

Traffic Accommodation in Work Zones Urban Areas



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Alberta
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TRAFFIC ACCOMMODATION IN URBAN WORK ZONES 2003

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Executive Director, Technical Standards Branch
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SECTION I

**GUIDELINES FOR TRAFFIC
ACCOMMODATION**

TRAFFIC ACCOMMODATION IN URBAN WORK ZONES

1. INTRODUCTION

When activities such as roadway/bridge work, utilities work, or materials testing and surveying are performed on or adjacent to public highways in Alberta, the person(s) performing the work must make suitable provisions to safely accommodate the travelling public.

The purpose of this document is to provide information and guidance to the various parties to Alberta Transportation contracts, agreements, permits and authorizations 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, outlines general considerations for developing an effective traffic accommodation strategy and provides guidelines for the use of various Traffic Control Devices. Also included are a series of drawings detailing minimum temporary signing requirements for typical Work Zones on Alberta Transportation contracts and agreements.

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

Users of this manual should note that Section I.6, Compliance with Contract Specifications and Traffic Accommodation Strategy pertains to Alberta Transportation highway/bridge construction projects only. Due to the duration and nature of highway maintenance and utility work, the process used to address incidents of non-compliance may differ for those types of projects.

2. DEFINITIONS

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

Department	Alberta Transportation.
Department Representative	The Department official who liaises with the Contractor, Consultant or Utility Company. On Department construction contracts, this person would typically be the "Project Sponsor". On Department maintenance contracts, this person would typically be the Maintenance Contract Inspector (MCI). For Utility work, this person would typically be the Development Planning Technologist.
Consultant	The person(s) retained by the Department to design and/or administer a highway/bridge construction or maintenance contract.
Contractor	The person(s) performing the work on a Department highway/bridge construction or maintenance contract.

Utility Company	The person(s) installing, adjusting, maintaining or relocating a utility within the highway right-of-way.
Work Zone	The area extending from the “Construction Ahead” sign to the “End of Construction” sign.
Work Area	The area or location of the actual traffic disruption or hazard. (There may be several Work Areas within the Work Zone.)
Traffic Accommodation Strategy	Plans and written procedures detailing the traffic accommodation activities for the project.
Traffic Control Devices	Temporary signing, traffic control signals, arrowboards, pavement markings, delineators, message boards, etc., used for traffic accommodation in the Work Zone.
Urban Highway	An urban highway is considered any highway under the jurisdiction of Alberta Transportation and located within the corporate boundaries of a municipality.
Specifications	The latest editions of Alberta Transportation's Standard Specifications for Highway Construction Specifications for Bridge Construction or Highway Maintenance Specifications as applicable.

3. PRIMARY RESPONSIBILITIES

To ensure traffic accommodation is handled in a consistent, safe and effective manner, it is critical that all parties to Alberta Transportation’s contracts, agreements, permits and authorizations carry out their respective responsibilities concerning traffic accommodation.

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

A. Contractor

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

On construction projects, any required submissions or reporting by the Contractor shall be directed to the Consultant. On maintenance projects, any required submissions or reporting by the Contractor shall be directed to the Department Representative.

- # Develop a Traffic Accommodation Strategy and submit it for evaluation 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 for both daytime and nighttime conditions during periods of construction and shut down.
- # Maintain all Traffic Control Devices.
- # Modify the Traffic Accommodation Strategy as necessary.
- # Take appropriate and timely action to correct any deficiencies identified by the Contractor, the Consultant or the Department. 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 Consultant to address any concerns regarding the performance of the Traffic Accommodation Strategy.
- # On construction projects, submit a timely and accurate schedule of the sub-contractors 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.

B. Consultant

The following are the Consultant's primary responsibilities for traffic accommodation, when administering a Department highway/bridge construction contract.

When a Consultant performs work such as survey and materials testing within the highway 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 (eg. limiting the length of the Work Zone, establishing the posted speed for the Work Zone, etc.).
- # Where applicable, confirm "traffic counts" with the Department 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 for the Work Area (other than flagperson stations) with the Department 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 Department 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 department and ambulance service of the impending work and anticipated site conditions.
- # Provide the Department 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 Department Representative in cases where such orders are issued.
- # Immediately notify the Department 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 Department 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.

C. Utility Company

- # When performing work in conjunction with a Department 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 Contractor and Consultant.
- # When performing work which is not inside the Contractor's Work Zone, develop a Traffic Accommodation Strategy and submit it to the Department Representative for evaluation 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 Department 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 Department 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 Department Representative immediately. Provide a copy of the completed accident report within 72 hours of the occurrence.

D. Department

The Department establishes standards for the specifications and typical drawings and ensures that public safety is a high priority on Department construction and maintenance contracts and utility work. In addition, the Department performs the following functions:

(i) On projects where the Department has retained a Consultant to administer the project

- # 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 Department 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.

(ii) On projects where the Department has not retained a Consultant to administer the project

- # 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 Department 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 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 Department Representative in cases where such orders are issued.
- # For 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, 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.)

E. Municipality

On urban highways, the work may be performed by a municipality in some instances.

The following are the municipality's primary responsibilities for traffic accommodation when undertaking work on provincial highways.

- # Develop a Traffic Accommodation Strategy and submit it to the Department Representative for evaluation prior to the commencement of work.
- # 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 the Department Representative 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 Department 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 the Department Representative immediately.

4. TRAFFIC ACCOMMODATION

4.1 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 (TCD's) used to advise, warn and direct traffic are appropriate for the site conditions. Any TCD's which are not required must be removed or covered immediately.

In all cases, any required TCD's, flagpersons and detours must be in place prior to the commencement of the work. In addition, the required minimum lane width must be maintained at all times.

4.2 FLAGPERSONS

In situations where the sole use of TCD's does not provide sufficient warning or direction to traffic, the use of flagpersons may be required. The proper use of flagpersons 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 flagpersons and/or repositioning of the "Flagperson Ahead" sign may be necessary. All flagpersons must be certified in accordance with the requirements outlined in the contract, agreement, permit or authorization.

4.3 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 Department and/or other jurisdictions.

Where the conditions dictate that construction of a detour is necessary, the Contractor shall design the detour in accordance with the temporary highway detour geometric guidelines contained in the latest edition of the Department manual entitled Highway Geometric Design Guide and also the drawings contained in this document.

4.4 TEMPORARY SPEED REDUCTIONS

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

On Long Duration construction projects, the Department ensures local authorities are aware of the temporary speed reduction by requiring the Consultant to complete the "Order Fixing Maximum Speed" form.

On Short Duration utility work or highway maintenance projects, the form is not required as the Work Zone is often mobile and/or in place for less than a day.

4.5 TRANSITIONAL SPEED REDUCTIONS

The typical drawings included in this document do not show incremental speed reductions in advance of the Work Zone. In situations where the posted highway speed in advance of the Work Zone is greater than 30 km/hr above posted speed in the Work Zone, the speed approaching the Work Zone shall be reduced incrementally over a reasonable transition distance.

4.6 COORDINATION OF ACTIVITIES

On Department construction projects, it is not uncommon to have the Contractor, Consultant, and/or Utility Company simultaneously performing work within the Contractor's Work Zone. In these situations, it is important that traffic accommodation is a coordinated effort between all parties and that the positioning of Traffic Control Devices required for each activity is established prior to commencement of the work.

4.7 ACCOMMODATING PEDESTRIANS

Accommodation shall be made for the safe passage of pedestrians through or around the Work Area. Pedestrian traffic shall be physically separated from workers and equipment when allowed to pass through the Work Area. When pedestrian traffic can not be accommodated through the Work Area, an alternate route shall be made available.

5. TRAFFIC ACCOMMODATION STRATEGY

5.1 GENERAL

When activities are performed on or adjacent to the roadway which disrupt the normal flow of traffic, a Traffic Accommodation Strategy is required. A Traffic Accommodation Strategy consists of plans and written procedures which address the traffic accommodation issues relevant to the specific activity being performed. To be effective, the Traffic Accommodation Strategy must provide road users with adequate warning of the activity being performed, protection for workers and equipment within the Work Area and allow traffic to pass safely through the Work Zone.

For work performed by a Contractor on a Department construction or highway 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 Consultant prior to commencement of the work and in sufficient time to allow the Consultant to evaluate the suitability of the proposed strategy. The 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 highway maintenance contracts, Traffic Accommodation Strategies for "planned" maintenance activities shall be submitted by the Contractor to the Department Representative for review prior to commencement of the work and in accordance with the Specifications.

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.

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

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

5.2 GENERAL CONSIDERATIONS FOR 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:

- # Duration of work.
- # Traffic volumes (AADT, ASDT, peak hours, statutory holidays, special events and recreation traffic, etc.).
- # Class of roadway (capacity, level of service, etc.).
- # Available sight distance.
- # Intersecting roadways.
- # Gradeline (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.
- # Occupational Health and Safety legislation pertaining to clothing, hardhats, etc., to be worn by workers.
- # 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 flagpersons 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 typical drawings included in this document pertaining to the use and location of tapers and transitions.
- # Weather conditions (dust, rain or snow).
- # Site specific safety issues.

5.3 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 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 specific issues such as:

- # Installing, relocating and removing Traffic Control Devices.
- # Accommodating wide or long vehicles.
- # Accommodating vehicles around fresh tack coat.
- # Sequential installation and implementation and removal of the Traffic Control Devices.
- # 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 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.

5.4 MONITORING TRAFFIC ACCOMMODATION

To ensure traffic control measures are performing as intended, it is necessary to monitor and maintain the TCD's 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 TCD's.

5.5 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 Area. This information is recorded each day, as the work area changes and for the entire duration of the project. A sample form is included in this document. The person performing the work may develop and use his own form provided it clearly contains all the information shown on the sample form.

Information to be recorded includes the following:

- # Project description.
- # Date and time the Traffic Control Devices were inspected by the Contractor.
- # Station number of the beginning of each Work Area.
- # Designation and location (station number) of the temporary construction sign immediately prior to each Work Area.
- # "Reference number" of the signing drawing which reflects the temporary construction signing existing at the time of the inspection. Typically, the drawing referenced will be one which forms part of the Traffic Accommodation Strategy.
- # Any significant issues concerning the signing, including any variations between the actual signing and that which is shown on the signing drawing. This information should be noted in the "comments" section of the form.

As a minimum, the signing should be inspected and the information recorded for each Work Area, at the commencement of work each day and any other times throughout the day when the 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 Traffic Accommodation Strategy at all

times during the project.

6. COMPLIANCE WITH CONTRACT SPECIFICATIONS AND TRAFFIC ACCOMMODATION STRATEGY ON DEPARTMENT CONSTRUCTION CONTRACTS

It is the Department'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 Consultant 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. Therefore, to ensure proper administration of this authority the Consultant must exercise good judgement in each case.

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 Consultant'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 Consultant 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 Consultant 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 Project Sponsor. 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 Consultant must issue the Contractor with a written order to suspend work on the project. At this point, the Project Sponsor 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 Project Sponsor, 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 Department'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 Department projects may require that alternative measures be used to ensure effective traffic accommodation. In these cases, the Project Sponsor 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.

7. LONG DURATION PROJECTS

Generally, Long Duration projects involve activities such as the construction of a new roadway or bridge, the reconstruction or resurfacing of an existing roadway and other similar types of work. These projects may have a duration of anywhere from one or two weeks to several months. The work generally requires the use of a large fleet of heavy equipment working in relatively long Work Zones, on and adjacent to the roadway surface.

Due to the varying duration and site conditions and the complexity of these types of projects, a unique 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 shutdown, etc.).
- # Bridge sites.

8. SHORT DURATION PROJECTS

Typically, a Short Duration project is a project which does not require an overnight traffic disruption.

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 highway travel lanes, the highway shoulders, in the highway right-of-way and on or around drainage facilities.

9. TRAFFIC CONTROL DEVICES

9.1 GENERAL

To accommodate traffic safely and effectively, the use of TCD's in Work Zones must achieve the following:

A. Awareness and Identification

- # Advise road users of the type of activity they will encounter.
- # Divert traffic from its normal path when necessary.
- # Advise road users when it is safe to resume normal speed.

B. 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, a minimum of 1 barricade for each lane shall be used.

C. 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), 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.
- # The "Maximum 50 km/h Passing Workers" sign is used when workers are on the roadway surface for Short Duration work on 2-lane undivided highways only.

D. Lane Delineation

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

9.2 TEMPORARY SIGNING

Temporary signing is necessary to accommodate traffic through the Work Zone. The various types of temporary signing generally used includes temporary warning signs, temporary regulatory signs and information signs. Temporary signs must conform to the specifications for shape, color, reflectivity 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.

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.

9.3 SIZE OF SIGNS

High speed multilane urban highways typically handle large volumes of traffic. In these situations, normal sized signs would not be effective. On multilane highways where the original gazetted speed is greater than 60 km/hr and the Average Summer Daily Traffic volumes (ASDT) exceeds 10,000 vehicles per day, oversize signs are required.

The sizes of the various signs are as shown on the Urban Sign Schedule included in this document.

9.4 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 ahead
- # Survey Crew
- # Pavement Drop-off

- # Begin Detour 300 m

9.5 TEMPORARY REGULATORY SIGNS

Temporary regulatory signs are used to direct road users in the Work Zone. 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
- # Maximum Speed When Passing Workers

9.6 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 may be used to advise and direct traffic to alternate routes, even though the Work Area is not closed to traffic. There are also special information signs relating to certain types of activities.

9.7 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. For Long Duration work on multilane divided highways, signs must be installed on both the shoulder side and the median side of the highway. Special brackets may need to be fabricated for installing signs on a concrete median. The requirement for temporary signing on the median side of the highway may be waived for Short Duration work where it is determined by the Department that the installation of such signs is not practical.

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 over night, signs shall be installed on posts or suitable industry standard sign stands.

The position and height of all signs relative to the roadway surface must conform with the Specifications. The posts and portable stands on which the signs are installed and any objects used to stabilize the portable stands must not present a hazard to traffic. (e.g. Posts stands and weights used to stabilize TCD's must be "industry standard").

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

9.8 DELINEATORS

Delineators are used to outline lane transitions and indicate the intended path for road users passing through the Work Area. Effective delineation can be achieved through the use of chevrons, plastic 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 dependant on traffic speed. Where the speed in the Work Zone is greater than 50 km/hr, traffic cones must be a minimum of 70 cm in height. Where the speed in the Work Zone is 50 km/hr or less, the height of the traffic cones must be a minimum of 45 cm. When barrels/drums are used, the height of the barrels/drums must be a minimum of 90 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

9.9 TAPERS

Tapers shall be 40:1 where the original gazetted speed is greater than 60 km/hr and 5:1 where the original gazetted speed is 60 km/hr or less. In situations where site conditions do not allow the use of a 40:1 taper, the length of the taper may be reduced.

Also, where consecutive tapers are required for lane closures on a multi-lane highway, the typical drawings indicate that a distance of between 350 m to 500 m be maintained between the tapers. In situations where site conditions do not allow the minimum distance to be used, the distance between the tapers may be reduced.

Tapers require delineation. Glow posts and/or cones may only be used to delineate tapers when the original gazetted speed is 60 km/hr or less. Traffic barrels may be used to delineate tapers under any circumstances but must be used if the original gazetted speed is greater than 60 km/hr.

The number and spacing required for devices delineating tapers and travel lanes is shown on the typical drawings included with this document.

9.10 SEQUENTIAL ARROWBOARDS AND VARIABLE MESSAGE BOARDS

In situations where lane closures are necessary on multi-lane urban highways, a sequential arrow board is required to supplement the signing. In addition, when the average summer daily traffic volumes (ASDT) exceed 10,000 vehicles per day or, when sight distance is restricted, an electronic variable message board is also required in advance of the arrow board.

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

Sequential arrowboards and variable message boards must conform with the specifications.

9.11 SPECIALIZED TRAFFIC CONTROL DEVICES

There are several other TCD's that can be used to supplement standard traffic control measures. These devices are generally used in unique situations or for specific activities (e.g. 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
- # Flagpersons

9.12 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-burn 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 in the Work Zone.

The types and intended use of barricade warning lights are:

- # Type A

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

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

9.13 NEW JERSEY BARRIERS (WATER FILLED AND F-SHAPED CONCRETE)

New Jersey barriers may be required for stationary Work Areas, 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. Individual barriers must be interlocked in order to function properly. Low profile barriers may be used in situations where speeds are lower. Additionally, screening may be required on the barriers in situations where a visual barrier is required for the Work Areas or where headlight glare from approaching vehicles is a problem.

10. TYPICAL DRAWINGS

The individual drawings included with this document are categorized as either “high speed/high traffic volume” or “low speed /low traffic volume”. These categories represent the majority of urban situations occurring in the province. Other urban situations such as low speed/high volume represent infrequent or unique situations and must be addressed as they occur on a project by project basis.

High speed/high volume urban highways are those which have an original gazetted speed greater than 60 km/hr and an ASDT exceeding 10,000 vehicles per day.

Low speed/low volume urban highways are those which have an original gazetted speed up to 60 km/hr and an ASDT less than 10,000 vehicles per day.

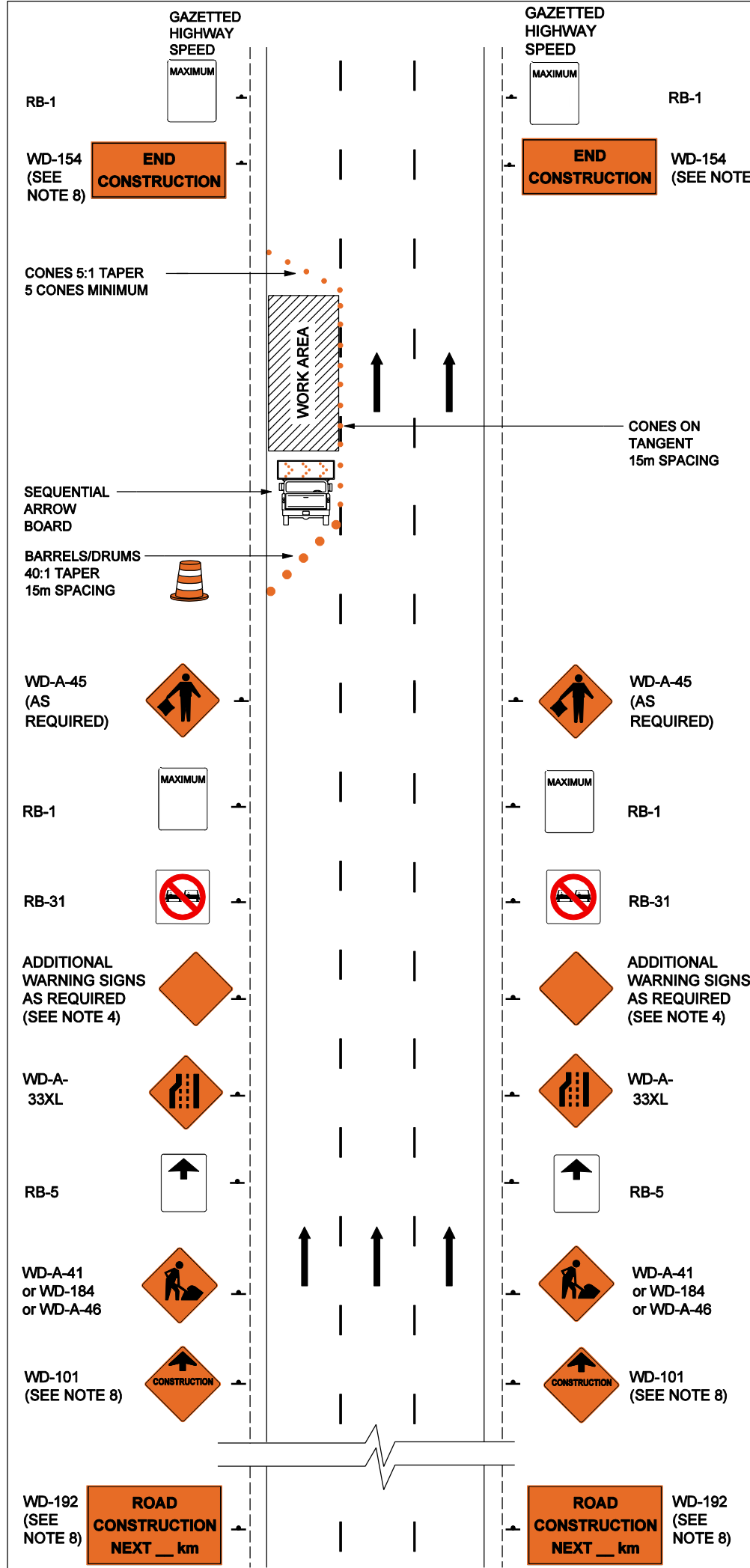
The ASDT volumes for provincial highways can be obtained on the Department’s website at www.trans.gov.ab.ca.

SECTION II

TYPICAL DRAWINGS FOR TRAFFIC CONTROL ON URBAN HIGHWAYS

TRAFFIC ACCOMMODATION IN URBAN WORK ZONES**LIST OF DRAWINGS**

HIGH SPEED/HIGH VOLUME	
TCS-B Drawing No.	Description
TCS-B-6.1B	Left Lane Closure
TCS-B-6.2B	Right Lane Closure
TCS-B-6.3B	Centre And Right Line Closed
TCS-B-6.4B	Centre And Left Lane Closure
TCS-B-6.5B	Detour Four Lane To Opposing Traffic
TCS-B-6.6B	Work On Shoulder
TCS-B-6.7B	Localized Excavation Adjacent To Shoulder (Within Work Zone)
TCS-B-6.8B	Ramp To One-Lane Closure
TCS-B-6.9B	Ramp To Two-Lane Closure
TCS-B-6.10B	3 Lane Closure To Off-Ramp
TCS-B-6.11B	Full Closure To Detour
TCS-B-6.12A	Detour



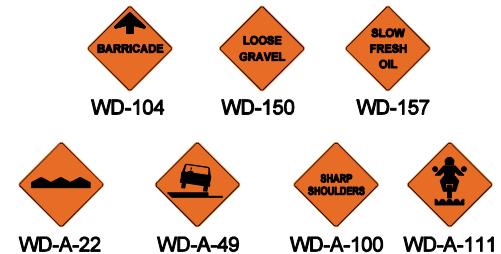
NOTES:

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. 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. Examples of additional warning signs that may be required in conjunction with this plan are:



5. Other hazard signs as shown in the schedule of signs may be used as required.

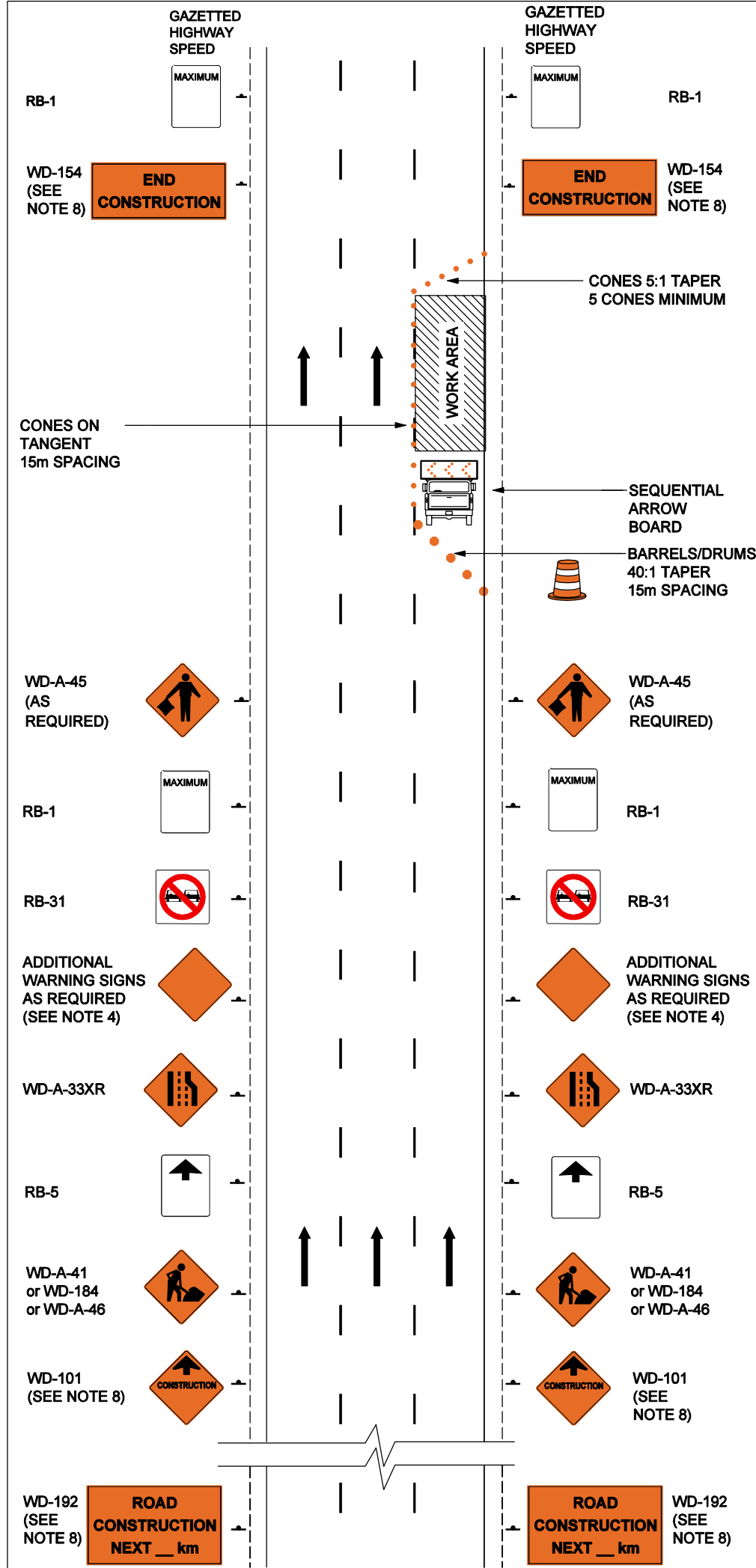
6. Electronic variable message board is required when average summer daily traffic (ASDT) volume exceeds 10,000 vehicles per day or when sight distance is restricted.

7. WD-192 shall be erected 2km in advance or the distance may be adjusted due to site specific requirements of the project. Distance tab to include project length plus setback from project limit.

8. WD-192, WD-101, WD-154 signs are not required for short duration work.



No.	REVISIONS	BY	DATE
Approved:		BY	
 Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (HIGH SPEED / HIGH VOLUME) LEFT LANE CLOSURE			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.IB



NOTES:

- 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.
- All sign spacing shall be 100m-150m unless otherwise indicated.
- 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.
- Examples of additional warning signs that may be required in conjunction with this plan are:

WD-104

WD-150

WD-157

WD-A-22

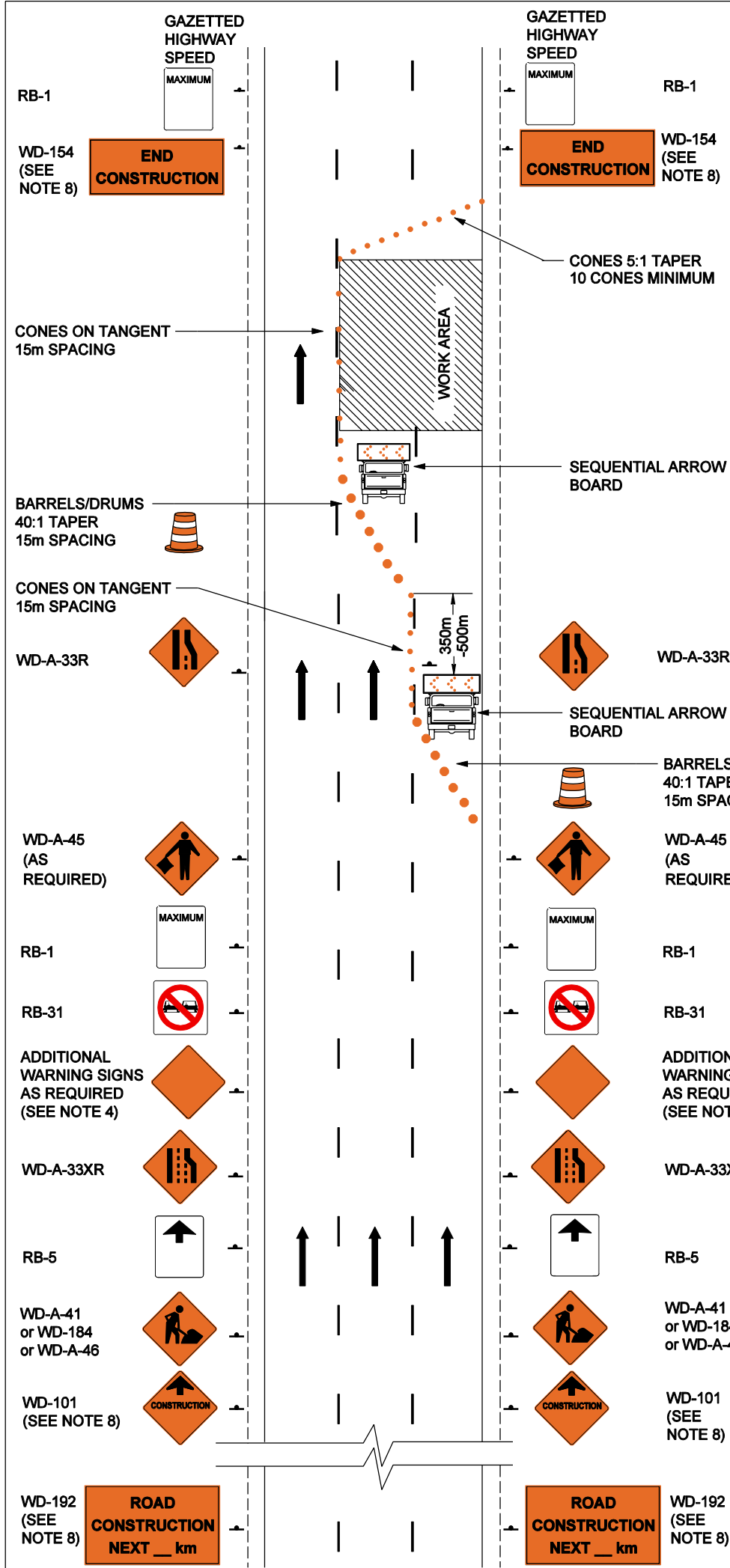
WD-A-49

WD-A-100

WD-A-111
- Other hazard signs as shown in the schedule of signs may be used as required.
- Electronic variable message board is required when average summer daily traffic (ASDT) volume exceeds 10,000 vehicles per day or when sight distance is restricted.
- WD-192 shall be erected 2km in advance or the distance may be adjusted due to site specific requirements of the project. Distance tab to include project length plus setback from project limit.
- WD-192, WD-101, WD-154 signs are not required for short duration work.
- WD-184


WD-A-46


No.	REVISIONS	BY	DATE
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>Approved:</p> <p>Executive Director, Technical Standards Branch</p> </div> <div style="text-align: center;"> </div> </div>			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (HIGH SPEED / HIGH VOLUME) RIGHT LANE CLOSURE			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.2B





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. 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. Examples of additional warning signs that may be required in conjunction with this plan are:



WD-104



WD-150


WD-157



WD-A-22



WD-A-49




WD-A-100

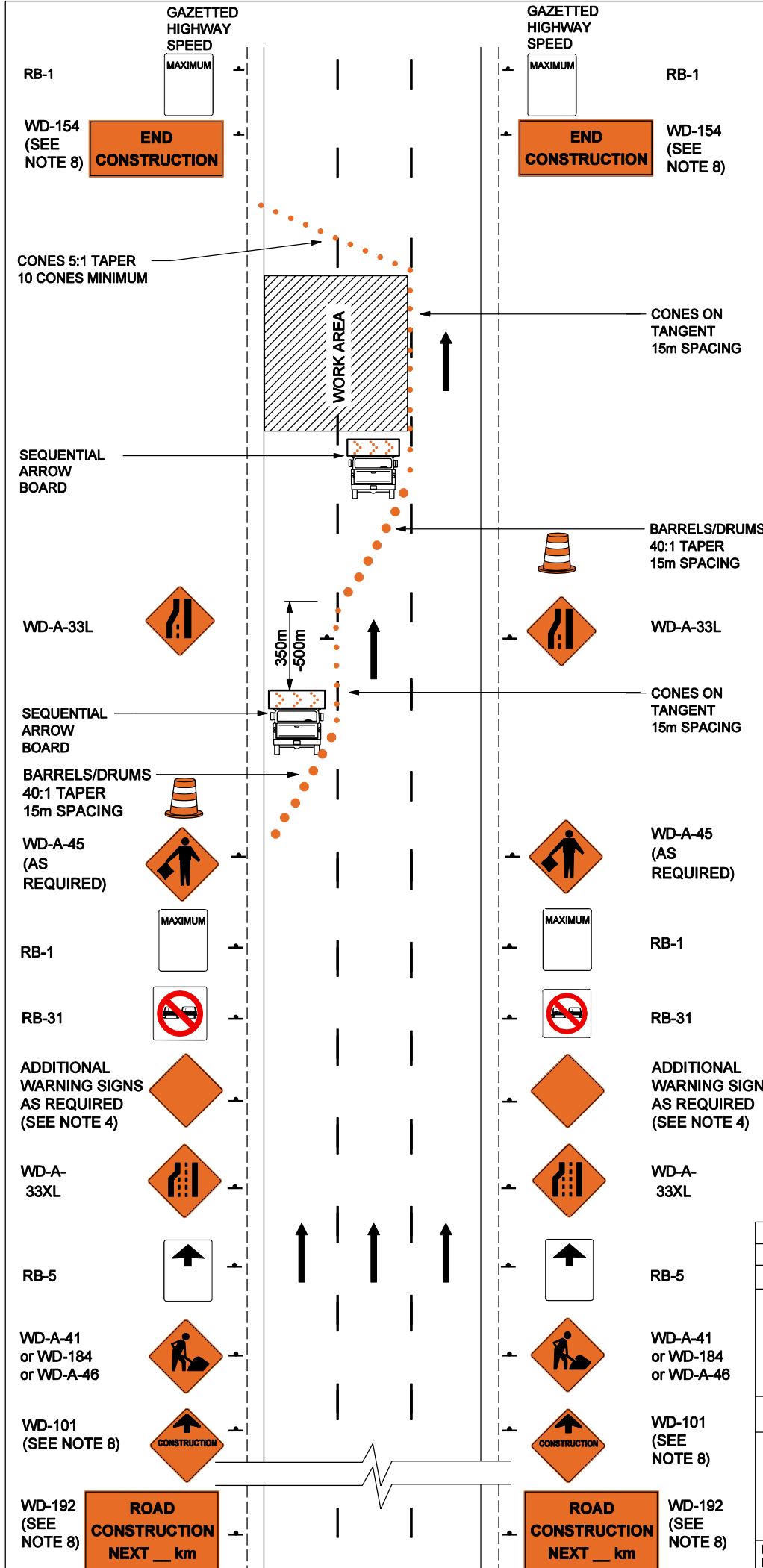

WD-A-111
5. Other hazard signs as shown in the schedule of signs may be used as required.
6. Electronic variable message board is required when average summer daily traffic (ASDT) volume exceeds 10,000 vehicles per day or when sight distance is restricted.
7. WD-192 shall be erected 2km in advance or the distance may be adjusted due to site specific requirements of the project. Distance tab to include project length plus setback from project limit.
8. WD-192, WD-101, WD-154 signs are not required for short duration work.

9.


WD-184

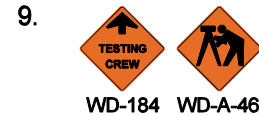

WD-A-46

2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (HIGH SPEED / HIGH VOLUME) CENTRE AND RIGHT LANE CLOSED			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.3B

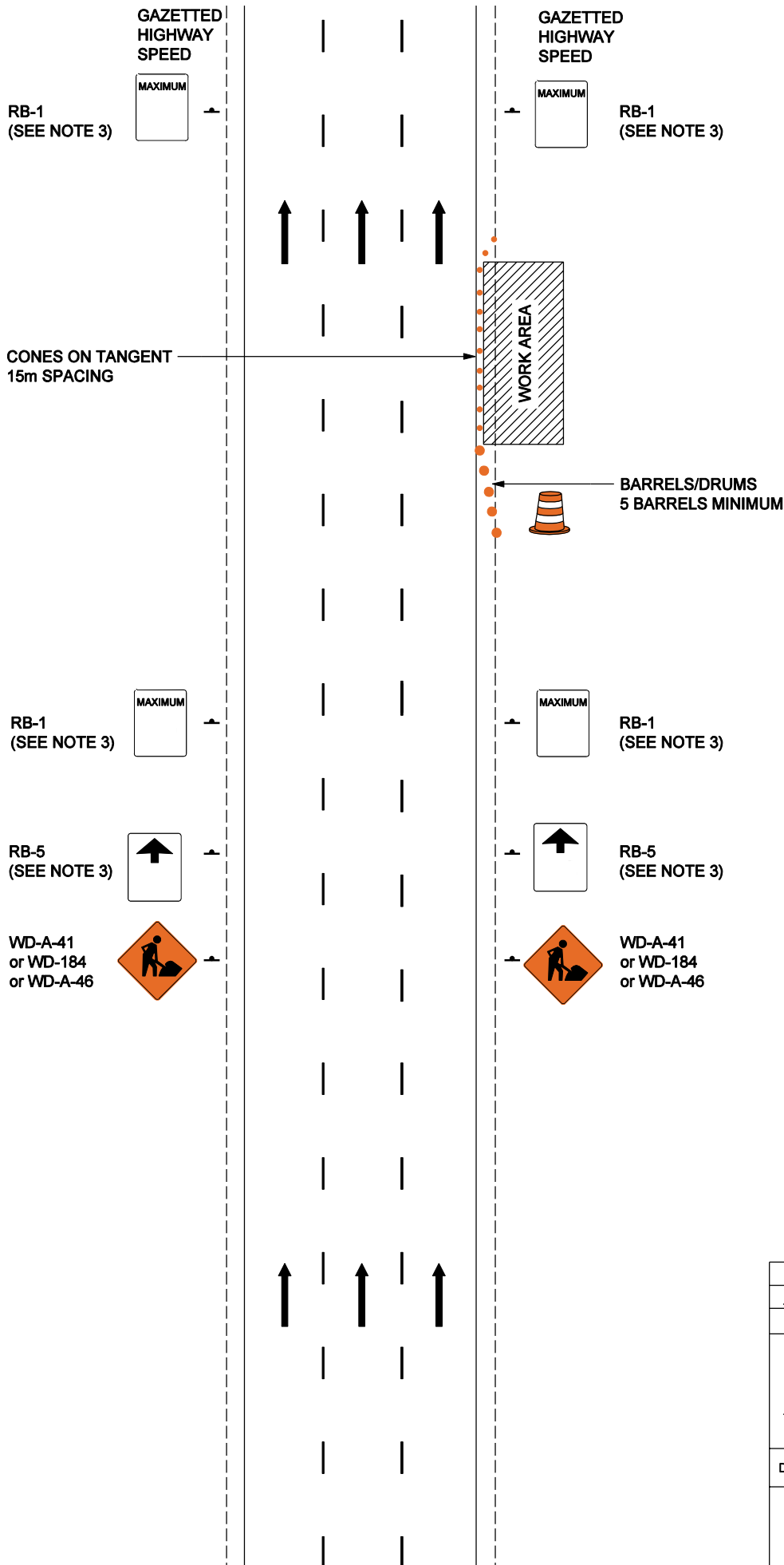


NOTES:

- 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.
- All sign spacing shall be 100m-150m unless otherwise indicated.
- 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.
- Examples of additional warning signs that may be required in conjunction with this plan are:
- Other hazard signs as shown in the schedule of signs may be used as required.
- Electronic variable message board is required when average summer daily traffic (ASDT) volume exceeds 10,000 vehicles per day or when sight distance is restricted.
- WD-192 shall be erected 2km in advance or the distance may be adjusted due to site specific requirements of the project. Distance tab to include project length plus setback from project limit.
- WD-192, WD-101, WD-154 signs are not required for short duration work.




2			
1			
No.	REVISIONS	BY	DATE
Approved:			
 Executive Director, Technical Standards Branch			
Date:		MARCH, 2003	
TYPICAL SIGNING FOR URBAN AREAS (HIGH SPEED / HIGH VOLUME) CENTRE AND LEFT LANE CLOSURE			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.4B




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. RB-5 and RB-1 signs will be required where a reduced speed zone is in place.
4.



WD-184

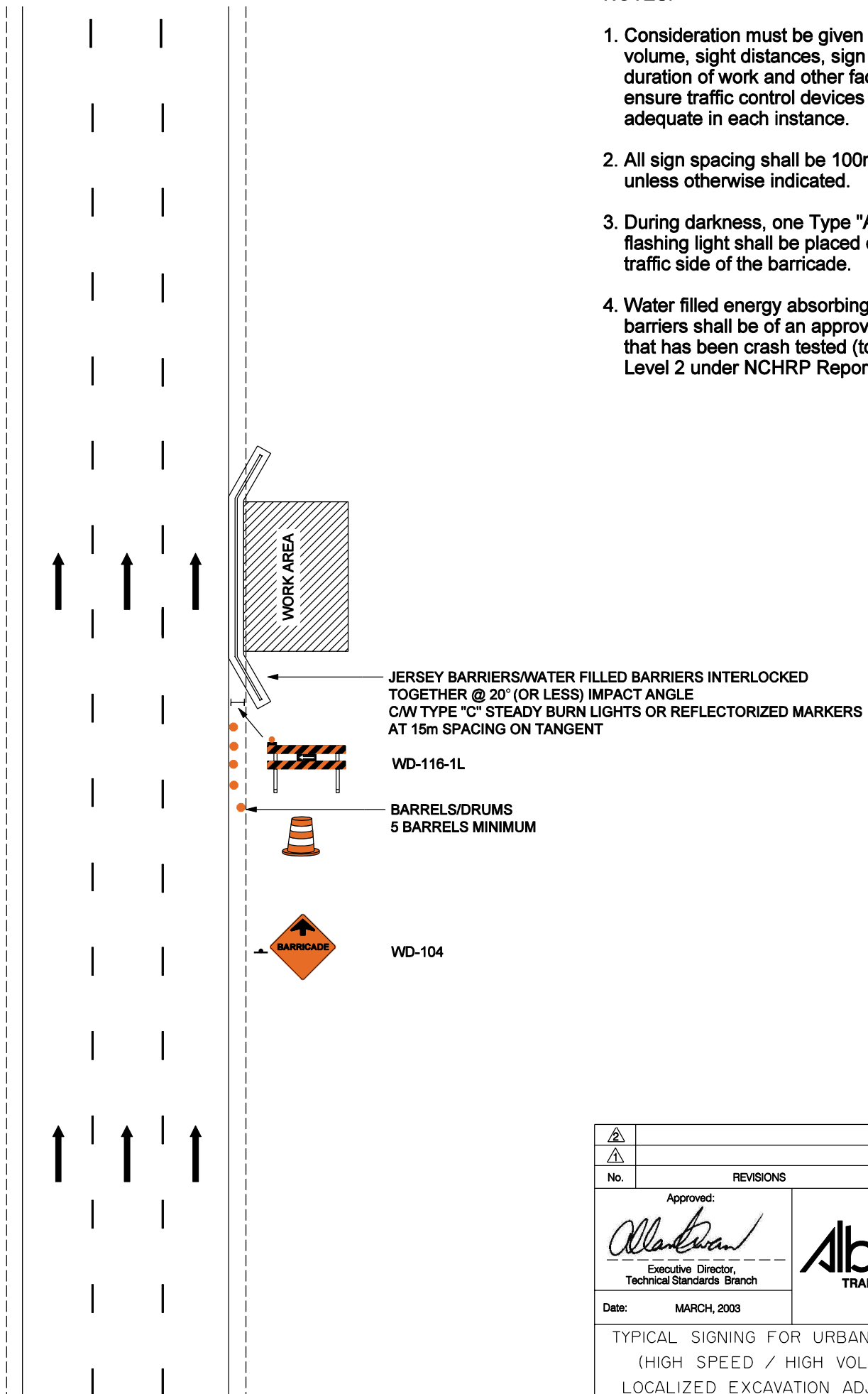




WD-A-46
5. Delineators/Cones shall be placed at 15m spacing. If the drop-off has slope flatter than 3:1, cones are not required.

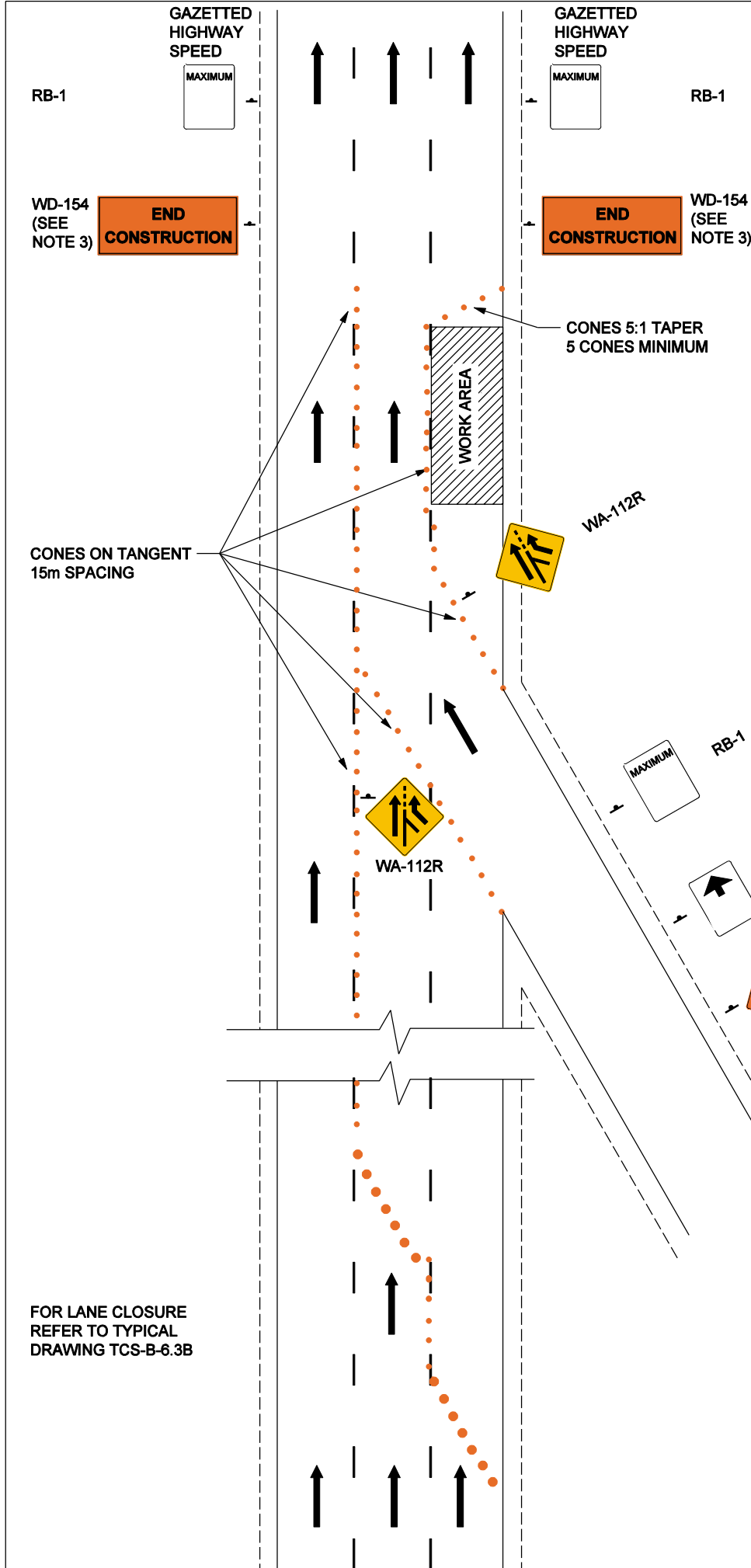
2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (HIGH SPEED / HIGH VOLUME) WORK ON SHOULDER			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.6B

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. During darkness, one Type "A" flashing light shall be placed on the traffic side of the barricade.
4. Water filled energy absorbing traffic barriers shall be of an approved type that has been crash tested (to meet Level 2 under NCHRP Report 350)





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No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (HIGH SPEED / HIGH VOLUME) LOCALIZED EXCAVATION ADJACENT TO SHOULDER (WITHIN WORK ZONE)			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.7B



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. WD-101, WD-154 signs are not required for short duration work.

2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (HIGH SPEED / HIGH VOLUME) RAMP TO ONE-LANE CLOSURE (FREE FLOW)			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.8B

GAZETTED
HIGHWAY
SPEED

RB-1

MAXIMUM

WD-154
(SEE
NOTE 3)

END
CONSTRUCTION

GAZETTED
HIGHWAY
SPEED

RB-1

MAXIMUM

END
CONSTRUCTION

WD-154
(SEE
NOTE 3)

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. WD-101, WD-154 signs are not required for short duration work.

CONES 5:1 TAPER
10 CONES MINIMUM

WORK AREA

CONES ON TANGENT
15m SPACING

RA-2

WA-16-R

RB-1

WB-2



RB-5

WD-A-41

WD-101
(SEE NOTE 3)

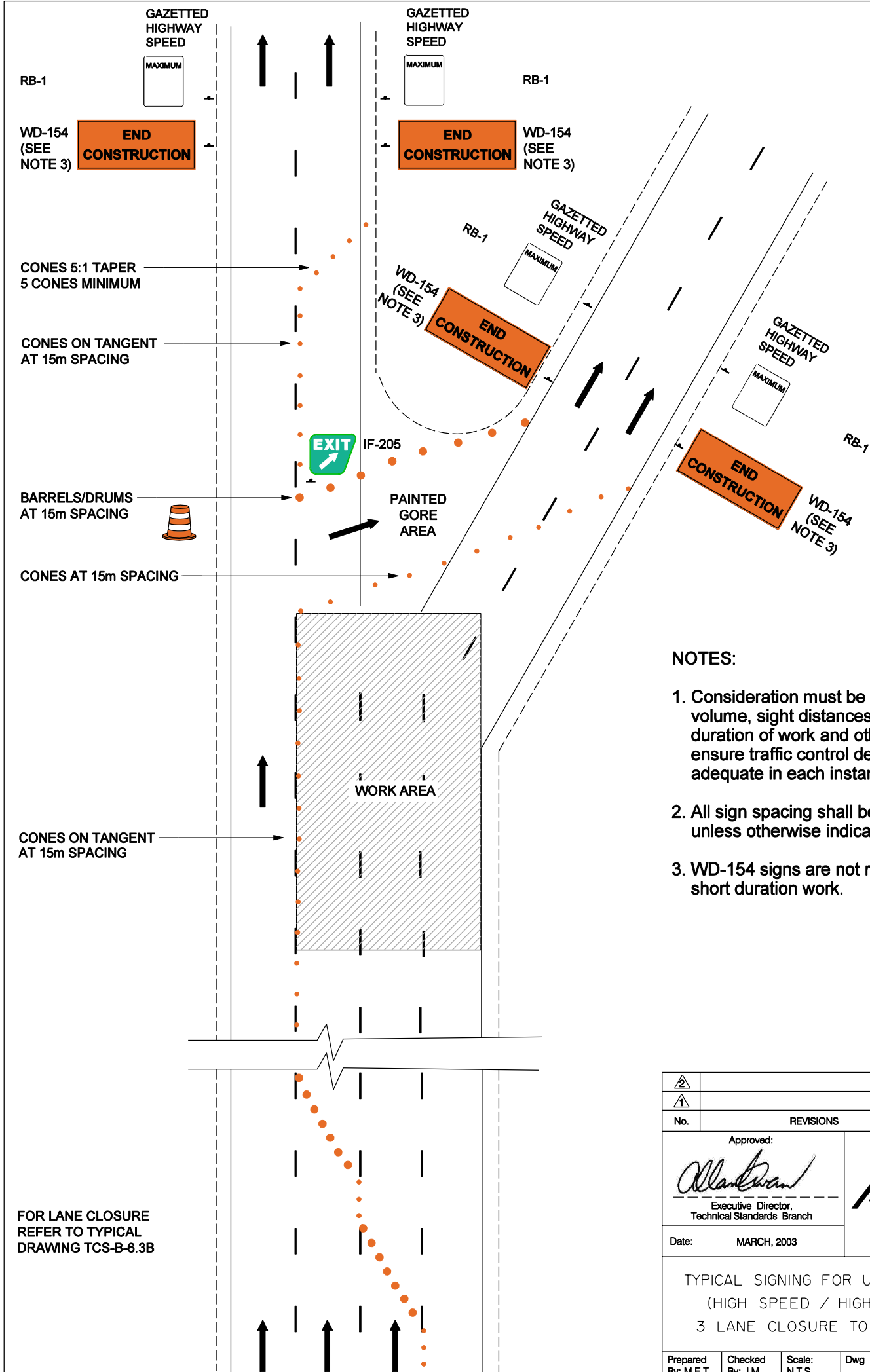
FOR LANE CLOSURE
REFER TO TYPICAL
DRAWING TCS-B-6.3B

2			
1			
No.	REVISIONS	BY	DATE

Approved:  Executive Director, Technical Standards Branch	
Date: MARCH, 2003	





TYPICAL SIGNING FOR URBAN AREAS
(HIGH SPEED / HIGH VOLUME)
RAMP TO TWO-LANE CLOSURE

Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.9B
------------------------	---------------------	------------------	---------------------



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. WD-154 signs are not required for short duration work.

			
			
No.	REVISIONS		DATE
Approved:  ----- Executive Director, Technical Standards Branch			
Date:	MARCH, 2003		
TYPICAL SIGNING FOR URBAN AREAS (HIGH SPEED / HIGH VOLUME) 3 LANE CLOSURE TO OFF-RAMP			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.10B

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. Highway shall be completely barricaded. During darkness, two Type 'A' flashing lights shall be placed on each barricade.

SEQUENTIAL ARROW BOARD



WD-116-2
(SEE NOTE 3)

BARRELS/DRUMS
40:1 TAPER
15m SPACING

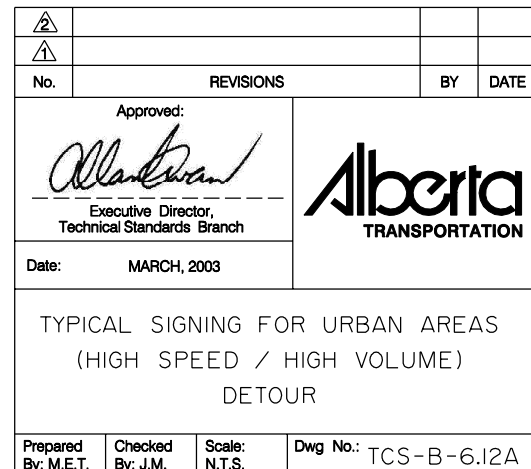
FOR DETOUR SIGNING
REFER TO TYPICAL
DRAWING TCS-B-6.12A

CONES ON TANGENT
15m SPACING

FOR LANE CLOSURE
REFER TO TYPICAL
DRAWING TCS-B-6.4B

2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (HIGH SPEED / HIGH VOLUME) FULL CLOSURE TO DETOUR			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-6.IIB

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 25m-100m unless otherwise indicated.
3. For all detours, customised plans will be required.
4. Intersection control must be determined for each intersection on the detour route and must conform to appropriate legislation.
5. Detour speed limit must be appropriate for each detour route.
6. During darkness, two Type "A" flashing lights shall be placed on each barricade.



TRAFFIC ACCOMMODATION IN URBAN WORK ZONES**LIST OF DRAWINGS**

LOW SPEED/LOW VOLUME	
TCS-B Drawing No.	Description
TCS-B-7.1A	One Lane Closure (One Lane Alternating Traffic) - Two Lane Undivided Highway
TCS-B-7.2B	Right Lane Closure - Four Lane Undivided Highway
TCS-B-7.3A	Work On Shoulder - Two Lane Undivided Highway
TCS-B-7.3B	Work On Shoulder - Four Lane Divided Highway
TCS-B-7.4A	Shoulder Drop-Off (Within Work Zone) - Two Lane Undivided Highway
TCS-B-7.5A	Intersecting Roads - Two Lane Undivided Highway
TCS-B-7.5B	Intersecting Roads - Four Lane Divided Highway
TCS-B-7.6A	Work On Centreline Two Lane Traffic - Two Lane Undivided Highway
TCS-B-7.7A	Detour - Two Lane Undivided Highway
TCS-B-7.8A	Embankment And Fixed Objects - Two Lane Undivided Highway
TCS-B-7.8B	Embankment And Fixed Objects - Four Lane Divided Highway
TCS-B-7.9A	One Lane Closure (One Lane Alternating Traffic) - Two Lane Undivided Highway
TCS-B-7.9B	One Lane Closure - Four Lane Divided Highway
TCS-B-7.10B	Two Lane Closure With 2-Way Traffic - Four Lane Undivided Highway

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 25m-100m unless otherwise indicated.
3. For mobile operation, cones may not be required.
4. WD-101 and WD-154 sign not required for short duration work.
5. RB-31 sign not required when existing solid yellow barrier line is in place.
6. WD-194 sign, together with RA-2 sign, may be used instead of WD-A-45 sign and flagperson if sight distance is adequate.



RA-2

WD-194

7. RB-5 and RB-1 signs will be used when a reduced speed zone is required. In this case gazetted speed to be posted after the work area.



RB-5



RB-1

8. Other hazard signs as shown in the schedule of signs may be used as required.

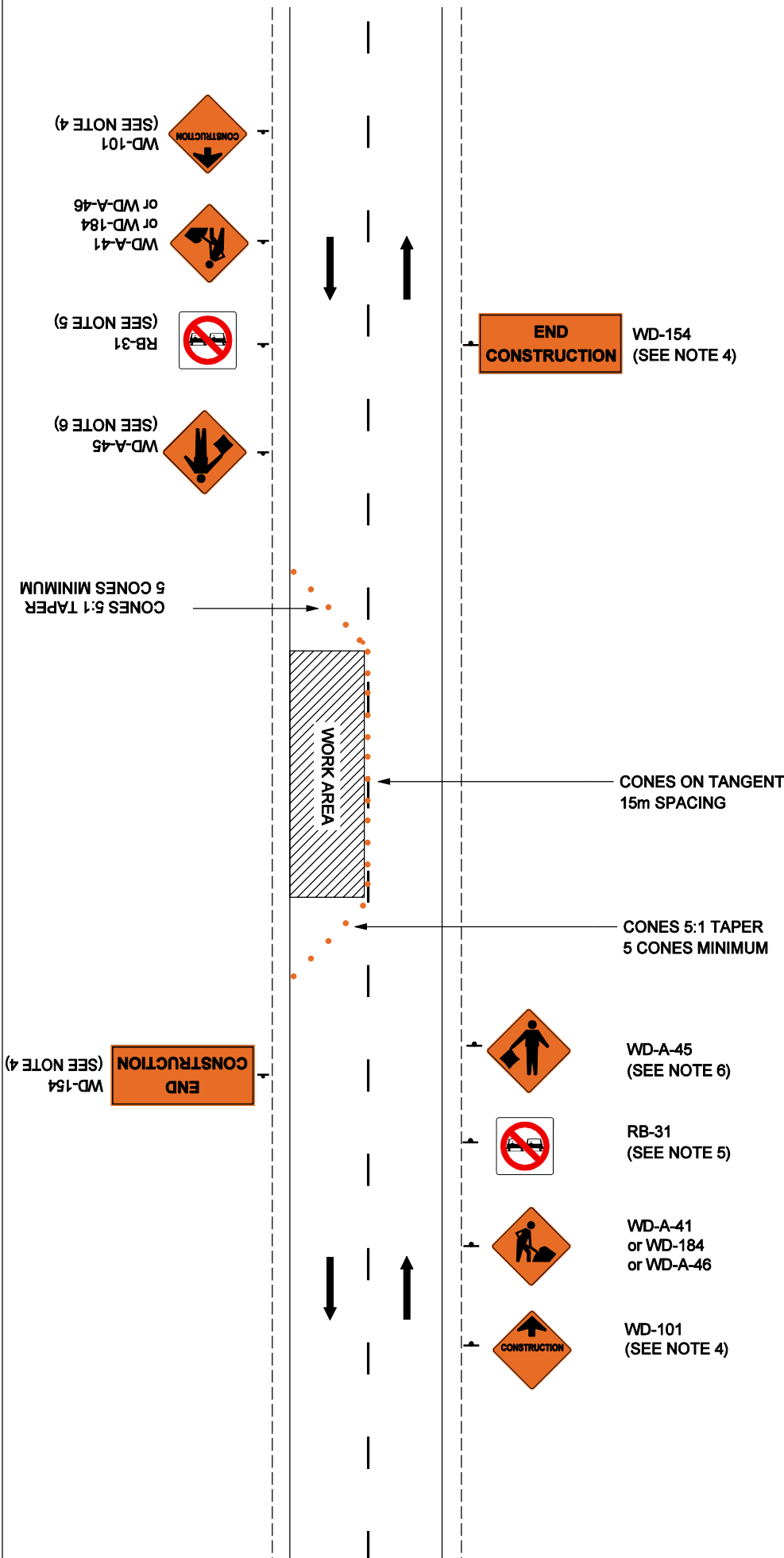
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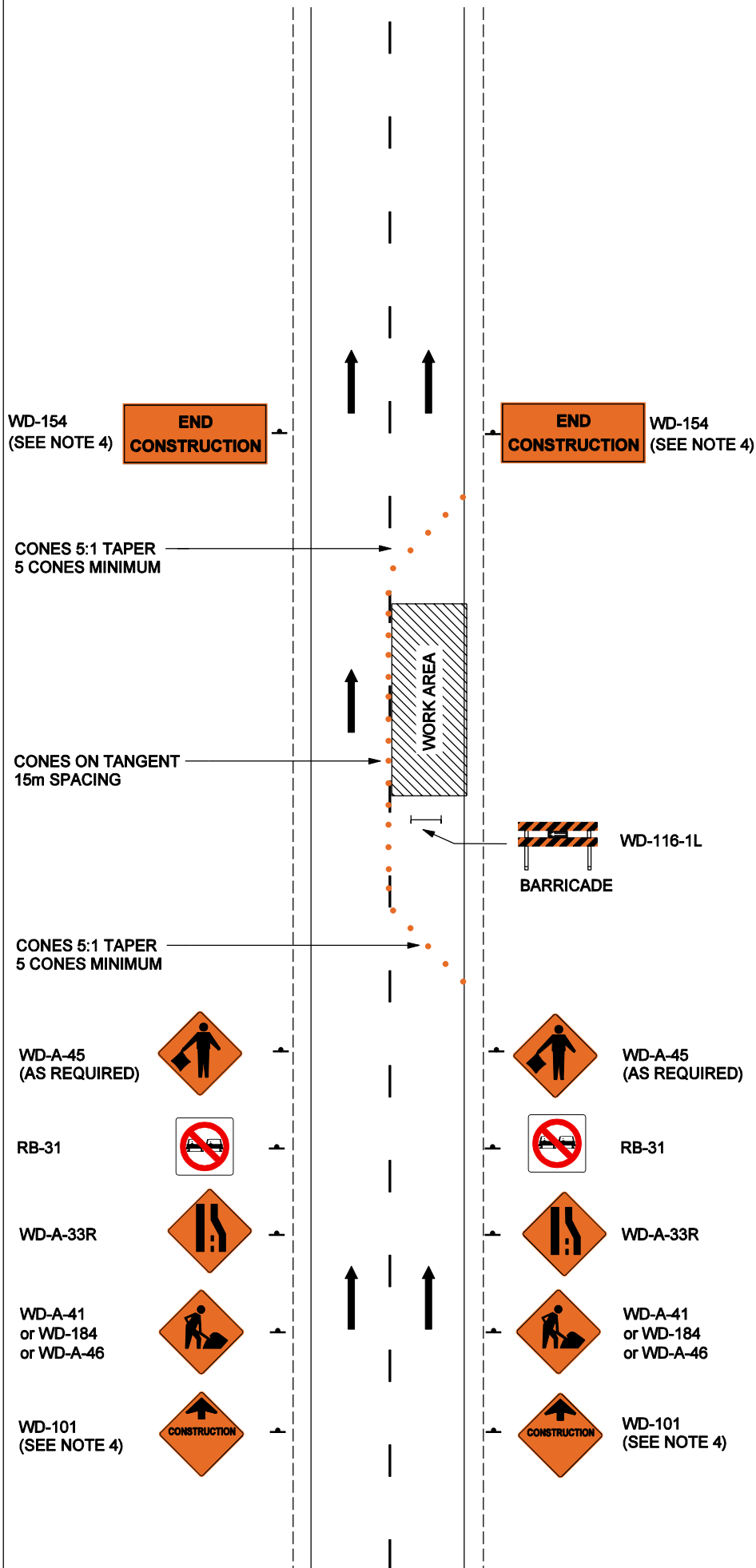
WD-184



WD-A-46



2			
1			
No.	REVISIONS	BY	DATE
Approved:			
 Executive Director, Technical Standards Branch			
Date:	MARCH, 2003		
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) ONE LANE CLOSURE (ONE LANE ALTERNATING TRAFFIC) TWO LANE UNDIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.1A



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 25m-100m unless otherwise indicated.
3. For mobile operation, cones may not be required.
4. WD-101 and WD-154 signs not required for short duration work.
5. RB-5 and RB-1 signs will be used when a reduced speed zone is required. In this case gazetted speed to be posted after the work area.
6. If construction operation is occurring on the opposite travel lanes, then applicable construction signing will also be required on those lanes.
7. Other hazard signs as shown in the schedule of signs may be used as required.



RB-5



RB-1



8.



WD-184



WD-A-46

2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) RIGHT LANE CLOSURE FOUR LANE DIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.2B

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 25m-100m unless otherwise indicated.
3. For mobile operation, cones may not be required.
4. WD-101 and WD-154 signs not required for short duration work.
5. RB-5 and RB-1 signs will be used when a reduced speed zone is required. In this case gazetted speed to be posted after the work area.



RB-5



RB-1

6. Other hazard signs as shown in the schedule of signs may be used as required.

7.



WD-184



WD-A-46

WD-101
(SEE NOTE 4)



WD-A-41
or WD-184
or WD-A-46



**END
CONSTRUCTION**

WD-154
(SEE NOTE 4)



CONES ON TANGENT
AT 15m SPACING

CONES ON TAPER

WD-154
(SEE NOTE 4)



**END
CONSTRUCTION**

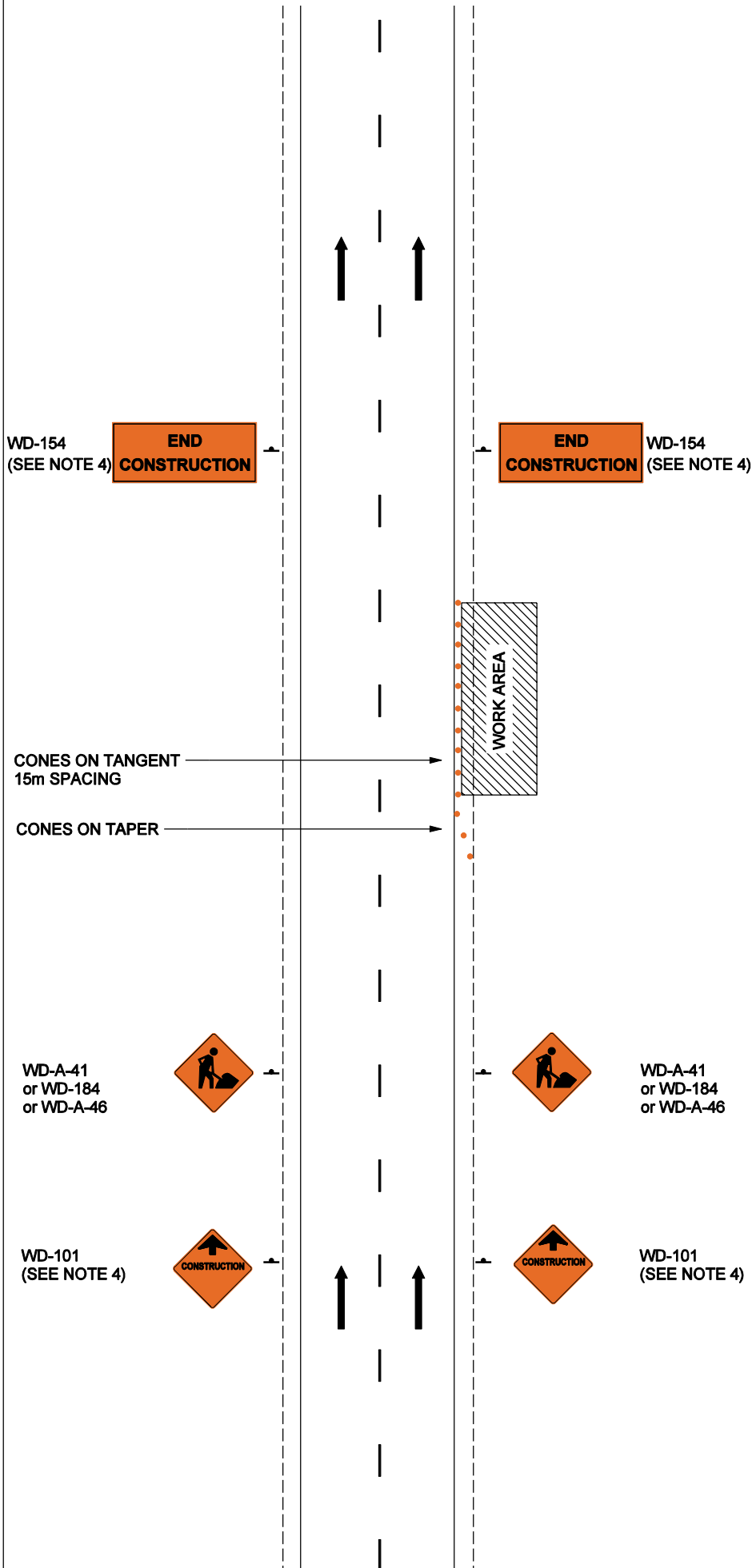


WD-A-41
or WD-184
or WD-A-46



WD-101
(SEE NOTE 4)

2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) WORK ON SHOULDER TWO LANE UNDIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.3A



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 25m-100m unless otherwise indicated.
3. For mobile operation, cones may not be required.
4. WD-101 and WD-154 signs not required for short duration work.
5. RB-5 and RB-1 signs will be used when a reduced speed zone is required. In this case gazetted speed to be posted after the work area.



RB-5



RB-1

6. If construction operation is occurring on the opposite travel lane, then applicable construction signing will also be required on those lanes.
7. Other hazard signs as shown in the schedule of signs may be used as required.

8.



WD-184



WD-A-46

2			
1			
No.	REVISIONS	BY	DATE
Approved: Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) WORK ON SHOULDER FOUR LANE DIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.3B

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 25m-100m unless otherwise indicated.
3. Delineators/Cones shall be placed at 15m spacing. If the drop-off has a slope flatter than 3:1, cones are not required.
4. During darkness, one Type 'A' flashing light shall be placed on traffic side of the barricade.
5. Light-duty barricades, WD-116-4L may be used instead of WD-116-1L and WD-116-4R may be used instead of WD-116-1R, when space is limited or where curbs/gutters are present.



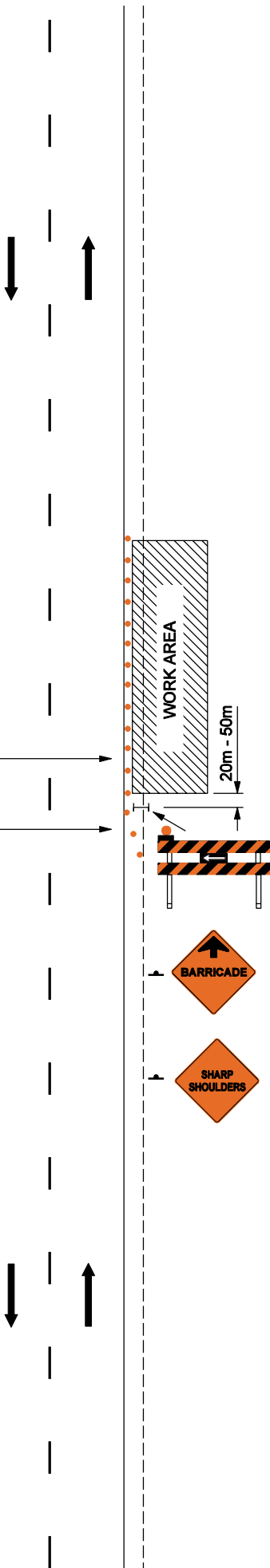
WD-116-4L



WD-116-4R

CONES ON TANGENT
15m SPACING



CONES ON TAPER



WD-116-1L
(SEE NOTE 5)

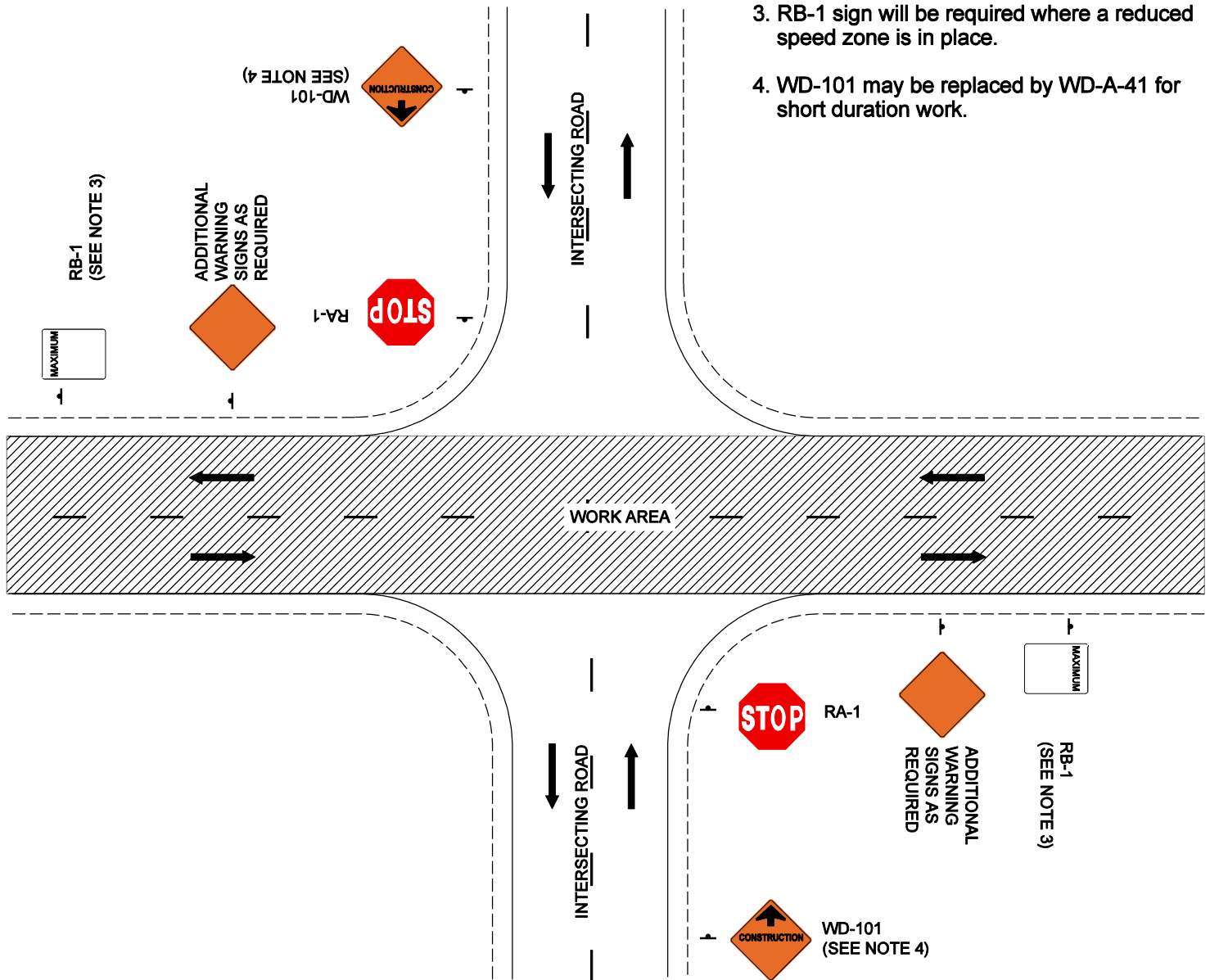
WD-104



WD-A-100

2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) SHOULDER DROP-OFF (WITHIN WORK ZONE) TWO LANE UNDIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.4A

NOTES:

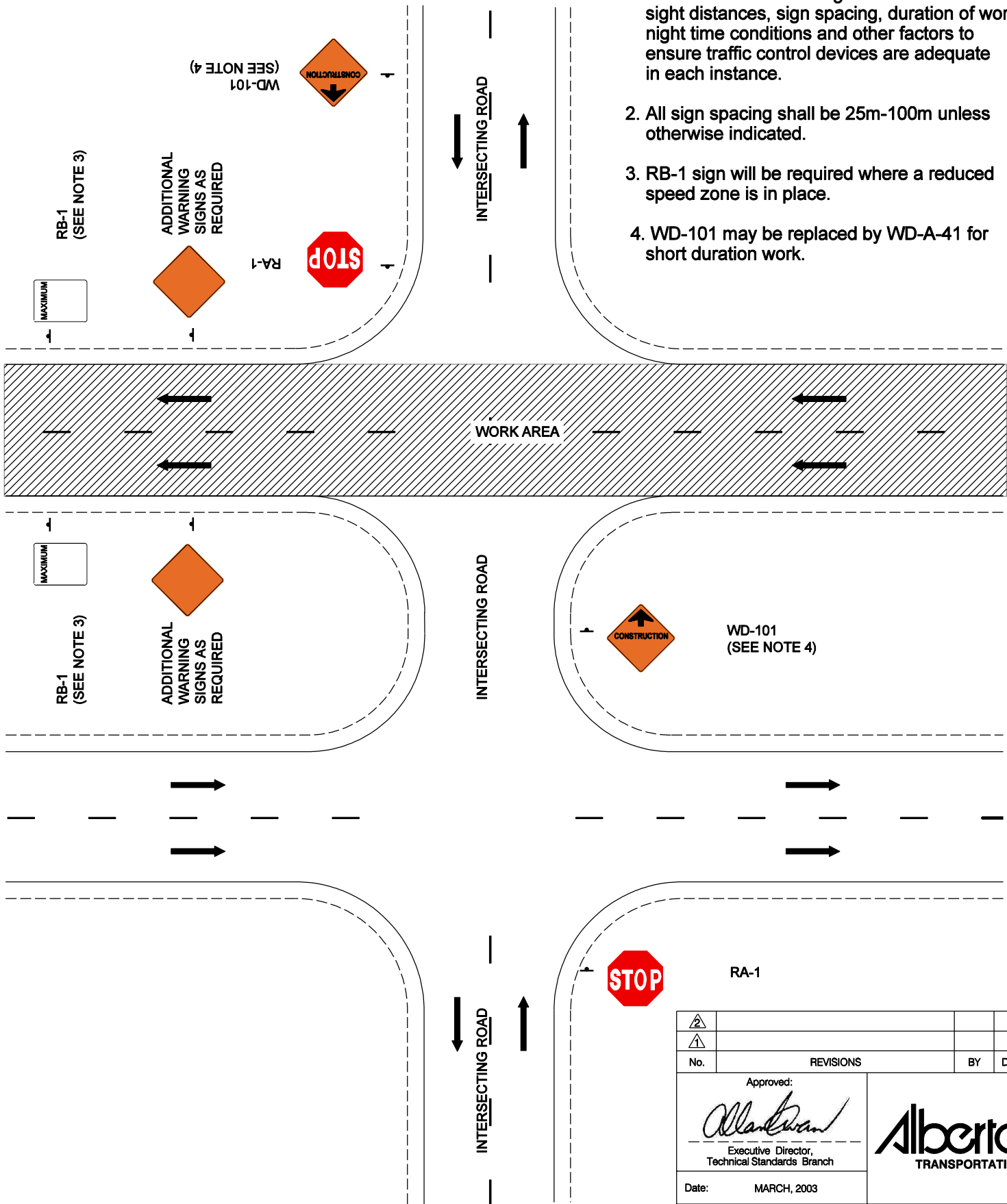
1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work, night time conditions and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 25m-100m unless otherwise indicated.
3. RB-1 sign will be required where a reduced speed zone is in place.
4. WD-101 may be replaced by WD-A-41 for short duration work.



2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) INTERSECTING ROADS TWO LANE UNDIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.5A

NOTES:

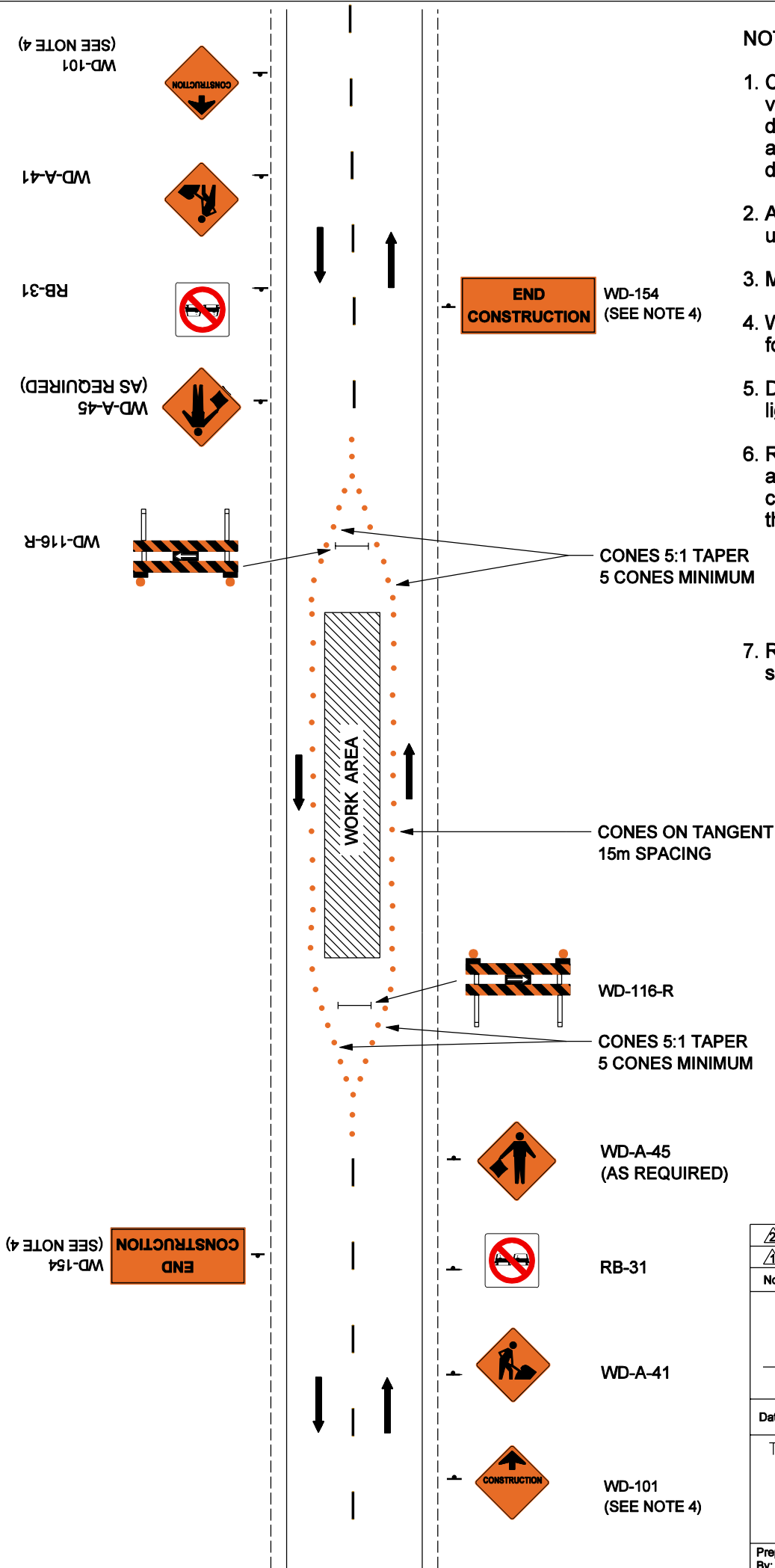
1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work, night time conditions and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 25m-100m unless otherwise indicated.
3. RB-1 sign will be required where a reduced speed zone is in place.
4. WD-101 may be replaced by WD-A-41 for short duration work.







2			
1			
No.	REVISIONS	BY	DATE
Approved:		Alberta TRANSPORTATION	
<i>Alan Ewan</i> Executive Director, Technical Standards Branch			
Date:		MARCH, 2003	
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) INTERSECTING ROADS FOUR LANE DIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.5B

NOTES:

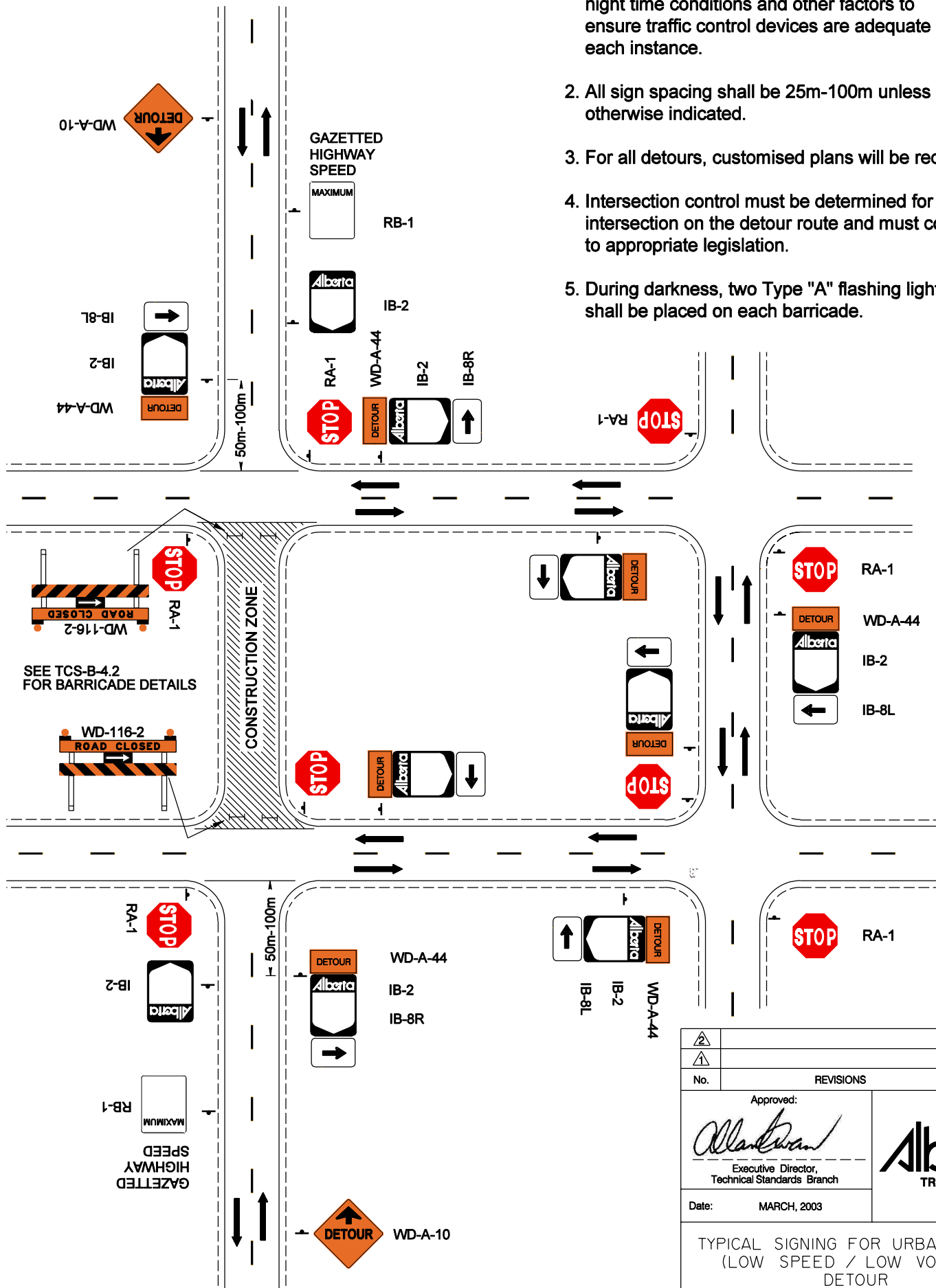
1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work, night time conditions and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 25m-100m unless otherwise indicated.
3. Minimum lane width of 3.5m is required
4. WD-101 and WD-154 signs not required for short duration work.
5. During darkness, two Type 'A' flashing lights shall be placed on each barricade.
6. RB-5 and RB-1 signs will be used when a reduced speed zone is required. In this case gazetted speed to be posted after the work area.
7. RB-31 may not be required when existing solid barrier yellow line is in place.







			
			
No.	REVISIONS		BY DATE
Approved:  ----- Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) WORK ON CENTRELINE TWO LANE TRAFFIC TWO LANE UNDIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.6A

NOTES:

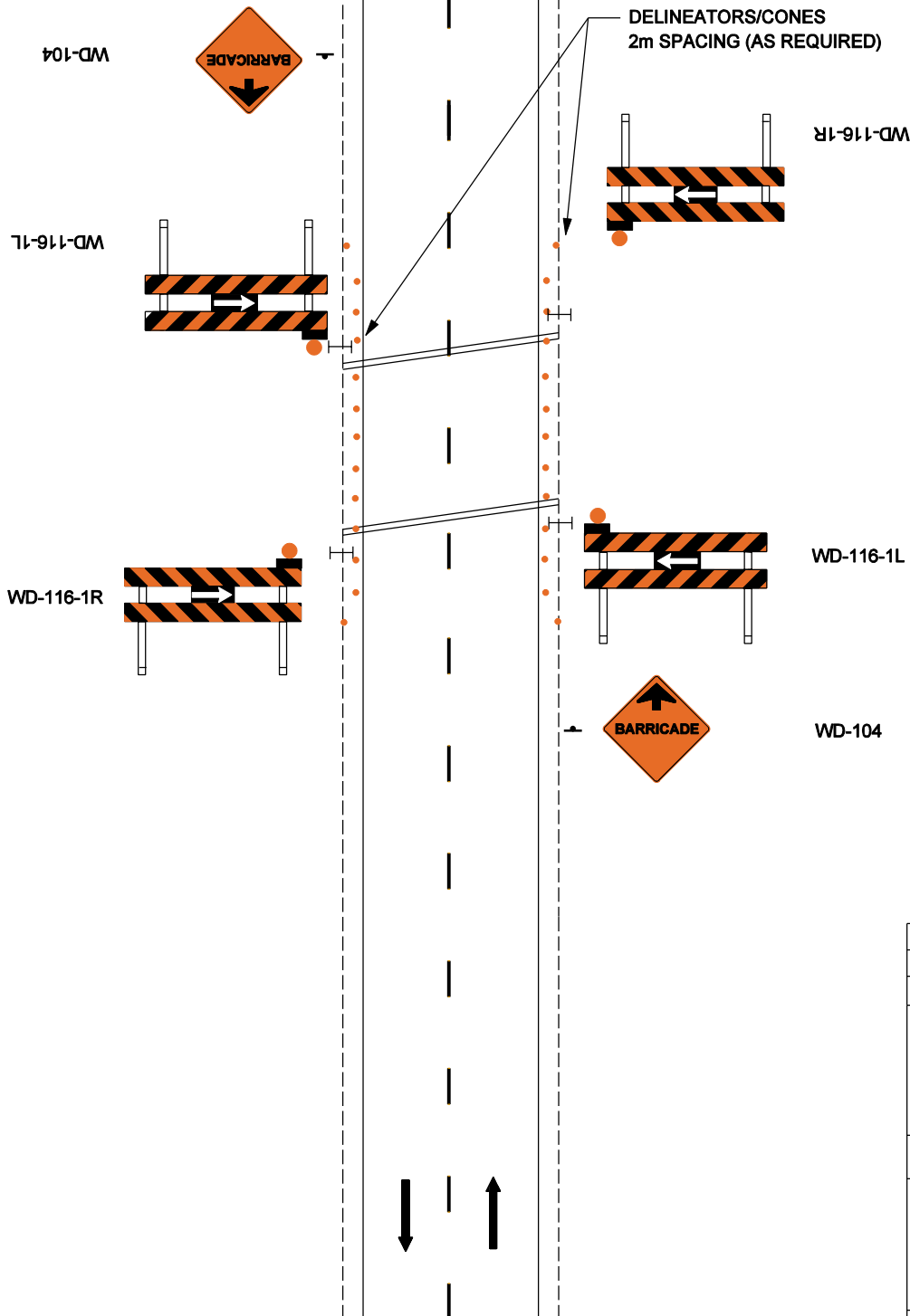
1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work, night time conditions and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 25m-100m unless otherwise indicated.
3. For all detours, customised plans will be required.
4. Intersection control must be determined for each intersection on the detour route and must conform to appropriate legislation.
5. During darkness, two Type "A" flashing lights shall be placed on each barricade.





			
			
No.	REVISIONS		BY DATE
Approved:  ----- Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) DETOUR TWO LANE UNDIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.7A

NOTES:

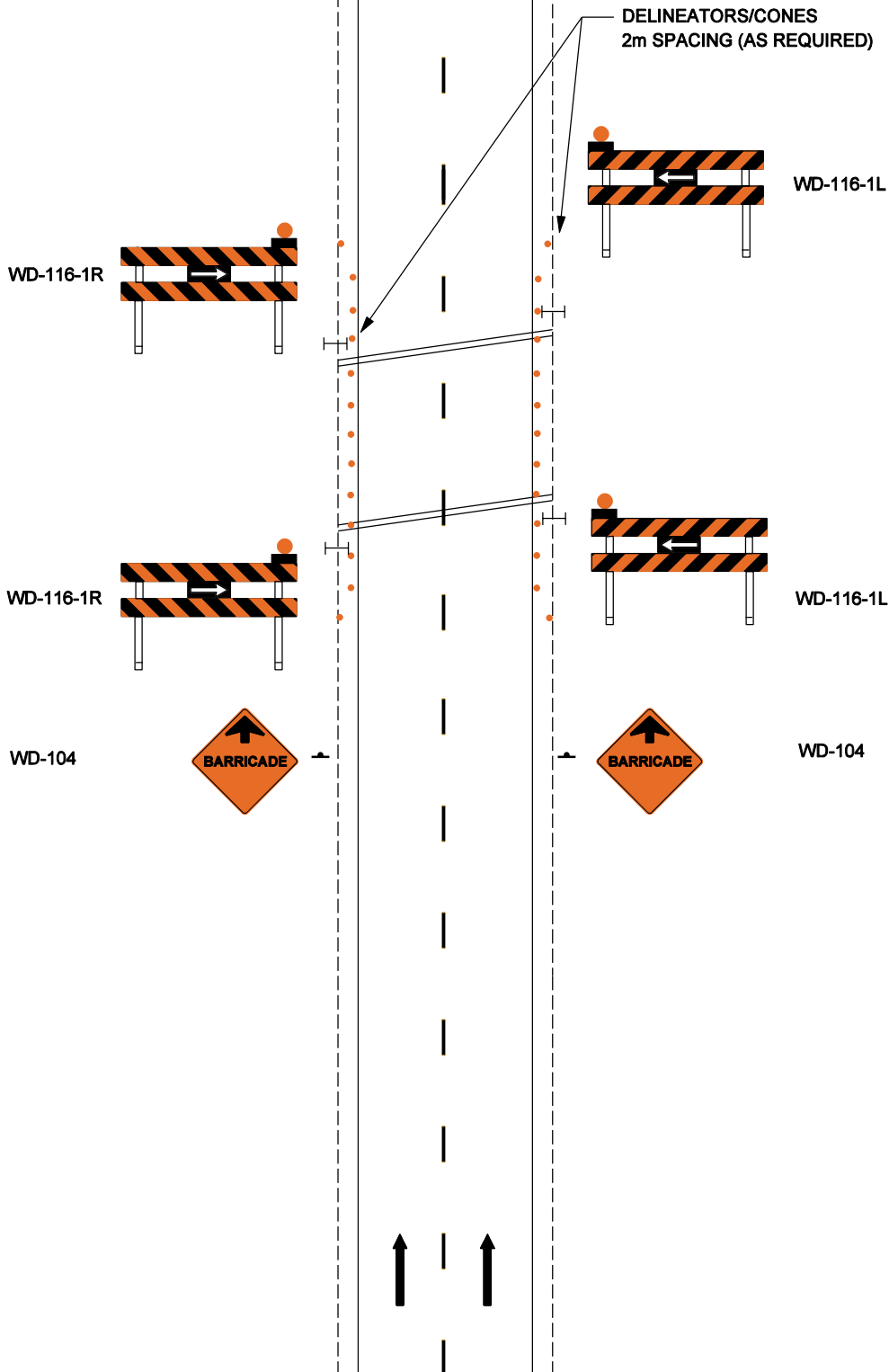
1. Consideration must be given to traffic volume, sight distances, sign spacing, duration of work, night time conditions and other factors to ensure traffic control devices are adequate in each instance.
2. All sign spacing shall be 25m-100m unless otherwise indicated.
3. During darkness, one Type 'A' flashing light shall be placed on each barricade.





2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) EMBANKMENT AND FIXED OBJECTS TWO LANE UNDIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.8A

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 25m-100m unless otherwise indicated.
3. During darkness, one Type 'A' flashing light shall be placed on each barricade.



2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) EMBANKMENT AND FIXED OBJECTS FOUR LANE DIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.8B

NOTE: DETAILS OF WARNING / REGULATORY SIGNS SAME AS THOSE ON OTHER SIDE OF HIGHWAY

PRECAST CONCRETE MEDIAN BARRIERS OR WATER FILLED ENERGY ABSORBING TRAFFIC BARRIERS SHALL BE USED WHEN THE DIFFERENCE IN ELEVATION BETWEEN ROADWAY SURFACE AND THE ADJACENT BRIDGE DECK IS GREATER THAN 200mm. MINIMUM 1.07m HIGH DELINEATORS WITH RUBBERIZED HEAVY DUTY BASE AT 2.0m SPACING WILL BE PERMITTED ALONG THE EDGE OF THE WORK AREA WHEN THE DIFFERENCE IN ELEVATION BETWEEN THE ROADWAY SURFACE AND THE ADJACENT BRIDGE DECK IS LESS THAN 200mm.

WD-154

END CONSTRUCTION

PAINTED STOP LINE

10m

2m

TRAFFIC LIGHTS
TEMPORARY LANE MARKINGS

END CONSTRUCTION

WD-154

CONES 5:1 TAPER
5 CONES MINIMUM

WD-116-1R

MINIMUM 4 BARRICADES COMPLETE WITH TYPE "C" STEADY BURN LIGHTS ON TRAFFIC SIDE

SUFFICIENT NUMBER OF WATER FILLED ENERGY ABSORBING TRAFFIC BARRIERS INTERLOCKED TOGETHER AT 20° (OR LESS) IMPACT ANGLE TO CLOSE OFF LANE COMPLETELY.

WATER BARRIERS ON TANGENT

MINIMUM 4 BARRICADES COMPLETE WITH TYPE "C" STEADY BURN LIGHTS ON TRAFFIC SIDE
WD-116-1L

CONES 5:1 TAPER
5 CONES MINIMUM

TEMPORARY LANE MARKINGS

PAINTED STOP LINE
TRAFFIC LIGHTS

10m

2m

60m

60m

60m



WD-A-45
(AS REQUIRED)



WD-104



WD-B-4



RB-31
(SEE NOTE 7)



WD-106



WD-A-41



WD-A-24



WD-B-4T



WD-101B

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. When switching traffic during staged construction, a specialized traffic accommodation plan is required.
3. Water filled energy absorbing traffic barriers shall be of an approved type that has been crash tested (to meet Level 2 under NCHRP Report 350).
4. All sign spacing shall be 25m-100m unless otherwise indicated
5. Traffic lights shall be 300mm diameter.
6. A minimum lane width of 3.5m is required.
7. RB-31 sign not required when existing solid yellow barrier line is in place.
8. RB-5 and RB-1 signs will be used when a reduced speed zone is required. In this case gazetted speed to be posted after the work area.



RB-5



RB-1

9. WD-194 sign, together with RA-2 sign, may be used instead of WD-A-45/traffic light if sight distance is adequate.



RA-2

WD-194

No.	REVISIONS	BY	DATE

Approved:

Alberta

Executive Director,
Technical Standards Branch

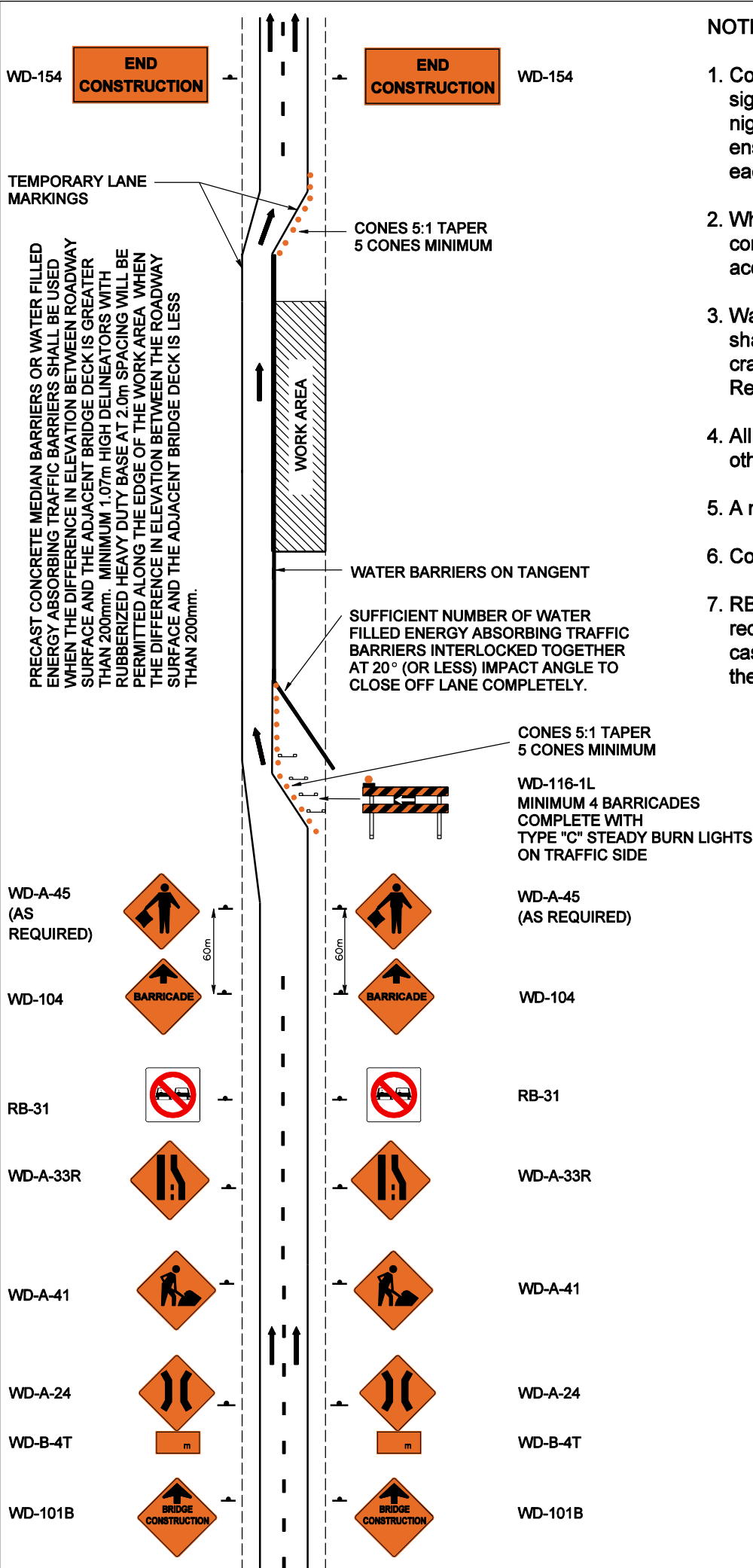
Date: MARCH, 2003

Alberta

TRANSPORTATION

TYPICAL EXCAVATION SIGNING FOR URBAN AREAS
(LOW SPEED / LOW VOLUME)
ONE-LANE CLOSURE
(ONE LANE ALTERNATING TRAFFIC)
TWO LANE UNDIVIDED HIGHWAY

Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.9A
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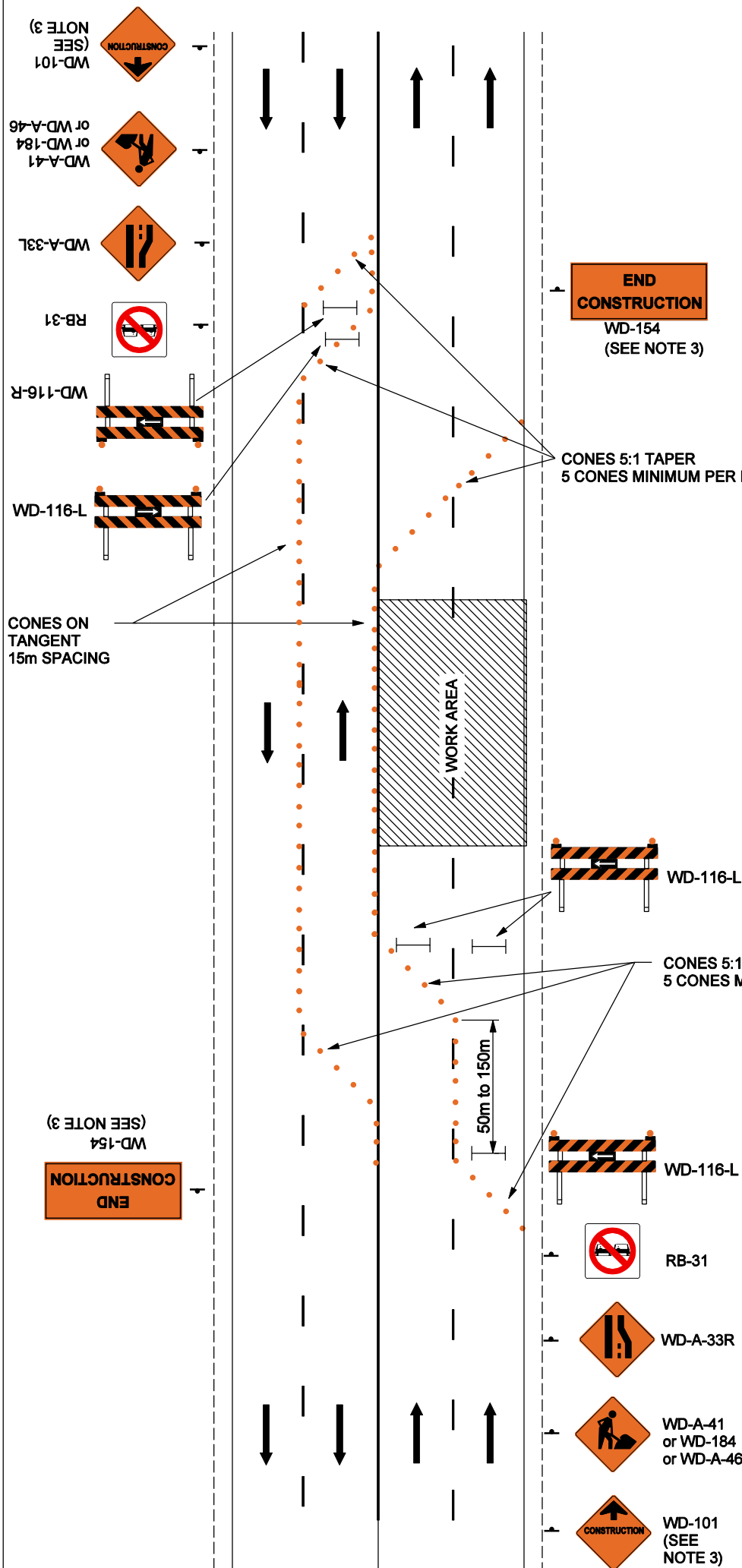


NOTES:

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. When switching traffic during staged construction, a specialized traffic accommodation plan is required.
3. Water filled energy absorbing traffic barriers shall be of an approved type that has been crash tested (to meet Level 2 under NCHRP Report 350).
4. All sign spacing shall be 25m - 100m unless otherwise indicated.
5. A minimum lane width of 3.5m is required.
6. Conflicting lane markings shall be removed.
7. RB-5 and RB-1 signs will be used when a reduced speed zone is required. In this case gazetted speed to be posted after the work area.



△			
△			
No.	REVISIONS	BY	DATE
Approved:			
 Executive Director, Technical Standards Branch			
Date:	MARCH, 2003		
TYPICAL EXCAVATION SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) ONE-LANE CLOSURE FOUR LANE DIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.9B



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 25m-100m unless otherwise indicated.
3. WD-101 and WD-154 sign not required for short duration work.
4. RB-5 and RB-1 signs will be used where a reduced speed zone is required. In this case gazetted speed to be posted after the work area.
5. Other hazard signs as shown in the schedule of signs may be used as required.
6. During darkness, two Type A flashing light shall be placed on each barricade and additional signs are required.



RB-5



RB-1



7.



WD-184



WD-A-46

2			
1			
No.	REVISIONS	BY	DATE
Approved:  Executive Director, Technical Standards Branch			
Date: MARCH, 2003			
TYPICAL SIGNING FOR URBAN AREAS (LOW SPEED / LOW VOLUME) TWO-LANE CLOSURE WITH 2-WAY TRAFFIC FOUR LANE UNDIVIDED HIGHWAY			
Prepared By: M.E.T.	Checked By: J.M.	Scale: N.T.S.	Dwg No.: TCS-B-7.10B

SECTION III

SAMPLE FORMS

DAILY RECORD OF TEMPORARY CONSTRUCTION SIGNS

NOTES:

(1) Signature confirms that the following items have been checked at the time and date indicated:

- All Traffic Control Devices conform to the Traffic Accommodation Strategy and the Contract Specifications
- All Traffic Control Devices are clean, unobstructed and clearly visible
- All Traffic Control Devices are properly located, in good condition and well secured
- All flashers are operating
- Temporary line marking is in place (where applicable)

(2) Designation and Station number of the sign immediately prior to the work area

(3) Station number of the start of the work area

(4) Information is recorded for each work area by the Contractor each day and submitted to the Consultant at the end of each week

Contract #: _____

Contractor: _____

Highway Location: _____

Type of Work: _____

Month: _____

Year: _____

[illegible]

SECTION IV

SHEETING REQUIREMENTS AND URBAN SIGN SCHEDULE









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, fluorescent 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 . lx ⁻¹ . m ⁻²)		

All other colours of sheeting material shall be Type III, High Intensity retroreflective sheeting meeting the requirements of ASTM D4956.









URBAN SIGN SCHEDULE

			<i>High Speed/High Volume</i> Dimensions (cm x cm)	<i>High Speed/Low Volume</i> Dimensions (cm x cm)	Background Colour	Message Colour
WD-101		CONSTRUCTION AHEAD	120 x 120	75 x 75	ORANGE	BLACK
WD-101B		BRIDGE CONSTRUCTION	120 x 120	90 x 90	ORANGE	BLACK
WD-101C		UTILITY CONSTRUCTION	120 x 120	90 x 90	ORANGE	BLACK
WD-104		BARRICADE AHEAD	120 x 120	90 x 90	ORANGE	BLACK
WD-106		ONE LANE TRAFFIC	90 x 90	75 x 75	ORANGE	BLACK
WD-116-1L		BARRICADE (LEFT)	2.44 x 25	2.44 x 25	ORANGE	BLACK
WD-116-1R		BARRICADE (RIGHT)	2.44 x 25	2.44 x 25	ORANGE	BLACK
WD-116-2		ROAD CLOSED BARRICADE	2.44 x 25	2.44 x 25	ORANGE	BLACK






URBAN SIGN SCHEDULE

Number	Sign	Description	High Speed/High Volume Dimensions (cm x cm)	High Speed/Low Volume Dimensions (cm x cm)	Background Colour	Message Colour
WD-116-3		BRIDGE OUT BARRICADE	2.44 x 25	2.44 x 25	ORANGE	BLACK
WD-116-4L		LIGHT DUTY (TYPE 1) BARRICADE	N/A	76 X 30	ORANGE	BLACK
WD-116-4R		LIGHT DUTY (TYPE 1) BARRICADE	N/A	76 X 30	ORANGE	BLACK
WD-116-5		BARRICADE ARROW	61.5 x 23	61.5 x 23	BLACK	WHITE
WD-150		LOOSE GRAVEL	90 x 90	75 x 75	ORANGE	BLACK
WD-154		END CONSTRUCTION	120 x 60	120 x 60	ORANGE	BLACK
WD-157		SLOW FRESH OIL	90 x 90	75 x 75	ORANGE	BLACK
WD-158		TESTING CREWS NEXT 5 km	120 x 120	90 x 90	ORANGE	BLACK


URBAN SIGN SCHEDULE

Number	Sign	Description	High Speed/High Volume Dimensions (cm x cm)	High Speed/Low Volume Dimensions (cm x cm)	Background Colour	Message Colour
WD-169		LOOSE CHIPS PLEASE SLOW DOWN	120 x 75	120 x 75	ORANGE	BLACK
WD-171		DO NOT PASS FOLLOW IN CONVOY	90 x 120	75 x 90	ORANGE	BLACK
WD-172		FOLLOW PILOT VEHICLE	75 x 90	60 x 75	ORANGE	BLACK
WD-173		PILOT VEHICLE DO NOT PASS	165 x 45	165 x 45	ORANGE	BLACK
WD-174		MAXIMUM _ LOOSE CHIPS	90 x 120	60 x 90	ORANGE / WHITE	BLACK
WD-175		SMOKE AHEAD FOLLOW IN CONVOY	90 x 90	75 x 75	ORANGE	BLACK
WD-179		TRAFFIC SURVEY AHEAD	90 x 90	75 x 75	ORANGE	BLACK
WD-182		NEW SIGN	90 x 90	75 x 75	FLUORESCENT YELLOW	RED AND WHITE









URBAN SIGN SCHEDULE

Number	Sign	Description	High Speed/High Volume Dimensions (cm x cm)	High Speed/Low Volume Dimensions (cm x cm)	Background Colour	Message Colour
WD-182T		TRAFFIC CONTROL TAB	60 x 30	60 x 30	YELLOW	BLACK
WD-184		TESTING CREW AHEAD	90 x 90	90 x 90	ORANGE	BLACK
WD-187		NO CENTRE LINE	90 x 90	90 x 90	ORANGE	BLACK
WD-188		RAMP EXIT 100 m	90 x 90	75 x 75	ORANGE	BLACK
WD-192		ROAD CONSTRUCTION NEXT _ km	120 x 90	120 x 90	ORANGE	BLACK
WD-194		TO ONCOMING TRAFFIC	NA	90 x 75	ORANGE	BLACK
WD-A-5L		REVERSE CURVE (LEFT)	90 x 90	75 x 75	ORANGE	BLACK
WD-A-5R		REVERSE CURVE (RIGHT)	90 x 90	75 x 75	ORANGE	BLACK









URBAN SIGN SCHEDULE

Number	Sign	Description	High Speed/High Volume	High Speed/Low Volume	Background	Message
WD-A-10		DETOUR AHEAD	90 x 90	75 x 75	ORANGE	BLACK
WD-A-22		BUMP	90 x 90	75 x 75	ORANGE	BLACK
WD-A-23R		ROADWAY NARROWS (RIGHT)	90 x 90	75 x 75	ORANGE	BLACK
WD-A-23L		ROADWAY NARROWS (LEFT)	90 x 90	75 x 75	ORANGE	BLACK
WD-A-24		NARROW STRUCTURE	90 x 90	75 x 75	ORANGE	BLACK
WD-A-33L		ROAD NARROWS LEFT LANE ENDS	90 x 90	75 x 75	ORANGE	BLACK
WD-A-33R		ROAD NARROWS RIGHT LANE ENDS	90 x 90	75 x 75	ORANGE	BLACK
WD-A-33XL		ROAD NARROWS LEFT LANE ENDS	90 x 90	75 x 75	ORANGE	BLACK






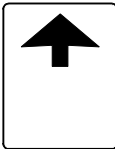


URBAN SIGN SCHEDULE

Number	Sign	Description	High Speed/High Volume Dimensions (cm x cm)	High Speed/Low Volume Dimensions (cm x cm)	Background Colour	Message Colour
WD-A-33XR		ROAD NARROWS RIGHT LANE ENDS	90 x 90	75 x 75	ORANGE	BLACK
WD-A-41		ROAD WORK	90 x 90	75 x 75	ORANGE	BLACK
WD-A-43L		ROADSIDE DIVERSION (LEFT)	90 x 90	75 x 75	ORANGE	BLACK
WD-A-43R		ROADSIDE DIVERSION (RIGHT)	90 x 90	75 x 75	ORANGE	BLACK
WD-A-44		DETOUR TAB	45 x 30	45 x 30	ORANGE	BLACK
WD-A-45		FLAG PERSON	90 x 90	75 x 75	ORANGE	BLACK
WD-A-46		SURVEY CREW AHEAD	90 x 90	75 x 75	ORANGE	BLACK
WD-A-48L		TRUCK ENTRANCE (LEFT)	90 x 90	75 x 75	ORANGE	BLACK






URBAN SIGN SCHEDULE

Number	Sign	Description	High Speed/High Volume Dimensions (cm x cm)	High Speed/Low Volume Dimensions (cm x cm)	Background Colour	Message Colour
WD-A-48R		TRUCK ENTRANCE (RIGHT)	90 x 90	75 x 75	ORANGE	BLACK
WD-A-49		PAVEMENT DROPOFF	90 x 90	75 x 75	ORANGE	BLACK
WD-A-51L		ROADSIDE DIVERSION (LEFT) (TWO LANES)	90 x 90	75 x 75	ORANGE	BLACK
WD-A-51R		ROADSIDE DIVERSION (RIGHT) (TWO LANES)	90 x 90	75 x 75	ORANGE	BLACK
WD-A-100		SHARP SHOULDERS	90 x 90	75 x 75	ORANGE	BLACK
WD-A-105L		HAZARD MARKER (KEEP LEFT)	30 x 90	30 x 90	ORANGE	BLACK
WD-A-105R		HAZARD MARKER (KEEP RIGHT)	30 x 90	30 x 90	ORANGE	BLACK
WD-A-111		GROOVED PAVEMENT	90 x 90	75 x 75	ORANGE	BLACK

URBAN SIGN SCHEDULE

Number	Sign	Description	High Speed/High Volume Dimensions (cm x cm)	High Speed/Low Volume Dimensions (cm x cm)	Background Colour	Message Colour
WD-B-3		TWO-WAY TRAFFIC AHEAD	90 x 90	75 x 75	ORANGE	BLACK
WD-B-4		TRAFFIC SIGNALS AHEAD	90 x 90	75 x 75	ORANGE	BLACK
WD-B-4T		STRUCTURE WIDTH TAB	60 x 30	60 x 30	ORANGE	BLACK
RA-2		YIELD	105 x 105 x 105	75 x 75 x 75	RED	WHITE
RB-1		MAXIMUM SPEED (CONTENT VARIABLE)	75 x 90	60 x 75	WHITE	BLACK
RB-5		MAXIMUM SPEED AHEAD (CONTENT VARIABLE)	75 x 90	60 x 75	WHITE	BLACK
RB-24A		TWO WAY TRAFFIC	75 x 90	60 x 75	WHITE	BLACK
RB-31		DO NOT PASS	75 x 75	60 x 60	WHITE	BLACK AND RED

URBAN SIGN SCHEDULE

Number	Sign	Description	High Speed/High Volume Dimensions (cm x cm)	High Speed/Low Volume Dimensions (cm x cm)	Background Colour	Message Colour
WA-16L		MERGING TRAFFIC (LEFT)	90 x 90	90 x 90	YELLOW	BLACK
WA-16R		MERGING TRAFFIC (RIGHT)	90 x 90	90 x 90	YELLOW	BLACK
WA-112L		ADDED LANE (LEFT)	90 x 90	90 x 90	YELLOW	BLACK
WA-112R		ADDED LANE (RIGHT)	90 x 90	90 x 90	YELLOW	BLACK
IF-205		EXIT	145 x 120 x 100	N/A	GREEN	WHITE