LLOYDMINSTER

MUNICIPAL DEVELOPMENT STANDARDS

SECTION 11 – SINGLE LOTS (DEVELOPMENT PERMITS)

October 2020

Planning & Engineering

TABLE OF CONTENTS

11 SINGLE LOTS (DEVELOPMENT PERMITS)

11.1 Foreword

Engineering review by the City of design drawings for Development Permits is required for all lots apart from new (greenfield) single family residential lots. The City's review and approval constitutes only an indication of acceptance by the City that the plans are compliant with the requirements of the City's Municipal Development Standards (MDS). The ultimate responsibility for the design of the plans, their implementation, and their effectiveness rests solely on the Applicant. Additionally, the Applicant must be able to demonstrate that the City's infrastructure (transportation, water, sanitary sewer, and stormwater management networks) has the capacity to accommodate the new development. In any case, all construction activities must be compliant with the requirements of the MDS and Standard Drawings.

The City's Land Use Bylaw puts forward a list of permitted and discretionary uses for each land use district, in addition to defining numerous design parameters. Any development carried out on a single lot must also be compliant with the Land Use Bylaw.

11.2 Definitions

These definitions are specific to Section 11.

Applicant – the individual or company who applied for the Development Permit for the lot. The Applicant also either constructs or arranges the construction of the development.

City – the corporation of the City of Lloydminster, its departments, employees and representatives.

Commercial – for the purposes of this section, commercial properties include commercial, industrial, institutional, and multi-family developments.

Engineering Licensee - a registered or licensed member, in good standing, of the Association of Professional Engineers and Geoscientists of Saskatchewan who has been granted a limited license to practice engineering in the Province of Saskatchewan. Note that this person can only certify documents or plans pertaining to properties in Saskatchewan, within the scope of their license.

Land Surveyor – a registered or licensed member, in good standing, of the Alberta or Saskatchewan Land Surveyor's Association, dependent upon which Province the development is in.

Licensed Professional – a Land Surveyor, Professional Engineer, Professional Licensee, Professional Technologist or Engineering Licensee licensed to practice by their governing body in the Province the development is in.

Major Development – development of a parcel which features multiple buildings connected to municipal services and/or has a lot area greater than 2.0 hectares.

Owner – any person or company who is registered under the Land Titles Act as the owner of the lot, or any other person in lawful possession of the lot, or who is in lawful possession or occupancy of any buildings situated on the lot, or any agent of, or person acting on behalf of the Owner.

Professional Engineer – a registered or licensed member, in good standing, of the Association of Professional Engineers and Geoscientists of Alberta or Saskatchewan, dependent upon which Province the development is in.

Professional Licensee - a registered or licensed member, in good standing, of the Association of Professional Engineers and Geoscientists of Alberta who has been granted a limited license to practice engineering in the Province of Alberta. Note that this person can only certify documents or plans pertaining to properties in Alberta, within the scope of their license.

Professional Technologist – a registered or licensed member, in good standing, of the Association of Science and Engineering Technology Professionals of Alberta who has been licensed to practice engineering in the Province of Alberta. Note that this person can only certify documents or plans pertaining to properties in Alberta, within the scope of their license.

Surface Works and Lot Grading Plan – a grading plan (drawing) submitted by the developer of a subdivision for final approval of a subdivision, which is approved by the City and illustrates the drainage systems and patterns common to two or more lots in a subdivision. The Surface Works and Lot Grading Plan is retained by the City and amended from time to time as required to reflect revisions arising from lot and building construction.

11.3 Pre-Development Meeting

The Applicant is encouraged to arrange a pre-development meeting with the City prior to summitting a Development Permit application, particularly if the proposed development features unique aspects or challenges, will a require a deviation from the Municipal Development Standards, is classified as a Major Development, or will have a significant impact on the City's service infrastructure. The purpose of this meeting is to discuss any enhanced requirements the City may have, and to allow the Applicant and their consultant(s) to request any clarifications regarding unique aspects of design of the development.

11.4 Traffic Impact Assessment

A traffic impact assessment (TIA) will be required whenever a proposed development will have a significant impact on the adjacent transportation system. If, in the opinion of The City, the development will have insignificant impact on the transportation system, a TIA may not be required. In general, a TIA should be required for developments generating more than 100 vehicle trips in the peak hour, as calculated using the latest edition of the Trip Generation Manual published by the Institute of Transportation Engineers. The TIA should adhere to the Lloydminster Traffic Impact Analysis Guidelines. Additional guidance may be obtained from The City.

11.5 Submission and Approval

The Applicant must submit the following to Planning & Development for engineering review and approval:

- One (1) set of full-size design drawings, and one (1) set of design drawings in PDF format, detailing the drainage and servicing of the lot; and
- Rationale calculations determining the storm runoff flows for a 1:5 year rain event, and Manning calculations demonstrating the storm water service pipes are sufficiently sized to convey those flows, including an expression of the design flow as compared to the maximum capacity, either as a percentage or a ratio. This requirement is waived for lots that only drain over land.

All drawings, and calculations should they be provided separately, must be sealed by a Professional Engineer licensed to practice in the Province the development is located. In the event the documents are digitally sealed, the Professional Engineer must email the digital files directly to Planning & Development, planning@lloydminster.ca.

11.5.1 Approval by the City

The City will inform the Applicant, within twenty (20) working days after receipt of the detailed design submission, whether the Applicant's submission has been approved. Should the City not approve any part of the Applicant's plans, they will be returned to the Applicant for revision to the satisfaction of the City. The twenty (20) working day approval period will begin again on the receipt of any re-submission.

Subsequent design submissions requiring changes to the previous submission must consist of the following:

- One (1) complete printed set of drawings and one (1) set in PDF format; and

- All subsequent submissions must have any changes made by the design engineer, as well as changes required by the City, to be clearly described and explained in a letter accompanying the new drawings.

11.5.2 Design Revisions after Approval

Whenever it is necessary, for any reason, to make changes to the design drawings after they have been approved, one (1) full size print and one (1) PDF format copy of each original drawing affected must be submitted with the proposed changes shown in red, accompanied by a letter outlining the reasons for the required changes. The City will inform the Applicant within five (5) working days after receipt if the proposed changes meet the approval of the City. One (1) copy of the requested change will be signed and returned, accompanied by a letter authorizing the changes to be made to the original approved detailed design drawings. No changes are to be made to any original approved drawings without following this procedure. The City may, at their sole discretion, opt to waive the requirement for revised drawings if, after reviewing the proposed changes, they are deemed to be minor.

11.5.3 Municipal Development Standards Deviation Process

The Applicant must identify and provide justification for any deviations or non-conformances from the MDS in the submission. Otherwise, the submission of detailed design drawings must be in accordance with the MDS. The City has the obligation to set minimum standards and is therefore the final authority as to whether deviations from the MDS that may have an impact upon its infrastructure or other properties are accepted or not.

Note that under no circumstances will a deviation from the MDS be considered by the City without the submission of detailed documentation demonstrating the justification for the deviation and the added benefit to the City.

11.6 Detailed Engineering Design Drawings

All submitted engineering design drawings must conform to the following criteria:

- On paper sized A2/ARCH C or larger, and within a title block;
- Scaled and dimensioned in a standard metric scale;
- All elevations referenced to either the geodetic datum or a clearly defined site benchmark;
- All text of a size and shade as to be clearly legible;
- Existing and proposed linework, line types, blocks and hatching clearly identified in a legend;
- All surface elevations to two (2) decimal places;
- All slopes to two (2) decimal places;
- All invert elevations of pipes to three (3) decimal places;
- All surface elevations of structures (manholes, catch basins, valves) to three (3) decimal places;
- Property lines, easements, rights of way and setbacks;
- Footprint of all buildings;
- North arrow;
- Radii of all curves identified;
- Street name(s), lot and block number, and civic address of the property;
- Phasing limits, if applicable; and
- Project name and applicant information.

Drawings not conforming to these criteria may be returned for revision prior to formal review.

11.6.1 Engineering Design

The Applicant must retain an Engineering Consultant who will be responsible for the design and preparation of drawings and specifications for all services (except lighting, telephone, cable television, gas, and power) as required. All services must be designed in accordance with the MDS.

The design drawings must show all existing and proposed services. It will be the Consultant's responsibility to coordinate with the utility companies to establish the location of their existing and proposed services.

11.6.2 Responsibility for Existing Municipal Structures and Utilities

The presence and location of underground utilities indicated on any plans that have been supplied by the City or otherwise determined from existing records are not guaranteed. These must be investigated and verified in the field by the Applicant. The Applicant will be held responsible for maintenance and protection of, and for any damage to, existing municipal structures and utilities during construction. All existing valves are only to be operated by the City's Water Services staff.

11.7 Required Drawings

11.7.1 Grading and Drainage Plans

These drawings must include, at a minimum, the following existing and proposed information:

- Curb lines, sidewalks, trails;
- Location of existing approaches or driveways of adjacent properties, including those on the opposite side of the roadway;
- Limits of construction;
- Limits and material of all surfaces;
- Existing lot elevations as measured by a topographic survey;
- Location of the site benchmark, if used;
- Design lot elevations, including lot corner elevations and building corner elevations;
- Finished floor elevations of all buildings;
- Slope arrows indicating the direction and slope of surface drainage. The slope of these arrows must be supported by design elevations at both ends;
- Swales, if used, will include both the channel slope and the side slopes to the channel, and bottom width;
- Centreline slope of all approaches, including residential driveways;
- Curbs, if used, will include both face of curb elevation and height of curb;
- Depth and extents of any ponding occurring during a 1:100 year or surcharge event (e.g. service pipe to the main has become blocked);
- Major overland flow path during a 1:100 year or surcharge event, from each trapped low spill point to the exit point from the property. It is preferred this exit point be located at an approach; and
- Both temporary and permanent elements of the ESC plan, including, but not limited to, rock riprap, berms, ditches, dykes, and synthetic materials provided for overland discharge points.

Should a Surface Works and Lot Grading Plan not exist for the area, the Licensed Professional must prepare a drawing showing the existing surface elevations at property corners, as well as surface elevations along shared lot lines to determine the existing side lot slopes, including any points of a change in slope. In addition, the geodetic elevation of a site benchmark (preferably the CC stamp on the sidewalk, unless the services are being replaced) will be identified.

11.7.1.1 Lot Grading Design

Lot grading plans are required for most property developments involving building construction or surface improvements and are a requirement of a development permit or pursuant to requirements of bylaws, regulations, other approvals or agreements.

The following criteria must be used when creating a lot grading plan:

- Each lot must be graded to drain to the municipal storm drainage system, independently of adjacent lots, where possible;
- In a redevelopment area, if the existing grading condition accommodated drainage from an adjacent property, the grading and drainage plan must accommodate this drainage;
- Areas around buildings must be graded away from the foundations to prevent flooding:
    - For residential properties, at a minimum 5% slope for at least 3 metres from the sides (or to the property line, if it is closer than 3 metres), and at a 10% slope for at least 1.5 metres from the rear. See Standard Drawings 8-100 and 8-101 for typical residential lot grading requirements;
    - For commercial properties, at a minimum of 0.5% slope for hard surfaces (e.g. concrete, asphalt), 1.0% slope for compacted gravel, and 2.0% for landscaped areas;
- The garage slab elevation for single family residential properties on the Surface Works and Lot Grading Plan indicates a minimum elevation (0.36 metres higher than the design elevation of the adjacent property corner). This elevation may be increased as needed to achieve the minimum 5% side lot slope. The preferred maximum slope of the driveway is 8.3%, to conform to the Alberta Transportation Design Guidelines for Pedestrian Accessibility. Driveway slopes more than 10.0% will require approval from the City;
- The final surface elevations at property line must match those on the Surface Works and Lot Grading Plan, or the existing elevations in the case of an infill development;
- On single family residential lots, all other interior slopes, including concrete driveways, sidewalks and patios, must be a minimum of 2, with the exception of swales%;
- Where swales are used:
    - Concrete swales must have a minimum slope of 0.6% and a maximum slope of 25%;
    - Grassed swales must have a minimum slope of 1.5% and a maximum slope of 25%;
    - Swales should be aligned as straight as possible and sudden or sharp deflections of greater than 45° should be avoided;
- Where storm sewer services are available, commercial lots must drain internally to catch basins within the property;
- Buildings must be above the Major System hydraulic grade line for a 100-year storm event (or the spill elevation of ponding areas) plus a freeboard generally of 0.3 m but a minimum of 0.15 m. Note: this may not apply to replacement of structures/developments within existing flood plains. In these areas, suitable precautions, such as mounting electrical panels above the 1:100 year level, must be taken; and
- Ponding of water may be of a depth up to 300 mm. This may be permitted to be increased to up to 450 mm, at the City's discretion, in locations where there is limited risk of persons entering the ponding area(s).

11.7.1.2 Boulevards

It is the responsibility of the Applicant, and ultimately the Owner, of a single lot that is being developed to complete and maintain the lot grading and landscaping of not only the lot itself, but the boulevard space adjacent to the property. In this instance, the boulevard is that space between the property line and the back of the curb of the roadway excluding the sidewalk, or the edge of the travelled surface of the lane, should there be one. This space can only be landscaped with grass (topsoil and seed or

sod); any other plantings, surface treatments or equipment (such as subsurface irrigation systems) require approval from the City. This space can contain a variety of items, but specifically contains water service valves, fire hydrants and fire hydrant valves. The height of any water service valve (CC) must be adjusted such that the top of it is flush to the finished surface of the lot. Any fire hydrant must be freely accessible, and the finished surface of any landscaping must be a minimum of 50 mm below the top flange, and flush with the top of the isolation valve for the hydrant. Should the height of the hydrant or isolation valve prevent the landscaping from being reasonably completed, and needs to be adjusted, it must be adjusted either by the developer of the subdivision, or Water Services staff. A boulevard Tree Planting Permit (available on the City's website) must be obtained (in addition to the Development Permit) prior to planting any trees on City property, in accordance with the Tree Bylaw. The adjacent landowner is responsible for the care and maintenance of the tree. The City may remove any tree that interferes with a public work, utility, causes a safety hazard or obstruction, or is not maintained, and the City will not be obligated to replace the tree.

11.7.1.3 Municipal Reserves

It is common for properties to be adjacent to Municipal Reserves, maintained by the City as green spaces and parks. Adjacent landowners have no responsibility for maintaining this space and are not permitted to perform any landscaping or planting activities on the property. This extends to removal or alteration of the fence. This fence must remain in place. An exception to the landscaping restriction would be the planting of trees; a permit will need to be obtained prior to planting in accordance with the Tree Bylaw. Access to Municipal Reserve spaces that is needed to perform landscaping on private property can be requested in writing from Parks Division.

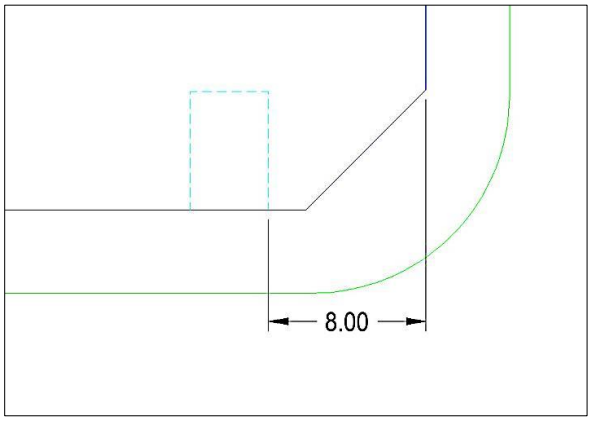
11.7.1.4 Approaches and Driveways

Urban approaches and driveways must be in accordance with the Transportation Association of Canada Geometric Design Guide for Canadian Roads and as modified herein. Driveway and approach aprons must be constructed in accordance with Standard Drawing 2-109 or 2-110. Approaches connecting to rural cross-section roadways must be constructed in accordance with Standard Drawing 1-201. Any installation of an approach or driveway which requires the removal of the existing curb and gutter must have the forms inspected by City staff prior to pouring concrete.

11.7.1.4.1. Residential Driveways

All driveways must be constructed to provide a minimum 1.5 m clearance from any structure such as hydrants, light-standards, service pedestals, and transformers. Driveways on corner lots must be located to provide a minimum of 8.0 m clearance from the property pin closest to the roadway that intersects with the road the driveway accesses, as illustrated in Figure 11.1.

Figure 11.1 - Residential Driveway Location



Where the space between adjacent driveways is filled with concrete, or where a contiguous driveway is shared between two properties, the elevations and slopes at property line must be such that the shared drainage between lots is collected at property line, as a continuation of the design slope, and conveyed to the roadway. See Standard Drawing 8-103.

Maximum driveway slopes are discussed in Section 11.7.1.1.

No residential driveways are permitted to be constructed on collector roadways, unless it can be demonstrated that the roadway will carry less than 4000 vehicles per day under the ultimate condition.

11.7.1.4.2. Commercial/Industrial Approaches

Commercial/industrial approaches must, at a minimum, be a horizontal distance of 10 m from the edge of the approach to the end of the nearest curb return and must be designed to accommodate the types of vehicles the business/industry will generate. Where possible, approaches must align with any existing approaches on the opposite side of the roadway.

Approaches will be reviewed and approved by the City on an individual basis, considering the requirements of the development, through the Development Permit process.

11.7.2 Commercial/Industrial Parking Lots

Parking lots for commercial or industrial developments adjacent to roadways must feature a hard paved surface (asphalt, concrete or other approved material) and must incorporate a barrier between the edge of the pavement and the roadway to prevent vehicles exiting the property at any point other than the approach. Materials that may comprise this barrier include curb, fencing, bollards or landscaping features.

11.7.3 Site Servicing Plans

These drawings must include, at a minimum, the following existing and proposed information:

- Location, diameter, material and invert elevation of existing service stubs;
- Alignment, diameter, length, material, slope and invert elevations of all proposed service pipes;
- Vertical separation distance between all service pipe crossings;
- Location and surface elevation of all service structures, including manholes, catch basins, valves, curb cocks and sanitary inspection risers;
- Configuration and connection details of any sump connected to the sanitary sewer service;
- Size, material and connection details of any internal roof leaders;
- A note that the service installation(s) must be inspected by the City prior to backfilling;
- Rationale and Manning calculations for storm water runoff, if not submitted separately; and
- Water daily demand and peak hour demand calculations.

Profiles of the service pipes must also be provided for review if the proposed development is classified as a Major Development, or it is required as part of the pre-development meeting.

See Section 7 (Service Connections) of the Standard Drawings for service connection installation details.

It is important to note that while the City reviews servicing design, and inspects lateral service installations, the City accepts no responsibility for the construction or maintenance of the services beyond the property line. Where new service connections to the main are required for whatever reason, all costs of the construction of those services and any associated surface restorations will be borne by the Applicant.

11.7.3.1 Separation of Storm and Sanitary Systems

All new systems or extensions from existing systems are to be designed on a separated basis. Run off from roofs, lots, streets and other outside areas including yards and parking areas and infiltration water from foundation drains and other sources, is to be excluded from the sanitary sewer system.

11.7.3.2 Sanitary Sewer Services

The design and construction of sanitary sewer service connections must conform to the City's Sewer Use Bylaw, as well as the following:

- Roof leaders, stormwater sump pumps, and weeping tile must not be connected to the sanitary sewer system. Where there is new development of existing areas where roof leaders and weeping tile are connected to the sanitary system, these connections must be removed;
- Trenching requirements:
    - In separate trench if larger than 200 mm; and
    - In a common trench with water service and stormwater sewer service laterals if smaller than 200 mm;
- The minimum size of sanitary sewer service connections to a single family dwelling is 100 mm;
- Sanitary sewer service connections for commercial, industrial, multi-family or institutional areas, must be 100 mm or greater based on required flows. The receiving system must have the capacity to accommodate the new flows;
- Changes in pipe size must be made either within a manhole, or by utilizing an eccentric reducer;
- Sanitary sewer service connections to single family dwellings from the main to property line must be designed for gravity flow with a minimum grade of 2.0%. All sanitary sewer service connections must provide a minimum of 2.85 m of cover from top of pipe at property line. If the sanitary sewer service minimum depth cannot be achieved, a servicing plan showing proposed insulation installation in conformance to Standard Drawing 4-101 must be submitted to the City for approval;
- All sanitary sewer service connections to a single family dwelling from property line to the house may not feature more than two bends, or a total deflection of greater 45°. The service must be sloped with a minimum grade of 2.0%, and a maximum grade of 10.0%;
- Any curved service pipes must not exceed the maximum allowable deflection as identified by the manufacturer;
- Sanitary sewer service connection materials must be polyvinyl chloride (PVC) SDR35 building service pipe conforming to CSA specification B182.2, latest revision thereof;
- Risers must be employed where the service connection at the main is 4.0 m or deeper;
- An inspection chamber located at 0.5 m inside the road right-of-way will be required on multifamily lot service connections, see Standard Drawing 7-202. If the inspection chamber is to be located within a hard surface, it must be protected with a metal driveway box (Royal Pipe Systems 71A08 or approved equivalent), see Standard Drawing 7-204;
- An inspection manhole located at 1.0 m inside the road right-of-way will be required on industrial and commercial sewer service connections, see Standard Drawing 7-203. This manhole may be either 900 mm or 1200 mm in diameter;
- Roof leaders and building foundation drains must not be connected to the sanitary sewer system;
- Any one lot may only have one sanitary sewer service connection to City mains. At the time of installation of new services to a building, any unused sanitary sewer service stubs on the lot must be abandoned at the main as per Section 10 of the MDS;
- In a redevelopment area, any existing services that are not PVC pipe must be upgraded to PVC pipe back to the main. Existing PVC services must be replaced unless they can be demonstrated to be in good repair and acceptable to the City, as well as certified by the Applicant's consultant as having the capacity to meet the requirements of the new development;

- All food processing establishments, shopping centres, service stations, vehicle washes, hotels/motels, manufacturing, equipment servicing and cleaning facilities, institutions (churches, schools, etc.) and any other facility that is expected to discharge sediment and/or oil/grease must install and maintain devices (e.g. grease traps, oil/grit separators) to prevent the entry of these deleterious substances into the sanitary sewer system; and
- Any facility that makes use of and/or will be discharging contaminants listed within the Sewer Use Bylaw (including, but not limited to: cleaning agents, food scraps, pharmaceutical drugs, dental amalgam, and petroleum-based products) is strongly encouraged to participate in a pre-application meeting; in any case this information must be disclosed when applying for a Development Permit. Common facilities that may be subject to this requirement include vehicle washes, restaurants and food services/processing, oil field services, manufacturing, vehicle servicing, dry cleaning, laboratories, medical facilities, recreation facilities, and photographic and printing operations.

11.7.3.3 Stormwater Sewer Services

Stormwater sewer services must discharge to a storm sewer system. Sump pumps in basements must have a pressure discharge connection to a stormwater sewer service riser pipe at the outside of the building foundation and a stormwater sewer service connection pipe from the riser connection at the house to the property line are required, see Standard Drawings 7-302 and 7-303. The pressure discharge connection to the gravity stormwater sewer service riser pipe must be provided with a clean out and an overflow discharge to a concrete splash pad. In areas without storm sewers, the discharge must be directed to a splash pad, as detailed in Standard Drawings 7-304 and 7-305. Installation and maintenance of these on-lot components are the responsibility of the property owner. Roof leaders of single family residential properties must not be connected to the stormwater sewer service riser pipe. All stormwater discharge must conform with the requirements of the Sewer Use Bylaw.

The following criteria must be used in the design and construction of stormwater sewer services:

- A stormwater sewer service must not be discharged to the sanitary sewer system under any circumstances;
- All stormwater sewer service connections to a single family dwelling from property line to the riser may not feature more than two bends, or a total deflection of greater 45°. The service must be sloped with a minimum grade of 2.0%, and a maximum grade of 10.0%;
- Preferably the depth of the stormwater sewer service should match that of the sanitary sewer service at the property line, 2.85 m from invert to proposed finished grade. Otherwise the stormwater sewer service must be a minimum depth of 1.5 m from top of service pipe to finished grade at the property line. If the stormwater sewer service minimum depth cannot be achieved, a servicing plan showing proposed insulation installation in conformance to Standard Drawing 4-101 must be submitted to the City for approval;
- Size the stormwater sewer services to be able to accommodate the 1:5 year storm event, with a minimum size of 100 mm for residential properties and 150 mm for commercial or industrial properties. The receiving system must have the capacity to accommodate the new flows;
- Changes in pipe size must be made within a manhole, catch basin, or by utilizing an eccentric reducer;
- Any one lot may only have one stormwater sewer service connection to City mains. At the time of installation of new services to a building, any unused stormwater sewer service stubs must be abandoned at the main as per Section 10 of the MDS;
- Pipe materials must be restricted to PSM type PVC SDR 35 or PVC profile with a 320 kPa pipe stiffness;

- In a redevelopment area, any existing services that are not PVC pipe must be upgraded to PVC pipe back to the main. Existing PVC services must be demonstrated to be in good repair and acceptable to Wastewater Services, as well as for the requirements of the new development;
- All fuel stations, oilfield service operations, and any other facility that is expected to discharge sediment (such as those with large gravelled yards) and/or oil/grease must adhere to the Sewer Use Bylaw with respect to their discharge. The prevention of the transport of sediment may require an oil/grit separator, the sump of which is to be cleaned regularly; and
- Any facility that may potentially discharge contaminants listed within the Sewer Use Bylaw is strongly encouraged to participate in a pre-application meeting; in any case this information must be disclosed when applying for a Development Permit. The design of the discharge must include the measures taken to maintain the effluent quality described within the Sewer Use Bylaw and prevent the introduction of contaminants into the environment. Common facilities that may be subject to this requirement include vehicle washes, food processing, oil field services, manufacturing, and vehicle servicing.

11.7.3.3.1. Roof Drainage

Roof drainage from single family dwellings must be discharged to the ground and dispersed via splash pads at the downspouts. No connections to the storm or sanitary service are permitted.

Roof drainage from apartment buildings and commercial/industrial areas may discharge to the storm sewer where the new and existing systems are designed to accommodate the direct discharge and only if approved by the City.

11.7.3.3.2. Culvert Design

Culverts placed within City ditches will require approval from the City.

Culvert size requirements must be determined through the stormwater drainage analysis however, the minimum size of culverts must be as follows:

- Residential approach culvert 400 mm
- Industrial approach culvert 500 mm

Culverts must be made of approved material with a minimum wall thickness of 1.6 mm for pipe sizes of 400 mm up to 600 mm and 2.0 mm for pipe sizes up to 900 mm, or as required by the loading criteria. The corrugation pattern must be 68 mm pitch and 13 mm depth. All culverts must be installed in accordance with the manufacturer's recommendations, bedded on granular base, and must be installed complete with bevelled end sections on both the inlet and outlet ends with the invert extended to the toe of the side slope.

Culverts must be installed to provide a minimum depth of cover of 500 mm or one-half (½) the culvert diameter, whichever is greater, as measured from the finished shoulder grade of the roadway to the top of the culvert. This cover material must be compacted to a minimum of 100% Standard Proctor Density before any equipment or vehicles are permitted to travel over it.

Riprap must be placed around the inlet and outlet of all culverts. Riprap material will consist of rock ranging in size from 150 mm to 350 mm with 50% of the rock material being larger than 200 mm. Typical riprap installations are illustrated in Standard Drawings 5-300 and 5-304.

The property owner will be responsible for maintenance of the culvert, including cleaning it periodically of debris and, where necessary, replacement or repair of damage which may occur over time.

11.7.3.3.3. Stormwater Management Storage Facilities

The design of wet ponds should adhere to the requirements of Section 5.6.2.1, however a pond surface of less than two (2) hectares may be permitted. The design of dry ponds should adhere to the requirements of Section 5.6.2.2.

Any proposed privately-owned control structure that, when operated, may result in the release of potentially contaminated materials must be accompanied by an operation procedure detailing how the discharge is monitored for contaminants to be reviewed and approved by the City. The procedure will include the keeping of records that will be made available to the City upon request, and a requirement that City staff verify the absence of contaminants, or levels in compliance with the Sewer Use Bylaw, prior to release.

11.7.3.4 Water Services

The design and construction of water service installations must conform to the following:

- Water service pipe:
  - Approved Materials are listed in Section 6.15;
  - Flexible pipe service connections must be Q-line. For service connections 37 mm to 50 mm, high density polyethylene (HDPE) is permitted;
  - Service connections larger than 50 mm must be PVC;
  - Couplings must be Standard Brass, compression type;
  - Dwellings without sprinklers 19 mm or 25 mm for services less than 30 m in length;
  - Sprinklered dwellings 37 mm minimum;
  - Multi-family/commercial sized accordingly;
- Water service fittings:
  - Approved materials are listed in Section 6.15; and
  - Curb stop will be stop and drain type;
- Water and sanitary sewer services in a common service trench must have the following minimum horizontal separation, based on the water service diameter:
    - 50 mm diameter or less: 0.3 m
    - Greater than 50 mm to less than 100 mm diameter: 2.0 m
    - Separate trenches required for services 100 mm diameter or larger
- Water service connection pipes must have minimum 2.85 m cover at the property line. If the water service minimum depth cannot be achieved, a servicing plan showing proposed insulation installation in conformance to Standard Drawing 4-101 must be submitted to the City for approval;
- Locate water service curb stops as per Standard Drawings 7-101, 7-102 and 7-103;
- Any one lot may only have one water service connection to City mains. At the time of installation of new services to a building, any unused water service stubs must be abandoned at the main as per Section 10 of the MDS, and the curb cock must be replaced prior to removal of the water meter. The cost of this replacement will be borne by the Applicant;
- Where there is more than one serviced building on a lot, each building will be connected separately to the lot's water service;
- Where the service is flexible pipe, it is to be one continuous piece from the union at the curb cock to the water meter; and
- If the daily demand exceeds 200 m^3 and/or the peak hour demand exceeds 50 m^3 per hour, justification for the high demand must be provided, and the Applicant must demonstrate there is capacity within the distribution network to support these demands.

11.7.3.5 Fire Hydrants

Hydrants must conform to the following requirements:

- Hydrants must not be connected downstream of a water meter for any reason;
- Hydrant main spindles must turn to the left (counter clockwise) to open;
- Hydrants must have two (2) 65 mm hose connections and one (1) 100 mm pumper connection as presently used in the community; and
- Hydrant connections must have threads conforming to the Saskatchewan specifications:

  Hose Connection:
  - 6 threads/inch
  - Outside diameter = 82.55 mm

  Pumper Connection:
  - 6 threads/inch
  - Major diameter = 123.11 mm
  - Pitch diameter = 119.76 mm
  - Minor diameter = 116.41 mm

Hydrants must be enamel painted to CAN/CGSB-1.59. All hydrants located on private property are to be all red in colour.

11.7.4 Detail Drawings

Any structure or feature in a plan must reference the relevant Standard Drawing, either in the leader label of the feature, or in the notes, if one exists. Sites which require an oil and/or grit separator under the requirements of the Sewer Use Bylaw, including those that may contribute large volumes of sediment into the Storm Sewer system, must include a detail drawing of the proposed oil/grit separator. Buildings containing sumps which connect to the sanitary sewer must provide detail drawings of those sumps and their connection. Approval drawings for the development should include copies of all the referenced Standard Drawings for the contractor's reference.

11.8 REDEVELOPMENT AREAS

Development which occurs on a previously developed lot (sometimes referred to as infill), requires additional considerations. To maintain or improve the existing drainage of the developed property and those adjacent to it, a holistic approach, evaluating the overall performance of the lots together, is required. Examples of work which would be considered redevelopment are:

- Additions to existing structures, or the construction of additional permanent structures on the property;
- Redesign of the existing lot grading;
- Demolition of any or all permanent structures on a property to accommodate the construction of a new permanent structure; and
- Development of a lot that has been severed or subdivided from an existing developed lot.

The specific additional requirements for construction in redevelopment areas are:

- In the case of new construction, or comprehensive re-design of the grading of the lot, the grading and drainage plan will include the existing elevation of the CC stamp (or other easily identified fixed feature to be used as a benchmark), the existing surface elevations at all property corners, as well as sufficient surface elevations along shared lot sides to determine the existing side lot slopes, as well as sufficient topography of adjacent properties to verify existing drainage patterns. It must be demonstrated that runoff will not enter adjacent properties except for

shared drainage features, and that the proposed lot grading will not impede the drainage of adjacent properties. If it does, this drainage must be demonstrated to be reasonably accommodated to prevent ponding and/or flooding of the impacted properties. If the drainage design incorporates draining to a lane, it must be demonstrated that the lane will convey the runoff to a roadway;

- In the case of an addition or additional structure being constructed, the grading and drainage plan will include enough existing topography within the lot to determine the existing drainage patterns of the affected area(s) to the collection point(s), and what changes in grading will be required to accommodate the new structure;
- Any existing services must be abandoned at the mains in accordance with the requirements set out in Section 10 of the MDS and/or replaced with new materials acceptable to the City. Service connections may only be reused if they are demonstrated to be in good repair and are acceptable to both Water Services and Waste Services. Sewer services must be PVC to be reused;
- The water demand, and contribution to the sewer systems, both sanitary and stormwater, must be identified. Apart from single family residential development, it must be demonstrated that there is adequate capacity in the existing service systems to meet the needs of the new development, especially in cases of intensification of the land use; and
- Any unused existing access aprons within the City's road right-of-way must be removed and replaced with curb and gutter and/or sidewalk, to match the surrounding City infrastructure. The forms for these replacements must be inspected by City staff prior to pouring concrete.

11.9 DEVELOPMENT WITH PRIVATE SERVICES

Development that occurs on a lot within an area of the City that does not have municipal services (water, sanitary sewer, and storm water sewer) provided adjacent to it will not require connections to municipal services as described in Section 11.7.3 and may instead incorporate the installation of new private services (e.g. water wells, septic tanks, etc.). In this instance, any lot with a property line within 75 metres of municipal service mains will be deemed adjacent. If at any time municipal services are later provided adjacent to the lot, no private services may be newly installed, replaced, or expanded upon, in accordance with the Land Use Bylaw. Applicants are responsible to obtain all required permits and/or licenses required for these installations prior to commencing construction.

The design of any private sewage system or water well must be compliant with the requirements of the most current version of the relevant regulations, codes, and standards of the province the system is located within, including:

- Alberta's *Water Act*;
- Alberta's *Water (Ministerial) Regulation*;
- Alberta's *Private Sewage Disposal Systems Regulation*;
- *Alberta Private Sewage Systems Standard of Practice*;
- *The Saskatchewan Watershed Authority Act*;
- Saskatchewan's *The Ground Water Regulations*;
- Saskatchewan's *The Public Health Act*; and
- Saskatchewan's *The Private Sewage Works Regulations*.

11.10 GENERAL CONSTRUCTION REQUIREMENTS

All work for construction carried out by the Applicant must be in accordance with all Federal, Provincial and Local statutes, acts, bylaws and regulations, and meet the City's general requirements, as detailed later in this Section.

In addition to these requirements, all new connections to City mains, and all lateral service installations must be inspected by City staff, prior to backfill. The contractor will be required to expose any uninspected buried services for inspection, at their cost. A lateral service inspection can be scheduled by calling the City of Lloydminster Operations Centre at 780-874-3700. A minimum of 24 hours' notice is required. If work will be occurring during or following a weekend or holiday, the notice must be provided the working day before. Following the initial notice, on the day of the work, confirm the requested inspection time, allowing a minimum of two hours' notice.

Any excavation into the roadway to install lateral services must be restored as per the conditions of the Excavation Permit, with asphalt and concrete replaced no more than four (4) weeks from the time of the excavation.

11.10.1 Responsibility for Existing Municipal Structures and Utilities

The Applicant must ensure that existing infrastructure, such as sewer mains, watermains, roadways, sidewalks, curbs, and landscaped areas, are not disturbed, damaged, or become inoperable because of actions by the Applicant. Existing infrastructure must not be exposed to loadings beyond design capacities. Existing infrastructure must continuously be maintained and cleaned by the Applicant where their actions are cause for additional maintenance. Where the road surface or concrete have been disturbed, these areas should be restored to their original condition within two (2) weeks, but in any case, must be restored no more than four (4) weeks from the time the subsurface work is completed. The existence and location of underground utilities indicated on the plans that have been determined from the City's records are not guaranteed. These must be investigated and verified in the field by the Applicant. The Applicant will be held responsible for maintenance and protection of, and for any damage to, existing municipal structures and utilities during construction.

The Applicant will be solely responsible for dust control, and debris and mud removal from sidewalks, curb, gutter, and boulevards adjacent to the development for the duration of construction. The Applicant will also be solely responsible for ensuring silt and debris cannot enter catch basins within the development and areas directly adjacent to, or downstream of, the development in accordance with the Erosion and Sedimentation Control Plan, as described in Section 11.9.2. Any clay ramps constructed for the protection of concrete must be removed at the end of the work, and the concrete surfaces cleaned.

11.10.2 Erosion and Sedimentation Control

The Applicant, for all developments but single family residential, must have Erosion and Sedimentation Control (ESC) measures in place to prevent erosion and the transport of sediment from the development, or across stages of the same development, or into the receiving stream, as identified in an Erosion and Sedimentation Control Report, as described in Section 5.8.1.2.1 with supporting drawings and calculations, submitted for review and approval by the City. This report will be in general conformance with the relevant portions of the current editions of the "Erosion and Sedimentation Control Guidelines" and "Erosion and Sedimentation Control Field Manual" published by the City of Edmonton, and relevant portions of Section 5.8 of these Standards. The Applicant must comply with the Federal and Provincial acts, regulations, codes of practice, standards and guidelines that are applicable to development activities that result or could result in erosion, sedimentation and cause adverse effects on the environment or City infrastructure.

Developers of single family residential lots, while not required to submit an ESC Report since sedimentation control is implemented at the subdivision level, are strongly encouraged to follow applicable portions of these guidelines.

11.10.3 Barricades, Guards and Safety Provisions

The Applicant is responsible to protect persons from injury and to avoid property damage. The Applicant must place and maintain adequate barricades, construction signs, warning lights and guards during the progress of the construction work and until it is safe for traffic or pedestrian use. Whenever required, flag people must be provided to facilitate adequate traffic control.

11.11 Traffic and Utilities Controls

11.11.1 Approvals

At least five (5) days prior to any work commencing within the Municipal road right-of-way, the Applicant must obtain an Excavation Permit from Planning & Development, as well as a Road Closure Permit (if applicable) from Roadway Services (forms are available on the City's website, www.lloydminster.ca).

11.11.2 Traffic Disruption

Excavations carried out within the roadway must be conducted to cause the least interruption to traffic. Hydrants under pressure, valve pit covers, valve boxes, curb stop boxes or other utility controls must be unobstructed and accessible during the construction period. All applicable permits must be obtained before work can commence.

11.11.3 Utility Disruption

Adequate provision must be made for the flow of sewers, drains and water courses encountered during construction. Valves, switches or other controls on the existing utility system must not be operated for any purpose by the Applicant. If utility disruption is unavoidable, Water Services must have a written request for a temporary shutdown stating timelines for shutdown and a contingency plan for unforeseen problems. A minimum of five (5) days' notice will be required. A response will be given within twenty-four (24) hours to leave enough time to give affected residents and businesses a written notice a minimum of seventy-two (72) hours before shutdown. In an emergency, Water Services is to be contacted immediately for further instructions. All costs incurred by the City must be the responsibility of the Applicant.

11.11.4 Traffic Accommodation Strategy

For all work in or on collector or arterial roadways, or intersecting roadways adjacent to them, a Traffic Accommodation Strategy (TAS) must be submitted a minimum of fifteen (15) working days in advance of the commencement of construction for review and approval by the City. This TAS must comply with the requirements set forth in the latest edition of the Alberta Transportation document *Traffic Accommodation in Work Zones.* The requirement for a TAS may be waived at the sole discretion of the City.

11.11.5 Temporary Water

Should a water supply be required for construction, an application for Temporary Water Supply for Construction is available from the City's website, www.lloydminster.ca. If, during the course of construction, temporary water service will need to be supplied to homes, businesses or a job site, the Applicant must provide and maintain all connections from the temporary water source to those businesses and residences, coordinating with Water Services. All costs and labour associated with providing these temporary services must be borne by the Developer.

11.11.6 Utility Connections

A City representative is to be present to witness and inspect all connections to existing City mains, prior to the connection being made. A minimum notice of 24 hours is required to request this inspection. On the day of the work, a minimum two hours' notice will be required. All service pipes up to the building envelope must also be inspected, and these inspections must take place prior to any backfilling.

11.12 Stop Work Order

The City may issue a "Stop Work Order" to the Applicant due to non-conformance. Non-conformance includes:

- Unsafe practices;
- Imminent danger;
- Lack of traffic control;
- Construction not in accordance with approved drawings and specifications;

- Non-compliance with the development requirements; and
- Damage to existing facilities.

Should a “Stop Work Order” be issued, the Applicant must immediately cease operation, rectify the non-conformance and obtain the City’s approval prior to proceeding.

Concrete Work

DRAWING NUMBER	DESCRIPTION	REVISION NUMBER	DATE
2-100	Standard 150 mm Curb with 250 mm Gutter	6	2020-05-04
2-101	Standard 200 mm Curb with 250 mm Gutter	6	2020-05-04
2-102	Rolled Face Curb and Gutter	6	2020-05-04
2-103	Standard Barrier Curb	5	2020-05-04
2-104	Pinned Curb Median Detail	5	2020-06-22
2-105	Rolled Face Curb, Gutter, and Monolithic Sidewalk	6	2020-06-22
2-106	Straight Face Curb, Gutter and Monolithic Sidewalk	5	2020-06-22
2-107	1.5m Separate Sidewalk	6	2020-05-04
2-109	Commercial / Lane Crossing – Monolithic Sidewalk	9	2020-09-29
2-110	Commercial / Lane Crossing – Separate Sidewalk	9	2020-09-21
2-111	Residential Apron Crossing Mono Sidewalk	0	2020-09-21
2-112	Residential Apron Crossing Separate Sidewalk	0	2020-09-21
2-200	Curb Ramp	6	2020-09-30
2-205	Concrete Drainage Swale (Roadway)	4	2020-05-04

Manhole Details

DRAWING NUMBER	DESCRIPTION	REVISION NUMBER	DATE
3-100	Precast Manhole for Pipes up to 525 mm Diameter	7	2020-03-06
3-101	Precast Manhole for Pipes 600 mm to 900 mm Diameter	8	2020-03-06
3-102	Typical T-Riser Manhole for Pipes 1050 mm Diameter and Larger	9	2020-05-04
3-104	Perched Manhole	0	2019-07-02
3-105	Manhole Penetrations and Design	2	2020-03-06
3-201	Safety Platform	4	2020-05-04
3-202	F-80 Manhole Frame	1	2016-04-14
3-204	TF-80LSAN Sanitary Sewer Cover (City Logo)	6	2020-03-06
3-205	TF-80LSTM Storm Sewer Cover (City Logo)	4	2020-03-06
3-206	Watertight Manhole Cover	3	2020-03-06
3-208	F-39 Frame and Locking Cover	1	2018-08-20

Trenching and Backfill

DRAWING NUMBER	DESCRIPTION	REVISION NUMBER	DATE
4-100	Trench Backfill	4	2020-03-06
4-101	Insulation Requirements	1	2020-03-06
4-102	Insulation Requirements Crossing Pipe Open to Atmosphere	0	2020-03-09
4-200	Pipe Zone Bedding Detail (Class A, B)	6	2020-05-04
4-300	Pipe Support	1	2018-03-23

Storm Drainage

DRAWING NUMBER	DESCRIPTION	REVISION NUMBER	DATE
5-100	900 mm Dia. Catch Basin c/w Frame and Cover	7	2018-03-23
5-101	1200 mm Dia. Catch Basin c/w F-51 Frame and Cover with Two Piece Side Inlet	4	2018-11-23
5-301	Metal Culvert	1	2018-11-23
5-304	Rock Rip-Rap Detail for Metal Culverts or Open Channels	1	2018-11-26

Water Distribution

DRAWING NUMBER	DESCRIPTION	REVISION NUMBER	DATE
6-100	Water Valve Installation	5	2020-03-10

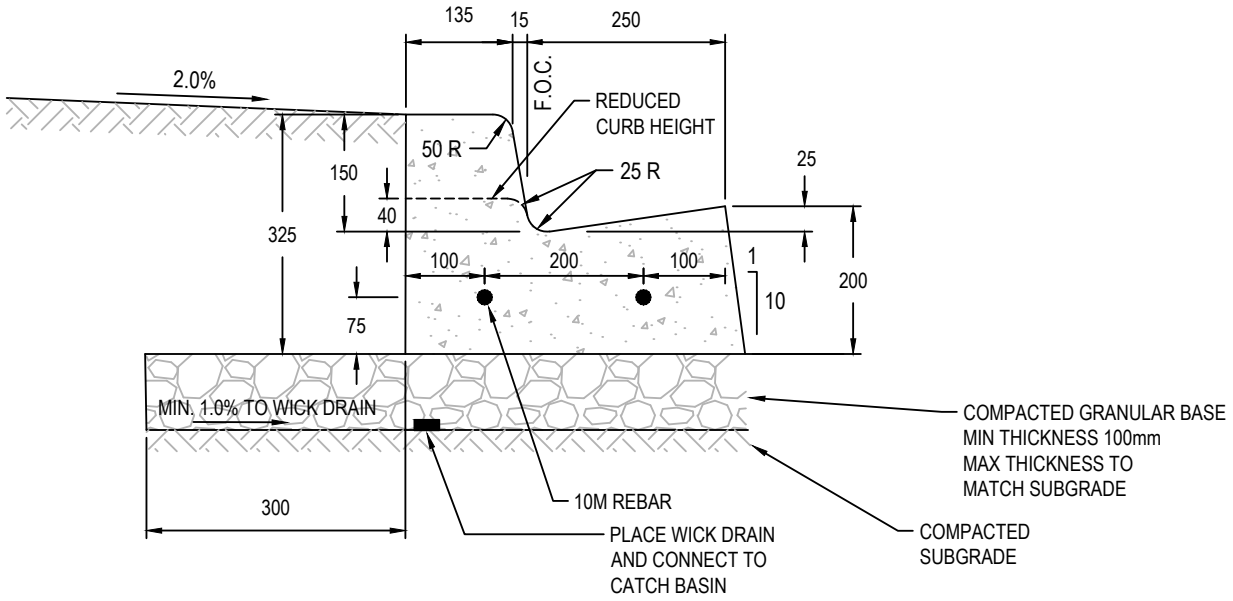
DRAWING NUMBER	DESCRIPTION	REVISION NUMBER	DATE
6-101	Hot Tapping Connection	6	2020-06-22
6-102	Hydrant Installation	7	2020-05-05
6-300	Poured Concrete Thrust Blocks for Horizontal Tees and Bends	4	2020-03-10
6-301	Poured Concrete Thrust Blocks for Vertical Bends (Downward Thrust)	4	2020-03-10
6-302	Poured Concrete Thrust Blocks for Vertical Bends (Upward Thrust)	4	2020-03-10
6-303	Poured Concrete Thrust Blocks for Dead-ends	4	2020-03-10
6-304	Poured Concrete Thrust Blocks for Dead-ends in Disturbed Soil	1	2020-03-10
6-400	Anode Installation at Hydrant	3	2018-03-22
6-401	Typical Anode Installation for Metallic Fittings used with PVC Water Mains	3	2018-03-22

Sanitary, Storm, and Water Service Connections

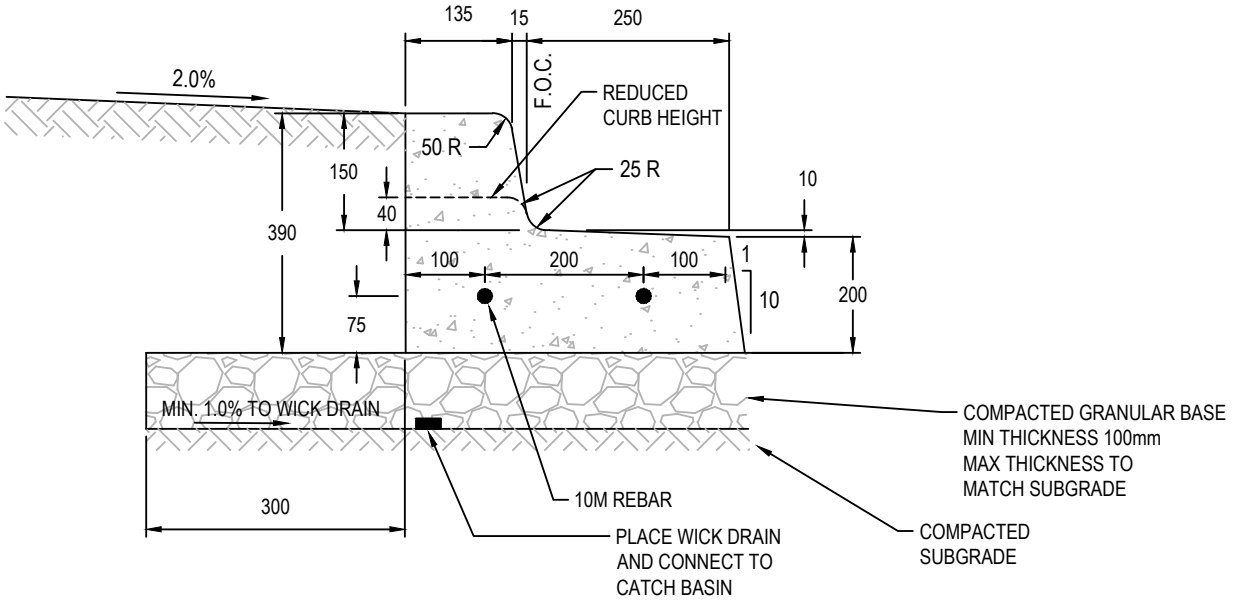
DRAWING NUMBER	DESCRIPTION	REVISION NUMBER	DATE
7-100	Typical Lateral Service Location Detail	8	2020-06-22
7-101	Residential Lateral Service Detail	7	2020-06-22
7-102	Multi-family Service Detail with Storm Service	5	2020-06-22
7-103	Multi-family Service Detail	5	2020-06-22
7-104	Commercial Service Detail with Storm Service	4	2020-06-22
7-105	Commercial Service Detail	4	2020-06-22
7-106	Service Connection Details for Sewer Manhole in Cul-de-Sac	2	2020-06-22
7-200	Residential Non-Riser Type Sanitary Service Connection	5	2020-06-22
7-201	Residential Riser Type Sanitary Service Connection	4	2020-06-22
7-202	Multi-family Sanitary Inspection Chamber	7	2020-06-22
7-203	Commercial / Industrial Sanitary Inspection Manhole	6	2020-06-22
7-204	Metal Driveway Box	2	2020-05-05
7-300	Residential Non-Riser Type Storm Service Connection	5	2020-06-22
7-301	Residential Riser Type Storm Service Connection	4	2020-06-22
7-302	Weeping Tile Discharge to Storm Service	4	2020-06-22
7-303	Granular Drainage Discharge to Storm Service	4	2020-06-22
7-304	Granular Drainage Overland Discharge If Storm Service Not Available	4	2020-05-05
7-305	Weeping Tile Overland Discharge If Storm Service Not Available	4	2020-05-05
7-400	Residential Water Service Connection	4	2020-03-11
7-401	Service Valve Rod for 20 mm, 25 mm, 38mm, 50 mm Curb Stops	0	2011-02-22
7-402	Service Box	5	2020-06-22

Lot Grading

DRAWING NUMBER	DESCRIPTION	REVISION NUMBER	DATE
8-100	Lot Grading Back to Front Drainage	6	2020-05-05
8-101	Lot Grading Split Drainage	6	2020-05-05
8-102	Shared Drainage Between Lots	3	2020-06-22
8-103	Concrete Between Driveways	3	2020-05-05
8-200	Concrete Drainage Swale (Landscaping)	6	2020-03-11



STANDARD



REVERSE

NOTES:

1. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT.
2. CURB RETURNS REQUIRED AT ALL CROSSINGS
3. COMPACT BACKFILL TO 95% FOR 500mm FROM BACK OF CURB AND PROVIDE POSITIVE DRAINAGE OVER THE TOP OF CURB.
4. 10M REBAR 6.0m LONG TO BE INSTALLED WHEN REPLACING CURB & GUTTER OVER SERVICE CONNECTION AND HYDRANT LEAD TRENCHES.
5. 10M REBAR TO BE INSTALLED AT ALL LANE AND COMMERCIAL CROSSINGS.
6. REDUCE CURB HEIGHT AT ALL CROSSINGS.
7. CONTRACTION JOINTS 50mm DEEP AND 5mm WIDE TO BE CONSTRUCTED AT 3.0m INTERVALS.

NO.	DATE	REVISION
8		
7		
6	04/05/20	Revised Details
5	03/03/20	Revised Notes
4	21/03/18	Revised Details
3	04/14/16	Revised Notes
2	10/12/13	Updated concrete notes
1	21/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

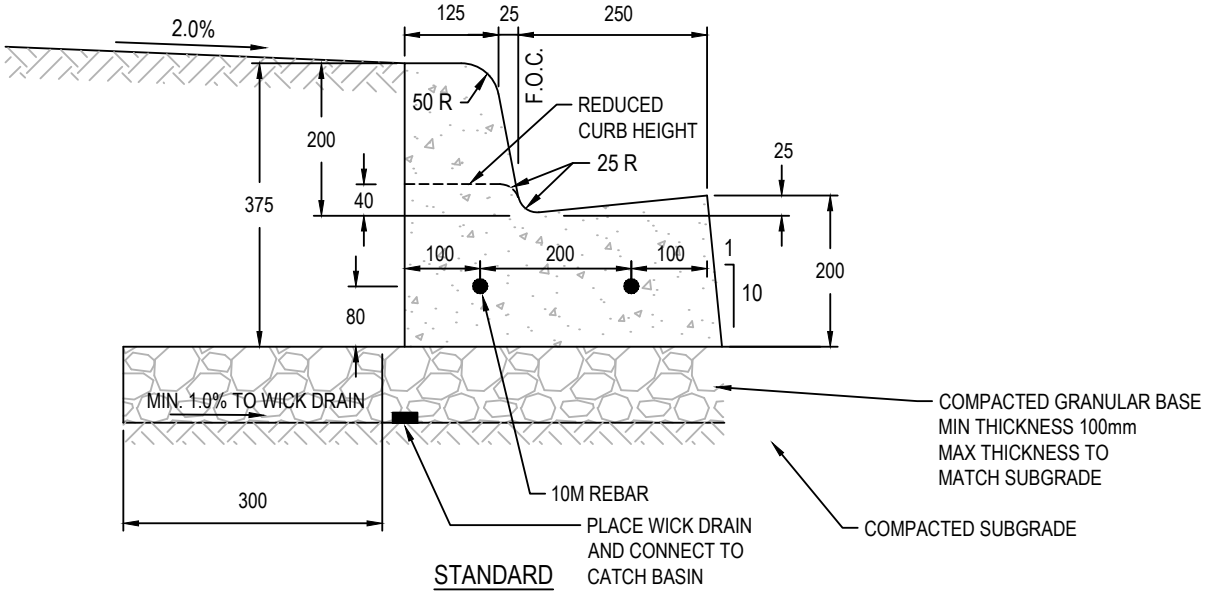
Drawn by: N / A

Scale: N.T.S.

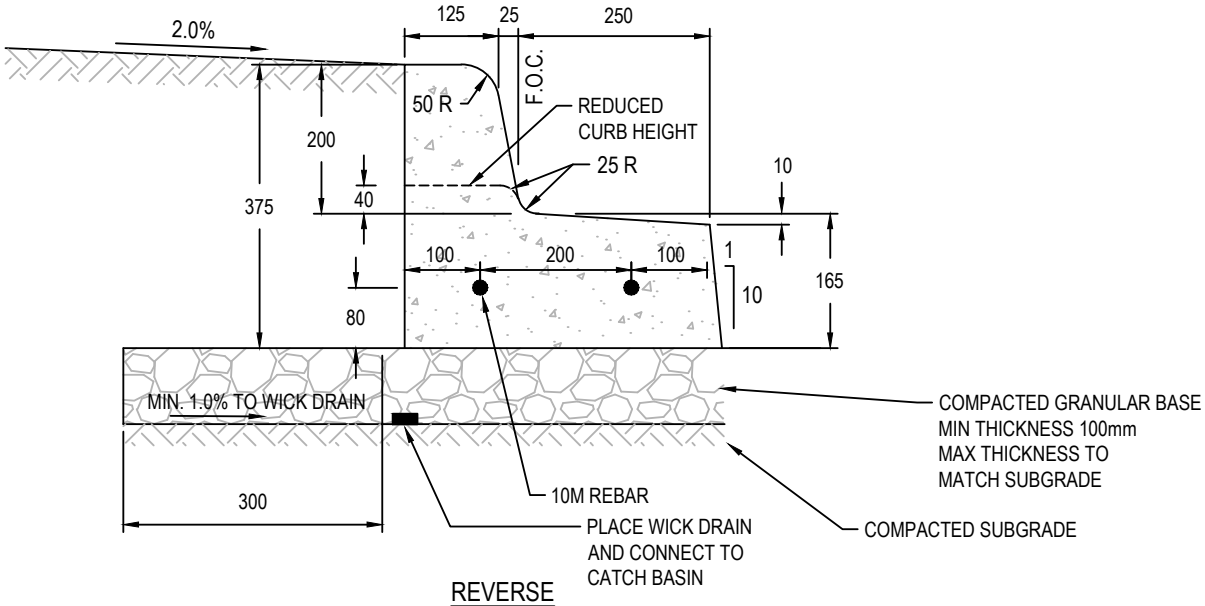
STANDARD 150mm CURB WITH 250mm GUTTER

Date: Feb. 22, 2011

Drawing #: 2-100



STANDARD



REVERSE

NOTES:

1. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT.
2. CURB RETURNS REQUIRED AT ALL CROSSINGS
3. COMPACT BACKFILL TO 95% FOR 500mm FROM BACK OF CURB AND PROVIDE POSITIVE DRAINAGE OVER THE TOP OF CURB.
4. 10M REBAR 6.0m LONG TO BE INSTALLED WHEN REPLACING CURB & GUTTER OVER SERVICE CONNECTION AND HYDRANT LEAD TRENCHES.
5. 10M REBAR TO BE INSTALLED AT ALL LANE AND COMMERCIAL CROSSINGS.
6. REDUCE CURB HEIGHT AT ALL CROSSINGS.
7. CONTRACTION JOINTS 50mm DEEP AND 5mm WIDE TO BE CONSTRUCTED AT 3.0m INTERVALS.

NO.	DATE	REVISION
8		
7		
6	04/05/20	Revised Details
5	03/03/20	Revised Notes
4	22/03/18	Changed Curb Dimensions
3	14/04/16	Revised Notes
2	10/12/13	Updated concrete notes
1	21/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

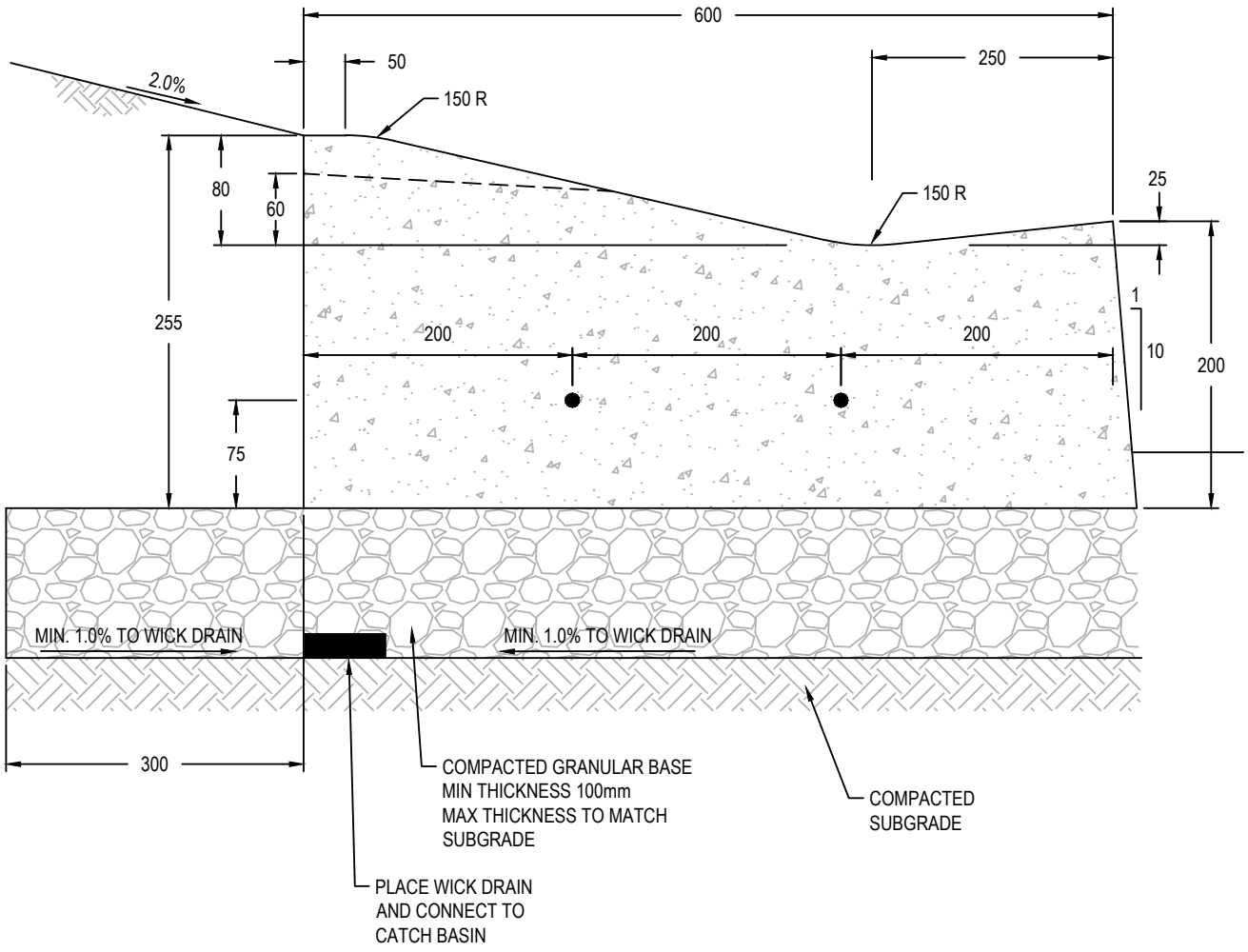
Drawn by: N / A

Scale: N.T.S.

STANDARD 200mm CURB WITH 250mm GUTTER

Date: April 14, 2011

Drawing #: 2-101



NOTES:

1. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT.
2. CURB RETURNS REQUIRED AT ALL CROSSINGS
3. COMPACT BACKFILL TO 95% FOR 500mm FROM BACK OF CURB AND PROVIDE POSITIVE DRAINAGE OVER THE TOP OF CURB.
4. 10M REBAR 6.0m LONG TO BE INSTALLED WHEN REPLACING CURB & GUTTER OVER SERVICE CONNECTION AND HYDRANT LEAD TRENCHES.
5. 10M REBAR TO BE INSTALLED AT ALL LANE AND COMMERCIAL CROSSINGS.
6. REDUCE CURB HEIGHT AT ALL CROSSINGS.
7. CONTRACTION JOINTS 50mm DEEP AND 5mm WIDE TO BE CONSTRUCTED AT 3.0m INTERVALS.

NO.	DATE	REVISION
8		
7		
6	04/05/20	Removed "mm" From Dims.
5	03/03/20	Revised Notes & Detail
4	22/03/18	Revised Notes
3	14/04/16	Revised Notes
2	10/12/13	Updated concrete notes
1	21/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

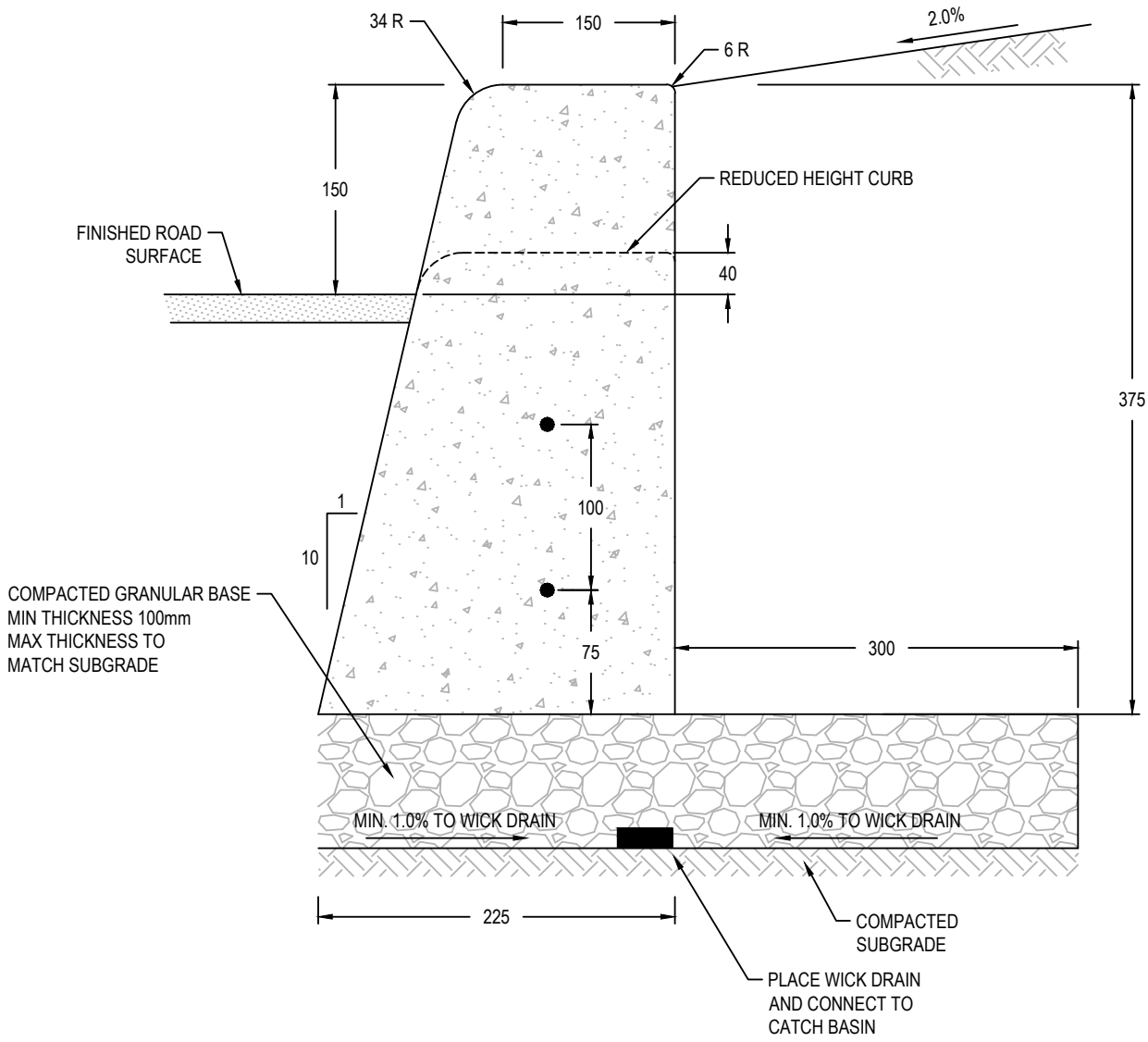
Drawn by: N / A

Scale: N.T.S.

ROLLED FACE CURB AND GUTTER

Date: Feb. 22, 2011

Drawing #: 2-102



NOTES:

1. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT.
2. CURB RETURNS REQUIRED AT ALL CROSSINGS.
3. COMPACT BACKFILL TO 95% FOR 500mm FROM BACK OF CURB AND PROVIDE POSITIVE DRAINAGE OVER THE TOP OF CURB.
4. 10M REBAR 6.0m LONG TO BE INSTALLED WHEN REPLACING CURB & GUTTER OVER SERVICE CONNECTION AND HYDRANT LEAD TRENCHES.
5. 10M REBAR TO BE INSTALLED AT ALL LANE AND COMMERCIAL CROSSINGS.
6. REDUCE CURB HEIGHT AT ALL CROSSINGS.
7. CONTRACTION JOINTS 50mm DEEP AND 5mm WIDE TO BE CONSTRUCTED AT 3.0m INTERVALS.

NO.	DATE	REVISION
8		
7		
6		
5	04/05/20	Removed "mm" from Dims.
4	13/08/18	Revised Notes
3	14/04/16	Revised Notes
2	10/12/13	Updated concrete notes
1	20/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

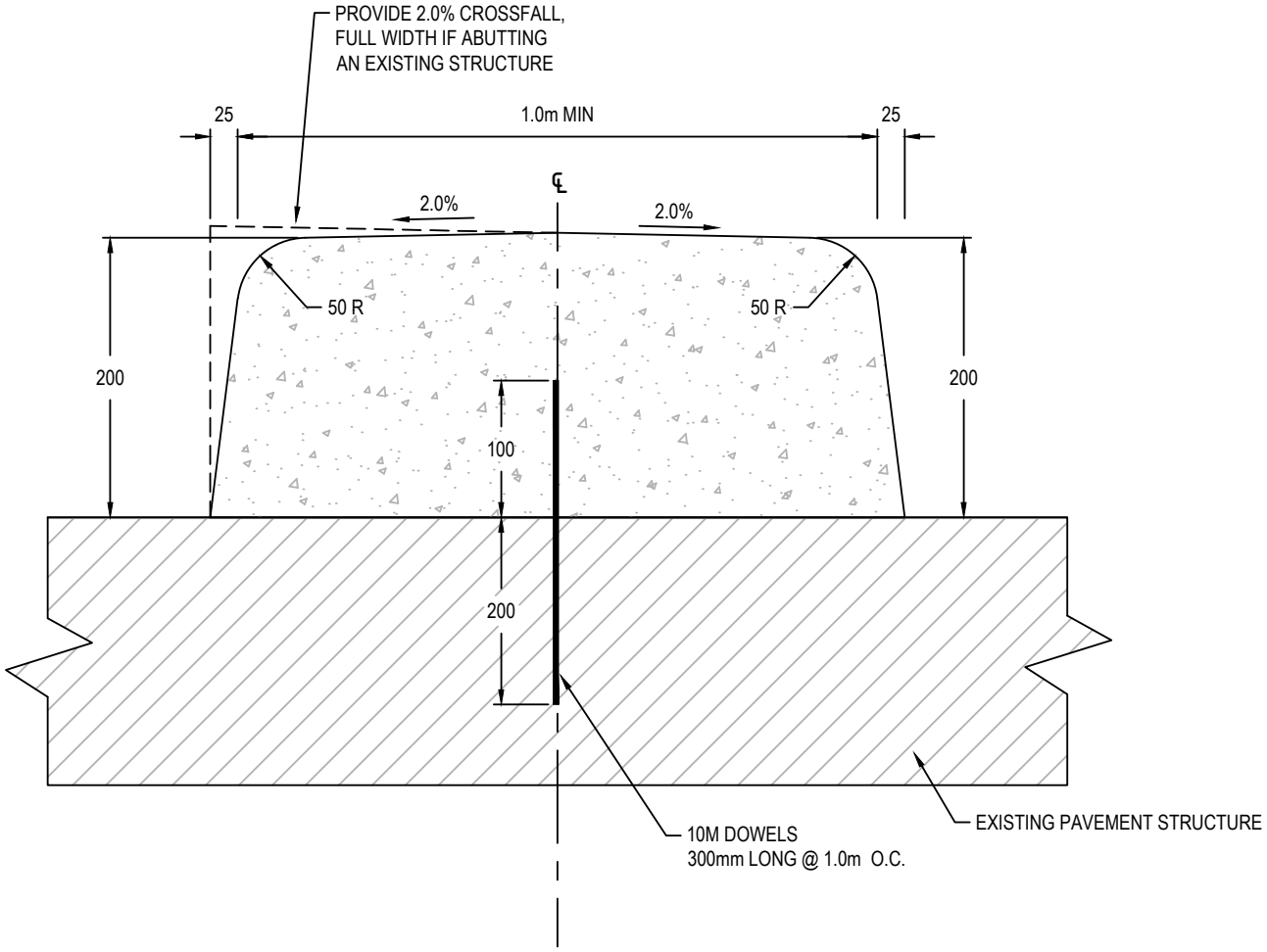
Drawn by: N / A

Scale: N.T.S.

Date: Feb. 22, 2011

STANDARD BARRIER CURB

Drawing #: 2-103



NOTES:

1. CONTRACTION JOINTS 50mm.DEEP AND 5mm WIDE TO BE CONSTRUCTED AT 3.0m INTERVALS.
2. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT.

NO.	DATE	REVISION
8		
7		
6		
5	22/06/20	Revised Note 1
4	03/04/20	Revised Notes
3	13/08/18	Revised Notes
2	14/04/16	Revised Notes
1	10/12/13	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

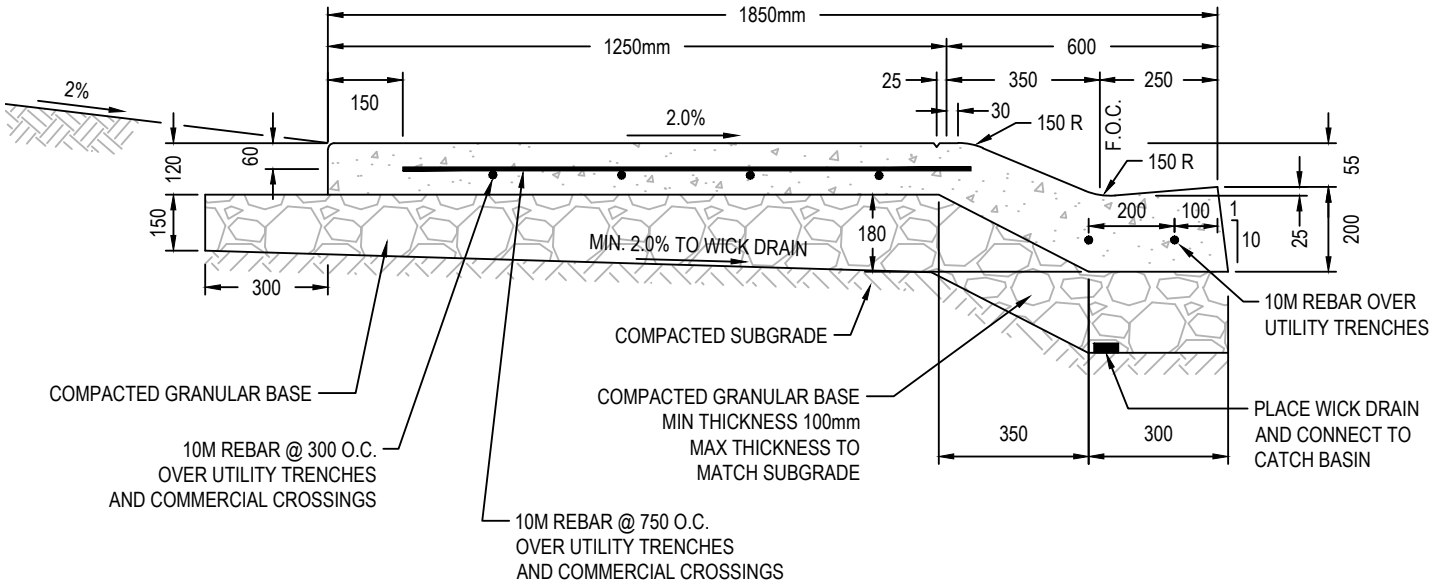
Drawn by: L. LEEPER

Scale: N.T.S.

PINNED CURB MEDIAN DETAIL

Date: Feb. 22, 2011

Drawing #: 2-104



NOTES:

1. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT.
2. CURB RETURNS REQUIRED AT ALL CROSSINGS
3. COMPACT BACKFILL TO 95% FOR 500mm FROM BACK OF WALK AND PROVIDE POSITIVE DRAINAGE OVER THE TOP OF WALK.
4. 10M REBAR 6.0m LONG TO BE INSTALLED WHEN REPLACING MONOLITHIC WALK OVER SERVICE CONNECTION AND HYDRANT LEAD TRENCHES.
5. 10M REBAR TO BE INSTALLED AT ALL LANE AND COMMERCIAL CROSSINGS AS PER DWG. 2-109.
6. REDUCE CURB HEIGHT AT ALL CROSSINGS AS PER DWG. 2-109.
7. CONTRACTION JOINTS 50mm DEEP AND 5mm WIDE TO BE CONSTRUCTED AT 3.0m INTERVALS.

NO.	DATE	REVISION
8		
7		
6	22/06/20	Revised Detail
5	22/03/18	Revised Detail
4	22/03/18	Revised Notes
3	14/04/16	Revised Notes
2	10/12/13	Updated concrete notes
1	21/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

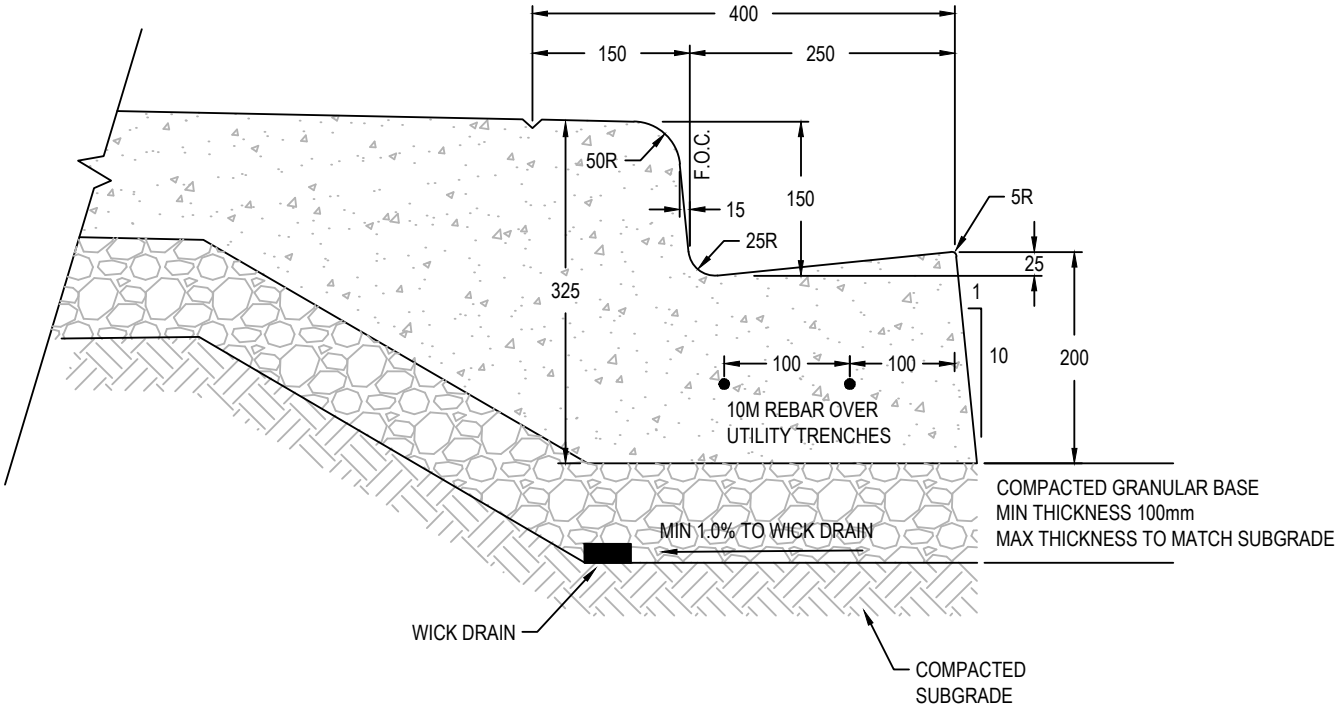
Drawn by: L. LEEPER

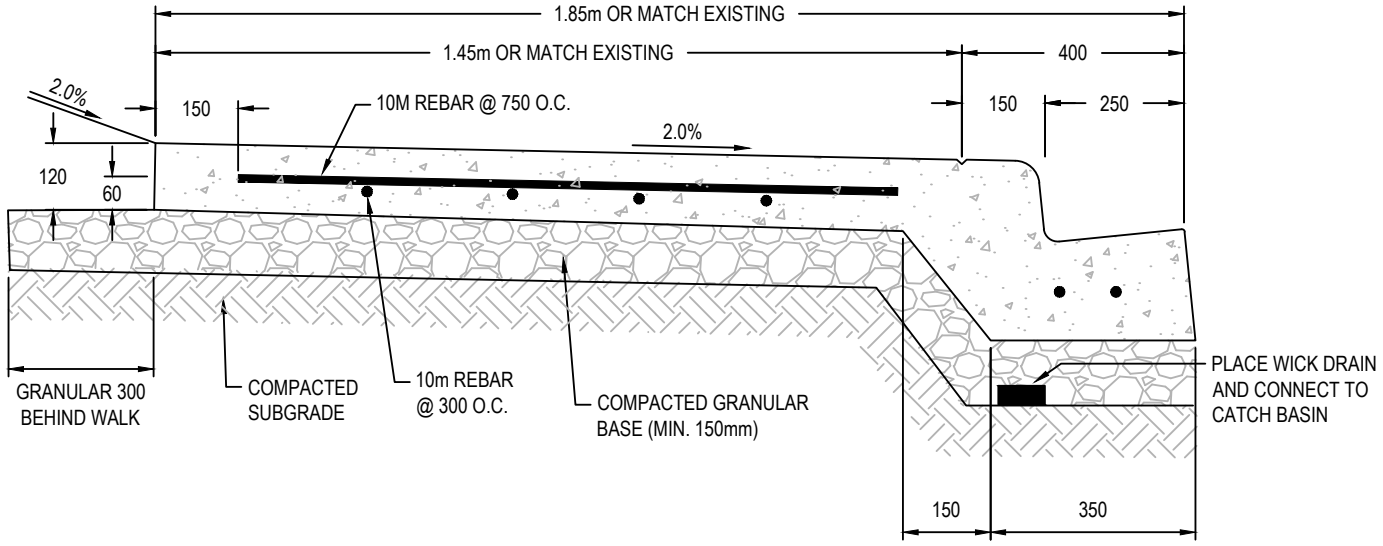
Scale: N.T.S.

ROLLED FACE CURB, GUTTER, AND MONOLITHIC SIDEWALK

Date: Feb. 22, 2011

Drawing #: 2-105





NOTES:

1. 10M REBAR 6.0m LONG TO BE INSTALLED WHEN REPLACING CURB & GUTTER OVER SERVICE CONNECTION AND HYDRANT LEAD TRENCHES.
2. ALL LANE OR COMMERCIAL CROSSINGS SHALL BE AS PER DWG. 2-109.
3. REDUCE CURB HEIGHT AT ALL CROSSINGS AS PER DWG. 2-109.
4. CONTRACTION JOINTS 50mm DEEP AND 5mm WIDE TO BE CONSTRUCTED AT 3.0m INTERVALS.
5. 150mm MINIMUM COMPACTED GRANULAR SUBBASE.
6. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT.
7. COMPACT BACKFILL TO 95% FOR 500mm FROM BACK OF WALK AND PROVIDE POSITIVE DRAINAGE OVER TOP OF WALK.

NO.	DATE	REVISION
8		
7		
6		
5	22/06/20	Revised Details
4	03/04/20	Revised Details & Notes
3	22/03/18	Revised Notes
2	14/04/16	Revised Notes
1	10/12/13	Revised Concrete Notes

The City of Lloydminster

Checked by:

Approved by:

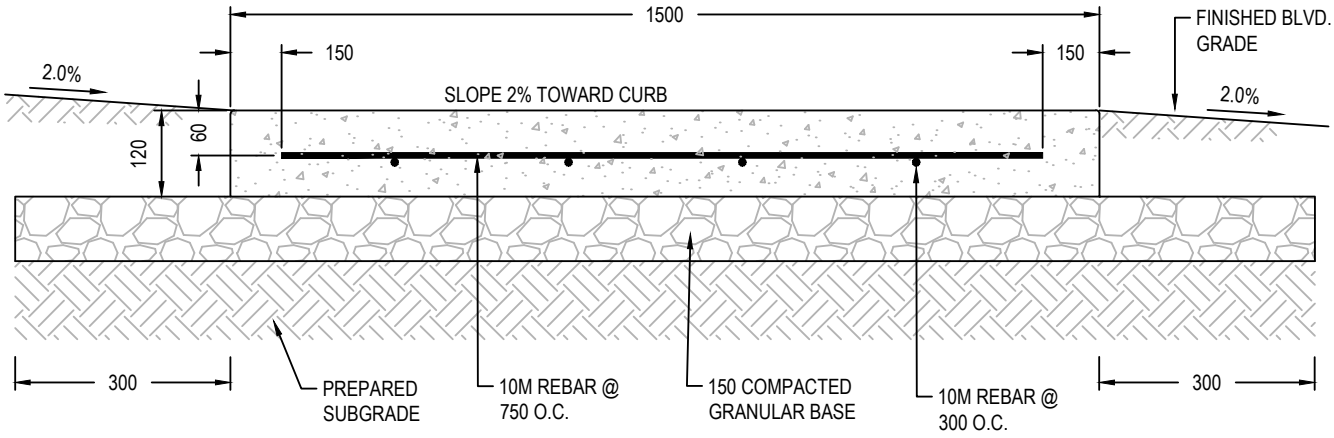
Drawn by: N / A

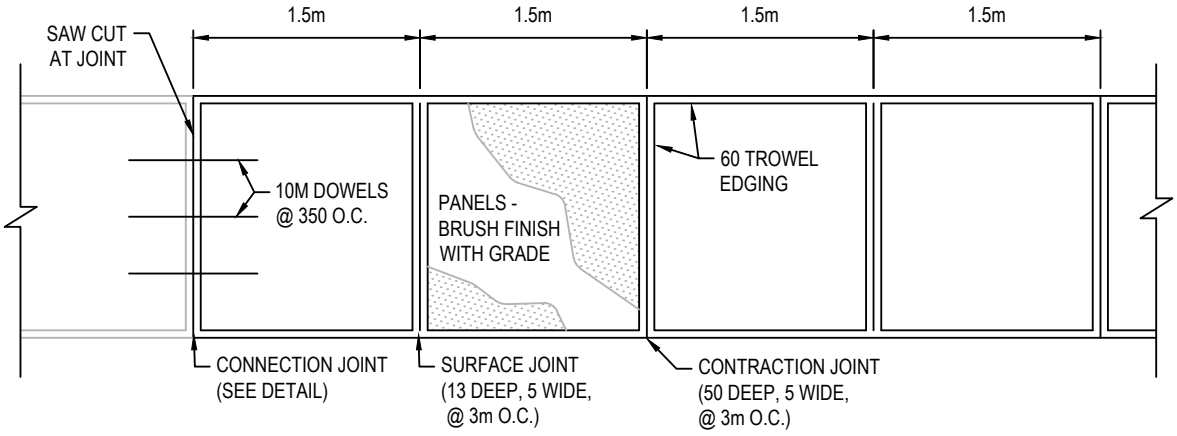
Scale: N.T.S.

STRAIGHT FACE CURB, GUTTER AND MONOLITHIC SIDEWALK

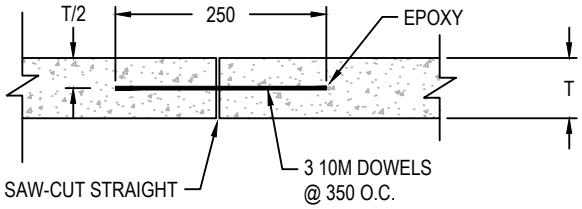
Date: Feb. 22, 2011

Drawing #: 2-106





PLAN



CONNECTION JOINT DETAIL

NOTES:

1. SIDEWALK IS 180mm THICK IN COMMERCIAL / INDUSTRIAL AREAS.
2. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT.
3. COMPACT BACKFILL TO 95% FOR 500mm FROM BACK OF WALK AND PROVIDE POSITIVE DRAINAGE OVER THE TOP OF WALK.
4. 10M REBAR 6.0m LONG TO BE INSTALLED WHEN REPLACING WALK OVER SERVICE CONNECTION AND HYDRANT LEAD TRENCHES.
5. 10M REBAR TO BE INSTALLED AT ALL LANE AND COMMERCIAL CROSSINGS.
6. WHEN CONNECTING TO EXISTING WALK, SAW CUT EDGE AND INSTALL THREE 10M DOWELS @ 350 O.C.

NO.	DATE	REVISION
8		
7		
6	04/05/20	Removed "mm" from Dims.
5	14/08/18	Revised Notes
4	22/03/18	Revised Notes
3	14/04/18	Revised Notes
2	10/12/13	Changed concrete notes
1	21/03/13	Changed concrete type

The City of Lloydminster

Checked by:

Approved by:

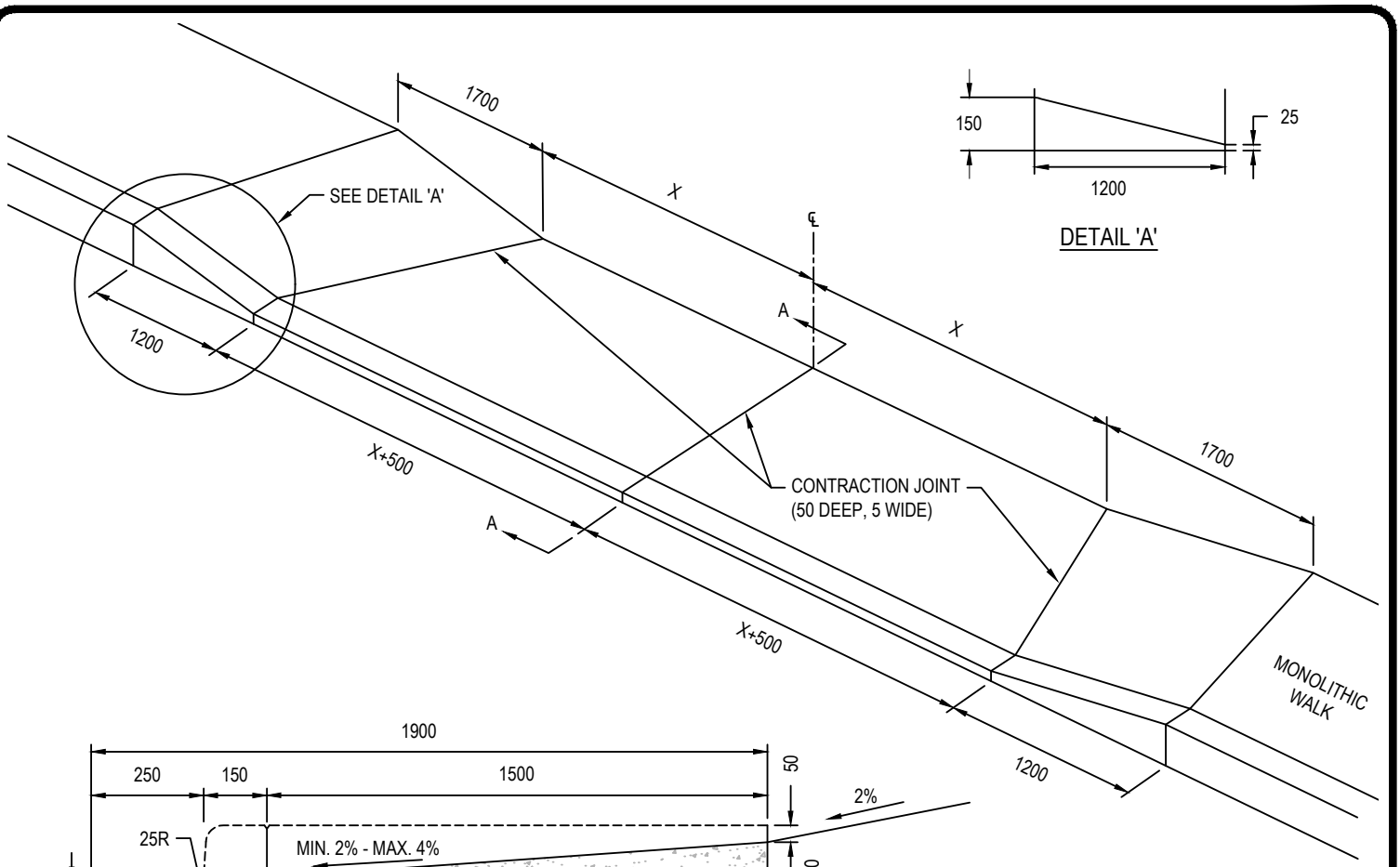
Drawn by: N / A

Scale: N.T.S.

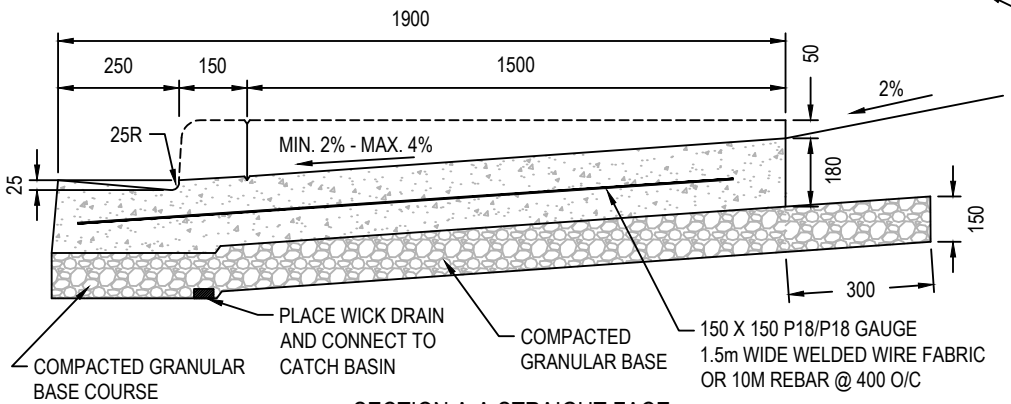
Date: Feb. 22, 2011

1.5m SEPARATE SIDEWALK

Drawing #: 2-107



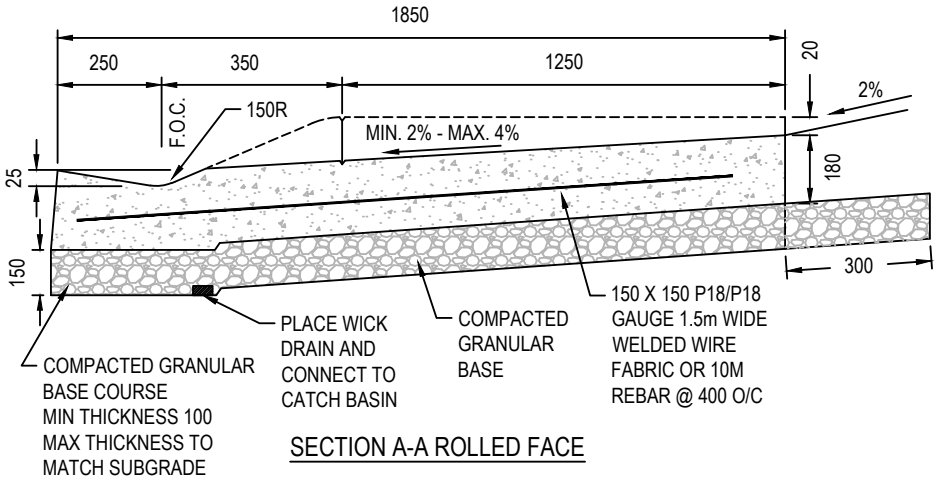
DETAIL 'A'



SECTION A-A STRAIGHT FACE

NOTES:

1. MAXIMUM ALLOWABLE 'X' AS PER ENGINEER.
2. CONCRETE STRENGTH TO BE TYPE HS, 32MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5-8% AIR ENTRAINMENT.
3. SIDEWALK THICKNESS = 120mm AT RESIDENTIAL CROSSINGS, 180mm AT ALL OTHER CROSSINGS.
4. CURB AND GUTTER SECTION REQUIRES REBAR. REFER TO DWGS 2-105 & 2-106.



SECTION A-A ROLLED FACE

NO.	DATE	REVISION
9	09/09/20	Labelled contraction joints
8	04/05/20	Removed "mm" From Dims.
7	04/03/20	Revised Details
6	14/08/18	Additional Notes
5	22/03/18	Additional Notes
4	22/11/16	Additional Notes
3	14/04/16	Revised Notes
2	10/12/13	Revised concrete notes

The City of Lloydminster

Checked by:

Approved by:

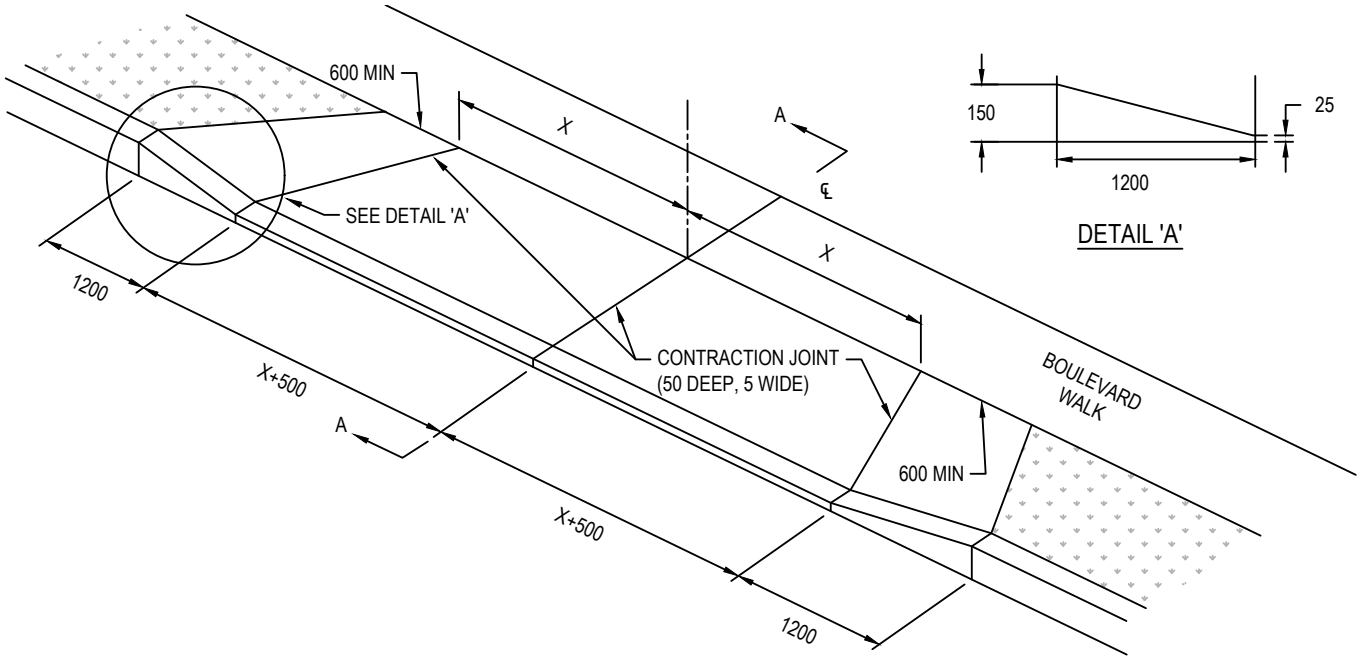
Drawn by: N / A

Scale: N.T.S.

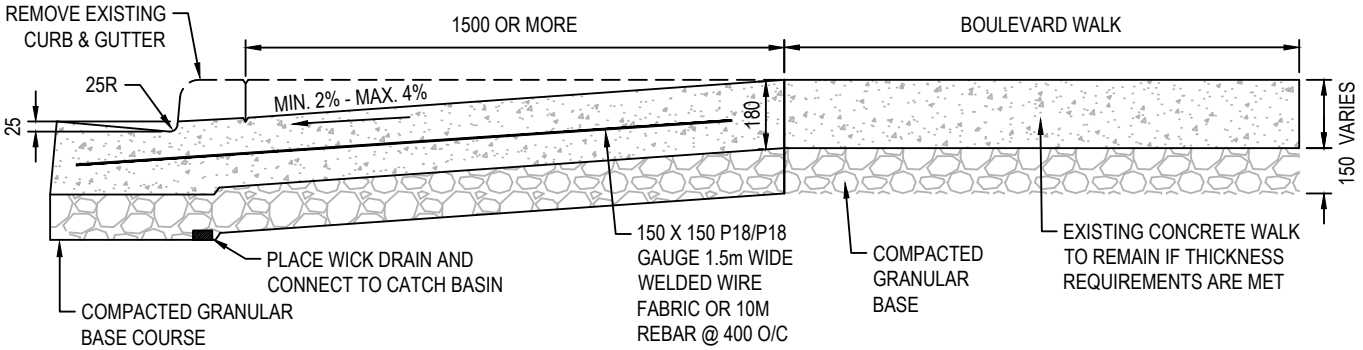
COMMERCIAL / LANE CROSSING MONOLITHIC SIDEWALK

Date: Feb. 22, 2011

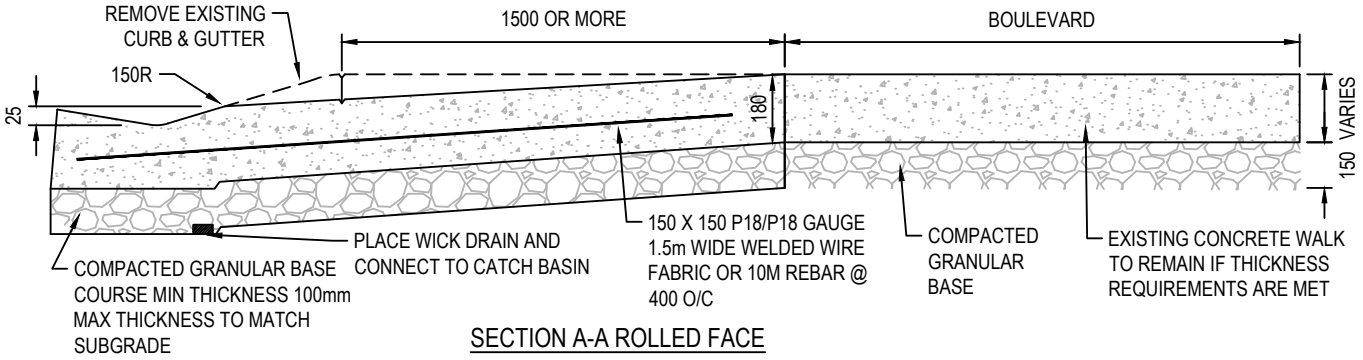
Drawing #: 2-109



DETAIL 'A'



SECTION A-A STRAIGHT FACE



SECTION A-A ROLLED FACE

NOTES:

1. MAXIMUM ALLOWABLE 'X' AS PER ENGINEER.
2. CONCRETE STRENGTH TO BE TYPE HS, 32MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5-8% AIR ENTRAINMENT.
3. SIDEWALK THICKNESS = 120mm AT RESIDENTIAL CROSSINGS, 180mm AT ALL OTHER CROSSINGS.
4. CURB AND GUTTER SECTION REQUIRES REBAR. REFER TO DWGS 2-100 & 2-101.

NO.	DATE	REVISION
9	21/09/20	Labelled contraction joints
8	05/03/20	Revised Details
7	14/08/18	Revised Details
6	22/03/18	Revised Details
5	03/06/17	Revised Taper
4	22/11/16	Additional Notes
3	14/04/16	Revised Notes
2	10/12/13	Updated concrete notes

The City of Lloydminster

Checked by:

Approved by:

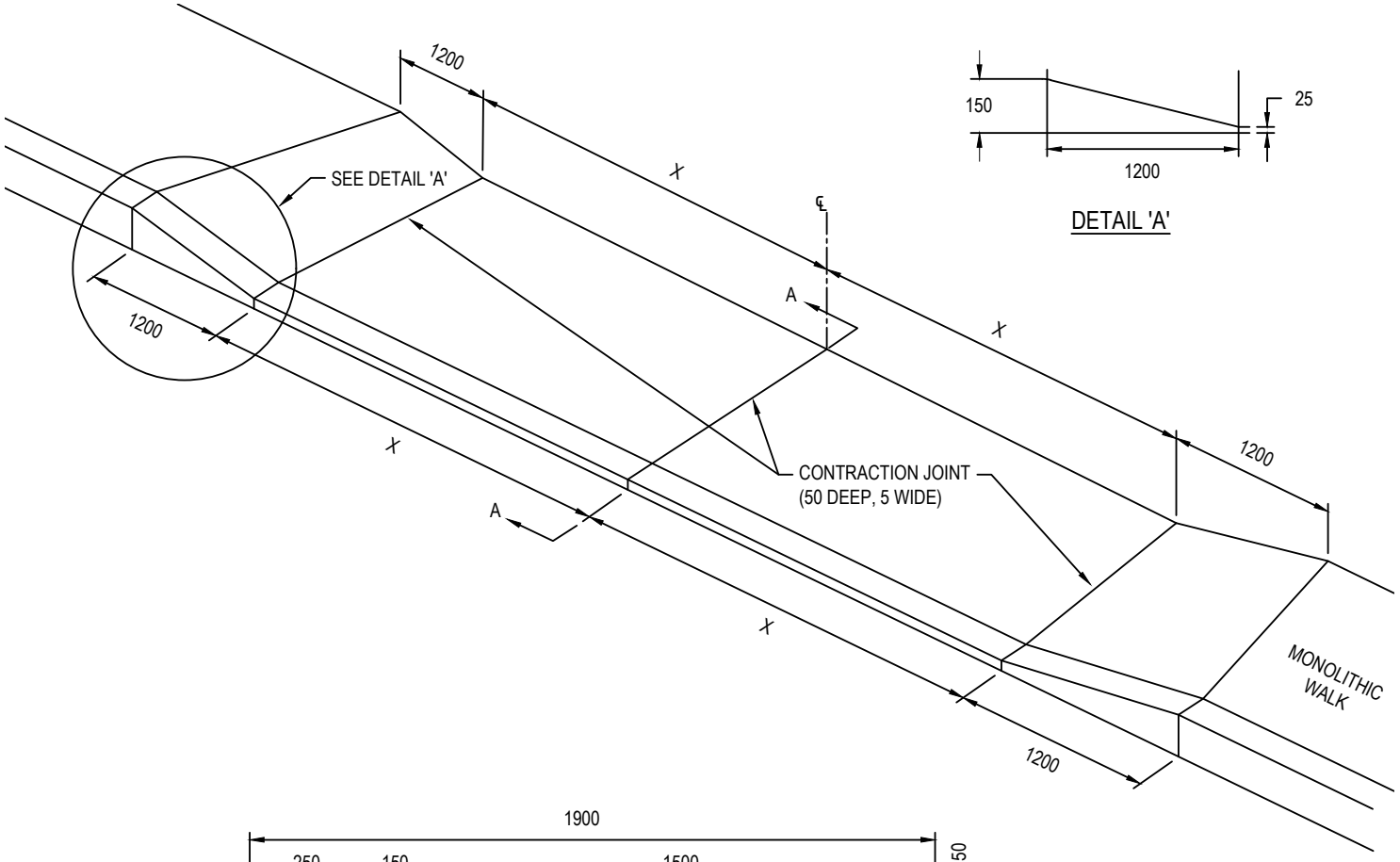
Drawn by: L. LEEPER

Scale: N.T.S.

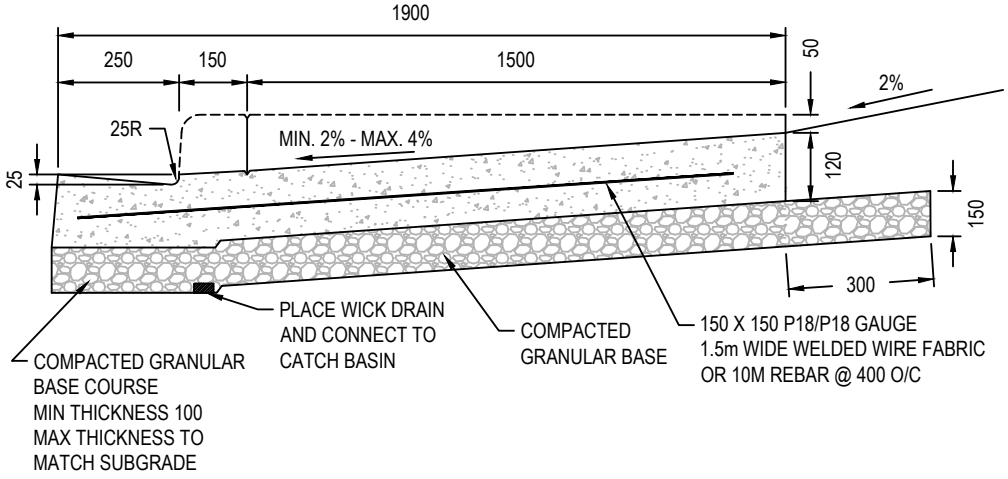
COMMERCIAL / LANE CROSSING SEPARATE SIDEWALK

Date: Feb. 22, 2011

Drawing #: 2-110



DETAIL 'A'



SECTION A-A STRAIGHT FACE

NOTES:

1. MAXIMUM ALLOWABLE 'X' AS PER ENGINEER.
2. CONCRETE STRENGTH TO BE TYPE HS, 32MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5-8% AIR ENTRAINMENT.
3. SIDEWALK THICKNESS = 120mm AT RESIDENTIAL CROSSINGS, 180mm AT ALL OTHER CROSSINGS.
4. CURB AND GUTTER SECTION REQUIRES REBAR. REFER TO DWGS 2-105 & 2-106.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1		

The City of Lloydminster

Checked by:

Approved by:

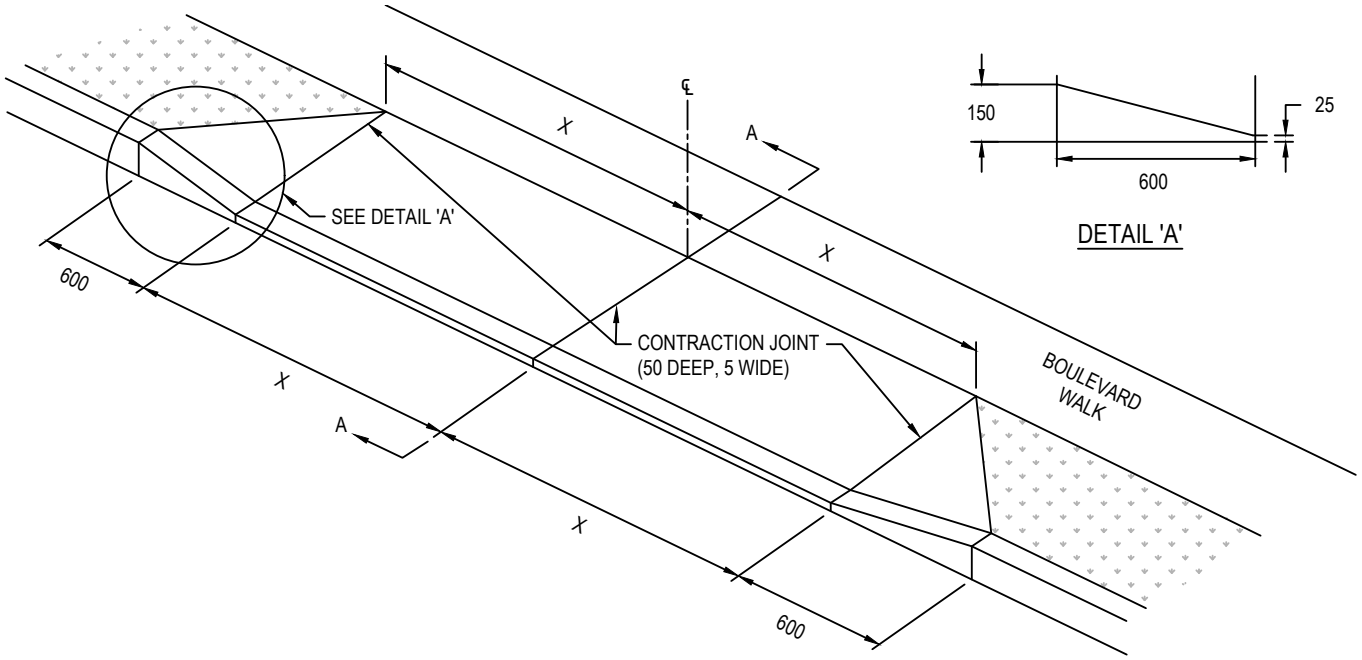
Drawn by: N / A

Scale: N.T.S.

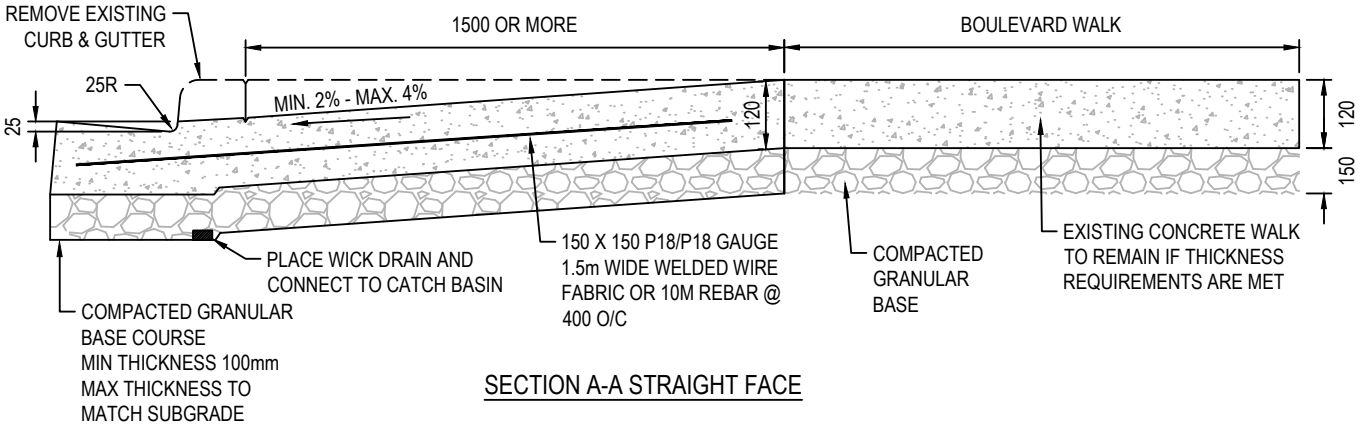
RESIDENTIAL APRON CROSSING MONOLITHIC SIDEWALK

Date: Sept. 21, 2020

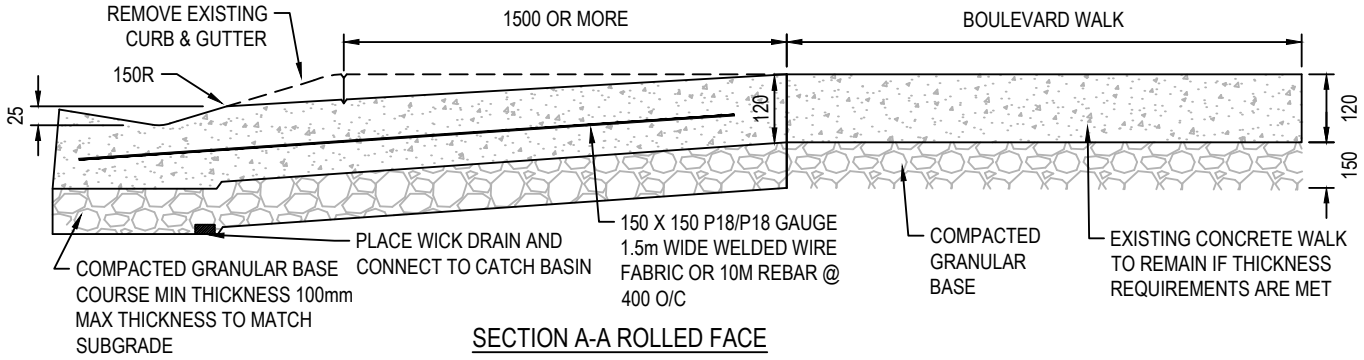
Drawing #: 2-111



DETAIL 'A'



SECTION A-A STRAIGHT FACE



SECTION A-A ROLLED FACE

NOTES:

1. MAXIMUM ALLOWABLE 'X' AS PER ENGINEER.
2. CONCRETE STRENGTH TO BE TYPE HS, 32MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5-8% AIR ENTRAINMENT.
3. SIDEWALK THICKNESS = 120mm AT RESIDENTIAL CROSSINGS.
4. CURB AND GUTTER SECTION REQUIRES REBAR. REFER TO DWGS 2-100 & 2-101.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1		

The City of Lloydminster

Checked by:

Approved by:

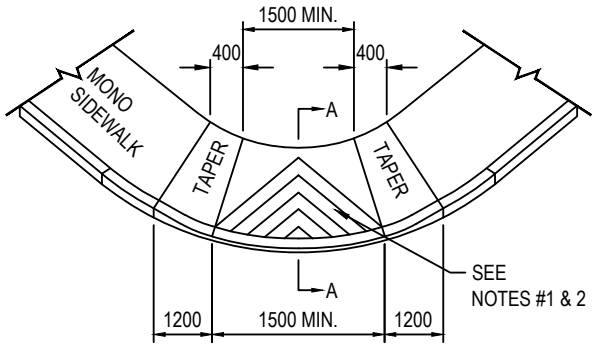
Drawn by: L. LEEPER

Scale: N.T.S.

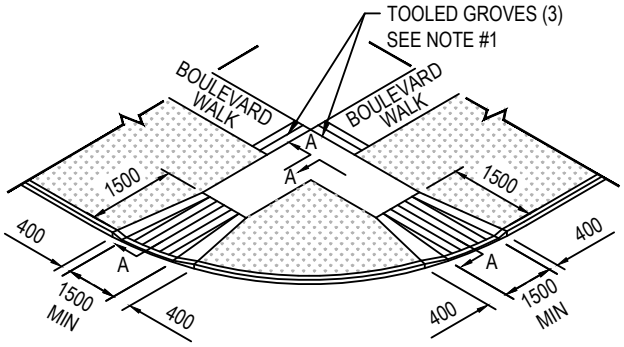
RESIDENTIAL APRON CROSSING SEPARATE SIDEWALK

Date: Feb. 22, 2011

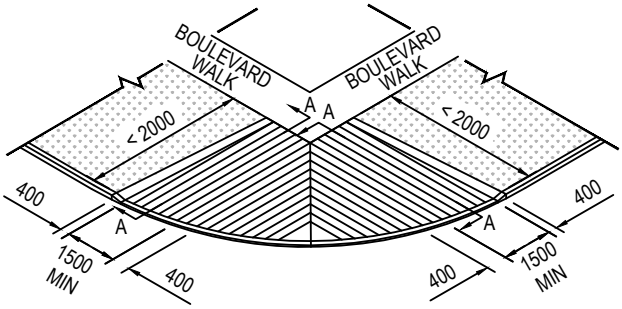
Drawing #: 2-112



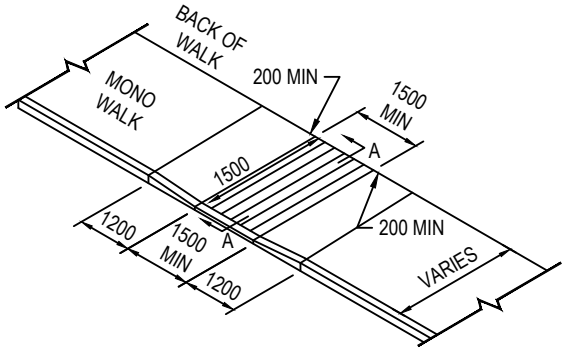
TYPE A



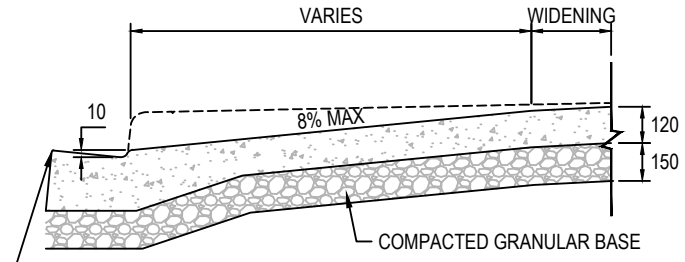
TYPE B-1 (BOULEVARD > 2.0m)



TYPE B-2 (BOULEVARD < 2.0m)

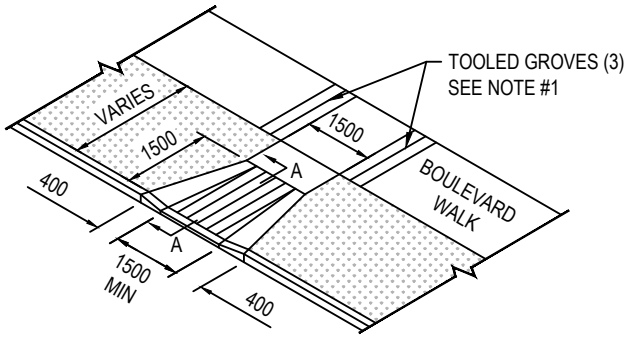


TYPE C



A) MATCH ASPHALT SURFACE TO GUTTER LIP WITHIN 3mm.
B) IF ASPHALT TOPLIFT IS DEFERRED, PLACE ASPHALT RAMP FOR THE WIDTH OF CURB RAMP, AND EXTENDING MINIMUM 1.0m INTO ROAD

TYPICAL CROSS SECTION A-A



TYPE D

NOTES:

1. TOOLED GROOVES 5mm WIDE X 10mm DEEP, BROOM FINISH. GROOVE SPACING 150mm O.C. ADJACENT TO CURB.
2. GROOVES TO BE IN DIRECTION OF TRAVEL.
3. WHEN REQUIRED, TRANSITION FROM STRAIGHT FACE CURB TO ROLLED FACE CURB AT CURB RAMP.
4. CURBS AND RAMP TO BE POURED MONOLITHICALLY.
5. WIDTH OF RAMP MUST EQUAL WIDTH OF WALK (MIN. 1.5m, MAX. 3.0m) EXCEPT "TYPE A".
6. MAXIMUM SLOPE ON CURB RAMP TO BE 8%.
7. COMPACT BACKFILL TO 95% FOR 500mm FROM BACK OF WALK AND PROVIDE POSITIVE DRAINAGE OVER THE TOP OF WALK.

NO.	DATE	REVISION
8		
7		
6	20/10/20	Removed Type A2, Added B2
5	01/02/19	Added Grass Hatch
4	22/03/18	Added Note
3	06/03/17	Revised Taper
2	22/11/16	Additional Dimensions
1	04/07/16	Removed widening in Type C

The City of Lloydminster

Checked by:

Approved by:

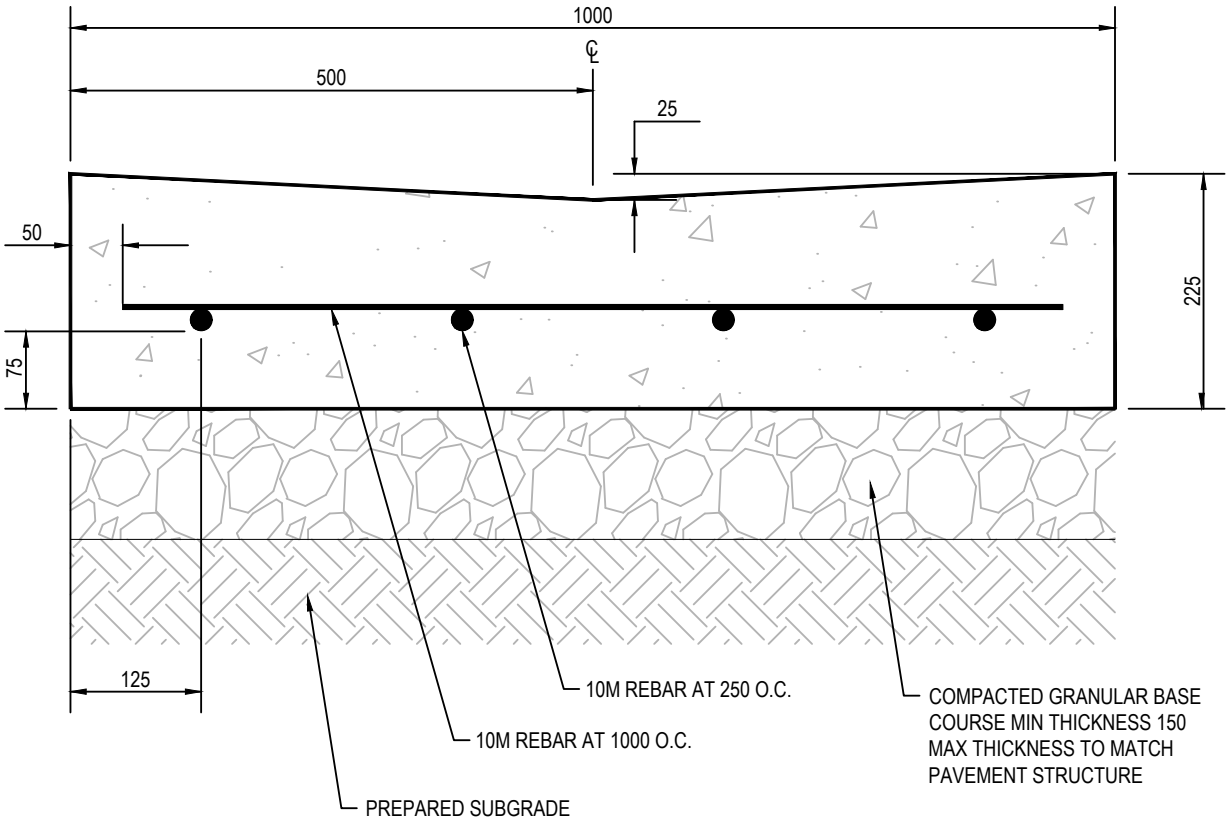
Drawn by: N / A

Scale: N.T.S.

Date: Feb. 22, 2011

CURB RAMP

Drawing #: 2-200



NOTES:

1. CENTERLINE OF SWALE TO MATCH GUTTER ELEVATION AT UPSTREAM END. LOWER GUTTER LIP TO MEET CENTERLINE OF SWALE.
2. SWALE EDGE TO MATCH GUTTER ELEVATION ON DOWNSTREAM END. LOWER GUTTER LIP TO MATCH CENTERLINE OF SWALE.
3. EXPANSION JOINTS TO BE CONSTRUCTED AT ENDS OF SWALE WHERE SWALE ABUTS GUTTERS.
4. CONTRACTION JOINTS 50mm DEEP AND 5mm WIDE TO BE CONSTRUCTED AT 3.0m INTERVALS.
5. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT

NO.	DATE	REVISION
8		
7		
6		
5		
4	04/05/20	Darkened Line, Rem. "mm"
3	06/03/20	Revised Notes
2	23/03/18	Revised Dimensions
1	22/11/16	Revised Line Width

The City of Lloydminster

Checked by:

Approved by:

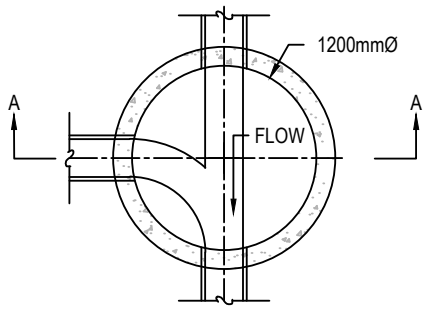
Drawn by: A. EDWARDS

Scale: N.T.S.

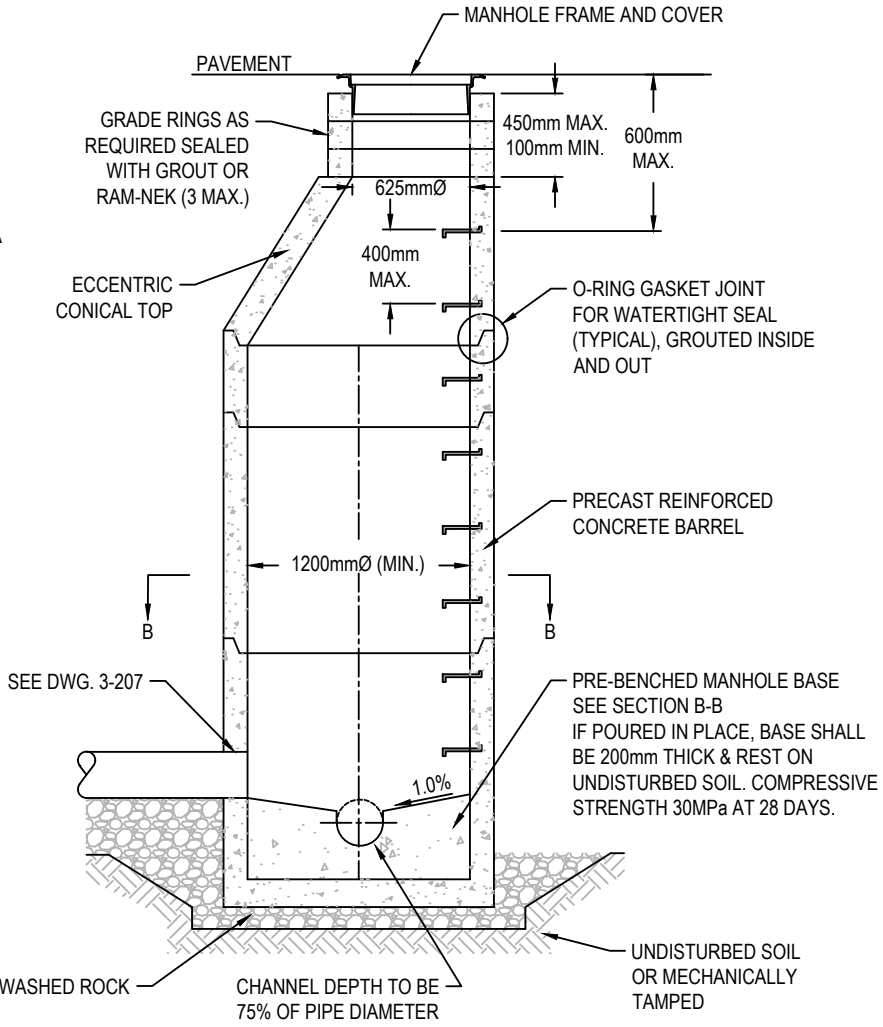
CONCRETE DRAINAGE SWALE (ROADWAY)

Date: July 25, 2017

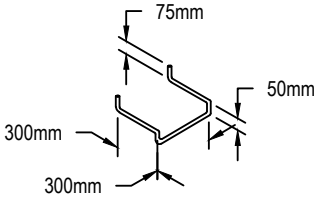
Drawing #: 2-205



SECTION B-B



SECTION A-A



20mm ALUMINUM FORGED MANHOLE STEPS OR AS PER MANUFACTURER SPECIFICATION

NOTES:

1. PRECAST RINGS, CONES AND BARRELS TO MEET CURRENT ASTM C478 STANDARDS.
2. SPECIAL BASE DESIGN REQUIRED FOR DEPTHS OVER 9.0m.
3. CHANNELLING AND BENCHING TO BE FINISHED TO TROWEL SMOOTHNESS. CONTINUE MAIN PIPE WHERE POSSIBLE.
4. CONICAL TOP TO BE USED WHERE DISTANCE FROM BENCH TO MANHOLE COVER EXCEEDS 2.0m.
5. INSTALL SAFETY PLATFORMS FOR ALL MANHOLES OVER 5.0m DEEP. LOCATE 2m ABOVE PIPE AS PER STANDARD DRAWING 3-201.
6. MANHOLE FRAME AND COVER TO BE AS PER STANDARD DRAWING 3-202.
7. BENCHING CONCRETE SHALL BE A MINIMUM OF 32MPa COMPRESSIVE STRENGTH, TYPE HS.
8. BUOYANCY CALCULATIONS TO BE PROVIDED TO THE CITY FOR ALL MANHOLES THAT HAVE HALF OR MORE OF VERTICAL DEPTH BELOW THE SURROUNDING WATER TABLE ELEVATION.

NO.	DATE	REVISION
8		
7	06/03/20	Added Note 8
6	23/03/18	Revised Details
5	14/04/16	Revised Notes
4	08/04/14	Changed grade ring thickness
3	10/12/13	Updated concrete notes
2	21/03/13	Updated concrete type
1	22/06/11	Detail reference, Note 6.

The City of Lloydminster

Checked by:

Approved by:

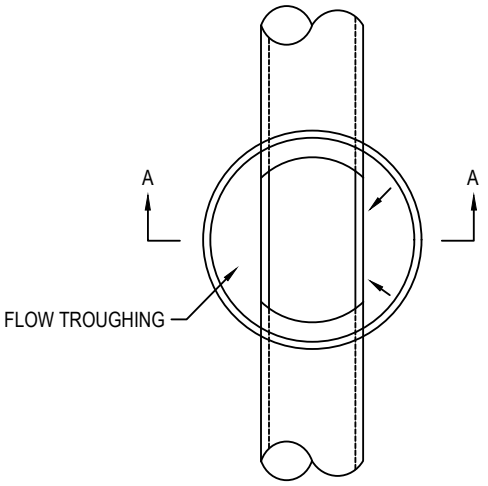
Drawn by: L. LEEPER

Scale: N.T.S.

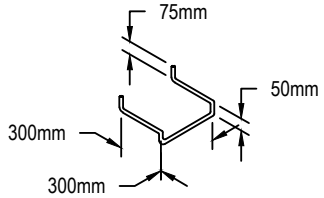
PRECAST MANHOLE FOR PIPES UP TO 525mm DIAMETER

Date: Feb. 22, 2011

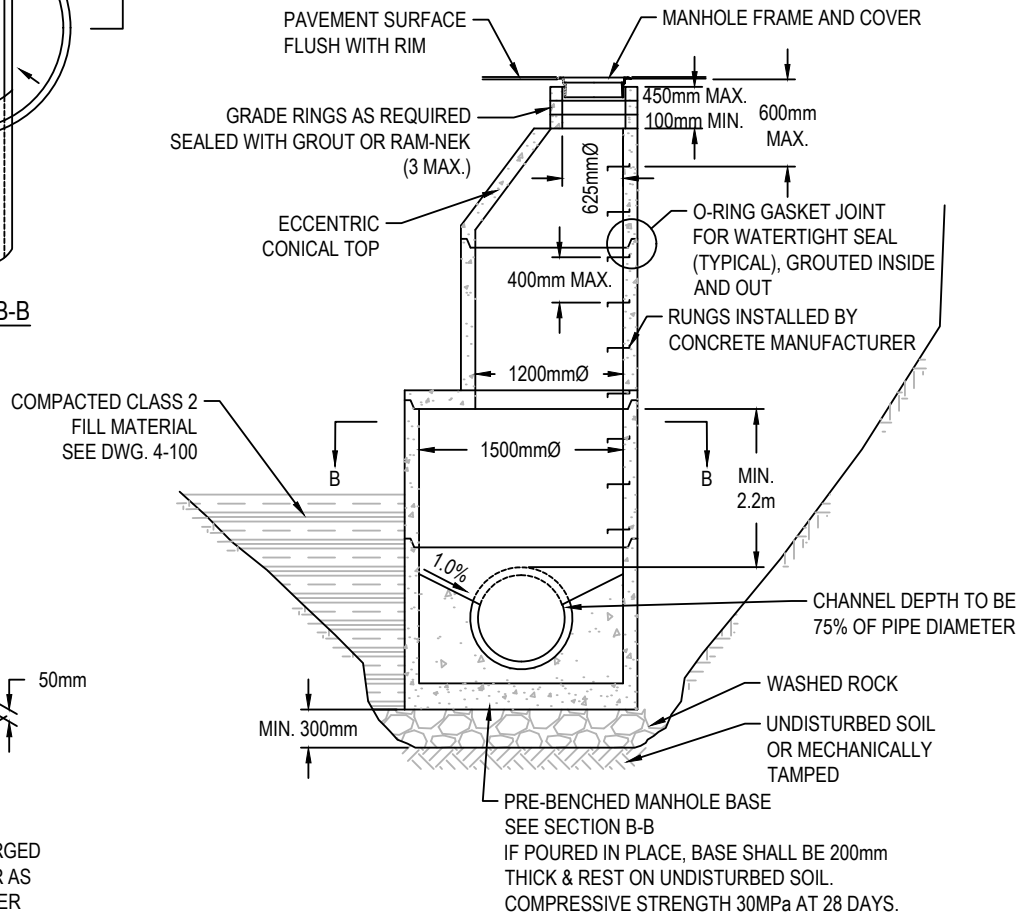
Drawing #: 3-100



SECTION B-B



20mm ALUMINUM FORGED MANHOLE STEPS OR AS PER MANUFACTURER SPECIFICATION



SECTION A-A

NOTES:

1. PRECAST RINGS, CONES AND BARRELS TO MEET CURRENT ASTM C478 STANDARDS.
2. SPECIAL BASE DESIGN REQUIRED FOR DEPTHS OVER 9.0m.
3. CHANNELLING AND BENCHING TO BE FINISHED TO TROWEL SMOOTHNESS. CONTINUE MAIN PIPE WHERE POSSIBLE.
4. CONICAL TOP TO BE USED WHERE DISTANCE FROM BENCH TO MANHOLE COVER EXCEEDS 2.0m.
5. INSTALL SAFETY PLATFORMS FOR ALL MANHOLES OVER 5.0m DEEP. LOCATE 2m ABOVE PIPE AS PER STANDARD DRAWING 3-201.
6. MANHOLE FRAME AND COVER TO BE AS PER STANDARD DRAWING 3-202.
7. BENCHING CONCRETE SHALL BE A MINIMUM OF 32MPa COMPRESSIVE STRENGTH, TYPE HS.
8. BUOYANCY CALCULATIONS TO BE PROVIDED TO THE CITY FOR ALL MANHOLES THAT HAVE HALF OR MORE OF VERTICAL DEPTH BELOW THE SURROUNDING WATER TABLE ELEVATION.

NO.	DATE	REVISION
9		
8	06/03/20	Added Note 8
7	16/08/18	Added surface flush with rim
5	14/04/16	Revised Notes
4	08/04/14	Changed grade ring thickness
3	10/12/13	Updated concrete notes
2	21/03/13	Updated concrete type
1	22/06/11	Detail reference, Note 6.

The City of Lloydminster

Checked by:

Approved by:

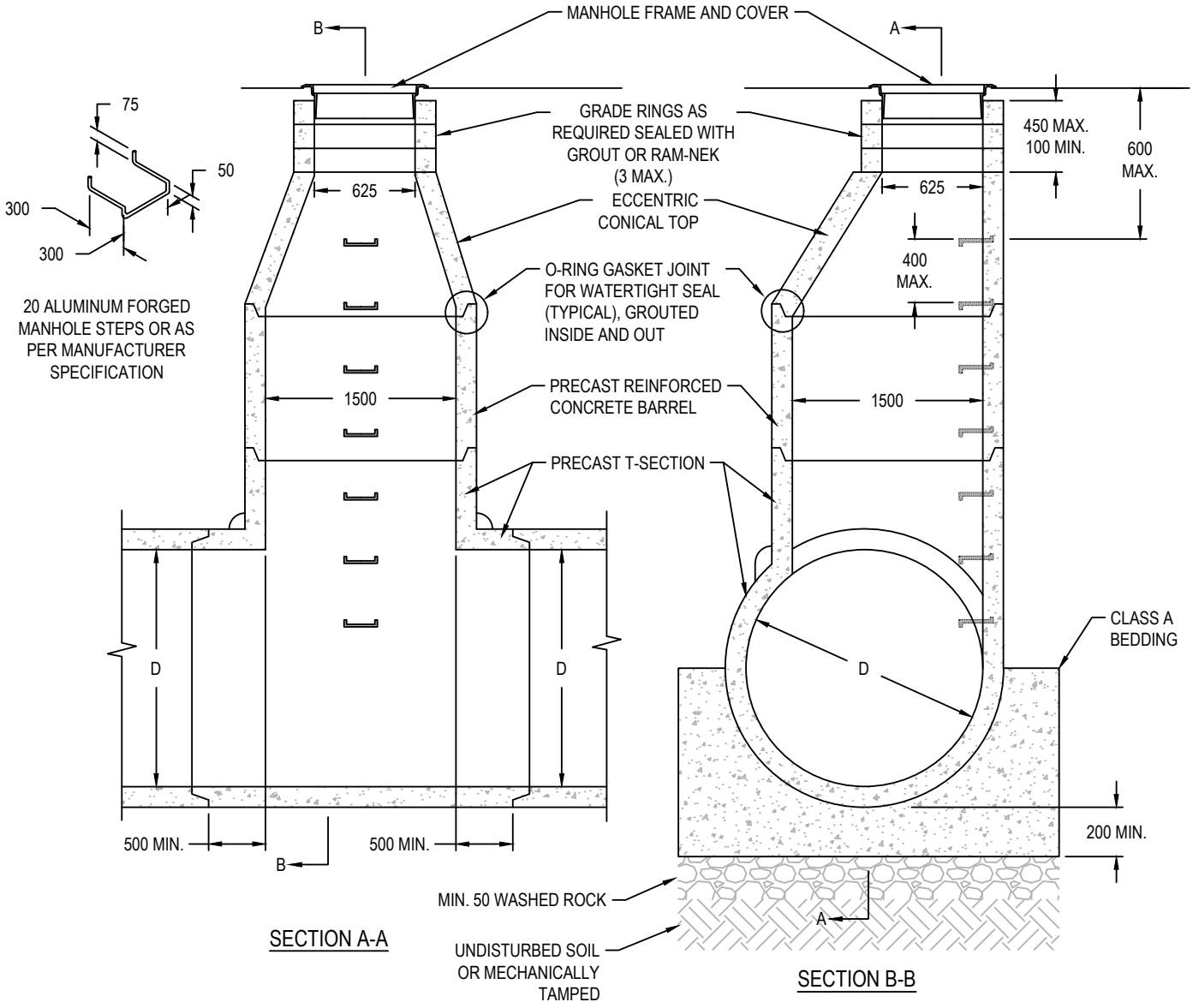
Drawn by: L. LEEPER

Scale: N.T.S.

Date: Feb. 22, 2011

PRECAST MANHOLE FOR PIPES 600mm TO 900mm DIAMETER

Drawing #: 3-101



NOTES:

1. PRECAST RINGS, CONES AND BARRELS TO MEET CURRENT A.S.T.M. C478 STANDARDS.
2. CHANNELLING AND BENCHING TO BE FINISHED TO TROWEL SMOOTHNESS. CONTINUE MAIN PIPE WHERE POSSIBLE.
3. CONICAL TOP TO BE USED WHERE DISTANCE FROM BENCH TO MANHOLE COVER EXCEEDS 2.0m.
4. INSTALL SAFETY PLATFORMS FOR ALL MANHOLES OVER 5.0m DEEP. LOCATE 2m ABOVE PIPE AS PER STANDARD DRAWING 3-201.
5. MANHOLE FRAME AND COVER TO BE AS PER STANDARD DRAWING 3-202.
6. BENCHING CONCRETE SHALL BE A MINIMUM OF 32MPa COMPRESSIVE STRENGTH, TYPE HS.
7. D => 1050mm .
8. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
9. BUOYANCY CALCULATIONS TO BE PROVIDED TO THE CITY FOR ALL MANHOLES THAT HAVE HALF OR MORE OF VERTICAL DEPTH BELOW THE SURROUNDING WATER TABLE ELEVATION.

NO.	DATE	REVISION
9	04/05/20	Changed Font Ht., Rem. "mm"
8	06/03/20	Added Note 9
7	02/07/19	Revised Notes
6	16/08/18	Revised Notes & Specs.
5	14/04/16	Revised Notes
4	08/04/14	Changed grade ring thickness
3	10/12/13	Updated concrete notes
2	21/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

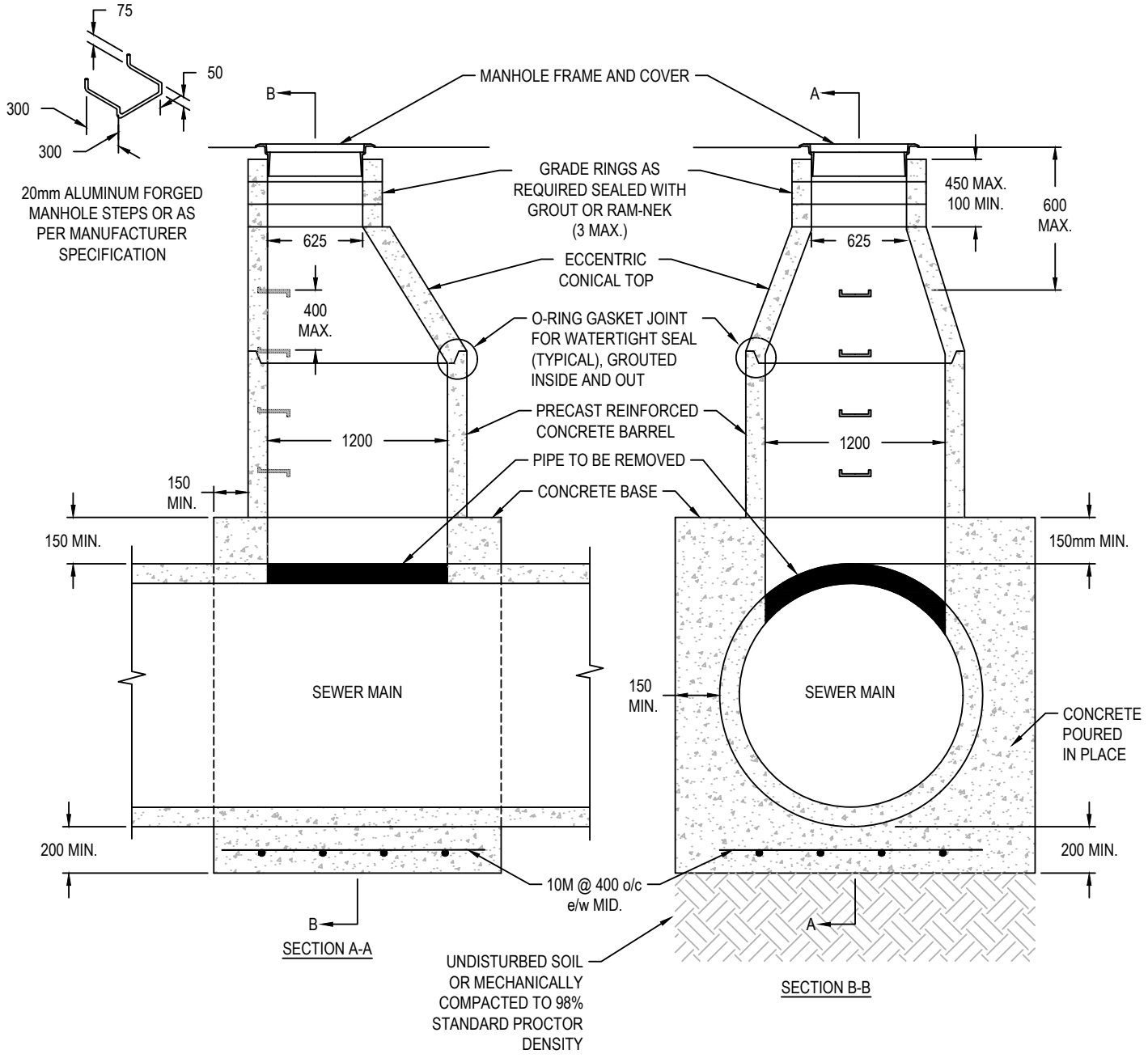
Drawn by: N / A

Scale: N.T.S.

TYPICAL T-RISER MANHOLE FOR PIPES 1050mm DIAMETER AND LARGER

Date: Feb. 22, 2011

Drawing #: 3-102



NOTES:

1. PRECAST RINGS, CONES AND BARRELS TO MEET CURRENT A.S.T.M. C478 STANDARDS.
2. CAST IN PLACE CONCRETE TO BE TYPE HS, 32MPa AT 28 DAYS.
3. COMPACT FILL AROUND MANHOLES TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY.
4. CONICAL TOP TO BE USED WHERE DISTANCE FROM TOP OF PIPE TO MANHOLE COVER EXCEEDS 2.0m.
5. VERTICAL SIDE OF CONICAL MANHOLE ON UPSTREAM SIDE.
6. INSTALL SAFETY PLATFORMS FOR ALL MANHOLES OVER 5.0m DEEP. LOCATE 2.0m ABOVE PIPE AS PER STANDARD DRAWING 3-201.
7. MANHOLE FRAME AND COVER TO BE AS PER STANDARD DRAWING 3-202.
8. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1		

The City of Lloydminster

Checked by:

Approved by:

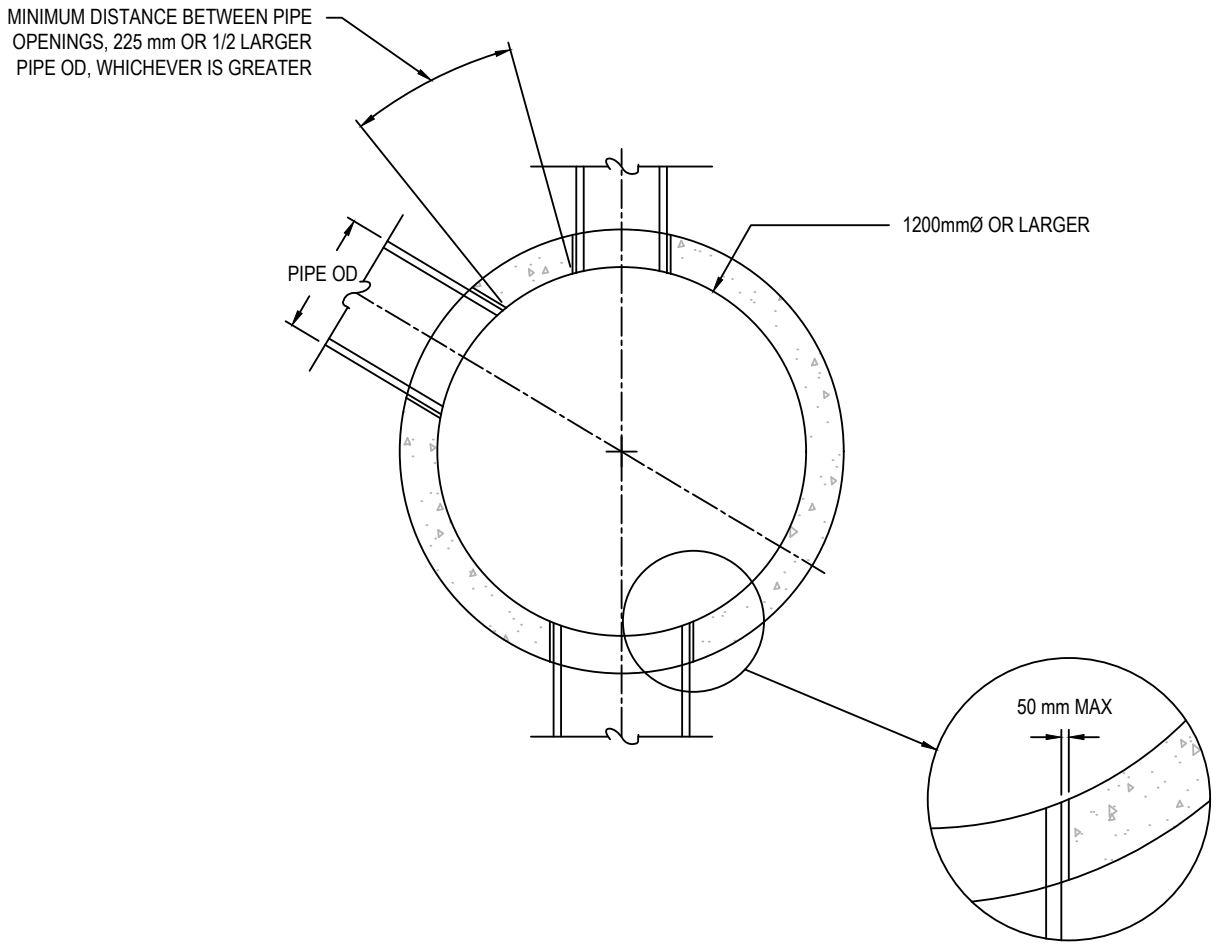
Drawn by: L. LEEPER

Scale: N.T.S.

Date: July 2, 2019

PERCHED MANHOLE

Drawing #: 3-104



NOTES:

1. MANHOLES MUST BE LARGE ENOUGH TO ACCOMMODATE THE MAXIMUM INTERSECTING PIPE SIZE.
2. THE MINIMUM DISTANCE BETWEEN OPENINGS FOR PIPES SHALL BE 225 mm OR 1/2 OF THE LARGER PIPE'S OUTER DIAMETER (OD), WHICHEVER IS GREATER.
3. MANHOLES SHALL BE DESIGNED WITH SUFFICIENT INSIDE DIMENSIONS TO PERFORM INSPECTION AND CLEANING OPERATIONS, ALLOW FOR PROPER CHANNEL CONSTRUCTION WITHOUT DIFFICULTY AND MINIMIZE HYDRAULIC LOSSES THROUGH THE MANHOLE.
4. PRE-BENCHED MANHOLE BASES SHALL BE USED WHEREVER POSSIBLE WITH PRE-CORED CONNECTION HOLES AND WATER-TIGHT DURASEAL OR G-LOC JOINTS OR APPROVED EQUAL.
5. OPENINGS FOR CONNECTIONS MADE IN THE FIELD SHALL NOT BE GREATER THAN THE OUTER DIAMETER OF THE PIPE BY MORE THAN 50 MM IN ANY DIRECTION AND SHALL BE CORED OR CUT, AND THE OPENING AROUND THE PIPE SEALED WITH NON-SHRINK GROUT.
6. 1500 mm OR LARGER DIAMETER MANHOLES ARE REQUIRED WHEN CONNECTING SEWERS THAT ARE BETWEEN 600 mm AND 900 mm.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2	06/03/20	Renumbered DWG from 3-207
1	23/03/18	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

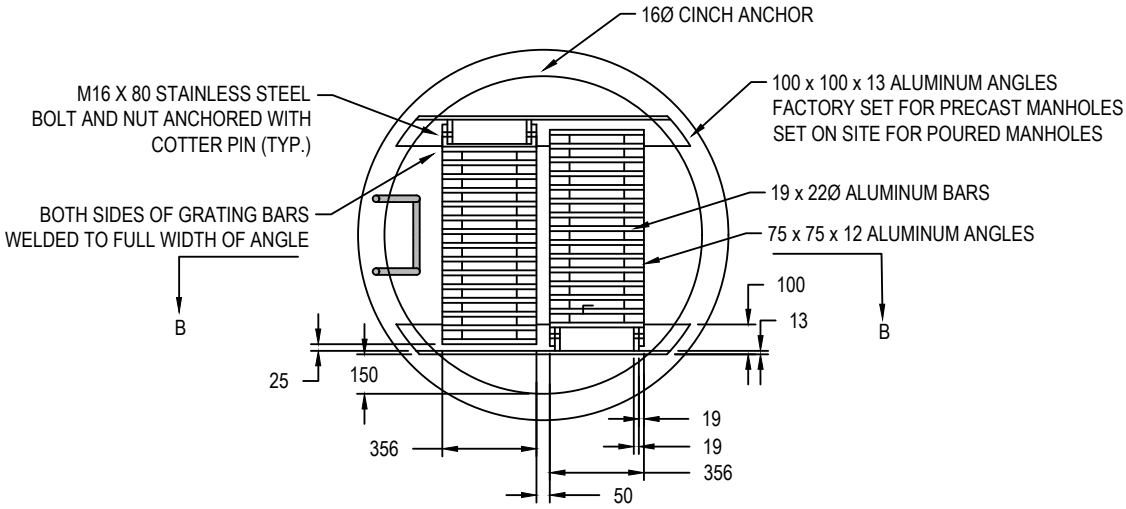
Drawn by: A. ADEBAYO

Scale: N.T.S.

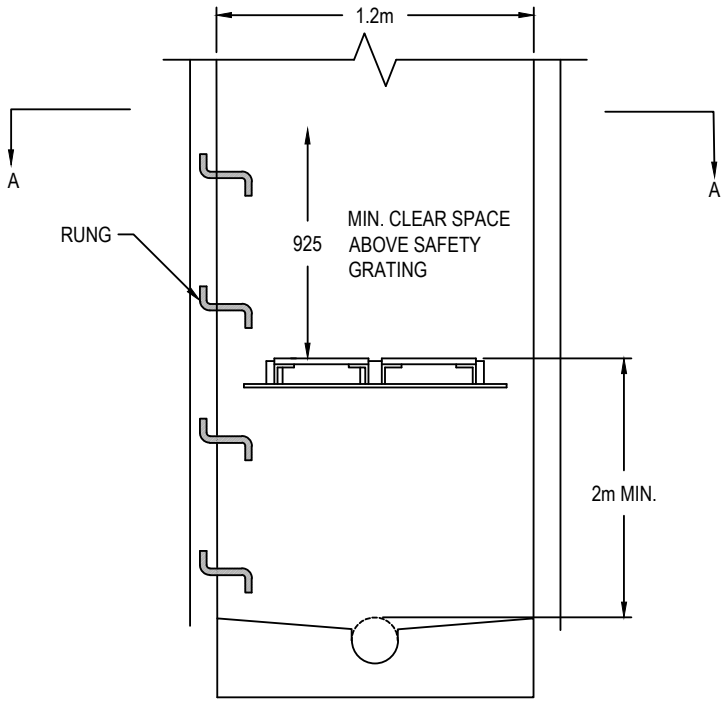
MANHOLE PENETRATIONS AND DESIGN

Date: Apr. 05, 2016

Drawing #: 3-105



SECTION A-A



SECTION B-B

NOTES:

1. PLATFORMS TO BE INSTALLED IN ALL MANHOLES OVER 5.0m IN DEPTH (RIM TO INVERT)

NO.	DATE	REVISION
8		
7		
6		
5		
4	04/05/20	Rem. "mm", Adj. Font Ht.
3	01/03/19	Removed Features
2	8/16/18	Added Features
1	4/14/16	Revised Notes

The City of Lloydminster *Planning & Engineering*

Checked by:

Approved by:

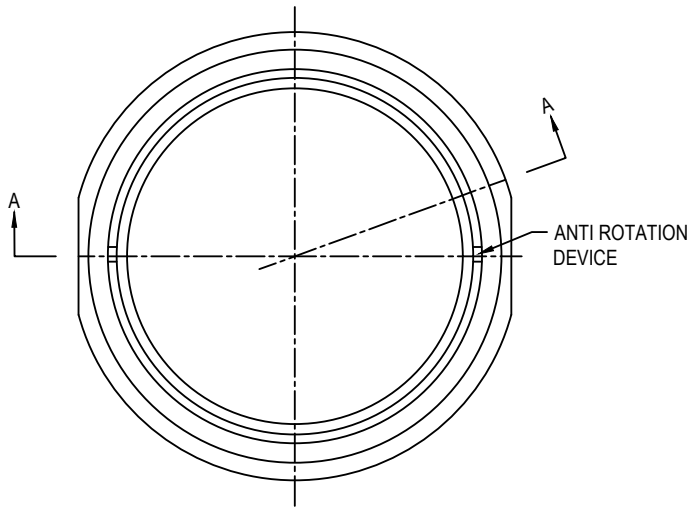
Drawn by: N / A

Scale: N.T.S.

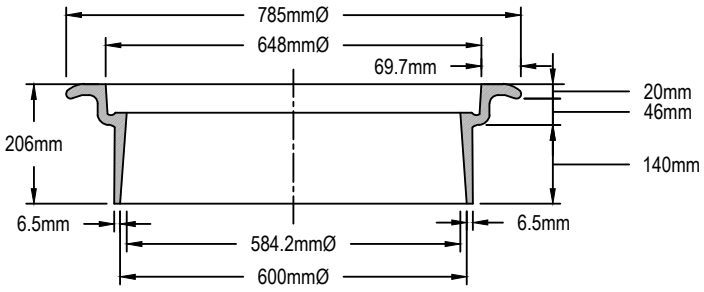
SAFETY PLATFORM

Date: Feb. 22, 2011

Drawing #: 3-201



FRAME



SECTION A - A

NOTES:

1. CASTINGS SHALL BE TRUE TO PATTERN AND FREE FROM CRACKS, GAS HOLES, FLAWS, OR SHRINKAGE. BEARING SURFACE SHALL BE MACHINED TO PREVENT ROCKING.
2. USE FOR ALL ROADWAY, GRAVEL APPLICATIONS.
3. COVER TO BE AS PER STANDARD DRAWING 3-204 FOR SANITARY SEWER SYSTEM OR 3-205 FOR STORM SEWER SYSTEM.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1	4/14/16	Rev. Notes, Dwg. Title, Rem. Cover

The City of Lloydminster

Checked by:

Approved by:

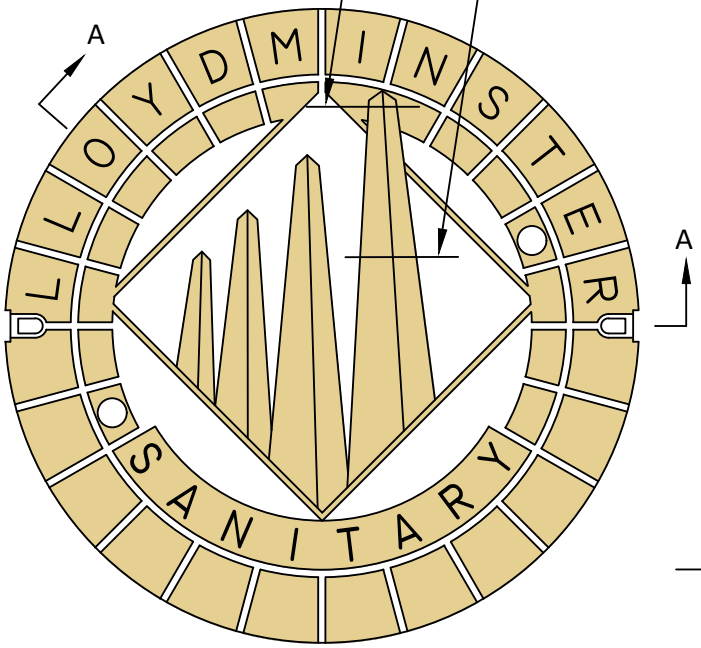
Drawn by: L. LEEPER

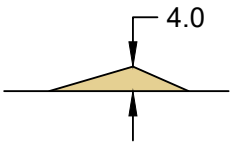
Scale: N.T.S.

F-80 MANHOLE FRAME

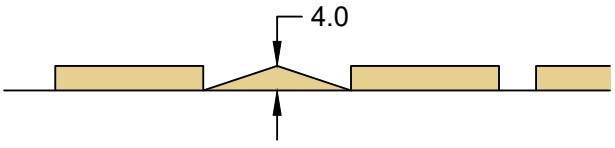
Date: Feb. 22, 2011

Drawing #: 3-202





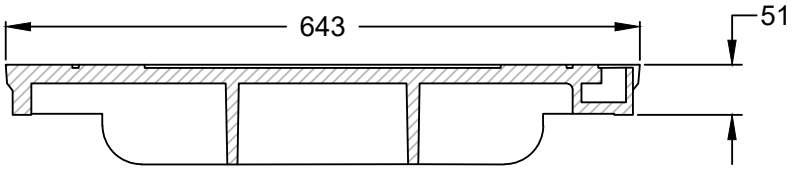
SECTION B



SECTION C

BOTTOM OF GROOVES - BASE LEVEL

4mm HIGHER



SECTION A-A

NO.	DATE	REVISION
8		
7		
6	06/03/20	Underlined Section Titles
5	03/12/18	Added Vent Holes
4	16/08/18	Revised Text's Font Height
3	23/03/18	Revised Text Height
2	22/11/16	Revised Dimensions
1	11/02/16	Revised Cover Text

The City of Lloydminster

Checked by:

Approved by:

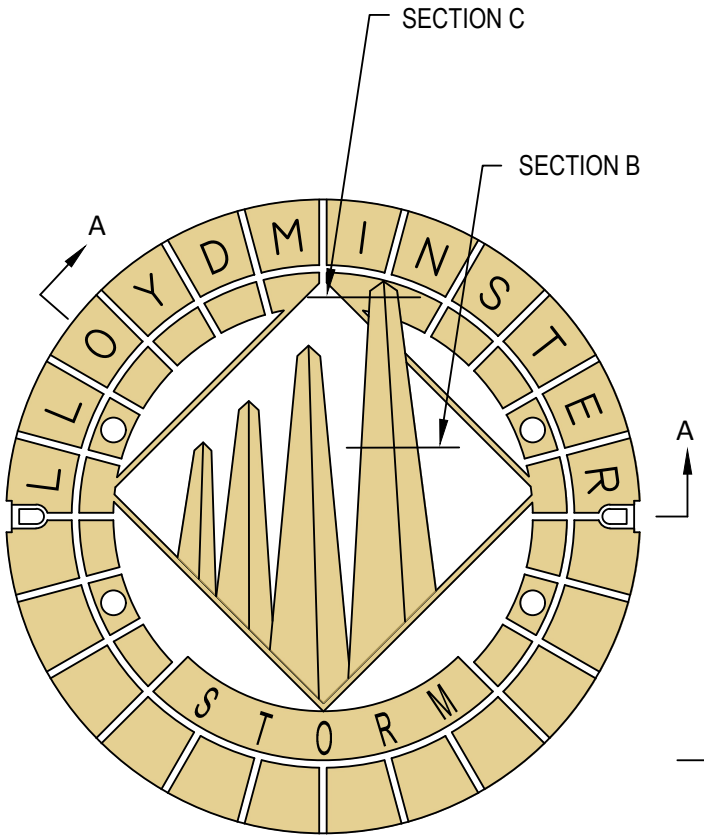
Drawn by: L. LEEPER

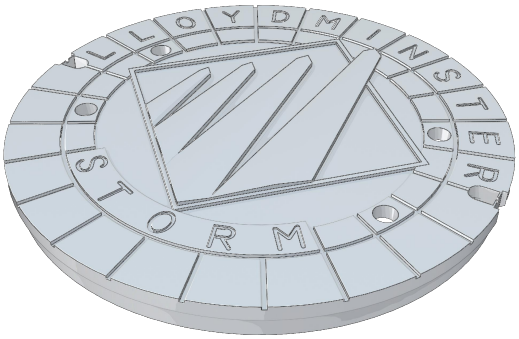
Scale: N.T.S.

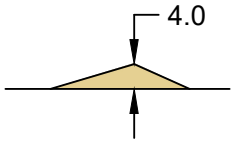
TF-80LSAN Sanitary Sewer Cover (City Logo)

Date: Dec. 14, 2015

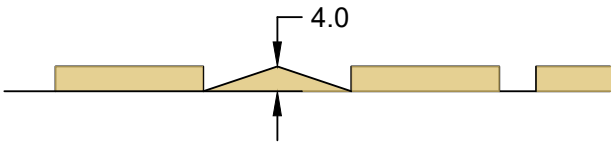
Drawing #: 3-204







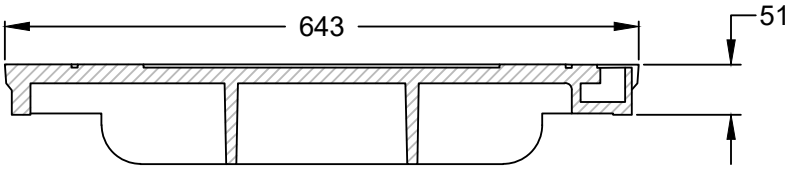
SECTION B



SECTION C

BOTTOM OF GROOVES - BASE LEVEL

4 mm HIGHER



SECTION A-A

NO.	DATE	REVISION
8		
7		
6		
5		
4	06/03/20	Underlined Section Text
3	23/03/18	Revised Text Height
2	22/11/16	Revised Dimensions
1	08/02/16	Revised Cover Text

The City of Lloydminster

Checked by:

Approved by:

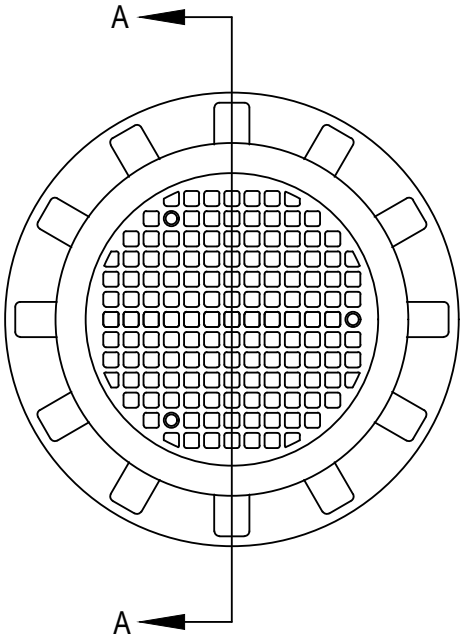
Drawn by: L. LEEPER

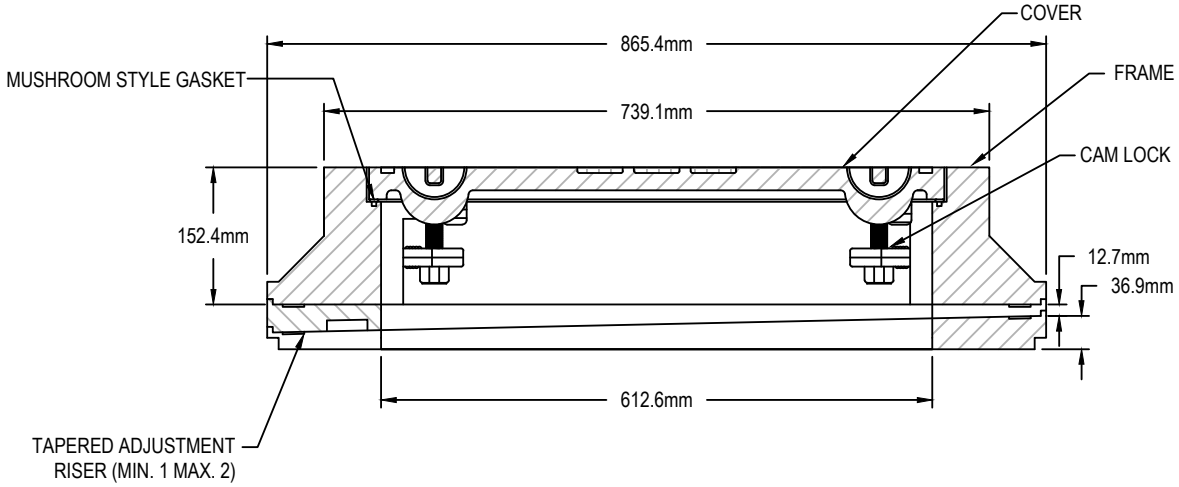
Scale: N.T.S.

TF-80LSTM Storm Sewer Cover (City Logo)

Date: Dec. 14, 2015

Drawing #: 3-205





SECTION A-A

NOTES:

1. USE ON SANITARY MANHOLES, LOCATED IN ROADWAY SAGS OR GRASSED AREAS WHERE THERE IS A RISK OF INFLOW.
2. INSTALLERS MUST HOLD A LIFESPAN INSTALLATION AND MAINTENANCE CERTIFICATE
3. ADJUST TAPERED ADJUSTMENT RISER(S) SO THAT FRAME IS ANGLED TO BE FLUSHED WITH THE PAVED SURFACE.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3	06/03/20	Underlined "Section A-A"
2	16/08/18	Additional Notes
1	22/11/16	Additional Notes

The City of Lloydminster

Checked by:

Approved by:

Drawn by: A. EDWARDS

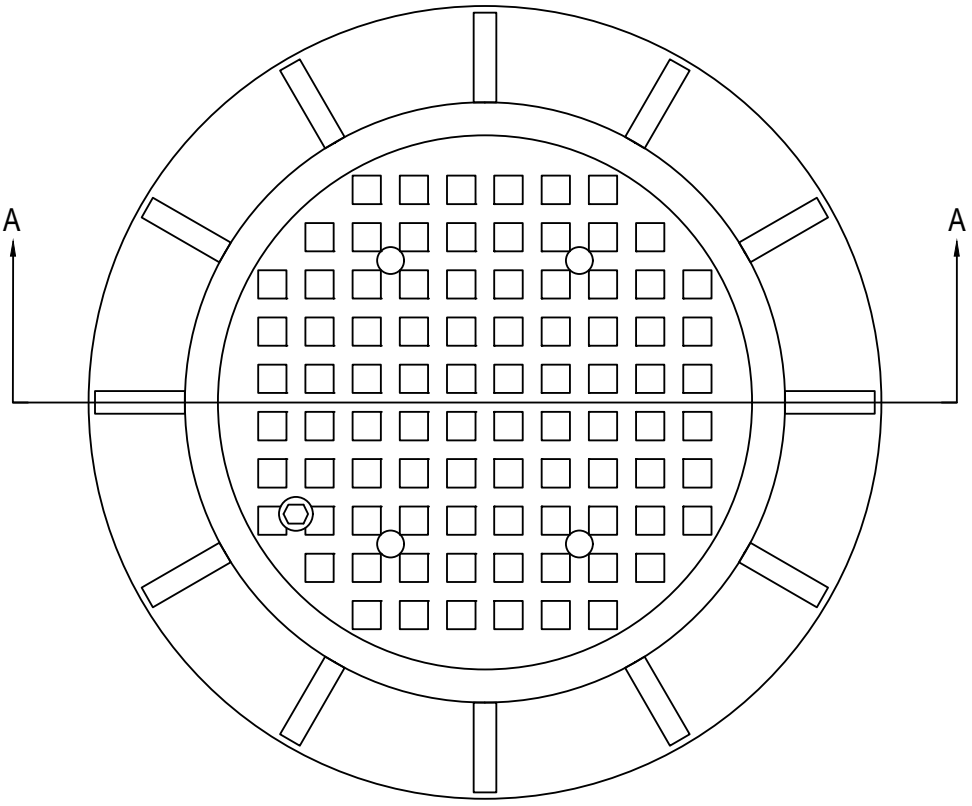
Scale: N.T.S.

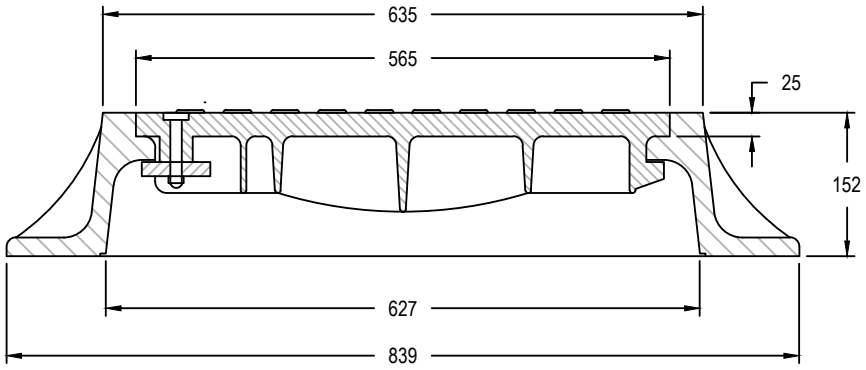
WATERTIGHT MANHOLE COVER

Date: April 19, 2016

Drawing #: 3-206

PLAN





SECTION A-A

NOTES:

1. CASTINGS SHALL BE TRUE TO PATTERN AND FREE FROM CRACKS, GAS HOLES, FLAWS, OR SHRINKAGE. BEARING SURFACE SHALL BE MACHINED TO PREVENT ROCKING.
2. USE FOR STORM SEWER MANHOLES IN GRASSED AREAS.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1	20/08/2018	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

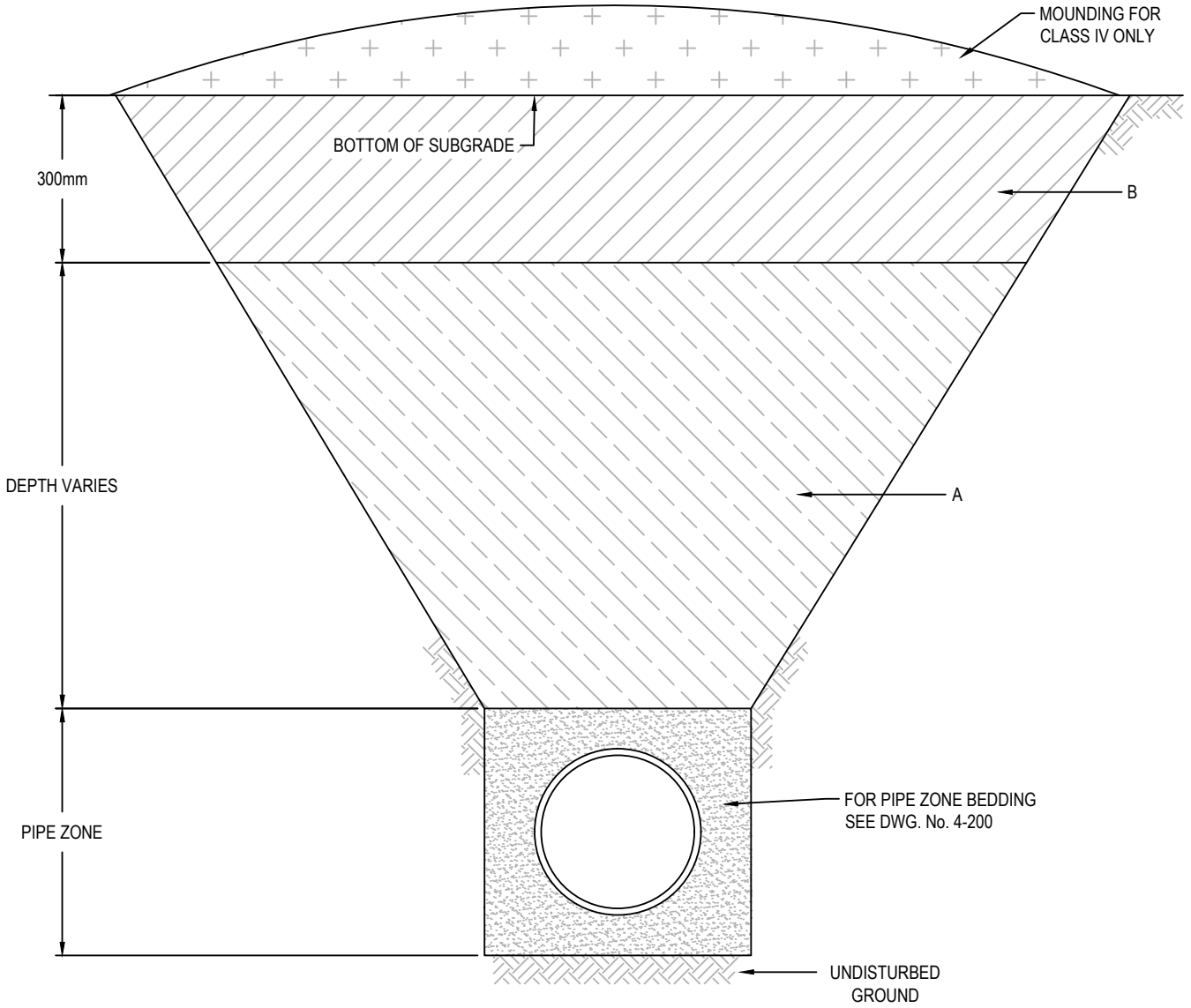
Drawn by: A. Edwards

Scale: N.T.S.

F-39 FRAME AND LOCKING COVER

Date: June 30, 2016

Drawing #: 3-208



CLASS	USE	A			B		
		MATERIAL	MAX LIFT	% SPD	MATERIAL	MAX LIFT	% SPD
I	UNDER ROADS	IMPORTED GRANULAR	300	98	IMPORTED GRANULAR	150	100
II	UNDER ROADS	NATIVE	300	98	NATIVE	150	100
III	LANDSCAPED AREAS	NATIVE	300	95	NATIVE	200	95
IV	OPEN FIELD	NATIVE	300	95	NATIVE	300	95

NOTES:

1. ALL TRENCHED WALLS SHALL BE SLOPED OR SHORED IN CONFORMANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY REGULATIONS CURRENTLY IN EFFECT.
2. SURFACE DRAINAGE TO BE RECTIFIED FOR IMMEDIATE AREA IF CLASS IV BACKFILL IS USED.

NO.	DATE	REVISION
8		
7		
6		
5		
4	06/03/20	Notes Formatting
3	21/12/16	Updated Notes
2	30/06/16	Updated Notes
1	08/04/14	Changed bedding ref dwg no.

The City of Lloydminster

Checked by:

Approved by:

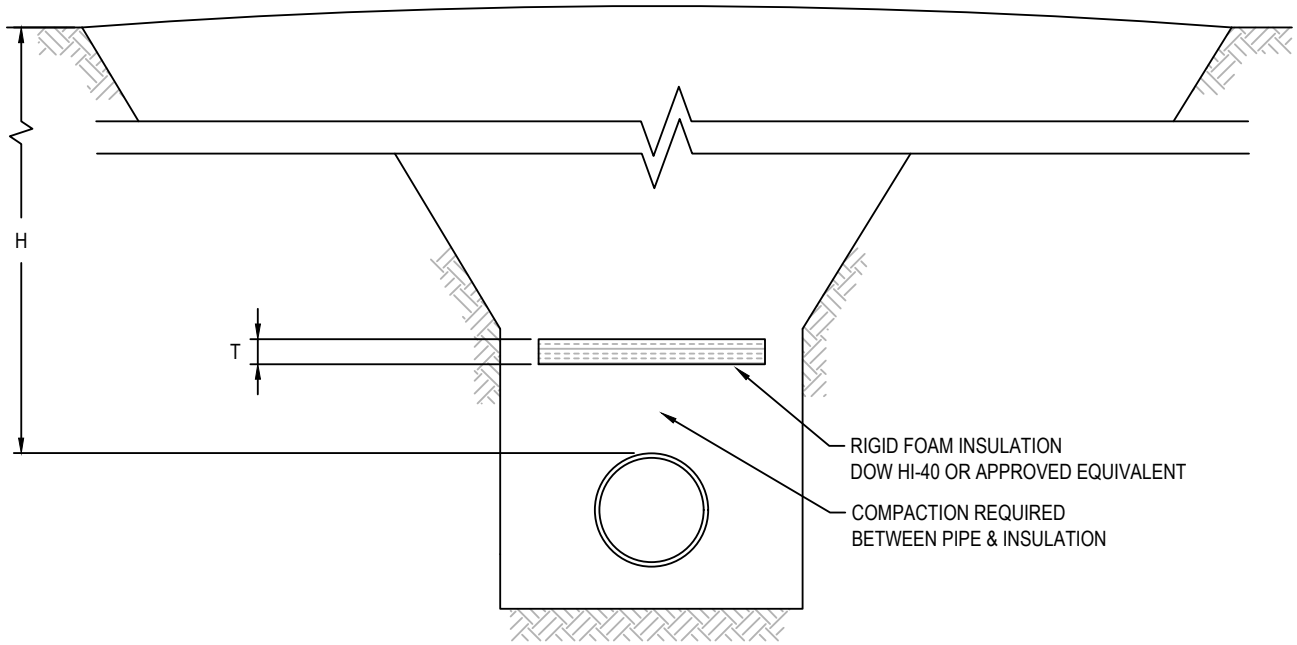
Drawn by: L. LEEPER

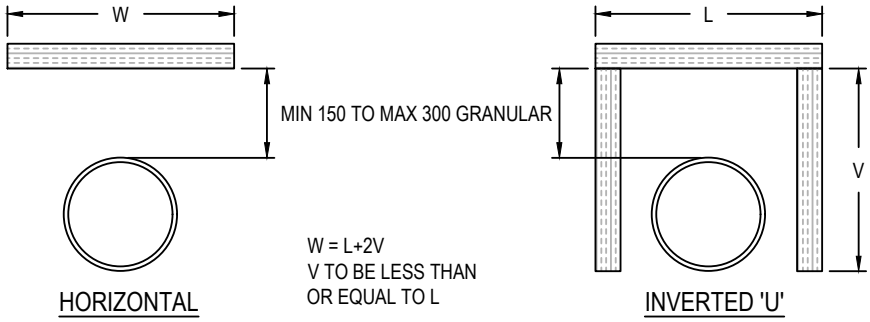
Scale: N.T.S.

TRENCH BACKFILL

Date: Feb. 22, 2011

Drawing #: 4-100





'H' DEPTH FROM FINISHED GRADE TO TOP OF MAIN IN METRES	TABLES FOR VALUES OF "T" (INSULATION THICKNESS) IN MILLIMETERS								'W' WIDTH OF INSULATION IN METRES
	MAINS IN LANES OR EASEMENTS		MAINS IN STREETS		DEAD END MAINS IN STREETS		DEAD END MAINS IN LANES		
	GRAVEL	CLAY	GRAVEL	CLAY	GRAVEL	CLAY	GRAVEL	CLAY	
0 - 1	*	*	*	*	*	*	*	*	*
1 - 1.25	125	100	150	125	175	150	150	125	3.7
1.25 - 1.5	100	75	125	100	150	125	125	100	3.2
1.5 - 1.8	75	50	100	75	125	100	100	75	2.6
1.8 - 2.1	50	25	75	50	100	75	75	75	2.0
2.1 - 2.4	25	0	50	25	75	50	50	25	1.4
2.4 - 2.7	0	0	25	0	50	25	25	0	1.0
2.7 - 3.0	0	0	0	0	25	0	0	0	1.0
3.0 OR MORE	0	0	0	0	0	0	0	0	-

* INDICATES DEPTH NOT PRACTICAL

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1	06/03/20	Revised Dwg, Details & Table

The City of Lloydminster

Checked by:

Approved by:

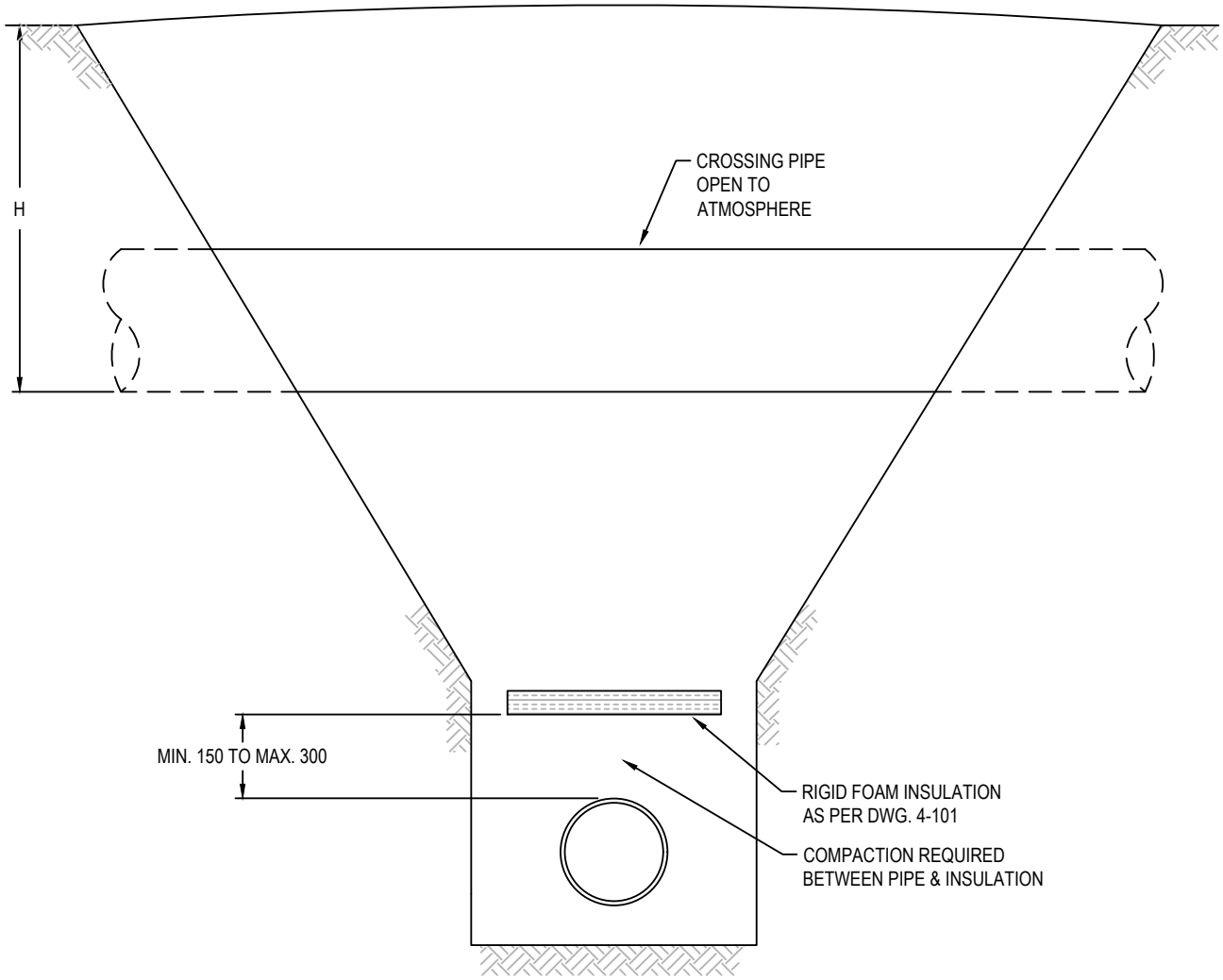
Drawn by: L. LEEPER

Scale: N.T.S.

INSULATION REQUIREMENTS

Date: Feb. 22, 2011

Drawing #: 4-101



NOTES:

1. TO BE USED WHERE CROSSING PIPE IS OPEN TO THE ATMOSPHERE (e.g. STORM SEWER, CULVERT CROSSING, etc.).
2. USE DEPTH "H" FOR INSULATION THICKNESS AND WIDTH AS PER DWG. 4-101.

NO.	DATE	REVISION
8		
7		
6		
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3		
2		
1		

The City of Lloydminster

Checked by:

Approved by:

Drawn by: L. LEEPER

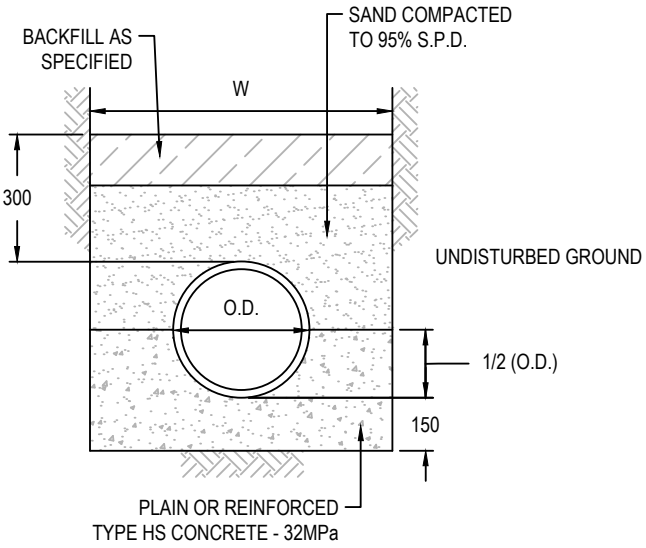
Scale: N.T.S.

Date: Mar. 9, 2020

INSULATION REQUIREMENTS

CROSSING PIPE OPEN TO ATMOSPHERE

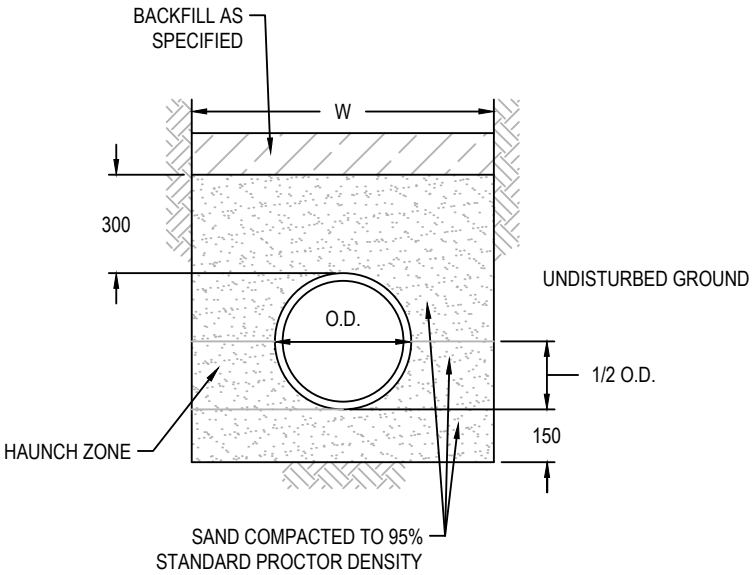
Drawing #: 4-102



CLASS A

LEGEND

W = TRENCH WIDTH.
O.D. = OUTSIDE DIAMETER OF PIPE.



CLASS B

NOTES:

1. ADD 100mm TO BEDDING IN ROCK EXCAVATION.
2. TRENCH WIDTH TO BE A MINIMUM OF TWICE THE OUTSIDE DIAMETER OF THE PIPE OR TO MANUFACTURERS SPECIFICATIONS.
3. COMPACT SAND IN THE HAUNCH ZONE IN BOTH DIRECTIONS AWAY FROM THE PIPE TO THE UNDISTURBED TRENCH WALLS.
4. FOR PIPES UP TO 600mm IN DIAMETER. FOR PIPES LARGER THAN 600mm IN DIAMETER PROVIDE BEDDING DESIGN IN CONFORMANCE WITH CITY STANDARDS.

NO.	DATE	REVISION
8		
7		
6	04/05/20	Removed "1/2 O.D." Text
5	09/03/20	Removed B-1 and Added Notes
4	23/03/18	Revised Notes
3	21/12/16	Updated Notes
2	17/04/14	Changed concrete strength
1	21/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

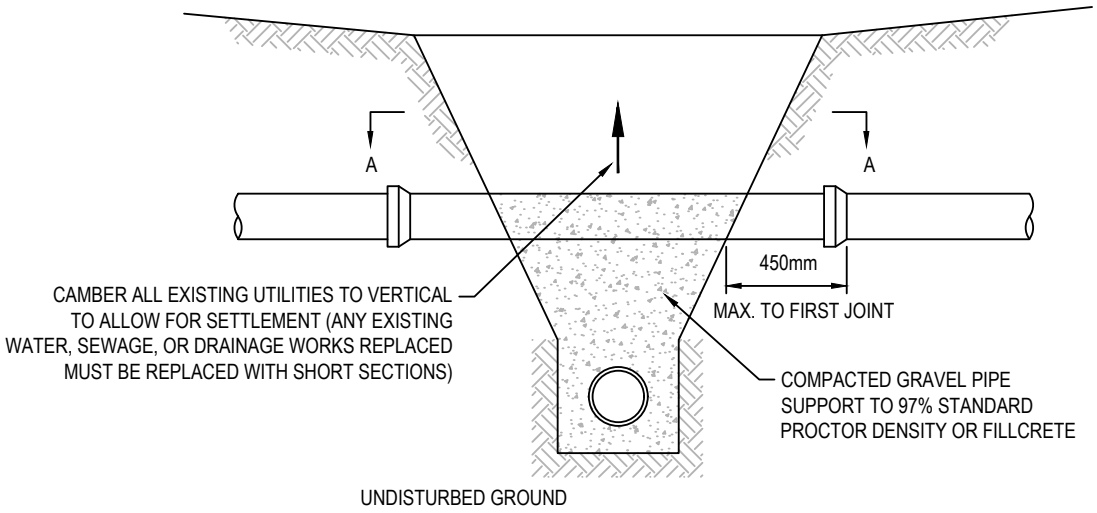
Drawn by: N / A

Scale: N.T.S.

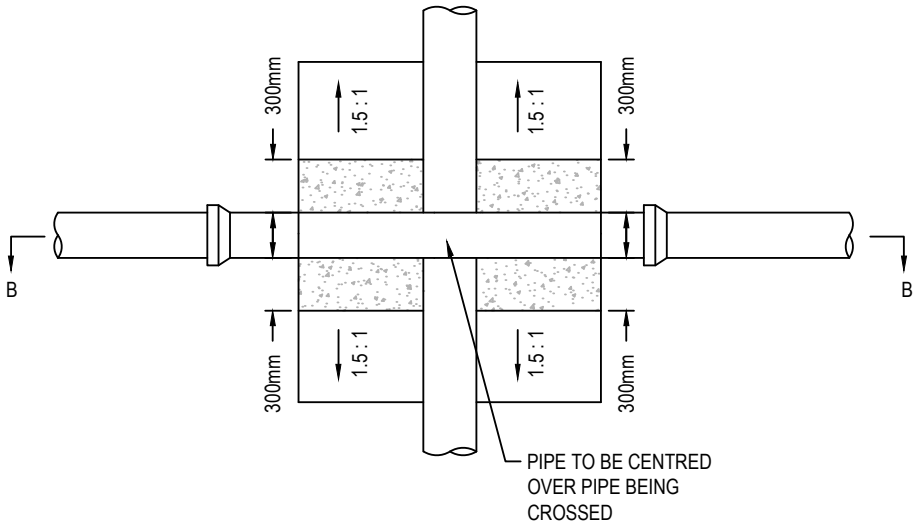
PIPE ZONE BEDDING DETAILS (CLASS A, B)

Date: Feb. 22, 2011

Drawing #: 4-200



SECTION B-B



SECTION A-A

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1	23/03/18	Revised Details

The City of Lloydminster

Checked by:

Approved by:

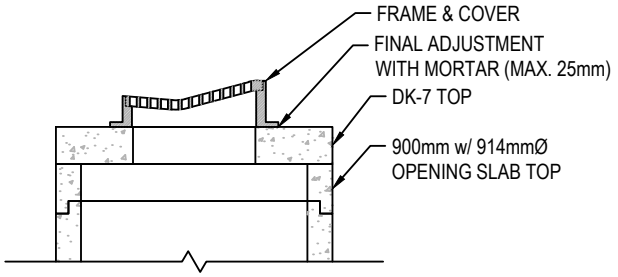
Drawn by: L. LEEPER

Scale: N.T.S.

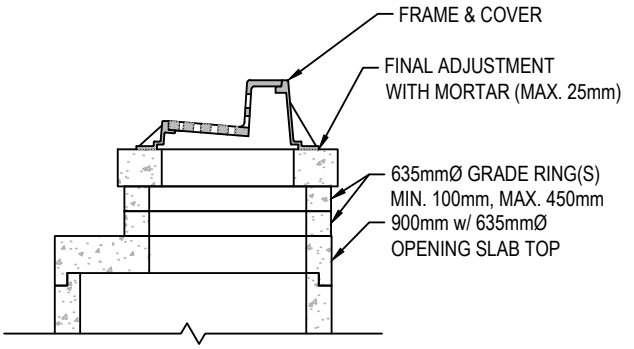
PIPE SUPPORT

Date: Feb. 22, 2011

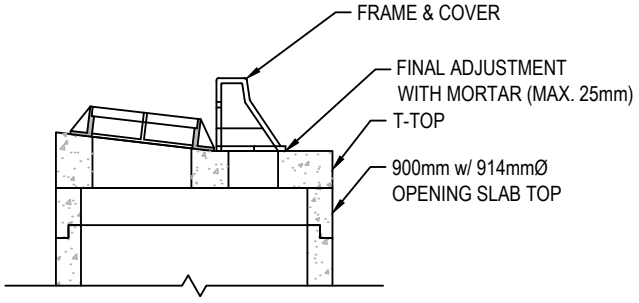
Drawing #: 4-300



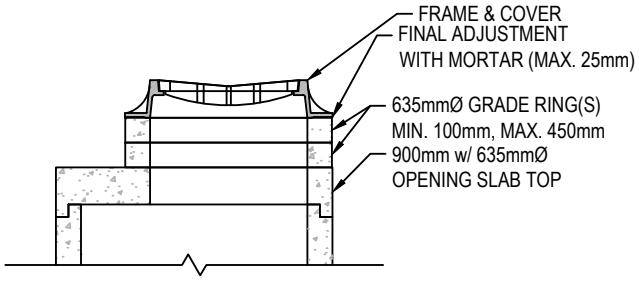
DK-7



F-36



F-51 c/w TWO PIECE SIDE INLET



F-38

K-7

NO.	DATE	REVISION
8		
7	23/03/18	Revised Note
6	22/11/16	Updated Dimensions
5	28/06/16	Updated Notes
4	14/04/16	Updated Dimensions
3	08/04/14	Changed grade ring thickness
2	10/12/13	Updated concrete strength
1	21/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

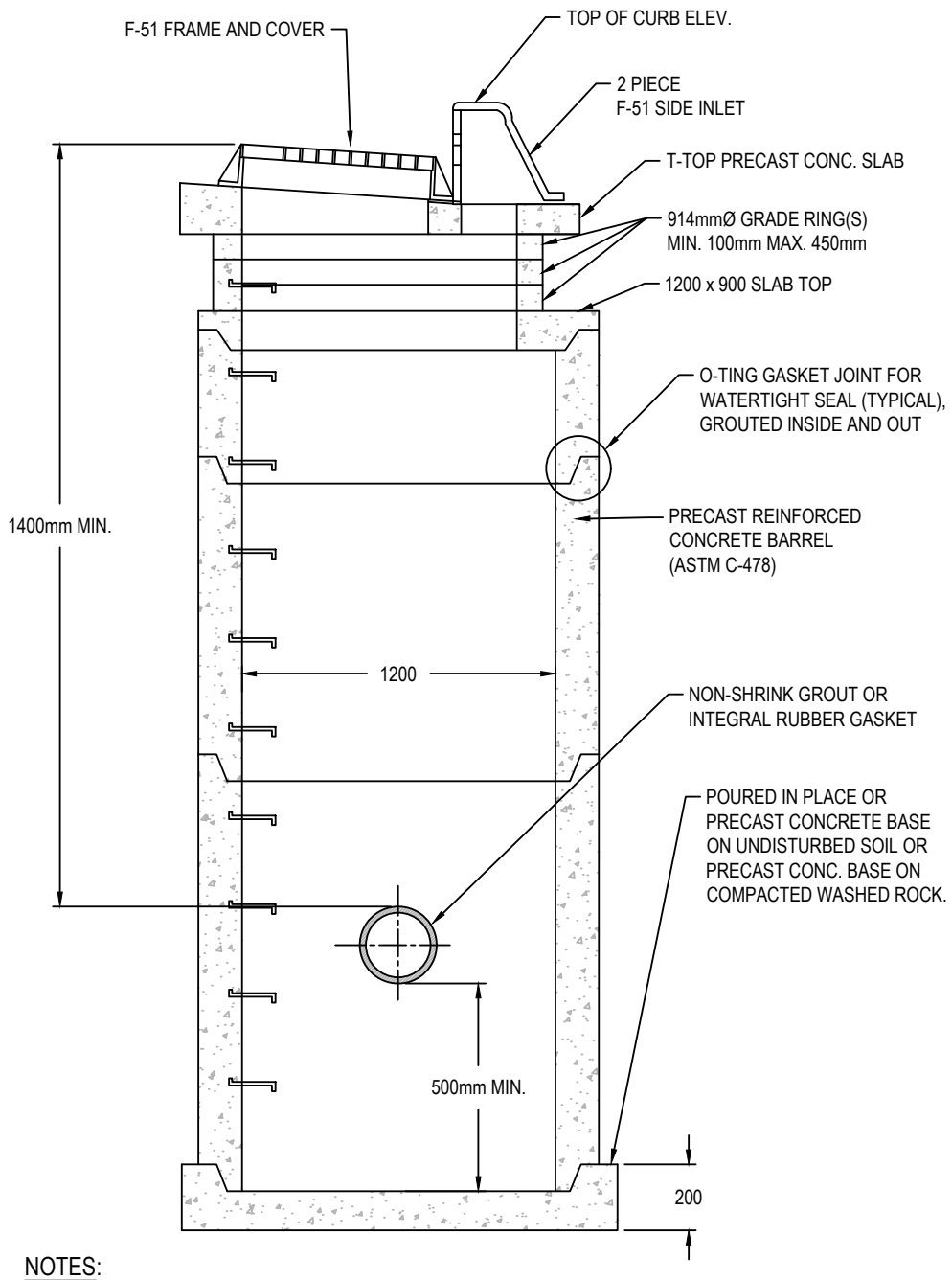
Drawn by: L. LEEPER

Scale: N.T.S.

900mm DIA. CATCH BASIN c/w FRAME AND COVER

Date: Feb. 22, 2011

Drawing #: 5-100



NOTES:

1. UNIT COULD BE MADE UP FROM TWO ITEMS (BASE AND BARREL).
2. OPPOSITE ORIENTATION OF JOINTS IS ACCEPTABLE.
3. SEE DWG. 2-202 FOR CURB INSTALLATION DETAIL

NO.	DATE	REVISION
8		
7		
6		
5		
4	23/11/18	Updated Notes
3	22/11/16	Updated Dimensions
2	28/06/16	Updated Notes
1	14/04/16	Updated Dimensions

The City of Lloydminster

Checked by:

Approved by:

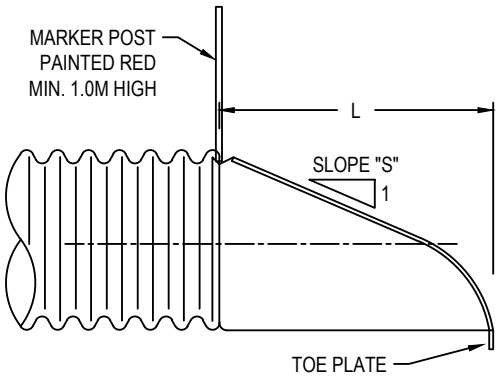
Drawn by: L. LEEPER

Scale: N.T.S.

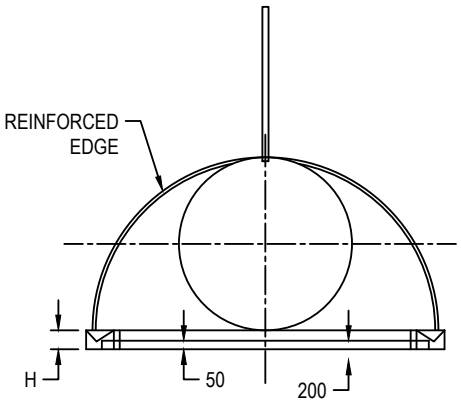
1200mm DIA C.B. MANHOLE c/w F-51 FRAME AND COVER WITH TWO PIECE SIDE INLET

Date: Feb. 22, 2011

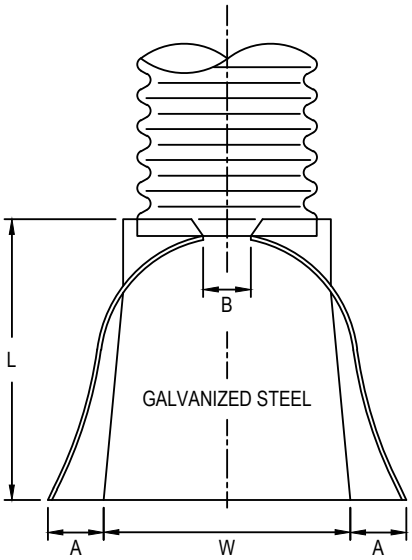
Drawing #: 5-101



CROSS SECTION



ELEVATION



PLAN

PIPE DIAMETER "D" mm	GALVANIZED METAL THICKNESS mm	DIMENSIONS, mm					SLOPE "S"	BODY
		A 25 mm ±	B MAX mm	H 25 mm ±	L 38 mm ±	W 50 mm ±		
300	1.6	150	140	150	535	610	2.5	1 PC
600	1.6	250	300	150	1040	1220	2.5	1 PC
1200	2.0	350	475	225	1500	1800	2.5	1 PC
1200	2.0	460	625	305	1980	2285	2.25	2 PC

NOTES:

1. RIP-RAP TO BE PLACED AROUND OUTLET AS PER DWG. 5-304

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1	11/23/18	REVISED TEXT

The City of Lloydminster

Checked by:

Approved by:

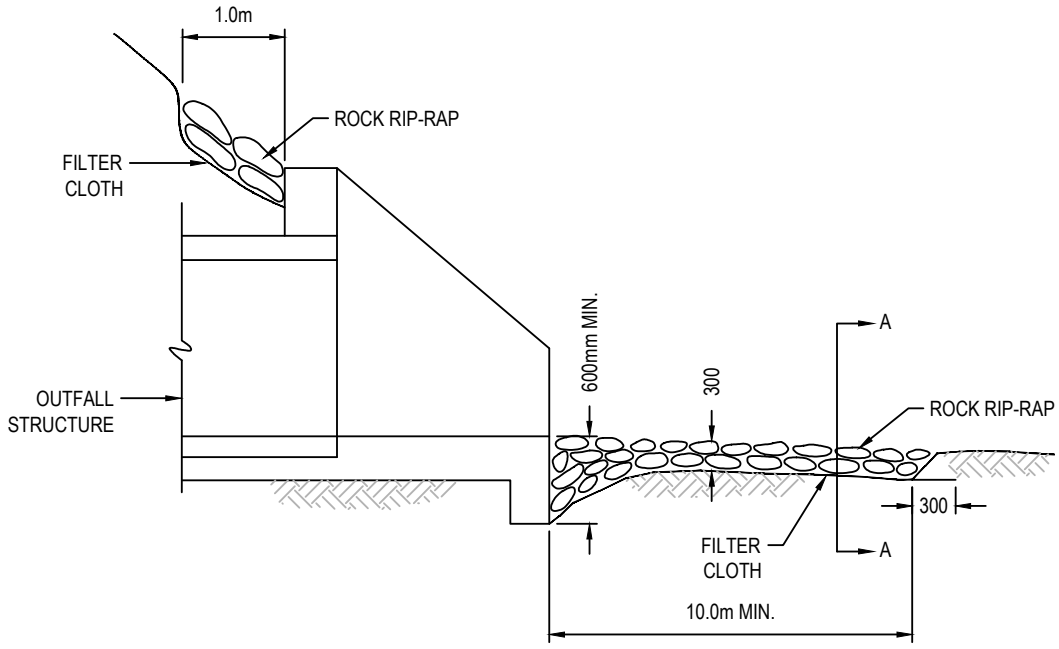
Drawn by: L. LEEPER

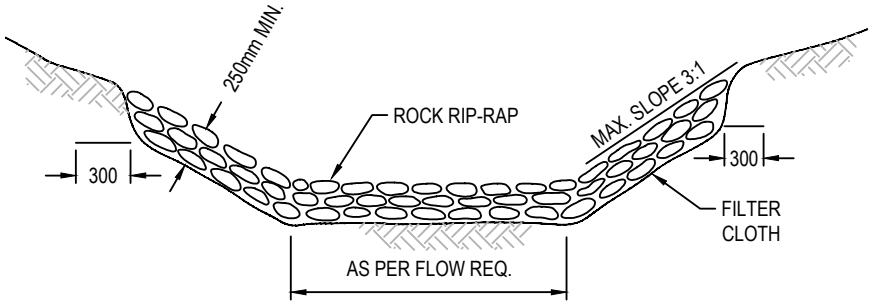
Scale: N.T.S.

METAL CULVERT

Date: Feb. 22, 2011

Drawing #: 5-301





SECTION A-A

NOTES:

1. STILLING BASIN SHALL BE REQ'D FOR HIGH-VELOCITY FLOWS.
2. ALL FILTER CLOTH PANEL JOINTS TO OVERLAP 1.0m IN THE DIRECTION OF FLOW.
3. FILTER CLOTH TYPE TO BE NON-WOVEN
4. RIP-RAP TO BE 150-350mm IN NORMAL DIAMETER WITH 50% BEING LARGER THAN 200mm
5. RIP-RAP ABOVE PIPE TO EXTEND TO CHANNEL SIDES

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1	11/26/18	UPDATED NOTES AND TITLE

The City of Lloydminster

Checked by:

Approved by:

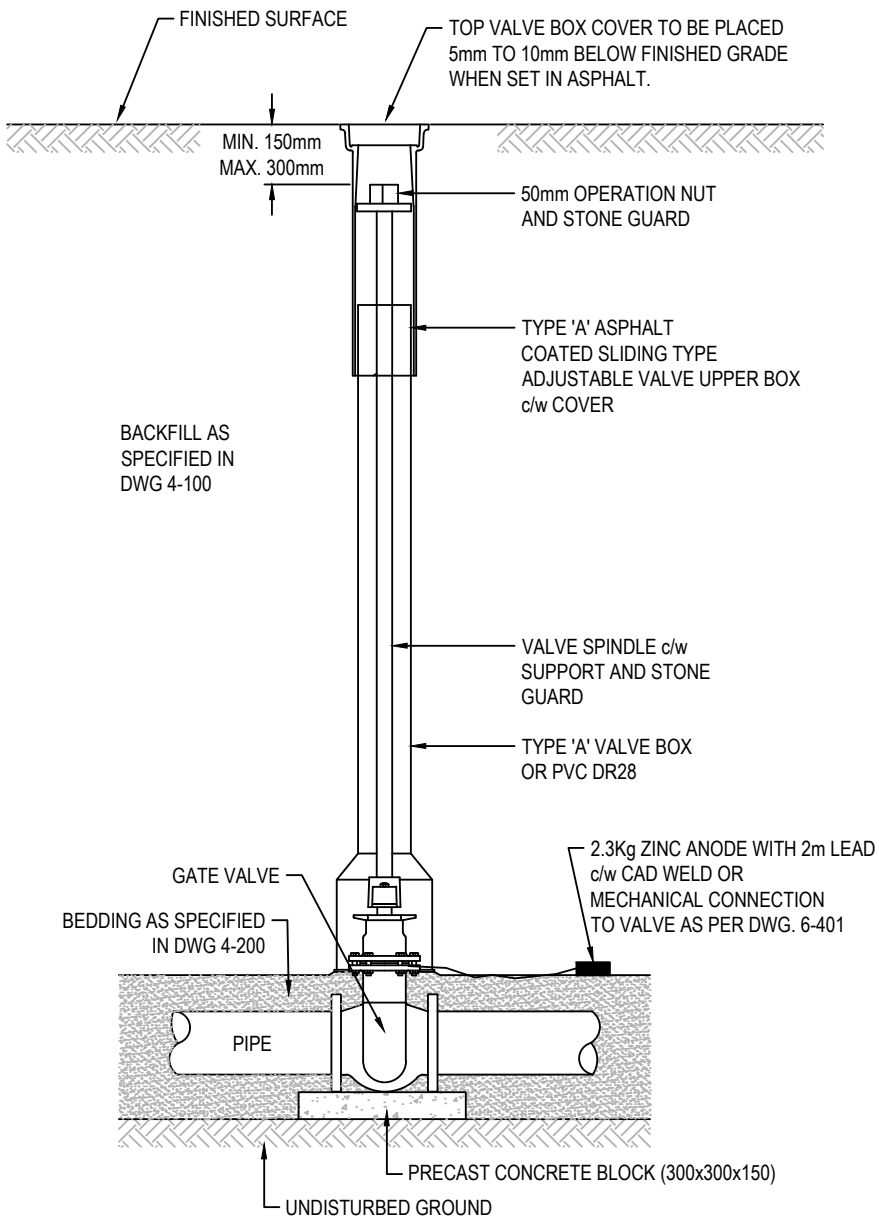
Drawn by: L. LEEPER

Scale: N.T.S.

ROCK RIP-RAP DETAIL FOR METAL CULVERTS OR OPEN CHANNELS

Date: Feb. 22, 2011

Drawing #: 5-304



NOTES:

1. VALVE BOX TOPS TO BE SET FLUSH WITH SURFACE IN BOULEVARDS, GREEN SPACES AND CONCRETE SIDEWALKS.
2. ALL BOLTS TO BE WRAPPED IN DENSO OR PETROGUARD PETROLATUM TAPE.
3. CAD WELD TO BE COVERED BY DENSO OR PETROGUARD PETROLATUM TAPE.

NO.	DATE	REVISION
8		
7		
6		
5	10/03/20	Revised Drawing
4	3/22/18	Revised Notes
3	22/11/16	Revised Notes
2	6/14/16	Revised Notes
1	4/14/16	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

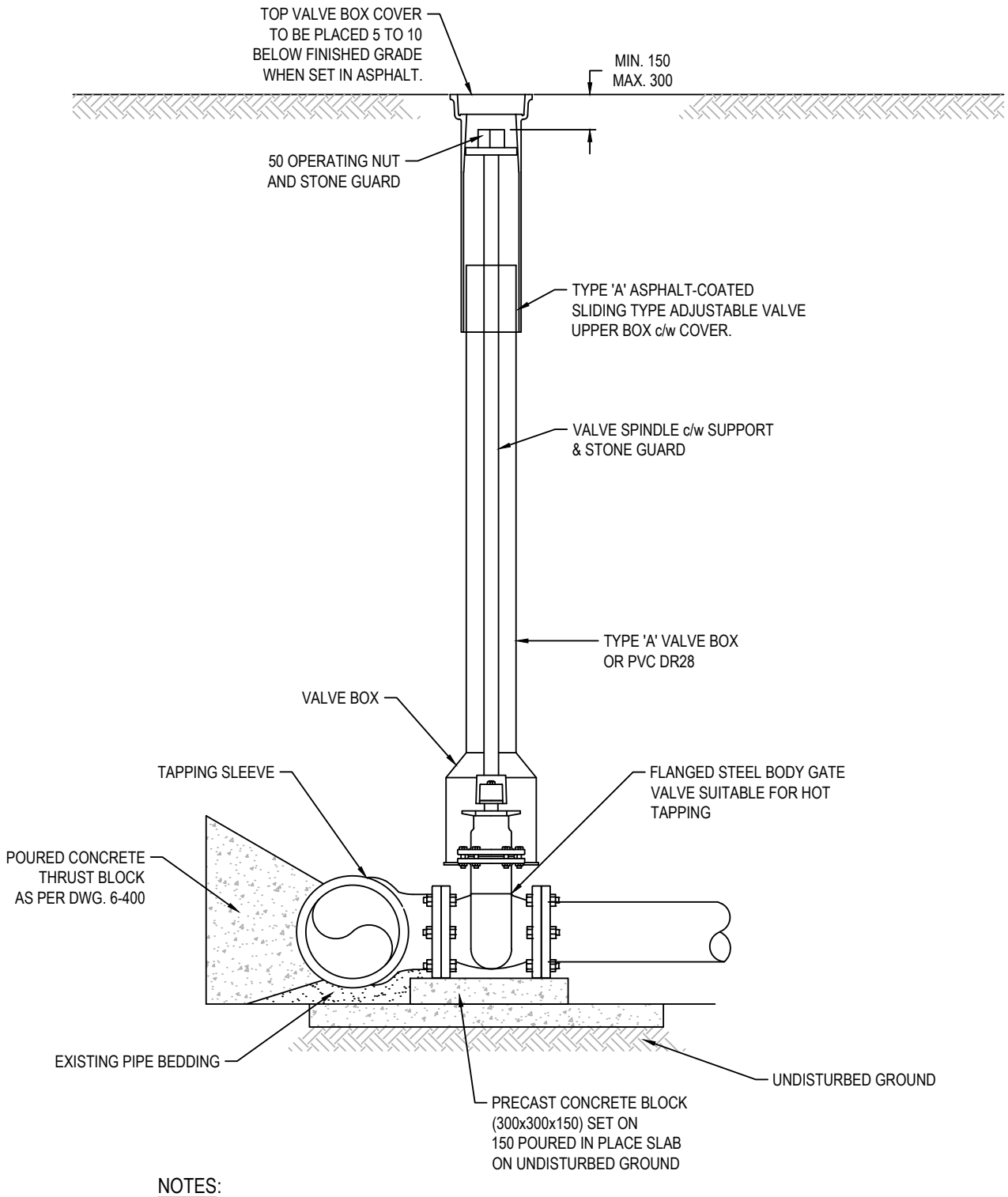
Drawn by: L. LEEPER

Scale: N.T.S.

WATER VALVE INSTALLATION

Date: Feb. 22, 2011

Drawing #: 6-100



NOTES:

1. VALVE BOX COVER TO BE SET FLUSH WITH SURFACE IN BOULEVARDS, GREEN SPACES AND CONCRETE SIDEWALKS.
2. ALL BOLTS TO BE WRAPPED IN DENSO OR PETROGUARD PETROLATUM TAPE.
3. SACRIFICIAL ANODE TO BE INSTALLED AS PER STANDARD DRAWING 6-401.

NO.	DATE	REVISION
8		
7		
6	22/06/20	Rev. Dim to Nut
5	05/05/20	Rev. Nut, Removed "mm"
4	27/11/18	Revised Notes & Drawing
3	22/11/16	Revised Notes
2	6/14/16	Revised Notes
1	4/14/16	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

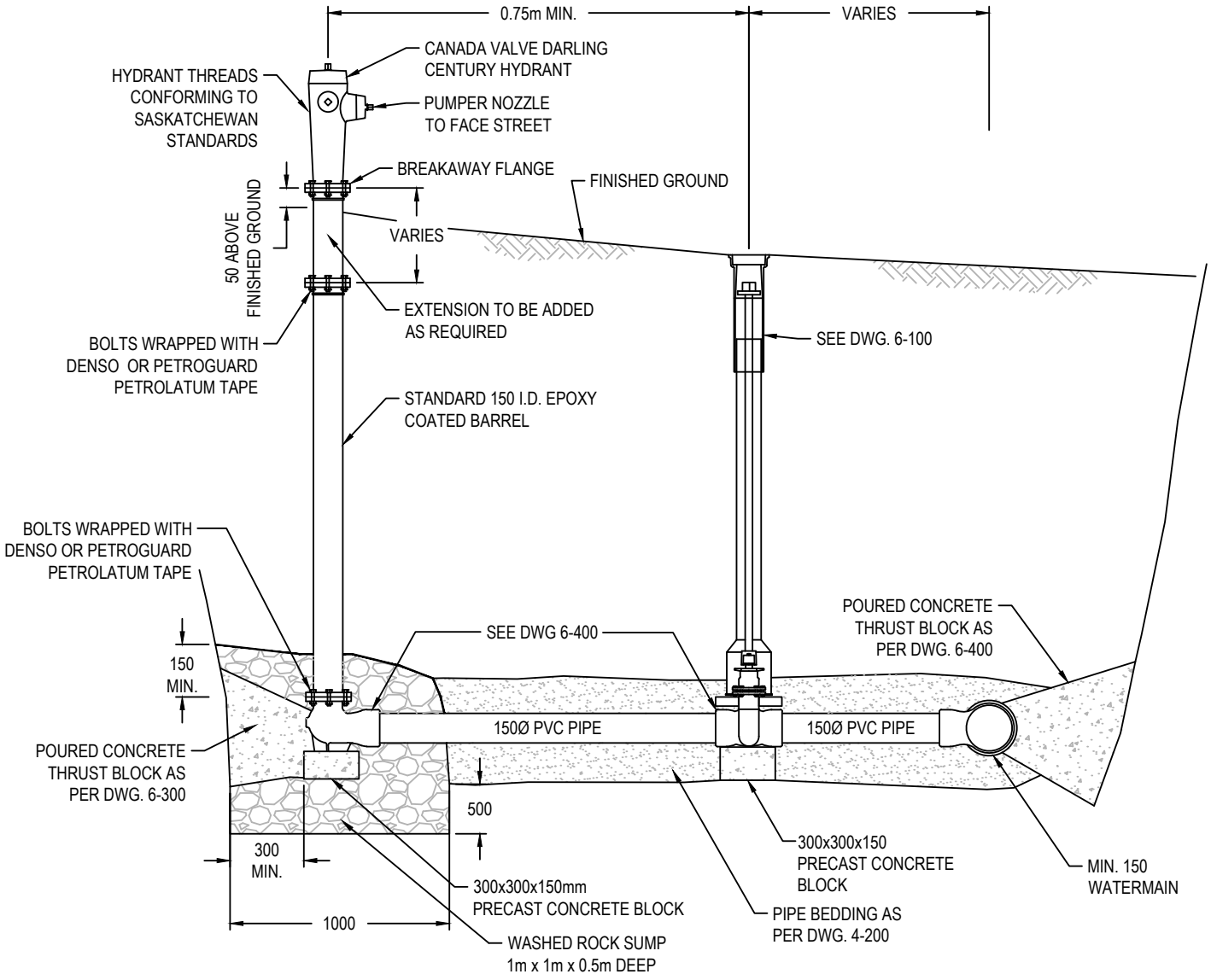
Drawn by: N / A

Scale: N.T.S.

HOT TAPPING CONNECTION

Date: Feb. 22, 2011

Drawing #: 6-101



NOTES:

1. HYDRANT TO BE SET PLUMB WITH BARREL EXTENSIONS TO SUIT DEPTH OF HYDRANT LEAD. HYDRANT LEAD TO BE SET LEVEL WITH A MIN. OF 3.0m OF COVER ABOVE TOP OF PIPE. EXTENSION TO BE INSTALLED BETWEEN HYDRANT AND TOP OF BARREL AS REQUIRED.
2. ALL THRUST BLOCKING TO BE AGAINST UNDISTURBED TRENCH WALL WITH DRAIN HOLES CLEAR OF CONCRETE.
3. VALVE BOX TO BE INSTALLED IN VERTICAL POSITION WITH TOP FLUSH WITH FINISHED GRADE.
4. HYDRANT SHALL BE COMPRESSION TYPE AS SPECIFIED.
5. ALL CAST IRON VALVES AND FITTINGS SHALL BE CATHODICALLY PROTECTED BY SACRIFICIAL ANODES AS PER DWG. 6-401. CAD WELDS TO BE COVERED WITH DENSO OR PETROGUARD PETROLATUM TAPE.
6. HYDRANT TO BE SUPPLIED WITH BREAKAWAY FLANGE INSTALLED ABOVE GROUND DIRECTLY BELOW THE BODY FLANGE..
7. CONCRETE TO BE 25MPa TYPE HS.
8. **ALL HYDRANTS TO HAVE THREADS CONFORMING TO SASKATCHEWAN SPECIFICATIONS:**
   - **HOSE CONNECTION: 6 THREADS PER INCH, OUTSIDE DIAMETER 82.55mm**
   - **PUMPER CONNECTION: 6 THREADS PER INCH, MAJOR DIAMETER 123.11mm, PITCH DIAMETER 119.76mm, MINOR DIAMETER 116.41mm.**
9. ALL BOLTS BELOW GROUND TO BE WRAPPED WITH DENSO OR PETROGUARD PETROLATUM TAPE.
10. INSIDE ROD COUPLING (TRAFFIC TYPE) TO BE LOCATED WITHIN 50mm OF BREAKAWAY FLANGE.

NO.	DATE	REVISION
8		
7	05/05/20	Removed "mm" From Dims
6	3/22/18	Revised Notes
5	22/11/16	Revised Notes
4	05/07/16	Revised Notes
3	4/14/16	Revised Notes
2	28/05/14	Removed drain plug ref.
1	21/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

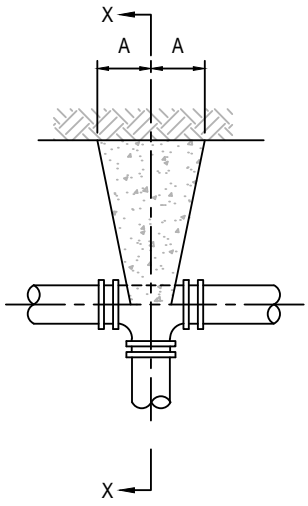
Drawn by: L. LEEPER

Scale: N.T.S.

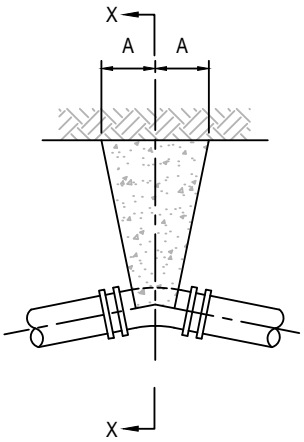
Date: Feb. 22, 2011

HYDRANT INSTALLATION

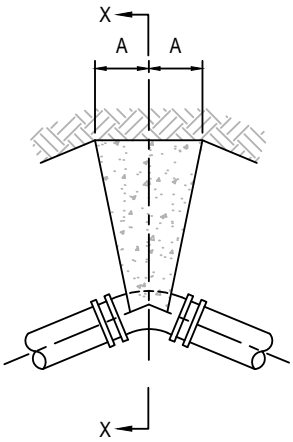
Drawing #: 6-102



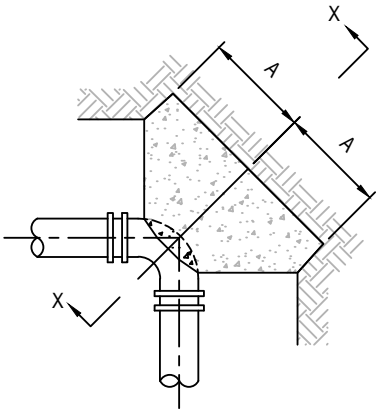
TEE



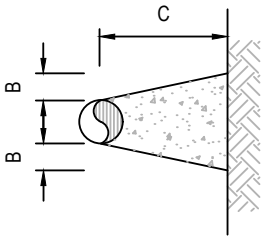
11 1/4° &
22 1/2° BENDS



45° BENDS



90° BENDS



SECTION X-X

PIPE SIZE	FITTINGS															
	TEE & DEAD END				11 1/4° & 22 1/2° BENDS				45° BEND				90° BEND			
	A	B	C	BEARING AREA	A	B	C	BEARING AREA	A	B	C	BEARING AREA	A	B	C	BEARING AREA
	(mm)	(mm)	(mm)	(m^2)	(mm)	(mm)	(mm)	(m^2)	(mm)	(mm)	(mm)	(m^2)	(mm)	(mm)	(mm)	(m^2)
150	348	100	275	0.244	159	75	225	0.095	311	75	225	0.187	575	75	225	0.345
200	433	150	400	0.433	211	100	300	0.169	415	100	300	0.332	766	100	300	0.613
250	521	200	525	0.677	264	125	375	0.264	518	125	375	0.518	958	125	375	0.958
300	609	250	650	0.975	317	150	450	0.380	622	150	450	0.746	1149	150	450	1.379
400	867	300	800	1.733	423	200	600	0.676	829	200	600	1.327	1532	200	600	2.451
450	954	350	925	2.194	476	225	675	0.856	933	225	675	1.679	1724	225	675	3.102
600	1393	400	1100	3.900	634	300	900	1.522	1244	300	900	2.985	2298	300	900	5.515
750	1741	500	1375	6.094	793	375	1125	2.378	1555	375	1125	4.664	2873	375	1125	8.618

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. DESIGN BASIS:
   a. HYDRAULIC DESIGN PRESSURE 690 kPA (100 psi).
   b. SOIL BEARING CAPACITY 50 kPA (1044 lb/sq.ft) (SOFT CLAY)
3. CONCRETE THRUST BLOCK BEARING SURFACE AREA AND PARAMETER 'A', 'B', & 'C' MUST BE ADJUSTED IF HYDRAULIC DESIGN PRESSURE AND SOIL BEARING CAPACITY ARE DIFFERENT THAN SHOWN IN ITEM 2, DESIGN BASIS.
4. HYDRAULIC DESIGN PRESSURE MUST INCLUDE HIGHEST OPERATING PRESSURE SCENARIO WITH SURGE PRESSURE INCLUDED.
5. TEMPORARY BLOCKING MUST BE APPROVED BY THE ENGINEER.
6. CONCRETE STRENGTH SHALL BE 25 MPa AT 28 DAYS, TYPE HS
7. CONCRETE TO BE CLEAR OF BELLS AND TO BEAR AGAINST UNDISTURBED TRENCH WALLS.
8. CONCRETE TO BE PLACED UNDER ALL FITTINGS.
9. CONCRETE TO BE CURED FOR 24 HOURS PRIOR TO BACKFILLING.
10. BOND BREAKER TO BE USED BETWEEN CONCRETE AND FITTINGS.
11. IF THE DESIGN IS BASED ON INFORMATION NOT VERIFIED IN THE FIELD AND NOT SUPPORTED BY HYDRAULIC MODELING / CALCULATIONS, A MIN. FACTOR OF SAFETY OF 1.50 SHOULD BE APPLIED TO ALL TABULATED BEARING AREAS.

NO.	DATE	REVISION
8		
7		
6		
5		
4	10/03/20	Reviewed Notes
3	27/11/18	Reviewed Notes
2	17/04/14	Changed concrete strength
1	24/03/14	Changed concrete strength

The City of Lloydminster

Checked by:

Approved by:

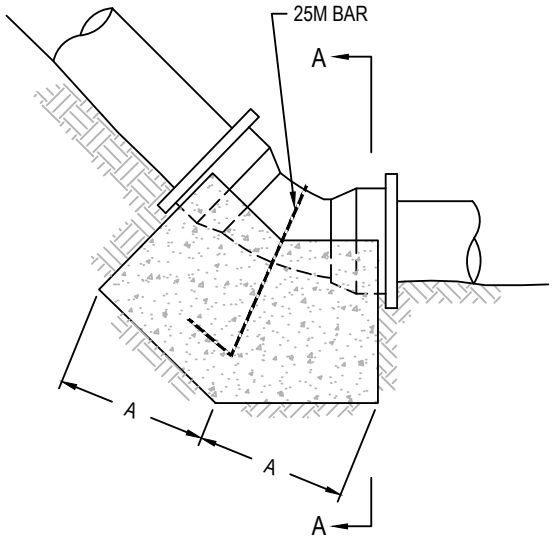
Drawn by: L. LEEPER

Scale: N.T.S.

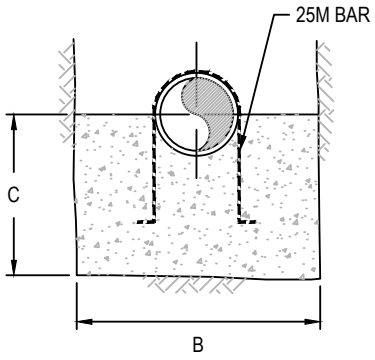
POURED CONCRETE THRUST BLOCKS FOR HORIZONTAL TEES AND BENDS

Date: Feb. 22, 2011

Drawing #: 6-300



ELEVATION



SECTION A-A

PIPE SIZE	FITTINGS							
	11 1/4° & 22 1/2° BENDS				45° BEND			
	A	B	C	BEARING AREA	A	B	C	BEARING AREA
	(mm)	(mm)	(mm)	(m^2)	(mm)	(mm)	(mm)	(m^2)
150	106	450	375	0.095	207	450	375	0.187
200	169	500	400	0.169	332	500	400	0.332
250	240	550	425	0.264	471	550	425	0.518
300	317	600	450	0.380	662	600	450	0.746
400	483	700	500	0.676	948	700	500	1.327
450	571	750	525	0.856	1119	750	525	1.679
600	845	900	600	1.522	1658	900	600	2.985
750	1132	1050	675	2.378	2221	1050	675	4.664

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. DESIGN BASIS:
   a. HYDRAULIC DESIGN PRESSURE 690 kPA (100 psi).
   b. SOIL BEARING CAPACITY 50 kPA (1044 lb/sq.ft) (SOFT CLAY)
3. CONCRETE THRUST BLOCK BEARING SURFACE AREA AND PARAMETER 'A', 'B', & 'C' MUST BE ADJUSTED IF HYDRAULIC DESIGN PRESSURE AND SOIL BEARING CAPACITY ARE DIFFERENT THAN SHOWN IN ITEM 2, DESIGN BASIS.
4. HYDRAULIC DESIGN PRESSURE MUST INCLUDE HIGHEST OPERATING PRESSURE SCENARIO WITH SURGE PRESSURE INCLUDED.
5. TEMPORARY BLOCKING MUST BE APPROVED BY THE ENGINEER.
6. CONCRETE STRENGTH SHALL BE 25 MPa AT 28 DAYS, TYPE HS.
7. CONCRETE TO BE CLEAR OF BELLS AND TO BEAR AGAINST UNDISTURBED TRENCH WALLS.
8. CONCRETE TO BE PLACED UNDER ALL FITTINGS.
9. CONCRETE TO BE CURED FOR 24 HOURS PRIOR TO BACKFILLING.
10. BOND BREAKER TO BE USED BETWEEN CONCRETE AND FITTINGS.
11. IF THE DESIGN IS BASED ON INFORMATION NOT VERIFIED IN THE FIELD AND NOT SUPPORTED BY HYDRAULIC MODELING / CALCULATIONS, A MIN. FACTOR OF SAFETY OF 1.50 SHOULD BE APPLIED TO ALL TABULATED BEARING AREAS.

NO.	DATE	REVISION
8		
7		
6		
5		
4	10/03/20	Revised Notes
3	23/03/18	Changed line weights
2	17/04/14	Changed concrete strength
1	24/03/14	Changed concrete strength

The City of Lloydminster

Checked by:

Approved by:

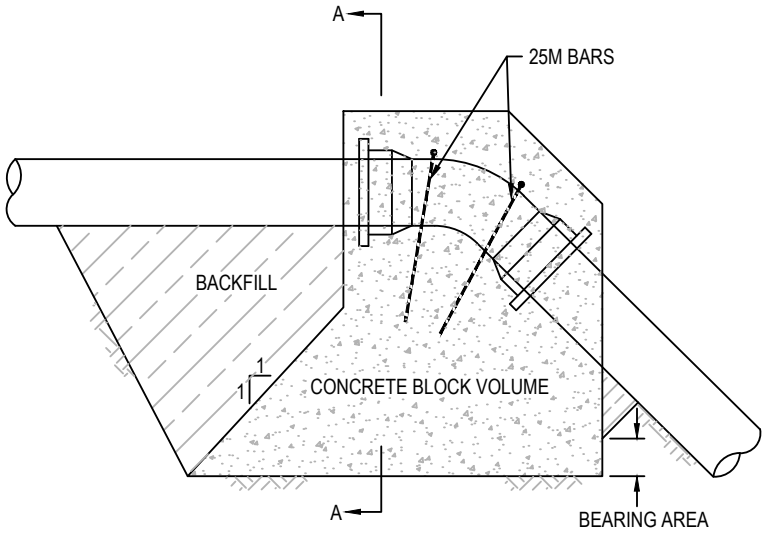
Drawn by: L. LEEPER

Scale: N.T.S.

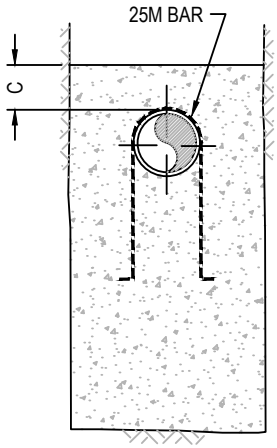
POURED CONCRETE THRUST BLOCKS FOR VERTICAL BENDS (DOWNWARD THRUST)

Date: Jan. 22, 2011

Drawing #: 6-301



ELEVATION



SECTION A-A

PIPE SIZE	FITTINGS					
	11 1/4° & 22 1/2° BENDS			45° BEND		
	BLOCK VOL.	C	BEARING AREA	BLOCK VOL.	C	BEARING AREA
	(m^3)	(mm)	(m^2)	(m^3)	(mm)	(m^2)
150	0.4	375	0.019	0.7	375	0.071
200	0.7	400	0.033	1.3	400	0.127
250	1.1	425	0.052	2.0	425	0.198
300	1.6	450	0.074	2.9	450	0.286
400	2.8	500	0.132	5.2	500	0.508
450	3.6	525	0.167	6.6	525	0.643
600	6.3	600	0.297	11.7	600	1.142
750	9.9	675	0.464	18.3	675	1.785

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. DESIGN BASIS:
   a. HYDRAULIC DESIGN PRESSURE 690 kPA (100 psi).
   b. SOIL BEARING CAPACITY 50 kPA (1044 lb/sq.ft) (SOFT CLAY)
3. CONCRETE THRUST BLOCK BEARING SURFACE AREA AND PARAMETER 'A', 'B', & 'C' MUST BE ADJUSTED IF HYDRAULIC DESIGN PRESSURE AND SOIL BEARING CAPACITY ARE DIFFERENT THAN SHOWN IN ITEM 2, DESIGN BASIS.
4. HYDRAULIC DESIGN PRESSURE MUST INCLUDE HIGHEST OPERATING PRESSURE SCENARIO WITH SURGE PRESSURE INCLUDED.
5. TEMPORARY BLOCKING MUST BE APPROVED BY THE ENGINEER.
6. CONCRETE STRENGTH SHALL BE 25 MPa AT 28 DAYS, TYPE HS.
7. CONCRETE TO BE CLEAR OF BELLS AND TO BEAR AGAINST UNDISTURBED TRENCH WALLS.
8. CONCRETE TO BE PLACED UNDER ALL FITTINGS.
9. CONCRETE TO BE CURED FOR 24 HOURS PRIOR TO BACKFILLING.
10. BOND BREAKER TO BE USED BETWEEN CONCRETE AND FITTINGS.
11. IF THE DESIGN IS BASED ON INFORMATION NOT VERIFIED IN THE FIELD AND NOT SUPPORTED BY HYDRAULIC MODELING / CALCULATIONS, A MIN. FACTOR OF SAFETY OF 1.50 SHOULD BE APPLIED TO ALL TABULATED BEARING AREAS.

NO.	DATE	REVISION
8		
7		
6		
5		
4	10/03/20	Revised Notes
3	23/03/18	Changed line weights
2	17/04/14	Changed concrete strength
1	24/03/14	Changed concrete strength

The City of Lloydminster

Checked by:

Approved by:

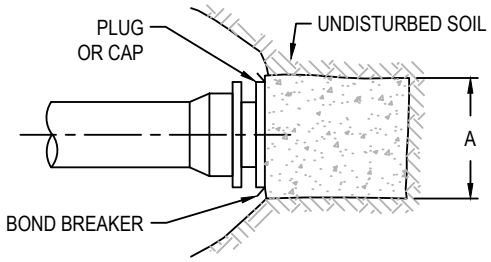
Drawn by: L. LEEPER

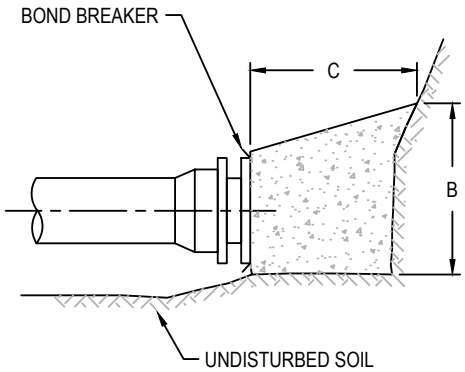
Scale: N.T.S.

POURED CONCRETE THRUST BLOCKS FOR VERTICAL BENDS (UPWARD THRUST)

Date: Jan. 22, 2011

Drawing #: 6-302





MINIMUM DIMENSIONS IN mm's				
SIZE OF PIPE	A	B	C	BEARING AREA
100	430	250	200	0.11
150	700	350	200	0.24
200	870	500	200	0.43
250	1040	650	275	0.68
300	1220	800	350	0.98
400	1730	1000	400	1.73
450	1910	1150	475	2.19
600	2790	1400	500	3.90
750	3480	1750	625	6.09

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. DESIGN BASIS:
   a. HYDRAULIC DESIGN PRESSURE 690 kPA (100 psi).
   b. SOIL BEARING CAPACITY 50 kPA (1044 lb/sq.ft) (SOFT CLAY)
3. CONCRETE THRUST BLOCK BEARING SURFACE AREA AND PARAMETER 'A', 'B', & 'C' MUST BE ADJUSTED IF HYDRAULIC DESIGN PRESSURE AND SOIL BEARING CAPACITY ARE DIFFERENT THAN SHOWN IN ITEM 2, DESIGN BASIS.
4. HYDRAULIC DESIGN PRESSURE MUST INCLUDE HIGHEST OPERATING PRESSURE SCENARIO WITH SURGE PRESSURE INCLUDED.
5. TEMPORARY BLOCKING MUST BE APPROVED BY THE ENGINEER.
6. CONCRETE STRENGTH SHALL BE 25 MPa AT 28 DAYS, TYPE HS.
7. CONCRETE TO BE CLEAR OF BELLS AND TO BEAR AGAINST UNDISTURBED TRENCH WALLS.
8. CONCRETE TO BE PLACED UNDER ALL FITTINGS.
9. CONCRETE TO BE CURED FOR 24 HOURS PRIOR TO BACKFILLING.
10. BOND BREAKER TO BE USED BETWEEN CONCRETE AND FITTINGS.
11. IF THE DESIGN IS BASED ON INFORMATION NOT VERIFIED IN THE FIELD AND NOT SUPPORTED BY HYDRAULIC MODELING / CALCULATIONS, A MIN. FACTOR OF SAFETY OF 1.50 SHOULD BE APPLIED TO ALL TABULATED BEARING AREAS.

NO.	DATE	REVISION
8		
7		
6		
5		
4	10/03/20	Revised Notes
3	23/03/18	Changed concrete type note 6
2	17/04/14	Changed concrete strength
1	24/03/14	Changed concrete strength

The City of Lloydminster

Checked by:

Approved by:

Drawn by: L. LEEPER

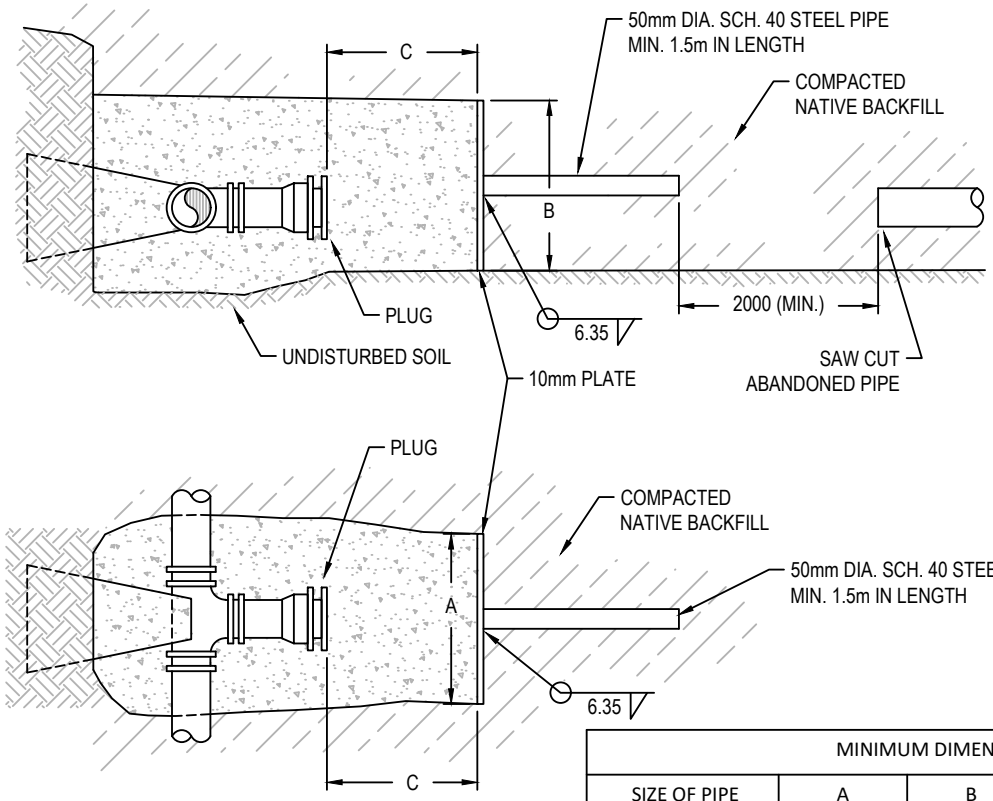
Scale: N.T.S.

POURED CONCRETE THRUST BLOCKS FOR DEAD-ENDS

Date: Feb. 22, 2011

Drawing #: 6-303

SIDE VIEW



TOP VIEW

MINIMUM DIMENSIONS IN mm				
SIZE OF PIPE	A	B	C	BEARING AREA
100	430	250	200	0.11
150	700	350	200	0.24
200	870	500	200	0.43
250	1040	650	275	0.68
300	1220	800	350	0.98
400	1730	1000	400	1.73
450	1910	1150	475	2.19
600	2790	1400	500	3.90
750	3480	1750	625	6.09

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. SAW CUT PIPE TO BE ABANDONED.
3. REMOVE PIPE FROM TEE ON MAIN. INSTALL PLUG ON TEE.
4. PLACE BACKFILL (COMPACTED TO 100% S.P.D.) TO A DEPTH OF TWO TIMES DIMENSION "B".
5. CUT 10mm THICK STEEL PLATE TO RECTANGULAR DIMENSIONS "A" x "B", WELD STEEL PIPE TO CENTRE OF PLATE.
6. DRIVE PIPE INTO BACKFILLED MATERIAL, CREATING A SPACE A MINIMUM OF DIMENSION "C" IN LENGTH BETWEEN THE PLUG AND THE FACE OF THE STEEL PLATE.
7. POUR CONCRETE THRUST BLOCK, COVERING THE ENTIRE TEE.
8. CONCRETE STRENGTH MUST BE 25 MPa AT 28 DAYS, TYPE HS.
9. CONCRETE TO BE CLEAR OF BELLS AND TO BEAR AGAINST EXCAVATED TRENCH WALLS AND PLATE.
10. CONCRETE TO BE PLACED UNDER ALL FITTINGS.
11. CONCRETE TO BE CURED FOR 24 HOURS PRIOR TO BACKFILLING.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2		
1		

The City of Lloydminster

Checked by:

Approved by:

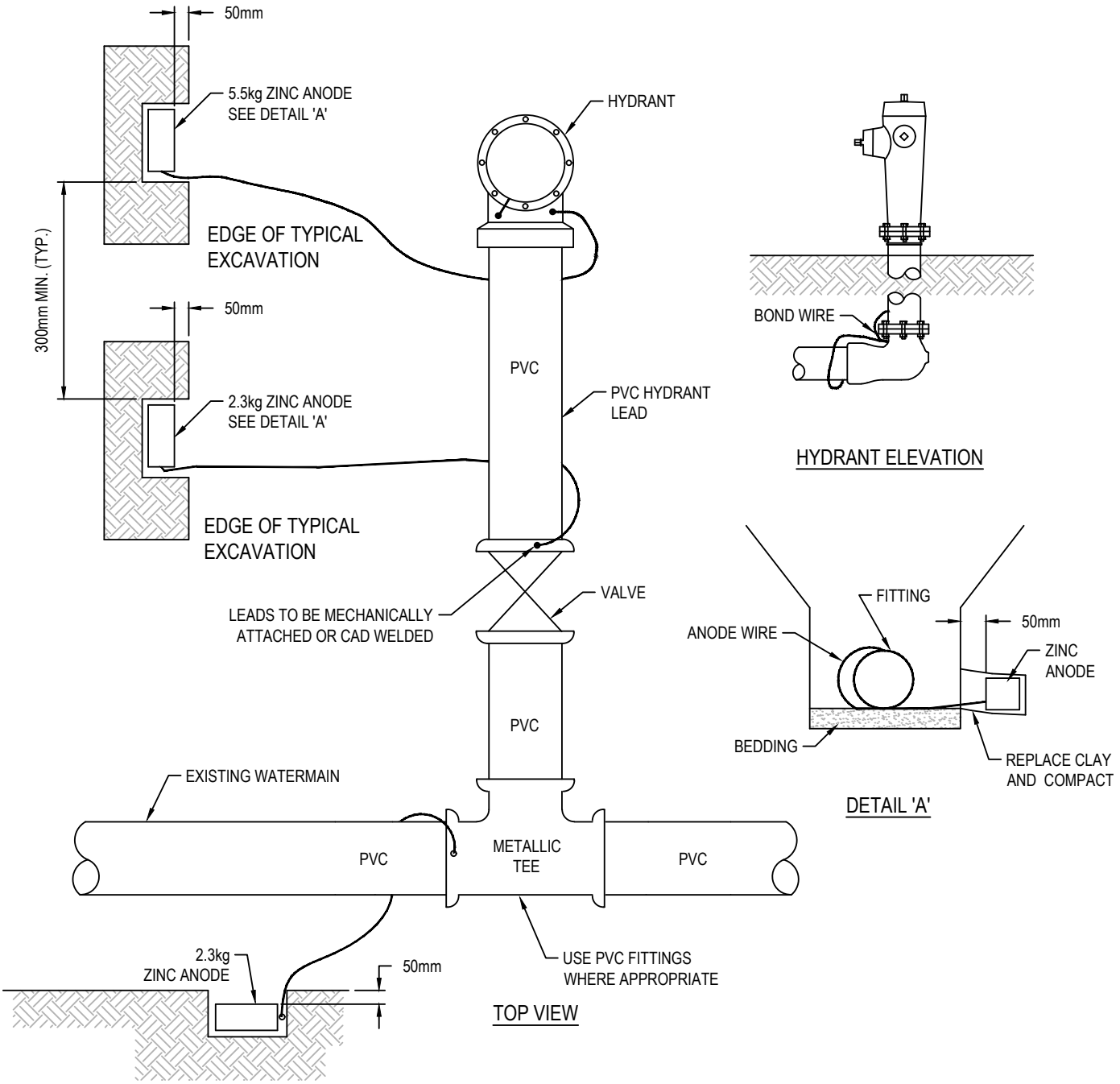
Drawn by: L. LEEPER

Scale: N.T.S.

POURED CONCRETE THRUST BLOCKS FOR DEAD-ENDS IN DISTURBED SOIL

Date: Oct. 29, 2018

Drawing #: 6-304



NOTES:

1. MINIMUM DISTANCE FROM ANODE TO PIPE, FITTING, VALVE, OR HYDRANT IS 150mm.
2. INSTALL ANODE AT APPROXIMATE PIPE DEPTH IN NATIVE SOIL.
3. ZINC ANODES TO BE EMBEDDED INTO TRENCH WALL TO PROVIDE FOR A MINIMUM OF 50mm OF NATIVE CLAY COMPLETELY SURROUNDING THE ANODE.
4. ANODES TO BE AT LEAST 300mm CLEAR OF THRUST BLOCK
5. CAD WELDS TO BE COVERED IN DENSO OR PETROGUARD PETROLATUM TAPE.
6. 3 LITRES OF WATER TO BE POURED ON ANODE FOLLOWING PLACEMENT TO ACTIVATE.
7. ANODE LEADS TO BE 2m IN LENGTH.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3	3/22/18	Revised Notes
2	22/11/16	Revised Notes
1	4/14/16	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

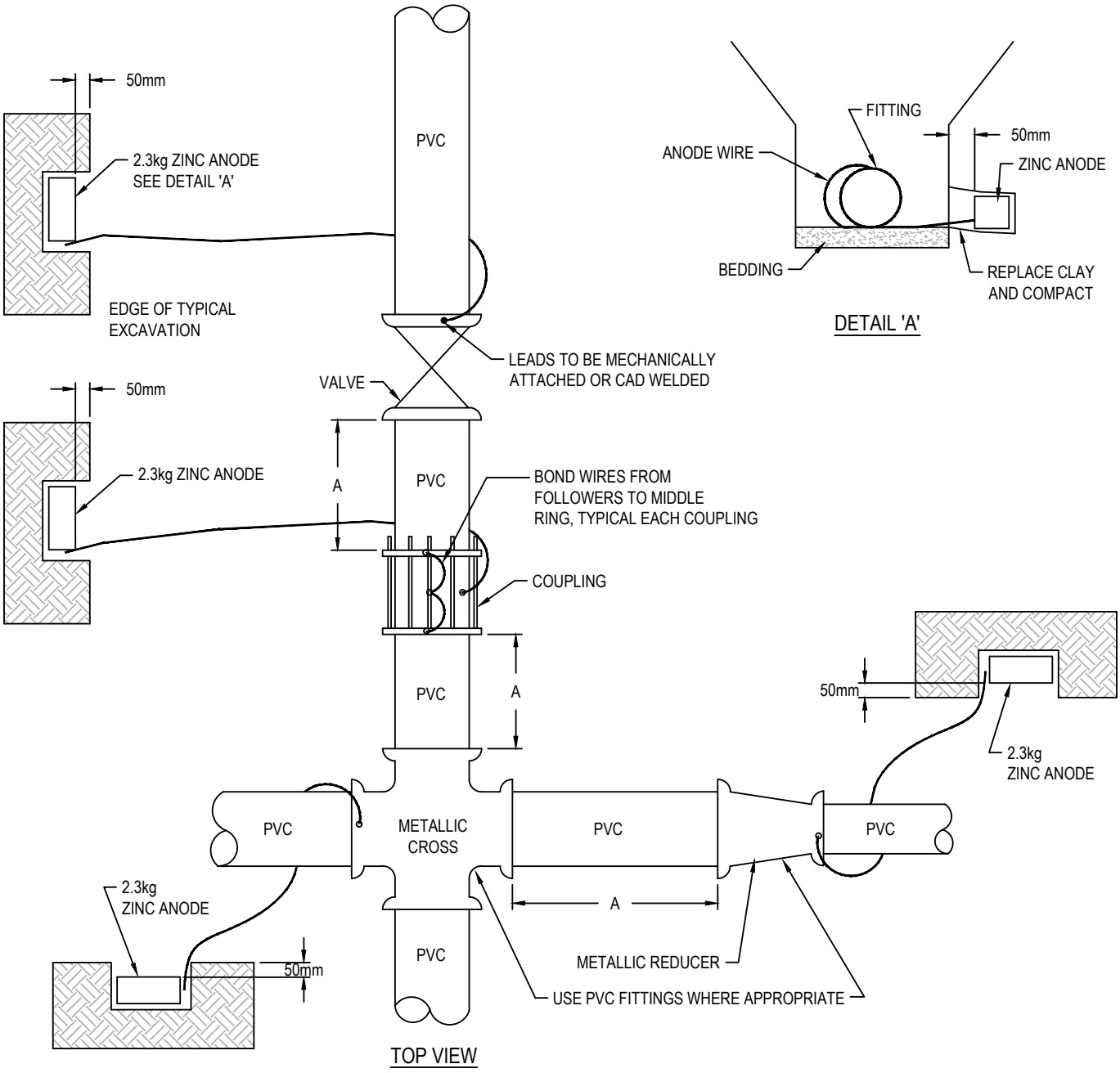
Drawn by: L. LEEPER

Scale: N.T.S.

ANODE INSTALLATION AT HYDRANT

Date: Feb. 22, 2011

Drawing #: 6-400



NOTES:

1. MINIMUM DISTANCE FROM ANODE TO PIPE, FITTING, VALVE, OR HYDRANT IS 150mm.
2. INSTALL ANODE AT APPROXIMATE PIPE DEPTH IN NATIVE SOIL.
3. BOND WIRES MAY BE USED TO PROTECT UP TO TWO FITTINGS WITH ONE ANODE WHEN DIMENSION 'A' DOES NOT EXCEED ONE (1) METER.
4. ALL ZINC ANODES ON FITTINGS AND VALVES ARE 2.3kg.
5. ZINC ANODES TO BE EMBEDDED INTO TRENCH WALL TO PROVIDE FOR A MINIMUM OF 50mm OF NATIVE CLAY COMPLETELY SURROUNDING THE ANODE.
6. CAD WELDS TO BE COVERED IN DENSO OR PETROGUARD PETROLATUM TAPE.
7. 3 LITRES OF WATER TO BE POURED ON ANODE FOLLOWING PLACEMENT TO ACTIVATE.
8. ANODE LEADS TO BE 2m IN LENGTH.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3	3/22/18	Revised Notes
2	22/11/16	Revised Notes
1	4/14/16	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

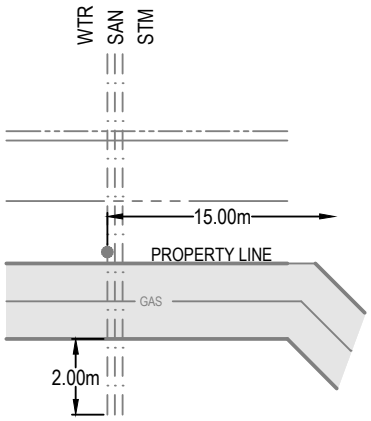
Drawn by: L. LEEPER

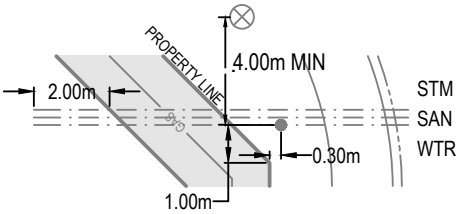
Scale: N.T.S.

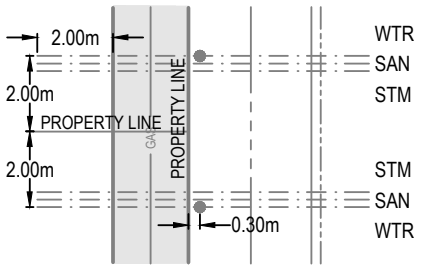
TYPICAL ANODE INSTALLATION FOR METALLIC FITTINGS USED WITH PVC WATER MAINS

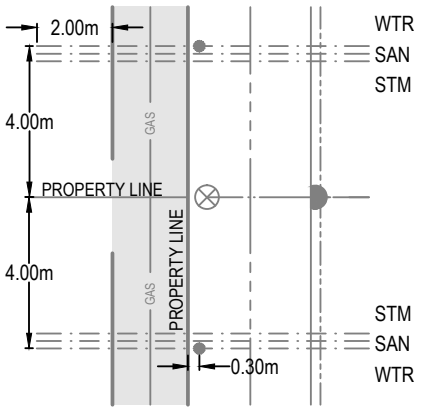
Date: Feb. 22, 2011

Drawing #: 6-401









NO.	DATE	REVISION
8	22/06/20	Added "m" to Dim
7	05/05/20	Added "m" to Dims, Chg Txt Ht.
6	10/03/20	Added Dimension
5	04/14/16	Removed Gas Line & Drawing dimensions
4	04/14/16	Added Hydrant Dimension
3	06/03/13	Revised Side Lot Dimension
2	22/10/12	Revised Side Lot Dimension
1	14/02/12	Revised Dimensioning

The City of Lloydminster

Scale: N.T.S.

Checked by:

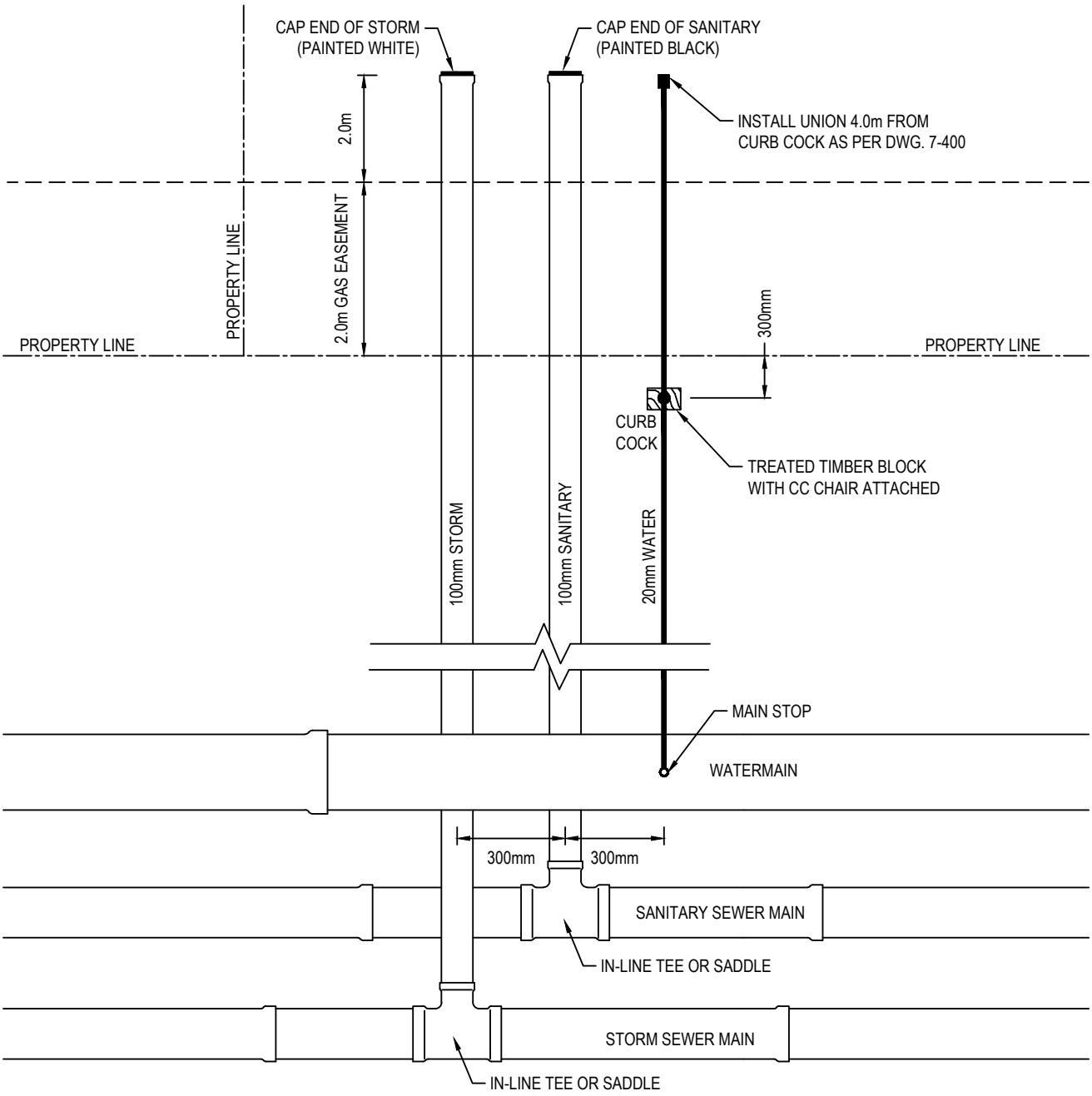
Approved by:

Drawn by: N / A

TYPICAL LATERAL SERVICE LOCATION DETAIL

Date: Feb. 22, 2011

Drawing #: 7-100



NOTES:

1. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.
2. THE END OF THE WATER SERVICE SHALL NOT BE CRIMPED CLOSED, PERMEABLE FILTER CLOTH WILL BE USED TO PREVENT INTRUSION OF DEBRIS AND TO ALLOW TESTING FLOW OF CURBSTOP.
3. STORM SERVICE SHALL ALWAYS BE LOCATED CLOSEST TO PROPERTY LINE.
4. INSERTABLE TEES MAY BE USED ON CONCRETE MAINS AND OPEN PROFILE PVC MAINS.

NO.	DATE	REVISION
8		
7	22/06/20	Revised Note 1
6	10/03/20	Added Union Block to Water
5	3/22/18	Revised Notes
4	22/11/16	Revised Notes
3	04/14/16	Updated Dimensions & Notes
2	09/04/14	Added property line for clarity
1	14/02/12	Revised drawing name & notes.

The City of Lloydminster

Checked by:

Approved by:

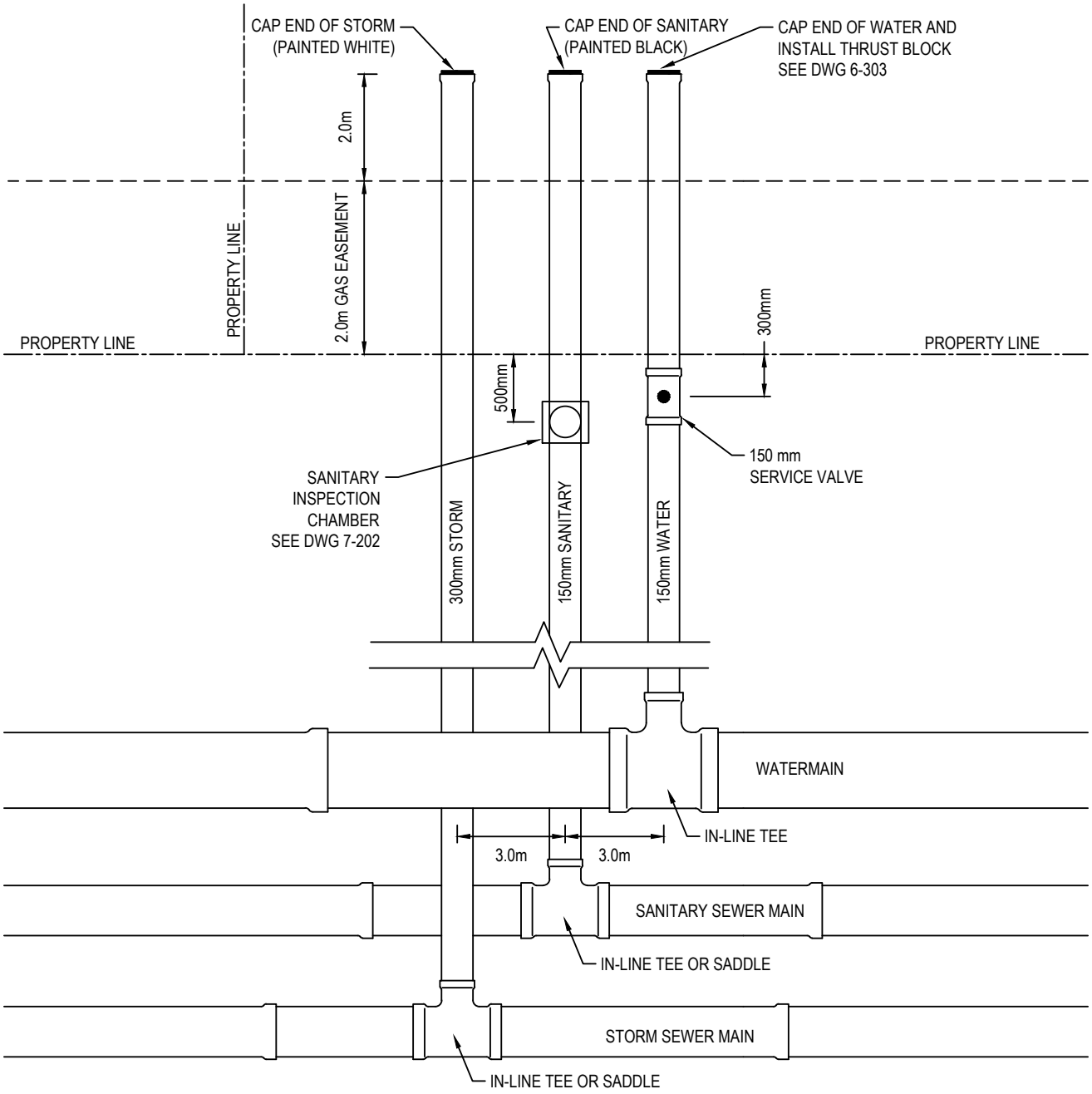
Drawn by: L. LEEPER

Scale: N.T.S.

RESIDENTIAL LATERAL SERVICE DETAIL

Date: Feb. 22, 2011

Drawing #: 7-101



NOTES:

1. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.
2. STORM SERVICE SHALL ALWAYS BE LOCATED CLOSEST TO PROPERTY LINE.
3. SIZE OF THE SERVICES BEYOND THE PROPERTY LINE MAY BE REDUCED BY THE DEVELOPER AS REQUIRED.
4. INSERTABLE TEES MAY BE USED ON CONCRETE MAINS AND OPEN PROFILE PVC MAINS

NO.	DATE	REVISION
8		
7		
6		
5	22/06/20	Revised Note 1
4	28/11/18	Revised Notes
3	22/11/16	Revised Notes
2	4/14/16	Revised Notes
1	24/02/15	Rem. Saddle from WM, Chg. Title

The City of Lloydminster

Checked by:

Approved by:

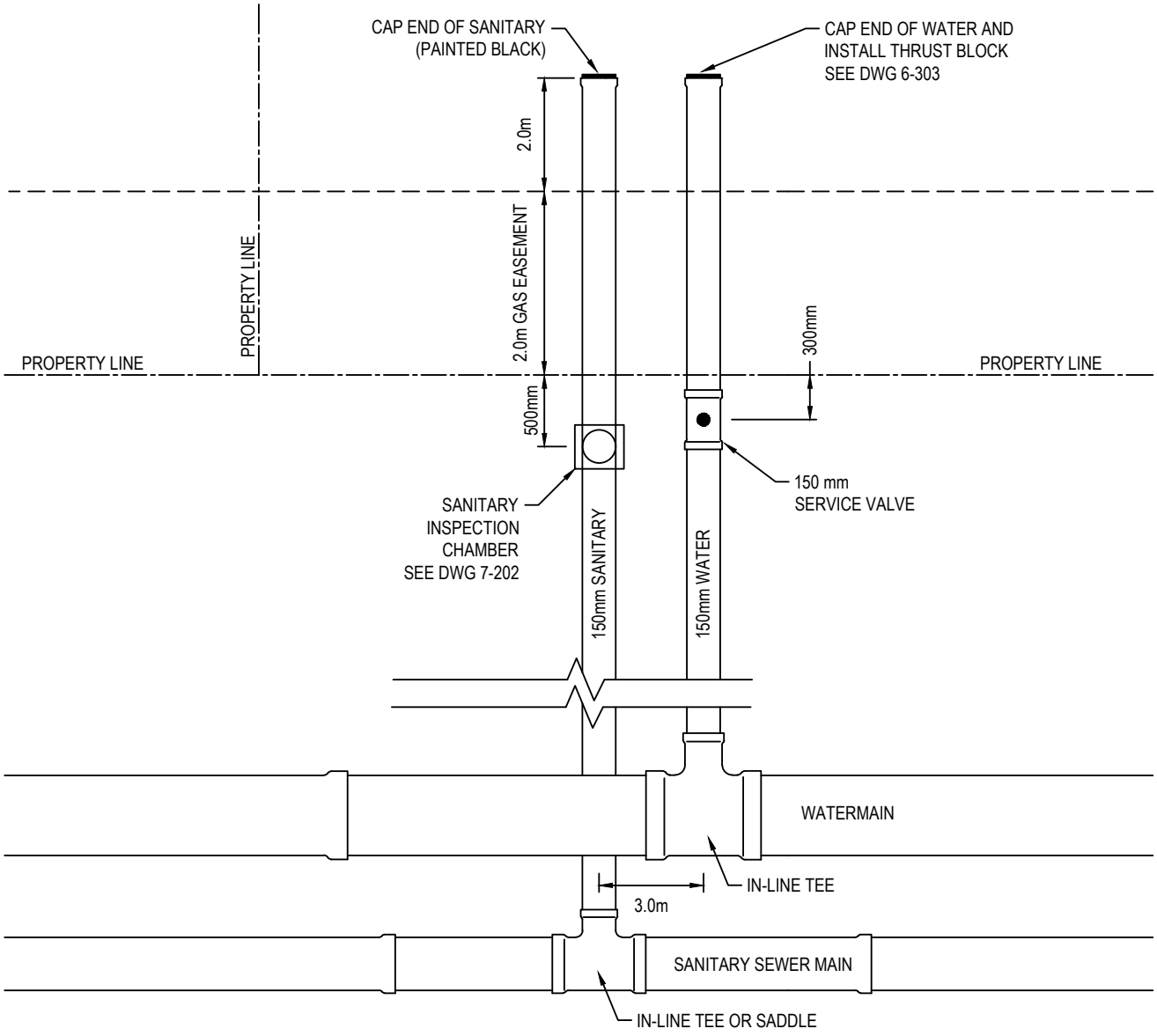
Drawn by: N / A

Scale: N.T.S.

MULTI-FAMILY SERVICE DETAIL WITH STORM SERVICE

Date: Apr. 30, 2014

Drawing #: 7-102



NOTES:

1. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.
2. SIZE OF THE SERVICES BEYOND THE PROPERTY LINE MAY BE REDUCED BY THE DEVELOPER AS REQUIRED.
3. INSERTABLE TEES MAY BE USED ON CONCRETE MAINS AND OPEN PROFILE PVC MAINS.

NO.	DATE	REVISION
8		
7		
6		
5	22/06/20	Revised Note 1
4	3/22/18	Revised Notes
3	22/11/16	Revised Notes
2	4/14/16	Revised Notes
1	24/02/15	Changed dwg title & detail text

The City of Lloydminster

Checked by:

Approved by:

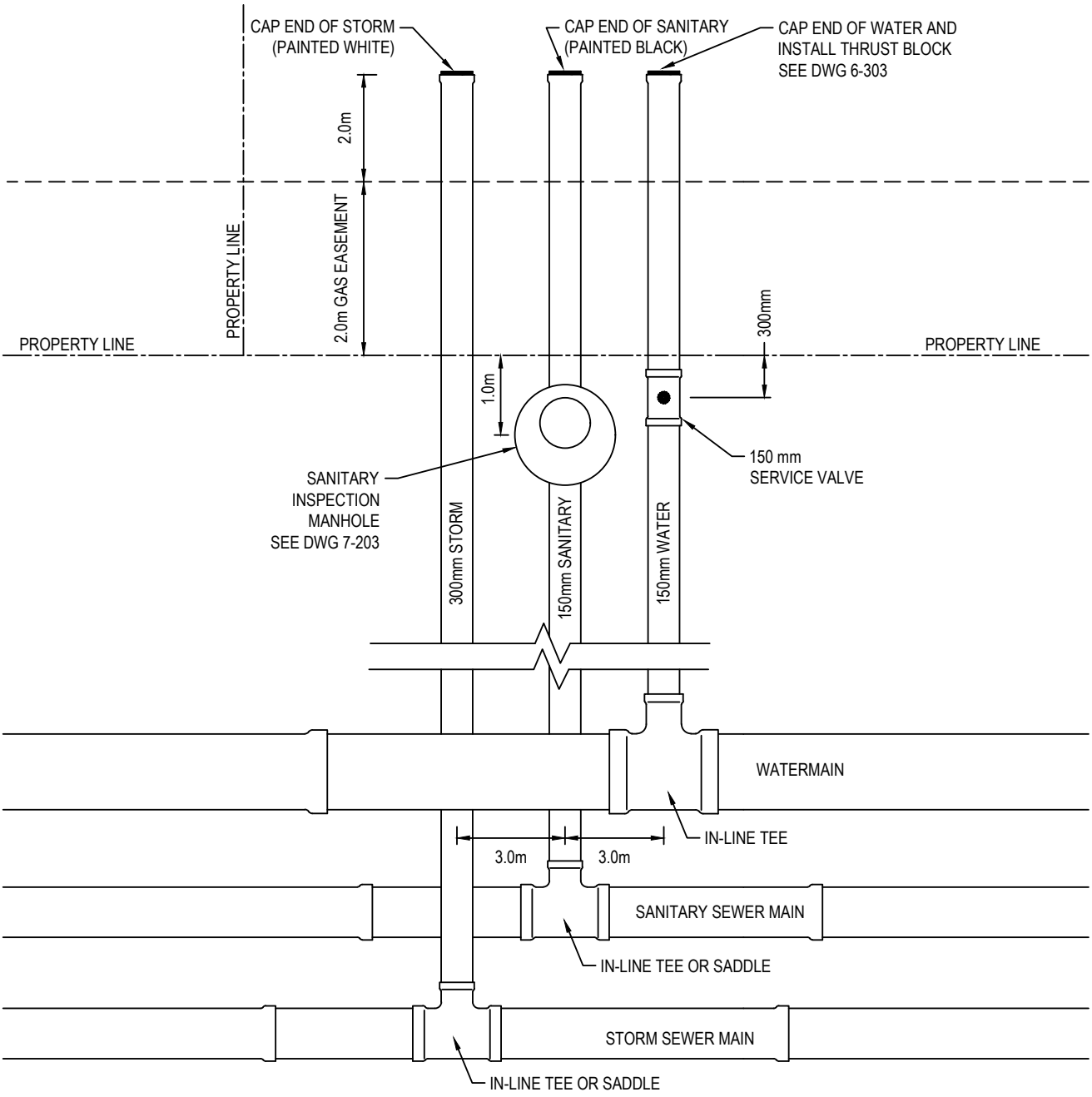
Drawn by: N / A

Scale: N.T.S.

MULTI-FAMILY SERVICE DETAIL

Date: Apr. 30, 2014

Drawing #: 7-103



NOTES:

1. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.
2. STORM SERVICE SHALL ALWAYS BE LOCATED CLOSEST TO PROPERTY LINE.
3. SIZE OF THE SERVICES BEYOND THE PROPERTY LINE MAY BE REDUCED BY THE DEVELOPER AS REQUIRED.
4. IINSERTABLE TEES MAY BE USED ON CONCRETE MAINS AND OPEN PROFILE PVC MAINS

NO.	DATE	REVISION
8		
7		
6		
5		
4	22/06/20	Revised Note 1
3	28/11/18	Revised Notes
2	22/11/16	Revised Notes
1	24/02/15	Rem. Saddle from WM, Chg. dwg no.

The City of Lloydminster

Checked by:

Approved by:

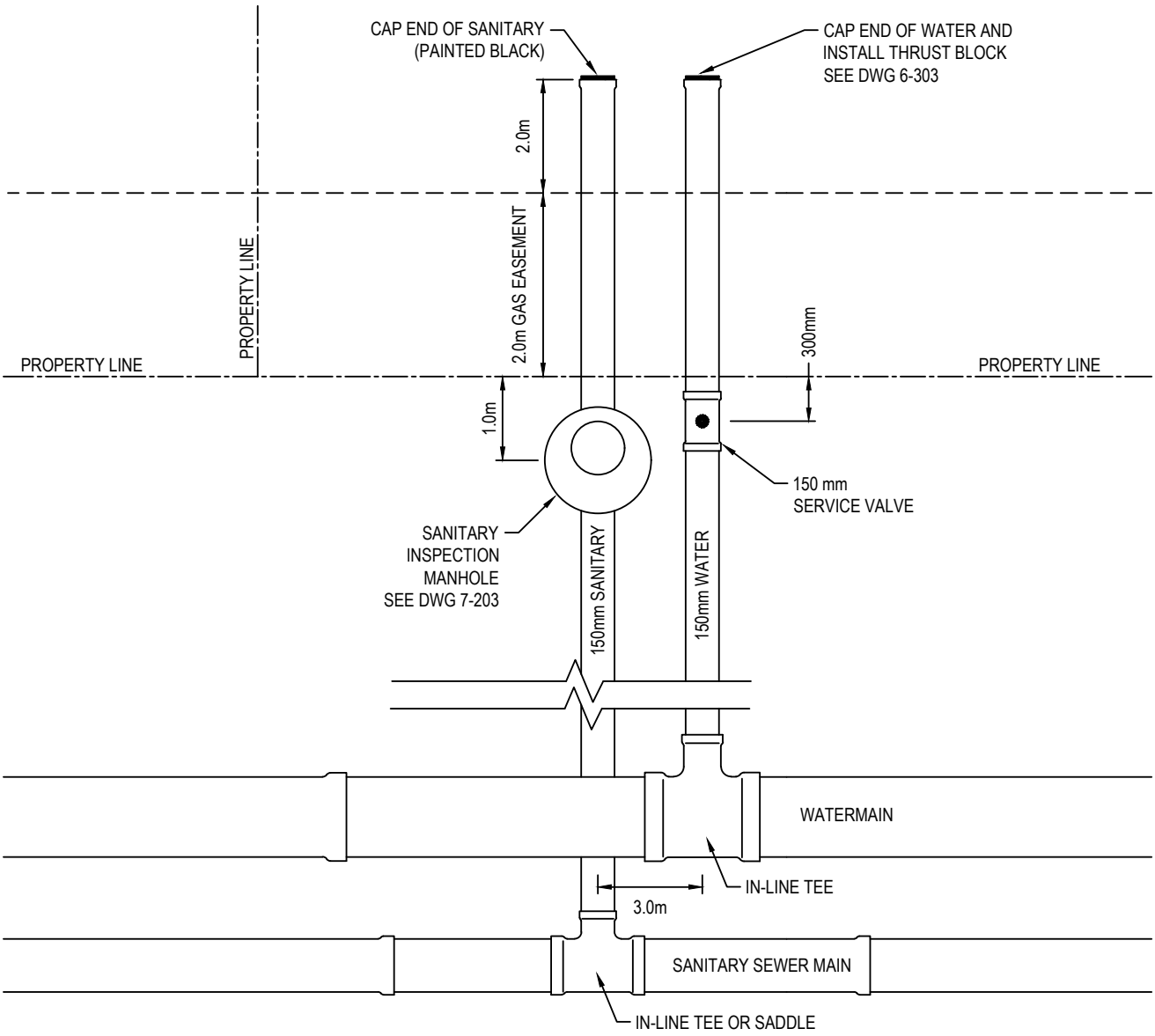
Drawn by: N / A

Scale: N.T.S.

COMMERCIAL SERVICE DETAIL WITH STORM SERVICE

Date: Apr. 30, 2014

Drawing #: 7-104



NOTES:

1. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.
2. SIZE OF THE SERVICES BEYOND THE PROPERTY LINE MAY BE REDUCED BY THE DEVELOPER AS REQUIRED.
3. INSERTABLE TEES MAY BE USED ON CONCRETE MAINS AND OPEN PROFILE PVC MAINS.

NO.	DATE	REVISION
8		
7		
6		
5		
4	22/06/20	Revised Note 1
3	28/11/18	Revised Notes
2	22/11/16	Revised Notes
1	24/02/15	Changed dwg no., added MH

The City of Lloydminster

Checked by:

Approved by:

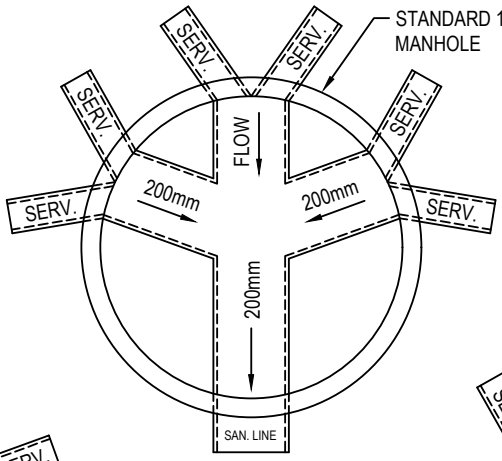
Drawn by: N / A

Scale: N.T.S.

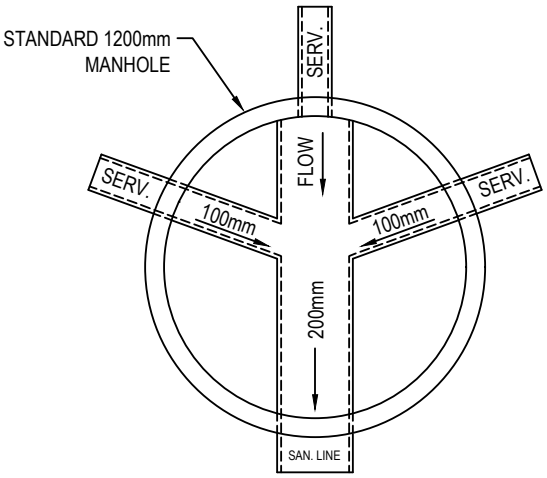
COMMERCIAL SERVICE DETAIL

Date: Feb.24, 2015

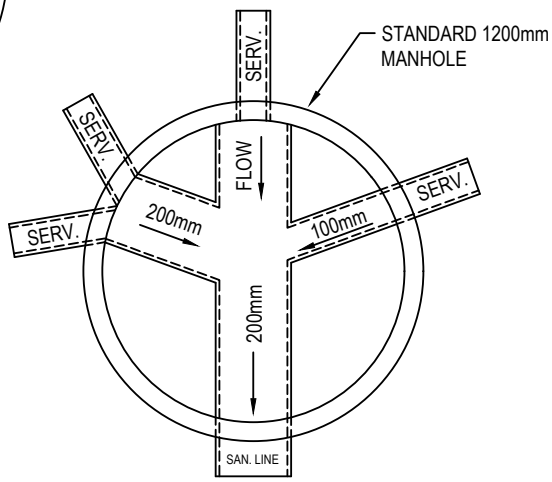
Drawing #: 7-105



TYPICAL



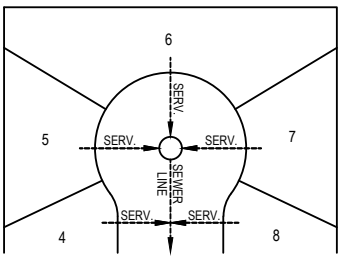
ALTERNATE #1



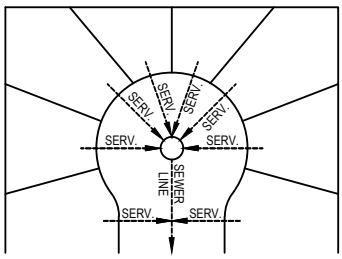
ALTERNATE #2

NOTES:

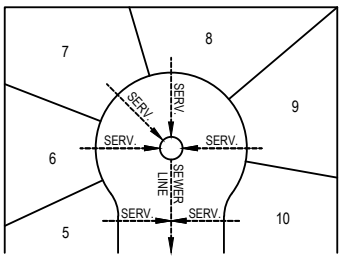
1. IN THE CASE OF MORE THAN 6 CONNECTIONS INTO A MANHOLE, A DETAIL DRAWING SHALL BE SUBMITTED TO THE CITY OF LLOYDMINSTER FOR APPROVAL.
2. MAXIMUM HEIGHT - INVERT OF INCOMING SERVICE PIPES SHALL NOT EXCEED 300mm ABOVE THE INVERT OF THE OUTLET MAIN LINE PIPE.
3. MINIMUM HEIGHT - MATCH CROWN OF SERVICE PIPES WITH CROWN OF OUTLET MAIN LINE PIPE.
4. PIPE BENCHING TO ACCOMMODATE BRANCH CONNECTIONS.
5. SERVICE CONNECTIONS INTO BARREL TO BE MACHINE CORED OR CUT, AND SEALED WITH NON-SHRINK GROUT AS PER DWG. 3-207
6. MIN. 100 FOR 1 SERVICE, MIN. 200 FOR 2 SERVICES.



ALTERNATE #1



TYPICAL



ALTERNATE #2

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2	22/06/20	Revised Note 1
1	11/28/18	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

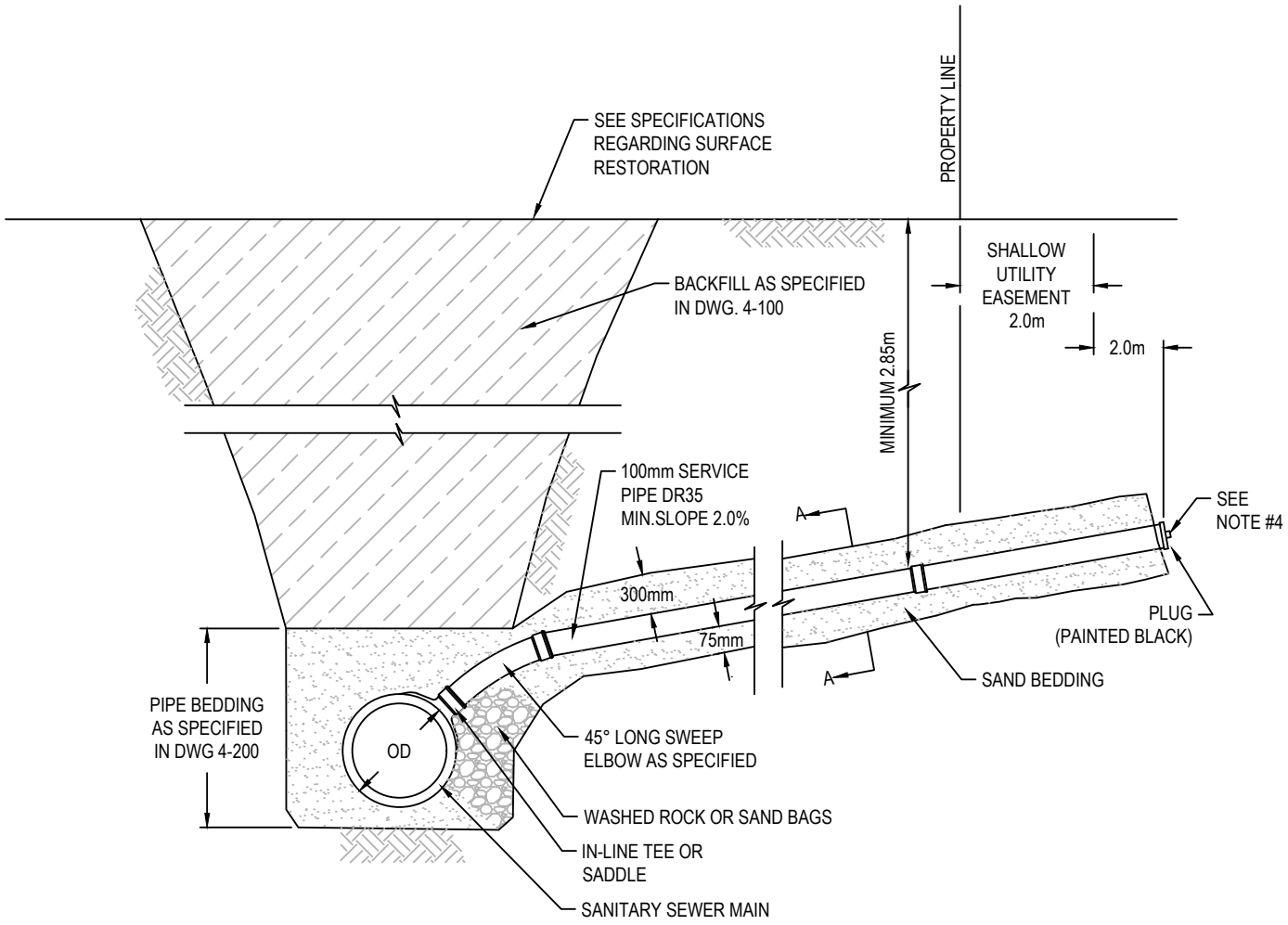
Drawn by: A. EDWARDS

Scale: N.T.S.

SERVICE CONNECTION DETAILS FOR SEWER MANHOLE IN CUL DE SAC

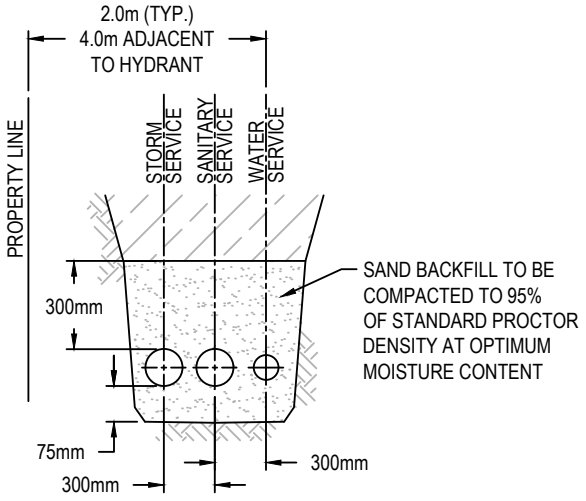
Date: April 14, 2016

Drawing #: 7-106



NOTES:

1. ALL TRENCH WALLS SHALL BE SLOPED OR SHORED IN CONFORMANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY REGULATIONS CURRENTLY IN EFFECT
2. OD = OUTSIDE DIAMETER
3. SERVICE CONNECTIONS TO BE MADE AT THE 10:00 OR 2:00 POSITION.
4. INSTALL 100mm SERVICE PIPE FROM PLUG TO THE HOUSE CONNECTION.
   - MIN SLOPE = 2.0%
   - MAX BEND = 45° TOTAL
   - MAX NUMBER OF BENDS = 2
5. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.



SECTION A-A

NO.	DATE	REVISION
8		
7		
6		
5	22/06/20	Revised Note 5
4	10/03/20	Revised Notes & Dwg
3	3/22/18	Revised Notes
2	4/14/16	Revised Notes
1	08/04/14	Added property line to Sec. A-A

The City of Lloydminster

Checked by:

Approved by:

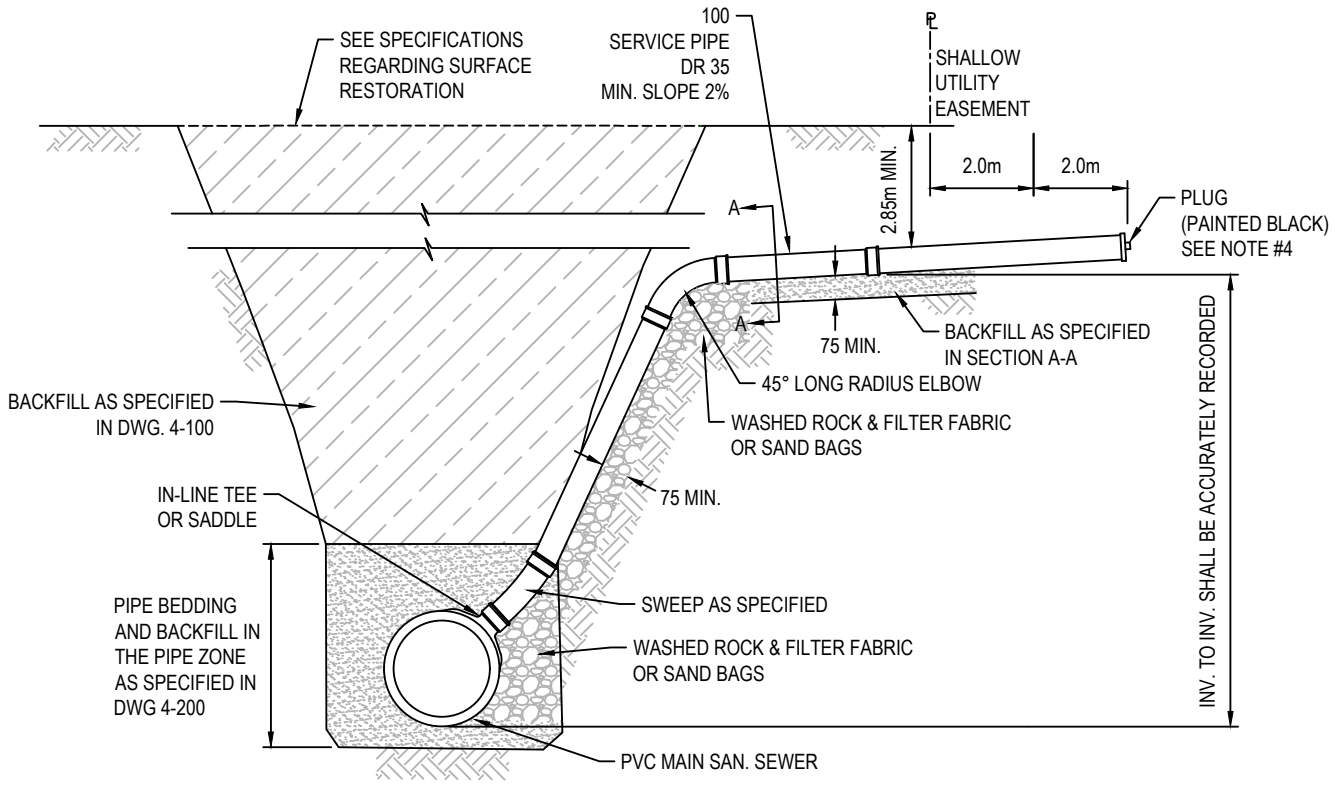
Drawn by: N / A

Scale: N.T.S.

RESIDENTIAL NON - RISER TYPE SANITARY SERVICE CONNECTION

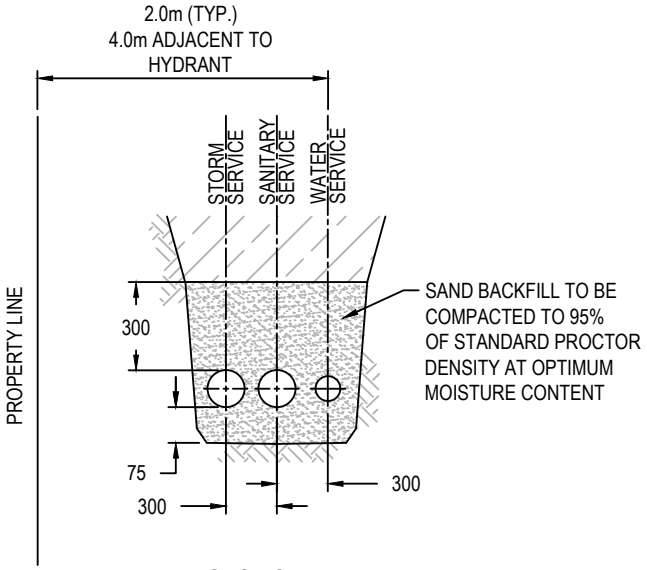
Date: Feb. 22, 2011

Drawing #: 7-200



NOTES:

1. ALL TRENCH WALLS SHALL BE SLOPED OR SHORED IN CONFORMANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY REGULATIONS CURRENTLY IN EFFECT
2. OD = OUTSIDE DIAMETER
3. SERVICE CONNECTIONS TO BE MADE AT THE 10:00 OR 2:00 POSITION.
4. INSTALL 100mm SERVICE PIPE FROM PLUG TO THE HOUSE CONNECTION.
   MIN SLOPE = 2.0%
   MAX BEND = 45° TOTAL
   MAX NUMBER OF BENDS = 2
5. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.



SECTION A-A

NO.	DATE	REVISION
8		
7		
6		
5		
4	22/06/20	Revised Note 5
3	10/03/20	Changed Dwg, Added Note
2	01/03/18	Added Drawing Text
1	4/14/16	Revised Notes

The City of Lloydminster

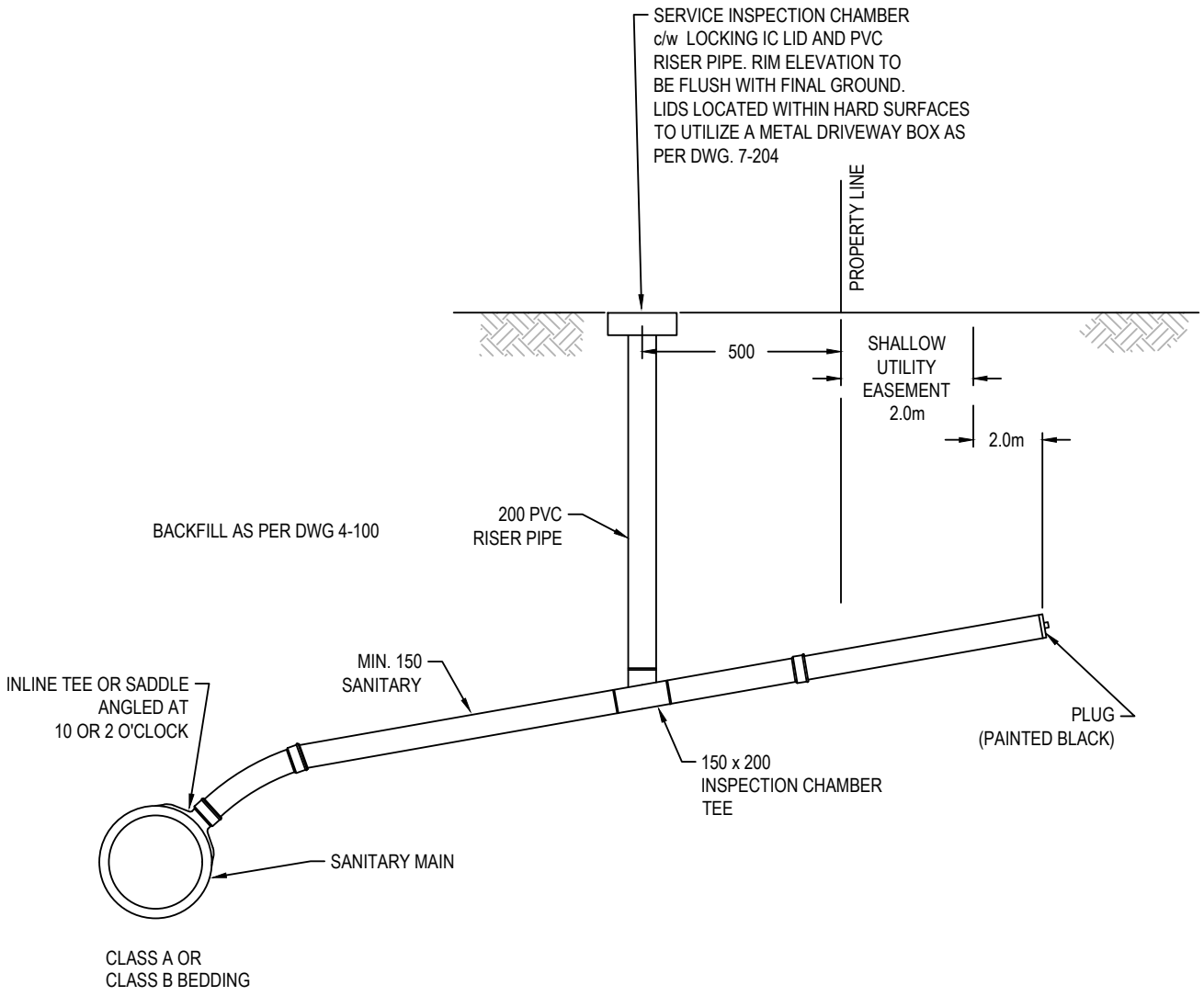
Checked by: | Approved by: | Drawn by: N / A

Scale: N.T.S.

RESIDENTIAL RISER TYPE SANITARY SERVICE CONNECTION

Date: Feb. 22, 2011

Drawing #: 7-201



NOTES:

1. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.
2. SEWER SERVICE MUST BE PROPERLY CAPPED.
3. INSTALL SERVICE PIPE FROM PLUG TO THE BUILDING CONNECTION MIN SLOPE = 1.0%

NO.	DATE	REVISION
8		
7	22/06/20	Revised Note 1
6	05/05/20	Added Text
5	11/03/20	Added Text, Rev. Notes
4	3/22/18	Revised Notes
3	22/11/16	Revised Notes
2	14/04/16	Revised Notes
1	24/02/15	Min slope, dwg title

The City of Lloydminster

Checked by:

Approved by:

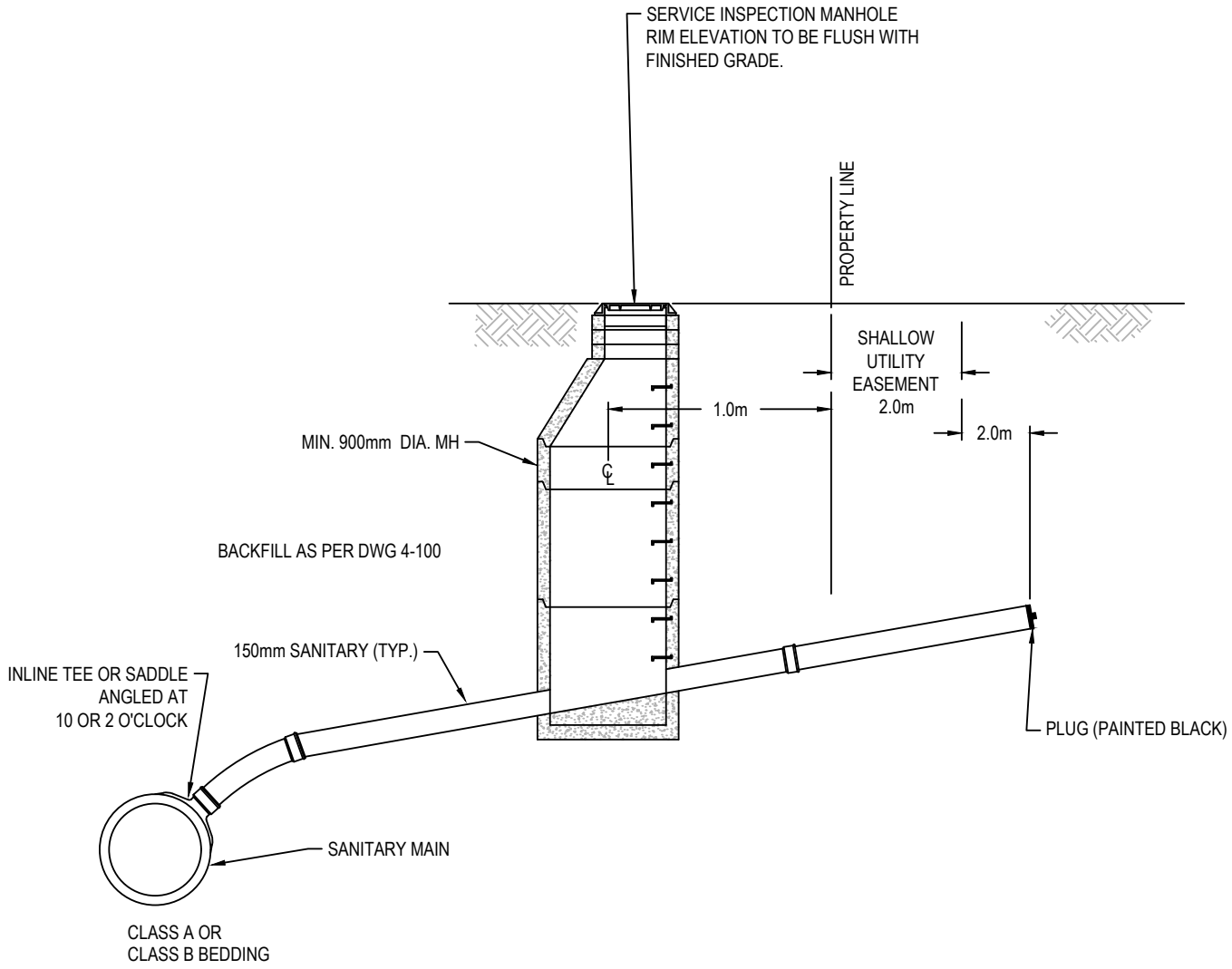
Drawn by: N / A

Scale: N.T.S.

MULTI-FAMILY SANITARY SERVICE INSPECTION CHAMBER

Date: Feb. 22, 2011

Drawing #: 7-202



NOTES:

1. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.
2. INSTALL SERVICE PIPE FROM PLUG TO THE BUILDING CONNECTION.
   MIN SLOPE = 1.0%

NO.	DATE	REVISION
8		
7		
6	22/06/20	Revised Note 1
5	11/03/20	Revised Notes & Dwg.
4	28/11/18	Revised Notes & Painted Plug
3	28/06/16	Revised Notes
2	14/04/16	Revised Notes
1	24/02/15	Min slope, dwg no.

The City of Lloydminster

Checked by:

Approved by:

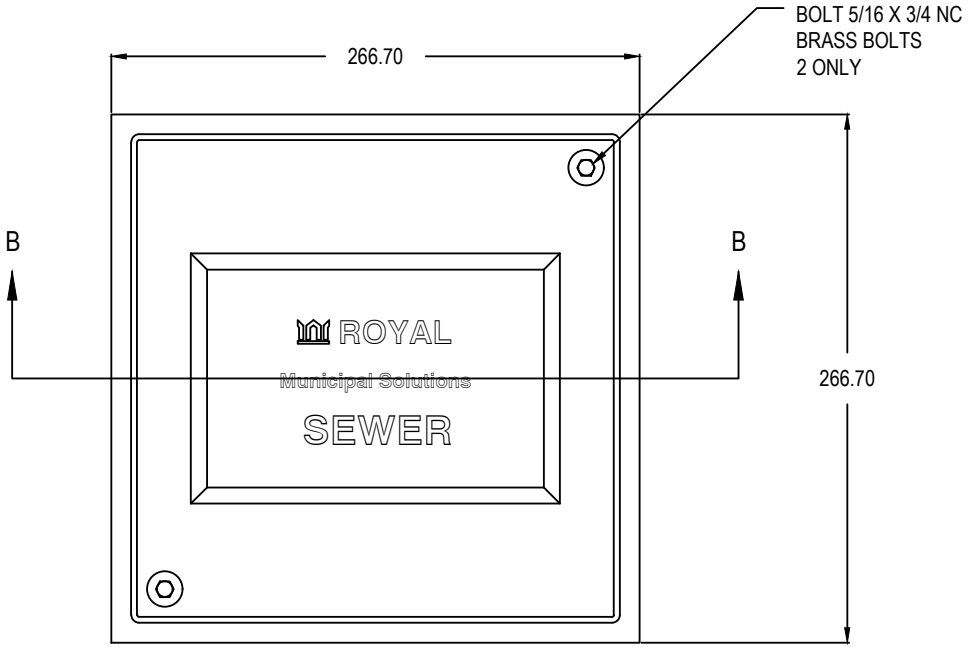
Drawn by: N / A

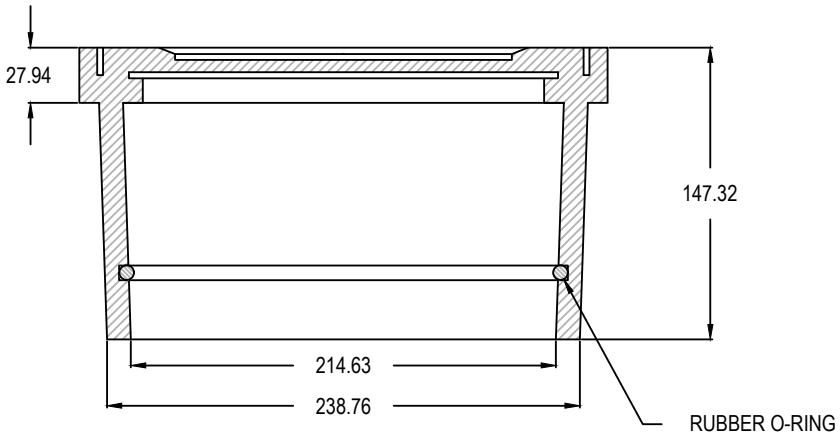
Scale: N.T.S.

COMMERCIAL / INDUSTRIAL SANITARY SERVICE INSPECTION MANHOLE

Date: Feb. 22, 2011

Drawing #: 7-203





SECTION B-B

NOTES:

1. TO BE UTILIZED FOR INSPECTION CHAMBERS PLACED IN A HARD SURFACE.
2. USE ROYAL PIPE SYSTEMS 71A08 OR APPROVED EQUIVALENT.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3		
2	05/05/20	Rev. Text Size & Style
1	11/03/20	REV. TEXT SIZE & STYLE

The City of Lloydminster

Checked by:

Approved by:

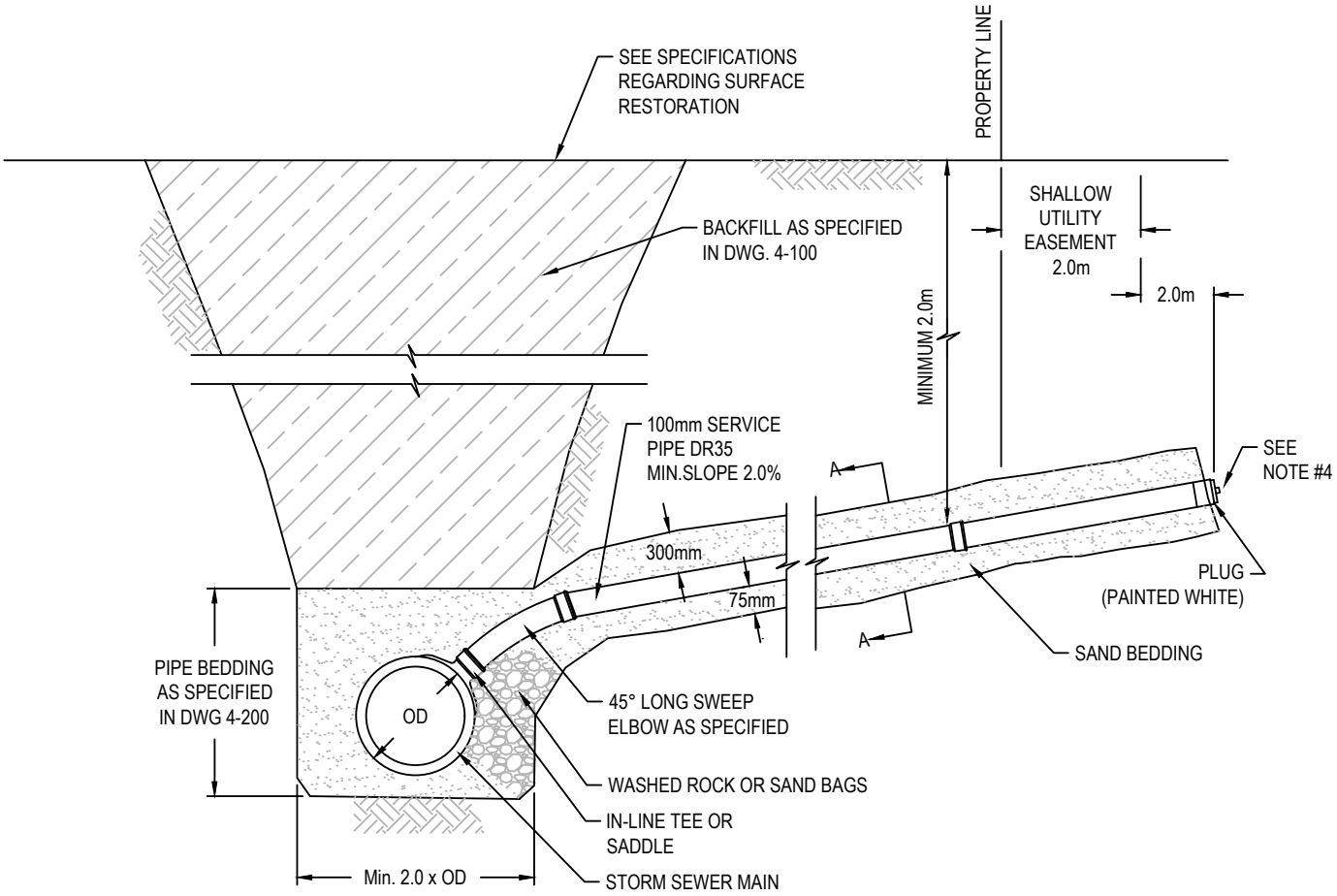
Drawn by: A. EDWARDS

Scale: N.T.S.

METAL DRIVEWAY BOX

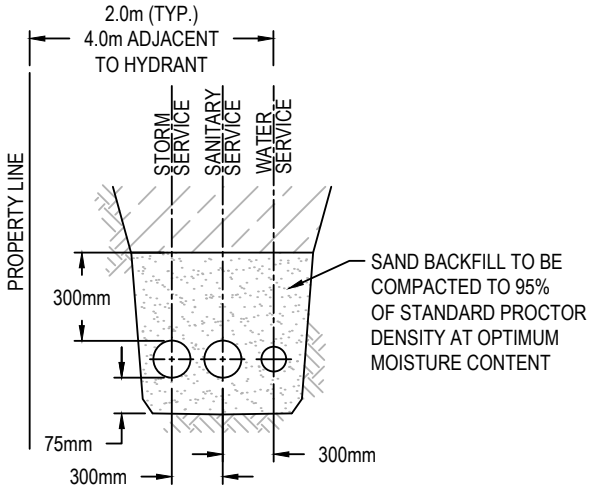
Date: Nov 22, 2016

Drawing #: 7-204



NOTES:

1. ALL TRENCH WALLS SHALL BE SLOPED OR SHORED IN CONFORMANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY REGULATIONS CURRENTLY IN EFFECT
2. OD = OUTSIDE DIAMETER
3. SERVICE CONNECTIONS TO BE MADE BETWEEN THE 10:00 AND 2:00 POSITION.
4. INSTALL 100mm SERVICE PIPE FROM PLUG TO THE HOUSE CONNECTION.
   - MIN SLOPE = 2.0%
   - MAX BEND = 45° TOTAL
   - MAX NUMBER OF BENDS = 2
5. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.



SECTION A-A

NO.	DATE	REVISION
8		
7		
6		
5	22/06/20	Revised Note 5
4	11/03/20	Added Note 5
3	11/28/18	Added Property Line
2	4/14/16	Revised Notes
1	08/04/14	Reduced min cover @ P/L

The City of Lloydminster

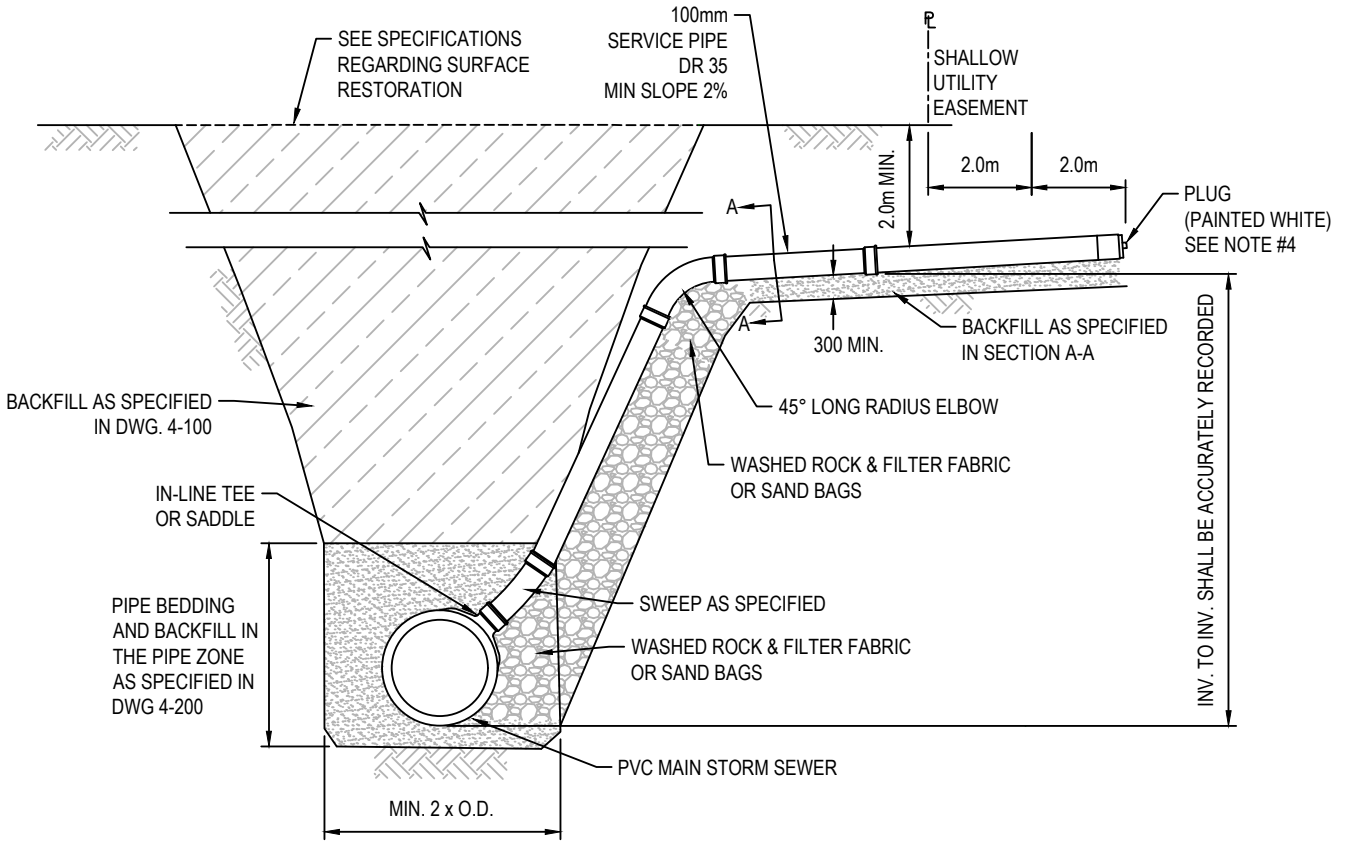
Checked by: | Approved by: | Drawn by: N / A

Scale: N.T.S.

RESIDENTIAL NON - RISER TYPE STORM SERVICE CONNECTION

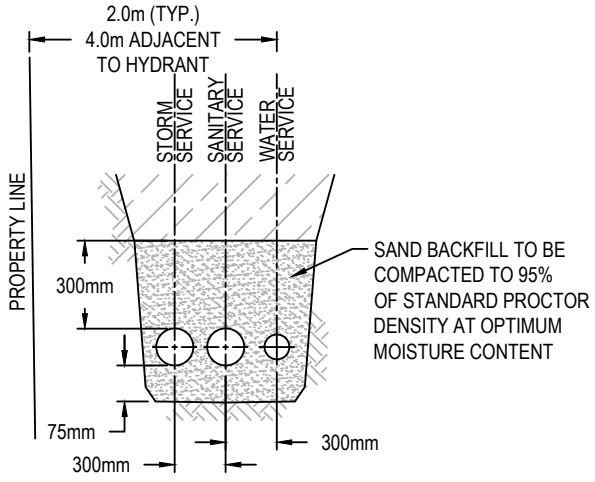
Date: Feb. 22, 2011

Drawing #: 7-300



NOTES:

1. ALL TRENCH WALLS SHALL BE SLOPED OR SHORED IN CONFORMANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY REGULATIONS CURRENTLY IN EFFECT
2. OD = OUTSIDE DIAMETER
3. SERVICE CONNECTIONS TO BE MADE BETWEEN THE 10:00 AND 2:00 POSITION.
4. INSTALL 100mm SERVICE PIPE FROM PLUG TO THE HOUSE CONNECTION.
   - MIN SLOPE = 2.0%
   - MAX BEND = 45° TOTAL
   - MAX NUMBER OF BENDS = 2
5. THE CITY OF LLOYDMINSTER ACCEPTS NO RESPONSIBILITY FOR THE CONSTRUCTION OR MAINTENANCE OF THE SERVICES BEYOND THE PROPERTY LINE.



SECTION A-A

NO.	DATE	REVISION
8		
7		
6		
5		
4	22/06/20	Revised Note 5
3	11/03/20	Revised Drawing & Notes
2	11/28/18	Revised Drawings & Title
1	4/14/16	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

Drawn by: N / A

Scale: N.T.S.

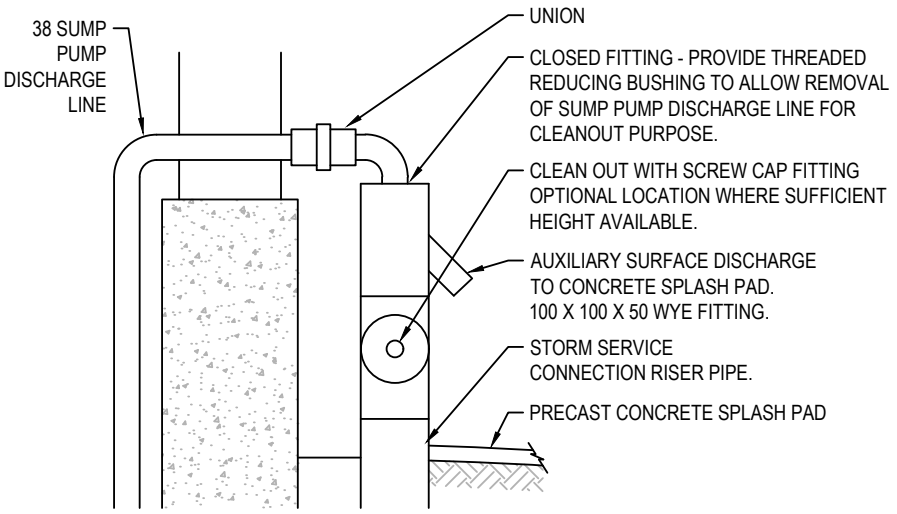
RESIDENTIAL RISER TYPE STORM SERVICE CONNECTION

Date: Feb. 22, 2011

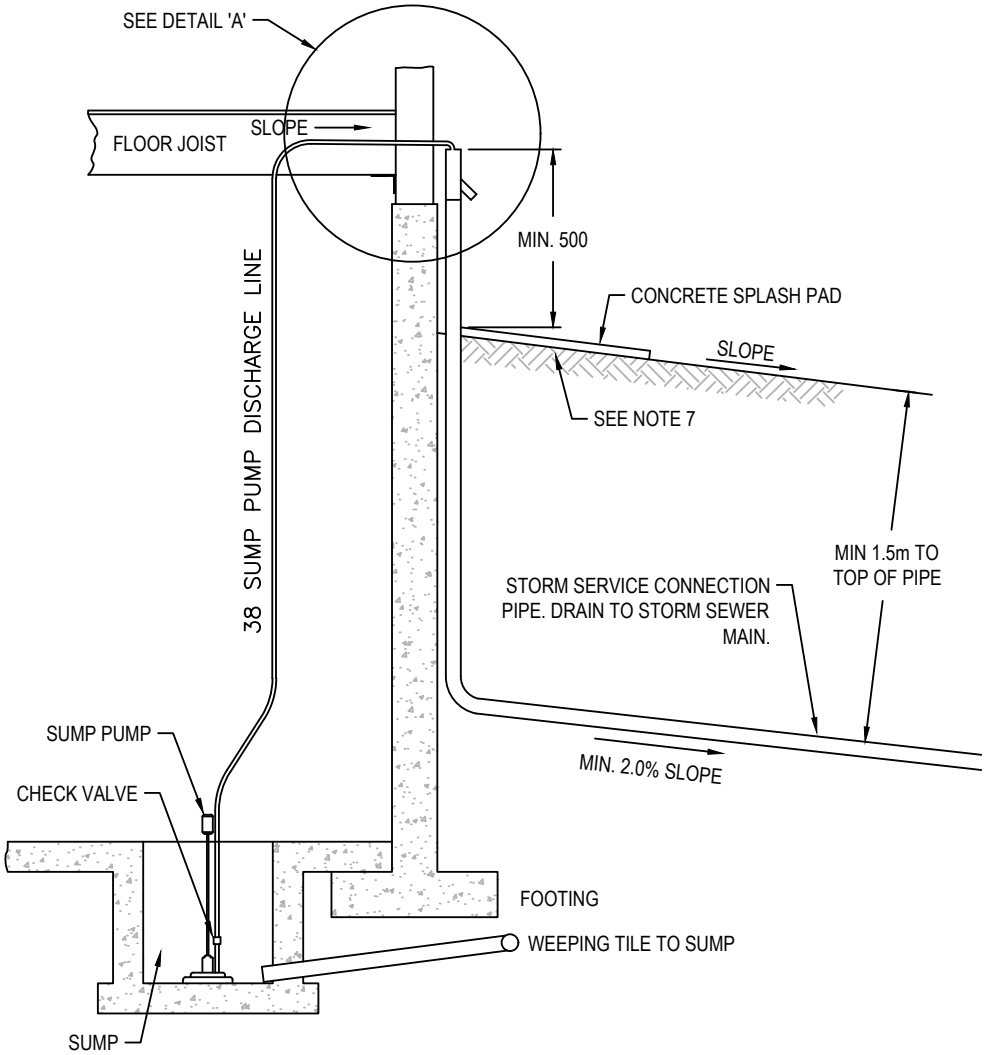
Drawing #: 7-301

NOTES:

1. ROOF LEADERS (DOWNSPOUTS) OR ANY OTHER STORM WATER SOURCE MUST NOT BE CONNECTED TO THE FOUNDATION DRAIN DISCHARGE COLLECTION SYSTEM.
2. THE AUXILIARY SURFACE DISCHARGE MUST BE INSTALLED TO PROVIDE AN OVERFLOW IN THE EVENT THAT THE STORM DRAINAGE SYSTEM CANNOT ACCOMMODATE FLOWS DUE TO BLOCKAGE OR OTHER PROBLEMS.
3. EVERY PART OF THE PLUMBING SYSTEM SHALL BE PROTECTED FROM FREEZING THROUGH THE USE OF AN APPROVED METHOD.
4. WEEPING TILES SHALL NOT BE CONNECTED TO THE SANITARY SYSTEM.
5. THE LOCATION OF THE POINT OF DISCHARGE SHALL BE DIRECTED AWAY FROM ADJACENT PROPERTIES.
6. THE DISCHARGE MAY NOT BE DIRECTED INTO THE SIDE YARD UNLESS THE SIDE YARD IS ADJACENT TO A STREET.
7. DISCHARGE MAY NOT BE DIRECTED ONTO A PERVIOUS GROUND SURFACE WITHIN ONE METRE (1m) OF ANY BUILDING.



DETAIL A



NO.	DATE	REVISION
8		
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4	05/05/20	Revised Text Height
3	11/03/20	Revised Text Height
2	21/10/16	Revised Notes
1	08/04/14	Removed San. service

The City of Lloydminster

Checked by:

Approved by:

Drawn by: N / A

Scale: N.T.S.

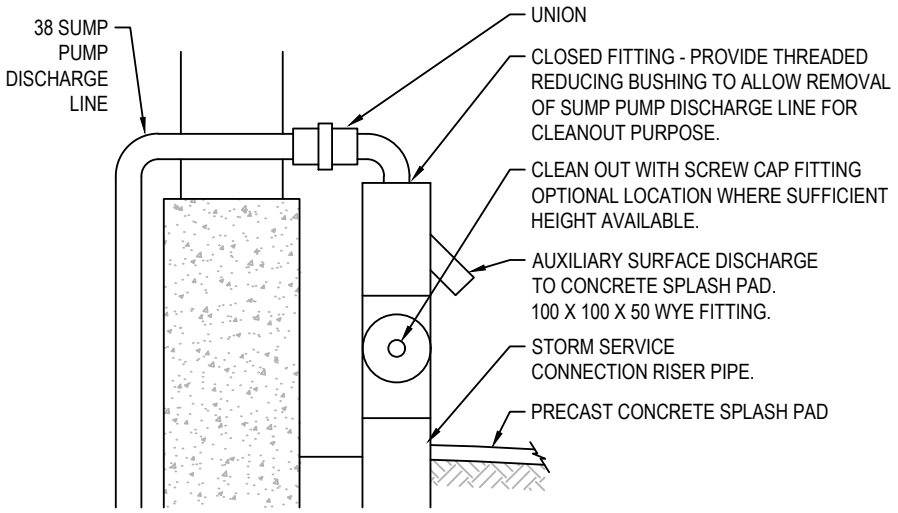
WEEPING TILE DISCHARGE TO STORM SERVICE

Date: Feb. 22, 2011

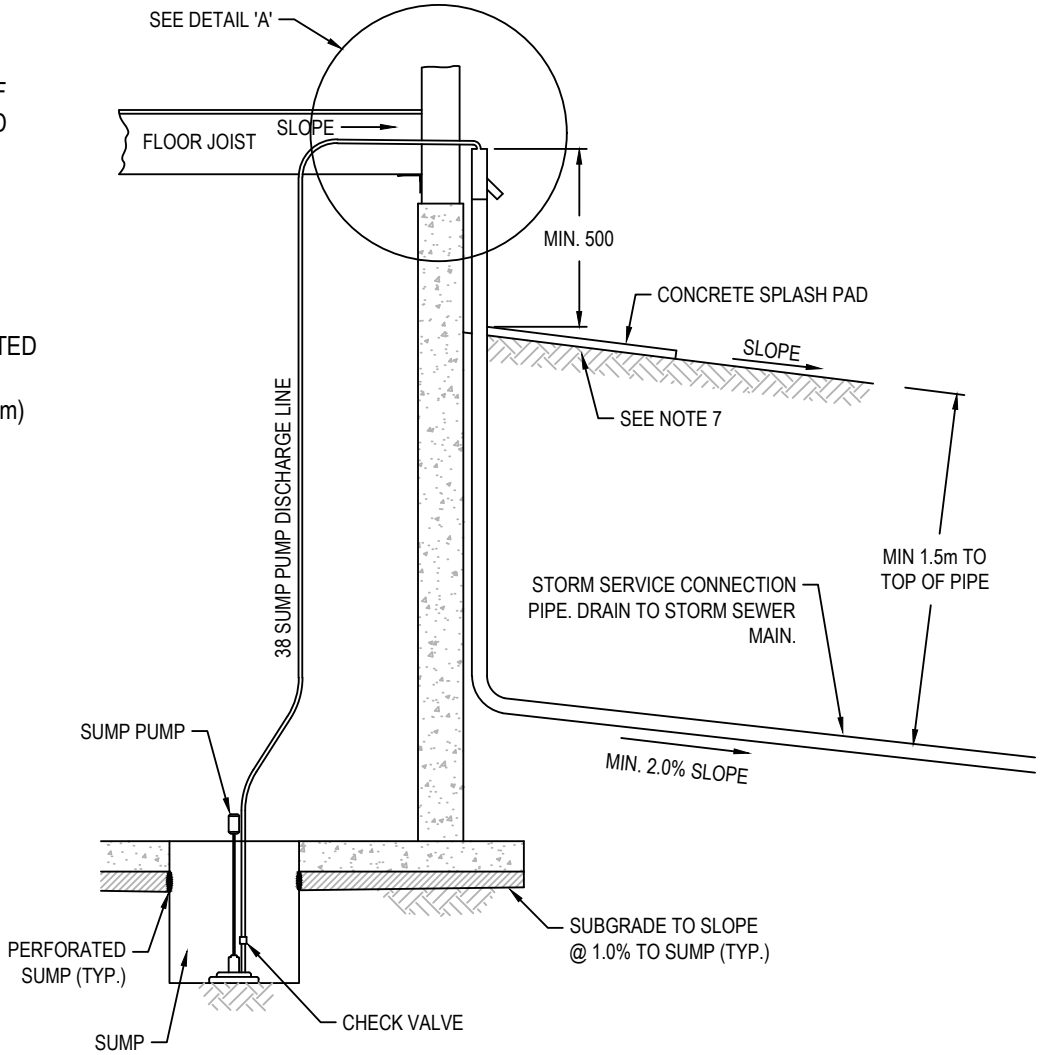
Drawing #: 7-302

NOTES:

1. ROOF LEADERS (DOWNSPOUTS) OR ANY OTHER STORM WATER SOURCE MUST NOT BE CONNECTED TO THE FOUNDATION DRAIN DISCHARGE COLLECTION SYSTEM.
2. THE AUXILIARY SURFACE DISCHARGE MUST BE INSTALLED TO PROVIDE AN OVERFLOW IN THE EVENT THAT THE STORM DRAINAGE SYSTEM CANNOT ACCOMMODATE FLOWS DUE TO BLOCKAGE OR OTHER PROBLEMS.
3. EVERY PART OF THE PLUMBING SYSTEM SHALL BE PROTECTED FROM FREEZING THROUGH THE USE OF AN APPROVED METHOD.
4. WEEPING TILES SHALL NOT BE CONNECTED TO THE SANITARY SYSTEM.
5. THE LOCATION OF THE POINT OF DISCHARGE SHALL BE DIRECTED AWAY FROM ADJACENT PROPERTIES.
6. THE DISCHARGE MAY NOT BE DIRECTED INTO THE SIDE YARD UNLESS THE SIDE YARD IS ADJACENT TO A STREET.
7. DISCHARGE MAY NOT BE DIRECTED ONTO A PERVIOUS GROUND SURFACE WITHIN ONE METRE (1m) OF ANY BUILDING.



DETAIL A



NO.	DATE	REVISION
8		
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4	05/05/20	Revised Text Height
3	11/03/20	Revised Text Height
2	21/10/16	Revised Notes
1	08/04/14	Removed San. service

The City of Lloydminster

Checked by:

Approved by:

Drawn by: N / A

Scale: N.T.S.

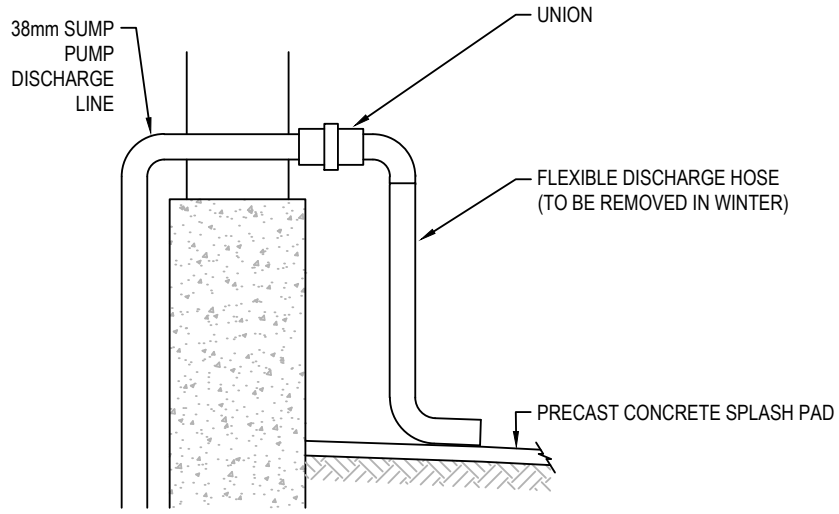
GRANULAR DRAINAGE DISCHARGE TO STORM SERVICE

Date: Feb. 22, 2011

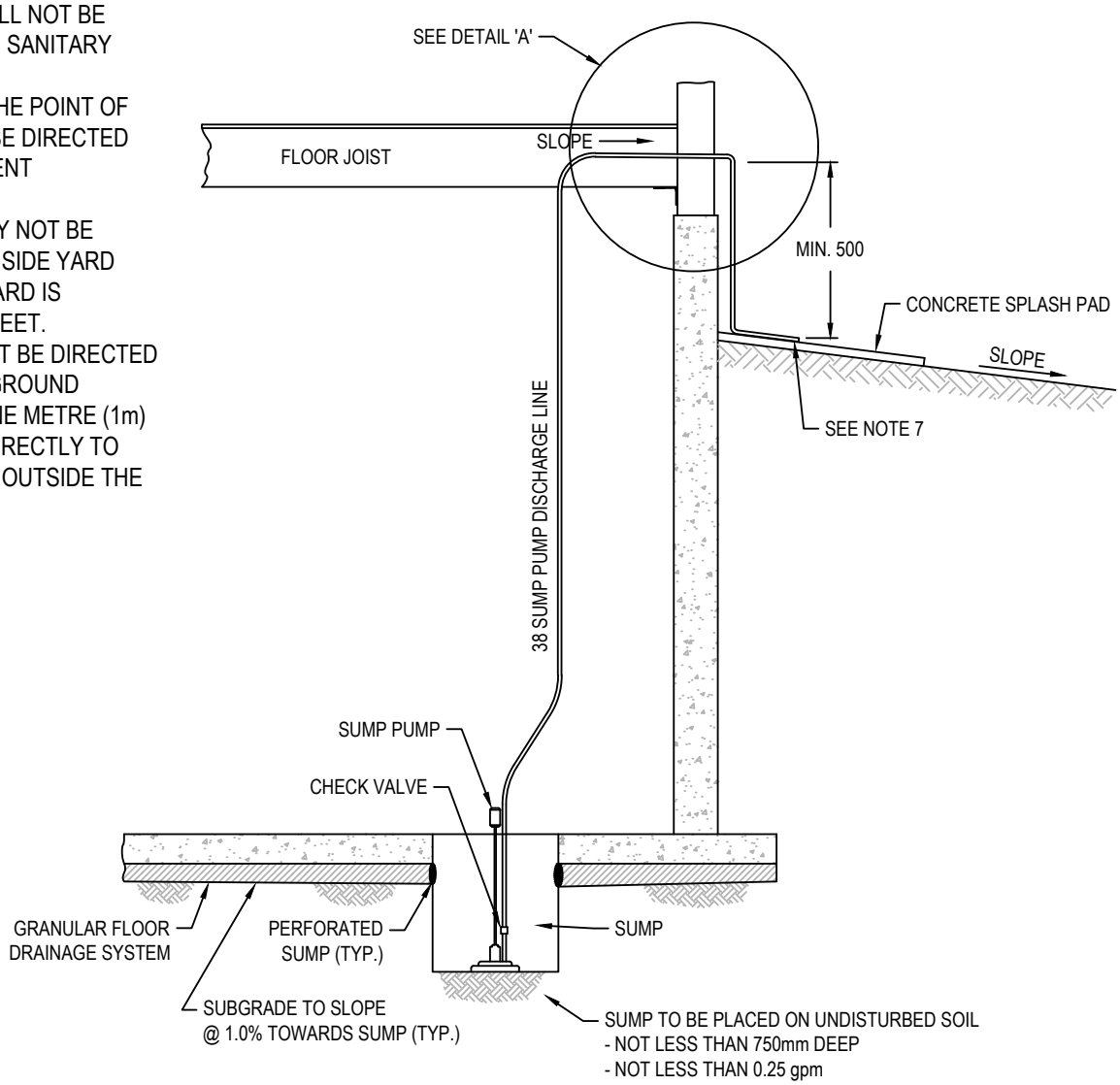
Drawing #: 7-303

NOTES:

1. ROOF LEADERS (DOWNSPOUTS) OR ANY OTHER STORM WATER SOURCE MUST NOT BE CONNECTED TO THE FOUNDATION DRAIN DISCHARGE COLLECTION SYSTEM.
2. THE AUXILIARY SURFACE DISCHARGE MUST BE INSTALLED TO PROVIDE AN OVERFLOW IN THE EVENT THAT THE STORM DRAINAGE SYSTEM CANNOT ACCOMMODATE FLOWS DUE TO BLOCKAGE OR OTHER PROBLEMS.
3. EVERY PART OF THE PLUMBING SYSTEM SHALL BE PROTECTED FROM FREEZING THROUGH THE USE OF AN APPROVED METHOD.
4. WEEPING TILES SHALL NOT BE CONNECTED TO THE SANITARY SYSTEM.
5. THE LOCATION OF THE POINT OF DISCHARGE SHALL BE DIRECTED AWAY FROM ADJACENT PROPERTIES.
6. THE DISCHARGE MAY NOT BE DIRECTED INTO THE SIDE YARD UNLESS THE SIDE YARD IS ADJACENT TO A STREET.
7. DISCHARGE MAY NOT BE DIRECTED ONTO A PERVIOUS GROUND SURFACE WITHIN ONE METRE (1m) OF ANY BUILDING, DIRECTLY TO PROPERTY LINE, OR OUTSIDE THE PROPERTY.



DETAIL A



NO.	DATE	REVISION
8		
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4	05/05/20	Revised Text Height
3	11/03/20	Revised Text Height
2	21/10/16	Revised Notes
1	16/11/15	Changed note number

The City of Lloydminster

Checked by: | Approved by: | Drawn by: N / A

Scale: N.T.S.

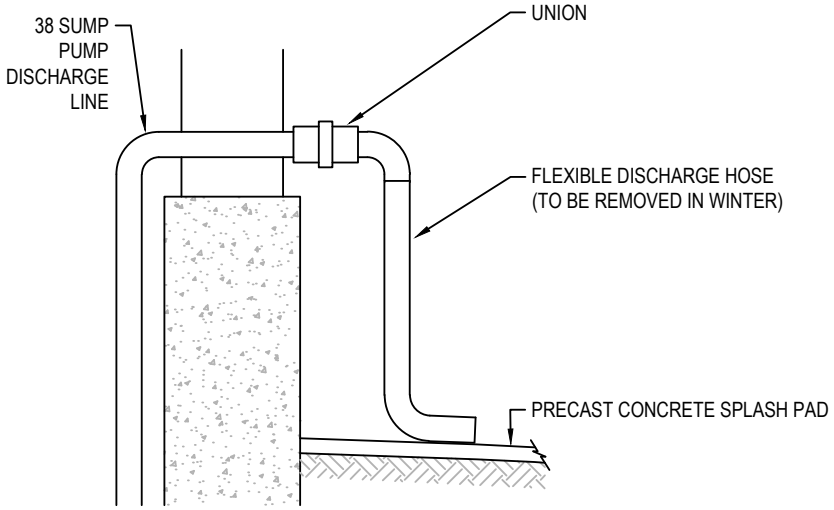
GRANULAR DRAINAGE OVERLAND DISCHARGE IF STORM SERVICE IS NOT AVAILABLE

Date: Feb. 22, 2011

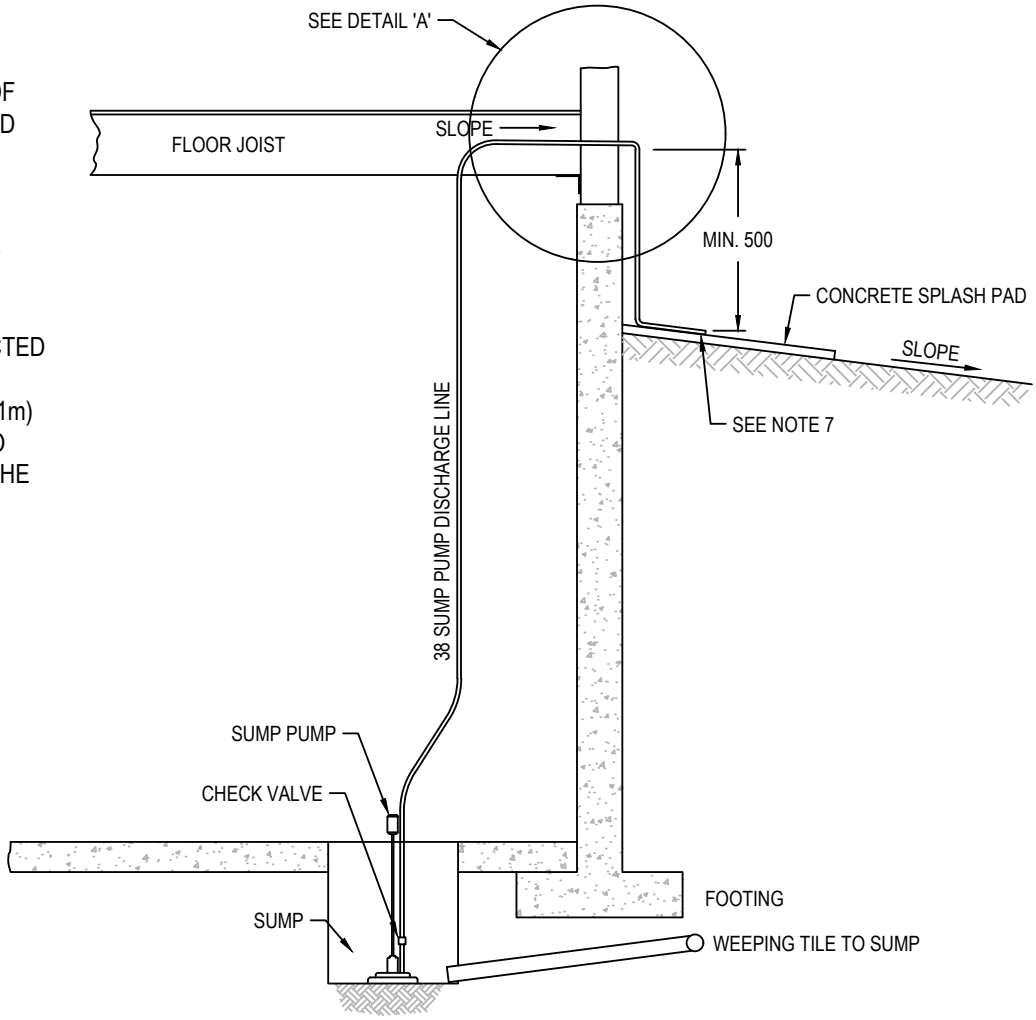
Drawing #: 7-304

NOTES:

1. ROOF LEADERS (DOWNSPOUTS) OR ANY OTHER STORM WATER SOURCE MUST NOT BE CONNECTED TO THE FOUNDATION DRAIN DISCHARGE COLLECTION SYSTEM.
2. THE AUXILIARY SURFACE DISCHARGE MUST BE INSTALLED TO PROVIDE AN OVERFLOW IN THE EVENT THAT THE STORM DRAINAGE SYSTEM CANNOT ACCOMMODATE FLOWS DUE TO BLOCKAGE OR OTHER PROBLEMS.
3. EVERY PART OF THE PLUMBING SYSTEM SHALL BE PROTECTED FROM FREEZING THROUGH THE USE OF AN APPROVED METHOD.
4. WEEPING TILES SHALL NOT BE CONNECTED TO THE SANITARY SYSTEM.
5. THE LOCATION OF THE POINT OF DISCHARGE SHALL BE DIRECTED AWAY FROM ADJACENT PROPERTIES.
6. THE DISCHARGE MAY NOT BE DIRECTED INTO THE SIDE YARD UNLESS THE SIDE YARD IS ADJACENT TO A STREET.
7. DISCHARGE MAY NOT BE DIRECTED ONTO A PERVIOUS GROUND SURFACE WITHIN ONE METRE (1m) OF ANY BUILDING, DIRECTLY TO PROPERTY LINE, OR OUTSIDE THE PROPERTY.



DETAIL A



NO.	DATE	REVISION
8		
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4	05/05/20	Revised Text Height
3	11/03/20	Revised Text Height
2	21/10/16	Revised Notes
1	16/11/15	Changed Note Number

The City of Lloydminster

Checked by:

Approved by:

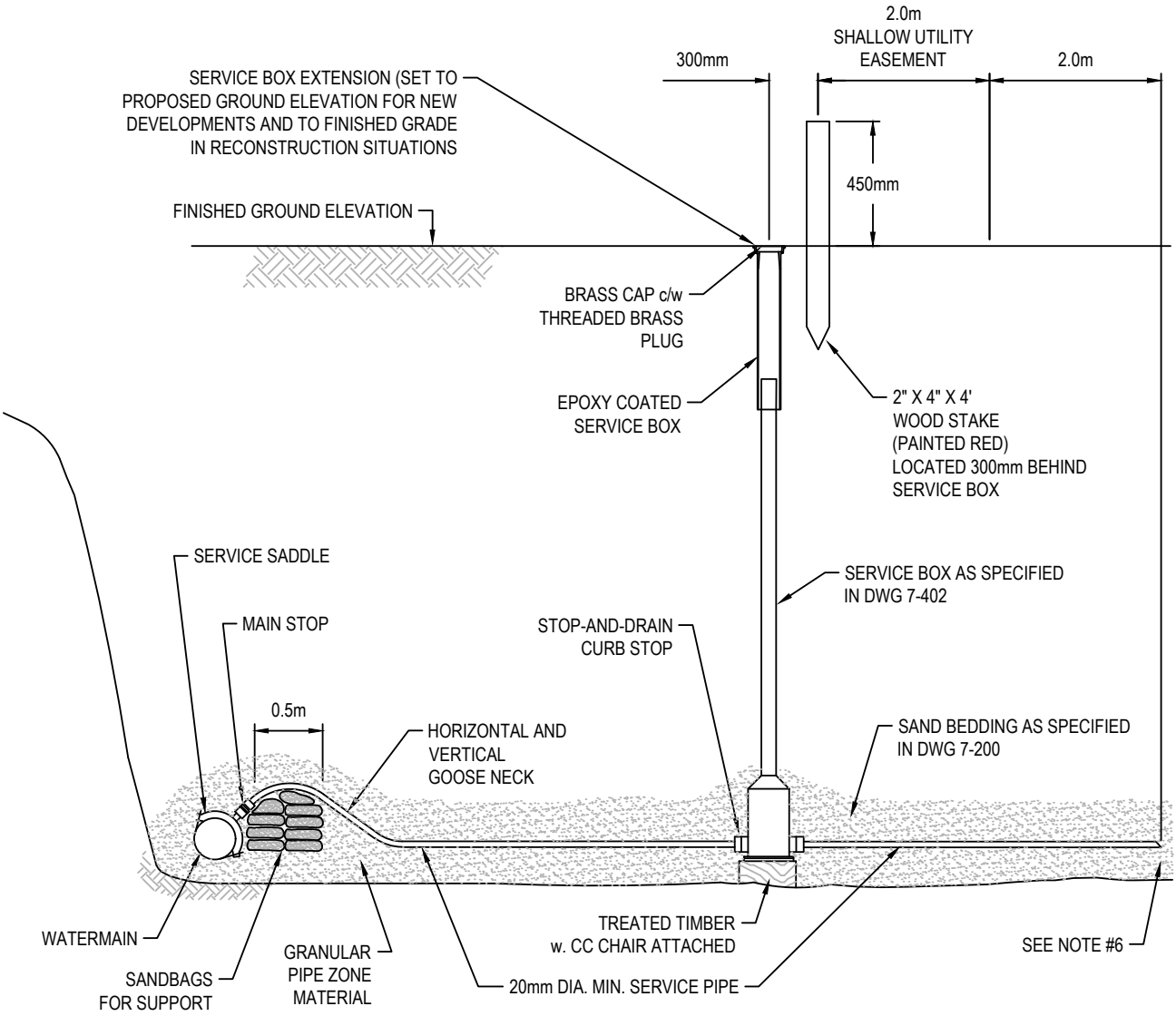
Drawn by: N / A

Scale: N.T.S.

WEEPING TILE OVERLAND DISCHARGE IF STORM SERVICE IS NOT AVAILABLE

Date: Feb. 22, 2011

Drawing #: 7-305



NOTES:

1. SERVICES TO BE INSTALLED AT RIGHT ANGLES TO WATERMAINS WHERE POSSIBLE.
2. SERVICE BOXES TO BE INSTALLED PLUMB. 150mm ABOVE THE SIDEWALK/CURB WHEN THE SERVICE BOX IS IN THE EXTENDED POSITION.
3. SERVICE PIPE TO BE UNIFORM DIAMETER AND CONTINUOUS FROM UNION AT CC STOP TO WATER METER.
4. MINIMUM COVER OVER SERVICE PIPES TO BE 2.85m AT THE PROPERTY LINE.
5. THE END OF THE WATER SERVICE SHALL NOT BE CRIMPED CLOSED. PERMEABLE FILTER CLOTH WILL BE USED TO PREVENT INTRUSION OF DEBRIS AND TO ALLOW TESTING FLOW OF CURBSTOP.
6. INSTALL UNION 4.0m FROM CC.
7. SERVICE BOX TO BE ADJUSTED TO BE SET FLUSH WITH FINISHED SURFACE IN BOULEVARDS. IN CONCRETE DRIVE WAYS, SERVICE BOX IS TO EITHER BE SET FLUSH WITH FINISHED SURFACE OR RECESSED BENEATH A REMOVABLE CAP.
8. SEE DWG. 7-402 FOR SERVICE BOX DETAILS.

NO.	DATE	REVISION
8		
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4	11/03/20	Revised Notes & Detail
3	23/03/18	Revised Notes & Detail
2	22/11/16	Revised Notes
1	4/14/16	Revised Notes

The City of Lloydminster

Checked by:

Approved by:

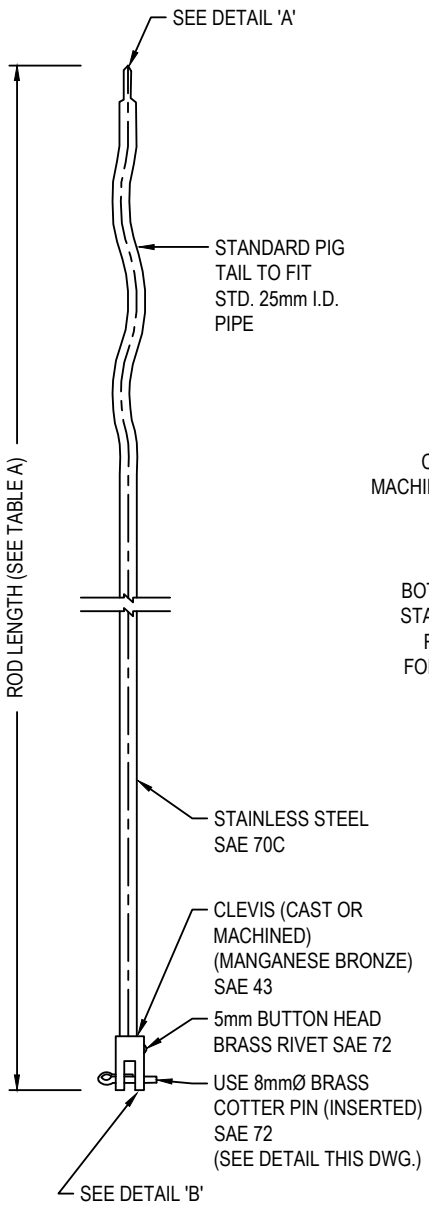
Drawn by: L. LEEPER

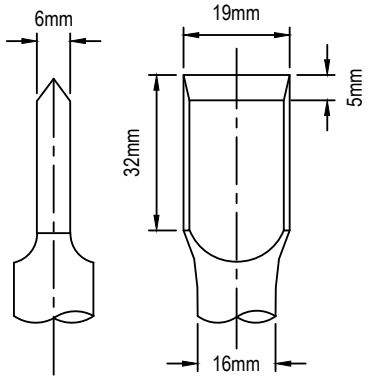
Scale: N.T.S.

RESIDENTIAL WATER SERVICE CONNECTION

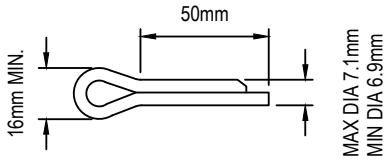
Date: Feb. 22, 2011

Drawing #: 7-400

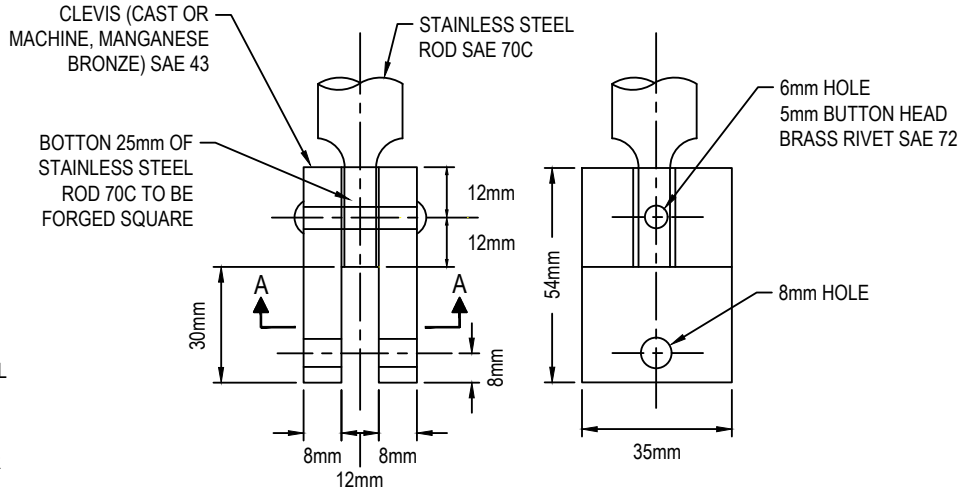




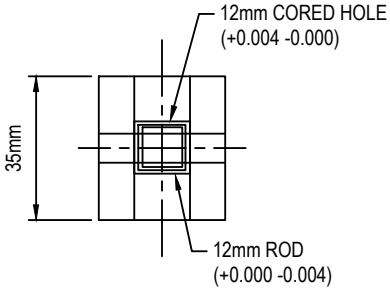
DETAIL 'A'



BRASS COTTER PIN DETAIL



DETAIL 'B'



SECTION A-A

TABLE A

DEPTH OF COVER	ROD LENGTH	CASING LENGTH
2.4m	2.15m	1.97m
2.85m	2.60m	2.42m
3.0m	2.75m	2.57m
3.3m	3.05m	2.87m

NO.	DATE	REVISION
8		
7		
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2		
1		

The City of Lloydminster

Checked by:

Approved by:

Drawn by: L. LEEPER

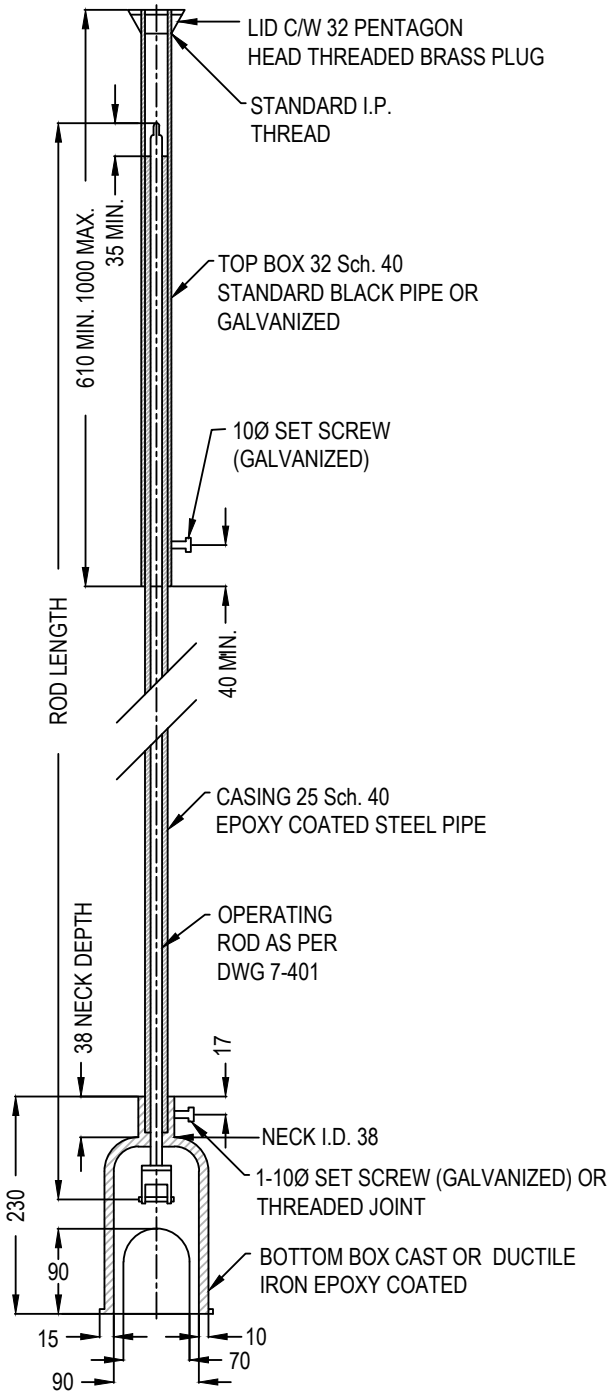
Scale: N.T.S.

SERVICE VALVE ROD FOR 20mm, 25mm, 38mm, 50mm CURB STOPS

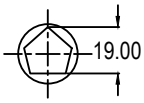
Date: Feb. 22, 2011

Drawing #: 7-401

FOR 20mm & 25mm VALVES

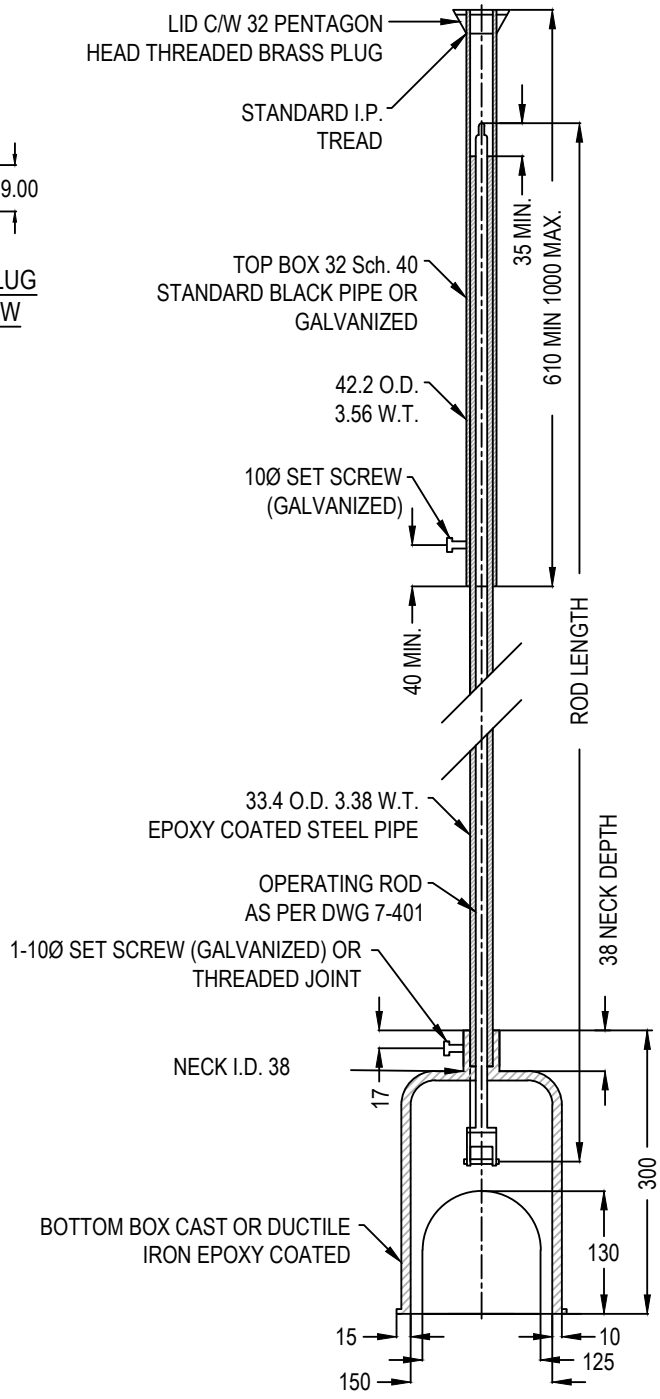


SMALL BOOT FOR
20mm & 25mm SERVICE



BRASS PLUG
TOP VIEW

FOR 40mm & 50mm VALVES



LARGE BOOT FOR
40mm & 50mm SERVICE

NOTES:

1. THE EXTERIOR & INTERIOR OF THE BOTTOM BOX SHALL BE FACTORY COATED.
2. GREY CAST IRON SHALL CONFORM TO ASTM A-48 CLASS 25 (LATEST EDITION).
3. OPERATING RODS TO BE AS PER DWG 7-401.

NO.	DATE	REVISION
8		
7		
6		
5	22/06/20	Underlined Detail Names
4	05/05/20	Changed Text Ht, Rem. "mm"
3	11/03/20	Changed Text Ht, Added Note 3
2	3/22/18	Revised Notes
1	2/3/17	Revised Lineweight

The City of Lloydminster

Checked by:

Approved by:

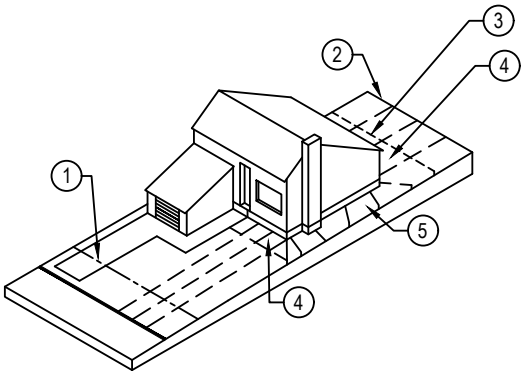
Drawn by: A. Edwards

Scale: N.T.S.

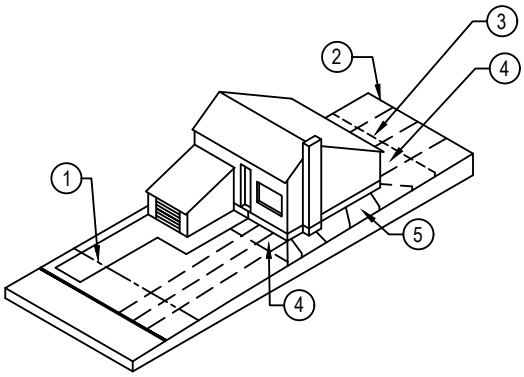
SERVICE BOX

Date: Nov 23, 2016

Drawing #: 7-402



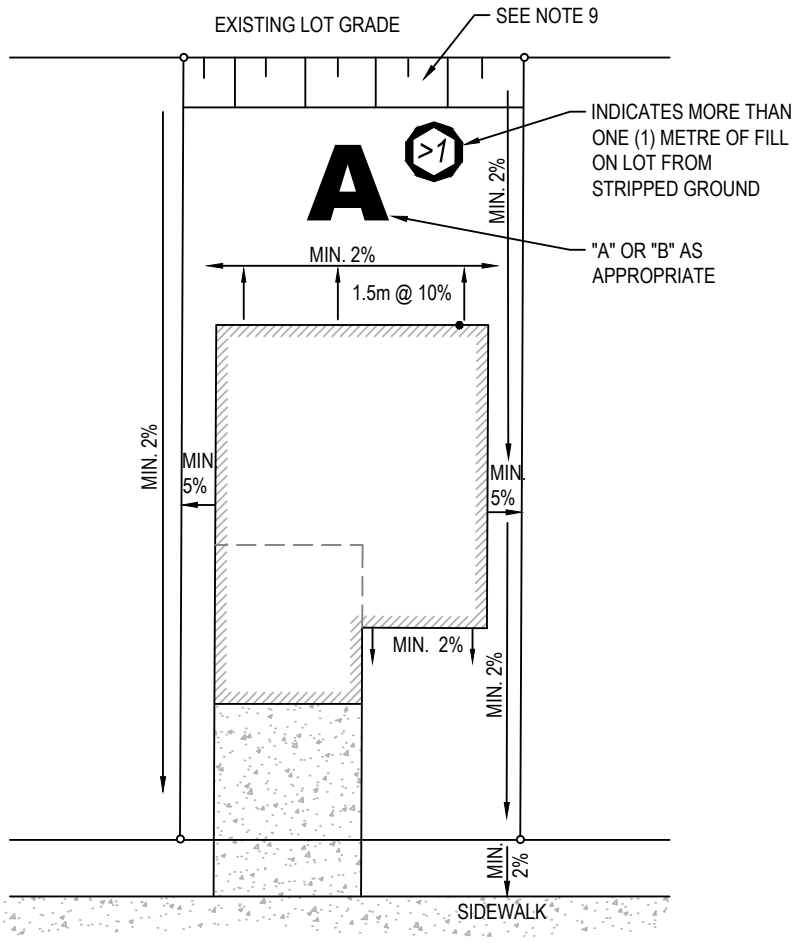
TYPE A
2-3% OVERALL LOT SLOPE
REAR TO FRONT DRAINAGE



TYPE B
3-6% OVERALL LOT SLOPE
REAR TO FRONT DRAINAGE

NOTES:

1. FRONT PROPERTY LINE.
2. REAR PROPERTY LINE.
3. TYPICAL RELATIVE HIGH POINT ACROSS YARD DRAINAGE MAY BE SPLIT FROM CENTER OR ALL SLOPED TO LOW SIDE.TYPICAL 2.0% MIN. CROSS YARD SLOPES.
4. 2% MIN. SLOPE AWAY FROM BLDG.
5. 3.0m @ 5% MIN. SLOPE FROM WALL TO PROPERTY LINE.
6. MINIMUM GARAGE SLAB ELEVATION TO BE SET 0.36m ABOVE HIGHEST FRONT CORNER LOT ELEVATION.
7. ALL INTERIOR SLOPES, INCLUDING CONCRETE DRIVEWAYS, SIDEWALKS AND PATIOS TO BE A MINIMUM OF 2%.
8. DRIVEWAY SLOPE SHOULD BE LESS THAN 8.3%. SLOPES GREATER THAN 10.0% REQUIRE APPROVAL FROM THE CITY.
9. WHERE DESIGN BACK OF LOT ELEVATIONS ARE MUCH MORE THAN 2% ABOVE FRONT, A 10m SECTION OF LOT CAN BE SLOPED AT 3% MIN.
10. WHERE LOT BEHIND HAS SPLIT DRAINAGE, THIS LOT MUST ACCOMMODATE THE DRAINAGE FROM THE REAR OF THE LOT BEHIND IT.
11. ESTABLISHING AND MAINTAINING LOT GRADING AND DRAINAGE IS THE RESPONSIBILITY OF THE PROPERTY OWNER.



NO.	DATE	REVISION
8		
7		
6	05/05/20	Rev. Text Height
5	11/03/20	Revised Notes & Drawing
4	11/28/18	Revised Notes
3	1/27/17	Revised Notes
2	4/14/16	Revised Notes
1	08/06/15	Added min. drop to Note 5

The City of Lloydminster

Checked by:

Approved by:

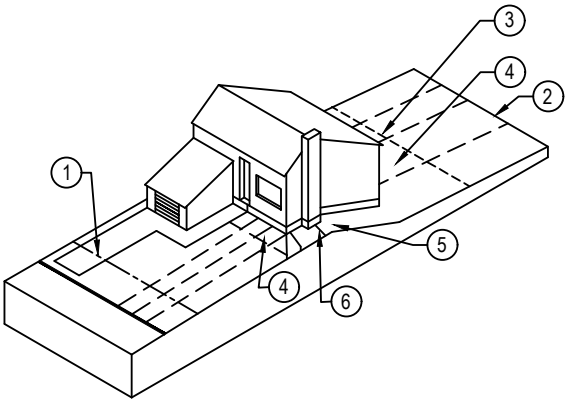
Drawn by: N / A

Scale: N.T.S.

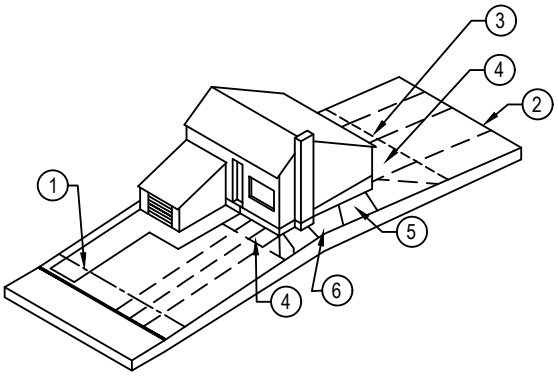
LOT GRADING
BACK TO FRONT DRAINAGE

Date: Feb. 22, 2011

Drawing #: 8-100



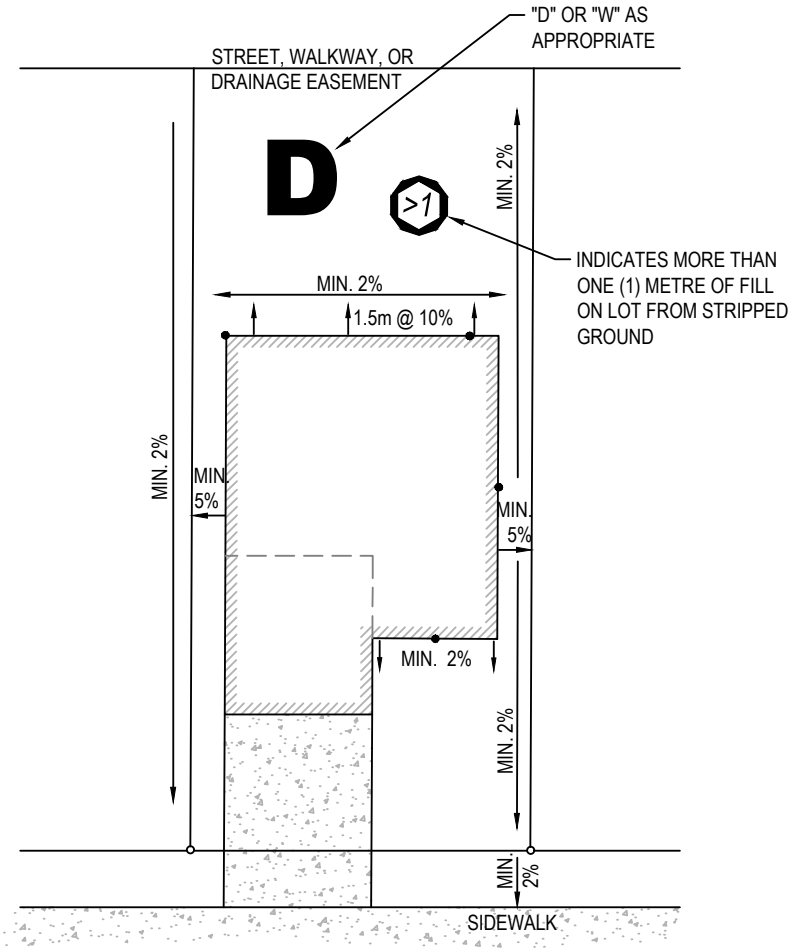
TYPE W
WALKOUT BASEMENT
SPLIT DRAINAGE



TYPE D
STANDARD SPLIT DRAINAGE

NOTES:

1. FRONT PROPERTY LINE.
2. REAR PROPERTY LINE.
3. TYPICAL RELATIVE HIGH POINT ACROSS YARD DRAINAGE MAY BE SPLIT FROM CENTRE OR ALL SLOPED TO LOW SIDE.TYPICAL 1.5% MIN. CROSS YARD SLOPES.
4. 2% MIN. SLOPE AWAY FROM BLDG.
5. 3.0m @ 5% MIN. SLOPE FROM WALL TO PROPERTY LINE.
6. HIGH POINT - VARIES.
7. MINIMUM GARAGE SLAB ELEVATION TO BE SET 0.36m ABOVE HIGHEST FRONT CORNER LOT ELEVATION.
8. ALL INTERIOR SLOPES, INCLUDING CONCRETE DRIVEWAYS, SIDEWALKS AND PATIOS TO BE A MINIMUM OF 2%.
9. DRIVEWAY SLOPE SHOULD BE LESS THAN 8.3%. SLOPES GREATER THAN 10.0% REQUIRE APPROVAL FROM THE CITY.
10. HIGH POINT MAY BE AT FRONT, REAR, OR MID-POINT, DEPENDANT ON HOUSE DESIGN AND RELATIVE ELEVATIONS OF LOT CORNERS.
11. ESTABLISHING AND MAINTAINING LOT GRADING AND DRAINAGE IS THE RESPONSIBILITY OF THE PROPERTY OWNER.



NO.	DATE	REVISION
8		
7		
6	05/05/20	Revised Text Height
5	11/03/20	Revised Notes and Drawing
4	11/29/18	Revised Notes
3	1/27/17	Revised Notes
2	4/14/16	Revised Notes
1	08/06/15	Added Min. drop to Note 5

The City of Lloydminster

Checked by:

Approved by:

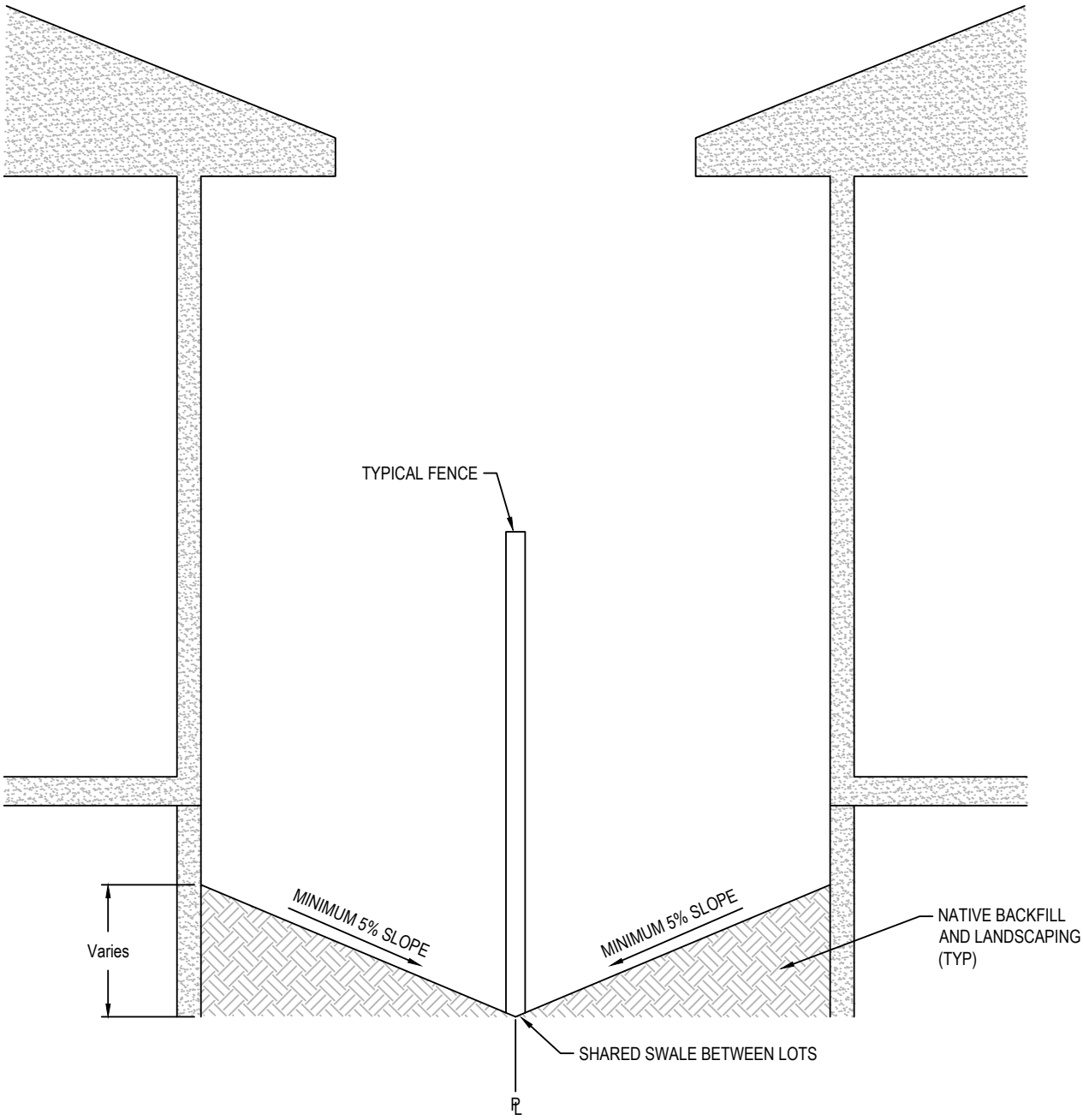
Drawn by: N / A

Scale: N.T.S.

LOT GRADING
SPLIT DRAINAGE

Date: Feb. 22, 2011

Drawing #: 8-101



NOTES:

1. SLOPE OF SHARED SWALE MUST BE CONSISTENT WITH THE DESIGN SIDE LOT SLOPE.
2. ROOF LEADERS MUST BE ANGLED IN THE DIRECTION OF FLOW.
3. ESTABLISHING AND MAINTAINING LOT GRADING AND DRAINAGE IS THE RESPONSIBILITY OF THE PROPERTY OWNER.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3	22/06/20	Revised Notes Height
2	11/29/18	Revised Notes
1	02/03/16	Revised height req'd

The City of Lloydminster

Checked by:

Approved by:

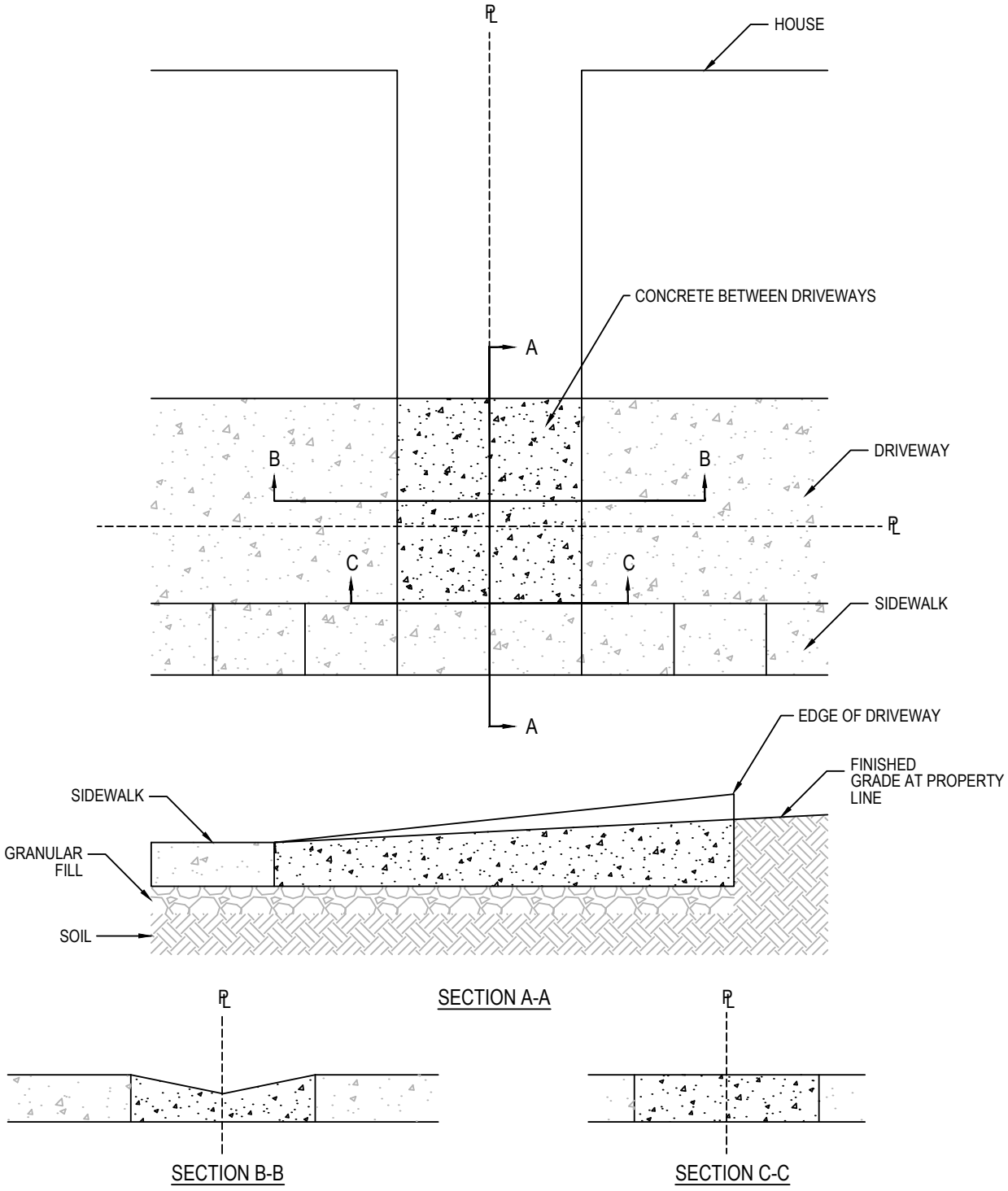
Drawn by: L. LEEPER

Scale: N.T.S.

SHARED DRAINAGE BETWEEN LOTS

Date: June 8, 2015

Drawing #: 8-102



NOTES:

1. SLOPE OF CONCRETE AT FINISHED DRIVEWAY TO MATCH DESIGN SLOPE OF FINISHED GRADE.

NO.	DATE	REVISION
8		
7		
6		
5		
4		
3	05/05/20	Revised Hatch Style
2	11/03/20	Revised Drawing
1	11/29/18	Revised Drawing

The City of Lloydminster

Checked by:

Approved by:

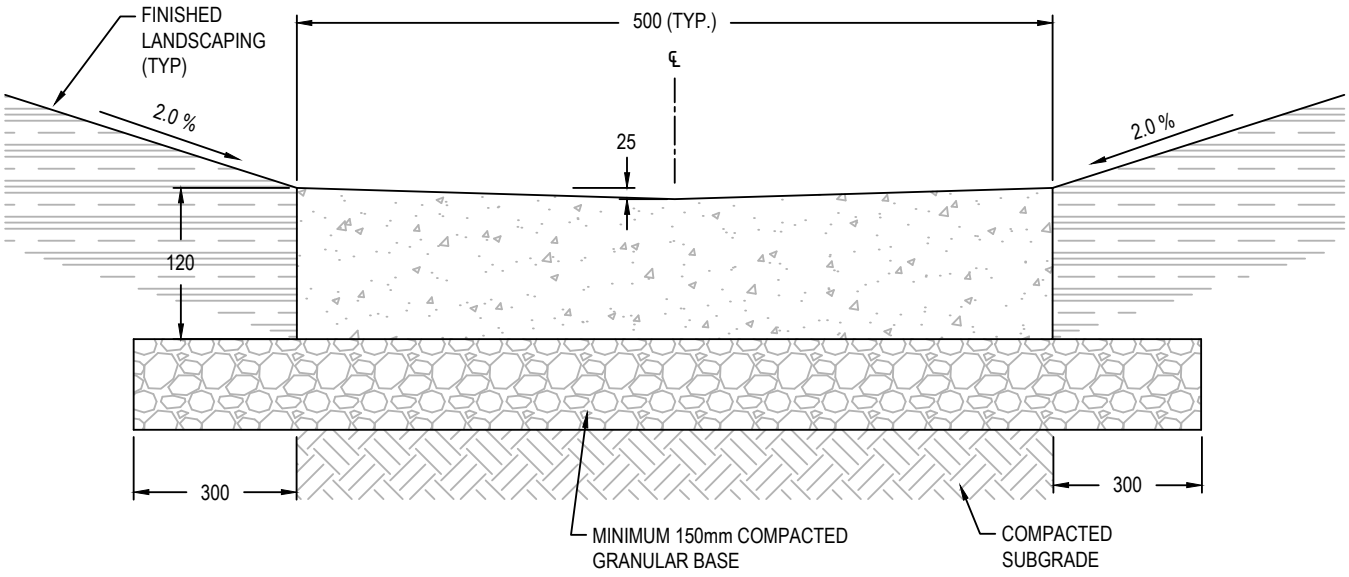
Drawn by: A. EDWARDS

Scale: N.T.S.

CONCRETE BETWEEN DRIVEWAYS

Date: Jan 26 2017

Drawing #: 8-103



NOTES:

1. CONCRETE TO BE TYPE HS, 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS WITH 5% TO 8% AIR ENTRAINMENT.
2. COMPACT BACKFILL TO 95% FOR 500mm FROM BACK OF SWALE AND PROVIDE POSITIVE DRAINAGE OVER THE TOP OF SWALE.
3. CONTRACTION JOINTS 50mm DEEP AND 5mm WIDE TO BE CONSTRUCTED AT 3.0m INTERVALS.
4. EXPANSION JOINTS TO BE CONSTRUCTED AT ENDS OF SWALE WHERE SWALE ABUTS GUTTERS.

NO.	DATE	REVISION
8		
7		
6	11/03/20	Revised Slope Text & Hatch
5	01/04/19	Revised Drawings
4	11/29/18	Revised Notes & Drawings
3	4/14/16	Revised Notes
2	10/12/13	Updated concrete notes
1	21/03/13	Updated concrete type

The City of Lloydminster

Checked by:

Approved by:

Drawn by: L. LEEPER

Scale: N.T.S.

CONCRETE DRAINAGE SWALE (LANDSCAPING)

Date: Feb. 22, 2011

Drawing #: 8-200