City of Brandon

Municipal Servicing Standards

Section 6

Transportation Design Standards

Rev 00 (2025)

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6A Typical Roadway Cross-Sections

6B Typical Intersections and Other Details

TRANSPORTATION SERVICING STANDARDS REVISION HISTORY

The Municipal Servicing Standards (MSS) may be reviewed, updated or otherwise modified at any time. The Proponent's Engineer shall ensure that the current version of the MSS is applied.

Where such alternative solutions, systems, or approaches are being considered, a written proposal outlining the benefits, limitations, and total cost of ownership of the proposed solution shall be submitted to the City of Brandon Engineering Department for formal approval.

Table 3-1 below summarizes the revision history.

Table 3-1 – Revisions to MSS

Date	Modification or Adjustment
July 2025	Transportation Chapter (Section 6), Revision 0, Published

1.0 INTRODUCTION

1.1. General

The City of Brandon's ("City") transportation network shall provide residents, businesses, and others who visit the area with a range of safe and accessible travel options, such as walking, cycling, public transit use, and driving motor vehicles. The City will provide for/accommodate these options while supporting the long-term environmental, social, and economic sustainability of individual neighbourhoods, business districts and the City as a whole. The design of the transportation network should reflect the Brandon and Area Road Network (BARN) Development Plan and Active Transportation Plan goals and objectives, and align with the Brandon City Plan, as well as incorporate industry best practices and applicable City of Brandon regulations, guides, standards and supporting documents.

In keeping with industry best practices, the City's transportation network will be multi-modal (i.e. not solely for personal vehicles) and will include all road users, including vulnerable road users, into its design decisions and future construction projects. The City should plan and design its streets to effectively support the movement of people of all ages and levels of mobility by providing appropriate and accessible facilities while integrating the street environment with existing and future land uses.

The transportation network in residential neighbourhoods shall consist of a fully integrated combination of pedestrian pathways/sidewalks, bicycle routes, transit routes, and streets. Similarly, commercial and industrial areas shall integrate streets with transit routes and active transportation options as they currently exist or are planned.

1.2. Engineering Submissions

For all submissions and approvals required as part of a Proponent's project refer to Section 2 – Engineering Submission Standards.

1.3. Road Safety: Vision Zero and Safe System Approach

Vision Zero and the Safe System Approach have become accepted frameworks both nationally and internationally to inform road safety agendas and guide activities. With respect to road safety priorities and goals, the City is considering the adoption of Vision Zero as its underlying framework and implementation of the Safe System Approach to guide future decision making.

As an initial step, given the City's increasing focus on community health, safety and the environment, the City will be promoting development and infrastructure strategies that include modal shift and new transportation options. Over time, the City anticipates this will evolve into multi-partner/multi-stakeholder relationships with the long-term goal of eliminating deaths and serious injuries resulting from collisions on Brandon's transportation network (roadways, bridges, active transportation facilities, pathways, etc.).

Accordingly, beyond the transportation engineering standards set forth in this document, the City will be encouraging developers and transportation infrastructure designers to achieve conceptual, functional, and detailed designs that generally align with (and support the interaction between) the main components currently recognized as part of the Safe System Approach:

- Safe Road Users
- Safe Speeds
- Safe Roads
- Safe Vehicles
- Safe Land Use Planning
- Post-collision Care

The City wishes to work proactively with its developers and all design practitioners to achieve a transportation system that is inclusive and considers the safety of all user groups, including pedestrians, cyclists, other vulnerable road users, and all vehicles' operators and occupants – no matter their abilities, socio-economic status, or nature of trip on Brandon's roadways and other transportation facilities.

Designs submitted to the City will be evaluated at a high level with respect to moving away from the Traditional Approach to road safety, in favour of moving toward the Safe System Approach as outlined in the following table.

Table 1-1 – Road Safety Comparison: Traditional Approach and Safe System Approach

Traditional Approach	Safe System Approach
Focus on collisions Aim to reduce risk of collisions	Focus on injuries Aim to eliminate death and serious injury
Road user has primary responsibility	System designer has primary responsibility
Change individual road user behaviors	Change the roadway environment (i.e., safe roads, safe vehicles, safe speeds) to enable road users to tolerate collision forces
Safety is "optimized" once mobility and accessibility objectives have been achieved	Safety is a fixed parameter with threshold levels that cannot be exceeded – mobility and accessibility are variables within this framework
Roads are made as safe as reasonably practical	Roads are self-explaining and forgiving of mistakes, such that road users are protected from collision forces that exceed human biomechanical injury thresholds

1.4. Objective

The objective of this Section is to present background information on the City's transportation network, including roadway classifications and typical cross-sections, as well as design standards/practices, for use by consultants/developers (Proponents) in their submissions to the City and subsequent approvals for construction as well as by City staff undertaking in-house designs and external design reviews.

In addition to the information contained herein, the following regulatory and supporting documents that shall be referenced for the design and installation of the transportation system, and its ancillary services, include:

- City of Brandon Greenspace Master Plan (2015)

- City of Brandon By-laws, City of Brandon
- City of Brandon Recreation and Community Facilities Master Plan
- Temporary Traffic Control Manual (2006), City of Brandon
- Standard Construction Specifications, City of Brandon
- Brandon and Area Road Network Development Plan, City of Brandon
- Geometric Design Guide for Canadian Roads (2017), Transportation Association of Canada (TAC);
- Canadian Guide to Neighbourhood Traffic Calming (2018), TAC;
- Pedestrian Crossing Control Guide (3rd Edition), TAC;
- Digital and Projected Advertising Displays: Regulatory and Road Safety Assessment Guidelines, March 2015, TAC;
- Canadian Guidelines for Establishing Posted Speed Limits, 2009, TAC;
- School and Playground Areas and Zones: Guidelines for Applications and Implementation, 2006, TAC;
- Manual of Uniform Traffic Control Devices for Canada, 6th Edition, TAC;
- Bikeway Traffic Control Guidelines for Canada (2012), TAC;
- Guide for the Design of Roadway Lighting (2006), TAC;
- Canadian Roundabout Design Guide (2017), TAC;
- NCHRP Report 672: Roundabouts: An Informational Guide, 2nd Edition, National Cooperative Highway Research Program (TRB/NCHRP)
- A Policy on Geometric Design of Highways and Streets (2018), American Association of State Highway and Transportation Officials (AASHTO)
- Roadside Design Guide (2011), AASHTO
- Traffic Impact Study Guidelines, City of Brandon (Appendix B herein)
- Transportation Impact Analysis for Site Development (2005), Institute of Transportation Engineers (ITE); and
- Trip Generation Manual, 11th Edition, ITE.

Section 6 contains standard design elements that will be applicable and appropriate in the vast majority of projects. They are in line with current industry practice and Transportation Association of Canada (TAC) guidance, but they are not intended to replace engineering design / judgment on behalf of the Proponent/Project Engineer who are responsible for ensuring their designs properly integrate design geometrics, safety, and overall applicability to the surrounding area.

2.0 ROADWAY NETWORK CLASSIFICATION

The roadway network within and surrounding the City is comprised of various street types, each of which performs a particular function in facilitating the way people and goods move through and within the City. The current street classification system used by the City of Brandon considers many principles and factors including land use, land service function, typical traffic volume, traffic flow characteristics, posted speed, vehicle type, roadway network connections, and design user groups, and modes. The goal is to provide a connected roadway network balanced for all types of transportation and users. The City uses the following classifications to define the roadway network:

- Arterial Streets
- Collector Streets
- Local Streets
- Back Lanes

Note that while freeways/expressways and other provincial routes, such as the Trans-Canada Highway, do exist within the City, these roadways fall under Provincial jurisdiction and are thus not included in this document. Any Proponent wishing to develop along the provincial highway system should coordinate with Manitoba Transportation and Infrastructure (MTI), as well as the City.

These roadway classifications are described in further detail in this Subsection 2.0. Standard design elements are presented in the following Subsection 3.0 and with typical cross-sections and other design details presented in Appendices A and B.

2.1. Arterial Streets

Function

Arterial Streets (refer to Table 2-1) are intended to carry large volumes of all types of traffic moving at medium-to-high speeds. They expedite movement of through traffic to major traffic generators and from subdivision to subdivision. Arterial Streets should operate as uninterrupted flow except at traffic control signals and crosswalks. In many cases they will include frequent transit services to local area land uses and travel across the City. Arterial Streets may connect to freeway/expressways, other arterials, and collectors.

Access

Along Arterial Streets, traffic movement is the primary consideration while land access is a secondary consideration in the design of the arterial network. Land access shall be strictly controlled, and in some locations prohibited, to minimize impact to the street's traffic operations. While certain land uses may have an increased need for direct property access, those accesses should be planned for and where possible connect to the collector street network. Access to arterial streets will be subject to the approval of the City Engineer and will be determined at the Secondary Plan and/or Neighborhood Plan stage.

Median openings on divided arterials shall only be considered if sufficient adjacent land access demand is established (demonstrated through a TIS) and the proposed median opening meets the intersection spacing guidelines outlined herein and in the Geometric Design Guide for Canadian Roads (GDG).

Typical Cross-Section Geometrics

All Arterial Streets feature a four-lane divided ultimate cross-section (though one lane in each direction may be constructed for interim conditions). Active transportation accommodation is required, sidewalks as a minimum, as well as MUPs, when the arterial street makes up part of the AT network (separated cycling lanes may be used based on a submission of an exemption to the City). Right-of-way (ROW) widths vary between 30 – 33m, with 3.7m lane widths (excluding gutter) with 5.5m raised medians. Illumination and water/wastewater/storm sewer are all provided within the ROW while private utilities (communications and hydro) are provided in a utility easement on private property.

Traffic Features

Arterial Streets are typically found around the boundaries of large residential or commercial/industrial areas. Major intersections are typically controlled by traffic signals or roundabouts. Intersections may include left-turn and/or right-turn lanes as well as active transportation facilities. Depending on the nature of the surrounding land uses, parking is restricted along Arterial Streets and is only considered when/where it does not impact traffic operations/safety. When permitted on Arterial Streets, parking is often prohibited during peak hours. Sidewalks are to be provided on both sides of the arterial street to accommodate pedestrian movements unless otherwise directed by the City. Arterial streets often serve as major transit routes. Arterial streets carry the heaviest traffic volumes and are often truck routes as well.

Arterial Streets typically include some or all of the following street elements in their design:

- Sidewalks on both sides, separated cycling facilities or multi-use pathways;
- Travel lanes;
- Turn lanes
- Median;
- Boulevard.

Each of these elements should be considered in conjunction with land use plans and area/environmental context. Separated cycling facilities are the preference of the City, and the option of integrated/shared bike lanes are considered a design exception and must be reviewed. Transit considerations and accessible design should be taken into account when planning the street function and elements.

Table 2-1 – Arterial Street Examples

Street	From	To	Cross-Section	Lanes	Parking	AT	Access	
1st Street (PTH 1A)	Kirkcaldy Drive	Centre Avenue	Rural Divided High-Speed	4 lanes + turn lanes	Not Permitted	Paved Shoulder	Controlled Access	
1st Street (PTH 1A)	Richmond Avenue	Park Avenue	Urban Divided Residential	4 lanes + turn lanes	Not Permitted	Sidewalk/Shared On-Street	Uncontrolled Direct Property Access	
18th Street (PTH 10)	Richmond Avenue	Victoria Avenue	Urban Divided Commercial	4 lanes + turn lanes	Not Permitted	Sidewalks/Shared On-Street	Controlled / Direct Property Access	
Victoria Avenue	26th Street	18th Street	Urban Divided Residential	4 lanes + turn lanes	Parking only permitted at 2505 Victoria Avenue	Sidewalk/ Shared On-Street	Controlled Access	
Richmond Avenue East	1st Street	Park Avenue East	Urban Undivided Commercial	4 lanes	Not Permitted	Multi-Use Path (North Side Only)	Controlled/Direct Property Access	

2.2. Collector Streets

Function

Collector Streets (refer to Table 2-2) are intended to collect and distribute traffic to the Arterial Streets and Local Streets as well as provide access to adjacent areas. Collector Streets typically operate as neighbourhood-wide connections and may connect to Arterial Streets, other Collector Streets, Local Streets, and occasionally Back Lanes. Direct access to adjacent land, although controlled, is generally provided and consistent with adjacent land use development. Transit service may exist on Collector Streets and should be considered for design purposes.

Access

Along Collector Streets, traffic movement and land access are equally considered. Land access to fronting properties is permitted subject to traffic and design conditions. Access to Collector Streets will be subject to the approval of the City Engineer and will be determined at the Conceptual Plan stage. Similar with Arterial Streets, median openings on divided Collector Streets shall only be considered if supported by a TIS and compliant with intersection spacing guidelines herein.

Typical Cross-Section Geometrics

Collector Streets vary in width from two lanes to four lanes and can be divided or undivided. AT accommodation (sidewalks as a minimum) is considered which can include on-street cycling lanes or MUP's when the Collector Street makes up part of the AT network. Right-of-way widths are variable, dependent upon rural/urban/industrial classification, but typically range from 22 – 30m with 3.7m lane widths (excluding gutter). Illumination and water / wastewater / storm sewer are all provided within the right-of-way while private utilities (communications and hydro) are provided in a utility easement on private property.

Depending on the neighbourhood's current or future AT network, land use, expected traffic volumes, and recommendations in the City Plan, Greenspace Master Plan, Secondary Plans, or any Neighbourhood Plan, AT facilities may be taken into consideration for the collector network. On-street parking may be provided, on one or both sides of the street, depending on adjacent land uses and parking demand.

Traffic Features

Collector Streets typically make up residential, commercial, and industrial developments. As with Arterial Streets, major intersections are controlled by traffic signals and roundabouts. They may include left-turn and/or right-turn lanes. Parking is typically permitted, on one or both sides of the streets, but may be prohibited during peak hours. Sidewalks are typically provided on both sides of the Collector Streets, while cycling facilities may be limited to shared on-street use or multi-use pathways. Collector Streets in industrial areas may also serve as truck routes.

Collector Streets typically include some or all of the following street elements in their design:

- Sidewalks on both sides, separated from street by a boulevard;
- Separated cycling facilities;

- On-street parking on one or both sides;
- Travel lanes; and
- Boulevard.

Each of these elements should be considered in conjunction with land use plans and area/environmental context. Separated cycling facilities are the preference of the City, and the option of integrated/shared bike lanes are considered a design exception and must be reviewed. Transit considerations and accessible design should be taken into account when planning the street function and elements.

Table 2-2 – Collector Street Examples

Street	From	To	Cross-Section	Lanes	Parking	AT	Access	
Braecrest Drive	1st Street North	18th Street North	Rural Undivided Residential	2 lanes	Not Permitted	Multi-Use Path (South Side Only)	Controlled Access	
26th Street	Victoria Avenue	Park Avenue	Urban Divided Residential	4 lanes + parking lanes (no turn lanes)	Permitted on both sides	Sidewalk	Controlled/Direct Property Access	
10th Street	Richmond Avenue	Victoria Avenue	Urban Undivided Residential / Commercial	2 lanes + parking lanes (no turn lanes)	Permitted on both sides	Sidewalk	Controlled/Direct Property Access	
Park Avenue	18th Street	26th Street	Urban Undivided Residential / Commercial / Industrial	2 lanes + parking lanes + turn lanes	Permitted on both sides	Sidewalk (north side only)	Controlled/Direct Property Access	

2.3. Local Streets

The primary function of Local Streets (refer to Table 2-3) is direct land access with traffic movement as a secondary consideration. Local Streets are not intended to carry large volumes of traffic, but primarily traffic with an origin or destination along its length. Local Streets may connect to Collector Streets, other Local Streets and Lanes.

Local Streets are generally found within residential neighbourhoods servicing residential land uses or within downtown urban cores. Local Streets may also be found in business/industrial areas servicing industrial and commercial land uses.

Local streets typically include some or all of the following street elements in their design:

- Sidewalks on one side, either combined with the curb or separated by a boulevard;
- Separated cycling facilities;
- On-street parking on one or both sides;
- Travel Lanes; and
- Boulevard.

Each of these elements should be considered in conjunction with land use and existing/planned development.

Table 2-3 – Local Street Examples

Street	From	To	Cross-Section	Lanes	Parking	AT	Access	
Lorne Avenue	10th Street	6th Street	Urban Residential/ Commercial Local	2 lanes + parking lanes	Permitted on both sides	Sidewalks/Shared On-Street	Controlled	
12th Street	Princess Avenue	Rosser Avenue	Urban Core Local	2 lanes + parking lanes	Permitted on both sides	Sidewalks/Shared On-Street	Direct Property Access	
14th Street	Richmond Avenue East	Granite Road	Industrial Local	2 lanes	No parking permitted	N/A	Direct Property Access	
3rd Street North	Kirkcaldy Drive	Kirkham Crescent	Urban Residential Local	2 lanes + parking lanes	Permitted on both sides	Sidewalks/Shared On-Street	Direct Property Access	
10th Street	Balmoral Avenue	Richmond Avenue	Rural Residential Local	2 lanes + parking	Permitted on both sides	On-Street	Direct Property Access	

2.4. Back Lanes

Back Lanes are intended to provide direct land access, typically adjacent to the rear of a property. Back Lanes are not intended to carry large volumes of traffic or through traffic, but primarily traffic with an origin or destination directly on the back lane. Full access to adjacent land is provided and Back Lanes may connect to Collector Streets, Local Streets, or other Back Lanes.

Commercial, industrial, and new residential Back Lane material shall be asphalt with no curbing. Commercial/industrial Back Lanes will require a minimum 8m right-of-way, while residential Back Lanes will require a minimum 6.1m right-of-way. No AT facilities are provided along Back Lanes and parking is prohibited.

Although minimal in their design requirements, when Back Lanes intersect other Back Lanes, or deflect, corner visibility triangles are required.

3.0 STANDARD DESIGN ELEMENTS

As presented in Subsection 2.0 above, the City uses a hierarchical system to classify its streets, with the following categories used:

- Arterial Streets;
- Collector Streets;
- Local Streets; and
- Back Lanes.

Each of these street types has unique elements that should be considered in their design. These design elements are described in detail below. Throughout this Section of the Municipal Servicing Standards, TAC's Geometric Design Guide for Canadian Roads (GDG) should be referenced for further background and discussion.

While the elements discussed below are intended to provide uniform standards across the City's transportation network, there are occasions when the values / philosophies provided below cannot be achieved. In such situations, Proponents are directed to the Design Exception Memorandum discussed in Chapter 2.

3.1. Roadway Classification

The Proponent, following review of the Secondary Plan, if applicable, is responsible for the proposed classification designation of new streets in the development. Street classification should generally be established on the basis of the system detailed above in Subsection 2.0, Roadway Network Classification. The City is responsible for confirming classification of existing streets and will approve all new classifications proposed by the Proponent.

Roadways shall be designed to accommodate design traffic flows for the proposed development (as determined through the TIS and its design horizons/build-out) and, if applicable, to reasonably accommodate extensions to adjacent future development areas as described in the Secondary/Neighbourhood Plans.

The daily traffic volumes and design speeds that are used by the City to assist in establishing street classification can be found in Table 3-1. The design speed is a speed selected as a basis to establish appropriate geometric design elements for a particular section of road. Further explanation of design speed can be found within TAC's GDG Chapter 1.2. The speeds listed are typical maximum posted speeds and may be reduced on some streets by up to 20km/hr.

Table 3-1 – Representative Traffic Volumes / Speeds by Roadway Classification

Roadway Classification	Typical Daily Traffic Volumes	Posted Speed (Maximum)	Design Speed (Above Posted)
Arterial Street	5,000 – 10,000	70 km/hr	+0 to 10 km/hr
Collector Street	500 – 5,000	60 km/hr	+0 to 10 km/hr
Local Street	500 – 1,000	50 km/hr	+0 km/hr
Back Lane	< 500	30 km/hr	+0 km/hr

3.2. Connectivity between Roadway Classifications

Streets shall reflect the normal progression of connectivity based on their classifications discussed in Subsection 2.0 above. In an ideal system, lanes connect with locals, locals with collectors, collectors with arterials, and arterials with freeways/expressways. This allows for street users to adjust to gradual changes in street cross-section features and user expectations/workload. Connections beyond this hierarchy should be minimized. Table 3-2 summarizes desirable connections by roadway classification.

Table 3-2 – Roadway Classification Connectivity

Roadway Classification	Connects to:			
	Arterial	**Collector**	**Local**	**Back Lane**
Arterial Street	Yes	Yes		
Collector Street	Yes	Yes	Yes	Yes
Local Street		Yes	Yes	Yes
Back Lane		Yes	Yes	Yes

*Blank cells indicate connection not permitted.

3.3. Universal Accessibility

Streets are to be designed so that they can be accessed, understood, and used to the greatest extent possible by all people regardless of their age and ability, in the most independent and natural manner possible without the need for adaptation, modification, assistance, or specialized devices. A barrier free and interconnected network of accessible facilities should be provided to ensure mobility for all residents of Brandon, including those with physical, auditory or visual impairments.

The City's ultimate goal is to provide universal accessibility throughout its transportation network and the City will work to maximize accessibility within its infrastructure framework. The Proponent shall be responsible for ensuring that streets are designed to be safe and accessible for users. City standards and specifications shall be followed. Where none exist, current industry best practices shall be followed.

3.4. Emergency Vehicle Access

Streets shall follow the Brandon Fire and Emergency Services P19 Street Development/Access Road Regulation and be designed so that they permit ingress/egress of emergency vehicles as large as a fire truck. For design purposes the City uses a Smeal Pumper Midship.

3.5. Travel Lanes

Travel lane widths should be carefully considered in conjunction with other street elements. Table 3-3 identifies appropriate lane widths for consideration on urban streets. Additional discussion on travel lanes is included in TAC's GDG Chapter 4.2.

Table 3-3 – Travel Lane Widths

Roadway Classification	Travel Lane Width
Arterial Street	3.7m
Collector Street	3.5 – 3.7m
Local Street	3.0 – 3.7m
Back Lane	3.0m

Lane widths described in Table 3-3 are independent of gutter pan width and do not account for the presence of parked cars, snow storage, or accommodation of cyclists. These additional needs should be considered when determining lane widths for a specific development.

3.6. Auxiliary Lanes

Auxiliary lanes provide a space for motorists to park outside the travel lanes, decelerate outside of the travel lanes, accelerate and merge into a travel lane, and provide storage for vehicles that are turning. Properly designed auxiliary lengths take into account both deceleration and required storage lengths to promote their proper and safe use. Additional discussion on auxiliary lanes is included in TAC's GDG Chapter 4.3

3.6.1. Parking Lanes

Parking lanes should be considered on Local Streets, Collector Streets, and Arterial Streets depending on land use and access conditions, as well as street function. Proponents will need to demonstrate their development's parking requirements and parking lane designs. A summary of parking lanes in relation to street classification is provided in Table 3-4.

Table 3-4 – Parking Lanes

Roadway Classification	Parking Permitted	Width (m)	Considerations
Arterial Street	No	2.8 – 2.9m*	Not considered
Collector Street	Yes	2.8 – 2.9m*	Always consider; may be present on both sides
Local Street	Yes	2.3 – 2.9m	Always consider on one side; may be present on both sides
Lane	No	-	Not considered

* Includes gutter pan width (0.3m).

3.6.2. Turn Lanes

Turn lanes are the most common type of auxiliary lane in the City. Turn lanes should be considered on Collector and Arterial Streets depending on the results of the TIS/traffic operations analysis and resulting Level of Service (LOS). Turn lanes are typically not provided on local streets or lanes, unless supported by an operational analysis. A summary of turn lanes in relation to street classification is provided in Table 3-5

.

Table 3-5 – Turn Lane Widths

Roadway Classification	Turn Lanes Considered	Width (m)	Considerations
Arterial Street	Yes	3.5*	Considered if TIS supported, may be left- or right-turn
Collector Street	Yes	3.5*	Considered if TIS supported, may be left- or right-turn
Local Street	Sometimes	3.0*	Sometimes considered
Back Lane	No	-	Not considered

* Includes gutter pan width (0.3m) where applicable.

Refer to **Appendix B** for Standard Drawings on left-turn and right-turn lane design.

3.6.3. Speed Change Lanes

Typically used along Arterial Streets with commercial frontage, speed change lanes are used in lieu of turn lanes to provide ingress/egress to large developments with a high number of trips. Acceleration movements to merge into travel lanes and deceleration movements to diverge from travel lanes both occur in speed change lanes, so as to not negatively impact the traffic operations of the travel lanes. Speed change lanes do not typically account for storage, but do take into account acceleration/deceleration characteristics, and are the same width as the adjacent through lanes.

3.7. Curb and Gutter

Curbs are raised, vertical/rounded elements located at the edge of the roadway. Gutters are the slightly sloped, horizontal elements located between the vertical/rounded curb and the adjacent travel lanes, cycling facilities, parking lanes, or shoulders. Together they are implemented on urban streets for several reasons including drainage control, delineation of the pavement edge, right-of-way reduction, access control or provision, and aesthetics.

The City uses several different curb types, as listed in Table 3-6 and shown graphically in **Appendix B**.

Table 3-6 – Curb Selection

Curb Type	Implementation Criteria
Rolled Curb & Gutter	▪ Nominal width = 0.5m (0.3m gutter, 0.2m curb) ▪ Provides delineation, but is mountable ▪ Permits over-riding by large vehicles such as trucks ▪ Typically used on Local Streets
150mm Barrier Curb & Gutter	▪ Nominal width = 0.5m (0.3m gutter, 0.2m curb) ▪ Provides delineation and complete access control ▪ Can redirect errant low-speed traffic ▪ Typically used on Arterial and Collector Streets
Median Curb	▪ Nominal width = 0.2m (no gutter, 0.2m curb) ▪ Provides delineation of raised medians and left-turn lanes ▪ Same curbing as Barrier Curb above ▪ Typically used on divided roadways with raised medians

3.8. Active Transportation Facilities

In this document, walking and cycling facilities are specifically acknowledged since other forms of active transportation can also use walking and cycling facilities.

The proponent shall be responsible for identifying the active transportation network in a neighbourhood, as well as the design and installation of all active transportation facilities within the neighbourhood. These may include sidewalks, cycling facilities, multi-use pathways, crosswalks, etc. AT facilities (cycling lanes, MUP's) should be identified by the City at the Transportation Master Plan and Secondary Plan level, and in more detail by the developer at the neighbourhood plan level.

3.8.1. Sidewalks

Sidewalks encourage and facilitate people to move around the City. A connected network of sidewalks can help support community vibrancy and public health while providing an equitable form of transportation for all citizens.

Sidewalks shall be located to facilitate pedestrian movement for the proposed development, and to reasonably accommodate extensions to adjacent future development areas as described in the Secondary/Neighbourhood Plans.

In general, pedestrian movement shall be provided along the various street types as specified in Table 3-7. In locations with high volumes of pedestrian traffic, sidewalk widths are to be increased depending on the intensity of the adjacent development. Appropriately increased widths can be determined by referencing TAC's GDG, Chapter 4.6.

Table 3-7 – Sidewalk Requirements

Street Classification	Locations Considered	Minimum Walking Surface Clear Width (m)	Material	Offset from Back of Curb
Arterial Street	Both Sides	1.5	Concrete	Separate (1.5 – 4.0 m)
Collector Street	Both Sides	1.5	Concrete	Separate (1.5 – 4.0 m)
Local Street	One Side	1.5 - 1.8*	Concrete	Combined* or Separate (1.5 – 4.0 m)
Back Lane	N/A	N/A	N/A	N/A

*1.8m combined sidewalks are only permissible on Local Streets with fewer than 400 vehicles per day.

3.8.2. Cycling Facilities

Cycling facilities encourage and facilitate people of all ages and abilities to move around the City. The cycling network is an integral part of the transportation system and cyclists shall be accommodated on all streets and in all weather conditions. Providing a complete and interconnected network of bicycle facilities throughout Brandon is critical to supporting and encouraging people to choose cycling.

At a minimum, a development/neighbourhood shall accommodate connections with the adjacent existing and future cycling infrastructure. The network of cycling facilities shall be connected, safe and secure, convenient, and accessible.

While the operating envelope of a typical bicycle is 1.5 metres wide and 1.8 metres long, bicycles can be up to 3.0 metres in length. The vertical operating envelope of a cyclist is approximately 2.5 metres. It is important to ensure that tree branches or other overhead obstacle clearances are higher than a cyclist's head.

Cycling facilities can be provided in two basic forms: exclusive facilities where a portion of the right-of-way is designated for cyclists; and shared-use facilities where street space is shared between motor vehicles and cyclists. Land-use and built form may also influence the cycling facility chosen and should be given careful consideration. *Table 3-8* provides guidance on cycling facility design options.

Table 3-8 – Cycling Facility Design

Roadway Classification	Location	Minimum Clear Width (m)	Facility Type
Arterial Street	Both Sides	2.0	Exclusive, protected facility
Collector Street	Both Sides	1.8	Exclusive, protected facility
Local Street	N/A	N/A	Shared-use, on-street
Back Lane	N/A	N/A	Shared-use, on-street

3.8.3. Multi-Use Paths

Multi-use pathways (MUPs) are an integral part of the City's planned cycling network intended to encourage AT. Typically, multi-use paths can be found parallel to arterials or major collectors within the ROW or greenspace buffers, minor collectors within the ROW with limited

driveway access or within parks. Multi-use pathways may be implemented as an alternative to sidewalks and cycling facilities where the volumes of pedestrians and cyclists are low enough that mixing uses will not create a safety issue, and where adjacent land use supports the implementation of a multi-use path.

The width of multi-use paths varies depending on the volume of pedestrians and cyclists, but is typically 2.5 – 3.0 metres wide, with additional width provided for higher user volumes. Multi-use paths are typically built with asphalt surfaces.

3.8.4. Accessibility Ramps

Accessibility ramps provide a graded transition between the AT facility (often times a sidewalk) and the street providing a link to the pedestrian/bicycle crossing and the broader AT network.

Although confirmed on a project-by-project basis, accessibility ramps should generally:

- Be provided at all Arterial Street intersections and other crosswalk locations where practicable;
- Include tactile walking surface indicators (Arterial Streets and Collector Streets only) when connected to the larger AT network; and
- Be provided for all crossing directions.

3.9. Accesses and Driveways

All construction and modification of City sidewalks, curbs, and ditches require approval by the City and must conform to the Standard Drawings and provide sight lines/intersection sight distance. Prior approval is required before construction of a driveway, access or other form of ingress/egress to any property abutting the transportation network. Public safety and traffic operations of the roadway itself are the main technical considerations when determining access. In general, access to private property from the City's transportation network is only considered as shown in Table 3-9.

Table 3-9 – Access Management by Roadway Classification

Roadway Classification	Typically Permitted Direct Accesses	Minimum Intersection Spacing	Minimum Access[1] Spacing	Minimum Driveway[2] Spacing
Arterial Street	With priority to traffic movement, accesses are controlled and may be prohibited depending on anticipated traffic volumes, road user safety, and traffic operations	400 m	400m	N/A
Collector Street	With equal importance to both traffic movement and land access, accesses are permitted depending on traffic operations and road user safety	100 m	60m	See Table 3-10 below
Local Street	With priority to land access, accesses are permitted depending on road user safety	100m	15m	

Back Lane	With is sole function land access, accesses are permitted	N/A	N/A	15m or Lot Width

[1]Access is defined as access to non-residential or moderate to high density residential development that allows for two-way traffic, such as to a parking lot, but does not permit backing out.

[2]Driveway is defined as an access to a low density residential development that permits backing out.

Spacing considerations for accesses and driveways on opposite sides of the road must be taken into consideration for collector and arterial roadways. Accesses will be approved after review of existing and proposed driveways on the opposite sides of the road and whether key traffic movements can accommodate left turns into opposing developments as well as potential inter-development traffic flow. Steps to align accesses within 1.0 meters of centreline and/or consolidation of accesses into a shared access may be required for new access proposals.

A centre median may be incorporated into a street design to eliminate consideration of opposite side accesses, especially in residential areas with proposed low density unit development on collector or moderate to high traffic volume local streets.

Where direct access is provided, their occurrences, locations and designs will be approved by the City. Abutting developments will generally be served by a single shared access/driveway for ingress and egress. Where supported by a TIS, multiple accesses/driveways may be considered.

Accesses/driveways shall be designed to permit one lane in and one lane out, unless otherwise supported by a traffic analysis and approved by the City.

Where driveways, private streets or Back Lanes connect into the City's transportation network, they shall adhere to the minimum corner clearances from adjacent intersections (edge-to-edge) as provided in TAC's GDG (Chapter 8.8 and 8.9 and Figure 8.8.2). In general, driveways, private streets and Back Lanes should be located:

- On Arterial Streets
  - 35m from a stop-controlled intersection, 70m from a signal-controlled intersection (unless left-turn lanes provided)
- On Collector Streets
  - 25m from a stop-controlled intersection, 55m from a signal-controlled intersection
- On Local Streets
  - 15m from all intersections (*if lot widths are sufficiently narrow that they cannot accommodate a driveway 15m from an intersection within their property limits, an access can be provided on the minor street at the further point from the intersection.)

An effective way to ensure reasonable spacing between adjacent driveways is to limit the number permitted per individual property. A typical guideline, based on property frontage width, is provided in Table 3-10.

***Table 3-10 – Maximum* Number of Driveways Based on Property Frontage**

Property Frontage (m)	Maximum Number of Driveways*
15m	1
16 – 50m	2
51 – 150m	3
> 150m	4 or more

*Includes both one-way and two-way driveways.

With respect to corner lots and frontage determination, side yard accesses will be restricted in residential areas/Local Streets, considered on Collector Streets and limited to a case-by-case basis on Arterial Streets.

Where driveways connect into the transportation network, they shall follow TAC guidance and will generally be governed by Table 3-11 with confirmation based on design vehicle turning movement templates.

*Table 3-11 – Typical Driveway / Access Width and Flare Taper Dim*ensions

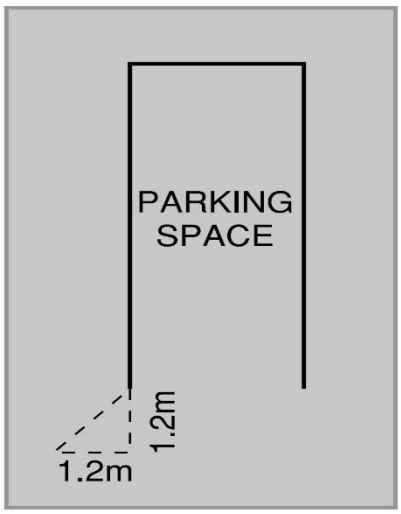
Dimension (m)	Land Use		
	Residential	Commercial	Industrial
Single Driveway Width (W)*	3.0 – 4.3m	N/A	N/A
Double Driveway Width (W)*	3.0 – 7.0m	N/A	N/A
One-Way Access Width (W)*	3.0 – 4.3m	4.0 – 7.0m	5.0 – 9.0m
Two-Way Access Width (W)*	6.0 – 8.0m	7.3 – 12.0m	9.0 – 15.0m
Flared Taper Ratio	1m wide : 2m deep		

*Maximum driveway widths shall not exceed the maximum widths presented above or 50% of the frontage width, whichever is lower.

Wherever possible, the grade change through a driveway should occur through the boulevard so as to not effect sidewalk cross-slope grades. Additional information on accesses and driveways can be found in the City's Standard Construction Specifications and TAC's GDG Chapter 8.

A 45-45-90 right triangle area shall be created by extending either boundary of a parking space 1.2m. No hydro poles, utility pedestals, or any above ground features shall be located within this triangle area. See Figure 1.

Figure 1: Above Ground Feature Restriction



3.10. Medians

A median is defined as the portion of a street which physically separates the travelled lanes of traffic travelling in opposing directions. A median is a safety device which provides some measure of freedom from interference of opposing traffic and can provide a recovery area for errant vehicles, speed change lanes for left-turn and U-turn traffic, and reduce headlight glare. Other uses may include location for utilities or street lighting, snow storage, drainage, access control, and a pedestrian crossing refuge area.

Medians within the City may be flush with or raised above adjacent travel lanes. Landscaping in medians should not obstruct visibility of intersections, pedestrian and AT crossings, or street signs. Obstructions may negatively affect a driver's ability to safely react to approaching traffic of all modes. Similarly, obstructions may impact the sightlines of pedestrians, cyclists and other vulnerable road users and their ability to react to vehicle movements.

Typically, medians are found on higher-to-intermediate order streets such as arterials and some collectors, particularly those with low-density residential development desiring frontage driveways. Clear zone calculations, which are intended to provide safe, traversable, and recoverable areas for errant vehicles/road users, must be presented to determine if barriers are required to separate opposing traffic flows. An explanation of clear zone can be found in TAC's GDG.

Typically, the minimum width of raised medians shall be 2.0m (face of curb to face of curb) when no left-turn lanes are intended, and 5.5m (face of curb to face of curb) when a left-turn lane is included/planned. The minimum width provides 1.6m clear space for traffic control signals, illumination, and signage between the 0.2m curbs. The maximum width of medians can vary depending on the detailed design and number of left turn bays.

Additional information about medians can be found in TAC's GDG Chapter 4.5.

3.11. Boulevard

A boulevard is the area between the back of curb and the AT facility, most often a sidewalk. They are implemented on streets with separated AT facilities for several reasons, including safety and comfort of AT modes, location for surface and underground utilities, snow storage area, and location for street amenities like transit waiting areas, bike racks, benches, street signs, traffic control, street illumination, and landscaping.

Boulevards should be designed in consideration of adjacent land use as well as maintenance / operations/sustainability. Typical boulevards are sodded to continue the aesthetic qualities of the adjacent development. Landscaping in boulevards should not obstruct visibility of intersections, pedestrian crossings, or street signs, as these obstructions may negatively affect a driver's ability to safely react to approaching traffic of all modes.

In general, and where provided, boulevards should maintain to the degree possible the following design elements:

- Width of at least 2.0m (back of curb to edge of sidewalk) to accommodate snow storage and separation between motor vehicles and pedestrians;
  - Wider widths with increased snow storage capacity and improved clear zone, as shown in **Appendix A**, are preferred.
- Minimum cross-fall of 2% preferred, 4% (maintaining sidewalk cross-fall) is preferred;
- Maximum cross-fall of 8%

Additional information regarding boulevards can be found in TAC's *GDG* Chapter 4.6

3.12. Public Reserve

Public reserve (PR) land is city-owned land that is adjacent to, but not part of, the roadway right-of-way. It is a buffer area provided in some locations along the Arterial Street network. When present, multi-use paths (MUPs) can be located within the PR, as can watermains.

Public reserves are required to be 12.0m wide with the presence of underground utilities (water, domestic sewer, and land drainage) and 9.0m wide without the presence of underground utilities. Shallow utilities, such as telecommunications and hydro lines, shall be within the PR on Arterial Streets. If no PR is requested by the Planning Department, follow the typical cross-sections presented in Appendix A.

3.13. Ancillary Structures

Ancillary structures include sound attenuation, fencing, roadside safety systems, illumination, and traffic control devices.

3.13.1. Roadside Safety Systems

Roadside safety systems shall be designed in accordance with TAC's *GDG* and *MUTCD-C*, AASHTO's *Roadside Safety Guide*, and FHWA's *Highway Safety Manual*.

3.13.2. Traffic Control Devices

Traffic control devices include all pavement markings, traffic signs, and traffic signals required to operate the transportation system in a safe and efficient manner. The City follows, as closely as practical, the guidelines established by the Manual for Uniform Traffic Control Devices for Canada (MUTCD-C).

The City shall be responsible for determining the need for traffic control devices and Proponents are responsible for the cost of design, manufacture, and installation of all traffic control devices. Controls shall be provided as described in Table 3-12 for each street classification.

Table 3-12 – Traffic Control Device Requirements

Roadway Classification	Traffic Control Devices
Arterial Street	▪ Longitudinal lane pavement markings required ▪ Pedestrian crossing markings and signs are required ▪ Traffic signals and pedestrian crossing devices are required as warranted and should be installed prior to street opening
Collector Street	▪ Longitudinal lane pavement markings may be required ▪ Pedestrian crossing markings and signs may be required at significant intersections ▪ All traffic control devices and pavement markings shall be installed ▪ prior to street opening
Local Street	▪ No longitudinal lane pavement markings required ▪ Pedestrian markings may be required at significant intersections ▪ All traffic control devices and pavement markings shall be installed ▪ prior to street opening
Back Lane	▪ No traffic control devices required

3.13.3. Illumination

Full illumination shall be provided on all Arterial Streets, Collector Streets and Local Streets. Back Lanes do not require illumination. Active Transportation (AT facilities and intersections) shall require illumination to increase road user safety. The level of illumination for street, AT, and intersections shall be in accordance with Manitoba Hydro requirements and standards.

3.13.4. Fencing

Fencing shall be provided along the right-of-way of Arterial Streets where AT access is not allowed from private property. Fencing is not required along Collector Streets, Local Streets or Back Lanes.

3.13.5. Underground Utilities and Utility Boxes

The locations of underground utilities should be designed to not impede accessibility of the transportation network. Catch basins, maintenance covers, and utility boxes should not be located within the accessible route, including crosswalks, accessibility ramps, refuge areas, and other AT pathways. If a utility must be located within an AT facility, appropriate grate type and direction must be used.

Refer to **Appendix A**, Standard Drawings, for conceptual locations of underground utilities within the roadway's corridor.

3.13.6. Street Name Signs

Streets shall be named in accordance with the City of Brandon Street Naming Policy 1003.

https://www.brandon.ca/municipal-property/civic-addresses-street-names?highlight=WyJzdHJlZXQiLCJuYW1pbmciLCJzdHJlZXQgbmFtaW5nIl0=

3.13.7. Sound Attenuation

Sound attenuation measures should be implemented following discussion with City staff. While the City of Brandon does not have a formal sound attenuation policy, it generally follows the City of Winnipeg's *Motor Vehicle Noise Policies and Guidelines (1984*). The proponent is responsible for traffic noise mitigation in new developments.

3.14. Intersections

An intersection is a location where two or more streets join or cross, either at-grade or through an interchange/grade-separation. At-grade intersections shall provide for the movement of pedestrians, cyclists, motor vehicles and other road users. An at-grade intersection differs from a grade-separated interchange in terms of capacity, operation, cost of construction and maintenance, safety, complexities of design features, signing, traffic signals, and right-of-way requirements. Subsection 3.14 presents City standards relative to at-grade intersections only.

Intersections should be spaced based on function, traffic volumes, and relative presence of various street user modes. Typical intersection spacing is outlined in

Table 3-13.

Table 3-13 – Minimum Intersection Spacing

Groupings	Typical Minimum Spacing (m)			
	Arterial	Collector	Local	Lane
Arterial Streets	400	200		
Collector Streets	200	60	60	
Local Streets		60	60	N/A
Back Lanes			N/A	N/A

*Blank cells indicate connection not permitted.

3.14.1. Corner Radii and Sight Triangles

Intersection corners should be designed to safely accommodate the movement of all expected road users, including pedestrians, cyclists, transit vehicles, passenger vehicles, and commercial vehicles.

The selection of corner radius shall be completed by referencing the standard intersection drawings in **Appendix B** and then analyzing the intersection geometry using industry-supported software's turning templates (such as AutoTURN) of varying anticipated design vehicles.

By analyzing these vehicles, a radius can confirmed/selected that accommodates all anticipated vehicles. Vehicle turning speeds should be minimized through an intersection, typically less than 20 km/h, to improve AT safety. Typical vehicles that should be analyzed for each street classification are listed in Table 3-14.

Table 3-14 – Typical Design Vehicles by Roadway Classification

Roadway Classification	Design Vehicle
Arterial Street	City Bus/WB19
Collector Street	City Bus/WB19
Local Street	Medium Single Unit (MSU)
Back Lane	Medium Single Unit (MSU)

* There may be locations where alternate vehicles must be analyzed.

The corner radius and effective turning radius should also be considered when determining the appropriate corner radius. The effective turning radius of a vehicle is the space needed for the vehicle to make a right-turn from one lane to another that may cross parking and bicycle lanes. The corner radius should be minimized to lessen pedestrian crossing times and provide greater comfort and safety for pedestrians. The actual corner radius should be defined after considering the effective turning radius.

Providing adequate sight lines and sight triangles is important for providing safe intersection operations.

Additional guidance on sight distance requirements at intersections can be found in TAC's GDG Chapters 9.8 and 9.9.

3.14.2. Channelization

Channelization is the separation and direction of traffic movements and pedestrians/cyclists into defined paths at an at-grade intersection through the use of geometric features, pavement markings and traffic control devices. Channelization at an intersection may be implemented for a variety of reasons. Some of these reasons include:

- Provision of protected storage areas for turning vehicles;
- Segregate traffic movements into left-turning, right-turning, and through traffic streams;
- Separate and reduce areas of potential conflict so the driver is required to make only one decision at a time;
- Control the angle of merging traffic streams; and
- Provide a safe refuge area for pedestrians between the various traffic streams; etc.

Channelization should be considered as indicated in Table 3-15. Additional information on channelization can be found in TAC's GDG, Chapter 9.15.

***Table 3-15 – Channelization of Intersections* based on Connecting Roadway Classifications**

	Arterial Street	Collector Street	Local Street	Lane
Arterial Street	Considered	Considered	Never	Never
Collector Street	Considered	Never	Never	Never
Local Street	Never	Never	Never	Never
Back Lane	Never	Never	Never	Never

Left-turn bays and right-turn lanes shall have sufficient length to accommodate anticipated traffic queue lengths.

Traffic islands define the area between traffic lanes for control of vehicle movements in intersection areas or for pedestrian/cyclist refuge. Traffic islands may be considered on all street types, excluding Local Streets and Lanes.

Design of channelization shall ensure the accessibility of the intersection is maintained. Traffic islands shall incorporate accessibility ramps for all movements and maintain clear areas at the top of each ramp to provide an acceptable landing area for refuge.

3.14.3. Roundabouts

The planning, traffic operation, and design of roundabouts shall be governed by the guidelines presented in TAC's GDG and TAC's *Canadian Roundabout Design Guide* as well as the *NCHRP Report 672: Roundabouts: An Informational Guide.*

Roundabouts are supported on the City's transportation network and may be considered on Arterial Streets, Collector Streets and Local Streets. Based on traffic volumes and traffic operations, roundabouts can be either single-lane or multi-lane roundabouts, with inscribed circle diameters (ICD) ranging between 15m – 60m or more depending on approaches, entry/exit widths and required design vehicles. Refer to **Appendix D** for a representative standard drawing for Arterial-Collector, Collector-Local, and Local-Local situations. In all situations, roundabouts shall be designed following industry best practices and taking into account both traffic volumes / operations and adjacent land uses / access.

3.14.4. Anticipated Traffic Operations

As part of all proposed developments the Proponent is responsible for quantifying the development's impact on the operations (traffic flow, delay, etc.) of the existing transportation network and any improvements required as part of the development.

In general:

- Arterial Streets shall operate at a Level of Service (LOS) C or better during peak hour, with overall intersections a LOS D or better and critical intersection movements a LOS E or better;
- Collector Streets shall operate at a LOS D or better during peak hour, including overall intersections and critical intersection movements; and
- Local Streets shall operate at a LOS C or better during peak hour.

3.15. Traffic Calming Measures

Traffic calming is a process and measures applied to the transportation network to address behavioural concerns of motor vehicle drivers. Typically, these concerns relate to speed, and the intention behand traffic calming measures is to achieve driver behaviours that are more appropriate for the local context and enhance the safety and functionality of the City's streets, while ensuring access to properties and accommodating all modes of travel in a safe and appropriately designed environment.

There is no one universal solution for traffic calming that is applicable in all contexts. Rather, the objective is to determine the best combination of measures that result in an improvement in the quality of life and community safety at a reasonable cost. The 2017 Edition of TAC's *Canadian Guide to Traffic Calming* presents a wide variety of traffic calming measures, including geometric elements, pavement markings, access closures and educational programs. While the City will review traffic calming plans on a project-by-project basis, below are a few of the most common measures.

- Vertical deflection measures, such as speed tables and raised crosswalks;
- Roadway narrowing measures, such as curb extensions, lane narrowing and on-street parking;
- Surface treatment measures, such as textured pavements;
- Pavement marking measures, such as converging chevrons and narrowed (painted) lanes; and
- Access restriction measures, such as raised medians, full access closure, and right-in/right-out access.

When a development that affects adjacent streets occurs, the developer shall be responsible for identifying locations and installing appropriate traffic calming measures to mitigate these affects.

3.16. Horizontal Alignment Design

Horizontal alignment refers to the configuration of the streets as seen in plan view, consisting of tangent sections, circular curves, and spiral transitions. All horizontal alignment designs shall be designed following TAC's GDG with the following subsections. Minimum standard values shall only be used in extremely difficult design circumstances, and use of successive minimums shall be avoided.

3.16.1. Tangent Sections

Tangent segments shall be sufficiently long to rotate super elevations back to normal crown, with minimum lengths as follows:

- Arterial Streets – Refer to TAC's *GDG* Section 3.2
- Collector Streets – 60m
- Local Streets – 30m
- Back Lanes – N/A

When necessary due to site constraints, tangent segments can be eliminated between reverse curve alignments on Collector Street and Local Streets. Broken back curves (two curves in the same direction) shall have a minimum tangent length between curves of 250m.

3.16.2. Horizontal Curves and Superelevation

Superelevation design is impacted by street classification, design speed, curve radius, curb lane parking, direct access from fronting residences, and positive drainage on curbed roadways. Maximum rates of superelevation can also be controlled by factors such as climatic conditions, terrain, type of environment, frequency of slow-moving vehicles, and maintenance.

The City of Brandon has adopted TAC's GDG standards for superelevation and curve radii, and streets shall be designed in accordance with the GDG, except as noted below.

- Local Streets, and Lanes shall not be superelevated.
- Arterial Streets and Collector Streets with an urban cross-section shall consider:
  - Superelevations on curbed arterial roadways shall be individually designed according to TAC's GDG criteria and TAC's GDG Table 3.2.8.
  - Transition lengths are variable, but the longitudinal gradient shall never be less than 0.5%.
- Arterial Streets and Collector Streets with a rural cross-section shall consider:
  - A maximum rate of superelevation of e = 0.04 m/m is typical.
  - The Engineer shall determine design superelevations according to TAC's GDG criteria and TAC GDG Table 3.2.5.

3.16.3. Sight Distance and Intersection Sight Triangles

Sight distance is the unobstructed distance a driver can see along the roadway before them. It is determined by the driver's eye height and the object height plus any obstructions (such as trees, buildings or parked vehicles) that are in the line of sight.

Intersection sight triangles are areas along intersecting roadways that should be clear of obstructions that might block a driver's view of potentially conflicting vehicles or active transportation users. The dimensions of these triangles vary by speed and intersection control.

Proponents' designs shall comply with the guidance offered in TAC's GDG Sections 9.8 (Sight Distance) and 9.9.2 (Sight Triangles). All situations in which TAC sight distance/intersection sight triangles cannot be provided will require City approval prior to advancing.

3.17. Vertical Alignment Design

Vertical alignment refers to the configuration of the streets as seen in profile view, consisting of longitudinal gradients, vertical curves, and consideration of sight distances. Factors impacting the design of vertical alignments include the slope of the surrounding landscape, safety in vehicle operation, and efficient removal of runoff. The design of vertical alignments, vertical clearances, cross-section elements, and roadway pavement structures are based on criteria outlined in TAC's GDG, Chapter 3.3, and the following subsections.

3.17.1. Stopping Sight Distance

Stopping sight distance (SSD) is the sum of the distance travelled during breaking (slowing of the vehicle to a stop condition) and the time it took to perceive the need to stop. Values vary based on design speed, driver eye height, object height, and the longitudinal gradient of the roadway.

Values presented herein are based on a level grade and are consistent with TAC's GDG, however deviations may be necessary based on site specific conditions.

3.17.2. Longitudinal Gradients

Longitudinal grades are expressed as a percentage; that is the rise or fall in metres over a horizontal length of 100 metres. Acceptable grades vary based on multiple factors and should be designed in compliance with TAC's GDG.

Generally, the City supports the following with respect to longitudinal gradients:

- Maximum gradients of 3% when feasible to promote cycling and accessible design;
- Minimum gradients of 0.5% on curbed roadways to accommodate surface drainage;
- In ditch areas, the ditch gradients should be sufficiently low to avoid erosion of the grassed bottom but sufficiently high to promote positive drainage and reduce ponding.

3.17.3. Vertical Curves

Vertical curves provide a smooth transition between adjacent longitudinal grades and can be either crest (i.e. hill) or sag (i.e. valley) curves. Factors impacting the design of vertical curves include stopping sight distance, decision sight distance, riding comfort and safety, positive drainage on curbed roadways, illumination, algebraic difference between intersecting tangents, and design speed. All of these factors are considered and incorporated in vertical curve design presented in TAC's GDG.

Vertical curves shall be provided where grade changes (the algebraic difference "A") take place in accordance with Table 3-16.

Table 3-16 – Vertical Curve Selection Criteria by Roadway Classification

Applicable Roadway Classifications	Selection Criteria	Must Use	Consider
Arterial Streets	Algebraic Difference "A"	If "A" ≥ 1.5%	If "A" ≥ 0.5%
Collector Streets		--	If "A" ≥ 2.0%
Local Streets	Not Applicable		
Back Lanes	Not Applicable		

The City of Brandon has adopted standards that lend priority to positive drainage and riding comfort for the design of vertical curves on curbed roadways. K values should be verified using TAC's GDG standards during the design phase, but in general are guided by Table 3-17.

Table 3-17 – Vertical Curve K Values

Design Speed (km/h)	Stopping Sight Distance (m)	Crest Curve K-Value	Sag Curve K-Value (Comfort)
20	20	1	1
30	35	3	2
40	50	5	4
50	65	8	6
60	85	14	9
70	105	21	12
80	130	32	16

3.18. Snow Clearing and Snow Storage

The cross-sections presented within these standards not only include travel lanes, parking lanes and active transportation accommodation, they also include space to store snow during winter maintenance. This space is either located in the boulevard (between the curb and sidewalk) or between the sidewalk and right-of-way when a combined curb-sidewalk is used. Effort should be made to keep snow storage areas free from obstructions to the extent possible.

Responsibilities of snow clearing are presented within Brandon's Traffic By-Law No. 5463 and Snow Clearing Policy.

3.19. Transit Routes, Transit Stops, and Bus Bays

Brandon Transit operates 8 regular routes and several industrial routes concentrated on the Arterial Street/Collector Street system that provide access to major destination and employment points in the City. Annual ridership is approximately 750,000 – 800,000 rides per year with peak periods during the winter months and slower periods during the summer months.

Brandon Transit provides current route maps/schedules on its website (www.brandontransit.ca).

Where development abuts an existing or planned transit route, the Proponent shall confirm (with the City Planning Department) any requirements to provide transit stops adjacent to or within their proposed development. When required, refer to **Appendix B** for bus bay standard drawings.

3.20. Truck Routes/Over-Dimensional Routes

The purpose of a truck route network is to minimize widespread deterioration of the transportation network as a result of heavy truck traffic, and to minimize traffic hazards and nuisances (such as noise and dust) in residential areas. The City's truck route network is available for viewing on the City's COBRA site and includes four classifications based on gross vehicle weight (GVW), from RTAC routes all the way down to city-restricted routes. The truck route map can be found here: https://brandon.ca/truck-routes.

For information relating to City truck routes and dangerous goods routes refer to Brandon's Traffic By-Law No. 5463, Part III and Schedule D.

Beyond the City truck route network, over-dimensional vehicles will (at times) also require access to the City's transportation network to move within and beyond the City. Permits for over-dimensional vehicles are administered by MTI's Motor Carrier Division. Permits are required for every over-dimension vehicle that accesses the transportation network.

3.21. Private Streets

Private streets may be developed at the local level or through industrial development. Proponents and/or the property owner are fully responsible for the construction and maintenance of these streets. Intersections of public streets and private streets will be considered as driveways and subject to the guidance provided above in Subsection 3.9 - Access and Driveways. At a minimum, private streets shall:

- meet the requirements set forth in Brandon Fire and Emergency Services' (BFES) *Street Development/Access Road Regulation/Addressing Policy*, "P19";
- be designed to accommodate ingress/egress, at all times, of both emergency response vehicles and sanitation vehicles;
- be designed/constructed in such a manner so as to have a similar design life as city-designed/constructed Local Streets and have a pavement design equivalent to that of a Local Street; and

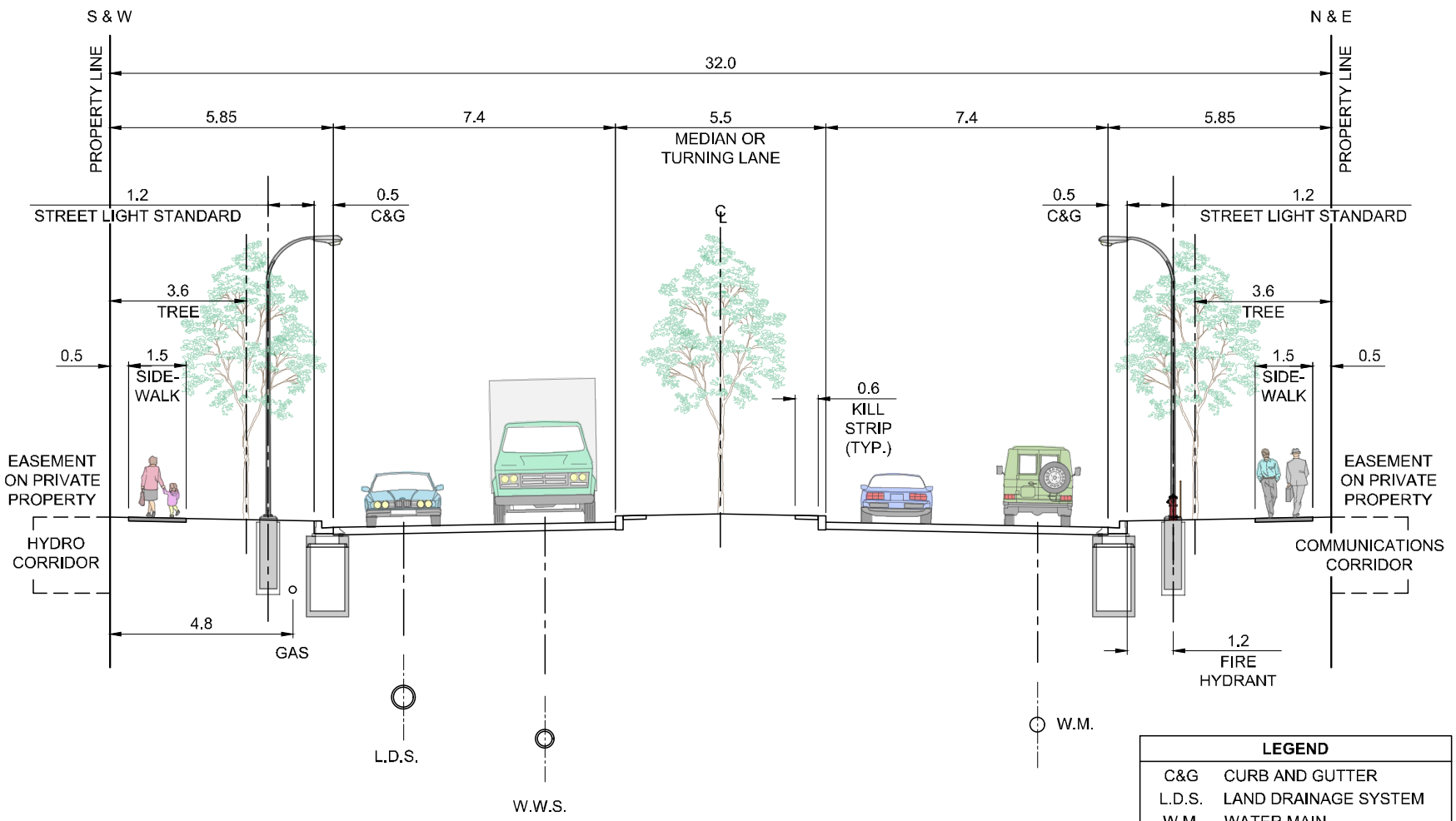
- Residential private streets are identified as common element on a plan of condominium typically to provide access to rowhouse development, or under one owner typically to provide access to a mobile/modular home development. A roadway cross-section shall include, at a minimum:
  - 7.3m of asphalt roadway surface with no street parking, or 9.4m with street parking on one side (excluding curb and gutter);
  - Where street parking is not provided or is insufficient for the development size, additional stand-alone parking shall be provided;
  - 1.5m sidewalk on one side (separate) or 1.8m when combined;
  - Lighting on one side.; and
  - Tree planting on both sides (May be included in either the common element or within private property)

All private streets that require connection to the City's transportation network will require City approval of their designs as part of the subdivision and/or development permit process.

Appendix 6A - Typical Roadway Cross-Sections

Includes:

- Cross-Sections Arterial – Urban
- Cross-Sections Arterial – Urban, With Public Reserve
- Cross-Sections Arterial – Rural
- Cross-Sections Arterial – Rural With Centre Median
- Cross-Sections Arterial – Rural With Public Reserve
- Cross-Sections Collector – Urban Single Parking Lane
- Cross-Sections Collector – Urban Two Lane Divided Double Parking Lanes
- Cross-Sections Collector – Urban Two Lane Undivided Double Parking Lanes
- Cross-Sections Collector – Rural Industrial
- Cross-Sections Local Street – Urban
- Cross-Sections Local Street – Urban (Downtown)
- Cross-Sections Local Street – Rural
- Cross-Sections Service Road
- Cross-Sections Back Lanes



LEGEND	
C&G	CURB AND GUTTER
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

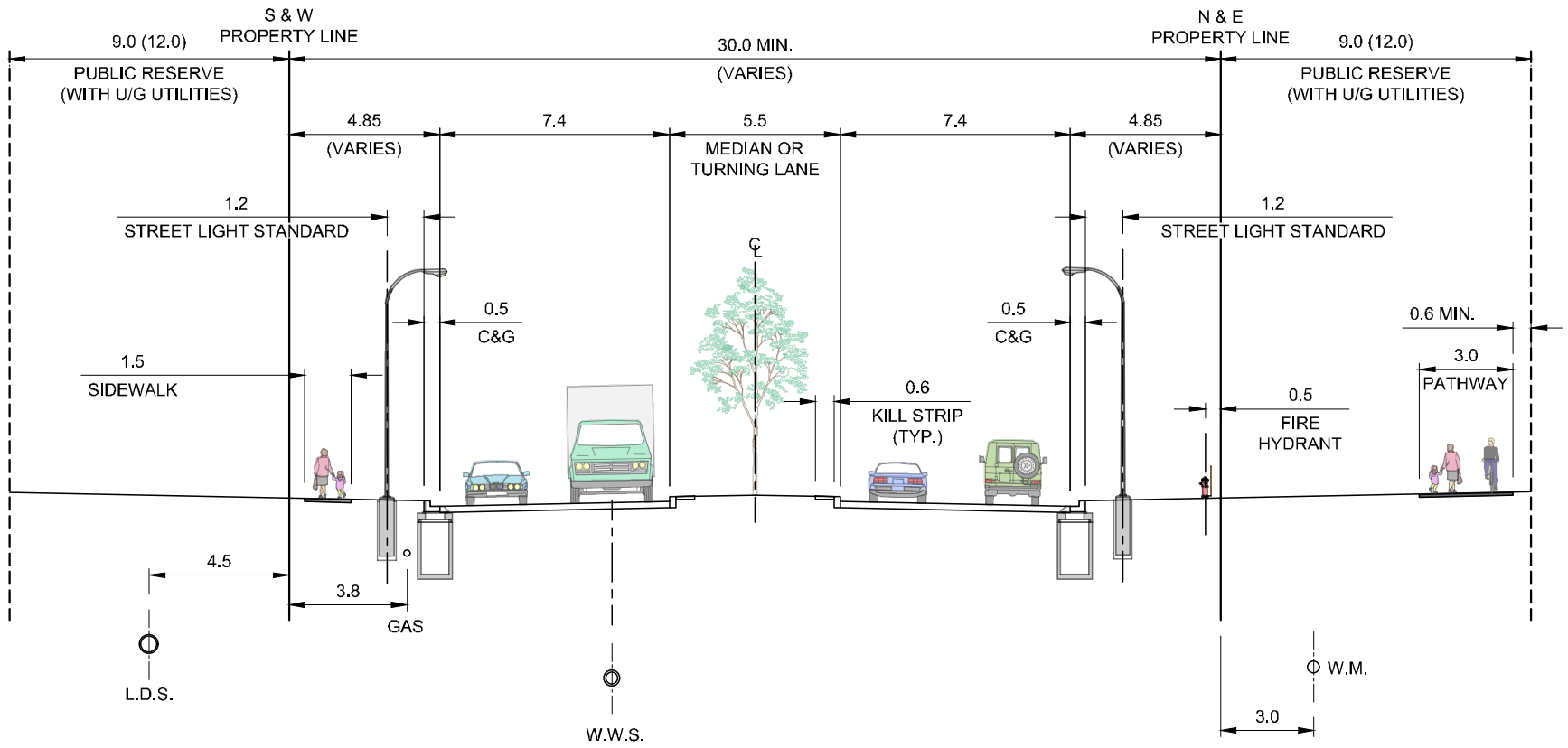
City of BRANDON

CROSS-SECTION

ARTERIAL - URBAN

SCALE: NTS

DRAWING No. 0001



LEGEND	
C&G	CURB AND GUTTER
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

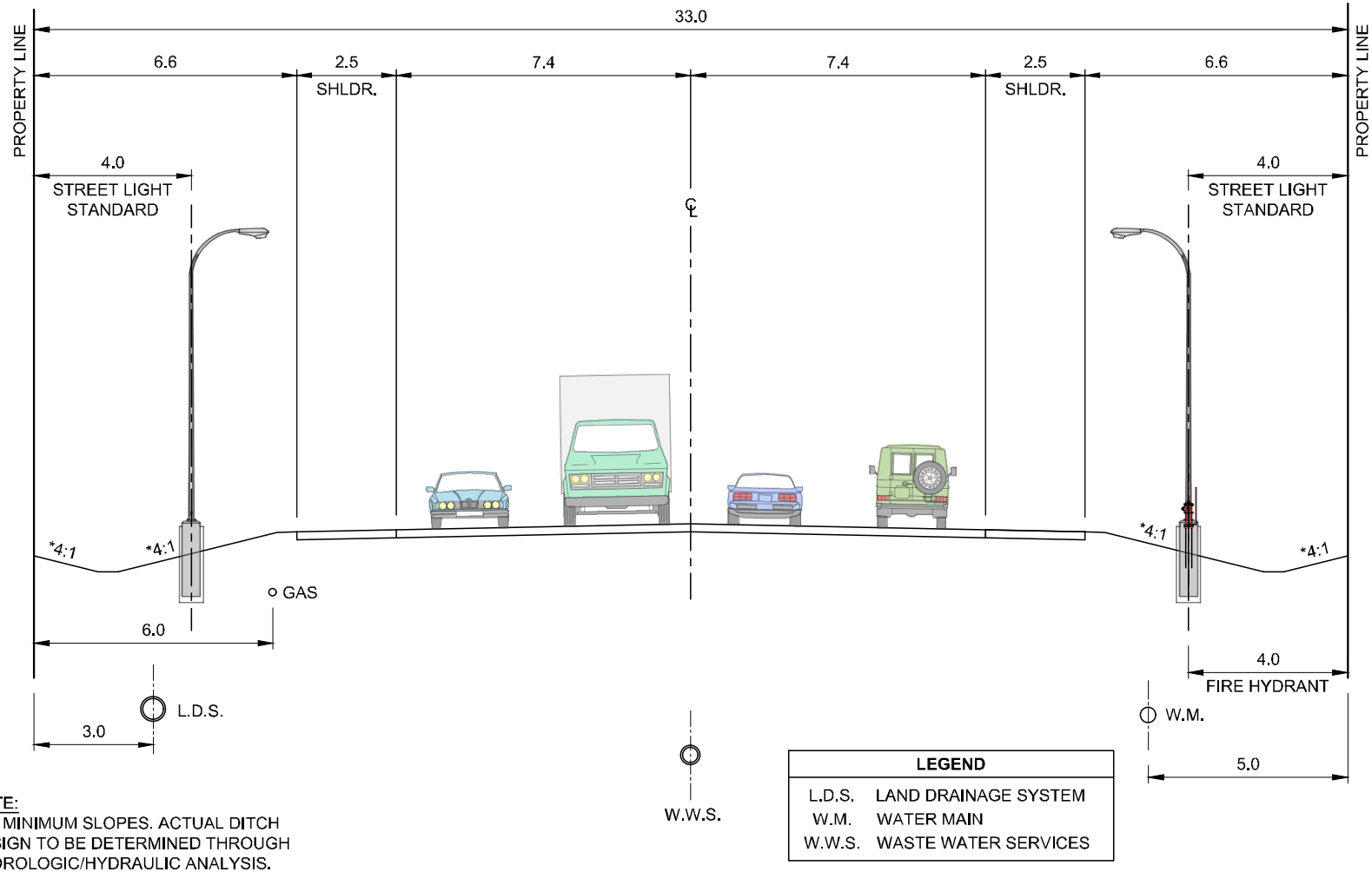
APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

CROSS-SECTION

ARTERIAL - URBAN
WITH PUBLIC RESERVE

SCALE:	DRAWING No.
NTS	0002



NOTE:
*4:1 MINIMUM SLOPES. ACTUAL DITCH DESIGN TO BE DETERMINED THROUGH HYDROLOGIC/HYDRAULIC ANALYSIS.

LEGEND	
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

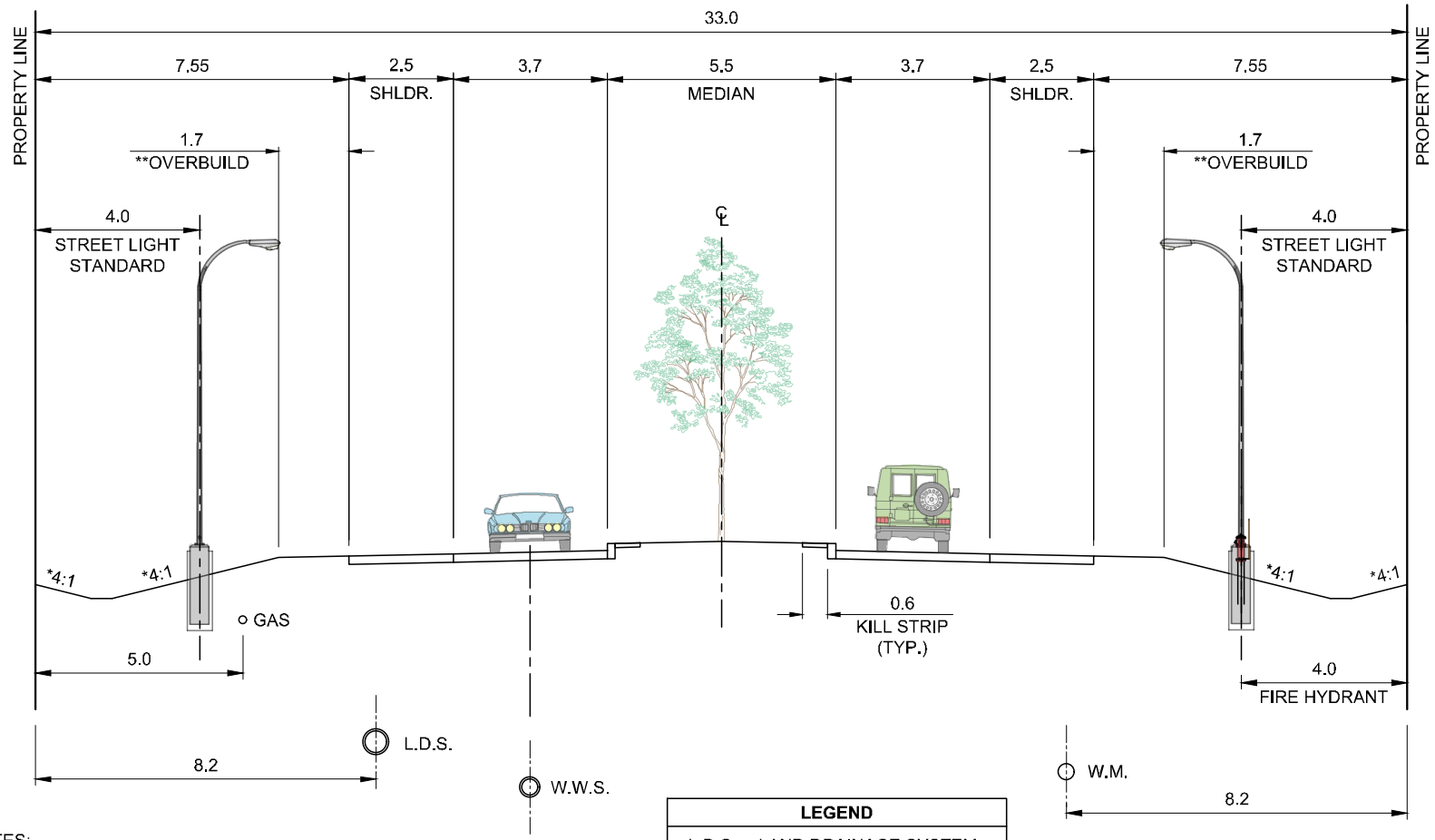
City of BRANDON

CROSS-SECTION

ARTERIAL - RURAL

SCALE: NTS

DRAWING No. 0003



NOTES:
*4:1 MINIMUM SLOPES. ACTUAL DITCH DESIGN TO BE DETERMINED THROUGH HYDROLOGIC/HYDRAULIC ANALYSIS.
**ROAD BED OVERBUILT TO ACCOMMODATE URBAN ARTERIAL.

LEGEND	
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

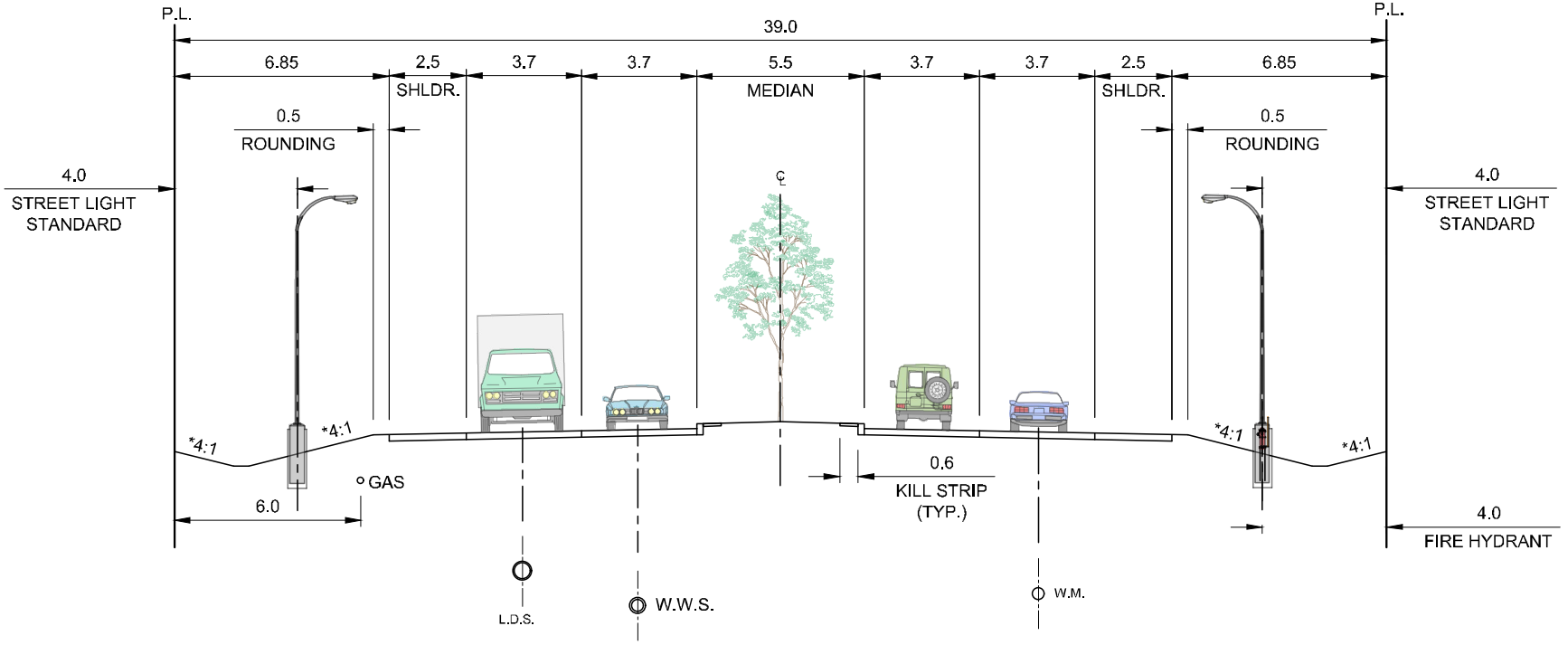
City of BRANDON

CROSS-SECTION

ARTERIAL - RURAL, 2-LANE DIVIDED

SCALE: NTS

DRAWING No. 0004



LEGEND	
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

NOTES:
*4:1 MINIMUM SLOPES. ACTUAL DITCH DESIGN TO BE DETERMINED THROUGH HYDROLOGIC/HYDRAULIC ANALYSIS.
**ROAD BED OVERBUILT TO ACCOMMODATE URBAN ARTERIAL.

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

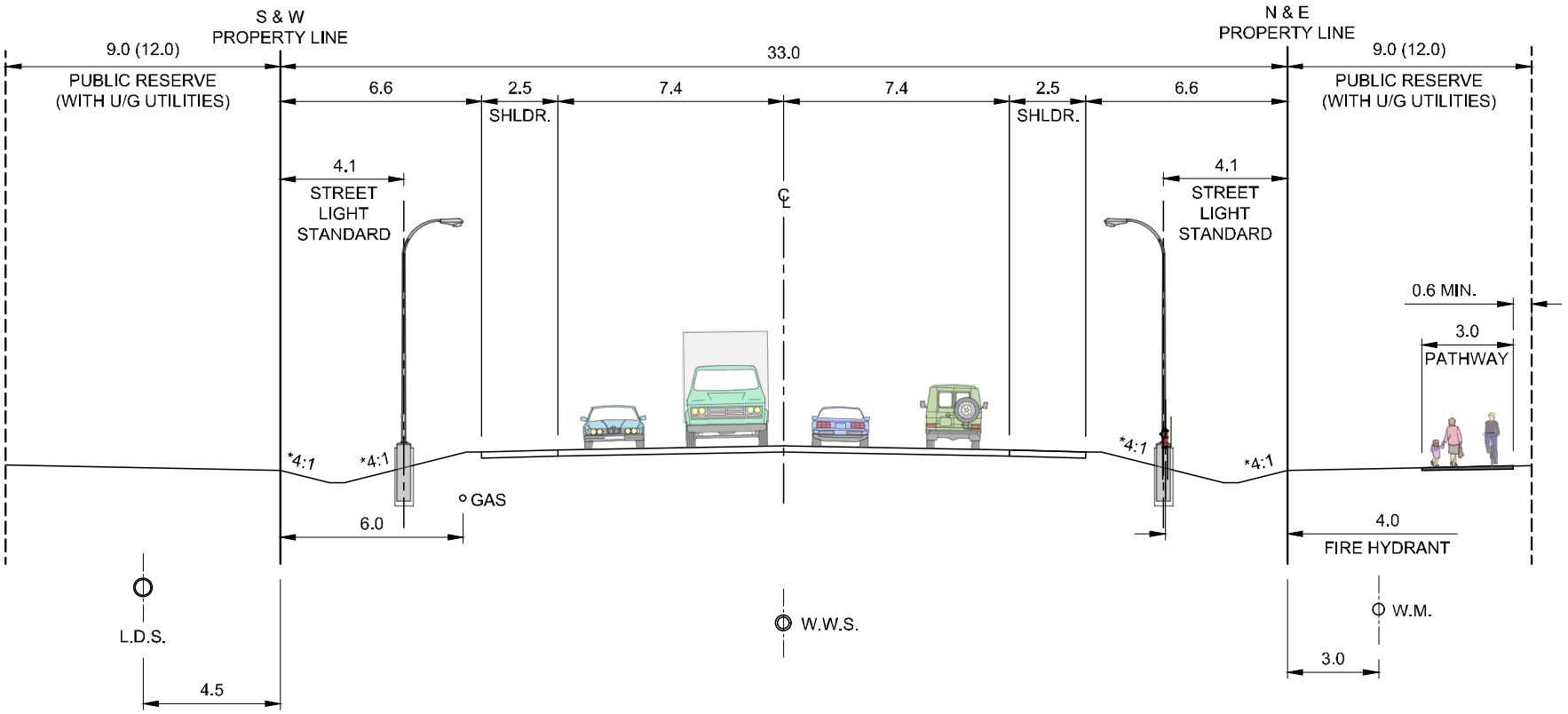
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

CROSS-SECTION

ARTERIAL - RURAL,
4-LANE DIVIDED

SCALE:	DRAWING No.
NTS	0005



LEGEND	
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

NOTE:
*4:1 MINIMUM SLOPES. ACTUAL DITCH DESIGN TO BE DETERMINED THROUGH HYDROLOGIC/HYDRAULIC ANALYSIS.

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

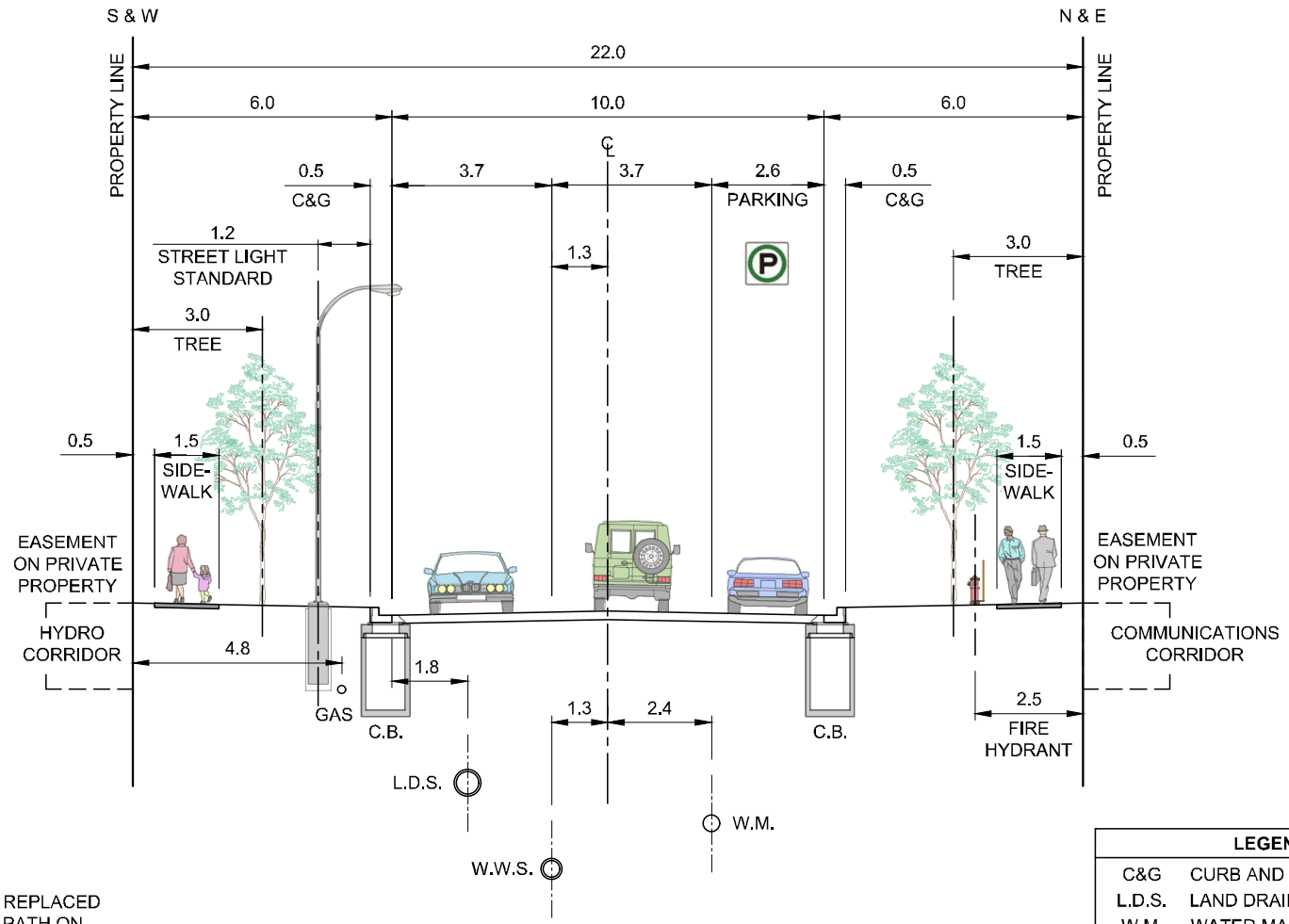
City of BRANDON

CROSS-SECTION

ARTERIAL - RURAL
WITH PUBLIC RESERVE

SCALE: NTS

DRAWING No. 0006



NOTE:
SIDEWALK MAY BE REPLACED WITH A MULTI-USE PATH ON THE SIDE WITHOUT HYDRANT.

LEGEND	
C&G	CURB AND GUTTER
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

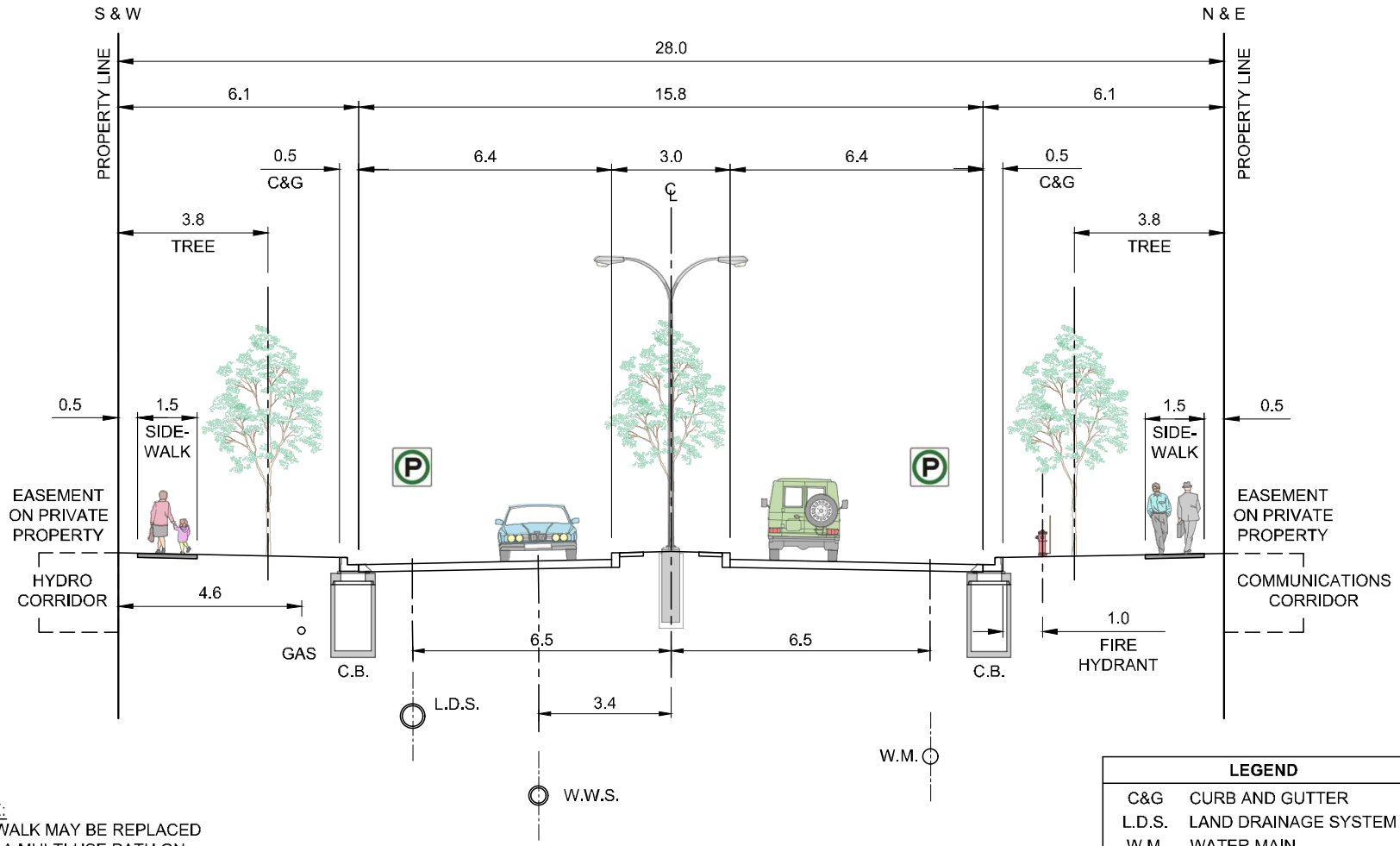
APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

CROSS-SECTION

COLLECTOR - URBAN
SINGLE PARKING LANE

SCALE:	DRAWING No.
NTS	0007



NOTE:
SIDEWALK MAY BE REPLACED WITH A MULTI-USE PATH ON THE SIDE WITHOUT HYDRANT.

LEGEND	
C&G	CURB AND GUTTER
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

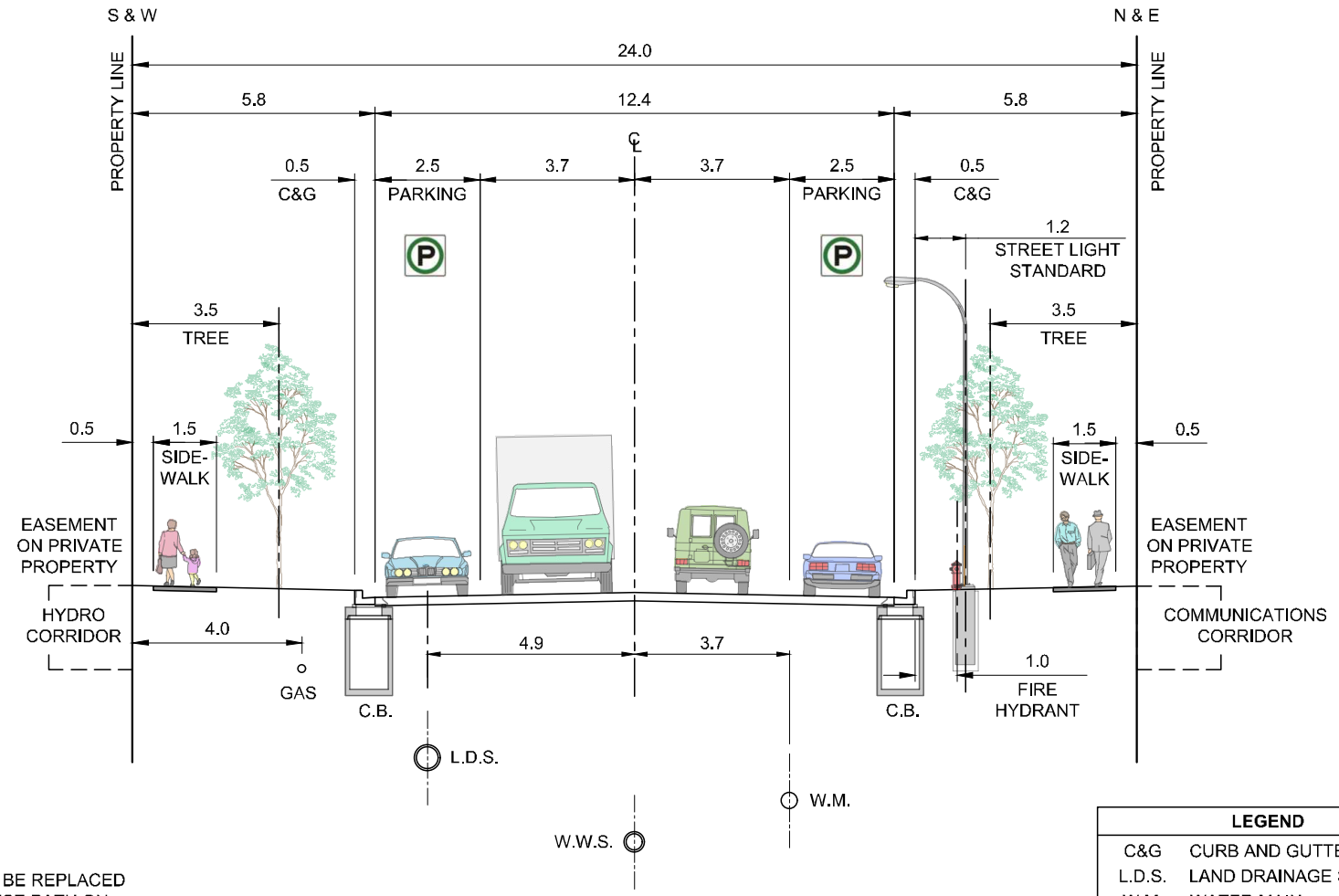
APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

CROSS-SECTION

COLLECTOR - URBAN
2-LANE DIVIDED
DOUBLE PARKING LANES

SCALE:	DRAWING No.
NTS	0008



NOTE:
SIDEWALK MAY BE REPLACED WITH A MULTI-USE PATH ON THE SIDE WITHOUT HYDRANT.

LEGEND	
C&G	CURB AND GUTTER
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

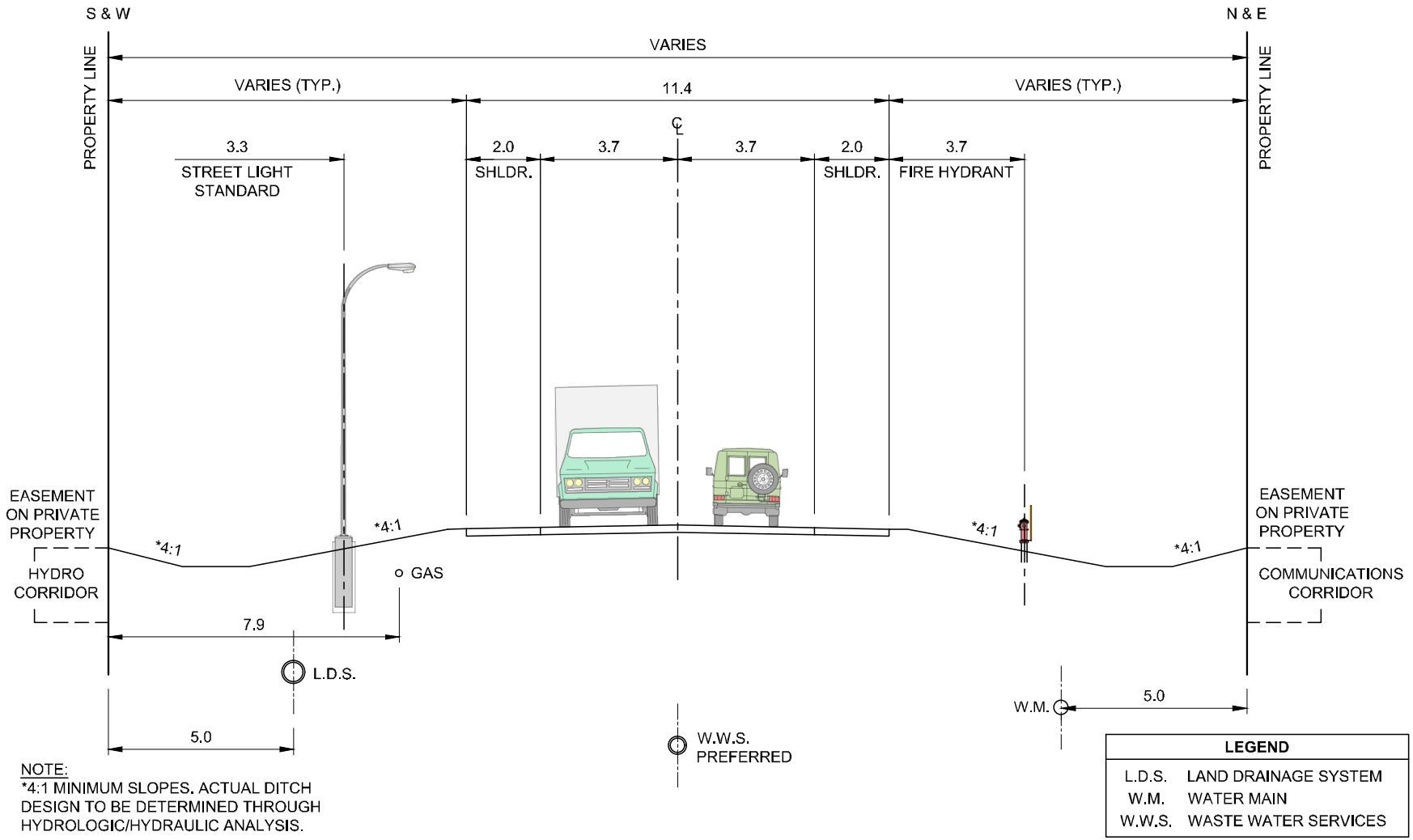
APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

CROSS-SECTION

COLLECTOR - URBAN,
2-LANE UNDIVIDED,
DOUBLE PARKING LANES

SCALE:	DRAWING No.
NTS	0009



NOTE:
*4:1 MINIMUM SLOPES. ACTUAL DITCH DESIGN TO BE DETERMINED THROUGH HYDROLOGIC/HYDRAULIC ANALYSIS.

LEGEND	
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

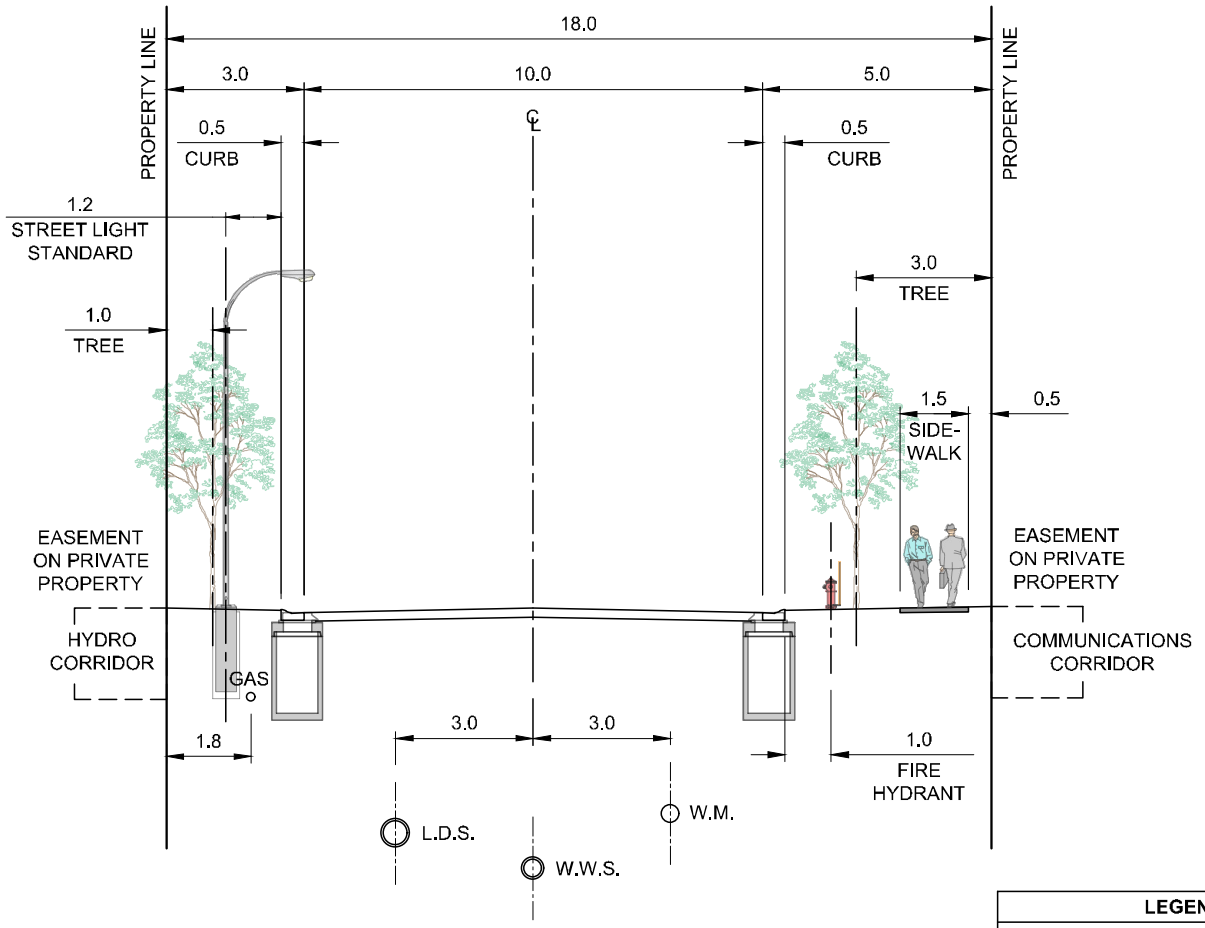
APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of Brandon

CROSS-SECTION

COLLECTOR - RURAL INDUSTRIAL

SCALE:	DRAWING No.
NTS	0010



LEGEND	
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

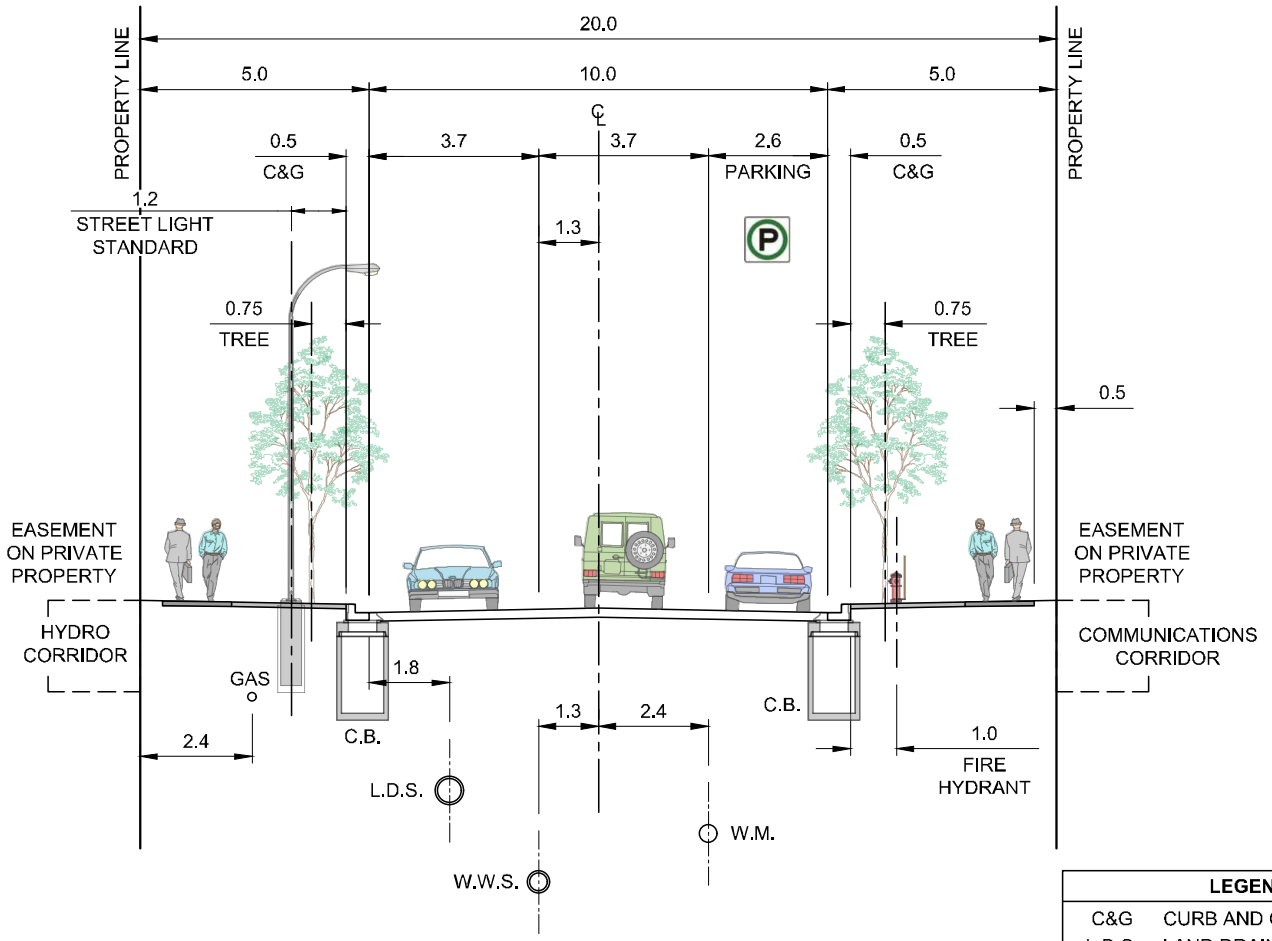
City of Brandon

CROSS-SECTION

LOCAL - URBAN

SCALE: NTS

DRAWING No. 0011



LEGEND	
C&G	CURB AND GUTTER
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

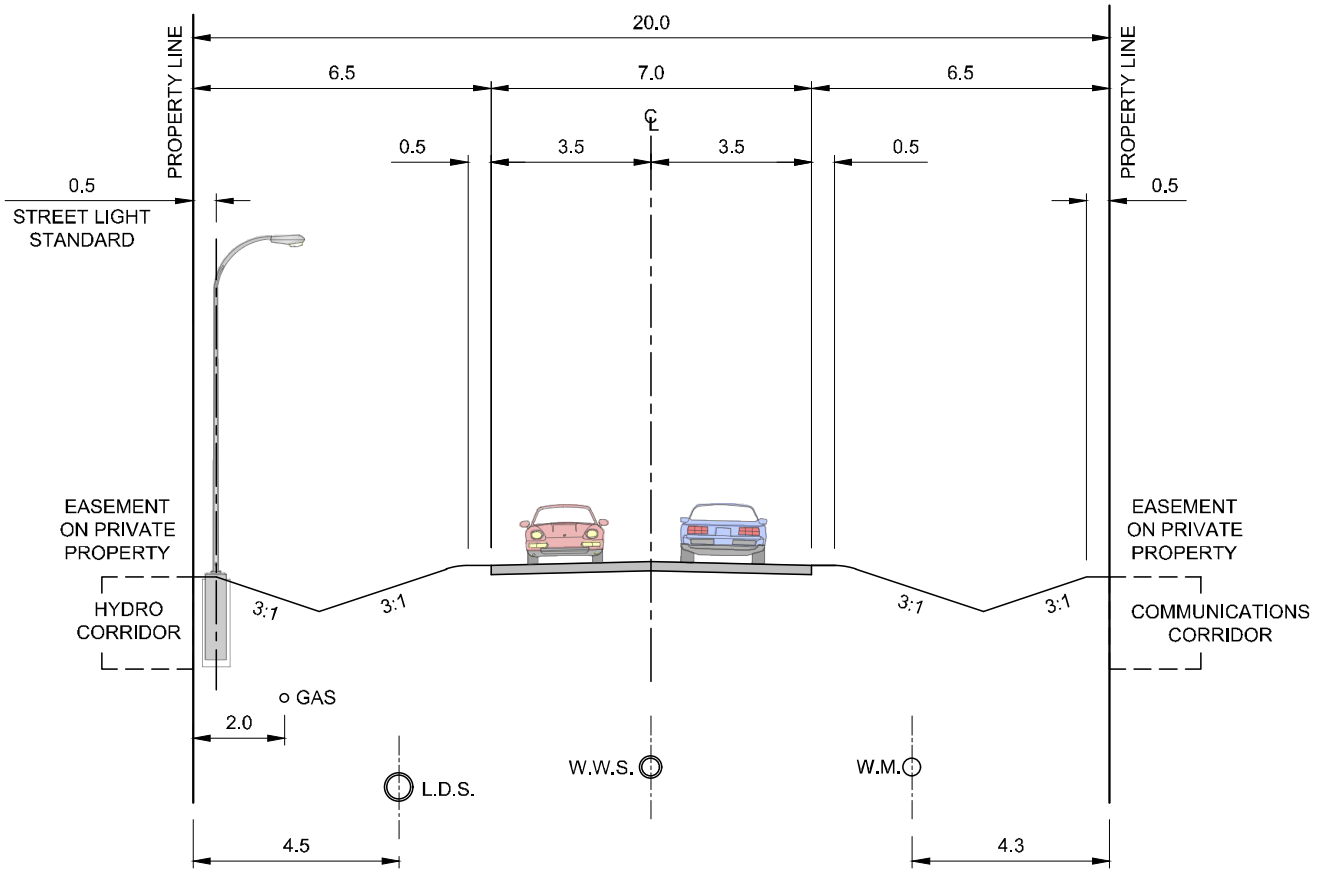
City of BRANDON

CROSS-SECTION

LOCAL - URBAN
(DOWNTOWN)

SCALE: NTS

DRAWING No. 0012



LEGEND	
L.D.S.	LAND DRAINAGE SYSTEM
W.M.	WATER MAIN
W.W.S.	WASTE WATER SERVICES

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

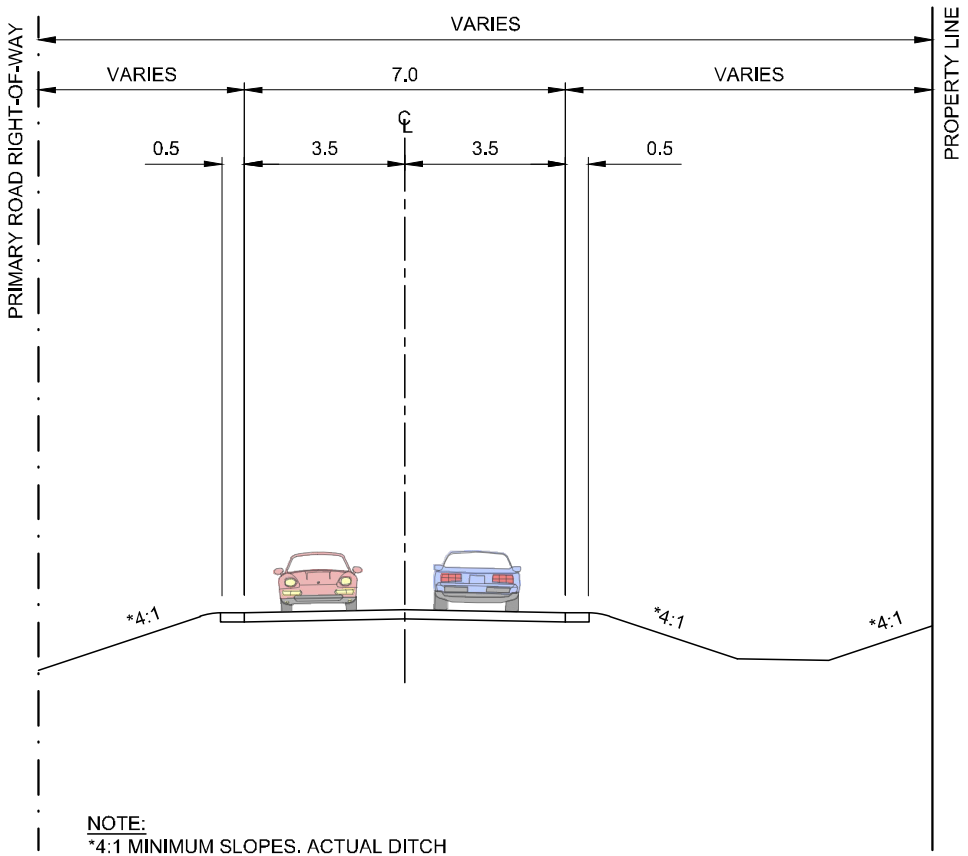
APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of Brandon

CROSS-SECTION

LOCAL - RURAL

SCALE:	DRAWING No.
NTS	0013



NOTE:
*4:1 MINIMUM SLOPES. ACTUAL DITCH DESIGN TO BE DETERMINED THROUGH HYDROLOGIC/HYDRAULIC ANALYSIS.

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

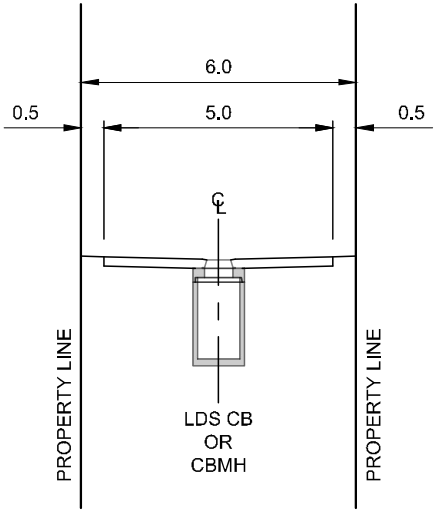
City of BRANDON

CROSS-SECTION

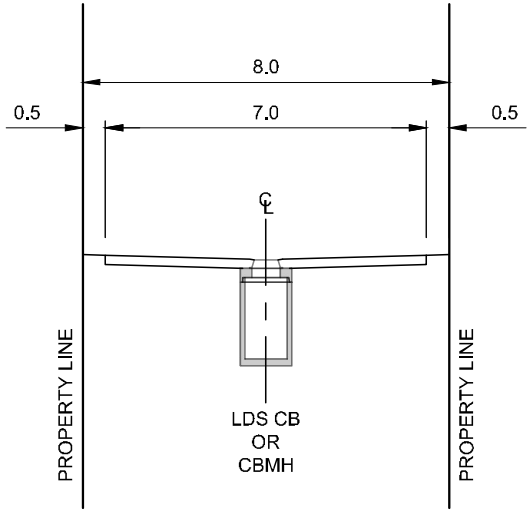
SERVICE ROAD

SCALE: NTS

DRAWING No. 0014



RESIDENTIAL LANE



COMMERCIAL / INDUSTRIAL LANE

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of Brandon

CROSS-SECTION

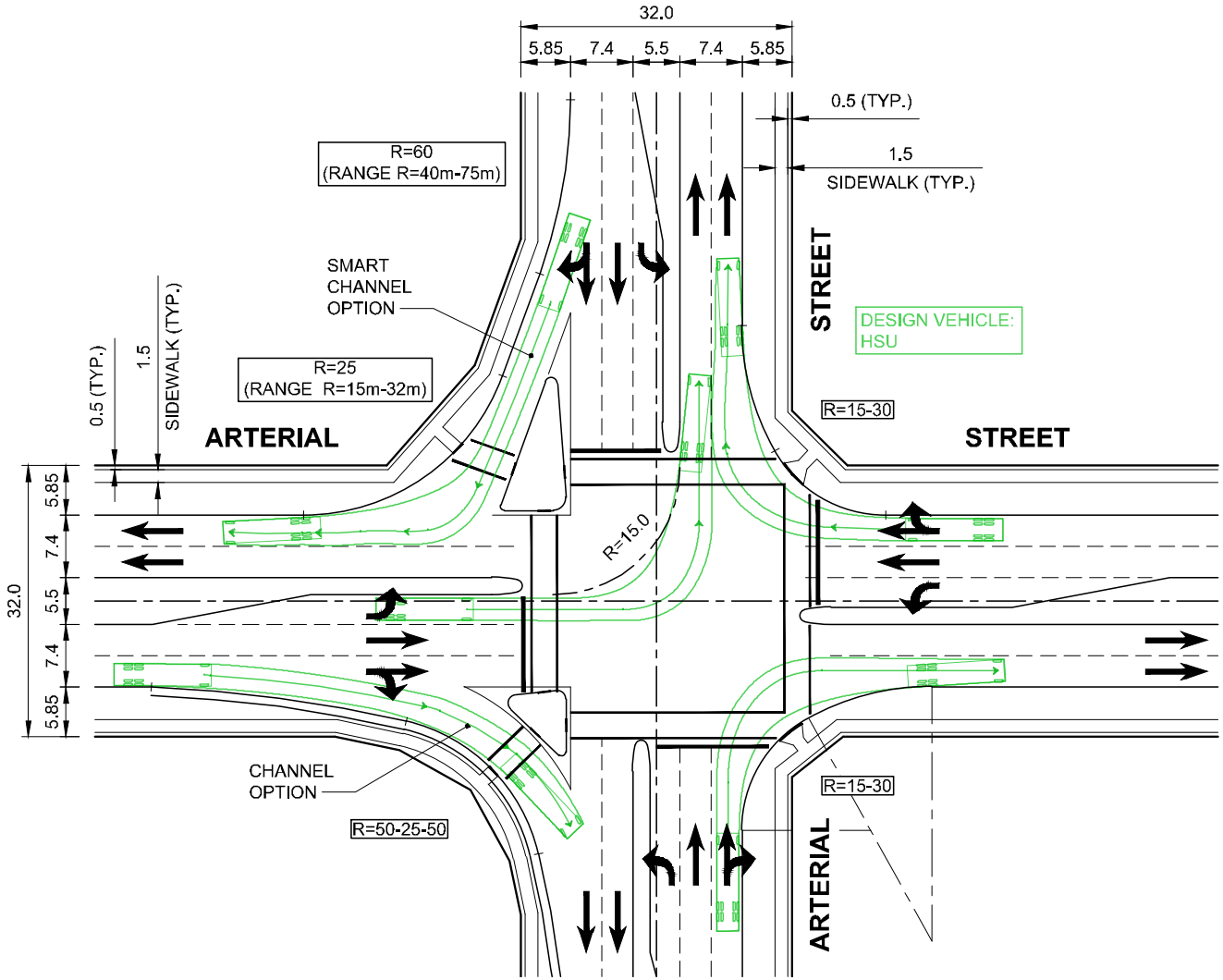
PUBLIC LANE

SCALE:	DRAWING No.
NTS	0015

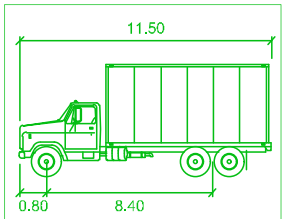
Appendix 6B – Typical Intersections and Other Details

Includes:

- Typical Intersections Arterial / Arterial
- Typical Intersections Arterial / Collector
- Typical Intersections Arterial / Service Road
- Typical Intersections Collector / Collector
- Typical Intersections Collector / Local
- Typical Intersections Collector / Back Lane
- Typical Intersections Local / Local
- Typical Intersections Local / Back Lane and Back Lane / Back Lane
- Roundabout Arterial / Collector Intersection
- Roundabout Collector / Local Intersection
- Roundabout Local / Local Intersection
- Turn Lanes Right-Turn Lane
- Turn Lanes Left-Turn Lane
- Cul-de-Sac Residential & Commercial / Industrial
- Typical Back Lane Turnarounds
- Bus Bays
- Typical Transit Stop Landing Pad
- Typical Curbs



DRIVING VEHICLE:



HSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

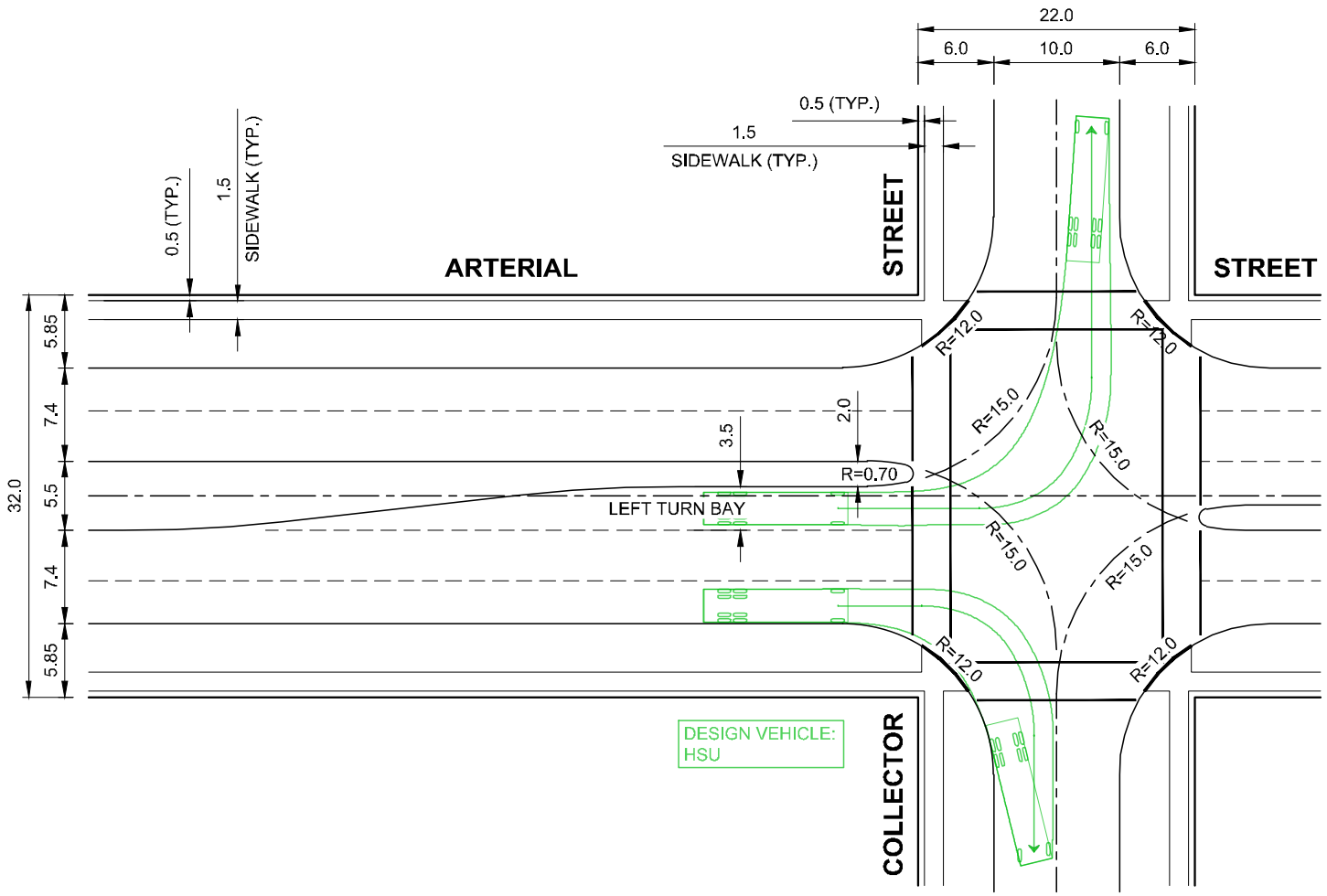
City of BRANDON

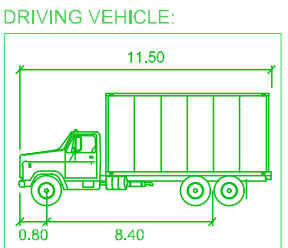
TYPICAL INTERSECTION

ARTERIAL / ARTERIAL

SCALE: NTS

DRAWING No. 0016





No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

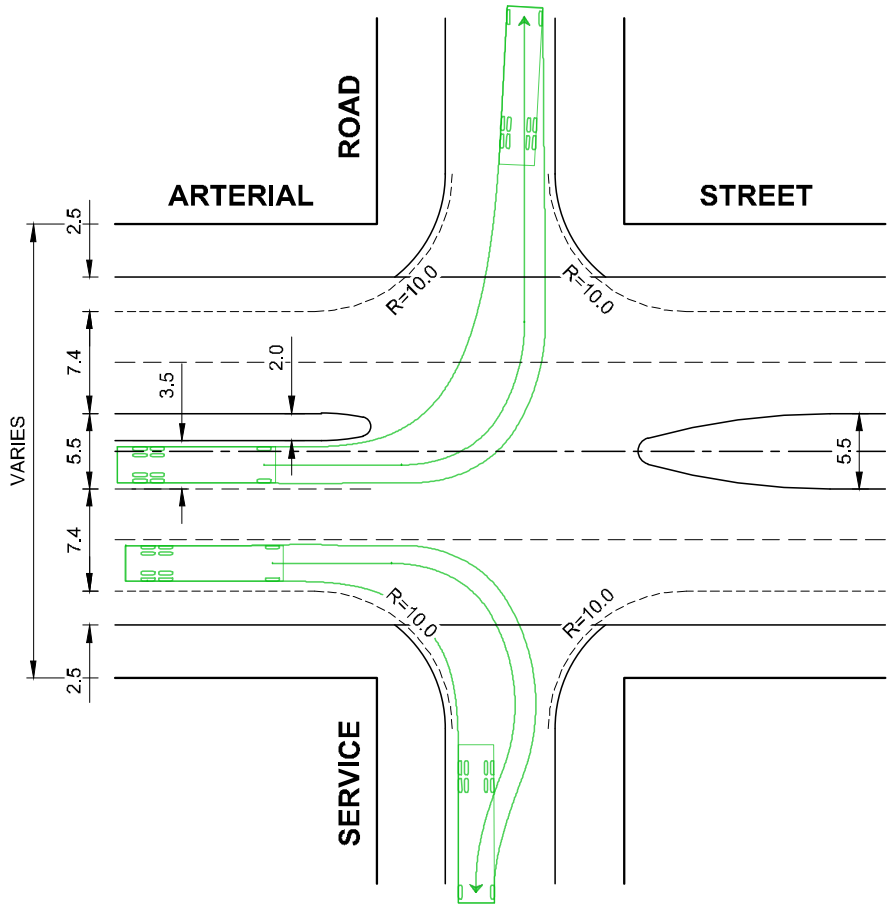
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

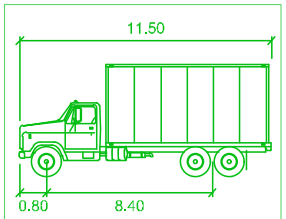
TYPICAL INTERSECTION
ARTERIAL / COLLECTOR

SCALE: NTS

DRAWING No. 0017



DRIVING VEHICLE:



HSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

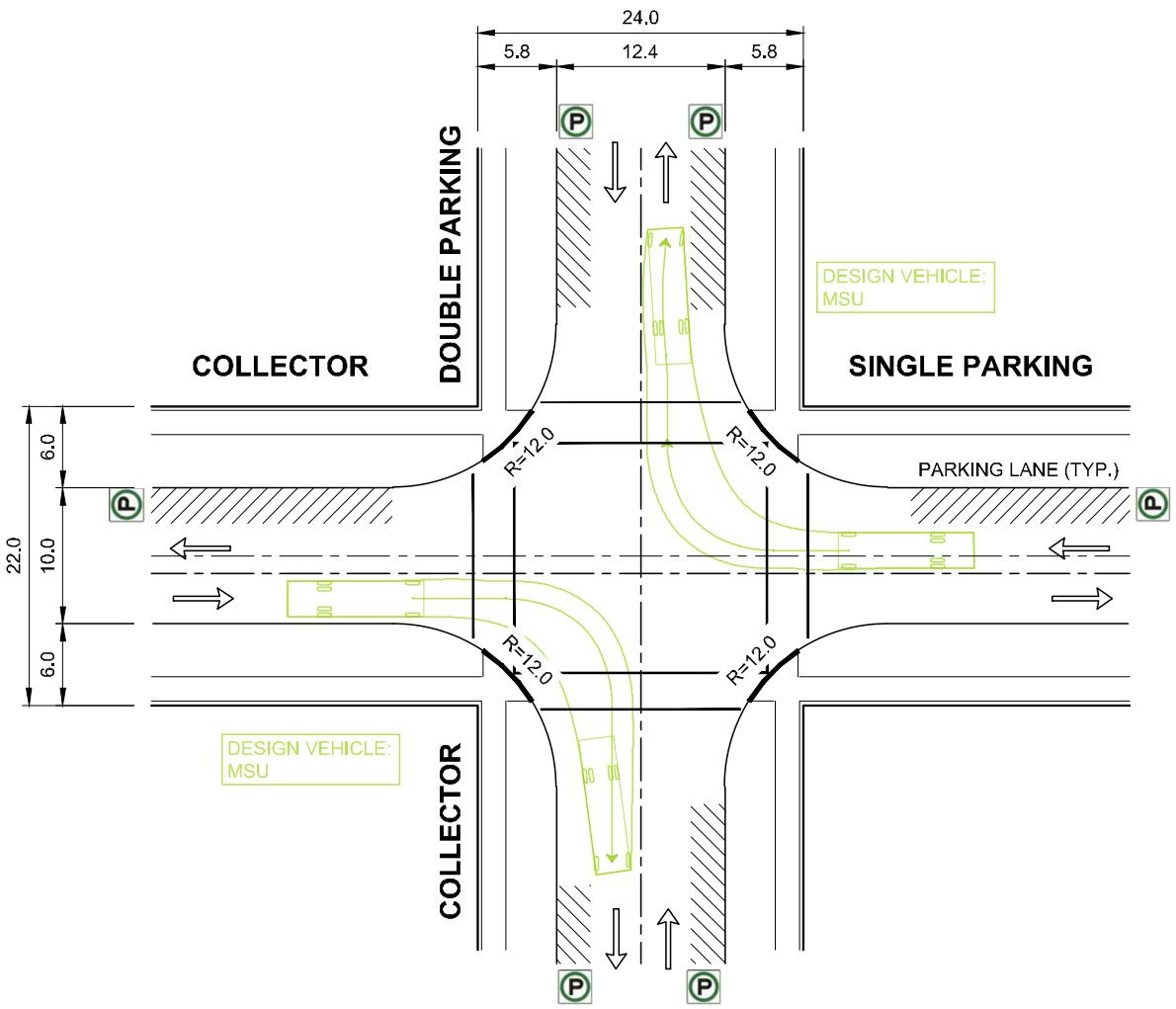
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

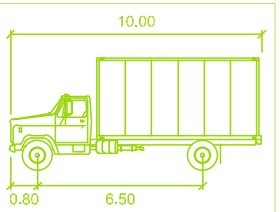
TYPICAL INTERSECTION
ARTERIAL / SERVICE RD

SCALE: NTS

DRAWING No. 0018



DRIVING VEHICLE:



MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

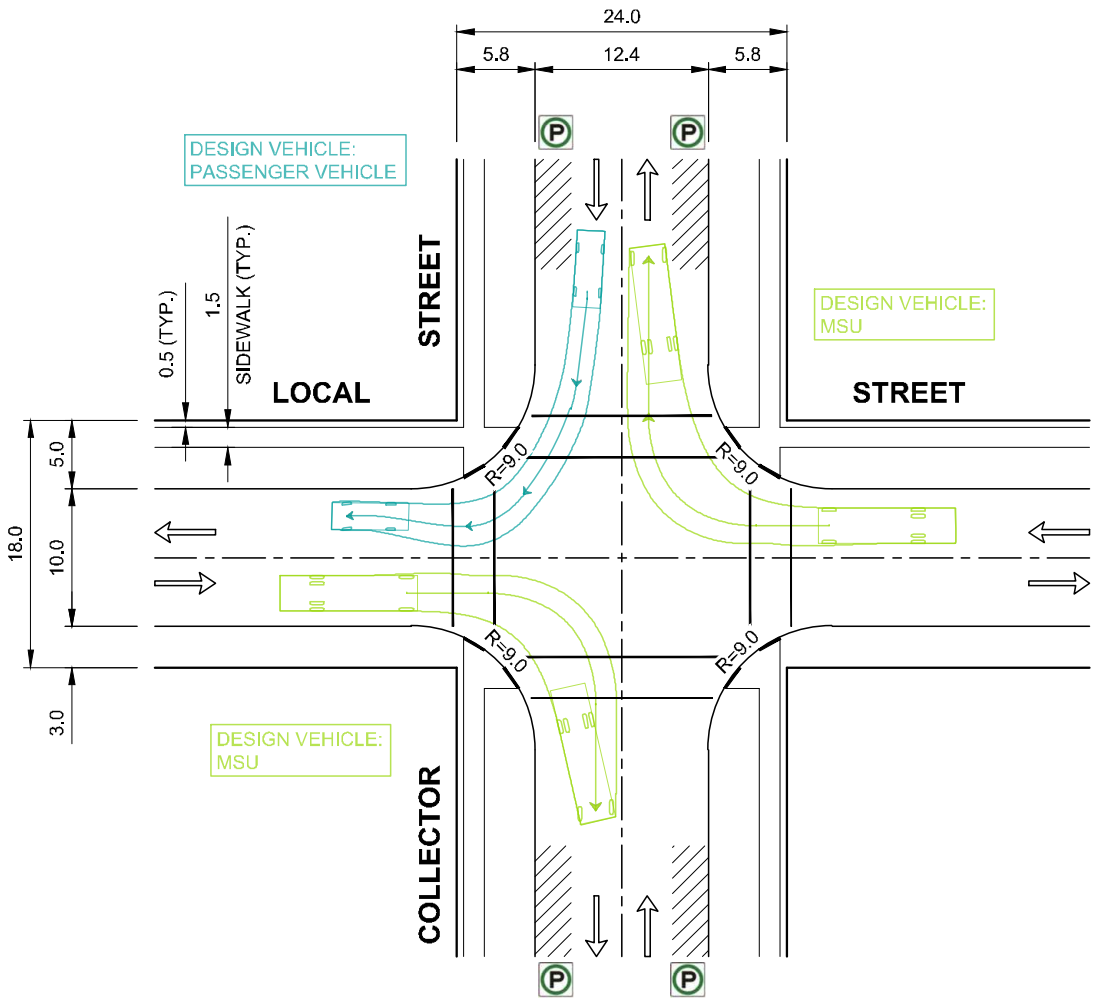
No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

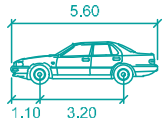
City of BRANDON

TYPICAL INTERSECTION
COLLECTOR / COLLECTOR

SCALE:	DRAWING No.
NTS	0019

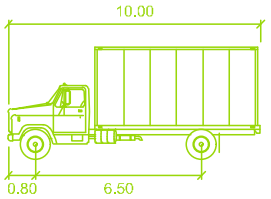


DRIVING VEHICLES:



PASSENGER VEHICLE

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9



MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

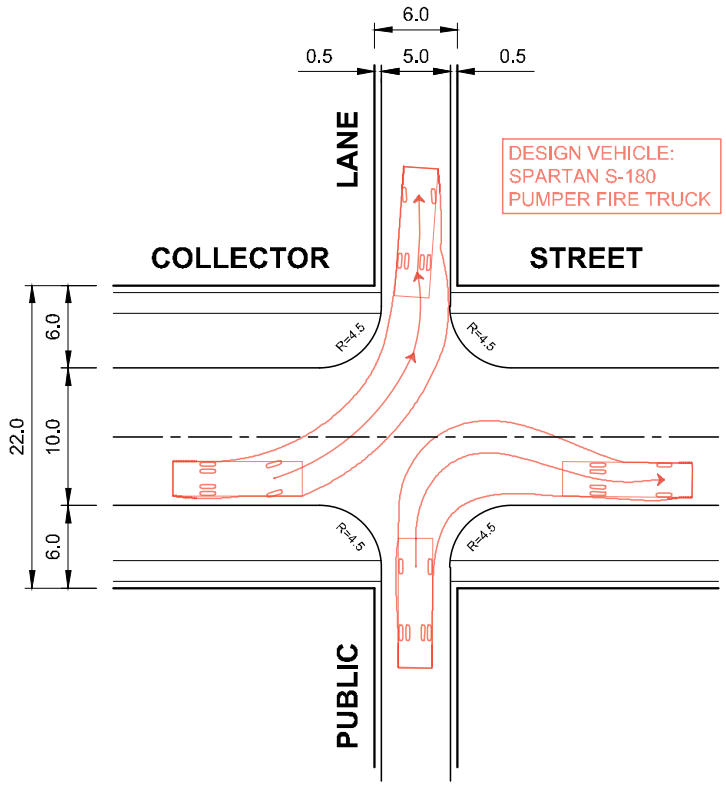
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

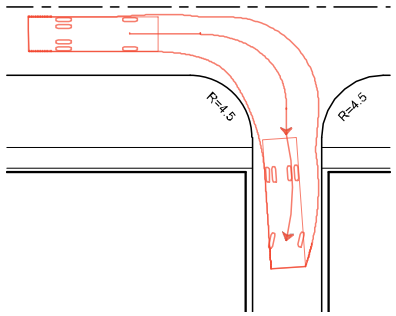
TYPICAL INTERSECTION
LOCAL / COLLECTOR

SCALE: NTS

DRAWING No. 0020

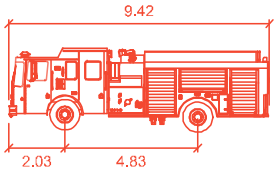


DESIGN VEHICLE:
SPARTAN S-180
PUMPER FIRE TRUCK



RIGHT TURN INTO LANE

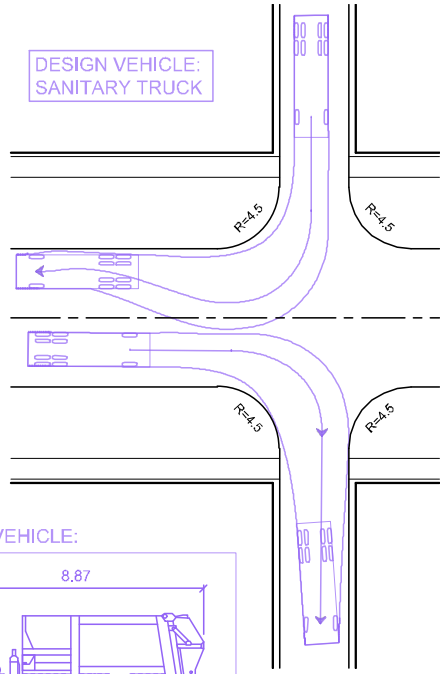
DRIVING VEHICLE:



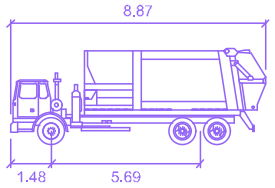
Spartan S-180 Pumper

	meters
Width	: 2.49
Track	: 2.42
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

DESIGN VEHICLE:
SANITARY TRUCK



DRIVING VEHICLE:



Sanitation Truck

	meters
Width	: 2.44
Track	: 2.44
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

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APPROVALS

SIGNATURE	SIGNATURE
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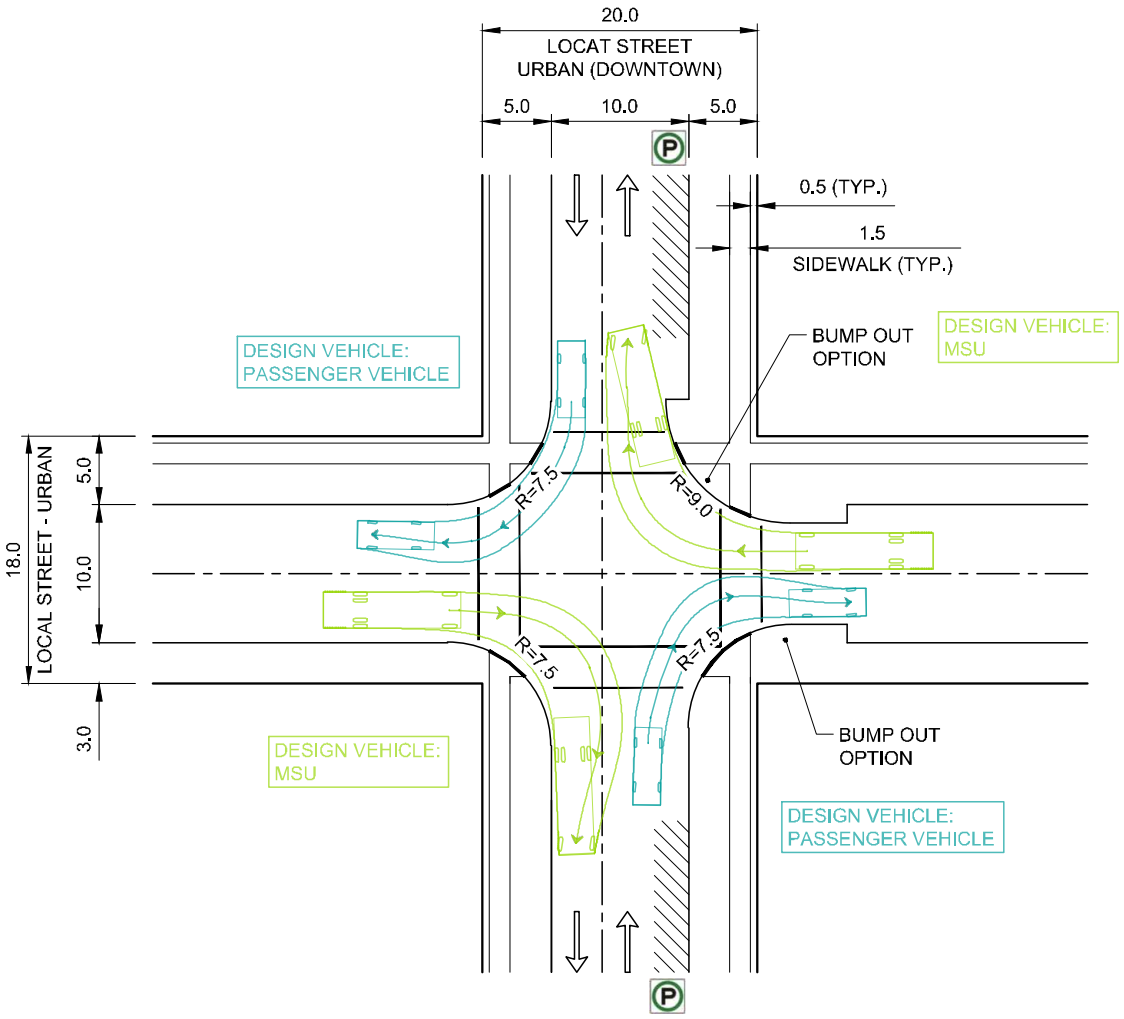
City of BRANDON

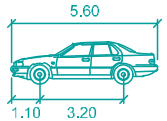
TYPICAL INTERSECTION

COLLECTOR / PUBLIC LANE

SCALE:	DRAWING No.
NTS	0021

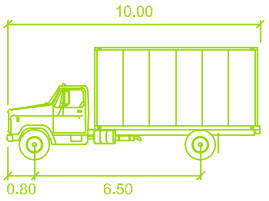


DRIVING VEHICLES:



PASSENGER VEHICLE

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9



MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

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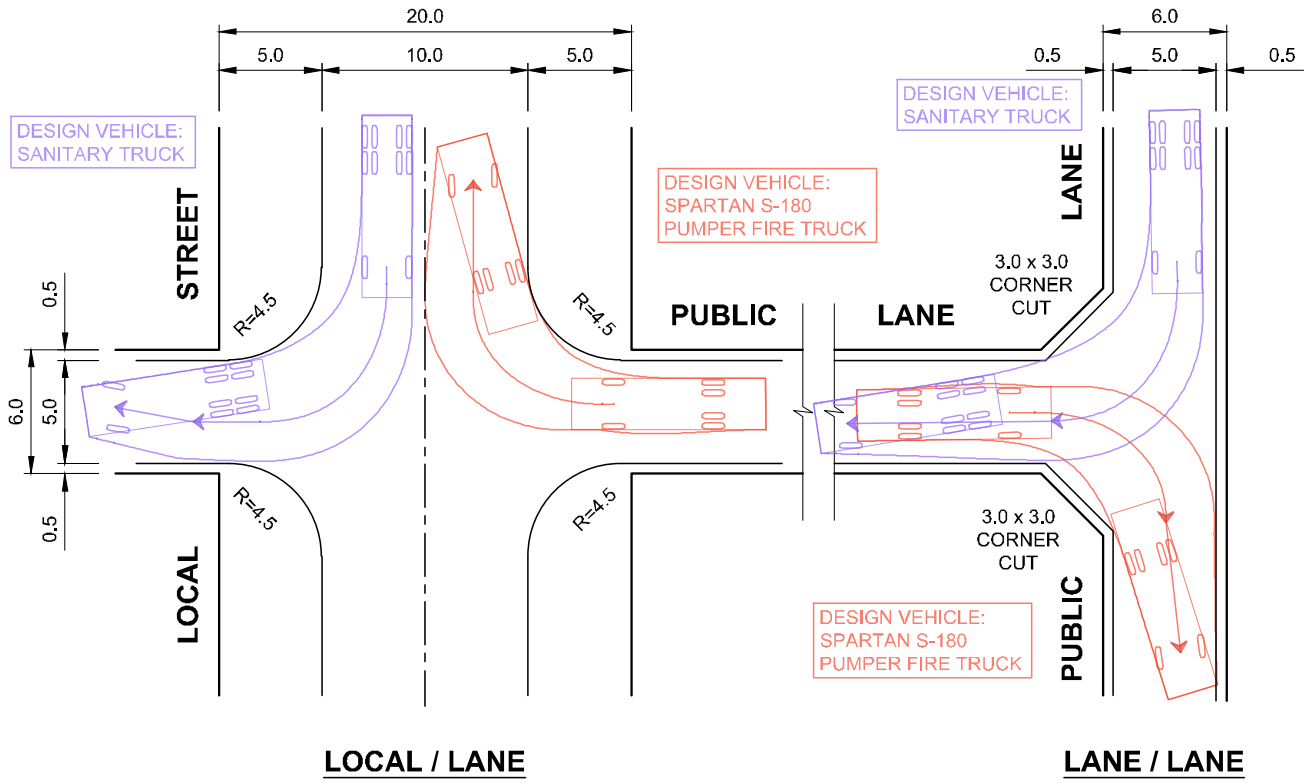
City of BRANDON

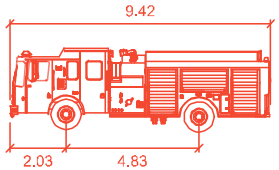
TYPICAL INTERSECTION

LOCAL / LOCAL

SCALE:	DRAWING No.
NTS	0022

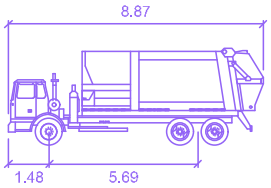


DRIVING VEHICLE:



Spartan S-180 Pumper

	meters
Width	: 2.49
Track	: 2.42
Lock to Lock Time	: 6.0
Steering Angle	: 45.0



Sanitation Truck

	meters
Width	: 2.44
Track	: 2.44
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

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APPROVALS

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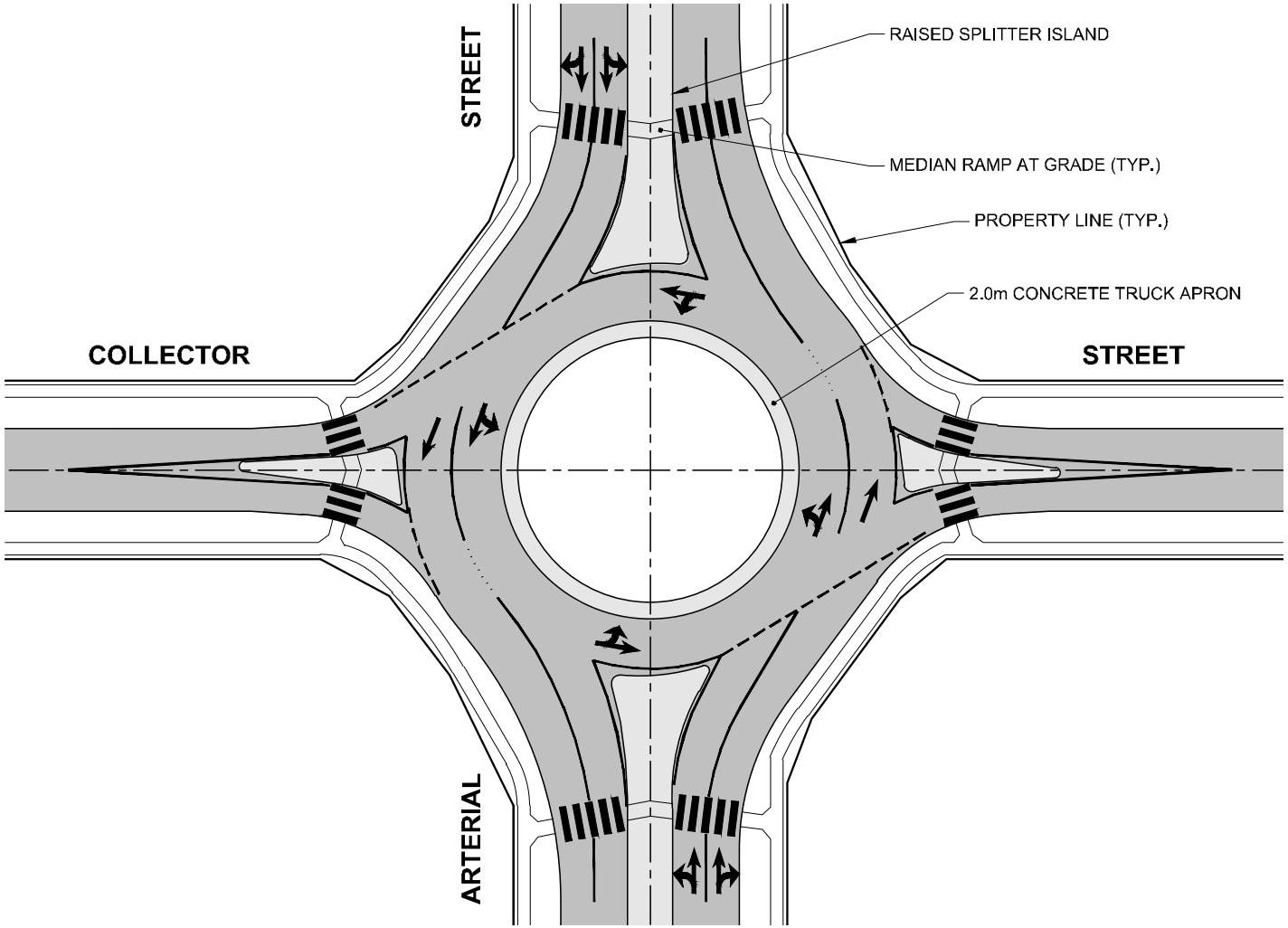
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

TYPICAL INTERSECTION

LOCAL / LANE
LANE / LANE

SCALE:	DRAWING No.
NTS	0023



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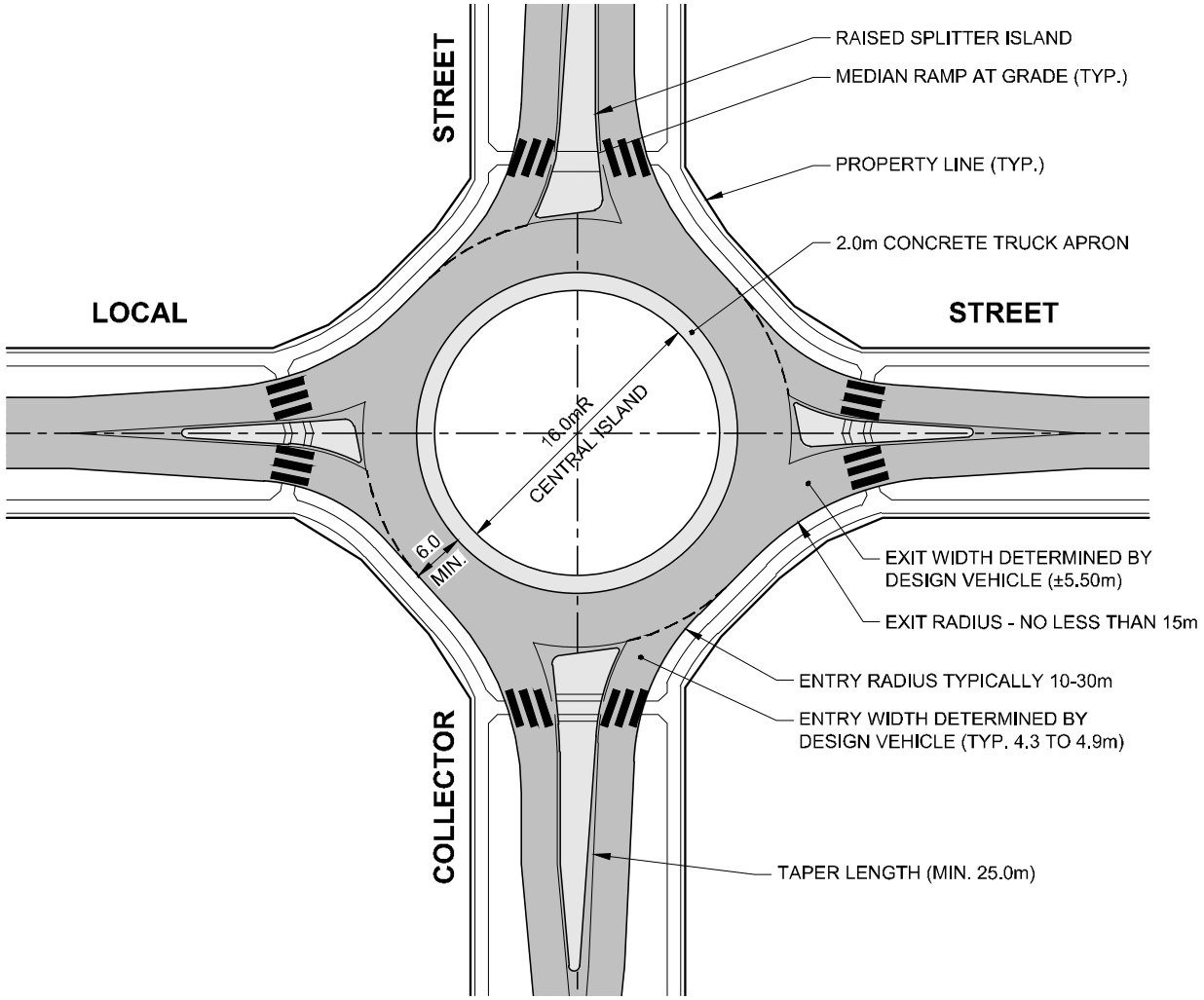
APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

ROUNDABOUT

ARTERIAL - COLECTOR INTERSECTION

SCALE:	DRAWING No.
NTS	0024



No.	REVISION DESCRIPTION	DATE	BY
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APPROVALS

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NAME	NAME
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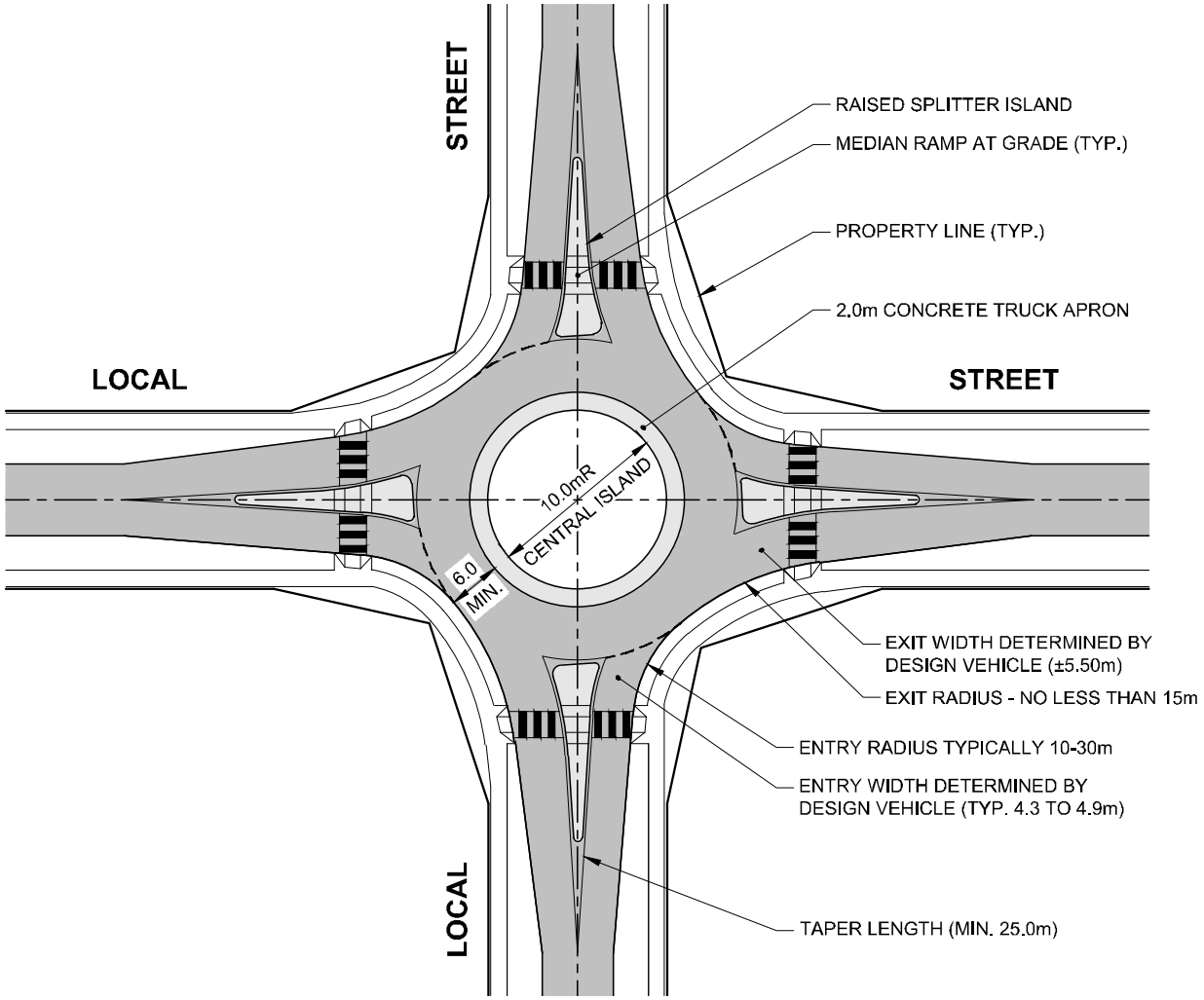
City of BRANDON

ROUNDABOUT

COLLECTOR - LOCAL INTERSECTION

SCALE: NTS

DRAWING No. 0025



No.	REVISION DESCRIPTION	DATE	BY
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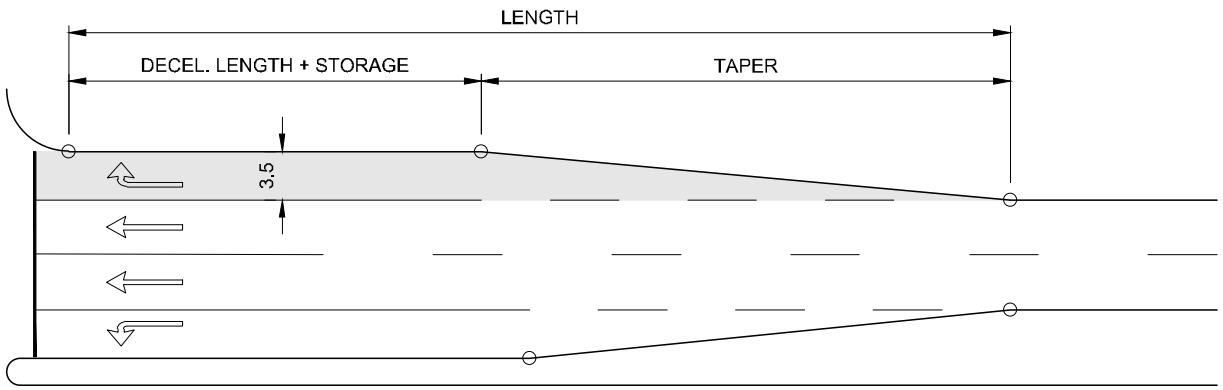
APPROVALS	
SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

ROUNDABOUT

LOCAL INTERSECTION

SCALE:	DRAWING No.
NTS	0026



CONDITION	DESIGN SPEED (km/h)	DECEL. LENGTH (m)	MINIMUM STORAGE (m)	TAPER	MINIMUM LENGTH (m)
FREE FLOW	50	30	0	11 : 1	70
	60	45	0	14 : 1	95
	70	60	0	17 : 1	120
	80	75	0	17 : 1	135
STOP / SIGNAL	50	30	15*	11 : 1	85
	60	45	15*	14 : 1	110
	70	60	15*	17 : 1	135
	80	75	15*	17 : 1	150
NO TURN ON RED / CONFLICT	50	30	15*	11 : 1	85
	60	45	15*	14 : 1	110
	70	60	15*	17 : 1	135
	80	75	15*	17 : 1	150

* NOTE: 15m IS THE MINIMUM STORAGE LENGTH. OPERATIONAL ANALYSIS MAY RESULT IN LONGER STORAGE NEEDS.

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APPROVALS

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DATE SIGNED	DATE SIGNED

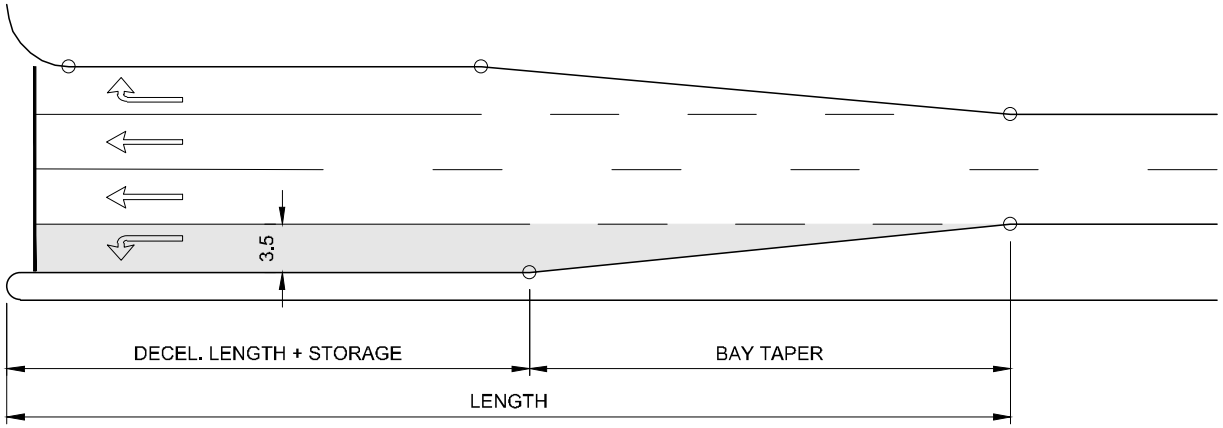
City of BRANDON

TURN LANES

RIGHT-TURN LANE

SCALE: NTS

DRAWING No. 0027



DESIGN SPEED (km/h)	DECEL. LENGTH + STORAGE (m)	MINIMUM STORAGE (m)	TAPER	MINIMUM LENGTH (m)
50	30	15*	10 : 1	80
60	45	15*	10 : 1	95
70	60	15*	10 : 1	110
80	75	15*	13 : 1	140

* NOTE: 15m IS THE MINIMUM STORAGE LENGTH. OPERATIONAL ANALYSIS MAY RESULT IN LONGER STORAGE NEEDS.

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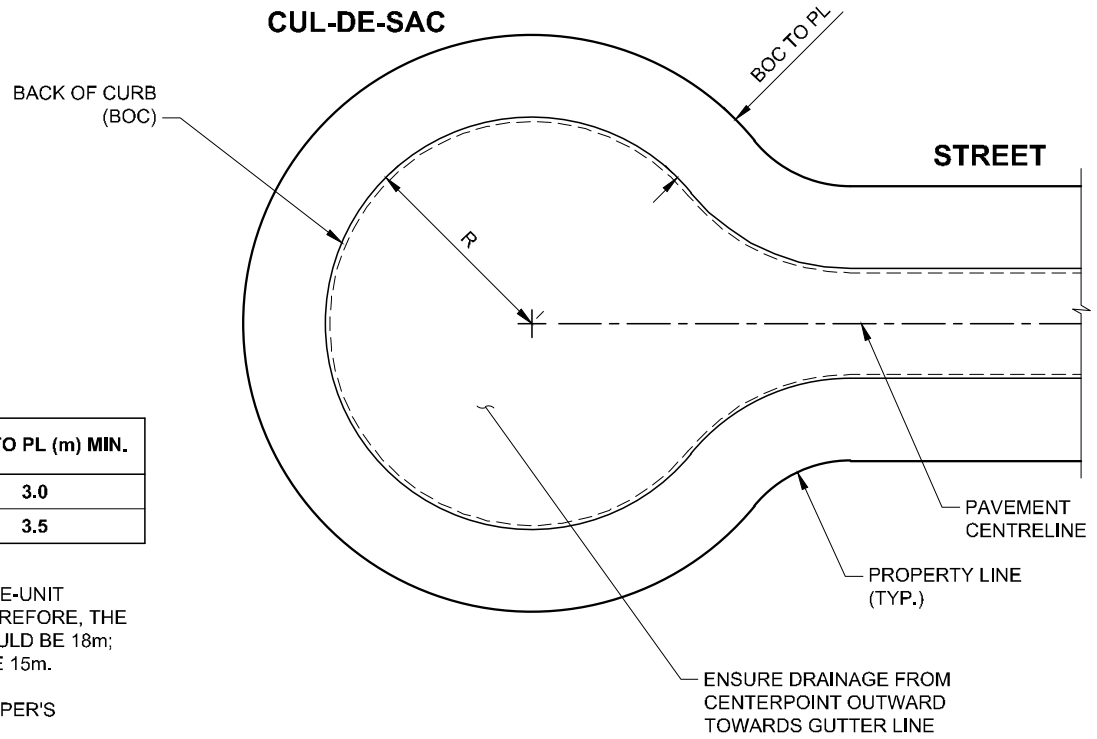
City of BRANDON

TURN LANES

LEFT-TURN LANE

SCALE: NTS

DRAWING No. 0028



CUL-DE-SAC PARAMETERS:

CLASSIFICATION	R (m)	BOC TO PL (m) MIN.
RESIDENTIAL	15.0	3.0
COMMERCIAL / INDUSTRIAL	18.0	3.5

NOTES:
THE CUL-DE-SAC MUST ALLOW MEDIUM HEAVY SINGLE-UNIT VEHICLE TURNAROUND AND PARALLEL PARKING, THEREFORE, THE MINIMUM RADIUS FOR COMMERCIAL/INDUSTRIAL SHOULD BE 18m; FOR LOCAL RESIDENTAL MINIMUM RADIUS SHOULD BE 15m.

THE FOLLOWING CONDITIONS APPLY (AT THE DEVELOPER'S EXPENSE):

1. MINIMUM RADIUS OF 18m.
2. ENTRY MUST BE POSTED WITH "NO EXIT SIGNS": FOR COMMERCIAL & INDUSTRIAL ROADWAYS ONLY.
3. R.O.W. MUST BE DEDICATED AT THE TIME OF SUBDIVISION.
4. NO PARKING SIGNS.

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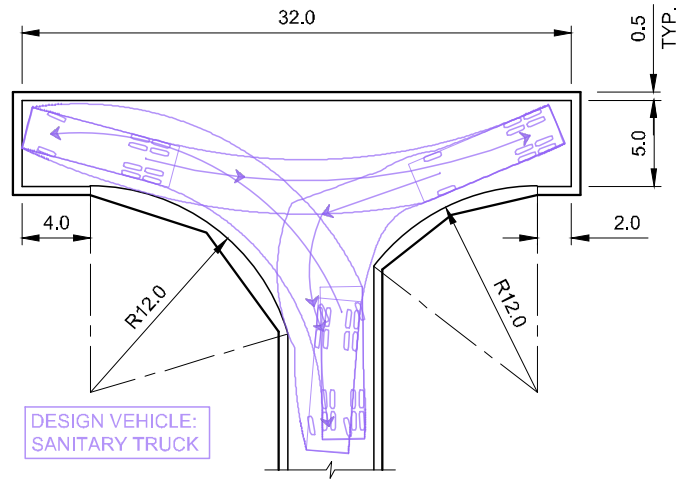
City of BRANDON

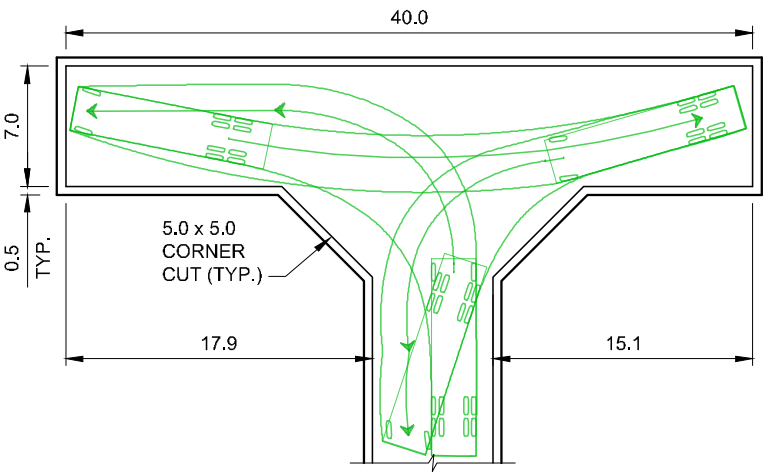
CUL-DE-SAC

RESIDENTIAL & COMMERCIAL/INDUSTRIAL

SCALE:	DRAWING No.
NTS	0029

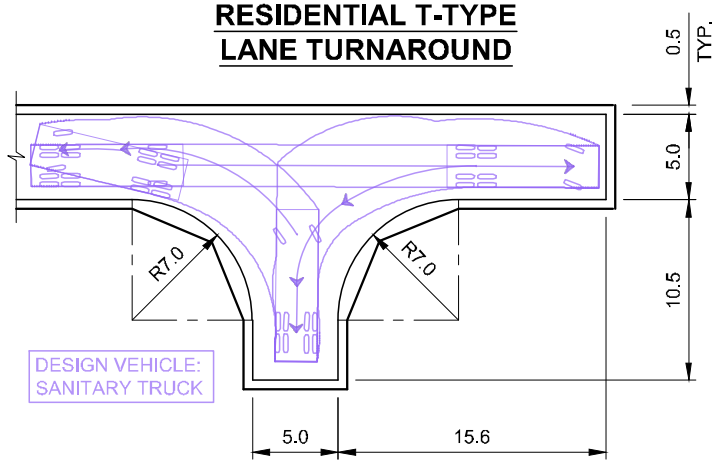


RESIDENTIAL T-TYPE LANE TURNAROUND

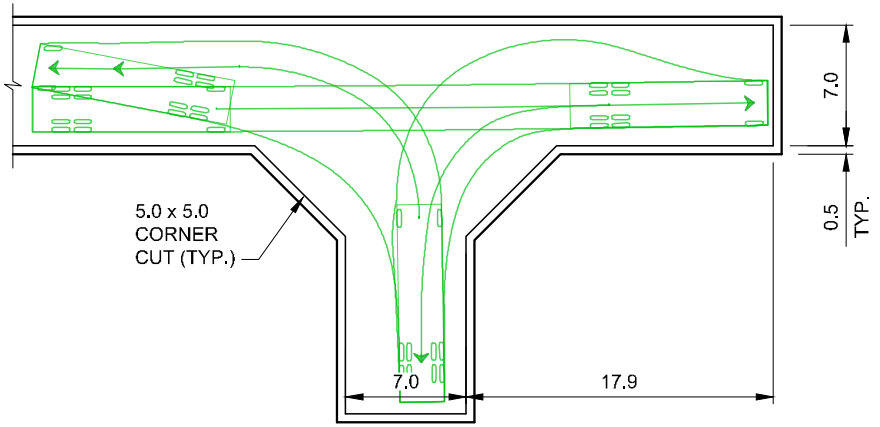


COMMERCIAL T-TYPE LANE TURNAROUND

DESIGN VEHICLE: HSU



RESIDENTIAL BRANCH-TYPE LANE TURNAROUND



COMMERCIAL BRANCH-TYPE LANE TURNAROUND

DESIGN VEHICLE: HSU

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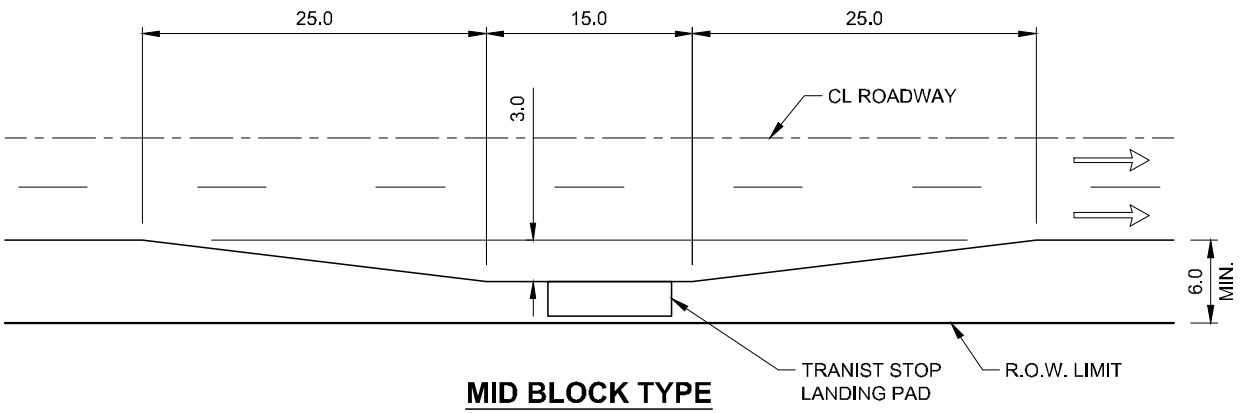
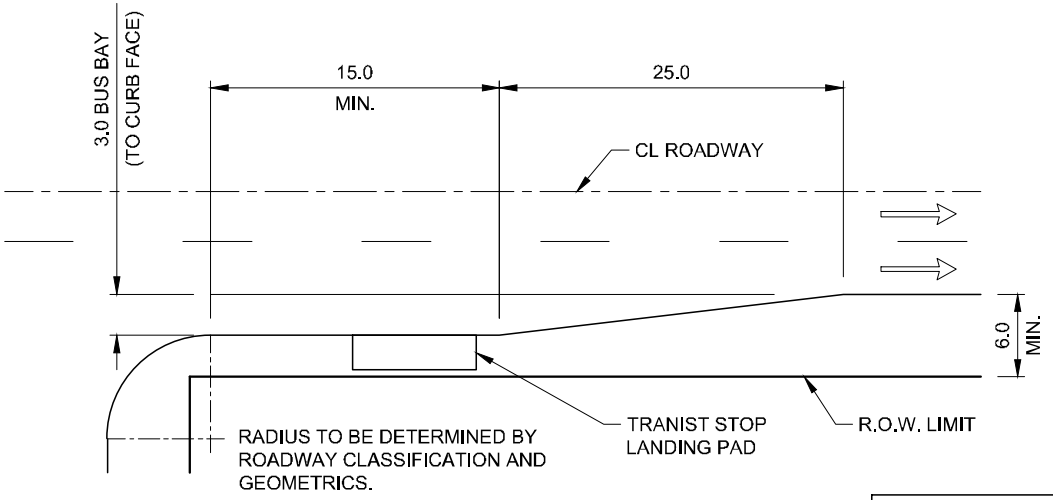
TYPICAL LANE TURNAROUNDS

SCALE:	DRAWING No.
NTS	0030



MID BLOCK TYPE



CORNER TYPE

NOTE:
DIMENSIONS ACCOMMODATE
A STANDARD 12.2m BUS.

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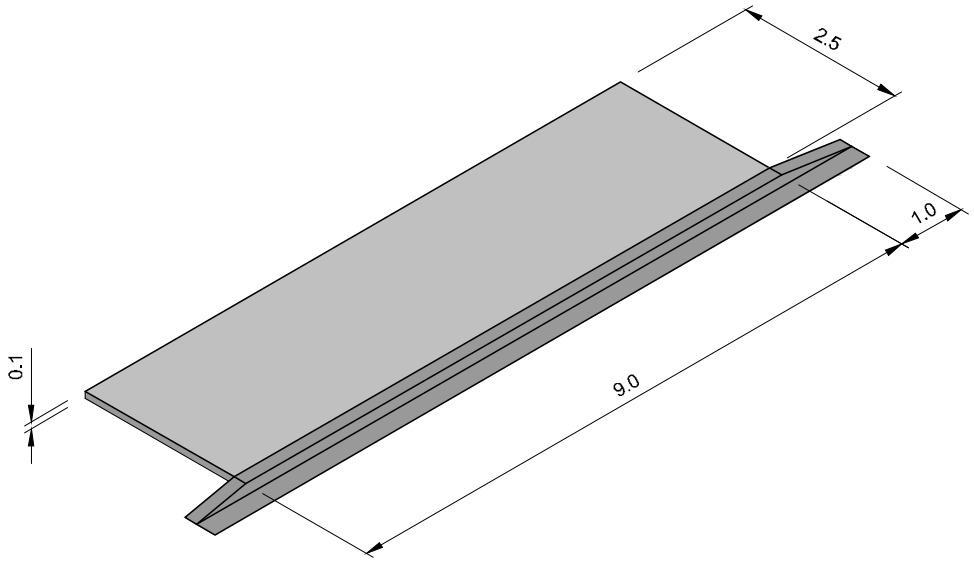
City of BRANDON

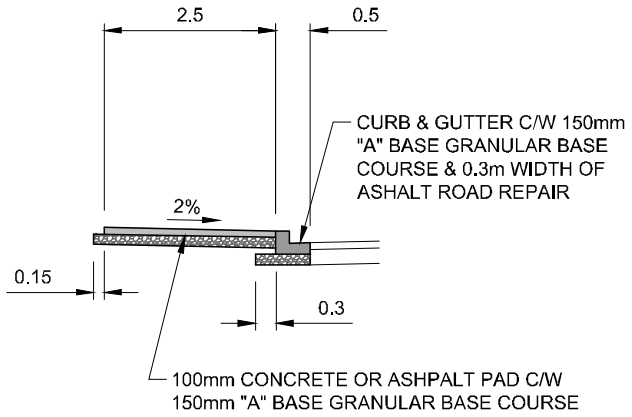
BUS BAYS

SCALE: NTS

DRAWING No. 0031



TYPICAL TRANSIT STOP LANDING PAD



TYPICAL TRANSIT STOP LANDING PAD (SECTION)

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APPROVALS	
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NAME	NAME
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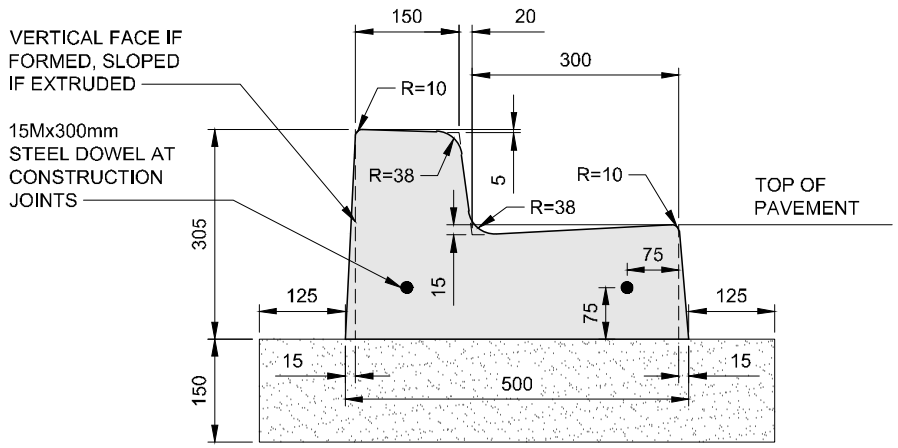
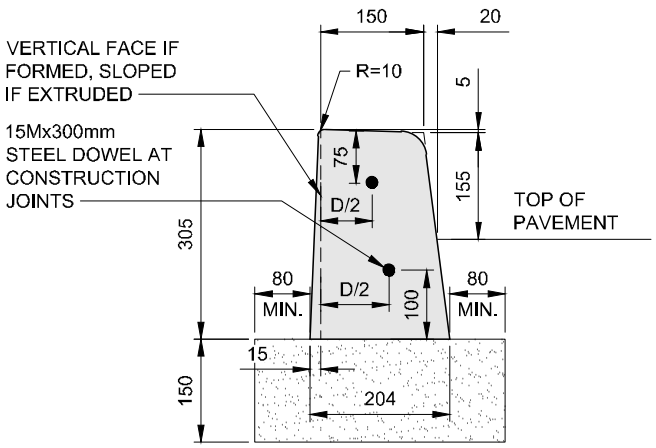
City of BRANDON

TYPICAL TRANSIT STOP LANDING PAD

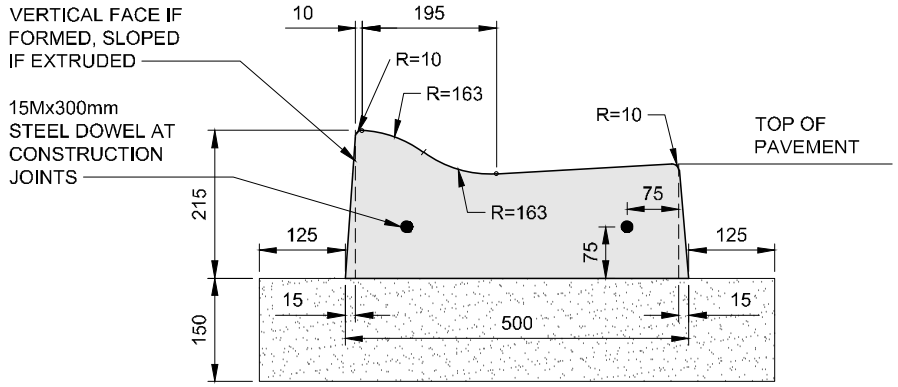
SCALE:	DRAWING No.
NTS	0032



BARRIER CURB AND GUTTER SECTION



MEDIAN CURB SECTION



ROLLED CURB SECTION

No.	REVISION DESCRIPTION	DATE	BY
1	ORIGINAL STANDARD DRAWING	2023.04.28	XXX

APPROVALS

SIGNATURE	SIGNATURE
NAME	NAME
DATE SIGNED	DATE SIGNED

City of BRANDON

TYPICAL CURBS

SCALE: NTS

DRAWING No. 0033