

THE CITY OF CALGARY FIRE DEPARTMENT
FIRE PREVENTION BUREAU

Fire Department Access Standard









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THE CITY OF
CALGARY
FIRE

The City of Calgary Fire Department Standards are established in accordance with, but are not limited to:

-  The Alberta Fire Code 2006 (AFC)
-  The Alberta Building Code 2006 (ABC)
-  Safety Codes Council standatas, bulletins, interpretations, rulings
-  City of Calgary Bylaws 37M84
-  Transportation, Streets, Roads and other related City business unit guidelines
-  Fire Response benchmarks as set by The City of Calgary Fire Department

This standard will be reviewed on an annual basis for accuracy, current information, application and/or changes in The City of Calgary Fire Department policies or operational requirements.

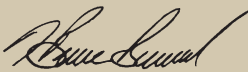
The signing authorities have read and understand the contents within this standard, as well as the application of this standard.

This document was completed by the Technical Services Division of the Fire Prevention Bureau on 04/07/11 (Amended 05/10/18).



APPROVED BY: FIRE MARSHAL

DATE: October 23, 2008



APPROVED BY: FIRE CHIEF

DATE: October 23, 2008

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SECTION ONE

GUIDING STATEMENTS

SCOPE

This standard is designed to provide a method for installing and maintaining adequate, unobstructed emergency or secondary access for emergency vehicles and emergency personnel to buildings, structures, complexes, subdivisions or other developments.

This standard will also help ensure that the application of emergency services response requirements can be carried out in a safe, efficient and timely manner while maintaining the highest level of safety for life and property for all involved.

PURPOSE

The purpose of this standard is to provide guidance on emergency services access requirements to agencies, departments, stakeholders, developers, registered professionals, designers or any individual responsible for the design, installation, provision and maintenance of required emergency services access in compliance with the *Alberta Fire Code 2006* (AFC) and the *Alberta Building Code 2006* (ABC). This standard is designed to cover emergency services access requirements not currently addressed in either the ABC 2006 or the AFC 2006. The provisions outlined in this standard are not intended to override federal, provincial or municipal codes, bylaws or other requirements, but to be applied in conjunction with them.

INTENT

The intent of this standard is to provide clear direction with regard to emergency vehicle access requirements into the subdivision and development process in the early stages of design, prior to the building permit review. This is done by identifying and clarifying the terms of an emergency access route or a second public access as it would apply to all developments within Calgary. The standard provides criteria regarding access and safe set-up and operation of all emergency vehicles and all emergency personnel related to an emergency situation and scene.

REVIEW AND UPDATES

This standard is subject to periodic review and updates to accommodate changes in local requirements, nationally and internationally recognized standards, related technology, or where required by provincial or federal legislation and/or regulations.

APPLICATION

This standard applies in principle to buildings described in the *Alberta Building Code 2006* and the *Alberta Fire Code 2006* and to the need for emergency vehicle access not defined or identified in either code. The objective is to address the issue of consultation with the Calgary Fire Department prior to the design, installation and construction of a community, sub-division, site or building in order to meet the operational requirements for the Calgary Fire Department to effectively and safely provide emergency services to the businesses and citizens of Calgary.

SECTION TWO

SUBMITTING PLANS

Plans for streets, emergency access routes, second public access and emergency access gates or bollards are to be submitted to the Calgary Fire Department for review and approval prior to the start of any projects, including:

- 🔥 Land Use Application
- 🔥 Subdivision Application
- 🔥 Development Permit Application
- 🔥 Building Permit Application
- 🔥 Modifications to existing emergency access routes, second public access or fire lanes

Each application will be assessed individually and is not to be viewed as precedent setting or as an industry standard.

EMERGENCY VEHICLE SET UP AND OPERATIONAL DIMENSIONS

A width of 6 m is required for fire department apparatus to set up at an emergency scene and to provide a safe work area for emergency personnel performing their duties. This includes:

- 🔥 3 m for the vehicle
- 🔥 2 m for non-restricted hose operation, so as not to restrict water flow
- 🔥 1 m for operation of doors, equipment and manpower
- 🔥 Aerial units require a minimum of 5 m for operation and 6 m for setup.

SECTION THREE

ACCESS

PRIMARY ACCESS

The primary access is considered to be the principal access to a site used by occupants of a development on a daily basis. Primary access will be connected to a thoroughfare that has a minimum 9-metre width.

EMERGENCY ACCESS ROUTES

An emergency access route is required when the distance from the centre line of the primary access street to the closest point of the access route at a building's principal entrance exceeds 120 m but is less than 200 m and/or the total number of residential households exceeds 100 (NFPA 1141).

The emergency access route shall be a minimum of 6 m wide, designed to support a load of 38,556 kg (85,000 lbs.) and to meet the access requirements set out in ABC article 3.2.5.6.

It is to be installed in the early stages of the development or in conjunction with the primary access.

It shall provide an additional route into and out of building sites, complexes, developments, communities or subdivisions.

These routes shall be provided by the owner or developer for every building or portion hereafter constructed or moved into, full or partial, within the jurisdictional boundaries of The City of Calgary. This would apply to public and private roads.

The emergency access route is to be installed as remote from the primary access as possible or practical.

It shall be connected to a thoroughfare.

The emergency access route will be made available for emergency services vehicles/personnel only and restricted from unauthorized use by way of approved bollards (break-away style) or approved access gate. (Figs. M, N; pp. 16 - 18) No-parking signs shall be posted (Fig. B) 20 m apart and 2.3 m above surrounding grade.

See Emergency Access Route (Fig. A)

SECTION THREE

ACCESS

REMOVAL/ALTERATIONS TO EMERGENCY ACCESS ROUTES

Emergency access routes shall not be altered, modified, removed or placed out of service without written request to and written approval by the Fire Marshal.

SECOND PUBLIC ACCESS

A second public access is required when the distance from the centre line of the primary access street to the closest point of the access route at a building's principal entrance exceeds 200 m and/or the total number of households exceeds 100 (NFPA 1141).

It shall be designed to a City of Calgary standard, a minimum 9 m wide.

The second public access is to be installed in the early stages of the development or in conjunction with the primary access.

The second public access provides an additional route into and out of building sites, complexes, developments, communities or subdivisions. These streets are to remain accessible to all, be maintained and remain unobstructed.

These streets shall be provided by the owner or developer for every building or portion hereafter constructed or moved into, full or partial, within the jurisdictional boundaries of The City of Calgary. This would apply to public and private roads.

The second public access is to be installed as remote from the primary access as possible or practical.

It shall be connected to a thoroughfare.

See Second public access (Fig. A)

SECTION THREE ACCESS

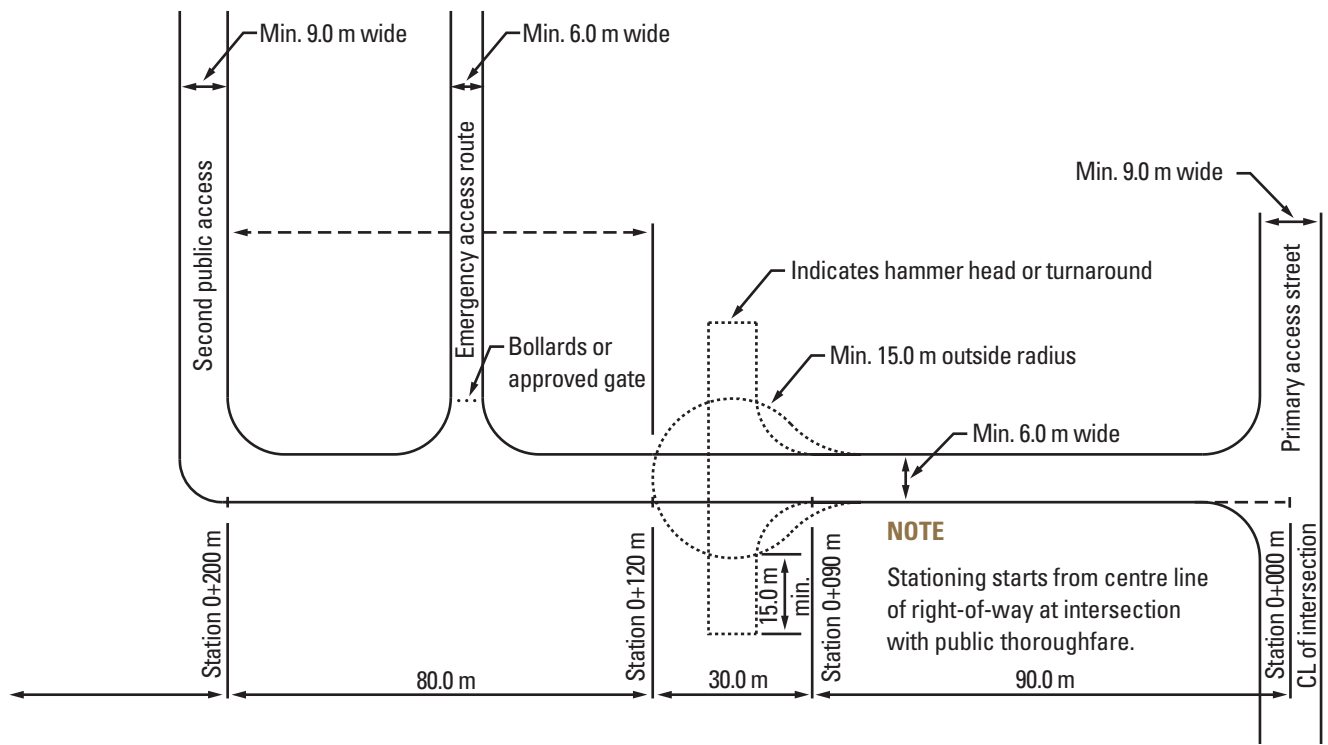


FIG. A: SITE ACCESS CRITERIA

SECTION THREE

ACCESS

UP TO 90 M LENGTH

- 🔥 No turnaround required.
- 🔥 No other access required.

MORE THAN 90 M WITH A DEAD-END

- 🔥 Turnaround required for any dead-end portion of the access route more than 90 m long.
- 🔥 “Hammer-head” or turnaround.
- 🔥 No other access required.
- 🔥 Turnaround can also be a parking lot meeting 12.0 m centre line of roadway radius at corners and 6.0 m minimum road width.

BETWEEN 120 M AND 200 M LENGTH

- 🔥 Emergency access route required (minimum 6 m wide and designed to carry fire apparatus load of 38,556 kg (85,000 lbs.))
- 🔥 Emergency access road must connect to public thoroughfare.
- 🔥 Bollards or approved gate may be used to limit access to emergency vehicles only.

OVER 200 M LENGTH

- 🔥 Second public access required.
- 🔥 Full public road standard (9.0 m minimum width) connecting to public thoroughfare.

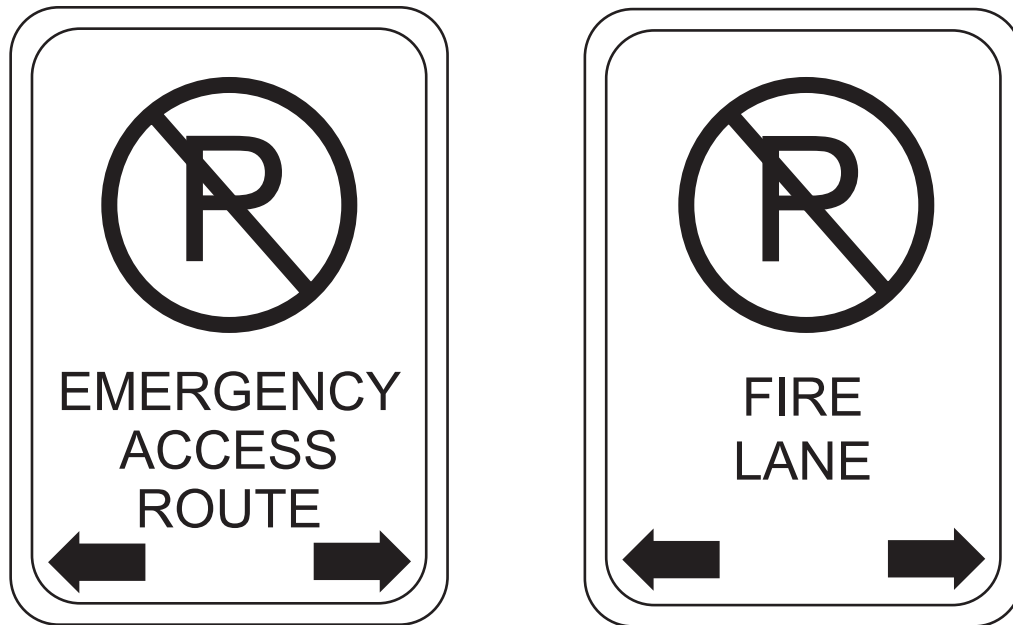
ADDITIONAL NOTES

1. Residential projects with one to 100 households require one primary access point. Residential projects with 101 to 600 households require two access points. 601 households or more require three access points. The Calgary Fire Department reserves the right to declare these additional access points as emergency access routes or second public access depending on the operational requirements, topography etc. of each site as per NFPA 1141 *“Standard for Fire Protection Infrastructure for Land Development in all Suburban and Rural Areas.”*
2. Access routes/streets design and construction standards to confirm Alberta Building Code – article 3.2.5.6. and/or City of Calgary design guidelines for subdivision servicing.

MAINTENANCE OF ACCESS

It is unrealistic to assume that either a municipality or a private owner can guarantee an operational year-round snow removal program to ensure routes will be clear of snow and debris at all times. However, routes should be designed to readily allow for snow removal throughout the year. **This is the responsibility of the owner(s) to maintain.**

SECTION THREE ACCESS



SIZE 300 mm x 450 mm

COLOUR RED – circle and slash

BLACK – lettering, arrows and border

SILVER (WHITE) – background

SIGN Hi-intensity grade reflective sheeting
(**3M** brand or equal)

SIGN BLANK – 0.081 in. high tensile aluminum;
or 0.5 in. Crezone overlay plywood – both sides
(Weldwood Duraply or equal)

NOTE Use applicable arrow right and arrow left to
indicate limits of zone; and double arrows on
mid-zone signs.

Posted 20 m apart 2.3 m above surrounding grade

FIG. B: NO-PARKING SIGN

SECTION THREE

ACCESS

DEAD-END ACCESS ROUTE REQUIREMENTS

Dead-end access routes in excess of 90 m shall be provided with the required turnaround as per ABC article 3.2.5.6. (*Fig. A*)

SPLIT-ENTRY ACCESS

A split-entry access (primary access divided by an island or boulevard feature creating an entrance and exit at the primary access location) will not be deemed to be the primary access on one side and an emergency access route or second public access on the other side. An incident at this location would render the access inoperable either for additional emergency vehicle access or for occupants exiting the site. (*Fig. B*)

ACCESS THROUGH P-LOOP, PLACE OR CLOSE

Access to a building by a street with a single access (such as the stem of a P-loop) shall be considered a single point of entry *even if there is more than one entry point into the building site within the loop of the P-loop*. Measurements to the principal entrance of each building will be taken from this single access start/choke point. (*Fig. C*)

EMERGENCY USE ZONE/LAY BY

Should an emergency use zone/ lay by be required or provided, it shall be designed and installed as per *figure D*.

ROUNDAABOUT

Should a roundabout be planned, it shall meet the minimum dimensions as per *figure E*.

SECTION FOUR

SIGNS AND NOTICES

Approved signs shall be provide by the owner(s) or agents of the owner and maintained at all times. This will clearly identify the building address, access gates, access routes, fire lanes, no parking zones, etc.

POSTING OF LOAD LIMIT SIGNS

Vehicle load limits shall be posted in conspicuous, clearly visible areas and maintained by the owner(s) at both entrances to a bridge or access over a below grade structure. Lighting may be required for illumination during night hours.

REMOVAL OF REQUIRED SIGNS, GATES OR BARRIERS

Locks, gates, chains, signs, tags or seals that have been installed as per this standard and for use by emergency personnel shall not be removed, unlocked, destroyed, tampered with or defaced in any manner. They shall be maintained in proper working condition.

SECTION FIVE

STREET DESIGN PARAMETERS

ACCEPTABLE ROUTE/STREET SURFACE FINISH

The street/route shall be designed to support 38,556 kg (85,000 lbs.) and be finished with concrete, heavy duty asphalt or other hard-surface approved material designed to permit accessibility. It shall be maintained under all weather conditions. **Turfstone, Structural Grass or similar products are not acceptable finishes** for an emergency access route surface.

GRADES

Access routes shall have a grade of not more than 8 per cent. This is the maximum grade at which Calgary Fire Department aerial units can position and function.

CONNECTIONS

All access routes, whether emergency or secondary, **shall** be connected to a public thoroughfare and not to a lane, alley or pedestrian pathway unless approved by the Fire Marshal.

ENTRANCE POINTS TO EMERGENCY ACCESS ROUTES

Street entrances to emergency access routes shall provide the required curb structure or transition to allow Calgary Fire Department apparatus adequate space to turn from the adjoining thoroughfares. The transition from a thoroughfare to the emergency access route shall not be in excess of an eight-per cent grade to prevent bottoming out of the fire apparatus bumpers or undercarriage.

STREETS

All streets are to be nine metres (9 m) or more in width as described in this standard (ABC 2006 – definition of a street). Street means any highway, road, boulevard, square or other improved thoroughfare 9 m or more in width that has been dedicated or deeded for public use and is accessible to fire department vehicles and equipment.

SECTION FIVE

STREET DESIGN PARAMETERS

PARKING RESTRICTIONS ON ACCESS ROUTES

6.0 M WIDE: No parking of any kind. No-parking signs shall be posted on both sides of the access route. (Fig. G)

7.5 M WIDE: Parking will be permitted on one side of the access route. No-parking signs posted on one side of the access route. (Fig. H)

9.0 M WIDE OR GREATER: Parking shall be permitted on both sides of the access route. (Fig. I)

ONE-WAY ACCESS ROUTE: One-way access routes are to be a minimum of 6 m wide with no parking. No-parking signs shall be posted on both sides of the access route. (Fig. G)

DRIVING SURFACE MEASUREMENT: The acceptable driving surface of an access route or street is the asphalt area measured between the concrete curb and gutter on each side of the route/street. The .25 m of the curb and gutter on each side of the access route are not to be included in the access route/street's required dimensions. (Figs. G, H, I)

VARIANCES

Any variance from this standard will require written application to the Fire Marshal for review and approval. Any request could require a field test with Calgary Fire Department apparatus to demonstrate that the alternate design meets the requirements of the Calgary Fire Department. Upon approval, the application will be signed and accepted by the Fire Marshal. Any variance will be *site specific to that particular application and is not to be viewed as an industry standard or as precedent setting*. It is to be noted a fee structure will be applied to any request for a field test of a proposal involving the Calgary Fire Department and is payable by the applicant prior to the field test.

SECTION FIVE

STREET DESIGN PARAMETERS

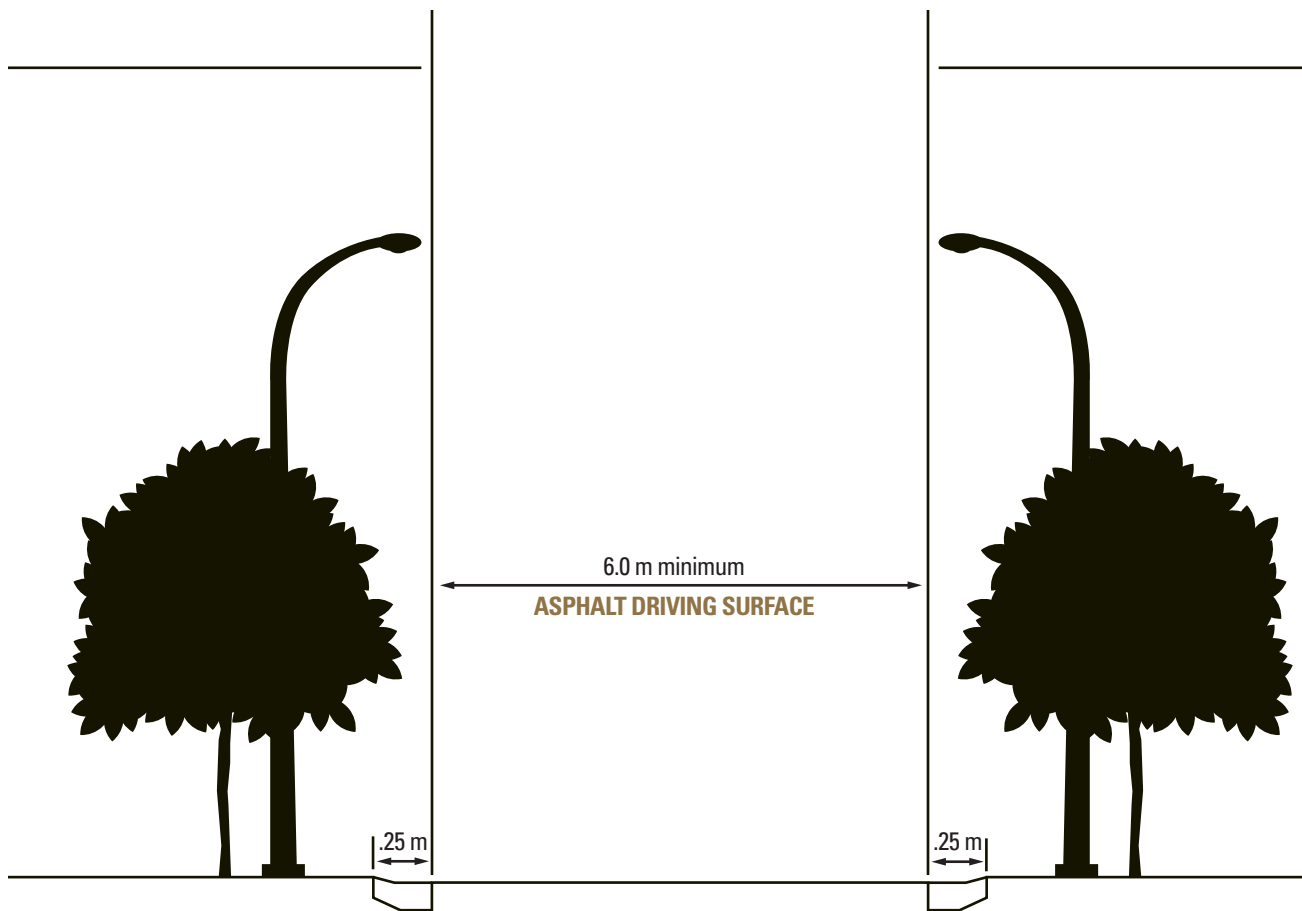


FIG. G : EMERGENCY ACCESS ROUTE, ONE-WAY OR TWO-WAY STREET
NO PARKING PERMITTED, NO-PARKING SIGNS POSTED EACH SIDE 20 m APART, 2.3 m ABOVE SURROUNDING GRADE

SECTION FIVE STREET DESIGN PARAMETERS

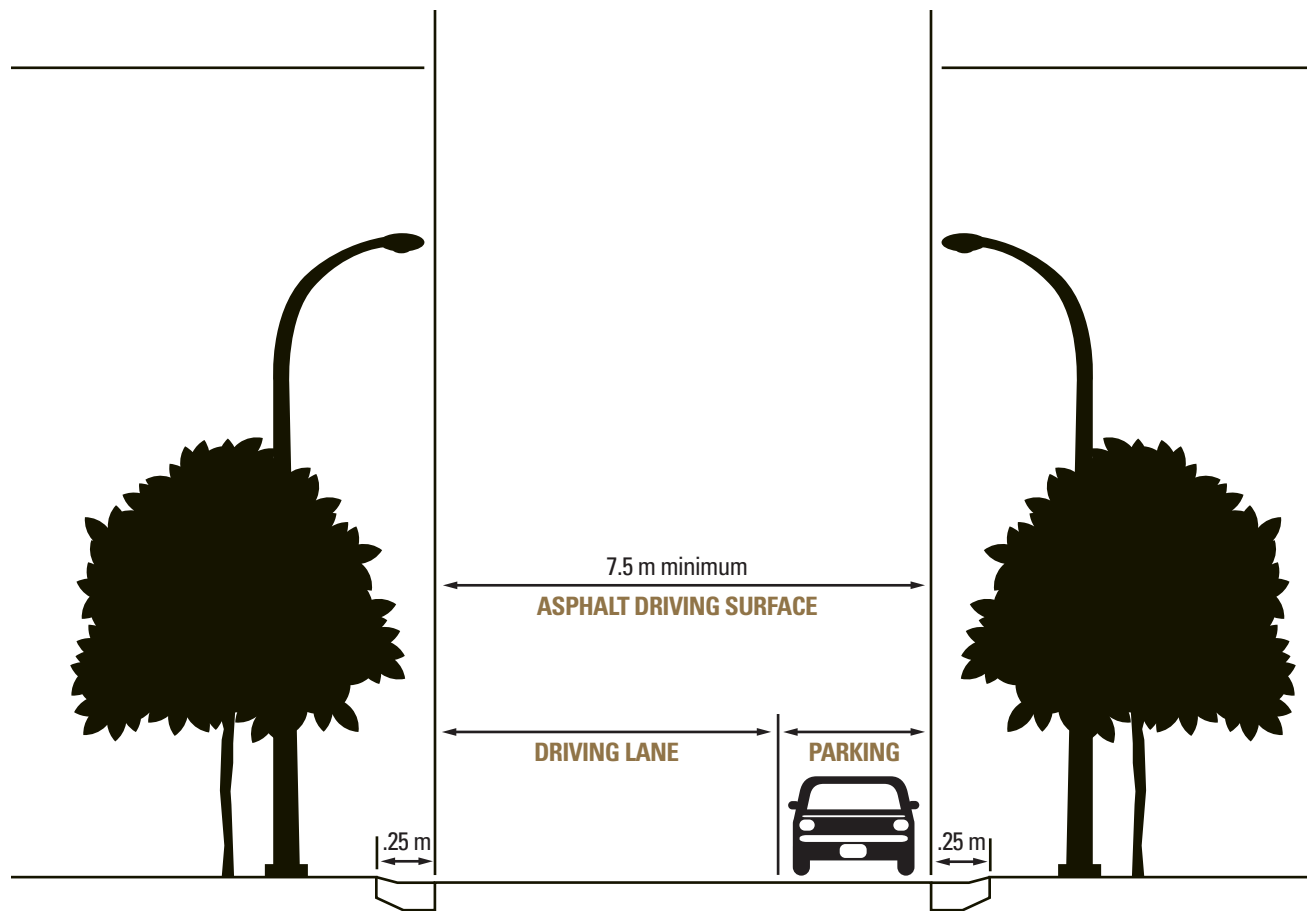


FIG. H: TWO-WAY ROAD

PARKING ONE SIDE ONLY, NO-PARKING SIGNS POSTED 20 m APART, 2.3 m ABOVE SURROUNDING GRADE.

SECTION FIVE STREET DESIGN PARAMETERS

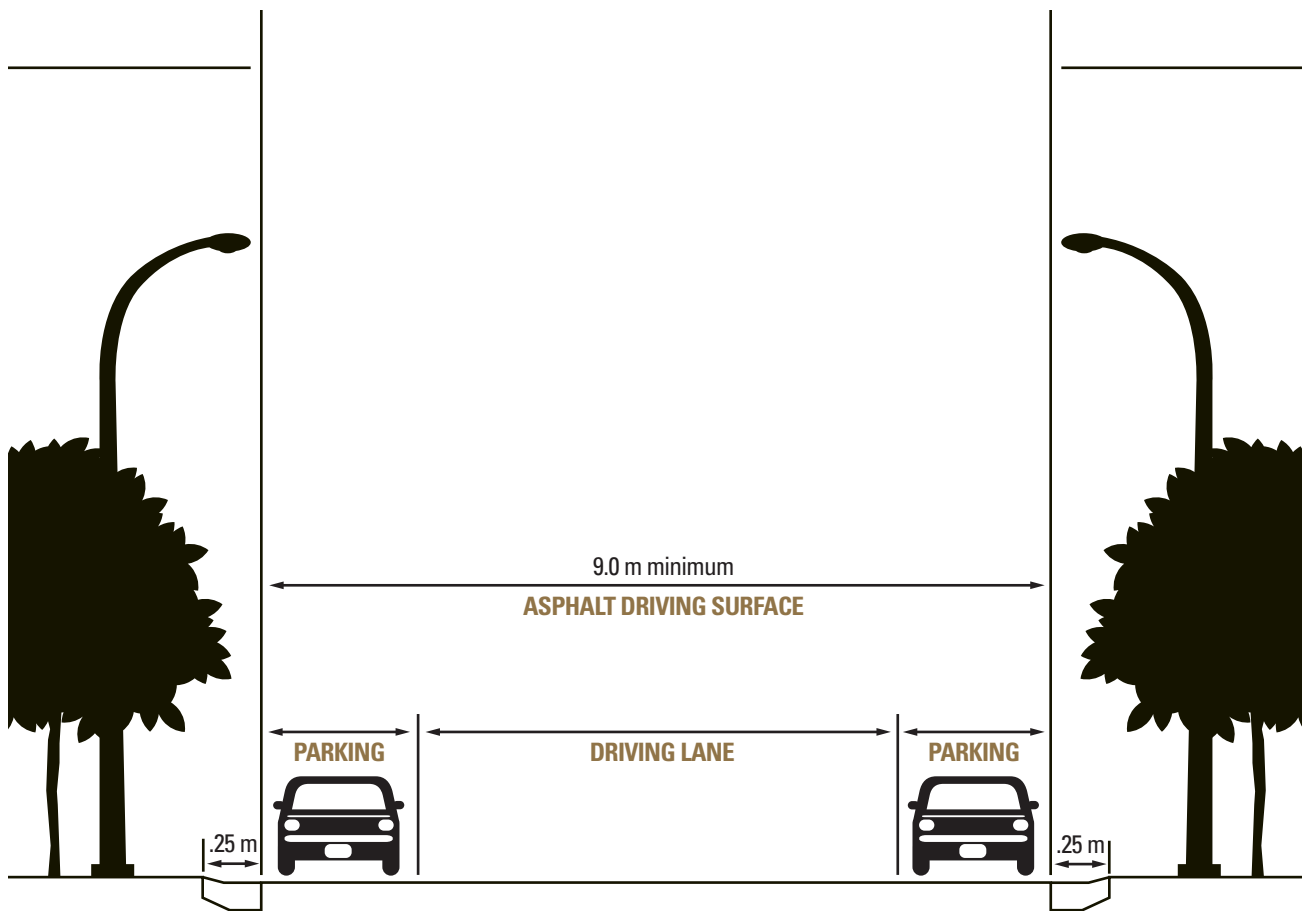


FIG. 1: TWO-WAY ROAD PARKING BOTH SIDES

SECTION FIVE STREET DESIGN PARAMETERS

NOTE: All measurements in mm

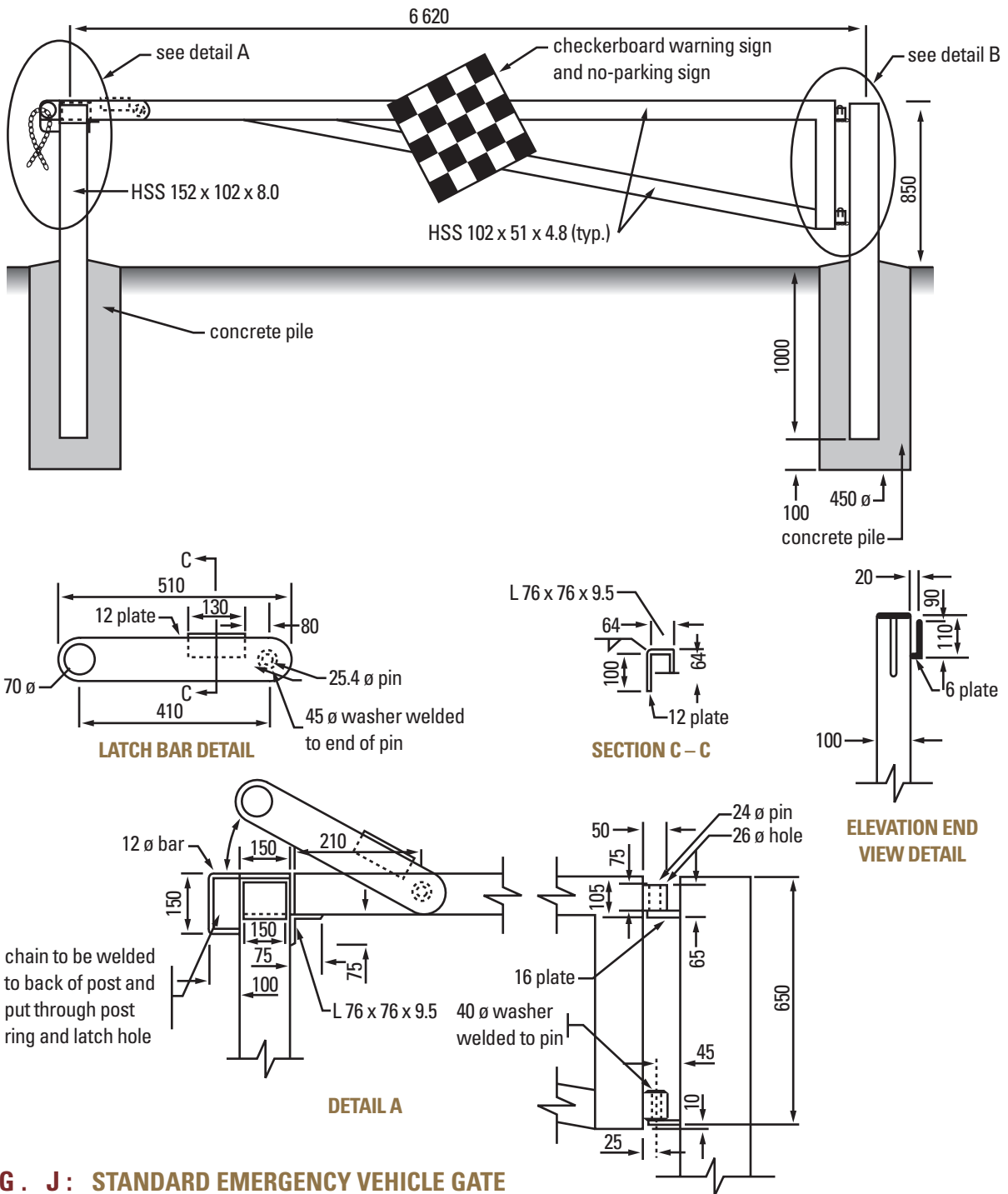


FIG. J: STANDARD EMERGENCY VEHICLE GATE

SECTION FIVE

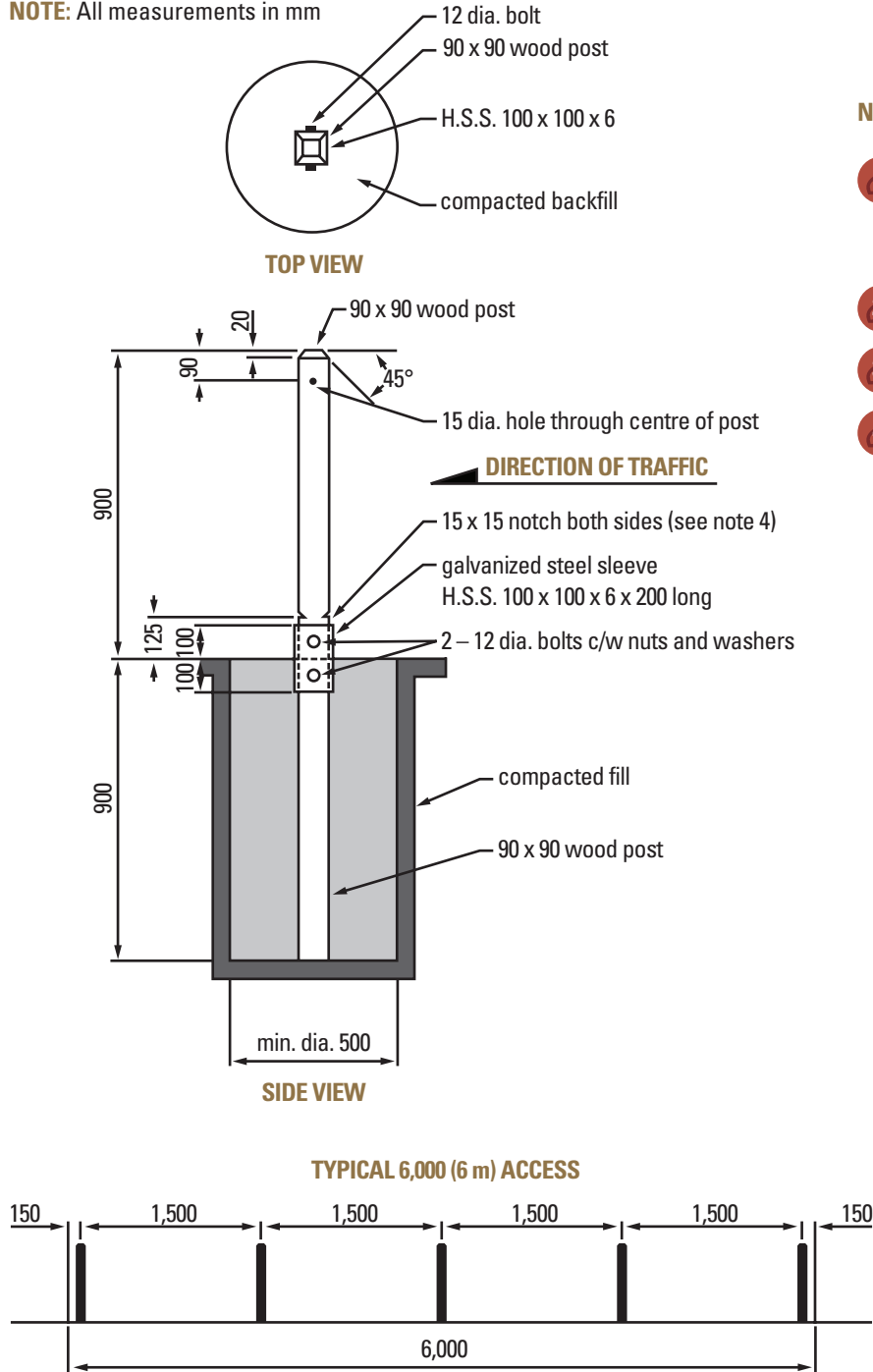
STREET DESIGN PARAMETERS

NOTES

1. Concrete strength
 - ↳ Piles shall be a minimum compressive strength of 25 MPA at 28 days.
2. Steel
 - ↳ Structural steel shall conform to CSA spec. G 40.21 m grade 300 W.
 - ↳ Hollow structural sections shall conform to CSA standards G 40.2 m grade 350 W.
 - ↳ All welding shall conform to CSA spec. W 59.
 - ↳ All welding to be ground smooth.
 - ↳ All exposed open ends to be capped.
 - ↳ Posts and gate shall be galvanized in accordance with CSA.
 - ↳ All galvanizing shall be done after fabrication.
 - ↳ All steel members to be painted red and white in alternate bands 300 mm wide.
 - ↳ Prime coat and finish coat with high solids epoxy paint.

SECTION FIVE STREET DESIGN PARAMETERS

NOTE: All measurements in mm



NOTES

1. Emergency break-away post is composed of two separate wood posts, each 900 mm long.
2. All wood to be pressure treated.
3. Do not notch end posts.
4. Install posts at 1,500 mm on centre unless otherwise specified.

FIG. K: EMERGENCY BREAK-AWAY POSTS

SECTION FIVE

STREET DESIGN PARAMETERS

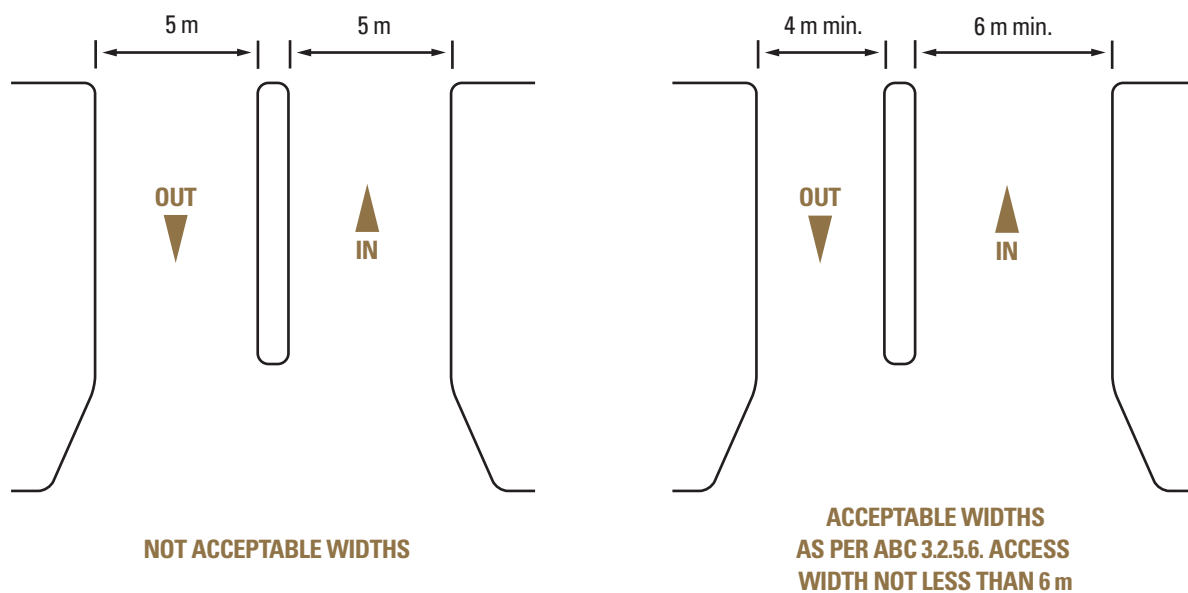


FIG. B: SPLIT-ENTRY ACCESS

NOTE

A split-entry access is not deemed an emergency access route or second public access. A split-entry access is deemed a single access point.

SECTION FIVE

STREET DESIGN PARAMETERS

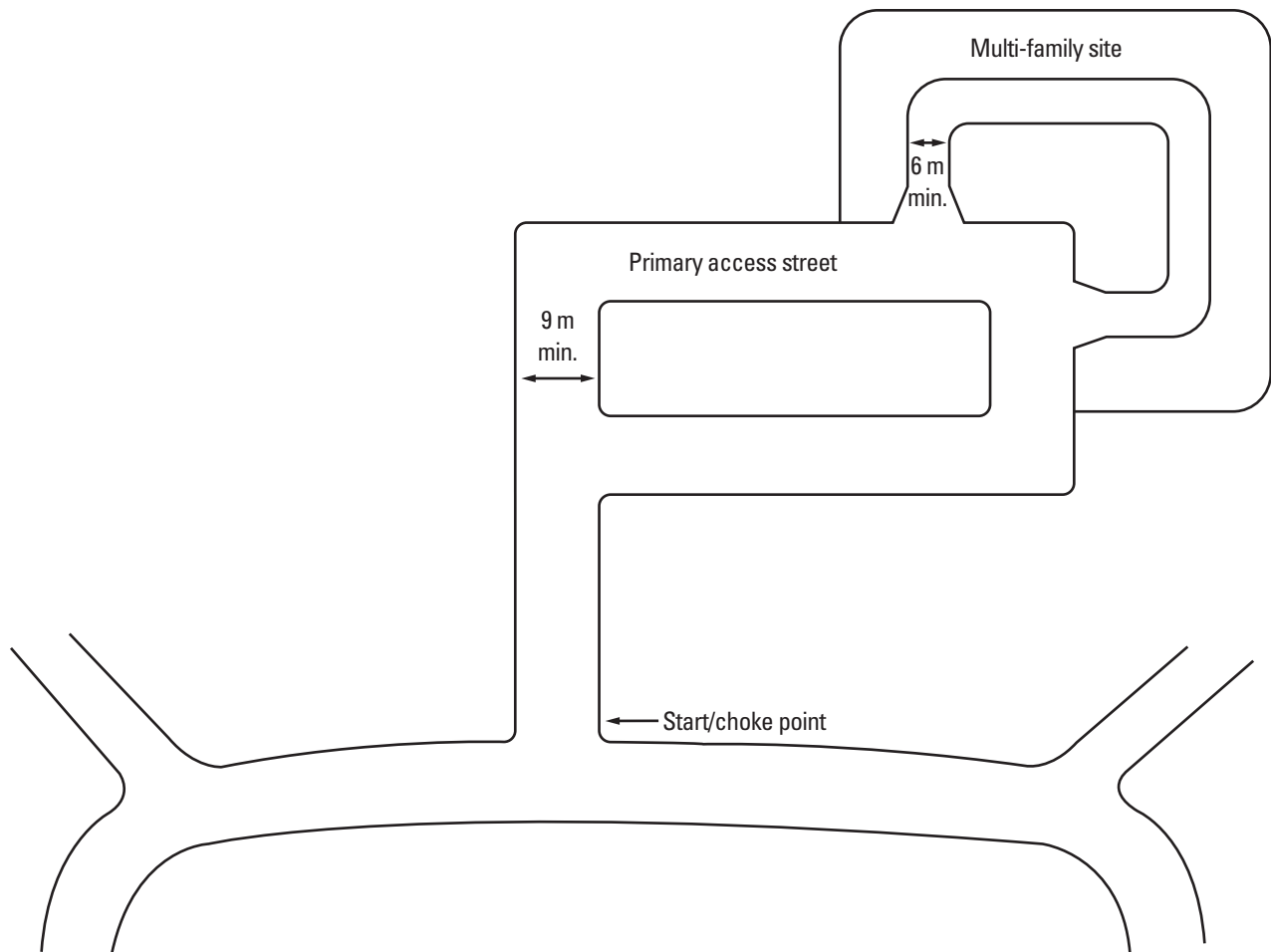


FIG. C: ACCESS THROUGH A P-LOOP, PLACE OR CLOSE

NOTES

- 🔥 Emergency or second public access measurements taken at "start /choke point" to building principal entrance(s).
- 🔥 There are two entrances to the multi-family site from within the P-loop, but only one entrance to the entire area.

SECTION FIVE

STREET DESIGN PARAMETERS

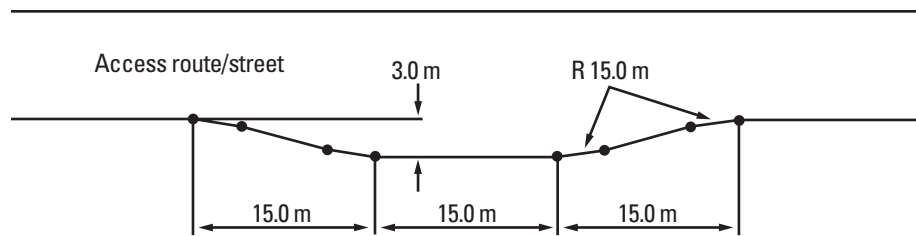


FIG. D: EMERGENCY USE ZONE LAY-BY

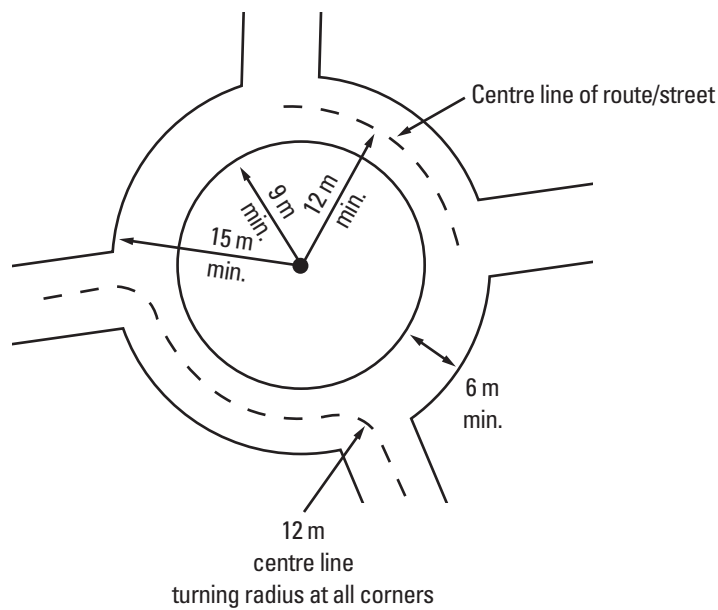
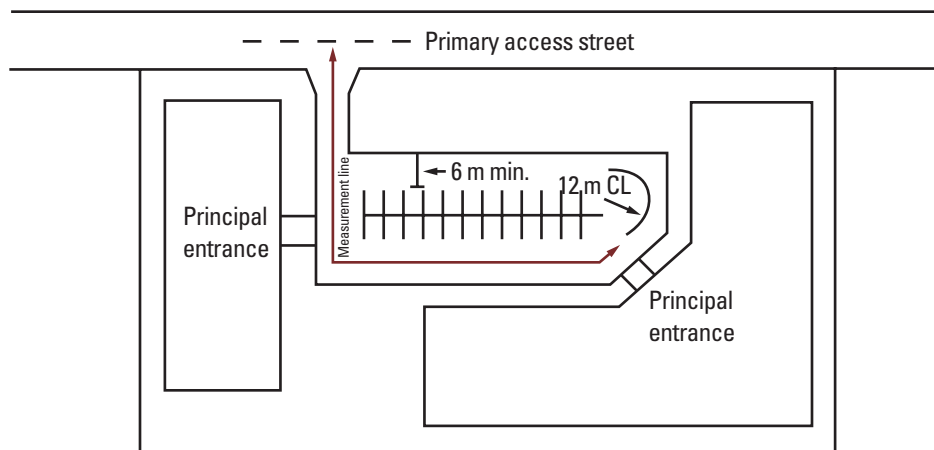


FIG. E: ROUNDABOUT MINIMUM DIMENSIONS

SECTION FIVE

STREET DESIGN PARAMETERS



NOTES

- ⚠ If measurement line exceeds 120 m, but is less than 200 m, an emergency access route is required.
- ⚠ If measurement line exceeds 200 m, a second public access is required.
- ⚠ If there are 101 – 600 households, additional access (emergency route or second public street) is required regardless of measurement line distance.
- ⚠ For 601 households or more, a third access is required. Not more than one emergency access route is permitted per site. Other accesses to be primary and second public access streets.

FIG. F: SITE ACCESS CRITERIA

SECTION SIX

DEFINITIONS

1. **ACCESS GATE** – is any approved means of restricting access to an emergency access route that is built and designed as per this standard. Access gates are to be designed and installed as per this standard.
2. **AUTHORITY HAVING JURISDICTION** – means a safety codes officer in the fire or building discipline, exercising authority pursuant to designation of powers and terms of employment in accordance with the Safety Codes Act.
3. **BUILDING** – means any structure used or intended for supporting or sheltering any use or occupancy.
4. **DEAD-ENDS** – are access roads connected to a thoroughfare, which do not include a turnaround area and are not over 90 m in length.
5. **EMERGENCY ACCESS ROUTE** – provides a way into a building, complex, development or community to facilitate, supplement or assist emergency operational procedures, such as fire fighting and is to be used by emergency services personnel only. They are to be designed and implemented as outlined in this standard and following ABC article 3.2.5.6.
6. **FIRE LANE** – is part of an access road adjacent to a building or structure clearly marked and indicated, as per this standard, to be used by emergency vehicles and personnel in the event of a fire or emergency situation.
7. **LANE OR ALLEY** – is used in reference to “rear lanes” so as to avoid confusion with parking lane, driving lane or fire lane.
8. **LOAD LIMIT** – is the operational total weight of an apparatus with equipment and manpower assigned to the vehicle.
9. **OWNER** – means a person who
 - a. Controls the property under consideration.
 - b. Holds him/herself out as the person having the powers and authority of ownership or who, for the time being, exercises the powers and authority of ownership.
 - c. Is registered under provincial legislation as the owner of a freehold estate in possession of land.
 - d. Has purchased or otherwise acquired land, whether directly from a previous owner or from another purchaser, and has not yet registered his/her ownership.

SECTION SIX

DEFINITIONS

10. **PRIVATE ROAD** – is privately owned by one or more persons or groups (e.g., condo boards) that provides and connects into, through or between one or more streets or to any portion of a parking lot, shopping center, commercial area or development. All services related to maintenance, upkeep or snow removal for this type of road are the responsibility of the owner(s) or designated person(s).
11. **PUBLIC ROAD** – is a public right-of-way, however designated, dedicated to providing access to adjacent property that is built and maintained by public service business units and that may include above and below ground services such as gas, power, telephone, etc.
12. **PROJECT** – means any construction, alteration or demolition operation.
13. **PUBLIC WAY** – means a sidewalk, street, highway, square or other open space to which the public has access, as of right or by invitation, expressed or implied.
14. **REGISTERED PROFESSIONAL** – means a person who is registered or licensed to practice in the Province of Alberta as
- a. an architect under the *Architects Act*.
 - b. a professional engineer under the *Engineering, Geological and Geophysical Professions Act*.
15. **STREET** – means any highway, road, boulevard, square or other improved thoroughfare 9 m or more in width, that has been dedicated or deeded for public use and is accessible to Fire Department vehicles and equipment.
16. **SECOND PUBLIC ACCESS** – is a street 9 m wide or more designed to City of Calgary standards and connected to a thoroughfare. They are to be designed and implemented as outlined in this standard.
17. **THOROUGHFARE** – is deemed to meet the minimum design and dimension of a street.

SECTION SEVEN

CODE QUOTATIONS

ABC – 3.2.5.6. (1) ACCESS ROUTE DESIGN

1. A portion of a roadway or yard provided as a required access route for fire department use shall
 - a. have a clear width not less than 6 m, unless it can be shown that lesser widths are satisfactory,
 - b. have a centreline radius not less than 12 m,
 - c. have an overhead clearance not less than 5 m,
 - d. have a change of gradient not more than 1 in 12.5 over a minimum distance of 15 m,
 - e. be designed to support the expected loads imposed by firefighting equipment and be surfaced with concrete, asphalt or other material designed to permit accessibility under all climatic conditions,
 - f. have turnaround facilities for any dead-end portion of the access route more than 90 m long, and,
 - g. be connected with a public thoroughfare.

APPENDIX – 3.2.5.6. (1) FIRE DEPARTMENT ACCESS ROUTE

The design and construction of fire department access routes involves the consideration of many variables some of which are specified in the requirements in the code. All these variables should be considered in relation to the type and size of fire department vehicles available in the municipality or area where the building will be constructed. *It is appropriate, therefore, that the local fire department be consulted prior to the design and construction of access routes.*

SECTION SEVEN

CODE QUOTATIONS

ABC – 9.10.20.3. **FIRE DEPARTMENT ACCESS TO BUILDINGS**

1. Access for fire department equipment shall be provided to each building by means of a street, private roadway or yard. (See A – 3.2.5.6. (1) & A – 9.10.20.3. (1) in Appendix A.)
2. Where access to a building as required in Sentence (1) is provided by means of a roadway or yard the design and location of such roadway or yard shall take into account connection with public thoroughfares, weight of firefighting equipment, width of roadway, radius of curves, overhead clearance, location of fire hydrants, location of fire department connections and vehicular parking.

APPENDIX – 9.10.20.3. (1) **FIRE DEPARTMENT ACCESS ROUTE MODIFICATION**

In addition to other considerations taken into account in the planning of fire department access routes, special variations could be permitted for a house or residential building that is protected with an automatic sprinkler system. The sprinkler system must be designed in accordance with the appropriate NFPA standard and there must be assurance that water supply pressure and quantity are unlikely to fail. These considerations could apply to buildings that are located on the sides of hills and are not conveniently accessible by roads designed for firefighting equipment and also to infill housing units that are located behind other buildings on a given property.

SECTION SEVEN

CODE QUOTATIONS

ABC – 9.10.14.3. (1) **LIMITING DISTANCE WHERE** **FIREFIGHTING FACILITIES ARE INADEQUATE**

1. The limiting distance required by Article 9.10.14.4. shall be doubled where firefighting facilities and protective wetting facilities are not available within 10 min of an alarm being received by the fire department.

ABC – 3.2.3.1. (5) **LIMITING DISTANCE AND** **UNPROTECTED OPENINGS**

5. If a building has any storey that is not sprinklered and firefighting facilities cannot reach it within 10 min of the alarm being received, the limiting distance shall be doubled.

AFC 2.5.1.5. **MAINTENANCE OF FIRE DEPARTMENT ACCESS**

1. Streets, yards and roadways provided for fire department access shall be maintained so as to be ready for use at all times by fire department vehicles.
2. Vehicles shall not be parked to obstruct access by fire department vehicles and signs shall be posted prohibiting such parking. (*Fig. B*)
3. Signs posted in conformance with sentence (2) shall be permanently installed not more than 20 m apart and not more than 2.3 m above surrounding ground level to ensure they are clearly visible to approaching vehicles.

AFC – 2.5.1.1. (1) ACCESS TO A BUILDING

Fire department vehicles shall have direct access to at least one face of every building by means of a street, yard or roadway in conformance with the Alberta Building Code 2006.

SECTION EIGHT

REFERENCED DOCUMENTS AND ORGANIZATIONS

1. ALBERTA FIRE CODE 2006
2. ALBERTA BUILDING CODE 2006
3. NATIONAL BUILDING CODE 2005
4. NATIONAL FIRE CODE 2005
5. NATIONAL FIRE PROTECTION ASSOCIATION NFPA 1141
6. SAFETY CODES COUNCIL
7. CITY OF CALGARY BYLAW 37M84
THE CALGARY FIRE DEPARTMENT BYLAW
8. CITY OF CALGARY STREET DESIGN GUIDELINES 2004

CALGARY FIRE DEPARTMENT
FIRE PREVENTION BUREAU
TECHNICAL SERVICES OFFICE 04/07/11
(Amended Sept. 15, 2008)

NOTES