			RURAL	URBAN			MESSAGE	BACK-GROUND
				High Speed/ High Volume	Low Speed/ Low Volume			
	WA-31	Divided Highway Begins	90 x 90	90x90	90x90	Symbol	Black	Yellow
	WA-31 T	Divided Highway Begins Tab	60 x 45	60 x 45	60 x 45	150 mm "C"	Black	Yellow
	WA-32	Divided Highway Ends	90 x 90	90 x 90	90 x 90	Symbol	Black	Yellow
	WA-112L	Added Lane (Left)	90 x 90	90 x 90	90 x 90		Black	Yellow
	WA-112R	Added Lane (Right)	90 x 90	90 x 90	90 x 90		Black	Yellow
	WB-1	Stop Ahead	75 x 75	90 x 90	75 x 75	Symbol	Red, Black	Yellow
	WD-101	Construction Ahead	75 x 75	120 x 120	90 x 90	#1 - 150 mm "C", 180 mm "C", #2 - 150 mm "C"	Black	Orange
	WD-101B	Bridge Construction Ahead	120 x 120	120 x 120	120 x 120	#1 - 150 mm "C", 180 mm "C", #2 - 150 mm "C"	Black	Orange
	WD-101C	Utility Construction	90 x 90	120 x 120	90 x 90	#1 - 150 mm "C", 180 mm "C", #2 - 150 mm "C"	Black	Orange
	WD-102	Begin Detour 300 m	90 x 90	120 x 120	90 x 90	#1 & #2 - 150 mm "C", #3 - 125 mm "E"	Black	Orange
	WD-103	Detour Next _ km	120 x 60	120 x 60	120 x 60	150 mm "C"	Black	Orange
	WD-104	Barricade Ahead	90 x 90	120 x 120	90 x 90	#1 - 150 mm "C", #2 - 125 mm "C"	Black	Orange
	WD-106	One Lane Traffic	75 x 75	90 x 90	75 x 75	#1 - 150 mm "C", #2 - 150 mm "C"	Black	Orange
	WD-111	Be Prepared To Stop	75 x 75	90 x 90	75 x 75	#1, #3, #4 - 100 mm "E", 42 - 100 mm "D"	Black	Orange
	WD-116-1L	Barricade (Left)	2.44 x 25	2.44 x 25	2.44 x 25	See Plan TCS-B-4.2	Black	Orange

SIGN SCHEDULE

	SIGN NO.	MESSAGE OR DESCRIPTION	SIZE (cm x cm)			LETTER HEIGHT AND SERIES NO.	COLOUR	
			RURAL	URBAN			MESSAGE	BACK-GROUND
				High Speed/ High Volume	Low Speed/ Low Volume			
	WD-116-1R	Barricade (Right)	2.44 x 25	2.44 x 25	2.44 x 25	See Plan TCS-B-4.2	Black	Orange
	WD-116-2	Road Closed Barricade	2.44 x 25	2.44 x 25	2.44 x 25	See Plan TCS-B-4.2	Black	Orange
	WD-116-3	Bridge Out Barricade	2.44 x 25	2.44 x 25	2.44 x 25	See Plan TCS-B-4.2	Black	Orange
	WD-116-4L	Light Duty (Type 1) Barricade	N/A	N/A	76 x 30		Black	Orange
	WD-116-4R	Light Duty (Type 1) Barricade	N/A	N/A	76 x 30		Black	Orange
	WD-116-5	Barricade Arrow	61.5 x 23	61.5 x 23	61.5 x 23	See Plan TCS-B-4.2	White	Black
	WD- 150	Loose Gravel	75 x 75	90 x 90	75 x 75	#1 - 125 mm "D", #2 - 125 mm "D"	Black	Orange
	WD-154	End Construction	120 x 60	120 x 60	120 x 60	Pattern Available	Black	Orange
	WD-157	Slow Fresh Oil	75 x 75	90 x 90	75 x 75	125 mm "D"	Black	Orange
	WD-158	Testing Crew Next 5 km	90 x 90	120 x 120	90 x 90		Black	Orange
	WD-169	Loose Chips Please Slow Down	120x75	120 x 75	120 x 75	Pattern Available	Black	Orange
	WD-170B	Bridge Construction 3 km	120 x 120	120 x 120	120 x 120	#1 -180 mm "C", #2 -180 mm "E"	Black	Orange
	WD-171	Do Not Pass Follow In Convoy	75 x 90	90 x 120	75 x 90	Pattern Available	Black	Orange
	WD-172	Follow Pilot Vehicle	60 x 75	75 x 90	60 x 75	Pattern Available	Black	Orange
	WD-173	Pilot Vehicle Do Not Pass	165 x 45	165 x 45	165 x 45	Pattern Available	Black	Orange

SIGN SCHEDULE

	SIGN NO.	MESSAGE OR DESCRIPTION	SIZE (cm x cm)			LETTER HEIGHT AND SERIES NO.	COLOUR	
			RURAL	URBAN			MESSAGE	BACK-GROUND
				High Speed/ High Volume	Low Speed/ Low Volume			
	WD-174	Maximum __ Loose Chips	60 x 120	90 x 120	60 x 120	Pattern Available	Black	White, Orange
	WD-175	Smoke Ahead Follow in Convoy	75 x 75	90 x 90	75 x 75		Black	Orange
	WD-179	Traffic Survey Ahead	75 x 75	90 x 90	75 x 75		Black	Orange
	WD-182	New Sign	75 x 75	90 x 90	75 x 75		Red and White	Fluoresc-ent Yellow
	WD-182T	Traffic Control Tab	60 x 30	60 x 30	60 x 30		Black	Yellow
	WD-184	Testing Crew Ahead	90 x 90	90 x 90	90 x 90		Black	Orange
	WD-187	No Centre Line	75 x 75	90 x 90	75 x 75		Black	Orange
	WD-188	Ramp Exit	75 x 75	90 x 90	75 x 75		Black	Orange
	WD-191	Road Grading 3 km	75 x 75	N/A	N/A		Black	Orange
	WD-192	Road Construction Next __ km	120 x 90	120 x 90	120 x 90	Pattern Available, 160mm "C"	Black	Orange
	WD-193	Grading Next 3 km	120 x 120	N/A	N/A	Symbol	Black	Orange
	WD-194	To Oncoming Traffic	N/A	N/A	90 x 75		Black	Orange
	WD-200	Police Emergency Ahead	90 x 90	90 x 90	90 x 90		Black	Pink
	WD-A-1L	Turn (Left)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-1R	Turn (Right)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange

SIGN SCHEDULE

	SIGN NO.	MESSAGE OR DESCRIPTION	SIZE (cm x cm)			LETTER HEIGHT AND SERIES NO.	COLOUR	
			RURAL	URBAN			MESSAGE	BACK-GROUND
				High Speed/ High Volume	Low Speed/ Low Volume			
	WD-A-5L	Reverse Curve (Left)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-5R	Reverse Curve (Right)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-7	Advisory Speed	60 x 60	75 x 75	60 x 60	255 mm "E"	Black	Orange
	WD-A-10	Detour Ahead	75 x 75	90 x 90	75 x 75		Black	Orange
	WD-A-22	Bump	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-23R	Roadway Narrows (Right)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-23L	Roadway Narrows (Left)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-24	Narrow Structure	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-31	Divided Highway Begins	90 x 90	120 x 120	90 x 90	Symbol	Black	Orange
	WD-A-32	Divided Highway Ends	90 x 90	120 x 120	90 x 90	Symbol	Black	Orange
	WD-A-33L	Road Narrows - Left Lane Ends	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-33R	Road Narrows - Right Lane Ends	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-33XL	Road Narrows - Left Lane Ends	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-33XR	Road Narrows - Right Lane Ends	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-41	Road Work	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange

SIGN SCHEDULE

	SIGN NO.	MESSAGE OR DESCRIPTION	SIZE (cm x cm)			LETTER HEIGHT AND SERIES NO.	COLOUR	
			RURAL	URBAN			MESSAGE	BACK-GROUND
				High Speed/ High Volume	Low Speed/ Low Volume			
	WD-A-41-T	Road Work Tab	60 x 45	60 x 45	60 x 45	Symbol	Black	Orange
	WD-A-43L	Roadside Diversion (Left)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-43R	Roadside Diversion (Right)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-44	Detour Tab	45 x 30	45 x 30	45 x 30	150 mm "C"	Black	Orange
	WD-A-45	Flagperson	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-46	Survey Crew Ahead	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-48L	Truck Entrance (Left)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-48R	Truck Entrance (Right)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-49	Pavement Drop-off	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-51L	Roadside Diversion (Left) (Two Lanes)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-51R	Roadside Diversion (Right) (Two Lanes)	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-A-100	Sharp Shoulders	75 x 75	90 x 90	75 x 75	150 mm "C"	Black	Orange
	WD-A-105R	Hazard Marker - Keep Left	30 x 90	30 x 90	30 x 90		Black	Orange
	WD-A-105L	Hazard Marker - Keep Right	30 x 90	30 x 90	30 x 90		Black	Orange
	WD-A-111	Grooved Pavement	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange

SIGN SCHEDULE

	SIGN NO.	MESSAGE OR DESCRIPTION	SIZE (cm x cm)			LETTER HEIGHT AND SERIES NO.	COLOUR	
			RURAL	URBAN			MESSAGE	BACK-GROUND
				High Speed/ High Volume	Low Speed/ Low Volume			
	WD-A-111T	Grooved Pavement Tab	60 x 30	60 x 30	60 x 30	150 mm "C"	Black	Orange
	WD-A-120	Slow Moving Vehicle	51 x51 x51	51 x51 x51	51 x51 x51	Symbol	Orange	Red
	WD-B-3	Two-Way Traffic Ahead	75 x 75	90 x 90	75 x 75	Symbol	Black	Orange
	WD-B-4	Traffic Signals Ahead	90 x 90	90 x 90	90 x 90	Symbol	Red, Yellow, Green, Black	Orange
	WD-B-4T	Structure Width Tab (__ m)	60 x 30	60 x 30	60 x 30		Black	Orange
	WD-T	Distance Tab (__ km)	60 x 30	60 x 30	60 x 30		Black	Orange