DEVELOPMENT GUIDELINES
&
MUNICIPAL SERVICING STANDARDS

(Effective October 14, 2025)

Municipal District of
GREENVIEW

Box 1079 | 4806-36 Ave | Valleyview, AB, T0H 3N0
Phone: 780.524.7600 | Toll-Free 1.888.524.7601
www.mdgreenview.ab.ca

FOREWORD

Municipal District of Greenview No. 16's (Greenview) Development Guidelines & Municipal Servicing Standards are intended to provide information and guidance to Landowners, Developers, Engineering Consultants, Utility Companies, and other interested parties to ensure that public infrastructure meets required minimal allowable standards, to address demands for continued long-term growth, as well as operation and maintenance by the Municipality. These Municipal Servicing Standards are applicable to a variety of land development activities within Greenview, from single approach installations to road construction, subdivision, recreation facilities, as well as road and utility development activities. Subdivision and development within Greenview fall into the residential, commercial, recreational and/or industrial categories and may involve both urban and rural properties. Sewer and water services may or may not be a component of the development.

Different types of subdivisions and developments will require specific aspects of the Standards document to be applied. Single parcel subdivisions and subdivisions which, at the discretion of Greenview, may be considered to have a low impact on the existing infrastructure, will be managed in a simplified application of the principles and requirements contained herein.

Subdivisions that Greenview may consider to be high impact can include but are not limited to those which dedicate new public infrastructure: the construction of new roads; the extension of water or sewer mainlines; alteration of existing off-site stormwater infrastructure maintained by Greenview; or the expansion of any other utility which will be operated by the Greenview.

Proponents of development should consult with Greenview early in the planning stage of any proposed development, with respect to the anticipated requirements.

These standards do not cover the detailed design or construction of shallow utilities such as power, street lighting, gas, telephone, fibre optics and cablevision services, but do include general requirements and the need for coordination with the various franchise or utility companies.

These standards form an appendix to the subdivision approval process, and it is necessary that applicants for potential subdivision or development should consider these standards during the subdivision planning and conceptual design phases to minimize the potential for unforeseen difficulties during the detailed design and/or construction of the improvements required. It is suggested that these standards be appended to information supplied to applicants for potential development of subdivisions in order to facilitate orderly planning and full disclosure by Greenview. All proposed developments shall be designed and constructed in accordance with the Standards outlined herein or to a higher standard. Where approval has been granted with variations from these Standards, or for improvements not covered by the Standards, good planning and engineering practices shall be followed to maintain the integrity of the development. Whenever these standards may vary from the provisions of the Development Agreement, the higher standard shall take precedence, or the Development Agreement shall govern if the higher standard is not readily definable. Variances will only be granted in cases in which adherence to these Standards would produce an unsafe or impractical development.

This manual will be reviewed and updated periodically to stay current with Greenview's Strategic Policy, the Municipal Development Plan, industry best practices, and to remain compliant with regulatory requirements. People using the Municipal Servicing Standards are encouraged to contact the Infrastructure & Engineering department or the Planning & Economic Development department to ensure they have the latest version. This document can be accessed online at Greenview's website: www.mdgreenview.ab.ca.

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1 GENERAL INFORMATION

The following design standards sections apply to any and all activities for the construction of Municipal Services including:

Section 1: General Information

Section 2: Engineering Plans and Drawings

Section 3: Water Distribution Systems
- e.g. Water distribution systems for drinking water, fire flows, and lot services.

Section 4: Sanitary Sewer Systems
- e.g. Sanitary sewage collection systems and related appurtenances, and lift stations.

Section 5: Storm Drainage Systems
- e.g. Storm collection systems and related appurtenances, lot grading, and stormwater management facilities.

Section 6: Common Details and Service Connections

Section 7: Roadway Systems
- e.g. Approaches, roadways, sidewalks, curbs & gutters, and lanes.

Section 8: Signage

Section 9: Miscellaneous Requirements
- e.g. Shallow utilities (gas, power, lighting, telephone and cable), landscaping, fencing, erosion & sediment control and noise attenuation barrier requirements.

1.1 BACKGROUND, DEFINITIONS AND ACRONYMS

MUNICIPAL DISTRICT OF GREENVIEW# 16, Incorporated on January 1, 1994.

Website: www.mdgreenview.ab.ca

Urban centers within Greenview: (Independent Municipalities)	Town of Fox Creek Town of Valleyview
Hamlets within Greenview:	Hamlet of Little Smoky Hamlet of Ridgevalley Hamlet of DeBolt Hamlet of Landry Heights Hamlet of Grovedale Hamlet of Grande Cache
Remaining portion of Greenview:	Largely agricultural, rangeland or forest
Energy sector:	Largely oil, gas and logging throughout Greenview, with a pocket of coal mining just north of Grande Cache.

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In these Standards, the following definitions shall apply:

DEFINITIONS:

"Adjacent" – shall mean lands next to the proposed development area.

"Alberta Land Surveyor" – shall mean the professional land surveyor who is registered and authorized to practice land surveying under the *Land Surveyors Act* through the Alberta Land Surveyors Association.

"Alberta Environment (AEPA)" – shall mean and refer to the Government of Alberta's Ministry of Environment and Protected Areas.

"Alberta Transportation (ATEC)" – shall mean and refer to the Government of Alberta's Ministry of Transportation and Economic Corridors.

"Applicant" – shall mean a person or entity who has applied for approval of a proposed subdivision, or to develop or service an existing parcel of land, whether as the owner or an agent for the owner of the land included therein.

"Approved by Greenview" – where indicated within Greenview's Development Guidelines & Municipal Servicing Standards, approval shall **always** mean to be **in writing**.

"As-Built Drawings" – see Record Drawings.

"Conditional Construction Completion Certificate (CCCC) – this document is issued by Greenview during a construction project to acknowledge the achieved stage of completion, yet contingent upon meeting specific criteria before Construction Completion acceptance. It delineates areas where construction aligns with required standards, while also outlining outstanding tasks, defects, or contractual obligations that must be rectified or fulfilled. Once all conditions are met, the certificate can be converted into a Construction Completion Certificate.

"Construction Completion Certificate" (CCC) – this document is issued by Greenview following the Construction Completion Inspection and, when approved, initiates the warranty period in accordance with the Development Agreement.

"Construction Drawings" – shall mean those Engineering plans, profiles, reports and specifications prepared by the Consulting Engineer, showing the details of the installation of the various municipal improvements within the development, conforming to Greenview's Development Guidelines & Municipal Servicing Standards. Drawings must be stamped by the Consulting Engineer and be marked/stamped "Issued for Construction".

"Construction Specifications" – shall refer to the documents prepared by the Consulting Engineer specifying the legal, administrative, and technical aspects of the infrastructure improvements, all of which shall conform to the minimum requirements as outlined in Greenview's Development Guidelines & Municipal Servicing Standards.

"Consulting Engineer" – shall mean a qualified Professional Engineer and/or firm, registered and licensed to practice in the Province of Alberta (APEGA), who is appointed or engaged by the Developer to be responsible for the design of municipal improvements, preparation of drawings and specifications, and provision of construction supervision during the installation of the local or municipal improvements.

"Contractor" – shall mean any person, persons or corporation who undertakes the construction of local improvements or municipal improvements on behalf of the Developer, Owner, or Municipality.

"Council" – shall mean (collectively) persons duly elected to the Council of Greenview.

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"Descriptive Plan" – shall mean a plan prepared by an Alberta Land Surveyor, where only a minimal amount of field work is conducted, so as to describe a parcel of land to be subdivided and as permitted by the Alberta *Land Surveyors Act*.

"Developer" – shall mean any person or entity that has obtained a subdivision approval or development permit and who has entered into a Development Agreement with Greenview with respect to specifically identified lands.

"Development Agreement" – an agreement between Greenview and the Developer or Owner specifying general requirements, terms and conditions of the municipal improvements, for the development of specified lands. This will generally refer to infrastructure which will fall under the ownership and control of Greenview but may also include related appurtenances and franchise utilities.

"Development Authority" – shall mean the Development Officer and/or Municipal Planning Commission, permitted to exercise the duties and powers and perform the functions prescribed in Greenview's Land Use Bylaw.

"Development or Development Area" – shall refer to the area to be serviced or developed, as delineated in the Development Agreement and may include both onsite and offsite areas of development.

"Development Permit" – shall mean a permit issued by Greenview in response to an application, which specifies the legal, administrative, and technical requirements of the Developer for developing lands.

"Development Officer" – shall mean a person or persons appointed and acting on behalf of the Municipality to regulate orderly development.

"Easement" – shall mean an interest in, or right of access to, a specified parcel of land, held by Greenview for the purpose of providing utilities, access and/or drainage.

"Endorsement" – shall mean the final approval from Greenview of a subdivision upon completion of all of the "Conditions of a Notice Approval", allowing for the Subdivision Authority Approval to be issued allowing for a subdivision Plan to be registered at Land Titles.

"Final Acceptance Certificate" (FAC) – this document is issued by Greenview following the Final Acceptance Inspection and, when approved, signals the expiry of the warranty period of each infrastructure improvement outlined in the Development Agreement. The purpose of the FAC is to transfer full ownership of, and responsibility for, an infrastructure improvement from the Developer to Greenview.

"General Design Standards" – shall mean the Development Guidelines & Municipal Servicing Standards as amended by Greenview and approved by Greenview's Engineer for installation of the local improvements.

"Geotechnical Report" - shall mean a document prepared by a Geological or Geophysical Professional Engineer licensed to practice in the Province of Alberta and that bears the seal(s) or stamp(s) of, and is signed and dated by, the professional in accordance with the enactments that govern their profession.

"Grading" – shall mean an operation or process intended to level, or to grade, the development area to a desired horizontal gradient.

"Greenview" – shall mean the Municipal District of Greenview No. 16, in the Province of Alberta, whether in reference to the Municipality as a body of authority, or the physical boundaries of the Municipality. The applicable departments within Greenview that oversee, review and provide approval in accordance with these Standards are Infrastructure & Engineering, and Planning & Economic Development.

"Greenview's Engineer" – shall mean the Professional Engineer(s) and/or firm (APEGA) retained by Greenview to review, inspect and recommend approval or rejection of the work proposed or performed by the Developer under the terms of the Development Agreement.

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"Hamlet" – shall mean an unincorporated community administered by, and within the boundary of, Greenview meeting the requirements of Section 59 of the *Municipal Government Act, RSA 2000, cM-26.*

"Industrial" – shall mean any parcel of land used for industrial and/or commercial purposes, as well as any parcel of land used for agricultural purposes and any lands zoned as Agricultural One (A-1) District or Agricultural Two (A-2) District as per Greenview's Land Use Bylaw.

"Internal Road" – shall mean a public roadway, the primary function of which is to provide access to individual sites within a multi-lot subdivision, with the exception of mobile home communities or bare land condominium developments in which case the internal roads are privately owned.

"Local Improvements, External/Offsite" – shall mean all of the local improvements, or the portions thereof, to be constructed by the Developer outside of the proposed development as described in the Development Agreement.

"Local Improvements, Internal" – shall mean all of the local improvements, or the portions thereof, to be constructed by the Developer within the proposed development as described in the Development Agreement.

"Local or Municipal Improvements" – shall refer to all improvements within or related to the development, including but not restricted to:

- Paved roads, including pavement markings
- Gravel roads including culverts, guardrails
- Sidewalk, curb and gutter
- Stormwater management systems and drainage
- Water supply and treatment facilities or upgrades
- Lift Stations
- Sewage treatment and disposal facilities
- Solid Waste disposal or transfer stations
- Paved or graveled lanes
- Water, sanitary, and storm sewer mains
- Water, sanitary and storm sewer service connections
- Franchise utilities, including electrical, street lighting, natural gas, telephone, fibre optics and cable television
- Landscaped boulevards, medians, municipal reserves, trails, parks and public utility lots
- Lot grading
- Paved, concrete or gravel walkways/bikeways
- Park and recreation amenities (e.g. playground equipment, benches etc.)
- Traffic control, street names, subdivision information signs

"Maintenance Period" – see Warranty Period.

"Multi-family Lot" – shall mean any parcel of land with a building(s) that contains multiple separate residential units to accommodate more than one family living separately.

"Municipal Development Plan" – the Council-approved planning document that outlines a strategic path to manage regional, urban and rural growth.

"Municipal Planning Commission" – shall mean the Council committee, consisting of Council as a whole, as established by Bylaw, responsible for decisions regarding subdivision and development permit applications.

"Municipality" – shall mean Greenview.

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"Municipality Property" – shall mean:

- Any property owned or leased by Greenview developed for use as public park, sports field, playground or other recreation area; or
- Undeveloped reserve land designated as either: reserve, municipal reserve, school reserve, environmental reserve or combination of reserves; or
- Municipal rights-of-way including all forms of public roadways (roads, lanes, streets, highways), sidewalks, boulevards, road allowances, utility rights-of-way, public utility lots, public spaces, undeveloped rights-of-way and stormwater management facilities, bridges, culverts and water bodies; or
- Any property developed as a pathway or park trail system; or
- Any property owned or titled to Greenview including buildings, structures and parking facilities.

"Off-site Levies" – shall mean the monies collected by Greenview from the Developer or industry to assist with the payment of the portion of the off-site services that the development may utilize.

"Plan of Survey" – shall mean a plan prepared by an Alberta Land Surveyor where the boundaries of a new parcel of land are identified by legal survey posts placed at the corners of the lots as dictated by the Alberta *Land Surveyors Act*. A Plan of Survey is required by Greenview or as per the requirements of the *Land Surveyors Act*.

"Property" – shall mean any land, building, structures or premises including any personal property located on, over or in the property, that is located within the municipal boundaries of the Municipality.

"Private Property" – shall mean land owned by a person, group, corporation or entity that is not a government body.

"Record Drawings" – shall mean design drawings updated to accurately show utility and municipal improvements as constructed in the field. Such drawings shall be stamped and signed by the Developer's Engineer.

"Rural" – shall mean any territory lying outside of a Hamlet, within the boundaries of Greenview.

"Subdivision Authority" – see Municipal Planning Commission.

"Tentative Plan of Subdivision" – shall mean a drawing prepared by an Alberta Land Surveyor that illustrates the approximate location of all relevant existing and proposed improvements on a lot relative to existing and proposed lot boundaries and natural features.

"Units of Measurement" – shall mean that the standard units of measurement approved by Greenview are System International (metric) only, and any reference to imperial measurement units may be allowed for convenience purposes only.

"Urban" – shall mean those areas within an identified Hamlet or which has a Hamlet specific land use designation.

"Utilities" – shall mean those utilities together with all necessary appurtenances, which are described in the Development Agreement.

"Warranty Period" – a minimum two (2) year period commencing with the issuance of a Construction Completion Certificate (CCC) and ending with the issuance of a Final Acceptance Certificate (FAC), during which time the Developer shall be responsible for maintenance of the development and reparation of any deficiencies, in accordance with the Development Agreement and/or Contract documents.

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ACRONYMS:

AADT	Average Annual Daily Traffic
AEPA	(Alberta) Environment and Protected Areas
ATEC	(Alberta) Transportation and Economic Corridors
APEGA	The Association of Professional Engineers and Geoscientists of Alberta
ASBC	Asphalt Stabilized Base Course
ASTM	American Society for Testing and Materials
ASTM 03212	Standard Specification for PVC Pipe
ASTM A048	Standard Specification for Gray Iron Castings
ASTM B148	Standard Specification for Aluminum-Bronze Sand Castings
ASTM B952	Standard Specification for Zinc Alloys in Ingot Form for Spin Casting
ASTM C076	Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
ASTM C117	Standard Test Method for materials finer than 75.0 µm (No.200) sieve in Mineral Aggregates by washing
ASTM C136	Test method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C443	Standard specifications for Joints for Concrete Pipe and Manholes, using Rubber Gaskets
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole sections
ASTM C655	Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM D3034	Standard Specification for Type PSM Polyvinyl Chloride (PVC) Sewer pipe and Fittings
ASTM F794	Standard Specification for PVC Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
AWWA	American Water Works Association
AWWA C110	American National standard for Ductile-Iron and Gray-Iron Fittings, 75.0 mm through 1200.0 mm, for Water and Other Liquids
AWWA C502	AWWA standard for Dry-Barrel Fire Hydrants
AWWA C504	AWWA standard for Rubber-Seated Butterfly Valve
AWWA C509	AWWA standard for Resilient-Seated Gate Valves for water supply service
AWWA C651	Disinfecting Water Mains
AWWA C800	Underground Service Line Valves and Fittings
AWWA C900	AWWA standard for Polyvinyl Chloride (PVC) Pressure Pipe, 100.0 mm through 300.0 mm, for Water Distribution
AWWA C903	Polyethylene-aluminum, polyethylene and crosslinked polyethylene aluminum. Crosslinked polyethylene composite pipe 12 mm through 50 mm for water servicing
AWWA M17	Installation, Field testing and maintenance fire hydrant
CBR	California Bearing Ratio
CCC	Construction Completion Certificate
CCTV	Closed-Circuit Television
CSA	Canadian Standards Association
CSA A23.1	Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard practices for Concrete
CSA A3000	Cementitious Materials Compendium
CSA B137.1	Polyethylene Pipe, Tubing and Fittings for Cold Water Pressure Services

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CSA B137.2	PVC Injection-Molded Gasketed Fittings for Pressure Applications-General Instruction No. 1
CSA B182.4	Profile PVC Sewer Pipe and Fitting
C.S.P.	Corrugated Steel Pipe
DFO	Department of Fisheries and Oceans Canada
EPDM	Ethylene Propylene Diene Monomer (rubber)
FAC	Final Acceptance Certificate
Ha	Hectares
HDPE	High-Density Polyethylene
kg	Kilograms
km	Kilometres
kPa	Kilopascals
L	Litres
M.C.	Medium Curing (Asphalt)
MD	Municipal District
m	Metres
mm	Millimetres
Mpa	Mega Pascal
NAAPI	North American Association of Pipeline Inspectors
NFPA	National Fire Protection Association
NFPA 13D	Standard for the Installation of Sprinkler Systems in One (1) and Two (2) Family Dwellings and Manufactured Homes
NSF	National Sanitation Foundation
O.D.	Outside Diameter
OHS	Occupational Health and Safety
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride
R.C.	Rapid Curing (Asphalt)
R.O.W.	Right-of-Way
RTAC	Roads and Transportation Association of Canada
s	Seconds
SCC	Substantial Completion Certificate
S.E.P.	Special Emulsified Primer
SPD	Standard Proctor Density
SS	Slow Setting (Asphalt)
T	Tonnes
TAC	Transportation Association of Canada
TIA	Traffic Impact Assessment
ULC	Underwriters Laboratories of Canada

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1.2 PLANNING AND DEVELOPMENT POLICY

This document is intended to provide information and guidance to Developers, Engineering Consultants and Utility companies regarding the standards governing the design, preparation of plans, specifications, construction standards and supervision for municipal improvements within Greenview. These standards are considered to be a minimum of good planning and engineering judgement and/or requirements of Greenview.

1.2.1 Application of the Development Guidelines & Municipal Servicing Standards

These Development Guidelines & Municipal Servicing Standards are applicable to subdivision, road and utility development activities within the Municipality. Subdivision and development within Greenview fall into the following categories for both urban and rural properties:

- Residential
- Recreational
- Commercial
- Industrial

Developments considered as "low impact" by Greenview will be accommodated through a simplified application process, which will be addressed during the subdivision approval or development approval, pursuant to conditions. These types of developments typically include any development or subdivision that does not require the construction of infrastructure contributed to the Municipality, other than approaches and service connections.

All other residential, industrial, commercial or recreational development, regardless of lot numbers, would not be considered "low impact" and would need to adhere to these Development Guidelines & Municipal Servicing Standards.

1.2.2 Municipal Planning Documents

The following documents provide guidance for the planning of municipal growth. These documents shall be reviewed by the Developer to ensure conformity with the proposed development.

- Federal Acts or Regulations
- Any applicable Regional Plan pursuant to the *Alberta Land Stewardship Act*
- Inter-Municipal Development Plan
- Municipal Development Plan
- Area Structure Plans (Municipal)
- Land Use Bylaw
- Development Agreement

1.2.3 Approvals

There are several potential approvals and/or permits required for developments through Municipal, Provincial and Federal legislation and agencies. These may include, but are not limited to:

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Federal

- Canadian Environmental Assessment Act (CEAA)
- Migratory Birds Convention Act (MBCA)
- Fisheries Act

Provincial

- Water Act
- Environmental Protection and Enhancement Act (EPEA)
- Forests Act
- Wildlife Act
- Wetland Policy
- Public Lands Act
- Historical Resources Act
- Municipal Government Act (MGA)

Other

- Utility Safety Partners (ground disturbance)
- Alberta Transportation guidelines
- Alberta Environment guidelines

1.2.4 Developer's Responsibility

The Developer shall be responsible for the following, at their own expense:

- Commissioning of:
    - Alberta Land Surveyor
        - Preparation of Tentative Plan of Subdivision
        - Preparation of easements and/or right-of-way
        - Preparation of a legal plan
    - Consulting Engineer and/or other Professionals
        - Preparation of Concept Plan or Area Structure Plan
        - Preparation of a design brief
        - Design of required municipal infrastructure
        - Geotechnical investigation
        - Material testing
        - Biophysical and Environmental assessments
        - Other specialty services (e.g. structural, process, hydrological, mechanical, electrical, etc.)
- Design and construction of the required municipal improvements associated with the development, including road widening, internal roads, and approach construction to all lots and the remainder of the quarter.

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- Design and construction of water and sewer services when tying into municipal services.
- Design and construction of drainage and stormwater management features.
- Quality control and material testing by an independent third-party qualified professional engineering firm.
- Registration with Alberta Land Titles, of all easements including plans and documents for the construction of municipal improvements outside of the municipal rights-of-way.
- Satisfying all statutory requirements governing such works and obtaining approvals and permits for compliance with those requirements from authorities having jurisdiction (see Section 1.2.3 above).
- Satisfying all design and construction requirements established in Greenview's Development Guidelines & Municipal Servicing Standards manual.

1.2.5 Development Procedure

An outline of the major steps and development procedures from subdivision approval to final acceptance are listed, but not limited to the following:

1. Preparation and submission of proposed plan.
2. Pre-Application Meeting (see Section 1.2.6 below).
3. Subdivision or Development Application submitted and reviewed.
4. Submission of a Tentative Plan of Subdivision and design brief.
5. Amendments to the Land Use Bylaw and Area Structure Plan, if necessary.
6. Decision made on development or subdivision application.
7. Development and finalization of easement and Reserve Agreements.
8. Development and finalization of Road Dedication, Widening and Approach.
9. Preparation of detailed Engineering Drawings and Specifications.
10. Approval of Engineering drawings and specifications.
11. Preparation and endorsement of a Development Agreement.
12. Execution of a Development Agreement.
13. Security deposit for improvements.
14. Preparation and registration of the Legal Plan of Subdivision for endorsement by Municipality.
15. Complete construction activities in accordance with the Development Guidelines & Municipal Servicing Standards and the approved plans and specifications.
16. Submission of As-Built Drawings and related data.
17. Inspection by Municipality and issuance of Construction Completion Certificate(s) (CCC).
18. Two (2) year warranty period(s).
19. Final overlays, correction of deficiencies.
20. Inspection, Final Acceptance Certificate (FAC) and takeover by Municipality.
21. Release of Financial Security.

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1.2.6 Pre-Application Meeting

The primary purpose of the pre-application meeting is to provide the Developer with specific information on application process requirements. The pre-application meeting is intended to provide an opportunity for the Developer to receive preliminary feedback from Greenview including review of the proposed plan.

Pre-application meeting is required for any of the following types of developments:

- Multi-lot subdivisions
- Multi-family residential
- Commercial/Industrial
- Recreation

The Developer shall contact the Planning & Economic Development department for the scheduling and coordination of the pre-application meeting.

1.2.7 Application Process

1.2.7.1 Application Form

The subdivision application must be filled out in its entirety and accompanied by the appropriate fees and all required supporting documents fulfilling any applicable requirements of Section 6 of the Government of Alberta's Matters Related to Subdivision and Development Regulation, latest revision thereof. Incomplete applications will be returned and must be completed before they will be officially considered.

The application shall include a Tentative Plan of Subdivision as described below.

When Planning & Economic Development determines that there is sufficient information to render a decision on the application and all comments and concerns from internal and external departments have been, or can be resolved, the application will be forwarded to the Municipal Planning Commission for consideration.

1.2.7.2 Tentative Plan of Subdivision and Design Brief

Tentative Plan of Subdivision

The intent of the Tentative Plan of Subdivision is to illustrate the key features of the proposed development. This includes proposed lots, roads, drainage and stormwater features, water and sanitary sewer servicing, shallow utilities and recreational amenities (e.g. walkways, parks, etc.).

The Developer shall, at their own expense, retain the services of a qualified Consulting Engineer or Surveyor, registered and licensed to practice in the Province of Alberta, who shall be responsible for the design and preparation of the Tentative Plan of Subdivision.

The requirements for a tentative plan will be determined by the Planning & Economic Development department, pursuant to the Land Use Bylaw.

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Design Brief

A design brief shall accompany the Tentative Plan of Subdivision. The design brief is the basis for the creation of the Tentative Plan of Subdivision and shall include calculations to support the proposed servicing of the subdivision (e.g. water distribution system and/or sanitary sewer hydraulic analysis). Supporting assessments, documentation or reports are to be included with the design brief. The requirements for any assessment, documents or reports will depend on the specific development, the specific lands, and the constraints or requirements applied to those areas. This may include:

- Area Structure Plan (ASP)
- Heritage Site Assessment
- Sanitary Sewer Analysis
- Supporting Design Calculations
- Surveyed Grading Plan
- Traffic Impact Assessment (TIA)
- Wetland Assessment
- Hydrological Report
- Geotechnical Report
- Stormwater Management Plan (SWMP)
- Environmental and/or Biophysical Assessments

Any report, drawing, or study required in support of an application is to be provided at the Developer's expense.

Following the approval of the Tentative Plan of Subdivision, the Developer may proceed with a subdivision application and may be required to provide a more detailed engineered plan for the proposed subdivision pursuant to Greenview's Development Guidelines & Municipal Servicing Standards manual.

1.2.7.3 Decision on Application

The Municipal Planning Commission (MPC) is both the Subdivision Authority and Development Authority for Greenview and will decide on the application during one of its regular meetings. MPC will make a decision on an application within a limited time period from the date of receipt of a complete application.

The MPC may:

- Approve the subdivision application, with conditions;
- Refuse the application, and provide reasons for the refusal; or
- Refer the subdivision application back to the Planning & Economic Development department for further review to consider comments and/or concerns that MPC has raised in considering the application.

The decision of the MPC may be appealed in accordance with the *Municipal Government Act*.

1.2.7.4 Easement and Reserve Agreements

As part of the subdivision process, the Developer may be required to dedicate municipal and school reserves and/or environmental reserves to the Municipality.

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Greenview can require a minimum of 10% of land from the subdivision to be provided for municipal or school reserve or as cash in lieu of land or as a combination thereof.

Environmental reserves may be taken on land with environmental conditions that may be deemed unsuitable for development or when sensitive areas need to be protected. The *Municipal Government Act* stipulates which landforms qualify for environmental reserve dedication.

Reserves are not required when:

- A single lot is to be created from a quarter section of land.
- Land is to be subdivided into lots of 16.0 hectares or more and is to be used only for agricultural purposes.
- The land that will be subdivided is 0.8 hectares (2 acres) or less.
- Reserve land, or money in place of it, was provided previously for the same piece of land.

1.2.7.5 Road Dedication, Widening and Approaches

For a subdivision application, Greenview requires that the Developer dedicate road widening to Greenview in accordance with policy, along all road right-of-way of the parcel, unless previously dedicated or waived by Greenview. Road dedication shall be by way of a road plan and the cost of preparing and registering the road plan shall be Greenview's responsibility.

The Developer is responsible for providing access to new parcels and to the remaining balance of the quarter section by upgrading existing approaches or installing new approaches, as well as constructing any internal access roads.

1.2.8 Engineering Plans and Construction Drawings

The Developer shall, at their own expense, retain the services of a qualified Professional Engineer, registered and licensed to practice in the Province of Alberta, who shall be responsible for the design and preparation of drawings and specifications for all municipal improvements to be constructed within and/or related to the proposed development area.

The Engineer will design all infrastructure necessary to allow the proposed usage to take place within the new development. The detailed design will include a water distribution system, a wastewater collection system, a stormwater management system, as well as any required surface features such as, but not limited to, grading, roads, sidewalks, lanes and landscaping.

1.2.9 Development Agreement

Pursuant to Sections 650 and 655 of the *Municipal Government Act*, when a development permit or subdivision has been approved with the condition of a Development Agreement, the Developer shall contact Greenview to commence the process.

The Development Agreement is between Greenview and the Developer and outlines details about the intended process for development that may include plans, servicing, financial implications, and various municipal requirements that need to be met.

The Developer must enter into the Development Agreement prior to initiating the construction of any improvements or infrastructure.

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1.2.9.1 Security Deposit for Improvements

Upon entering into a Development Agreement with Greenview, the Developer must provide a security deposit for all improvements in the form of cash or an Irrevocable Letter of Credit acceptable to Greenview.

The security deposit shall be a guarantee for the performance of the requirements and obligations of the Developer as set out in the Development Agreement and shall be retained by Greenview until the issuance of the Final Acceptance Certificate.

The Developer shall provide Greenview with a security deposit of the estimated construction, materials and engineering costs for all developments within Greenview (with no interest), based on the relevant category for their project as set out below. The cost of the project shall be approved by Greenview and based upon actual costs provided by the Consulting Engineer. The approval of the amount of security by Greenview shall be final and binding on the Developer.

The security will be refunded at the stages of Project Completion and in the amount described under each category outlined below. After project completion and once any deficiencies noted are corrected and accepted, the Construction Completion Certificate (CCC) will be issued, with an additional 10% of the security to be refunded back to the Developer. However, if deficiencies are outstanding upon issuance of the CCC, 125% of the estimated cost to correct those deficiencies will be held back from the 10% prior to refund. Once the deficiencies have been completed and approved by Greenview, the balance of the 10% will be refunded to the Developer.

Greenview will retain the remaining 15% for the warranty period. Within 90 days prior to the warranty expiry date, a final acceptance inspection will be completed. If there is any noted warranty work required, the work will be completed prior to the warranty expiry date. Once the warranty work is completed, a Final Acceptance Certificate (FAC) will be issued. Greenview then assumes the asset and the remaining security is refunded back to the Developer.

PROJECT SECURITY		
Project Estimate will be based on cost of Construction, Materials & Engineering		
	Category 1	**Category 2**
Municipal Development / Improvement ('Project')	Projects **over $750,000**	Projects **$750,000 or less**
Security to be Retained by Greenview	**125%** of Project Estimate	**50%** of Project Estimate
50% Project Completion	**40% Refund** of Project Costs	**No Refund** of Project Costs
100% Project Completion	**60% Refund** of Project Costs	**25% Refund** of Project Costs
CCC Issuance (start of Warranty Period)	**10% Refund** (less 125% holdback of estimated cost of any deficiencies.)	
FAC Issuance (end of Warranty Period)	**15% Refunded** or Remaining Balance	

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1.2.9.2 Endorsement of Subdivision Plan for Registration

Endorsement is the final review by Greenview to ensure that the subdivision plan complies with the subdivision approval and meets the conditions that were attached to that approval.

After a subdivision has been approved, the Developer is responsible, at their own expense, for having an acceptable final document (plan of survey) prepared by a certified Alberta Land Surveyor.

The final document is submitted to Greenview for endorsement. The Municipality will endorse the document only if the conditions of approval have been met to its satisfaction. Once the plan is endorsed, it is returned to the Surveyor who will submit the plan to Alberta Land Titles for registration. Final documents must be submitted for Greenview's endorsement within one (1) year of the date of approval unless an extension has been approved prior to the expiry of the one (1) year period.

1.3 CONSTRUCTION PHASE

1.3.1 Inspections

Weekly, throughout the construction process, the Developer will submit detailed engineered progress reports completed by Greenview's Engineer and/or the Consulting Engineer.

The detailed engineering reports will be reviewed by the Infrastructure & Engineering department, with any deficiencies noted and pre- and post-inspections conducted to ensure that construction meets municipal requirements in accordance with Greenview's Development Guidelines & Municipal Servicing Standards manual.

1.3.2 Construction Completion Certificate (CCC)

The Construction Completion Certificate will be issued after construction of the works outlined in the Development Agreement have been completed to the satisfaction of Greenview and all required submissions and reporting have been provided. The date of issuance of a CCC will commence the warranty period.

1.4 POST CONSTRUCTION PHASE

1.4.1 Record Drawings

Within 60 days of issuance of the Construction Completion Certificate (CCC), record drawings of the constructed works must be provided to Greenview for review and approval.

1.4.2 Warranty Period

At minimum, a two (2) year period of time commencing with the issuance of a Construction Completion Certificate (CCC) and ending with the issuance of a Final Acceptance Certificate (FAC), during which time the Developer shall be responsible for maintenance of the development and

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reparation of any deficiencies, in accordance with the Development Agreement and/or Contract documents.

Prior to the expiry of the warranty period, the Developer shall notify Greenview and arrange for an inspection.

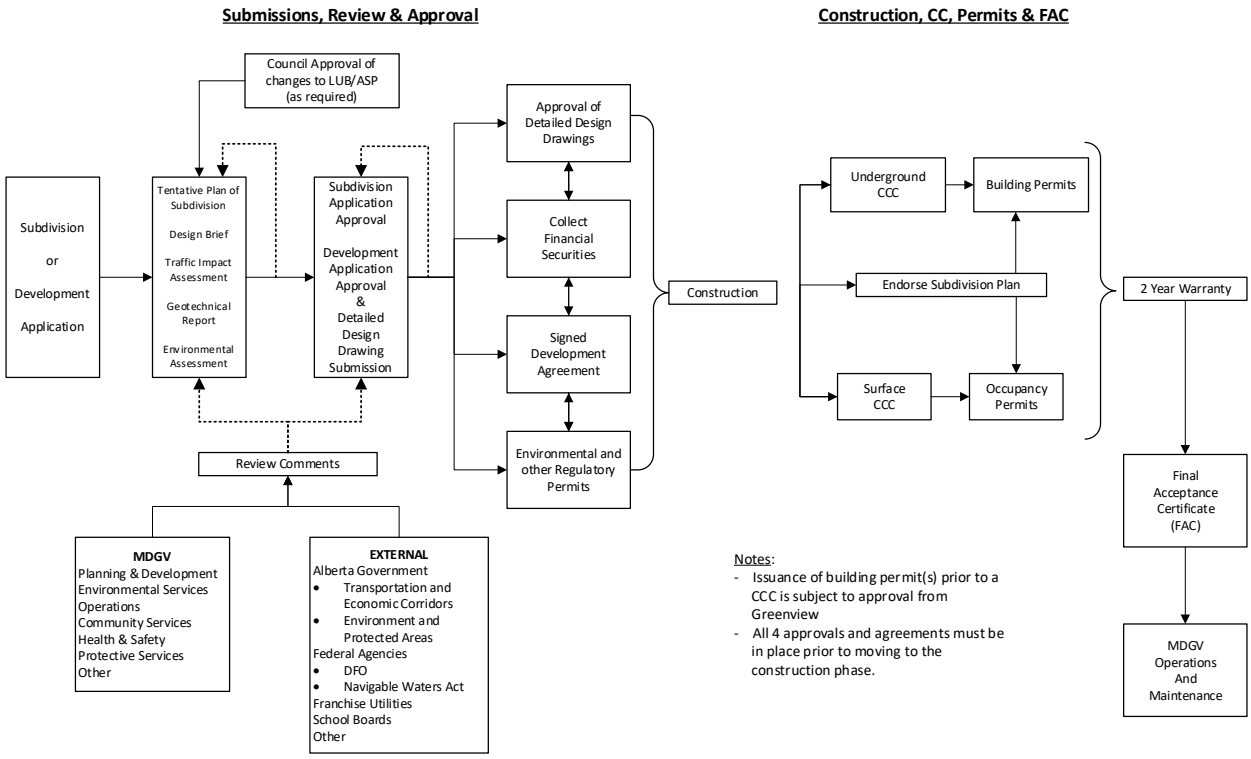
1.4.3 Final Acceptance Certificate (FAC)

The Final Acceptance Certificate will not be issued until the Developer provides Greenview with such evidence and assurance that the construction and installation of all improvements and infrastructure meets Greenview's Development Guidelines & Municipal Servicing Standards.

1.4.4 Release of Financial Security

Once the FAC has been issued, the securities will be released as outlined in Section 1.2.9.1 above.

APPROVAL PROCESS FLOWCHART



1.5 ENGINEERING DESIGN

- The Developer shall retain the services of a qualified Consulting Engineer, registered and licensed to practice in the Province of Alberta, who shall be responsible for the design and preparation of drawings and specifications for all municipal improvements to be constructed within and/or related to the proposed development area. All required improvements shall be designed in accordance with accepted engineering practices and shall meet or exceed Greenview's Development Guidelines & Municipal Servicing Standards as set out herein.

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- It shall be the responsibility of the Consulting Engineer to delineate the location and alignment of all existing and proposed municipal improvements including coordination with the shallow utilities, overhead power and street lighting. Unless approved otherwise by Greenview, the location of all underground utilities shall be subject to the inspection and approval of Greenview and its representatives and any and all Statutory or Regulatory Approval Agencies.
- The Developer and the Consulting Engineer shall be responsible for conducting all surveys and investigations necessary to prepare the design. It shall further be the responsibility of the Consulting Engineer to identify the need for any easements or additional rights-of-way that may be required within or outside of the development area. Where such easements or right- of-ways are required, the surveys, plans and related documents shall be prepared by a qualified licensed Alberta Land Surveyor at the Developer's expense.
- While the Consulting Engineer may arrange to have certain portions of the work conducted by other qualified people, they shall remain responsible for the coordination of the work and the certification of its quality and accuracy.

1.6 GEOTECHNICAL REPORT

If Greenview and/or Greenview's Engineer deem it necessary, the Developer shall submit a Geotechnical Engineering Report, prepared by a qualified Professional Geotechnical Engineer, which identifies and evaluates the subsurface ground characteristics of the development area.

Such report shall identify soil types and conditions including frost susceptibility, soil stability, water table elevations, etc. as well as any potential difficulties that could be encountered during the construction of the municipal improvements. This report shall include recommended design, construction requirements and techniques that are applicable to the specific site or sites for any and all of the improvements required or proposed.

Where a steep slope or the bank of a body of water or a watercourse is a component or characteristic of the development area, Greenview may require a bank stability study to be conducted by a qualified Professional Geotechnical Engineer. The results of which must be to the satisfaction of Greenview at the Development and/or Subdivision Application Stage. At Greenview's discretion, a Preliminary Slope Stability Study may be accepted, rather than a complete geotechnical study.

1.7 SUBMISSION OF ENGINEERING DESIGN

- Three (3) complete sets of plans and specifications for the proposed subdivision area, including the design calculations, plus a digital copy in a format acceptable to Greenview, shall be submitted to Greenview for review.
- All proposed roadways and streets shall be named on the drawings to the satisfaction of Greenview. In addition, all Lots and Blocks shall be numbered and municipal addresses indicated and consistent with the addressing system employed by Greenview.
- The design drawings, specifications and relevant data shall be reviewed by Greenview's designated representative who shall return one (1) marked-up set to the Consulting Engineer identifying any required revisions.
- The Consulting Engineer shall incorporate the required revisions and submit four (4) sets of the Construction Drawings to Greenview for final review and "Approval to Construct".

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- Two (2) sets of the Construction Drawings stamped "Approved to Construct" shall be returned to the Consulting Engineer within two (2) weeks of the date of their receipt if final review is deemed acceptable.
- Greenview's review of the Construction Drawings is to confirm their compliance with Greenview's Development Guidelines & Municipal Servicing Standards. **Approval to construct does not, in any manner, imply approval of the technical aspects of the engineering design.**
- No work respecting the municipal improvements shall be commenced until the subdivision is approved, the Development Agreement has been executed, any required security is in place and Greenview's review of the drawings and plans has been completed and approved.
- Final As-builts to be provided to Greenview are as follows:
    - Two (2) Final Hard Copies
    - Electronic (PDF) File
    - AutoCAD File or a digital file that is acceptable to Greenview

1.8 ENGINEERING SUPERVISION

- For the construction of municipal improvements, the Consulting Engineer shall be responsible for:
    - The inspection and approval of all materials to be used.
    - Conducting all necessary construction survey layouts to ensure the finished construction conforms to the lines and grades shown on the approved plans.
    - All necessary construction supervision to ensure all construction is conducted to meet the requirements of the approved plans and specifications, and any supplementary standards required by Greenview.
    - The recording of all "as-builts" information and creation of Record Drawings.
- A complete set of all approved drawings and specifications shall be maintained at the construction site at all times.
- In addition to the supervision conducted by the Consulting Engineer, Greenview's designated representative may periodically inspect the work to ensure conformance with these Standards. Greenview may also assist in the coordination of the subdivision works with any other related municipal works.
- Greenview shall bring the use of any unacceptable materials or practices, in particular, matters related to safety, to the attention of the Consulting Engineer or their contractors. If remedial action is not taken to the satisfaction of Greenview, the work may be stopped until such time as the required corrective action has been taken.
- If the Consulting Engineer wishes to make any changes to the design prior to or during the execution of the work, they shall first submit to Greenview, a marked print (drawing) showing in red, the proposed revision(s). If approval is granted for the revision, the original drawing shall be immediately revised and new prints issued.
- The design exception shall be signed off by Greenview.

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1.9 TESTING

It shall be the responsibility of the Consulting Engineer to ensure that testing of all materials indicated in the specifications is conducted by a third-party certified material testing firm. The Developer shall bear the cost of all testing.

Underground municipal improvements shall not be permitted to operate or be operated as part of the existing municipal systems until the respective service has been inspected, tested and approved in writing by Greenview's designated representative.

1.10 REPORTING REQUIREMENTS

After satisfactory completion of all municipal improvements within the development and as a condition of the execution of the Construction Completion Certificate (CCC), the Developer shall submit to Greenview the following information:

- Certification by the Consulting Engineer that all work has been completed in accordance with the plans and specifications, the Development Guidelines & Municipal Servicing Standards, and that all work and deficiencies have been completed.
- All material reports, certificates and tests including, at a minimum:
    - Inspection Certificates
    - Asphalt mix designs
    - Deflection testing
    - Concrete strength tests
    - Compaction tests
    - Flushing/disinfection
    - Infiltration/ex-filtration tests
    - Video inspections and construction site photos
    - Any further relevant information

  The reports shall be organized into a binder with tab labels separating each type of test.
- Operation and Maintenance Manuals.
- Request for a Construction Completion Inspection can be submitted after 15 days from receipt of the above-noted deliverables.
- Within 60 days from the issuance of the CCC, submit three (3) copies of Engineer stamped record drawings plus an electronic copy in both PDF (portable document format) and DWG (AutoCAD digital file or file that is acceptable to Greenview). The Developer must consult with Greenview for details on the required layering structures for the DWG and coordinate system utilized by Greenview.

1.11 ACCEPTANCE

Upon the satisfactory completion of the municipal improvements in the development and after all the identified deficiencies have been corrected, a Construction Completion Certificate (CCC) shall be issued by Greenview to the Developer, noting acceptance of the work and the commencement of the maintenance period. The Developer shall be responsible, at their own expense, to remedy any defect,

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fault or deficiency in the completed work during the maintenance period, all in accordance with the terms and conditions of the Development Agreement.

Upon completion of the maintenance period and after a final inspection and correction of all deficiencies as approved by Greenview, a Final Acceptance Certificate (FAC) shall be issued to the Developer or the Consulting Engineer.

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2 ENGINEERING PLANS AND DRAWINGS

2.1 GENERAL

All detailed engineering plans and specifications submitted to Greenview for review and approval must comply with the following standards and specifications:

2.1.1 Drawing Size

The standard A-1 drawing 594 mm x 841mm (23.4" x 33.1") will be prepared with the profile located at the bottom of the sheet. Greenview may request reduced drawings on a 279 mm x 432 mm (11" x 17") page size. These drawings must be printed with double the scale of the A-1 size drawings.

Electronic copies (CAD, Civil3D, Shape files) of all drawings are required to be submitted.

2.1.2 Scales

Drawings shall be prepared using the following scales (where possible):

Overall Plan	1:1000, 1:1500 or 1:2000
Plan/Profiles	1:500 Horizontal, 1:50 Vertical
Cross-Sections and Details	As required

2.1.3 Elevations

- Elevations shall be relative to Geodetic Datum (NAD 83). Reference benchmarks and elevations are to be identified on the Index Plan.
- The Consulting Engineer shall establish and maintain a minimum of three (3) benchmarks within the development site boundary throughout the duration of construction and the maintenance period. These shall be clearly noted in the drawings.

2.1.4 Drawing Techniques

Points of drawing techniques that are significant to the preparation of drawings are as follows:

- Clarity, legibility, and accuracy will be the governing criteria when preparing drawings.
- Care shall be taken to ensure a balanced distribution of detail throughout the drawing.
- Letters and figures will be clearly legible, 2.0 mm size or larger.
- A north arrow will be shown on each drawing. In general, north arrows shall be directed towards the top of the page.

2.1.5 Dimensioning

- All dimensions shall be in the metric system.

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- Dimensioning of a drawing is extremely important and should be such that it will not be misinterpreted. Dimensions shall be given from an iron pin, lot line, chainage station, centerline, or any other reference that can be readily established or identified on the plan and on the ground.

2.1.6 Title Block

All drawings must clearly show the following in the title block:

- Developer's/Owner's name.
- Consulting Engineer or Consulting Engineering Firm name.
- Subdivision name including staging and/or phasing identifier(s).
- Drawing name, number and issue date.
- Drawing scales (horizontal and vertical).
- Space for the dates and signature of the designer, draftsperson, reviewer or checker and approving professional or principal.
- Space for professional stamps and permits.
- Space for revisions including number, date, description, and approval signature.

2.2 DESIGN DRAWINGS

The detailed engineering plans and drawings submitted to Greenview for review and approval must be stamped by the Consulting Engineer. The plans shall typically include the following:

2.2.1 Cover Sheet

This sheet shall show the name of the subdivision, type of development, and the names of the Developer and the Consulting Engineer. In addition, Greenview shall be identified. A key plan of Greenview or an appropriate portion thereof shall be included, illustrating the location of the development or project with enough detail to facilitate navigation to the site.

2.2.2 Index Plan

This plan shall be prepared to fit the standard A-1 sheet and will indicate that portion of the development which relates to a particular plan/profile sheet. The plan shall also list each drawing included in the set of drawings. Each drawing is to be listed sequentially along with its corresponding drawing number.

2.2.3 Topographical and Feature Plan

This plan will indicate the existing contours at a suitable accuracy and interval, the proposed development concept, if appropriate, and all significant above-ground and subsurface features such as buildings, trees, utilities, rights-of-way, well sites (abandoned and active), etc.

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2.2.4 Drainage and Stormwater Management Plan

This plan will indicate the pre- and post-development drainage systems including any required stormwater management features. The drawing shall indicate catchment areas and contain calculation summaries for pre- and post-flow rates at key discharge locations and volume storage requirements for stormwater facilities.

2.2.5 Water, Storm Sewer and Sanitary Sewer Overall Plan

This plan shall show the location and alignment of the existing and proposed water and sewer mains, pipe size, pipe type, direction of flow, and the location of all related fixtures and appurtenances.

2.2.6 Roads and Drainage Plan

This plan shall show:

- All roads, lanes, trails and walkways including road surface, right-of-way widths and alignments.
- Surface stormwater drainage systems including the local drainage areas and culvert locations, sizes, inverts, direction of flow, etc. It shall be clearly indicated where the road drainage ties into the overall stormwater management features, if applicable.
- All proposed lot approaches.

2.2.7 Lot Grading Plan

A lot grading plan may not be required in a low-density subdivision or development unless grading of lots is proposed or required to control run-off flows or is a specific integral component of a Stormwater Management Plan.

If grading of lots is proposed or required in any development, a Lot Grading Plan shall be prepared at an appropriate scale which will indicate: topography and features as noted in Section 2.2.3, proposed area of grading, finished lot grades and direction of final surface drainage flows.

Introduction of flows or maintaining natural flows across other properties may require utility rights-of-way or easements which shall also be clearly indicated as a requirement of the legal survey component.

In a subdivision or development, and in instances where sewer and water services are proposed, a Lot Grading Plan shall be prepared to Greenview's specifications and will indicate the following:

- Original contours at suitable accuracy and interval.
- Proposed finished lot corner elevations.
- Proposed finished lot grades.
- Direction of lot surface drainage flows.
- Minimum building elevations.
- Alignment of sewer and water lines, c/w manholes, valves and hydrants.
- Location of lot services at the property.
- Invert elevation of sewer service at property line.

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- Proposed piped storm sewer, if applicable.
- Location and invert elevations of approach culverts.

2.2.7.1 Commercial/Industrial Subdivision

A Lot Grading Plan shall be prepared to Greenview's specifications that indicate, at a minimum, the following:

- Original contours at suitable accuracy and interval.
- Proposed finished lot grades.
- Direction of lot surface drainage flows.
- This plan may be combined with the Road and Drainage Plan and Contour Plan provided clarity can be maintained.

2.2.8 Shallow Utilities Plan

An overall plan, drawn to a scale as indicated in Section 2.1.2 above, shall be prepared compiling the location and alignment of the deep utilities (water and sewer lines) with power, gas, telephone, and cablevision lines and including the location of all related street furniture such as power poles, streetlights, transformers, pedestals, hydrants, valves, manholes, signs, mailboxes, etc.

2.2.9 Signage and Pavement Markings Plan

An overall plan shall be prepared compiling the location and alignment of traffic signs, street signs, information signs, details of sign types, rural addressing signage, and complete pavement markings required to be supplied and installed by the Developer in accordance with these Standards.

2.2.10 Detail Plan/Profile Drawings

These plans, prepared in accordance with accepted engineering drafting standards and practices, are intended to provide location, alignment and dimensioning detail respecting the proposed municipal improvements required to be constructed. Existing infrastructure and other relevant features shall also be shown in detail.

2.2.10.1 General

- These plans shall be prepared to Greenview's specifications.
- The plan portion shall be positioned at the top of the Standard A-1 sheet and the profile portion at the bottom.
- The location and alignment of all underground utilities including mains, valves, hydrants, manholes, catch basins, etc. and surface improvements including carriageways, drainage channels, ditches, approaches, culverts, etc. shall be shown on the same plan portion.
- Profiles of all underground utilities and surface improvements shall be shown on the same drawing.

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- Stationing and chainages shall be arranged so that both the plan and profile portions align wherever possible.
- All dimensioning shall be relative to property lines. Wherever possible, all dimensions shall be provided to a minimum of two (2) property lines.

2.2.10.2 Plan Portion

Information to be shown on the plan portion shall include, but not be limited to, the following:

- Legal subdivision information including lot and block numbers consistent with the addressing system employed by Greenview and lot dimensions, where practical.
- Road and street names and, where applicable, civic addresses.
- Horizontal alignment of all roadways, carriageways, ditches, approaches, culverts, signage, etc. including horizontal curve data, chainages and dimensions of all items related to the property lines.
- Horizontal alignment of all underground mains and fittings, size and type of materials, valves, hydrants, manholes, catch basins, pipe grades, service connection locations, etc., all dimensioned through stationing and chainages and offsets to the property lines.
- Any other information or data deemed necessary and/or appropriate by Greenview.

2.2.10.3 Profile Portion

Information to be shown on the profile portion shall include, but not be limited to, the following:

- Existing ground profiles.
- Proposed design profiles for the centerline of the road carriageway including chainages, vertical alignments and grades, and vertical curve data.
- Proposed design profile for ditch bottoms including chainages, grades, elevations, culvert inverts, erosion and flow control devices, etc.
- Proposed design profile for the underground utilities including stationing, percent grades, size, type and class of pipe, class of bedding, type of trench backfill, invert elevations at all inlets and outlets as well as at all grade changes, manhole rim elevations, existing underground utilities data, etc.
- Any other information or data deemed necessary and/or appropriate by Greenview.

2.2.10.4 Landscape Plans

- The landscaping plans are to include all tree planting, sodded or seeded areas, entrance signage, fence locations, trails, trail signage, playground sites, furniture, bollards, lighting details, retaining walls and all other details that relate to the final landscape designs.
- The Landscape Contractor is responsible for damages and liabilities incurred with respect to damages to site utilities.

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3 WATER DISTRIBUTION SYSTEMS

3.1 GENERAL

- This section outlines the minimum standards or requirements for water distribution systems required to be provided in a development. Refer to Section 6.2 for individual Water Service Connections.
- The Standards outlined herein are intended to be the minimum requirements. It is the Developer's responsibility to meet or exceed these standards in accordance with good engineering practices, specific site conditions, and/or as may be required by Greenview, as well as any and all Statutory and Regulatory Approval Agencies.
- All materials used in the development shall be new and in compliance with the most recent standards of AWWA, ASTM, CSA, NSF or ULC.
- A backflow preventor shall be installed in compliance with National Building Code – Alberta Edition, latest revision thereof.

3.2 DESIGN CRITERIA

- The water distribution system shall be designed in accordance with recommended standards and the design manual of the AWWA, and Alberta Environment's Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, latest revisions thereof, and any higher standards approved by these agencies will supersede Greenview's Development Guidelines & Municipal Servicing Standards.
- The system shall be designed as part of the overall or ultimate distribution system to meet maximum daily consumption plus fire flows or peak hour flows, whichever is greater. A design report shall be submitted to Greenview outlining the calculations for pipe sizing, hydrant flows and pressures including flow and pressure criteria when sprinkler systems are required.
- Fire flow requirements shall be in accordance with the Fire Underwriters guidelines, latest revision thereof.
- The minimum ground elevation residual pressure in the system shall be 310 kPa (45 psi), except at the hydrant used to fight a fire where the residual pressure shall be a minimum of 140 kPa (20 psi) at the minimum required fire flow at the location.
- A pressure-sustaining valve will be required for any development that would have its own fire pump to ensure the municipal system is not drawn below 150 kPa (22 psi).
- Distribution mains shall be continuous (looped) whenever possible. Where a dead-end main is approved, the maximum number of single-family services shall not exceed twenty (20) and a flush point assembly or hydrant shall be installed.
- Wherever there is a requirement that the water main cannot be interrupted, a hot tap shall be placed on the water main.
- The minimum pressure to be maintained in a residential distribution system where automatic sprinklers are a requirement is 350 kPa (51 psi).
- A design report shall be provided to Greenview outlining the minimum service pipe sizing and design pressure required at each lot to meet the Residential Sprinkler Standard.

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3.3 WATER MAIN PIPE MATERIAL

- The water main pipe material shall be designed in accordance with recommended standards and the design manual of the AWWA, and Alberta Environment's Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, and any higher standards approved by these agencies will supersede Greenview's Development Guidelines & Municipal Servicing Standards.

3.4 WATER MAIN INSTALLATION CRITERIA

- All mains shall be installed to a minimum depth of 3.2m to top of pipe below the finished design grade. Alternative methods may include appropriate insulation techniques only as approved by Greenview. Refer to Drawing 6.8: Insulation Requirements for Water Mains & Services.
- All pipes shall be installed on compacted granular bedding. Class B granular bedding material shall be placed and compacted around the pipe to at least 300 mm above the top of pipe. The granular bedding shall be a material approved by Greenview and shall typically consist of:
    - Crushed or screened stone, gravel or sand consisting of hard durable particles free from clay lumps, cementation, organic matter, frozen material or other deleterious material;
    - Gradations to be within limits specified when tested to ASTM C136 and ASTM C117 and to have a smooth curve without sharp breaks when plotted on semi-log charts.
- All pipe installations shall be in compliance with the manufacturer's recommendations, including vertical and horizontal allowable deflections.
- Unless approved otherwise, all water mains shall be installed within the road right-of-way.
- A minimum of 3.0m horizontal separation shall be maintained between a water main and any sewer (sanitary or storm).
- A minimum distance of 3.0m horizontal separation shall be maintained between any water main or water main fixtures and any power line including streetlights, gas line, telephone/television cable, or any duct line or pipeline, subject to further approval in writing by the shallow utility and/or pipeline company and by Greenview.
- Unusual conditions including excessive rock, dewatering problems, or congestion with other utilities may prevent the normal required separation of 3.0m. Under these conditions, Greenview may approve a lesser separation distance. Under no circumstances shall the horizontal distance be less than 1.0m.
- Unless approved otherwise, water mains shall cross above sewers with sufficient vertical separation to allow for proper bedding and structural support of the water and sewer mains. If a water main is to be constructed underneath a sewer main, a minimum 0.5m vertical separation is required and adequate structural support shall be provided.
- Thrust blocking shall be type 50.0 sulphate-resistant concrete having a minimum compressive strength of 20.0 Mpa quick set or employ mechanical thrust blocks. Do not perform a hydrostatic test before concrete cures for a minimum of 5 days.
    - Refer to Drawing 3.2: Horizontal Thrust Block.
    - Refer to Drawing 3.3: Vertical Bend & Offset Thrust Block.
- Pipe Restraint Devices shall be used separately or in conjunction with thrust blocks, where identified as being required, and shall be installed in accordance with the manufacturer's

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recommendations. Restraint Devices for Mechanical Joint or Push-On fittings shall be as per current industry standards.

  - Refer to Drawing 3.4: Typical Mechanical Joints.

- Piping may be installed utilizing Horizontal Directional Drilling method as per Section 6.5 and as shown on design drawings.

3.5 WATER VALVES

- Water main valves shall be the same size as the diameter of the main.
- Valves on the distribution mains shall be located such that during a shutdown:
  - No more than three (3) valves are required to affect the shutdown, with two (2) valves at a tee and three (3) at a cross;
  - No more than one (1) hydrant is taken out of service;
  - No more than twenty (20) single-family services are taken out of service.
- For water mains with a diameter up to and including 400 mm, gate valves conforming to AWWA C509, latest revision thereof.
- For water mains with a diameter greater than 400 mm, butterfly valves conforming to AWWA C504, latest revision thereof.
- In paved roadways, the lid of the top box shall be set flush with the finished surface. In graveled roadways and lanes, the lid of the top box shall be set 150mm below the finished graveled surface. The top of the operating rod shall not be lower than 450mm below the finished surface grade.
- Record drawings, including embedded construction photos, shall be provided by the Consulting Engineer illustrating the exact locations of all valves, complete with their model and make.
- Refer to:
  - Drawing 3.5: Valve Casing Detail for Fillcrete & Granular Backfill
  - Drawing 3.6: Gate Valve Installation
  - Drawing 3.7: Butterfly Valve Installation
  - Drawing 3.8: Air Relief Valve Installation
  - Drawing 3.15: Flush Point

3.6 HYDRANTS

- Hydrants shall be Canada Valve brand, model(s) as approved by Greenview.
- Hydrants shall be "dry barrel" type conforming to AWWA C502, latest revision thereof, and shall include the following supplementary requirements:
  - Bottom connection with drip valve and drain; non-drain hydrants, if required, will be marked as non-drain on the barrel.
  - All hydrants to be finished (e.g. colour) as designated by Greenview.
- Hydrant leads shall be a minimum 1m separation and may require approved frost protection around storm leads.

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- A 150mm gate valve complete with valve box located a minimum of 1.0m from the hydrant shall be provided on each hydrant lead.
- All hydrants along roadways shall be located consistent with:
    - Drawing 3.9: Hydrant & Valve Locations;
    - Drawing 3.10: Hydrant Bollard Placement for Commercial/Industrial Development; and
    - Drawing 3.14: Hydrant Shoulder Widening Layout.

  Whenever possible, fire hydrants shall be installed at the furthest point of a dead-end main for the purposes of flushing; otherwise, a flush point assembly shall be utilized. Design shall account for flushing to a paved surface or rip-rapped ditch to prevent erosion from flushing.
- A minimum 0.5m^3 wash rock drainage sump shall be provided around the hydrant base. Top of sump to be 150mm above the hydrant drain and covered with 6.0mm polyethylene to minimize intrusion of silt or clay into the gravel. Refer to Drawing 3.11: Hydrant & Valve Detail.
- The maximum allowable spacing between fire hydrants shall be consistent with the Fire Underwriters guidelines, latest revision thereof.
- Furthermore, hydrants shall be located such that the distance to any commercial/industrial building shall not be greater than 75m.
- Record drawings shall be provided by the Consulting Engineer illustrating the exact location of all hydrants and hydrant valves relative to the property line and the main water valves.
- Hydrant Markers (Pollard Water Flexi-Flag Hydrant Marker, 1.83m (68802)) shall be installed at each hydrant.
- Where the water table is located above the fire hydrant drain, the hydrant drain port may require plugging. The hydrant must be clearly identified on the record drawings and colour-coded yellow on the hydrant with a note that this hydrant must be pumped out after each use.
- Fire hydrants shall be operated in a full-open or full-closed position only. Flow control shall be achieved by throttling a secondary valve which must be installed on the hydrant outlet(s) on a temporary basis.

3.7 TRENCHING AND BACKFILLING

- All trenching and backfilling operations shall be conducted in accordance with current industry standards.
    - Refer to Drawing 3.12: Trench Excavation & Backfill.
- Prior to backfilling, all piping, fittings, valves, and backfill material shall be inspected by the Consulting Engineer or their representative for compliance with drawings and these Standards.

3.8 THRUST BLOCKING

- Thrust blocking shall be in accordance with AWWA standards and required at applicable locations.
- The size and configuration of the thrust blocking shall be designed for each particular application.

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3.9 CATHODIC PROTECTION

- Cathodic protection shall be required on all metallic main valves, fittings and hydrants.
- Denso tape will be wrapped on all valves and all underground appurtenances.
- Drawing 3.13: Hydrant & Valve Anode Detail.

3.10 TESTING

- Following construction, all water mains shall be flushed, disinfected, and leakage tested. Greenview shall be notified at least forty-eight (48) hours in advance of all proposed tests, which shall be conducted in their presence. All water used shall be from an independent potable water source (e.g. water truck); if available, Greenview water will be used.
- Water main installations shall be pressure and leakage tested in accordance with AWWA standards, latest revision thereof.
- For existing water mains that are repaired, the line must be flushed until chlorine residual and turbidity levels are within normal operating ranges (average turbidity < 2.0 NTU and total chlorine residual > 0.1 mg/L), before putting the main back into service.
- Water Systems which will not provide water main flushing velocities of at least 3.0m/sec shall be flushed using foam swabs prior to disinfecting the water mains. Two (2) points along the waterline shall be used for testing.
- Disinfection shall be conducted in accordance with standards outlined in AWWA C651, latest revision thereof.
- A bacteriological test sample must show:
    - The absence of coliform organisms and E. coli.
    - Meet the Guidelines for Canadian Drinking Water Quality, latest revision thereof.
- Following disinfection, the chlorine solution shall be de-chlorinated by mixing with sodium thiosulphate according to the manufacturer's instruction and re-tested prior to discharge to ditches or storm sewers. All water mains shall be thoroughly flushed. Extreme care shall be exercised to ensure that no contamination of any adjacent property or utility occurs. In addition, discharge of water during flushing operations shall be undertaken in such a manner as to minimize erosion of or damage to adjacent property.
- All testing results shall be documented and submitted to Greenview for approval prior to commissioning of the system and the issuance of a Construction Completion Certificate.

The leakage allowance is calculated from AWWA Manual, latest revision thereof.

Leakage allowance for new construction of materials other than PVC shall be in accordance with the applicable AWWA standard or as specified by Greenview.

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3.11 LOW DENSITY WATER DISTRIBUTION SYSTEMS

3.11.1 General

This section outlines the minimum standards or requirements for water distribution systems required to be provided in rural low density residential developments, as determined by Greenview. All materials used in the development shall be new and in compliance with the most recent standards of AWWA, ASTM and CSA.

3.11.2 Design Criteria

The water distribution system shall be designed in accordance with recommended standards and the design manual of AWWA, and Alberta Environment's Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, latest revisions thereof.

Plan/profile drawings, specifications, and a letter report shall be prepared by the Consulting Engineer and be submitted to Greenview and to Alberta Environment for review and approval prior to construction.

3.11.3 Water Main Pipe Material

- All materials must refer to Section 3.11.2 Design Criteria above.
- The Developer shall supply and install only new materials. All such materials that are defective in manufacture, damaged in transit, or have been damaged after delivery shall be replaced by the Developer at their expense.
- Where specific products are referenced, it is intended that approved equals will be considered.
- The "approved as equal" must be obtained from Greenview, in writing, before the equal product is used.
- Pipe age is not to exceed two (2) years at time of installation.

3.11.4 Fittings

- All fittings must refer to Section 3.11.2 Design Criteria above.

3.11.5 Valves

- All valves must refer to Section 3.11.2 Design Criteria above.
- The interior is to be factory coated with epoxy coating conforming to AWWA C550, latest revision thereof. The exterior is to be factory applied epoxy coated. Corrosion reduction is to be provided by installation of a zinc sacrificial anode.
- Valve boxes shall meet current AWWA standards. The top of the box is to be marked "WATER".
- A rock disk plate is required on all valves.

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3.11.6 Service Connection

- All service connections must refer to Section 3.11.2 Design Criteria above.
- Each lot unit must have a separate service. Meter chambers or CC valves shall be installed at or just before the private property line, located within a utility easement or as approved in writing by Greenview.
- Meter chambers and CC valves shall be located 3m minimum from road-facing property line.
- Minimum depth of cover shall be 3.2m from finished grade to the top of pipe.

3.11.7 Water Mains Installation Criteria

- Water main alignments shall be approved by Greenview.
- Mains shall be at a depth adequate to provide a minimum of 3.2m depth of cover from finished grade to top of pipe.
- Mains and service connections shall be installed by auguring under existing streets, roadways, railways, sidewalks, curbs and gutters.
- In general, backfilling shall be conducted with approved native material in 300mm layers, compacted to a minimum of 98% SPD within the road right-of-way, and 95% SPD in all other areas. The top 1m shall be in 150mm lifts compacted to 98% SPD.
- Final alignment for shallow utilities to be approved in writing by Greenview.
- Tracer wire with insulation shall be installed simultaneously with the pipe on all mains and services. The following shall apply:
    - Tracer wire shall not be connected to the steel pipe or transition couplings;
    - Tracer wire shall be secured to the top of every valve box riser, at every road crossing, at every facility location, and at each end of every plastic pipe section. It shall be brought flush to the ground inside a rigid PVC conduit and looped inside a PVC junction box within a Type A valve box marked "WATER".
    - Splicing of tracer wire shall be soldered only, no mechanical connections are permitted, and an electrical continuity test is to be performed prior to acceptance.
- Marker posts shall be installed perpendicular to all valve and appurtenance locations, adjacent to the property line. Warning signs and painted fence posts shall be installed at the edge of the road right-of-way, where water mains cross roadways.

3.11.8 System Installation

- The system installation standards are intended to address key points only and are not to be considered as a substitute for a detailed construction specification to be prepared by the Consulting Engineer.
- If unsuitable soil conditions (e.g. organics, high moisture content, rock, etc.) are encountered, the method for dealing with these conditions shall be assessed by a qualified Professional Engineer commissioned by the Developer, and a letter report is to be submitted to Greenview.
- Drawing 3.1: Classes of Pipe Bedding

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3.11.9 Augering of All Service Connections

- All augering of service connections must be approved by Greenview before proceeding.

3.11.10 Inspection and Testing

- Before acceptance of the work, the entire system shall be subjected to a hydrostatic pressure test in the presence of Greenview's Engineer or designated representative. The Developer shall provide all necessary labour, materials, and equipment for the test including a suitable pump, measuring tank, pressure hoses, connections, plugs, caps, gauges, and all other apparatus necessary for filling the main, pumping to the required test pressure, and recording the pressure and leakage losses. The Developer shall provide evidence that the gauges used are accurate.
- The water distribution system may only be charged through one valve. Only one valve may be operated during pressure and leakage testing as well.
- Prior to the start of pressure and leakage, chlorination and bacteria testing, the Consulting Engineer will be required to provide a plan outlining how the testing is to be accomplished. The plan must include the sequence of valve turning, the sections of water main to undergo pressure and leakage testing, how chlorination is to be accomplished, and locations where chlorine residual and bacteria tests are to be taken. Testing will not be allowed to proceed until the above is approved by Greenview and/or Greenview's Engineer.
- The allowable leakage for High-Density Polyethylene (HDPE) pipe material shall be determined by current AWWA standards.

3.11.11 Acceptance

- Prior to the initial acceptance of the water system, water mains are to be disinfected in accordance with AWWA C651, latest revision thereof. Procedural methods of disinfection, including chlorine concentration calculations and contact times, are to be submitted to Greenview for acceptance. The water main valves are to remain closed until such time as the bacteria sample results are approved.
- All existing infrastructure to be operated by Greenview only.
- Under Alberta Environment's Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, super chlorinated water used for disinfection of the system cannot be directed into a ditch drainage system or open water body. De-chlorination will be required before being discharged into the environment.
- Prior to initial acceptance of the water system and the system being put into service, bacteriological testing shall be conducted on all water mains and acceptable test results must be achieved.

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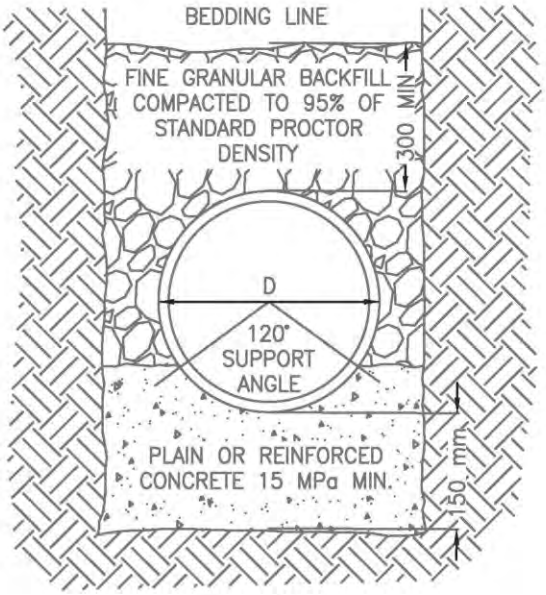
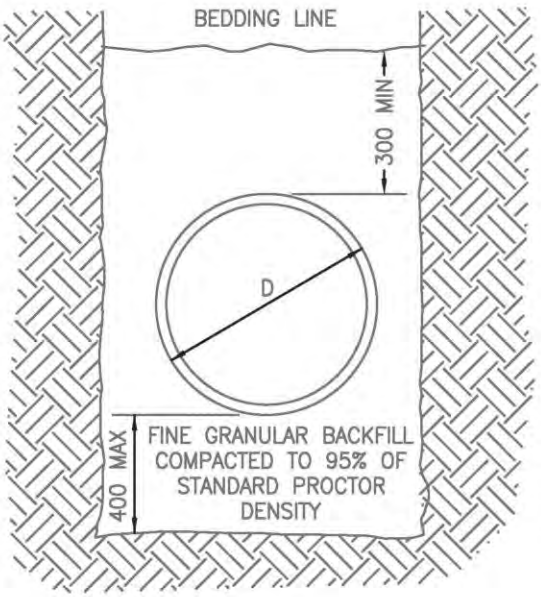
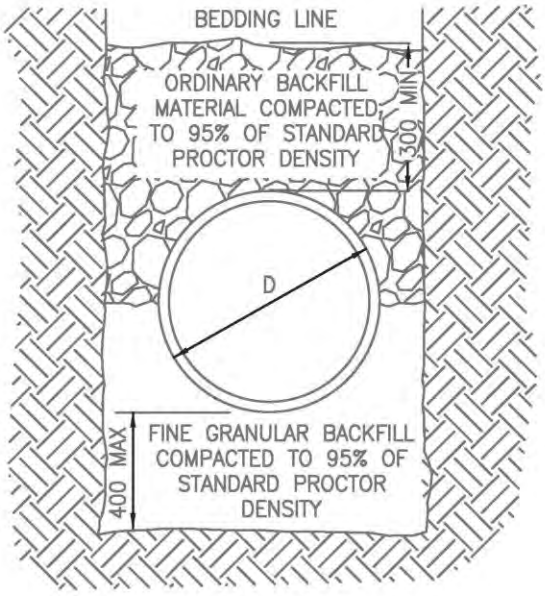


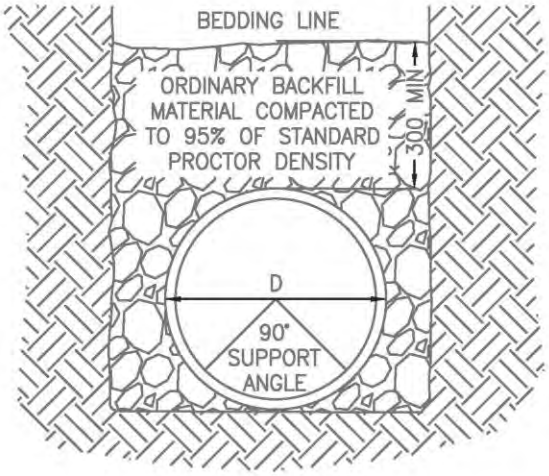
CLASS "A"



CLASS "B"



CLASS "C"



CLASS "D"

NOTES:
1. ALL MATERIAL TO BE BACKFILLED IN 150mm LAYERS.
2. WHERE INSTRUCTED OR AS SHOWN ON DRAWINGS, REPLACE FINE GRANULAR WITH COURSE GRANULAR MATERIAL.
3. FOR DIMENSIONS OF TRENCH SEE DWG. 3.12.
4. "D" IS THE OUTSIDE DIAMETER OF THE PIPE.
5. BACKFILL ABOVE BEDDING LINE TO BE PLACED IN ACCORDANCE WITH THE SPECIFICATION.
6. APPLICABLE ONLY TO SINGLE PIPE INSTALLATIONS IN TRENCHES EXCAVATED IN UNDISTURBED GROUND.
7. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

N.T.S.

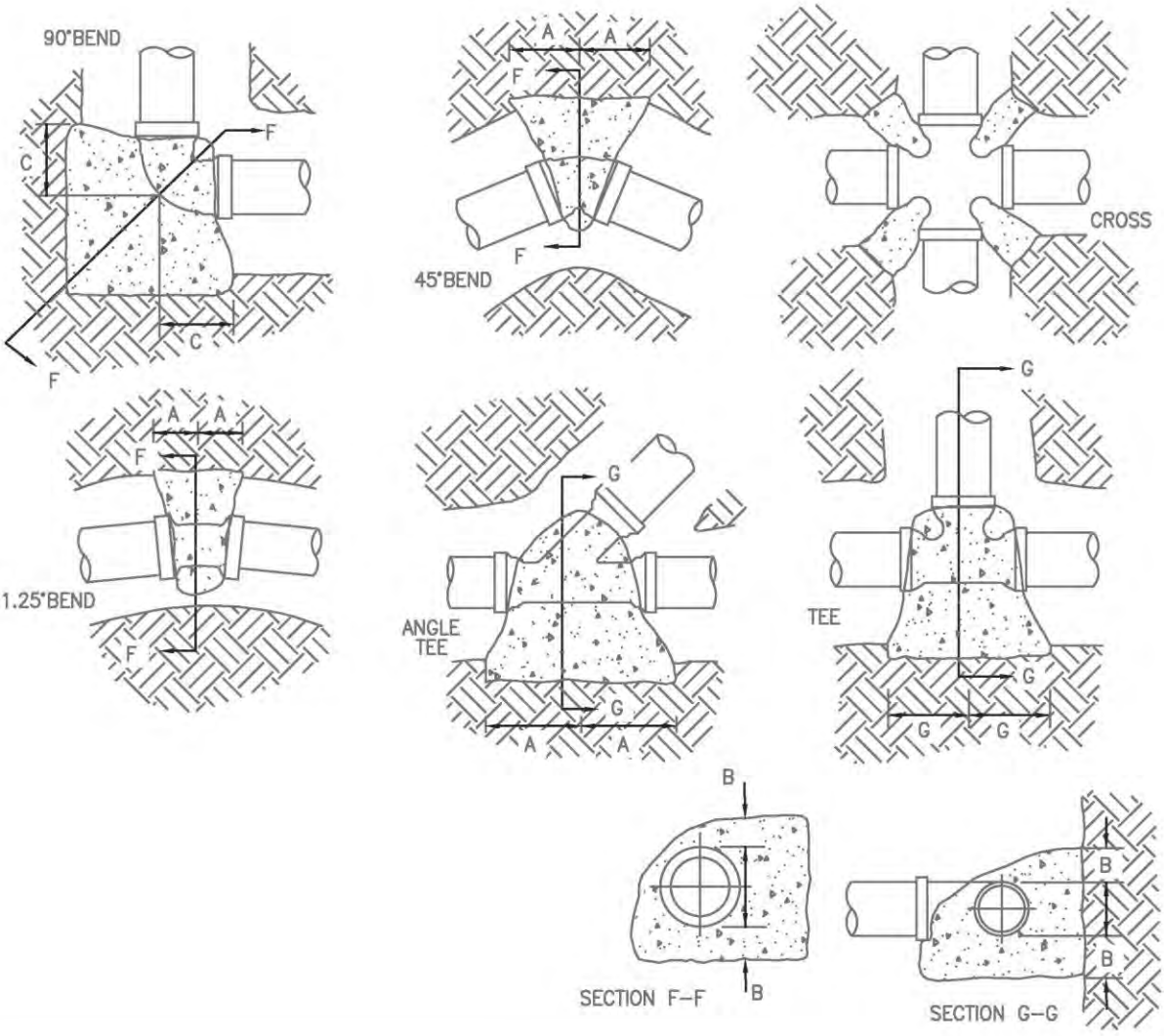
MUNICIPAL DISTRICT OF GREENVIEW No. 16

CLASSES OF PIPE BEDDING

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.1



REQUIRED BEARING AREA																				
	TEE BRANCH & DEAD END					22.5° & 11.25° BENDS					45° BENDS					90° BENDS				
DIA (mm)	300	250	200	150	100	300	250	200	150	100	300	250	200	150	100	300	250	200	150	100
A (mm)	975	775	550	375	250	300	225	200	150	100	550	450	375	300	200					
B (mm)	75	75	75	75	75	150	125	100	75	75	150	125	100	75	75	525	350	300	200	150
C (mm)																450	400	350	300	200
AREA (m^2)	1.025	0.750	0.475	0.275	0.125	0.500	0.275	0.200	0.150	0.050	0.800	0.550	0.375	0.225	0.100	1.475	1.025	0.700	0.400	0.175

NOTES:
1. DESIGN BASIS:
   a. HYDRAULIC PRESSURE 1035 kPa
   b. SOIL BEARING CAPACITY 72 kPa (MEDIUM SOFT CLAY)
2. TEMPORARY BLOCKING MUST BE APPROVED BY THE ENGINEER
3. CONCRETE STRENGTH SHALL BE 25 MPa AT 28 DAYS
4. CONCRETE TO BE CLEAR OF BELLS AND PIPE UNDER ALL FITTINGS
5. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

HORIZONTAL THRUST BLOCK

MUNICIPAL SERVICING STANDARDS

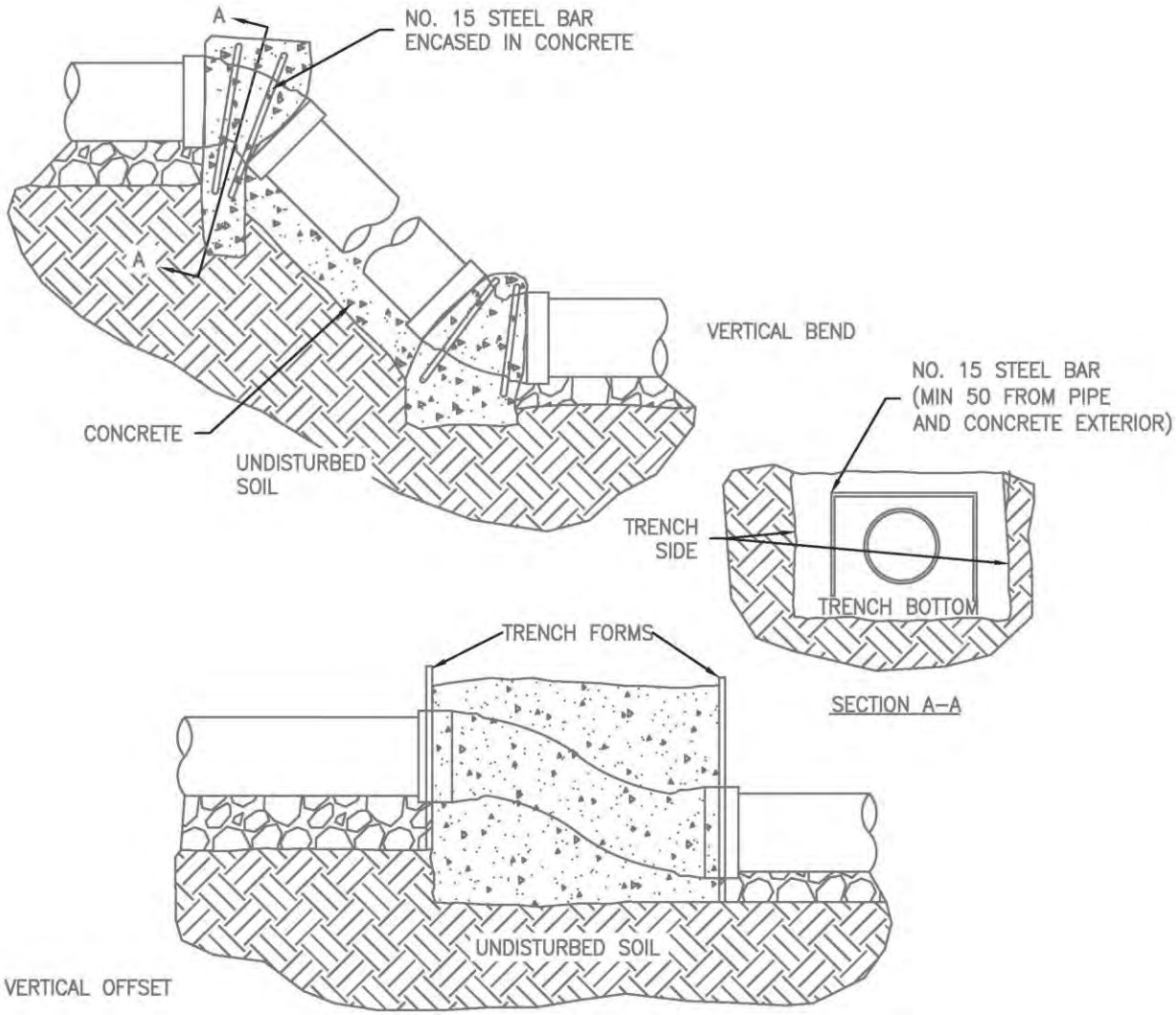
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE

DATE: JAN. 2015

REVISED: SEPT. 2025

DRAWING NO: 3.2



REQUIRED BEARING AREA										
	22.5° & 11.25° BENDS					45° BENDS				
DIA (mm)	300	250	200	150	100	300	250	200	150	100
AREA (m^2)	0.425	0.275	0.200	0.150	0.050	0.800	0.550	0.375	0.225	0.100

NOTES:
1. DESIGN BASIS:
   a. HYDRAULIC PRESSURE 1035 kPa.
   b. SOIL BEARING CAPACITY 72 kPa (MEDIUM SOFT CLAY).
2. CONCRETE MUST NOT ENCASE BELLS OR PIPE.
3. CONCRETE STRENGTH SHALL BE 25 MPa AT 28 DAYS.
4. CONCRETE TO BE CLEAR OF BELLS AND PIPE UNDER ALL FITTINGS.
5. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

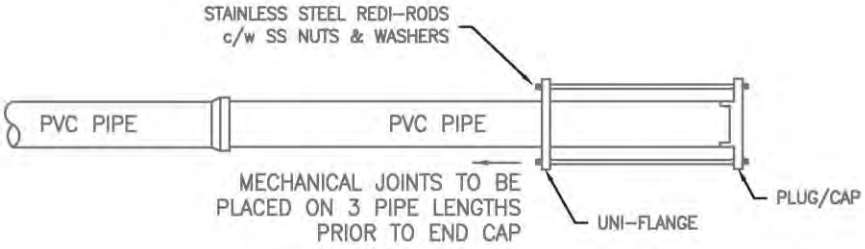
MUNICIPAL DISTRICT OF GREENVIEW No. 16

VERTICAL BEND & OFFSET THRUST BLOCK

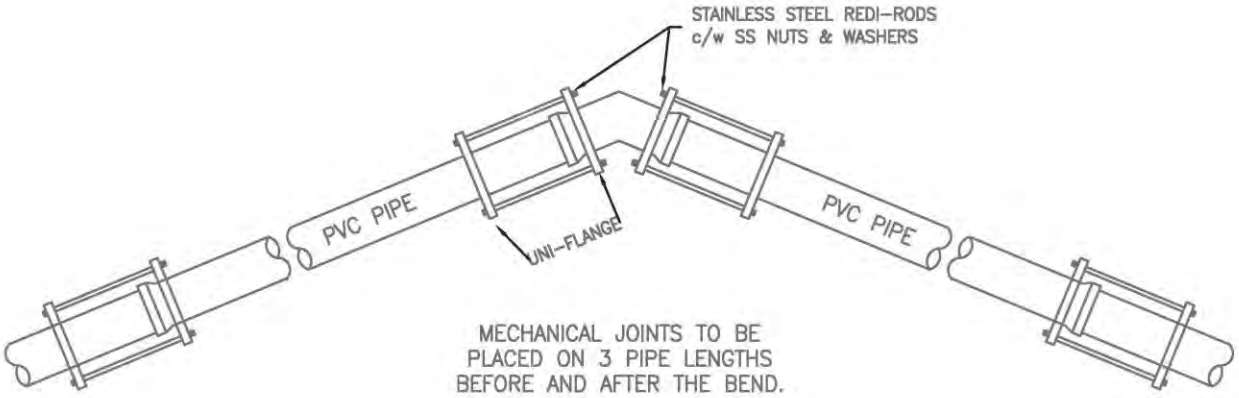
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.3



AT DEAD END



AT BEND

BELL/SPIGOT PVC PIPES

NOTES:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

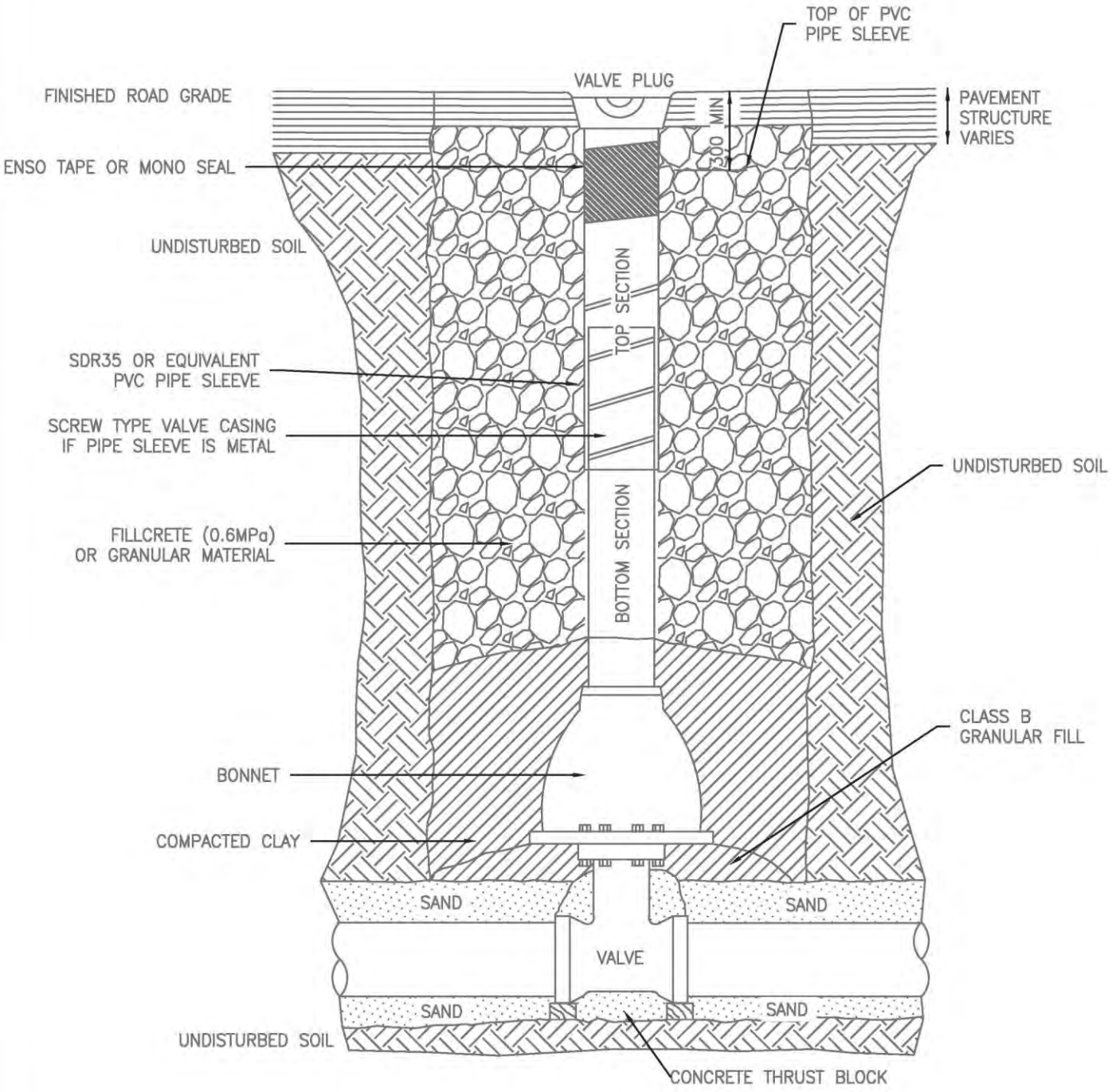
MUNICIPAL DISTRICT OF GREENVIEW No. 16

TYPICAL MECHANICAL JOINTS

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.4



NOTES:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

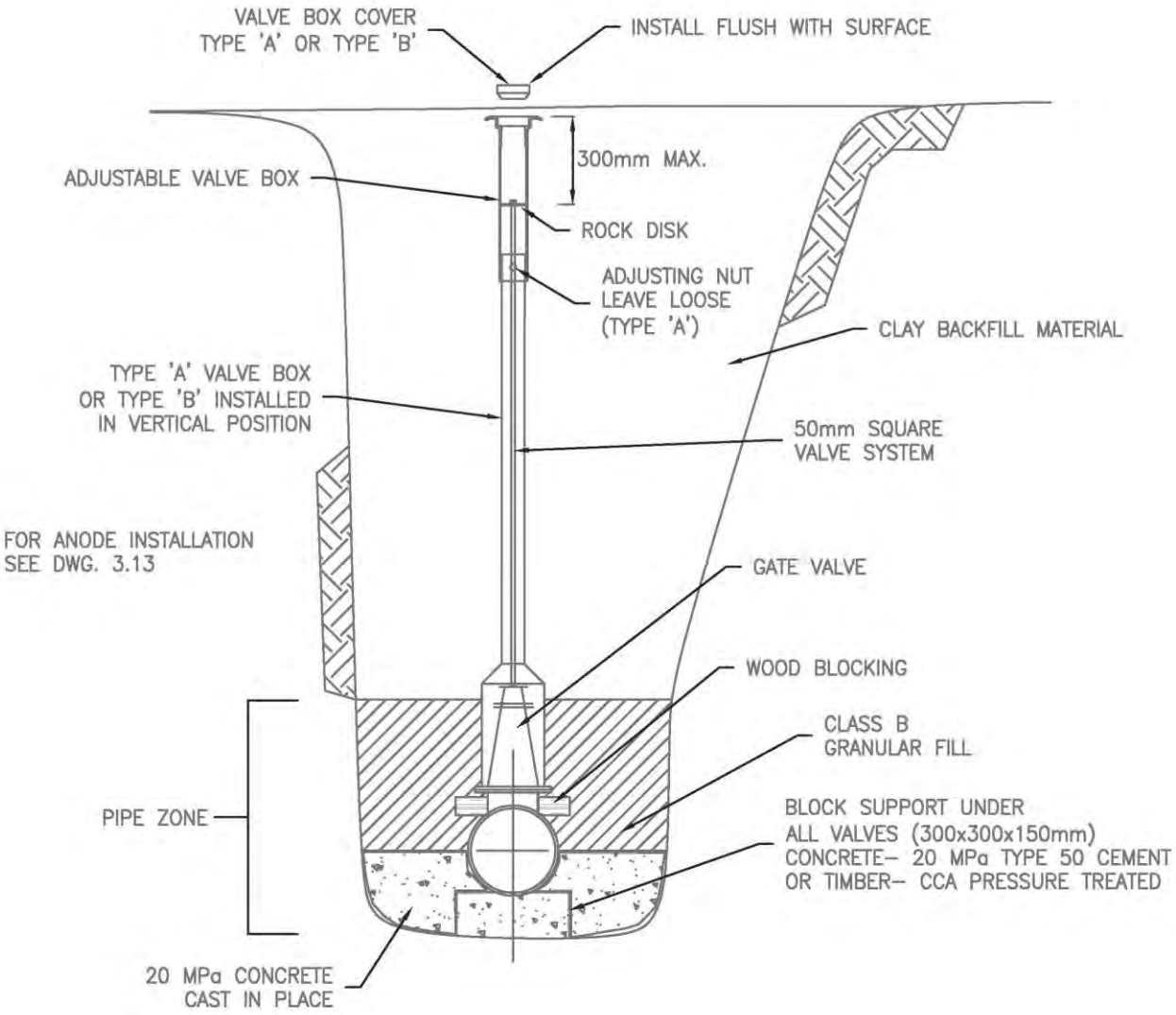
MUNICIPAL DISTRICT OF GREENVIEW No. 16

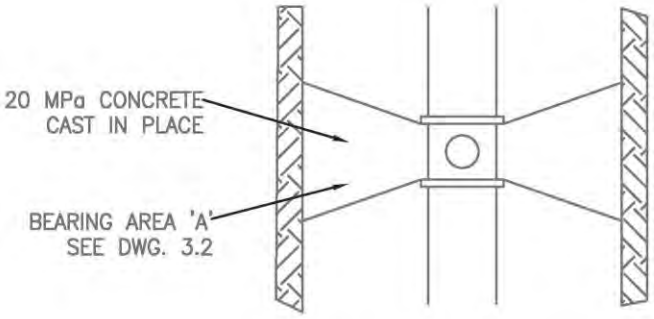
VALVE CASING DETAIL FOR FILLCRETE & GRANULAR BACKFILL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.5





THRUST BLOCK DETAIL

NOTES:
1. FOR VALVES LESS THAN 400mm USE FLOATING TYPE OR TYPE 'A' VALVE BOX.
2. ALL BOLTS TO BE STAINLESS STEEL WRAPPED WITH DENSO MASTIC AND DENSO TAPE.
3. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

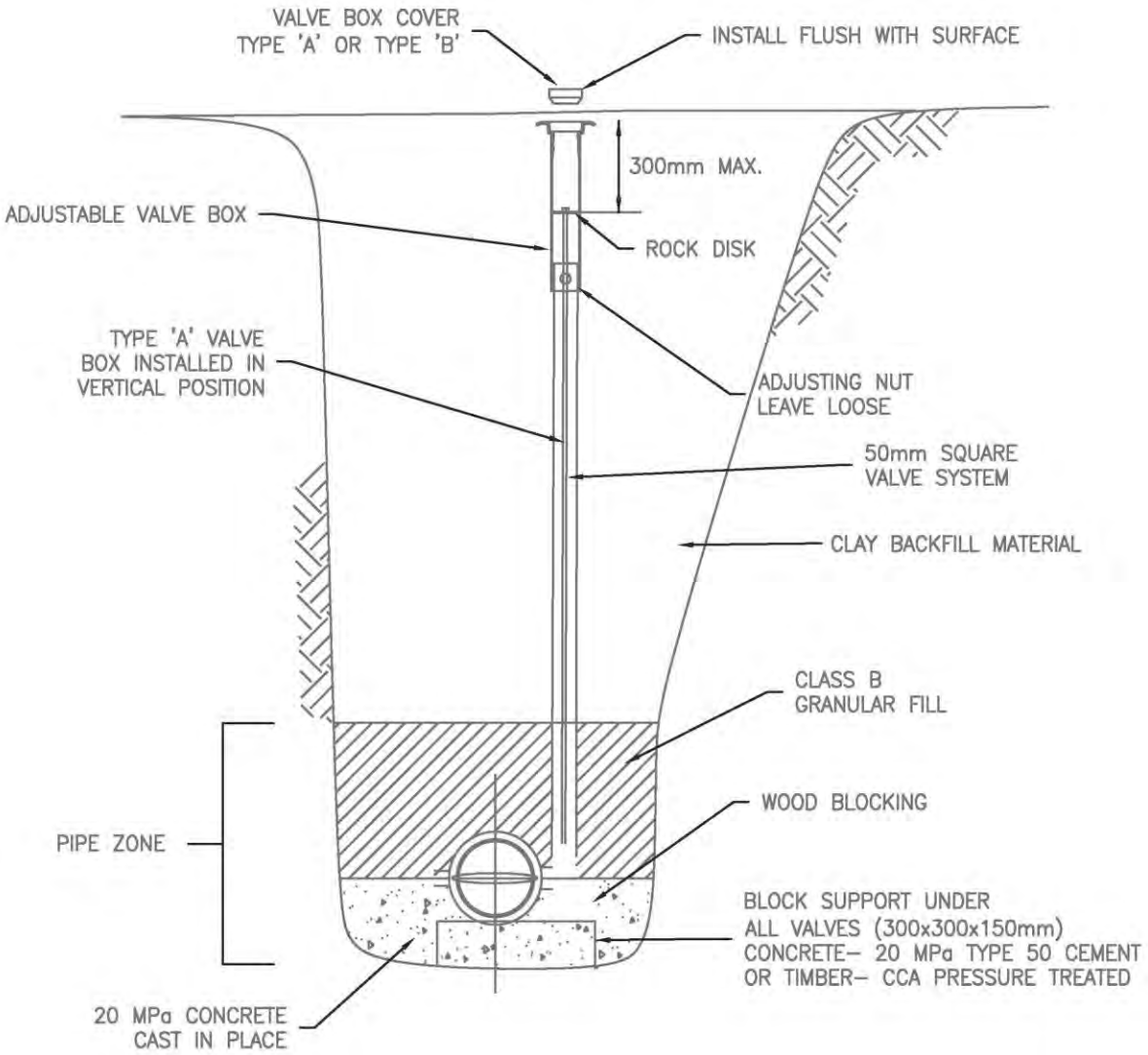
MUNICIPAL DISTRICT OF GREENVIEW No. 16

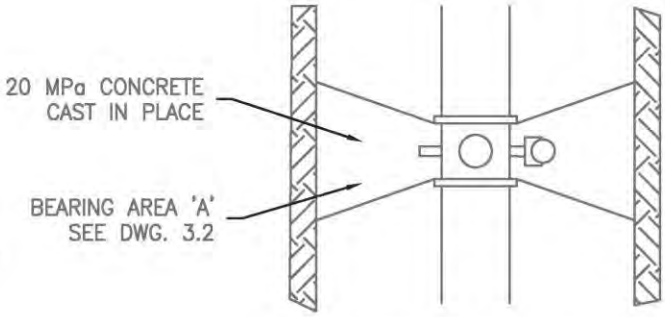
GATE VALVE INSTALLATION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.6





THRUST BLOCK DETAIL

NOTES:
1. ALL BOLTS TO BE STAINLESS STEEL WRAPPED WITH DENSO MASTIC AND DENSO TAPE.
2. PAINT TOP OF INTERIOR BOX BRIGHT RED AND STAMP CAP 'BV'.
3. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

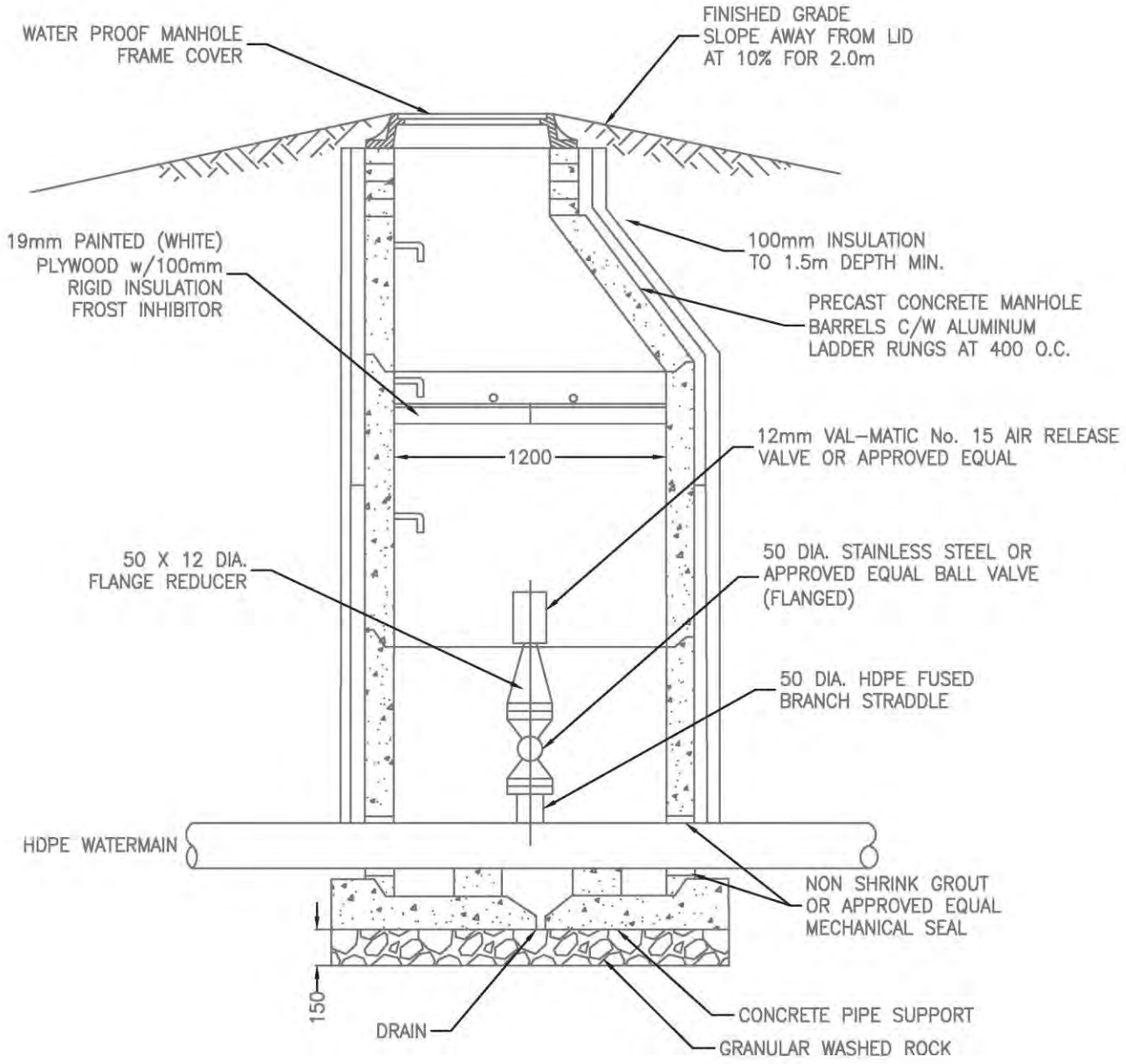
MUNICIPAL DISTRICT OF GREENVIEW No. 16

BUTTERFLY VALVE INSTALLATION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.7



NOTES:
1. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. EXTERIOR OF MANHOLE TO BE INSULATED WITH 100mm HIGH LOAD STYROFOAM INSULATION TO AT LEAST 1.5m BELOW GROUND.

N.T.S.

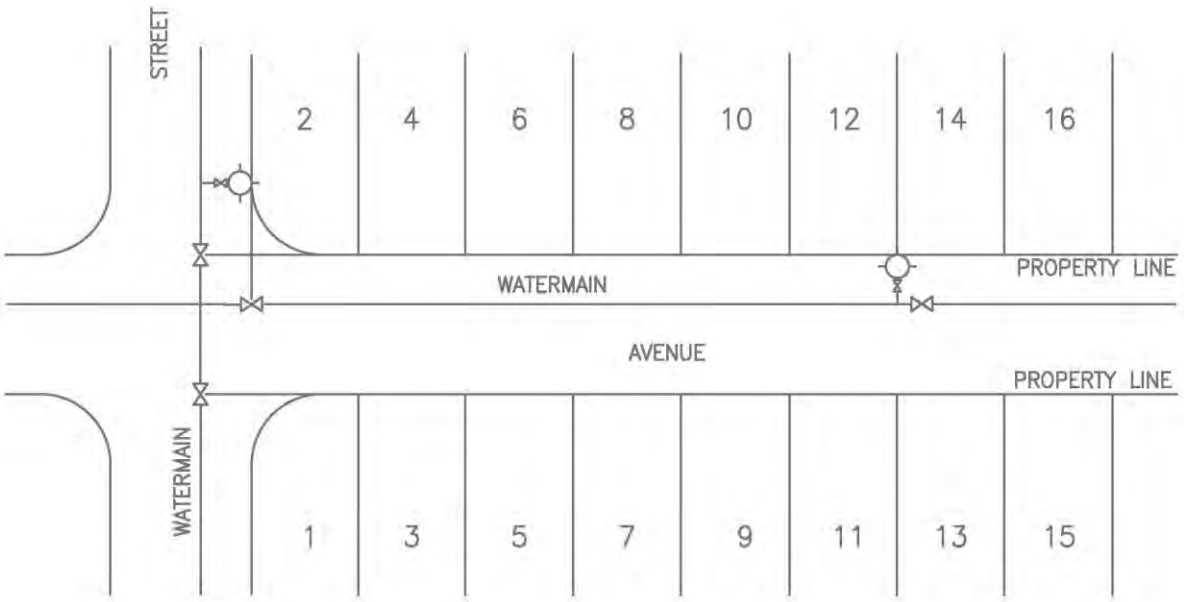
MUNICIPAL DISTRICT OF GREENVIEW No. 16

AIR RELIEF VALVE INSTALLATION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.8



– VALVE

– HYDRANT AND VALVE

NOTES:
1. AVOID USE OF EASEMENTS WHERE A STREET OR LANE ALIGNMENT IS AVAILABLE.
2. HYDRANTS TO BE LOCATED NEAR STREET INTERSECTIONS AND SPACED AS PER SPECIFICATION.
3. VALVES TO BE LOCATED OPPOSITE PROPERTY LINES AS ILLUSTRATED.

N.T.S.

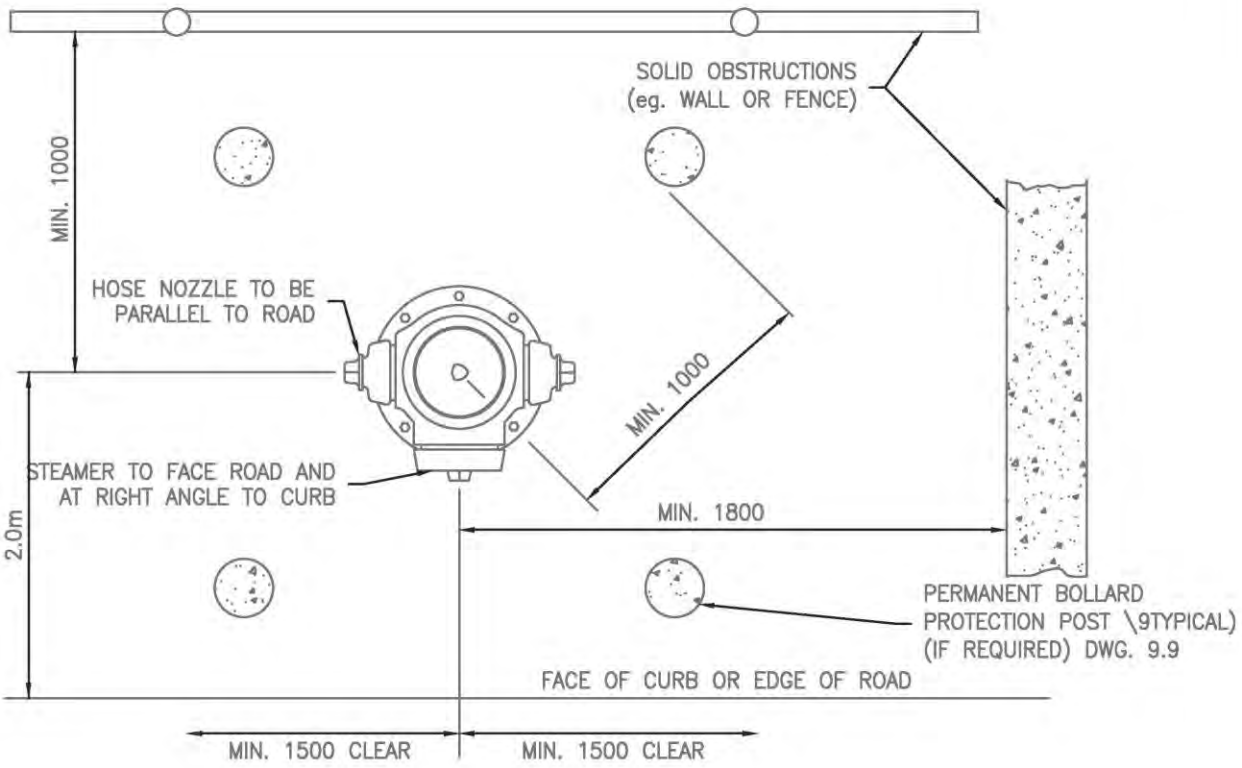
MUNICIPAL DISTRICT OF GREENVIEW No. 16

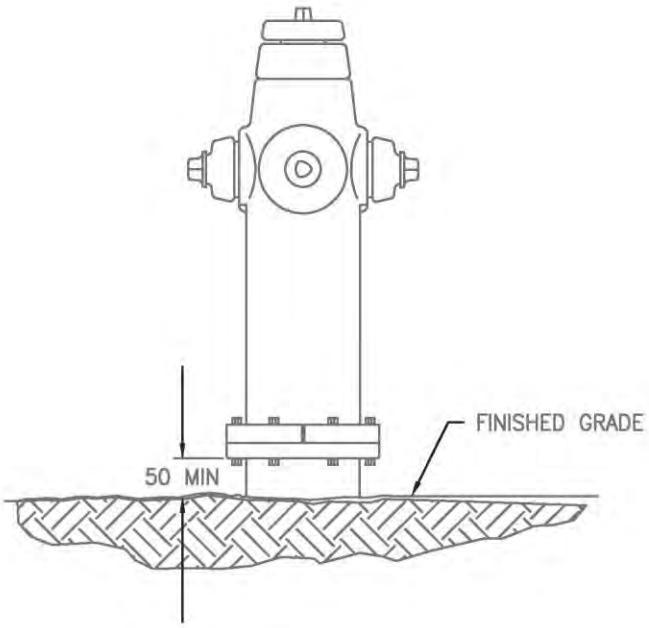
HYDRANT & VALVE LOCATIONS

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.9





NOTES:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

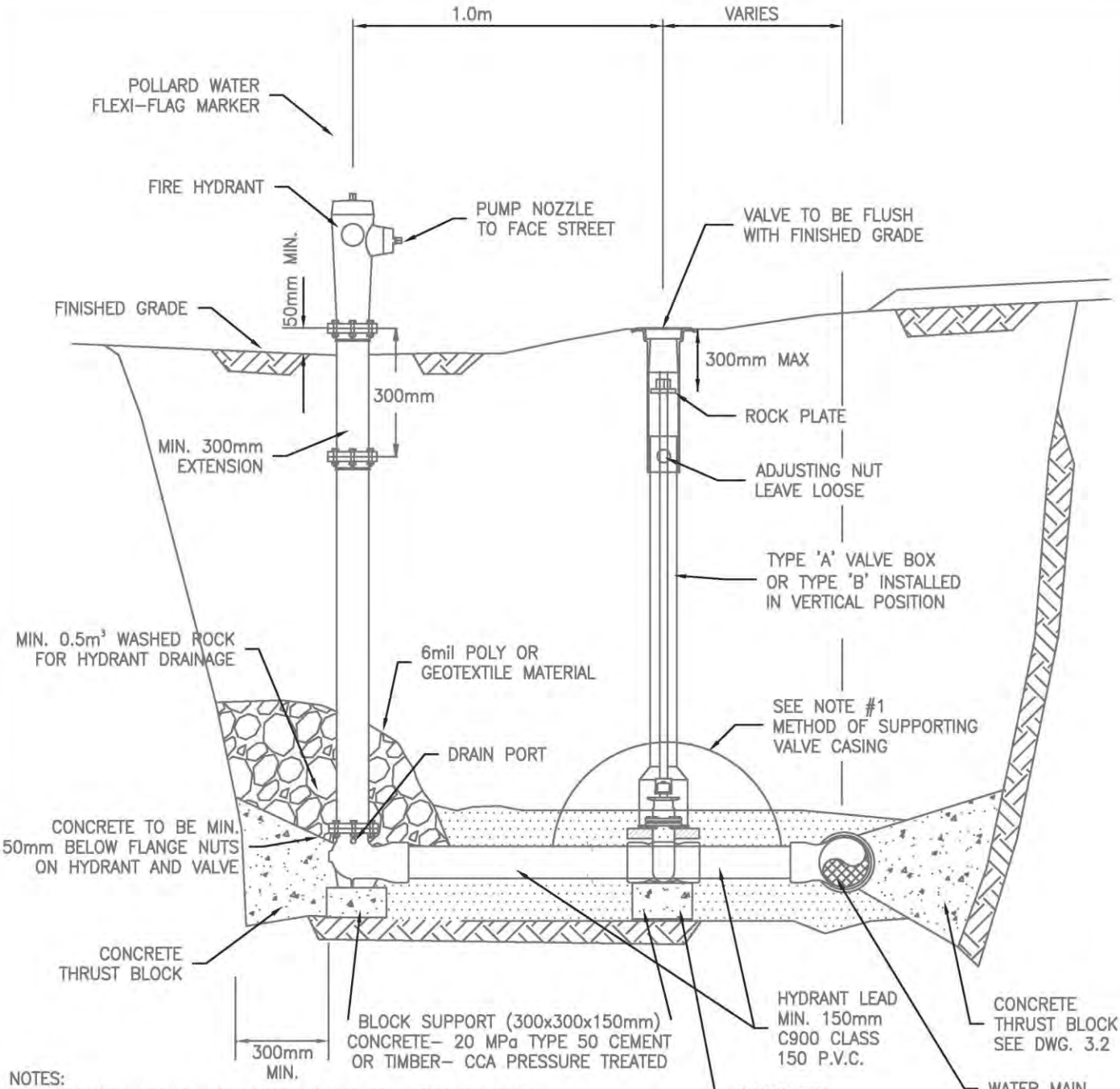
MUNICIPAL DISTRICT OF GREENVIEW No. 16

HYDRANT BOLLARD PLACEMENT FOR COMMERCIAL/INDUSTRIAL DEVELOPMENT

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.10



NOTES:

1. HYDRANTS ARE TO BE CANADA VALVE OR APPROVED EQUAL.
2. HYDRANTS TO BE EQUIPPED WITH A STORZINTERNAL LUG, QUICK CONNECTION NOZZLE OR EQUIVALENT.
3. HYDRANT DRAIN HOLES TO BE PLUGGED IN AREAS OF HIGH GROUND WATER.
4. ALL BOLTS TO BE STAINLESS STEEL WRAPPED WITH DENSO MASTIC AND DENSO TAPE.
5. AFTER INSTALLATION PAINT HYDRANTS TO AN APPROVED COLOUR USING EXTERIOR ENAMEL.
6. ALL MEASUREMENTS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

METHOD OF SUPPORTING VALVE CASING:

1. BUILD 600x600mm LEVEL BASE OF COMPACTED CLAY AROUND AND OVER VALVE BONNET.
2. DO NOT BLOCK DRAIN PORT.

N.T.S.

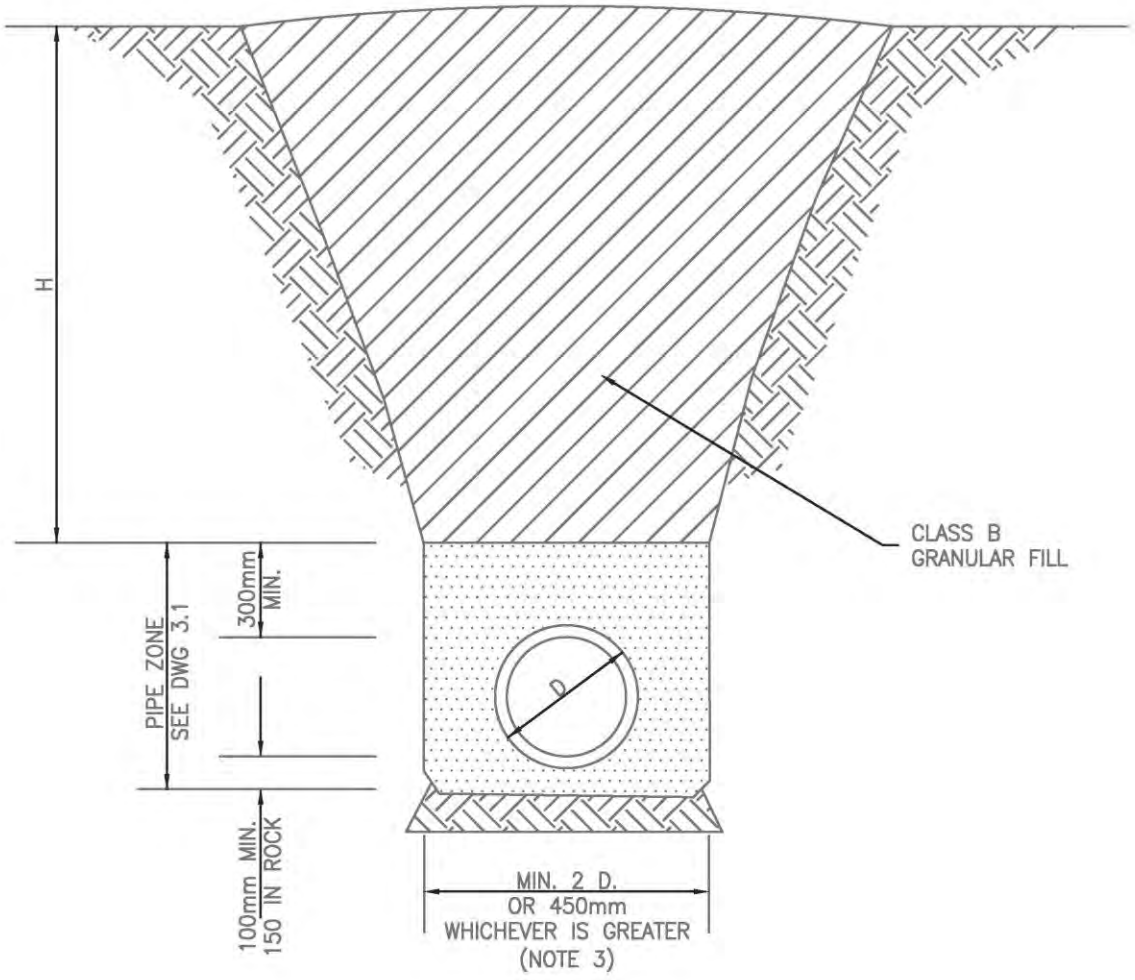
MUNICIPAL DISTRICT OF GREENVIEW No. 16

HYDRANT & VALVE DETAIL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.11



NOTES:
1. WHEN CUT BACK SLOPES ARE TO BE USED IN LIEU OF CAGES AND SHORING, THESE SLOPES ARE TO MEET REQUIREMENTS OF LOCAL CODES.
2. SEE STANDARDS FOR MINIMUM COVER ABOVE PIPE.
3. MINIMUM PIPE ZONE WIDTH IS SPECIFIED TO ALLOW PROPER PIPE ZONE COMPACTION.
4. D = OUTSIDE PIPE DIAMETER.
5. FOR UNCOMPACTED NATIVE OR IMPORTED BACKFILL, ROACH TRENCH BY 0.1xH.
6. H = BACKFILL AS PER SPECIFICATIONS & AS PER GEOTECHNICAL REPORT
6. ALL MEASUREMENTS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

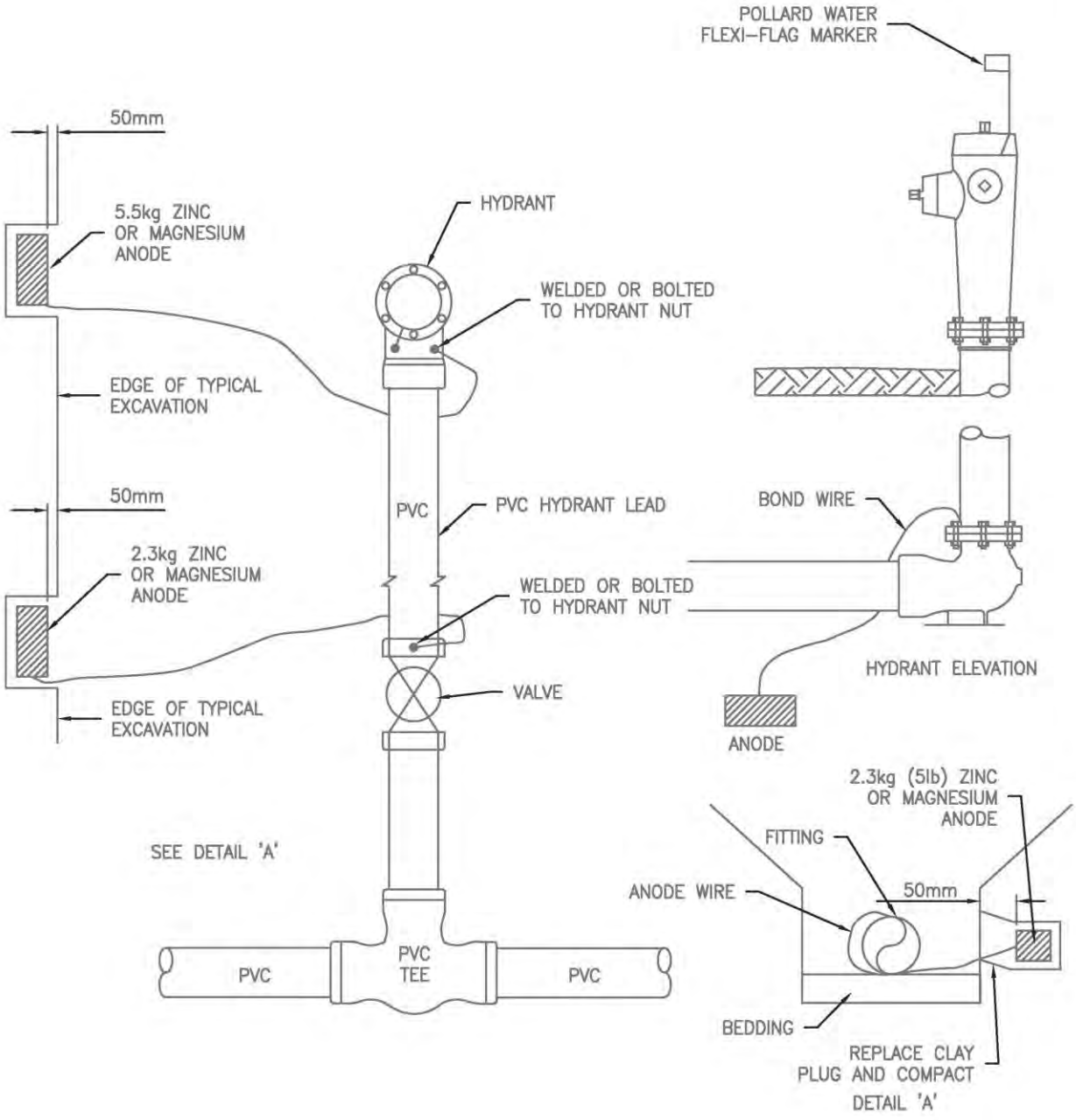
MUNICIPAL DISTRICT OF GREENVIEW No. 16

TRENCH EXCAVATION & BACKFILL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.12



NOTES:
1. MINIMUM DISTANCE FROM ANODE TO PIPE, FITTING, VALVE, OR HYDRANT IS 150mm.
2. INSTALL ANODE AT APPROX. PIPE DEPTH IN UNDISTURBED SOIL.
3. ZINC OR MAGNESIUM ANODES ARE TO BE EMBEDDED INTO TRENCH WALL TO PROVIDE FOR A MINIMUM OF 50mm OF CLAY COMPLETELY SURROUNDING THE ANODE.
4. ANODES TO BE AT LEAST 300mm CLEAR OF THRUST BLOCK.
6. ALL MEASUREMENTS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

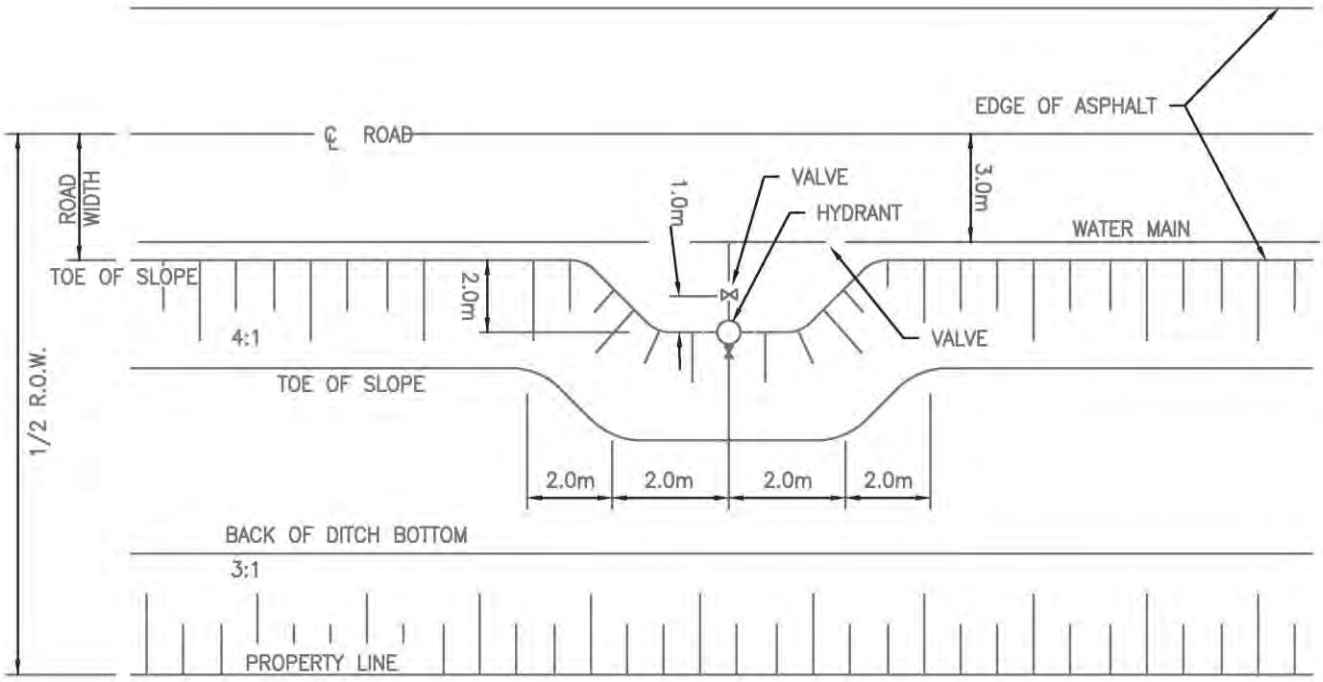
MUNICIPAL DISTRICT OF GREENVIEW No. 16

HYDRANT & VALVE ANODE DETAIL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.13



NOTES:
1. WATER MAIN AND HYDRANTS MAY BE LOCATED ON EITHER SIDE OF ROAD.
2. STREET LIGHTS TO BE OPPOSITE SIDE TO WATER MAIN.
3. DIMENSIONS SHOWN ARE IN METERS
6. ALL MEASUREMENTS SHOWN IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

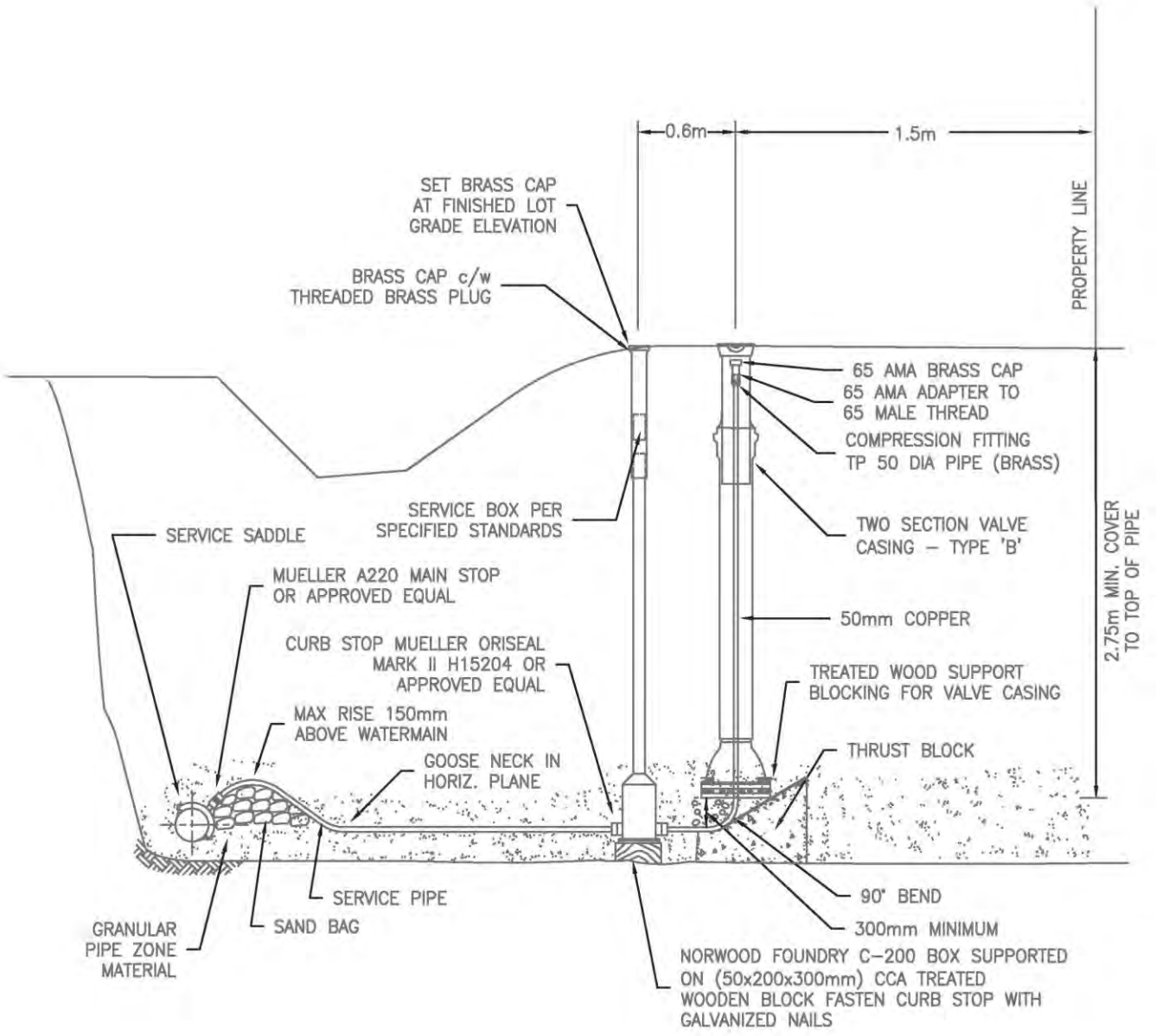
MUNICIPAL DISTRICT OF GREENVIEW No. 16

HYDRANT SHOULDER WIDENING LAYOUT

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.14



NOTES:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

FLUSH POINT

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT. 2025
DRAWING NO:	3.15

4 SANITARY SEWER SYSTEMS

4.1 GENERAL

- This section outlines the minimum standards or requirements for sanitary sewer systems required to be provided in a development. Refer to Section 6.3 Sanitary Sewer Service Connections.
- The standards outlined herein are intended to be the minimum requirements. It is the Developer's responsibility to meet or exceed these standards in accordance with good engineering practices, specific site condition requirements, and/or as may be required by Greenview, as well as any and all Statutory and Regulatory Approval Agencies.
- All materials used in the development shall be new and in compliance with the standards of AWWA, ASTM, CSA, ULC and NSF, latest revisions thereof.
- A backflow preventor shall be installed in compliance with National Building Code – Alberta Edition, latest revision thereof.

4.2 DESIGN CRITERIA

All design shall meet Alberta Environment's Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems.

4.2.1 Infiltration

- Foundation weeping tile and roof leaders or any sump pumps shall not be connected for discharge into the sanitary sewer. Where applicable and only with the written approval of Greenview, roof leaders may be tied into an underground piped storm sewer system.

4.2.2 Design Report

- An engineered design report shall be submitted by the Consulting Engineer to Greenview outlining the pipe sizes and capacities, contributing area, inflow and infiltration and all other relevant information.

4.2.3 Pipe

- Pipe sizing shall be determined by utilizing Manning's Formula with an "n" value as recommended by the pipe manufacturer and as approved in writing by Greenview.
- Minimum pipe sizes shall be:
  - 200mm diameter for residential areas
  - 250mm diameter for commercial/industrial areas
  - 150mm diameter for residential service
  - Commercial service minimum 150mm depending on development

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- Minimum pipe slopes shall be in accordance with Alberta Environment's Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, latest revisions thereof.
- All sanitary sewers to be designed to carry the design flow at a flow depth no more than 80% of the sewer's diameter.
- All pipe installations shall comply with the manufacturer's recommendations.

4.2.4 Manholes

- Manholes shall be precast reinforced concrete sections conforming to ASTM C478, latest revision thereof.
- Concrete for manholes and appurtenances shall utilize type 50 sulphate-resistant cement with a 28-day strength of 28 MPa. The maximum allowable slump shall be 75mm.
- All manholes shall be 1,200mm inside diameter in the main portion of the structure unless otherwise required by the diameter of the incoming and outgoing pipes. Manholes, frames and covers shall be cast iron conforming to Class 20 ASTM A48.
- Manholes frames and covers shall be type NF-81 in paved areas, type NF-90 gasketed in sags, all capable of withstanding H-20 loading. Type NF-39 frames and covers may be used in landscaped or natural areas.
- Manhole rungs shall be standard safety type extruded aluminum.
- Manhole bases shall be pre-benched precast slabs. Cast-in-place bases are acceptable provided the benching is constructed in the bottom of the manhole.
- Inverts at manholes at changes in direction shall have at least a 50mm fall across the manhole.
- To maintain continuous energy gradient through manholes, the obvert elevation of the lowest upstream pipe shall be equal to, or higher than, the obvert of the downstream pipe.
- An internal drop manhole shall be utilized where the vertical drop between inlet and outlet inverts exceeds 1,000mm. Refer to Drawing 4.4: Internal Drop Manhole Detail.
- All connections to existing manholes shall be cored at the proper elevation with a link seal (Kor-n-seal or approved equal).
- All joints shall be watertight using carefully installed rubber gaskets and installation of ConSeal Joint Wrap. Manholes and adjustment rings shall be grouted and seal coated inside and out to prevent infiltration.
- Manholes shall be provided at the end of each line and at all changes in pipe size, grade, and alignment.
- The maximum spacing between manholes shall be to current AWWA standards.

4.2.5 Sewer Main Installation

- Mains shall be installed to provide a minimum depth of cover of 3.0m to invert below finished grade. Alternative methods may include appropriate insulating techniques only as approved in writing by Greenview. Refer to Drawing 6.8: Insulation Requirements for Water Mains & Services.

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- Mains shall be installed to provide adequate sewer service connection depth at the property line.
- Unless approved otherwise, all mains shall be installed within the roadway or right-of-way.
- A minimum distance of a 3.0m horizontal separation between sewer and water lines must be maintained. Separation to other features and utilities are subject to further approval in writing by a shallow utility owner/operator, pipeline Company and by Greenview.
- All pipes shall be installed on bedding as stipulated in the design drawings or specifications. The bedding shall be a material approved by Greenview.
    - Refer to Drawing 3.1: Classes of Pipe Bedding.

4.3 TRENCHING AND BACKFILL

- All trenching and backfilling operations shall be conducted in accordance with current industry standards.
- Prior to backfilling, all backfill material shall be inspected by the Consulting Engineer or their representative for compliance with drawings and these Standards.

4.4 TESTING OF SEWERS

Following construction, all sewer mains shall be thoroughly cleaned and flushed of any earth, gravel and other debris. Special care shall be taken to capture and remove all the deleterious material and prevent it from entering the existing system.

All tests shall be performed in the presence of a representative from Greenview. Greenview must be given at least 48-hour notice before commencing any tests.

4.4.1 Water Leakage Test

- Tests shall be undertaken on each section of sewer main and the results recorded. Allowable leakage for pipe, other than rubber gasket concrete pipe, shall be in accordance with the type of joint and the manufacturer's recommendations.

4.4.2 Closed Circuit Television (CCTV) Inspection

- Prior to issuance of a Construction Completion Certificate (CCC), and Final Acceptance Certificate (FAC), all sewer lines shall be thoroughly flushed.
- All sections of the sanitary sewer, mains and services must be inspected with Closed Circuit Television (CCTV) camera equipment. The CCTV operator should be certified through NAAPI (North American Association of Pipeline Inspectors). An inspection report, photos, and digital recording shall be submitted to Greenview for Greenview's records prior to issuance of a Substantial Completion Certificate (SCC) and Construction Completion Certificate.
- All photos and videos shall be of a high quality showing details of the pipe in a clear and unobstructed view. Where, in the opinion of Greenview, the picture quality is not clear and deemed unsatisfactory, the CCTV inspection shall be redone at the Developer's expense.

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4.4.3 Mandrel Testing

- A mandrel test as per CSA B182.11 shall be performed prior to the issuance of a CCC or FAC.

4.5 LOW PRESSURE SEWER SYSTEMS

Engineered design plan shall be submitted by the Consulting Engineer to Greenview for review.

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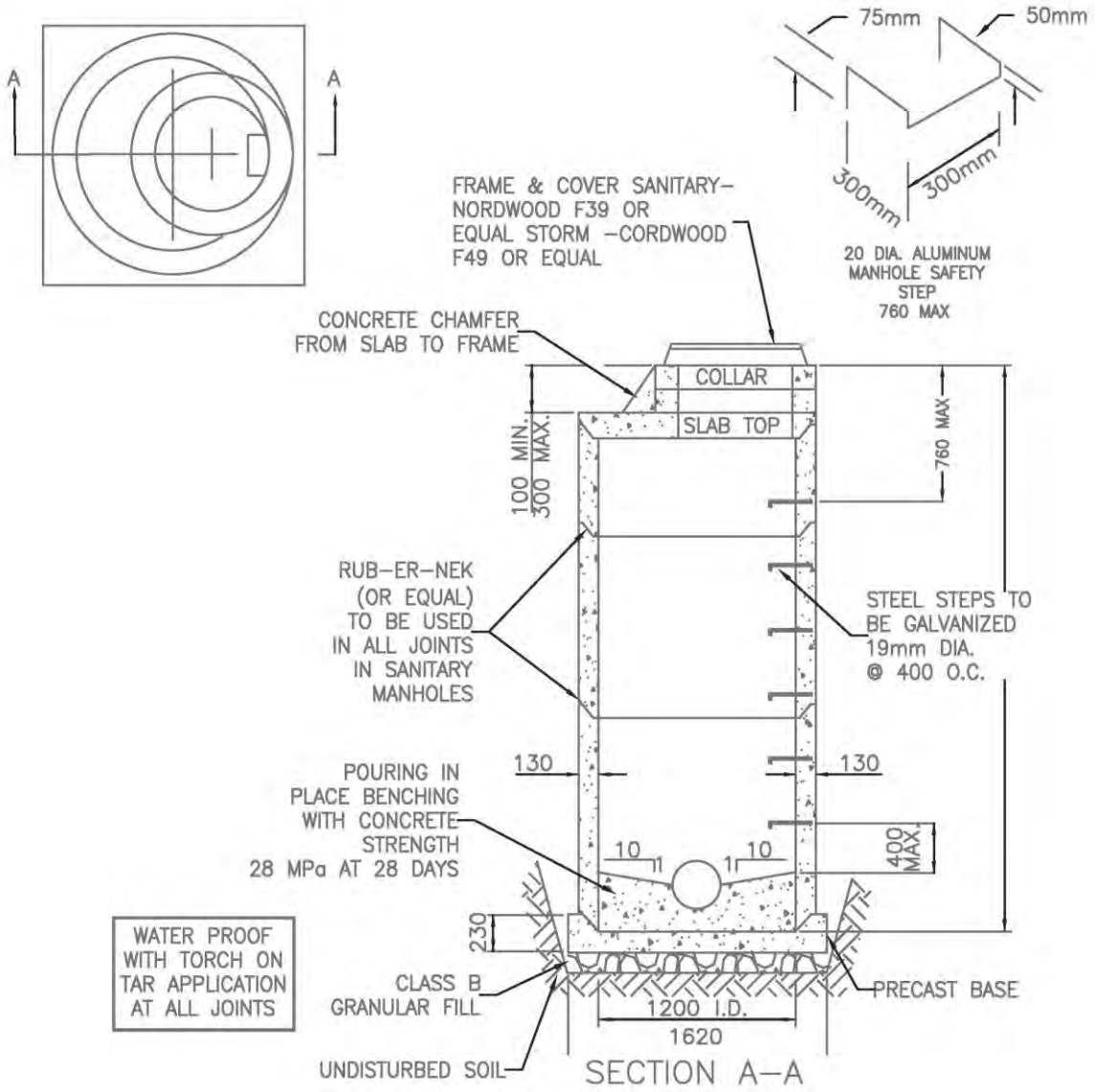


NOTES:

1. PRECAST CONCRETE COMPONENTS TO MEET CURRENT A.S.T.M. C478 STANDARDS.
2. CAST IN PLACE CONCRETE TO BE 25 MPa AT 28 DAYS.
3. ALL JOINTS TO BE SET WITH RUBBER GASKET AND FINISHED WITH NON–SHRINK GROUT INSIDE AND OUTSIDE FOR FULL CIRCUMFERENCE.
4. CHANNELING AND BENCHING TO BE FINISHED TO TROWEL SMOOTHNESS.
5. COMPACT BACKFILL AROUND MANHOLES TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY. CHANNELING AND BENCHING TO BE FINISHED TO TROWEL SMOOTHNESS.
6. PRE–BENCHED MANHOLE BASES MUST BE USED WHEREVER POSSIBLE WITH PROCTORED CONNECTION HOLES AND WATER TIGHT DURBARS OR BLOC JOINTS OR APPROVED EQUAL.
7. IF PRECAST CONCRETE BASES ARE UNAVOIDABLE THICKNESS AND REINFORCEMENT MUST BE DESIGNED FOR THE SPECIFIC MANHOLE DEPTH AND SOIL CONDITIONS.
8. JOINTS BETWEEN GRADE RINGS, GRADE RINGS AND CONES, AND BETWEEN RINGS AND FRAMES MUST BE WATERTIGHT. RAM NECK MATERIAL FINISHED WITH NON–SHRINK GROUT MAY BE USED IF WATERTIGHT JOINTS CANNOT BE ACHIEVED.
9. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

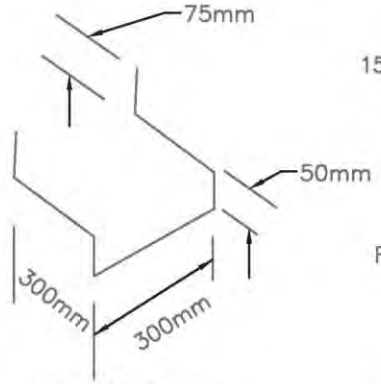
SLABTOP MANHOLE DETAIL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	4.1

MANHOLE RUNG DETAIL



ALUMINUM LADDER RUNG
MANHOLE STEPS

SECTION A-A

NOTES:

1. PRECAST RINGS, CONES AND BARRELS TO MEET CURRENT A.S.T.M. C478 STANDARDS.
2. SPECIAL BASE DESIGN REQUIRED FOR DEPTHS OVER 5.0m.
3. CHANNELING AND BENCHING TO BE FINISHED TO TROWEL SMOOTHNESS.
4. CONTINUE MAIN PIPE WHERE POSSIBLE. THROUGH MH & CUT TOP PART FOR USUAL INSPECTION.
5. CONICAL TOP TO BE USED WHERE DISTANCE FROM BENCH TO MH COVER EXCEEDS 2m.
6. VERTICAL SIDE OF CONICAL MH ON UPSTREAM SIDE.
7. INSTALL SAFETY PLATFORMS FOR ALL MH OVER 5m DEEP, LOCATED 2m ABOVE PIPE.
8. FOR PRE-BENCHED MANHOLE BASE SEE DWG 4.3.
9. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

N.T.S.

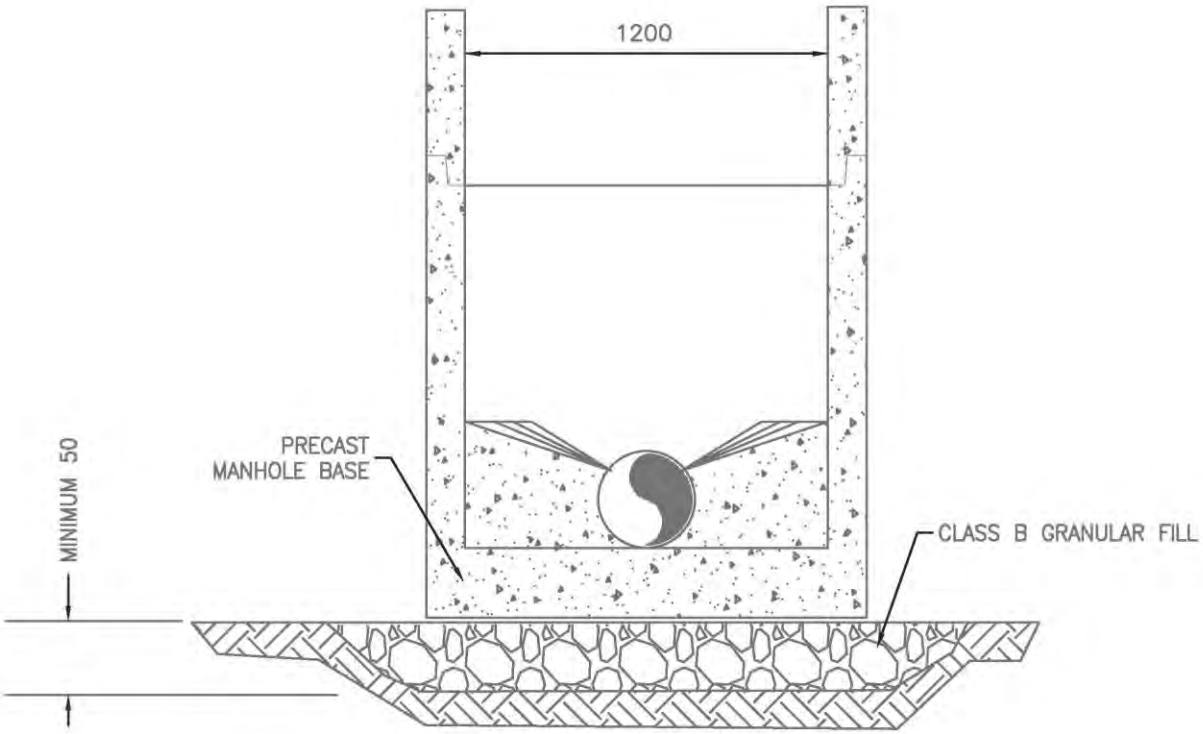
MUNICIPAL DISTRICT OF GREENVIEW No. 16

STANDARD MANHOLE DETAIL

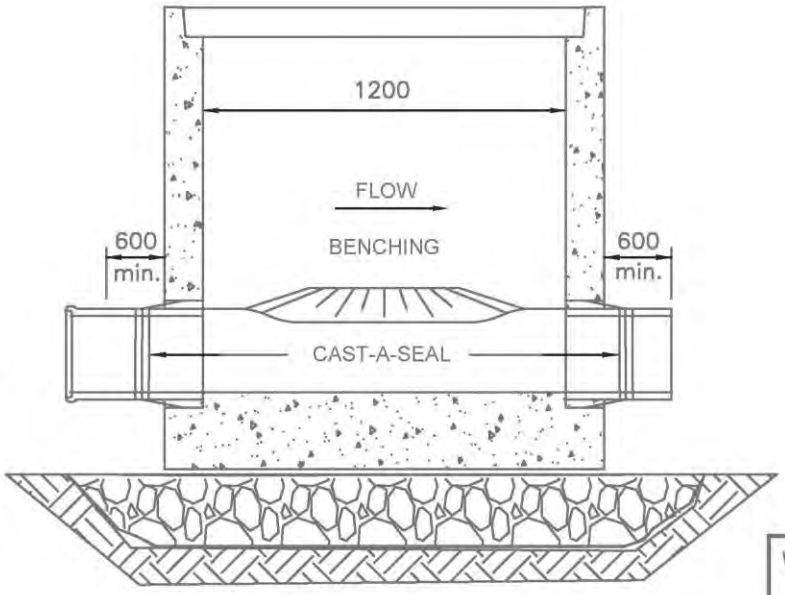
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	4.2



STANDARD MANHOLE
SECTIONS ABOVE



FOR P.V.C. PIPE

NOTES:
1. PREBENCHED MANHOLE BASES AS SUPPLIED BY CONCRETE MANUFACTURER.
2. TYPE 50 SULPHATE RESISTANT CEMENT TO BE USED.
3. PIPE PENETRATIONS THROUGH MANHOLE WALL TO BE MADE USING CAST–A–SEAL OR KWIK SEAL FOR WATERTIGHT CONNECTION OF PIPE.
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

WATERPROOF WITH TORCH ON TAR APPLICATION

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

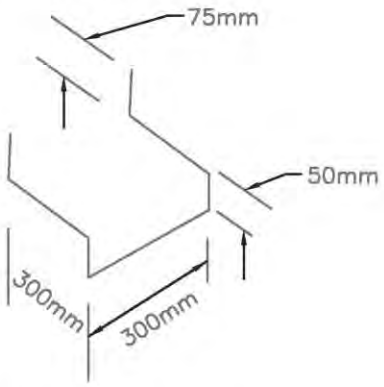
PREBENCHED MANHOLE BASE

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	4.3

MANHOLE RUNG DETAIL



No. 20M ALUMINIUM MANHOLE RUNGS

SECTION A-A

NOTES:

1. PRECAST RINGS, CONES AND BARRELS TO MEET CURRENT A.S.T.M. C478 STANDARDS.
2. SPECIAL BASE DESIGN REQUIRED FOR DEPTHS OVER 5.0m.
3. CHANNELING AND BENCHING TO BE FINISHED TO TROWEL SMOOTHNESS.
4. CONTINUE MAIN PIPE WHERE POSSIBLE.THROUGH MH & CUT TOP PART VISUAL INSPECTION.
5. CONICAL TOP TO BE USED WHERE DISTANCE FROM BENCH TO MH COVER EXCEEDS 2m.
6. VERTICAL SIDE OF CONICAL MH ON UPSTREAM SIDE.
7. INSTALL SAFETY PLATFORMS FOR ALL MH OVER 5m DEEP, LOCATED 2m ABOVE PIPE.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

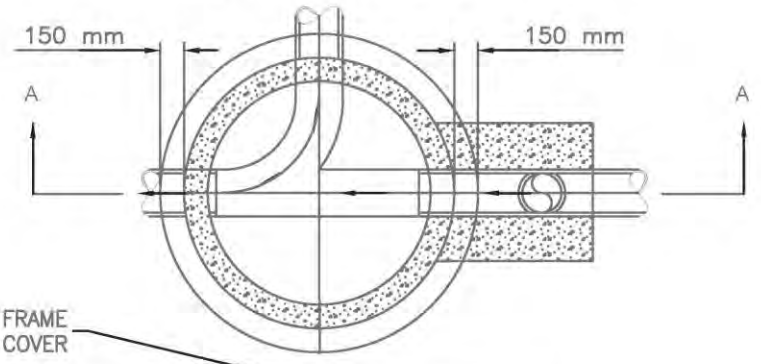
INTERNAL DROP MANHOLE DETAIL

MUNICIPAL SERVICING STANDARDS

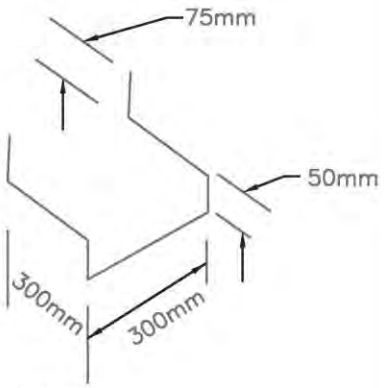
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	4.4

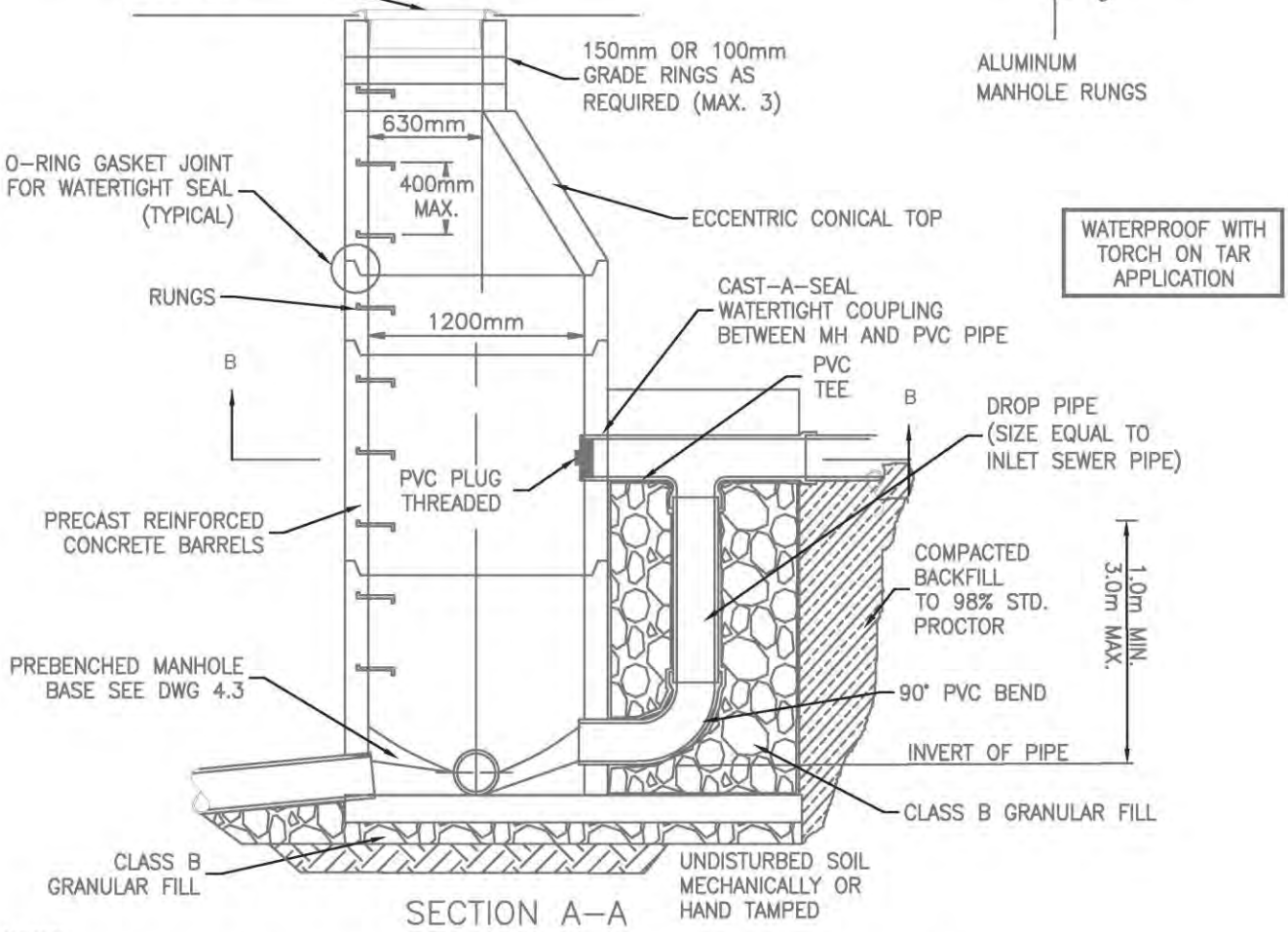
PLAN SECTION B–B



MANHOLE STEP DETAIL



ALUMINUM MANHOLE RUNGS



SECTION A–A

NOTES:

1. PRECAST RINGS, CONES AND BARRELS TO MEET CURRENT A.S.T.M. C478 STANDARDS.
2. SPECIAL BASE DESIGN REQUIRED FOR DEPTHS OVER 5.0m.
3. CHANNELING AND BENCHING TO BE FINISHED TO TROWEL SMOOTHNESS.
4. CONTINUE MAIN PIPE WHERE POSSIBLE.
5. CONICAL TOP TO BE USED WHERE DISTANCE FROM BENCH TO MH COVER EXCEEDS 2m.
6. VERTICAL SIDE OF CONICAL MH ON UPSTREAM SIDE.
7. INSTALL SAFETY PLATFORMS FOR ALL MH OVER 5m DEEP, LOCATED 2m ABOVE PIPE.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

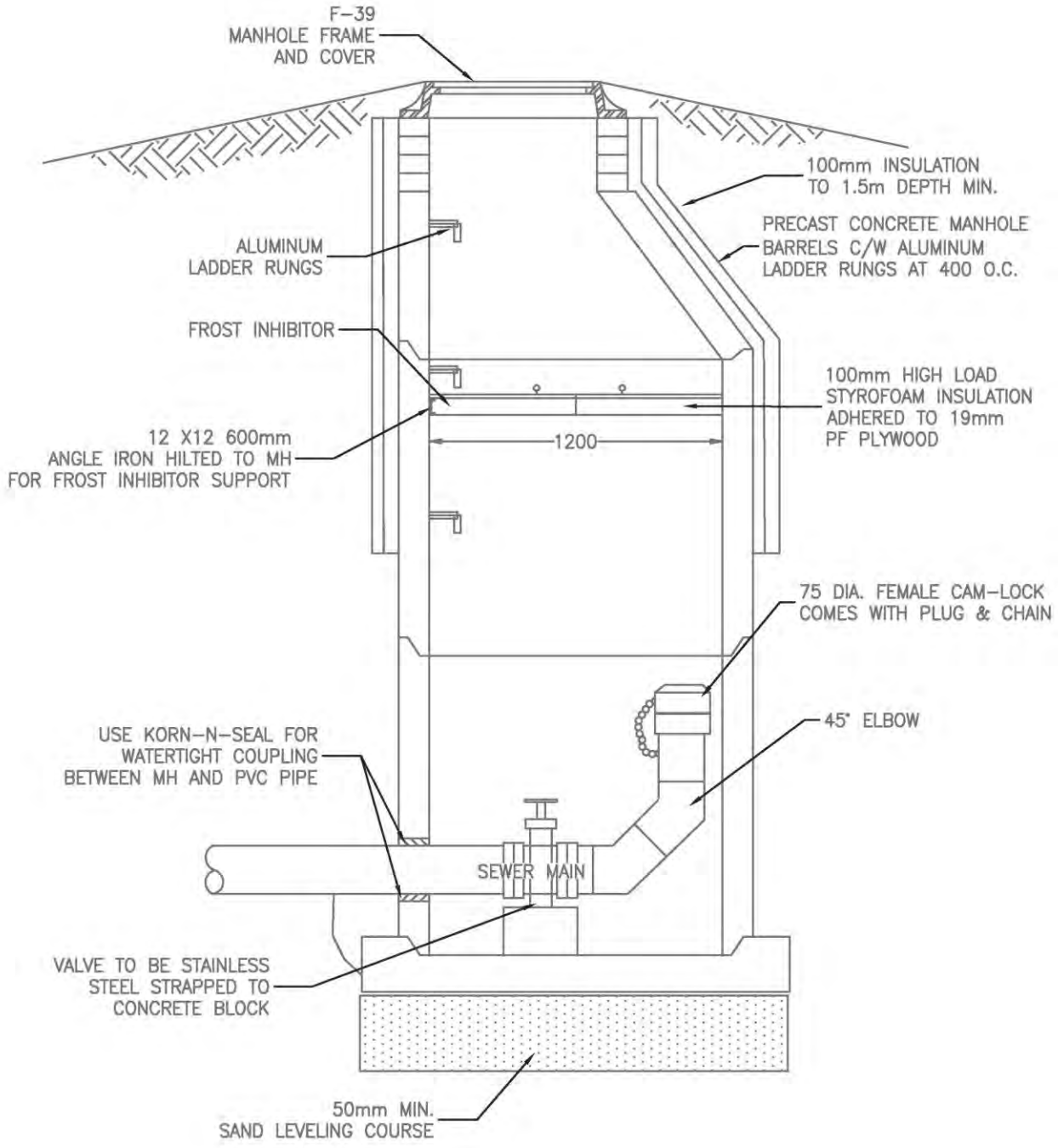
MUNICIPAL DISTRICT OF GREENVIEW No. 16

EXTERNAL DROP MANHOLE DETAIL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	4.5



NOTES:

1. EXTERIOR OF MANHOLE BE INSULATED WITH 100mm HIGH LOAD STYROFOAM INSULATION TO AT LEAST 1.5m BELOW GROUND.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

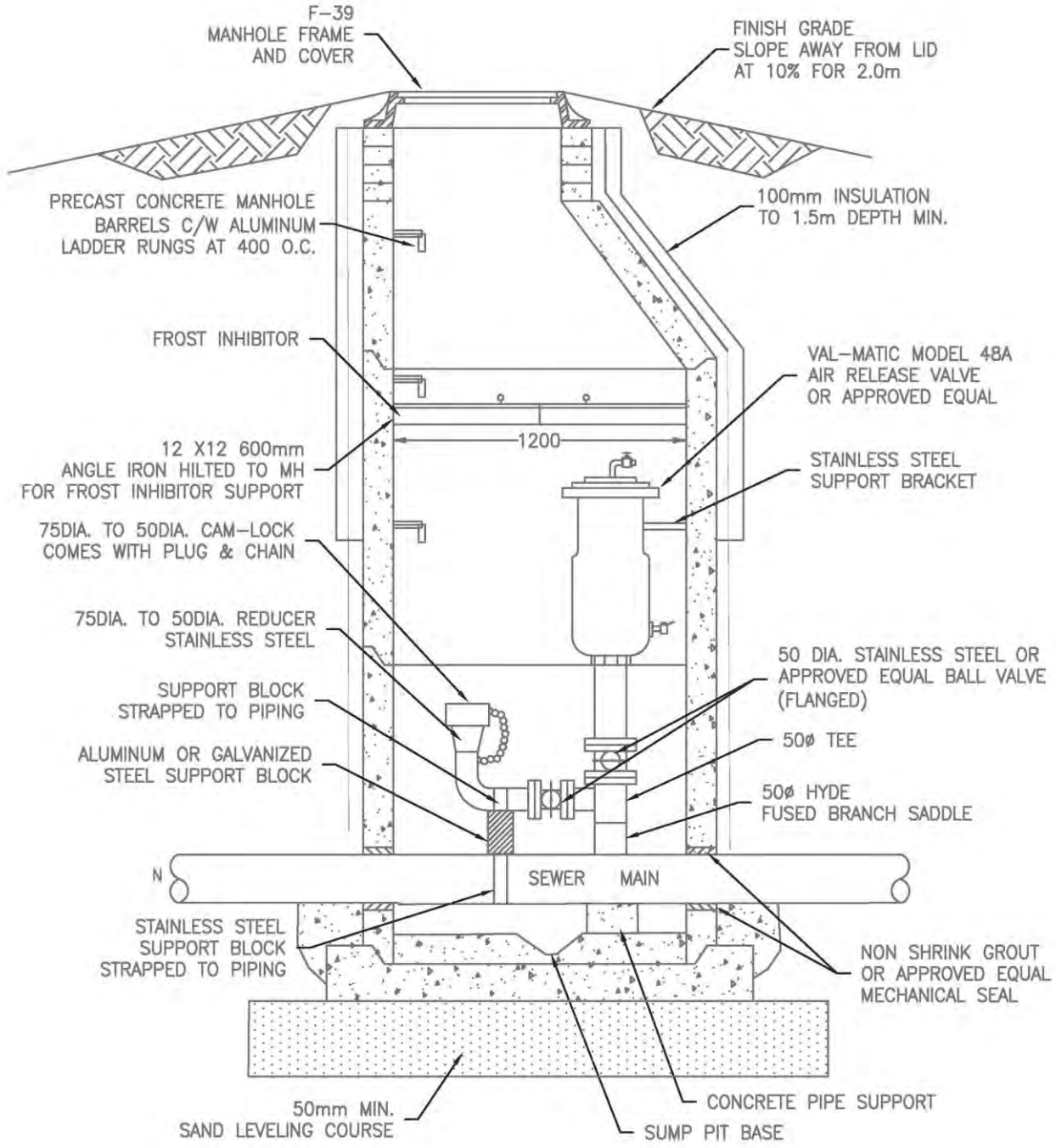
MUNICIPAL DISTRICT OF GREENVIEW No. 16

LOW PRESSURE SEWER FLUSHING STATION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	4.6



NOTES:

1. EXTERIOR OF MANHOLE TO BE INSULATED WITH 100mm HIGH LOAD STYROFOAM INSULATION TO AT LEAST 1.5m BELOW GROUND.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

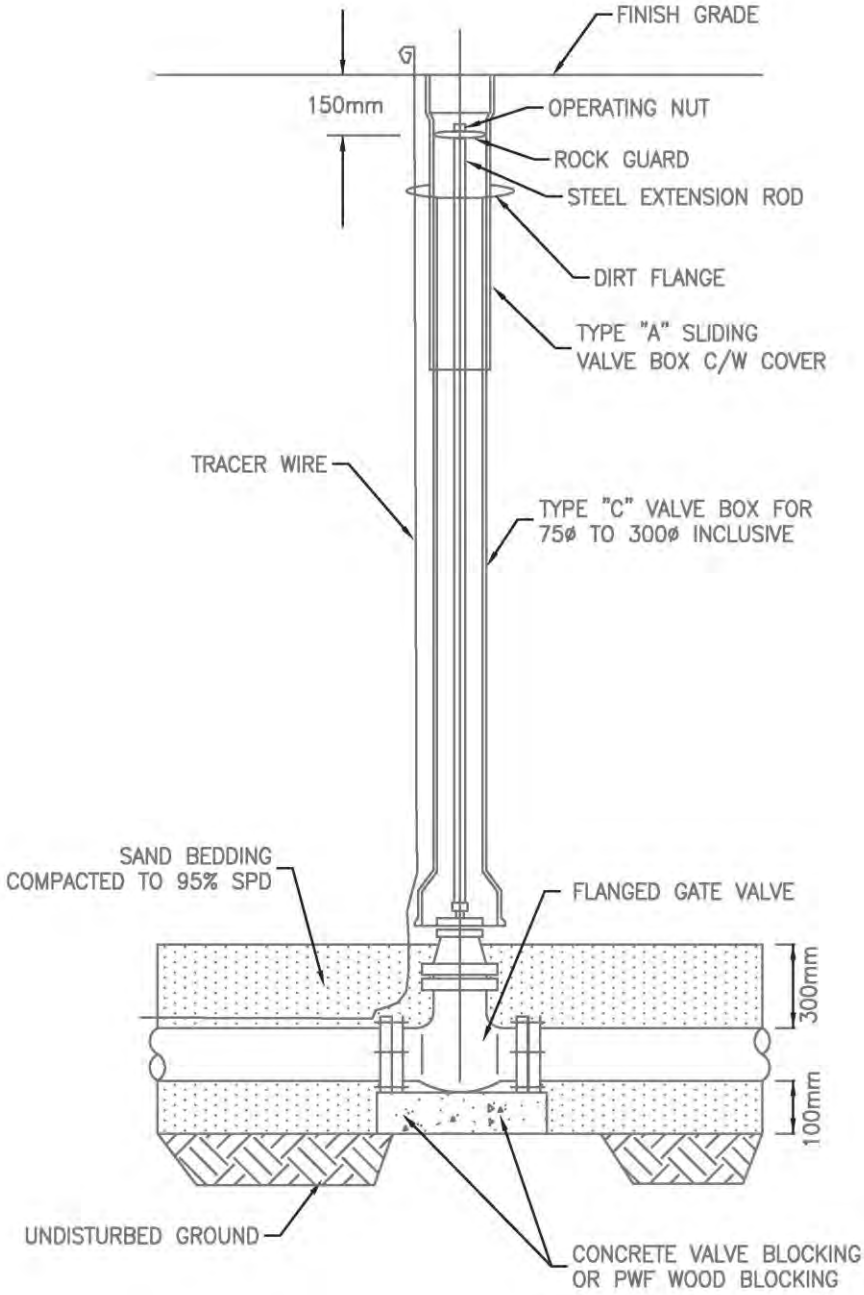
MUNICIPAL DISTRICT OF GREENVIEW No. 16

LOW PRESSURE SEWER AIR & VACUUM RELIEF VALVE CHAMBER

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	4.7



NOTES:

1. VALVE BOX TOPS TO BE SET FLUSH WITH HARD SURFACES, 300mm ABOVE FINISHED GRADE IN ALL LANDSCAPED AREAS.
2. VALVE AND VALVE BOXES SHALL BE EPOXY COATED TO PREVENT CORROSION. ALL TRIM TO BE STAINLESS STEEL.
3. VALVE BOX TOPS MARKED "SEWER".
4. RACER WIRE TO SURFACE OF EVERY MAINLINE VALVE.
5. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

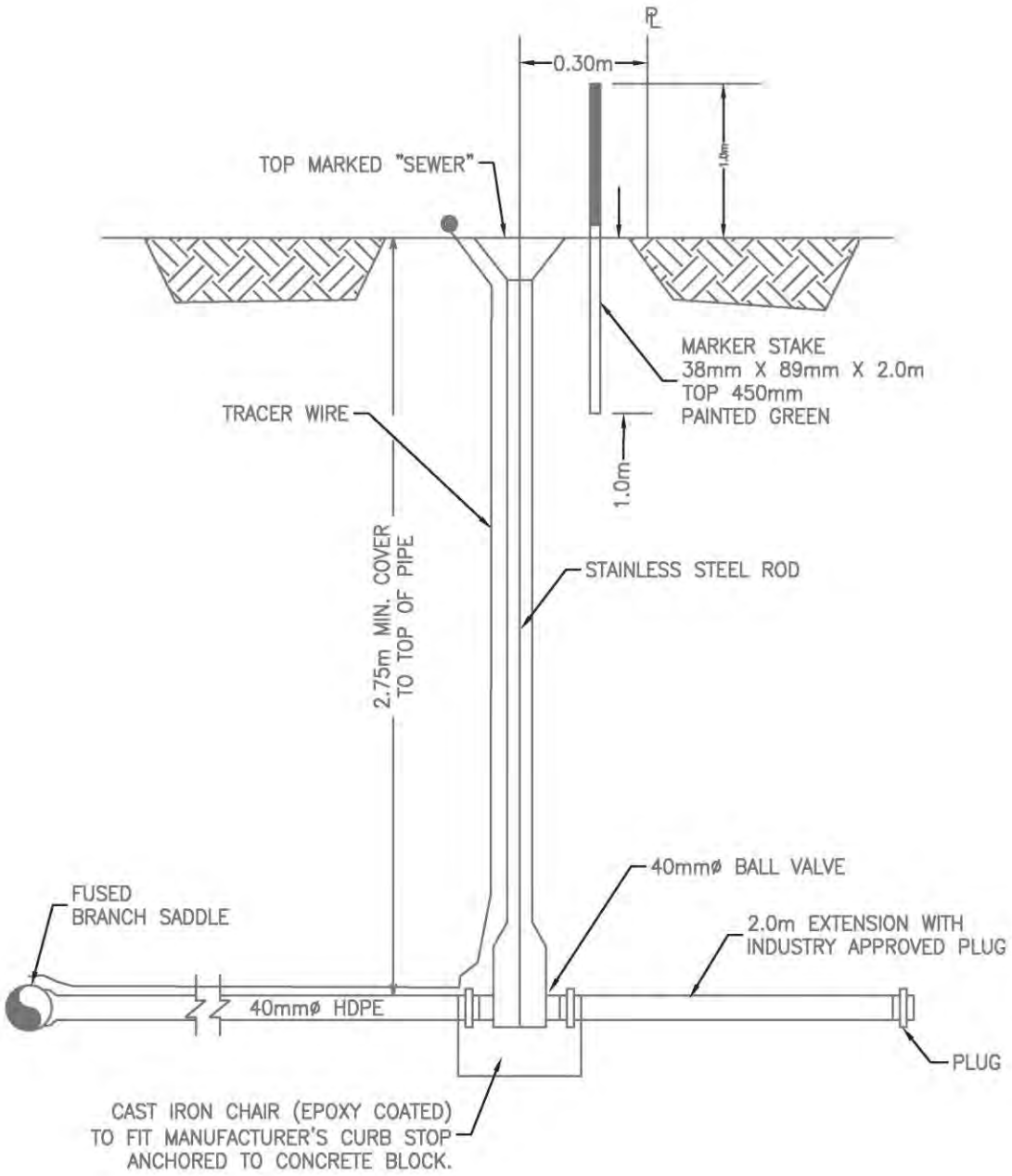
MUNICIPAL DISTRICT OF GREENVIEW No. 16

LOW PRESSURE SEWER VALVE

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	4.8



NOTES:

1. CURB STOP AND BOX TO BE EPOXY COATED TO PREVENT CORROSION. ALL TRIM TO BE STAINLESS STEEL.
2. ALL CURB STOPS TO BE NON-DRAINING.
3. TRACER WIRE TO SURFACE ON SELECTED SERVICE BOXES.
4. SERVICES ARE COPPER PIPE SIZES (CPS).
5. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

LOW PRESSURE SEWER SERVICE CONNECTION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	4.9

5 STORM DRAINAGE SYSTEMS

5.1 GENERAL

- The management of stormwater is an integral part of any development and must be handled effectively to preserve and promote the general health, welfare, security and economic well-being of the public.
- The general level of service required by Greenview regarding stormwater management shall be in keeping with the minor/major drainage concept wherein:
  - The minor system shall be designed and implemented to accommodate drainage to avoid property damage and flooding and to minimize inconvenience to the public for one (1) in five (5) year rainfall events.
  - The major system shall be designed and implemented for flood control to avoid loss of life, injuries, and significant damage to property from events greater than one (1) in one-hundred (100) year return producing unusual high intensity rainfall and/or large volume run-off.
- The minor stormwater system in subdivision development areas in Greenview shall be accommodated by either rural ditching or in urban development, via curb and gutter and an underground piped system.
- The major system shall typically be designed as an open channel system with detention/retention facilities, as may be required, to control flows to the design criteria.

5.2 STORMWATER MANAGEMENT PLAN

A Stormwater Management Plan shall be required and shall be consistent with the storm drainage engineering design criteria outlined in Section 5.3 Design Criteria below, and shall minimally:

- Identify the impact of the proposed development on the watershed.
- Identify and quantify the amount of upstream drainage entering onto the proposed development lands, including all points(s) of entry.
- Identify all existing flow channels, drainage patterns or routes, and containment areas.
- Identify the point(s) of discharge from the lands as well as the type and calculated capacity of the receiving drainage facility(s), whether natural, anthropogenic, or a combination of both.
- Provide details of required stormwater retention/detention facilities.
- Provide details of water quality enhancement facilities.
- Identify and comply with all licensing requirements as may be required by Alberta Environment, Greenview and Department of Fisheries and Oceans Canada (DFO), as well as any and all Statutory and Regulatory Approval Agencies.

5.3 DESIGN CRITERIA

- Whenever possible, rural type drainage systems, e.g., roadside ditches, culverts, swales, open channels and storage facilities, for both the minor and major systems, shall be used in the

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evaluation, design and implementation of stormwater drainage systems, except in situations warranting piped systems for transmission of stormwater.

- The minor system shall be designed to carry the peak flow resulting from a one (1) in five (5) year rainfall event.
- The major system design shall be based on a one (1) in one-hundred (100) year rainfall event. Detention shall be provided to attenuate peak run-off flows.
- When the minor system capacity is exceeded, the major system must provide a continuous route for run-off to follow.
- Any stormwater system, or part thereof, must be designed to serve not only the area within the development boundaries, but also any area which is tributary to the system and to the development area.
- Stormwater drainage systems shall be consistent with Alberta Environment's Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, latest revision thereof. Post-development impact of flow rates, duration and run-off quality must be analyzed on a case-by-case basis. This may also require an assessment of the impact on the body into which the effluent is ultimately released.
- Stormwater drainage systems shall be designed as a separate system with no connection to any sanitary sewer system.
- All lots shall be graded to provide drainage away from all foundations and/or buildings.

5.3.1 Run-off Analysis

Run-off analysis methods outlined herein are considered to be appropriate for most circumstances encountered within Greenview. Greenview may, however, consider and approve other methods deemed to be appropriate.

- Rational method for stormwater drainage design may be used for:
  - High density country residential and commercial/industrial development areas up to 40.0 hectares (99 acres) in size.
  - Low density country residential development area up to 65.0 hectares (161 acres) in size, provided the system does not require storage facilities over and above the in-line storage.
- Computer modeling shall be used for stormwater drainage design for:
  - High density country residential and commercial/industrial development areas greater than 40.0 hectares in size.
  - Low density country residential development areas greater than 65.0 hectares in size.
  - Any system requiring storage or detention facilities in addition to in-line storage, including parking lot detention, roadside ditches or pipe over-sizing.
  - Alternatively, computer modeling may be used for areas smaller than those outlined above.
  - The computer model chosen by the Consulting Engineer shall meet with the approval of Greenview.

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5.3.2 Run-off Coefficients

Run-off coefficients are to be consistent with the respective land use and site-specific characteristics. As a general rule, the coefficients listed under Section 5.4.1 Design Criteria below, may be utilized as a starting guideline subject to the site-specific characteristics.

5.3.3 Storage Facilities

- These sub-sections deal with the requirements for detention/retention facilities, hereinafter referred to as "separate storage facilities", in addition to the in-line storage provided by way of planned ponding in ditches, swales and channels during peak run-off events. All separate storage facilities shall be designed in accordance with Alberta Environment's Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, latest revision thereof.
- The requirements for separate storage facilities shall be determined using computer modeling regardless of the size of the development area.
- The facilities must be sized so as to control the total post-development run-off release equal to or less than the pre-development flows during peak run-off conditions for all events up to and including the one-hundred (100) year event.
- The pre-development and post-development run-off conditions shall be analyzed for the five (5) year, twenty-five (25) year and one-hundred (100) year events.
- Sufficient outlet capacity shall be provided to permit post-event drawdown of the water levels in the storage facilities such that the availability of storage capacity is restored within the following time frames:
    - Five (5) year event capacity, within twenty-four (24) hours.
    - Twenty-five (25) year event capacity, within forty-eight (48) hours.
    - 95% of a one-hundred (100) year event capacity, within ninety-six (96) hours.
- An emergency overflow, suitably protected against erosion, shall be provided to ensure that run-off in excess of the storage capacity is safely directed to the downstream receiving facility.
- Wherever practical, separate storage facilities shall be designed as wet ponds.
- Storage pond facilities shall be appropriately fenced and signed for the protection of the public.

5.3.4 Dry Pond Design Criteria

- Pond shall be sized to store storm run-off in excess of the pre-development flows.
- Side slopes shall not be steeper than 5:1.
- Pond bottom shall be graded to provide positive drainage to the outlet at a minimum slope of 2%, refer to Drawing 5.4: Dry Pond Section.
- Topsoil shall be placed on all surfaces, including the bottom and then seeded with a seed mixture approved by Greenview's Agricultural Services department.
- All piped outlet structures (and inlet structures if applicable) shall be provided with a grate affixed with hinges and locked to prevent unauthorized entry.

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- All outflow piping shall be sized for a flow 25% greater than the maximum designed control flow. Water release shall be controlled by means of an orifice or other approved means and shall include provisions for increasing the release rate in an emergency event. Water release location shall be erosion controlled.

5.3.5 Wet Pond Design Criteria

- Wet pond shall ideally be in a natural depression, preferably adjacent to a natural drainage course.
- Pond shall have a minimum depth of 2.0m at normal water level (level above which outflow commences).
- Designed maximum level for the pond shall be no higher than any designated basement level and at least 600mm below the lowest ground surface level for any adjacent property.
- Side slopes shall be no steeper than 3:1 from the pond bottom, to 1.0m below normal water level; above this, to at least 600mm above the maximum flood level, the side slopes shall be no steeper than 7:1. Refer to Drawing 5.5: Wet Pond Section.
- An erosion-resistant rock or equivalent shoreline treatment shall be provided from 1.0m horizontally below, to 2.0m horizontally above, the normal water level.
- Topsoil shall be placed on all side slopes and then seeded with a seed mixture approved by Greenview's Agricultural Services department.
- The outlet pipe (and inlet pipe if applicable) shall be submerged so that its top is at least 500mm below the normal water level. The exposed end of the outlet pipe shall be provided with a grate affixed with hinges and locked to prevent unauthorized entry.
- All outflow piping shall be sized for a flow 25% greater than the maximum designed control flow. Water release shall be controlled by means of an orifice or other approved means and shall include provisions for increasing the release rate in an emergency event. Water release location shall be erosion controlled.
- Wet ponds shall be constructed in impervious soils to minimize water losses during dry weather periods and to minimize groundwater contamination.

5.3.6 Wetlands Design Criteria

- Approximately 10% of the wetland surface area should contain a 1.5m to 2.0m deep sediment forebay upstream of the wetland area for the settling of solids (removal).
- Average permanent water wetland depth to be determined on a case-by-case basis to ensure flow redistribution, and for fish and submerged or floating aquatic vegetation habitat.
- Active storage is 0.3m to 0.6m deep.
- Length-to-width ratios can be as low as 1:1.
- Shape of the treatment cell(s) may vary and will depend on landscaping features required for attracting wildlife and for public enjoyment, as well as the configuration and attributes of available land.

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- Gravity flow is the preferred method of movement of water into, through and out of the treatment wetland.
- Incorporate a bypass that will collect first flush flows and divert high flows during extreme rainfall events around the wetland.
- Regulated inflow and outflow structures are required that will consider a wide range of rainfall intensities. Drawing 5.6: Storm Pond Release Control Manhole.

5.3.7 Lot Grading

- Lot grading is directly linked to surface drainage of stormwater (and snowmelt), along with human-induced types of drainage, such as grass-watering and car-washing.
- The level of service involved in lot grading tries to strike a balance between protecting private property against 1:100 year storm flooding and routing the stormwater too quickly to the public major and minor storm drainage systems (e.g. the road allowance).
- At minimum, the design gets stormwater away from the house foundation, but still allows for some infiltration into lawn, garden and mulched areas, in order to reduce the run-off to the road allowance.
- Since hydraulic pressures on house concrete walls, along with possible entire foundation uplift, can be a major source of expense for the homeowner, sump pumps can be specified in lower areas to aid in reducing the pressures on foundation walls. However, these can present a false sense of security if the lot grading is insufficient and there is constant heavy ponding of water up against the outside of the house foundation after major storms.
- Side and end swales through and around the lot perimeters allow for orderly routing of the stormwater off the lot once the infiltration areas (e.g. lawns) are saturated. These swales are usually grass or mulch and route this water to the front and/or back of the lot. Refer to Drawing 5.7: Swales.
- Concrete swales are used where it is unavoidable that multiple (more than three) lots have flows that join together. Then there is an urgency to contain this flow and route it to the street as quickly as possible by use of the concrete swale.
- Overall, the design must achieve a balance between street/building grade elevations and their relationship to the surrounding development and existing topography.
- Refer to Drawing 5.1: Lot Grading Guidelines.

5.3.8 Swales

- Drainage swales on private or municipal lands must be constructed prior to the development of the lots. All swales located on private lands will be protected by an easement in favor of Greenview.
- The following minimum design parameters will apply:
    - Earth swales must be protected from erosion by grass cover or other measures approved by Greenview.
    - Concrete swales shall be used when drainage is being accommodated from more than three (3) lots (for lots less than 0.5Ha).

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- The minimum design slope for earth swales is 1.0%.
- The minimum design slope for concrete swales is 0.75% on private property and 0.50% on public property.

- Refer to Drawing 7.23: Concrete Swale (Plan) and Drawing 5.7: Swales.

5.4 BURIED PIPE STORM SEWER SYSTEMS

- Where the storm drainage system is comprised of a buried pipe system, the minimum standards outlined herein shall apply.
- All materials used in the development shall be new and in compliance with the most recent standards of AWWA, ASTM and CSA.

5.4.1 Design Criteria

Determination of storm sewer flows entering an underground piped storm sewer system shall be designed in accordance with the Rational Method, latest revision thereof, following AEPA Standards and Guidelines.

- Minimum run-off coefficients shall be:
  - Agricultural 0.15
  - Residential 0.40
  - Multi-family 0.50
  - Commercial 0.70
  - Industrial 0.70
- Run-off coefficients must be calculated for site-specific conditions where details of ultimate site development are known. The following formula relates the run-off coefficient "C" with imperviousness.
  - C = (0.95 x imp) + 0.1 (1.0 - imp) where imp is % imperviousness

5.4.2 Pipe

- Pipe sizing shall be determined utilizing the Manning's Formula where the "n" value is as recommended by the pipe manufacturer.
- Minimum pipe sizes:
  - 300mm diameter for mains.
  - 250mm diameter for catch basin leads.
- Minimum and maximum flow velocities in any storm sewer main shall be 0.75m/s and 3.0m/s, respectively. Designs containing velocities in excess of 3.0m/s shall require special provisions to protect against pipe displacement by erosion or impact. Such special provisions are subject to written approval by Greenview.
- Pipe material shall be:
  - Reinforced sulphate-resistant concrete pipe conforming to ASTM C76.

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- Polyvinyl chloride (PVC) conforming to ASTM F794, minimum Class DR35 or sizes up to 400mm diameter.
- Ultra-Rib (PVC) to ASTM F794 and CSA B182.4, minimum Class DR35 for sizes up to 600mm diameter.
- Perma-Loc (PVC) for sizes over 600 mm to ASTM F794 and CSA B182.4.
- Pipe joints shall be rubber ring conforming to ASTM C443 for concrete pipe and ASTM 03212 for PVC pipe.
- All pipe installations shall comply with the manufacturer's recommendations.

5.4.3 Manholes

- Manholes shall be precast reinforced concrete sections conforming to ASTM C478, latest revision thereof.
- All manholes shall be 1,200mm inside diameter in the main portion of the structure unless otherwise required by the size of the incoming and outgoing pipes.
- Manhole frames and covers shall be cast iron conforming to Class 20 ASTM A48. Manhole frames and covers capable of withstanding H-20 loading shall be type NF-80 in paved areas; type NF-39 frames and cover may be used in landscaped or natural areas.
- Each manhole cover shall minimally have the words "STORM SEWER" embossed on it.
- Manhole rungs shall be standard safety extruded aluminum.
- Manhole bases should be pre-benched, precast slabs. Cast-in-place bases are acceptable, provided the benching is constructed in the bottom of the manhole.
- Manholes shall be provided at the end of each line and at all changes in pipe size, grade and alignment.
- Maximum spacing between manholes shall not exceed 150m.
- Safety platforms at intermediate levels are required for manholes greater than 5.0m depth.

5.4.4 Catch Basins

- Surface water shall not be permitted to run a distance greater than 180m without provision for interception, which shall be via catch basins of sufficient number and inlet capacity to receive the designed stormwater flow. Dead-end runs may extend to 300m provided the hydraulic calculations support this.
- All catch basin structures shall be minimum 600mm inside diameter precast sulphate-resistant concrete sections conforming to ASTM C478.
- All catch basin structures shall be constructed to provide a minimum 500mm deep sump.
- Minimum size catch basin lead shall be 250mm, with a minimum slope of 1.0% and a maximum length of 30m.
- Where catch basin leads exceed the 30m length, catch basin manholes consisting of 1200mm diameter barrels shall be provided.
- Catch basin frames and covers shall be cast-iron at a minimum (ductile iron is an alternate).

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- Refer to Drawing 5.2: Catch Basin Detail.
- Refer to Drawing 5.3: Catch Basin Manhole Detail.

5.4.5 Storm Sewer Main Installation

- Mains shall be installed to provide a minimum depth of cover to top of pipe, of 1.85m below the design finished grade.
- Unless approved otherwise, all mains shall be installed within the roadway right-of-way.
- All pipes shall be installed on compacted granular bedding. Class B granular bedding material shall be placed and compacted around the pipe to at least 300mm above the top of pipe. The granular bedding shall be a material approved in writing by Greenview.
- Refer to Drawing 3.1: Classes of Pipe Bedding.

5.4.6 Curved Storm Sewers

In general, curved storm sewer installations will only be allowed where the difficulty of avoiding other utilities necessitates such applications, in which cases, the following restrictions shall apply:

- The sewer shall be laid as a simple curve with a radius equal to or greater than 90m or the manufacturer's minimum recommended radius, whichever is larger.
- Manholes shall be located at the beginning and the end of the curve with the maximum internal between manholes no greater than 90m along the curve.
- The curve shall run parallel to the road right-of-way, wherever possible.
- The minimum grade for sewers laid on a curve shall be 50% greater than the minimum grade required for straight runs of sewers.
- The maximum deflection at each joint shall be no greater than the maximum deflection recommended by the pipe manufacturer.

5.4.7 Trenching and Backfill

- All trenching and backfilling operations shall be conducted in accordance with the OHS.
- Widths of trenches shall be such that pipes can be laid and jointed properly and the backfill placed and compacted properly.
    - Maximum width for single pipe:

=	pipe diameter of 750mm or less	=	O.D. of pipe plus 450mm
=	pipe diameter larger than 750mm	=	O.D. of pipe plus 600mm

    * Refer to Drawing 3.12: Trench Excavation & Backfill
- Trench wall shall be vertical to 300mm above the top of pipe and the width at this location shall not exceed the maximum noted above.
- If it is not possible during construction to maintain the allowable trench width presumed by design, the structural design of the pipe shall be re-evaluated to ensure earth loads will not

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exceed design load carrying capacity or that deflection of flexible pipe will not exceed performance criteria.

- Backfilling under or within 2m of existing or proposed roadways, alleys, walkways, streetlights or similar structures shall be compacted in lifts not exceeding 300mm, to 98% SPD from the designated subgrade elevations or existing ground level, whichever is lower, to 1.5m below and to 95% SPD for areas more than 1.5m below.
- Backfilling within areas that are in landscaped or non-travelled surfaces shall be compacted in lifts not exceeding 300mm to 95% SPD.
- Backfill around manholes and catch basins shall be placed in 150mm layers and compacted with mechanical tampers to a minimum of 98% SPD.
- Culvert installation; Refer to Section 7.3.6 Culverts for Hamlets, Subdivisions and Roadways.

5.4.8 Inspection

- All excavating, laying and joining of pipes, backfilling, compaction and completion of all works shall be subject to inspection by an authorized representative of Greenview. Unsatisfactory conditions shall be remedied immediately upon notification at the Developer's expense.
- Following construction, all storm sewer mains, manholes, catch basins, catch basin leads and culverts shall be thoroughly cleaned and flushed of any earth, gravel and other debris. Such material shall be collected and removed to a disposal site approved by Greenview.
- All sections of the storm sewer system up to and including a 900mm size shall be inspected with CCTV camera equipment. An inspection report, photos, and digital video recording shall be submitted to Greenview, for Greenview's records and approval prior to issuance of a Construction Completion Certificate.
- All sections of a storm sewer system larger than 900mm in size shall be visually inspected.

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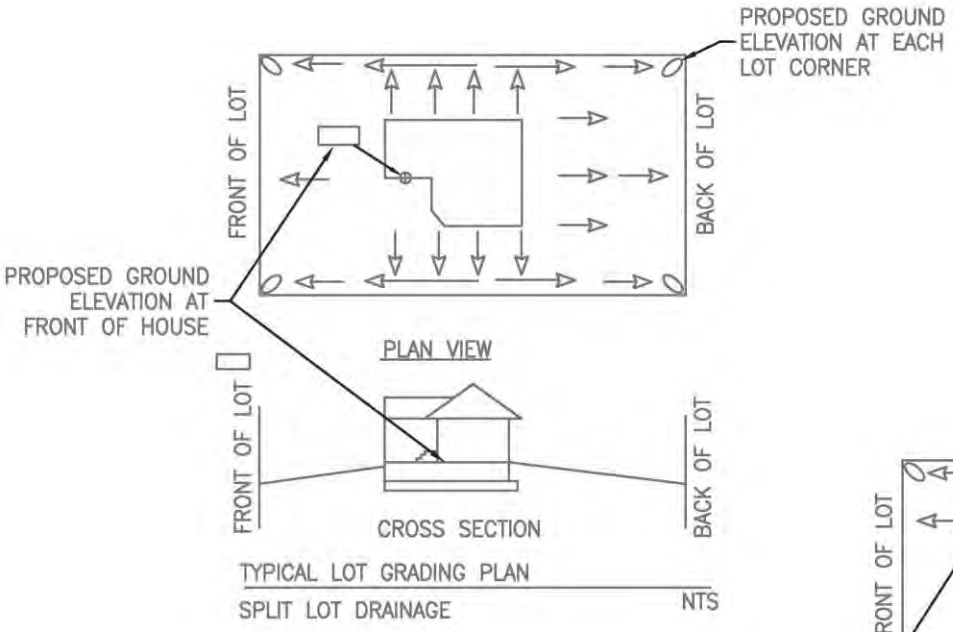
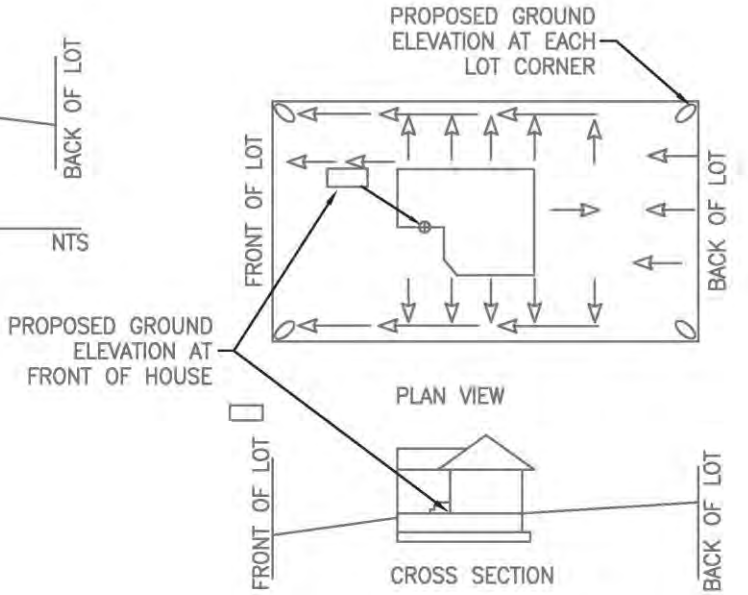
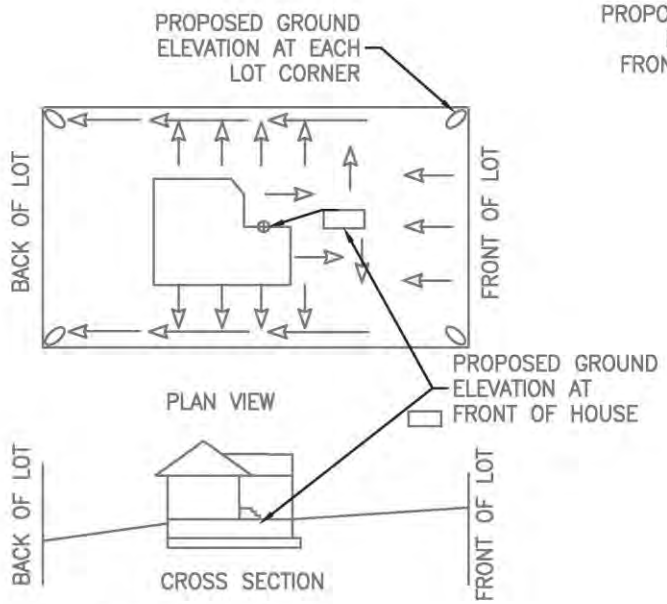


TYPICAL LOT GRADING PLAN
SPLIT LOT DRAINAGE
NTS



TYPICAL LOT GRADING PLAN BACK
TO FRONT DRAINAGE
NTS



TYPICAL LOT GRADING PLAN
FRONT TO BACK DRAINAGE
NTS

NOTES:
1. MINIMUM SLOPES:
   TRANSVERSE (DIRECTED TO SIDE SWALES)
   = 7.5% FOR 2.0m AWAY FROM HOUSE FOUNDATION
   = 1.5% AWAY FROM PARCEL CENTERS LONGITUDINAL SIDE SWALES.
2. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

LOT GRADING GUIDELINES

MUNICIPAL SERVICING STANDARDS

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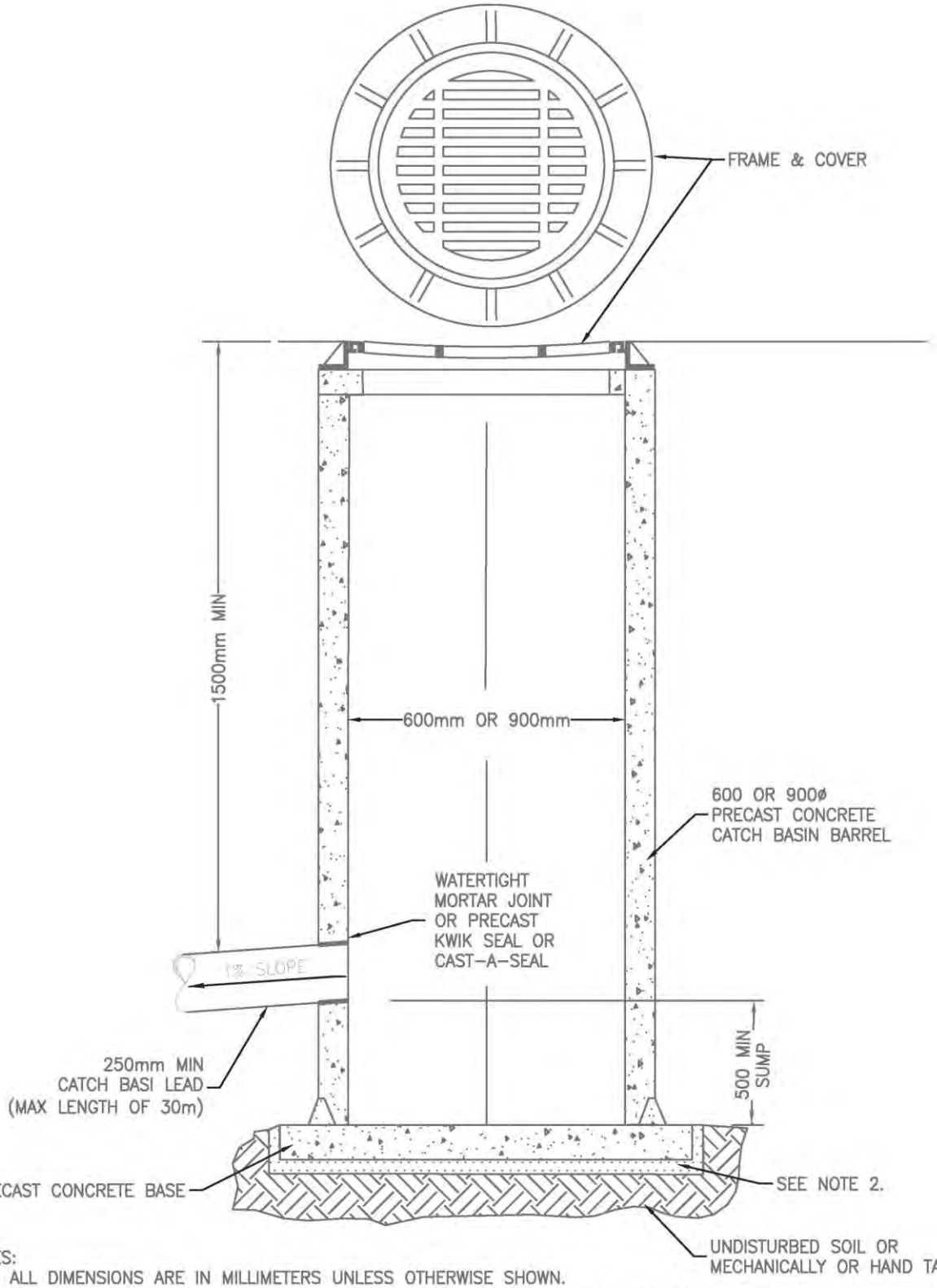

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
2. 150 mm MIN. COMPACTED GRANULAR 'A'/ CLASS B BEDDING MATERIAL AT 95% SPD. PLACE OVER UNDISTURBED SUBGRADE OR ENGINEERED FILL. INSTALL SEPARATION GEOTEXTILE IF SUBGRADE IS UNSTABLE.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

CATCH BASIN DETAIL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
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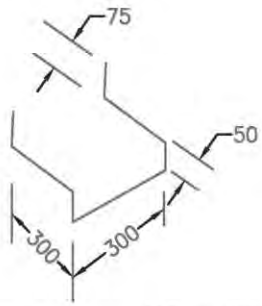
MANHOLE RUNG DETAIL



ALUMINUM MANHOLE RUNGS

NOTES:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.
2. 150 mm MIN. COMPACTED GRANULAR 'A'/ CLASS B BEDDING MATERIAL AT 95% SPD. PLACE OVER UNDISTURBED SUBGRADE OR ENGINEERED FILL. INSTALL SEPARATION GEOTEXTILE IF SUBGRADE IS UNSTABLE.

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CATCH BASIN MANHOLE DETAIL

MUNICIPAL SERVICING STANDARDS

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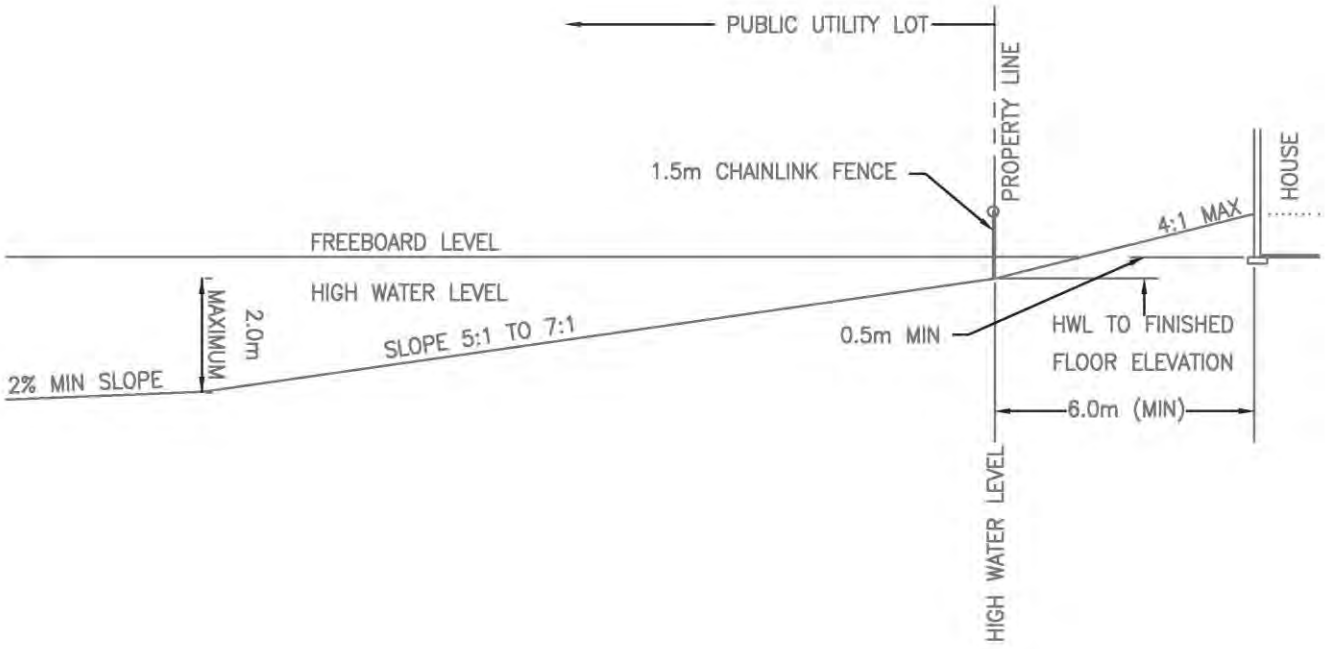

NOTE:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

DRY POND SECTION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
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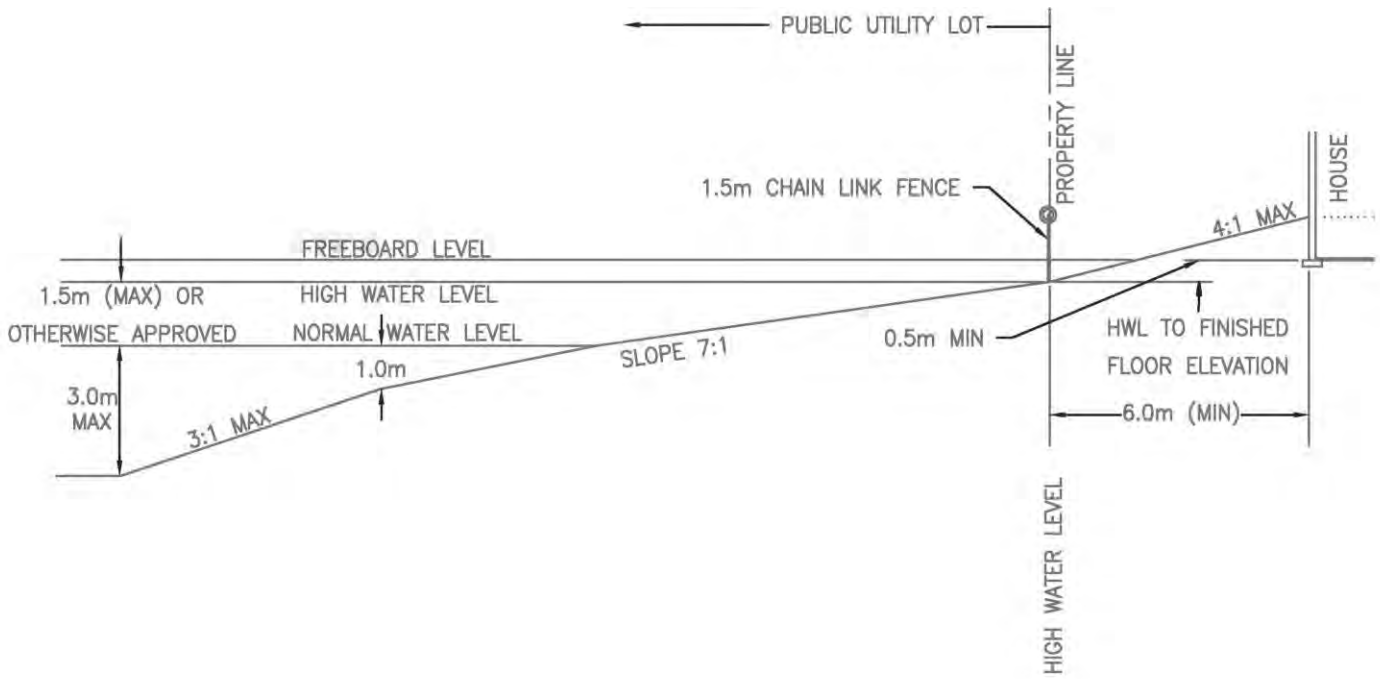

NOTE:
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

WET POND SECTION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

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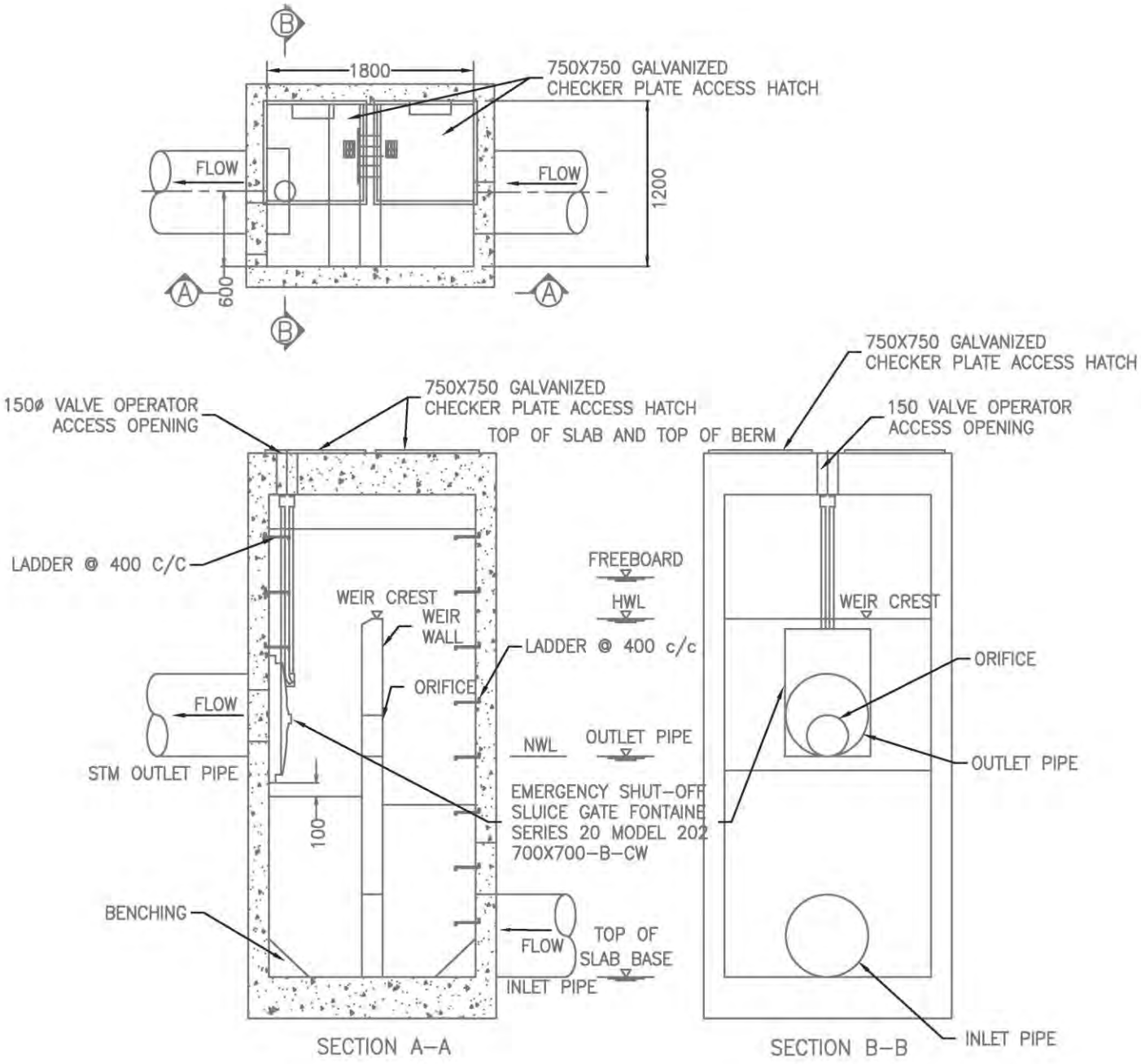

NOTES:

1. SLUICE GATE SHALL BE FONTAINE SERIES 20 c/w NON-RISING STEM AND REMOVABLE KEY OR APPROVED EQUAL.
2. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

STORM POND RELEASE CONTROL MANHOLE

MUNICIPAL SERVICING STANDARDS

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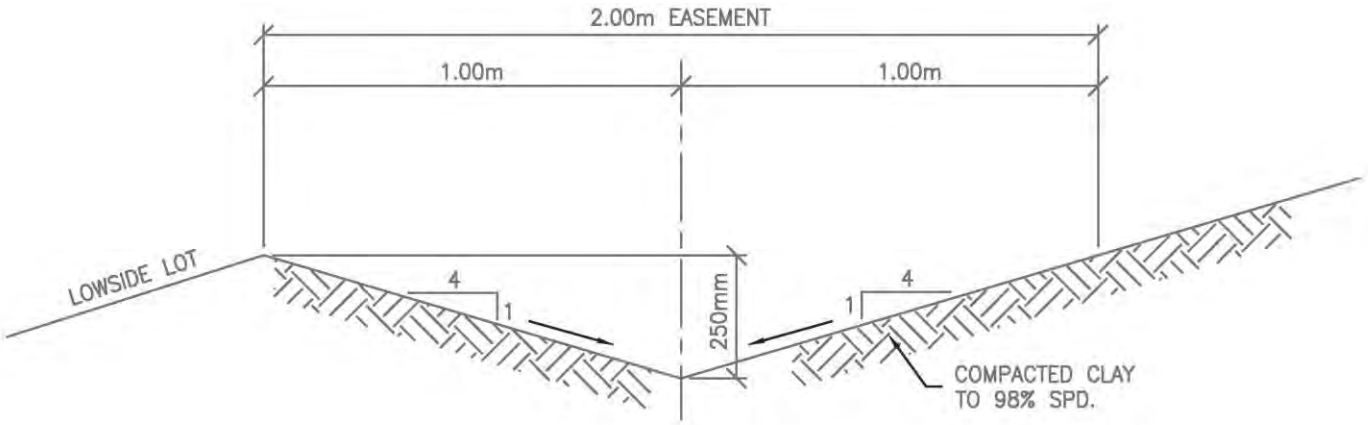
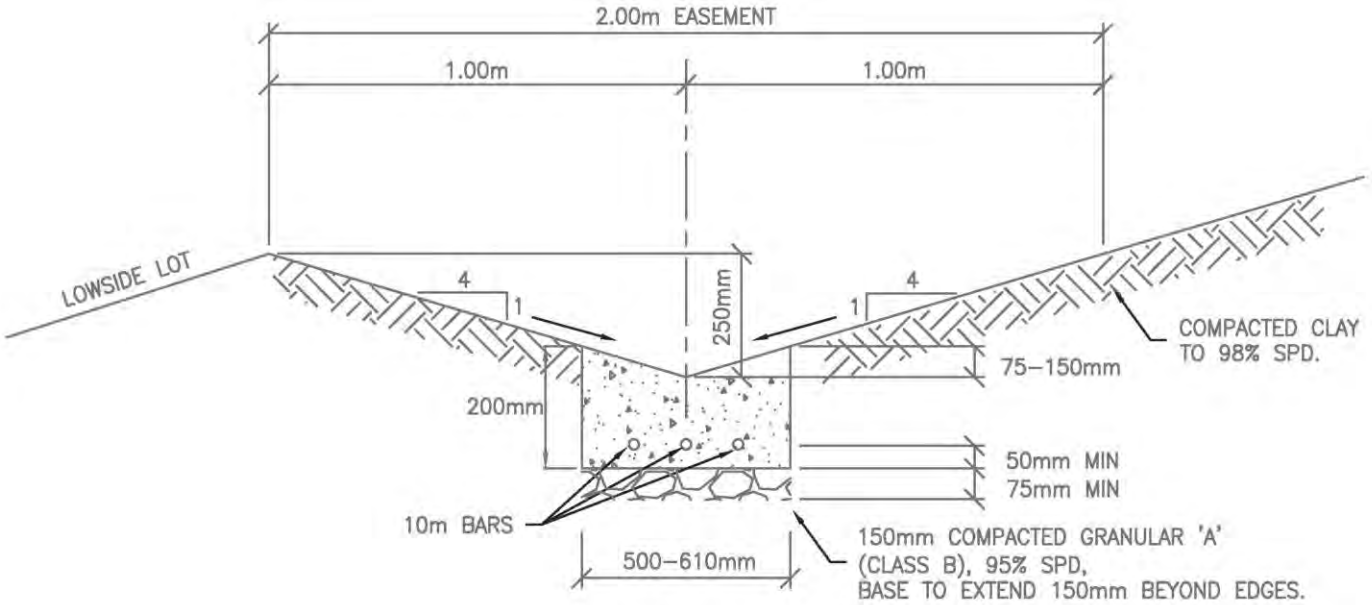
REVISED:	SEPT 2025
DRAWING NO:	5.6



TYPICAL GRASS SWALE SECTION



TYPICAL GRASS SWALE SECTION
WITH CONCRETE GUTTER

NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

SWALES

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	5.7

6 COMMON DETAILS & SERVICE CONNECTIONS

6.1 GENERAL

The requirements for water and sanitary sewer service connections shall depend on the size and type of development. The sizes and locations of these services shall be subject to, and no service installations shall be permitted without, the written approval of Greenview.

6.2 WATER SERVICE CONNECTIONS

- Unless calculated otherwise, the minimum size of water service connection to a single-family dwelling shall be as follows:
  - Water service (un-sprinklered dwelling) 19mm (Urban Lots)
  - Water service (un-sprinklered dwelling) 38mm (Multi-family and Rural Lots)
  - Water service (sprinklered dwelling) 50mm
- Water service connections for commercial, industrial, institutional and multi-family areas, unless otherwise approved in writing by Greenview, shall only be made after the service requirements have been determined and a permit approving the installation is issued by Greenview.
- Water service connections shall be designed as a single connection from the main to the property line at the edge out of developed driveways of the lot. Refer to Drawing 6.1: Typical Services Single & Dual. If double servicing is designed, place at property line.
- Where the water service is 50mm or smaller, the water and sanitary sewr service connections may be installed in a common trench.
- Water service connection material shall be:
  - For commercial/industrial and multi-family services: continuous Type K copper conforming to AWWA C800, latest revision thereof, for all diameters 50 mm and under; for all diameters greater than 50mm, use water main piping.
  - For residential services: HDPE Pipe Series 160 DR11 for all diameters 50mm and under; for all diameters greater than 50mm, use water main piping.
  - Corporation (main) stops required to be provided at the mains shall be Mueller A220, 110 compression types, or approved equal.
  - Curb stops required to be provided with each service connection shall be Mueller, Oriseal Mark 11 H15024/IHI5214 stop and drain, 110 compression type, or approval equal.
  - When using HDPE Pipe, metal inserts shall be utilized at all fittings.
  - Service box shall be epoxy coated extension type for maximum extension to 3.5m c/w stainless steel operating rod, brass clevis and key, and set at final landscape level.
  - Service saddles shall be double strapped stainless steel.
- For water service size up to 50mm, the tapping shall be at the 2 to 10 o'clock (on the opposite side) position on the distribution main.
- All water service lines shall be installed to provide a minimum depth of 3m of cover to top of pipe, including the goose neck off the main.

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- Service boxes, supported by pressure-treated preserved wood timber, shall be installed within 300mm of property line. Set service box plumb and adjust to grade. Service boxes to be protected by placing a 1.5m X 100 mm PVC pipe over the service box, flush with the finished elevation. Refer to Drawing 6.2: Water Service Connection.

- If there is an easement for shallow utilities adjacent to the road right-of-way, the water service connection shall be extended 1m beyond the limits of the shallow utility easement.
- The end of the water service connection shall be adequately capped and sealed to prevent the flow of water out of the service.
- Furthermore, the end of the pipe shall be marked by a vertical, nominal size 50mm x 100mm (2" x 4") timber, set 0.5m into the ground and extending 1m above the top surface of the surrounding ground. Top 300mm of the exposed portion of the marker shall be painted blue.
- Refer to Drawing 6.2: Water Service Connection.
- Minimum service connection trench width shall be the pipe diameter plus 600mm and wide enough so that the pipe(s) can be laid to alignment and at the depth required and compacted properly.
- Trench backfill shall be granular around the pipe(s) and clay above the pipe zone as approved in writing by Greenview. Silt is not an acceptable backfill material.
- Service connection trenches under paved or concrete surfaces, or under areas proposed for pavement or concrete surfacing, shall be backfilled in 150mm layers with each layer compacted to a minimum of 98% SPD.
- Service connection trenches in landscaped or natural areas shall be backfilled in 300mm layers with each layer compacted to a minimum of 95% SPD.

6.3 SANITARY SEWER SERVICE CONNECTIONS

- The minimum size of sanitary sewer service connection to a single-family dwelling shall be 150mm diameter unless the service length exceeds 30m.
    - An inspection chamber shall be installed on all service connections exceeding 30m in length.
- Sanitary sewer service connections for commercial, industrial, institutional, and multi-family areas, unless otherwise approved in writing by Greenview, shall only be made after service requirements have been determined and a permit approving the installation is issued by Greenview.
- Sanitary sewer service connections shall be designed as a single connection from the main to the property line at the edge out of developed driveways of the lot. If double servicing is designed, place at property line.
- All sanitary sewer service connections shall be designed for gravity flow with a minimum grade of 2.0% from the main to the property line. Refer to Drawing 6.3: Gravity Sewer Service Connection.
- Sanitary sewer service connection materials shall be:
    - Polyvinyl chloride (PVC) DR28 building service pipe conforming to CSA specification B182.1, latest revision thereof.
- Sanitary sewer service connections from the main to the property line shall be installed to provide a minimum depth of 2.8m from finished surface grade to invert.

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- Risers shall be employed where the service connection at the main is 4m or deeper. Refer to Drawing 6.4: Gravity Riser Detail.
- A manhole located at 0.5m inside the road right-of-way shall be provided on all industrial sanitary sewer service connections.
- If there is an easement for shallow utilities adjacent to the road, right-of-way shall be provided on all industrial sanitary sewer service connections.
- The end of the sewer service connection shall be adequately capped or plugged to prevent the entry of earth, water or other deleterious material into the pipe. Furthermore, the end of the pipe shall be marked by a vertical, nominal size 50mm x 100mm (2" x 4") timber, set at the service invert and extending 1m above the top surface of the surrounding ground. The top 300 mm of the exposed portion of the marker shall be painted green.
- For trench widths and backfill requirements, refer to Section 6.2 herein.
- For inspection chamber requirements, refer to Drawing 6.5: Inspection Chamber Detail.
- For casing under roads, rivers, railroads, etc., refer to Drawing 6.6 Casing Pipe with Insulator.
- For safety platforms in manholes, refer to Drawing 6.7: Manhole Safety Platform.
- For insulation requirements on services, refer to Drawing 6.8: Insulation Requirements for Water Mains & Services.

6.4 SERVICE CONNECTION REPORTS

The Consulting Engineer shall provide detailed record drawings for all installed service connections that include information relating to pipe dimension, invert elevations, depth of service lines and location of services relative to the property line, manholes and water main valves.

6.5 HORIZONTAL DIRECTIONAL DRILLING (HDD)

6.5.1 General

The Developer must provide regulatory, environmental, geotechnical, risks, economics, engineering, contractual and construction considerations, and provide the best practices and recommended procedures for the installation of piping systems utilizing the Horizontal Directional Drilling Method.

6.5.2 Compliance

All Horizontal Directional Drilling methods must comply with the latest edition of CSA Z662, which contains requirements for the design, material selection, construction and operation of pipelines.

6.5.3 Temporary Workspace

The Developer may require a separate temporary workspace other than the easement required for the construction. The temporary workspace may include exit mud containment tanks/pits;

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cuttings settlement tanks/pits; rollers and pipeline handling equipment, side booms, welding equipment, and coating and testing equipment. The Developer must apply for this right-of-way prior to construction. All disturbed areas relating to the HDD operations in this right-of-way shall be restored to the original condition or better.

6.5.4 Regulatory Agencies and Legislation

- Fisheries Act
- Navigable Waters Protection Act
- The Canadian Environmental Assessment Act
- Alberta's Ministry of Environment and Protected Areas
- Alberta's Ministry of Transportation and Economic Corridors
- M.D. of Greenview No. 16
- Others, as required on a project-by-project basis

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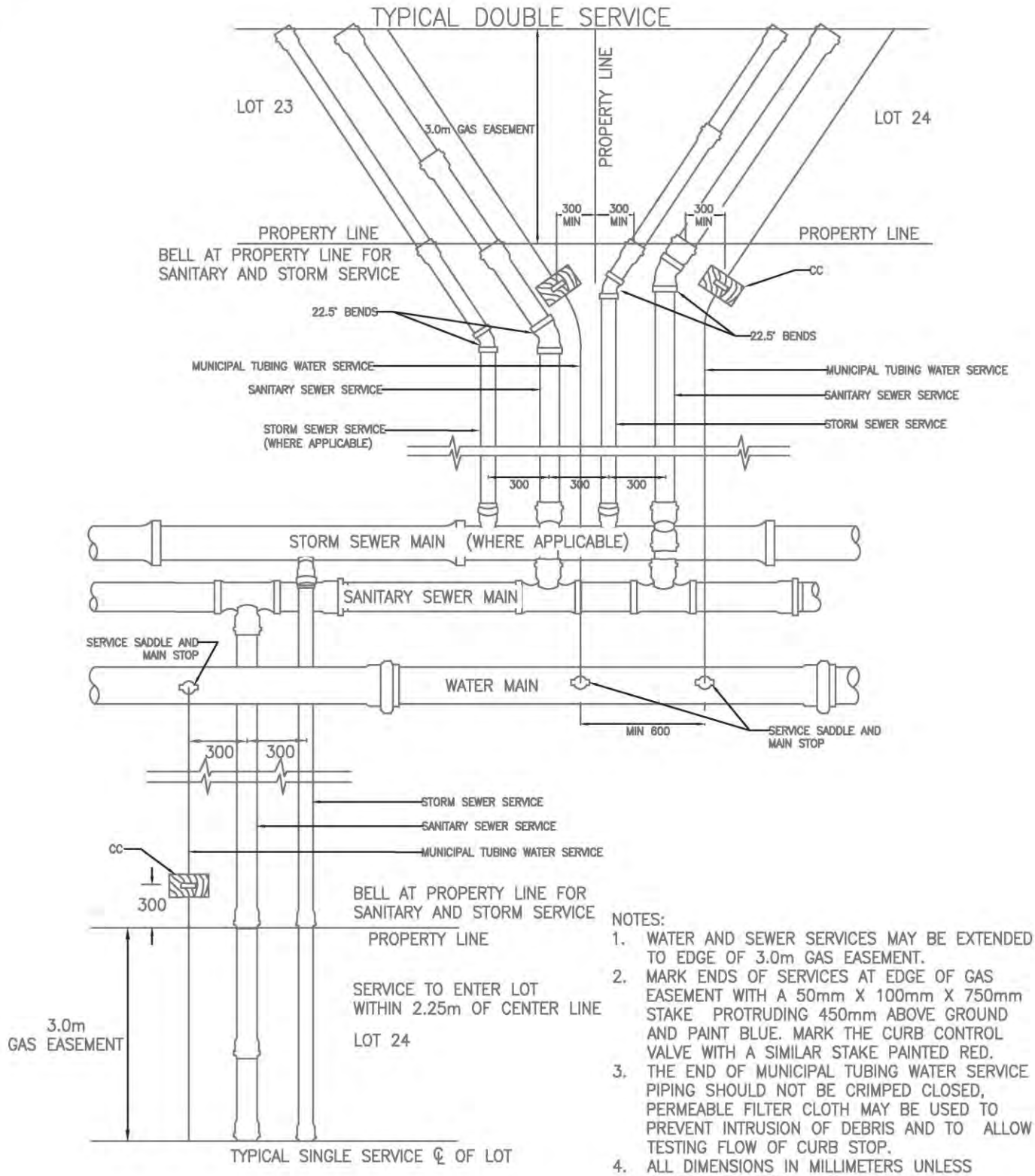


NOTES:

1. WATER AND SEWER SERVICES MAY BE EXTENDED TO EDGE OF 3.0m GAS EASEMENT.
2. MARK ENDS OF SERVICES AT EDGE OF GAS EASEMENT WITH A 50mm X 100mm X 750mm STAKE PROTRUDING 450mm ABOVE GROUND AND PAINT BLUE. MARK THE CURB CONTROL VALVE WITH A SIMILAR STAKE PAINTED RED.
3. THE END OF MUNICIPAL TUBING WATER SERVICE PIPING SHOULD NOT BE CRIMPED CLOSED, PERMEABLE FILTER CLOTH MAY BE USED TO PREVENT INTRUSION OF DEBRIS AND TO ALLOW TESTING FLOW OF CURB STOP.
4. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

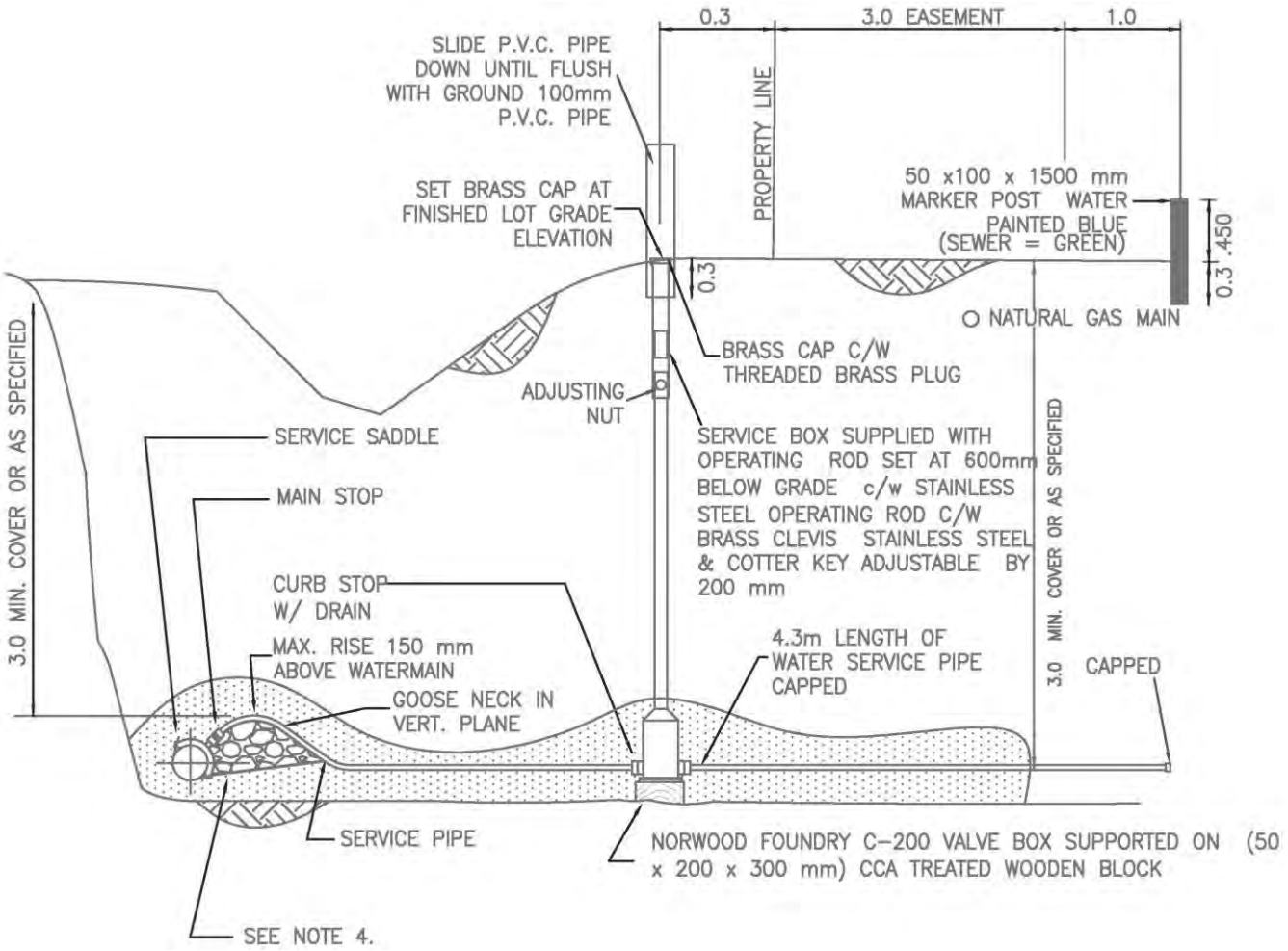
MUNICIPAL DISTRICT OF GREENVIEW No. 16

TYPICAL SERVICES SINGLE & DUAL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	6.1



NOTES:
1. ALL FITTINGS TO BE MUELLER OR APPROVED EQUAL.
2. ALL SERVICE PIPE TO BE PE OR IPEX PVC.
3. ALL DIMENSIONS SHOWN IN METERS UNLESS OTHERWISE NOTED.
4. PROVIDE 150 MM CLASS B GRANULAR BEDDING BELOW WATER MAIN AND SERVICE CONNECTION. HAND-PLACE AND COMPACT GRANULAR TO FULLY SUPPORT GOOSENECK BEND. NO ROCK, CLAY, OR FROZEN MATERIAL PERMITTED IN BEDDING ZONE. PROVIDE 300 MM GRANULAR COVER ABOVE BEFORE TRENCH BACKFILL.

N.T.S.

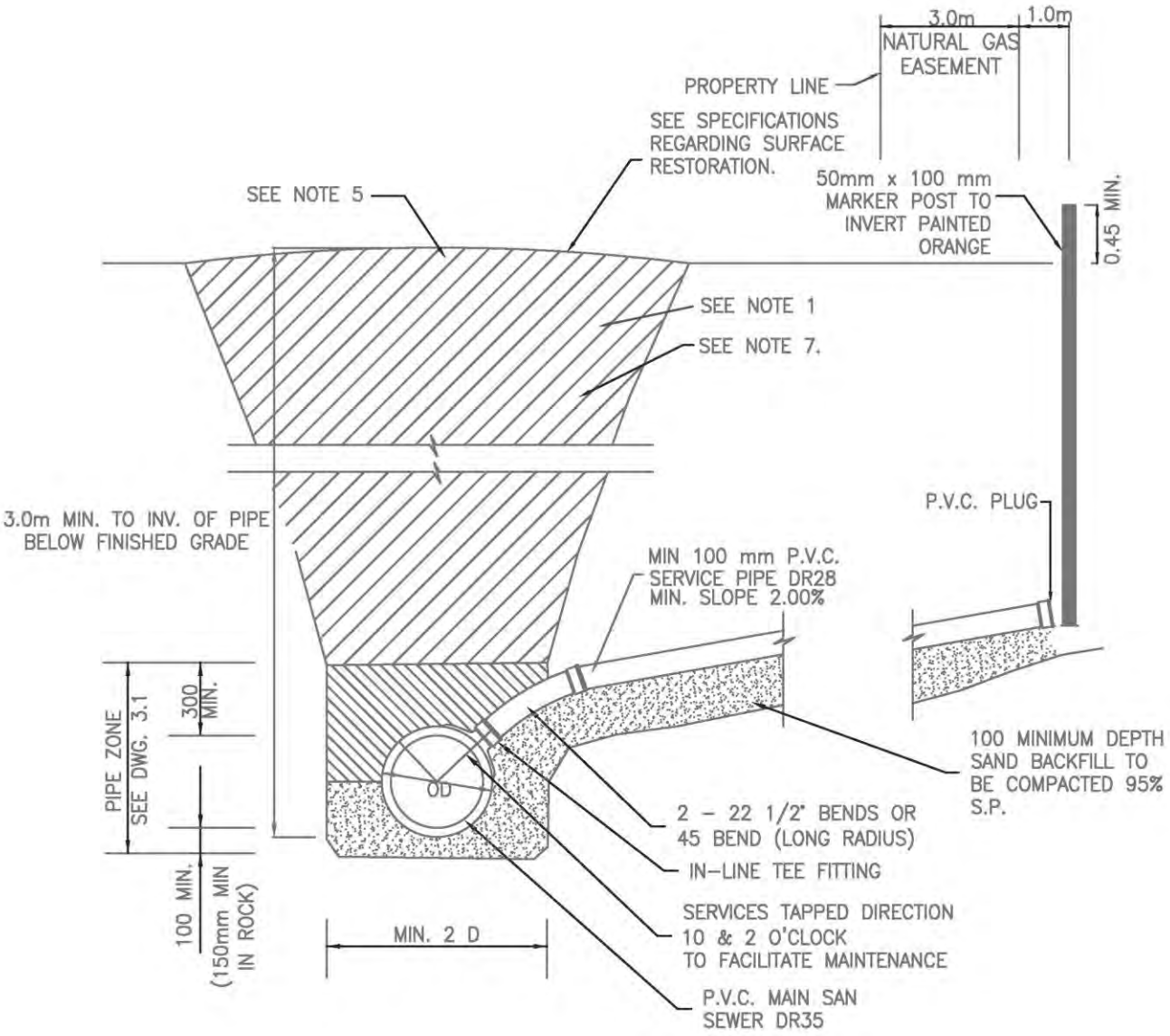
MUNICIPAL DISTRICT OF GREENVIEW No. 16

WATER SERVICE CONNECTION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	6.2



NOTES:
1. WHEN CUT BACK SLOPES ARE TO BE USED IN LIEU OF CAGES AND SHORING, THESE SLOPES ARE TO MEET REQUIREMENTS OF LOCAL CODES AND OH&S MANUAL.
2. MINIMUM COVER ABOVE PIPE 2.5m.
3. MIN. PIPE ZONE WIDTH IS SPECIFIED TO ALLOW PROPER PIPE ZONE COMPACTION.
4. OD = OUTSIDE PIPE DIAMETER.
5. FOR UNCOMPACTED BACKFILL, CROWN TRENCH BY H x 0.1.
6. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
7. ABOVE GRANULAR PIPE COVER, BACKFILL IN ROADWAY/SIDEWALK AREAS SHALL CONFORM TO CURRENT MD ROADWAY SPECIFICATIONS. IN BOULEVARDS/LANDSCAPE AREAS, USE APPROVED NATIVE MATERIAL COMPACTED TO 95% SPD.

N.T.S.

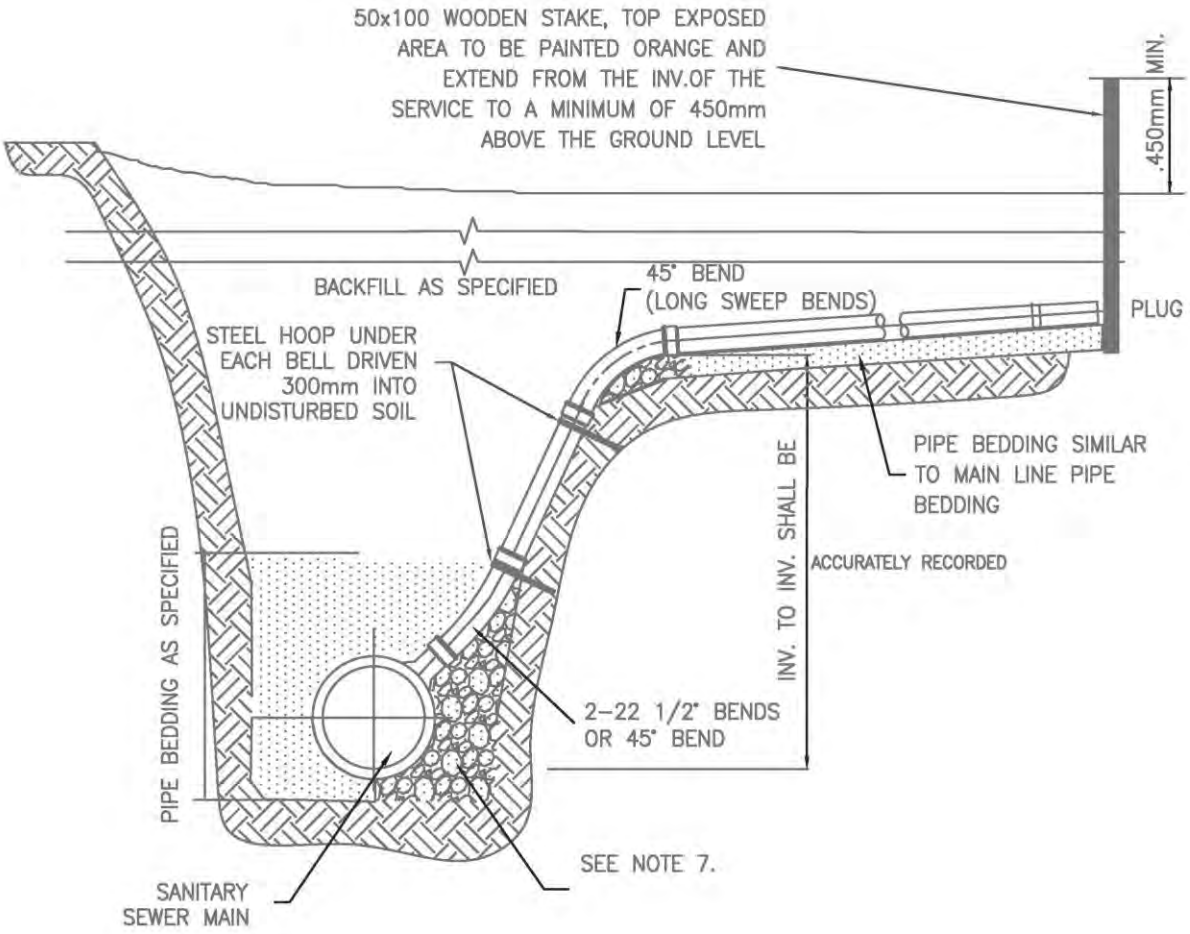
MUNICIPAL DISTRICT OF GREENVIEW No. 15

GRAVITY SEWER SERVICE CONNECTION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	6.3



NOTES:

1. REFER TO DWG. 6.3 FOR APPLICABLE NOTES 1 TO 6.
2. NO SHORT 45° BENDS UNLESS APPROVED BY GREENVIEW.
3. MIN. LONG 45° BENDS.
4. ONLY LONG SWEEPING BENDS.
5. INV = INVERT
6. ALL DIMENSIONS ARE IN MILLILITERS UNLESS OTHERWISE NOTED.
7. ABOVE GRANULAR PIPE COVER, BACKFILL IN ROADWAY/SIDEWALK AREAS SHALL CONFORM TO CURRENT MD ROADWAY SPECIFICATIONS. IN BOULEVARDS/LANDSCAPE AREAS, USE APPROVED NATIVE MATERIAL COMPACTED TO 95% SPD.

N.T.S.

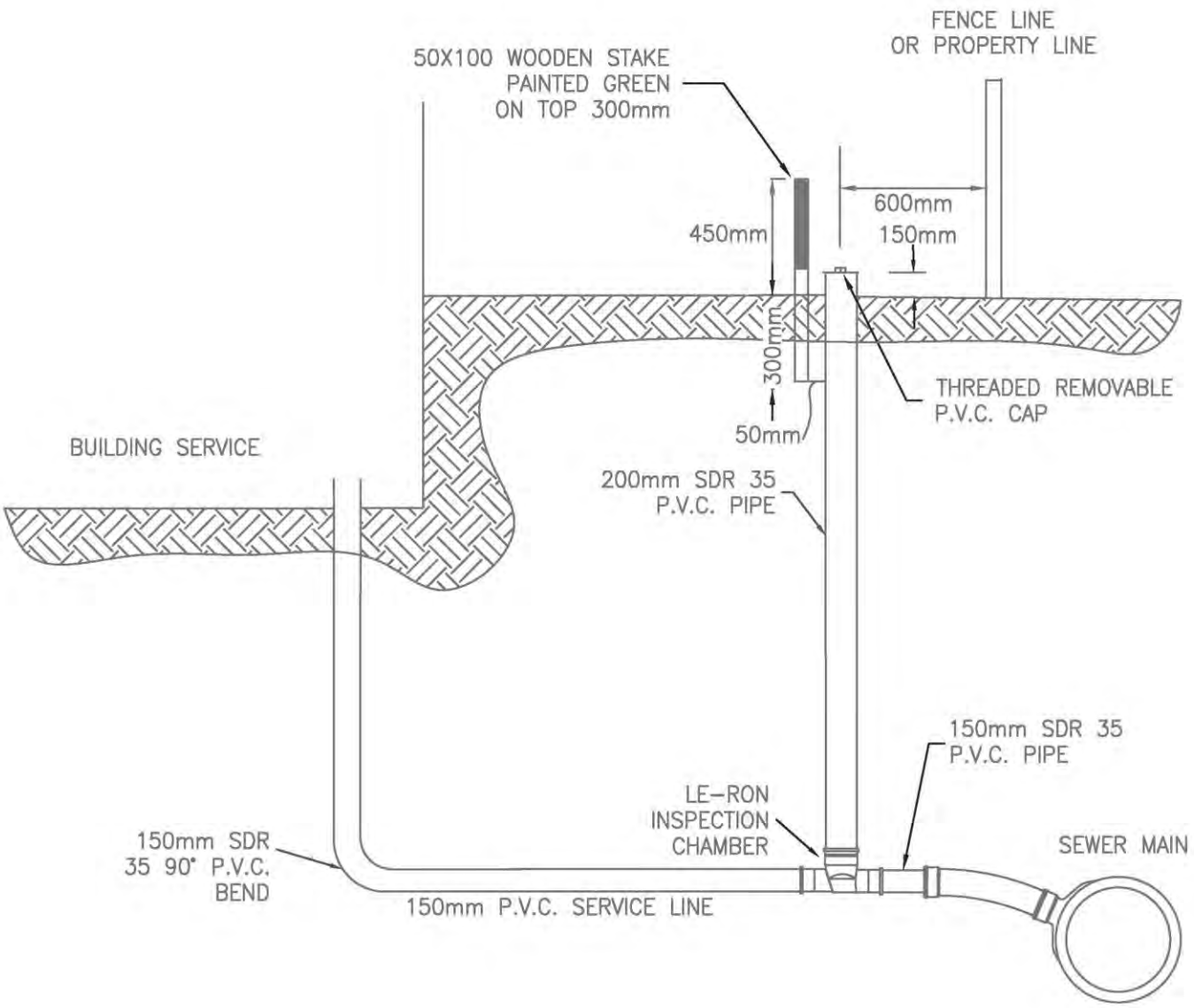
MUNICIPAL DISTRICT OF GREENVIEW No. 16

GRAVITY RISER DETAIL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	6.4



NOTE:
1. INSPECTION CHAMBER TO BE LOCATED IN A NON-TRAFFIC AREA AND APPROPRIATELY PROTECTED AND MARKED.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

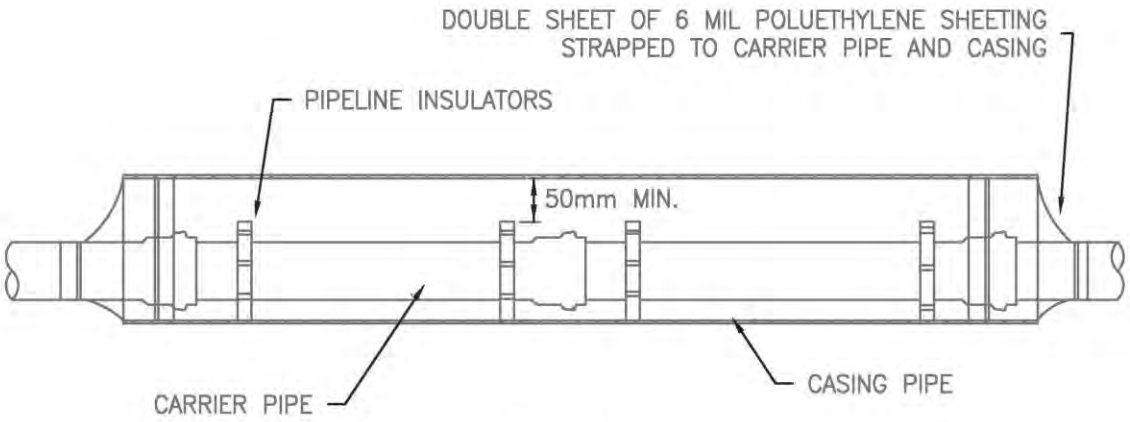
MUNICIPAL DISTRICT OF GREENVIEW No. 16

INSPECTION CHAMBER DETAIL

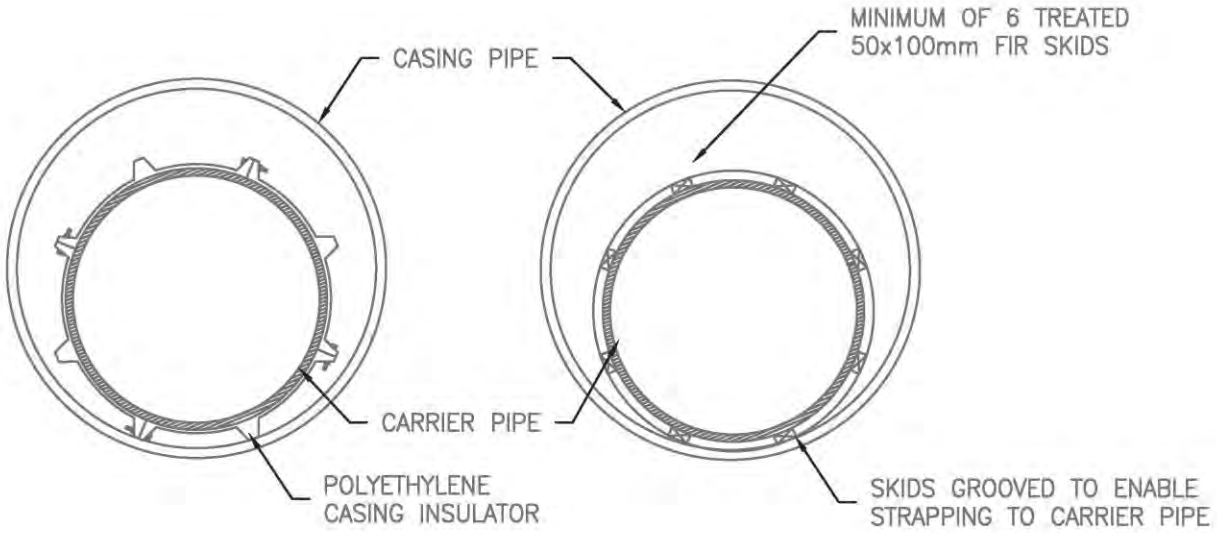
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	6.5



ELEVATION



SECTION

NOTES:
1. CASING MATERIAL AND THICKNESS TO BE AS SPECIFIED ON CONSTRUCTION DRAWINGS.
2. INSULATOR SPACING TO BE DETERMINED BY THE MATERIAL AND JOINT TYPE OF CARRIER PIPE BEING USED.
3. CASING COATING AND CATHODIC PROTECTION REQUIREMENTS TO BE AS SPECIFIED ON CONSTRUCTION DRAWINGS.
4. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

N.T.S.

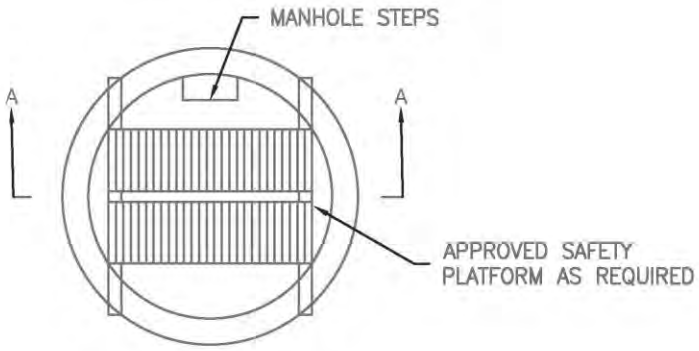
MUNICIPAL DISTRICT OF GREENVIEW No. 16

CASING PIPE WITH INSULATOR

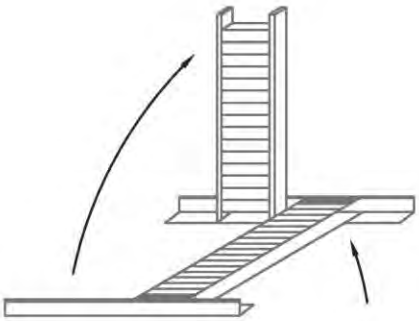
MUNICIPAL SERVICING STANDARDS

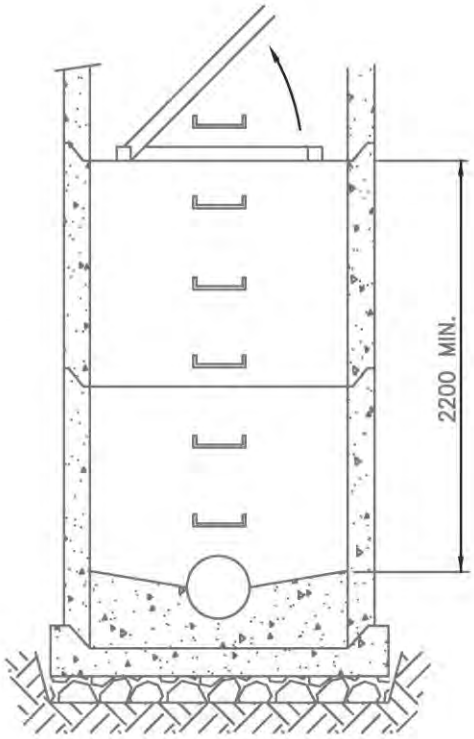
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	6.6



PLAN VIEW





SECTION A–A

NOTES:
1. TO BE INSTALLED ON MANHOLES GREATER THAN 5.0m DEEP
2. TO BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

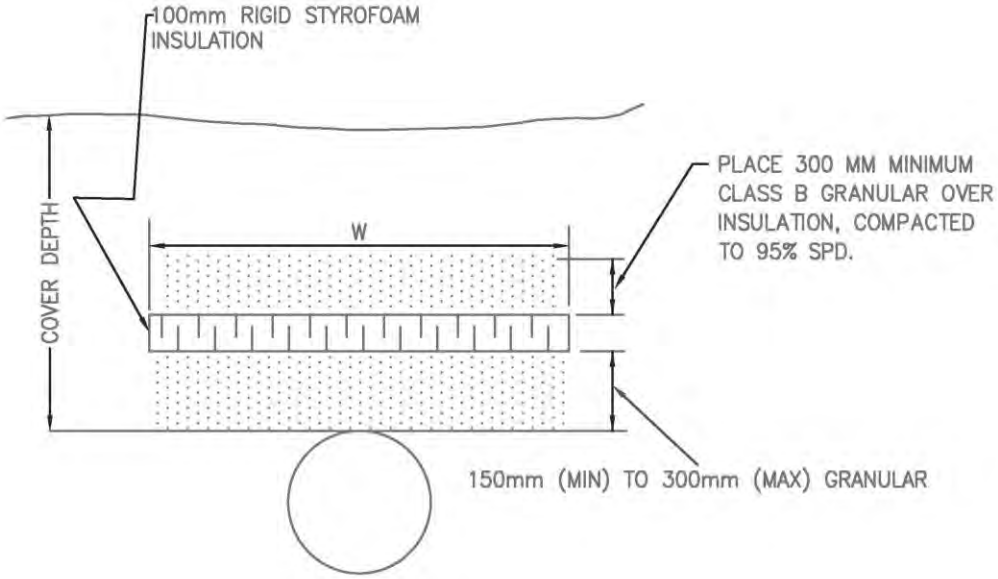
MUNICIPAL DISTRICT OF GREENVIEW No. 16

MANHOLE SAFETY PLATFORM

MUNICIPAL SERVICING STANDARDS

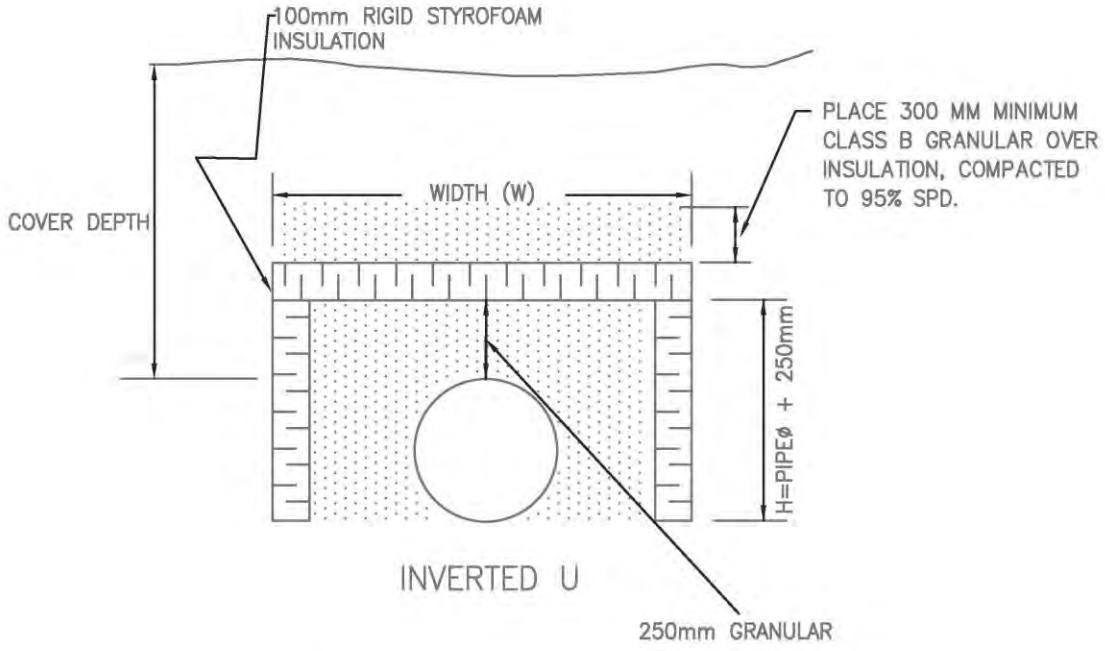
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	6.7



HORIZONTAL

OR



INVERTED U

NOTES:
1. W=ø+2H
2. MINIMUM 3m DEPTH TO TOP OF PIPE BELOW FINISHED DESIGN GRADE.
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

INSULATION REQUIREMENTS FOR WATER MAINS & SERVICES

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	6.8

7 ROADWAY SYSTEMS

7.1 GENERAL

Roadways in development areas within Greenview shall be developed to either an urban or rural cross-section with either a gravel or an asphalt surface. The appropriate roadway classification and design designation shall be determined during the engineering pre-design stages in consultation with Greenview.

All requirements are referred to in Alberta Transportation's Standard Specifications for Highway Construction, latest revision thereof (herein referred to as "ATEC's Specifications").

7.2 ROADWAY CLASSIFICATIONS

7.2.1 Rural Residential Road

The function of local roads is to provide access to adjacent properties carrying traffic from higher traffic volume roads to individual land parcels. Local roads are typically low speed and low volume roadways and typically a gravel structure.

7.2.2 Urban Residential Road

The function of the urban residential road is to provide access within a built-up area. Typically characterized by the presence of street lighting. Low to moderate posted speeds and frequent entrances.

7.2.3 Collector Road

A collector road is a low-to-moderate capacity road which serves to move traffic from local roads to arterial roads. These roads will often provide access to rural or urban residential roadways.

7.2.3.1 Minor Collector Road

Minor collectors receive relatively smaller volumes of through traffic from local roads (residential and industrial).

7.2.3.2 Major Collector Road

Major collectors carry significant volumes of through traffic, with origin and destination points outside the general area to arterials.

7.2.4 Industrial/Commercial Road

The typical function of an industrial/commercial road is to provide access to a designated area and/or where there is a high presence of commercial buildings on both sides of the road.

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7.2.5 Arterial Road

The arterial road classification is applicable to a road that collects traffic from all classifications and directs traffic to primary or secondary numbered highways.

7.3 DESIGN CRITERIA

7.3.1 General

The Developer is responsible for assessing the traffic impact associated with the proposed development. The assessment must include the projected Average Annual Daily Traffic (AADT) over a twenty (20) year design life. Depending on the size and/or location of the development, an overall Traffic Impact Assessment (TIA) may be required by Greenview or Alberta Transportation.

Road rights-of-way shall be of adequate width to accommodate the roadway surface and the roadside ditches, if applicable, complete with the required side slopes and backslopes or all facilities relating to a curb and gutter design.

Right-of-way requirements are the standards set out below and any deviations will require approval in writing by Greenview prior to construction.

Minimum right-of-way requirements for roadways are as follows:

- RURAL RESIDENTIAL ROADWAY minimum 30m right-of-way
- URBAN RESIDENTIAL minimum 30m right-of-way
- MINOR COLLECTOR minimum 30m right-of-way
- MAJOR COLLECTOR minimum 40m right-of-way
- INDUSTRIAL/COMMERCIAL minimum 40m right-of-way
- ARTERIAL minimum 40m right-of-way

Refer to:

- Drawing 7.1: Typical Asphalt & Gravel Roads Cross Section
- Drawing 7.2: Rural Residential Roadways with Parking & Sidewalk
- Drawing 7.3: Industrial/Commercial Roadways

7.3.2 Geometric Design

- Roads shall be designed in accordance with the geometric design standards outlined in the latest revision of ATEC's Highway Geometric Design Guide and the Transportation Association of Canada (TAC) manual "Geometric Design Guide for Canadian Roads."
- The design speed selected should relate to the expected operating speed on the road after improvement. It should reflect public expectations and include an allowance for safety. The design speed is typically 10km/hr higher than the anticipated posted speed limit.
- The roadway design, when prepared, shall consider the future requirements, economic factors, safety considerations, staging, and other road uses not currently associated with the development.

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- In addition, the designer shall give due consideration to the soil conditions in the area as derived through geotechnical investigations.

7.3.3 Road Intersections

Each intersection shall be designed according to ATEC's Specifications. Should there be a difference in requirements compared to the specifications contained within these Standards, the more stringent shall apply.

Refer to Drawing 7.10: Design of Intersections.

7.3.4 Dead-End Roads

Any dead-end roads will require a cul-de-sac. If a temporary cul-de-sac is required, approval from Greenview must be obtained. Refer to:

- Drawing 7.11: Commercial/Industrial Cul-De-Sac
- Drawing 7.12: Residential Cul-De-Sac

7.3.5 Expanded Bulb Corners

Expanded bulb corners may be used in subdivisions and Hamlets, if approved by Greenview. Please refer to ATEC's Specifications.

7.3.6 Culverts for Hamlets, Subdivisions and Roadways

All culverts will be installed to the manufacturer's specifications and ATEC's Specifications.

Greenview requires a minimum 600mm corrugated pipe culvert size, where culverts are required (subdivisions, Hamlets, rural roads), unless otherwise approved by Greenview. Based on site conditions, Greenview will determine if the minimum size of culvert can be adjusted. If ditch drainage is positive in both directions from an approach, at the discretion of Greenview, a culvert may not be required.

Greenview may require a stormwater management plan to be completed, at the Developer's expense, for the development area, to determine the minimum size of culvert required (e.g. site-specific conditions).

Refer to:

- Drawing 7.4: Urban Residential with Sidewalks
- Drawing 7.5: Urban Residential Roadways
- Drawing 7.6: Minor Collector Separate or Mono Sidewalk
- Drawing 7.7: Major Collector Separate or Mono Sidewalk
- Drawing 7.15: Culvert Installation
- Drawing 7.17: Residential & Industrial Approach

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7.3.7 Drainage for Hamlets and Subdivisions

Greenview requires a stormwater management plan to be developed by an approved APEGA member. For specifics on stormwater drainage please refer to Section 5 Storm Drainage Systems.

7.3.8 Road Ditches

Where a ditch is present, the Developer will be responsible for the site-specific design of a sediment erosion control plan, which will be submitted to Greenview for approval in writing.

The standard ditch bottom width will be 3m, unless otherwise approved by Greenview. The run-off capacities must meet the specific site requirements as determined in the stormwater management plan.

- Drawing 7.13: Rock Ditch Checks
- Drawing 7.14: Geogrid/Coconut Matting & Silt Fence Ditch Checks
- Drawing 7.15: Culvert Installation
- Drawing 7.16: General Rip Rap for Culverts

7.3.9 Access

Access refers to any access to a single-family driveway, an industrial approach or local rural approach to access any titled property. All accesses within Greenview will be built to the standards and drawings herein. Refer to Drawing 7.17: Residential & Industrial Approach.

7.3.10 Access Requirements

This subsection outlines the requirements with respect to the design and construction of access within Greenview.

7.3.10.1 Rural Residential and Industrial Access Approaches (including Rural Subdivision)

Refer to Greenview Policy 4010 Road Access Approaches, latest revision/replacement thereof.

- The rural access width of road top shall be 8 meters with no deviations.
- The industrial (including farming operations) access width of road top shall be 15 meters with no deviations.
- Culverts must be installed along roadways with ditches. Refer to Section 7.3.8 above.
- The minimum clearance of approaches must be 5m from any structure (power pole, utility station), unless otherwise approved in writing by Greenview.
- The minimum distance from property line to the new access is 30m, unless otherwise approved in writing by Greenview.
- Sightline distance from either side of approach must meet 200m, unless otherwise approved in writing by Greenview.

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- Refer to Drawing 7.17: Residential & Industrial Approach

7.3.10.2 Hamlet Access - Residential, Industrial

Refer to Greenview Policy 4010 Road Access Approaches, latest revision/replacement thereof.

- The width of a single-family or duplex residential driveway, multi-family residential driveway, or industrial driveway, including the driveway crossing and motor vehicle parking stall(s):
  - must not exceed 60% of the parcel width, where no culvert is required (e.g. curb and gutter); or
  - shall be 8 meters or 15 meters wide, where a culvert is required.
- The minimum clearance of an approach must be 1.5m from any utility feature.
- The minimum distance from intersection is 30m, unless otherwise approved in writing by Greenview.
- Refer to:
  - Drawing 7.4: Urban Residential with Sidewalks
  - Drawing 7.5: Urban Residential Roadways
  - Drawing 7.17: Residential & Industrial Approach

7.3.11 Roadway Surface Finishes

All road surface finishes shall be determined based upon recommendations contained within the geotechnical investigation and considering the design AADT, site-specific conditions and minimum requirements as required by Greenview and ATEC's Specifications.

If any weather conditions affect the condition of the road surface, Greenview reserves the right to request additional material laid during construction, at no cost to Greenview.

Greenview presently approves two types of roadway surface finishes:

- Graveled surface
  - Refer to ATEC's Specifications
  - Drawing 7.1: Typical Asphalt & Gravel Roads Cross Section
- Asphaltic concrete (hot mix asphalt) pavement surface
  - Refer to ATEC's Specifications
  - Drawing 7.1: Typical Asphalt & Gravel Roads Cross Section
  - Drawing 7.4: Urban Residential with Sidewalks
  - Drawing 7.5: Urban Residential Roadways

7.3.12 Urban Concrete Curb and Gutter

- Concrete curb and gutter shall be constructed on all urban cross sections according to the typical cross sections.

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- The straight face curb and gutter cross section shall be used on all roads fronting public lands, such as parks and public utility lots.
- Straight face curbs shall also be used within the right-of-way when crossing pipelines unless separate vehicle barriers are provided to prevent unauthorized access.
- The rolled faced curb and gutter cross section may be used on all hamlet and subdivision roadways allowing driveway access, as approved by Greenview.
- Curb returns on all intersections within the hamlet shall have a minimum radius of 15m and shall be designed to accommodate truck turning movements, unless otherwise approved by Greenview.
- Refer to:
    - Section 5 Storm Drainage Systems and ATEC's Specifications
    - Refer to ATEC's Specifications and Design Standards
    - Drawing 7.4: Urban Residential with Sidewalks
    - Drawing 7.5: Urban Residential Roadways
    - Drawing 7.23: Concrete Swale (Plan)
    - Drawing 7.24: Concrete Swale (Cross Section)

7.3.13 Sidewalks

Sidewalks shall be accessible to all persons as well as being safe, functional and aesthetically pleasing. Sidewalks installed for new subdivisions shall integrate with the existing walkway system on intersecting roadways. Separate sidewalks are preferred and shall be of a minimum width to provide storage space between the roadway and sidewalk for snow removal. The requirements for sidewalks in commercial and industrial areas shall be reviewed on a site-specific basis in conjunction with the proposed use and other required services. Curb ramps shall be used at all curbed intersections.

For all specifications refer to ATEC's Specifications.

- Drawing 7.25: Sidewalk & Boulevard Drainage Crossing for Separate Walk
- Drawing 7.26: Sidewalk & Drainage Crossing for a Mono Walk
- Drawing 7.27: Standard Curb & Gutter
- Drawing 7.28: Monolithic Curb, Gutter & Sidewalk

7.3.14 Walkways/Bikeways

Walkways and bikeways are to be designed and constructed to provide minimum width. The Developer will be required to provide linkages from existing developments and/or for future developments. Refer to Drawing 7.19: Walkway/Bikeway.

7.3.15 Curb Ramps

Specifications regarding the location and construction for wheelchair accessible ramps at intersections and off sidewalks can be found in ATEC's Specifications. Refer to Drawing 7.20: Curb Ramp.

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7.4 CONSTRUCTION STANDARDS

7.4.1 Preparatory Work

- The entire roadway right-of-way shall not have any vegetation (trees, shrubs, brush, etc.) including all tree roots and stumps. No burying of any material, or any portion thereof, shall be permitted within the right-of-way.
- Organic soils and material are not acceptable as subgrade materials and shall be stripped within the roadway, ditch and backslope portion of the new construction. Organic soils (clean topsoil) shall be stockpiled and then spread on the ditches, backslopes and/or boulevards after completion of the roadway construction.

7.4.2 Roadway Construction

This sub-section deals with the requirements covering all aspects of roadway construction. Refer to ATEC's Specifications for the following:

- Roadway Excavation
- Embankment Excavation
- Subgrade Preparation
- Subgrade Excavation
- Surfacing Gravel

Refer to Drawing 7.1: Typical Asphalt & Gravel Roads Cross Section, and the Road Classifications table contained therein for road widths.

7.4.3 Pavement Structure

Any pavement structure design will be provided by a professional sealed APEGA engineer for construction with the following design parameters:

- Geotechnical Reports
- Asphalt Institute Method of Pavement Design
- California Bearing Ratio (CBR)
- Alberta Transportation's Specifications

Paved roadways will be designed in accordance with the Asphalt Institute Method of pavement design, using a minimum design loading of 8,165kg axle loads for local roadways and 10,866kg axle loads for industrial/commercial roadways. Refer to ATEC's Specifications and ATEC's Highway Pavement Marking Guide, latest revision thereof.

7.4.4 Asphaltic Concrete Pavement

All asphalt design and construction specifications shall meet or exceed those outlined in ATEC's Specifications. Should there be any discrepancy between the requirements listed within as compared to ATEC's Specifications, the more stringent shall apply.

- Mix design

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- Weather Limit
- Asphalt thickness & placement
- Prime, tack and fog coats
- Smoothness
- Final Density requirements
- Final Testing and Quality Control

7.4.5 Asphalt Stabilized Base Course (ASBC)

Asphalt stabilized base course shall consist of a mixture of crushed aggregate and asphalt, which is placed in layers upon the previously prepared surface, compacted and finished to the specified thickness, approved grades, lines, and typical cross-section.

Construction specifications shall meet or exceed those outlined in the latest revision of ATEC's Specifications and the consulting engineer. Should there be any discrepancy between the requirements listed within as compared to ATEC's Specifications, the more stringent shall apply.

- Mix design
- Weather Limit
- Asphalt thickness & placement
- Prime, tack and fog coats
- Smoothness
- Final Density requirements
- Final Testing and Quality Control

7.4.6 W-Beam Guardrail

A barrier placed along the edge of a highway or area that has a dangerous slope or cut in a bank will be required. Refer to ATEC's Specifications.

7.4.7 Railway Crossing

All railway crossings shall be developed in accordance with the latest edition of the Grade Crossing Regulation as published by Transportation Canada and in consultation with the railway company. Refer to ATEC's Specifications.

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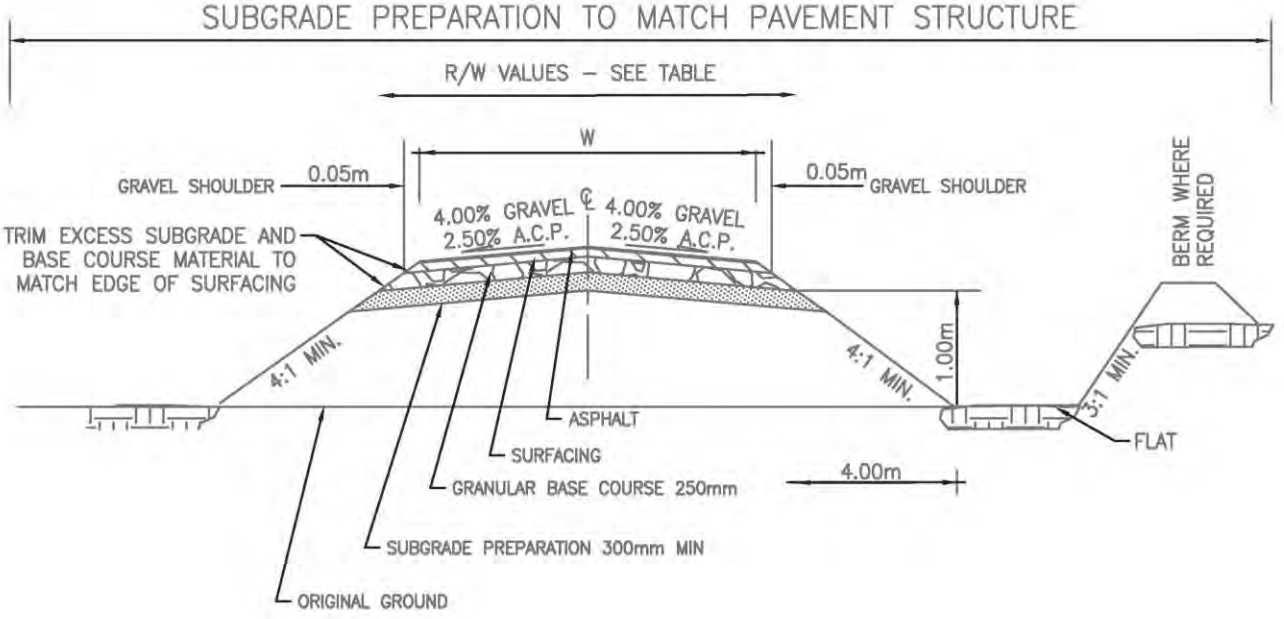
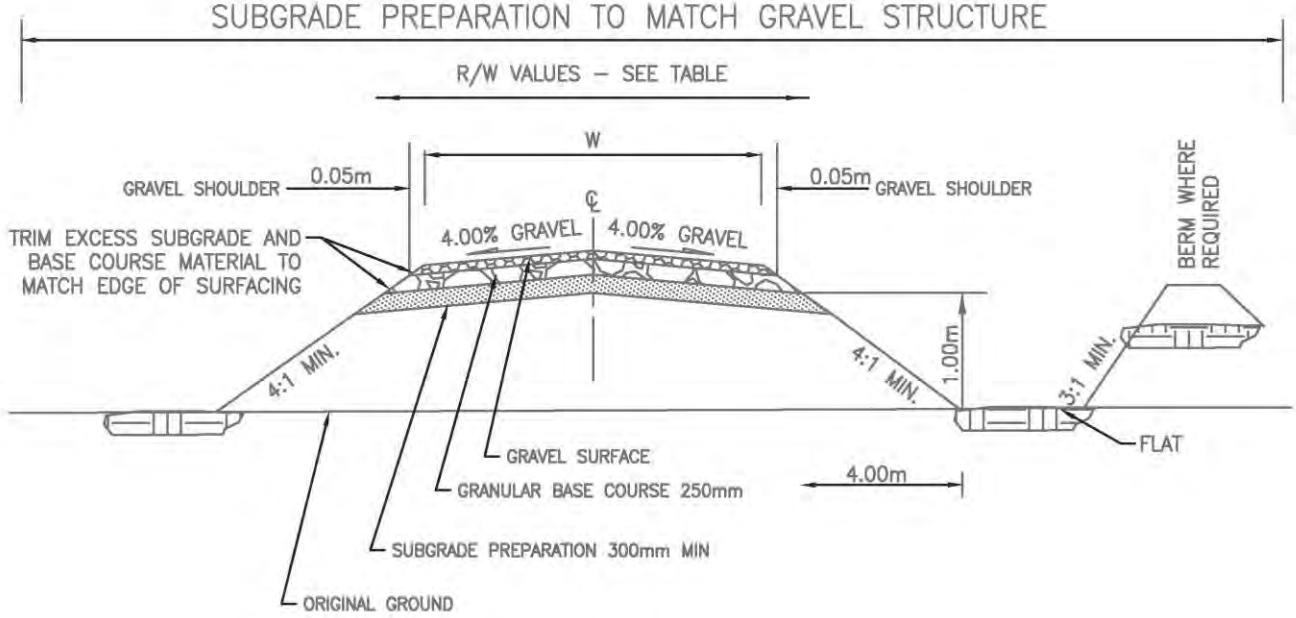
SUBGRADE PREPARATION TO MATCH PAVEMENT STRUCTURE



SUBGRADE PREPARATION TO MATCH GRAVEL STRUCTURE



FILL SLOPE TABLE

DEPTH OF FILL	SLOPE
0 – 2.5m	3:1
2.5 – 3.5m	3:1
3.5 – 4.5m	2.5:1
> – 4.5m	2:1

ROAD CLASSIFICATION	ROADWAY	MIN. ROW
Residential/Local	8.0m	30m
Urban Residential	10.0m	30m
Minor Collector	9.0m	30m
Major Collector	10.0m	40m
Commercial/Industrial	10.0m	40m
Secondary & Primary Highways	11.0m	40m

NOTES:
1. ALL BACK SLOPES 3:1 UNLESS NOTED OTHERWISE.
2. SLOPES STEEPER THAN 3:1 REQUIRES 1m SHOULDER WIDENING & GUARD RAIL INSTALLATION.
3. FILL SLOPES GREATER THAN 3.5m AND/OR STEEPER THAN 3:1 REQUIRE GEOTECHNICAL DESIGN.
4. EROSION PROTECTION REQUIRED ON ALL EXPOSED CUT AND FILL SLOPES.
5. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

TYPICAL ASPHALT & GRAVEL ROADS CROSS SECTION

MUNICIPAL SERVICING STANDARDS

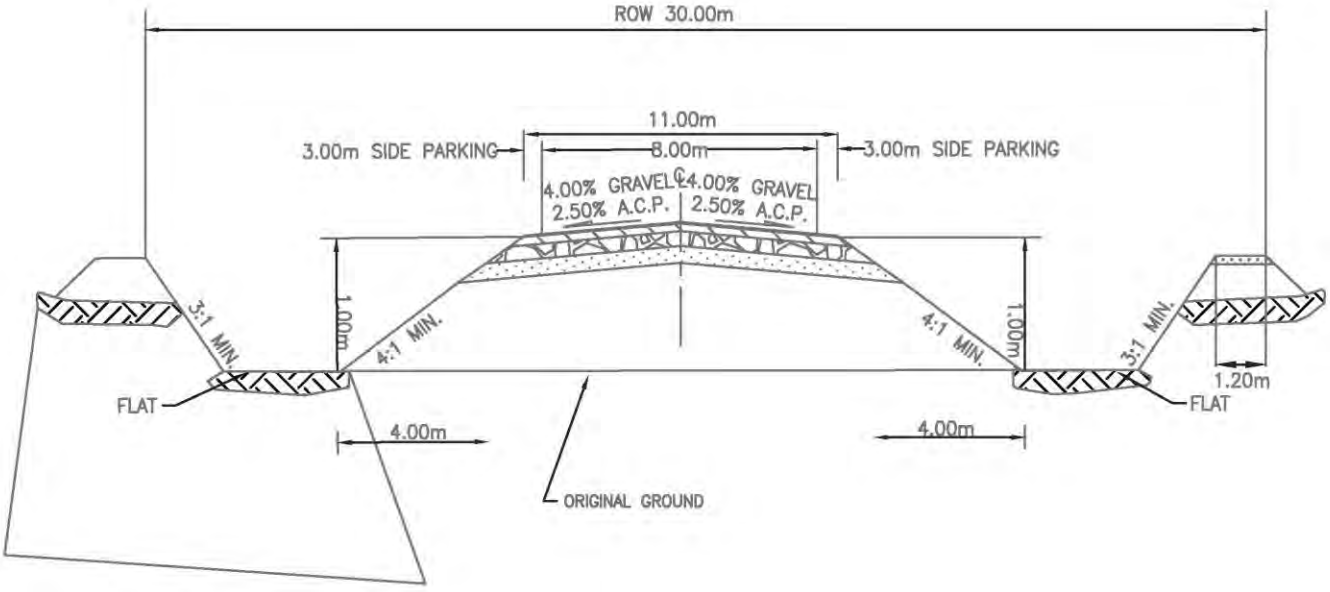
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE

DATE: JAN. 2015

REVISED: SEPT 2025

DRAWING NO: 7.1



NOTES:
1. ALL BACK SLOPES 3:1 UNLESS NOTED OTHERWISE.
2. SLOPES STEEPER THAN 3:1 REQUIRES 1m SHOULDER WIDENING & GUARD RAIL INSTALLATION.
3. FILL SLOPES GREATER THAN 3.5m AND/OR STEEPER THAN 3:1 REQUIRE GEOTECHNICAL DESIGN.
4. EROSION PROTECTION REQUIRED ON ALL EXPOSED CUT AND FILL SLOPES.
5. THE ONE SIDE WALK CAN BE ON EITHER SIDE OF THE ROAD.
6. MINIMUM CONCRETE SIDE WALK WIDTH SHALL BE 1.20m
7. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

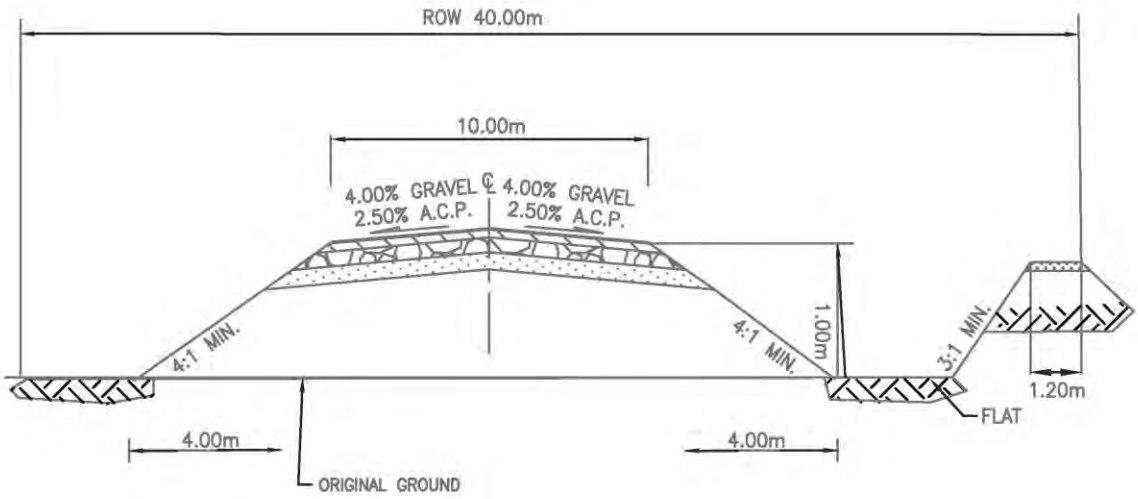
RURAL RESIDENTIAL ROADWAYS WITH PARKING & SIDEWALK

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

RURAL

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.2



NOTES:

1. ALL BACK SLOPES 3:1 UNLESS NOTED OTHERWISE.
2. SLOPES STEEPER THAN 3:1 REQUIRES 1m SHOULDER WIDENING & GUARD RAIL INSTALLATION.
3. FILL SLOPES GREATER THAN 3.5m AND/OR STEEPER THAN 3:1 REQUIRE GEOTECHNICAL DESIGN.
4. EROSION PROTECTION REQUIRED ON ALL EXPOSED CUT AND FILL SLOPES.
5. THE ONE SIDE DITCH AND WALKWAY CAN BE ON EITHER SIDE OF THE ROAD.
6. MINIMUM CONCRETE SIDE WALK WIDTH SHALL BE 1.20m.
7. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

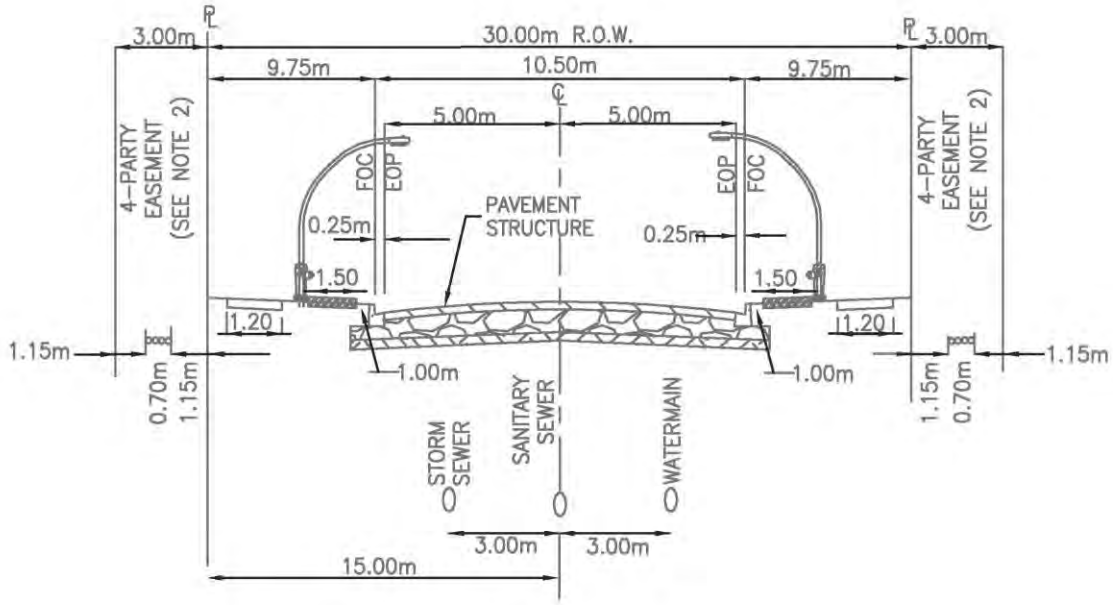
INDUSTRIAL/COMMERCIAL ROADWAYS

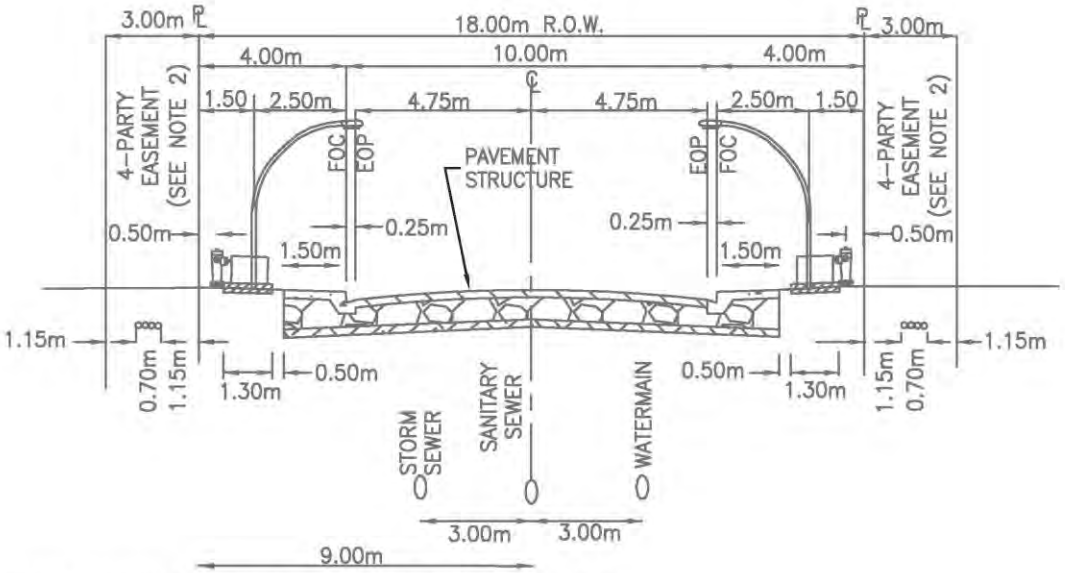
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

RURAL

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.3





NOTES:
1. 4–PARTY TRENCH CONTAINS GAS,POWER,PHONE AND CABLE LINES.
2. EOP–EDGE OF PAVEMENT
3. FOC–FACE OF CURB.
4. SHALLOW UTILITIES TO BE IN BOULEVARD SPACE WITH NO OTHER STREET FEATURES.
5. PAVEMENT STRUCTURES STATED ARE MINIMUM. DEVELOPER TO PROVIDE PAVEMENT STRUCTURE.
6. THE ONE SIDEWALK CAN BE ON EITHER SIDE OF THE ROAD.
7. MINIMUM CONCRETE SIDEWALK WIDTH SHALL BE 1.20m.
8. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

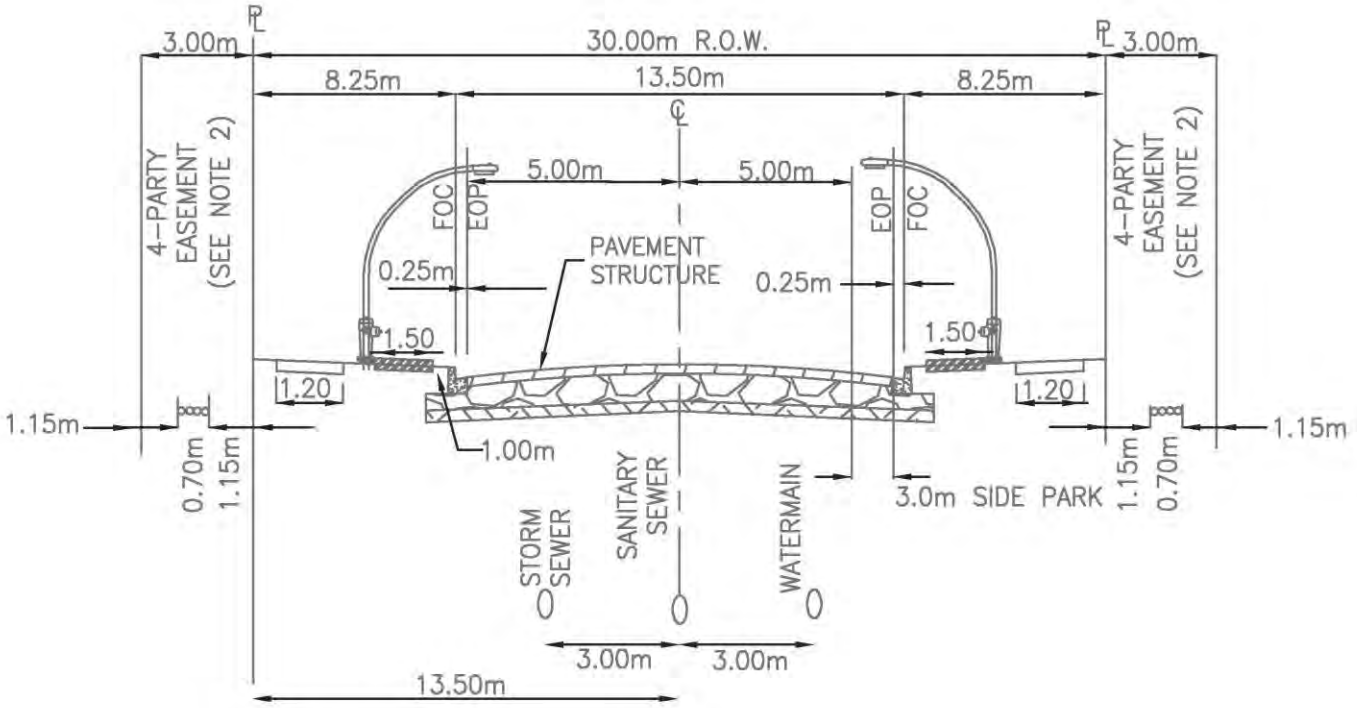
URBAN RESIDENTIAL WITH SIDEWALKS

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

URBAN

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.4



NOTES:
1. 4–PARTY TRENCH CONTAINS GAS, POWER, PHONE AND CABLE LINES.
2. EOP– EDGE OF PAVEMENT
3. OC– FACE OF CURB.
4. SHALLOW UTILITIES TO BE IN BOULEVARD SPACE, WITH NO OTHER STREET FEATURES.
5. PAVEMENT STRUCTURES STATED ARE MINIMUM. DEVELOPER TO PROVIDE PAVEMENT STRUCTURE.
6. THE ONE SIDE PARKING AND SIDE WALK CAN BE ON EITHER SIDE OF THE ROAD.
7. MINIMUM CONCRETE SIDE WALK WIDTH SHALL BE 1.20m.
8. ALL DIMENSIONS ARE IN METRES. UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

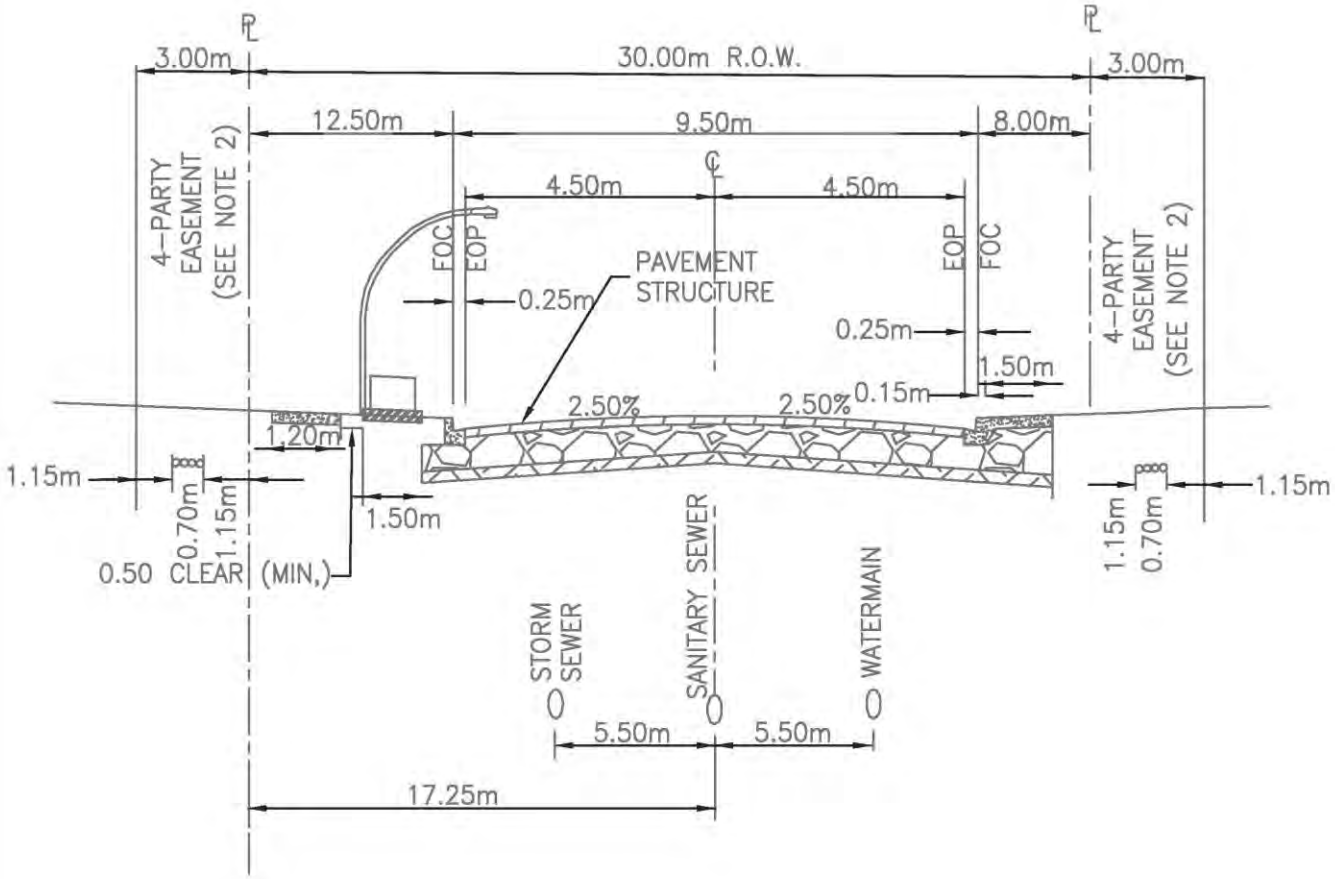
URBAN RESIDENTIAL ROADWAYS

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

URBAN

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.5



NOTES:
1. 4–PARTY TRENCH CONTAINS GAS, POWER, PHONE AND CABLE LINES.
2. EOP–EDGE OF PAVEMENT.
3. FOC–FACE OF CURB.
4. HARD SURFACING ENTIRE BOULEVARD MAY BE REQUIRED FOR COMMERCIAL AREAS WHERE STORE FRONTS FACE THE STREET..
5. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

MINOR COLLECTOR SEPARATE OR MONO SIDEWALK

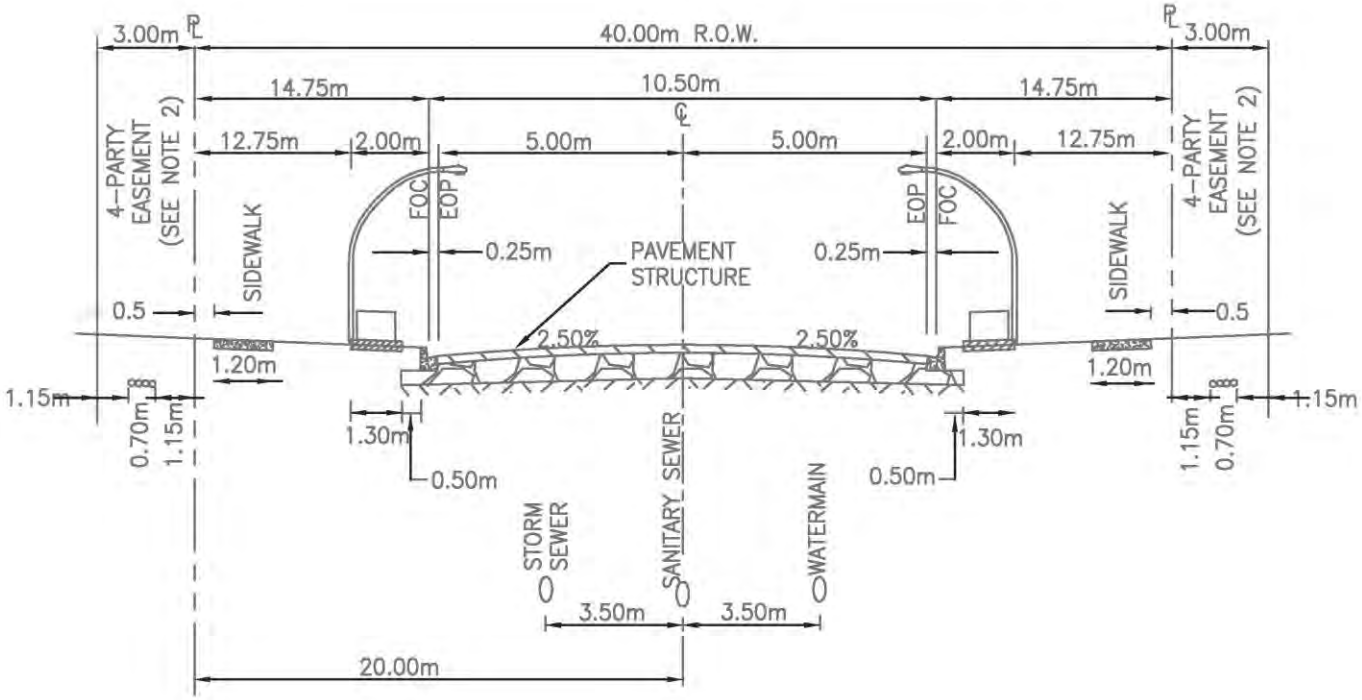
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

URBAN

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.6

MAJOR COLLECTOR



NOTES:
1. 4–PARTY TRENCH CONTAINS GAS, POWER, PHONE AND CABLE LINES.
2. EOP– EDGE OF PAVEMENT.
3. FOC– FACE OF CURB.
4. HARD SURFACING ENTIRE BOULEVARD MAY BE REQUIRED FOR COMMERCIAL AREAS WHERE STORE FRONTS FACE THE STREET.
5. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

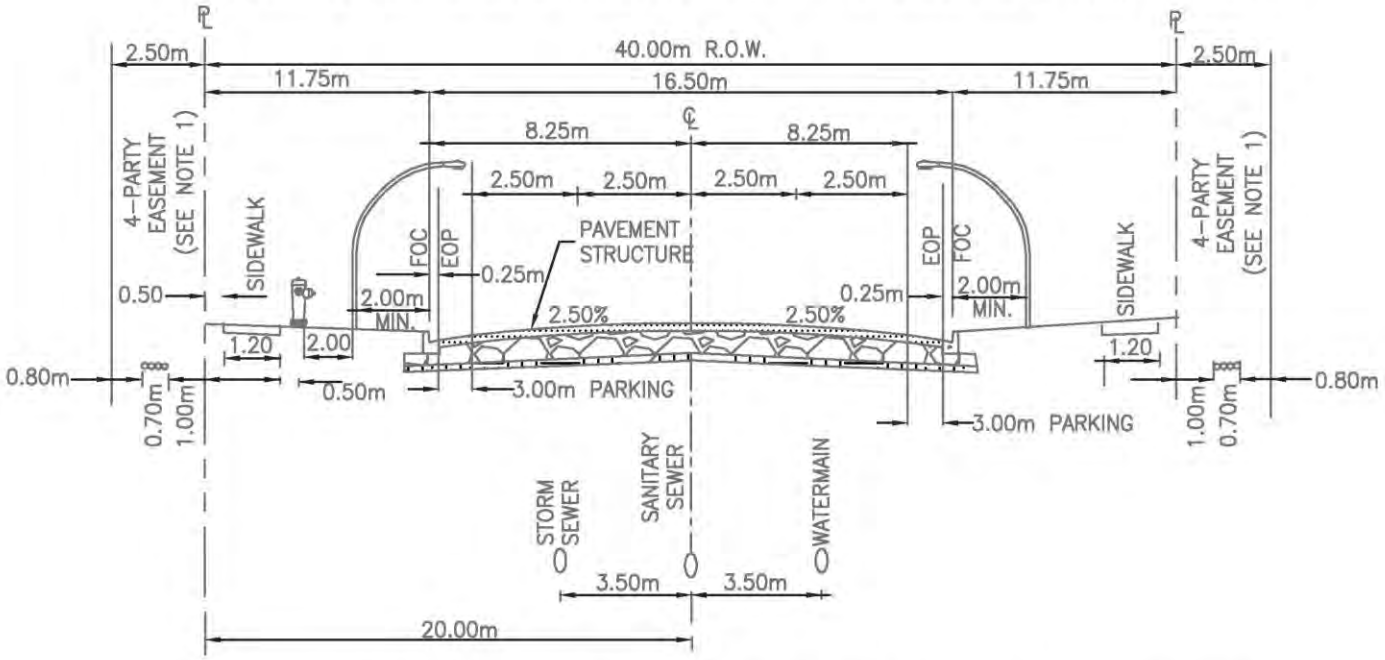
MUNICIPAL DISTRICT OF GREENVIEW No. 16

MAJOR COLLECTOR
SEPARATE OR MONO SIDEWALK
MUNICIPAL SERVICING STANDARDS
MUNICIPAL DISTRICT OF GREENVIEW No.16

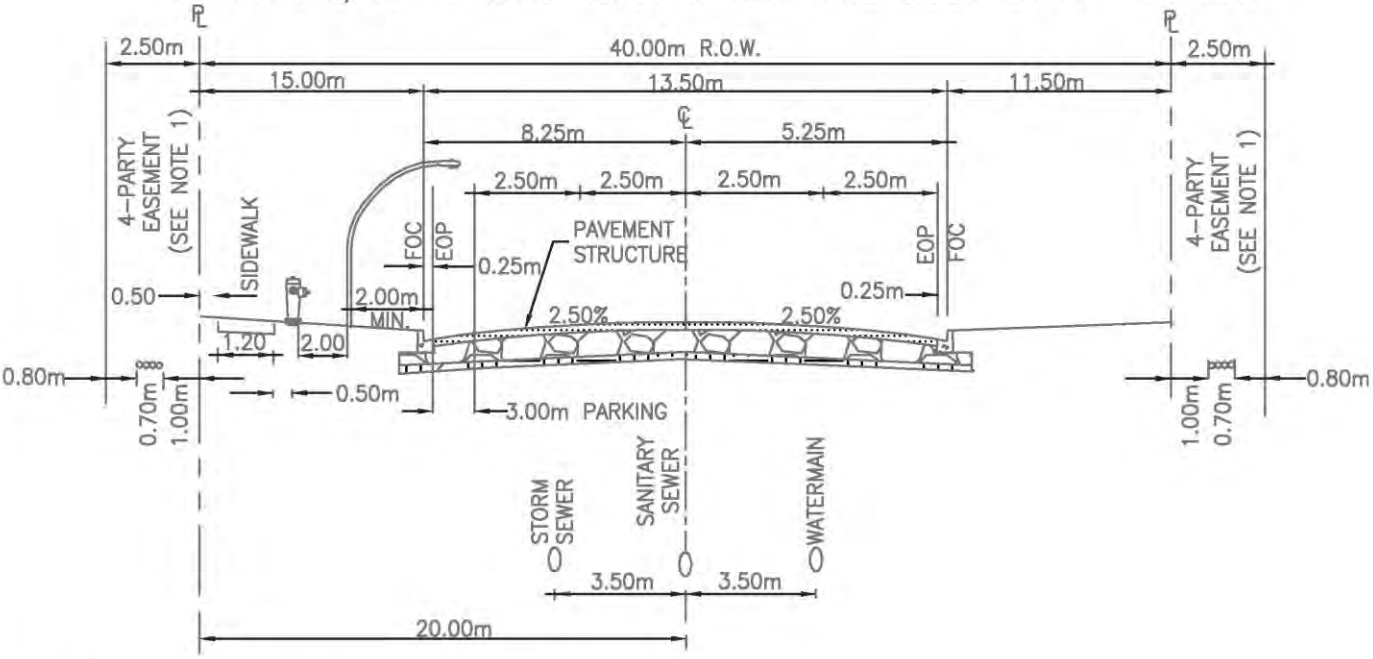
URBAN

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.7

INDUSTRIAL/COMMERCIAL ROADWAY WITH TWO SIDEWALKS AND PARKING



INDUSTRIAL/COMMERCIAL ROADWAY WITH ONE SIDEWALK AND PARKING



NOTES:
1. 4–PARTY TRENCH CONTAINS GAS, POWER, PHONE AND CABLE LINES.
2. EOP – EDGE OF PAVEMENT.
3. FOC – FACE OF CURB.
4. MINIMUM CONCRETE SIDE WALK WIDTH SHALL BE 1.20m.
5. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

INDUSTRIAL/COMMERCIAL ROADWAYS

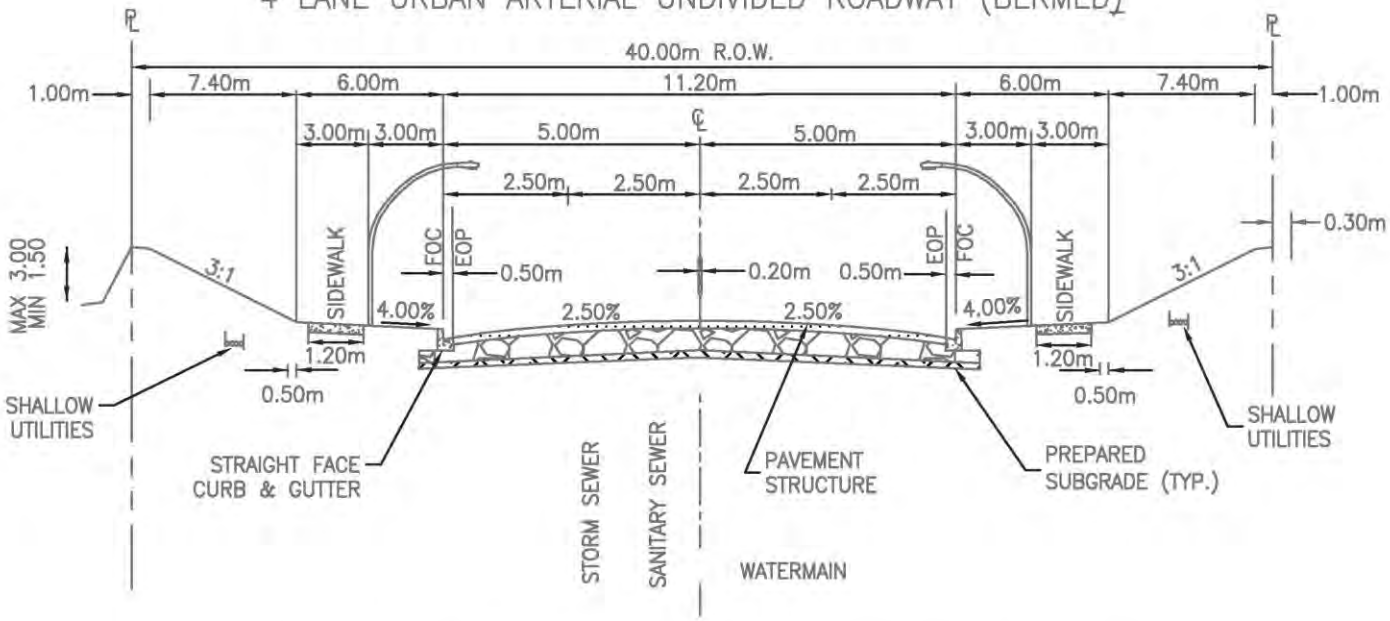
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

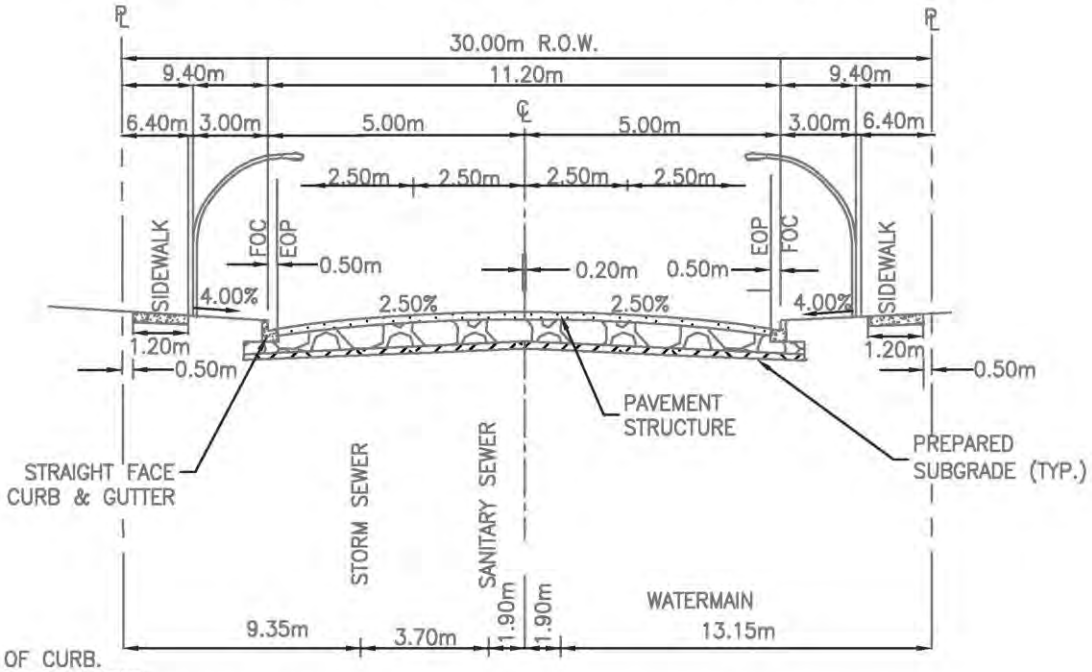
URBAN

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.8

4 LANE URBAN ARTERIAL UNDIVIDED ROADWAY (BERMED)



4 LANE URBAN ARTERIAL UNDIVIDED ROADWAY (NO BERM)



NOTES:
1. FOC– FACE OF CURB.
2. EOP– EDGE OF PAVEMENT.
3. FOR A 6 LANE URBAN ARTERIAL, ADD 7.4m TO THE R.O.W.
4. CO–ORDINATE WITH MD FOR SHALLOW UTILITY LINE ASSIGNMENTS.
5. DEEP UNDERGROUND UTILITIES TO BE INSTALLED IN ALIGNMENT WITH WITH CENTER OF DRIVING LANES.
6. MINIMUM CONCRETE SIDE WALK WIDTH SHALL BE 1.20m.
7. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

UNDIVIDED ARTERIAL ROADWAYS (4 LANE)

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

URBAN

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.9

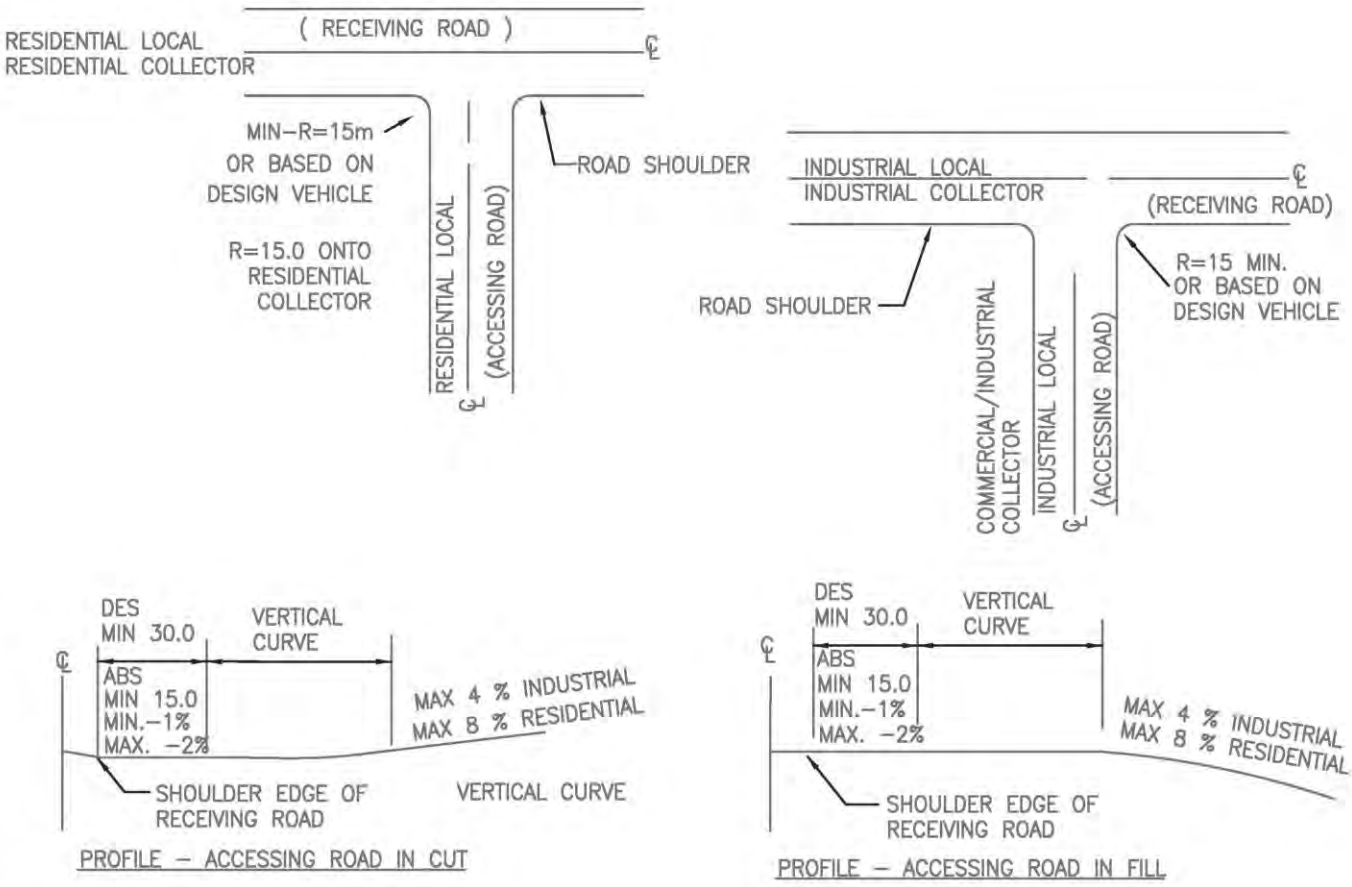


TABLE 1 – SUGGESTED APPROACH SIDESLOPES *

	DESIRABLE SLOPE ON NEW APPROACH
RECEIVING ROAD <= 100 km/hr	4:1
RECEIVING ROAD POSTED> 100 km/hr	6:1

NOTE:
1. LENGTH OF VERTICAL CURVE SHALL BE ACCORDING TO TAC MANUAL.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

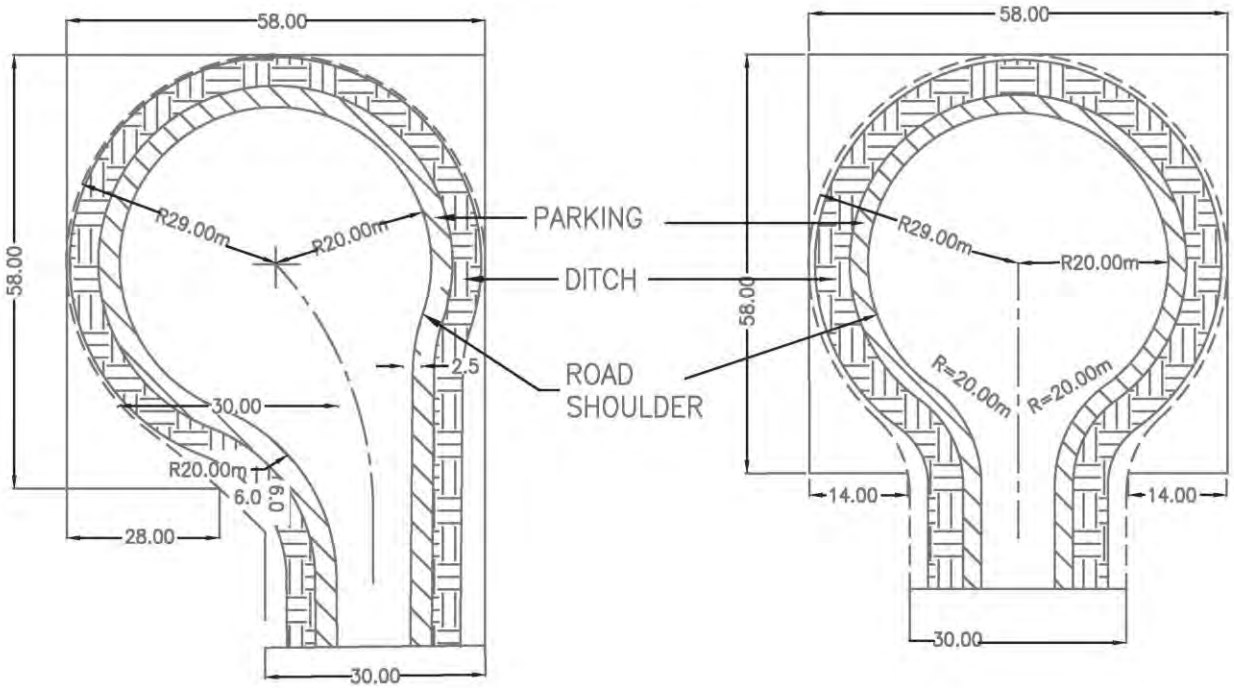
DESIGN OF INTERSECTIONS

MUNICIPAL SERVICING STANDARDS

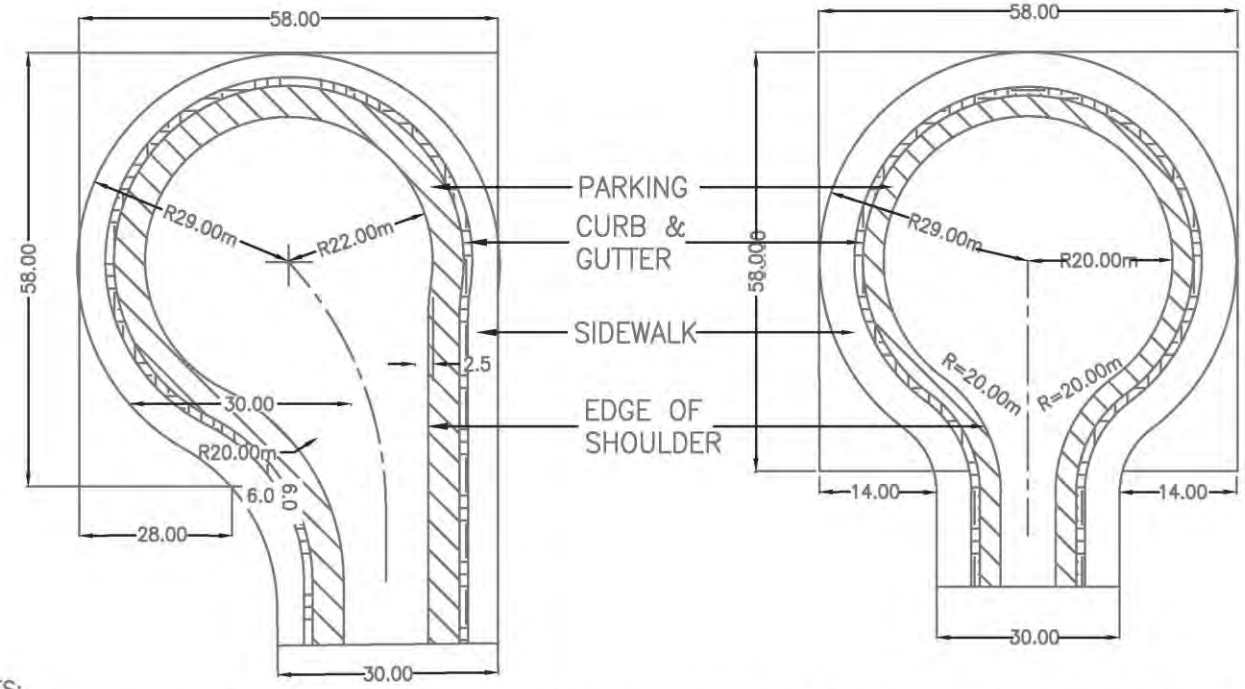
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.10

PARKING AND DITCH



PARKING, SIDEWALK AND CURB & GUTTER



NOTES:
1. THE MINIMUM CROWN SLOPE WITHIN THE CUL-DE-SAC SHALL BE 4.00% FOR GRAVEL AND 2.50% FOR ASPHALT.
2. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

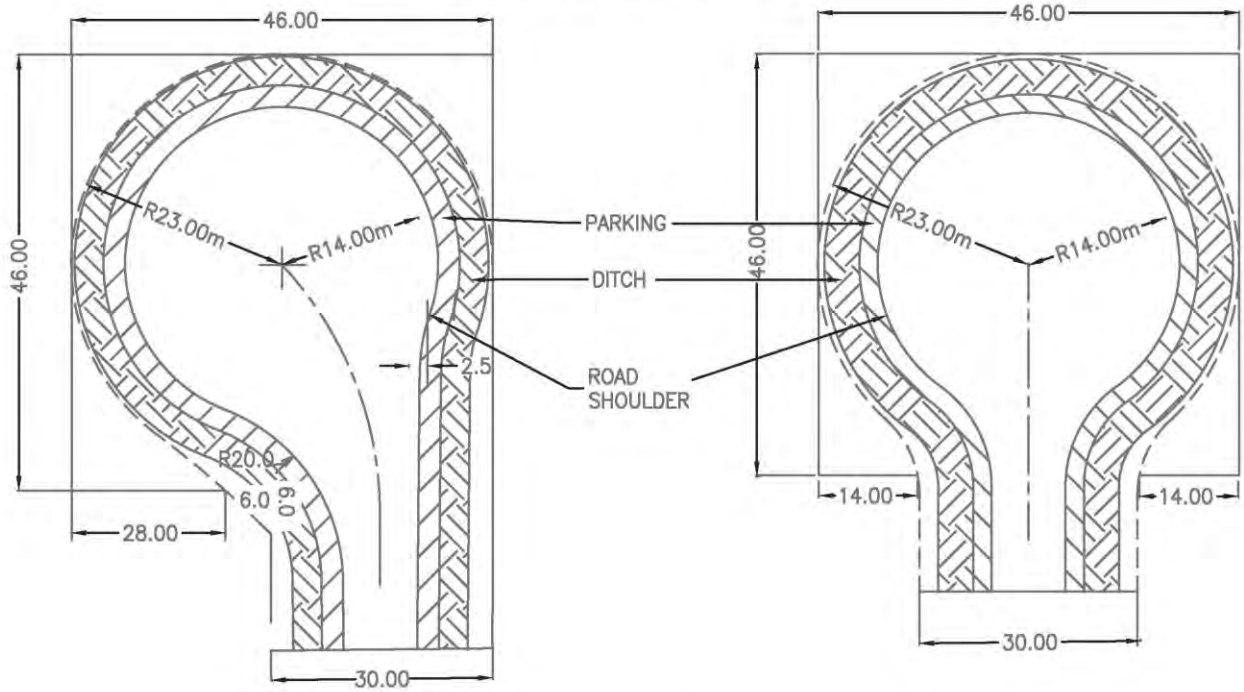
COMMERCIAL/INDUSTRIAL CUL-DE-SAC

MUNICIPAL SERVICING STANDARDS

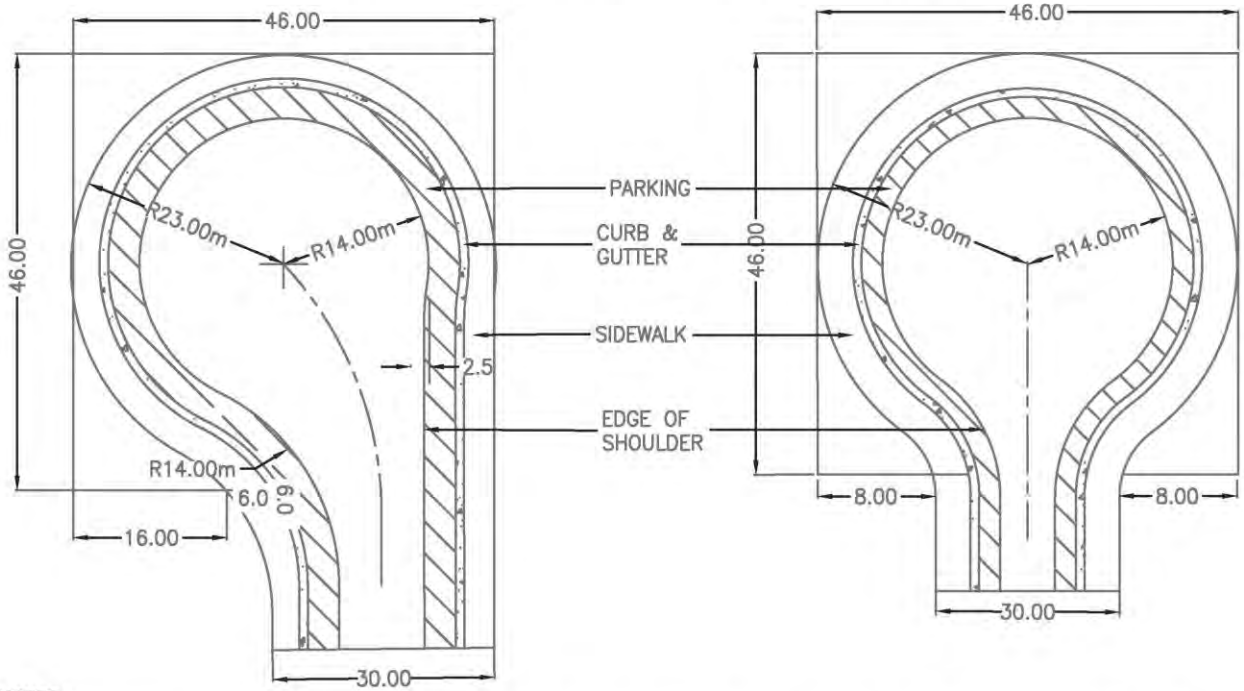
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.11

PARKING AND DITCH



PARKING, SIDEWALK AND CURB & GUTTER



NOTES:

1. THE MINIMUM CROWN SLOPE WITHIN THE CUL-DE-SAC SHALL BE 4.00% FOR GRAVEL AND 2.50% FOR ASPHALT .
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

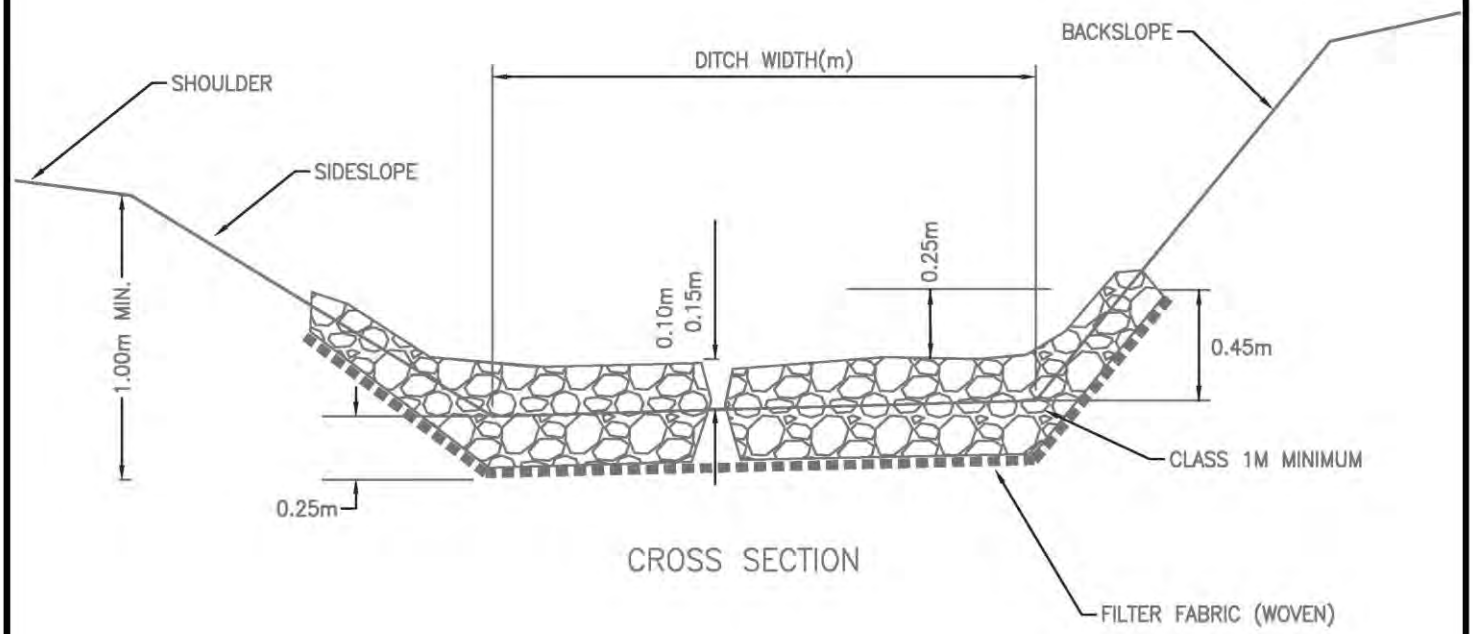
MUNICIPAL DISTRICT OF GREENVIEW No. 16

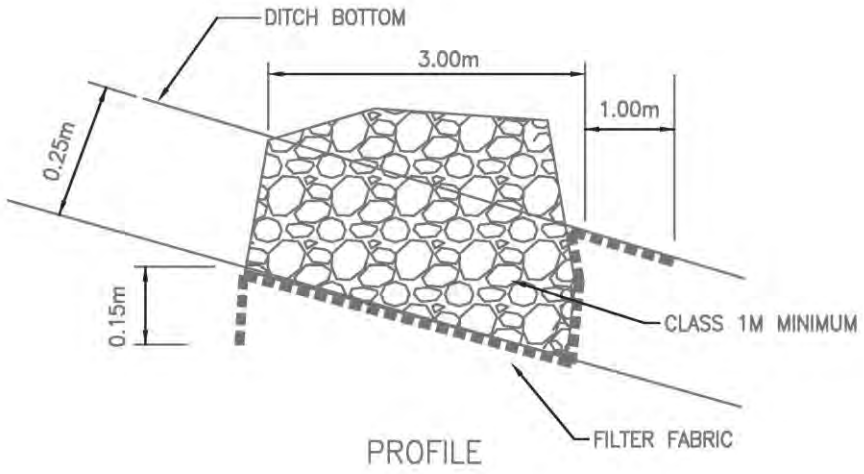
RESIDENTIAL CUL-DE-SAC

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.12





NOTES:
1. ROCK SHALL BE TRENCHED INTO THE SIDESLOPE AND BACKSLOPE AT A POINT AT LEAST 450mm ABOVE THE DITCH BOTTOM AND AT LEAST
2. 250mm ABOVE THE LOW POINT OF THE SURFACE OF ROCK IN THE DITCH.
3. THE ROCK SHALL BE TRENCHED INTO THE DITCH BOTTOM AND SLOPES A MIN. OF 250mm. THE LOWEST POINT OF THE DITCH CHECK MUST
4. BE A MIN.OF 100mm TO A MAX OF 150mm ABOVE THE DITCH BOTTOM.
5. ROCKS TO BE USED SHALL BE AS NEARLY CUBICAL IN FORM AS POSSIBLE AND MUST NOT BE SMALLER THAN 150mm.
6. ROCKS SHALL BE LAID IN CLOSE CONTACT SO AS TO BREAK JOINTS WITH THE LARGER STONES ON THE BOTTOM.
7. FILTER FABRIC SHALL BE PLACED IN THE BOTTOM OF THE TRENCH.
8. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

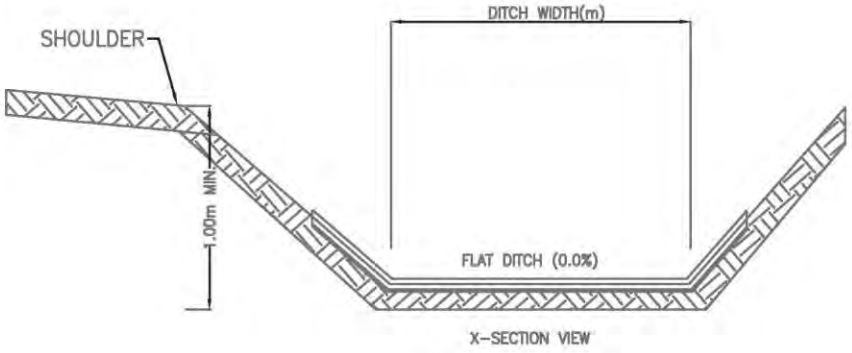
MUNICIPAL DISTRICT OF GREENVIEW No. 16

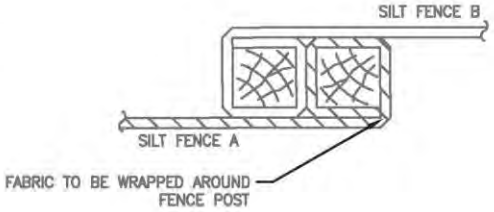
ROCK DITCH CHECKS

MUNICIPAL SERVICING STANDARDS

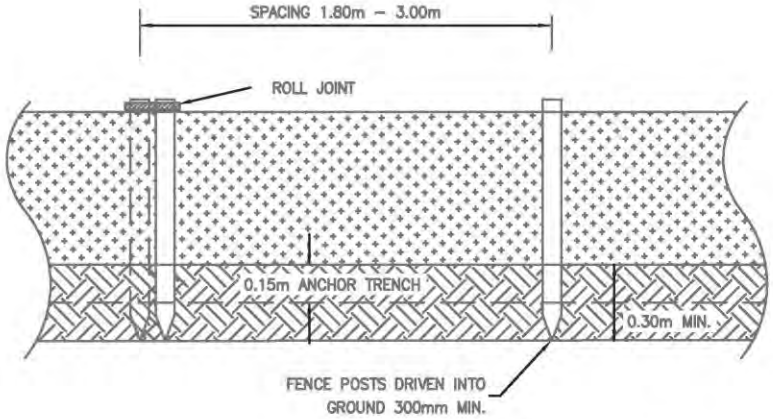
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.13

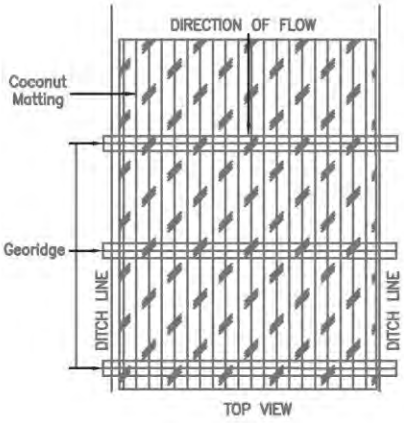


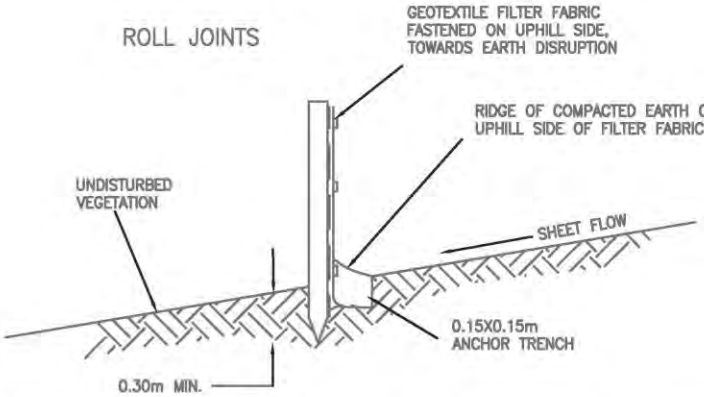


SILT FENCE



ROLL JOINTS





NOTES:

1. EROSION CONTROL MATTING SHALL INTERSECT AND BE TRENCHED INTO THE SIDESLOPE AND BACKSLOPE AT LEAST 300mm ABOVE THE LOWEST POINT IN THE SURFACE OF THE MATTING IN THE DITCH. COCONUT MATTING OR AN EQUIVALENT PRODUCT (AS APPROVED BY GREENVIEW) SHALL BE USED.
2. GEOGRID SHALL BE USED IN CONJUNCTION WITH EROSION CONTROL MATTING AND PROPERLY ANCHORED TO THE SUB-GRADE AS PER THE MANUFACTURER'S RECOMMENDATIONS.
3. SPACING OF THE GEOGRID SHALL MEET MANUFACTURER'S RECOMMENDATIONS AND SPECIFIC TO THE DESIGN REQUIREMENTS FOR THE PROJECT.
4. WHERE DITCHES LEAD TO A DRAINAGE COURSE AND/OR CREEK, RIVER OR WATER BODY, SILT FENCING WILL BE REQUIRED PRIOR TO THE INLET DURING CONSTRUCTION TO PREVENT SEDIMENTATION FROM ENTERING THE FEATURE.
5. PROJECT SPECIFIC REQUIREMENTS MAY NECESSITATE THE DESIGN OF OTHER EROSION AND SEDIMENT CONTROL PRODUCTS AS APPROVED BY GREENVIEW. AN EROSION AND CONTROL SEDIMENT PLAN (ESC) MAY BE REQUIRED.
6. TO BE INSTALLED AS PER MANUFACTURERS SPECIFICATIONS OR B.M.P. (BEST MANAGEMENT PRACTICES).
7. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

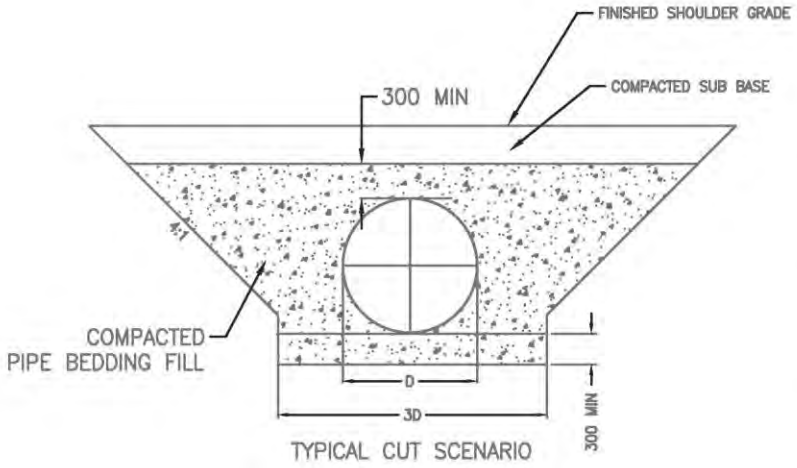
MUNICIPAL DISTRICT OF GREENVIEW No. 16

GEOGRID/COCONUT MATTING & SILT FENCE DITCH CHECKS

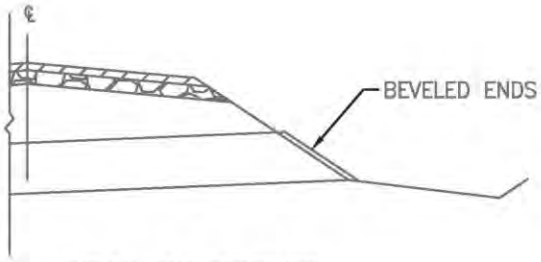
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

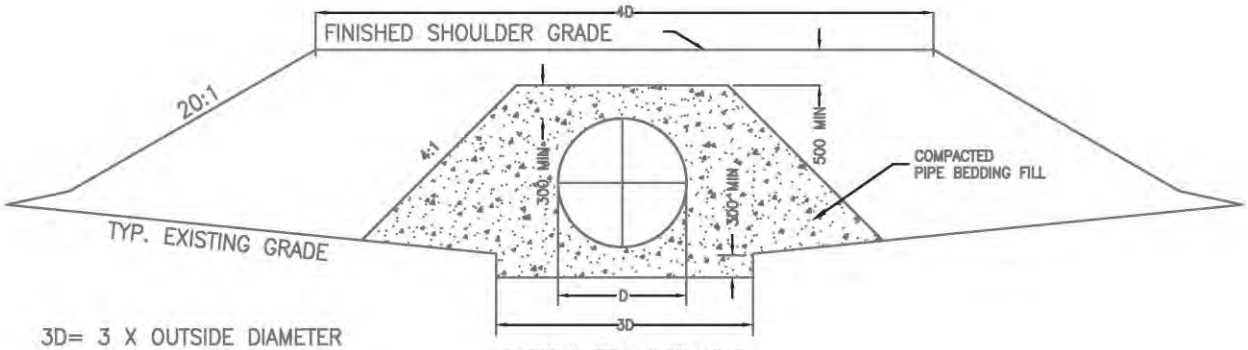
SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.14



TYPICAL CUT SCENARIO



TYPICAL END EXPOSURE



TYPICAL FILL SCENARIO

3D= 3 X OUTSIDE DIAMETER

4D= 4 X OUTSIDE DIAMETER

NOTES:

1. SELECT DRY MATERIAL SHALL BE PLACED IN 150mm COMPACTED LIFTS. A 600mm LONG CLAY PLUG SHALL BE PLACED AT INLET & OUTLET ENDS OF THE PIPE.
2. IN SOFT WET AREAS (ie MUSKEG) DEPTH OF SUBCUT BELOW THE PIPE WILL BE DETERMINED BY THE DEVELOPERS ENGINEER AS APPROVED BY GREENVIEW.
3. WHEN PIPES ARE PLACED PRIOR TO EMBANKMENT CONSTRUCTION, A MINIMUM OF 1000mm OF MATERIAL SHALL BE PLACED OVER TOP OF PIPES FOR PROTECTION DURING CONSTRUCTION OR AS APPROVED BY GREENVIEW.
4. ALL CULVERT INVERTS WILL BE STAKED IN THE FIELD BY THE DEVELOPERS ENGINEER.
5. THROUGH GRADE: 800mm, RESIDENTIAL APPROACH: 800mm , INDUSTRIAL APPROACH: 800mm OR APPROVED BY GREENVIEW
6. SLOPED END PIPES ONLY.
7. STRAIGHT END PIPES ONLY TO BE USED IN SPECIAL CIRCUMSTANCES AS DIRECTED BY GREENVIEW
8. COUNTER SINK PIPE DEPTH SHALL BE OUTSIDE DIAMETER OF THE PIPE DIVIDED BY 4.
9. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

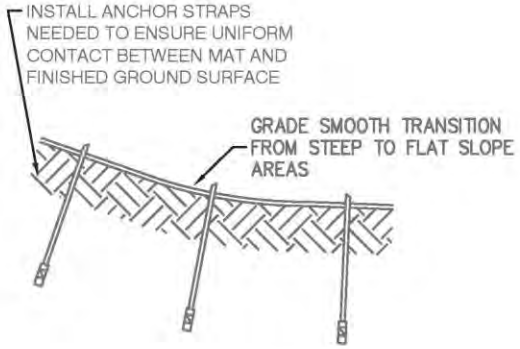
MUNICIPAL DISTRICT OF GREENVIEW No. 16

CULVERT INSTALLATION

MUNICIPAL SERVICING STANDARDS

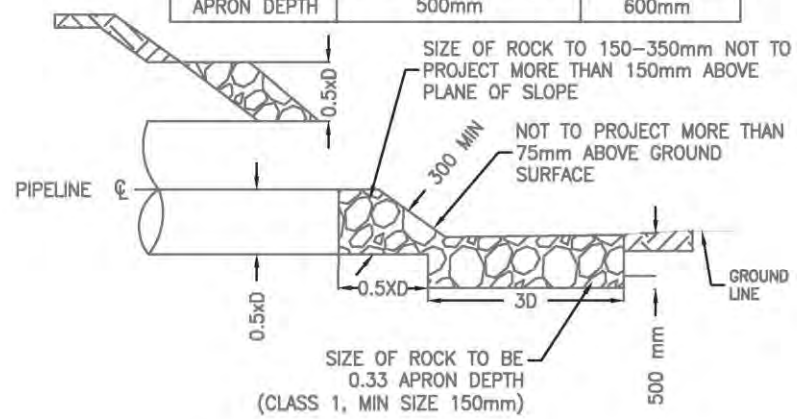
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.15



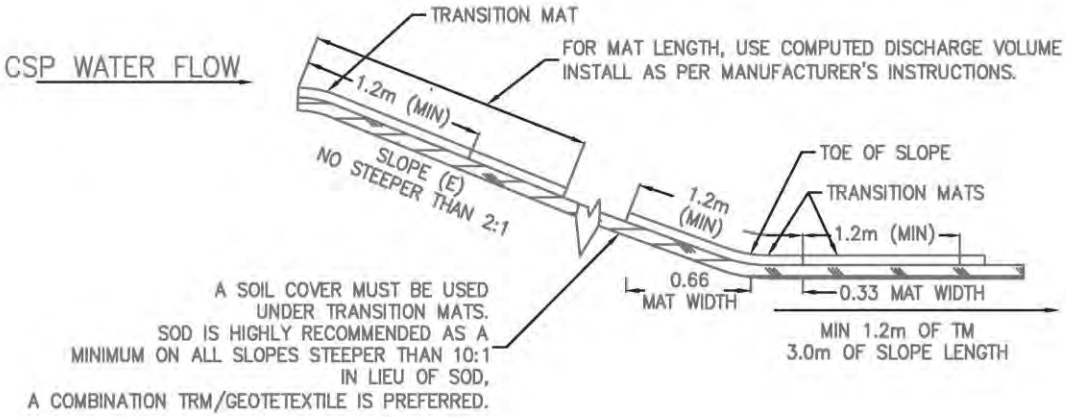
TOE OF SLOPE INSTALLATION

D (mm)	400	500	600	700	800	900	1000	1200
APRON DEPTH	500mm					600mm		



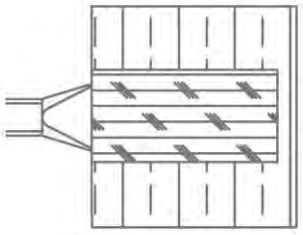
SECTION A–A
N.T.S.

RIP RAP DETAIL



SCOURSTOP TRANSITION MAT DETAIL

PIPE DIAMETER	SCOURSTOP WIDTH X LENGTH
300 mm	1.2 X 1.2 m
500 mm	1.2 X 2.0 m
600 mm	1.2 X 2.4 m
800 mm	2.4 X 3.2 m
900 mm	2.4 X 3.6 m
1000 mm	2.4 X 4.0 m
1200 mm	3.6 X 4.8 m
1500 mm	3.6 X 6.1 m



STAPLE SOD EVERY 250mm WITHIN 100mm OF LEADING EDGE AND RANDOMLY THROUGHOUT

STAPLED SOD DETAILS
N.T.S.

NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

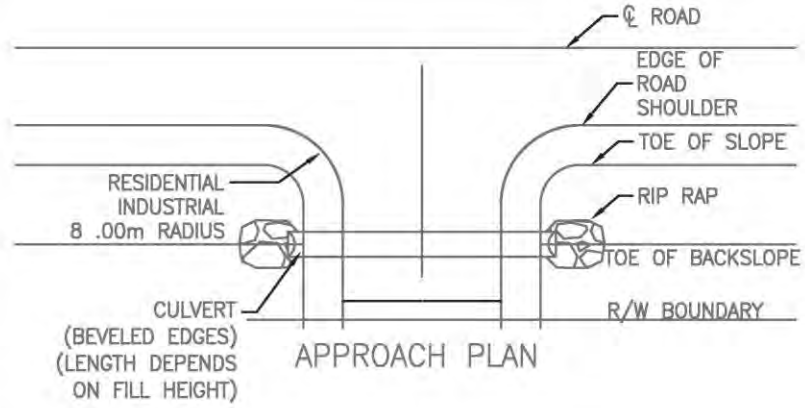
MUNICIPAL DISTRICT OF GREENVIEW No. 16

GENERAL RIP RAP FOR CULVERTS

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

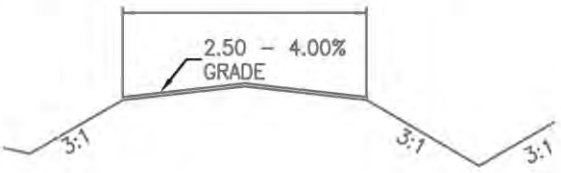
SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.16



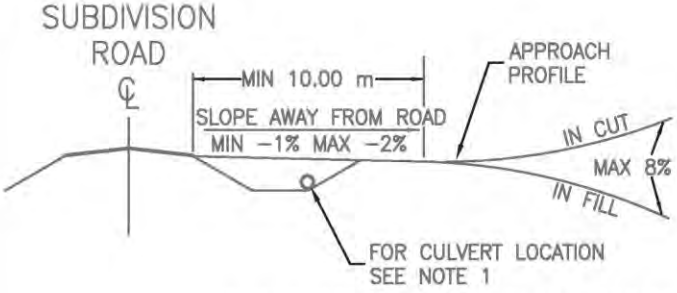
APPROACH PLAN

APPROACH WIDTHS
RESIDENTIAL = 8.00m

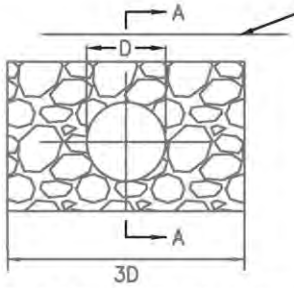
INDUSTRIAL / COMMERCIAL = 15.00m



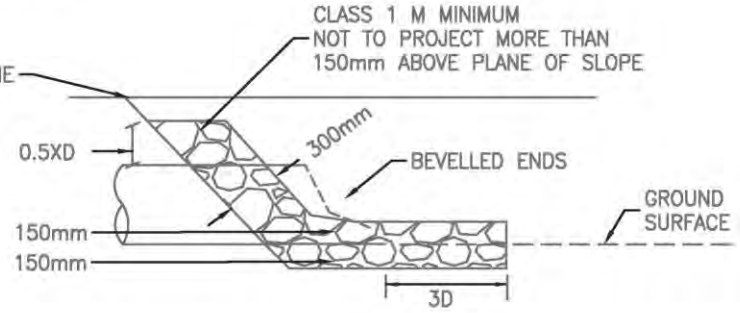
APPROACH CROSS SECTION



DITCH AND CULVERT LOCATION



RIP RAP – END VIEW



SECTION A–A

NOTES:
1. WHEN CULVERTS ARE REQUIRED, THEY MUST BE NEW GALVANIZED CORRUGATED STEEL PIPE (CSP) WITH 3:1 BEVELED ENDS AND BE THE FOLLOWING DIAMETERS:
   –RESIDENTIAL–600mm UNLESS SPECIFIED BY GREENVIEW
   –THROUGH GRADE–600mm UNLESS SPECIFIED BY GREENVIEW
   –INDUSTRIAL/COMMERCIAL–600mm UNLESS SPECIFIED BY GREENVIEW
2. THE BEVEL RIP RAP MUST BE PLACED 150mm DEPTH.
3. APRON RIP RAP MUST BE PLACED MIN OF 300mm,150mm ABOVE GROUND. SURFACE AND 150mm BELOW GROUND SURFACE.
4. STRAIGHT END PIPES IN SPECIAL CIRCUMSTANCES AS DIRECTED BY GREENVIEW.
5. CULVERT LENGTH WILL VARY WITH DEPTH OF FILL.
6. SURFACE STRUCTURE TO MATCH ADJOINING ROAD STRUCTURE.
7. CSP TO BE COUNTERSUNK–DIAMETER DIVIDED BY 4.
8. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

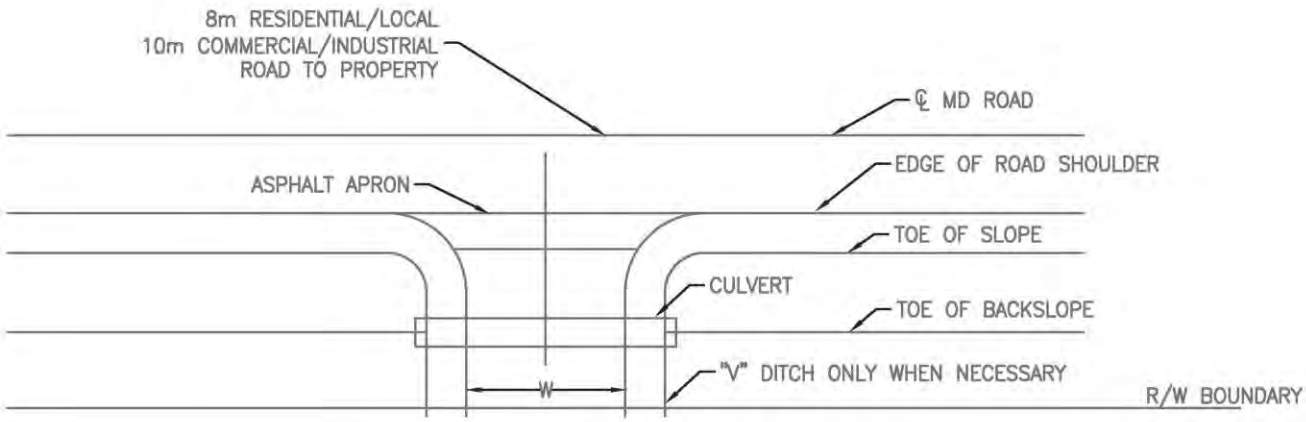
MUNICIPAL DISTRICT OF GREENVIEW No. 16

RESIDENTIAL & INDUSTRIAL APPROACH

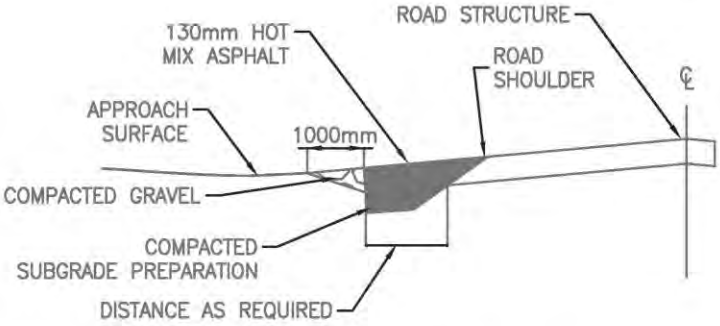
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

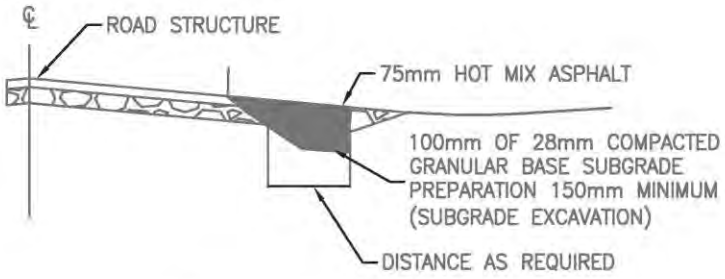
SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.17



APPROACH PLAN



CROSS SECTION
USING DEEP STRENGTH BASE



CROSS SECTION
USING GRANULAR BASE

NOTES:
1. INDUSTRIAL/COMMERCIAL APRONS TO BE CONSTRUCTED TO MATCH EXISTING ROAD STRUCTURE AND TO DISTANCE IDENTIFIED.
2. PRIVATE ASPHALT APRON TO EXTEND REQUIRED DISTANCE FROM SHOULDER OF PAVED MUNICIPAL OR SUBDIVISION ROADS.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

N.T.S.

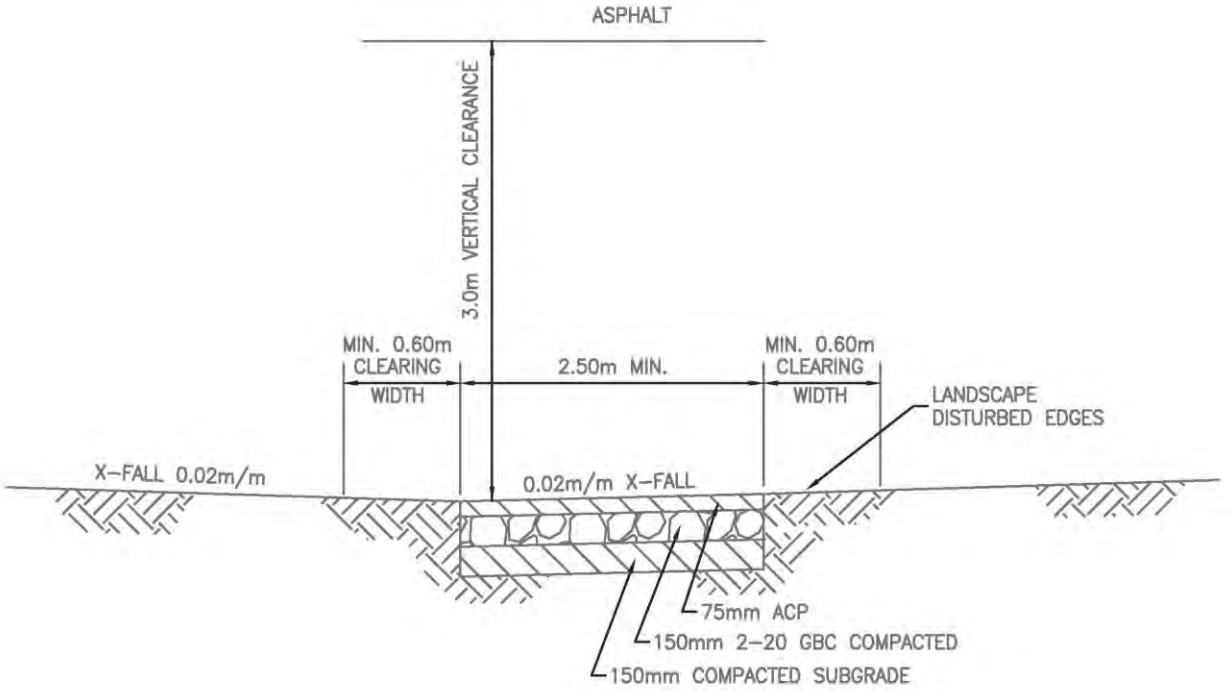
MUNICIPAL DISTRICT OF GREENVIEW No. 16

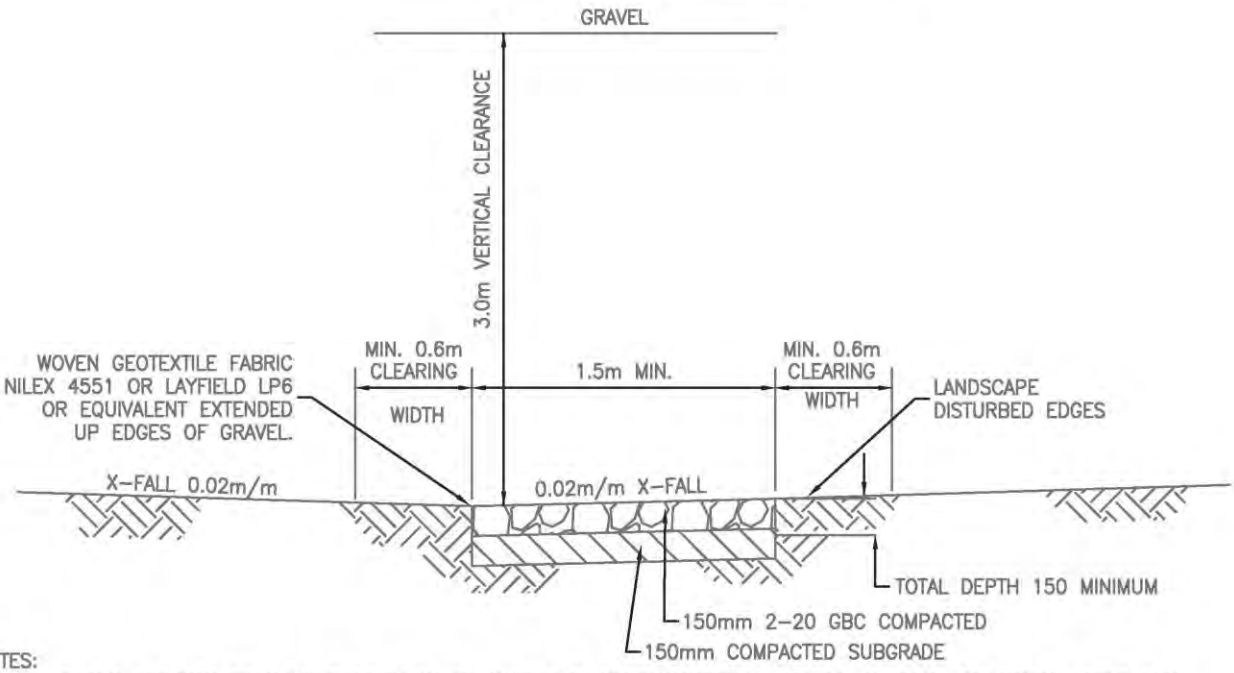
ASPHALT APRONS

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.18





NOTES:

1. 150 X 150 P18/P18 GAUGE WIRE MESH TO BE PLACED IN SIDEWALK ACROSS ALL COMMERCIAL, INDUSTRIAL LANES AND APARTMENT BUILDING DRIVEWAY ENTRANCES.
2. ELEVATION OF FRONT OF WALK TO BE SET SUCH THAT A MINIMUM SLOPE OF 4% IS MAINTAINED ACROSS BOULEVARD BETWEEN FRONT OF WALK AND TOP OF CURB.
3. CONCRETE TO BE HS, 40MPa. COMPRESSIVE STRENGTH AT 28 DAYS WITH 6% TO 8% AIR ENTRAPMENT.
4. *150mm AT COMMERCIAL, INDUSTRIAL LANES AND APARTMENT BUILDING DRIVEWAY ENTRANCES.
5. DRIVEWAY ENTRANCES REQUIRE GRANULAR BASE TO LANE STANDARD.
6. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

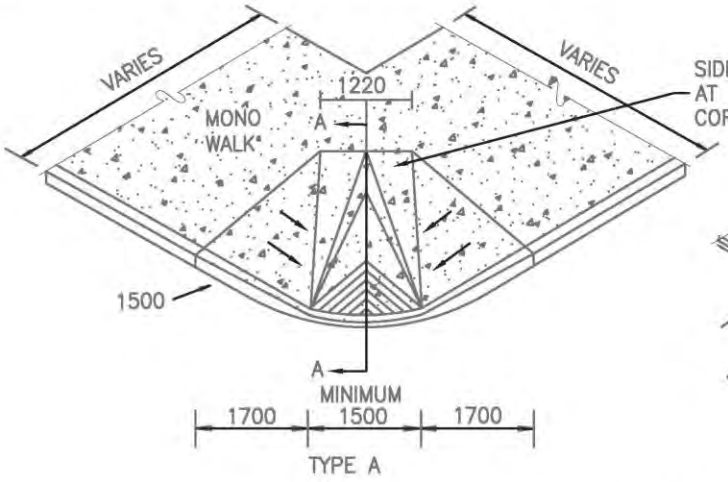
MUNICIPAL DISTRICT OF GREENVIEW No. 16

WALKWAY/BIKEWAY

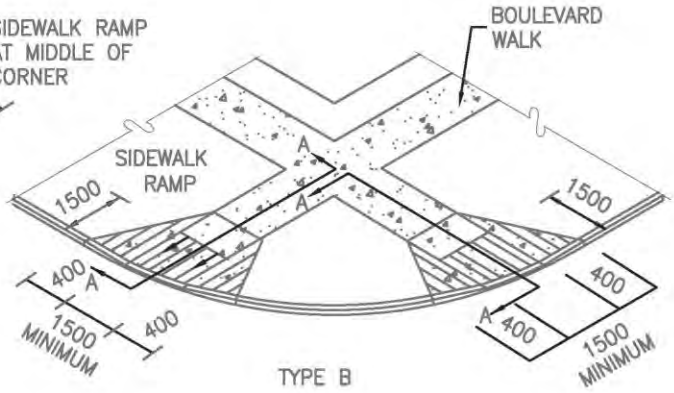
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.19



TYPE A



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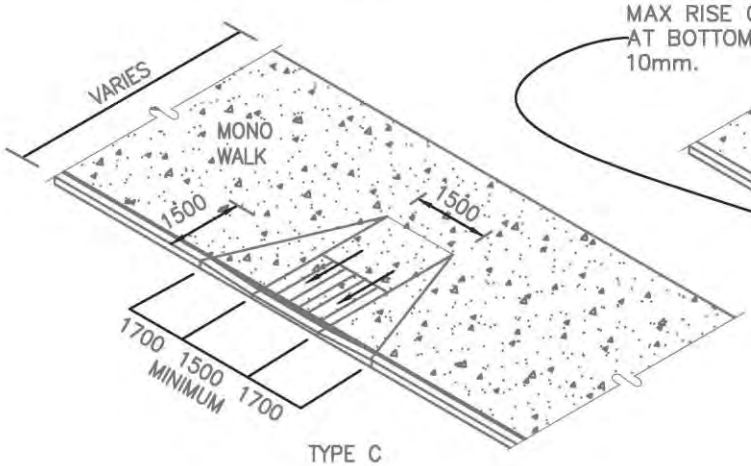

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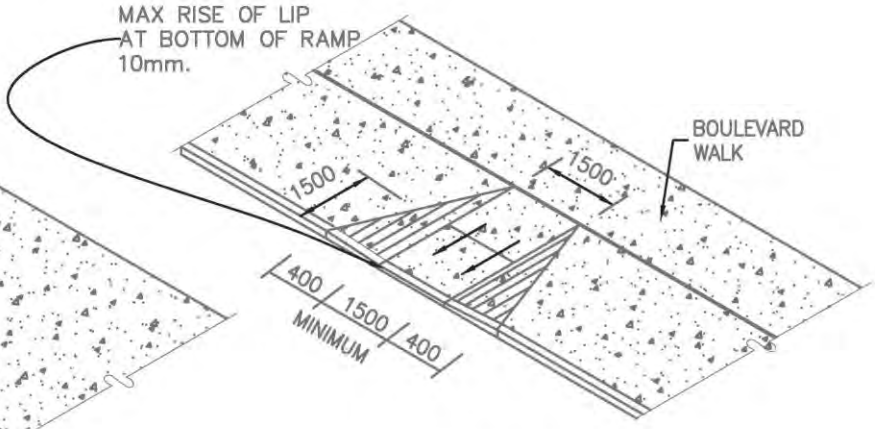

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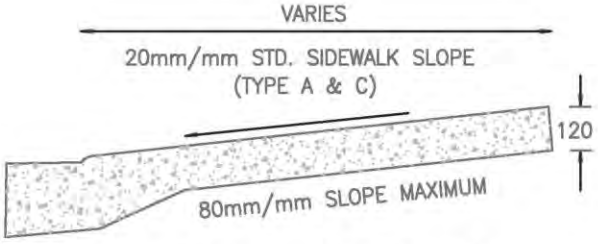
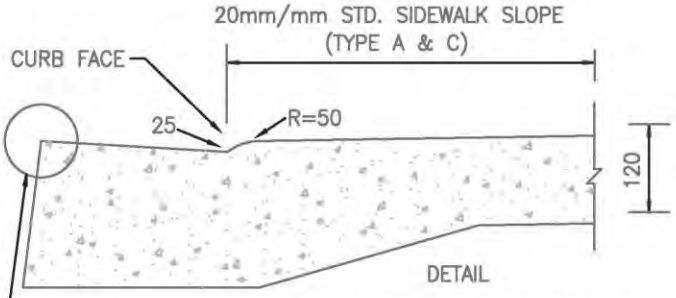


TYPICAL CROSS SECTION A–A



DETAIL

a) MATCH ASPHALT SURFACE TO OUTER LIP WITHIN 3mm:
b) IF ASPHALT TOPLIFT IS DEFERRED, PLACE ASPHALT RAMP FOR THE WIDTH OF PARARAMP, AND EXTEND MINIMUM 1.0m INTO ROAD.

NOTES:

1. TOOLED GROOVES 5mm WIDE X 10mm DEEP, BROOM FINISH GROOVE SPACING 150mm o.c. ADJACENT TO CURB.
2. WHERE RAMP IS TO BE USED AS A TRANSITION USE THE CENTRE.
3. CURBS AND RAMP ARE TO BE POURED MONOLITHICALLY.
4. IT MAYBE NECESSARY TO BUILD RAMPS WIDER AT HIGH PEDESTRIAN TRAFFIC VOLUME LOCATIONS
5. WHEN THE CURB RETURNS RADIUS IS LESS THAN 4.00m TWO RAMPS ARE REQUIRED.
6. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

N.T.S.

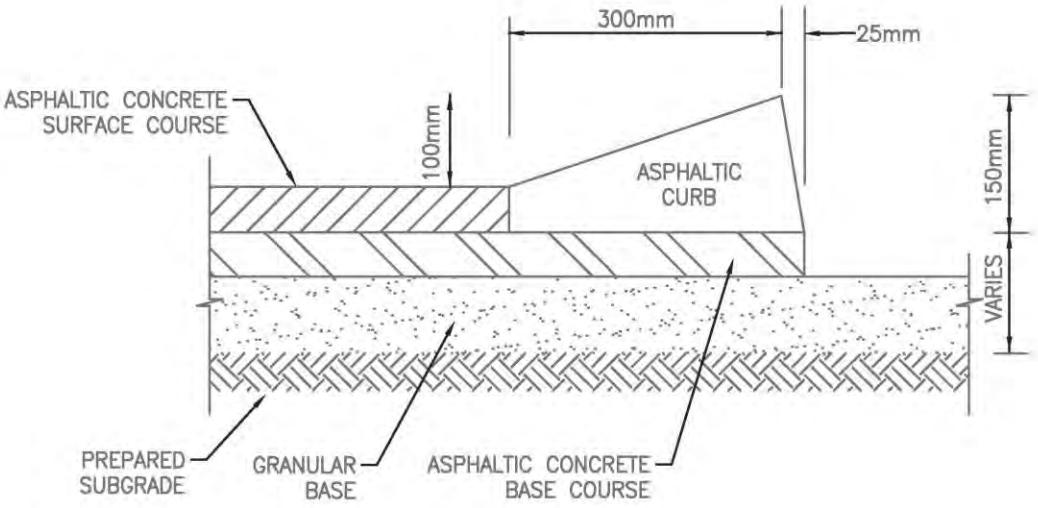
MUNICIPAL DISTRICT OF GREENVIEW No. 16

CURB RAMP

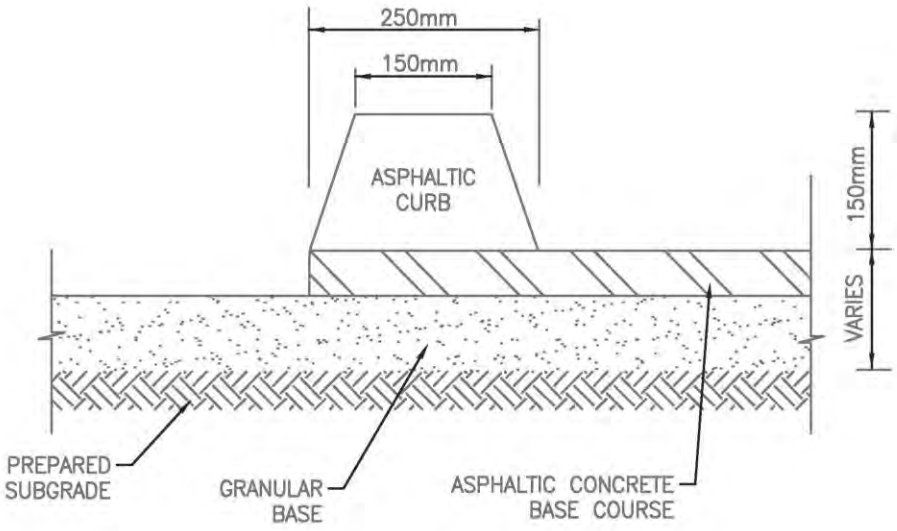
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.20



MACHINE LAID MOUNTABLE ASPHALT CURB



MACHINE LAID BARRIER ASPHALT CURB

NOTES:
1. BACKFILL CURB WITHIN 24 HOURS TO MINIMUM 95% STANDARD PROCTOR DENSITY.
2. TACK COAT SHALL BE PLACED BETWEEN ASPHALT LIFTS.
3. COMPACT TO 95% FOR 600mm FROM BACK TO CURB.
4. FOR OFF-ROADWAY USE ONLY.
5. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

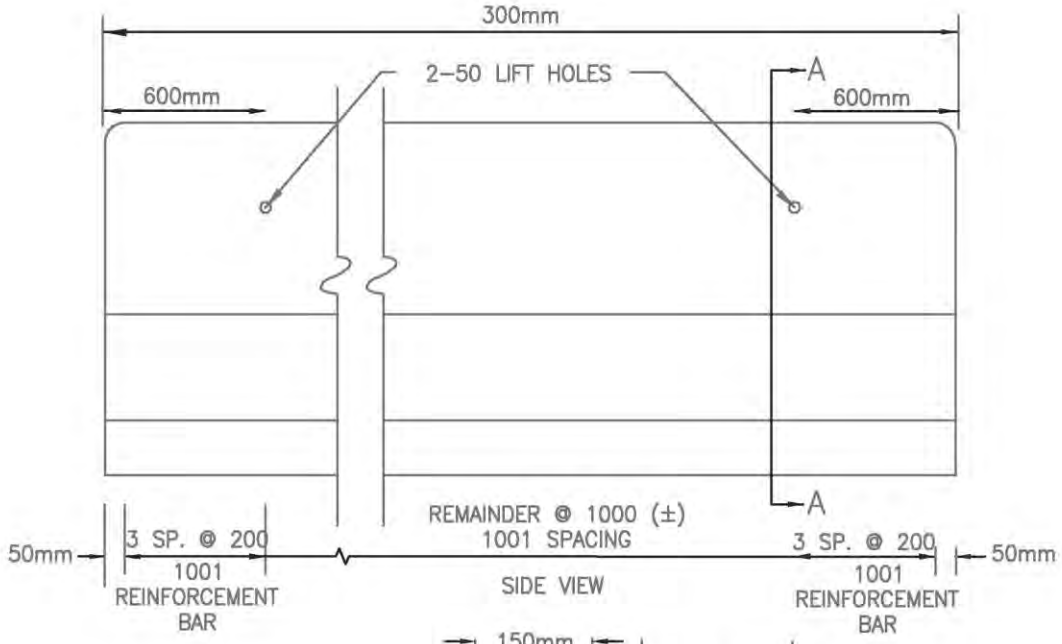
MUNICIPAL DISTRICT OF GREENVIEW No. 16

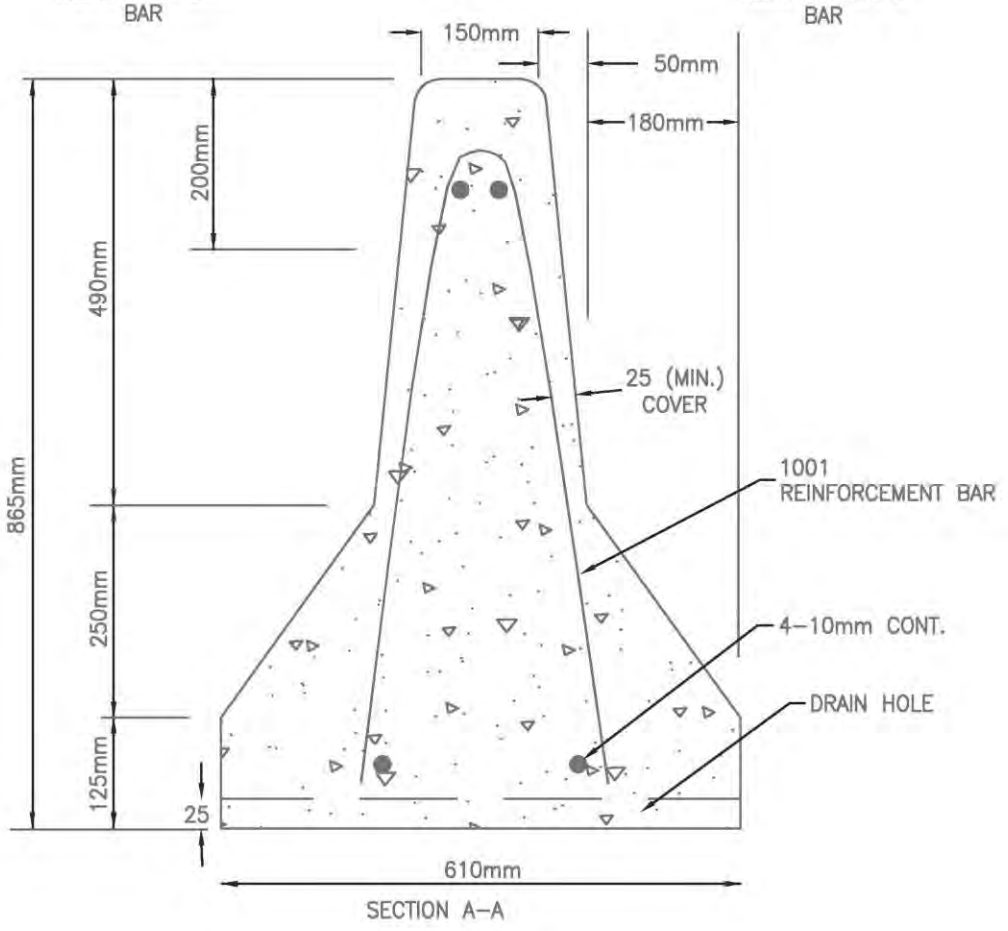
ASPHALT CURB

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.21





NOTE:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

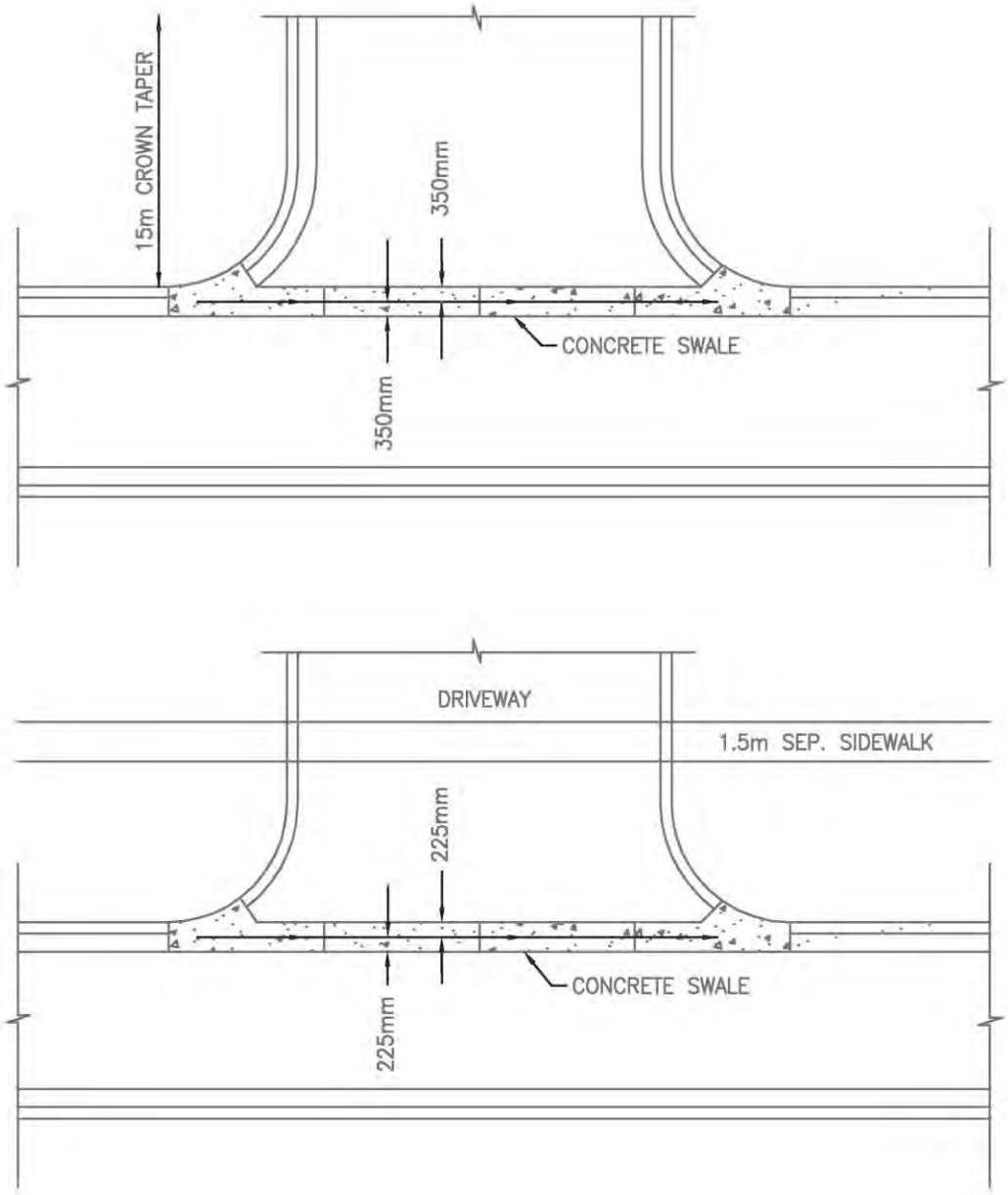
MUNICIPAL DISTRICT OF GREENVIEW No. 16

PRECAST CONCRETE BARRIER

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.22



NOTES:

1. CROWN OF ROAD TO BE TAPERED STARTING 15m FROM SWALE EDGE.
2. CONTRACTION JOINTS 50mm DEEP AND 5mm WIDE TO BE CONSTRUCTED ON 3m CENTERS ALONG SWALE.
3. EXPANSION JOINTS TO BE CONSTRUCTED WHERE SWALE SECTIONS ABUT CURB AND GUTTER.
4. SWALE TO BE FORMED AND FINISHED SUCH THAT UPSTREAM AND DOWNSTREAM ENDS MATCH GUTTER ELEVATIONS.
5. CONCRETE SHALL BE TYPE HS, COMPRESSIVE STRENGTH AT 28 DAYS WITH 6% TO 8% AIR ENTRAPMENT.
6. ASPHALT SHALL BE FULL DEPTH AT FACE OF SWALE TAPERED TO DESIGN ROAD DEPTH IN 2m.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

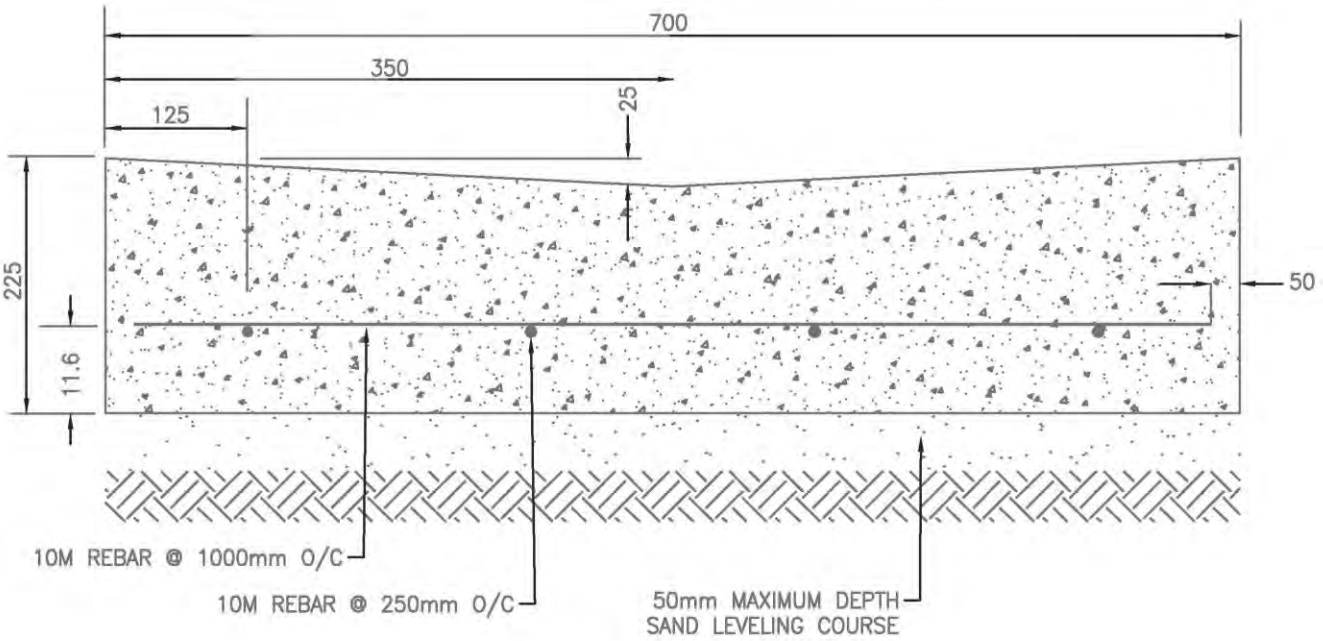
CONCRETE SWALE (PLAN)

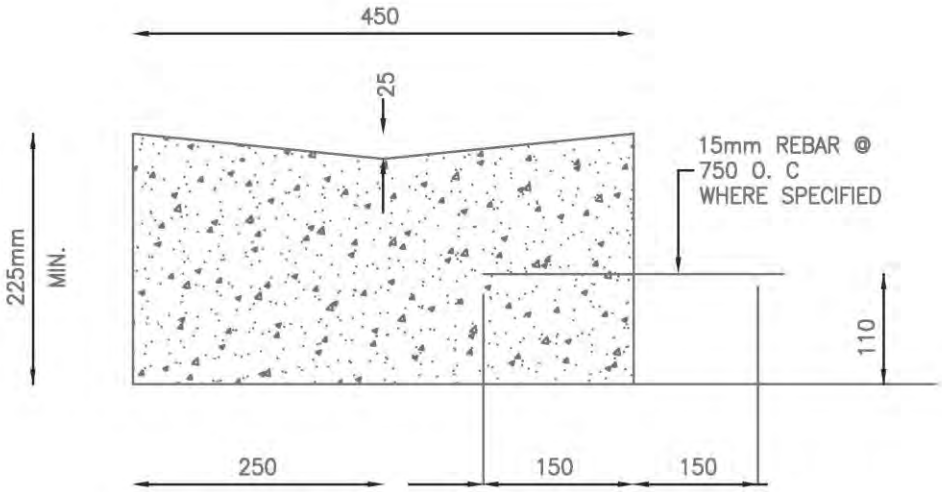
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.23

700mm SWALE (USE AT HIGHWAY INTERSECTIONS)





NOTES:

1. C/L SWALE TO MATCH GUTTER ELEVATION AT UPSTREAM END. LOWER GUTTER LIP TO MEET SWALE EDGE.
2. SWALE EDGE TO MATCH GUTTER ELEVATION ON DOWNSTREAM END. LOWER GUTTER LIP TO MATCH C/L OF SWALE.
3. EXPANSION JOINTS TO BE CONSTRUCTED AT ENDS OF SWALE WHERE SWALE ABUTS GUTTERS.
4. CONTRACTION JOINTS 50mm DEEPP AND 5mm WIDETO BE CONSTRUCTED 3m ON CENTRES ALONG SWALE.
5. CROWN OF ROAD TO BE TAPERED STARTING 15m FROM SWALE, TO PROVIDE SMOOTH VEHICULAR CROSSING OF SWALE.
6. CONCRETE TO BE TYPE HS, 40Mpa COMPRESSIVE STRENGTH AT 28 DAYS WITH 6% TO 8% AIR ENTRAPMENT.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

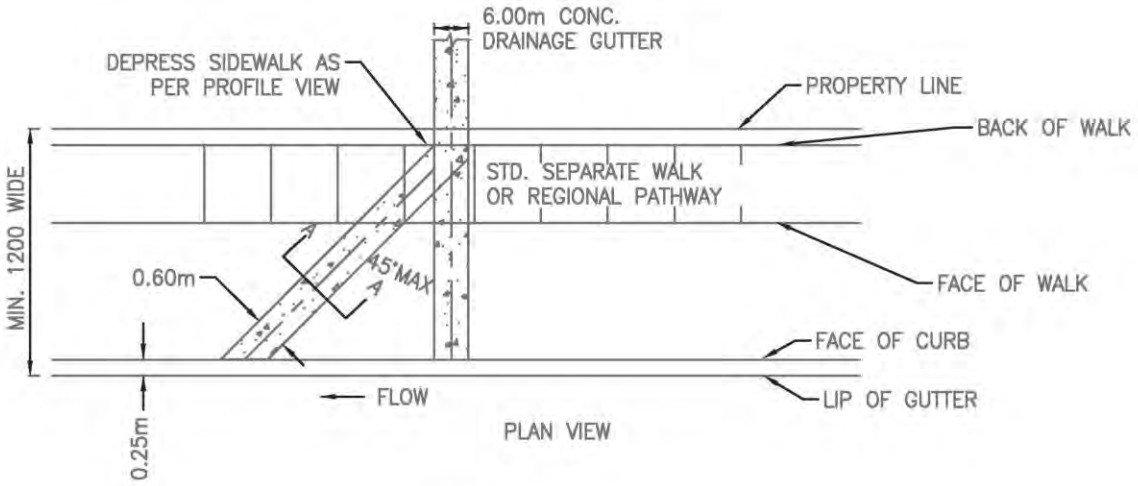
MUNICIPAL DISTRICT OF GREENVIEW No. 16

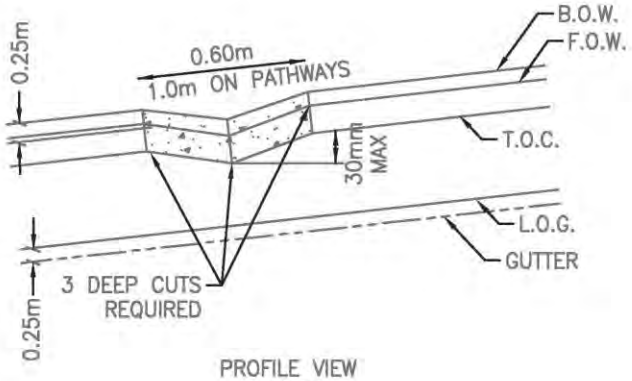
CONCRETE SWALE (CROSS SECTION)

MUNICIPAL SERVICING STANDARDS

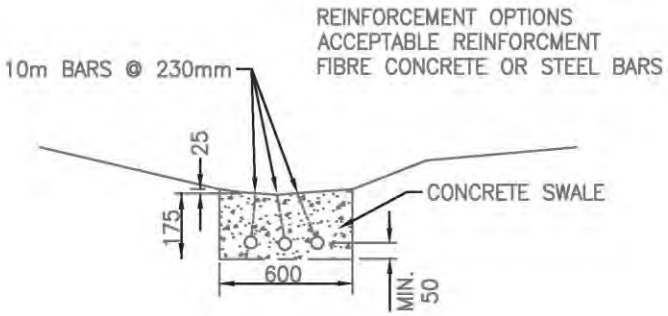
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.24

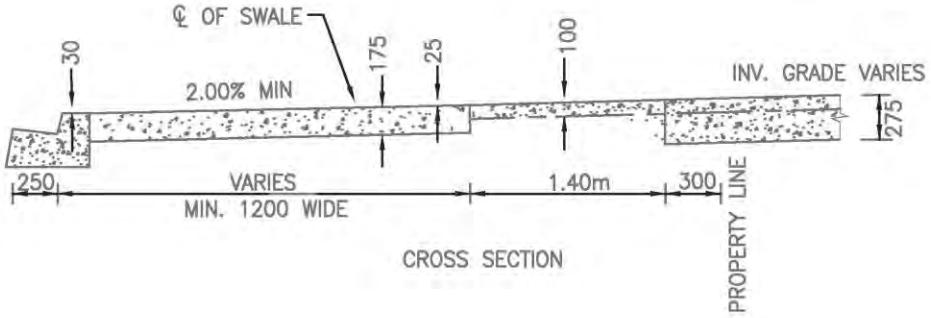




PROFILE VIEW
N.T.S.



SECTION A–A TYPICAL
N.T.S.



CROSS SECTION

NOTES:
1. ON ROAD WITH GRADE >3%. THE SWALE MUST BE "OFFSET" TO ALLOW BETTER FLOW.
2. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

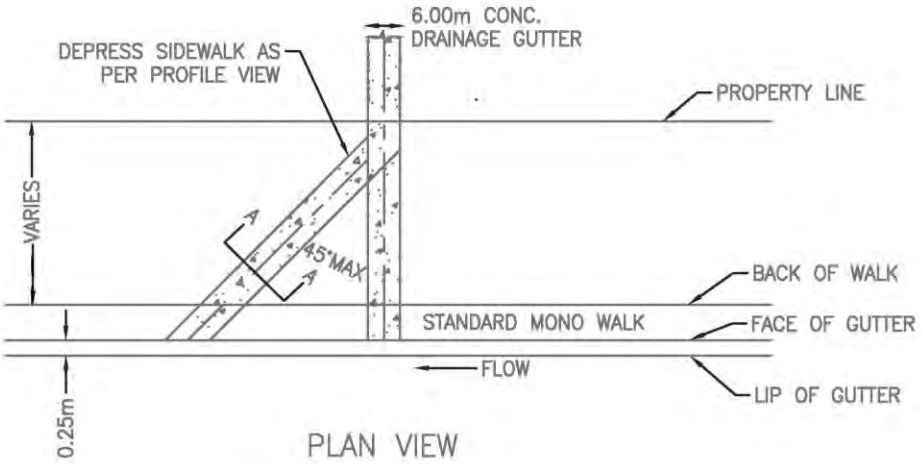
MUNICIPAL DISTRICT OF GREENVIEW No. 16

SIDEWALK & BOULEVARD DRAINAGE CROSSING FOR SEPARATE WALK

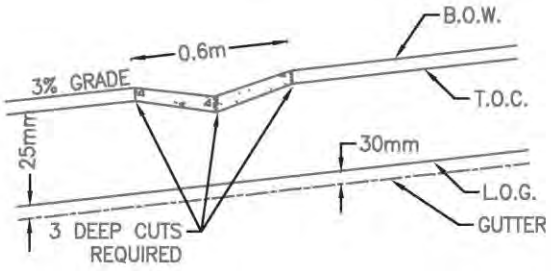
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

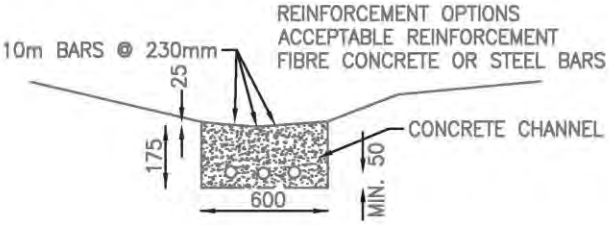
SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.25



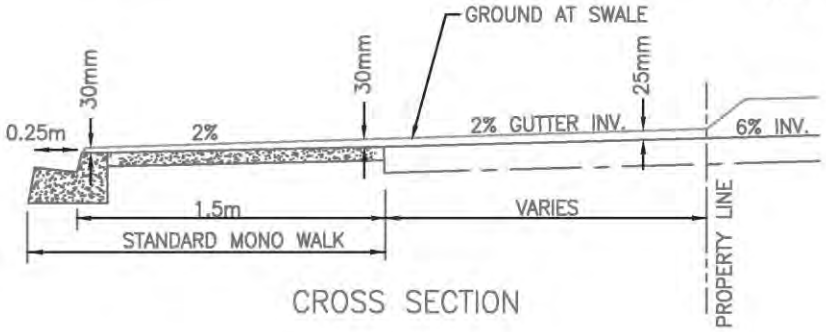
PLAN VIEW



PROFILE VIEW
N.T.S.



SECTION A–A TYPICAL
N.T.S.



CROSS SECTION

NOTES:
1. ON ROAD WITH GRADE >3% "ANGLED" SWALE MUST BE CONSTRUCTED TO ALLOW BETTER FLOW.
2. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

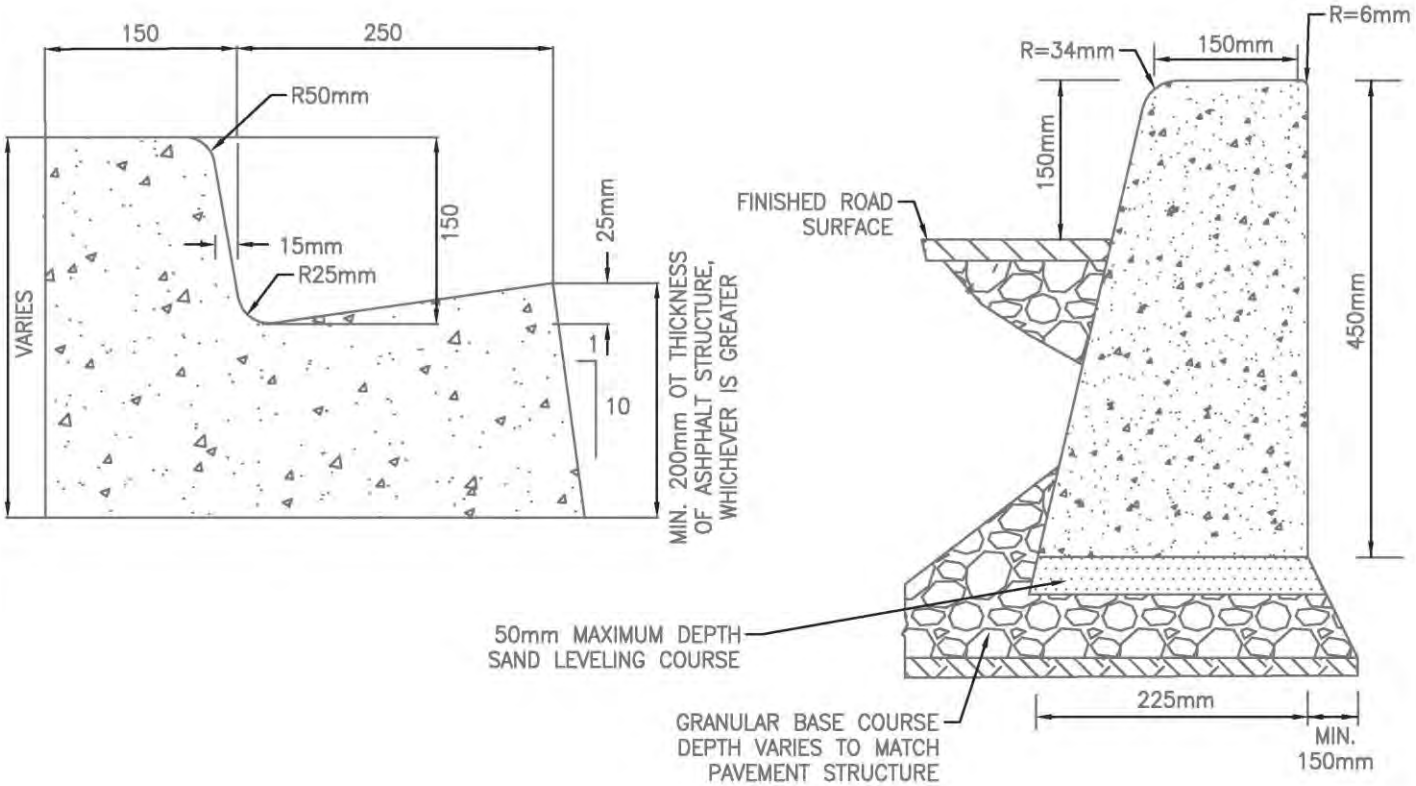
MUNICIPAL DISTRICT OF GREENVIEW No. 16

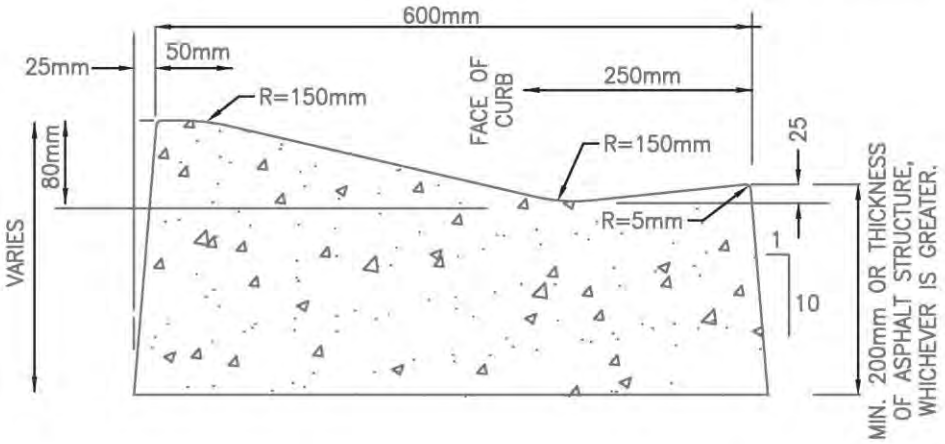
SIDEWALK & DRAINAGE CROSSING FOR A MONO WALK

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.26





NOTE:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

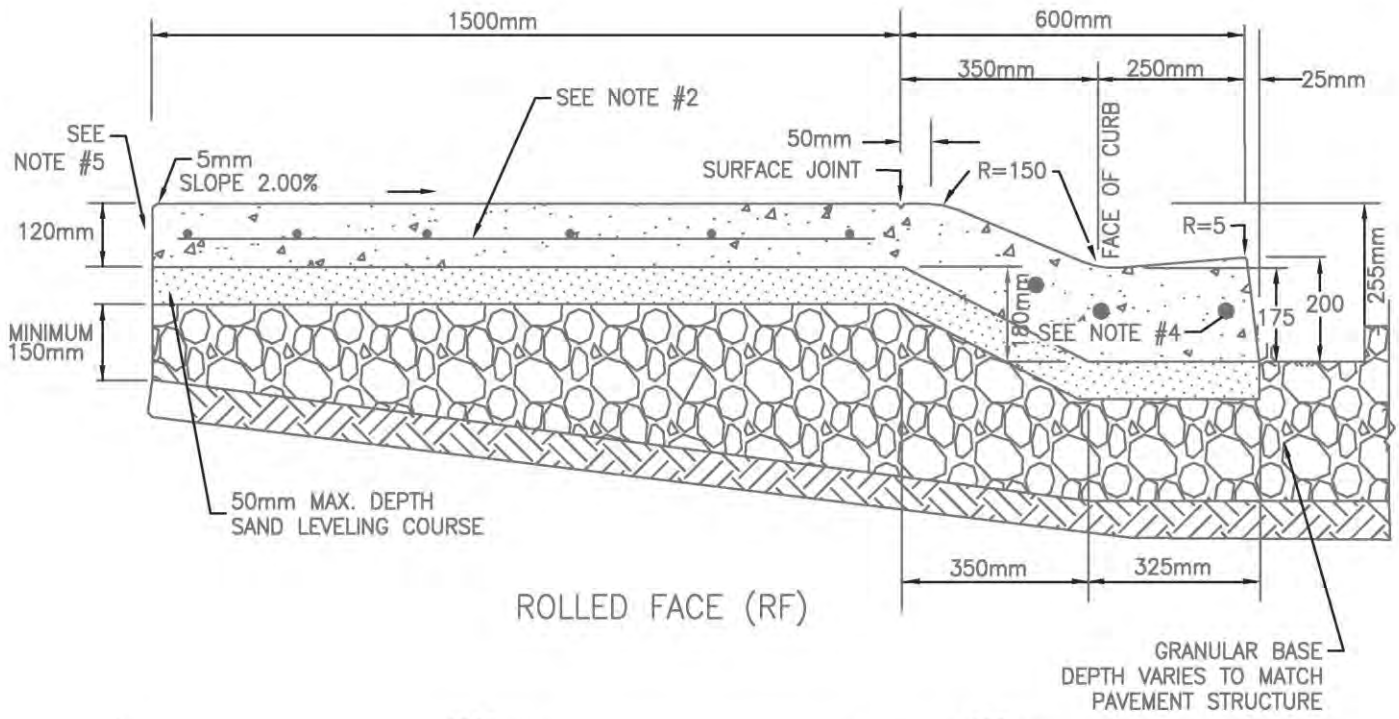
MUNICIPAL DISTRICT OF GREENVIEW No. 16

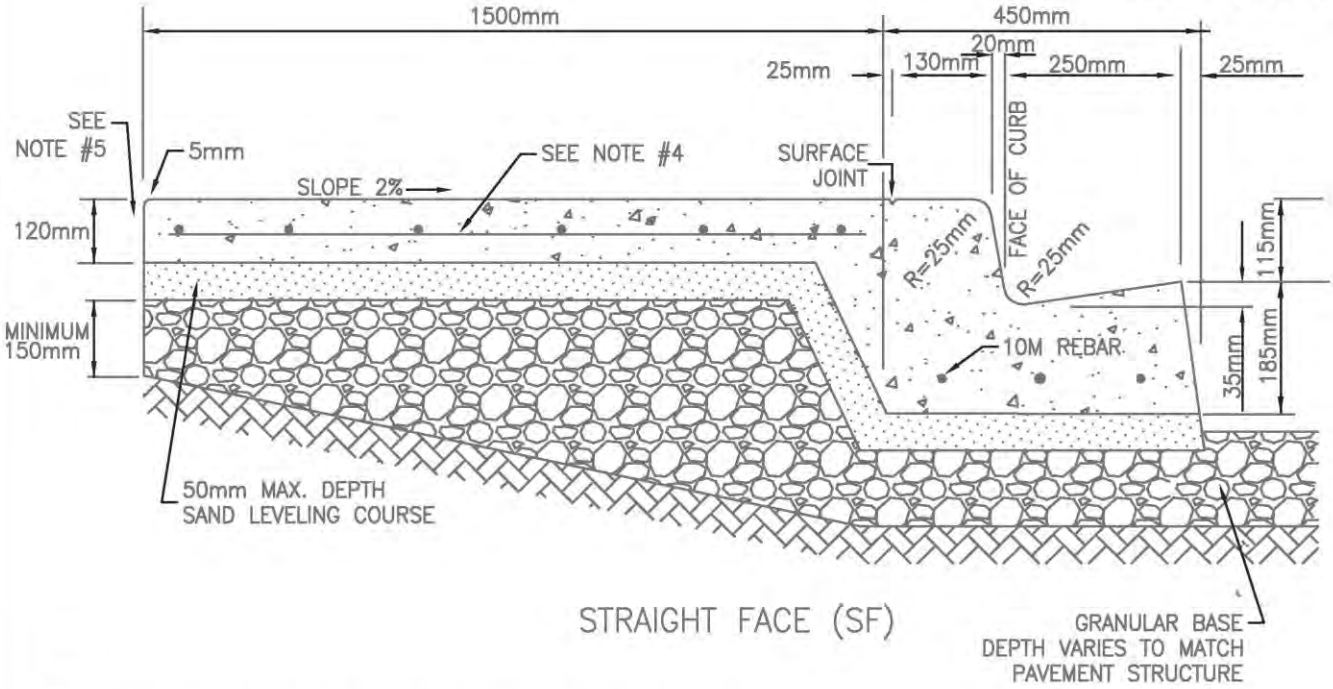
STANDARD CURB & GUTTER

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.27





NOTES:

1. 15mm MAXIMUM BATTER AT BACK OF WALK FOR EXTRUDED SECTIONS.
2. 150X150 P18/P18 GAUGE WIRE MESH TO BE PLACED IN SIDEWALK ACROSS ALL COMMERCIAL INDUSTRIAL, LANES AND APARTMENT BUILDING DRIVEWAY ENTRANCES.
3. CONCRETE TO BE HS, 40Mpa. COMPRESSIVE STRENGTH AT 28 DAYS WITH 6% TO 8% AIR ENTRAPMENT.
4. 3-10M REINFORCEMENT BARS AT ALL COMMERCIAL INDUSTRIAL, LANES AND APARTMENT BUILDING DRIVEWAY ENTRANCES.
5. *150mm AT COMMERCIAL,INDUSTRIAL,LANE AND APARTMENT BUILDING DRIVEWAY ENTRANCES.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

MONOLITHIC CURB, GUTTER & SIDEWALK

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	7.28

8 SIGNAGE

8.1 MUNICIPAL ADDRESSING SIGNAGE

- The Developer shall supply and erect parcel identification markers in each rural multi-parcel subdivision based on the municipal addressing system in existence within Greenview; three (3) or more lots may be considered as a multi-parcel subdivision unless otherwise approved. They will include the address for the main entrance to the subdivision and the assigned parcel numbers for each of the lots in the subdivision. The municipal address parcel numbers will be the same as the lot numbers shown on the registered subdivision plan.
- The two (2) or three (3) digit parcel identification signs must be in an obvious place next to the driveway at the property line. The sign shall be located on the right side of the driveway, a minimum 2.0m from the approach shoulder, a minimum 1.0m above ground level and at 90° to the driveway.
- Municipal Address Signs shall be constructed and installed in accordance with the following minimum requirements:
    - Size: Two (2) digit 250mm x 200mm (minimum)
Three (3) digit 325mm x 200mm (minimum)
    - Sign Material: 2mm high tensile flat aluminum
    - Finish: 3m medium green vinyl with silk screened or die-cut reflectorized white lettering
    - Lettering Size: 150mm (minimum)
    - Posts: 1.5m angled aluminum post
    - Sign Attachment: The marker sign shall be attached to the post with two (2) stainless steel bolts and nuts.
- Refer to Drawing 8.1: Municipal Addressing Sign and Drawing 8.6: Rural Address Sign.
- Municipal Address Signs may be purchased from Greenview.

All other addressing requirements, including but not limited to those set out in Greenview's addressing bylaw(s), will be addressed through the application process.

8.2 SUBDIVISION SIGNS

- The Developer shall supply and erect a subdivision display sign at the identified main entrance of each multi-parcel subdivision with the exact location being approved by Greenview prior to installation. The sign shall show the subdivision name, municipal address of the identified main entrance to the subdivision (sign location) and the subdivision layout with the assigned parcel identification number on each lot in the subdivision, including the reserve parcel designations.
- The subdivision sign shall be constructed by a commercial sign manufacturer in accordance with an approval issued by Greenview.
- Refer to Drawing 8.2: Subdivision Sign and Drawing 8.3: Subdivision Sign Installation for details on the subdivision signage, along with Drawing 8.4: Traffic Sign Installation Detail, if applicable.

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8.3 TRAFFIC CONTROL SIGNAGE

- A traffic control signage plan shall be submitted for review and approval by Greenview as part of the engineering design drawings.
- All traffic control signage erected within subdivision road allowances shall be of high intensity grade signage and shall be in accordance with the standards contained in the latest edition of the Transportation Association of Canada's Manual regarding Uniform Traffic Control Devices for Canada or ATEC's standards.
- All signposts shall be horizontally located a minimum of 3.0m from the shoulder of the adjacent road and the bottom of the sign shall be 1.5m above the shoulder elevation of the road. Refer to Drawing 8.4: Traffic Sign Installation Detail and Drawing 8.6: Rural Address Sign.
- Stop and yield signs shall be positioned as per sign installation location specifications.

8.4 ENVIRONMENTAL RESERVE SIGNAGE

- The Developer shall supply and erect an Environmental Reserve Marker Sign at each property corner within a subdivision, where a subdivision lot corner forms a common point with an Environmental Reserve.
- An Environmental Reserve Sign is not required for an Environmental Reserve Easement (ERE), as no public access is created under an ERE and its identification may encourage trespass.
- Environmental Reserve signs shall be constructed by a commercial sign manufacturer and be installed in accordance with an approval issued by Greenview meeting Drawing 8.5: Environmental Reserve Marker Sign.

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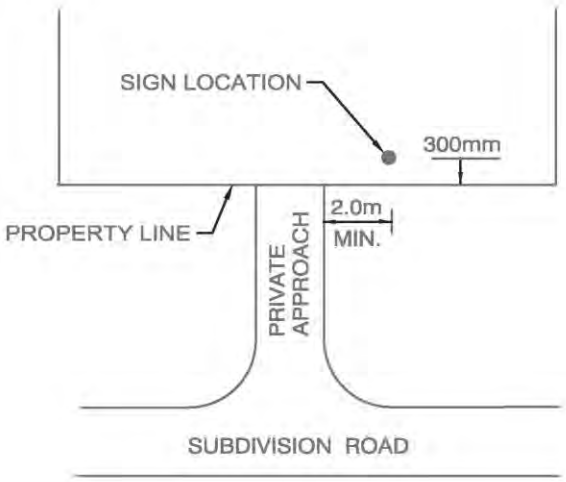
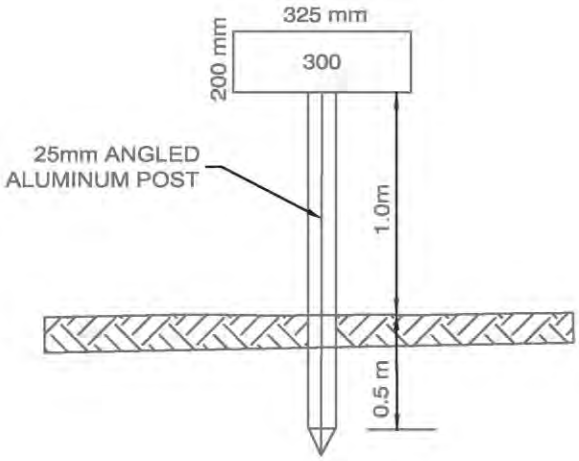




NOTES:
1. DEVELOPER RESPONSIBLE FOR SUPPLY AND INSTALLATION OF ALL SIGNS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

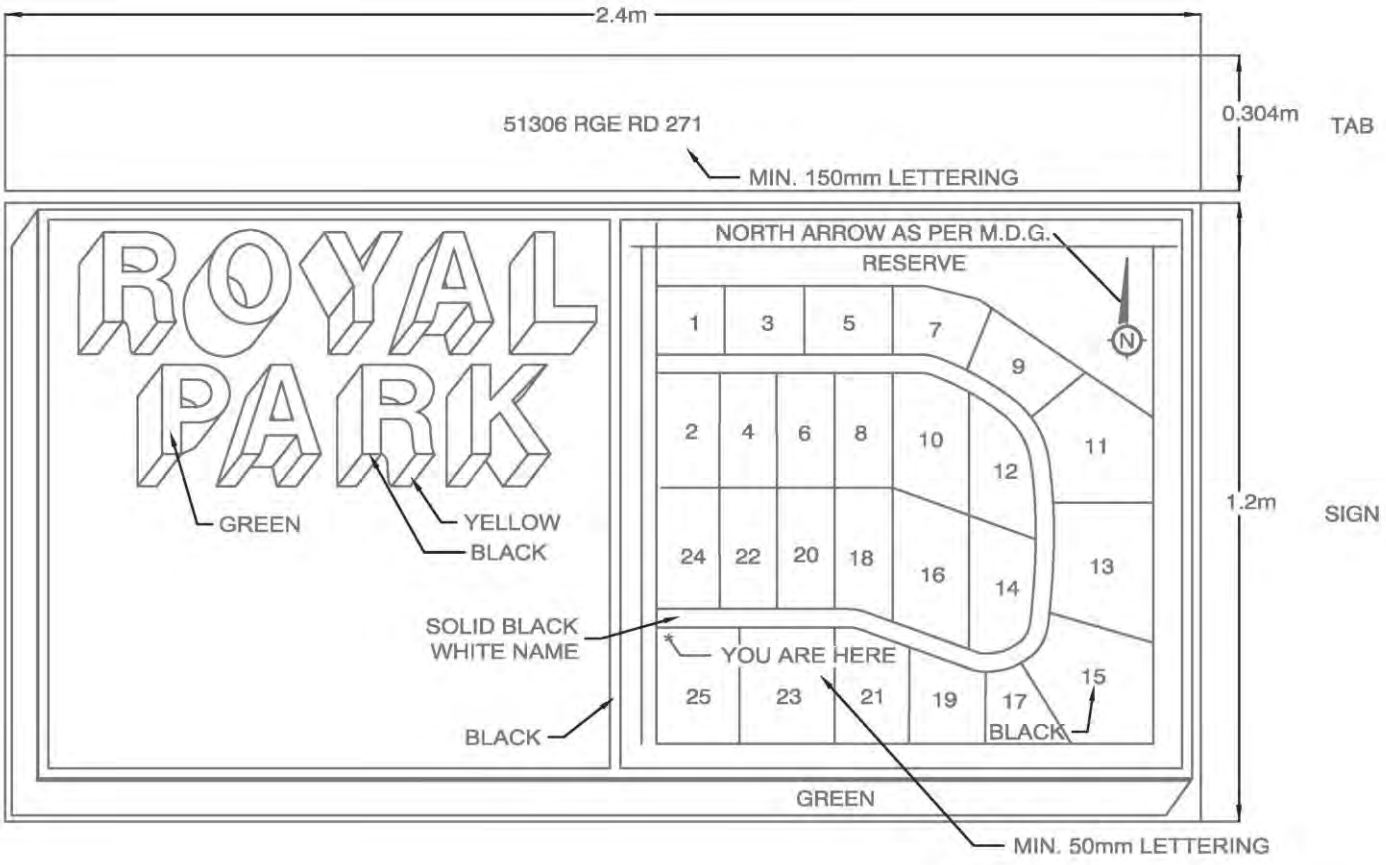
MUNICIPAL DISTRICT OF GREENVIEW No. 16

MUNICIPAL ADDRESSING SIGN

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	8.1



NOTES:

1. OUTLINE AROUND LOT AREAS IS BLACK.
2. PARK RESERVES ARE GREEN.
3. ROADS ARE SOLID BLACK WITH WHITE NAMES INSIDE.
4. COLORS TO BE RECOMMENDED INKS OR APPROVED EQUIVALENT.
5. ADDRESS NUMBERS TO BE PLACED ON MAP WHERE APPLICABLE.
6. ANY SUBDIVISION THAT HAS 3 OR MORE LOTS IS CONSIDERED "MULTIPARCEL".
7. DEVELOPER RESPONSIBLE FOR SUPPLY AND INSTALLATION OF ALL SIGNS.
8. ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

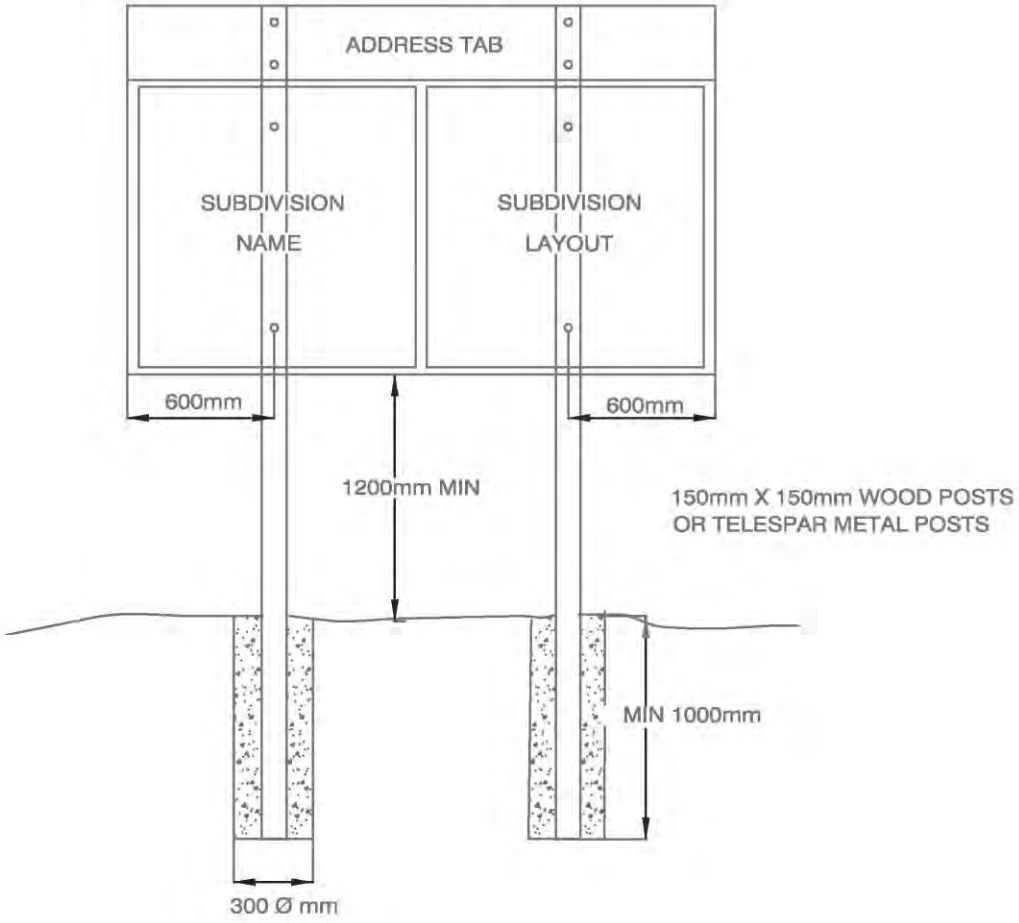
SUBDIVISION SIGN

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	8.2

POSTS TO BE FLUSH
WITH TOP OF SIGN



NOTES:
1. DEVELOPER RESPONSIBLE FOR SUPPLY AND INSTALLATION OF ALL SIGNS.
2. ALL DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

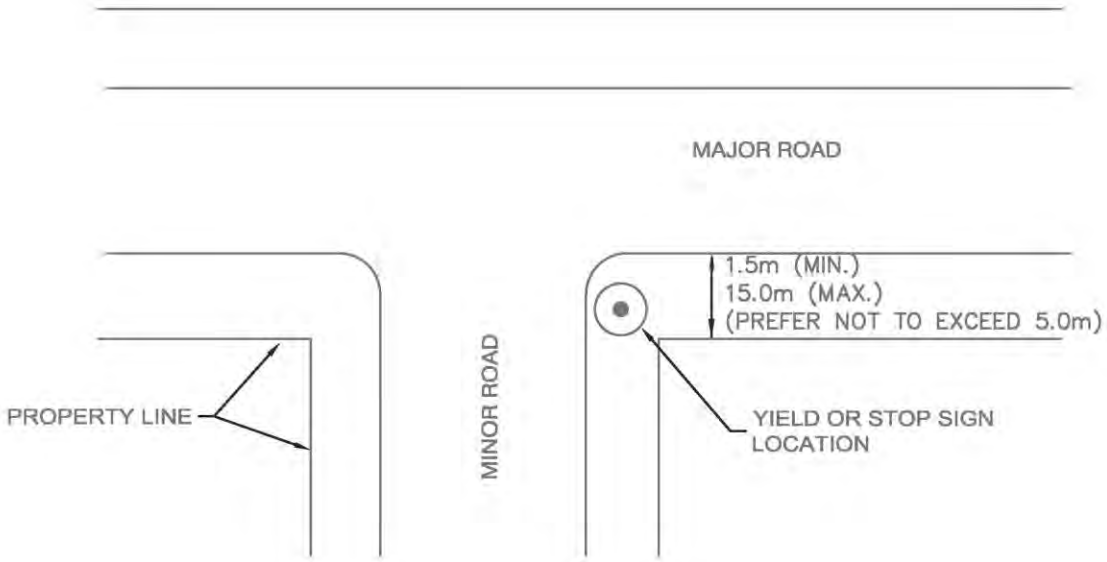
MUNICIPAL DISTRICT OF GREENVIEW No. 16

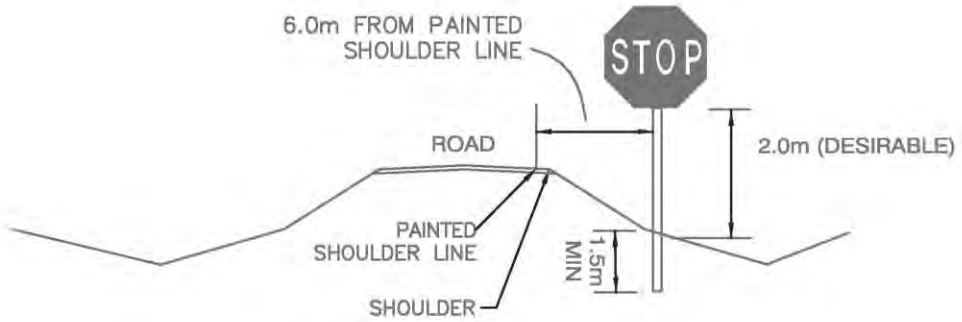
SUBDIVISION SIGN INSTALLATION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	8.3





NOTES:
1. LOCATION AND HEIGHT IS COMMON FOR ALL SIGNS.
2. ALL SIGNS SPECIFICATIONS TO AT/TAC STANDARDS.
3. ALL STOP SIGNS REQUIRE 0.75m RA-1 DIAMOND GRADE SIGN.
4. DEVELOPER RESPONSIBLE FOR SUPPLY AND INSTALLATION OF ALL SIGNS.
5. ALL DIMENSIONS SHOWN IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

TRAFFIC SIGN INSTALLATION DETAIL

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	8.4

ENVIRONMENTAL

RESERVE

IN ORDER TO PROTECT THE

NATURAL ENVIRONMENT,

THIS LAND WAS DESIGNATED

AS ENVIRONMENTAL RESERVE

ALTERATION OR DEVELOPMENT

OF RESERVE PROPERTY

IS UNLAWFUL.

For More Information Contact:

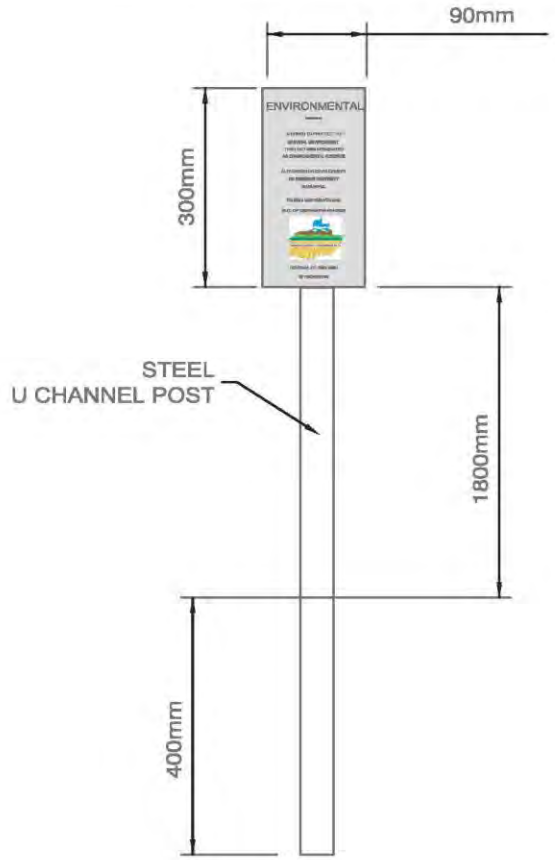
M.D. OF GREENVIEW

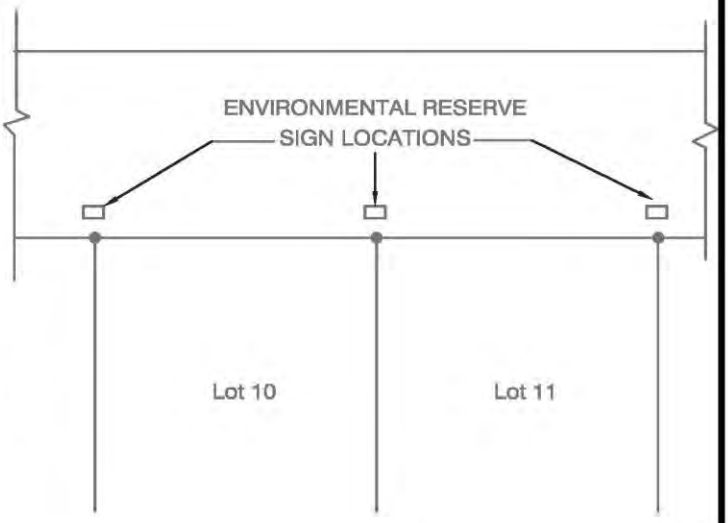
(780) 524-7600

MUNICIPAL DISTRICT OF GREENVIEW No. 16

REMOVAL OF THIS SIGN

IS PROHIBITED





NOTES:

1. SIGNS TO BE LOCATED AT EACH COMMON ENVIRONMENTAL RESERVE AND PROPERTY LOT CORNER.
2. SIGNS TO BE 300mm ON RESERVE FACING PRIVATE LOTS.
3. DEVELOPER RESPONSIBLE FOR SUPPLY AND INSTALLATION OF ALL SIGNS.
4. ALL DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

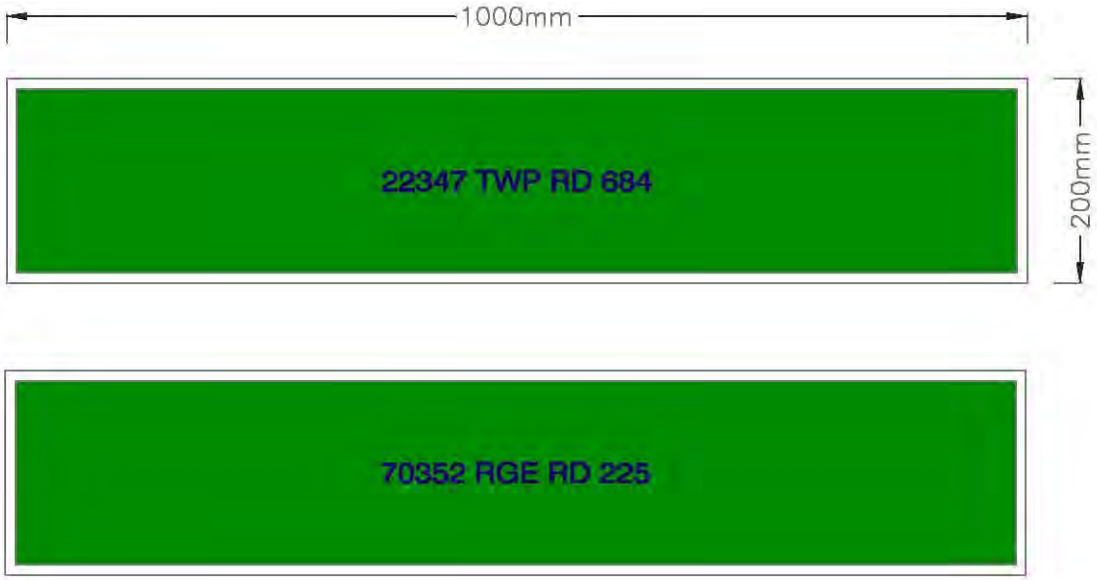
MUNICIPAL DISTRICT OF GREENVIEW No. 16

ENVIRONMENTAL RESERVE MARKER SIGN

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	8.5



101mm HWY C TEXT

NOTE:
1. TWO 9.5mm HOLES ON EACH END (152mm CENTER, 152mm in)
   9–13 CHARACTERS – 1000mm
2. ALL DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

RURAL ADDRESS SIGN

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	8.6

9 MISCELLANEOUS REQUIREMENTS

9.1 GENERAL

This section outlines standards, guidelines, and requirements for numerous miscellaneous items that are relevant to the development of subdivisions within Greenview.

9.2 PROPERTY BOUNDARY MONUMENTS

The Developer shall, in conjunction with the legal survey of the property, cause to be installed the Statutory Iron Survey Posts in accordance with the *Surveys Act* and in such a manner that the monuments will survive the construction of the roads, utilities and landscaping. Greenview will require the Land Surveyor or Survey Firm conducting the legal survey to certify the current existence of all survey monuments shown on the plan as being in the ground at the time of registration of the subdivision at Land Titles. The Developer shall install marker posts to identify and protect all legal survey lot corner pins in the subdivision. Care shall be taken so as not to disturb the legal survey pins. Any disturbed legal survey pins shall be replaced by a legal surveyor at the Developer's expense.

9.2.1 Survey Control Markers

Every effort shall be made to protect existing markers. The Developer shall provide additional markers as required.

9.3 LANDSCAPING

- A landscaping plan may be required as a condition of a planning approval. Landscaping shall meet the requirements herein, unless an alternative is approved under a specific landscaping plan provided for a development and the rationale for the substitution shall be provided; acceptance of these substitutions are at the discretion of Greenview.
- All topsoil will be sourced in accordance with Greenview's Administrative Policy, Topsoil & Fill Material Sourcing, latest revision or replacement thereof.
- A uniform thickness of topsoil shall be placed on all roadway ditch bottoms, side slopes, backslopes, and open areas disturbed during construction with salvage topsoil, and be seeded to grass following preparation of the seed bed.
- The seed bed shall consist of a minimum 75mm (3") of topsoil capable of supporting good vegetation growth. The topsoil shall be spaced and graded evenly and shall be free of rocks, roots, stumps, weeds and other deleterious material.
- All seed mixtures are to be approved by Greenview's Agricultural Services department.
- All seed shall be certified and verified with a primary and secondary noxious-weed-free certificate. No sweet clover is permitted.
- If seeding after September 1, add 10kg/Ha of a fall rye to the mix.
- The rate of application of seed shall be 25kg per hectare by mechanical applicators. An application of 75kg per hectare of starter fertilizer shall also be applied at the time of grass seeding.

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- All seeded areas will be accepted following consistent germination and conducting a first cut after 50mm (2") of growth.
- Trees shall be planted as per Drawing 9.10: Tree Planting Detail.
- Asphalt barriers shall be shown in Drawing 7.21: Asphalt Curb.
- Hydro-seeding is an acceptable option as per Alberta Transportation's Civil Works Master Specifications, Section 02924, Hydroseeding, latest revision thereof.
- Follow-up seeding applications shall be made as needed to cover weak spots.
- All seeding shall be in accordance with the latest editions of:
    - Canada Seeds Act and Seeds Regulation
    - Fertilizer Act and Fertilizer Regulation
    - Alberta-Weed Control Act and Weed Regulation
- For fencing requirements, refer to:
    - Drawing 9.1 Chain-Link Fence Frame Detail
    - Drawing 9.2 Chain-Link Single Gate
    - Drawing 9.3 Chain-Link Double Gate
    - Drawing 9.4 Wood-Screen Fence Detail
    - Drawing 9.5 Modified Class 'B' Fencing
    - Drawing 9.6 Post & Cable Fence-Section

9.4 PROTECTION AND/OR COORDINATION OF UTILITIES

- The Developer shall be responsible for the identification, location and protection of all utilities which may exist within or adjacent to the proposed subdivision. A complete list of public utilities is set out in Section 1(1)(y) of the *Municipal Government Act*. Utilities commonly encountered on lands within Greenview may include, but are not limited to:
    - Telephone, Cablevision and Cables
    - Fibre optics
    - Power cables
    - Natural gas distribution lines
    - Oil and gas distribution lines
- The Developer shall be responsible for contacting all utility agencies and for arrangements, coordination, protection, and/or modifications to the utilities during the development of the subdivision, at their expense, or as agreed upon with the specific utility company.

9.5 ELECTRICAL POWER SERVICE

- The Developer shall make arrangements with the appropriate Franchise Utility Operator for the installation of above-ground or underground electrical power within a subdivision.
- Where underground power is proposed within a subdivision, the Developer shall be required to hire an engineering consultant, as approved by the Franchise Operator, to design the electrical system in accordance with Statutory and Operator's requirements. The Developer shall be

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required to hire an electrical contractor to install the electrical system in accordance with the approved electrical system design and the Franchise Operator. The alignment and location of all electrical facilities within a subdivision shall be subject to the approval of Greenview.

- Greenview may direct the placement of electrical services underground as a requirement of a Development Agreement if it is consistent with the existing aesthetic or urban nature of any development.
- Acceptance of the electrical system within the subdivision shall be subject to the approval of the Franchise Operator and Greenview. Where underground power is being installed, the Developer shall make arrangements for the common installation of telecommunication cables within the underground trench.

9.6 NATURAL GAS SERVICE

- The Developer shall make arrangements with the Gas Franchise Company in the area for the installation of natural gas in a subdivision.
- The alignment and location of all natural gas facilities within a subdivision shall be subject to the approval of Greenview and the appropriate Provincial authorities.

9.7 STREET LIGHTING

- Street lighting will be required in subdivisions at the Developer's expense.
- In Low Density and High Density Country Residential subdivisions of four (4) lots or greater, the Developer shall pay streetlight energy costs until at least 50% of the lots are occupied. Following 50% occupancy, Greenview will assume streetlight energy costs and recover the energy costs from the lot owners through a Special Tax Levy Assessment.
- In Industrial/Commercial subdivisions, Greenview will assume streetlight energy costs following the installation of streetlight infrastructure by the Developer and subdivision plan registration.

9.8 MAILBOX PULLOUTS

The Developer shall construct, when identified as being required, a mailbox pullout at the entrance to or within the subdivision, in accordance with Drawing 9.11: Mailbox Pullout Locations.

9.9 OFFSITE ROAD CONSTRUCTION

9.9.1 General

- A subdivision or development approval may require that the Developer reconstruct an existing road or construct a road within an undeveloped road allowance. This section outlines the Developer's responsibility relative to such a requirement. Standards shall be as per the current Municipal Rural Roads Standards or ATEC/TAC specifications.
- The Developer, in the construction or reconstruction of a road, shall ensure and be responsible for the safety of the travelling public and access to adjacent landowners.

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9.9.2 Coordination of Existing Utilities

9.9.2.1 General

The Developer shall be responsible for contacting all affected utility agencies and for arranging and coordinating all protection and/or modifications necessitated by the construction or reconstruction of a Greenview road. This section outlines the arrangements applicable to the utility agencies commonly involved, as well as the responsibilities relating to costs. The information provided is based upon conditions normally encountered and may not be applicable where unusual site-specific circumstances are involved. The Developer is advised to contact each affected utility agency at the earliest possible time to confirm timing and coordination requirements.

All utility lines will be detectable using tracer wire.

9.9.2.2 Communications Utilities

The Developer is responsible for contacting the applicable communication providers, obtaining all necessary permits and following all Regulatory requirements. Temporary lines are replaced by permanent lines reploughed into the ditch area of the road upon completion of construction.

The cost of modifying, relocating or providing and replacing temporary lines may be charged directly to Greenview by the Communication provider pursuant to an agreement with respect to construction within municipal road allowances. Such charges are then assessed against the Developer by Greenview, along with any additional charges by the Communication provider with respect to inadequate notice of construction start provided by the Developer. Any damage to permanent or temporary telephone facilities by the Developer's construction activities will be the Developer's responsibility and will be charged directly to the Developer by the Communication provider.

All communication lines will be permanent and buried.

9.9.2.3 Electrical Utilities

The Developer is responsible for contacting the applicable Electrical franchise, obtaining all necessary permits and following all Regulatory requirements.

Where overhead power lines and/or underground power line crossings are within the existing road allowance, the cost of any required modification or relocation will require discussions and negotiations with the franchise operator. Where power lines are presently on private property adjacent to the existing road allowance, the actual costs of any required modification or relocation incurred will be determined by the construction activity. In all cases, the Developer is responsible for paying all costs.

9.9.2.4 Natural Gas

The Developer is responsible for contacting the applicable natural gas distribution agencies, obtaining all necessary permits, and following all Regulatory requirements. In some cases, the cost of modifications to natural gas line crossings are borne by the natural gas distribution

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agency; where costs are chargeable to Greenview, such costs will be assessed against the Developer.

9.9.2.5 Pipeline Crossings

Where transmission pipelines, such as oil and gas pipelines, oil distribution pipelines, water or any other pipelines not covered elsewhere within these Standards, are found to exist within the road allowance, the Developer shall be responsible for:

- Contacting and advising the appropriate pipeline agency of the proposed road construction or reconstruction crossing its pipeline.
- All costs, scheduling and delays.
- All activities must be in accordance with current legislation.

9.9.2.6 Utility Markers

Where utility markers exist within a road allowance identifying the location of an underground line, and the markers require relocating to accommodate road allowance widening and/or road construction, the Developer shall be responsible for contacting the appropriate utility company and arranging for marker relocation.

9.9.3 Land Acquisition and Access Agreements

9.9.3.1General

- The construction or reconstruction of a Greenview road can result in the need for negotiation and formal agreements.
- All negotiations and preparations of formal agreements will be conducted by Greenview land buyers, for consideration and approval by Greenview Council.
- All required payments pursuant to the provisions of the agreements, as well as the costs incurred by Greenview in arranging the agreements, will be assessed against the Developer.

9.9.4 Coordination of Traffic

9.9.4.1 General

Wherever it is considered necessary by Greenview to accommodate the passage of traffic during construction or reconstruction of a road, the Developer shall be responsible for ensuring that their contractor makes all needed and suitable provisions for such traffic, whether pedestrian or vehicular, as per the Transportation Association of Canada (TAC) Manual, latest revision thereof. This includes maintaining signs, barriers, fences, lights, and flag people as may be required for this purpose. No construction project shall start until all necessary construction signs are in place. A Traffic Accommodation Strategy (TAS) shall be prepared and submitted to Greenview for review and approval.

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9.9.4.2 Construction Signs

- All construction signs and barricades shall be fully reflectorized and shall conform to the Transportation Association of Canada (TAC) Manual regarding Uniform Traffic Control Devices for Canada, latest revision thereof. Any required oversized signs or special signs for specific circumstances shall be of a design as approved by Greenview.
- Refer to Drawing 9.7: Minimum Construction Signing.
- When work is not in progress, regulatory and construction signs not essential for the protection of the public shall be removed or covered to reduce inconvenience to a minimum. All construction signs shall be removed as soon as possible after the project is completed.

9.9.4.3 Existing Signs

All existing signs and guideposts which must be removed to conduct the work shall be carefully salvaged and stored by the Developer. Upon completion of the project, the Developer shall re-install all signs, subject to Greenview's inspection of current sign condition/quality; the cost for all replacement(s) of existing signs shall be the responsibility of Greenview. Certain essential existing signs such as railway crossing, intersection warning or stop signs shall be maintained for the duration of the project.

9.9.4.4 Detours

- Detouring of traffic around the work, off the road allowance, or along other roadways must receive the prior written approval of Greenview.
- Where Greenview approves the use of a detour route, the Developer's contractor shall provide and maintain such signs, barriers, lights and flag people, as may be considered necessary by Greenview, to divert the travelling public through the detour. The contractor shall acceptably maintain and be responsible for the detour route and upon completion of its use, shall restore it to its original condition or better.

9.9.4.5 Traffic Assistance

Where traffic is required to use a route over or around the work which is of a lower standard than was available before the work commenced, the Developer shall submit a plan for approval.

9.10 GUARD RAILS

Guard rails are to be installed as per ATEC's specifications. Refer to Drawing 9.8: Installation of Guardrail or Barrier Post.

9.11 BOLLARDS

For protection of structures and for protection of emergency access rights-of-way, refer to Drawing 9.9: Fixed & Knockdown Bollards.

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9.13 EROSION AND SEDIMENT CONTROL MEASURES (ESC)

In accordance with Alberta's *Soil Conservation Act*, latest revision thereof, every Developer shall take appropriate measures to prevent soil loss or deterioration from taking place. Furthermore, the Developer must stop any loss or deterioration from continuing.

All new development and redevelopment that includes land-disturbing activities such as clearing, grading, filling and excavation will require an Erosion and Sediment Control (ESC) plan and Best Management Plan (BMP).

The objective is to control erosion and prevent sediment from leaving the site. The ESC plan should provide for the interception and treatment of all potential silt-laden runoff that could occur during clearing, grading, construction and site stabilization.

The site plan for an ESC plan shall be prepared by the Consulting Engineer and include the following: location of clearing limits and easements, setbacks, water quality sensitive areas and their buffers, locations and descriptions of all erosion and sediment control measures for each phase of construction, and cross-sections of fills or excavations.

All ESC shall be in place prior to any site material disturbance.

9.14 NOISE IMPACT ASSESSMENT (NIA)

Greenview may request that a Noise Impact Assessment (NIA) be conducted during the planning stages of a project where projects are situated adjacent to or near major roadways, railways, commercial or industrial facilities, existing or planned multi-parcel residential developments, or any other land use identified to generate noise.

The threshold at which noise mitigation measures shall be implemented is 65dB (24-hour average). With typical house construction, the inside noise level would be approximately 15dB lower, at 50dB. This is considered acceptable for most applications.

There are several strategies that can be considered as part of the design to mitigate the impact of noise due to external sources. These include:

- Acoustic site planning
    - Modifying orientation of buildings/houses
    - Locating barrier-type buildings parallel to the source of noise
    - Situate non-residential land uses closest to the source of noise (parking areas, maintenance facilities)
- Employ perimeter berms
- Construct noise reducing fencing

For developed areas, there are products that are readily available to retrofit existing fencing that will reduce noise (e.g. vinyl panel inserts for chain link fencing).

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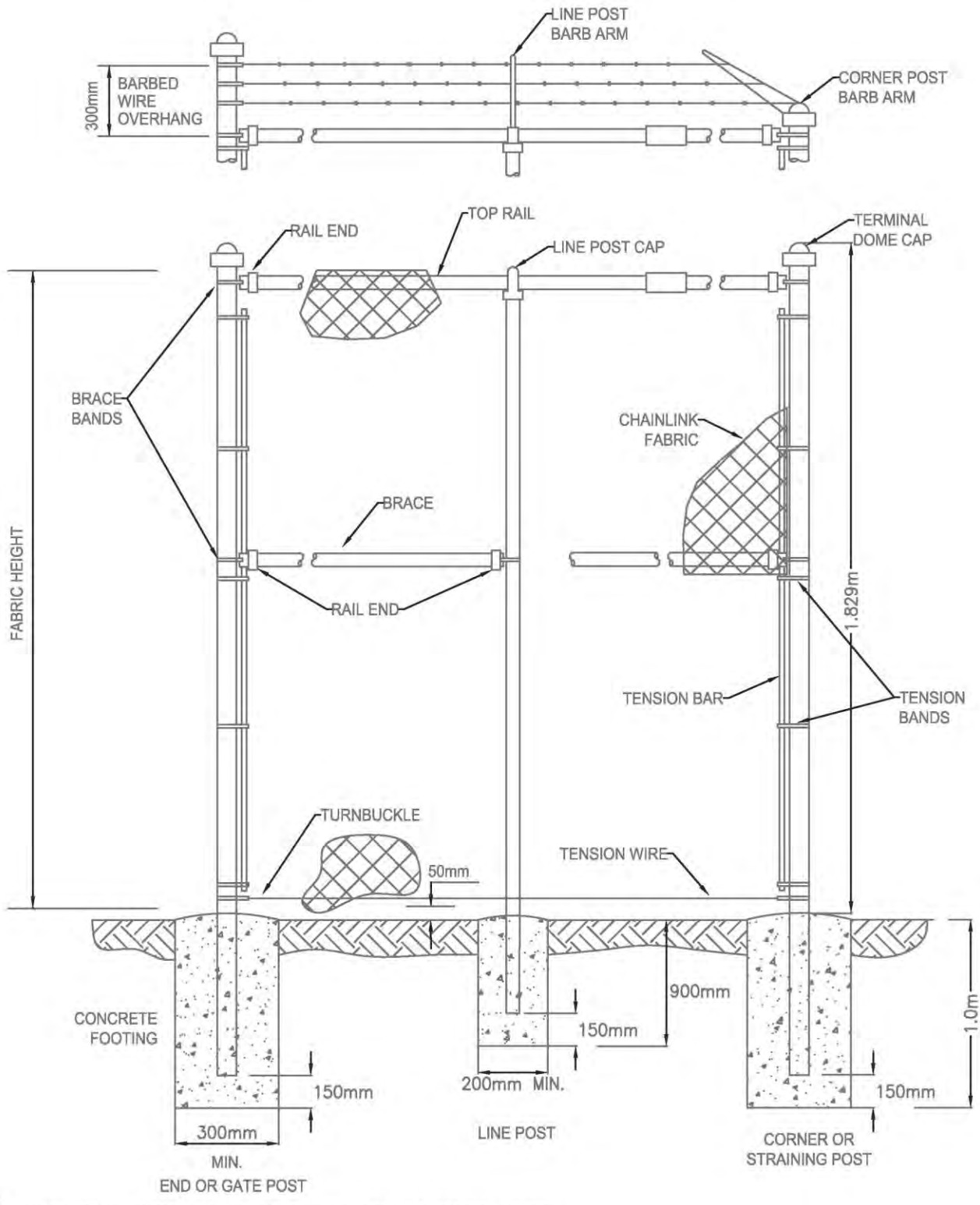


NOTES:

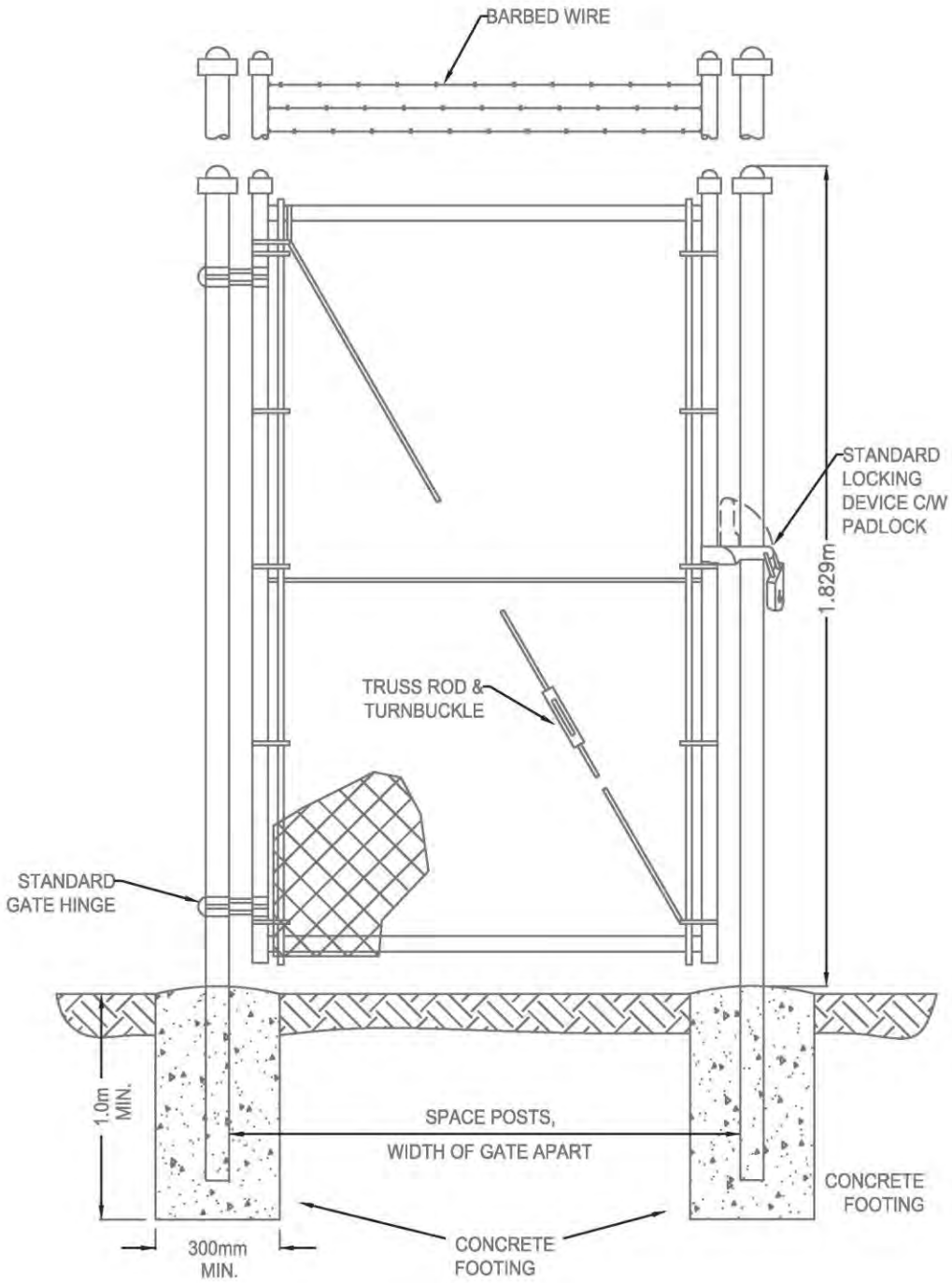
1. ALL DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

CHAIN-LINK FENCE
FRAME DETAIL
MUNICIPAL SERVICING STANDARDS
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.1



NOTES:
1. ALL DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

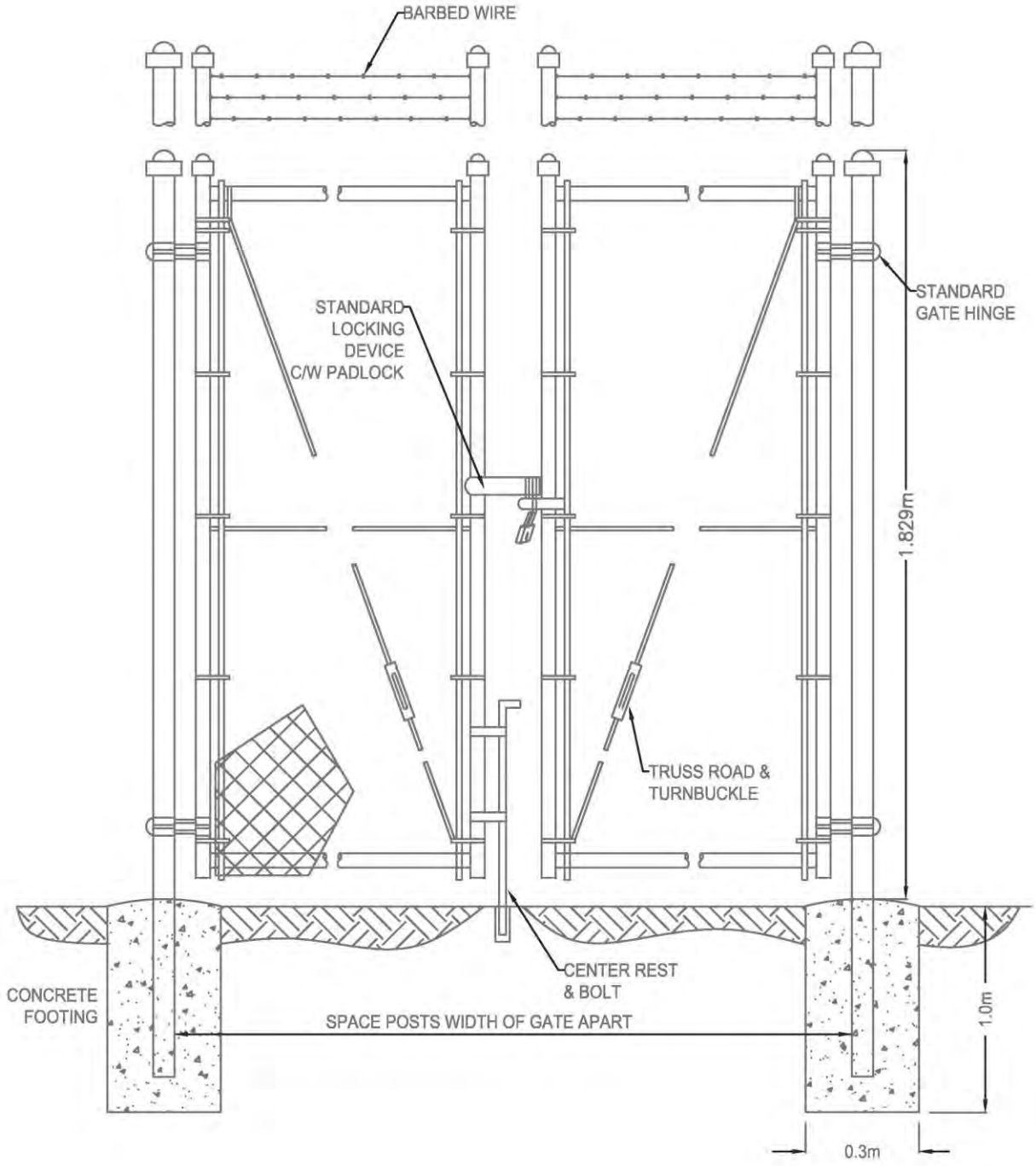
MUNICIPAL DISTRICT OF GREENVIEW No. 16

CHAIN-LINK SINGLE GATE

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.2



NOTES:
1. ALL DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

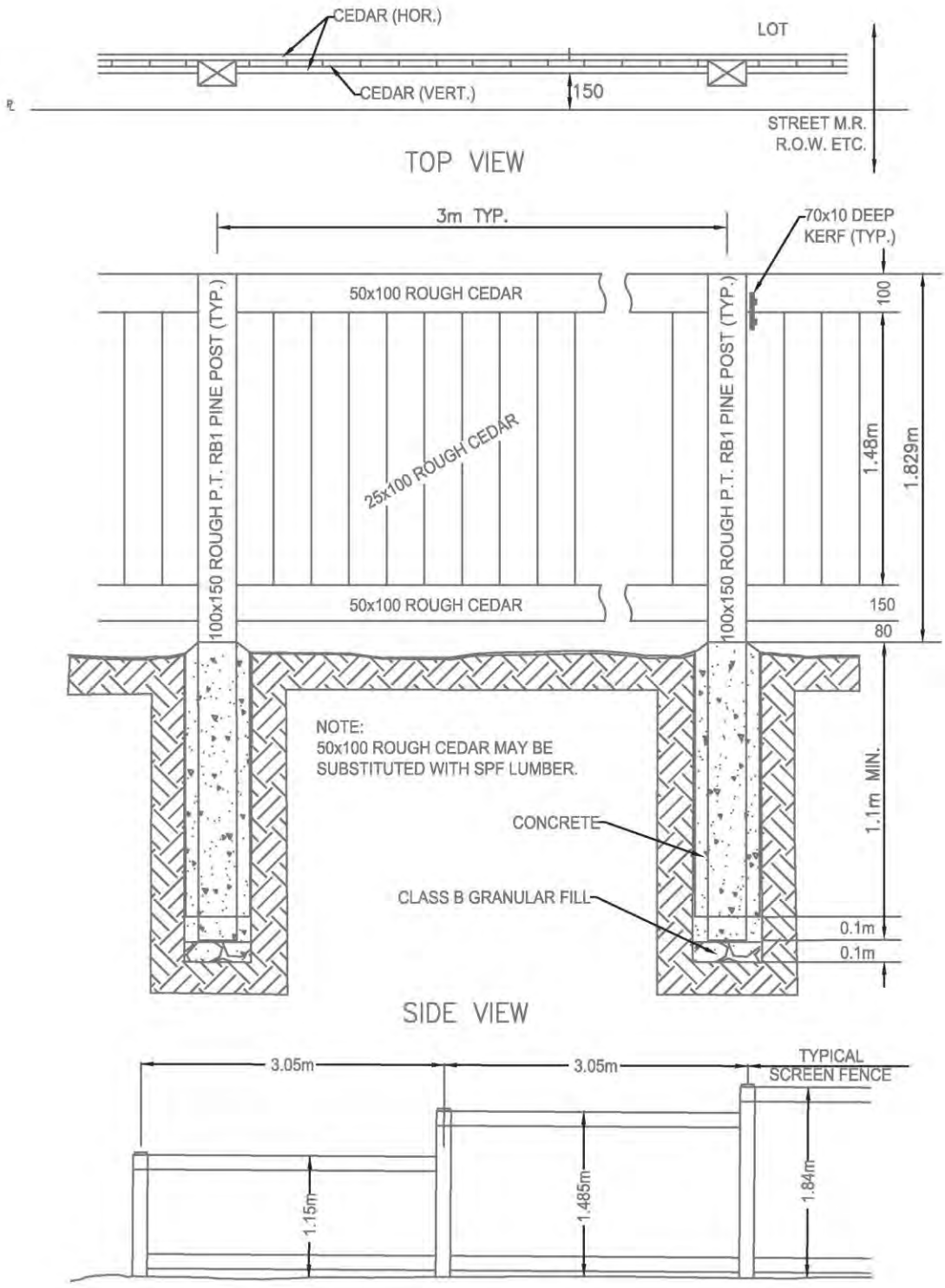
MUNICIPAL DISTRICT OF GREENVIEW No. 16

CHAIN-LINK DOUBLE GATE

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.3



NOTES:
1. ALL DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

N.T.S.

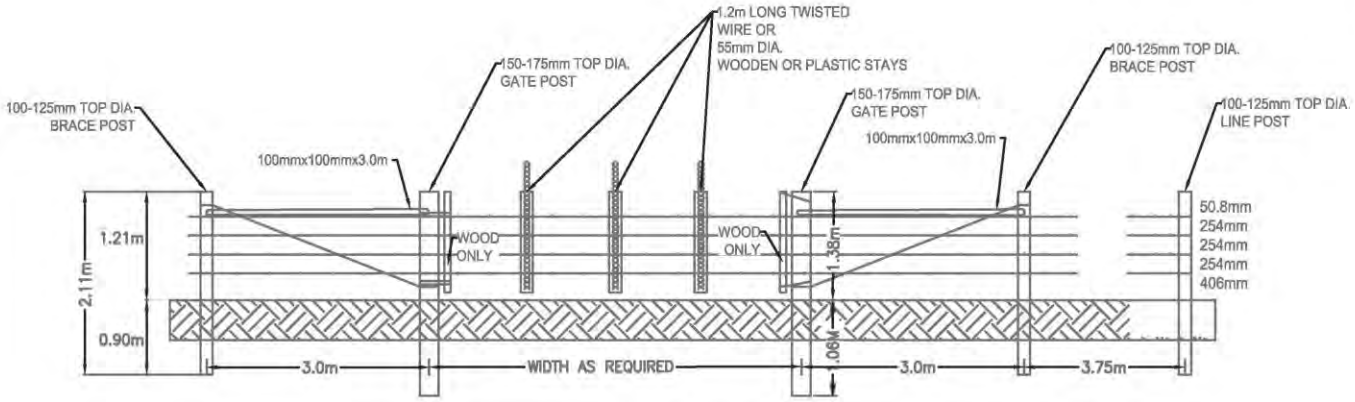
MUNICIPAL DISTRICT OF GREENVIEW No. 16

WOOD-SCREEN FENCE DETAIL

MUNICIPAL SERVICING STANDARDS

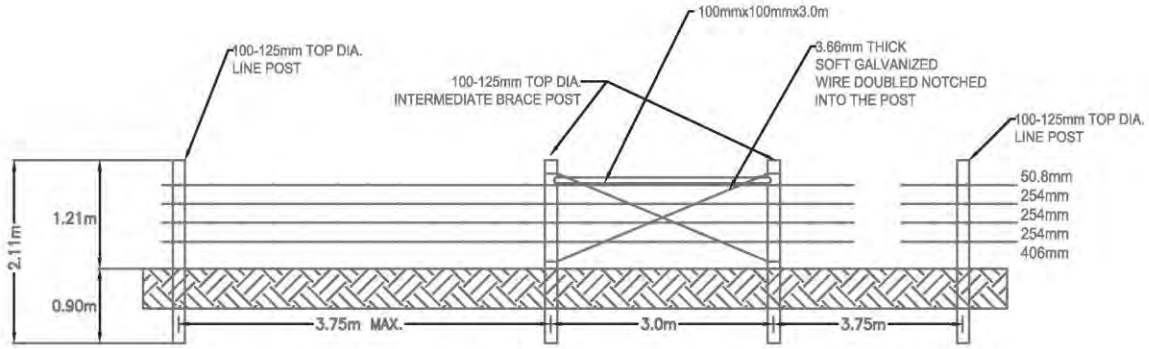
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.4



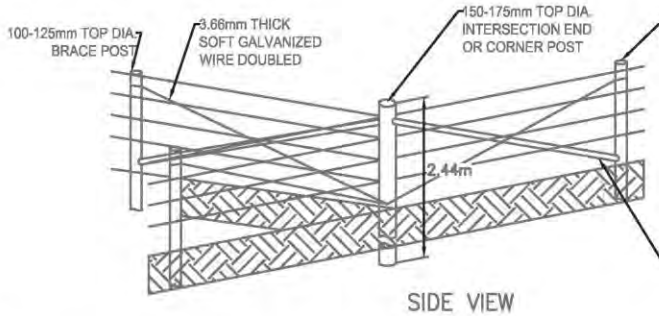
ELEVATION FARM GATE

SPACING OF BRACE ASSEMBLIES:
ON TANGENT- 400m MAX.
ON CURVES- 200m MAX.



ELEVATION FENCE

ESTIMATED MATERIAL INCLUDED IN 1km OF FENCING:
-LINE POSTS- 2.11m LONG AND 100-125mm TOP DIA. 267
-BARBED WIRE (1 SPOOL=402m) ..... 10 SPOOLS
TWO STRAND BARBED WIRE (FOUR POINT GALVANIZED 2.5mm THICK STRANDS)
-40mm STAPLES (APPROX. 140 STAPLES PER kg) 8kg
-PROPER STAPLE CLEARANCE TO ALLOW WIRE TO MOVE



SIDE VIEW

ESTIMATED MATERIAL REQUIRED FOR 1 GATE:
-GATE STAYS:
1.2m LONG TWISTED WIRE OR 55mm DIA. WOODEN OR PLASTIC STAYS..... 3
-GATE INTERSECTION AND END CORNER POSTS:
2.44m LONG AND 150-175mm TOP DIA. 4
-100x100mm DIMENSION LUMBER BRACES 7
-3.66mm THICK SOFT GALVANIZED WIRE FOR DIAGONAL BRACING (APPROX. 1.5kg PER BRACE) 11kg

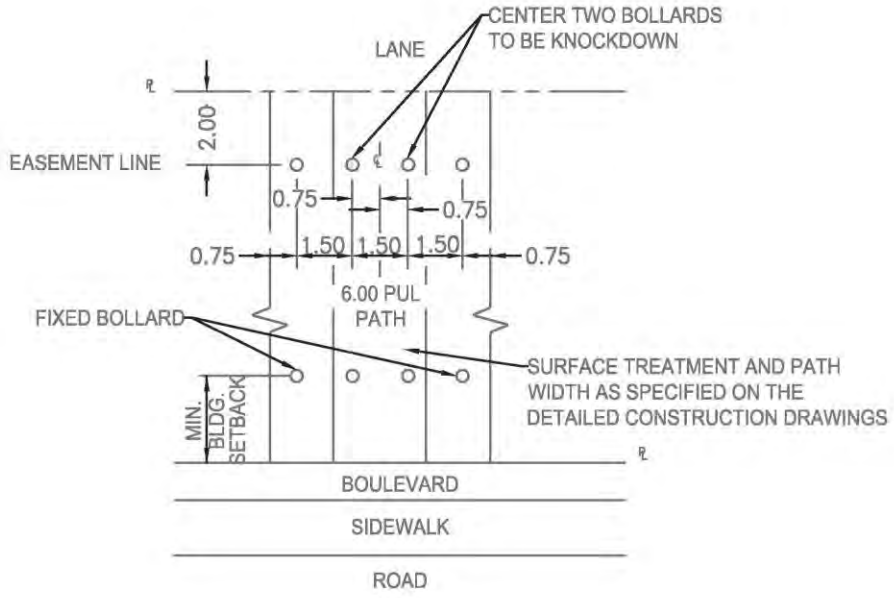
NOTES:
1. ALL FENCE POSTS SHALL BE PRESSURE TREATED, RATED 30 YEAR.
2. ALLOWABLE TAPER FROM END TO END OF POSTS SHALL NOT EXCEED 38mm IN DIAMETER. POSTS SHALL BE INSTALLED WITH THE LARGE END DOWN.
3. SINGLE STRAND CANADIAN BARBED WIRE OR EQUIVALENT ALLOWED IF REQUESTED BY THE LANDOWNER.
4. ANY FENCE MODIFICATIONS TO BE APPROVED BY GREENVIEW IN WRITING.
5. ALL FENCING TO BE 0.3m OR GREATER ONTO PRIVATE PROPERTY.
6. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

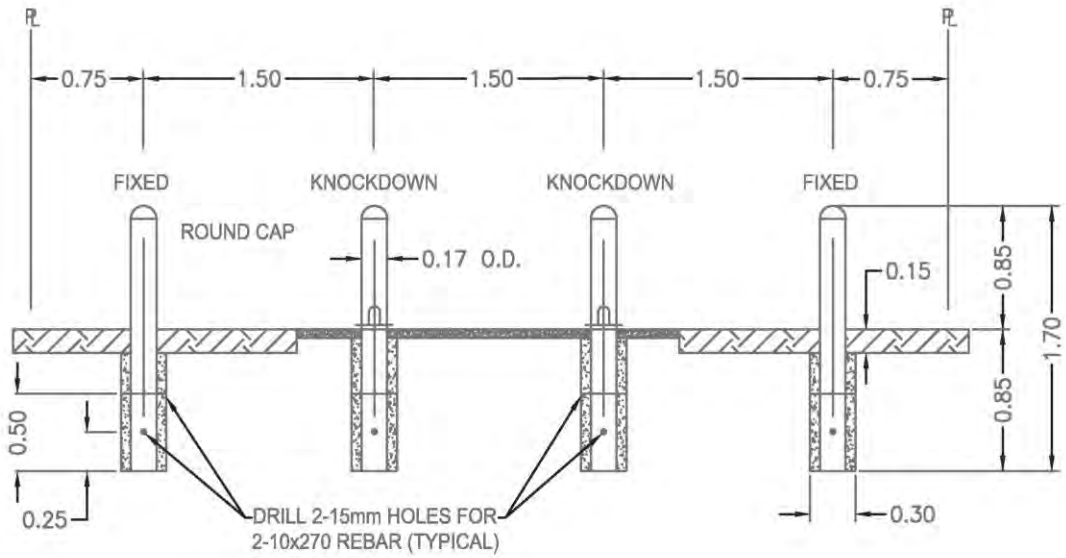
N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

MODIFIED
CLASS 'B' FENCING
MUNICIPAL SERVICING STANDARDS
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.5





NOTES:
1. ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED.
2. OD = OUTSIDE DIAMETER.

N.T.S.

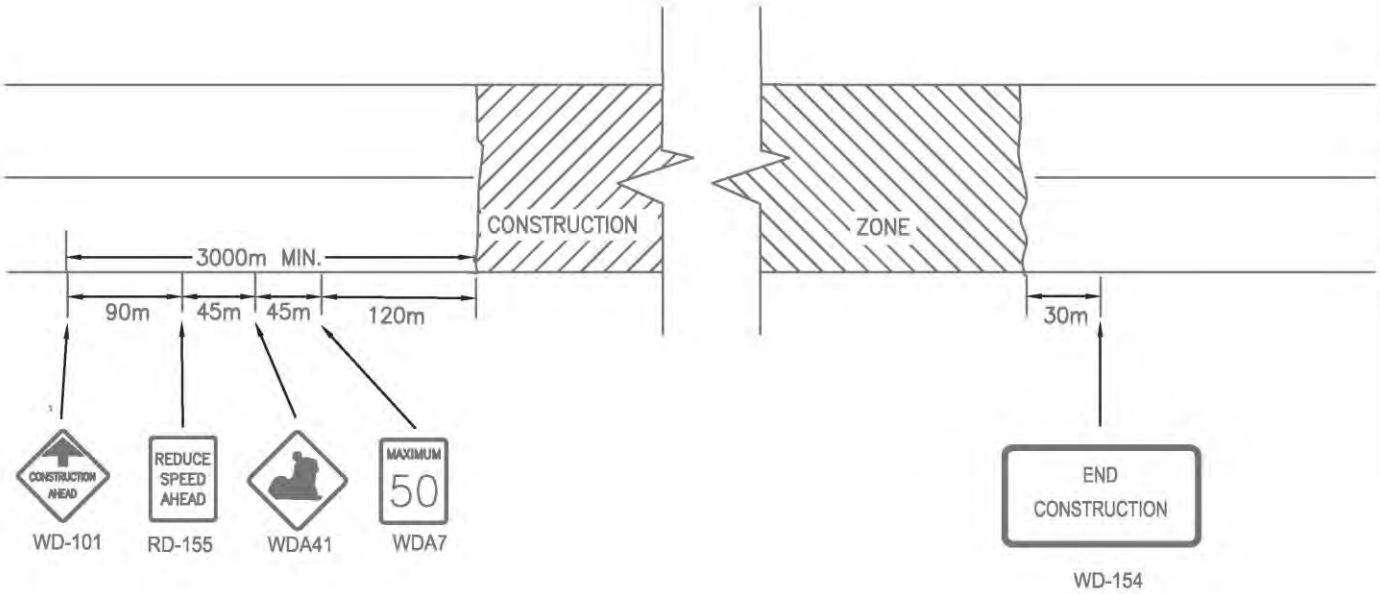
MUNICIPAL DISTRICT OF GREENVIEW No. 16

POST & CABLE FENCE-SECTION

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.6



NOTE:
1. EACH SIGN TO BE PLACED 3m FROM EDGE OF TRAVELED SURFACE WITH BOTTOM OF SIGN 1.5m ABOVE ROAD TRAVEL.
2. REPEAT SIGNING FOR EACH DIRECTION OF TRAVEL SURFACE.
3. ALL SIGNS TO BE INSTALLED ON METAL OR WOOD STANDARDS.
4. MIN. STANDARDS FOR SIGNS SHALL CONFORM TO STANDARD SPECIFICATION NUMBERS ABOVE.
5. ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

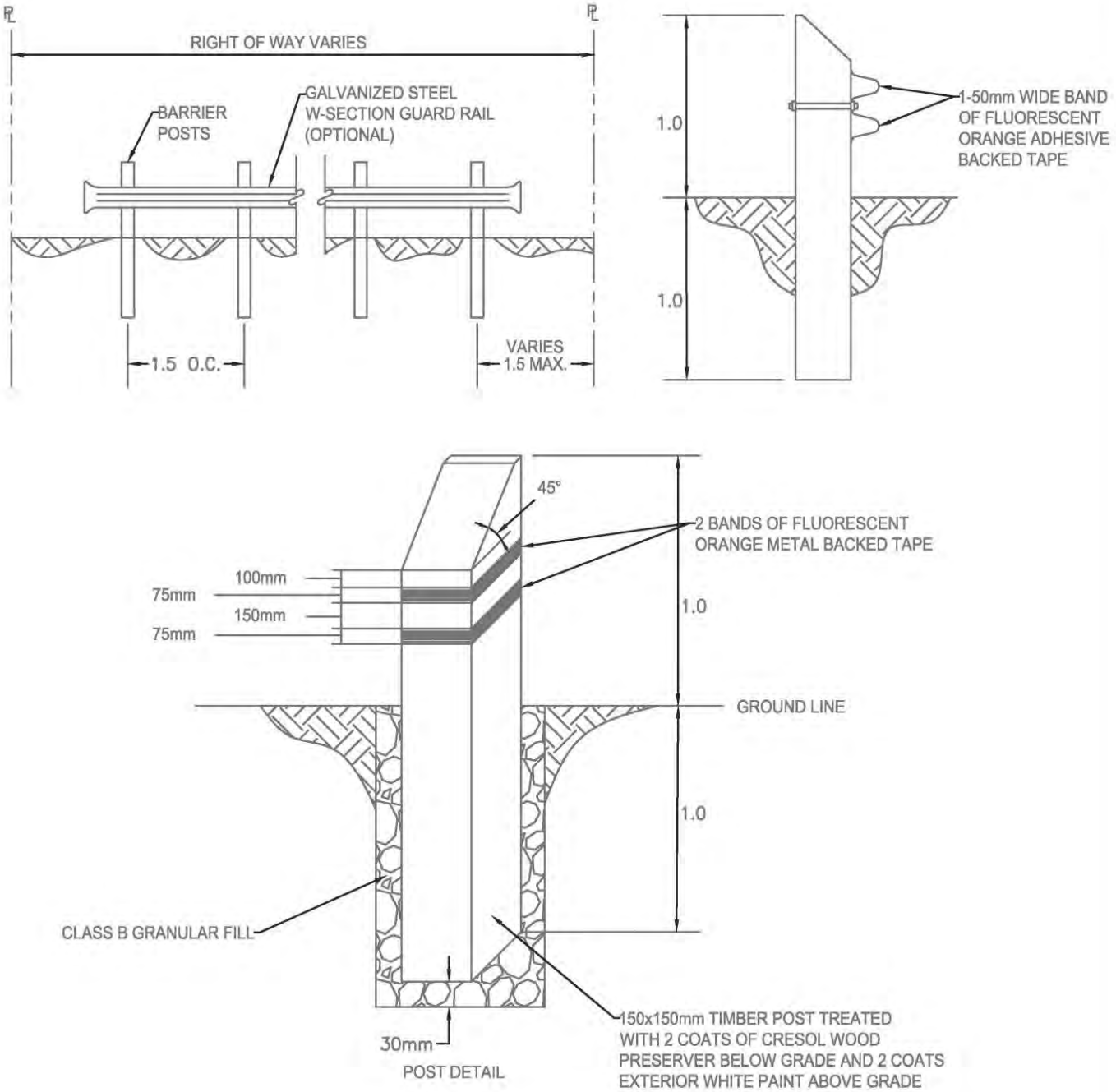
MUNICIPAL DISTRICT OF GREENVIEW No. 16

MINIMUM CONSTRUCTION SIGNING

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.7



NOTES:
1. ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

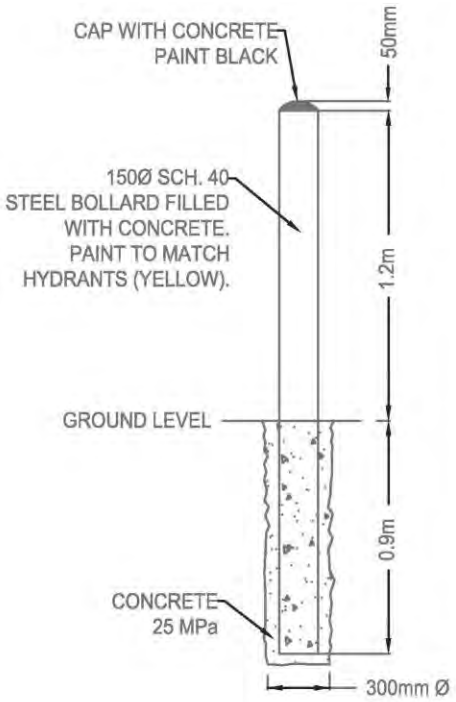
MUNICIPAL DISTRICT OF GREENVIEW No. 16

INSTALLATION OF GUARDRAIL OR BARRIER POST

MUNICIPAL SERVICING STANDARDS

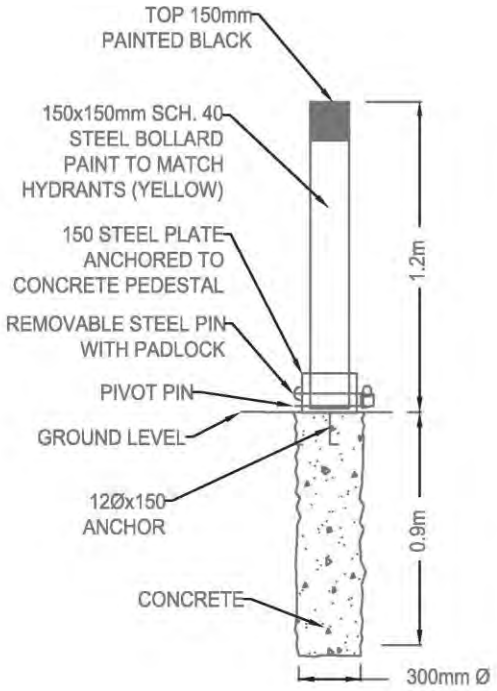
MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.8



TYPICAL

PERMANENT BOLLARD



TYPICAL

KNOCKDOWN BOLLARD

NOTE:

1. ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

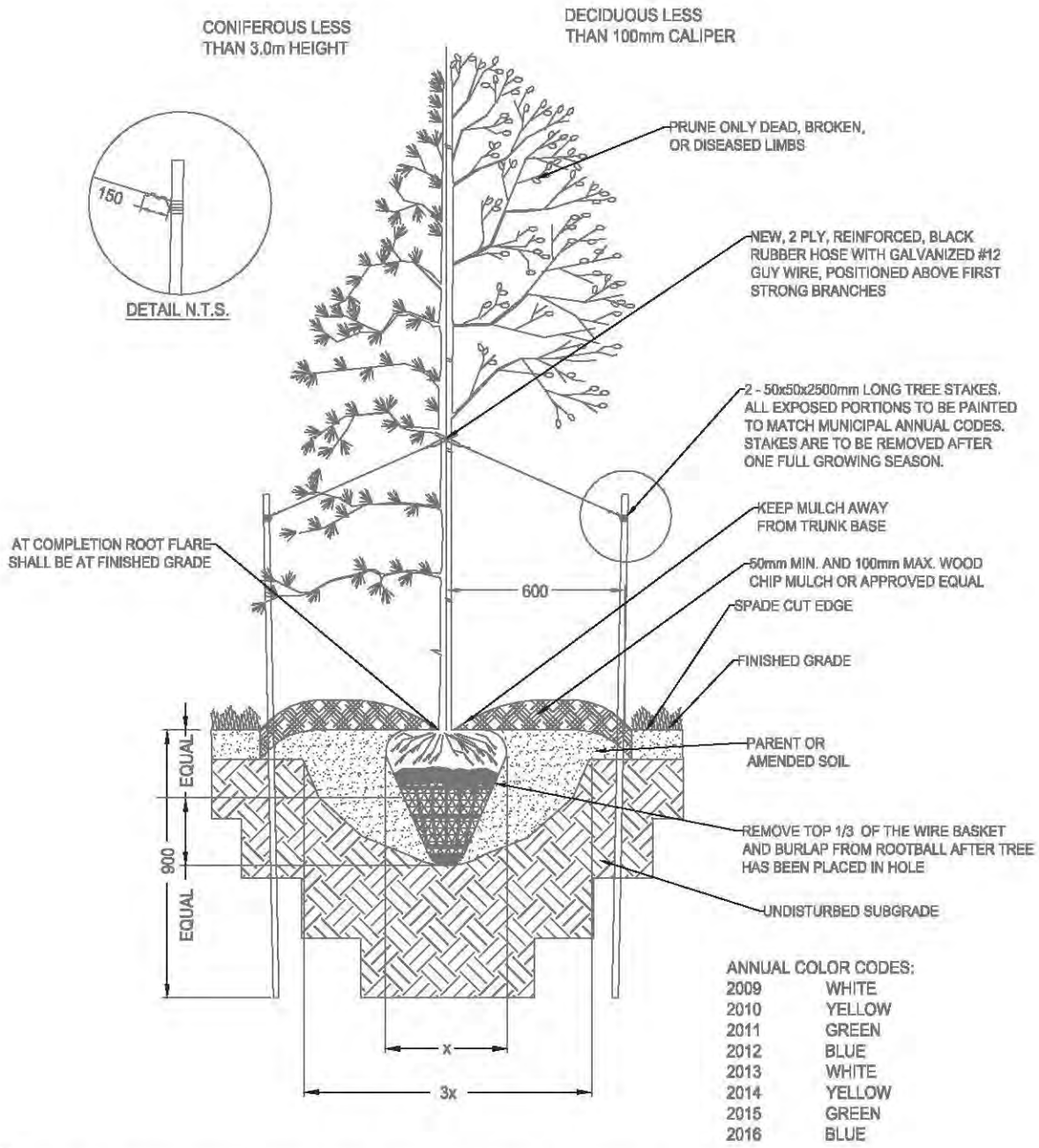
MUNICIPAL DISTRICT OF GREENVIEW No. 16

FIXED & KNOCKDOWN BOLLARDS

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.9



ANNUAL COLOR CODES:

2009	WHITE
2010	YELLOW
2011	GREEN
2012	BLUE
2013	WHITE
2014	YELLOW
2015	GREEN
2016	BLUE

NOTES:
1. IF MIN. UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS.
2. ALL TREES TO MAINTAIN A MIN. CLEARANCE AS SET OUT IN THESE STANDARDS FROM ALL UTILITIES.
3. DIG ALL ROOT HOLES BY HAND WHEN TREE PIT IS CLOSER THAN 1m FROM EDGE OF PIT TO THE STAKED UTILITY LINE.
4. ALL SPECIMEN SHALL MEET THE CANADIAN NURSERY LANDSCAPE ASSOCIATION STANDARDS.
5. TREES LARGER THAN 100mm CAL. OR 3.0m HEIGHT REQUIRE 3 TREE STAKES.
6. ALL PAINT MATERIAL SHALL MEET THE HORTICULTURAL STANDARDS AND PRACTICES OF THE CANADIAN NURSERY LANDSCAPE ASSOCIATION.
7. SITES WITH HEAVY CLAY SHALL HAVE A LARGER THAN NORMAL HOLE AND EQUAL MIX OF SOIL FROM HOLE, ORGANIC MATTER AND SAND.
8. AVOID GLAZING THE SIDES OF THE HOLE. SIDES OF HOLE SHALL BE SCARIFIED.
9. ALL DIMENSIONS SHOWN IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

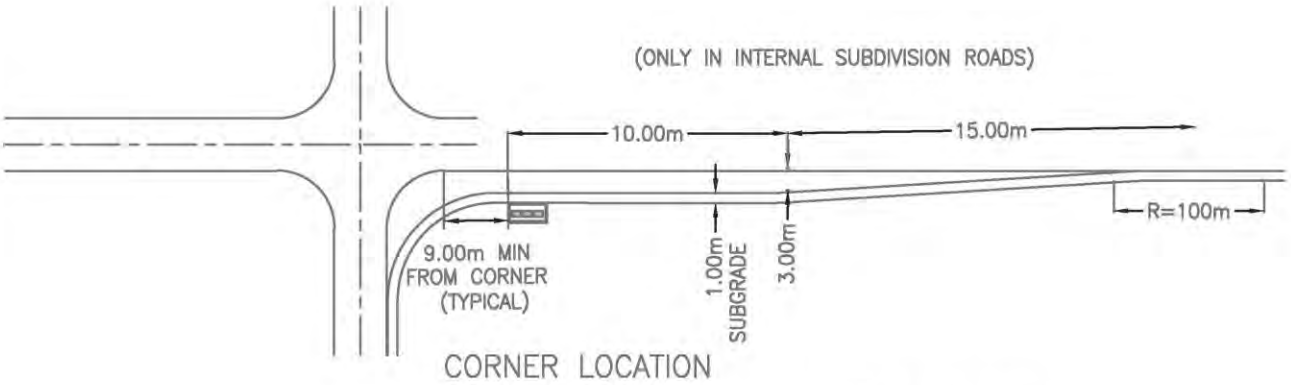
MUNICIPAL DISTRICT OF GREENVIEW No. 16

TREE PLANTING DETAIL

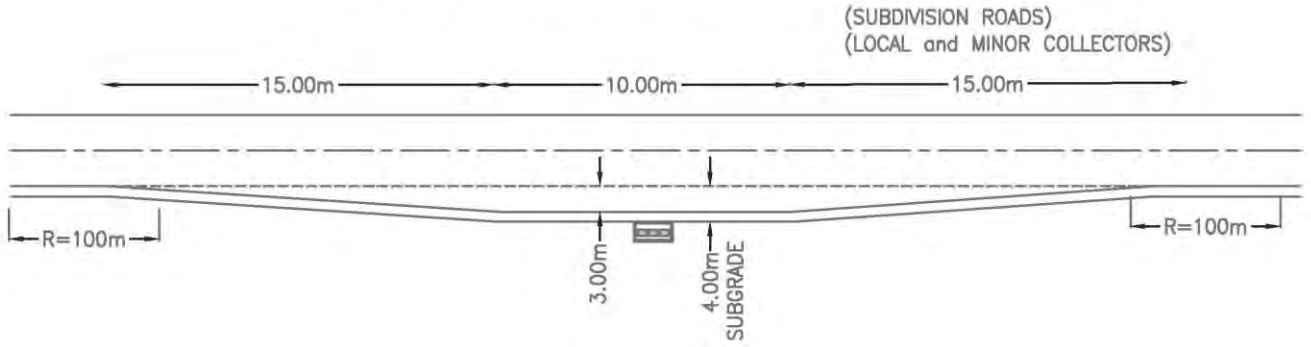
MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

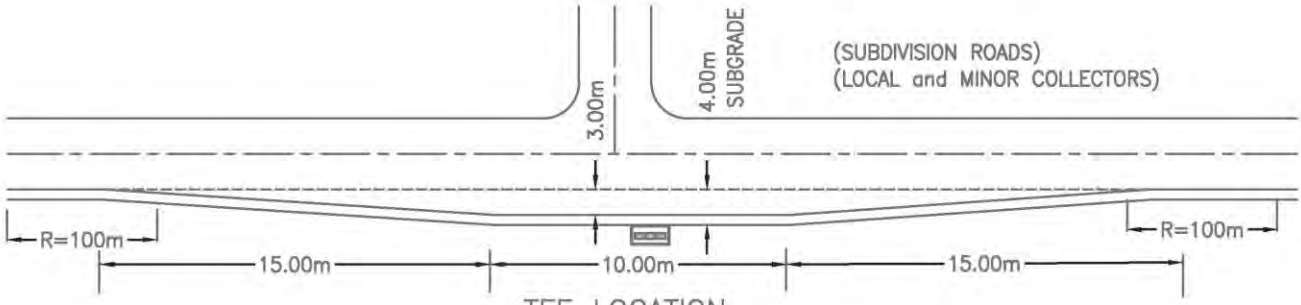
SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.10



CORNER LOCATION



MID BLOCK LOCATION



TEE LOCATION

NOTES:

1. STANDARD COMMUNITY MAILBOX INSTALLATIONS ARE DONE BY CANADA POST.
2. EACH COMMUNITY MAILBOX (CMB) LOCATION IS CHOSEN BY THE DELIVERY PLANNER AFTER CONSULTATION WITH THE PROPERTY DEVELOPER AND GREENVIEW.
3. CMB SHOULD BE LOCATED A MINIMUM OF 9m FROM INTERSECTION CORNERS, SO AS NOT HAMPER DRIVER VISIBILITY.
4. CMB SITES SHOULD NOT BE INSTALLED AT MAJOR INTERSECTIONS.
5. SITE SELECTION CRITERIA MUST BE CONSIDERED WHEN PLANNING THE LOCATION:
   - AT A NATURAL ENTRY POINT TO A DEVELOPMENT,
   - WITHIN A BOULEVARD OR AT A CONVENIENT LOCATION WITHIN THE DEVELOPMENT
   - NEAR EXISTING LIGHTING FIXTURES.
6. WHERE A COMMUNITY MAILBOX IS TO BE LOCATED ON PRIVATELY HELD LAND, THE PROPERTY OWNER MUST GRANT CANADA POST A LICENSE TO OCCUPY THE LAND, THIS LICENSE IS AVAILABLE FROM YOUR DELIVERY PLANNER.
7. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

N.T.S.

MUNICIPAL DISTRICT OF GREENVIEW No. 16

MAILBOX PULLOUT LOCATIONS

MUNICIPAL SERVICING STANDARDS

MUNICIPAL DISTRICT OF GREENVIEW No.16

SPEC. REFERENCE	
DATE:	JAN. 2015
REVISED:	SEPT 2025
DRAWING NO:	9.11

Docusign Envelope ID: 75455426-C5A5-4DED-807C-47669DC38AAA

ADMINISTRATIVE POLICY

Title: Topsoil & Fill Material Sourcing

Policy No: 04-01

Effective Date: 7/16/2025

Responsible Department: I&E

Review Date: July 2028

Legal References:	**Cross References:**
Alberta *Weed Control Act* Alberta *Weed Control Regulation* Canada *Seeds Act*	Greenview's Development Guidelines & Municipal Servicing Standards Bylaw 22-894 Designated Noxious Weeds

Purpose: to standardize the sourcing of topsoil and fill material within Greenview boundaries, that limits distance and soil contamination (ie. weeds), and promotes Greenview businesses where economically practical.

1. DEFINITIONS

1.1. **Approved Laboratory** means a laboratory certified to conduct soil testing.

1.2. **Area Properties** means any property within the boundaries of Greenview, where the landowner/resident is privately selling topsoil or fill material.

1.3. **Close Proximity** means within 100km radius of the project site, *when possible*.

1.4. **Greenview** means the Municipal District of Greenview No. 16.

1.5. **Fill Material** means any mixture of sand, clay, and broken-down minerals for the purposes of filling landscaping space (ie. a foundation structure, approaches, road building, etc.).

1.6. **Topsoil** means the surface layer of soil which supports good vegetative growth (and is suitable for use in top dressing, landscaping and seeding).

1.7. **Weeds** means plants that are designated as Noxious or Prohibited Noxious under the Alberta *Weed Control Act* or elevated locally by Greenview to become such.

1.8. **Weed Analysis** means the examination of soil to detect and identify the type, abundance and potential impact of weed species present.

2. POLICY STATEMENT

2.1. Topsoil containing known and actively growing noxious or prohibited noxious weeds, seed or live root is not acceptable for use in any Greenview project.

2.2. Any project within Greenview shall include a plan for the retention of as much original topsoil and fill material as feasible, from the project location.

2.3. All **topsoil** and/or **fill material** used for Greenview projects, should be:

2.3.1. sourced from within as close proximity to the project locations as possible;
2.3.2. sourced from within Greenview's boundaries, where economically practical;
2.3.3. free of any weeds from outside of the project area;
2.3.4. sourced from area properties or local businesses, when possible.

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2.4. Following best practices, a weed analysis should be performed by an approved laboratory for the purpose of identifying the seed types present in the soil, for future weed control and management upon vegetation growth. Such testing should not cause any substantial delay in the project schedule.

3. PROCEDURE

3.1. Administration shall seek out sources from **within** Greenview boundaries:

3.1.1. primarily from an area property(ies); or
3.1.2. alternatively, from local businesses.

3.2. Should all sources within Greenview be exhausted without success, or should a source within Greenview boundaries not be fiscally responsible, then Administration will seek out the nearest outside source, which must be a business.

3.3. Administration shall seek out available laboratories for conducting a weed analysis. Should a weed analysis not be reasonably accessible/practical, a site visit should be arranged to visually determine weed types growing in the area.

4. ROLES AND RESPONSIBILITIES

4.1. The Department overseeing the project is responsible for sourcing topsoil and fill material.

Stacey Wabick
CHIEF ADMINISTRATIVE OFFICER