

# Engineering Code of Practice 2020

---

Owner Department	Asset Management
------------------	------------------

---

Approval date	8 December 2020
---------------	-----------------

---

Version	7a
---------	----

---

Review date	March 2022
-------------	------------

---

# Document Control

## Revision Schedule

This document is a controlled document and is therefore subject to review and amendment. Amendments will be recorded in this Revision Schedule. Note that minor amendments are not always identified.

Issue	Description	Author	Part Number	Document version/ Date
1	First Draft Published			Sept 2008
2	Second Draft Published			Jan 2009
3	Third Draft Published			April 2010
4	Fourth Draft revised to reflect release of NZS 4404:2010			Oct 2010
5	Final Document prepared for Plan Change Notification			July 2011
6	Review of the 2011 document	Asset Management – Transportation, 3 Waters, Parks and Property Services	Part Three; Schedules C, D, E, F	Jan 2019
7	Amendments to Table C4	Sarath Kuruwita	Part Four – Table C4 – Urban Access (Low Volume) and Urban Access	Sep 2019
7a	Final Document for Plan Change Notification	Sarath Kuruwita		Feb 2020

## Contents

Document Control .....	1
List of Tables .....	3
<b>Part One - Context .....</b>	<b>4</b>
<b>Part Two – Development Principles .....</b>	<b>7</b>
1. Design Process .....	7
2. Concept Plan .....	8
3. Resource Consents .....	9
4. Contributions .....	11
5. Assessment of Environmental Effects (AEE) .....	11
6. Scheme Plans .....	12
7. Water Permits .....	13
8. Network Utility Services .....	14
8.1 Telecommunications.....	14
<b>Part Three – Engineering Requirements .....</b>	<b>15</b>
<b>Section 1: General Requirements and Procedures .....</b>	<b>15</b>
1. Introduction .....	15
1.1 General Requirements and Procedures.....	15
1.2 Developer’s Representatives .....	15
1.3 Suitably Qualified Persons .....	15
1.4 Maintenance of Standards .....	16
1.5 Safety .....	16
1.6 Engineering Services .....	16
1.7 Natural Ecosystems .....	17
1.8 Working in Legal Road Reserve .....	17
1.9 Design performance criteria .....	17
1.10 Commuted Sums .....	18
1.11 Alternative Approaches .....	18
<b>Section 2: Earthworks and Geotechnical Requirements .....</b>	<b>19</b>
2. General Requirements and Objectives .....	19
2.1 Performance Criteria .....	19
2.2 Archaeological and Cultural Sites .....	19

2.3	District Plan Provisions .....	19
<b>Section 3: Transportation</b>		<b>21</b>
3.	General Requirements and Objectives .....	21
3.1	Performance Criteria .....	21
3.2	Construction .....	21
<b>Section 4: Stormwater</b>		<b>22</b>
4.	General Requirements and Objectives .....	22
4.1	Quantity .....	23
4.2	Quality .....	24
4.3	High Risk Sites .....	24
4.4	Monitoring and Compliance .....	25
4.5	Management and Maintenance .....	25
4.6	Reference Documents .....	26
4.7	Construction .....	26
<b>Section 5: Wastewater</b>		<b>27</b>
5.	General Requirements and Objectives .....	27
5.1	Performance Criteria .....	27
5.2	Design Principles .....	27
5.3	Private and Public Sewer .....	28
5.4	Alternative Wastewater Systems .....	28
5.5	Reuse of Treated and Untreated Wastewater .....	30
5.6	Construction .....	30
<b>Section 6: Water Supply</b>		<b>31</b>
6.	General Requirements and Objectives .....	31
6.1	Performance Criteria .....	31
6.2	Design Principles .....	32
<b>Section 7: Landscape</b>		<b>33</b>
7.	General Requirements and Objectives .....	33
<b>Part Four – Minimum Engineering Requirements</b>		<b>34</b>
Schedule A – Hastings District Council Altered Requirements to Section 1 NZS 4404:2010 – General Requirements and Procedures .....		35
Schedule B – Hastings District Council Altered Requirements to Section 2 NZS 4404:2010 – Earthworks and Geotechnical Requirements .....		38
Schedule C – Hastings District Council Altered Requirements to Section 3 NZS 4404:2010 – Roads .....		41
Schedule D – Hastings District Council Altered Requirements to Section 4 NZS 4404:2010 – Stormwater Drainage .....		58
Schedule E – Hastings District Council Altered Requirements to Section 5 NZS 4404:2010 – Wastewater ...		71



Schedule F – Hastings District Council Altered Requirements to Section 6 NZS 4404:2010 – Water Supply	83
References	94
Producer Statements	96
<b>Appendices</b>	<b>97</b>
<b>Appendix A – Standard Construction Drawings</b>	<b>97</b>
Transportation Drawings	97
Water Services Drawings	98
Parks and Property Services	99
<b>Appendix B – HDC Street Lighting Code of Practice</b>	<b>100</b>

## List of Tables

### TABLE OF FIGURES

FIGURE 1 - CYCLE OF ENGINEERING INFORMATION, REQUIREMENTS AND GUIDELINES	5
FIGURE 2 - CMP AREAS	23
FIGURE 3 - NETWORK CORRIDOR FOR DRAINS AND WATERWAYS	62

### TABLE OF TABLES

TABLE B1 - GUIDANCE FOR RISK CLASSIFICATION FOR SITES SUBJECT TO LAND INSTABILITY	39
TABLE C1 - HASTINGS DISTRICT ONRC ROAD HIERARCHY	41
TABLE C2 - CHARACTERISTICS FOR URBAN ROADS (POSTED SPEED LIMITS < 70KM/HR)	42
TABLE C3 - CHARACTERISTICS OF RURAL ROADS (POSTED SPEED LIMITS > 70 KM/HR)	42
TABLE C4 - MINIMUM ROAD DESIGN STANDARDS – URBAN AND RURAL ROADS	44
TABLE C5 - MAXIMUM HEIGHTS OF FENCES	50
TABLE C6 - PREFERRED ROAD MARKING AND DELINEATION STANDARDS	51
TABLE C7 - REQUIRED ROAD CORRIDOR LEVEL OF SERVICE FOR STORMWATER MANAGEMENT	55
TABLE D1 - DESIGN CRITERIA	59
TABLE D2 - DESIGN STORMS	59
TABLE D3 - MINIMUM CLEARANCES	63
TABLE D4 - ESTIMATED PERMEABILITY CLASSES: HERETAUNGA PLAINS SOILS ADJACENT TO HASTINGS URBAN AREA	69
TABLE D5 - PERMEABILITY CLASSES	70

## Part One - Context

This document is a guideline for the engineering of subdivision and land developments within the Hastings District. It sets out what the Hastings District Council (Council) expects from developers (and their agents) so that the requirements of the [RESOURCE MANAGEMENT ACT 1991](#) and the [DISTRICT PLAN](#) are met. This document should also be used in conjunction with the [SUBDIVISION AND INFRASTRUCTURE DEVELOPMENT BEST PRACTICE DESIGN GUIDE \(2011\)](#) which illustrates acceptable innovative design solutions.

The [RESOURCE MANAGEMENT ACT](#) (RMA) is concerned with promoting the sustainable management of natural and physical resources. In the RMA emphasis is placed on the integrated management of the effects of activities on the environment. Environmental management under the RMA is intended to be outcome orientated, and this provides challenges for both developers and Council.

The RMA provides for effects-based Regional and District Plans through which the implementation of established and new or innovative solutions for development can be undertaken. However, the successful adoption of new or innovative designs depends to some degree of certainty in the resource consent process.

Section 11 of the RMA requires local authorities to control subdivision, and to make specific provision for subdivision and land development in the [DISTRICT PLAN](#). To date, this Council's response to Section 11 has been mainly through rules and standards defined in the [DISTRICT PLAN](#) and through a prescriptive Code of Practice (CoP). Although the previous CoP was only one means of compliance, it tended to become the norm because of the certainty it provided in the resource consent process.

Council now wishes to support, where appropriate, greater innovation in the design and consent process and in the provision of engineering services.

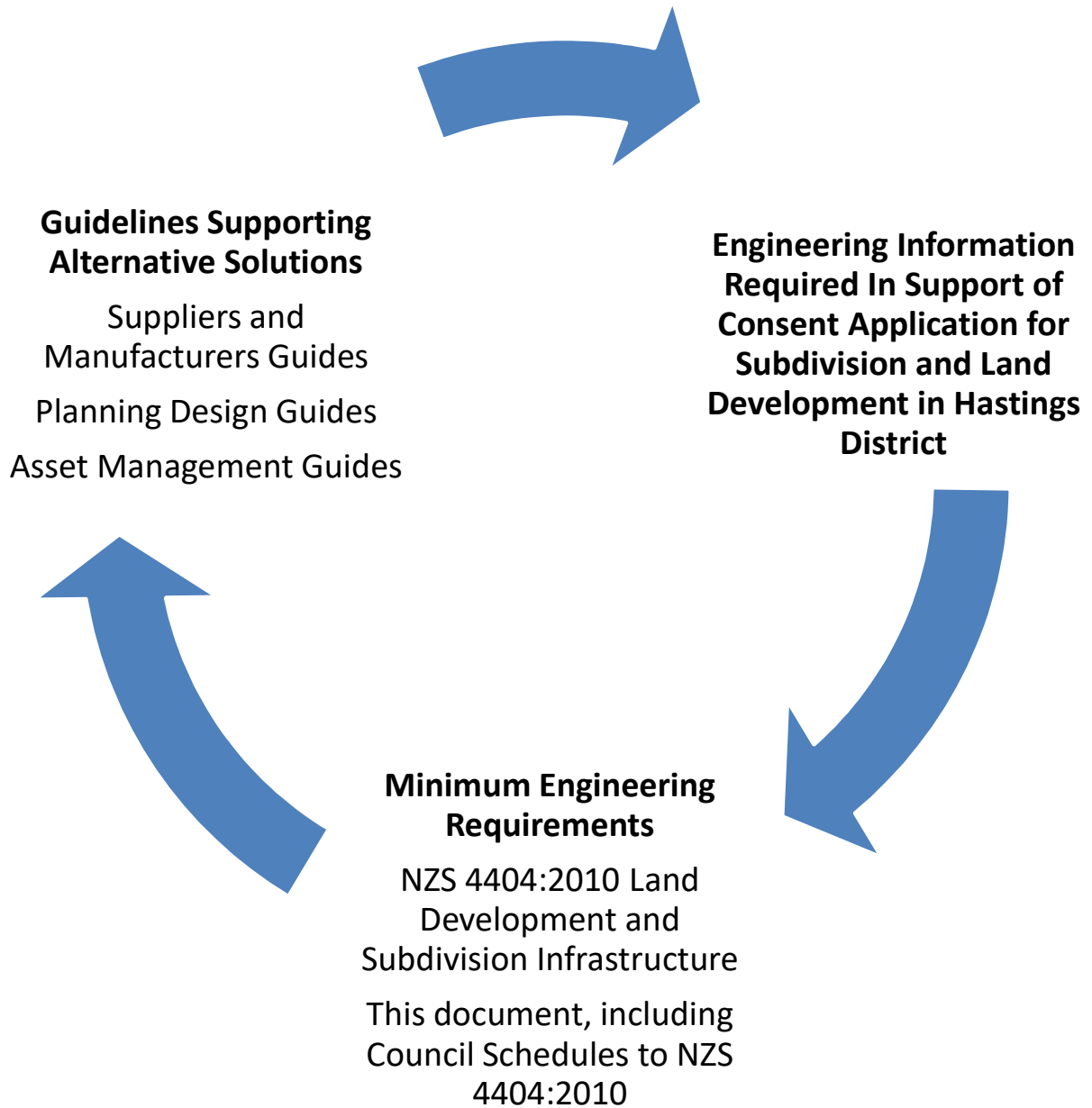
Council's policies are evolving in response to increasing environmental awareness, the desire to promote and implement sustainable solution, and Council and community concerns about service and infrastructure constraints within the District. These concerns include the provision of adequate potable water supplies, treatment and disposal of wastewater, dealing with stormwater issues and design of roads and facilities to support alternative transport options. These are all relevant to development planning and need to be taken into account in development proposals.

Council acknowledges that some developments will continue to be more suited to traditional engineering approaches. These will be best provided for by using the New Zealand Standard [NZS 4404:2010 LAND DEVELOPMENT AND SUBDIVISION INFRASTRUCTURE](#) as the base document for meeting minimum engineering requirements with Schedules that provide specific design information and any other Council requirements that may differ from those in [NZS 4404:2010](#).

Alternative means of compliance are not discouraged in the [DISTRICT PLAN](#). The acceptability or otherwise of alternative means of compliance will make use of best practice design guides such as [SNZ HB 44:2001 SUBDIVISION FOR PEOPLE AND THE ENVIRONMENT](#) and the [SUBDIVISION AND INFRASTRUCTURE DEVELOPMENT BEST PRACTICE DESIGN GUIDE \(2011\)](#).

This approach is based on the use of alternative design guides and minimum engineering requirements, as illustrated in the diagram below:

FIGURE 1 - CYCLE OF ENGINEERING INFORMATION, REQUIREMENTS AND GUIDELINES



The subdivision and land development consent system now in place seeks to provide a degree of certainty for both developers and Council, to be sufficiently flexible to allow innovation, and to provide information about minimum engineering requirements and acceptable solutions. It provides a mechanism for developer's to propose alternative design solutions. Compliance with minimum standards is still available for those situations where alternatives are not desired.

The system also seeks to integrate the consent and approval process across departments within the Council and to align with national directions and legislative changes. Accordingly, the approach to land development and subdivision within the Hastings District has been considered in conjunction with the direction of the [LOCAL GOVERNMENT ACT 2002](#) and the implications of community planning on Council activities and subdivision and land development in the future.

To assist Council to assess applications, a combined interdisciplinary process is used that enables the applicants, developer's representative, and Council engineering, resource management, and parks and recreation representatives, to examine proposals in an interactive and integrated manner. A Design and Review group within Council is responsible for assessing applications and/or early design concepts, recognising that compromises may need to be made in some areas for the benefit of the wider community. This is the essence of sustainable management and the process provides for dialogue between Council staff, applicants and the community to ensure an integrated approach to decision-making is achieved.

Developers should discuss their development concepts with the Council at an early stage. Having a robust subdivision design process is critical in ensuring that consideration is given to the site and wider context and that multiple outcomes are achieved e.g. traffic calmed, high amenity streets (refer [SUBDIVISION AND INFRASTRUCTURE DEVELOPMENT BEST PRACTICE DESIGN GUIDE \(2011\)](#) for detailed requirements).

The following design process should be used when undertaking the design of significant subdivisions:

#### STAGE 1

- Identify and analyse the wider, suburb / neighbourhood context

#### STAGE 2

- Identify and analyse the characteristics, constraints and opportunities of the site

#### STAGE 3

- Design the proposal using the principles outlined in the design guide
- Hold minute recorded pre-application meeting with the Council
- Consult with affected parties
- Refine design proposals
- **Lodge resource consent application**

The use of alternative and/or innovative subdivision design and environmental technologies (compared to more conventional engineering approaches) may mean that industry knowledge about the long term operation, maintenance and success of some designs may be limited or not available. This is apparent on a national basis and is not just a local issue. This may require, at least initially, that Council take a trial and error approach to allowing developers to use these alternative designs, thereby building local experience to a level where some degree of certainty in the selection and application of alternatives can be gained.

It also requires developer's to adequately research alternatives and innovative processes prior to submitting a consent application, and to clearly document this research in their development proposals, including addressing ongoing maintenance and asset management considerations, and "lowest whole of life costing".

Each application will be assessed on its merits against the general requirements and objectives that are documented in the [DISTRICT PLAN](#) and in this document.

In all cases, the specifications and guidelines referred to in this document are the current published version.

# Part Two – Development Principles

## 1. Design Process

Before any subdivision or land development can commence a resource consent will almost always be required. Developers should consult with the Council at an early stage to ascertain any particular requirements or site limitations for the development proposed.

The Team Leader, Environmental Consents/Subdivision will coordinate a *Design and Review Group* comprising cross sectional staff representation which can meet to work through design issues with developers. Experience has shown that there is a great deal of value in having such meetings at a very early stage, particularly prior to the lodgement of any resource consent application and before detailed design has been undertaken.

The trigger for initiating a pre-application meeting would be for subdivisions creating new public space e.g. new roads, reserves, open spaces or is a Council development project which has significant design implications e.g. significant road upgrading, new road or community facilities such as an Aquatic centre where there are opportunities for innovative design and best practice.

**However prior to meeting with the Design and Review Group the following design process should be followed:**

### (i) Context Analysis

Identify and analyse elements that contribute to the wider context of the site e.g. landforms, transport patterns, development patterns, open space, community facilities, waterways, surrounding land uses etc.

### (ii) Site Analysis

Identify and analyse site characteristics, constraints and opportunities to develop a comprehensive understanding of the site. This could include natural features, topography, orientation, aspect, accessibility, natural hazards, soil types, groundwater levels, climatic conditions, existing infrastructure and buildings, previous land use, cultural or historic features.

### (iii) Planning Requirements

Research and understand the planning requirements that apply to the site. This could include the Hawke's Bay Regional Council Regional Fresh Water Plan, Regional Discharge to Land Plan, Regional Soil Plan and Regional Air Quality Management Plan. They should consult with the Regional Council to seek advice on the above plans and to ascertain if resource consents are required from the Regional Council. This is particularly the case where large scale earthworks and/or changes to waterways are involved in a subdivision or land development proposal.

*Applicants should also consider the Hawke's Bay Regional Council Waterway Design Guidelines which outline innovative low impact stormwater design solutions.*

### (iv) Consultation

Discuss the development proposal with parties who may have an interest in the development including:

- Adjoining land owners
- Tangata whenua
- Department of Conservation
- Land Information New Zealand
- New Zealand Historic Places Trust
- Network Utility Operators
- New Zealand Transport Agency
- New Zealand Fire Service
- Local environmental interest groups

## (v) Subdivision Design

Use all of the information collected in the steps above to inform the layout and design of the subdivision or development.

Once the above analysis and initial design has been completed you should make contact with the Team Leader, Environmental Consents/Subdivision who can make the necessary arrangement for the pre application process. A sketch/outline of proposal should be emailed to the Team Leader, Environmental Consents/Subdivision at least 2 days prior to meeting. Minutes will be taken at meeting and they will be circulated with agreement reached on design outcomes.

## 2. Concept Plan

A concept plan will be required where a large area is proposed to be developed, particularly if it is to be staged over a number of years. It may also be advantageous to provide concept plans where alternative designs are proposed. Concept plans will need to look beyond the site to consider any strategic issues within the area.

Where the Council requires a concept plan, sufficient copies of the plan and supporting information shall be provided to the Council for evaluation of the proposal. The plan shall include sufficient details to give a general outline of the nature of the development, either as part of the plan or in the explanatory material accompanying the plan. Information supporting alternative design proposals should be sufficient to enable Council staff to assess the effectiveness of operation and consider the “whole of life cost implications” if the facility is to become public property.

The concept plan should identify and analyse elements that contribute to the wider context of the site and identify and analyse site characteristics, constraints and opportunities to develop a comprehensive understanding of the site.

### Context

**This includes approximate locations of:**

- The existing and planned built environment including local commercial centres, open spaces (parks), schools and other community facilities, medical centres, churches, scale of buildings, housing typology and land use density;
- Movement Networks (arterial roads, local roads, cycleways, pedestrian routes and desire lines) and the opportunity to create highly connected, walkable and cycle friendly communities which relate to the built environment;
- Infrastructure, both existing and planned and any possible capacity issues;
- Existing natural features such as waterways, topography, view shafts or significant trees or native vegetation should be incorporated into the subdivision design;
- Need to consider downstream capacity and sensitive receiving environments.

### Site Analysis

- Topography and landforms, natural features, wetlands, springs and streams;
- Existing native vegetation and significant trees;
- Soils and groundwater;
- Coastal conditions;
- View shafts, site orientation, solar, wind and climatic conditions;
- Existing buildings and structures;
- Heritage and cultural elements;
- Surrounding road network and possible connection points;
- Possible future road connections;
- Reserves, parks, open spaces;
- Existing and proposed cycleway, walkways or bridle paths which link with the site;

- Existing pedestrian desire lines which may exist through the site;
- Drainage, stormwater paths and any downstream capacity constraints;
- Existing and proposed water and sewer infrastructure and any capacity constraints;
- Possible contamination issues;
- Natural Hazards, e.g. flooding, coastal erosion;
- Location of nearby shops, schools, commercial or community facilities;
- Character of the surrounding area, in terms of land use, density and building types;
- Other significant features.

The concept plan should also extend beyond the site to take account adjoining developable land, whether or not owned by the developer, and any effects on existing developed land. Refer to [SUBDIVISION AND INFRASTRUCTURE DEVELOPMENT BEST PRACTICE DESIGN GUIDE \(2011\)](#) for examples of subdivision design.

### 3. Resource Consents

The following guidance is provided in relation to the preparation and submission of Resource Consents. Specialist advice on the requirements for Resource Consents can be obtained from Council.

- (a) Subdivisions and land developments projects usually require resource consents in accordance with the [RMA](#). In some cases resource consents will be needed from both the Hastings District Council and the Hawke's Bay Regional Council. Developers are advised to consult with the Council's Consents staff prior to lodging resource consent applications;
- (b) Section 88 of the RMA and the Hastings [DISTRICT PLAN](#) set out the information that must be included with any application to subdivide. A checklist is available from Council's Consent Planners which states the information required by the [DISTRICT PLAN](#). Important parts of any application are the Assessment of Environmental Effects, reports covering specific aspects of the proposed development and plans of the development; being concept plans, scheme plans for subdivisions and development plans for other developments;
- (c) The application (particularly for subdivisions) should include reports covering; proposed land uses, factors influencing the design of the development, the extent of any earthworks proposed, geotechnical report if required for land stability considerations, foundation design and/or as evidence to support any proposal to dispose of sewage effluent on-site, stormwater disposal proposals, potable and firefighting water supply provisions, road safety audits, current and future effects of traffic, the provision of off-street parking, access for firefighting appliances, landscaping proposals and any other relevant information which may assist the Council in making an informed assessment of the proposals. Where alternative designs are proposed, then the applicant shall provide sufficient evidence to enable Council staff to assess the viability of the proposal, ongoing maintenance requirements and whole of life cost assessments;
- (d) If a subdivision is likely to fall within the provisions of Section 106 of the [RMA](#), then the Council may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions. In cases where Section 106 provisions may apply, applicants should propose suitable conditions for the purpose of avoiding, remedying or mitigating the material damage effects referred to in subsection (1) of Section 106;
- (e) An applicant is required to assess the flood risks associated with any proposed subdivision through direct liaison with the authority responsible for the administration of watercourses in the area. If the Hawke's Bay Regional Council or the Hastings District Council does not have the necessary information, then the applicant will be responsible for providing it. Applications should include proposals for dealing with stormwater from the development, including, where necessary, assessment of the effects of the proposed development on upstream and downstream stormwater flows and levels. The assessment should also include possible effects the proposed development may have on groundwater levels and, where applicable, what measures are proposed to mitigate

any adverse effects arising from possible changes in groundwater levels. Existing stormwater systems shall be able to cope with stormwater runoff from the development without adverse impacts on other properties either upstream or downstream of the development site, within Council's agreed levels of service. Potential increases in stormwater runoff peak flows shall be mitigated within the development by appropriate measures;

- (f) To meet the requirements of Section 106 of the *RMA*, Council needs to consider in any subdivision application the implications of flooding or inundation and any coastal hazards. Building sites within subdivisions are required to be above the flood level of the 1% annual exceedance probability (AEP) storm event plus an approved freeboard. A distinction is made between inundation by ponding and inundation where flood waters are likely to generate scour velocities and consequent erosion. Applicants must either establish that the land is not subject to material damage, or propose measures that will ensure that material damage under "bank full" conditions does not occur or can be remedied;
- (g) A report from a suitably qualified person covering stormwater disposal and inundation issues, including a catchment plan and calculations, should be included with the resource consent application;
- (h) Council will require easements or covenants to be recorded on the title if a planned secondary flow path arising from the 1% AEP event intrudes into an allotment within the development to a point where a dwelling site is normally permitted;
- (i) Once an application is submitted Council will decide whether to notify it or not. Under the Act it is possible to gain consent for discretionary and non-complying activities without public or limited notification and hearings. However, the Council must consider each application and be satisfied that this is only possible if:
- That the effects on the environment will be minor; and
  - Approval of all potentially affected parties has been obtained (unless the Council considers it unreasonable in the circumstances).

*Note: The Resource Management Act allows any application to be notified under special circumstances, even if a relevant plan expressly provides that it need not be notified.*

- (j) If an application is non-notified then Council staff may make the decision to grant or refuse consent under delegated authority. Applicants can object to the Council if consent is refused, or if they are not happy with the conditions. The Council is happy to forward draft conditions to applicants and consider any comments they may have prior to issue of the resource consent. Further information can be obtained from the Council regarding non-notified applications and objections;
- (k) If the Council decides to notify an application, it will first decide if it is to be publicly notified or have limited notification. If it is to be publicly notified, it will be advertised in the Public Notices section of an appropriate local newspaper. A sign is generally erected on the site of the proposed activity and any parties who are considered to be potentially affected are notified in writing. These parties are invited to inspect the application at the Council buildings or the local library, and to make a submission either for or against the proposal. The aim of notification is to ensure that everyone that may be affected by a proposal is given the opportunity to make a submission;
- (l) If notification is to be limited, then only those parties who are considered to be directly affected by the application, such as immediate neighbours, will be served notice and invited to participate in the hearing process;
- (m) Once the closing date for submissions has passed the Council may arrange a prehearing meeting. The applicant and all submitters are invited to discuss the application in an informal way. The aim is to first clarify the concerns and goals of all parties, and to agree on the facts as far as possible.



Secondly, the prehearing meeting can go on to resolve as many differences as possible. If all differences are resolved a hearing may not be necessary. If some concerns remain unresolved, then the application will go to Hearing. A Hearing Committee of at least three elected Councillors, or independent commissioners, will hear the case and make a decision to grant or refuse consent. This decision may be appealed to the Environment Court. Further information is available from the Council;

- (n) Consents may have conditions imposed to ensure that developments are sound in relation to both engineering and environmental aspects, and to protect other landowners and future residents. Council staff will set the conditions using the [DISTRICT PLAN](#) and other planning and engineering documentation, including these requirements, as guidance. Applicants may appeal or object to any conditions set on their consent. Further information regarding appeals can be obtained from the Council;
- (o) Once resource consent has been granted, there is normally a period of five years to submit a land transfer plan for the Council's approval. This plan must be in accordance with the original plan and any conditions of approval. If the land transfer plan satisfies the Council's requirements, approval is granted. The land transfer plan is then lodged with Land Information New Zealand (LINZ);
- (p) A longer period for the survey plan to be submitted may be agreed by the Council at the time consent is granted, and an extension can be granted later by the Council if certain criteria are met;
- (q) A certificate stating that all the conditions of consent have been satisfied must be provided within three years of the Council's approval of the land transfer plan. This certificate and other documents are then lodged with the District Land Registrar to allow the new certificates of title to be issued. Failure to gain this certificate within the time limit may result in the consent approval lapsing;
- (r) The Council imposes fees for the processing of resource consent applications and for the later monitoring of resource consent conditions. Fees are split into two components. An application fee is required for the consent planning processes required for decisions on applications and, where applicable, an application fee is required for the engineering considerations required. Where consent monitoring is involved additional fees may be required. The quantum of these will generally be included in the resource consent conditions. Additional charges and costs are required to be fair and reasonable. Schedules of the fees and charges are available from the Council;
- (s) Resource consent procedure and time frames can be obtained from the Council's Resource Consents Section.

## 4. Contributions

Reserves contributions for subdivision and land development projects may be required in accordance with the requirements of the [DISTRICT PLAN](#).

Development contributions for capital expenditure to accommodate growth in demand for roads, cycling, walking and bridle ways (CWB), water supply and waste water treatment facilities, community infrastructure and flood mitigation activities, can take the form of money or land or both at Council's discretion in accordance with Council's Development Contributions Policy.

## 5. Assessment of Environmental Effects (AEE)

The following guidance is provided in relation to the preparation and submission of AEE reports.

- (i) For all resource consent applications it is necessary to provide an assessment of any actual or potential effects that may result from the activity for which the consent is sought. An Assessment of Environmental Effects needs to be prepared in accordance with the Fourth Schedule to the Resource Management Act. The Council has a series of brochures describing the Assessments of Environmental Effects reports;

- (ii) An Assessment of Environmental Effects may include such issues as increased traffic (vehicular and pedestrian), effects upon vegetation and the landscape, effects arising from stormwater, wastewater and provision of potable water supply, and effects of additional buildings on amenity values. The amount of detail of an assessment of environmental effects should be proportional to the scale of the potential or actual effects of the activity;
- (iii) The Fourth Schedule to the Resource Management Act requires details of who is affected, any consultation undertaken with the parties (including Tangata Whenua), the results of this consultation and the views of those consulted. It is best to consult early on in the preparation of an application. Effective consultation can resolve any misunderstandings and concerns that affected parties may have. This in turn can result in the application being simpler and quicker to process. If adequate consultation is not undertaken by the applicant, this will be done by the Council, at the applicant's cost;
- (iv) If an Assessment of Environmental Effects is not completed or does not have sufficient information for Council staff to make a decision, a request will be made for further information. There is the right to formally object to a request for further information. Advice on this is available from Council.

## 6. Scheme Plans

Scheme plans for subdivision and land development projects shall comply with those requirements of the DISTRICT PLAN that apply to the land being subdivided and be submitted by a Registered Professional Surveyor or Licensed Cadastral Surveyor with the resource consent application.

### **Scheme plans shall provide the following information:**

- (a) The position of all existing public utility services and water courses, water catchments and other significant water features;
- (b) Adequate contour information to illustrate the existence on each allotment of a suitable building platform and to enable the gradients proposed for roads, rights of way and access ways to be assessed. For two or three lot subdivisions spot levels in terms of mean sea level datum (Hastings) may be acceptable where the land is of gentle enough contour to enable road and right of way grades and feasibility to be assessed from such limited information;
- (c) Sufficient topographical information, including a locality plan if necessary, to accurately identify the site. The position of all buildings and significant stands of trees or bush and any other significant feature of historic, cultural, environmental or other interest shall be shown;
- (d) Where a scheme plan forms only part of the future potential development of a larger block of land held in the same ownership and zoned residential, and a concept plan has not previously been provided, the scheme plan shall show the total development including roading, drainage, water supply and the number of allotments, so as to ensure that the initial scheme plan application does not prejudice full and future development. The extended development may be shown to a smaller scale as an insert on the initial application;
- (e) All allotments on the plan shall be numbered, including any land to vest, and shall show metric dimensions for all boundaries as well as the area of each allotment;
- (f) Indicative roading networks and service layouts shall be shown with typical road cross-sections that provide sufficient information to check that adequate gradients and suitable manhole invert levels can be achieved;
- (g) The draft conceptual cycleway, walkway and bridleway indicative network;
- (h) All landscape works proposed, including on road reserves, including the location and species of trees;

- (i) Details shall be given of any proposed reserve and its proposed development. The applicant shall be responsible for nominating the purpose for which each reserve is to vest and such information shall be shown on the plan. Council may or may not approve part or any of the proposals;
- (j) Public roads, private ways, service lanes, access ways and cycleway, walkway and bridleway networks shall be laid out to fit in with the general roading requirements of the locality in which they are situated. They shall generally provide for connectivity and any requirements arising from road safety audits that have been undertaken;
- (k) The width of legal road reserves and carriageways and road geometry and gradients shall be in accordance with the requirement of the Hastings District Council Development Requirements, unless alternative designs are required or approved by Council;
- (l) Plans shall be drawn to commonly accepted metric scales. The Council's preference is for scales of either 1:500 or 1:1000. However scales of 1:100 or 1:200 are acceptable in appropriate situations. Datum shall have reference to mean sea level (Hastings). A north point must be shown on plans;
- (m) Due regard shall be given for any road widening or upgrading proposals which the Council may have and any requirements shall be ascertained by consultation at an early stage with appropriate Council staff;
- (n) In designing any scheme plan, consideration shall be given to the future development of adjoining land and the Council may, as a condition of consent, require the creation of road reserve and/or the formation of roads to or near the boundary of adjoining land;
- (o) In submitting any scheme plan for approval, the applicant shall provide documentary evidence that the general layout is sufficient for reticulation by other utility services authorities and meets New Zealand Fire Service requirements. When a scheme plan has been approved adequate provision shall be made for transformer sites, junction boxes and other special needs of these authorities.

## 7. Water Permits

The applicant shall undertake a thorough evaluation of the effects which the proposed works are likely to have on surface run-off and the consequences thereof, both on the land to be developed and also on adjoining lands, or into water. Water permits shall be obtained from the Hawke's Bay Regional Council for any restricted activity covered by Section 14 of the [RMA](#) and any requirements arising from the Regional Fresh Water Plan and Regional Discharges to Land Plan.

The approval of the Hawke's Bay Regional Council shall be obtained for temporary or emergency overflows from sewage pumping stations in order to comply with the requirements of Section 15 of the [RMA](#) "Discharge of Contaminants into the Environment".

A water permit may be granted on either a temporary or permanent basis. A permanent permit is required if the obstruction, impounding, diversion or discharge of water, whatever the case may be, is to become a permanent part of the development.

Any condition imposed by the Hawke's Bay Regional Council or the Hastings District Council shall be deemed to be a condition of scheme plan approval for the land development and/or subdivision.

Where a water permit requires the Council to assume responsibility for any of the temporary works which will remain in operation subsequent to the sealing of the Land Transfer Plan, the Council will require the applicant to enter into an agreement enabling the Council to recover any costs arising from the operation of such temporary works.

The applicant shall be responsible for the payment of all fees to the Hawke's Bay Regional Council for the licensing of the permits to discharge stormwater. Application for a permanent water permit will be made by the council to the Hawke's Bay Regional Council where necessary, in the name of the Hastings District Council.

## 8. Network Utility Services

### 8.1 Telecommunications

**It will be necessary at the time of subdivision for the applicant to demonstrate the following requirements:**

- The provision of telecommunications infrastructure to the boundary of each lot to the requirements of the telecommunication provider;
- The provision of power infrastructure to the boundary of each lot to the requirements of the power provider;
- Written agreement be obtained from the telecommunication and power providers that there is sufficient capacity in the wider network to supply the subdivision.

# Part Three – Engineering Requirements

## Section 1: General Requirements and Procedures

### 1. Introduction

Council has adopted the New Zealand Standard [NZS 4404:2010 LAND DEVELOPMENT AND SUBDIVISION INFRASTRUCTURE](#) as the base document to specify the minimum engineering requirements. Schedules outlining the Council requirements that are different to, or not covered in this Standard, have been developed and form part of the minimum engineering requirements. These are presented in Part Four of this document.

#### 1.1 General Requirements and Procedures

Developments shall comply with Section 1, General Requirements and Procedures of [NZS 4404:2010](#) whether using the Minimum Engineering Requirements or alternative approaches, except as modified by the schedule titled **SCHEDULE A - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO PART 1 NZS 4404:2010 - GENERAL REQUIREMENTS AND PROCEDURES** in Part Four of this document.

#### 1.2 Developer's Representatives

The owners of any development projects shall appoint a Developer's or Owner's Representative or Representatives who shall be responsible for the investigation, design and obtaining of approvals of the works, contract administration and supervision of the works, and certification upon completion of the works. The Developer's Representative shall be a person with qualifications and/or experience appropriate to the project with suitable liability and indemnity cover commensurate with the scale of the development.

#### 1.3 Suitably Qualified Persons

Where investigations and reports are required by a suitably qualified person, this person or persons will have nationally recognised qualifications and accreditation, such as Chartered Professional Engineer (CPEng), Registered Professional Surveyor or Licensed Cadastral Surveyor. The person or persons will normally be expected to be professionally recognised in the area of competence claimed and to carry professional indemnity insurance to a level suitable for the purpose but in any case not less than \$1,000,000 per project.

Council reserves the right to have any work peer reviewed regardless of any prior approval as to the acceptability of the suitably qualified person. The cost of all peer review work will be borne by the developer.

Without limiting the Council's rights to require the use of suitably qualified persons the following are examples of areas of expertise, together with the expected minimum qualifications where such people may be required:

- Geotechnical engineering (CPEng with recognised discipline competence);
- Traffic and transportation engineering (CPEng with recognised discipline competence);
- Stormwater engineering and flood mitigation (CPEng with recognised discipline competence);
- Wastewater engineering (CPEng with recognised discipline competence);
- Potable water supply engineering (CPEng with recognised discipline competence);
- Non- potable or rural water supply engineering (CPEng with recognised discipline competence);
- Landscape design and practice (Registered Landscape Architect);
- Land surveyor (subdivision plans) (Registered Professional Surveyor, Registered Engineering Surveyor or Licensed Cadastral Surveyor);
- Land legalisation, subdivision lots, roads, reserves etc. (Registered Professional Surveyor and Licensed Cadastral Surveyor).

## 1.4 Maintenance of Standards

Developers have the responsibility, both directly and through their appointed representatives, to ensure that all works carried out directly or by contractors or sub-contractors on their behalf are at all times in accordance with the approved drawings and specifications (including approved variations), and in accordance with sound engineering practice. While Council staff will be available to offer advice and guidance, it remains the developers' representatives' responsibility to supervise all investigation, design and construction and certify that the required standards have been achieved.

## 1.5 Safety

Developers, Developer's Representatives and Contractors must meet the requirements of the [HEALTH AND SAFETY AT WORK ACT 2015](#) and its associated regulations. Developers and/or contractors working on a development site are responsible for the safety of workers onsite, which may include Council employees and anyone else undertaking work on, or inspections of, the development.

Developers and their representatives shall ensure that contractors have in place effective safety management systems. These systems will include having in place suitable plans to carry out the required work in a safe manner, ensuring that the contractors comply with the requirements of relevant legislation covering the works.

Where a contractor working on a developer's behalf is to make connections to Council owned existing services or roads then the Developer, the Developer's Representative and the Contractor shall comply with Council instructions and guidelines at all times. For the purposes of the Health and Safety Manual requirements any work on Council owned assets is deemed to be managed by the Developer's Representative on behalf of the Council.

## 1.6 Engineering Services

Engineering services required for a development shall be provided in accordance with Council requirements, and could include the design and provision of:

### **For urban developments:**

- (a) Earthworks;
- (b) Stormwater drainage, including pipe systems, swales, ponds, lakes, wetlands, attenuation devices, etc.;
- (c) Wastewater collection, treatment and disposal;
- (d) Water supply, including for firefighting purposes;
- (e) Underground power, gas and telecommunication services;
- (f) Street lighting;
- (g) Kerbs and/or channels where appropriate;
- (h) Road formation, pavement construction, sealing, drainage, kerbs and/or channels (where appropriate) and provision of services for private rights-of-way and service lanes;
- (i) Paths and fencing (where appropriate) in public access ways, cycleway, walkways and bridleways;
- (j) Grass areas, planting and other landscaping within road reserve or recreational and drainage reserves to vest.

### **For rural developments:**

- (a) Earthworks;
- (b) Road surface water drainage and culvert installations;
- (c) Wastewater treatment and disposal;
- (d) On site water supply or restricted water supply reticulation if a public system is available, including for firefighting services;

- (e) Electric power and telecommunication services;
- (f) Street lighting, if appropriate;
- (g) Formed, metalled and sealed road pavements, and adjoining features;
- (h) Cycleways, walkways and bridleways where appropriate.

## 1.7 Natural Ecosystems

Developers will ensure that natural ecosystems are able to continue to function and are not unnecessarily degraded or lost as a result of the proposed land development and/or subdivision. Enhancement of existing natural ecosystems should be considered a priority as a form of mitigation.

**As a minimum, developers are required to:**

- Provide information about any natural values (including indigenous fauna) that occur within the development site or that will be affected by the development site (i.e. can be off site as well)
- Submit to the Council a plan detailing how any natural values will be protected and enhanced, and appropriate conditions or methods to achieve this.

**The natural values/ecosystem assessment and plan will:**

- Identify all natural values that will be affected and detail appropriate mitigation
- Manage the impact of proposed roads, buildings, structures, people, domestic animals, introduced vegetation etc. and increased use of the area and adjacent on indigenous vegetation, landforms (e.g. dunes) and fauna etc.

**Investigation and design requirements may include:**

- Protection of areas of indigenous flora and fauna through good design, legal protection, fencing and pest and weed control
- No build areas or planted buffer areas to ensure that 'edge effects' and conflicts in use are not caused by building too close to natural areas (including watercourses)
- Improving Community Understanding: this can help residents and the public to understand the values of a site and determine how these should be protected.

## 1.8 Working in Legal Road Reserve

Any person proposing to carry out construction or maintenance work in a Legal Road Reserve shall apply to Council (or if required New Zealand Transport Agency) for a Works Approval Permit.

**For Legal Road Reserves under the control of Council the excavation work must be:**

- Carried out in accordance with the current codes of practice ([NATIONAL CODE OF PRACTICE FOR UTILITY OPERATORS' ACCESS TO TRANSPORT CORRIDORS](#)) for working on the road;
- Restored to the specified standards, by appropriately qualified and experienced contractors;
- Works Completion Certificate to be issued at the completion of works.

## 1.9 Design performance criteria

The purpose of an engineering design is to provide common terms of reference for defining the physical works (as may be required to meet Council requirements and/or resource consent conditions) and to provide a mechanism to evaluate the works against their performance requirements.

**An engineering design shall:**

- Define the objective for and scope of the works, and incorporate all of the components required for the intended project, including references to appropriate standards and specifications;
- Be legible and understandable and be supported by sufficient drawings, calculations, reports and associated documentation to facilitate competent appraisal and if required peer review;
- Provide sufficient information for construction purposes;

- Provide for
  - Safety;
  - The whole of the catchment;
  - Sudden or catastrophic failure;
  - Future development;
  - Efficiency in operation and maintenance;
  - Optimisation of life cycle costs.
- Be prepared and verified by suitably qualified professionals;
- Demonstrate compliance with resource consent conditions, this document and other regulatory and statutory requirements;
- Be a platform for approvals and certification.

### 1.10 Commuted Sums

In some situations the Council will require a commuted sum to be paid by the developer based on the net present value of the ongoing operation, maintenance and replacement costs for a facility taken over by the Council. This particularly relates to sewer pumping stations, but may also apply to other non-normal situations. If relevant, applicants should discuss this aspect with the Council at an early stage.

### 1.11 Alternative Approaches

The Council is prepared to consider alternative approaches to engineering design and construction provided that the DISTRICT PLAN requirements can still be achieved.

**Approval for the engineering design and construction of works on subdivision and land development projects can be achieved by either:**

- Following a more prescriptive approach based on Minimum Engineering Requirements as outlined in this document, or
- Utilising a less prescriptive approach, which offers opportunity for greater innovation, and which is based on other published design guides and standards.

*The requirements outlined in the following paragraphs of this section apply to both approaches.*

- The Council has adopted the New Zealand Standard NZS 4404:2010 as the base document to meet its minimum engineering requirements. Schedules outlining the Council requirements that are different to, or not covered in the Standard, have been developed and form part of the minimum engineering requirements in Section 4
- Other published design guides including the SUBDIVISION AND INFRASTRUCTURE DEVELOPMENT BEST PRACTICE DESIGN GUIDE (2011), HAWKES BAY REGIONAL COUNCIL WATERWAY DESIGN GUIDELINES 2009 and Standards New Zealand Handbook, SNZ HB 44:2001 SUBDIVISION FOR PEOPLE AND THE ENVIRONMENT, provide guidance on alternative means of carrying out the engineering of subdivision and land development projects. Applicants can also submit to Council alternative designs based on other appropriate published Design Guides and with appropriate supporting detail
- Applicants can choose for their developments whether to use the Minimum Engineering Requirements in the following sections, other published Design Guides or use a combination of the two.



# Section 2: Earthworks and Geotechnical Requirements

## 2. General Requirements and Objectives

Developments shall comply with Section 2, Earthworks and Geotechnical Requirements of [NZS 4404:2010](#), whether using the Minimum Engineering Requirements or the Design Guide approaches, except as modified by the schedule titled **SCHEDULE B - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 2 NZS 4404:2010 - EARTHWORKS AND GEOTECHNICAL REQUIREMENTS** in Part Four of this document.

**Geotechnical appraisal and design may be required:**

- Prior to detailed planning, which usually involves some form of subsurface investigation and consideration of historic behaviour;
- During the review of design concepts;
- During construction to ensure the adequacy of bulk filling and the execution of the earthworks design; and
- Following construction, to provide certification and/or define limitations of the works.

### 2.1 Performance Criteria

**The overall site, including earthworks proposed as part of the development shall:**

- Meet the relevant standards and criteria of the [DISTRICT PLAN](#);
- Be safe and stable and geotechnically sound during and after construction, and for the life of intended structures;
- Not unnecessarily alter the natural land form or interfere with natural features;
- Provide stable locations and foundations for roads, berms and drainage paths, pedestrian and cycleway access, overhead and underground services;
- Provide an accessible and stable building platform within each lot of a subdivision appropriate to the zoning of the land and in accordance with the requirements of the [Building Act 2004](#);
- Control surface and ground water flows and sediment movement both during and after construction;
- Not cause undue nuisance from silt, dust, noise or disposal of vegetation;
- Be able to be reinstated and planted in a manner that is consistent with the zoning and consent conditions.

### 2.2 Archaeological and Cultural Sites

**Should a waahi tapu or other cultural site be unearthed during earthworks the contractor and/or owner shall:**

- (a) Cease operations;
- (b) Inform local iwi;
- (c) Inform the NZ Historic Places Trust (NZHPT) and apply for an appropriate authority if required; and
- (d) Take appropriate action, after discussion with the NZHPT, the Council and iwi to remedy damage and/or restore the site.

Where an archaeological site is present (or uncovered), an authority from the NZ Historic Places Trust is required if the site is to be modified in any way, in accordance with the [HISTORIC PLACES ACT 1993](#).

### 2.3 District Plan Provisions

The Hastings [DISTRICT PLAN](#) contains various provisions for the preservation of vegetation and or landform. Developers shall comply with those provisions and should note that this may have an impact on the extent of

earthworks which may be permitted, and hence on the conditions to be imposed on a subdivision or land development project.

## Section 3: Transportation

### 3. General Requirements and Objectives

Developments shall comply with Section 3, Roads, of NZS 4404:2010, whether using the Minimum Engineering Requirements or the Design Guide approaches, except as modified by the schedule titled **SCHEDULE C - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO PART 3 NZS 4404:2010 - ROADS** in Part Four of this document.

The Council's transportation objective is to plan, provide and maintain an efficient transportation network appropriate to the agreed level of use that will ensure the safe and orderly passage of all road users (including public transport, cyclists and pedestrians) throughout the Hastings District. This will be achieved by:

Planning and implementing a balanced transportation network, including roads, cycleway and footpaths, with adequate opportunity for future growth, that supports the wellbeing and economic development of the District

Ensuring that the roads, cycleway and footpaths that make up the District's transportation network are fit for purpose, compatible with the environment in which they operate, and fully integrated to provide the necessary transport links for the wider community.

#### 3.1 Performance Criteria

**The layout, structure and performance of the transportation network and the associated amenities shall:**

- Meet the relevant standards and criteria in the DISTRICT PLAN;
- Be appropriate for the relevant position in the published ONE NETWORK ROAD CLASSIFICATION (ONRC) road hierarchy;
- Provide safe and sustainable transport systems, compatible with the surrounding environment;
- Provide effective and sustainable linkages and connectivity;
- Be fit for purpose, and generally allow for the least "whole of life" cost in respect to structures, pavements and amenities;
- Provide adequately for stormwater management, landscaping and other utility services;
- Minimise the adverse effects of noise, runoff and contaminants in a manner compatible with the surrounding environment and the character of the neighbourhood;
- Provide all Lots in the land development or subdivision with safe, sustainable and stable road access.

#### 3.2 Construction

Construction of all transportation systems shall be undertaken in accordance with the requirements of Section 3, Roads of NZS 4404:2010, except as modified by the schedule titled **SCHEDULE C - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 3 NZS 4404:2010 - ROADS**, unless otherwise approved by Council.

## Section 4: Stormwater

### 4. General Requirements and Objectives

Developments shall comply with Section 4, Stormwater Drainage, of [NZS 4404:2010](#), except as modified by the schedule titled **SCHEDULE D - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 4 NZS 4404:2010 - STORMWATER DRAINAGE**, in Part Four of this document.

**Any stormwater systems (primary and secondary system) shall:**

- (a) Meet the relevant standards and criteria in the [DISTRICT PLAN](#), Council Bylaw, and Regional Plan;
- (b) Comply with all applicable Consents (both District and Regional Plan Consents and Bylaw Consents) and minimise adverse effects on the environment;
- (c) Convey the flow by gravity, unless this is not practicable;
- (d) Ensure stormwater infrastructure (including manmade and natural systems) are designed to minimise whole of life costs, including maintenance costs;
- (e) Be compatible with the existing drainage network, and not impose any adverse effects on the existing system, and on upstream and downstream properties;
- (f) Ensure secondary flow paths are located in public land in areas where they will not be obstructed by fences or planting;
- (g) Ensure stormwater systems do not conflict with the operation of other utilities;
- (h) Ensure safety of the general public in terms of the management of stormwater;
- (i) Preserve natural watercourses as public open space and ensure these become landscaped features of the urban environment.

Council seeks to promote the utilisation and enhancement of natural systems for stormwater treatment and integration into the environment through subdivision and land development design.

**When assessing proposals, the Council will look to:**

- Encourage the efficient use of water resources within subdivision and land development projects;
- Support the use of alternative or low impact stormwater disposal systems, provided that they succeed in reducing impacts on the receiving environment;
- Ensure any stormwater treatment and disposal/use systems proposed in a subdivision or land development project are able to maintain or enhance the natural and human environment.

To achieve sustainable improvements in stormwater management HDC has developed a Catchment Management Plan for the main urban areas of the Hastings District. Development will need to be undertaken so as to comply with specific performance requirements set out in the catchment plans.

FIGURE 2 - CMP AREAS



In accordance with the regional plan, Council has an obligation to meet stormwater quality requirements set out by HBRC. The [HDC WATER SERVICES BYLAW](#) sets out criteria (Schedule A) defining the flow and quality parameters governing stormwater discharge to the HDC system. Where stormwater flow or quality breach the standard, the discharge is deemed a controlled discharge and an approval to discharge is required. Approved discharges will trigger discharge flow attenuation and treatment requirements. The bylaw is the key means by which HDC ensures that all discharges comply with the Regional and [DISTRICT PLAN](#), and the relevant New Zealand legislation. For any development, within or outside the Hastings urban area, which discharges directly to a regional council controlled water course, depending on the scale and nature of activities, a specific discharge consent may be required from Hawkes Bay Regional Council for the development.

#### 4.1 Quantity

A key characteristic of typical urbanised catchments is the high proportion of impervious surfaces. Impervious surfaces reduce rainwater infiltration to the soil and consequently an increase in the stormwater runoff occurs. A reticulated urban drainage network efficiently conveys runoff to rural drains or streams, with an increase in peak runoff rates.

Schedule A of HDC's Water Services bylaw defines a maximum permitted stormwater discharge flow. Any stormwater discharge to the HDC stormwater network exceeding this flow rate may require attenuation of flows to reduce the impact on the receiving network or downstream water course. In some cases an Approval to discharge may be required where attenuation is not possible or practical.

**In conjunction with design guidelines outlined within [NZS 4404:2010](#), stormwater designs need to consider the following aspects:**

- The current land use and any proposed changes in land use of the catchment/s affected;
- Engineering aspects such as stormwater inlet sizes, pipe and network capacity, downstream conveyance constraints, ponding areas and overland flow paths;
- Areas of concentrated population or assets, or localities at high risk of being prone to flooding. Any such areas will be subject to rules within the District Plan;
- Management of stormwater quantity at a community level as well as for individual sites, such as detention ponds;
- Be compatible with existing groundwater conditions, and control groundwater flows when necessary and in an appropriate manner;
- In areas subject to flooding, ensure any planting does not obstruct stormwater flows;

- On site disposal - Refer to [HAWKE'S BAY REGIONAL COUNCIL WATERWAY DESIGN GUIDELINES 2009](#) for design options & solution.
- Maintain water flows to support healthy aquatic life by maximising infiltration;
- Give priority to solutions that incorporate water quality and habitat values. This should be done by ensuring a practical balance is achieved between both flooding and ecological considerations.

## 4.2 Quality

The passage of stormwater runoff over impervious surfaces to watercourse to discharge (or other environments) provides an effective pathway for contaminants to be entrained and discharged

Schedule A of HDC's Water Services bylaw defines the quality requirements for any stormwater discharge to the HDC stormwater network. Discharges which do not meet these requirements are considered as Controlled Stormwater and will require an approval. The approved will include a requirement for treatment to mitigate the risk and level of any contaminant discharge.

**Developers should also consider the following:**

- Source control of contaminants and general site housekeeping;
- Current and future land use and potential for high contaminant discharge areas;
- Treatment options at a community level as well as for individual sites;
- The proposed receiving environment and its sensitivity to stormwater discharges.

Stormwater quality issues shall be considered at all stages of a development, both during construction (short term issues) and as a result of the proposed land use (long term issues). Council prefers treatment at source. If a proposal includes design of stormwater treatment systems that are to be vested in Council, the option(s) delivering least whole of life cost to Council and the community will be used.

Water quality ponds (wet ponds), wetlands, or other effective treatment facilities shall be constructed when required to address either short term or long term sources of contamination.

Pre-treatment devices may be constructed to prevent contaminants and debris entering into the receiving environment.

The design and construction of any treatment facilities shall be undertaken in such a way that future maintenance can be carried out easily.

When considering these issues, designers are referred to the [HAWKE'S BAY REGIONAL COUNCIL WATER DESIGN GUIDELINES 2009](#), which outlines low impact stormwater design solutions.

The Developer is responsible for complying with all statutes, standards, regulations, bylaws, requirements and obligations. The Developer is also responsible for giving all notices, obtaining all necessary consents approvals and providing for the protection of other property from damage resulting from the development works.

## 4.3 High Risk Sites

Based on the land use or industry type present sites within the Hastings Urban area have been assessed with respect to the risk (actual or potential) of discharging contaminants likely to breach quality limits imposed in the discharge consents issued to HDC. Both existing and new developments which have been assessed as High Risk will be required to complete site assessments and implement effective stormwater management in order that stormwater can be discharged to the HDC network.

Stormwater discharges from premises where activities are carried out that may result in that stormwater containing Hazardous Substances or contaminants is Controlled Stormwater requiring an Approval ([SCHEDULE A-WATER SERVICES BYLAW](#)).

Truck stops, fuel storage and service station facilities are identified as being high risk sites in HDC's catchment management plans. In assessing any application to discharge Controlled Stormwater from these sites into the HDC network, the level of compliance with the [ENVIRONMENTAL GUIDELINES FOR WATER DISCHARGES FROM PETROLEUM](#)

INDUSTRY SITES IN NEW ZEALAND (1998), and any subsequent revisions, will be taken into account and full compliance with the Guideline will usually be sufficient.

Developers are required to assess the risk level for their site and include provision for effective stormwater management as part of the stormwater design for the site.

#### 4.4 Monitoring and Compliance

The HDC WATER SERVICES BYLAW - Schedule A defines the characteristics of stormwater (volume, flow rate and quality) the discharge of which is defined as a controlled activity. Controlled stormwater discharges require an approval from Council and will be subject to site specific conditions requiring engineered design to effectively manage discharge quantity and quality.

**Approval conditions will require:**

- A site specific Stormwater Management Plan;
- Assessment of high risk areas within the property;
- A spill management and containment plan;
- Management and maintenance requirement for the site system;
- Sampling and testing of the controlled Stormwater discharge.

#### 4.5 Management and Maintenance

Developers are required to ensure that any new stormwater networks are designed to provide for cost effective management and ease of maintenance in respect of the stormwater system.

**The new stormwater system should:**

- Be designed and constructed to facilitate accessible ongoing maintenance, minimise risk of debris or gravel blockage, outlet scour or land instability, and provide efficient and safe inlet and discharge;
- Not cause undue restrictions on the location of any future building or development;
- Not cause any undue risk to public health and safety.

**The key areas of importance for providing efficient stormwater collection and disposal systems are:**

- Identification of catchments, or sub-catchments that require additional maintenance and/or treatment installations;
- Management of identified high risk and consented sites;
- Management of the stormwater network in terms of capacity;
- Management and maintenance of the flood protection systems (flood gates, pump stations, open channels and ponding areas);
- Development of a renewal strategy for the stormwater network incorporating low impact design solutions, where practicable.

The extent of any stream or open watercourse improvement work shall be agreed with both the Regional and District Council.

**Factors that should be considered in the design process are:**

- The retention of natural topography and vegetation;
- Land stability;
- Hydraulics;
- On-going maintenance requirements.

Where open watercourses are retained through a new development, channel upgrading/enhancement and/or land-raising may be required.

Natural watercourses shall remain as public open space wherever possible, and become landscaped features of the urban environment. Bank protection and/or channel lining may be necessary to protect the adjoining

environment (natural and developed) from the increased stormwater flows generated by a development. Protection works shall utilise methods that are sensitive to the surrounding environment.

All overland flow paths shall be identified and protected from conflicting uses and restrictions or obstruction.

The discharge of stormwater into ephemeral watercourses must not cause adverse effects to downstream owners, or increase the potential for erosion or land instability.

Health and Safety should be factored into all system design. This is to ensure safety to the public during construction and the life of the stormwater asset. This includes allowing for fencing and signage to prevent the public from entering or interfering with hazardous sites.

## 4.6 Reference Documents

The Hawkes Bay Regional Council's Waterway Guidelines have been adopted by Hastings District Council as a means of compliance for stormwater design.

ON-SITE STORMWATER MANAGEMENT GUIDELINE (NZWERF/ Ministry for the Environment, 2004) is a further document that provides information regarding appropriate on-site stormwater management devices. This can be found on the Water New Zealand website – [WWW.WATERNZ.ORG.NZ](http://WWW.WATERNZ.ORG.NZ)

- HDC SUBDIVISION AND INFRASTRUCTURE DEVELOPMENT BEST PRACTICE DESIGN GUIDE (2011)
- HDC CATCHMENT MANAGEMENT PLANS
- AUSTRALIAN AND NEW ZEALAND GUIDELINES FOR FRESH AND MARINE WATER QUALITY

## 4.7 Construction

Construction of stormwater systems shall be undertaken in accordance with the requirements of Section 4, Stormwater Drainage of NZS 4404:2010, except as modified by the schedule titled **SCHEDULE D - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 4 NZS 4404:2010 - STORMWATER DRAINAGE**, unless otherwise approved by the Council.



## Section 5: Wastewater

### 5. General Requirements and Objectives

All developments shall comply with Land Development and Subdivision Infrastructure, [NZE 4404:2010](#), Section 5-Engineering Requirements-Wastewater, whether using the Minimum Engineering Requirements or the Design Guide approaches, except as modified by the schedule titled **SCHEDULE E - HASTINGS DISTRICT COUNCIL (HDC) ALTERED REQUIREMENTS TO SECTION 5 NZS 4404:2010 - WASTEWATER** in Part Four of this document.

#### 5.1 Performance Criteria

For all subdivision and land development projects, the design of a wastewater collection and disposal system shall:

- Meet the relevant standards and criteria of the District Plan and the Hawke’s Bay Regional Council (HBRC) Regional Plans;
- Provide for the collection of wastewater, allowing for ultimate future development within the catchment and/or adjoining catchments;
- Minimise public health and safety related risks;
- Minimise environmental risks;
- Be compatible with the existing wastewater system where this is available;
- Prevent stormwater ingress (inflow and infiltration) into the system and sewage egress out of the system;
- Where the HDC wastewater system is available, provide an individual connection for each lot.

In order to protect the wastewater network, treatment plant performance and ensure no adverse environmental effects, HDC has set out ([SCHEDULE B – CONTROLLED WASTEWATER OF COUNCIL'S CONSOLIDATED BYLAWS OCTOBER 2016 – BYLAWS CHAPTER 7 WATER SERVICES](#)) characteristics of controlled wastewater discharges that require an approval to discharge. Approved discharges may trigger pre-treatment requirements and specific flow sampling and testing requirements in order to determine trade waste charges.

#### 5.2 Design Principles

**The design of a wastewater collection and disposal system shall include consideration of the following:**

- Pipe sizes shall be based on the design flow without surcharging. Mains that are to pass into HDC ownership shall be a minimum of 150 mm diameter, except where a common private drain services more than one dwelling on a Lot;
- The design flows shall be calculated using the flow parameters detailed in **SCHEDULE E**
- The proposed wastewater system shall be compatible with the existing network and comply with current requirements as identified by HDC;
- If future demand on the system requires use of HDC’s wastewater reticulation model to ascertain effects, then this will be at the cost of the applicant;
- The system design shall identify and incorporate downstream improvements required as a result of the proposed works;
- Where a proposed development cannot be adequately serviced by a gravity system, a public wastewater pumping station may be proposed for consideration by HDC, provided it is located and designed to service the entire area of potential catchment beyond the reach of the gravity system;
- Pressure sewer systems may be considered in circumstances where conventional wastewater design is not feasible;
- On-site wastewater disposal systems shall be designed in accordance with HBRC design guidelines. Onsite wastewater systems must be approved and consented by the HBRC;
- [COUNCIL'S CONSOLIDATED BYLAWS OCTOBER 2016 – BYLAWS CHAPTER 7 WATER SERVICES](#), specifically Schedule B (Controlled Wastewater) should be referenced and taken into account for any new

connections to existing wastewater networks. New wastewater connections must be applied for in accordance with HDC waster services new connections procedures;

- All new Lots/Titles in existing developed areas shall be individually serviced unless otherwise approved in advance by HDC.

### 5.3 Private and Public Sewer

#### Private Sewer

- Means a section of sewer between any premises and the point of discharge to HDC’s sewer system. Refer to Drawing WS 301A for point of discharge details. A private sewer is owned and maintained by the property owner, not HDC.
- A private sewer is a sewer which serves one dwelling, regardless of whether it traverses adjacent lots.
- The minimum size of private sewer pipes shall be 100mm in diameter.

#### Common Private Sewer

- May service a maximum of two single dwellings and have one point of discharge only.
- Serve a maximum of four single dwelling units provided the discharge unit entitlement of each dwelling has been defined and registered against the titles of the properties and have one point of discharge only.
- Serve any number of single dwelling units located on the property of a company from which they obtain services.
- Serve any number of single dwelling units located on a property served by a body corporate providing drainage services in which they hold a common interest.
- Means a sewer with appropriate easements, served by a Body Corporate or Company serving more than two dwellings will be considered common private sewer.
- Refer to Drawing WS 301B.

#### Public Sewer

- A sewer or pipeline which serves more than one lot, except where a common private sewer situation applies and includes the sewer lateral within the road reserve between the lot served by it and the pipeline to which it connects.
- Any sewer over which HDC has exercised control for a period of not less than 20 years.
- Any sewer provided for the general interest of the district as opposed to the particular or personal benefit of one or two individuals or households.
- Any sewer so declared under Section 462 of the [LOCAL GOVERNMENT ACT 2002](#).
- Refer to Drawing WS 301B.

#### Point of Discharge

The Point of Discharge is defined as the boundary between the public sewer system and a Private sewer (marking the boundary of responsibility between the occupier and HDC, irrespective of property boundaries). Refer to Drawing WS 301A.

A Trade Waste Consent may further designate the Point of Discharge for the purposes of monitoring, sampling and testing. Refer to Drawing WS 204A for typical Trade waste layout and sampling chambers. Refer to Drawing WS 301b for typical layout for discharge points from private properties.

### 5.4 Alternative Wastewater Systems

HDC may consider alternative wastewater servicing solutions. Early consultation with HDC is required as the acceptance of any alternative solution is at the discretion of HDC.

HDC will require documentation providing evidence that an alternative wastewater system’s performance, maintenance and running costs are at least equal to or superior to a more traditional wastewater solution.

The following principles are applicable when considering alternative wastewater systems.

#### 5.4.1 Pressure Sewer Systems

##### General

The use of pressure sewer systems shall be subject to the discretion of HDC and will require specific approval.

**HDC will consider the connection of pressure sewer systems to HDC reticulated network where;**

- The cumulative effects of onsite sewage disposal on public health and/or the environment are deemed by HDC to be significant;
- Risk issues such as infiltration through the use of conventional gravity sewerage is high.

For HDC to consider approval of pressured systems, the designer will be required to demonstrate the need for the system in terms of at least one of the following criteria:

- Topographical constraints: Steep catchment that makes the installation of conventional gravity sewer systems very difficult;
- Presence of watercourse or open stormwater channels within the development area that make the use of onsite disposal impractical;
- Difficult ground conditions such as high groundwater table, widespread hard rock within 1.0m of the natural ground surface;
- Density of development not likely to change by greater than 20%.

##### Design

The design of the pressure sewer system must be carried out by a suitably qualified expert with proven experience.

**The design must:**

- Be in accordance with HDC adopted Water Services Association of Australia's [WSA-07-2007 PRESSURE SEWERAGE CODE OF AUSTRALIA](#) as the engineering code of practice for pressurised systems;
- Include provisions for 1 day's storage (24hrs);
- Show that there is sufficient capacity in HDC's network to accept peak flows from the pressurised system;
- Include a septicity assessment to prove that there is no risk to the receiving HDC network or demonstrate how any risk will be mitigated;
- Include provision for a boundary kit for isolating the household system close to the point of connection to the receiving system.

##### Level of Responsibility for Pressure Sewer Systems

- HDC will be responsible for the system downstream of the boundary kit.
- Responsibility for installation and maintenance of the system upstream of this point is the responsibility of the property owner(s).
- The systems used should be selected on the basis that they meet and exceed HDC performance and quality standards.
- The property owner is responsible for the cost of operation and maintenance of the pumping unit.
- The developer/private owners are responsible for any fines or consequential damages due to a failure to adequately maintain the system.

##### Pressure Sewer Systems with a pre-treatment stage

- The installation shall be the responsibility of the developer.
- This includes full responsibility for maintaining and operating the pre-treatment stage and pumping unit.

- The property owner is responsible for the operation and maintenance costs of the pumping unit.

#### 5.4.2 Community Wastewater Collection and Disposal Systems

Community Wastewater Collection and Disposal Systems will require resource consents from the HBRC. Reference should be made to the [HAWKE'S BAY REGIONAL RESOURCE MANAGEMENT PLAN \(RRMP\)](#) for further details regarding the rules and consent requirements. Consents will be subject to conditions that will be the responsibility of both the Developer and the future residing community to meet.

### 5.5 Reuse of Treated and Untreated Wastewater

- Any wastewater system proposing the re-use of treated wastewater will require consents HDC and the HBRC.
- Acceptance of the alternative solution will be at the discretion of HDC.
- Any alternative solution should be discussed with HDC at an early stage.

### 5.6 Construction

Construction of wastewater systems shall be undertaken in accordance with the requirements of Section 5, Wastewater of [NZS 4404:2010](#), except as modified by the schedule titled **SCHEDULE E - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 5 NZS 4404:2010 - WASTEWATER.**

Alternative specific proposals may be submitted with appropriate engineering information that will enable the Council to assess the proposal.

## Section 6: Water Supply

### 6. General Requirements and Objectives

Developments shall comply with Section 6, Water Supply, NZS 4404:2010, whether using the Minimum Engineering Requirements or the Design Guide approaches, except as modified by the schedule titled **SCHEDULE F - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 6 NZS 4404:2010 - WATER SUPPLY** in Part Four of this document.

#### 6.1 Performance Criteria

The water supply system design shall at all times consider water safety and quality.

##### The design shall:

- Meet the HDC Water services objectives:
  - Safe Drinking Water;
  - Enough Water;
  - Appropriate Pressure;
  - Fire Fighting Capability;
  - Supports Growth;
  - Resilient supply;
  - Conservation and Demand Management.
- Embody the six FUNDAMENTAL PRINCIPLES OF DRINKING WATER SAFETY (REFER TO HDC'S DRINKING WATER STRATEGY), developed by the Havelock North Board of Enquiry;
- Consider water quality at source as the primary objective;
- Consider water quality in the basis of design for all system components;
- Meet the relevant standards and criteria established in the District and Regional Plan and this document;
- Be compatible with the existing and future water supply system;
- Where connection to an existing reticulation supply is possible, provide a connection for each new Lot;
- Provide for an adequate water supply that will meet firefighting, domestic needs, commercial and industrial requirements, and allowing for the future development within the catchment or adjoining catchments;
- At all times prevent contamination of the water supply system for all users and minimise public health and safety related risks.

##### Water Quality

Council's preference is for connection to Council owned and operated water supply networks. However, other options may be considered where this is not practicable.

Where a development includes a new and separate water source e.g. bore, spring, etc., and / or surface storage, water safety is the primary objective of water source selection.

##### To support this objective the designer must demonstrate:

- That all requirements of the operative RESOURCE MANAGEMENT ACT and the DRINKING-WATER STANDARDS FOR NEW ZEALAND 2005 (REVISED 2018) (DWSNZ), can be met;
- Shall make provision for the sampling requirements of the DRINKING-WATER STANDARDS FOR NEW ZEALAND 2005 (REVISED 2018) (DWSNZ);
- That the water supply is registered and approved by the Ministry of Health;
- Has an approved Water Safety Plan which is also to Council's satisfaction;
- The design considers "least whole of life costs" and environmental sustainability;
- Consider water quality in the basis of design for all system components;

- Embodies the six FUNDAMENTAL PRINCIPLES OF DRINKING WATER SAFETY, developed by the Havelock North Board of Enquiry.

## 6.2 Design Principles

The design of a new water supply system shall:

- Confirm pipe sizes, pump, valve and hydrant sizes and positions, and overall reticulation layouts based on the need to deliver the design flows required to meet anticipated fire-fighting level of service and water supply consumptive demands;
- Where appropriate, identify and incorporate improvements to the existing network as a result of the proposed works;
- The designer shall demonstrate resilience in the design and document Safety in Design considerations;
- Early in the development process, confirm with Council whether the proposed works require the inclusion of booster pumping stations and/or storage in order to comply with Council's requirements;
- Where on-site water supply systems are required, these shall be specifically designed with water quality and public safety as the primary objective.

## Section 7: Landscape

### 7. General Requirements and Objectives

Developments shall comply with Section 7, Landscape, of [NZS 4404:2010](#), whether using the Minimum Engineering Requirements or the Design Guide approaches.

Developers are encouraged to undertake landscaping within their developments that will provide an interesting and varied living environment which is attractive to residents and visitors.

**As a minimum, developers are required to:**

- Meet the relevant standards and criteria of the District Plan with regard to landscaping and amenity value;
- Submit to the Council for approval with the proposal a comprehensive landscape plan where new roads are created or existing roads extended, and, where required, for reserves and other community features. The plan shall consider existing amenity value and ambiance of and any special character of the adjacent street and landscape;
- Consideration of drawings C 4, C 5, LD 1 and LD 2 shall be made when producing the landscape plans where appropriate;
- Complete the landscaping work in accordance with the approved landscape design and provide temporary screening as protection during building construction;
- Other landscaping and plantings may be required for specific locations e.g. riparian planting in drainage situations, coastal areas and adjacent to open space.

When preparing the landscape plan, the designer shall consider how the Hawke's Bay climate will affect the proposal, and seek within the design to mitigate the risk of hot dry summers and cold winters where appropriate.

# Part Four – Minimum Engineering Requirements

**The Minimum Engineering Requirements are made up of:**

- The following Schedules A to F containing Council’s amendments and additions to [NZS 4404:2010 LAND DEVELOPMENT AND SUBDIVISION INFRASTRUCTURE](#)
- Other Standards and Guidelines as listed in [NZS 4404:2010](#)
- Other Standards as listed in this Section
- Council’s Engineering Specifications where applicable.



## Schedule A – Hastings District Council Altered Requirements to Section 1 NZS 4404:2010 – General Requirements and Procedures

The Hastings District Council has adopted Part 1 of NZS 4404:2010 with the following additions and/or alterations to be used in conjunction with NZS 4404:2010:

### Clause 1.8.1 Documents to be submitted for design approval

- The Council requires the documents listed in paragraphs 1.8.1.1 (a) to (c) inclusive to be submitted.
- Two copies of preliminary drawings, specifications and calculations shall be supplied to the Council. One set will be returned to the applicant when these have been checked by Council staff with any required amendments endorsed on the plans and specifications. These check prints shall be preserved intact and returned to the Council when the required amendments have been completed, along with two copies of the amended set of plans and specifications. Drawings may be provided in electronic format.
- The Council requires the documents listed in paragraph 1.5.1.1 (d) to use the attached Producer statements PS1 and PS2.

### Clause 1.8.3.3 Lifestyle Costing

- Where a developer proposes to use “alternative” solutions evidence that the proposed solution provides the least whole of life cost option for Council owned assets shall be provided with the design documentation. The discount rate shall be 10%, over a 100 year life cycle

### Clause 1.8.4 Approval of Design

Add to the existing paragraph 1.8.4.1:

- In order to expedite the commencement of works, design approval in principle may be applied for prior to the granting of the resource consent. However design approval will not be given until after a resource consent is granted.

### Clause 1.8.6 Supervision of Work

The Council requires completion certificate using the attached Producer Statements PS3 and PS4.

### Clause 1.8.9 Maintenance

Replace the existing clause with the following.

- The developer shall maintain the works until they are formally taken over by the Council. Formal takeover is the date when the Council issues the Section 224(c) certificates, or such other earlier date as may be agreed by the Council. For uncompleted works covered by a bond the developer shall maintain the works until a date specified in the bond or, if earlier than such date, the works are completed to the satisfaction of the Council.
- Unless stated otherwise in the engineering approval, a defects liability period of six months from formal takeover by the Council shall apply. However the developer shall not be responsible for damage caused by other activities, such as building construction on completed sections, or for fair wear and tear caused by public use.

### Clause 1.9.1 Uncompleted works bonds

The amount of any bond under paragraph 1.9.1.3 is 150% of the estimated and agreed value of the uncompleted work.

### Schedules 1A to 1C – Certificates

The Certificates covering design and construction in NZS 4404:2010 shall be used for all subdivision or land development works. In cases where design or construction certification is required for all or parts of works requiring a **Building Consent**, the ACENZ Certificates presented in Appendix A of this document shall be used as appropriate.

### *Schedule 1D – As-Built plans*

Council will require that as built drawings are submitted with the information required for Compliance. These will need to be submitted by a suitably qualified person.

- “As built” drawings of all engineering works will be drawn as required in clause 1.8.2 and meet the requirements as set out in clause 1.8.10 and schedule 1D of [NZS 4404:2010](#).
- Each drawing will be clearly stamped as ‘as built’ and signed by the appropriately qualified person so certifying the same. Council will retain a copy of all “as built” drawings. If Computer Aided Drawing (“AutoCAD”) has been used, A1 paper “as built” copies and computer file copy will be supplied in all cases. The computer file must be compatible with council’s systems. Developers should confirm with council the software compatibility before supplying the computer file copy.
- Survey control and locations for “As-Built” will be based on co-ordinated data (x, y and z) from permanent control points, in accordance with LINZ datum. All locations will be dimensioned and shown on the plans.

#### **The tolerances shall be:**

- Horizontal  $\pm$  10mm
- Vertical  $\pm$  10mm

#### **It will be necessary to refer to the following Council documents for further details:**

- [HASTINGS DISTRICT COUNCIL WATER SERVICES POLICIES AND PROCEDURES MANUAL](#)
- [HASTINGS DISTRICT COUNCIL TRANSPORTATION POLICIES AND PROCEDURES MANUAL](#)

### **Additional Requirements**

#### **Emergency Works**

If during the course of the development, any situation arises associated with the development whereby, in the opinion of the Council, public safety, the security of public or private property, or the operation of any public facility or ecological site is endangered, the developer shall immediately carry out such remedial measures as the Council requires removing the danger. Any work so required shall be at the expense of the developer.

If such emergency works are not immediately carried out, the Council will be entitled to arrange for the necessary remedial work to be carried out and charge the developer the cost for carrying out the works.

#### **Damage to Existing Roads, Services and Property**

All damage to existing roads, services or private property, or any disturbance of survey boundary marks due to or caused by any new works, shall be the liability of the developer. All damage must be repaired by the developer immediately. If such remedial works are not commenced expeditiously, the Council will be entitled to arrange for the necessary work to be carried out and charged to the developer. This provision includes the removal of mud and debris from existing roads in the vicinity of the development. A daily removal of such debris may be necessary in the interests of traffic safety.

In any situation where the Council considers that damage to existing roads, services or private property constitutes a risk or potential risk to the safety, of road users, pedestrians or other persons, the developer shall immediately repair the damage or otherwise abate the hazard or potential hazard.

#### **Safety**

Temporary fencing and warning signs shall be erected in accordance with the Contractors Health and Safety Plan to protect site personnel and the general public, particularly children, from all hazards associated with the development. All fences and warning signs shall comply with Occupational, Health and Safety requirements.

#### **Final Valuations for the Council’s Asset Register**

An itemised schedule of quantities and costs shall be provided for those services and assets which are to vest in the Council.

Where the work has been built by an “arm’s length” contractor the work Schedule of Prices, modified to represent the work as built and complete with the market unit rates, will be considered a current market valuation.

Where the work has not been undertaken by an arm’s length contractor (i.e. by own staff) the valuation shall be provided by a suitably qualified person in the form of a Schedule of Works as built, priced at current commercial market rates as assessed by the suitably qualified person.

**The Schedule shall take the following form:**

Item Description	Unit	Quantity	Rate \$ / Unit	Amount \$

**Easements**

Easements are required over any rights of way and communal services where these pass through private lots in subdivisions. The Council may also require other easements. Easements shall be shown on the land transfer title plan and documentation shall be prepared by solicitors at the Developer’s expense. Draft easement documentation will require Council approval.

## Schedule B – Hastings District Council Altered Requirements to Section 2 NZS 4404:2010 – Earthworks and Geotechnical Requirements

The Hastings District Council has adopted Part 2 of NZS 4404:2010 with the following additions and/or alterations to be used in conjunction with NZS 4404:2010.

### Standards and Codes

Any development that involves significant earthworks may, on the advice of the geotechnical engineer require reference be made to the following recommended publications:

- NZS 4431:1989 CODE OF PRACTICE FOR EARTH FILL FOR RESIDENTIAL DEVELOPMENT
- NZS 3604:2011 TIMBER-FRAMED BUILDINGS (PARTS 3 – SITE REQUIREMENTS AND 4 - DURABILITY IN PARTICULAR)
- NZS 4229:2013 CONCRETE MASONRY BUILDINGS NOT REQUIRING SPECIFIC ENGINEERING DESIGN (PARTS 3 – SITE REQUIREMENTS AND 4 – BRACING DEMAND IN PARTICULAR)
- NZS 4402:1986 METHODS OF TESTING SOILS FOR CIVIL ENGINEERING PURPOSES – SOIL TESTS, PARTS 1 – PRELIMINARY AND GENERAL & 2 – SOIL CLASSIFICATION TESTS
- TRANSIT NEW ZEALAND TNZ F/1 (1997): SPECIFICATION FOR EARTHWORKS CONSTRUCTION
- THE NEW ZEALAND BUILDING CODE, IN PARTICULAR SECTION B1 AND SECTION E1.

### Clause 2.1 Scope

In addition to the scope described in this section, Council would expect that a geotechnical assessment would be required in support of a Land Development or Subdivision proposal when a particular project involves any or all of the following:

#### Earthworks – General Refer Section 13.4.8 of District Plan

- Total earthworks volume (cut plus fill) >100m<sup>3</sup>, in-situ measure.
- Rural 2,000m<sup>3</sup> per hectare of property per annum.
- Plains 100m<sup>3</sup> per hectare of property per annum.
- Urban 25m<sup>3</sup> per property per annum.
- Earthworks within designated hazard zones.
- Earthworks that significantly alter surface or subsurface drainage patterns.

#### Excavation

- Excavations greater than 2.5 metres overall vertical extent.
- Excavations steeper than 2.5 Horizontal to 1 Vertical (22°).
- Excavations on, or within ten metres of, existing slopes higher than 5 metres overall vertical extent.
- Excavations below the ground water table.
- Excavations the top of which are within 10 metres of buildings or surcharge loads.

#### Fill

- Building platforms or roads on fill or made ground
- Fills on existing ground sloping steeper than 3.5H:1V (16°)
- Fills constructed on, or within a zone extending above an angle of 3 Horizontal to 1 Vertical (18°) from, the toe of a slope or river bank
- Fills within 10 metres of a building or the base of a slope
- Fills with a maximum depth greater than 1.5 metres
- Fills with batter slopes steeper than
  - (a) 2H:1V (26°) in sand and gravel

(b) 3H:1V (18°) in silt and clay

### Retaining Structures

- Retaining walls higher than 1.5 metres overall vertical extent.
- Retaining walls with sloping backfill.
- Retaining walls with surcharge loading within three metres of top of wall.

Table B1 below gives guidance on the extent of geotechnical investigation required based on the risk of instability, and the evidence on the site, the consequences of instability, and the implications of development. Developers and their geotechnical advisors are encouraged to discuss the extent of geotechnical investigation with Council staff at the beginning of the project.

TABLE B1 - GUIDANCE FOR RISK CLASSIFICATION FOR SITES SUBJECT TO LAND INSTABILITY

Risk Classification for Sites Subject to Instability				
Risk of Instability	Evidence / Type of Instability	Consequence of Instability	Implications for Development	Extent of Investigation Required
<b>Very high</b>	Evidence of active or past instability – landslide or rock face failure; extensive instability may occur within site or beyond site boundaries.	High risk of loss of life. Catastrophic or extensive significant damage or economic loss.	Unsuitable for development unless major geotechnical work can satisfactorily improve the stability. Risk after development may be higher than normally accepted (includes Building Act Section 36(2)).	Extensive geotechnical investigation required.
<b>High</b>	Evidence of active creep, potentially progressive/regressive/minor slips or minor rock face instability; significant instability may occur during and after extreme climatic conditions and may extend beyond site boundaries.	Low risk of loss of life. Significant damage or economic loss.	Development restrictions and/or geotechnical works required. Risk after development may be higher than normally accepted (may include Section 36(2)).	Engineering geological assessment with drilling investigation required.
<b>Medium</b>	Evidence of possible soil creep or a steep soil covered slope; significant instability can be expected if the development does not have due regard for the site conditions.	Virtually nil risk of loss of life. Moderate damage and economic loss.	Development restrictions may be required. Engineering practices suitable to hillside construction necessary. Risk after development generally no higher than normally accepted.	Visual assessment. Hand and possible drill investigation methods.
<b>Low</b>	No evidence of instability observed; instability not expected unless major site changes occur.	Minor damage, limited to site unless major development occurs.	Good engineering practices suitable for hillside construction required. Risk after development normally acceptable.	Visual assessment. Possible hand investigation method.
<b>Very Low</b>	Typically shallow soil cover with flat to gently sloping topography.	Virtually nil.	Good engineering practices should be followed.	Visual assessment.

### Clause 2.2.4 – Geotechnical requirements

- Function (b) will be reported on in a **Preliminary Geotechnical Assessment** which will need to be submitted with the Resource Consent Applications
- Functions (c) and (d) will be reported on in a **Comprehensive Geotechnical Assessment** which will need to be submitted in support of any consent conditions and as a normal part of the documentation of the design process

- Functions (d) to (g) will be reported on in a **Geotechnical Completion Report**, as discussed in Section 2.6.1 of NZS 4404:2010, which will need to be submitted with the application for the 224 Certificate.

#### *Clause 2.3.2 – Preliminary site evaluation*

The Preliminary site evaluation will lead to the preparation of the **Preliminary Geotechnical Assessment**. In addition to the expectations described in Clause 2.3.2, Council will expect that specific attention in this report is given to the following:

- The results of any site investigations and material testing;
- The assessment of geological hazards;
- The geotechnical constraints on land development;
- The geotechnical recommendations for site development, for issues such as batter slopes, fill construction, drainage, erosion control etc.;
- The identification of any requirements for additional investigations or analysis;
- The confirmation that a suitable and stable building site is available on each lot;
- The confirmation that suitable and stable vehicle access can be provided to each lot, and building site.

Council will expect the **Comprehensive Geotechnical Assessment** to give specific attention to and report on the following:

- A review, as required, of all the aspects discussed in the Preliminary Geotechnical Assessment;
- The review and recommendations for any special design or construction requirements;
- Special considerations for foundation requirements, services, road access, effluent disposal and stormwater management, both engineered and non-engineered fills;
- Reporting on all slope stability assessments;
- A statement of professional opinion as to the suitability of the land for its intended purpose – refer NZS 4404:2010 Schedule 2A.

#### *Clause 2.3.4 – Stability Criteria*

The minimum factor of safety for the design of permanent slopes in land development and subdivision projects of 1.5 is required for the conditions which may be expected to occur during the design life of the structure – 100 years for dwellings and 50 years for retaining structures beyond 8m from the dwelling. A reduced factor of safety of 1.2 is applicable for extreme conditions, Reference to Crawford, S A, and Miller, P J. contained in referenced documents of NZS 4404:2010.

#### *Clause 2.3.8 – Seismic Considerations*

The minimum factor of safety for the numerical analysis of slope stability of 1.2 shall be adopted for the return periods discussed in Crawford, S A, and Miller, P J. contained in referenced documents of NZS 4404:2010.

#### *Clause 2.6.2 – As Built Drawings for Earthworks and sub soil drains*

Refer to Part Four, **SCHEDULE A - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 1 NZS 4404:2010 - GENERAL REQUIREMENTS AND PROCEDURES** of this document.

## Schedule C – Hastings District Council Altered Requirements to Section 3 NZS 4404:2010 – Roads

The Hastings District Council has adopted Section 3 of NZS 4404:2010 with the following additions and/or alterations to be used in conjunction with NZS 4404:2010 due to the Council’s adoption of the ONE NETWORK ROAD CLASSIFICATION (ONRC).

### Clause 3.2.4.2 Link Context

Hastings District Council uses the ONRC road hierarchy which has four overall classifications, as shown below in Table C1. These classifications are described in more detail in Tables C2 and C3.

**TABLE C1 - HASTINGS DISTRICT ONRC ROAD HIERARCHY**

Classification	Description	Roads included	Typical Annual Daily Traffic (AADT) in Vehicles per day (vpd)	
			Urban	Rural
<b>Arterial</b>	Roads of strategic regional importance and contributing significantly to the regional economy. Linking regionally significant places, industries, ports or airports. Additionally may perform a ‘lifeline’ function.	State Highways (not managed by Council) and major local roads that are of an inter-regional nature and provide links between significant areas of population and other inter-urban links.	>5000	> 3000
<b>Primary Collector</b>	Roads of strategic importance which provide significant links within the local economy. Links to arterials or state highways.	Links between areas of activity within a community, providing alternative links between centres of population and contributing significantly to the movement of goods or produce.	3000 – 5000	1000 – 3000
<b>Secondary Collector</b>	These roads link population and economic sites. Locally preferred routes or within areas of population and activities.	Road giving connectivity between local populations areas and places of interest.	These roads link population and economic sites. Locally preferred routes or within areas of population and activities.	Road giving connectivity between local populations areas and places of interest.
<b>Access (Low Volume)</b>	These roads provide access and connectivity. Roads whose primary function is a street for people, public space, meeting, gathering as well as accessing property. These also provide access to the wider network.	All Council roads not categorised in the above hierarchies and servicing land use activities including cul-de-sacs.	200 – 1000	50 – 200  (0-50)

To encourage a more appropriate use of the ONRC road hierarchy, both urban and rural roads have been classified based on characteristics of traffic volumes and use/purpose factors.

Tables C2 and C3 provide more description of how the ONRC hierarchy is intended to operate in the District’s urban and rural areas. State Highways, Motorways and Expressways have not been included as these are managed nationally.

TABLE C2 - CHARACTERISTICS FOR URBAN ROADS (POSTED SPEED LIMITS < 70KM/HR)

Road Class – Urban Roads				
Criteria	Access (Low Volume)	Secondary Collector	Primary Collector	Arterial
<b>Traffic versus Land Access Function</b>	Land access primary function	Land access and traffic movement of equal importance	Traffic movement primary function; some land access control	Traffic movement primary function; subject to land access control
<b>Typical Two Way AADT (vpd)</b>	200 – 1000 (0-200)	1000 – 3000	3000 – 5000	> 5000
<b>Flow Characteristics</b>	Interrupted flow		Generally uninterrupted flow with at grade intersections	
<b>Desirable Operating Speed (km/h)</b>	30 – 50	40 – 50	45 – 70	50 – 70
<b>User Types</b>	Pedestrians, cyclists, all motor vehicle types, except restrictions on use by heavy vehicles may be necessary		Pedestrians, cyclists, all motor vehicle types.	Some restriction may apply to pedestrians and cyclists
<b>Accommodation for Public Transport</b>	Limited	Preferred	Preferred	Preferred
<b>Allowable connections for new roads</b>	Access (Low Volume) , collectors	Access , collectors, arterials	Collectors, arterials	Arterials
<b>Provision of Landscaping / LIUD</b>	Preferred	Preferred	Limited	Limited

Urban roads are those which have posted speed limits of < 70 km/h. These can exist within established urban areas (e.g. Hastings and Havelock North) and also within smaller urban areas in generally rural zones, such as smaller coastal settlements (e.g. Waimarama) and isolated rural settlements (e.g. Maraekakaho).

TABLE C3 - CHARACTERISTICS OF RURAL ROADS (POSTED SPEED LIMITS > 70 KM/HR)

Road Class – Rural Roads				
Criteria	Access (Low Volume)	Secondary Collector	Primary Collector	Arterial
<b>Traffic versus Land Access Function</b>	Land access primary function		Land access and traffic movement of equal importance	Traffic movement primary function; some land access control
<b>Typical Two Way AADT (vpd)</b>	0 – 200 (0-50)	200 – 1000	1000 – 3000	> 3000
<b>Flow Characteristics</b>	Interrupted flow		Generally uninterrupted flow	
<b>Desirable Operating Speed (km/h)</b>	60 – 80		70 – 100	80 – 100
<b>User Types</b>	Pedestrians, cyclists, all motor vehicle types			
<b>Accommodation of Pedestrians</b>	Footpaths generally not required, except for safety provisions to support adjoining communities			
<b>Accommodation of Cyclists</b>	Cycle lanes or sealed shoulders desirable on sealed roads		Separate cycle lanes or sealed shoulders recommended	
<b>Allowable connections level (new roads only)</b>	Access , Collectors		Access , Collectors, Arterial	Collectors, Arterials

Rural roads are those which have posted speed limits greater than 70 km/hr.



For both urban and rural roads, where additional traffic from a new development is likely to have an adverse effect on the agreed Level of Service (LoS) of the existing adjoining network, Council may require the developer to commission a traffic study to determine the effects, and possible mitigation options. Levels of Services are defined in the Austroads Traffic Management Volumes.

*Clause 3.3.1 Minimum Requirements*

Table C4 below sets out the minimum road design standards for use on urban and rural roads in the Hastings District. This replaces Table 3.2 in [NZS 4404:2010](#). Where parking and access performance require improvement, the alternative sealed widths suggested in 3.3.1 of [NZS 4404:2010](#) should be applied in lieu of minimum movement lane widths in Table 4

Drawings C 1 to C 3 provide more definition of these requirements. Drawings C 4 to C 6 provide definition of vegetation control and service location features of a development.

TABLE C4 - MINIMUM ROAD DESIGN STANDARDS – URBAN AND RURAL ROADS

Place Context		Typical Classification		Design Environment				Link Content			
Area	Land Use	Hierarchy	Traffic Volume (Max vpd)	Locality Served	Target operating speed	Minimum Road Reserve Width (m)	Max Grade	Pedestrians (See Note A)	Passing, Parking, Loading & Shoulder	Cyclists (See Note A)	Minimum movement lane (excluding parking and shoulder) (See Note E)
Urban	Live & Play ( Residential & Home Occupation)	Access (Low Volume)	100vpd	1 -10 du (Public) or 1-6 du (Private)	10	4.5	20%	Shared (in movement lane)	Allow for passing every 50m,	Shared (in movement lane)	2.75
		Access (Low Volume)	200vpd	Side or rear service access, up to 100m in length, (1 - 20 lots)	10	6	12.5%	Shared (in movement lane)	shared parking in the movement lane	Shared (in movement lane)	2 x 2.75
		Access (Low Volume)	200vpd	1-20 du	20	15	16%	1.5m one side where more than 100m in length	shared indented parking in the movement lane	Shared (in movement lane)	2 x 2.75
		Access	1000vpd	1 - 200 du	40	15	12.5%	1.5m one side or 1.5m each side where more than 20 du or more than 100m in length	Shared indented parking in the movement lane up to 100 du. Separate parking required over 100 du	Shared (in movement lane)	2 x 2.75
		Collector /Arterial	8000vpd	All other integrated activities in this land use not specified in this table	40	20	10%	1.5m each side	Parking, Public Transport, Turning	1.5m Network in accordance with cycle network strategy	2 x 3.0
	Shop and Trade (Commercial & Industrial)	Access (Low Volume)	200vpd	Side or rear service access, (1 - 20 lots)	10	6	12.5%	Shared (in movement lane)	loading bays	Shared (in movement lane)	2.75
		Access (Low Volume)	200vpd	1 to 20 Lots	10	18	10%	1.5m one side or 1.5m each side	parking	Shared (in movement lane)	2 x 2.75
		Access	1000vpd	1-200 lots	30	20	10%	3m each side	parking + loading bays.	Shared (in movement lane)	2 x 2.75

Table C4: Minimum Road Design Standards – Urban and Rural Roads Continued

Place Context		Typical Classification		Design Environment				Link Content			
Area	Land Use	Hierarchy	Traffic Volume (Max vpd)	Locality Served	Target operating speed	Minimum Road Reserve Width (m)	Max Grade	Pedestrians (See Note A)	Passing, Parking, Loading & Shoulder	Cyclists (See Note A)	Minimum movement lane (excluding parking and shoulder) (See Note E)
Urban continued	Work and Learn	Access (Low Volume)	200vpd	Side or rear service access, (1 - 20 lots)	10	6	12.5%	Shared (in movement lane)	loading bays	Shared (in movement lane)	2 x 2.75
		Access (Low Volume)	200vpd	1 to 20 Lots	10	15	10%	1.5m one side or 1.5m each side where more than 100m in length	parking	Shared (in movement lane)	2 x 2.75
		Access	1000vpd	1-200 lots	30	20	10%	1.5m each side	loading bays.	Shared (in movement lane)	2 x 2.75
	Mixed Use	Access	1000vpd	1 - 200 lots	30	20	10%	1.5m each side	parking	Shared (in movement lane)	2 x 2.75
		Collector/Arterial	8000vpd	Neighbourhood Centre, 200 - 800 lots	50	20	10%	2.0m each side	Parking, Public Transport, Turning	1.5m Network in accordance with cycle network strategy	2 x 3.5
Centre	Mixed Use	Access (Low Volume)	200vpd	Side or rear service access, (1 - 20 lots)	10	6	10%	Shared (in movement lane)	Loading bays (shared in movement lane)	Shared (in movement lane)	5
		Access (Low Volume)	200vpd	1 to 20 Lots	20	15	10%	2 x 2.5	Parking	Shared (in movement lane)	2 x 2.5
		Access	1000vpd	1-200 lots	30	20	10%	3m each side	Parking	Shared (in movement lane)	2 x 2.75
		Collector/Arterial	8000vpd	Urban Street, 200 - 800 lots	40	20	10%	3.0-3.5m each side	parking	1.5m Network in accordance with cycle network strategy	2 x 3.0

Table C4: Minimum Road Design Standards – Urban and Rural Roads Continued

Place Context		Typical Classification		Design Environment				Link Content			
Area	Land Use	Hierarchy	Traffic Volume (Max vpd)	Locality Served	Target operating speed	Minimum Road Reserve Width (m)	Max Grade	Pedestrians (See Note A)	Passing, Parking, Loading & Shoulder	Cyclists (See Note A)	Minimum movement lane (excluding shoulder) (See Note E)
Rural	Live & Play - (Residential & Home Occupation)	Access	100vpd	1 -10 du (Public) or 1-6 du (Private)	20	6	20%	Shared (on shoulder & Berm)	Allow for passing every 50m, total shoulder 0.5m, sealed	Shared (in movement lane)	3
		Access	200vpd	1-20du	30	9	16%	Shared (on shoulder & Berm)	Total shoulder 0.5m, sealed	Shared (in movement lane)	2 x 2.75
		Collector/Arterial	3000vpd	1-150du	70	15	12.5%	Shared (on shoulder & Berm)	Total shoulder 1.0m, sealed shoulder 0.5m	Shared (in movement lane)	2 x 2.75
	Make and Move	Access	200vpd	Low level agricultural activity	up to 100	20	10%	Shared (on shoulder & Berm)	Total shoulder 1.0m,	Shared (in movement lane)	2 x 2.75
		Secondary Collector	1000vpd	Medium level agricultural activity	up to 100	20	10%	Shared (on shoulder & Berm)	Total shoulder 1.0m, sealed shoulder 0.5m	Shared (in movement lane)	2 x 3.0
		Primary Collector	>3000vpd	Medium / high level agricultural activity + medium through traffic	up to 100	20	10%	Shared (on shoulder & Berm)	Total shoulder 1.5m, sealed shoulder 0.5m	Preferred on sealed shoulder.	2 x 3.5
		Arterial	>3000vpd	High/medium level agricultural activity + high level through traffic	up to 100	20	10%	Shared (on shoulder & Berm)	Parking and loading. Total shoulder 1.0m, sealed shoulder 1.0m	Preferred on sealed shoulder.	2 x 3.5

**TABLE C4.1 - MINIMUM ROAD DESIGN STANDARDS - DESIGN NOTES**

Note #	Note
<b>A</b>	Provision will be in accordance with HDC’s Walking and Cycling strategy
<b>B</b>	Minimum perpendicular parking should be 2.5 x 5m, parallel parking should be 2.1 x 6.0m
<b>C</b>	Where not shown in the table, cyclists shall be provided with separate movement lanes if identified in a local or regional cycle network
<b>D</b>	A full safety audit process will be required to accompany these designs
<b>E</b>	The movement lane can be reduced at intervals to provide for increased amenity and greening of the street and/or traffic calming based on guidelines in the <u>SUBDIVISION AND INFRASTRUCTURE DEVELOPMENT BEST PRACTICE DESIGN GUIDE (2011)</u>
<b>F</b>	It may be appropriate to consider an alternative to this design table however this will require discussion with Council (prior to design is preferable).
<b>G</b>	Any private road or lane serving greater than 6 sites shall be offered as public road to be vested by Council.
<b>H</b>	Link Context in Rural areas will only apply where residential activities are located within 800m of the subject site.
<b>I</b>	For carriageway widening of the curves refer to Clause 3.3.2.3 of <u>NZS 4404:2010</u> .

**Clause 3.3.2: Road Geometric Design**

Table C4 above sets out the minimum road design standards for use on urban and rural roads in the Hastings District. This replaces Table 3.2 in NZS 4404:2010.

**Clause 3.3.3: Pavement Structural Design**

The requirements set out in Clause 3.3.3 of NZS 4404:2010 will apply to all public and private road pavements presented with a development proposal, with the following additions:

- Pavement design shall be in accordance with the current published versions of the AUSTROADS AND TNZ: NZ SUPPLEMENT. The latter can be downloaded from the New Zealand Transport Agency website WWW.NZTA.GOVT.NZ;
- The minimum pavement design life is 25 years;
- In situations where seal widening is required the extended pavement shall be designed as a new pavement.

For all roads to be vested in Council, the designer must present comparisons of various pavement designs with respect to the following, to ensure that the best design option is being presented:

- Whole of life costing, taking into account construction, maintenance and rehabilitation costs, including possible salvage value of the pavements at the end of the design life;
- Constructability, including the availability of equipment especially material mixing, placing and compaction plant.

The structural design of a pavement also needs to take into account the surfacing treatment. For flexible pavements, surfacing treatments are considered to be thin surfaces and their purpose is to provide weather protection for the underlying pavement, and to improve the safety on the road by removing dust nuisance and providing adequate skid resistance.

The surfacing treatments commonly used in the District are:

- Chip Seal
- Asphaltic Concrete Paving (AC)
- Friction Course (FC)
- Interlocking Concrete Block Pavers

The use of asphalt surfacing must be approved by the Hastings District Council Asset Manager in conformity with the council asphalt policy.



**The following factors should be considered when choosing the appropriate surfacing treatment:**

- Urban residential areas should be designed for a pleasant appearance and low road noise.
- Busy traffic routes, particularly those carrying a high percentage of heavy commercial vehicles will subject surfacing treatments to wear and high stresses, particularly at intersections, industrial entranceways and cul-de-sac heads. The surfacing design will need to take these additional stresses into account.
- The surfacing in retail areas should be designed for appearance as well as resistance to wear from high turning stresses, particularly power steering.
- Asphaltic concrete shall be used as a surfacing in high stress areas such as steep grades on private access ways, roundabouts or cul-de-sacs, and where traffic noise needs to be mitigated, particularly in residential areas.
- The type of surface used must contribute to the safety of the road. Skid resistance is important in areas such as high speed corners and steep grades. If the carriageway does not drain quickly then vehicles may experience aquaplaning on smooth surfaces, such as AC.
- In special situations (e.g. high stress intersections) the structural design of the pavement and surfacing may need to change from a flexible to a rigid pavement design philosophy, as described in the Austroads guide to Pavement Technology Part 2: Pavement Structural Design and Guide to Asset Management Part 5: Pavement Performance Asset.
- Chip sealing is the most common surface treatment used on the District's roads. The designers of pavements using chip seal surfacing for a new development will design both Coats of the Seal. Reference should be made to the [CHIPSEALING IN NEW ZEALAND \(2005\)](#) and [CHIPSEALING IN NEW ZEALAND PRACTICE NOTES \(April 2011\)](#) of New Zealand Transport Agency when designing the seal surfacing.
- First coat sealing shall be designed to the current published versions of TNZ specifications (refer to [WWW.NZTA.GOVT.NZ](http://WWW.NZTA.GOVT.NZ)):
  - [M/01 \(2011\): SPECIFICATION FOR ROADING BITUMENS](#)
  - [P/3 \(1995\): SPECIFICATION FOR FIRST COAT SEALING](#)The sealing chips shall comply with TNZ specification [M/06 \(2011\): SPECIFICATION FOR SEALING CHIP](#).
- The second coat seal shall be a Grade 4/6 racked-in. The bitumen application rate shall be determined by the sand circle test method. The second coat seal can follow within a two week period of the first Seal coat.

**The designer of alternative surfacing treatments should utilise the following design advice:**

- Asphaltic concrete surfacing shall be designed in accordance with the current published versions of TNZ specification [M/10 \(2014\): SPECIFICATION FOR DENSE GRADED AND STONE MASTIC ASPHALTS](#).
- As an alternative to AC a friction course (FC) can be used. The design shall be carried out as detailed in the current published version of TNZ specification [P/11 \(2007\): SPECIFICATION FOR OPEN GRADED POROUS ASPHALT](#).
- The use of concrete block pavers as a surfacing treatment on roads can be considered particularly in traffic calming areas. Design of such surfaces shall comply with [NZS 3116:2002 CONCRETE SEGMENTAL AND FLAGSTONE PAVING](#), with specific note being made that collector and arterial roads are considered to be main roads for application of the standard. Cement and Concrete Association of New Zealand (1988): IB 67 [INTERLOCKING CONCRETE BLOCK ROAD PAVEMENTS](#) provides a guideline for the construction of paved roads. As an alternative to Concrete Pavers, kiln fired Clay Pavers may be used provided that appropriate design certification is provided.
- All pavements will require two coats of seal (as above) to be correctly applied to satisfy engineering conditions for s224 Certificate.
- For private pavements it will remain in perpetuity the (collective) responsibility of the owners of the pavement to ensure ongoing maintenance and the funding of any subsequent seals as and when required. If no Body Corporate or similar management arrangements for the common private property is provided, it is required that the responsibility for future maintenance is advised by way of an advice notice on each affected title.

### *Clause 3.3.6: Parking, passing and loading*

Council's requirements for off road parking are outlined in the District Plan, and in this section. The dimensions of car parks shall be as shown in District plan appendix 71, [NZS 4404:2010](#), and in Table C4.

If a development proposal includes provision for on road car parking in association with mountable kerb and channel, then the designer shall ensure that all associated infrastructure (e.g. footpaths, kerb and channel, sumps and grassed berms) are able to safely and effectively carry the proposed traffic loads from parked cars (and commercial vehicles as required).

### *Clause 3.3.8: No exit Roads*

Council prefers designers to design out no exit roads to ensure positive connectivity; however it should be noted that in instances where this is practically unachievable the use of cul-de-sac turning heads will be required. This will also apply to low level roads and Right of Ways.

### *Clause 3.3.11: Footpaths, access ways, cycleway paths and berms*

Footpaths are required on most urban roads on either side of the carriageway (refer to Table C4). It will be the objective to create footpaths that do not deviate in crossfall or gradient especially through access crossings. In rural areas footpaths may be required for safety reasons. In areas where topography makes it impractical or where the road width is insufficient one footpath may be approved.

Concrete footpaths are preferred. The minimum acceptable width of the footpath is 1.5m, with the footpath desired to be separated from the kerb for the safety of pedestrians. The footpath shall not sit over the underground service corridor provided from the back edge of the boundary. Refer to Indicative Locations of Utility Services in Berms (Drawing C 6) for further details. Concrete shall comply with [NZS 3109:1997 CONCRETE CONSTRUCTION](#), and shall have a minimum strength of 25 MPa at 28 days. All surfaces to have a broom finish.

Footpaths on local roads with vista control can be less than 1.5m wide and can be adjacent to the kerb in special approved circumstances.

To provide for shading and increased amenity there shall be at least one tree per section and/or the equivalent grouping of trees. This should be planted once houses have been built as planting before housing development runs the risk of being vandalised and/or damaged by constructors. A bond to cover the cost may be required.

The maintenance of grass berms will be undertaken by adjoining residents, however until occupancy occurs the maintenance of those berms will be the responsibility of the developer. A bond to cover the cost may be required.

In circumstances where mountable kerb and channel is installed, footpaths may need to support parked vehicles and therefore adequate provision of strength will be required.

Other surfacing materials (e.g. Asphaltic concrete or block paving) will be considered by Council provided specific design details are provided with the Consent Application.

Drawings C 7 to C 9 show the preferred footpath detailing.

Footpaths in commercial areas shall be the full width of the berm; that is from the kerb to the property boundary, unless specific features such as garden areas are approved by Council.

The longitudinal grade of the footpath should follow that of the carriageway. Where the footpath grade is steeper than 12.5 percent a special surface treatment may be required for safety reasons. On steep grades consideration shall be given to the use of steps and handrails. Specific attention needs to be paid to disabled persons access.

**In this and other regards, footpaths shall be designed as detailed in the current published version of the following references:**

- [NZS 4121:2001 DESIGN FOR ACCESS AND MOBILITY: BUILDINGS AND ASSOCIATED FACILITIES](#)
- [AUSTROADS TRAFFIC MANAGEMENT AND ROAD DESIGN MANUALS](#)
- [THE NEW ZEALAND BUILDING CODE](#)

Cross fall should be placed on the footpath surface towards the road (minimum cross fall 2%) sufficient to facilitate stormwater runoff to the street channel, while still preserving walking comfort.

Where due to the contour of the finished ground surface it is necessary to situate the footpath below the level of the road, adequate drainage must be provided, which includes provision for effective long term operation and maintenance.

When designing footpaths in high use areas, consideration shall be given to using tactile paving to assist vision-impaired people, in accordance with the reference below:

- [NEW ZEALAND TRANSPORT AGENCY \(2015\): RTS 14 - GUIDELINES FOR FACILITIES FOR BLIND AND VISION IMPAIRED PEDESTRIANS](#)

In all cases footpaths shall be designed to ensure there are good sightlines for drivers, cyclists and pedestrians, especially at intersections, driveways, desire lines and crossing points. At intersections a 1.5m x 1.5m pedestrian visibility splay is recommended, accompanied with low height fencing and vegetation so that vehicles can see pedestrians and cyclists.

#### *Clause 3.3.11.1– Footpaths and Access ways*

Pedestrian access ways shall generally have a minimum legal width of 6 metres and shall be formed to a specific design to be approved by the Council. The design shall include fencing that does not exceed 1.5 metres in height.

#### *Fencing of reserves*

The covenant will also specify that fencing on and within 3 metres of the boundary with the reserve shall be in accordance with the following table:

**TABLE C5 - MAXIMUM HEIGHTS OF FENCES**

	<b>Close Boarded</b>	<b>Visually Permeable*</b>
<b>Passive Reserve</b>	700mm	1200mm
<b>Active Reserve</b>	1200mm	1500mm

*Note: \* Visually Permeable means that more than 50% of the fence area is not obstructed by materials making up the fence.*

A fence shall be erected in accordance with the above table for urban areas. A fencing covenant in accordance with the criteria outlined in paragraph (a) will also be required.

#### *Clause 3.3.11.2: Cycle paths*

Drawing C 10 shows the preferred cycle barrier detail. Drawings RM 1 to RM 6 show the cycleway road markings.

Where provision needs to be made for cycle and pedestrian traffic, and in particular disabled pedestrian and mobility access, use shall be made of the current published versions for the following references when preparing the design detail:

- [AUSTROADS TRAFFIC MANAGEMENT AND ROAD DESIGN MANUALS](#)
- [CYCLING ASPECTS OF AUSTROADS GUIDES \(2017 EDITION\)](#)
- [HDC CYCLING STRATEGY – ‘TOWARDS BETTER CYCLING’ 2001](#)
- [HDC WALKING STRATEGY – ‘WALK THE WALK’ 2004](#)
- [LAND TRANSPORT NZ - CYCLE NETWORK AND ROUTE PLANNING GUIDE 2004 \(LTSA GUIDELINES\)](#)

#### *Clause 3.3.12: Traffic Services, Signage and Road Furniture*

Council places considerable emphasis on the District’s sign asset, standardising where possible the location, height, size and material composition of road and traffic signs. Developers will be expected to embrace this philosophy. Council where possible standardises signage materials and uses flute, powder coated sign poles, and the “SIGNFIX”™ connection system. Drawings C 10 to C 18 show acceptable details.

Council also places great emphasis on the standard of manufacture and maintenance of traffic signs, name signs, posts and fittings. The references, [TRAFFIC CONTROL DEVICES MANUAL \(TCD MANUAL\)](#), [NZ TRANSPORT AGENCY, 2008](#) and



RSMA COMPLIANCE STANDARD FOR TRAFFIC SIGNS, 2008 and TNZ P/24 PERFORMANCE BASED SPECIFICATION FOR TRAFFIC SIGNS shall be used in this regard.

**All traffic signs shall be designed and located in accordance with the current published version of the following references:**

- NEW ZEALAND TRANSPORT AGENCY (2010): MANUAL OF TRAFFIC SIGNS AND MARKINGS (MOTSAM), PART 1: TRAFFIC SIGNS.
- LAND TRANSPORT RULE 54002 - TRAFFIC CONTROL DEVICES 2004, with subsequent amendments.

The construction and location requirements for street names signs, in both urban and rural areas shall comply with the Hastings District Council, Street Name Sign Policy, as shown on Drawing C 18.

Private access ways that have a number of residential properties can have street numbers associated with streets they access off and an appropriate street name blade, with numbers, erected at the entrance showing all the numbers.

All road marking and delineation treatments in both urban and rural areas shall be designed with regard to the current published version of the following standards, and Table C6 below.

- NEW ZEALAND TRANSPORT AGENCY (2010): MANUAL OF TRAFFIC SIGNS AND ROAD MARKINGS (MOTSAM), PART 2: MARKINGS.
- NEW ZEALAND TRANSPORT AGENCY (2002): RTS 5, GUIDELINES FOR RURAL ROAD MARKING AND DELINEATION.
- LAND TRANSPORT RULE 54002 - TRAFFIC CONTROL DEVICES 2004 with subsequent amendments.

Table C6 describes the link between road marking, delineation standards and the road hierarchy preferred within the District. The installation of road marking and delineation shall be in accordance with the current published version of the following:

- TNZ P/12 (2000): SPECIFICATION FOR PAVEMENT MARKING
- TNZ M/07 (2009): SPECIFICATION FOR ROAD-MARKING PAINTS

**TABLE C6 - PREFERRED ROAD MARKING AND DELINEATION STANDARDS**

Roading Hierarchy		Minimum Requirements			
Urban Roads	Centreline	Edge Lines	Cycle Lane Marking	R.R.P.Ms	Edge Markers
Access Roads and Collectors					
< 9m carriageway	No (1)	No	No	N/A	N/A (7)
> 9m carriageway	Yes	Yes	(3)	N/A (5)	N/A
Arterials	Yes	Yes	(4)	Yes	N/A
<b>Rural Roads</b>					
Access roads					
< 6m carriageway	No (2)	No (7)	No	No	No (6), (7)
> 6m carriageway	Yes	Yes	(3)	No	No (7)
Collectors	Yes	Yes	(3)	Yes	Yes
Arterials	Yes	Yes	(4)	Yes	Yes

*Notes from Table C6:*

- 6.2.1 *A centreline may be marked on some < 9m carriageways when approved: parking restrictions may be required.*
- 6.2.2 *On narrow rural roads (i.e. < 6m carriageway) isolated centrelines may be required on corners and through winding sections for safety reasons. No centrelines shall be marked where the carriageway is less than 5.5m.*
- 6.2.3 *Where the sealed shoulder outside the edge line is 1m or more, that space may serve as a de facto cycle lane although care may be needed when the space is also utilised for parking.*

- 6.2.4 *Specific cycle lanes will be provided where the road is part of Council's agreed Cycling Network Strategy and where it is practical to do so.*
- 6.2.5 *Reflectorised Raised Pavement Marker (RRPMs) may be used on approved collectors.*
- 6.2.6 *Approval may be granted on a case by case basis depending on the geometry, crash history etc. of the site for the marking of specific hazards.*
- 6.2.7 *Edge lines to be marked as necessary – mandatory for 7.5m seals and greater.*

Where sections of new or improved road have been reconstructed to a greater width than the adjacent lengths, edge lines must be smoothly transitioned between the different widths.

Over wide seals can occur where sections of roads, usually locals or collectors, are rehabilitated and upgraded. Some have been sealed out to include the water tables to deal with scour, but with others it is the discontinuity of building a standard width of seal within a substandard length of road. Where sections of road have been upgraded and made significantly wider than the adjacent pavement, they must be marked to the correct standard for their classification.

#### **Clause 3.3.14: Lighting**

Road lighting is provided for traffic safety and public amenity value only. Council does not intend that roadway lighting be provided for security purposes, although there will obviously be some mutual benefit and lighting design for roads lit to AS/NZS 1158 LIGHTING FOR ROADS AND PUBLIC SPACES SET will take security into consideration, in line with the standard.

In recent years the Hastings District Council has invested considerable effort into improving the efficiency and effectiveness of the road lighting in the District.

STREET LIGHTING CODE OF PRACTICE of Hastings District Council is provided as a separate appendix to this Engineering Code of Practice. The current version of this document is dated 20/01/2016.

Approvals for the Street Lighting are based on the process in Sections 2.10 and 2.11 of the STREET LIGHTING CODE OF PRACTICE of Hastings District Council. Designers shall provide full lighting design documentation for approval along with related traffic safety analysis following the process in Sections 2.10 and 2.11. Luminaries shall be provided that have at least a minimum ten years manufacturer's guarantee and shall be on the NZTA M/30 (2014): SPECIFICATION AND GUIDELINES FOR ROAD LIGHTING DESIGN approved list

Poles shall be galvanized type ordinary streetlight poles and shall be on the Auckland Transport (AT) approved list for poles. No further approvals for decorative light poles shall be considered for any new subdivisions.

Lighting categories shall conform to the Table 1 of the STREET LIGHTING CODE OF PRACTICE.

All Luminaires shall be equipped with a nema socket and Light Control Unit to communicate with the Council central management system. Details to be supplied on request.

#### **Urban Road Lighting Design**

The lighting of urban roads should be designed to provide safety for vehicles, cyclists and pedestrians using NZS 1158 parts 1.1 and 1.3 for vehicular traffic. Lighting for other areas such as local roads, walkways, separate cycleway, car parks and access ways in public areas will require specific design to AS/NZS 1158 LIGHTING FOR ROADS AND PUBLIC SPACES SET, Part 3.1 – Pedestrian area (Category P) lighting – Performance and design requirements.

Pedestrian crossings should be evaluated in line with TRAFFIC REGULATIONS 1976 and TRAFFIC AMENDMENT REGULATIONS 1998. Should the crossing be used at night, lighting to AS/NZS 1158 LIGHTING FOR ROADS AND PUBLIC SPACES should be provided. Refer to section 1.6.8 of the STREET LIGHTING CODE OF PRACTICE for more information.

#### **Rural Roadway Lighting Design**

Lighting on rural roads is provided for vehicle safety in hazardous areas such as intersections. Rural road lighting shall comply in particular with Clauses 3.4 "Intersections, Junctions and other specified locations" and

3.5 “Isolated Intersections and junctions” of [AS/NZS 1158 LIGHTING FOR ROADS AND PUBLIC SPACES SET](#), Part 1.1 – Vehicular traffic (Category V) lighting – Performance and design requirements.

Where an unlit road fitting Category V meets a road lit to Category V, full intersection lighting should be provided. Where an unlit road fitting category P intersects a road lit to Category V, full intersection lighting is only required if there is channelization or a possible safety risk.

At unlit intersections full intersection lighting is only required if there are high traffic volumes or a possible safety risk. In other cases, strategically placed lighting (“flag lighting”) shall be used or the intersection shall be designed in such a way that lighting is not required (refer to Clause 3.5.2 (a) of the standard).

Where flag lighting is appropriate, a minimum of two fittings shall be used for those new roads intersecting with a Rural Arterial or Collector road. In this case one light on the opposite side of the main road, and one on the side road will be required.

#### Suburban Development Considerations in Areas of Significance

Lighting designs for areas that are in the central CBD and/or noted in the District Plan as having heritage, cultural or similar significance, should be submitted to the Landmarks and Community Services section of the Council for comment prior to the Consent application being submitted.

Lighting designs for special features such as sculptures or memorials should take the effect on any surrounding traffic into consideration. In particular, designs for any special lighting abutting State Highways shall be submitted to New Zealand Transport Agency for approval.

#### *Clauses 3.3.16: Private ways, private roads, and other private accesses*

The minimum formed and legal widths for all non-public accesses are described in Table C4.

#### *Clause 3.3.17.1: Urban Crossings*

Designers should utilise Drawing C 19A and Figure 3.9 in [NZS 4404:2010](#) for break over angles

Urban crossings shall be installed in accordance with Drawings C 19 and C 19A.

The design of all crossing points shall take into account all user visibility requirements.

#### **Refer to the current published version of the following:**

- [AUSTROADS \(2017\): GUIDE TO TRAFFIC MANAGEMENT PART 6, INTERSECTIONS, INTERCHANGES AND CROSSINGS](#)
- [AUSTROADS \(2009\): GUIDE TO ROAD DESIGN PART 4, INTERSECTIONS AND CROSSINGS - GENERAL](#)
- [NEW ZEALAND TRANSPORT AGENCY \(2015\): RTS 14 - GUIDELINES FOR FACILITIES FOR BLIND AND VISION IMPAIRED PEDESTRIANS](#)
- [NEW ZEALAND TRANSPORT AGENCY \(2009\): PEDESTRIAN PLANNING AND DESIGN GUIDE](#)

Concrete crossings are preferred. Concrete shall comply with [NZS 3109:1997 CONCRETE CONSTRUCTION](#), and shall have a minimum strength of 30 MPa at 28 days. All surfaces to have a broom finish. The underlying base course shall comply with the [TNZ M/04 \(2006\): SPECIFICATION FOR BASECOURSE AGGREGATE](#) and have a minimum compacted depth of 150mm below the concrete. Access points being constructed on low strength subgrade (CBR < 5%) shall have a specifically designed foundation.

For more difficult access across kerb and channel, especially where the access is a steep gradient (above 5%) a specific design is also required.

If an alternative crossing design is proposed using either Asphaltic concrete or block paving, this shall be specifically designed (refer to Clause 3.3.3).

No part of any crossing shall encroach any closer than 5m to the tangent point on any kerb radius at an intersection and any crossing to be installed directly onto a collector or arterial road shall be subject to safety audit.

Crossings expected to carry industrial or commercial traffic must be specifically designed to accommodate the additional traffic loading, usage and turning circles.

Pram, wheelchair and mobility scooter crossings shall be designed to the standards contained in the current published version of [NZS 4121:2001 DESIGN FOR ACCESS AND MOBILITY: BUILDINGS AND ASSOCIATED FACILITIES](#).

#### *Clause 3.3.17.2: Rural Crossings*

Rural vehicle crossings generally exist in a higher speed environment, and often have more variable topography to accommodate.

##### **The design of the vehicle crossing should:**

- Provide a safe environment for the traffic on the existing road;
- Protect the users of the access;
- Prevent detritus material from the access encroaching onto the road;
- Minimise maintenance risks such as cutting out of corners, blocked culverts, scour etc.

All vehicle crossings shall be specifically designed to suit the location in which these are being placed.

##### **The following design guidelines should be achieved:**

- Visibility at rural crossing points is critical. Reference should be made to [AUSTROADS \(2017\): GUIDE TO TRAFFIC MANAGEMENT PART 6, INTERSECTIONS, INTERCHANGES AND CROSSINGS](#) and [AUSTROADS \(2009\): GUIDE TO ROAD DESIGN PART 4, INTERSECTIONS AND CROSSINGS - GENERAL](#). In some instances it will be appropriate to make reference to [NEW ZEALAND TRANSPORT AGENCY \(2001\): RTS 6 GUIDELINES FOR VISIBILITY AT DRIVEWAYS, WHICH](#) provides useful guides to the design of commercial vehicle crossings. Alternative design options including the use of flush medians can also be considered. Existing cuttings and batters may require cutting back both within the road reserve and on private property in order to meet sight distance requirements. The speed environment is actual average vehicle speed (85% percentile speed km/hr), not the posted speed limit.
- Crossings must be constructed at right angles to the road. Where an access way then turns, a minimum 8m long straight must be provided from the edge of the carriageway to the gate or boundary.
- The gradient of entrances should be as flat as possible, however shall not be steeper than +3% over the distance from the carriageway to the boundary and shall have adequate cross fall to prevent water flowing onto the rural road. Additional measures may be required, E.g. Extended sealing may be required to prevent gravel migration in rural approach grades > 10%.
- Crossings expected to carry industrial or commercial traffic shall be specifically designed to accommodate the additional loading and vehicle usage. If necessary, the crossing width, radii and splay shall be greater than the standard dimensions.
- The pavement used in the crossing shall have sufficient strength to meet the anticipated traffic loads (refer to Clause 3.3.3). A rural crossing shall have a minimum formation thickness before sealing of no less than 150mm for flexible pavements.

The Drawings C 20 to C 29 can be used for guidance with respect to the design of acceptable solutions for rural crossings.

#### *Clause 3.3.19: Road run off*

Carriageway drainage on urban roads uses kerb and channel although dish channels, slotted drains, subsoil drains, open drains or culverts can be considered. Road stormwater systems will normally be connected to a sump which in turn is connected by a lead to a manhole on the main stormwater system.

It will be necessary to refer to Table C 7 for Expected Road Corridor Stormwater Level of Service requirements.

**TABLE C7 - REQUIRED ROAD CORRIDOR LEVEL OF SERVICE FOR STORMWATER MANAGEMENT**

Hierarchy Classification	Stormwater Return Period (Yrs.)			
	5	10	20	50
Arterial Road	All designed movement lanes	All designed movement lanes	2 X Full traffic lane	2 X Full traffic lane
Collector Road	All designed movement lanes	2 X Full traffic lane	2 X Full traffic lane	1 X Full traffic lane
Access Road	1 X Full traffic lane	1 X Full traffic lane	0 mm depth on the carriageway centreline	100 mm depth on the carriageway centreline
Lane	1 X Full traffic lane	0 mm depth on the carriageway centreline	100 mm depth on the carriageway centreline	200 mm depth on the carriageway centreline

On rural roads the provision of a surface water channel a minimum of 0.5m below the adjacent road surface is appropriate on a majority of rural roads where 5:1 verge slopes can be readily constructed. In situations where open drains are inadequate, additional stormwater systems such as kerb and channel, sealed, paved or concrete channels and subsoil drains will be necessary.

There may also be other sustainable stormwater systems that can be put forward for consideration by Council (refer to Part Four, **SCHEDULE D - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 4 NZS 4404:2010 - STORMWATER DRAINAGE** of this document).

*Clause 3.3.19.3: Subsurface Drains*

Figure 3.5 in NZS 4404:2010 describes an acceptable solution.

*Clause 3.3.19.4: Side Drains/Water Tables*

Reference should be made to Drawing C 30 and Table C4.

*Clause 3.3.19.6: Kerbs and Channels*

Drawing C 31 shows acceptable kerb and channel profiles. Other acceptable profiles are also given in Drawings C 32 to C 34.

Kerb and channel is required on all urban roads and on rural roads where open drainage/swales is impractical. Council currently uses two styles of kerb and channel, mountable and non-mountable. Nibs are also used around intersection details and streets using open drainage/swales.

**The following general standards shall be applied:**

The desirable minimum fall on channels is 1 in 400, with the absolute minimum fall being 1 in 500

- A kerb and channel shall be manufactured of concrete complying with NZS 3109 with a minimum strength of 20MPa at 28 days.
- All kerb and channel shall be placed on a foundation of not less than 200mm of compacted base course meeting the current TNZ M/04 (2006): SPECIFICATION FOR BASECOURSE AGGREGATE.
- The use of mountable or non-mountable kerb is influenced by the roads intended function and position within the hierarchy. When the use of mountable kerb and channel is required because there is insufficient room within the carriageway to accommodate reasonable on-road parking, then the design will need to consider whether un-reinforced kerb and channel will have sufficient long term strength and will not crack or deform under load. If cracking or deformation is expected in un-reinforced kerb and channel, Council will expect the designer to propose options to mitigate this risk, such as reinforcement or foundation strengthening.
- If the development proposes to use the mountable kerb and channel profile M1 (Drawing C 31) then no domestic stormwater connections can be made through this kerb and channel.

Therefore, in these situations the developer should provide a design that satisfies both transportation and storm water requirements.

A stormwater connection is required between the kerb and the boundary where runoff from adjacent properties is to be directed into the roadside channel. In the past this has routinely been provided by including an adaptor in the kerb and connecting this to the property boundary using pipe work in the footpath.

Council will now expect that designers consider the option of connecting stormwater connections from adjoining lots directly to stormwater rider mains placed underground in the berm area behind the kerb. These rider mains will be 200mm minimum diameter and be installed between adjacent sumps, discharging directly into the sump chamber. Gradients on rider mains will generally be the same as the adjacent kerb. Access “Ys” should be provided for each property connection. The property connection should be 75mm minimum diameter. The alignment of the rider main should be such that it can be rod cleaned without difficulty.

Drawing WS 105 and WS 106 provide acceptable detail for the connection of stormwater leads from private property to existing or new kerb and channel. This detail is not suitable for connection to the mountable kerb and channel profile M1 (refer to Drawing C 31). With the mountable kerb and channel profile the entrance of the outlet into the kerb may need to be shaped to ensure that a permanent kerb surface can be reinstated over the outlet. The means by which kerb reinstatement above the stormwater outlet is to be achieved shall be detailed on the design drawings that are submitted with the Consent Application.

#### *Clause 3.3.19.7: Sumps*

Sumps are normally connected to a manhole on the stormwater drainage system by sump leads, except that if the trunk stormwater drain is of a greater diameter than 600mm and a manhole is not conveniently located, the sump lead may be saddled directly into that drain, soffit to soffit. A manhole must be located within 40m of the sump lead connection. Manholes shall not be located in the traffic lane wheel paths.

When designing the road stormwater systems, the designer needs to check the surcharge depth for the proposed sump layout. The surcharge depth for grate sumps and dish channels in particular may impact unsatisfactorily on the adjoining road carriageway, and therefore may require additional sumps in the design solution. Surcharge depths need to be considered both with respect to the use of the road and its place in the ONRC road hierarchy. Council would expect the traffic flows are not disrupted on Arterial and Collector routes. The effect surcharge and water moving on secondary drainage paths is likely to have on other infrastructure and adjoining private properties will also need to be considered when the designer is designing the road stormwater system.

A number of manufacturers can supply precast concrete and cast iron components for sumps and leads. Council has over time developed several sump details (refer to Drawings WS 402 to WS 406).

**Council’s expectation with respect to the design and construction of sumps within a road drainage system are as follows:**

- Sumps should allow for the most effective movement of stormwater from the road into the stormwater drainage system that mitigates as much as possible the risk of blockage by debris such as plastic bottles and leaves.
- The design of sumps, and in particular sumps intruding either into the carriageway (cycle and parking lanes) or into the footpath (e.g. access lids to sump barrels) need to consider the safety of all road and footpath users, and mitigate accident risks by using appropriate components (e.g. cycle friendly sum grates).
- Access into the sump must be provided for long term maintenance.
- All components must be of suitable quality, and provide Council with the least whole of life cost option with respect to long term maintenance and system capacity.

On rural roads sumps are not usually required, except in areas where kerb and channel is used. Transverse and longitudinal culverts are the more common. Drawings WS 107 and WS 108 provides suitable details.

- Culverts should be installed to ensure longitudinal scouring of the water tables does not occur

- Culverts controlling stormwater flow across the road are generally spaced no greater than 100 metres apart.
- Spacing is dependent on a number of factors including area rainfall intensity, slope, soil type and the existing natural watercourses, refer to **PART FOUR**.
- Minimum culvert sizes are 375mm for culverts passing under the road and 300mm for culverts at vehicle crossings.
- Design of appropriate inlet/outlet structures should ensure support is provided under all flow conditions to the culvert structure and the adjoining road.
- No culverts are to be constructed in such a manner as to concentrate runoff into a neighbouring property without the consent of the owner of that property.
- Stormwater should, where possible, be directed onto stable virgin ground and energy dissipation by rock rip-rap or equivalent shall be provided in erosion prone areas. Where outlets are required on fillings or on unstable ground, fluming or other protection will be required.

#### *Clause 3.3.19.7.3: Sump Gratings*

Cycle friendly sump gratings will be required in all urban locations.

#### **Clause 3.4 Pavement Construction**

In general, the design principles outlined in Section 3.4 of NZS 4404:2010 are to be followed. The following text provides additional comments and some specific changes that will take precedent over Section 3.4 in NZS 4404:2010.

#### *Clause 3.4.2.2 Subbase*

TNZ M/03 (1986): SUB-BASE AGGREGATE NOTES provide an acceptable specification for subbase aggregate. Where possible it is desirable to use local material or recycle existing material to minimise carbon footprint and reduce waste.

#### *Clause 3.4.4.1 First and Second Coat Chip Seals*

**The principal objectives of the First Coat seal are to:**

- Waterproof the new pavement;
- Provide a safe surfacing with sufficient skid resistance;
- Be compatible with the adjoining environment, giving due consideration to noise, surface drainage etc.;
- The first coat seal shall generally be grade 3/5, 'raked in' rolled and then swept within 24 hours to remove loose chips;
- The second coat shall generally be laid 3-5 years after the first coat. The second coat seal shall be a grade 4/6 'raked in'.
- The bitumen application rate shall be determined by the sand circle test method.
- The second coat seal can follow within a two week period of the first seal coat.

#### *Clause 3.4.11 Deflection Testing*

The designer will need to assess acceptable deflection standards for each individual pavement project, based on the subgrade strength and proposed pavement structure. The proposed deflection standards to be used for quality assurance testing in the field will need to be described and justified in the design reports which are submitted with the Consent.

#### *Clause 3.4.16 Berms and Landscaping*

The designer will need to consider the location and climatic conditions, and the purpose of the vegetation cover when designing grass mix and vegetation types proposed to be used in a development. The Hawke's Bay climate will expose grass and vegetation to extremes of climate including drought in summer and cold temperatures in winter.

#### *Clause 3.4.20: As-built and completion documentation*

Refer **SCHEDULE A - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO PART 1 NZS 4404:2010 - GENERAL REQUIREMENTS AND PROCEDURES** of this document.



## Schedule D – Hastings District Council Altered Requirements to Section 4 NZS 4404:2010 – Stormwater Drainage

The Hastings District Council has adopted Section 4 of NZS 4404:2010 with the specific additions and/or alterations outlined in this schedule. In general, the principles outlined in Part 4 of NZS 4404:2010 are to be followed. Schedule D provides additional commentary and specific amendments that take precedent over the applicable clauses in Part 4 in NZS 4404:2010.

### DRAWINGS

Hastings District Council (HDC) standards water service drawings are to take precedence over NZS 4404:2010 STANDARD DRAWINGS.

Schedule D makes reference to the HDC Drawings, referenced as WS \*\*\*.

#### *Clause 4.2.4: Catchment Management Planning*

##### **Add the paragraph:**

HDC have completed catchment management studies and plans for a range of urban catchments within Hastings District. Reference shall be made to these catchment studies in completing any design work. If the development falls outside the coverage areas of these studies, then catchment planning will be required and will be subject to site specific conditions.

#### *Clause 4.2.9: Climate Change*

##### **Add the paragraph:**

Designers can use HIGH INTENSITY RAINFALL DESIGN SYSTEM (HIRDS) rainfall charts inclusive of climate change to 2090. Alternatively the HBRC WATERWAY GUIDELINES tables can be used.

Design must also include provision for other climate change related effects including sea level rise and coastal erosion.

### Clause 4.3 Design

#### *Clause 4.3.2: Structure plan*

##### **Add the following:**

- HDC have completed structure planning for some industrial and residential growth areas which detail HDC bulk services.
- Designers are to consult with HDC to identify any structure plan which may apply for a specific area.
- Designers must reference these structure plans and ensure the infrastructure design is consistent.

#### *Clause 4.3.3: Future Development*

##### **Add the paragraph:**

In all new developments, the upstream catchments are to be considered in design calculations.

Consultation must be undertaken with Council to confirm upstream catchment assumptions for use in design calculations and options determination.

#### *Clause 4.3.4.1: System Design*

##### **Add the following:**

- The primary stormwater drainage system of pipes and /or open watercourses shall have sufficient capacity to convey a 5 year rain storm without surcharging onto roads (not within 400 mm of kerb tops).



- If a detailed runoff calculation method is applied, a hydraulic grade line 250 mm below kerb level may be acceptable. This requires designers to consider 5 and 50 year storm scenarios in the design process, taking climate change into consideration.
- For rainfall in excess of a 5 year storm and up to a 50 year rainstorm, the secondary storm water system shall have sufficient capacity to prevent stormwater entry into existing habitable buildings and inundation of household gully traps
- Assessment of the effects of a 100yr Storm.

*Clause 4.3.4.2: Secondary Systems*

**Add the paragraph:**

The secondary stormwater system shall meet the following requirements:

- No existing habitable floors flooded for all events up to a 1 in 50 year ARI storm event or 2% AEP inclusive of climate change up to 2090.
- Safe egress / ingress for users up to a 1 in 50 ARI storm event or 2% AEP inclusive of climate change up to 2090.

*Clause 4.3.5: Stormwater Runoff*

**Add the following:**

When calculating stormwater runoff designers shall ensure that the average runoff coefficients for the site post development do not exceed those outlined in Table D1.

TABLE D1 - DESIGN CRITERIA

Type of Surface or Land Use	Return Period	
	5 Year	50 Years
Sealed Surfaces, Roofs	0.9	0.9
Central Business District	0.8	0.8
Industrial Heavy	0.5	0.6
Industrial Light	0.7	0.75
Residential	0.5	0.6
Parks (not residential)	0.3	0.5

*The above table above provides typical values for an average runoff coefficient, C, for use on catchments in this District. These can be used for the design of public stormwater infrastructure where there is no other downstream constraint.*

*Clause 4.3.5.1: Design Storms*

**Delete Table 4.1 and replace with the following table:**

TABLE D2 - DESIGN STORMS

System	Development	AEP	System
Primary System	All	20%	5
Secondary System	Existing	2%	50
Secondary System	New Developments	1%	100

*Clause 4.3.5.4: Hydraulic design of stormwater systems*

**Add the paragraph:**

- HDC is developing a network model using Infoworks.
- HDC support the use of industry approved software to carryout pipeline design. Supporting calculations will be required.
- Design plans shall show long-sections, identifying other service crossings and other drains with the pipe diameters and invert levels.

**Add Clause 4.3.5.7: Seismic Consideration**

The potential effects of seismic events should be considered when designing new pipework and associated structures. The design shall allow for adequate flexibility to minimise the risk of damage during a seismic event. This includes assessment of the hazards that are likely to occur during a seismic event such as liquefaction and ground movement.

**Specific design provisions shall include:**

- Consideration of pipe materials including PVC, PE or concrete lined steel pipe.
- Pipelines in areas with potential for liquefaction, lateral spreading, tsunami inundation or slope failure shall be designed and constructed using materials with suitable restraint, redundancy or appropriate mitigation.
- Trunk pipelines, reservoirs and pumping stations shall be designed with a higher level of resilience to seismic activity.
- Buried structures should have appropriate flexible couplings at the structure/fill interface to allow for differential movement.

**Add Clause 4.3.5.8: Stormwater Neutrality**

If the discharge runoff exceeds the Water Services Bylaw discharge allowance on-site attenuation, storage or infiltration is likely to be required.

For small sites, the range of on-site storage options is limited, and detention tanks may be a practical solution. HDC has developed a guideline and a spreadsheet for detention tank design. Copies are available on the Council website: [www.hastingsdc.govt.nz/stormwater-detention](http://www.hastingsdc.govt.nz/stormwater-detention).

Consent notice may be placed on property titles requiring site mitigation.

*Clause 4.3.6: Stormwater Pumping***Add the paragraph:**

Stormwater pumping will only be approved when there is no practical alternative to gravity disposal. This is because stormwater pump stations are often only used intermittently and under extreme conditions when mains power supply cannot be guaranteed.

**Pumping systems shall be specifically designed such that:**

- The performance matches the inflow hydraulics of the upstream system without backwater effects;
- Technical details such as pump configuration, type and manufacturer shall be discussed with Council staff before detailed design is commenced;
- All mechanical equipment shall be designed for a maximum of 15 starts per hour;
- Flanged or welded fittings shall be provided throughout, with a proprietary dismantling joint or similar in the system to facilitate dismantling;
- The control switchboard is to have the capability of connecting an emergency generator,
- Council may require that on-site emergency power generation be provided;
- To incorporate control, monitoring, alarm and telemetry communication systems to Council standards at the time of the design. The design of these systems is to be undertaken in consultation with the Council's Water Services Team.

**Pump Station Location****Add the paragraph:**

- All pump stations are to be located on public land with suitable all weather vehicle access.
- A private stormwater pump station for a single property represents an alternative solution in terms of the BUILDING ACT 2004. As such, the developer is required to demonstrate that the

pump station complies with the provisions of the New Zealand BUILDING CODE when seeking consent from the Council.

- A private stormwater pump station serving more than one property will require a compliance schedule as well as an annual building warrant of fitness in order to meet the requirements of the BUILDING ACT 2004.

#### *Clause 4.3.7: Low impact design*

##### **Add the paragraph:**

- The Council will support the use of alternative or low impact stormwater management systems, provided that these minimise the whole of life costs to Council and the community, and that they succeed in reducing impacts on the receiving environment.
- Stormwater attenuation and treatment facilities shall be protected within a drainage reserve. Easements may be considered in exceptional circumstances.
- Where open water courses are retained through a new development, channel upgrading enhancement may be required as part of the consent.
- Overland flow paths shall be identified and protected from conflicting uses and restrictions or obstruction.

Reference shall be made to the HAWKE'S BAY REGIONAL COUNCIL (2009): HAWKE'S BAY WATERWAY GUIDELINES - STORMWATER MANAGEMENT. These guidelines can be found at [www.hbrc.govt.nz](http://www.hbrc.govt.nz).

#### *Clause 4.3.7.3: Low impact design devices*

##### **Add the paragraph:**

Consider the use of HAWKE'S BAY REGIONAL COUNCIL'S HAWKE'S BAY WATERWAY GUIDELINES to determine the suitability & design of low impact devices.

#### *Clause 4.3.7.9: Soakage Devices*

##### **Replace 4.3.7.9 a) with the following:**

- (a) Capacity adequate as outlined in Section 4.3 Design.

##### **Add the paragraph:**

Council require geotechnical assessments to be carried out in order to adequately assess the suitability of soakage devices.

#### *Clause 4.3.8: Natural and Constructed Waterways*

Refer to HBRC regional rules related to waterways. Consents will be required from HBRC for works within or adjacent to waterways.

#### *Clause 4.3.9: Pipelines and culverts*

##### *Clause 4.3.9.1: Location and Alignment of Public Mains*

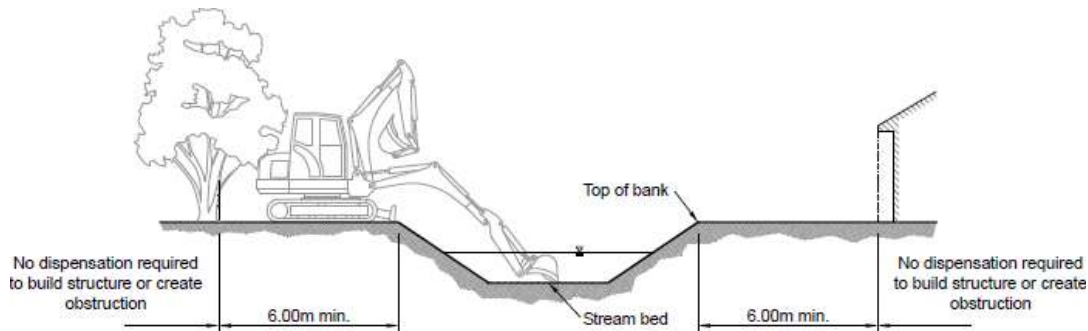
##### **Add the paragraph:**

In relation to piped network infrastructure and overland flow paths, the Network Corridor/Easement width is the area which extends:

- (a) Horizontally 1.5 metres on both sides from the centre of any pipe with an internal diameter of less than 1.0 metres or;
- (b) For pipes larger than 1.0m in diameter, and overland flow paths an appropriate width is to be discussed and confirmed with HDC.

For drains and waterways, the "Network Corridor" is the area between a 6.0 metre setback from the bank on each side of a drain, watercourse, or from a known flood extent.

FIGURE 3 - NETWORK CORRIDOR FOR DRAINS AND WATERWAYS



The lateral erosion risk and degradation erosion risk should also be considered for the setback distances.

**An Application for Approval will be required for any work undertaken along a network corridor.** The proposed works or structure will be assessed for the effect on the network infrastructure.

**Matters that will be considered include the following:**

- (i) Will the proposed works or planting result in damage to, or impair the structural stability of, the pipe, drain or waterway either during construction or over time after completion?
- (ii) Will the proposed works or planting affect the functioning of the pipe, drain or waterway either during construction or over time after completion?
- (iii) Will the proposed structure result in excessive loads on the network infrastructure?
- (iv) Will access for repair and maintenance, or renewal, of the network infrastructure be significantly affected or restricted?

It is preferred that any existing secondary flow path should either be secured by creation of public open space as a reserve, or used as a road.

Easements shall be provided for any public drainage pipelines located on private property. The width of the easement shall be as defined in the above paragraph.

*Clause 4.3.9.2: Materials*

**Add the sentence:**

All PVC pipes shall have a minimum SN16 rating.

*Clause 4.3.9.4: Minimum Cover*

**Add the following:**

All stormwater pipe lines shall have the following minimum cover:

- Within the road 0.75m
- Within the berm 0.6m

## Minimum Clearance

Table D3 below outlines the minimum vertical and horizontal clearances required between stormwater infrastructure and other underground services.

TABLE D3 - MINIMUM CLEARANCES

Other Services	Minimum Horizontal Clearance (mm) Proposed Stormwater Pipe Diameter		Minimum Vertical Clearance (mm)
	≤ DN300	>DN300	
Sewers ≤ DN300	300	600	150
Sewers >DN300	600	600	300
Low Pressure Gas	300	600	300
Telecommunications	500	600	300
Electricity	300	1000	300
Kerbs	300	600	150
Water mains	600	600	500

### Clause 4.3.9.5: Minimum Grade and Flow Velocities

#### Delete and replace with:

The minimum flow velocity for pipes flowing just full shall be 0.7m/s. The choice of a larger diameter pipe that is necessary for the peak discharge is not a satisfactory means of achieving compliance with the minimum velocity requirements.

### Clause 4.3.9.7: Inlets and Outlets

#### Add the paragraph:

- Any discharge to any open drain/waterway will require a consent from HBRC.
- To control debris and ensure safe access, all pipelines less than 600 mm in diameter, or with a length greater than 20 m, with an inlet from an open watercourse, shall have specially designed inlet structures.

## Sumps

#### Add the paragraph:

Sump design shall:

- Comply with HDC standard drawings WS 401, WS 402, WS 403, WS 404, WS 405, WS 406 and WS 407;
- Include a calculation of its capacity based on acceptable levels of ponding, the risk of debris blockage and orifice flow;
- Require specific design where large capacity sumps and lead pipe work is required;
- Consider the effects of road cross fall and longitudinal grade (particularly on steep grades) to ensure that the full design flow enters the sump.

Discharge from sumps shall be via pipe leads, either

- Directly into manholes, *or*
- Soffit to soffit into a stormwater main of at least 900 mm diameter, provided that the receiving pipe has a manhole within 40 m of the sump lead connection. Where the hydraulic gradient of a sump lead is affected by pipe full conditions in the main, specific design calculations to determine the size will be required.

*Clause 4.3.9.11: Trenchless Technology***Add the sentence:**

Trenchless technology is acceptable provided design and material standards are met.

*Clause 4.3.10.1: Standard Manholes***Add the sentence:**

Manholes are to be constructed as per HDC standard drawings WS 103, WS 202, WS 203, WS 204 and WS 207.

Permanent steps and ladders are not to be used. Manholes that will be deemed to be a confined space entry must incorporate safe operating procedures for entry as part of design.

**Manholes in Soft Ground**

Where a manhole is to be constructed in soft ground, the foundations will require specific investigation and design.

**Options for foundation strengthening can include:**

- Undercutting the surrounding area and backfilling.
- Founding on hard fill/reinforced concrete base. The dimensions of this base will require specific design, and shall not be less than 150mm thick, and twice the area of the manhole.

**Manholes on Large Pipelines**

- Manholes on pipelines where the use of a standard manhole is not suitable shall be specifically designed.
- Manholes on pipelines greater than 450mm diameter shall be constructed of larger diameter components to ensure benching space can be provided. Chimney style manholes may be used. See HDC standard drawing WS 207.
- Manholes on straight sections of pipelines of 1,200 mm diameter and larger may be constructed using pre-formed tees.
- On pipelines 1 m diameter and larger, the spacing of manholes may be extended to 200 m and curvature on the pipeline may be permitted providing that joint deflections are within the limits of the manufacturer's recommendations.

*Clause 4.3.10.2: Manhole Materials***Add the paragraph:**

- Manhole lids and covers shall be as detailed on HDC standard drawing WS 103.
- The use of precast spacer rings shall be detailed to allow for the slope of the road, and the need to provide for the proper construction of base course and surfacing construction, taking into account the need to apply both a first and second coat seal in the case of a chip sealed surface.
- Aluminium covers are not permitted.

*Clause 4.3.10.4: Shallow Manholes (or Mini Manholes)***Amend first sentence:**

For shallow systems (less than 1.0m to invert), a DN 400 or 600 mm minimum diameter MH may be permitted subject to approval by HDC.

**Add the paragraph:**

- Mini manholes/maintenance shafts require HDC approval for use and are only to be used where the depth to pipe invert is less than 1.0 m.
- Maintenance shafts shall only be used where the installation of a 1,050 mm diameter manhole is not feasible and pipe diameters do not exceed 225mm. Maintenance shafts are to be a minimum of 600 mm diameter and the maintenance shafts must allow for the insertion of a CCTV camera.

- Maintenance shafts are not be located in the carriageway and are to be installed in accordance with HDC standard drawings WS 103 and WS 204.

*Clause 4.3.10.6: Manhole Connections*

**Add the paragraph:**

- On all rigid pipes (i.e. concrete or earthenware) entering and leaving manholes, a flexible joint must be provided as detailed in HDC standard drawing WS 202.
- Pipe junctions shall be as per WS 203 unless approved by the Council.

*Clause 4.3.11: Connection to the public system*

**Add the paragraph:**

HDC preference is for kerb outlets.

Refer to HDC standard Drawing WS 407 for direct sump lead connection to the existing HDC network. See also WS 105 and WS 106 for further details.

Clause 4.4: Approval of Proposed Infrastructure

*Clause 4.4.2: Information to be provided*

**Add the paragraph:**

All information outlined in (a) to (j) is required to be provided as part of a development application.

All levels shall be referenced to the Hawke's Bay Datum (MSL = +10m). In terms of horizontal alignment the reference shall be to the Hawke's Bay 2000 Datum.

Clause 4.5: Construction

*Clause 4.5.1: Pipeline Construction*

**Add the paragraphs:**

The construction of pipelines shall be carried out in accordance with the requirements of:

- Applicable New Zealand Standards.
- Manufacturers published recommendations.
- Designer specified tolerances.

*Clause 4.5.2: Trenching*

**Add the paragraph:**

De-watering water (derived from groundwater systems or bores) may contain those characteristics defined as 'Controlled Stormwater'. Discharge of all de-watering water may require an approval. An alternative is to discharge de-watering water to the wastewater system (in accordance with a trade waste consent) but this option is often limited by the available pipe capacity and potentially high discharge flow rates.

The approval process for applications to discharge de-watering water will primarily focus on the effect of the proposed discharge on the integrity of the stormwater network. Consideration will also be given to the effect of the proposed discharge on the Council's stormwater network consent, but such consideration may not be necessary if the applicant has obtained or intends to obtain a water take/discharge consent from the HBRC.

In general, with good ground conditions, suitable bedding and trench details, installation shall be as shown in HDC standard drawing WS 201 and WS 104. In poor ground conditions, potentially unstable ground, or where extreme loadings will be encountered; pipe strength and bedding shall be specifically designed and certified.

*Clause 4.5.3: Reinstatement*

**Add the paragraph:**

- See WS 103 "Typical manhole cover adjustment and arrangement" for further details.
- The backfilling and reinstatement of suitable material should be in accordance with WS 104 "Typical Trench and Surfacing details".

- Backfilling and reinstatement shall be undertaken so as to:
- Prevent undue stress being imposed on the pipelines and associated infrastructure as a result of settlement or lack of foundation support.
- Control the movement of water into and along the backfill material.
- Control long-term settlement of all materials used to backfill the trench. Backfill materials shall comply with NZTA specifications F/1 and B/2.
- For backfill and reinstatement projects within a road carriageway, pavement construction shall be as per NZTA specification B/2 with materials complying with specifications M/3 and M/4.

#### *Clause 4.5.4: Inspection and Acceptance*

##### **Add the paragraph:**

Inspection on site shall be done by a suitably qualified person, who shall have reasonable liaison with and instruction from the design engineer for the works being inspected. The written records and certification of these inspections shall be included in the Completion Report, as specified in PART 1 OF NZS 4404:2010 SECTION 1.8.10 COMPLETION DOCUMENTATION.

##### **Inspection during construction shall be as set out below:**

- The pressure testing of sealed stormwater pipelines may be required, including pipelines that are being designed to operate in a surcharge condition. Testing will be to ground level.
- Appendix C of NZS 4404:2010 (field testing of pipelines) should be used to select an acceptable method for testing. The low pressure air test is the Council's preferred test method.
- Post construction CCTV inspection is required for all pipelines over 225mm diameter as set out in clause 4.5.4 Inspection and Acceptance.

##### **Details of the acceptance criteria are set out as follows:**

All CCTV inspections shall be carried out by a professional operator. The inspection shall be carried out using a pan and tilt camera. The operator shall pan around every joint and check every lateral connection for defects. The footage in digital format, and the accompanying CCTV log sheets for each inspected pipe length (as per the template in the NZ Pipe Inspection Manual), showing the features and condition of all inspected pipe lengths, shall be provided to the Council. Footage supplied without log sheets will not be accepted. All pipelines shall be flushed within 24 hours prior to inspection.

##### **The CCTV inspection shall confirm that there is no:**

- Pipe misalignment or deformation;
- Visible defects such as displaced joints or laterals, cracked barrels, or protruding rubber rings;
- Variation from the pipe design grades resulting in pipe displacement of greater than 10%;
- Visible dips or ponding;
- Evidence of inflow or infiltration at joints or laterals.
- CCTV will be required to be repeated after remediation work is carried out, should the first inspection indicate non-conforming pipe work.

##### **To ensure that the stormwater drainage works are constructed to the required standards, inspection by the developer's agent shall cover at least the following details:**

- Qualifications and experience of the staff constructing the works.
- Pipe sizes, pipe levels and pipe gradient. The inspection will need to confirm that the designer specified tolerances have been achieved for all stormwater system components, and in particular those relating to pipeline line and level.
- Quality, dimensions and reinforcement of all materials supplied, unless these are supplied by a manufacturer accredited to ISO 9002.
- Trench depth and width, quality of trench backfill material, and compaction data.
- Materials and workmanship in relation to jointing of pipes, manhole risers, etc.
- Sizes, construction materials and spacing of anti-scour blocks.



- Manhole benching and other details.
- CCTV inspection outcomes and defect reports. Refer clause 4.5.1 Pipeline Construction for acceptance criteria.
- Provision of as built drawings and information.

*Calculation Example: Determining Suitability for Soakage Disposal*

**Soakage is NOT to be used in the following circumstances:**

- For disposal of road runoff;
- For disposal of runoff in areas not approved for soakage - for example Havelock North;
- For disposal of runoff, where the method in this section shows that soakage is not suitable.

**Suitability for soakage is to be determined by a two-step process:**

**Step 1**

Designer provide a soil profile and use the data to determine that the permeability of the sand layer and depth to the water table makes soakage suitable using Tables D4 & D5 below.

**Step 2**

Then, follow the soakage design method in Section 9 of the NEW ZEALAND BUILDING CODE, Approved Document E1 - Surface Water. (Note the average runoff coefficient used in the soakage calculation may be adjusted by following the method above).

**Requirements for Sampling of Soil Profile**

The soil maps and table are sourced from the following document: LANDCARE RESEARCH (2006): SOILS AND THEIR INFILTRATION RATES AND PERMEABILITY. Unfortunately the soil sampling for this investigation was sparse and developers who wish to use the “*suitability for soakage method*” must provide a site-specific soil profile data from an IANZ accredited soils laboratory.

TABLE D4 - ESTIMATED PERMEABILITY CLASSES: HERETAUNGA PLAINS SOILS ADJACENT TO HASTINGS URBAN AREA

Name	Symbol	Texture	Drainage Class	Water-table depths after heavy rain	Ksat Class	Ksat (mm/hr)	Suitable for soakage
Omahu	1	Stony gravels	Well	>120 cm	Very rapid	>288	Yes - if calculations approved by Council's Drainage Services Manager
	1a	10–15 cm sand on stony gravels			Very rapid (stony gravels); Moderate or rapid (sands)	>288 (stony gravels); 4–288 (sands)	
	1b	15–30 cm sand on stony gravels					
Twyford	5	> 45 cm silt loam on sand	Well	>90 cm	Moderate	4–72	
	5s	30–45 cm silt loam on sand			Rapid	72–288	
	6	>45 cm sandy loam on sand		>160 cm	Moderate	4–72	
	6s	30–45 cm sandy loam on sand			Rapid	72–288	
Karamu	13	45–60 cm silt loam or clay loam on sand	Moderately well	60–75 cm	Rapid	72–288	No
	13s	30–45 cm silt loam or clay loam on sand					
Hastings	14	>60 cm silt loam on sand	Imperfect	30–60 cm	Moderate (>100 cm silt loam) Rapid (>60 cm sand)	4–72 (>100 cm silt loam); 72–288 (>60 cm sand)	
	15	30–60 cm silt loam on sand			Moderate to slow	1–72	
Kaiapo	19	>30 cm clay loam on silt loam	Poor	<30 cm	Slow	1–4	

Note 1: Permeability classes for Heretaunga Plains soils based on measurements made during the Heretaunga Plains soil survey (Griffiths 2001).

TABLE D5 - PERMEABILITY CLASSES

Permeability Class	Hydraulic conductivity (mm/hr)	
	Range	Midpoint of Range
<b>Very rapid</b>	>288	150
<b>Rapid</b>	72–288	180
<b>Moderate</b>	4–72	38
<b>Slow</b>	1–4	2.5
<b>Very slow</b>	<1	0.5

*Permeability classes and hydraulic conductivity rates: These classes are modified from Griffiths (1985) and are those used by Griffiths (2001).*

## Schedule E – Hastings District Council Altered Requirements to Section 5 NZS 4404:2010 – Wastewater

The Hastings District Council has adopted Section 5 of NZS 4404:2010 with the following additions and/or alterations to be used in conjunction with NZS 4404:2010.

### Drawings

NZS 4404:2010 includes Standard Drawings in Appendix A. Council has opted in this document to make reference back to the drawings produced for WSA 02, and has amended these drawings for inclusion in this document. Within the following text specific reference is made where appropriate to the attached Drawings, referenced as WS \*\*\* Document users are also encouraged to be familiar with and where appropriate utilise the Drawings in Appendix A in NZS 4404:2010.

#### Clause 5.2.1: Objectives

Under item (m) Council would expect the least “whole of life costs” to be achieved in the preferred design solution.

#### Clause 5.3: Design

##### Clause 5.3.5.1: Design flow

**When calculating the design flows, using the method outlined in NZS 4404:2010, use shall also be made of the following information and tabulated data:**

#### (a) Estimation of Equivalent Population (EP)

**Single occupancy lots – the EP per single occupancy shall be based on the following:**

<b>Hastings region general, excluding Waipatiki &amp; Waimarama</b>	3.5
<b>Waipatiki</b>	5.0
<b>Waimarama</b>	5.0

#### (b) Equivalent Populations for Synchronous Discharges

<b>Residential classification - Single occupancy lots</b>	EP per Unit shall use the data above.
<b>Peak dry weather (sanitary) flow</b>	the ADWF is deemed to be 250 L/p/EP or 0.0029 L/s/EP

### Commercial/Special Cases classification

Where Future Industrial Areas are proposed but the future industry types are not known, a covenant on the title to restrict activities will allow the worst case appropriate EP Classification to be applied to the reticulation design. Without a covenant, the development will be deemed a 'wet' industry and shall be subject to an EP Classification set at Council's discretion.

Sewage quality / Trade waste management - Refer to Council's [CONSOLIDATED BYLAWS OCTOBER 2016 – BYLAWS CHAPTER 7 WATER SERVICES](#) for conditions. A Trade Waste Consent application is required for acceptance or otherwise by Council.

TABLE E1 - EP OF NON-RESIDENTIAL EP/HA CLASSIFICATIONS

Industry EP Classification (refer to Table A2 in Drawing WSA 02)	EP Per Built Up Hectare (BU)			
	N = 1	N = 2	N = 3	N > 3
1	20,830	13,960	12,710	11,670
2	13,890	9,310	8,470	7,780
3	11,110	7,440	6,780	6,220
4	8,330	5,580	5,080	4,670
5	5,560	3,720	3,390	3,110
6	2,780	1,860	1,690	1,560
7	1,390	930	850	780
8	690	465	425	390
9	350	235	210	195
10	140	95	85	80

#### (c) Flow Estimation for Undeveloped Areas

<b>Peak dry weather (sanitary) flow</b>	The ADWF is deemed to be 250 L/p/EP or 0.0029 L/s/EP.
<b>IIF Calculation</b>	The Factor <sub>Containment</sub> shall be not less than 1.5, unless specifically approved otherwise by Council.

Values of I(1,2) for calculation of I shall be taken off Table E2 below:

TABLE E2 - APPROXIMATE VALUES OF I<sub>(1,2)</sub> FOR VARIOUS LOCATIONS

Location	I <sub>(1,2)</sub>
Eskdale	19
Hastings	15
Havelock North	16
Ocean Beach	17
Poukawa	19
Waimarama	18
Waipatiki	20

#### Clause 5.3.6: Structural Design

WSA Drawings SEW 1400 to 1411 and WS 101 to WS 509 provide acceptable solutions for specific design outcomes.

**Clause 5.3.7.2: Materials**

Council has a list of approved products for use in wastewater construction. This is available from Council’s Engineering Division. Where products are specifically stated, this shall be taken to mean that alternative products are not acceptable, unless specifically approved by Council.

**Where no specific products are stated as being acceptable, all of the following product selection criteria shall be met:**

- Manufacture by a nationally and/or internationally recognised leader in the applicable product range, *and*
- Manufactured in compliance with relevant standards, given in descending order of priority below. Should there not be a relevant standard for manufacture of the applicable product found within the standard at the higher level (highest = (i)) as stated below, then compliance with a standard found on the next level down shall be demonstrated unless again no applicable standard exists, moving on down the list until a applicable standard is found to demonstrate compliance:
  - (i) NZS, AS, AS/NZS
  - (ii) BS, EN
  - (iii) Other international standard authority (e.g. JAS, ASTM, DIN, ISO)
  - (iv) WSAA approved
  - (v) Australasian material supplier association recommended practice document(s)

*Should there be no available standard to which the product’s manufacture can be verified, the product will be deemed unacceptable.*

- Local maintenance support for the product within the Napier/Hastings district is required.
- For Principal Gravity Sewer Pipeline Systems, with reference to PVC-U pipe, SN16 pipe is the only acceptable stiffness class for ductility reasons.

**Clause 5.3.7.4: Pipes in private property**

**Location of Public Pipelines and Other Council Infrastructure**

When locating all pipelines, due account should be given to the location of other services, and kerb and channel, when defining pipeline alignments. Space limitations usually require that drainage pipes (sewer and stormwater) must be laid in or nearby the carriageway. Drains shall be laid so that future maintenance access is provided for as described in Council’s Bylaws.

Pipelines on private land shall be sited to minimize reduction of the building area available (i.e. within side and rear yards as defined in the District Plan). Pipelines shall be laid at least 1.0m clear of existing buildings, and consideration shall also be given to the width required for maintenance access and interaction with building foundations when locating pipelines. Drainage structures including manholes shall be located clear of boundaries and kerb lines. Easements shall be provided for any public drainage pipelines located on private property.

**Clause 5.3.7.9: Clearance from underground services**

**Table 5.6 in NZS 4404:2010 shall be replaced by Table E3 below:**

**TABLE E3 - CLEARANCES BETWEEN WASTEWATER AND OTHER UNDERGROUND SERVICES**

Utility (Existing Service)	Minimum Horizontal Clearance (mm)		Minimum Vertical Clearance <sup>1</sup> (mm)
	≤ DN300	>DN300	
Stormwater Pipes <DN 300	300	600	150 <sup>2</sup> /300
Stormwater pipes >DN 300	600	600	300
Low pressure Gas mains	300 <sup>3</sup>	600	150 <sup>2</sup> /300

Utility (Existing Service)	Minimum Horizontal Clearance (mm)		Minimum Vertical Clearance <sup>1</sup> (mm)
	New Wastewater Size		
	≤ DN300	>DN300	
Telecommunication conduits and cables	300 <sup>3</sup>	600	150 <sup>2</sup> /300
Electricity conduits and cables	500	1000	225 <sup>2</sup> /300
Other drains	300 <sup>3</sup>	600	150 <sup>2</sup> and <sup>4</sup> /300 <sup>4</sup>
Water mains	1000 <sup>5</sup> /600	1000 <sup>5</sup> /600	500 <sup>4</sup>

Notes:

1. Minimum vertical separation between wastewater pipe and other service.
2. A minimum vertical clearance of 300mm applies if the size of either the existing service or proposed pipe is >DN 300.
3. Clearances can be further reduced to 150mm for distances up to 2m when passing installations such as poles, pits and small structures, providing the structure is not destabilized in the process.
4. Clearance from kerbs shall be measured from the nearest point of the kerb.
5. A smaller clearance can be accepted if the upper pipe is suitably supported on a pedestal either side of the lower service pipe.

Table E4 gives minimum cover requirements for wastewater pipes.

**TABLE E4 - MINIMUM COVER OVER WASTEWATER SEWERS**

Location	Minimum cover to top of sewer (mm)
Private residential property/public land	375mm (no vehicle loading)
Private residential property	600mm (subject to vehicle loading)
Road reserve – berms and footpaths	600mm
Un-sealed carriageways	750mm
Sealed carriageways (<1000 vpd)	750mm
Sealed carriageways (>1000 vpd)	900mm
State Highway	Refer to New Zealand Transport Agency

#### Clause 5.3.8.4: Manholes

In addition to the information in Section 5.3.8.4 of [NZS 4404:2010](#), and [WSA Drawings SEW 1300 to 1317](#) and [WS 101 to WS 509](#) the following guidelines should be followed:

#### General

Manholes shall be provided on all pipelines at each change of direction and/or gradient, at each branching line of a diameter between 150mm and 600mm, at the termination of mains, and at a spacing of not more than 90m unless specifically approved by Council. Manholes using pre-cast component are required, unless the design conditions dictate otherwise in which case specific approval will be required. The standard manholes drawings in [NZS 4404:2010](#) (CM 004 to 006) are to be used, expect that Council will not allow the use of any rungs or permanent ladders. The use of lock down lids is required in heavily trafficked areas, or where a positive barrier to access is required by Council.

On Drawing CM 005 designers should note that sufficient workspace needs to be available within any manhole utilising an internal drop. In cases where the manhole does not provide sufficient internal space and external drop shall be used. Within any drop inlet, allowance needs to be made for rodding access in line with the entry pipe. One means of achieving this requirement is to use a Tee junction with screw cap.



For manholes located in road carriageways, the finishing of the concrete manhole lid and cast iron frame and cover must take into account the flexibility or otherwise of the adjoining road pavement. If the adjoining road pavement is a flexible pavement, then the manhole lid needs to be located below the base course layer (at least 150mm) and the lid and cast iron frame brought up to the surface using appropriate risers and rings. The lids used in any manhole structure must be compatible with the expected traffic loading.

Manholes requiring person-entry fall within the definition of a “confined space” and the design must facilitate the use of safe operating procedures (e.g. the use of tripods and harnesses) when entry is necessary.

### Standard Manholes

Standard manholes (refer [NZS 4404:2010](#) Drawing CM 004) are to be circular with an internal diameter of not less than 1050mm and shall be used on pipelines deeper than 600mm. On shallower pipelines an access chamber can be used. (Refer [NZS 4404:2010](#) Drawing CM 006)

Precast manholes shall consist of 1050mm internal diameter spun concrete pipe to NZS 4058:2007 Class 2 with the holes cast in the side for step irons to be securely plugged with mortar. Precast concrete bases are to be used for manholes with precast barrels. Riser sections shall be jointed as shown on the standard drawing, carried out in accordance with the manufacturer’s recommendations, to provide a watertight structure. The top riser is to be made 300mm deep, to allow for easy lowering of the manhole barrel height.

Cast in-situ manholes, where approved shall be constructed using ordinary grade concrete (20 MPa) vibrated to give maximum density and watertight construction.

All holes for pipe entry shall be saw cut. Impact holing is not to be used under any circumstances.

### Manholes on Large Pipelines

Manholes on pipelines where the use of a standard manhole is not suitable shall be specifically designed.

Manholes on pipelines greater than 450mm diameter shall be constructed of larger diameter components to ensure benching space can be provided. Chimney style manholes may be used.

Manholes on straight sections of pipelines of 1200mm diameter and larger may be constructed using pre-formed tees.

On pipelines 1m diameter and larger the spacing of manholes may be extended to 200m and curvature on the pipeline may be permitted providing that joint deflections are within the limits of the manufacturer’s recommendations.

### Deep Manholes

Manholes deeper than 5 metres shall match the wastewater manhole shown on WSA Drawing WS 202 and SEW 1311. Intermediate platforms shall not be used (to facilitate the use of exterior fall restraint and emergency evacuation equipment). Step irons or ladders are not to be installed, unless specifically approved by Council.

### Hydraulic Flow in Manholes

Losses in a manhole shall be compensated for by a drop in the invert across the manhole equivalent to 20mm plus 5mm per 10° of change in direction of flow, or as determined from a specific calculation. For a pipeline greater than 1m in diameter the drop shall always be determined by specific calculation.

### Benching

The pipe invert and benching through manholes shall either be as detailed in the standard drawings, or can utilise other options (e.g. half pipe) provided that the appropriate energy loss allowance has been made in the design. Edges shall be rounded and the benching given a form and finish which facilitates smooth flow, non-entrapment of debris, and easy access with cleaning rods.

### Steps and Ladders

Permanent steps and ladders are not to be used. This policy is to discourage entry to the confined space.

### Manhole Lids and Covers

Manhole lids and covers shall be as detailed on WSA Drawings SEW 1308 and CM 004 in [NZS 4404:2010](#). The use of precast spacer rings shall be detailed to allow for the slope of the road, and the need to provide for the proper construction of base course and surfacing construction, taking into account the need to apply both a first and second coat seal in the case of a chip sealed surface.

Aluminium covers are not permitted.

### Manholes in Soft Ground and High Water Tables

Where a manhole is to be constructed in soft ground the foundations will require specific investigation and design. Options for foundation strengthening can include undercutting the surrounding area down to stable ground and backfilled with suitable compacted hard fill to provide an adequate foundation bearing capacity. Alternatively, the manhole could be founded on hard fill/reinforced concrete base. The dimensions of this base will require specific design, (refer to Part Four, **SCHEDULE B - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 2 NZS 4404:2010 - EARTHWORKS AND GEOTECHNICAL REQUIREMENTS**) but will not be less than 150mm thick, and twice the area of the manhole.

Where manholes are to be constructed in areas of high water tables and there is a possibility of flotation, specific design shall be undertaken to ensure the manhole is stable under all conditions.

### Pipe Main Connections to Manholes

On all rigid pipes (i.e. concrete or earthenware) entering and leaving manholes, a flexible joint must be provided as detailed in WSA Drawings SEW 1302 and WS 202.

Pipe junctions in manholes shall be aligned to ensure streamlined flows through the manhole, unless specifically approved otherwise by Council.

*WSA Drawing SEW 1304 and WS 203 give guidelines on typical entry/exit arrangements.*

### Drop Connections for Service lines

Refer to WSA Drawings SEW 1303, 1306 and CM 004 and CM 005 in [NZS 4404:2010](#).

### Manhole Requirements for Pipe Inter-Connections

Manholes are required at all public drain pipe junctions.

#### *Clauses 5.3.8.5: Maintenance Shafts and 5.3.8.6: Terminal Maintenance Shafts*

The maximum depth of any Maintenance Shaft (MS) or Terminal Maintenance Shaft (TMS) shall be 2.0 m. Council will not accept the connection of reticulation sewers and property connections directly into the riser shaft of a MS or TMS.

#### *Clause 5.3.10: Connections*

In cases where the reticulation sewer is deeper than 1.5m and the required property connection level is such that the vertical drop from the required connection level to the sewer is greater than 1.2m, then a vertical riser (jump-up) shall be constructed as shown on WSA Drawing SEW 1106 (Vertical riser with single or double connections). Where the reticulation sewer is located in private property, the riser pipe and IO shall be located above the reticulation sewer as shown on WSA Drawing SEW 1106 and typical sewer connection drawings WS 301 to WS 303 and WW 001 to WW 002 and shall extend to the FSL. The buried interface method is not permitted by Council unless otherwise specifically approved for the development.

#### *Clause 5.3.11: Pumping stations and pressure mains*

Refer to Section 6.2.

### New Section: Alternative Systems

When considering the use of alternative wastewater collection and disposal systems, the designer will need to evaluate and report on the proposal in sufficient detail to allow Council to consider the proposal.

An evaluation of the site on which the system is to be constructed needs to provide sufficient information to determine if the site can support an onsite wastewater treatment and disposal system, what system design concept to use, and what design parameters to follow.

**The components of a soil/site evaluation shall include:**

- Topography and landscape position;
- Soil characteristics: soil texture, structure, clay mineralogy and organic soils;
- Soil wetness conditions in all seasons;
- Soil depth and permeability;
- Seasonal changes in groundwater level;
- Restrictive horizons;
- Available space (the area of suitable soil, the required setbacks, other site layout factors relevant to the development).

**The components of the system design shall include the:**

- Design wastewater flow and characteristics;
- Type of pre-treatment;
- Type of nitrification field;
- Type of distribution system;
- The location and layout of the proposed system;
- The conditions for any site modification.

For community based systems a compliance certificate will be required once the system is properly installed.

**This document shall detail:**

- System type;
- System performance;
- Operation and maintenance requirements;
- As-built-drawings;
- Operating manuals and;
- System monitoring and reporting requirements.

**Clause 5.5 Construction**

*In general, the design principles outlined in Clause 4.5 of Section 4 of [NZS 4404:2010](#) are to be followed. The following text provides additional comments and some specific changes that will take precedent over Section 4 in [NZS 4404:2010](#).*

*Cover to Pipelines*

**The cover provided to pipeline systems shall be in accordance with the specifications listed above, the manufacturers' published recommendations, and will need to take into account the following:**

- Imposed loads during construction of the pipeline or reconstruction of the road or other infrastructure assets above the pipeline (including possible reshaping of the road profile).
- Imposed loads during the lifetime of the pipeline system from backfill, expected traffic, and any surface structures.

If the required cover cannot be provided for technical reasons, then other means of protecting the pipeline such as spreading the imposed load should be implemented.

*Pipe Strength, Bedding, Surround and Backfilling*

In general, with good ground conditions, bedding and other trench details shall be as shown in [NZS 4404:2010](#) Drawings CM 001 to CM 003, or WSA Drawings SEW 1200 to 1202 and WS 201. In poor ground conditions, potentially unstable ground, or where extreme loadings will be encountered; pipe strength and bedding shall be specifically designed and certified, and as shown on Drawings SEW 1203 to 1205.

**Other additions to these drawings are:**

NZS 4404:2010 Drawing CM 002: Note 7 should also include the use of geotextile separation between granular trench fill (e.g. road base course) and the underlying pipe embedment if required to prevent migration of fines. Refer also to WS 201.

***Rigid Pipes up to 525mm diameter (Reinforced Concrete)***

Pipe strength and bedding shall be selected for suitability under the design loading conditions. The type of bedding and class of pipe adopted shall be in accordance with AS/NZS 3725:2007– DESIGN FOR INSTALLATION OF BURIED CONCRETE PIPES, and the appropriate pipe material standard (e.g. AS/NZS 4058:2007 PRECAST CONCRETE PIPES (PRESSURE AND NON-PRESSURE)).

Pipe bedding and backfilling shall be carried out in accordance with WSA Drawing SEW 1201 and SEW 1202 Types 1 & 2, and AS/NZS 3725:2007 - Design for Installation of Buried Concrete Pipes. The selected fill (free of organic materials, lumps larger than 75mm, and stones larger than 40mm) shall be placed in 150mm layers and compacted to a density of not less than 95% of Maximum Dry Density as determined by Test 4.1.2 of NZS 4402:1986 METHODS OF TESTING SOILS FOR CIVIL ENGINEERING PURPOSES – SOIL TESTS. The compaction shall be completed using a hand operated vibrating compactor with a total static weight not exceeding 0.5 tonne.

***Rigid Pipes greater than 600mm diameter (Reinforced Concrete)***

As per rigid pipes up to 525mm diameter except backfilling pipe surround shall be carried out in accordance with WSA Drawing SEW 1202 Type 4. The pipe bedding material shall comply with AS/NZS 3725:2007– DESIGN FOR INSTALLATION OF BURIED CONCRETE PIPES and a 150mm diameter subsoil pipe shall be laid for the first 30m upstream of every manhole (refer WSA Drawing SEW 1207).

***All Other Pipes***

Pipe strength and bedding shall be selected for suitability under the design loading conditions. The type of bedding and class of pipe adopted shall be in accordance with AS/NZS 2566.1:1998 (RECONFIRMED 2018) – BURIED FLEXIBLE PIPELINES - PART 1: STRUCTURAL DESIGN and AS/NZS 2566.2:2002 (RECONFIRMED 2016) – BURIED FLEXIBLE PIPELINES - INSTALLATION.

Pipe bedding and backfilling shall be carried out in accordance with WSA Drawing SEW 1201 and SEW 1202 Types 3 & 4. Following placement of the pipe, the granular bedding material shall be placed in layers not exceeding 150 mm and shall be carefully tamped with hand or mechanical tampers, with particular attention to compacting under the pipe haunches. The material shall not be dropped from a height of greater than 600mm. The granular fill shall be compacted to a density of not less than 95% of the Maximum Dry Density as determined by Test 4.1.2 of NZS 4402:1986 METHODS OF TESTING SOILS FOR CIVIL ENGINEERING PURPOSES – SOIL TESTS.

***Pipes on Steep Grades (greater than 1 in 10)***

If the pipeline gradient is steep (i.e. greater than 1 in 10), and/or ground conditions are poor, sufficient cement shall be added to the granular bedding material to provide a weak concrete with a strength of not less than 7 MPa. The depth of bedding shall be as shown in WSA Drawing SEW 1201 and SEW 1202, and shall be cleanly broken at the pipe joints with a 25mm gap formed with expanded polystyrene to maintain flexibility. Where the pipeline gradient exceeds 1 in 10 anti-scour blocks (refer to WSA Drawing SEW 1206) shall be constructed at the spacing's shown in Table E5, or alternatively, metal cut off plates made specifically as anti-scour blocks may be used.

TABLE E5 - SPACING OF ANTI SCOUR BLOCKS

Grade	Spacing (m)
<b>Steeper than 1 in 5</b>	5
<b>1 in 5 to 1 in 10</b>	10

***Construction and Backfilling in Road Reserve***

The designer and contractor will need to address compatibility between the often flexible pavement design and the more rigid stormwater construction works, in particular the works associated with manholes, service lids etc., in order to avoid cracks or differential movement. The use of base course overlays above lids, in associated with standard risers is one means of compliance.

### Acceptance and Testing of Wastewater System

Acceptance will be on the basis of the quality of materials and the general standard of construction. Inspection during construction shall be as set out below.

The pressure testing of sealed wastewater pipelines will be required, including pipelines that are being designed to operate in a surcharge condition. Testing will be to ground level or 50% above the hydraulic grade line head whichever is the greater. Pressure testing will be for leaks, with the acceptance requirement being that the pipeline must pass one of the three drainage leakage tests described in Clauses 8.1 to 8.3 of Section E1/VM1 of the Compliance Document for the New Zealand BUILDING CODE. Low pressure air testing is the preferred test. Pipeline inspection and recording by CCTV is required for all pipelines over 225mm diameter.

### Inspection during Construction

**To ensure that the stormwater drainage works are constructed to the required standards, inspection by the developer's agent during construction shall cover at least the following details:**

- Qualifications and experience of the staff constructing the works;
- Pipe sizes, pipe levels and gradient. *The designer will need to specify the tolerances required for construction of all stormwater system components, in particular the tolerances required for pipeline line and level. The design grades around the Heretaunga Plains in particular can be relatively flat. Achieving specified construction tolerances is extremely important;*
- Quality, dimensions and reinforcement of all materials supplied, unless these are supplied by a manufacturer accredited to ISO 9002;
- Trench depth and width, quality of trench backfill material, and compaction data;
- Materials and workmanship in joints between pipes, manhole risers, etc.;
- Sizes, construction materials and distances of anti-scour blocks;
- Manhole benching and other details;
- CCTV inspection outcomes and defect reports.

Inspection on site shall be done by a suitably qualified person with a good knowledge of drainage theory and construction practice, who shall have reasonable liaison with and instruction from the design engineer for the works being inspected. The inspector shall not have any financial affiliation with the contractor carrying out the work. The written records and certification of these inspections shall be included in the Completion Report, as specified in Part 1 of NZS 4404:2010.

### Specific Design Requirements for Pumping and Pressure Mains

If the scope of the proposed development is sufficiently large and/or complex to justify inclusion of pumping and pumping stations, then reference should be made to the current version of WSA 04-2005 SEWAGE PUMPING STATION CODE OF AUSTRALIA, along with the following amendments and additions to WSA 04-2005.

**The Clause numbers in italics below refer to WSA 04-2005:**

#### *Section 2.1 Concept Design Plan*

Under 'Maintainability' the last bullet point shall be modified to read "Utilise standard components that are readily available within the Hastings/Napier area and which are interchangeable where possible".

#### *Section 3.4.3 Emergency Structures*

Storage volumes shall be a minimum of six hours of ADWF. It should be noted that emergency relief discharge from the pumping station is not permissible.

#### *Section 3.5.4.3 Total Head losses*

The energy losses due to friction shall be calculated by a suitably qualified person from the Colebrook-White equation only. The roughness value 'k' used shall be 1.5mm for selecting the pump, but a sensitivity check with a k=0.1mm shall be undertaken to ensure the selected pump does not run off the end of its curve.

### Section 4.2.3 Pump Selection

The standard pumps shall be guiderail mounted Flygt pumps with either a C or N impellor, or Tsurumi pumps with a BZ channel impellor. Grinder pumps from the above two manufacturers may be acceptable where the duty flow is < 5 L/s. Approval from Council is required for using grinder pumps.

*With reference to (ii), the minimum sphere clearance (through let) shall be 75mm.*

With reference to (vi) and Note 4, the overall pump efficiency at the duty point for channel type impellors should be within 10% of the best efficiency point (BEP), with the BEP not less than 60%. Should the overall efficiency of the duty point be less than 54%, the designer shall provide details demonstrating the basis for the selection and showing why a pump of higher efficiency cannot be used.

### Section 4.3 Power System

Where WSA 04 is at variance to Council's pumping station electrical and control specification, the Council specification shall have precedence. This specification is available from Council's Engineering Division.

#### Section 4.3.5.1 Design

Cabinets shall be constructed from marine grade aluminium alloy, stainless steel or powder coated steel sheet to a colour agreed with Council.

#### Section 4.3.5.4 Lighting

Incandescent lighting shall be used instead of fluorescent.

### Section 4.4 Control and Telemetry System

The requirements of the Council Scada System Design Specification and Recommendations shall take precedence over any conflicting requirements in section 4.4.

#### Section 4.4.6 Operating Levels and Default Settings

With reference to (c) Cut-in and cut-out levels the maximum number of starts per pump per hour is 12.

#### Section 4.5.2.4 Soil Investigation

Replace the reference to NATA to read IANZ. Refer also to Part Four, **SCHEDULE B - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 2 NZS 4404:2010 - EARTHWORKS AND GEOTECHNICAL REQUIREMENTS** of this document.

#### Section 4.5.2.5 Control Levels

Replace Table 4.4 with the following Table E6.

TABLE E6 - TYPICAL CONTROL LEVELS

Parameter	Description
<b>Low level alarm</b>	Set at 50mm above the snort level of the pumps
<b>Duty cut-out level</b>	The cut-in/cut-out volume height determines the cut-out level. The cut-out level shall be 100mm above the manufacturer's specified minimum submergence level
<b>Standby cut-out level</b>	Set at 100mm above the duty cut-out level
<b>Duty cut-in level</b>	Set at 300mm below the incoming sewer invert level
<b>Standby cut-in level</b>	Set at 150mm below the incoming sewer invert level
<b>High level alarm</b>	Set at 100mm below the incoming sewer invert level
<b>High level alarm</b>	Set at the higher of the soffit level of the upstream end of the pipe connecting the inlet maintenance hole with the wet well, or the invert of the upstream end of the diversion pipe from the inlet maintenance hole to the emergency storage chamber
<b>Inflow emergency alarm</b>	Set at the obvert to the outlet to the wet well in the collecting chamber

#### Section 4.5.5.3 Emergency Relief Structure

No emergency relief discharge to the environment is permitted.

### Section 4.6.1.3 System Curves

Only the Colebrook-White equation is acceptable for determining pipe work friction losses. The roughness value (k) used for selecting the pump duty point shall be based on a k=1.5mm, a sensitivity check with a k=0.1mm shall be undertaken to ensure the selected pump does not run off the end of its curve.

### Section 4.6.4.7 Surge and Fatigue Control

Variable speed drives (VSDs) are also acceptable to minimise the development of a transient wave by controlling the acceleration and deceleration of the pump. Programming of the VSD controller shall be undertaken by a suitably experienced person familiar with the ramping requirements.

### Section 4.6.4.8.1 Pipe and Fittings within the Pumping Station

**Suitable pipe work for use in the wet well and valve chamber are in order of preference:**

1. ABS (AS/NZS 3518:2004);
2. Grade 316 or 316L Schedule 10 stainless steel (to ASTM-A312 specification);
3. Ductile Iron (PN 20 classification with internal and external coatings – refer to AS/NZS 2280).
  - Bends shall be standard radius bends.
  - All valves and fittings shall be ductile iron with thermal bonded polymeric coatings to AS/NZS 4158.
  - Gate valves shall be compliant with AS2638.2.
  - All connections shall be via bolted flanges. Flanges shall be a minimum of PN16 as specified in AS 4087. Bolts shall be Grade 316 SS.

### Section 4.6.4.8.2 Pressure Main Selection

Further to the requirements of this section, the acceptable materials for rising mains are:

- PE 80B and PE 100 (minimum PN 8)
- PVC-U (minimum PN 9)
- PVC-M (minimum PN 12)
- Reinforced Concrete

### Section 4.8.1.3 General Lighting and Power

Further to paragraph two, elevated lighting shall be provided over the wet well to provide illumination of the wet well opening and internals. Lighting units shall be fitted with vandal protection guards.

### Low Pressure Sewer Systems

Council will consider the use of low pressure sewer (LPS) systems to join with the Council reticulated network where the cumulative effects of onsite sewage disposal on public health and/or the environment are deemed by Council to be significant, or where risk issues such as infiltration through the use of conventional gravity is high

The use of LPS systems shall be subject to specific site specific Council approval.

**For Council to consider approval of LPS systems, the designer will be required to demonstrate the need for the LPS system in terms of at least one of the following criteria:**

#### **Topographical constraints:**

- (i) Steep catchment that makes the installation of conventional gravity sewer systems very difficult;
- (ii) Presence of watercourse or open stormwater channels within the development area that make the use of onsite disposal impractical.

Difficult ground conditions such as high groundwater table, widespread hard rock within 1.0m of the natural ground surface.

Density of development not likely to change by greater than 20%.

In addition to the above, the development or scheme proposal shall be for a minimum of 50 lots and shall be for the servicing of the full scheme area using LPS systems



Council have adopted the WSA 07-2007 PRESSURE SEWERAGE CODE OF AUSTRALIA as the engineering code of practice for LPS systems.

For grinder pump LPS systems Council will be responsible to the upstream side of the boundary kit. Responsibility for installation and maintenance of the system upstream of this point is the responsibility of the property owner(s).

For LPS systems with a pre-treatment stage, Council will accept responsibility for the maintenance of the pre-treatment unit and the pump. The installation shall be the responsibility of the developer and shall include full responsibility for managing and meeting the costs of a five year operational support agreement with the system manufacturer/constructor. After five years of operation in which the system is demonstrated to be performing satisfactorily, Council will take over the maintenance of the system.



## Schedule F – Hastings District Council Altered Requirements to Section 6 NZS 4404:2010 – Water Supply

The Hastings District Council has adopted Section 6 of NZS 4404:2010 with the specific additions and/or alterations outlined in this schedule. In general, the principles outlined in Part 6 of NZS 4404:2010 are to be followed. Schedule F provides additional commentary and specific amendments that take precedence over the applicable clauses in Part 6 in NZS 4404:2010.

Hastings District Council (HDC) standard water service drawings are to take precedence over NZS 4404:2010 Standard Drawings. Schedule F makes reference to clauses within NZS 4404:2010.

### Clause 6.3: Design

#### *Clause 6.3.2: Structure Plan*

##### **Add paragraph:**

HDC have completed structure planning for some industrial and residential growth areas, which detail HDC services. Designers to check with HDC of any structure plan which may apply for a specific area. Designers must reference these structure plans and infrastructure layouts to ensure their design is consistent.

#### *Clause 6.3.3: Future Development*

##### **Replace first sentence with:**

The location of mains, reservoirs and other infrastructure shall ensure that adjacent developments in the same supply zone are able to be provided for.

##### **Add paragraph:**

The designer shall make allowance for District Plan land use zonings and in particular the number of future allotments and / or dwellings provided for as 'permitted' or 'controlled' activities.

#### *Clause 6.3.4: System Design*

##### **Add paragraph:**

Liaison with, and acceptance by HDC will be required with regards to transfer of assets following project completion.

#### *Clause: 6.3.5.2: Network Analysis*

##### **Add paragraph:**

- The planned demand period shall encompass at least a 25 year growth model.
- The results shall be submitted to the Council for review with the detailed design documentation and drawings.
- The correct application of the results will be included as a condition of approval when appropriate.

#### *Clause: 6.3.5.3: Peak Flows*

##### **Add paragraph:**

The peak demand shall be based on the average summer day or hour demand. The peak day and peak hour demands shall be calculated using typical summer peak day and peak hour demand.

Residential demand shall be determined by multiplying the relevant peak hour demand per property or unit and the number of properties serviced.

##### **In existing residential areas, the number of properties serviced shall be determined by either:**

- (a) A field house count, or;
- (b) Interrogation of census data, or;
- (c) Interrogation of GIS system data, or;
- (d) A combination of (a), (b) and (c).

For un-subdivided areas zoned for future residential development in the local district plan (operative and proposed whichever greater) as 'permitted' or 'controlled' and where discretions has not been restricted for activity identified as restricted discretionary, an allowance shall be made for future potential demand in the area based upon the appropriate peak hour demand and advice from HDC with regards to the number and type of properties which may be permitted. Care must be taken to avoid overly conservative design.

Rural residential development, where a water supply is approved, shall be provided with a restricted supply based on supply of a fixed maximum volume over a 24hr period (e.g. 1500 litres per 24 hrs). The demand allowance used must be approved by Council, preferably at an early stage in the design process.

The actual demand allowance used for design purposes shall be authorised by HDC.

*Clause 6.3.5.4: Head Losses*

**Add paragraph:**

All hydraulic calculations for head losses shall be in accordance with Australian Standard AS 2200:2006 DESIGN CHARTS FOR WATER SUPPLY AND SEWERAGE.

*Clause 6.3.5.6: Minimum Water Demand*

Replace Clause 6.3.5.6 (a) with a daily consumption of 400L/p/day.

*Clause 6.3.5.7: Sizing of Mains*

**Add paragraph:**

DN50 rider mains are permitted if accompanied by a 100 DN (minimum) main.

*Clause 6.3.5.8: Pressure Zones*

**Add paragraph:**

A number of variable pressure zones exist within the existing water supply networks. Consultation with Council is required to determine any specific zone requirements.

*Clause 6.3.5.10: Design Pressure*

**Replace third paragraph:**

The design pressure shall be between 300 kPa and 800 kPa (30 m to 80 m). Unless otherwise advised based on pressure zones.

**Add paragraph:**

Proposed system must be designed to enable operation at minimum pressure.

*Clause 6.3.6: Water Quality*

*Clause 6.3.6.2: Prevention of backflow*

**Add paragraph:**

All new connections must have a HDC approved backflow device installed. The device must be suitable for the risk posed by any activity to be undertaken on the site.

All connections of reticulated water to mains being disinfected shall incorporate Council approved backflow prevention devices.

*Clause 6.3.8.3: Mains Layout*

**Add the following:**

- Add Clause 6.3.8.3 (f) Water main must be located within public open space, unless Council approves otherwise,
- Add Clause 6.3.8.3. (g) General layout provisions shall be as shown on HDC standard drawing WS501.
- Add Clause 6.3.8.3. (h) Air valves, vacuum release valves or hydrants are to be positioned at isolated high points on the system.
- Add Clause 6.3.8.3. (i) Necessary easements are obtained.

- Add Clause 6.3.8.3. (j) Services extended to neighbouring properties if required by HDC.
- Add Clause 6.3.8.3. (k) Provision must be made for flushing of all mains. Refer to Drawings WS 501 and WS 504

**Add paragraph:**

In selecting a water main route, the designer should evaluate the impact on the environment for the construction and operational phases consistent with national, regional, district and HDC policies, plans, instructions and guidelines.

*Clause 6.3.8.4: Water mains in private property*

**Add the sentence:**

Water mains in private property are NOT preferred. Approval from HDC is required for any services located in private property and will only be considered where alternative alignment within public space is not possible.

**Add the paragraphs:**

In relation to piped network infrastructure, the Network Corridor is the area which extends:

- (a) Horizontally 1.5 metres on both sides from the centre of any pipe with an internal diameter of less than 1.0 metres or;
- (b) For pipes larger than 1.0m in diameter an appropriate width is to be discussed and confirmed with HDC.

An Application for Approval will be required for any work undertaken along a network corridor. The proposed works or structure will be assessed for the effect on the network infrastructure.

**Matters that will be considered include the following:**

- (i) Will the proposed works or planting result in damage to, or impair the structural stability of, the pipe, drain or waterway either during construction or over time after completion?
- (ii) Will the proposed works or planting affect the functioning of the pipe, drain or waterway either during construction or over time after completion?
- (iii) Will the proposed structure result in excessive loads on the network infrastructure?
- (iv) Will access for repair and maintenance, or renewal, of the network infrastructure be significantly affected or restricted?

Easements shall be provided for any Water Supply pipelines located on private property.

The width of the easement shall be as defined in the above paragraph.

*Clause 6.3.8.5: Types of System configuration*

The network layout shall be as shown in the amended drawing WS 501.

*Clause 6.3.8.6: Water Main near trees*

**Add sentences:**

If removal of large tree branches is required, the advice of HDC parks and reserves department shall be sought. Specific approval will be required by HDC for any design where water mains are required to pass within the root zone of trees.

*Clause 6.3.8.9: Crossings*

**Add sentence:**

Specific detail design will be required. The designer shall demonstrate consideration of Safety in Design Principles and operational requirements for acceptance by HDC.

**Add sentence:**

Where crossing existing services, HDC may require the replacement of existing assets where deemed necessary.

*Clause 6.3.8.11: Location Marking of Valves and Hydrants*

**Delete and replace with:**

The location marking of service valves and fire hydrants shall be compliant with HDC standard drawings WS 101 and WS 102.

**Add sentence:**

The location marking of fire hydrants shall be to NZS 4501:1972. Extra marking near schools and other high risk areas may require as per NZS 4501:1972 (e.g. blue reflector in the centre of the street).

*Clause 6.3.9: Clearances*

**Amend Table 6.4 as follows:**

For a new main DN < 200 mm and an existing water main DN < 375 mm the minimum horizontal clearance shall be 600mm.

**Add paragraphs:**

- The minimum horizontal clearance between a new main and any stormwater main shall be 600mm.
- The minimum vertical clearance between a new main and any stormwater main shall be 600mm.
- Water mains shall be located to allow unhindered access for repairs and maintenance, e.g. not below kerb lines.

*Clause 6.3.11: Fire Flow*

Where specific additional flow allowance is required HDC shall specify design requirements.

The designer shall limit lot development such that the water supply system always meets the national guide. Where an extraordinary potential water demand for firefighting purposes is identified, the designer shall ensure provision is made in the development plans for alternative firefighting water sources which satisfy the Code of Practice.

**Add clause 6.3.11.2:**

- Any fire protection system must remain completely independent of and must not be interconnected with any other water system.
- In any case where the supply of water is metered, fire hose reels shall be connected only to the metered supply, not to a fire protection connection.

*Clause 6.3.12.10.1: Minimum Pipe Cover*

**Add paragraph:**

**The minimum cover to pipelines shall be:**

- 600mm in berm and;
- 800mm in road;
- Sufficient such that allowance for future road levels can be made, e.g. lowering of surface level where high crowns exist.

The minimum cover to trunk mains shall be;

- 1000mm for trunk mains.

*Clause 6.3.12.11: Pipeline Restraint*

**Add paragraph:**

Any pipe restraint shall be compliant with HDC standard drawings WS 507a and WS 507b. Council requires the use of anchors blocks over self-restrained pipes. Council will not allow the use of timber and recycled plastic blocks.

**Add sentence:**

Anchorage is necessary for valves larger than DN100.

*Clause 6.3.12.11.1: Thrust Blocks***Add paragraph:**

The design of any thrust block for mains greater than or equal to DN200 shall be checked and signed off by a chartered engineer. The soil type in HDC is typically soft clays but should be confirmed by site survey.

*Clause 6.3.13: Reservoirs and Pumping Stations*

HDC design criteria for pump stations and reservoirs are to be such that the combined reservoir, operating storage and pumping capacity to be designed for peak hour demand. Where significant operating storage can be provided, pumping capacity can be reduced provided that the operating storage in the service reservoir can be replenished within the specific design period.

*The designer shall liaise with and obtain approval and acceptance from HDC of specific reservoir and pump station details prior to acceptance of assets.*

**Add clause 6.3.13.1 Service Reservoirs**

The storage capacity shall consist of operating and reserve storage. Operating storage shall cater for demands exceeding the maximum available inflow rate. Reserve storage shall cater for system component failure. The reservoir capacity shall be determined through a risk assessment study of the supply zone, considering the characteristics of the zone to determine the risk to the continuity of water supply in the event a system component fails.

**The reservoir design shall consider the following:**

- Life cycle cost;
- Water safety/quality considerations; construction material, security, operational turnover;
- Operating storage capacity versus pumping station or supply capacity;
- Reserve storage capacity needed to enable emergency maintenance work;
- Availability of emergency supply from adjacent systems;
- The ratio of estimated long term demands to short term demand to deduce if additional storage be provided with initial storage or allowance for future provision will be more economical;
- Reserve storage capacity should be taken to be equal to 1/3 peak day capacity or 24 hr average summer usage storage capacity shall be provided whichever higher;
- For the design, due consideration shall be given for earthquake resistance. Additional features such as seismic shut off valves and controls shall be considered;
- Geological conditions should be considered when addressing the reservoir site aspect;
- The reservoir can provide no less than the minimum design pressure at the customer's services under peak demand conditions;
- Risk assessment in accordance with AS/NZS ISO 31000:2009 RISK MANAGEMENT – PRINCIPLES AND GUIDELINES shall be undertaken as part of the reservoir and pump station sizing and system configuration process. The minimum storage shall be based on an assessment and costing other risks associated with the most critical supply being interrupted;
- Site and reservoir access requirements/safety considerations (heights/confined spaces);
- Site security;
- Allowance for chlorination boosting or testing facilities;
- Screening/siting/colour to minimise landscape impact;

**Add clause 6.3.13.2 Pump Stations**

- All pump station shall have standby power generators to cut in during power failure and remote telemetry in accordance with HDC requirements.
- A standby pump unit shall be provided in addition to one or more duty units with automatic controls to alternate the pumps between duty and standby.

- Surge conditions arising from normal pump starts, stops and power failure during pumping to be assessed. The impact of any surge on connected pipe systems shall be assessed and any surge reduction measures shall be implemented accordingly.
- Variable speed drives (VSD) on pumps are required for new installations.
- Inline booster pumping without high-level storage to be used only if sufficient pressures can be provided by gravity flow during low demand periods or booster failure. Acceptance of design by HDC will be required.

#### *Clause 6.3.14: Valves*

##### *Clause 6.3.14.1: General*

###### **Add paragraphs:**

All valves shall have a protective coating on all parts subject to corrosion.

The valves on the main shall be sluice valves Class 1 to BS 5163:1986 16 bar rating, non- rising 2 spindles and anti-clockwise closing. They shall be a “Grade A” construction and suitable for gland packing under mains pressure. Flanges shall be to AS/NZS 4087:2011 METALLIC FLANGES FOR WATERWORKS PURPOSES PN16 except where the designer deems this unsuitable. In these circumstances, advice from HDC shall be sought.

Valves to individual properties are to be Acuflo900S manifolds or other approved equivalent. Hand wheels and retaining nuts shall be of corrosion resistant material. Valve packing shall be Teflon or similar approved.

##### *Valve and Hydrant Boxes*

Surface boxes shall be fitted over fire hydrants, valves and other fittings, which allow access for operation and maintenance.

Boxes and surrounds shall be constructed so that no load can be transferred to any pipe or fitting. They shall not move under loads. Valve and hydrant boxes shall be thoroughly bedded assuming supersaturated soil conditions.

The lids of valve boxes shall be painted light blue.

Valve and hydrant box construction requirements shall comply with HDC standard drawings WS 101, WS 102, WS 503 and WS 504.

##### *Stop Valves/General*

Stop valves shall be located where possible in the berm and in locations where these cannot become obstructed (e.g. parking areas).

##### *Clause 6.3.14.3: Gate Valves*

###### **Add sentence:**

Stop valves greater than or equal to DN32 shall be sluice valves. In line stop valves shall be the same diameter as the reticulation main.

##### *Clause 6.3.14.3.2: Branch Mains*

###### **Add sentence:**

Branch mains shall be connected by means of a flange directly to the adjoining mains tee.

##### **Add additional section 6.3.14.9 Automatic Inlet Control Valve (AICV).**

Refer to WSA 03 for design criteria around installation of AICV.

##### *Clause 6.3.15: Hydrants*

###### **Add paragraphs:**

Hydrants shall be to NZS/BS 750 with tees flanged for connection to AS/NZS 4087:2011 METALLIC FLANGES FOR WATERWORKS PURPOSES PN16. Otherwise flexible joints (gibault) are permitted. The tall pattern shall be used although short or medium may be allowed by permission of HDC in specific circumstances. Refer to WS 504 for Standard Hydrant Detail.

**The following modifications shall be specified:**

- Hydrants shall close by turning the spindle clockwise.
- All steel nuts and bolts used in the construction of the hydrant shall be hot dip galvanised with bolts of the square headed type to facilitate nut removal in place.
- The hydrant shall be coated internally and externally with the approved coating such as “Rilsan”.
- The washer shall be nitrone rubber.
- Frost plug drains shall not be fitted or alternatively the plug shall not be free draining. If the hydrant is supplied with the frost plug drain it shall be replaced by the plug without a hole.

A hydrant riser shall be used where necessary to ensure the spindle top is between 150 and 250mm below the finished surface level.

The location marking of fire hydrants shall comply with HDC standard drawings WS 101 and WS 504.

*Clause 6.3.16: Connections*

*Clause 6.3.16.2: Property Connections*

**Add paragraph:**

Property connections shall be made as per HDC standard drawing WS 508, and WS 509.

*Clause 6.3.17: Termination Points*

**Add sentence:**

Council requires all distribution mains to be looped, with no dead ends as detailed in drawing WS 501.

*Add new clause 6.3.19 Water Main Access*

**Add section:**

- The design and as-built drawings shall show any water mains which are to be disused or made redundant.
- The design shall specify action required such as the removal or sealing the ends of the water main, removal of surface fittings and restoration of the surface or protection reasons.
- Pipelines should not be filled if there is potential to use them as a host conduit for other services e.g. fibre optic telecommunication cables. If this is the case it should be agreed with HDC before proceeding.

*Clause 6.4: Approval of Proposed Infrastructure*

**Add paragraph:**

Once the designer has completed the system review, a written report with the appropriate Producer Statement is to be submitted to Council with the design documentation.

Specific connection requirements should be investigated and agreed with HDC during design to ensure any enabling works in the existing network can be understood and planned.

Application for connection to the HDC network must be completed prior to any connection being undertaken. No connection will be permitted until satisfaction with all HDC specific requirements have been met.

*Clause 6.4.1: Approval process*

**Add paragraph:**

The location of water mains shall be confirmed with HDC with regards to any preference, and final alignment approved as such.

#### Clause 6.4.2: Information to be provided

##### Add clause 6.4.2 (i)

All levels shall be referenced to the Hawke’s Bay Datum (MSL = +10m). In terms of horizontal alignment the reference shall be to the Hawke’s Bay 2000 Datum.

#### Clause 6.5: Construction

##### Add paragraphs:

To ensure that the water supply works are constructed to the required standards, inspection by the developer’s agent during construction shall include as a minimum the following:

- Qualifications of the staff constructing the works.
- Pipe sizes and locations (lines and level).
- quality, dimensions and reinforcement of all materials supplied, unless these are supplied by a manufacturer accredited to ISO 9002.
- Trench depth and width.
- Quality of trench backfill material, and compaction of trench fill material.
- Quality, dimensions and photographic records of all valve, hydrant, pipeline and service connections.
- Certified test results from all pressure testing and disinfection works.

Inspection on site shall be done by a suitably qualified person with a good knowledge of water supply theory and construction practice, who shall liaise closely with and receive instruction from the design engineer for the works being inspected. The inspector shall not have any financial affiliation with the contractor carrying out the work.

The written records and certification of these inspections shall be included in the Completion Report, as specified in Section 1 of [NZS 4404:2010](#).

##### Clause 6.5.1: Excavation

##### Add paragraphs:

De-watering water (derived from groundwater systems or bores) may contain those characteristics defined as ‘Controlled Stormwater’. Discharge of all de-watering water may require an approval. An alternative is to discharge de-watering water to the wastewater system (in accordance with a trade waste consent) but this option is often limited by the available pipe capacity and potentially high discharge flow rates.

The approval process for applications to discharge de-watering water will primarily focus on the effect of the proposed discharge on the integrity of the stormwater network. Consideration will also be given to the effect of the proposed discharge on the Council’s stormwater network consent, but such consideration may not be necessary if the applicant has obtained or intends to obtain a water take/discharge consent from the HBRC.

In general, with good ground conditions, suitable bedding and trench details, installation shall be as shown in HDC standard drawing WS 201 and WS 104. In poor ground conditions, potentially unstable ground, or where extreme loadings will be encountered; pipe strength and bedding shall be specifically designed and certified.

##### Clause 6.5.2: Embedment

##### Delete and replace with:

Installation of bedding material around pipes and fittings shall comply with HDC standard drawing WS 201.

##### Clause 6.5.3: Backfilling and reinstatement

##### Add paragraphs:

The backfilling and reinstatement of suitable material (refer to Drawing WS 104) shall be undertaken by suitably experienced contractors. The required standards for backfill material supply and compaction of fill materials shall be described in the contract specification.



**The objectives of the backfilling and reinstatement are:**

- To prevent undue stress being imposed on the pipelines and associated infrastructure as a result of settlement or lack of foundation support;
- Control the movement of water into and along the backfill material;
- To control long-term settlement in all materials used to backfill the trench. Comply with NZTA Specifications F/1 and B/2;
- For backfill and reinstatement projects within a road carriageway, required reference for pavement construction is NZTA Specification B/2, with materials being specified from the M/3 and M/4 specifications.

*Clause 6.5.5: Disinfection of Water Mains*

**Replace first sentence in Clause 6.5.5 with:**

Following satisfactory hydraulic pressure test, water mains, valves, services and other fittings shall be disinfected. Evidence of this testing shall be provided in writing to HDC to support an application to connect into existing services.

Connection to the water supply shall ONLY be completed by HDC nominated maintenance contractor. Refer to HDC WATER MAIN SHUTDOWN POLICY AND STANDARD OPERATING PROCEDURE.

*Clause 6.5.6: Discharge of testing water*

**Add paragraph:**

The methodology for discharge of disinfection water must be approved by the HDC.

All discharge of disinfection water to waste shall be undertaken to minimise the potential for contamination of equipment or reticulated water from the sewer drain that the disinfected water is being discharged to.

*Note: Chlorinated water shall not be discharged onto the ground or into any Stormwater drain.*

*Amended Appendix D of NZS 4404:2010 - Water Supply Disinfection Specification*

**Delete and replace first three sentences in D1:**

Following cleaning of the mains, the interiors of all the pipe and fitting are disinfected to the following standards:

- Free available chlorine (FAC) concentration of 10 mg/L to 50 mg/L.
- Minimum free chlorine concentration multiplied by contact time (CT) of 7,200 mg/L. minutes (CT is the time (in minutes) the chlorine solution is held in the main for).
- If FAC is less than 5 g/m<sup>3</sup> at the completion of the period, the disinfection shall be repeated until a satisfactory result is obtained.

**Add to third paragraph:**

The desired level of chlorine concentration, ranging from 20 mg/L to 50 mg/L, is produced by thoroughly mixing sodium hypochlorite (NaOCl with available chlorine of 12.5 %) with clean water in a clean tanker, to the proportions indicated in the table below.

Main diameter (mm)	Volume of Water (L) per 100m length of main	Volume of NaOCl (mL)
50	196	31.5
100	785	125.5
150	1767	282.5
200	3141	502.5

*Amount of NaOCl required to achieve 20mg/L concentration*

The manufacturer’s guidelines for handling sodium hypochlorite must be adhered to. The chlorine solution is fed to, preferably, the low end of the new main. All extremities of the lines shall have bleed points to expel the air and verify that the chlorine solution has reached all parts of the new pipe system. The contractor shall verify

that the concentration of the chlorine solution is within the desired range by testing at the extremities and then notify HDC. The bleed points shall be sealed off and the main shall stand for a contact period of 24 hours, to be certified by the Developer's Engineer to a representative of Council.

**Caution:** Excessive periods of contact with standing dose concentrations of disinfectant may affect future material performance. Taste and odour problems may also be experienced when the main is put into service.

*Calculation Example: Determining Suitability for Soakage Disposal*

Soakage is NOT to be used in the following circumstances:

- For disposal of road runoff;
- For disposal of runoff in areas not approved for soakage - for example Havelock North;
- For disposal of runoff, where the method in this section shows that soakage is not suitable.

**Suitability for soakage is to be determined by a two-step process:**

**Step 1**

Designer provide a soil profile and use the data to determine that the permeability of the sand layer and depth to the water table makes soakage suitable using Tables D4 & D5 in this document.

**Step 2**

Then, follow the soakage design method in Section 9 of the New Zealand BUILDING CODE, Approved Document E1 - Surface Water. (Note the average runoff coefficient used in the soakage calculation may be adjusted by following the method above).

**Requirements for Sampling of Soil Profile**

The soil maps and table are sourced from the following document, SOILS AND THEIR INFILTRATION RATES AND PERMEABILITIES, (LANDCARE RESEARCH, 2006). Unfortunately the soil sampling for this investigation was sparse and developers who wish to use the “suitability for soakage method” must provide a site-specific soil profile data from an IANZ accredited soils laboratory.

# References

- AS 2200:2006 *Design charts for water supply and sewerage*, Standards Australia
- AS/NZS 1158 *Lighting for roads and public spaces set*, Standards Australia/Standards New Zealand
- AS/NZS 2566.1:1998 (Reconfirmed 2018) *Buried flexible pipelines – Part 1: Structural design*, Standards Australia/Standards New Zealand
- AS/NZS 2566.2:2002 (Reconfirmed 2016) *Buried Flexible Pipelines – Installation*, Standards Australia/Standards New Zealand
- AS/NZS 3725:2007 *Design for Installation of Buried Concrete Pipes*, Standards Australia/Standards New Zealand
- AS/NZS 4058:2007 *Precast Concrete Pipes (pressure and non-pressure)*, Standards Australia/Standards New Zealand
- AS/NZS 4087:2011 *Metallic flanges for waterworks purposes*, Standards Australia/Standards New Zealand
- AS/NZS ISO 31000:2009 *Risk management – Principles and guidelines*, Standards Australia/Standards New Zealand
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra
- Building Act 2004*, New Zealand Government
- Chipsealing in New Zealand*, Transit New Zealand, Road Controlling Authorities & Roding New Zealand, 2005
- Chipsealing in New Zealand practice notes*, Transit New Zealand, Road Controlling Authorities & Roding New Zealand, 2005
- Cycle Network and Route Planning Guide*, Land Transport Safety Authority NZ (LTSA), 2004
- Cycling Aspects of Austroads Guides*, Austroads, 2017
- District Plan*, Hastings District Council
- Drinking-water Standards for New Zealand 2005 (Revised 2018)*, Ministry of Health, 2018
- Drinking Water Strategy*, Hastings District Council, 2018
- Environmental guidelines for water discharges from petroleum industry sites in New Zealand (ME 300)*, Ministry for the Environment, 1998
- Guide to Road Design Part 4: Intersections and Crossings – General*, Austroads, 2009
- Guide to Traffic Management Part 6: Intersections, interchanges and crossings*, Austroads, 2017
- Health and Safety at Work Act 2015*, New Zealand Government
- Historic Places Act 1993*, New Zealand Government
- Interlocking Concrete Block Road Pavements (IB 67)*, Cement and Concrete Association of New Zealand, 1988
- iWay Cycling Network Development Plan 2018-2028*, Hastings District Council, June 2017
- Land Transport Rule 54002: Traffic Control Devices 2004*, Minister for Transport Safety
- Local Government Act 2002*, New Zealand Government
- M/01: *Specification for Roding Bitumens*, NZ Transport Agency, 2011
- M/03: *Sub-base aggregate. Notes*, NZ Transport Agency (formerly Transit New Zealand), 1986
- M/04: *Specification for basecourse aggregate*, NZ Transport Agency (formerly Transit New Zealand), 2006

- M/06: *Specification for sealing chip*, NZ Transport Agency, 2011
- M/07: *Specification for roadmarking paints*, NZ Transport Agency, 2009
- M/10: *Specification for dense graded and stone mastic asphalts*, NZ Transport Agency, 2014
- M/30: *Specification and guidelines for road lighting design*, NZ Transport Agency, 2014
- Manual of traffic sign and markings: Part I Traffic Signs*, NZ Transport Agency, 2010
- Manual of traffic signs and markings: Part II Markings*, NZ Transport Agency, 2010
- On-Site Stormwater Management Guideline*, New Zealand Water Environment Research Foundation (NZWERF), October 2004
- The National Code of Practice for Utility Operators' Access to Transport Corridors*, NZ Utilities Advisory Group (NZUAG) Inc, 2016
- NZS 3109:1997 *Concrete construction*, Standards New Zealand
- NZS 3116:2002 *Concrete segmental and flagstone paving*, Standards New Zealand
- NZS 3604:2011 *Timber-framed buildings*, Standards New Zealand
- NZS 4121:2001 *Design for access and mobility: Buildings and associated facilities*, Standards New Zealand
- NZS 4229:2013 *Concrete masonry buildings not requiring specific engineering design*, Standards New Zealand
- NZS 4402:1986 *Methods of testing soils for civil engineering purposes – Soil Tests*, Parts: 1 – Preliminary and general & 2 – Soil Classification Tests, Standards New Zealand
- NZS 4404:2010 *Land development and subdivision infrastructure*, Standards New Zealand
- NZS 4431:1989 *Code of Practice for earth fill for residential development*, Standards New Zealand
- NZ supplement to the 2004 Austroads pavement design guide*, NZ Transport Agency, 2007
- One Network Road Classification (ONRC)*, NZ Transport Agency
- P/3: *Specification for first coat sealing*, NZ Transport Agency (formerly Transit New Zealand), 1995
- P/11: *Specification for open graded porous asphalt*, NZ Transport Agency (formerly Transit New Zealand), 2007
- P/12: *Specification for pavement marking*, NZ Transport Agency (formerly Transit New Zealand), 2000
- Pedestrian Planning and Design Guide*, NZ Transport Agency, 2009
- Resource Management Act 1991*, New Zealand Government
- Resource Management Plan*, Hawke's Bay Regional Council
- Road and Traffic Standard Series, Part 5 *Guidelines for rural road marking and delineation (RTS 5)*, Land Transport NZ 2002
- Road and Traffic Standard Series, Part 6 *Guidelines for visibility at driveways (RTS 6)*, Land Transport NZ 2001
- Road and Traffic Standard Series, Part 14 *Guidelines for facilities for blind and vision impaired pedestrians (RTS 14)*, NZ Transport Agency, 2015
- RSMA Compliance Standard for Traffic Signs*, Road Safety Manufacturers Association, 2008
- SNZ HB 44:2001 *Subdivision for people and the environment*, Standards New Zealand
- Soils and their Infiltration Rates and Permeability*, Landcare Research, 2006
- Street Lighting Code of Practice*, Hastings District Council, 2016
- Subdivision and Infrastructure Development in Hastings District. Best Practice Design Guide 2010*, Hastings District Council, 2011
- The Building Code*, New Zealand Government

- TNZ F/1:1997 *Specification for Earthworks Construction*, Transit New Zealand
- TNZ P/24 *Performance based specification for traffic signs*, NZ Transport Agency (formerly Transit New Zealand), 2008
- Towards better cycling*, Hastings District Council, 2001
- Traffic Control Devices Manual (TCD Manual)*, NZ Transport Agency, 2008
- Traffic Management and Road Design Manuals*, Austroads
- Traffic Amendment Regulations 1998*, New Zealand Legislation
- Traffic Regulations 1976*, New Zealand Legislation
- Walk the walk*, Hastings District Council, 2004
- Watermain Shutdown Policy and Watermain Shutdown Procedure*, Hastings District Council, 2017
- Water Services Bylaw (Chapter 7 – Consolidated Bylaws)*, Hastings District Council
- WSA 04-2005 *Sewage Pumping Station Code of Australia*, Water Services Association of Australia, 2006
- WSA 07-2007 *Pressure Sewerage Code of Australia*, Water Services Association of Australia, 2007

## Producer Statements

Refer to PS1, PS2, PS3 and PS4 standard forms provided by IPENZ ENGINEERING PRACTICE SUPPORT. [Online]  
<https://www.engineeringnz.org/resources/producer-statements/>

# Appendices

## Appendix A – Standard Construction Drawings

Standard Construction Drawings of NZS 4404:2010 in Appendix B are to be replaced with the following Hastings District Council modified Engineering Code of Practice Drawings:

### Transportation Drawings

Drawing No.	Issue	Drawing Title
C 1	July 2011	SEALED URBAN ROAD TYPICAL CROSS SECTION
C 2	July 2011	SEALED RURAL ROAD TYPICAL CROSS SECTION
C 3	July 2011	PRIVATE LANES TYPICAL CROSS SECTIONS
C 4	July 2011	URBAN ENVIRONMENT VEGETATION CONTROL
C 5	July 2011	RURAL ENVIRONMENT MOWING & VEGETATION CONTROL
C 6	NOV 18	INDICATIVE LOCATION OF SERVICES IN BERM
C 7	NOV 18	SHARED FACILITY AND FOOTPATH CONSTRUCTION TYPICAL CROSS SECTIONS
C 8	July 2011	STANDARD PEDESTRIAN CROSSING CORNER LAYOUT
C 9	July 2011	STANDARD PEDESTRIAN CROSSING DETAIL
C 10	July 2011	STANDARD CYCLE BARRIER
C 11	July 2011	TYPICAL SIGN DETAILS POLE FOUNDATIONS
C 12	July 2011	APPROACH VISIBILITY FOR TRAFFIC SIGNS & STREET FURNITURE
C 13	July 2011	APPROACH VISIBILITY FOR TRAFFIC SIGNS & STREET FURNITURE
C 15	July 2011	TYPICAL SIGN DETAILS FOR PATH LOCATION
C 16	July 2011	TYPICAL SIGN DETAILS SPLITTER ISLAND LOCATION
C 17	July 2011	TYPICAL SIGN DETAIL RURAL VERGE
C 18	July 2011	LAYOUT OF TYPICAL NAME & FINGERBOARD SIGNS
C 19	NOV 2018	MINIMUM STANDARDS FOR VEHICLE CROSSINGS ONTO URBAN ROADS
C 19A	NOV 2018	MINIMUM STANDARDS FOR VEHICLE CROSSINGS – TYPICAL SECTIONS
C 20	July 2011	PRIVATE RURAL ACCESS SIGHT LINES – DIAGRAM A
C 21	July 2011	PRIVATE RURAL ACCESS SIGHT LINES – PERSPECTIVE A
C 22	July 2011	PRIVATE RURAL ACCESS SEPARATION DISTANCES – DIAGRAM B
C 23	July 2011	PRIVATE RURAL ACCESS SEPARATION DISTANCES – PERSPECTIVE B
C 24	July 2011	PRIVATE RURAL ACCESS LOW USE – DIAGRAM C
C 26	July 2011	PRIVATE RURAL ACCESS MODERATE VEHICLE USE – DIAGRAM D
C 27	July 2011	PRIVATE RURAL ACCESS SIGHT LINES – PERSPECTIVE D
C 28	July 2011	PRIVATE RURAL ACCESS REGULAR HEAVY VEHICLE USE – DIAGRAM E
C 29	July 2011	PRIVATE RURAL ACCESS SIGHT LINES – PERSPECTIVE E
C 30	July 2011	CROSS-SECTION GUIDELINES FOR VEGES ON RURAL ROADS
C31	Nov 2018	KERB AND CHANNEL AND DISH CHANNEL TYPICAL CROSS SECTIONS
C32	Nov 2018	NIB DETAILS TYPICAL CROSS SECTIONS
C 33	July 2011	TYPICAL SPLITTER ISLAND DETAILS
C 34	July 2011	TYPICAL ROUNDABOUT DETAILS
C 35	July 2011	TYPICAL ROUNDABOUT DETAILS

Drawing No.	Issue	Drawing Title
C 36	July 2011	TYPICAL SPEED HUMP
C 38	July 2011	PEDESTRIAN VISIBILITY SPLAY
RM 1	July 2011	ROAD MARKING CYCLE LANE
RM 2	July 2011	ROAD MARKING CYCLE LANE WITHOUT PARKING
RM 3	July 2011	ROAD MARKING CYCLE LANE WITH PARKING
RM 4	July 2011	ROAD MARKING GIVEWAY / STOP INTERSECTION
RM 5	July 2011	ROAD MARKING ROUNDABOUT
RM 6	July 2011	ROAD MARKING TRAFFIC SIGNALISED INTERSECTION

### Water Services Drawings

Drawing No.	Issue	Drawing Title
WS 101	DEC 2018	FIRE HYDRANT LID ADJUSTMENT AND MARKINGS
WS 102	DEC 2018	VALVE LID ADJUSTMENT AND MARKINGS
WS 103	DEC 2018	TYPICAL MANHOLE COVER ADJUSTMENT AND ARRANGEMENT
WS 104	DEC 2018	TYPICAL TRENCH REINSTATEMENT AND SURFACING DETAILS
WS 105	DEC 2018	STORMWATER PROPERTY DISCHARGE TO KERB
WS 106	DEC 2018	DOMESTIC PROPERTY DISCHARGE BUBBLE UP SUMP
WS 107	DEC 2018	TYPICAL CULVERT HEADWALL DETAILS
WS 108	DEC 2018	TYPICAL CULVERT SAFETY HEADWALL
WS 201	DEC 2018	STANDARD EMBEDMENT DETAIL FLEXIBLE AND RIGID PIPES
WS 202	DEC 2018	STANDARD MANHOLE AND PIPE CONNECTION
WS 203	DEC 2018	MANHOLE – TYPICAL CHANNEL ARRANGEMENT
WS 204	DEC 2018	TYPICAL MAINTENANCE SHAFT DETAILS
WS 204A	DEC 2018	TRADE WASTE CHAMBER DETAILS
WS 205	DEC 2018	FIELD JOINT / REPAIR DETAILS – GRAVITY PIPES
WS 206	DEC 2018	CLOSE PIPE CROSSING SUPPORT DETAIL
WS 207	DEC 2018	STANDARD CHIMNEY MANHOLE DETAIL
WS 301	DEC 2018	TYPICAL SEWER RETICULATION LAYOUT
WS 301A	JAN 2019	SEWER POINT OF DISCHARGE DETAIL
WS 301B	JAN 2019	TYPICAL SEWER RETICULATION CONNECTION LAYOUTS
WS 302A	JAN 2019	TYPICAL SEWER CONNECTION, RODDING EYE AND ACCESS BOX
WS 302B	JAN 2019	TYPICAL SEWER CONNECTION, RODDING EYE AND ACCESS BOX
WS 303	DEC 2018	TYPICAL LATERAL CONNECTIONS TO EXISTING MAINS
WS 401	DEC 2018	TYPICAL SUMP BARREL AND OUTLET PIPE
WS 402	DEC 2018	BACK SUMP LID DETAIL
WS 403	DEC 2018	GRATE SUMP LID DETAIL STANDARD AND HIGH CAPACITY
WS 404	DEC 2018	DIRVERTED BACKSUMP DETAIL
WS 405	DEC 2018	STANDARD MAX-PIT DETAIL
WS 406	DEC 2018	STANDARD SPLAY SUMP DETAILS
WS 407	DEC 2018	DIRECT SUMP/LATERAL CONNECTION
WS 501	DEC 2018	TYPICAL WATER RETICULATION LAYOUT PLAN
WS 502	DEC 2018	TYPICAL PIPE AND FITTING INSULATION



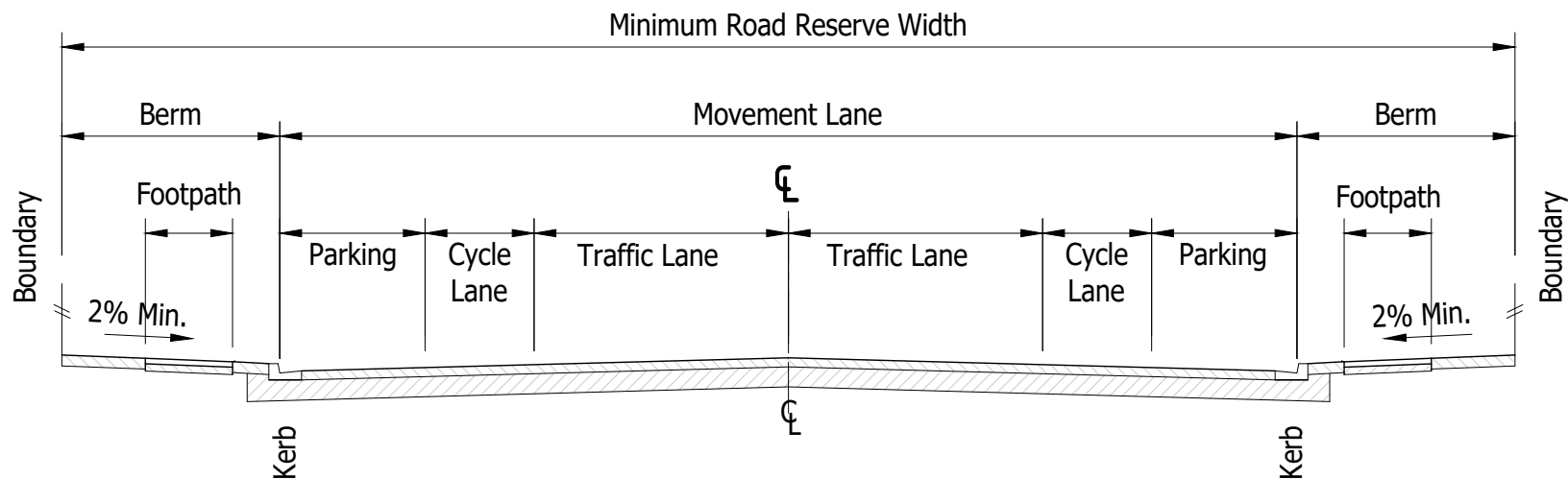
<b>Drawing No.</b>	<b>Issue</b>	<b>Drawing Title</b>
WS 503	DEC 2018	TYPICAL VALVE DETAIL
WS 504	DEC 2018	HYDRANT DETAILS
WS 505	DEC 2018	TYPICAL CONNECTIONS TO EXISTING MAINS
WS 506	DEC 2018	FLANGED JOINTS BOLTING DETAIL
WS 507A	JAN 2019	TYPICAL THRUST BLOCK DETAILS SHEET 1
WS 507B	JAN 2019	TYPICAL THRUST BLOCK DETAILS SHEET 2
WS 508	DEC 2018	TYPICAL SERVICE CONNECTIONS FROM MAINS
WS 509	DEC 2018	MANIFOLD BOX AND FITTINGS

### Parks and Property Services

<b>Drawing No.</b>	<b>Issue</b>	<b>Drawing Title</b>
LD 1	CONSTRUCTION	TYPICAL TREE PLANTING DETAILS – TREE PIT IN GRASS VERGE
LD 2	CONSTRUCTION	TYPICAL TREE PLANTING DETAILS – TREE PIT IN NARROW GRASS BERM (2.5m wide max. typical)

# Appendix B – HDC Street Lighting Code of Practice





Refer To Table C4 For Dimensions

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaptation of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

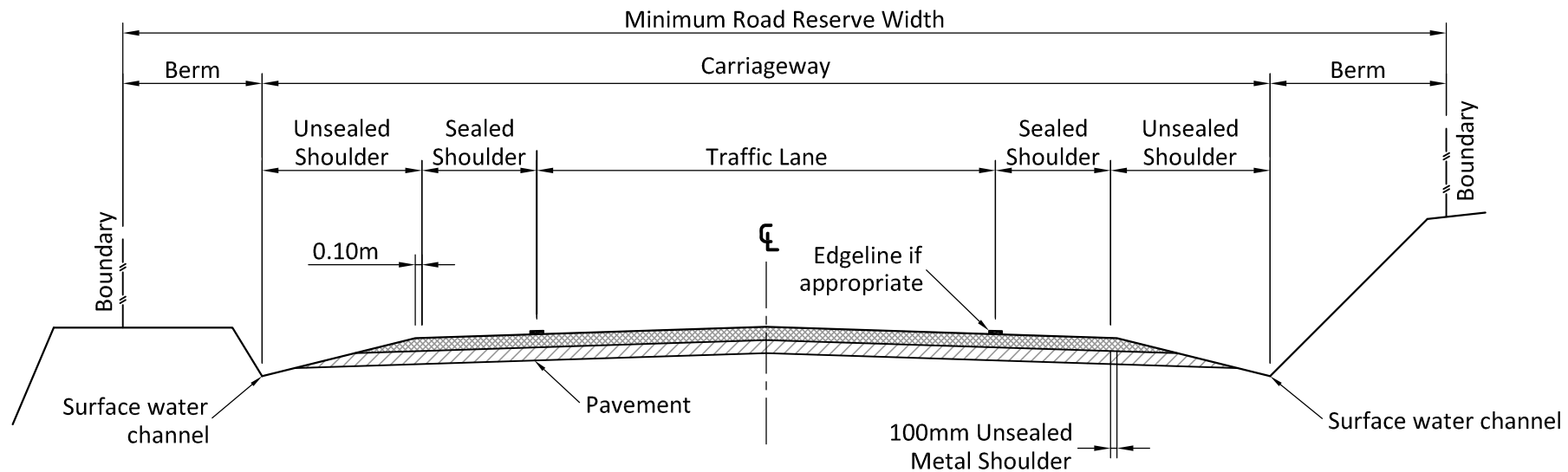


HASTINGS DISTRICT COUNCIL  
 ENGINEERING DIVISION  
 TYPICAL SEALED URBAN ROAD  
 CROSS SECTION


Scale N.T.S.	Drawing No. C1
-----------------	-------------------

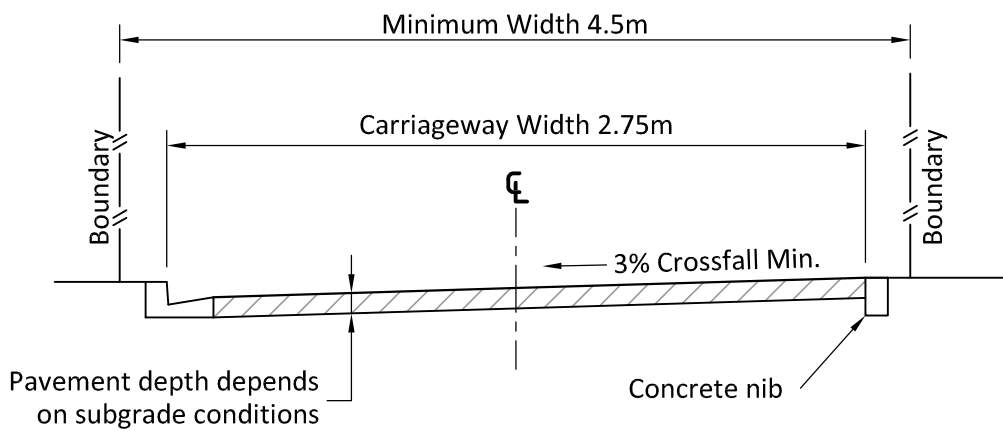
Issue MAR 2018

Trim Reference  
Manuals\CoP

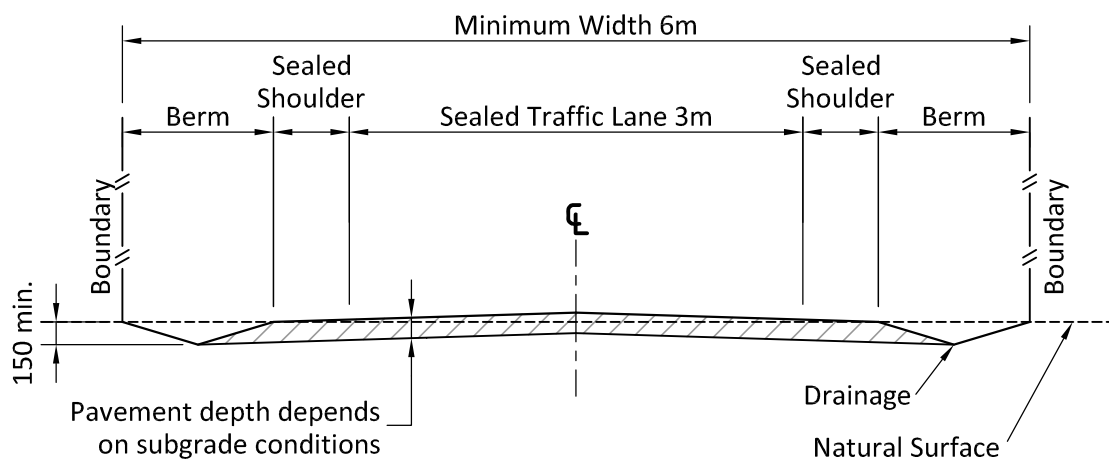


Refer To Table C4 For Dimensions

Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.		<b>ROAD CONTROLLING AUTHORITY</b>		Scale N.T.S	Drawing No. C 2
		<b>SEALED RURAL ROAD TYPICAL CROSS SECTION</b>		Issue	July 2011
				Trim Reference Manuals\CoP	



### URBAN PRIVATE LANE



### RURAL PRIVATE LANE

Refer To Table C4 For Dimensions

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

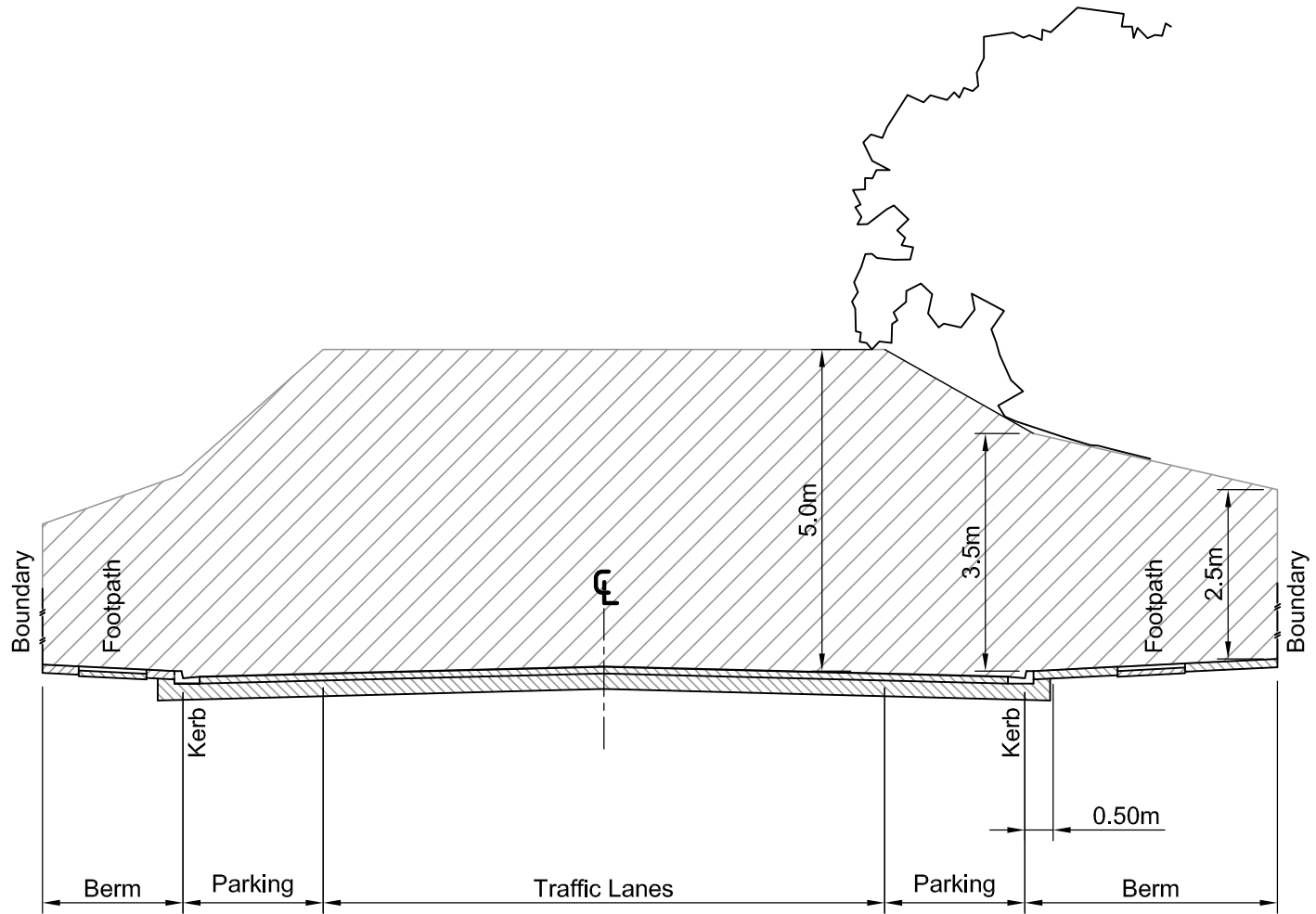
PRIVATE LANES  
TYPICAL CROSS SECTIONS

Scale  
N.T.S

Drawing No.  
C 3

Issue July 2011

Trim Reference  
Manuals\CoP



Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



**ROAD CONTROLLING AUTHORITY**

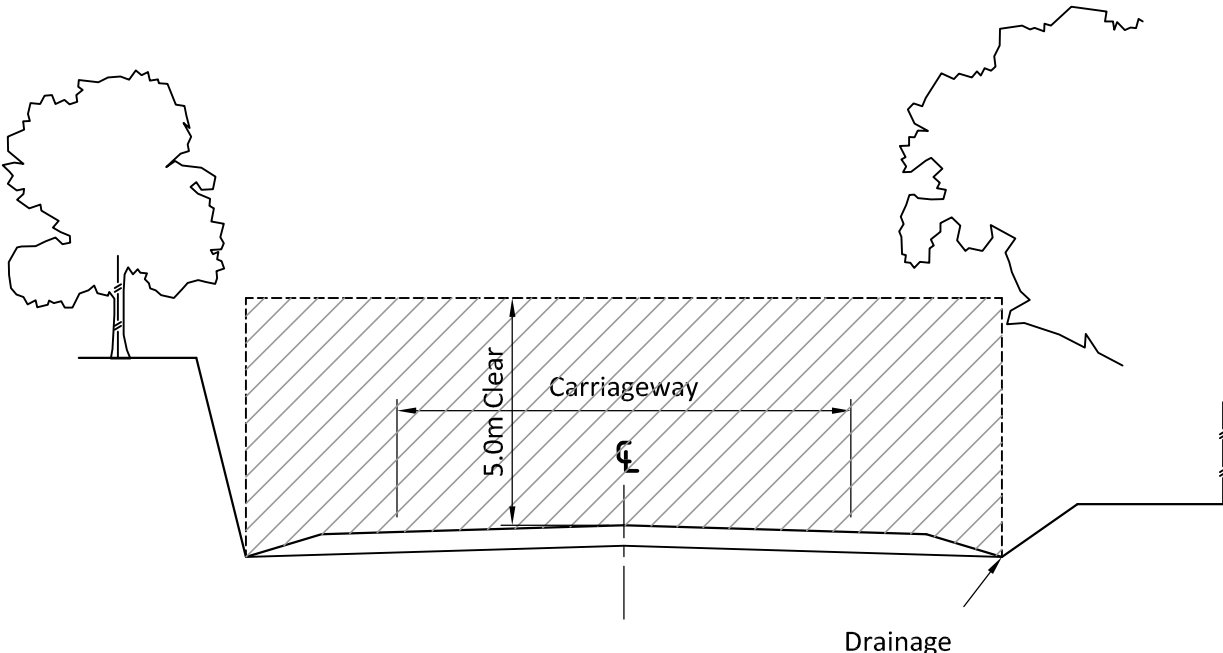
**URBAN ENVIRONMENT  
VEGETATION CONTROL**

Scale  
N.T.S

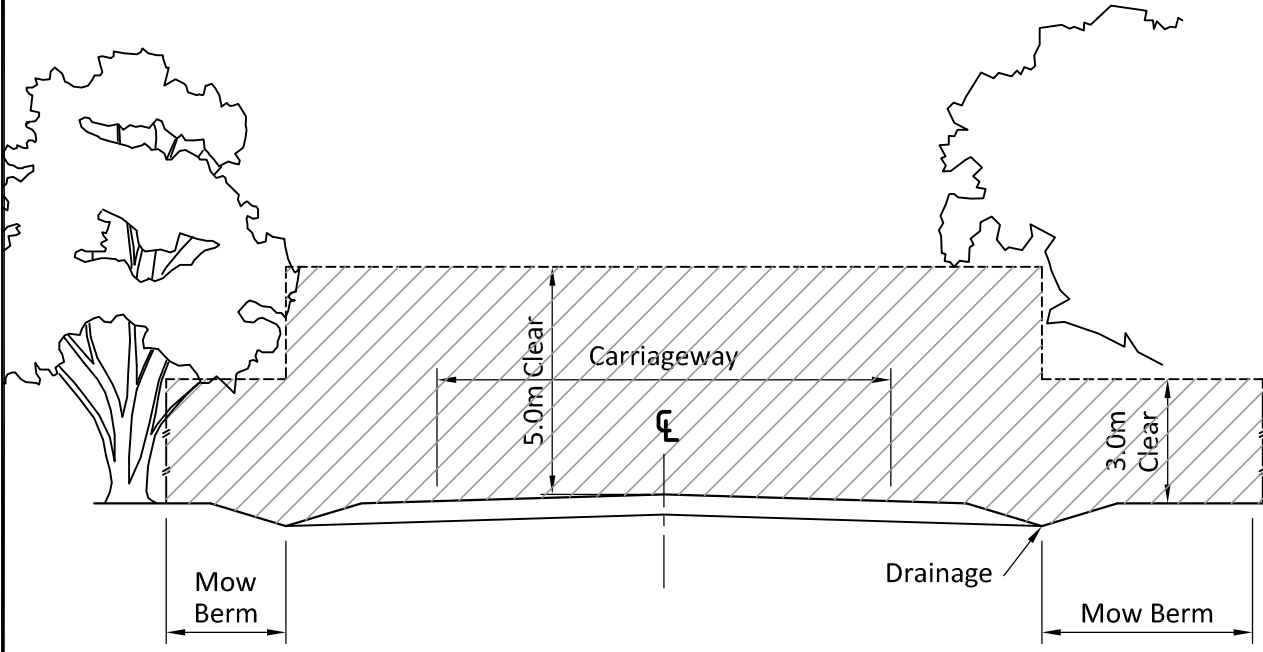
Drawing No.  
C 4

Issue July 2011

Trim Reference  
Manuals\CoP



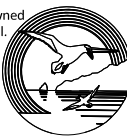
RURAL - MOWING NOT POSSIBLE



RURAL - MOWN

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

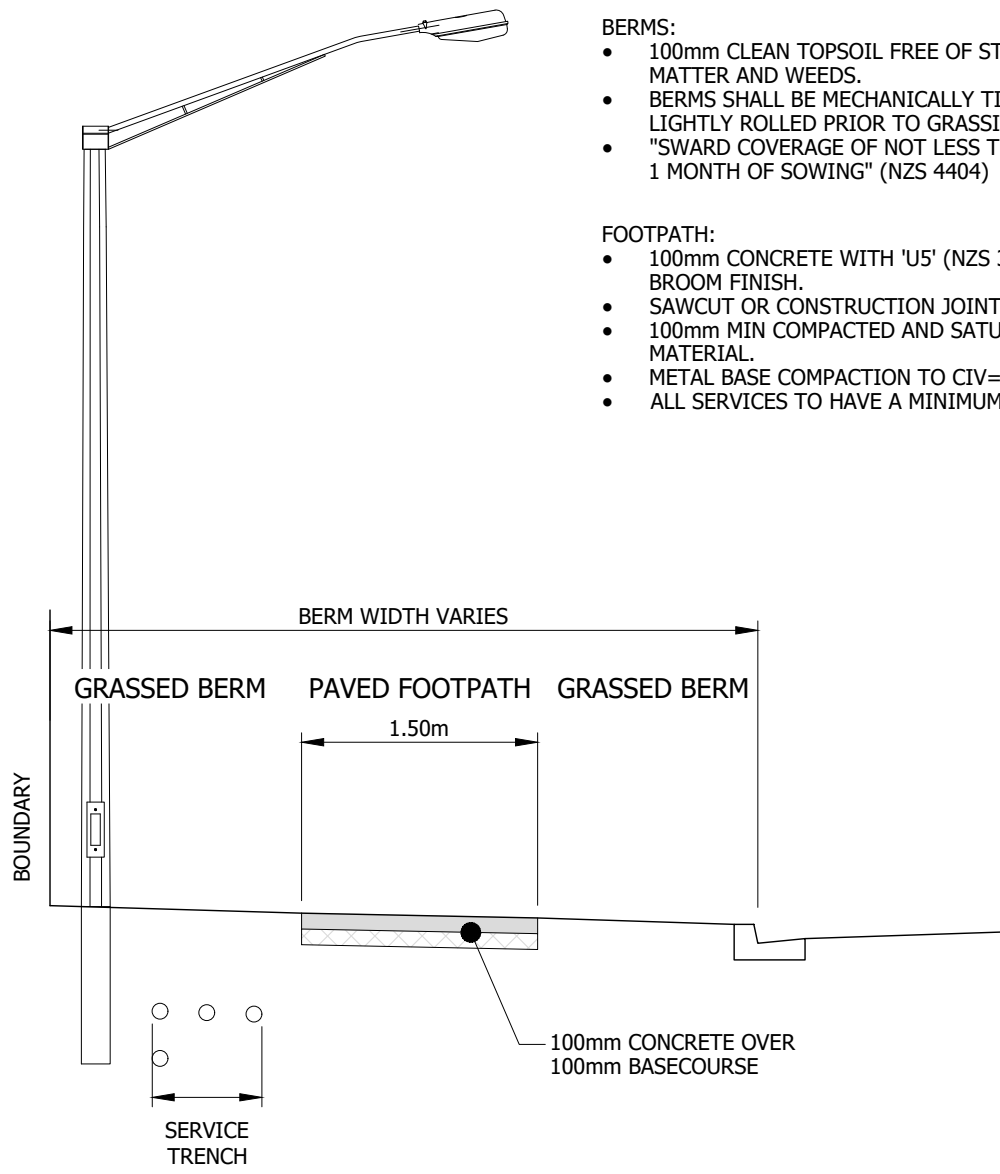


ROAD CONTROLLING AUTHORITY

RURAL ENVIRONMENT  
MOWING & VEGETATION CONTROL

Scale N.T.S	Drawing No. C 5
Issue July 2011	
Trim Reference Manuals\CoP	



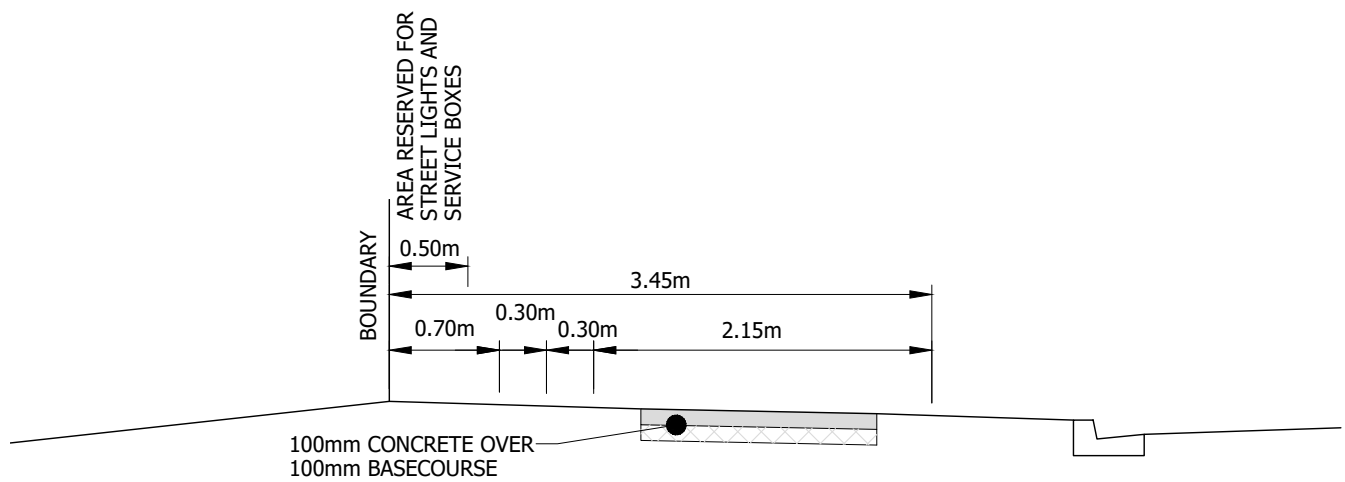


**BERMS:**

- 100mm CLEAN TOPSOIL FREE OF STONES, FOREIGN MATTER AND WEEDS.
- BERMS SHALL BE MECHANICALLY TILLED AND LIGHTLY ROLLED PRIOR TO GRASSING.
- "SWARD COVERAGE OF NOT LESS THAN 90% WITHIN 1 MONTH OF SOWING" (NZS 4404)

**FOOTPATH:**

- 100mm CONCRETE WITH 'U5' (NZS 3114) LIGHT BROOM FINISH.
- SAWCUT OR CONSTRUCTION JOINTS AT 3m CENTERS.
- 100mm MIN COMPACTED AND SATURATED M4 MATERIAL.
- METAL BASE COMPACTION TO CIV=+24.
- ALL SERVICES TO HAVE A MINIMUM 600mm COVER.



LV POWER DUCT/CABLE  
800 COVER

HV POWER DUCT/CABLE  
1.1m COVER

- RIDERMAIN 600mm COVER
- WATER MAIN 750mm COVER
- TELECOM DUCT 600mm COVER
- GAS LMP 600mm COVER

**NB: POWER DUCTS UNDER THE CARRIAGEWAY SHALL HAVE THE FOLLOWING COVERS**

- LV : 1.1m
- HV : 1.3m

**NOTE:**

COVER TO INDIVIDUAL SERVICES NEEDS TO BE CONFIRMED WITH APPROPRIATE UTILITY COMPANY.



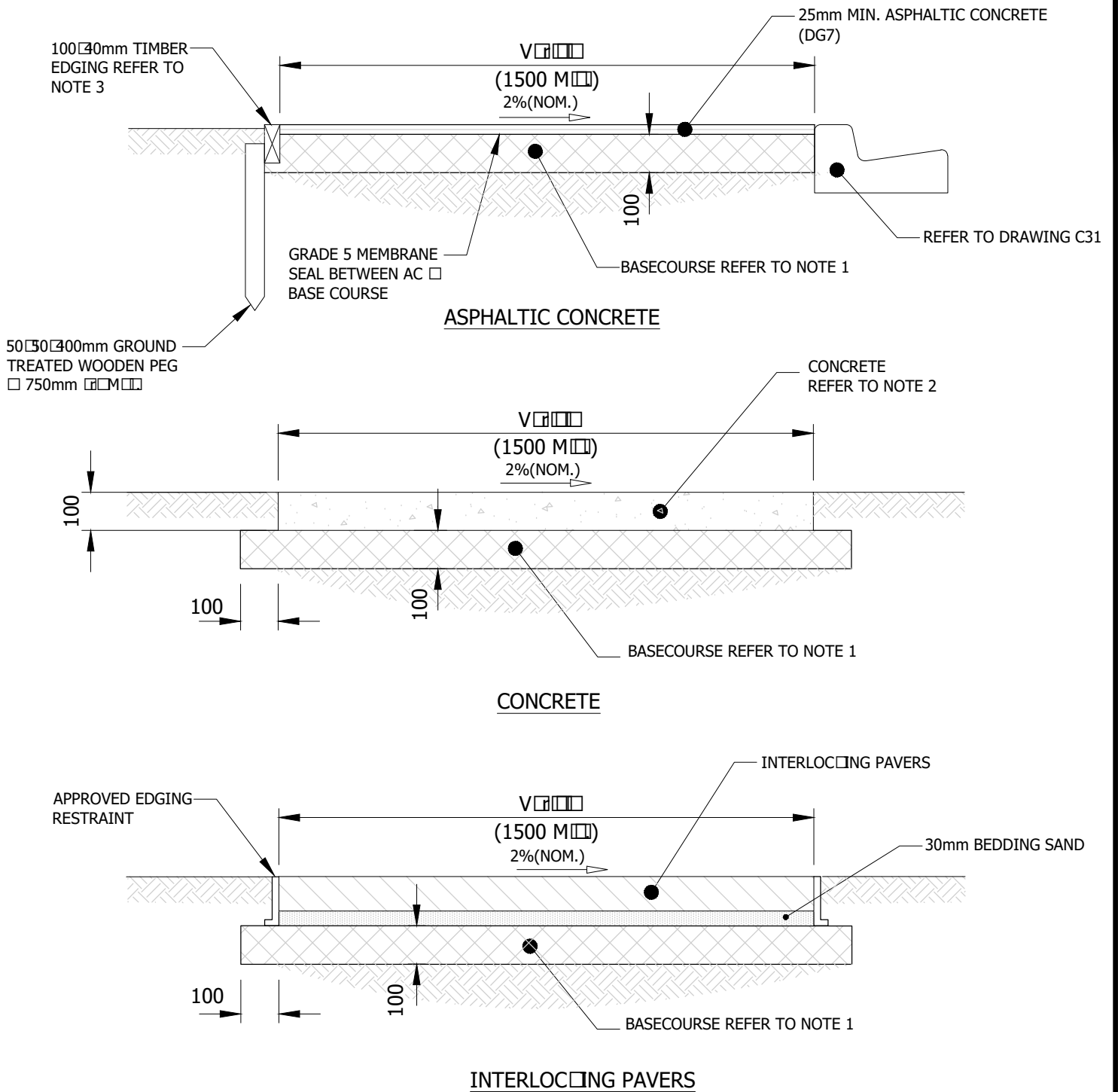
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

INDICATIVE LOCATION OF  
SERVICES IN BERM

C6

NOV 2018



NOTES:

1. TNZ M/4 BASECOURSE COMPACTED TO OBTAIN A CLEGG READING NO LESS THAN 24. DEPTH OF BASECOURSE WILL DEPEND ON SUBGRADE STRENGTH. DEPTH IS TO INCREASE IF SUBGRADE CBR < 5 (DEPTH TO BE DETERMINED BY THE ENGINEER). IF USED IN A PARALLEL BASECOURSE MAY BE CHANGED TO CRUSHED AP40 COMPACTED TO THE SAME SPECIFICATION AS ABOVE.
2. CONCRETE GRADE OF 25 MPa AT 28 DAYS. CONSTRUCTION JOINTS AT ≤3M, SAW CUT TO BE 40mm DEPTH WITHIN 48 HOURS OF POURING PLACING OR WETFORM.
3. ALL TIMBER IN CONTACT WITH THE GROUND TO BE GRADE H4 TO NZS 36040, TIMBER EDGING TO REMAIN
4. ALL DIMENSIONS IN MILLIMETRES
5. FOR CONSTRUCTION DETAILS OF BERM AND FOOTPATH REFER TO THE NOTES ON DRAWING C6.
6. MINIMUM SHARED FACILITY WIDTH IS 2.5m. ANY DEPARTURE FROM THIS STANDARD NEEDS THE APPROVAL FROM THE TRANSPORTATION DEVELOPMENT ENGINEER.



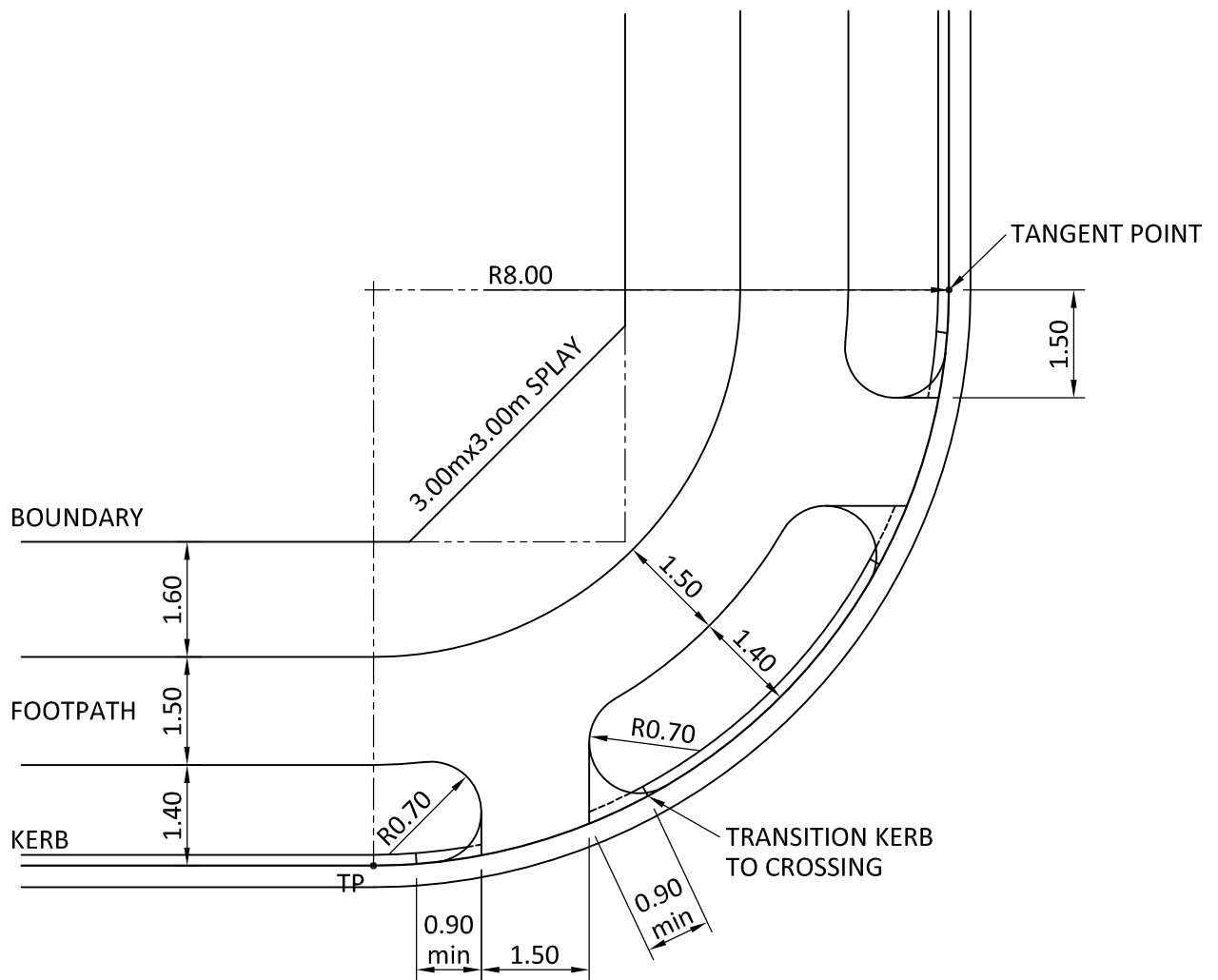
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

SHARED FACILITY AND FOOTPATH  
CONSTRUCTION TYPICAL CROSS SECTIONS


C7

NOV 2018



Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.



**ROAD CONTROLLING AUTHORITY**

**STANDARD PEDESTRIAN CROSSING CORNER LAYOUT**

Scale N.T.S	Drawing No. C 8
Issue July 2011	
Trim Reference Manuals\CoP	

Boundary \_\_\_\_\_

Berm

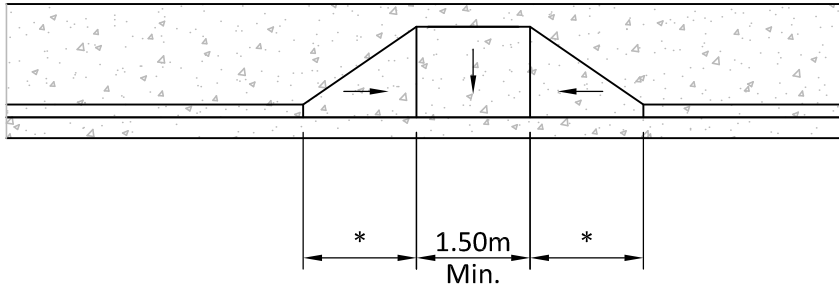
\* Splay

Minimum Splay Slope of 1in12

- 1.5m non-mountable kerb
- 1.0m mountable kerb

Path

Kerb



PATH AGAINST KERB

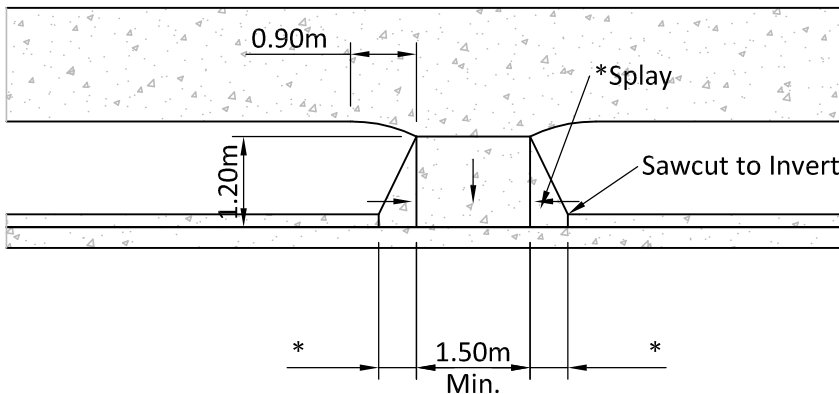
Boundary \_\_\_\_\_

Berm

Path

Berm

Kerb



\* Splay

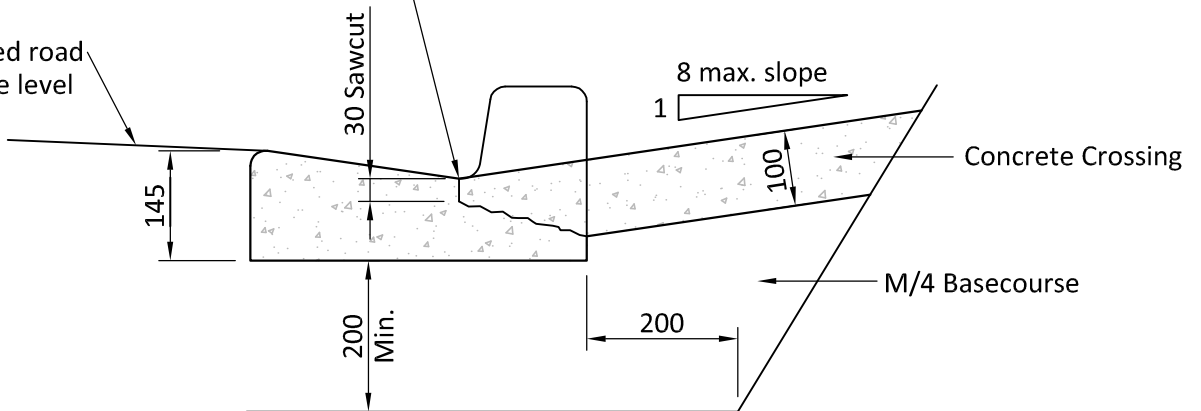
Minimum Splay Width

- 0.5m non-mountable kerb
- 0.5m mountable kerb

PATH OFFSET FROM KERB

Note: No lip, Maintain flush surface

Finished road surface level



KERB/CROSSING INTERFACE

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

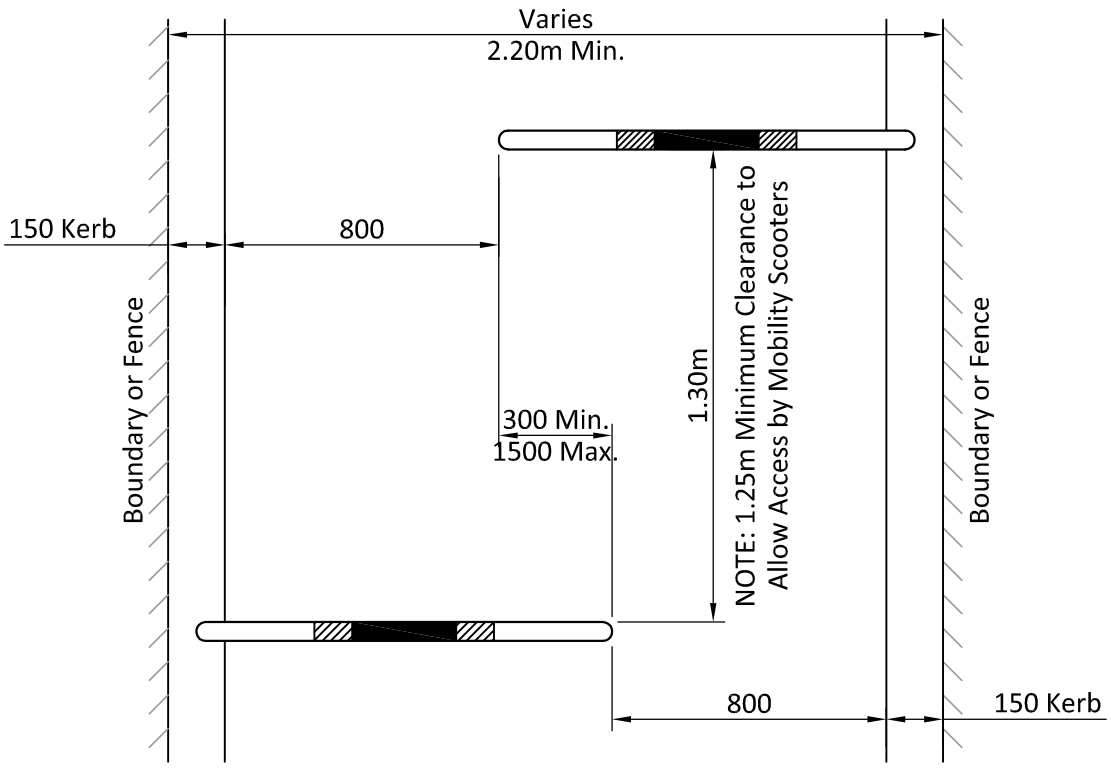
Scale N.T.S

Drawing No. C 9

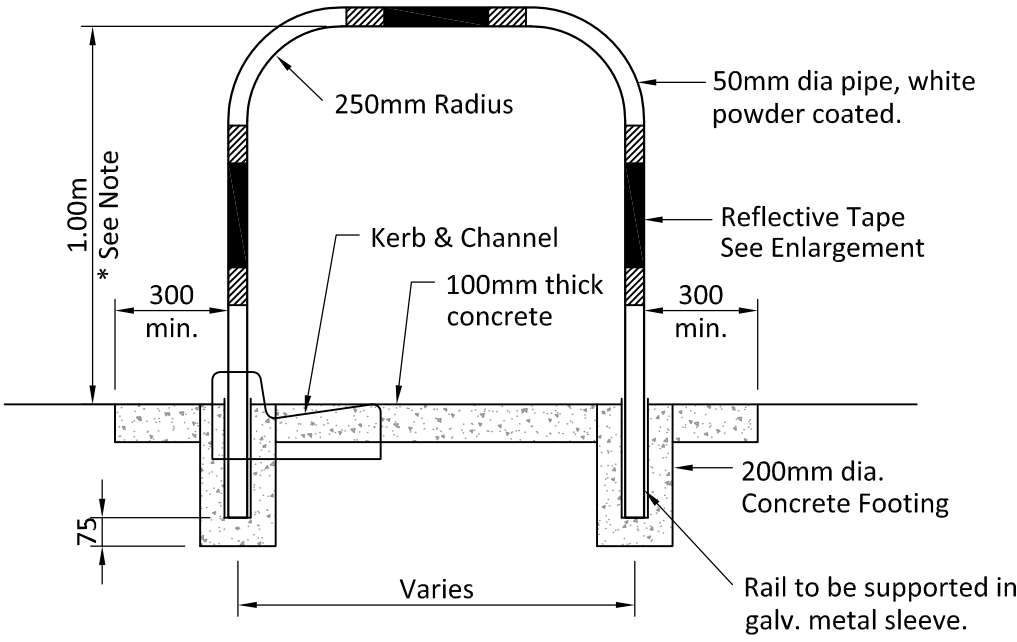
STANDARD PEDESTRIAN CROSSING DETAIL

Issue July 2011

Trim Reference Manuals\CoP

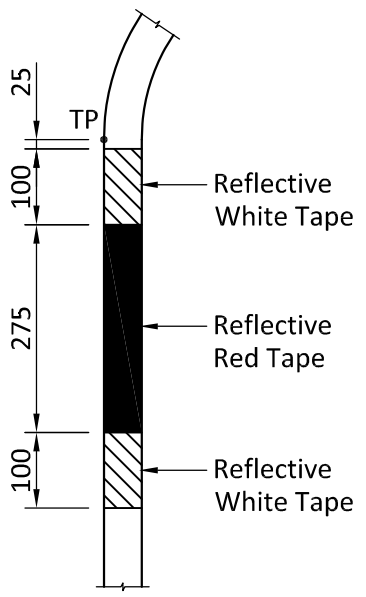


PLAN



NOTE: \* 1.25m Minimum Clearance to Allow Access by Mobility Scooters

ELEVATION




REFLECTIVE TAPE ENLARGEMENT

NOTE: Concrete to have a minimum strength of 17.5 MPa

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



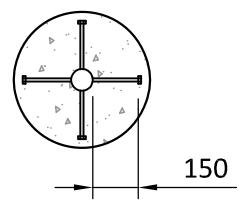
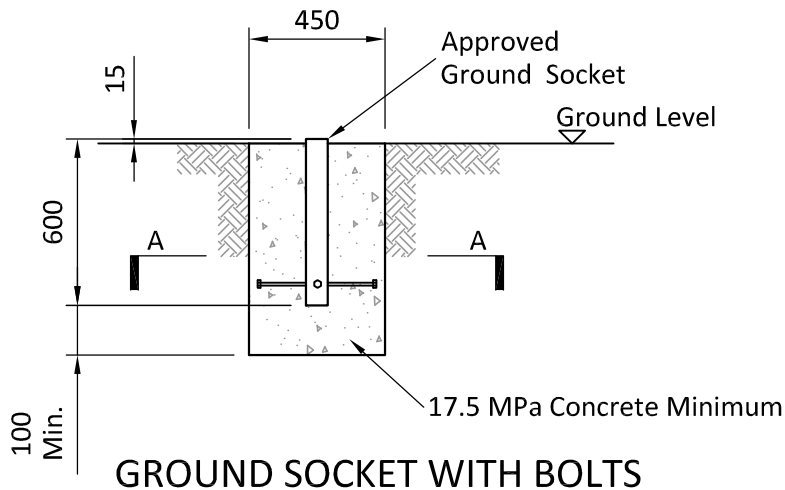
ROAD CONTROLLING AUTHORITY

STANDARD CYCLE BARRIER

Scale N.T.S Drawing No. C 10

Issue July 2011

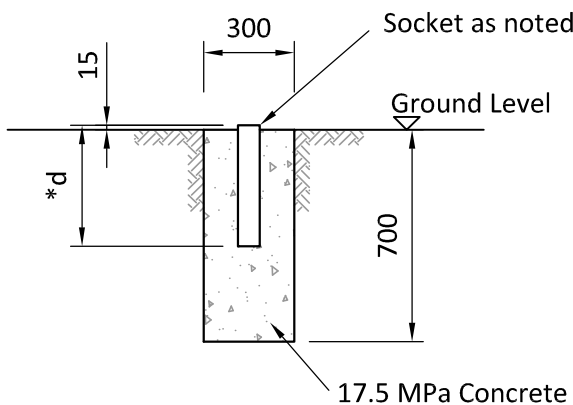
Trim Reference Manuals\CoP



SECT. A-A

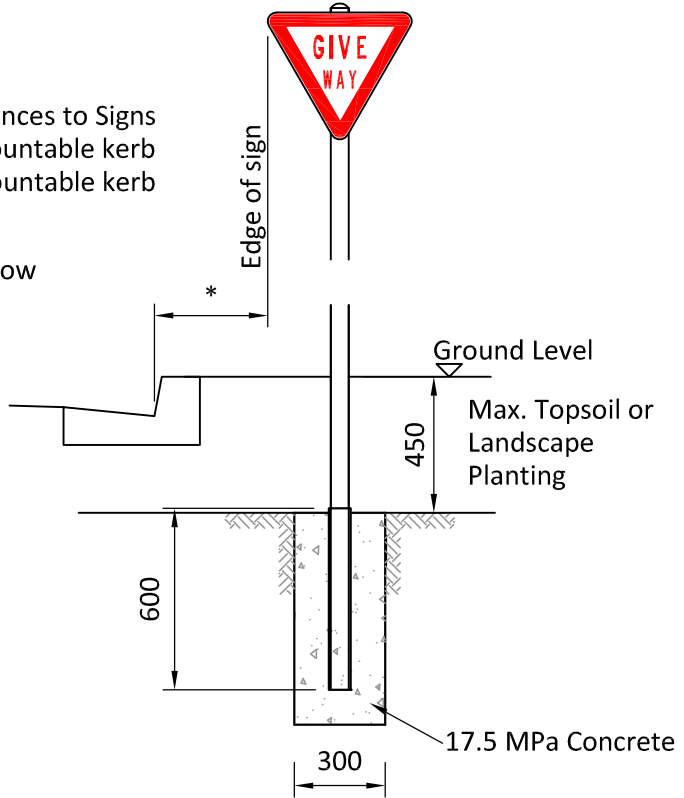
GROUND SOCKET WITH BOLTS

\* Clearances to Signs  
 300mm non-mountable kerb  
 >500mm mountable kerb



\*d = 400mm x 63 ID Socket for Poles up to 2.0m high  
 \*d = 600mm x 76 ID Socket for Poles 2.0m - 4.0m high

TYPICAL 'SIGNFIX' GROUND SOCKET



GROUND SOCKET IN GARDEN

Foundations in Planted and Grassed Areas

- A. Locate pole foundations to meet all contract requirements, and where possible, against a kerb for extra stability. Where socket is near a kerb place concrete to back of kerb to a minimum depth of 100mm. Side clearances, sight lines, pedestrian access, vehicle access and utility services must be considered during installation.
- B. Where no suitable adjacent kerb described in Note 1 is present, locate the pole in the garden or grassed area to satisfy the contract requirements.

NOTE:

- 1. All foundations to conform with Road Sign Manufacturers Association Compliance Standard

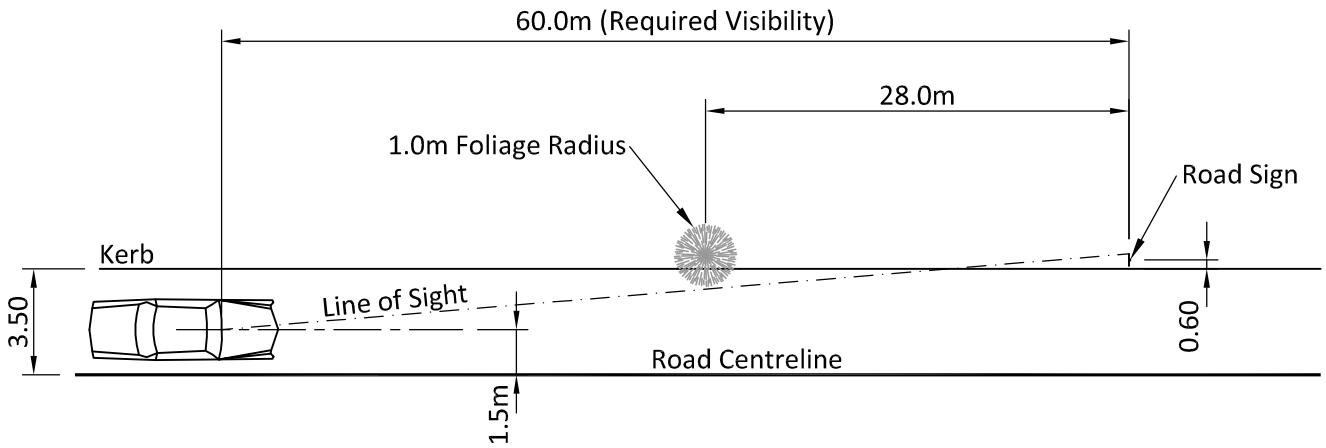
Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

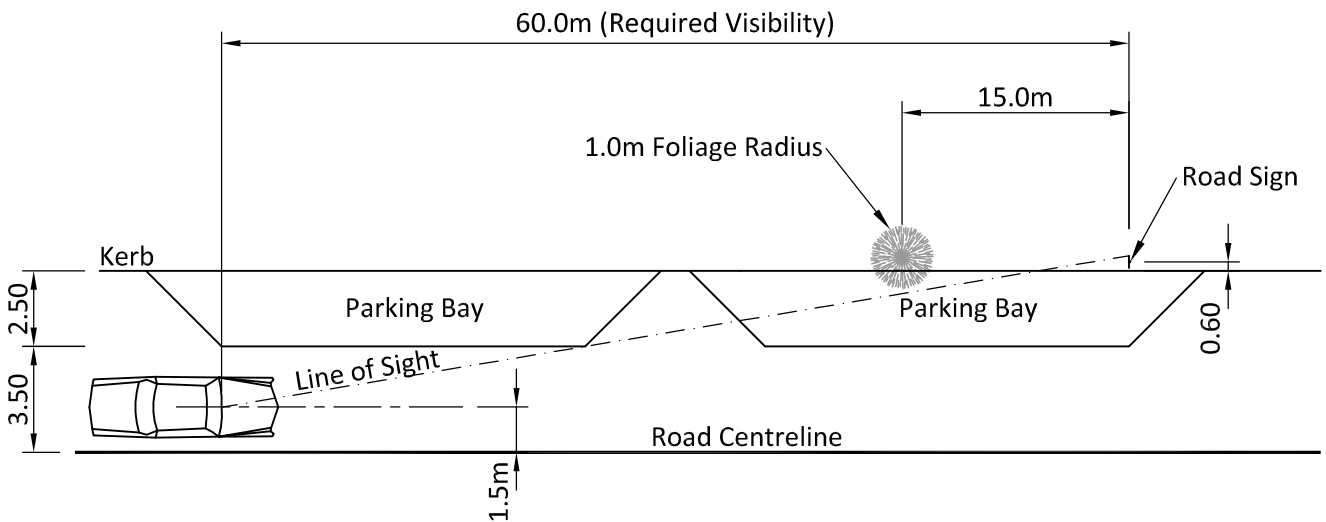
**ROAD CONTROLLING AUTHORITY**

**TYPICAL SIGN DETAILS**  
**POLE FOUNDATIONS**

Scale 1:25	Drawing No. C 11
Issue July 2011	
Trim Reference Manuals\CoP	



### DRIVING LANE ADJACENT TO KERB



### DRIVING LANE AND PARKING LANE

#### NOTES:

1. Mature foliage to be a minimum height of 2.0m clear of ground within the restricted zone.
2. Within intersections, plantings shall grow no higher than 0.5m to maintain clear sight splays.

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

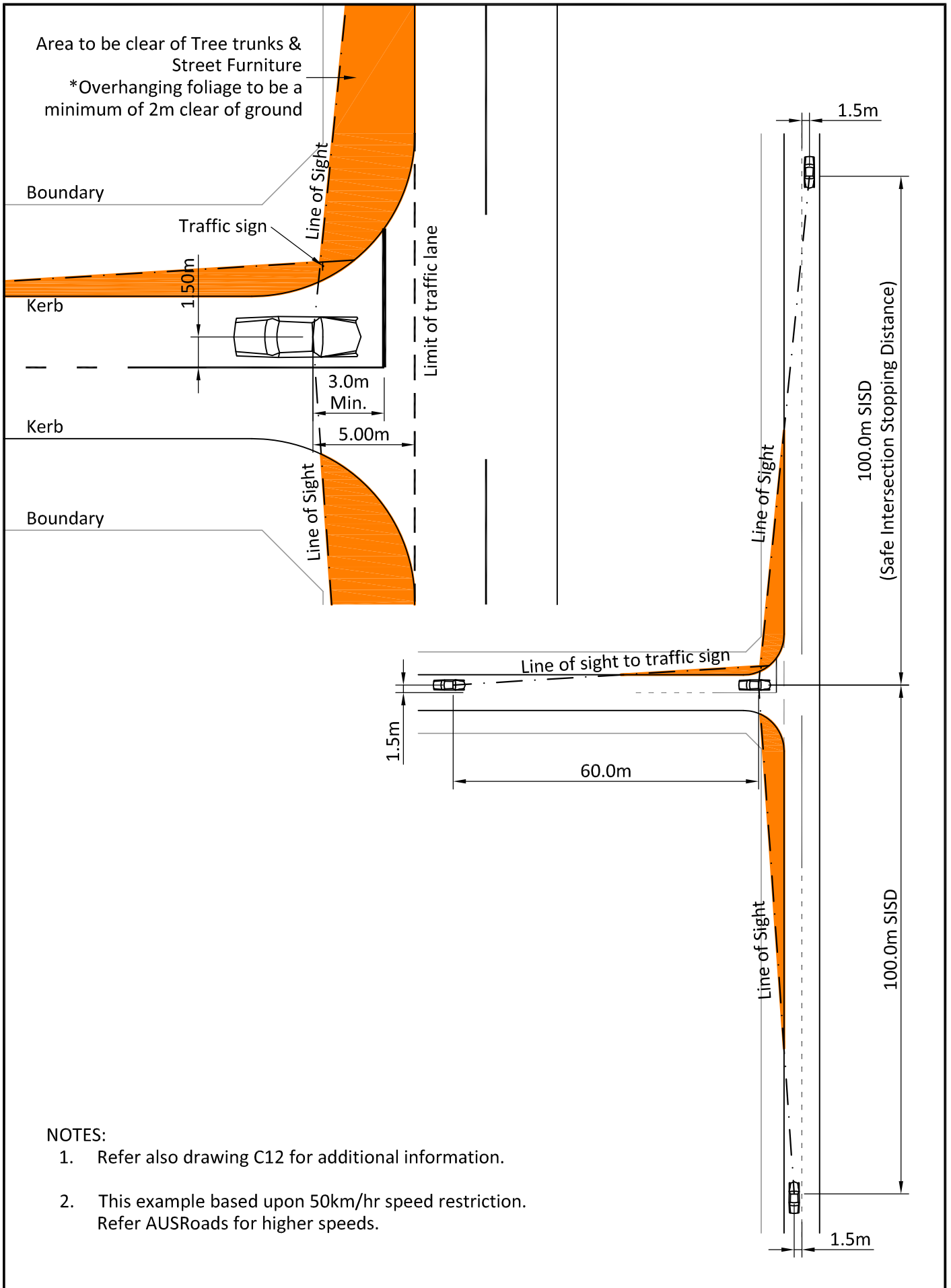
APPROACH VISIBILITY FOR TRAFFIC SIGNS  
& STREET FURNITURE

Scale  
N.T.S

Drawing No.  
C 12

Issue July 2011

Trim Reference  
Manuals\CoP



**NOTES:**

1. Refer also drawing C12 for additional information.
2. This example based upon 50km/hr speed restriction. Refer AUSRoads for higher speeds.

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



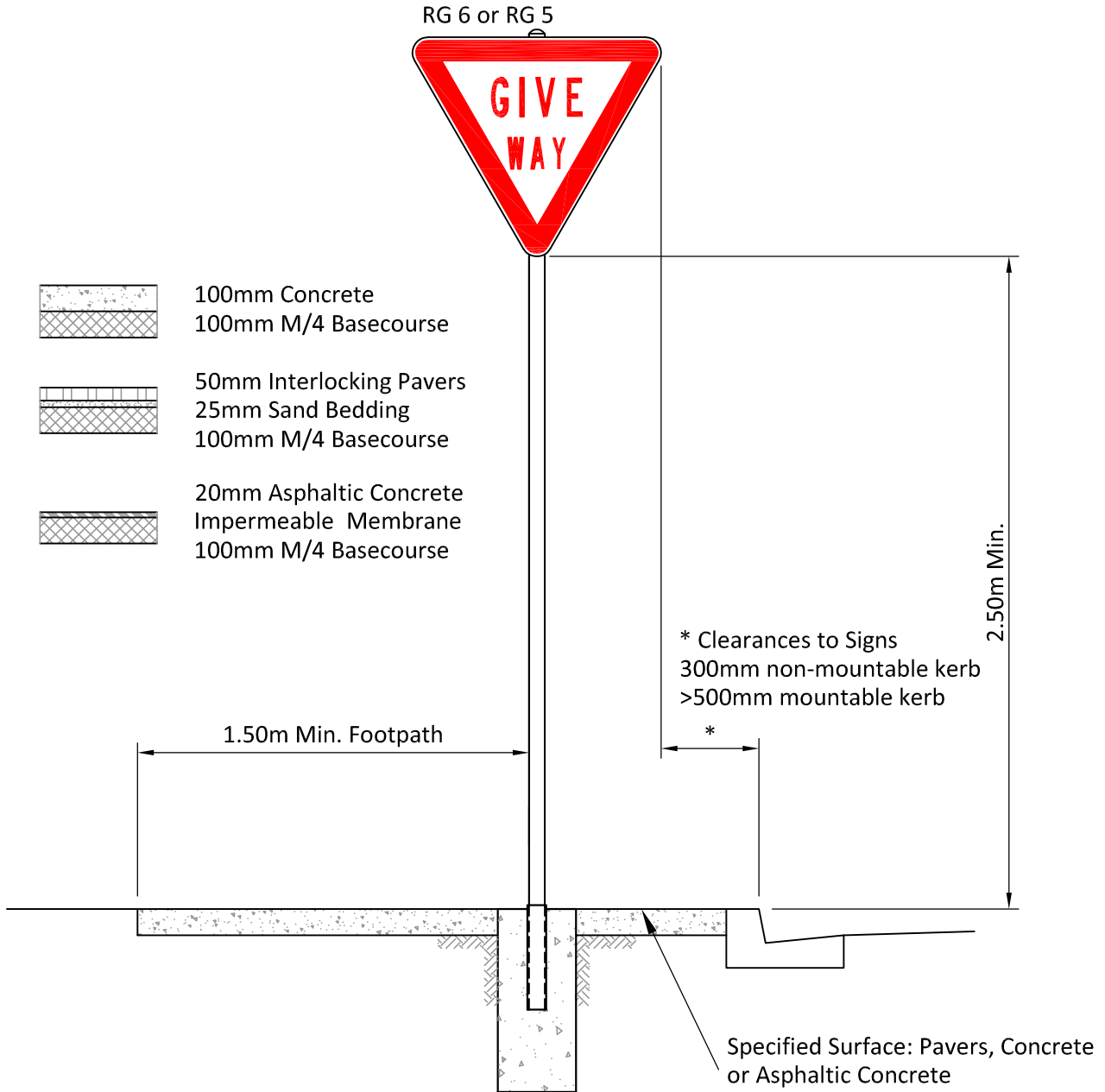
**ROAD CONTROLLING AUTHORITY**

**APPROACH VISIBILITY FOR TRAFFIC SIGNS & STREET FURNITURE - SAMPLE SETOUT**

Scale N.T.S	Drawing No. C 13
Issue July 2011	
Trim Reference Manuals\CoP	



Note: Sign Sizes & Siting Details shall be in accordance with MOTSAM



**SIGN LOCATION IN FOOTPATH**

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



**ROAD CONTROLLING AUTHORITY**

**TYPICAL SIGN DETAILS  
FOR PATH LOCATION**

Scale  
N.T.S

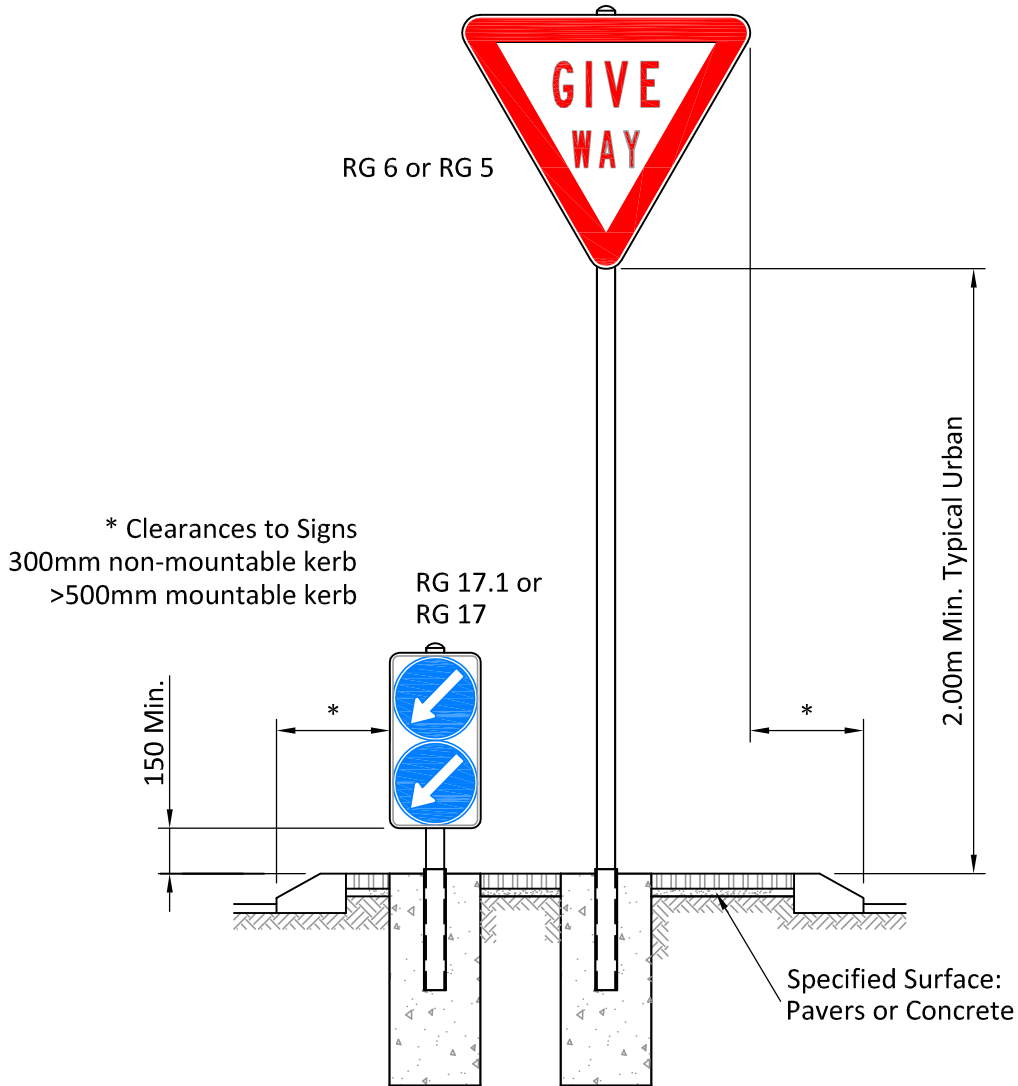
Drawing No.  
C 15

Issue July 2011

Trim Reference  
Manuals\CoP

Note: Sign Sizes & Siting Details shall be in accordance with MOTSAM

-  100mm Concrete  
100mm M/4 Basecourse
-  50mm Interlocking Pavers  
25mm Sand Bedding  
100mm M/4 Basecourse



### SIGN LOCATION IN SPLITTER ISLANDS

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

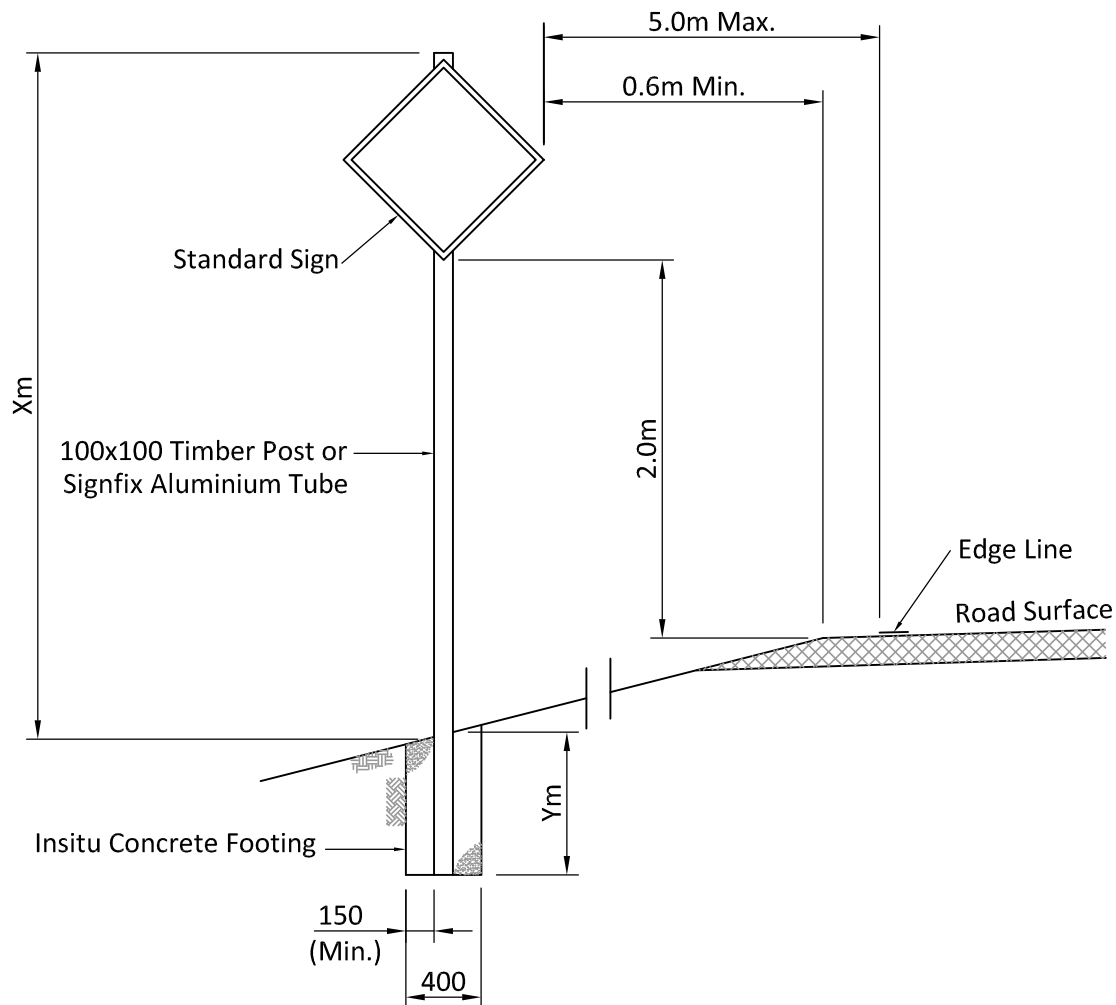
TYPICAL SIGN DETAILS  
SPLITTER ISLAND LOCATION

Scale  
N.T.S

Drawing No.  
C 16

Issue July 2011

Trim Reference  
Manuals\CoP



HEIGHT ABOVE GROUND LEVEL (X).	POST DEPTH BELOW GROUND (Y).	TOTAL POST LENGTH (X + Y)	POST ID mm	WALL THICKNESS	
				TROUGH	RIB
1.0m - 2.5m	0.70m	1.7m - 3.2m	60	2.80	3.75
2.5m - 3.0m	0.90m	3.4m - 3.9m	76	3.05	4.00
3.0m - 3.5m	1.10m	4.1m - 4.6m	89	3.55	4.50
3.5m - 4.5m	1.30m	4.8m - 5.8m	102	4.50	5.00
4.5m - 5.0m	1.50m	6.0m - 6.5m	114	4.60	5.50

**Note:**  
All foundations to conform with Road Sign Manufacturers Association Compliance Standard

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



**ROAD CONTROLLING AUTHORITY**

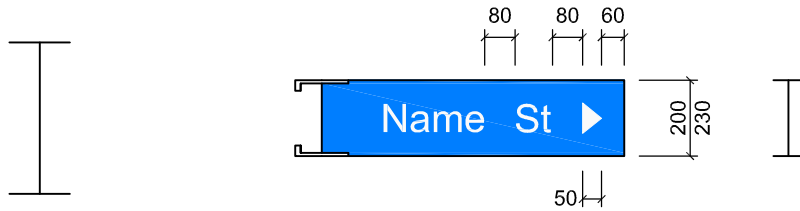
**TYPICAL SIGN DETAIL RURAL VERGE**

Scale  
N.T.S

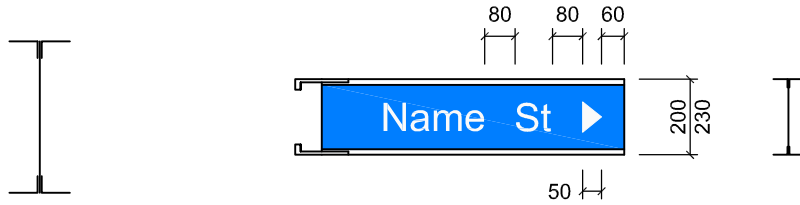
Drawing No.  
C 17

Issue July 2011

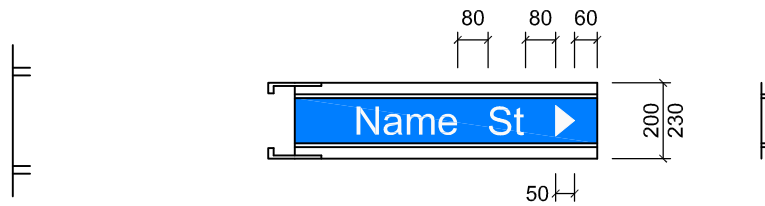
Trim Reference  
Manuals\CoP



SIGNFIX EXTRUSION I BEAM

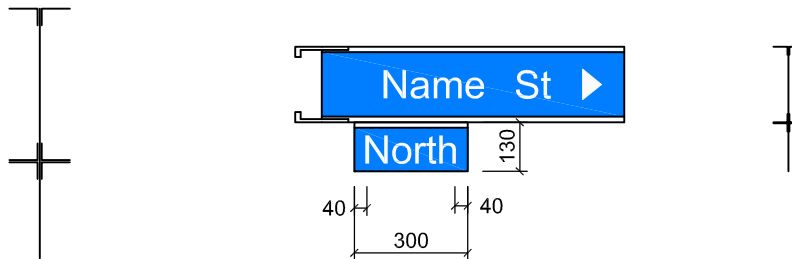


SIGNFIX CONSTRUCTED WITH 'T' CHANNEL

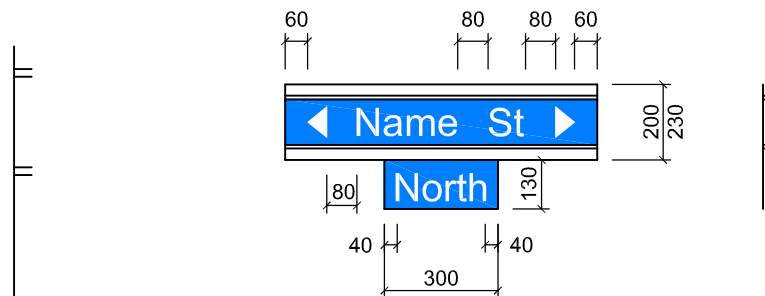


SINGLE SIDED SIGN

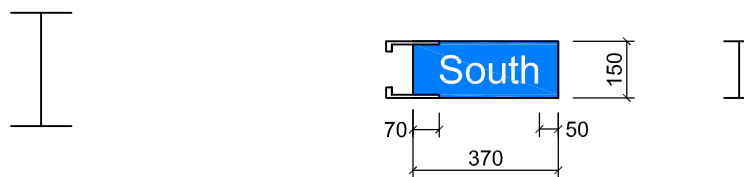
### SUPPLEMENTARY SIGNS



SIGNFIX CONSTRUCTED WITH 'T' CHANNEL



SUPPLEMENT FOR SINGLE SIDED SIGN



SUPPLEMENT FOR DOUBLE SIDED SIGN  
EXCEEDING 1200mm IN LENGTH.

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

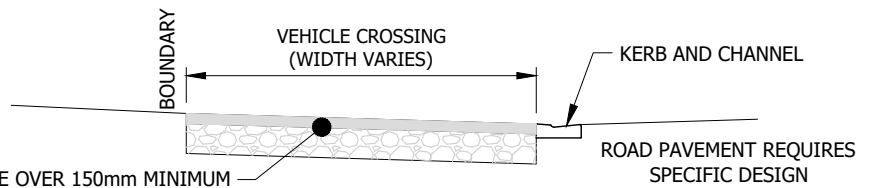
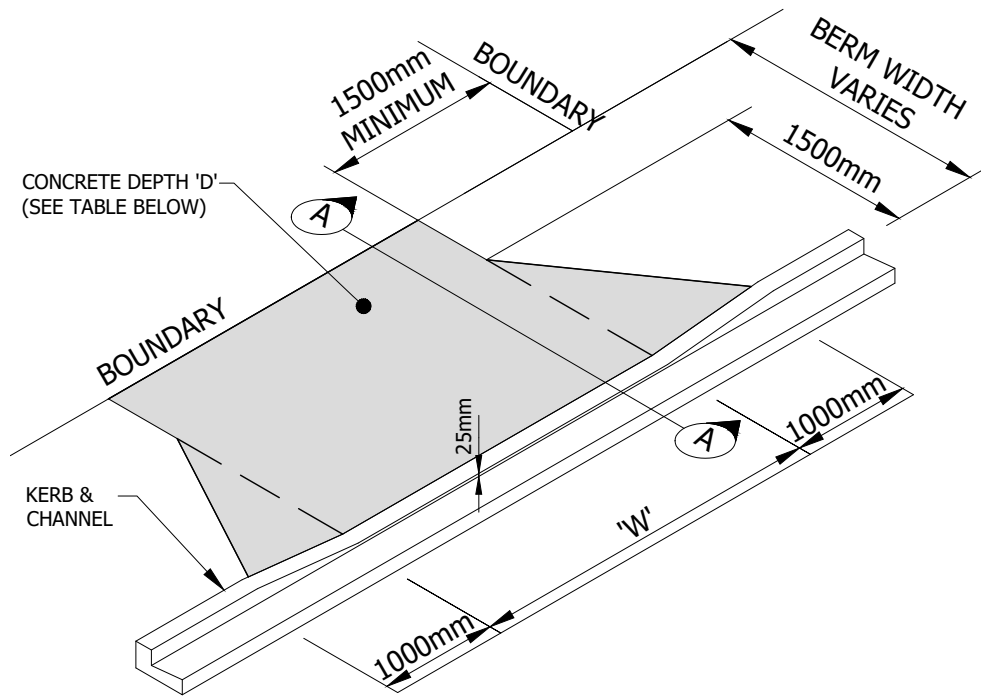
LAYOUT OF TYPICAL NAME  
& FINGERBOARD SIGNS

Scale  
N.T.S

Drawing No.  
C 18

Issue July 2011

Trim Reference  
Manuals\CoP



100-150mm THICK 30MPa CONCRETE OVER 150mm MINIMUM THICK M4 BASECOURSE COMPACTED IN 150mm LAYERS TO AN APPROPRIATE CLEGG READING INDICATED IN TABLE BELOW

SECTION A-A

Property Description		Min. Width 'W'	Max. Width 'W'	Concrete Depth 'D'	Mesh Reinforcing	Basecourse Thickness	Target Clegg Reading
Residential	1-2 Dwellings	3m	4.8m	100mm	No	150mm	25
	3-4 Dwellings	4m	4.8m	125mm	No	150mm	25
	5+ Dwellings	6m	6m	150mm	1 Layer 665	200mm	35
Light Commercial (not requiring specific design).		4m	6m	150mm	1 Layer 665	200mm	35
Industrial (not requiring specific design).		6m	9m	150mm	1 Layer 665	200mm	35

NOTES:

1. DEPTH OF BASECOURSE WILL DEPEND ON SUBGRADE STRENGTH. THE DEPTHS SHOWN ASSUME A SUBGRADE CBR > 5%. BASECOURSE IS TO BE COMPACTED TO 95% STANDARD COMPACTION.
2. FOR SUBGRADE STRENGTH BELOW CBR 5% SPECIFIC DESIGNS ARE REQUIRED.
3. CONCRETE STRENGTH TO BE A MINIMUM OF 30MPa AT 28 DAYS.
4. WHERE MOUNTABLE KERBS ARE PRESENT THERE IS TO BE NO CUT DOWN AND THE VEHICLE CROSSING WILL TIE INTO THE TOP OF KERB LEVEL.
5. REFER TO DRAWING C19A FOR DETAILS OF KERB AND CHANNEL PROFILE ADJACENT TO SHARED CYCLEWAY AND FOOTPATH.



HASTINGS DISTRICT COUNCIL

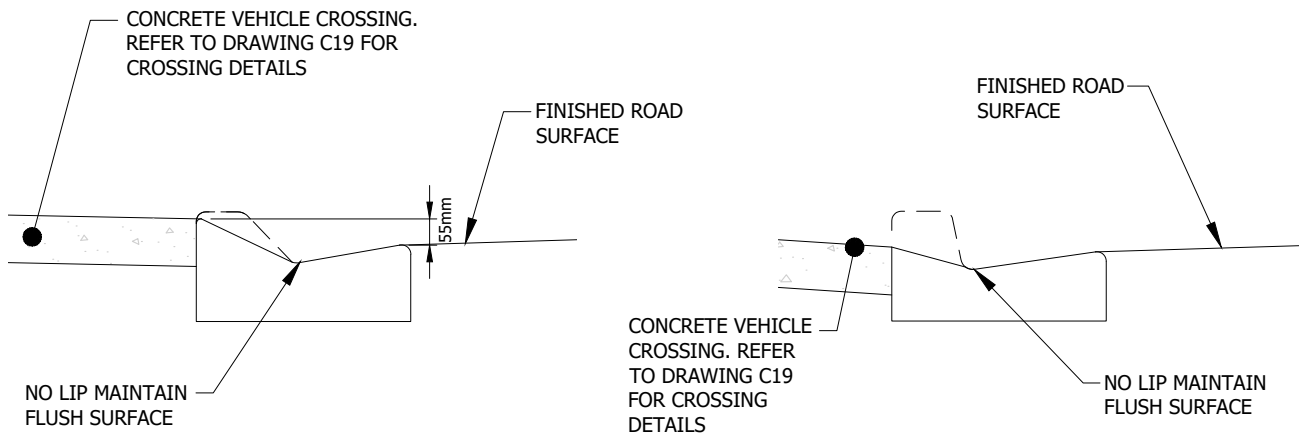
NOT TO SCALE

MINIMUM STANDARDS FOR VEHICLE CROSSINGS ONTO URBAN ROADS

C19

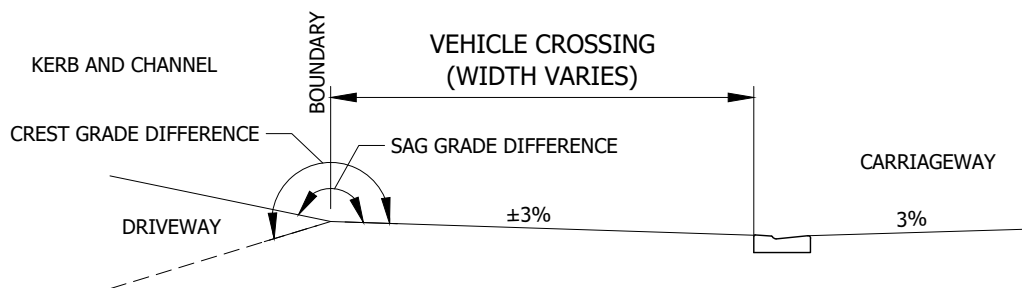
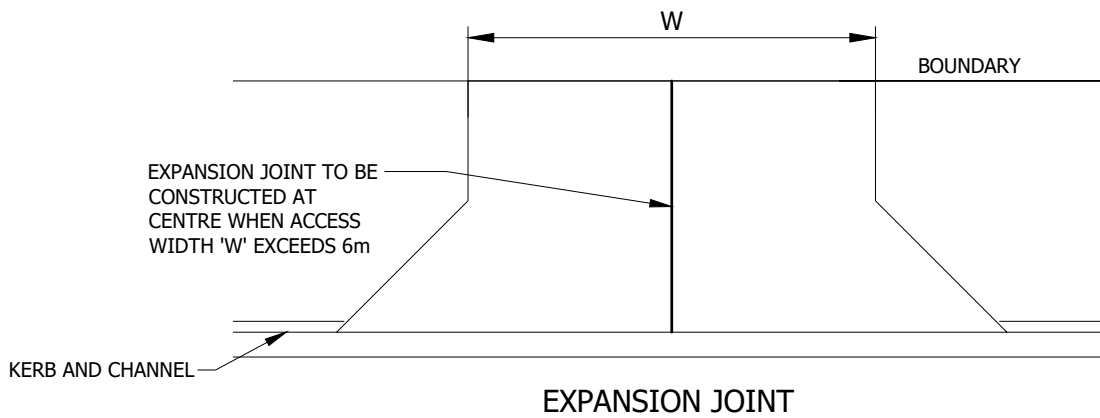
NOV 2018

TRIM Reference :



**MOUNTABLE KERB AND CHANNEL  
PROFILE AT DRIVEWAYS  
ADJACENT TO CYCLEWAY**

**NON-MOUNTABLE KERB AND CHANNEL  
PROFILE AT DRIVEWAYS ADJACENT  
TO CYCLEWAYS**



**MAXIMUM GRADE DIFFERENCES  
FOR URBAN VEHICLE CROSSINGS**

**NOTES:**

1. MAXIMUM CREST GRADE DIFFERENCE IS 10%
2. MAXIMUM SAG GRADE DIFFERENCE IS 17%



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

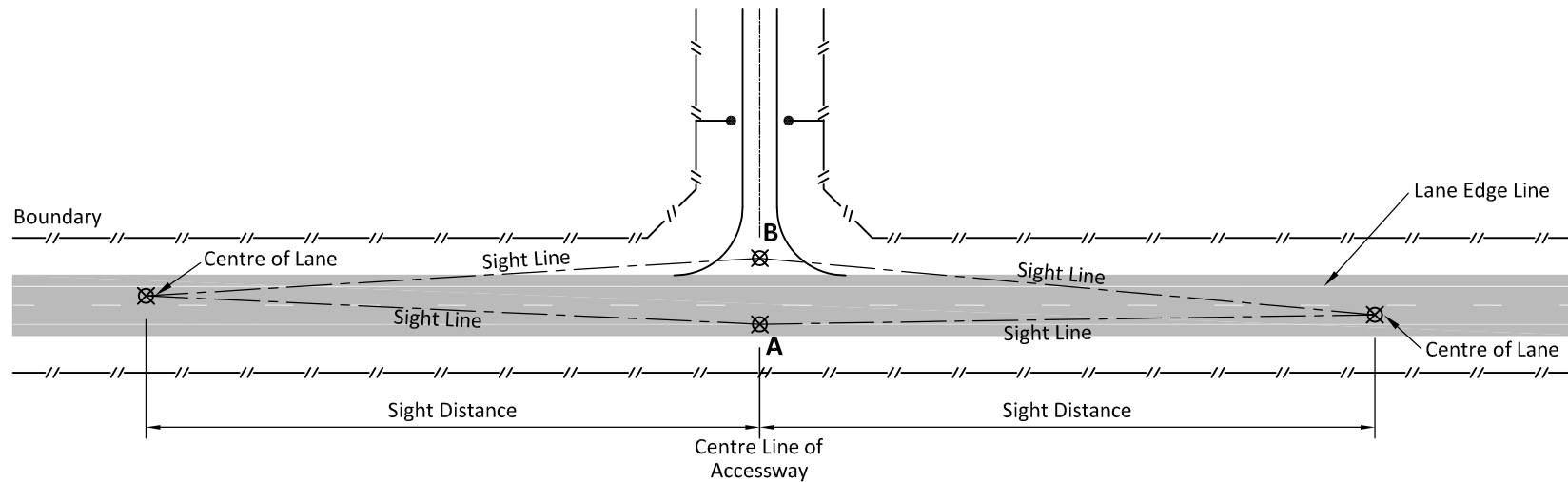
HASTINGS DISTRICT COUNCIL

MINIMUM STANDARDS FOR VEHICLE  
CROSSINGS - TYPICAL SECTIONS

NOT TO SCALE

C19A

NOV 2018



**POINT A** Edge line

**POINT B** 3.5m minimum setback from white lane edge line

**NOTES**

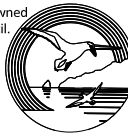
- Sight distance shall be measured 1.5m (motorists eye level) above the finished surface of the accessway and the highway.
- There shall be no obstructions to visibility inside the area bounded by the sight lines.

**SIGHT DISTANCES**

SPEED LIMIT	METRES
70	151
80	181
90	214
100	248

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



**ROAD CONTROLLING AUTHORITY**

**PRIVATE RURAL ACCESS  
SIGHT LINES - DIAGRAM A**

Scale  
N.T.S

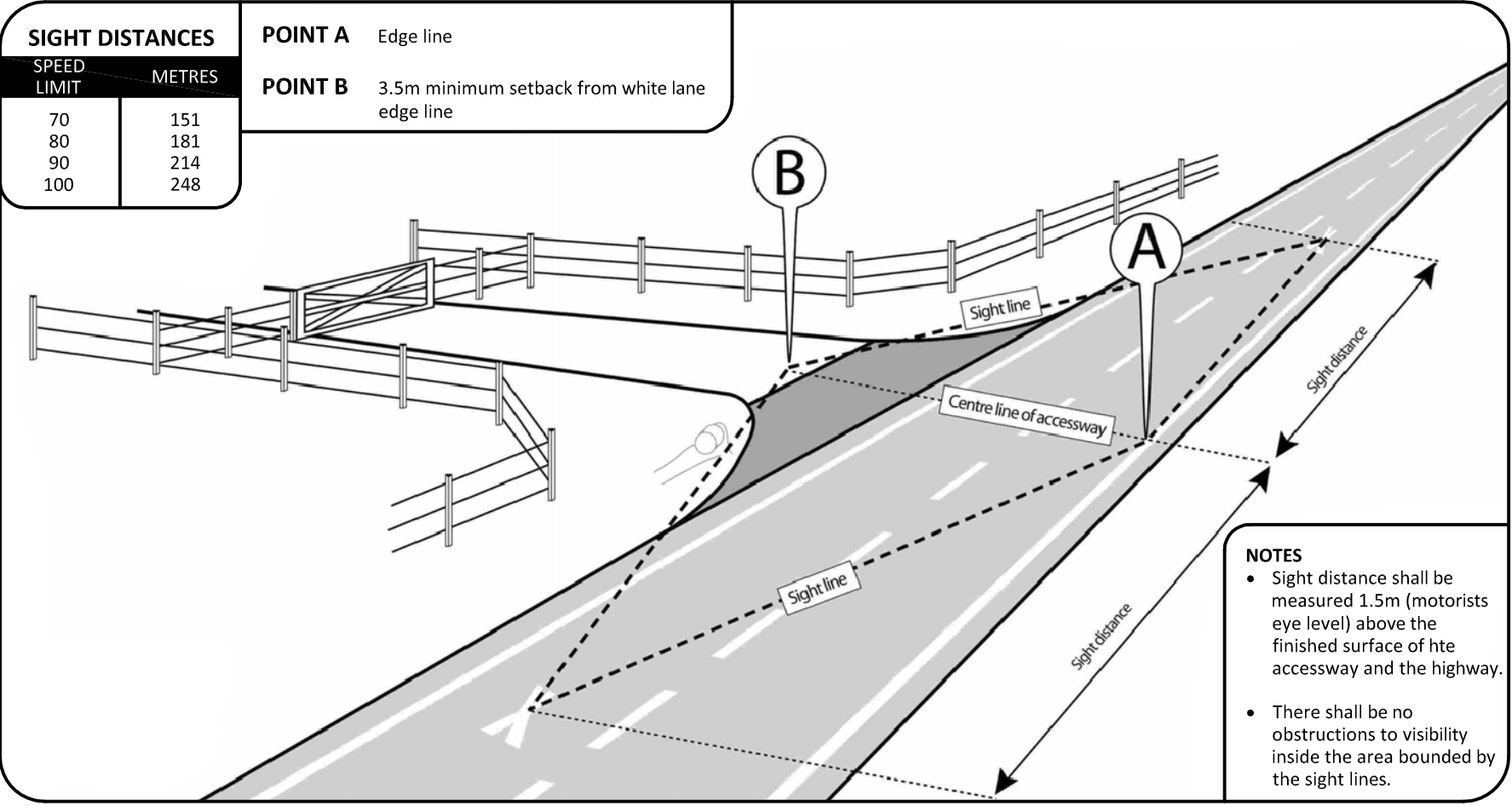
Drawing No.  
C 20

Issue July 2011

Trim Reference  
Manuals\CoP

SIGHT DISTANCES	
SPEED LIMIT	METRES
70	151
80	181
90	214
100	248

**POINT A** Edge line  
**POINT B** 3.5m minimum setback from white lane edge line



**NOTES**

- Sight distance shall be measured 1.5m (motorists eye level) above the finished surface of the accessway and the highway.
- There shall be no obstructions to visibility inside the area bounded by the sight lines.

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

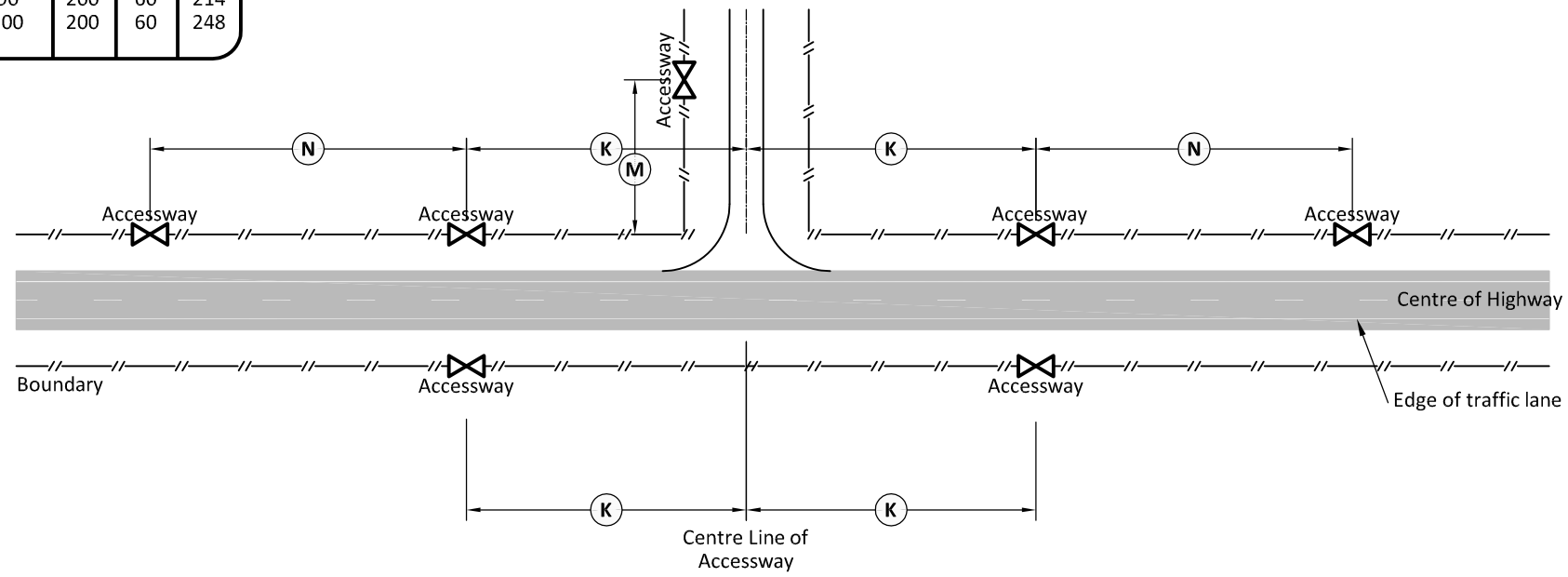
**ROAD CONTROLLING AUTHORITY**

**PRIVATE RURAL ACCESS  
SIGHT LINES - PERSPECTIVE A**

Scale N.T.S	Drawing No. C 21
Issue July 2011	
Trim Reference Manuals\CoP	

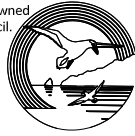


SPEED LIMIT	DISTANCE (metres)		
	K	M	N
70	100	45	151
80	100	45	181
90	200	60	214
100	200	60	248



Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

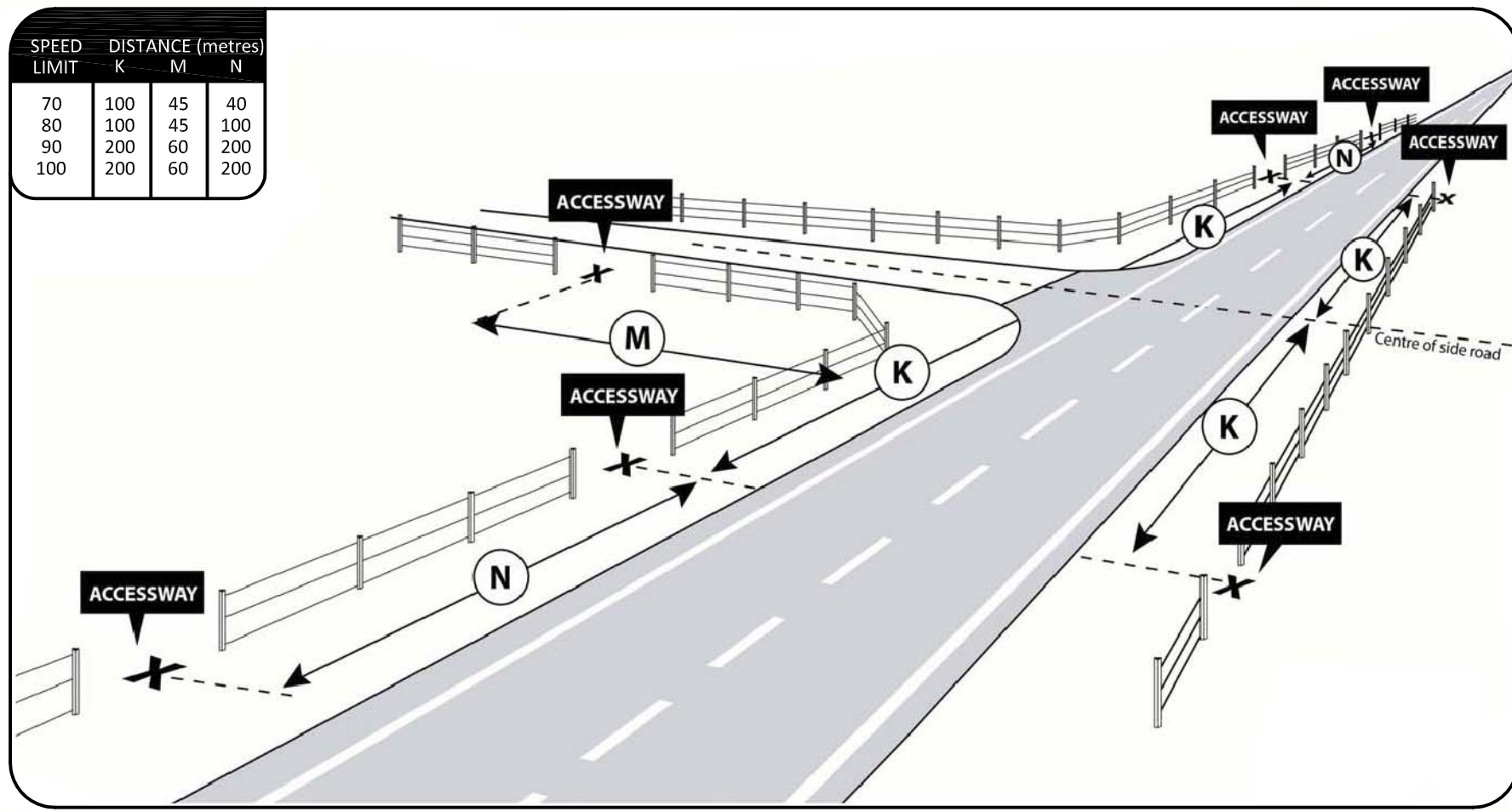


**ROAD CONTROLLING AUTHORITY**

**PRIVATE RURAL ACCESS SEPARATION DISTANCES - DIAGRAM B**

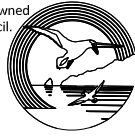
Scale N.T.S	Drawing No. C 22
Issue July 2011	
Trim Reference Manuals\CoP	

SPEED LIMIT	DISTANCE (metres)		
	K	M	N
70	100	45	40
80	100	45	100
90	200	60	200
100	200	60	200



Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



**ROAD CONTROLLING AUTHORITY**

**PRIVATE RURAL ACCESS SEPARATION DISTANCES - PERSPECTIVE B**

Scale N.T.S	Drawing No. C 23
Issue July 2011	
Trim Reference Manuals\CoP	

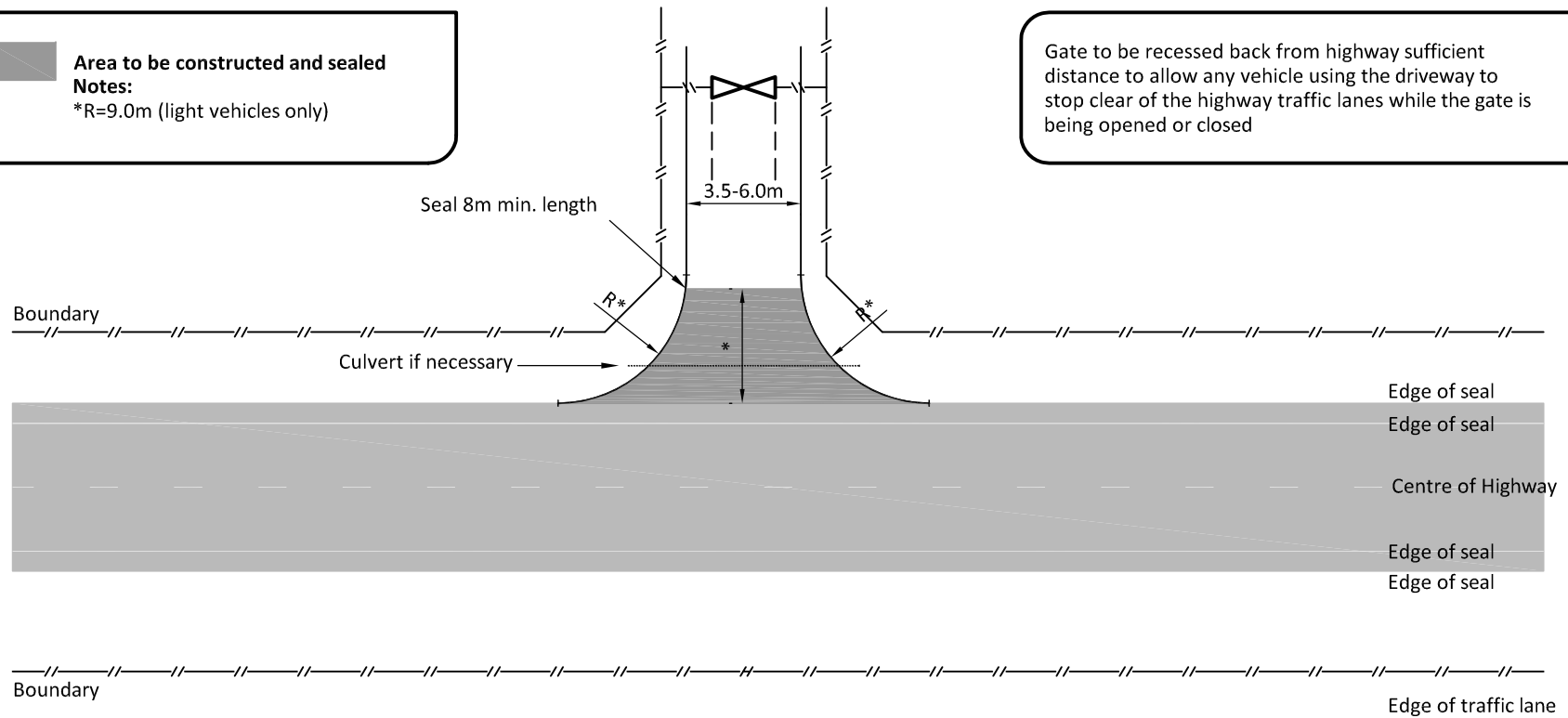


**Area to be constructed and sealed**

**Notes:**

\*R=9.0m (light vehicles only)

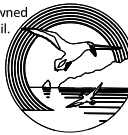
Gate to be recessed back from highway sufficient distance to allow any vehicle using the driveway to stop clear of the highway traffic lanes while the gate is being opened or closed



Note: TYPICAL LOW USE is defined as:  
1 - 30 ecm/day using entrance  
and  
≤ 5000 vpd using adjoining road

Copyright in this drawing is owned  
by the Hastings District Council

Any unauthorised copying or  
adaption of the whole or  
substantial part of the work  
in two or three dimensions is  
an infringement of copyright



ROAD CONTROLLING AUTHORITY

PRIVATE RURAL ACCESS  
LOW USE - DIAGRAM C

Scale  
N.T.S

Drawing No.  
C 24

Issue July 2011

Trim Reference  
Manuals\CoP



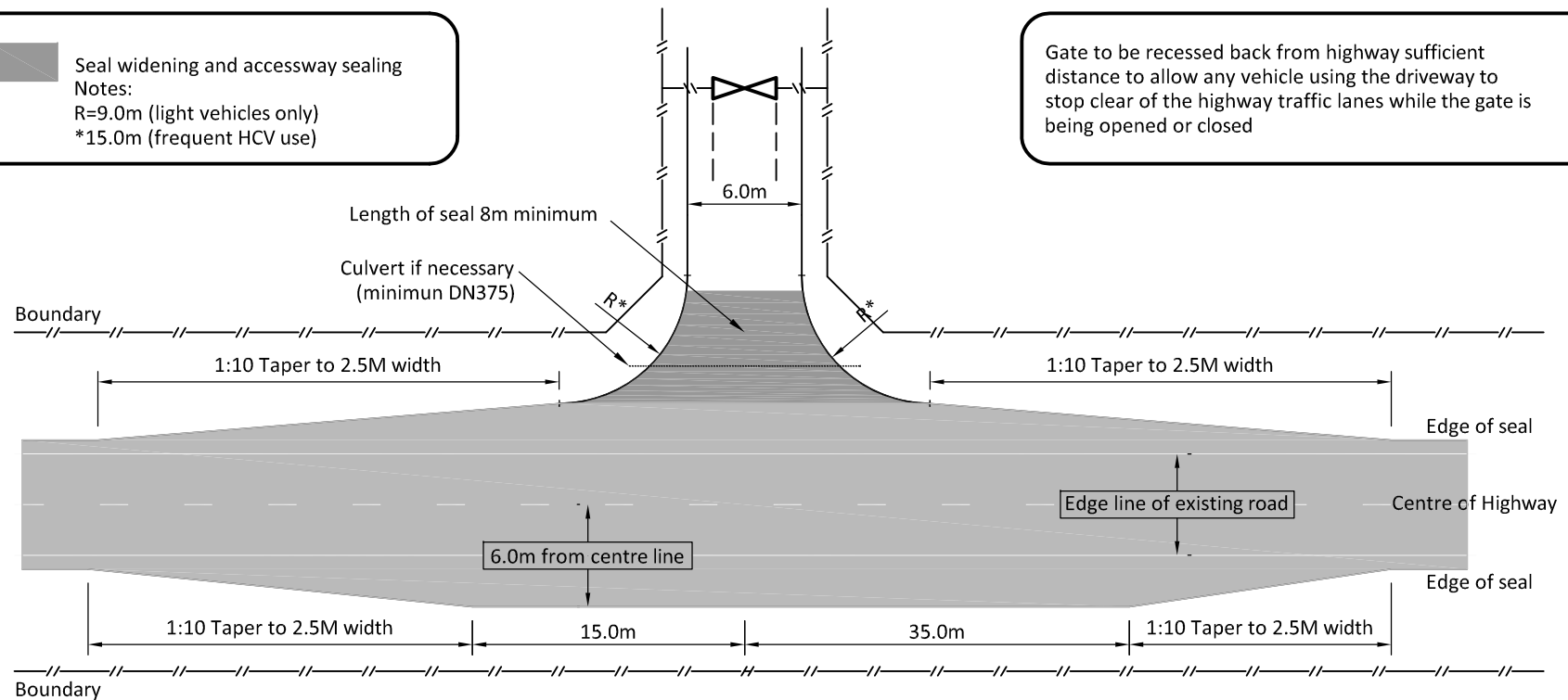
Seal widening and accessway sealing

Notes:

R=9.0m (light vehicles only)

\*15.0m (frequent HCV use)

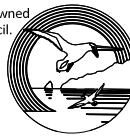
Gate to be recessed back from highway sufficient distance to allow any vehicle using the driveway to stop clear of the highway traffic lanes while the gate is being opened or closed



Note: TYPICAL MODERATE USE is defined as:  
 1 - 30 ecm/day using entrance  
 and  
 ≥ 5000 vpd using adjoining road

Copyright in this drawing is owned  
 by the Hastings District Council

Any unauthorised copying or  
 adaption of the whole or  
 substantial part of the work  
 in two or three dimensions is  
 an infringement of copyright



ROAD CONTROLLING AUTHORITY

PRIVATE RURAL ACCESS  
MODERATE VEHICLE USE - DIAGRAM D

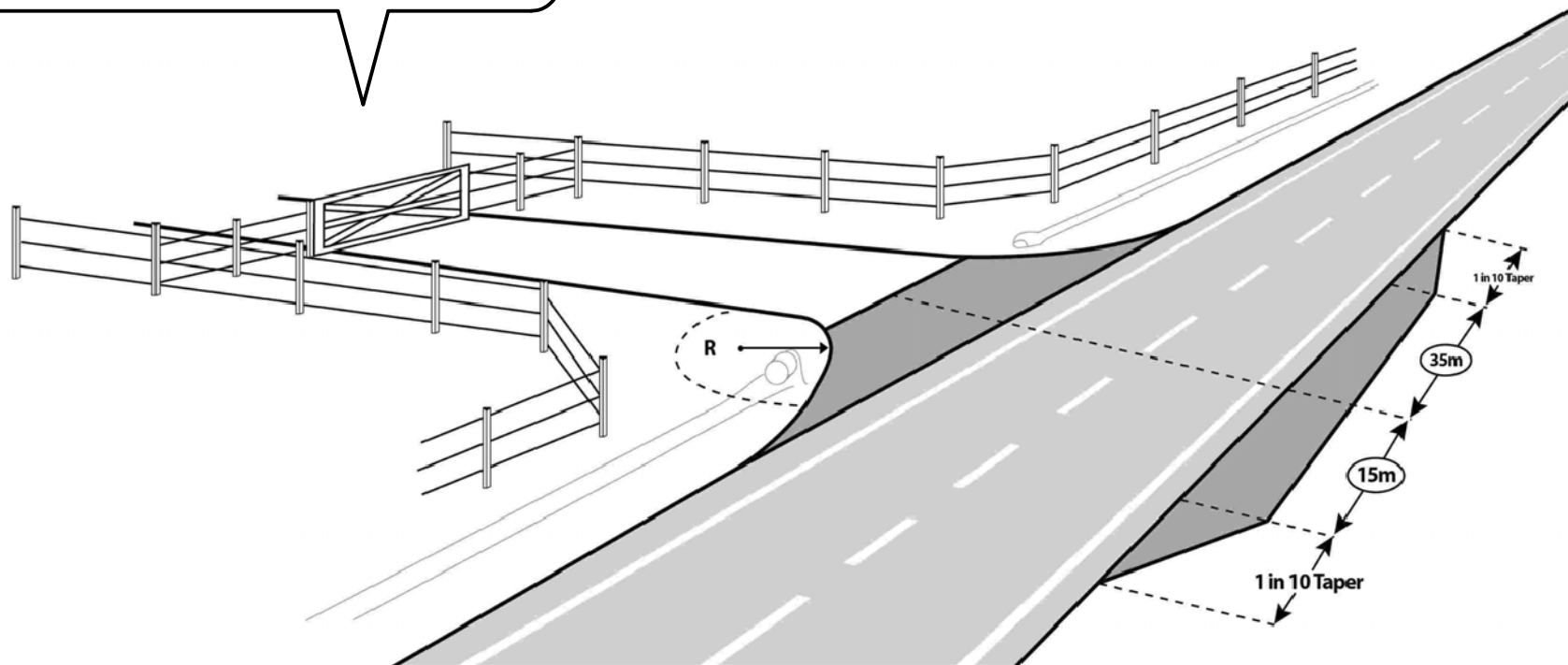
Scale  
N.T.S

Drawing No.  
C 26

Issue July 2011

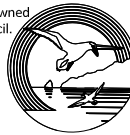
Trim Reference  
Manuals\CoP

Gate to be recessed back from highway sufficient distance to allow any vehicle using the driveway to stop clear of the highway lanes while the gate is being opened or closed



Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

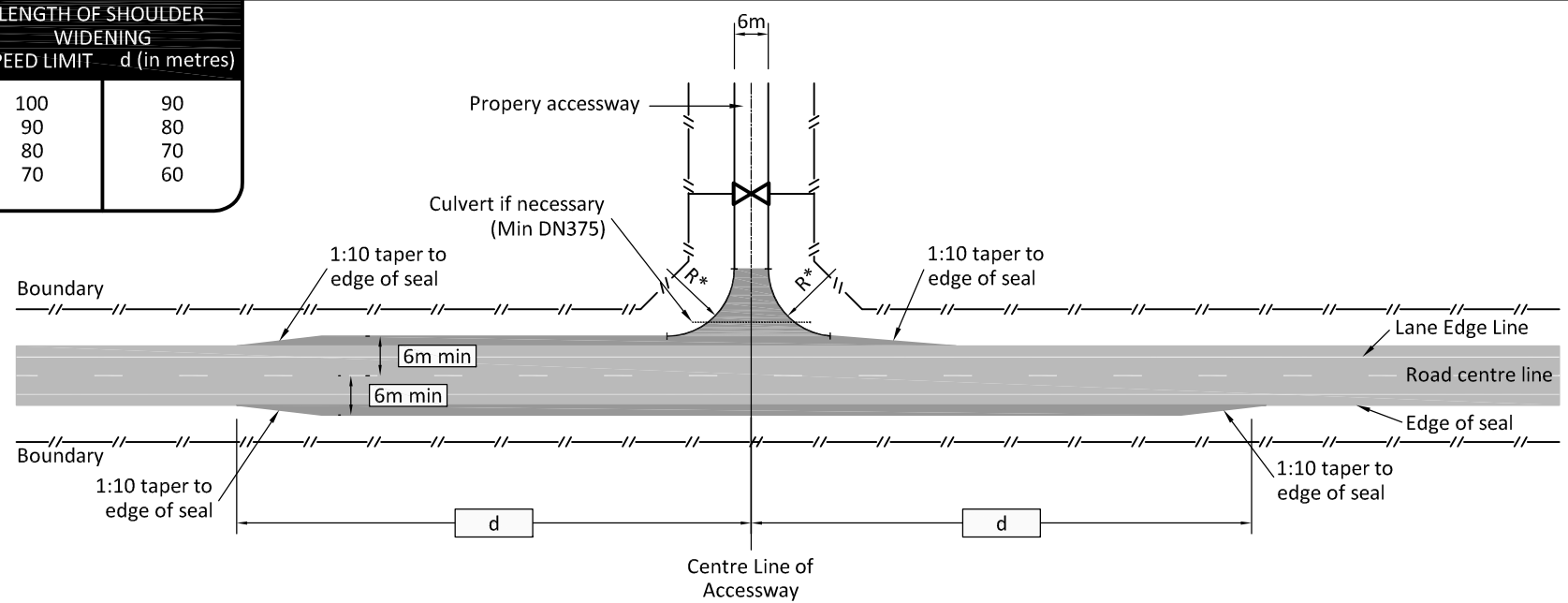
PRIVATE RURAL ACCESS  
SIGHT LINES - PERSPECTIVE D

Scale N.T.S. Drawing No. C 27

Issue July 2011

Trim Reference Manuals\CoP

LENGTH OF SHOULDER WIDENING	
SPEED LIMIT	d (in metres)
100	90
90	80
80	70
70	60



**Bellmouth Radii (R)**

R=9.0m (Light vehicle use only)  
R=15.0m (Frequent HCV use)

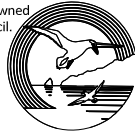
Area to be constructed and sealed

Gate to be recessed back from highway sufficient distance to allow any vehicle using the driveway to stop clear of the highway traffic lanes while the gate is being opened or closed

Note: TYPICAL HEAVY USE is defined as:  
> 30 & < 100 ecm/day using entrance and  
> 5,000 & < 10,000 vpd using adjoining road

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

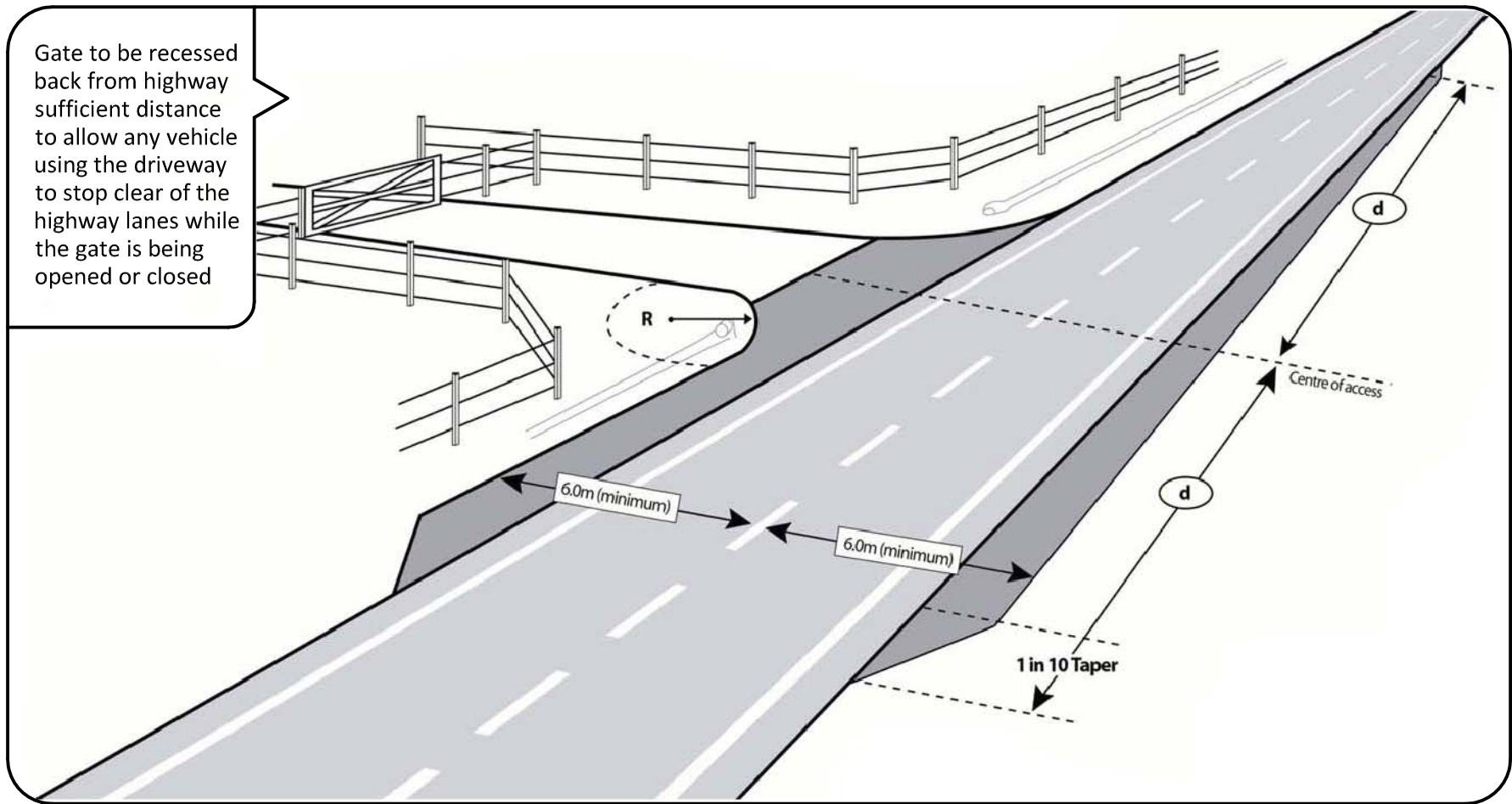


**ROAD CONTROLLING AUTHORITY**

**PRIVATE RURAL ACCESS**  
**REGULAR HEAVY VEHICLE USE - DIAGRAM E**

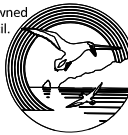
Scale N.T.S	Drawing No. C 28
Issue July 2011	
Trim Reference Manuals\CoP	

Gate to be recessed back from highway sufficient distance to allow any vehicle using the driveway to stop clear of the highway lanes while the gate is being opened or closed



Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

PRIVATE RURAL ACCESS  
SIGHT LINES - PERSPECTIVE E

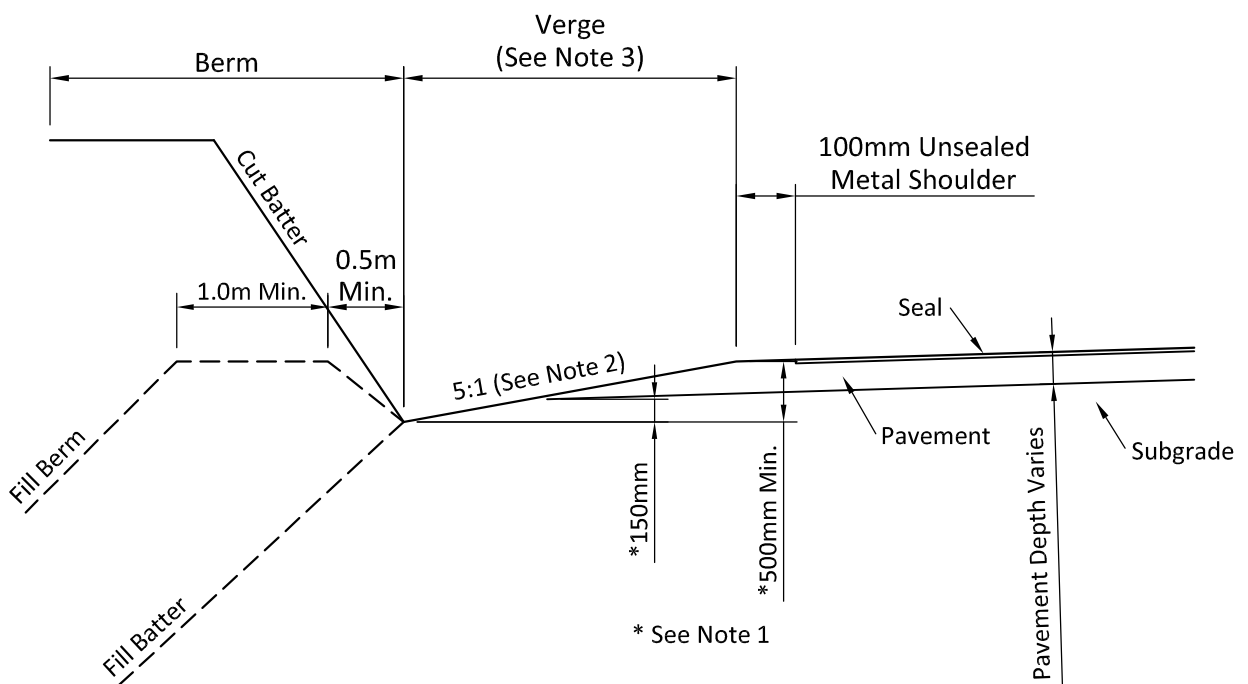
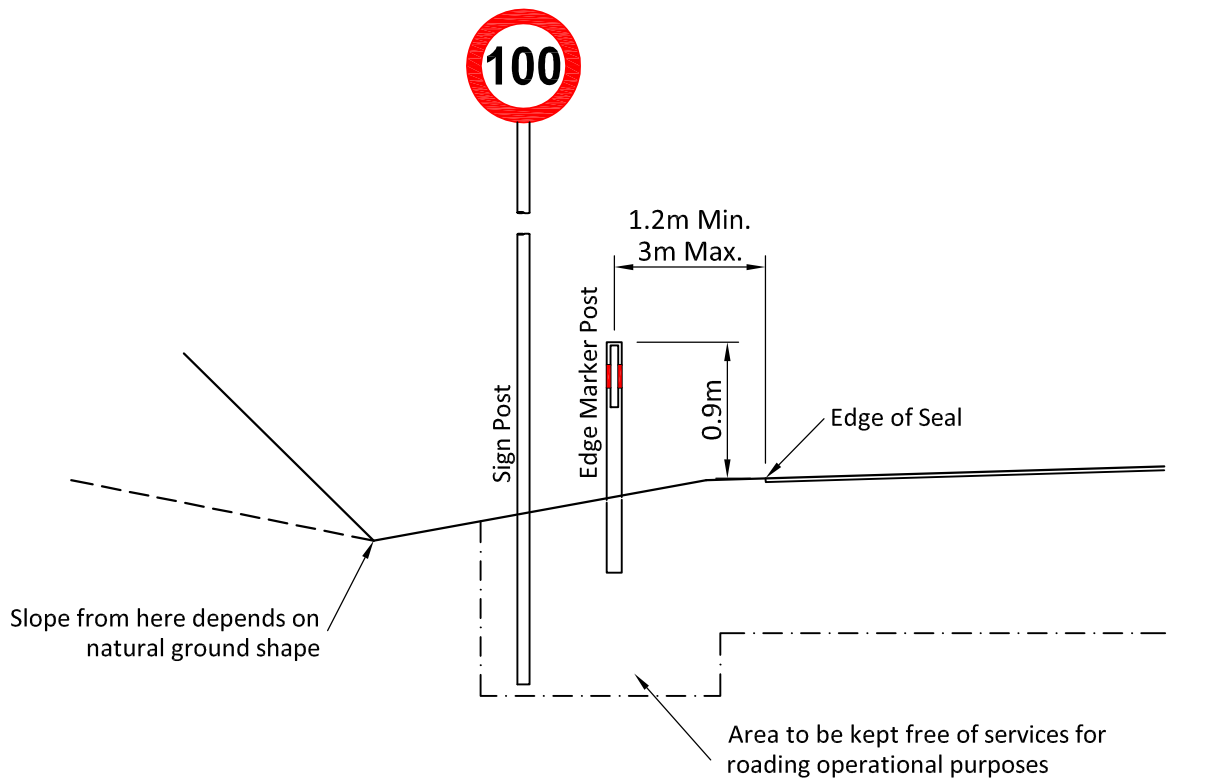
Scale  
N.T.S

Drawing No.  
C 29

Issue July 2011

Trim Reference  
Manuals\CoP

Note: Road & Verge Marking to be in accordance with MOTSAM



Notes:

- 1). \* Adopt whichever provides the greater depth:  
(A) 500mm below the seal edge, or  
(B) 150mm below the pavement/subgrade interface.
- 2). 5:1 Verge slope may be narrowed to an absolute minimum of 4:1 in constrained locations.  
6:1 Verge slope is required within 3.0m of topside of curves.
- 3). Cut batter, Fill batter, Fill slopes are dependant on site soil stability criteria

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

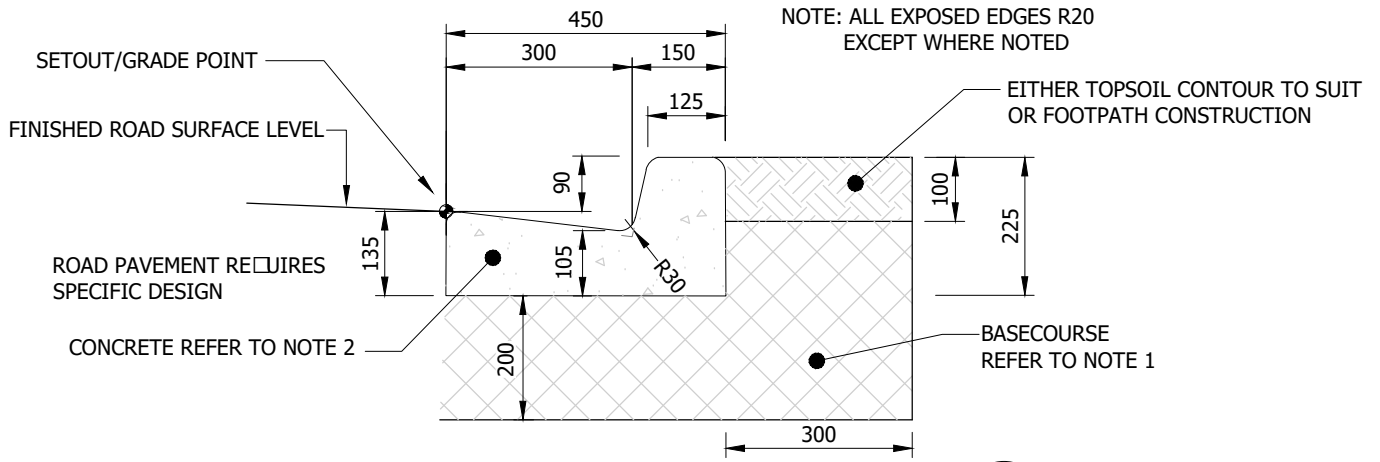
CROSS-SECTION GUIDELINES FOR VERGES ON RURAL ROADS

Scale N.T.S. Drawing No. C 30

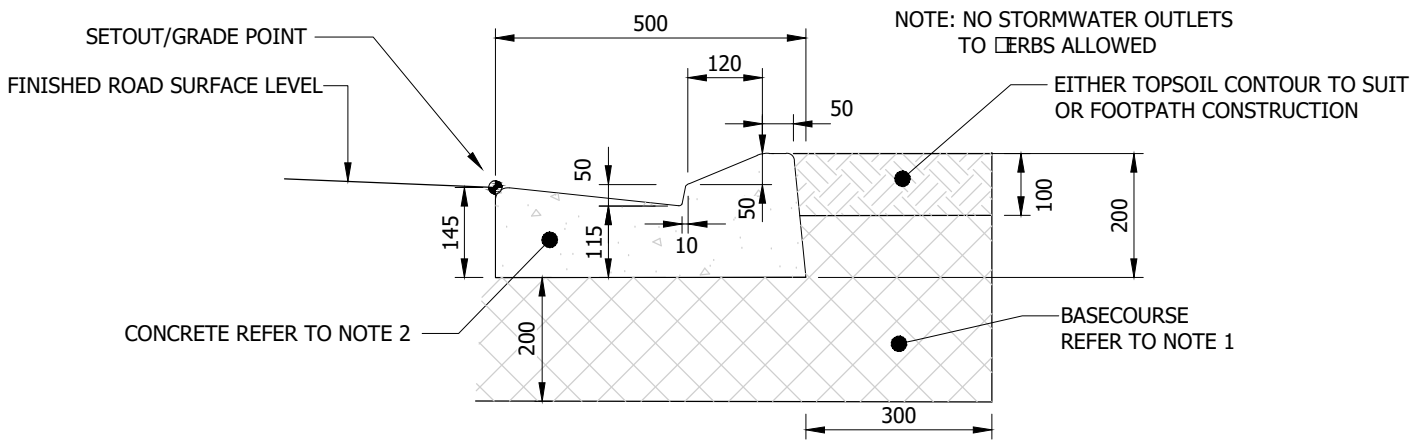
Issue July 2011

Trim Reference Manuals\CoP

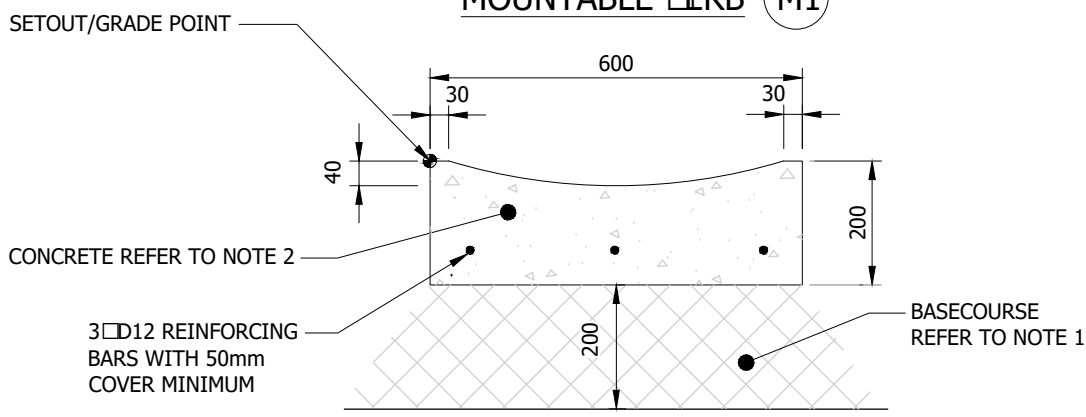




**NON-MOUNTABLE KERB CHANNEL (NM1)**



**MOUNTABLE KERB (M1)**



**DISH CHANNEL (C2)**

**NOTES:**

1. TNZ M/4 2006 NAPIER RIVER GRAVEL BASECOURSE COMPACTED TO OBTAIN A CLEGG READING NO LESS THAN 24. DEPTH OF BASECOURSE WILL DEPEND ON SUBGRADE STRENGTH. DEPTH IS TO INCREASE IF SUBGRADE CBR < 5 (DEPTH TO BE DETERMINED BY THE ENGINEER).
2. CONCRETE GRADE OF 20 MPa AT 28 DAYS. CONSTRUCTION JOINTS AT ≤3M, SAW CUT TO BE 40mm DEPTH WITHIN 48 HOURS OF POURING PLACING OR WETFORM.
3. ALL DIMENSIONS IN MILLIMETERS



HASTINGS DISTRICT COUNCIL

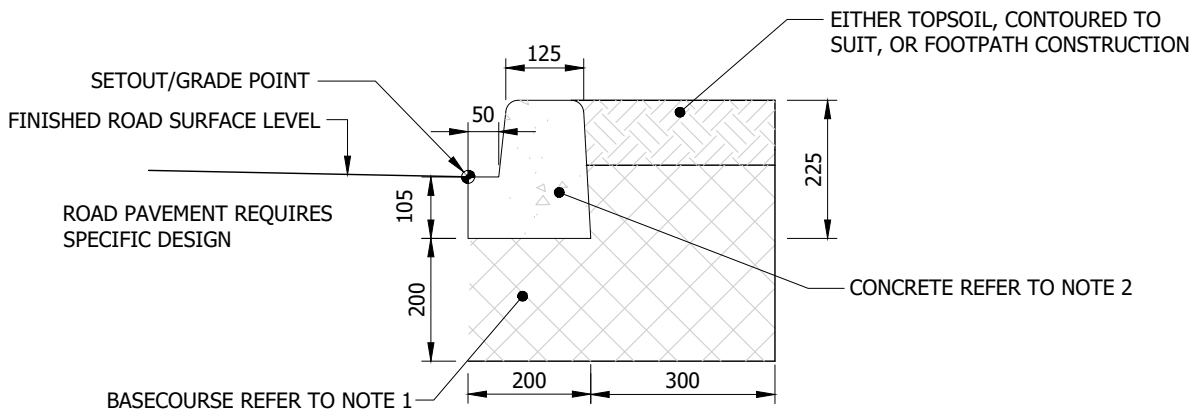
NOT TO SCALE

KERB AND CHANNEL AND DISH CHANNEL  
TYPICAL CROSS SECTIONS

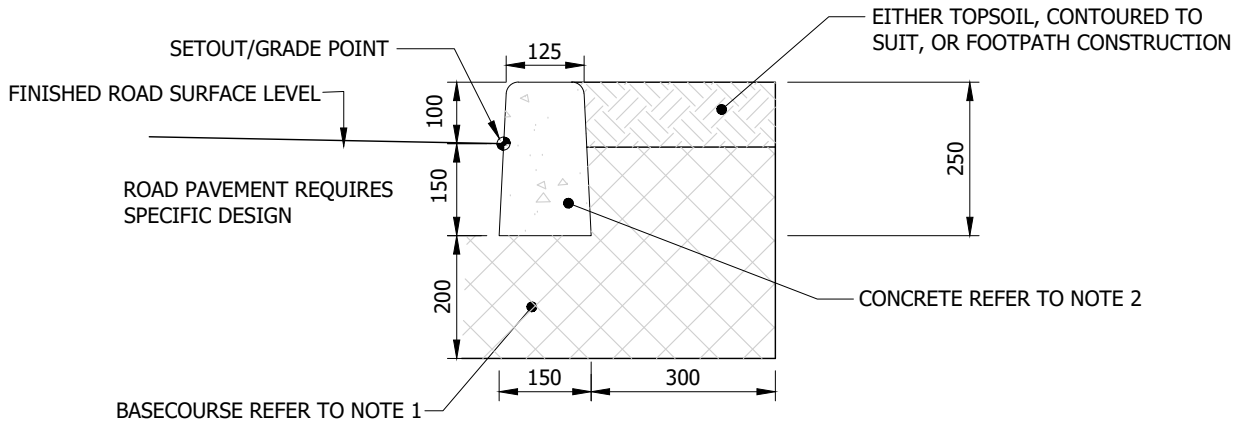
C31

NOV 2018

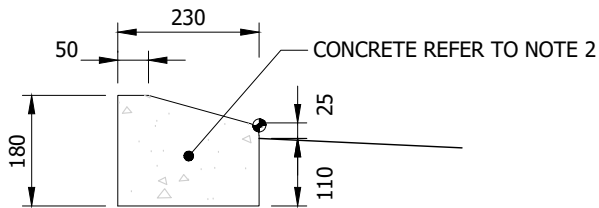
© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



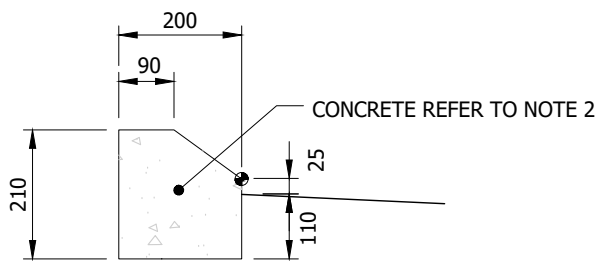
**TYPE 1 NIB DETAIL**



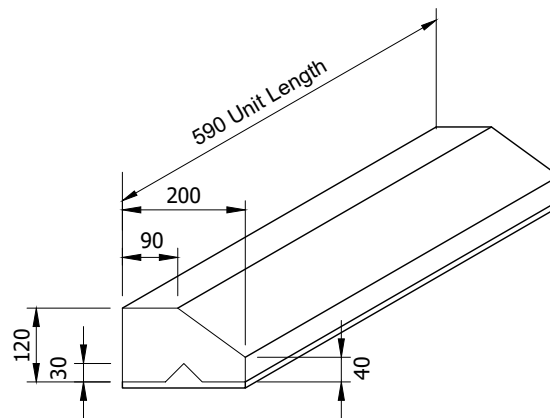
**TYPE 2 NIB DETAIL**



**ROUNDABOUT KERB**



**MEDIAN ISLAND KERB**



**SURFACE MOUNTED PRECAST  
ISLAND KERB BLOCK**

**NOTES:**

1. TNZ M/4 2006 NAPIER RIVER GRAVEL BASECOURSE COMPACTED TO OBTAIN A CLEGG READING NO LESS THAN 24 DEPTH OF BASECOURSE WILL DEPEND ON SUBGRADE STRENGTH. DEPTH IS TO INCREASE IF SUBGRADE CBR <5 (DEPTH TO BE DETERMINED BY THE ENGINEER).
2. CONCRETE GRADE OF 20 MPa AT 28 DAYS. CONSTRUCTION JOINTS AT  $\leq 3M$ , SAW CUT TO BE 40mm DEPTH WITHIN 48 HOURS OF POURING PLACING OR WETFORM.
3. ALL DIMENSIONS IN MM
4. ALL EXPOSED EDGES ARE TO HAVE A 20mm RADIUS UNLESS NOTED ELSEWHERE



HASTINGS DISTRICT COUNCIL

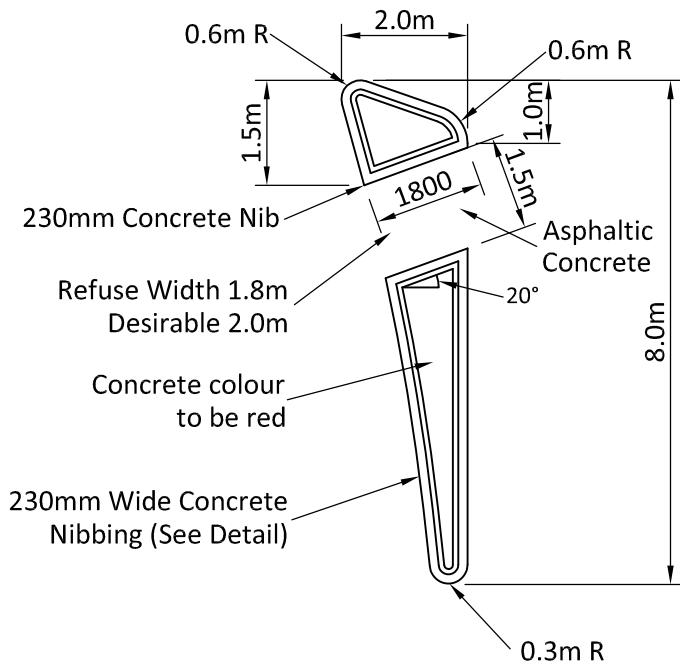
NOT TO SCALE

NIB DETAILS

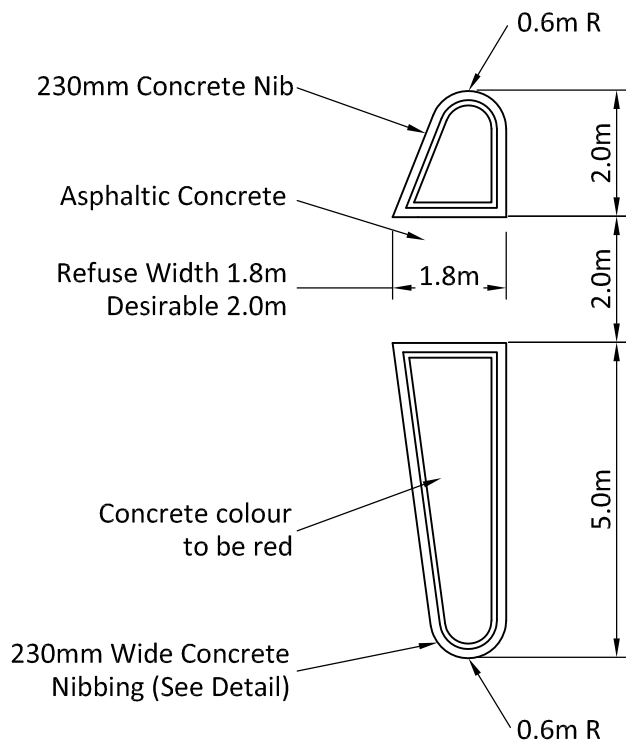
C32

TYPICAL CROSS SECTIONS

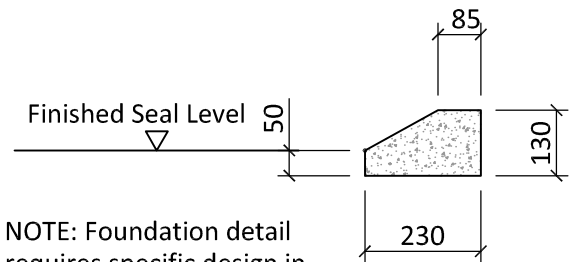
NOV 2018



SPLITTER ISLAND DETAIL  
ROUNDABOUTS



SPLITTER ISLAND DETAIL GIVE  
WAY/STOP CONTROL INTERSECTIONS



SPLITTER ISLAND NIB DETAIL

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

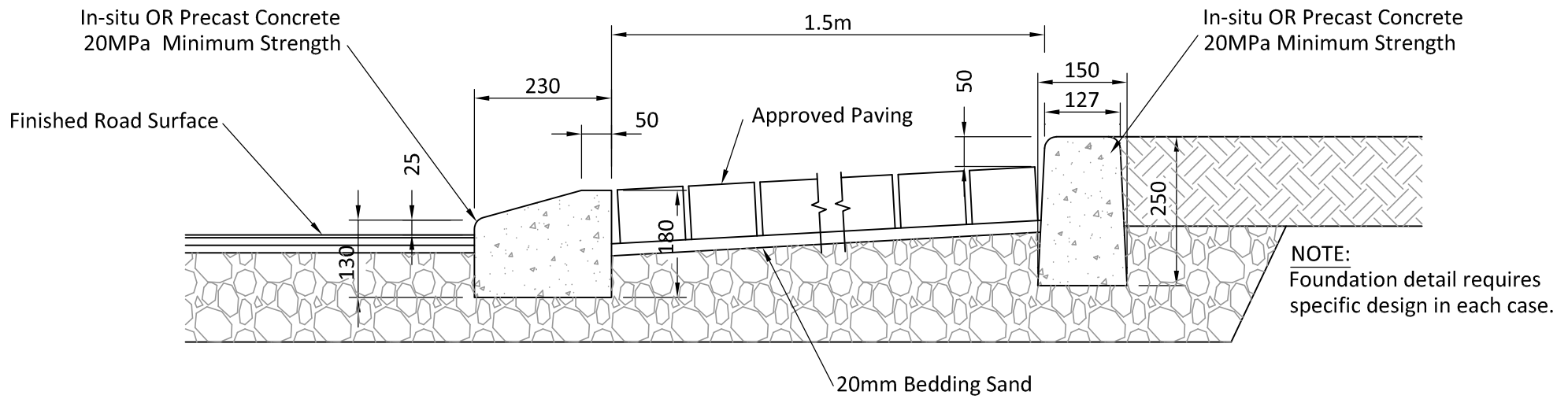
TYPICAL SPLITTER ISLAND DETAILS

Scale  
N.T.S

Drawing No.  
C 33

Issue July 2011

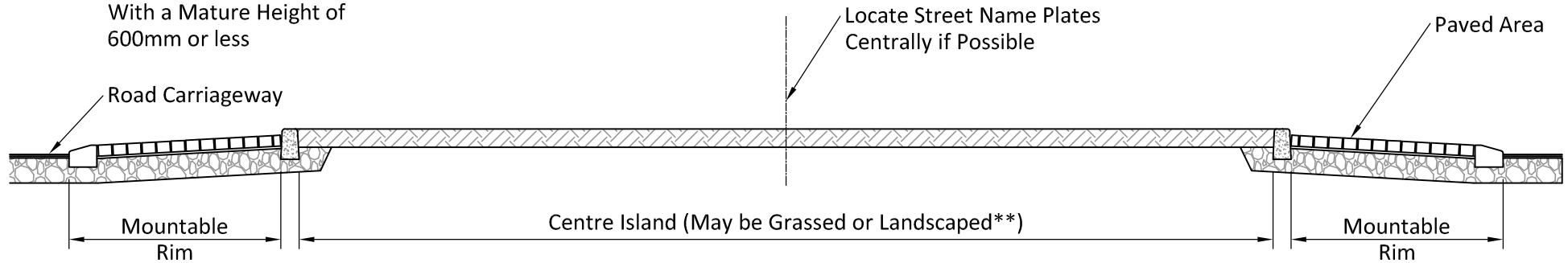
Trim Reference  
Manuals\CoP



**ROUNDABOUT MOUNTABLE RIM DETAIL**

SCALE 1:10

NOTE:  
 \*\* Landscape Planting Shall be Limited to Shrubs etc, With a Mature Height of 600mm or less

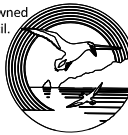


**SECTION THROUGH ROUNDABOUT**

N.T.S.

Copyright in this drawing is owned by the Hastings District Council

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



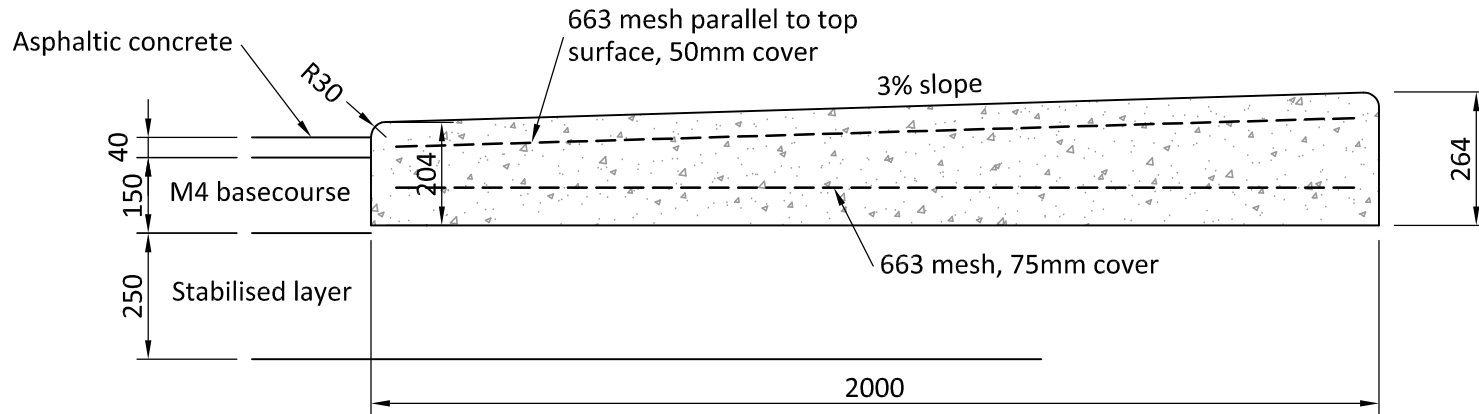
**ROAD CONTROLLING AUTHORITY**

**TYPICAL ROUNDABOUT DETAILS**

Scale N.T.S. Drawing No. C 34

Issue July 2011

Trim Reference Manuals\CoP

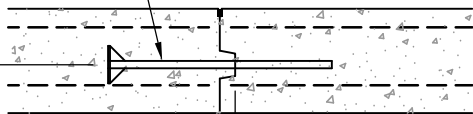


**CONCRETE ROUNDABOUT SECTION**

Garden area by HDC

R20 ramset dowelserts  
600mm long @ 300mm crs

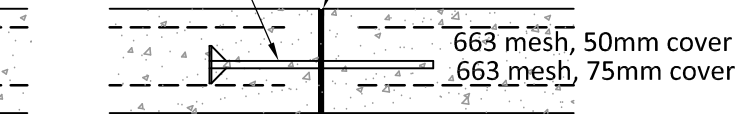
0.150  
111



**TIED JOINT DETAIL**

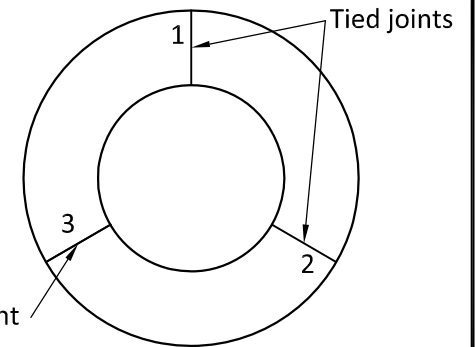
R20 ramset dowelserts  
600mm long @ 300mm crs

10x20mm groove filled with colper200  
on bond breaker/backing strip.  
Set sealant 4mm below top of concrete



20mm wide  
compressible material

**EXPANSION JOINT DETAIL**



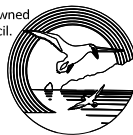
**JOINT LAYOUT PLAN**

**NOTES**

- All concrete 25 MPa
- Cover to reinforcement 75mm unless noted otherwise
- Stop reinforcing mesh either side of joints

Copyright in this drawing is owned  
by the Hastings District Council

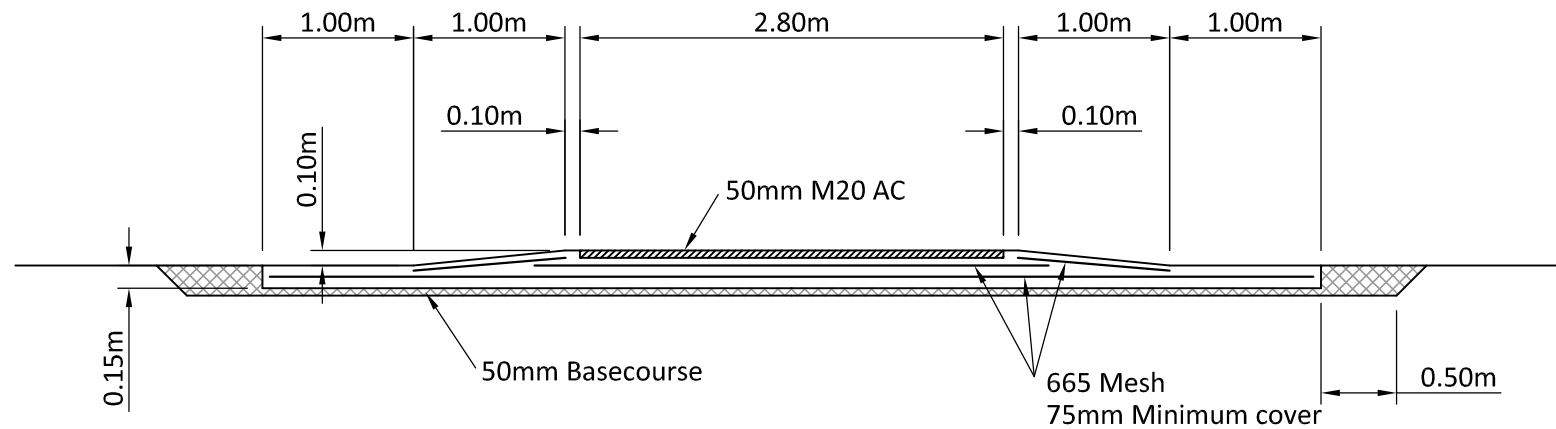
Any unauthorised copying or  
adaption of the whole or  
substantial part of the work  
in two or three dimensions is  
an infringement of copyright



**ROAD CONTROLLING AUTHORITY**

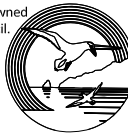
**TYPICAL ROUNDABOUT DETAILS**

Scale N.T.S	Drawing No. C 35
Issue	July 2011
Trim Manuals\CoP	Reference



Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

TYPICAL SPEED HUMP

Scale  
N.T.S

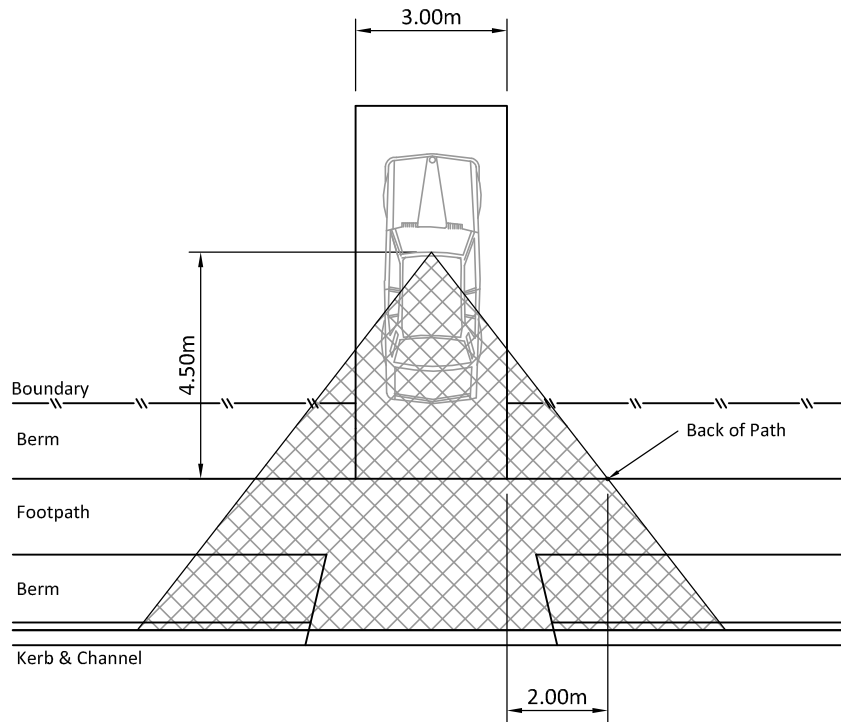
Drawing No.  
C 36

Issue July 2011

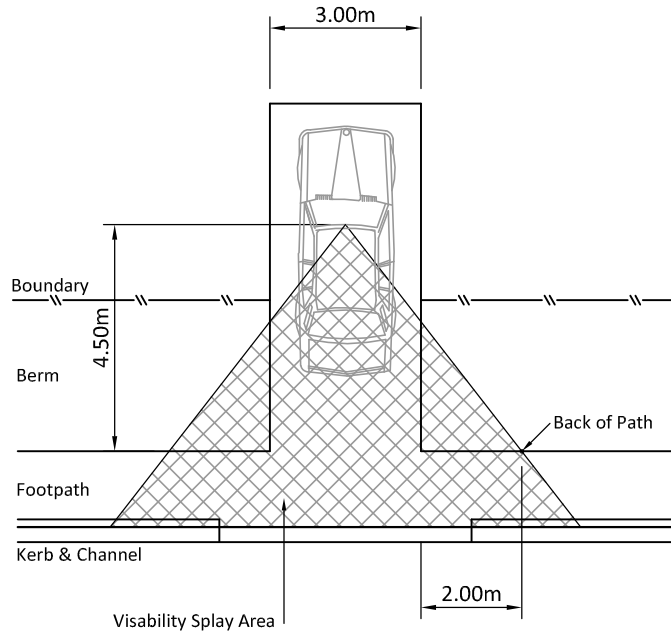
Trim Reference  
Manuals\CoP



Note: No vegetation or structure shall sit within the hatched zone at a height greater than 600mm above ground level or the level of footpath whichever is the lowest



FOOTPATH OFF KERB



FOOTPATH ON KERB

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

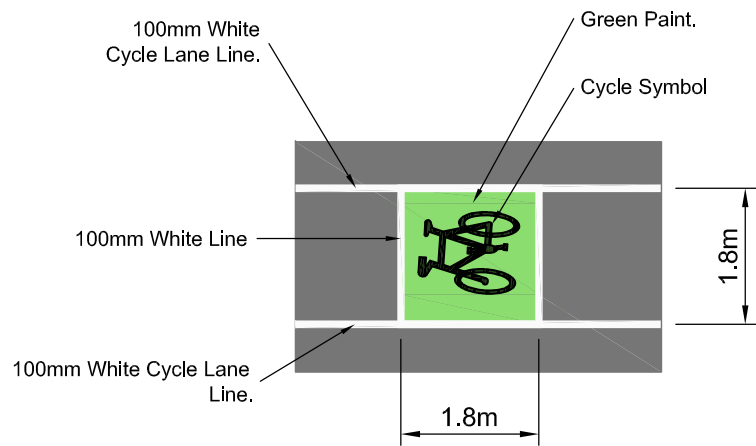
PEDESTRIAN VISIBILITY SPLAY

Scale  
N.T.S

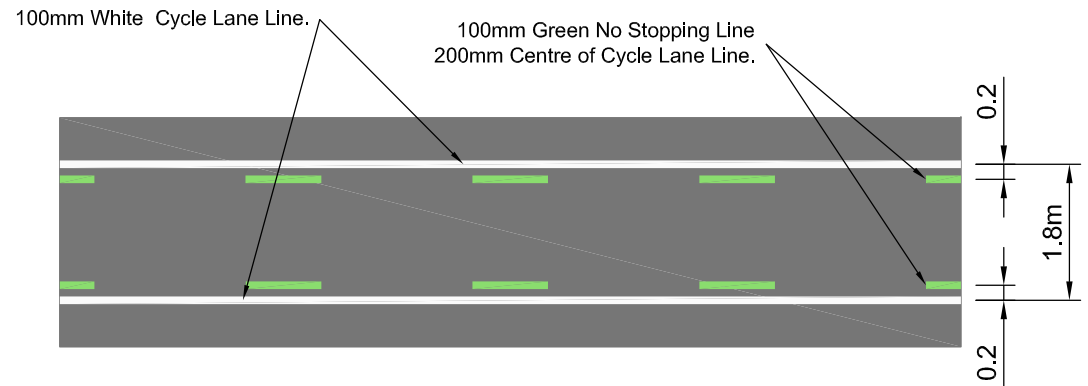
Drawing No.  
C 38

Issue July 2011

Trim Reference  
Manuals\CoP



CYCLE LANE SYMBOL BOX



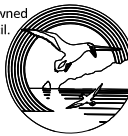
CYCLE LANE

NOTES

1. All road markings are to comply with MOTSAM.
2. The Green No Stopping Line in the Cycle Lane is to be the following:
  - 1.0m Line with 3.0m Gap in <60 Km/Hr. Area.
  - 1.0m Line with 5.0m Gap in >60 Km/Hr. Area.

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

ROAD MARKING  
CYCLE LANE

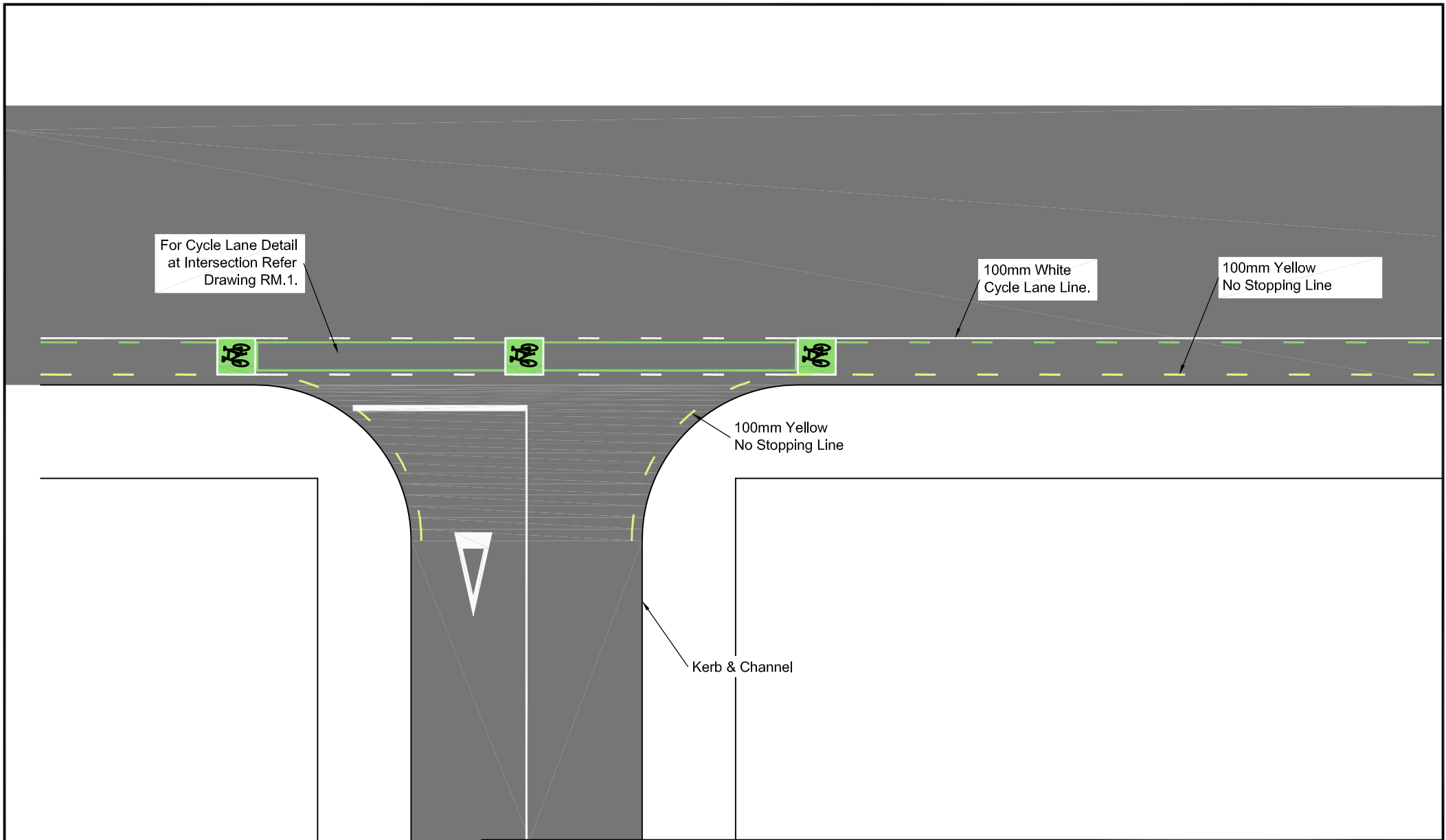
Scale  
N.T.S

Drawing No.  
RM 1

Issue July 2011

Trim Reference  
Manuals\CoP





Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

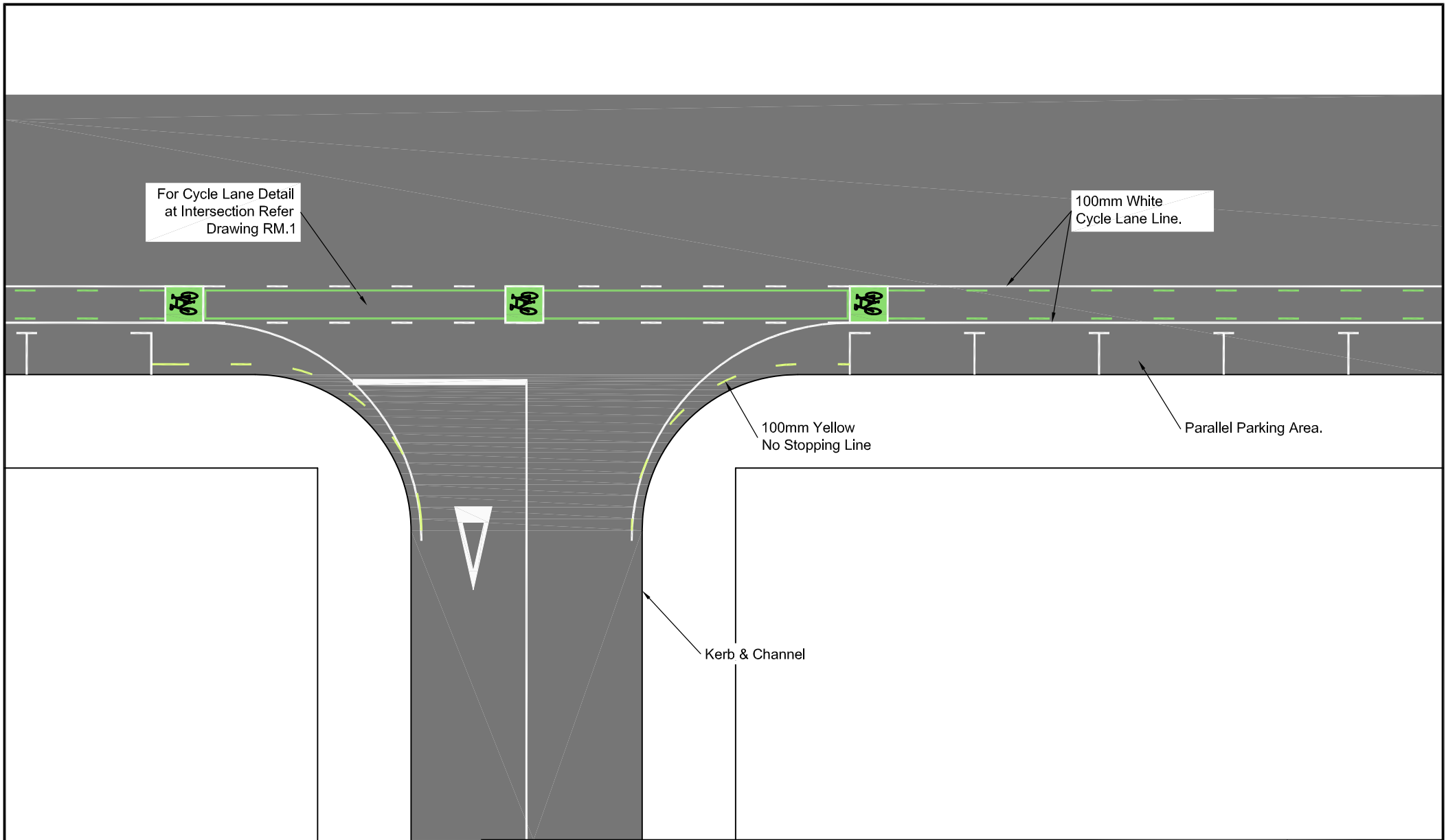
ROAD MARKING  
CYCLE LANE WITHOUT PARKING

Scale  
N.T.S

Drawing No.  
RM2

Issue July 2011

Trim Reference  
Manuals\CoP



For Cycle Lane Detail  
at Intersection Refer  
Drawing RM.1

100mm White  
Cycle Lane Line.

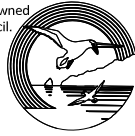
100mm Yellow  
No Stopping Line

Parallel Parking Area.

Kerb & Channel

Copyright in this drawing is owned  
by the Hastings District Council.

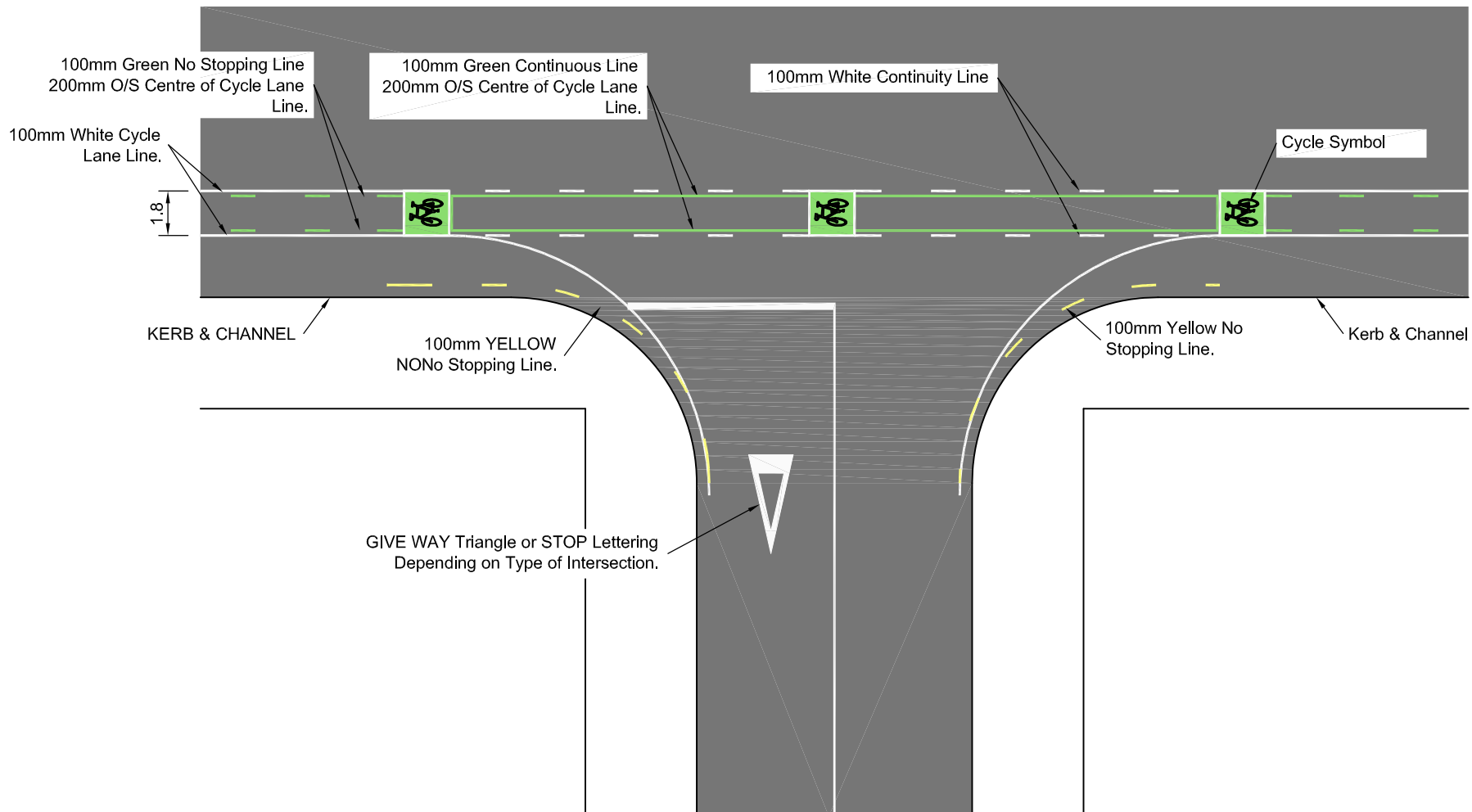
Any unauthorised copying or  
adaption of the whole or  
substantial part of the work  
in two or three dimensions is  
an infringement of copyright



ROAD CONTROLLING AUTHORITY

ROAD MARKING  
CYCLE LANE WITH PARKING

Scale N.T.S	Drawing No. RM 3
Issue July 2011	
Trim Reference Manuals\CoP	



Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



ROAD CONTROLLING AUTHORITY

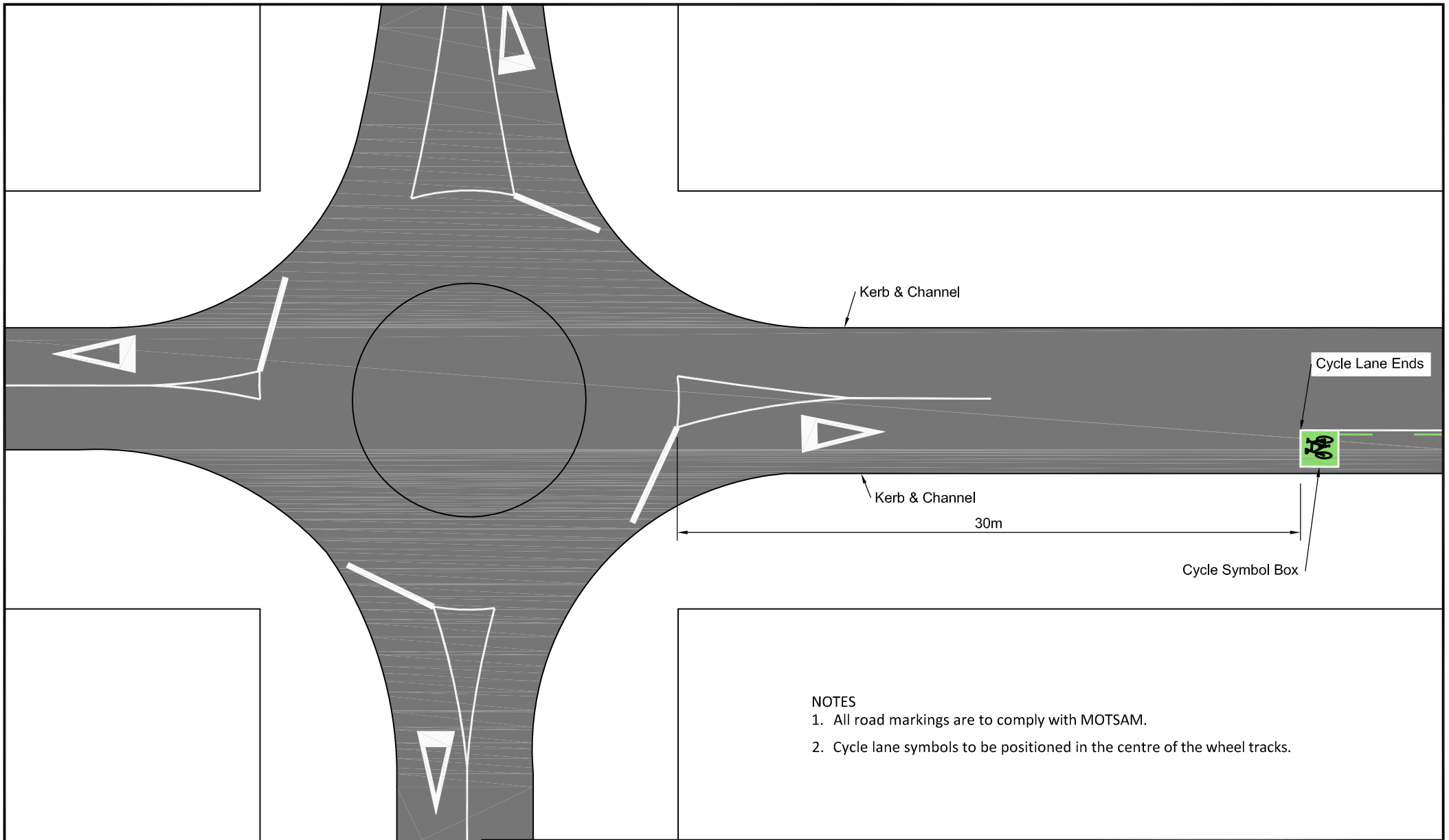
ROAD MARKING  
GIVEWAY / STOP INTERSECTION

Scale  
N.T.S

Drawing No.  
RM 4

Issue July 2011

Trim Reference  
Manuals\CoP



- NOTES
1. All road markings are to comply with MOTSAM.
  2. Cycle lane symbols to be positioned in the centre of the wheel tracks.

Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



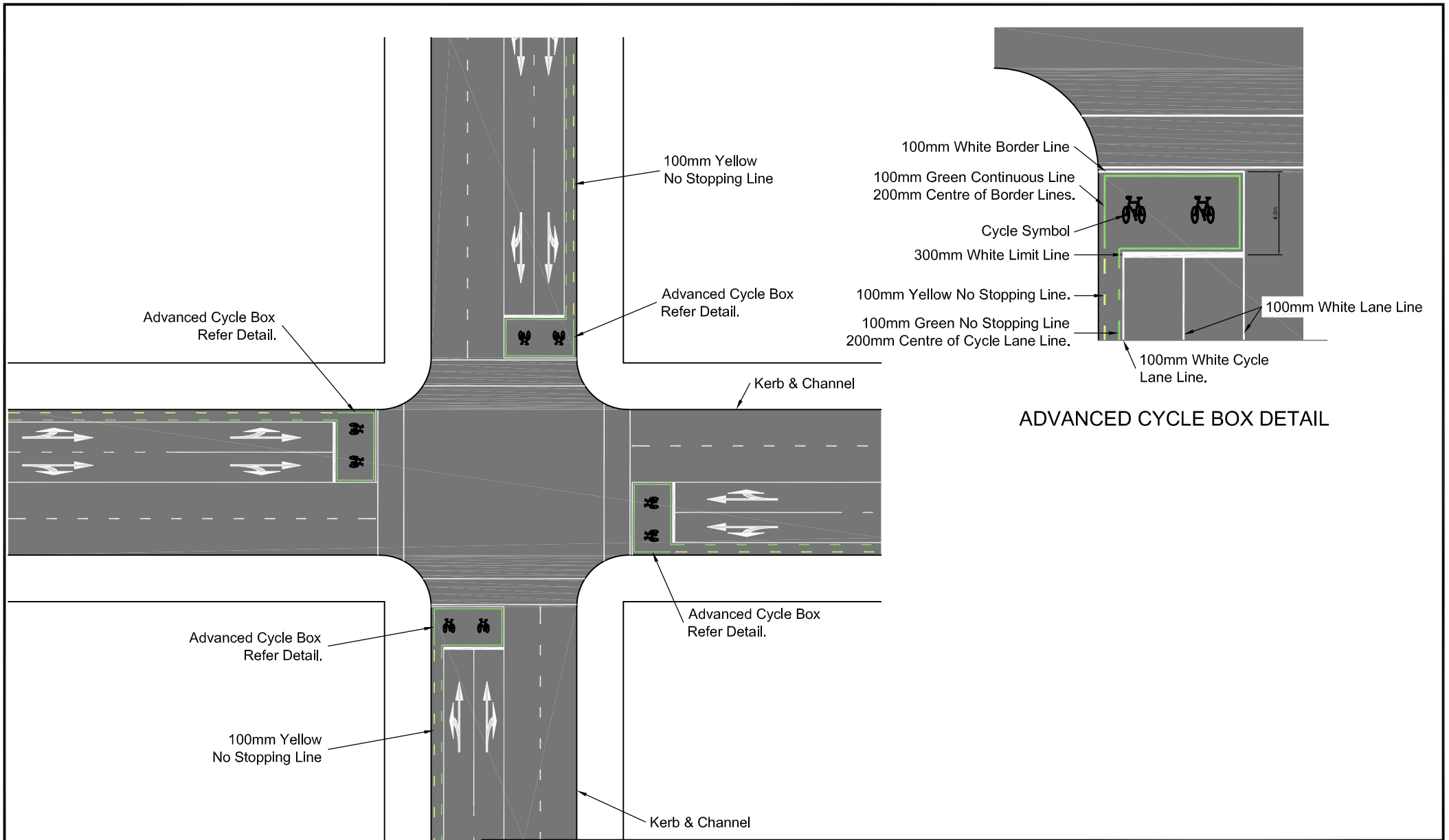
ROAD CONTROLLING AUTHORITY

ROAD MARKING  
ROUNDAABOUT

Scale N.T.S	Drawing No. RM 5
----------------	---------------------

Issue	July 2011
-------	-----------

Trim Reference Manuals\CoP
-------------------------------



Copyright in this drawing is owned by the Hastings District Council.

Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright



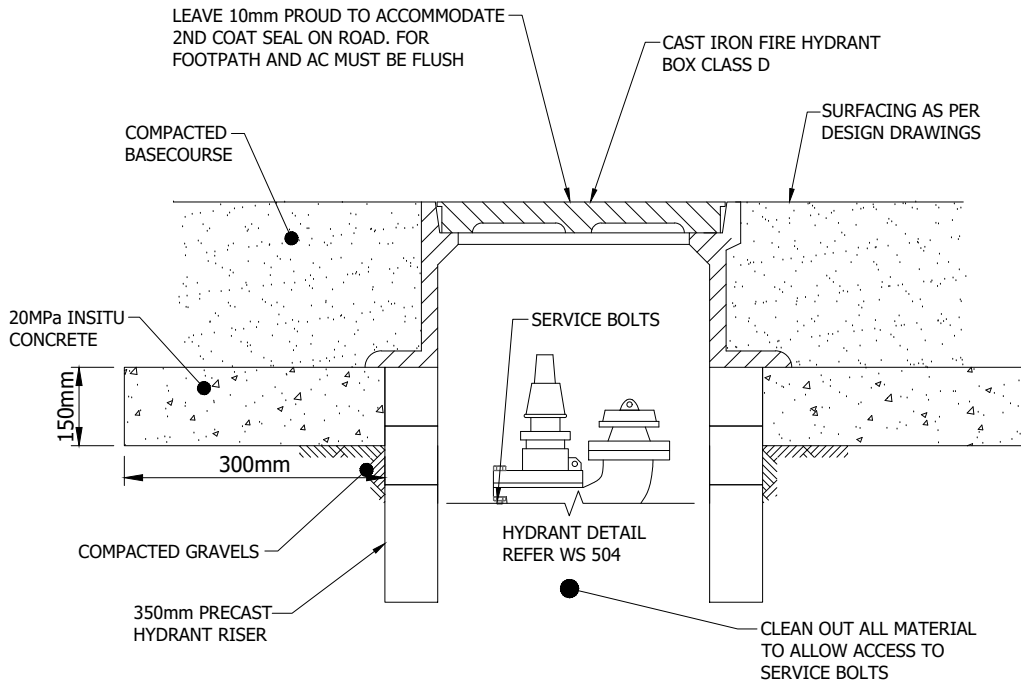
ROAD CONTROLLING AUTHORITY

ROAD MARKING  
TRAFFIC SIGNALISED INTERSECTION

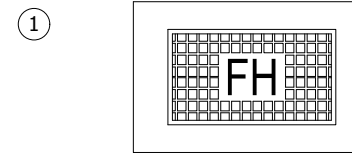
Scale N.T.S Drawing No. RM 6

Issue July 2011

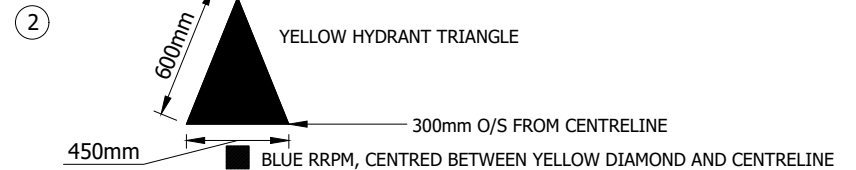
Trim Reference Manuals\CoP



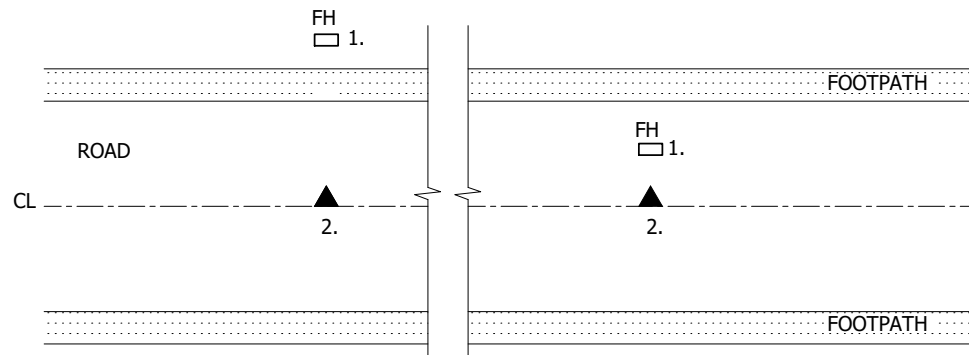
**FIRE HYDRANT LID ADJUSTMENT DETAILS**



**FIRE HYDRANT COVER PAINTED YELLOW**



**CENTRELINE MARKING / CENTRE OF ROAD /  
EDGE OF CENTRE MEDIAN**



**URBAN FIRE HYDRANT GENERAL ARRANGEMENT**

**GENERAL NOTES:**

1. COVER AND FRAME, HYDRANT BOX TO BE INSTALLED SO THAT NO LOADING IS TRANSMITTED TO THE HYDRANT OR PIPE.
2. IN SOME CIRCUMSTANCES FINISHING DETAIL FOR FIRE HYDRANT LIDS MAY VARY - CONSULT HDC DURING DESIGN.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

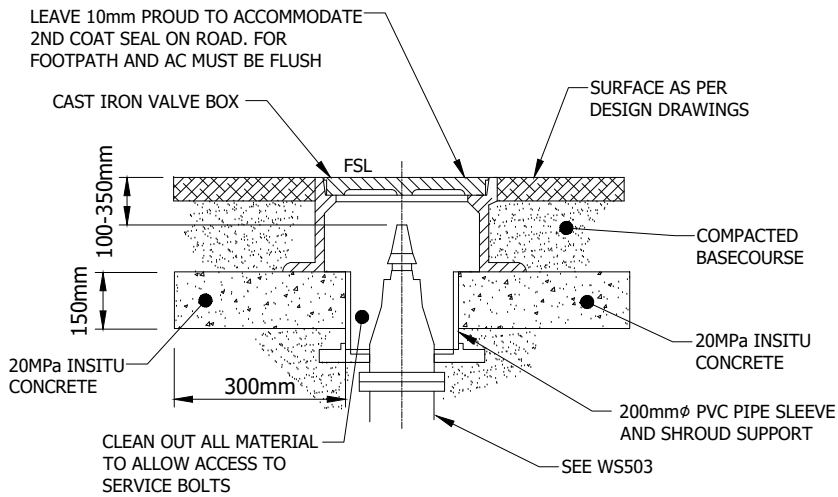
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

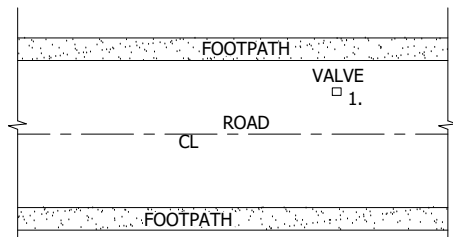
FIRE HYDRANT LID ADJUSTMENT  
AND MARKINGS

WS 101

DEC 2018



**VALVE LID ADJUSTMENT DETAILS**

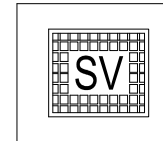


**URBAN VALVE MARKING  
GENERAL ARRANGEMENT**

**GENERAL NOTES:**


1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. COVER AND FRAME, SPINDLE SLEEVE, SHROUD AND SHROUD SUPPORT TO BE INSTALLED SO THAT NO LOADING IS TRANSMITTED TO THE VALVE OR PIPE.
3. INSTALL AN EXTENSION SPINDLE WHERE DISTANCE FROM THE SURFACE TO THE VALVE SPINDLE EXCEEDS 350mm.
4. METALLIC MARKER PLATES TO BE REFLECTIVE WHITE WITH NON-REFLECTIVE LETTERING. PLATES TO BE ATTACHED TO EMP WITH RIVETS
5. LOCATE MARKERS AT RIGHT ANGLES TO THE MAIN WITH MARKING FACING TOWARDS THE VALVE

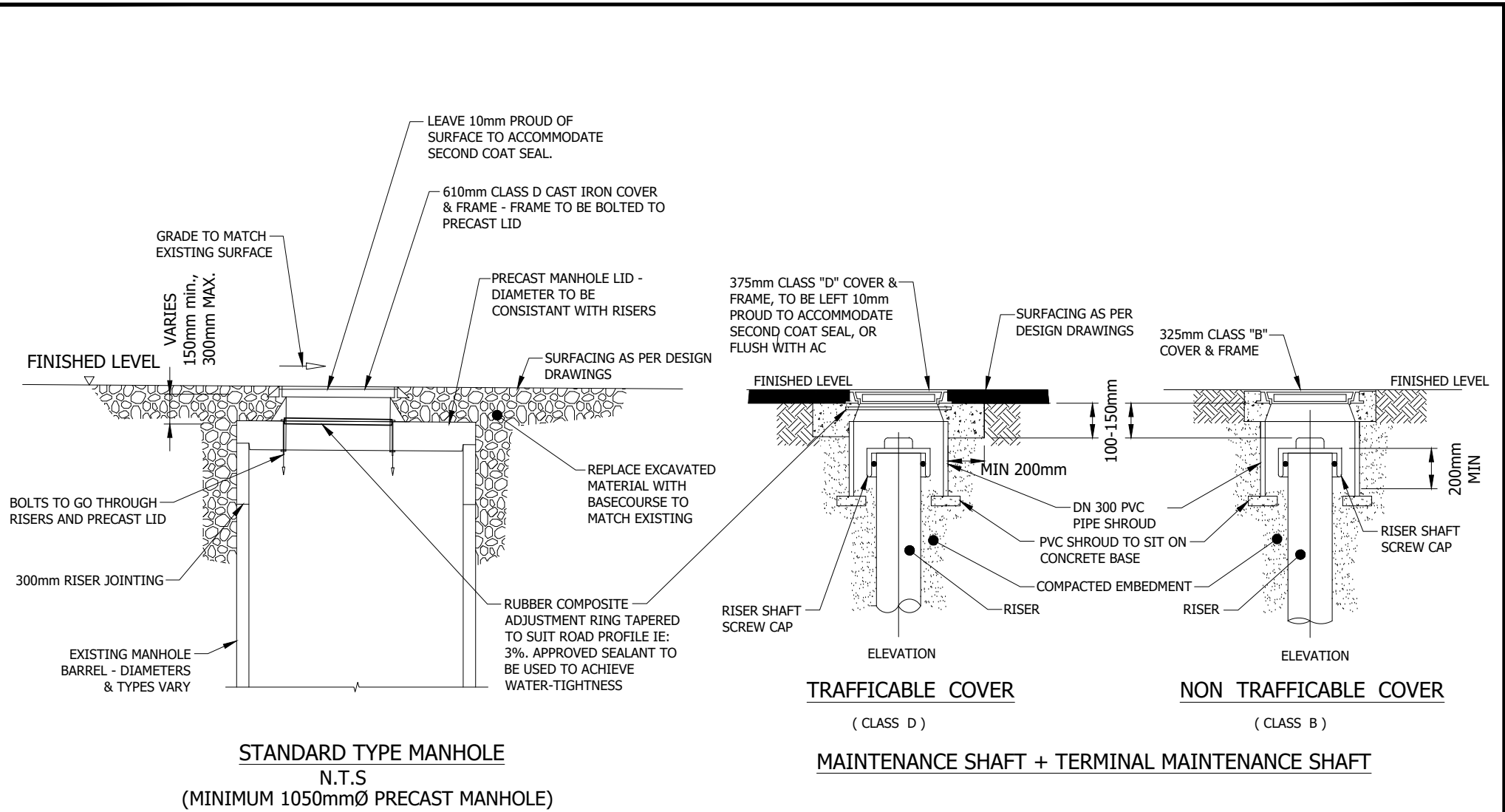
1



WATER VALVE COVER TO BE PAINTED BLUE.  
SEWER VALVE COVER TO BE PAINTED RED

**VALVE COVER**

 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	VALVE LID ADJUSTMENT AND MARKINGS	WS 102
		DEC 2018



GENERAL NOTES:  
1. ALL DIMENSIONS ARE IN MILLIMETRES.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

HASTINGS DISTRICT COUNCIL

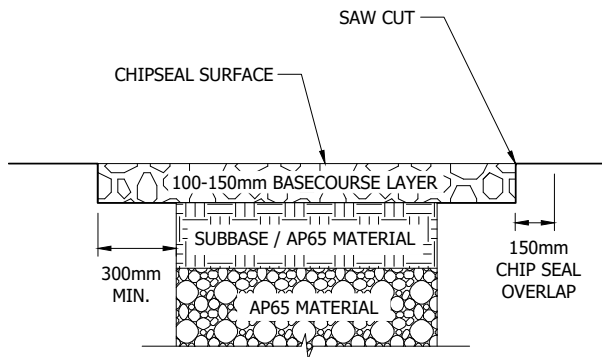
NOT TO SCALE

TYPICAL MANHOLE COVER ADJUSTMENT AND ARRANGEMENT

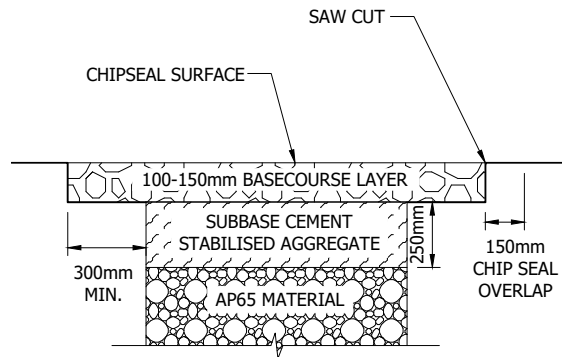
WS 103

DEC 2018



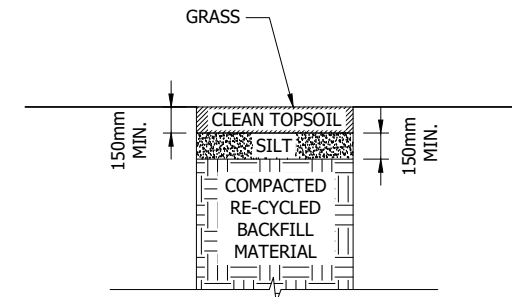


TYPICAL CHIP SEAL REINSTATEMENT

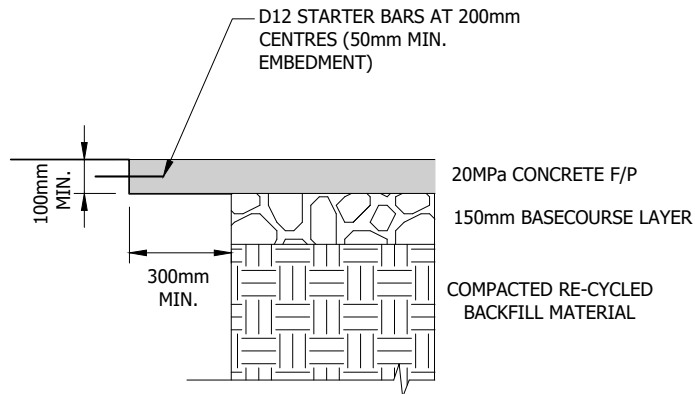


NOTE: SEE CONTRACT PAVEMENT SPECIFICATION FOR CEMENT APPLICATION RATE

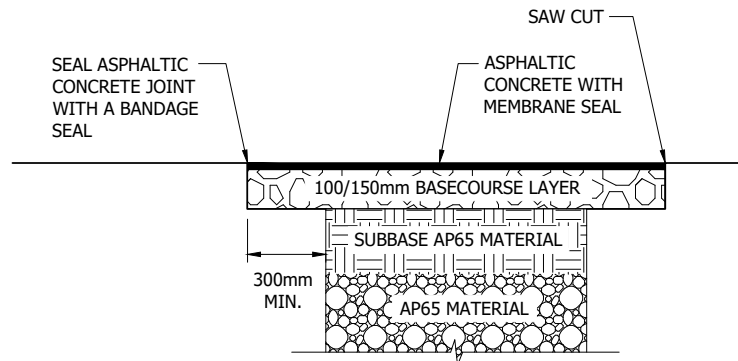
STABILISED TRENCH AND CHIPSEAL SURFACE REINSTATEMENT



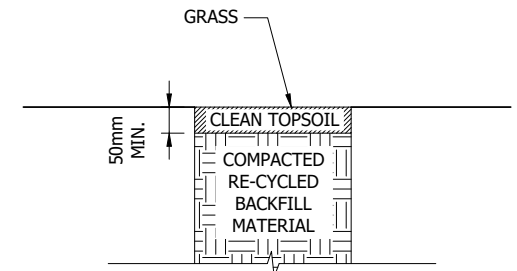
TYPICAL URBAN BERM REINSTATEMENT



CONCRETE FOOTPATH REINSTATEMENT



ASPHALTIC CONCRETE REINSTATEMENT



TYPICAL RURAL BERM REINSTATEMENT

GENERAL NOTE:  
WHEN SEALING WITH ASPHALTIC CONCRETE AGAINST AN EXISTING KERB AND CHANNEL ENSURE TACK COAT OR BITUMEN IS SPRAYED UP THE FACE OF THE CHANNEL.



**HASTINGS**  
DISTRICT COUNCIL

© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.

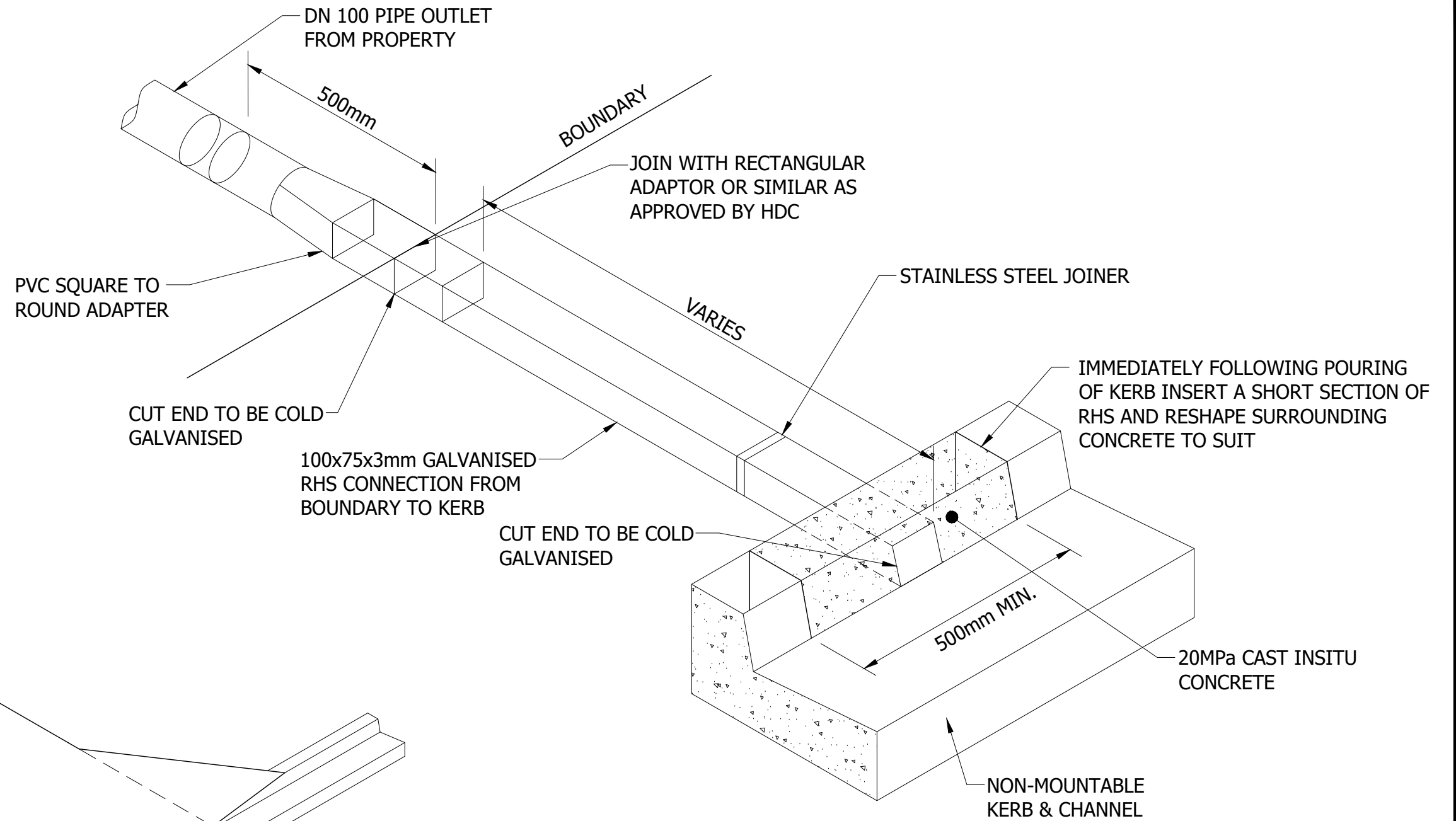
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

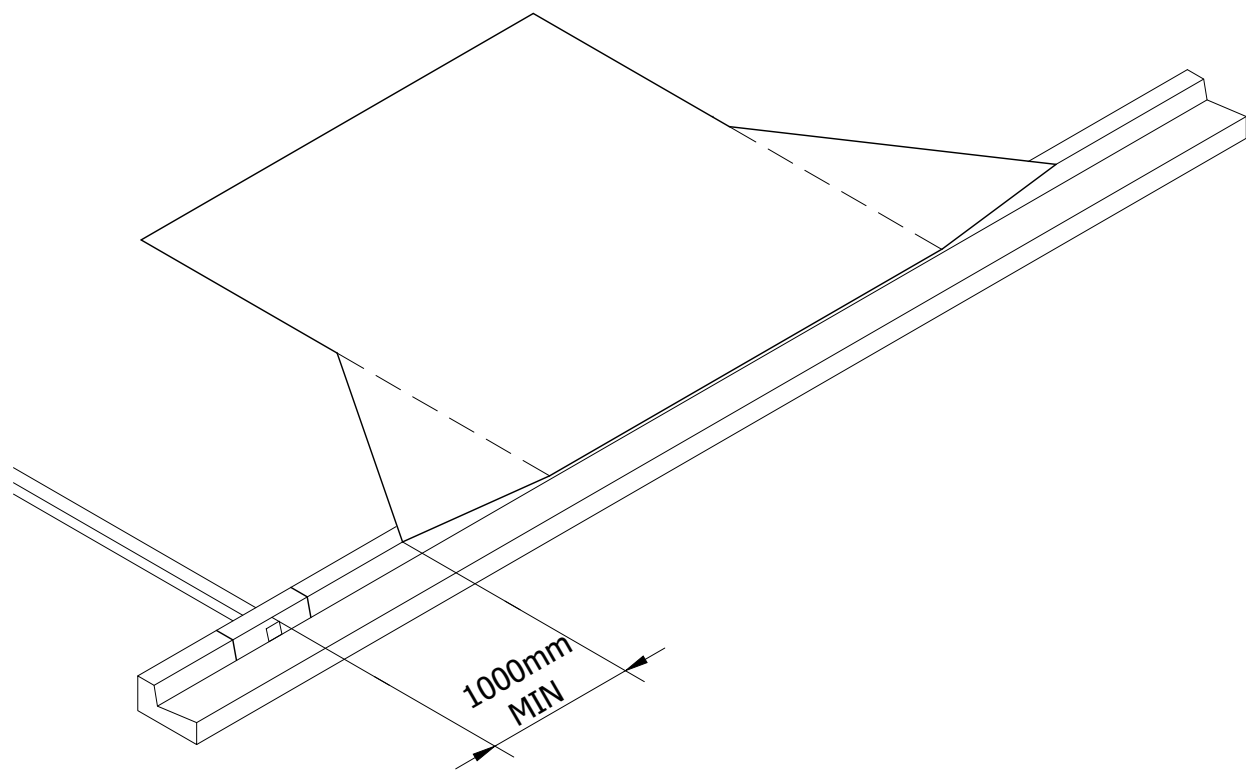
TYPICAL TRENCH REINSTATEMENT AND SURFACING DETAILS

WS 104

DEC 2018



**STORMWATER DISCHARGE DETAIL  
FROM PROPERTY BOUNDARY TO KERB**



**STORMWATER DISCHARGE TO KERB AT  
VEHICLE CROSSING - ISOMETRIC VIEW**



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

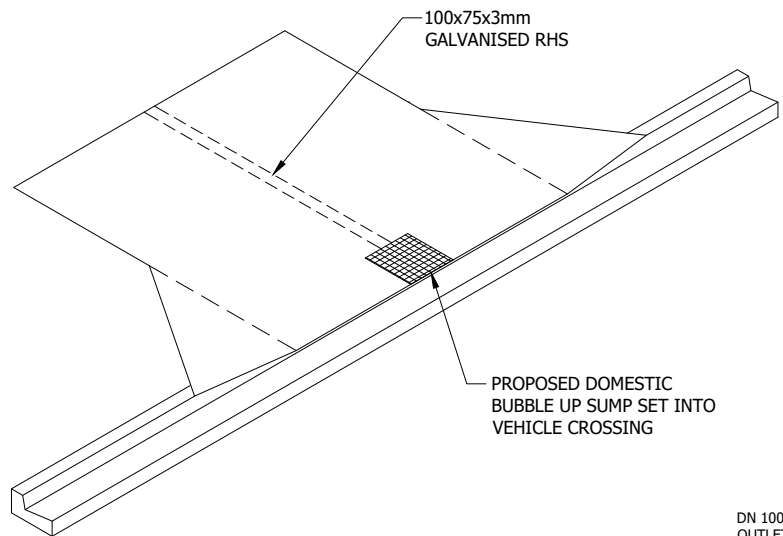
HASTINGS DISTRICT COUNCIL

STORMWATER PROPERTY DISCHARGE TO KERB

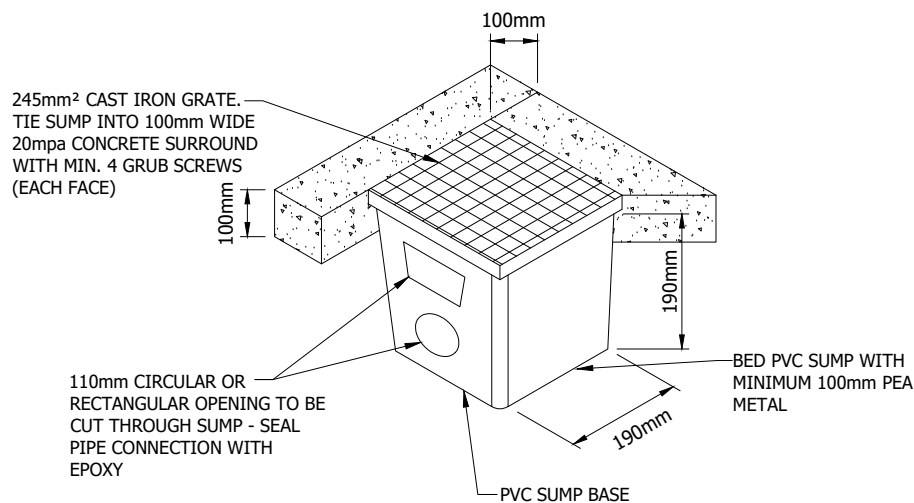
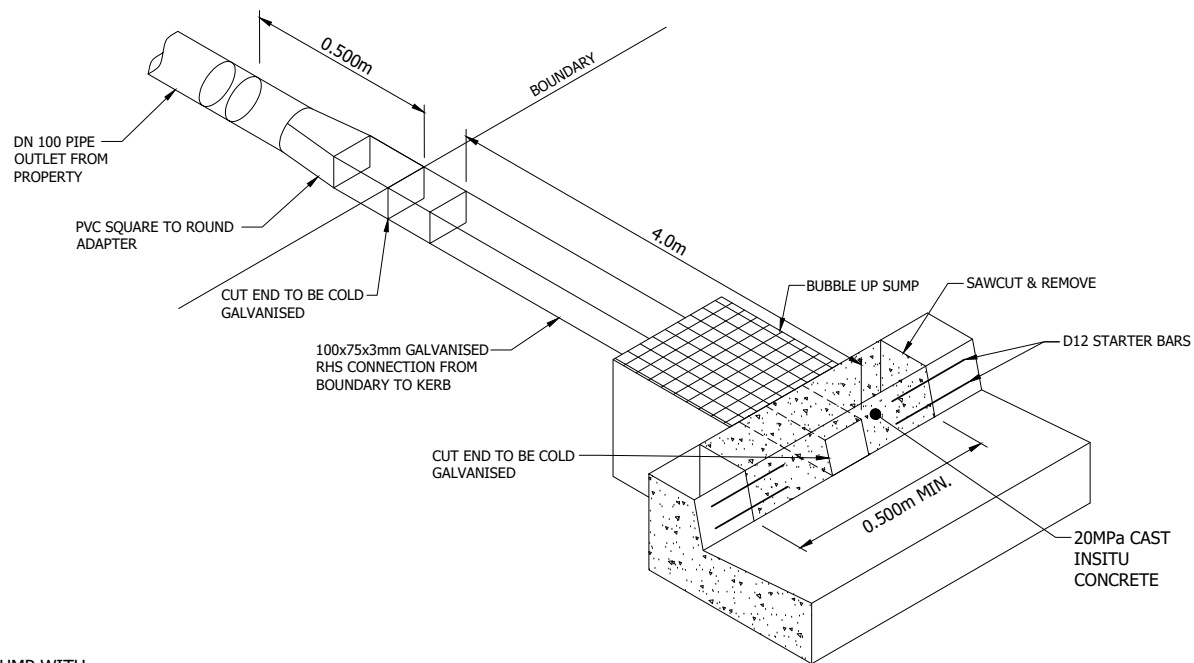
NOT TO SCALE

WS 105

DEC 2018



**DOMESTIC BUBBLE UP SUMP AT VEHICLE CROSSING**



**DOMESTIC BUBBLE UP SUMP**

GENERAL NOTE:  
THIS DETAIL IS ONLY TO BE USED WHERE DISCHARGE TO KERB BEYOND VEHICLE CROSSING IS NOT PRACTICAL



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

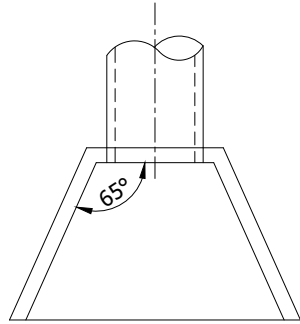
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

DOMESTIC PROPERTY DISCHARGE  
BUBBLE UP SUMP

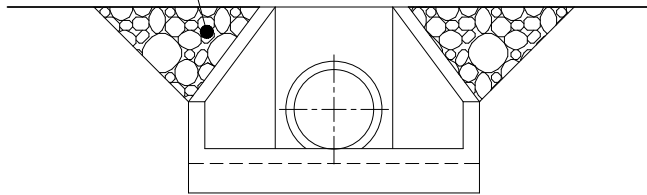
WS 106

DEC 2018

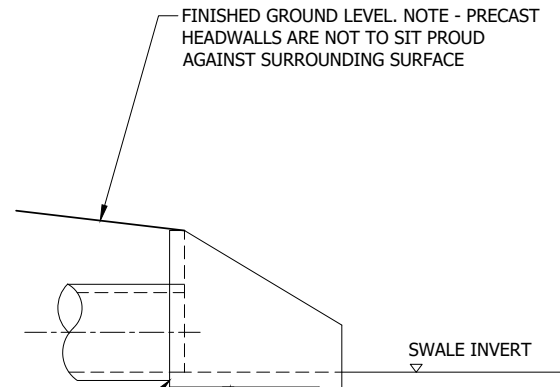


TOP

MORTARED RIVER STONES CAST IN-SITU TO TIE HEADWALL BACK INTO FINISHED SURFACE



FRONT



FINISHED GROUND LEVEL. NOTE - PRECAST HEADWALLS ARE NOT TO SIT PROUD AGAINST SURROUNDING SURFACE

SEAL CONNECTION WITH EPOXY MORTAR

200mm MIN.

200mm BEDDING MATERIAL CONSISTING OF 100mm PEA METAL LAYER ON TOP OF 100mm COMPACTED STRAIGHT HAUL LAYER

SWALE INVERT

SIDE

GENERAL NOTES:

1. REFER TO MANUFACTURERS SPECIFICATION FOR DIMENSIONS



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

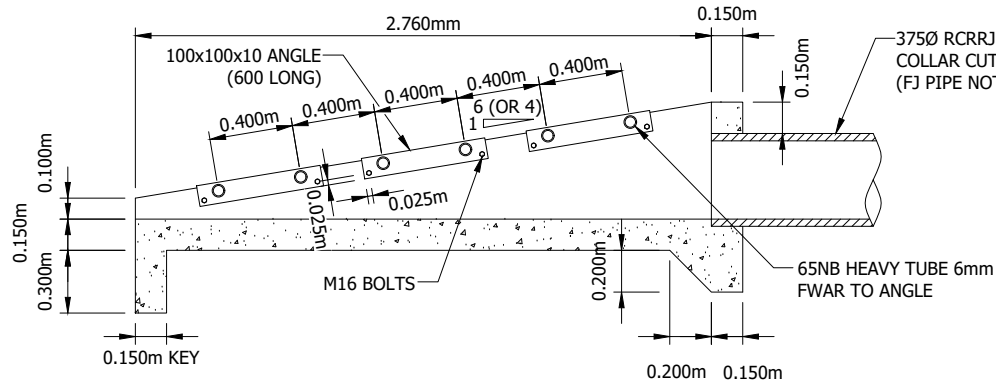
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

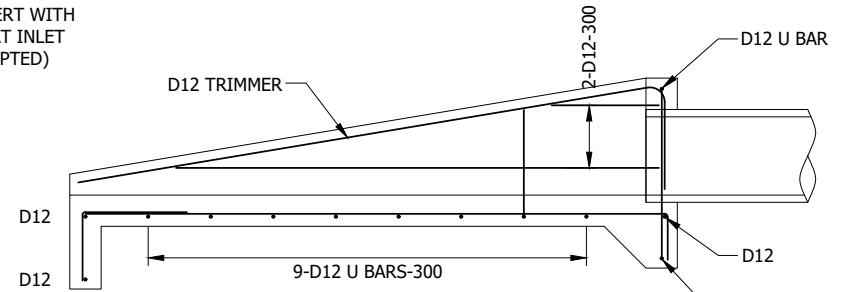
TYPICAL CULVERT HEADWALL DETAILS

WS 107

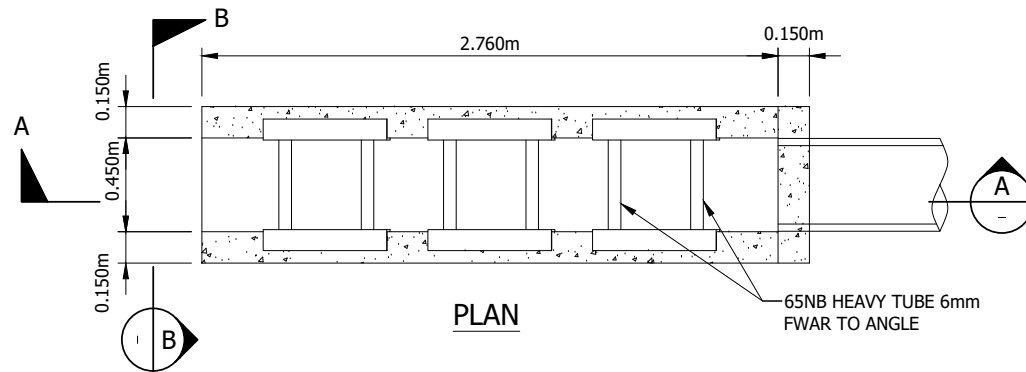
DEC 2018



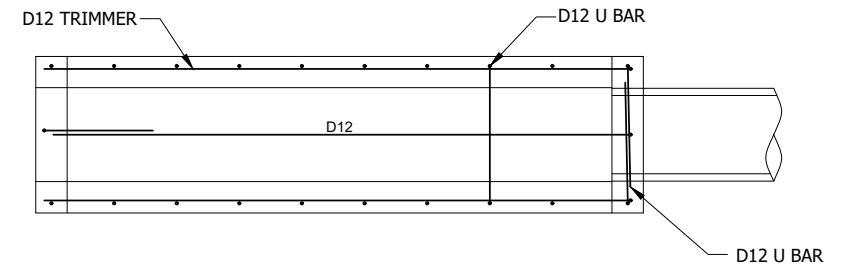
SECTION A-A



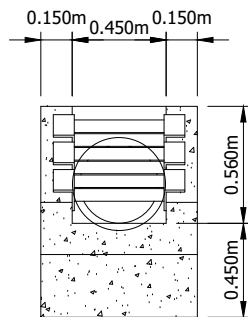
SECTION A-A



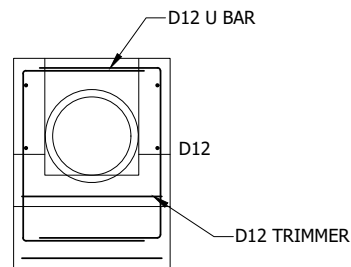
PLAN



PLAN



END ELEVATION B-B



END ELEVATION B-B

TO BE USED TO TREAT PIPE ENDS LOCATED ADJACENT TO AND RUNNING PARALLEL WITH THE TRAFFIC LANE WITH SPEEDS 80km/h OR GREATER

NOTES:-

1. UNIT MAY BE PRECAST.
2. ALL STEELWORK (INCL. FITTINGS) TO BE HOT DIP GALVANISED AFTER FABRICATION.
3. BOLTS TO SCREW INTO CAST-IN INSERTS.
4. GRADE 300 REINFORCING STEEL. LAP LENGTH FOR D12 BAR ~ 500mm MIN.
5. CONCRETE STRENGTH 25MPa.
6. BAR SPACING GENERALLY AT 300mm CRS. IN BOTH DIRECTIONS.
7. ALL EXPOSED CONCRETE CORNERS ARE TO HAVE 25x25 CHAMFERS OR FILLETS.
8. 40mm MIN. REINF. COVER TO WALL EARTH FACES & UNDERSIDE OF APRON FOR PRECAST UNIT.
9. INCREASE WIDTH OF KEY TO 200mm AND COVER TO 75mm WHERE CAST AGAINST EARTH.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

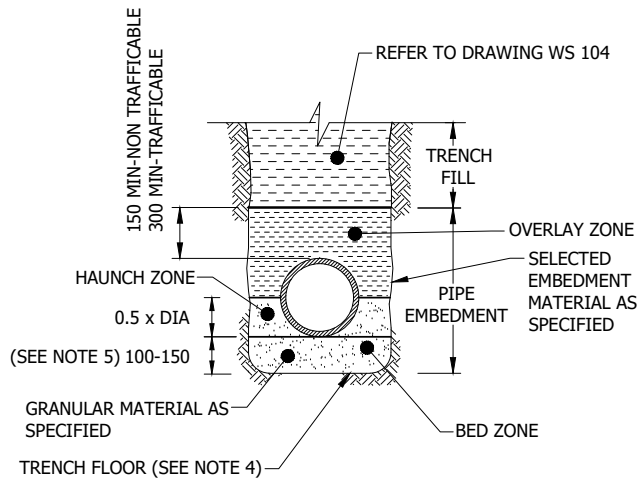
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

TYPICAL CULVERT SAFETY HEADWALL

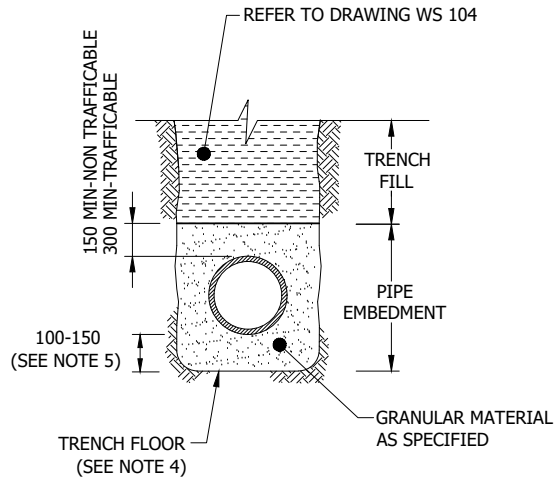
WS 108

DEC 2018



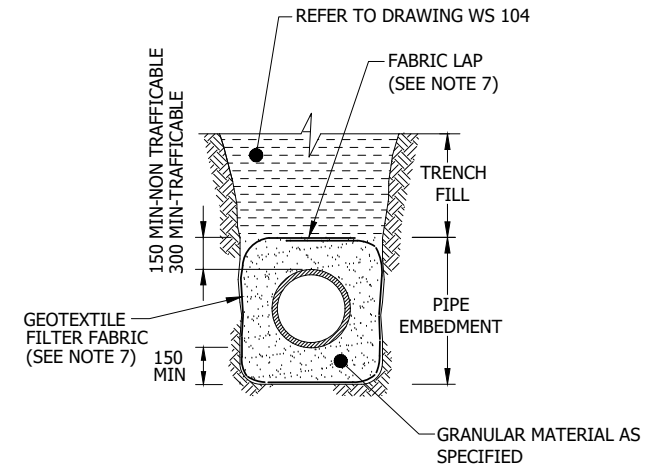
### TYPE HS2 SUPPORT

FOR RIGID PIPES ONLY (SEE NOTE 2)



### TYPE 3 SUPPORT

FOR FLEXIBLE & RIGID PIPES (SEE NOTE 2)



### TYPE 4 SUPPORT

WITH GEOTEXTILE FOR FLEXIBLE & RIGID PIPES (SEE NOTE 2)

NOTE:  
GEOTEXTILE EMBEDMENT TO BE USED WHEN THERE IS A RISK OF FINES MIGRATION FROM THE TRENCH. MIGRATION LIKELY TO OCCUR DUE TO PRESENCE OF GROUND WATER

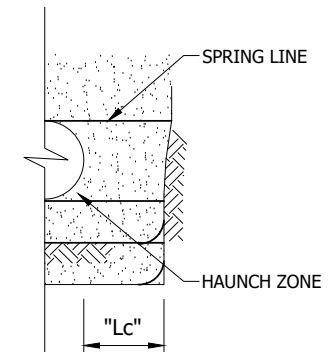
#### GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES.
- PIPE CLASSIFICATION:
  - RIGID PIPES: REINFORCED CONCRETE
  - FLEXIBLE PIPES: PVC, GRP, STEEL, DI AND PE.
- PLACEMENT OF EMBEDMENT, TRENCHFILL AND COMPACTION TO MEET THE REQUIREMENTS OF THE CONTRACT SPECIFICATIONS
- EXCAVATE OR COMPACT TRENCH FLOOR TO PROVIDE A FIRM BASE (min. 50KPa) TO SUPPORT BEDDING MATERIAL AND MINIMISE PIPELINE SETTLEMENT.
- ENSURE BEDDING IS DEEP ENOUGH THAT PIPE JOINT PROJECTIONS (SOCKETS, FLANGES) DO NOT TOUCH THE TRENCH FLOOR.
- TYPE 4 SUPPORT TO BE USED WHERE MIGRATORY NATIVE SOILS (SANDS, CLAYS) ARE ENCOUNTERED ADJACENT TO THE EMBEDMENT ZONE AND SINGLE SIZE AGGREGATE IS USED.
- GEOTEXTILE OVERLAY IS REQUIRED FOR COARSE AGGREGATE EMBEDMENT > 5mm.  
LAY GEOTEXTILE FILTER FABRIC AGAINST TRENCH FLOOR AND WALLS SUCH THAT IT FULLY ENCASES THE EMBEDMENT
  - PRESS FILTER FABRIC INTO THE VOIDS BEFORE INSTALLING EMBEDMENT TO PREVENT FABRIC TEARING.
  - PROVIDE A MINIMUM OF 250mm OVERLAP AT ALL FILTER FABRIC JOINTS.

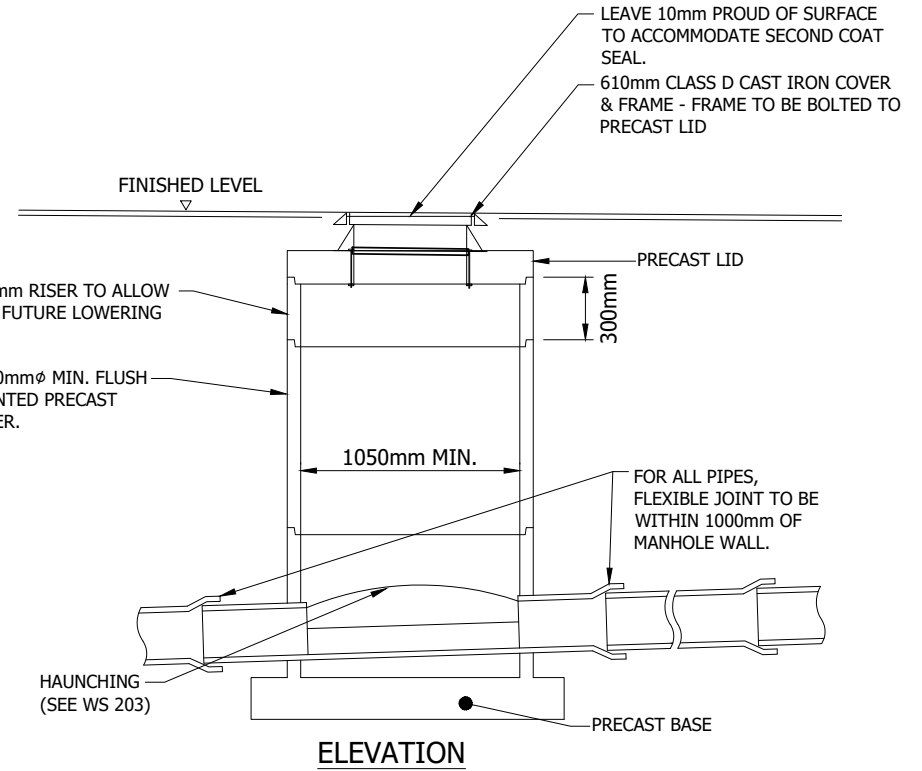
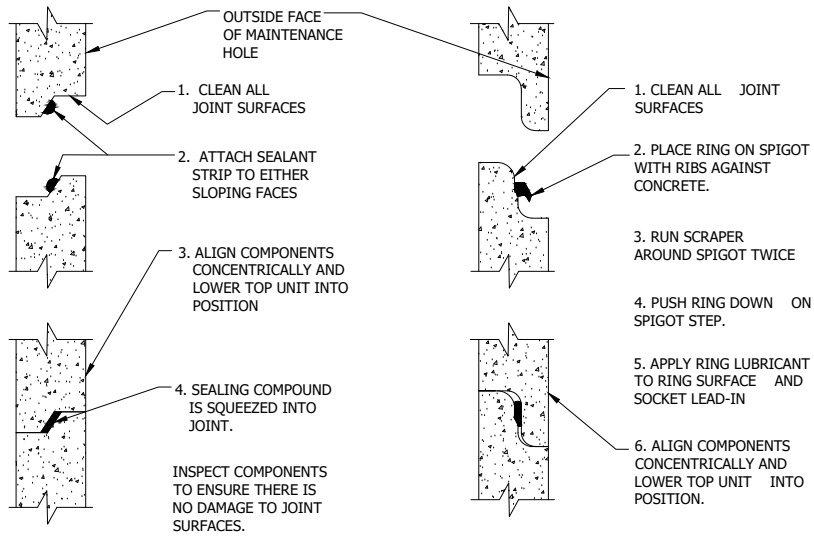
#### SPRING LINE TRENCH CLEARANCE

NOMINAL DIAMETER DN	MINIMUM CLEARANCE "Lc"
<150	100
>150-<300	150
>300-<450	200
>450-<900	300
>900-<1500	350

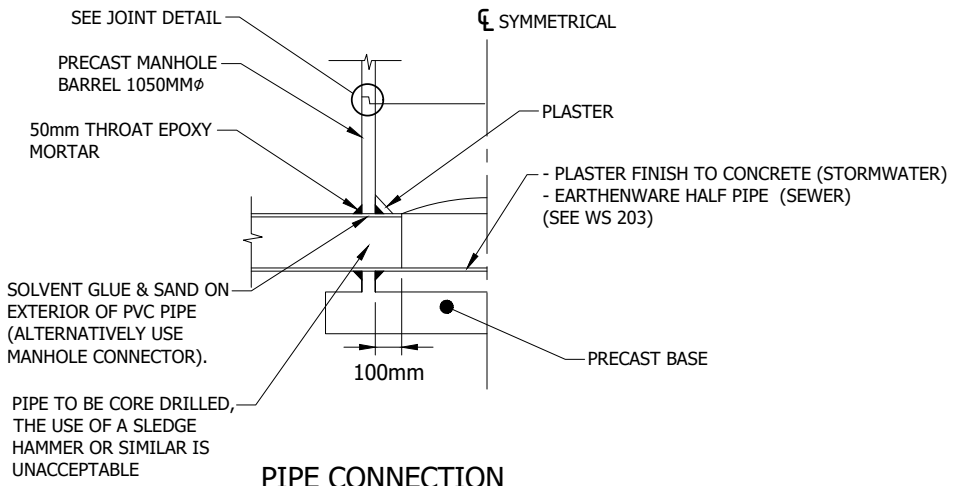
TRENCH WIDTH TO BE SUFFICIENT TO SAFELY LAY PIPE AND COMPACT THE SIDE SUPPORT ZONE.



### MINIMUM TRENCH WIDTH




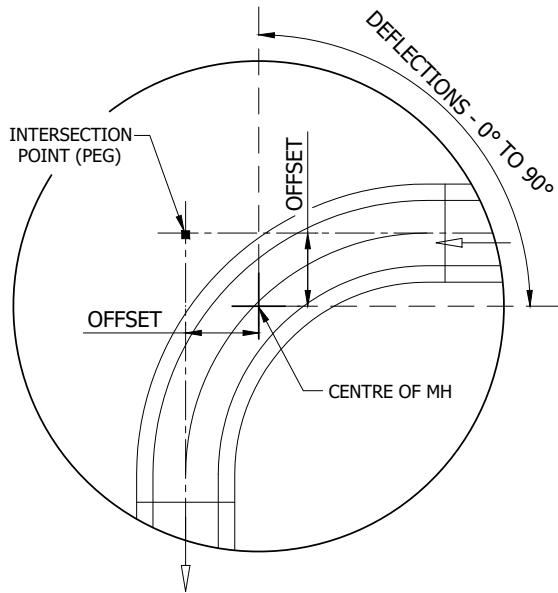
**MANHOLE RISER DETAIL**



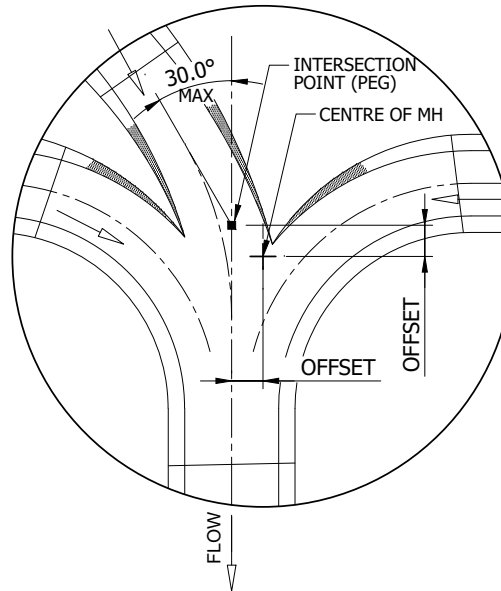
**PIPE CONNECTION**

- GENERAL NOTES:**
- MAKE-UP RINGS:  
USE MINIMUM OF ONE 300mm RISER AT TOP PER MANHOLE DURING CONSTRUCTION TO ALLOW FOR FUTURE SURFACE ADJUSTMENT WITHOUT AFFECTING THE SHAFT SECTIONS.
  - WHERE THERE IS SIGNIFICANT RISK OF INFILTRATION OR TREE ROOT INTRUSION APPLY AN EXTERNAL BITUMASTIC SEAL TAPE 150mm WIDE OVER A COAT OF MANUFACTURERS RECOMMENDED PRIME SEAL TO ALL JOINTS.

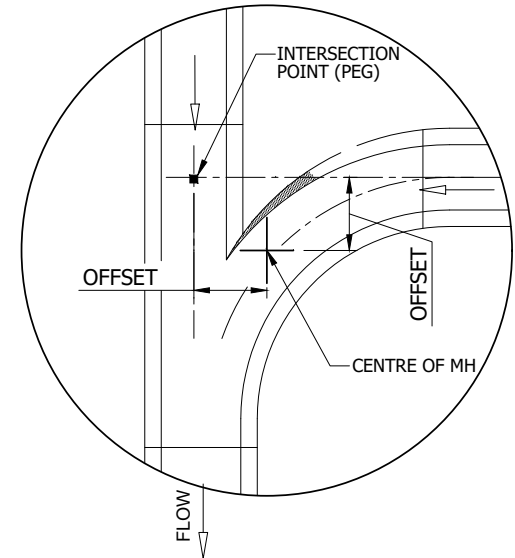
 © Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	STANDARD MANHOLE AND PIPE CONNECTION	WS 202
		DEC 2018



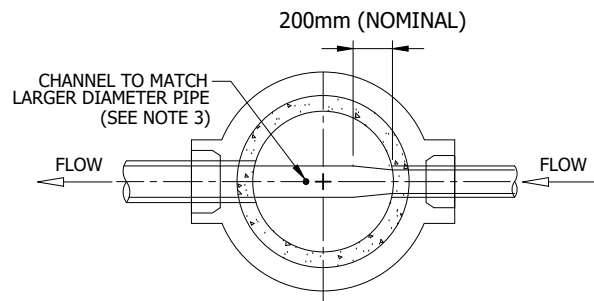
CHANGE IN DIRECTION



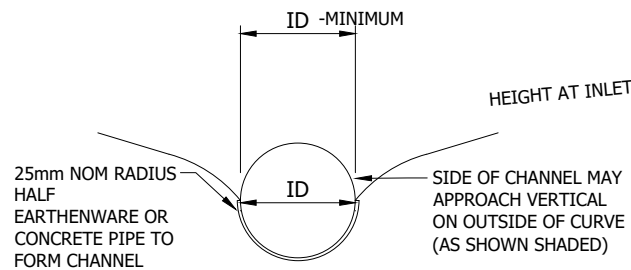
MULTIPLE INCOMING PIPES



STRAIGHT THROUGH & 90° INLET



CHANGE IN DIAMETER




TYPICAL CHANNEL DETAILS

NOTE:  
BENCHING WITHIN MANHOLES IS REQUIRED FOR ALL STORMWATER APPLICATIONS UNLESS OTHERWISE APPROVED BY HASTINGS DISTRICT COUNCIL

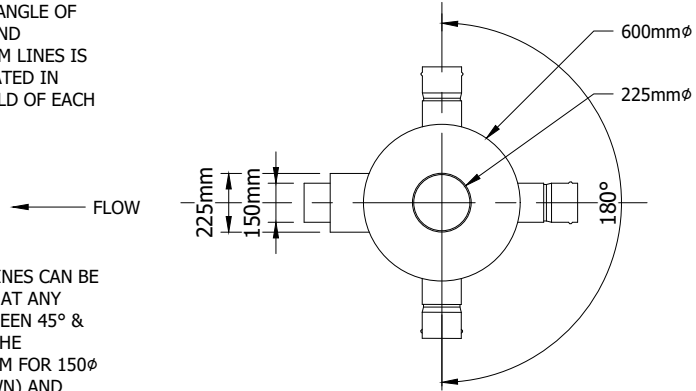
GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. PROVIDE ROUNDED NOSING ON INLET AND OUTLET PIPE TO PREVENT DAMAGE TO JETTING EQUIPMENT AND CCTV GUIDES AND CABLES
3. CONSTRUCTION MAY BE A COMBINATION OF PRECAST AND IN-SITU TO SUIT APPLICATION
4. WHERE NECESSARY PULL MANHOLE OFF CENTRELINE OF STORMWATER / SEWER (MAX 200mm) TO IMPROVE FLOW AND ACCESSIBILITY PROVIDED THE FOLLOWING CONDITIONS ARE MET:
  - ALL TANGENT POINTS TO BE CONTAINED WITHIN MANHOLE.
  - SUFFICIENT WORK AREA AVAILABLE.
  - MAINTENANCE EQUIPMENT CAN BE USED IN ALL MAINS.
  - OFFSET AS SPECIFIED

 <small>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright</small>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	MANHOLE - TYPICAL CHANNEL ARRANGEMENTS	
	WS 203	DEC 2018

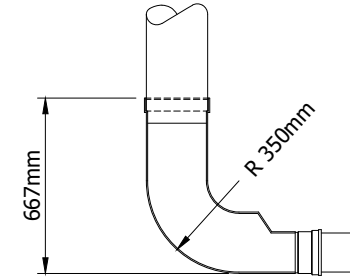


GRADE AND ANGLE OF UPSTREAM AND DOWNSTREAM LINES IS ACCOMMODATED IN CUSTOM BUILD OF EACH UNIT



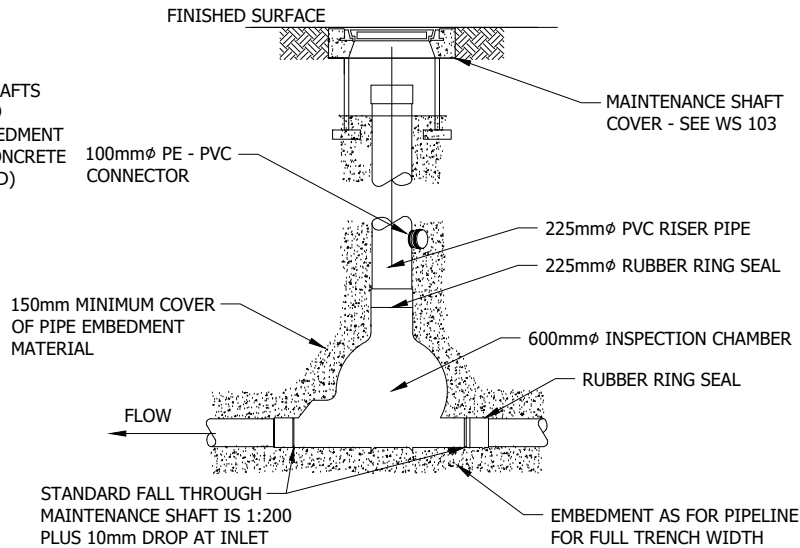
**PLAN VIEW**  
(SHOWS RANGE OF UPSTREAM ANGLES)

UPSTREAM LINES CAN BE POSITIONED AT ANY ANGLE BETWEEN 45° & 315° FROM THE DOWNSTREAM FOR 150φ LINES (SHOWN) AND BETWEEN 65° & 295° FOR 225φ LINES

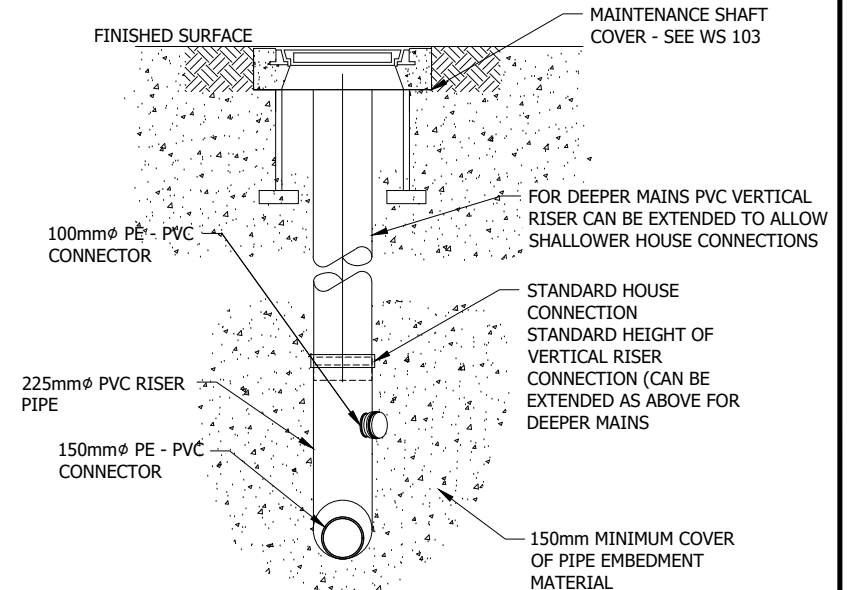


**TERMINAL SHAFT SECTION**  
(SHOWN WITH 150mmφ AKATHERM FITTING)

MAINTENANCE SHAFTS ARE PLACED INTO COMPACTED EMBEDMENT MATERIAL (NO CONCRETE CRADLE REQUIRED)



**SIDE ELEVATION**  
**MAINTENANCE SHAFT**  
**(POO PIT) - TYPICAL INSTALLATION**



**FRONT VIEW**  
**TYPICAL TERMINAL SHAFT (J-PIT)**  
**- TYPICAL INSTALLATION**

GENERAL NOTES:  
1. ALL DIMENSIONS ARE IN MILLIMETRES.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

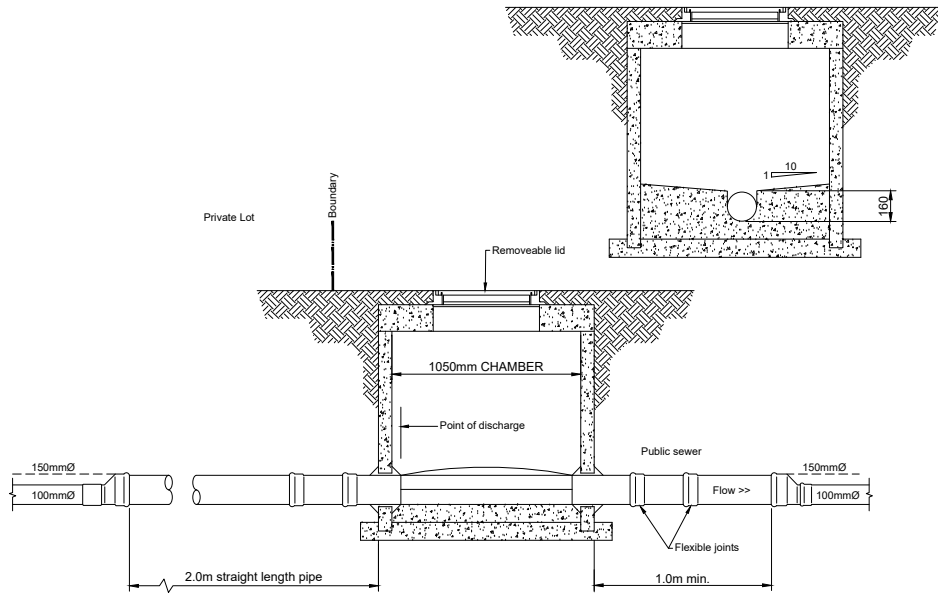
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

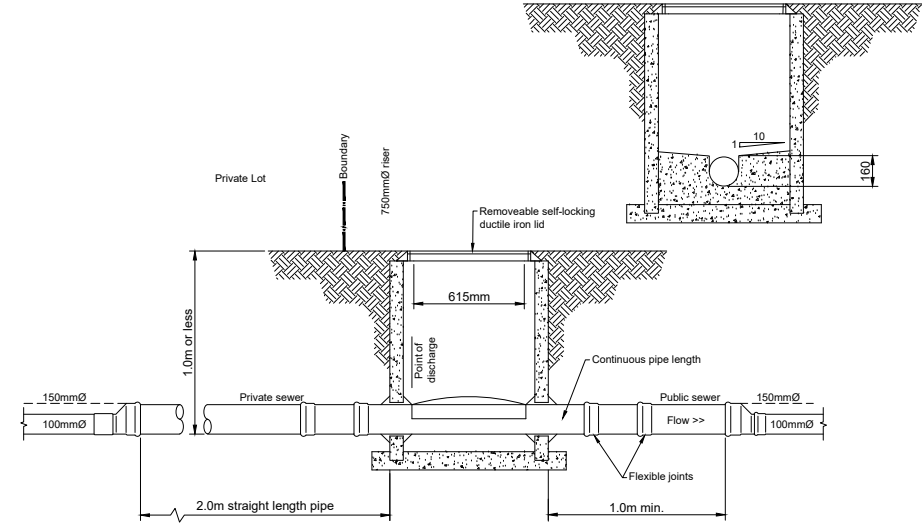
TYPICAL MAINTENANCE SHAFT DETAILS

WS 204

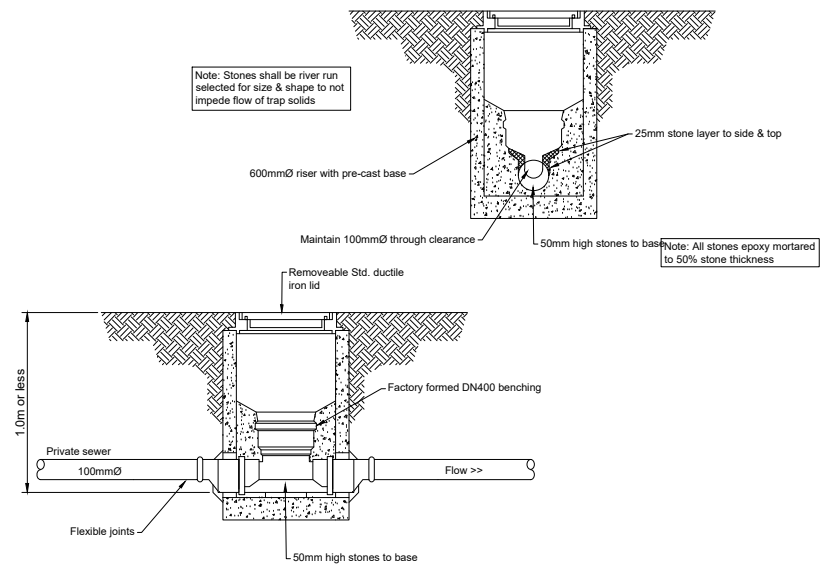
DEC 2018



**INSTALLATION OF WTA MONITORING MANHOLE IN 100mm PIPELINE**  
 (Note: No rodding eye at boundary required)  
**TRADE WASTE - MONITORING CHAMBER - ALTERNATIVE A**

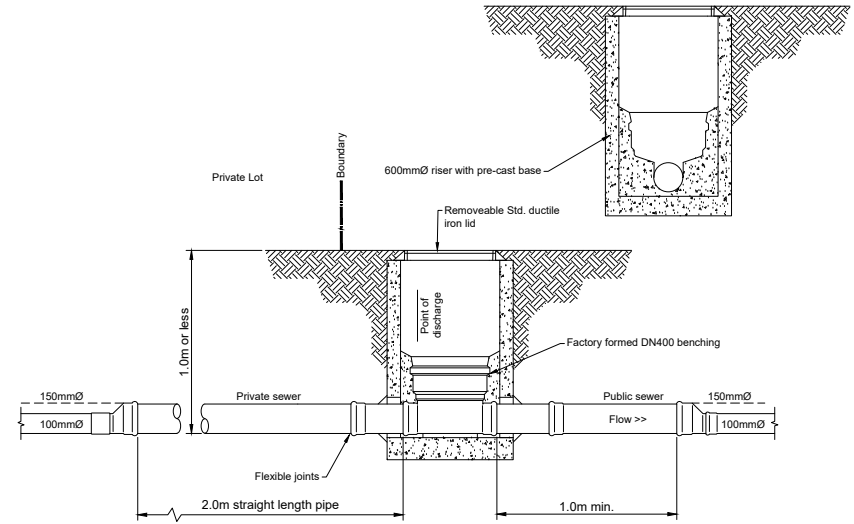


**CONDITIONAL TRADE WASTE DISCHARGES, NOT GREATER THAN 1.0 METRE DEEP**  
 (Note: No rodding eye at boundary required)  
**TRADE WASTE - MONITORING CHAMBER - ALTERNATIVE B**



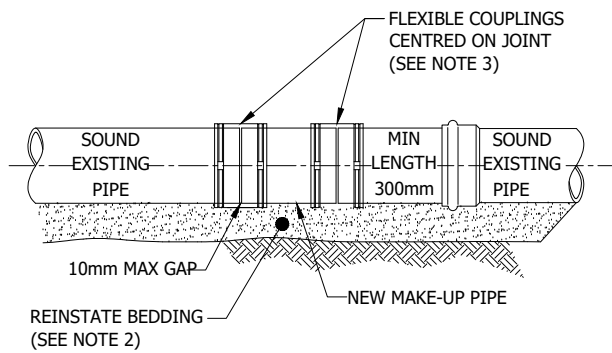
**ROCK CONTACT CHAMBER, NOT GREATER THAN 1.0 METRE DEEP**  
 (Note: stone lining of chamber by factory supplier)  
**CULTURALLY SENSITIVE WASTE CHAMBER**

**GENERAL NOTES:**  
 1. ALL DIMENSIONS ARE IN MILLIMETRES.

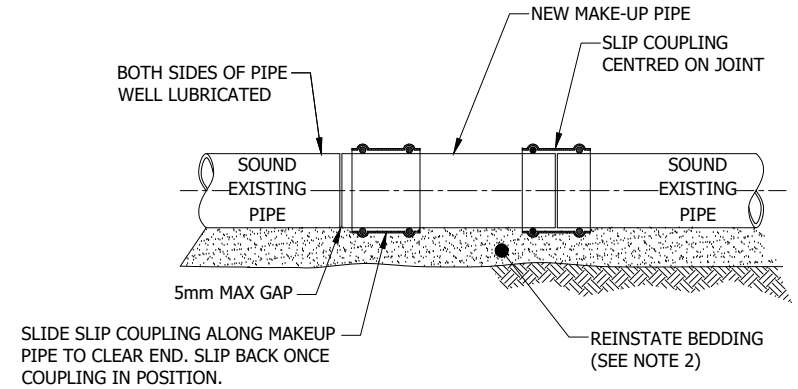


**ALTERNATIVE CONDITIONAL TRADE WASTE DISCHARGES, NOT GREATER THAN 1.0 METRE DEEP**  
 (Note: No rodding eye at boundary required)  
**TRADE WASTE - MONITORING CHAMBER - ALTERNATIVE C**

<p><b>HASTINGS</b> DISTRICT COUNCIL</p> <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	TRADE WASTE CHAMBER DETAILS	
	JAN 2019	

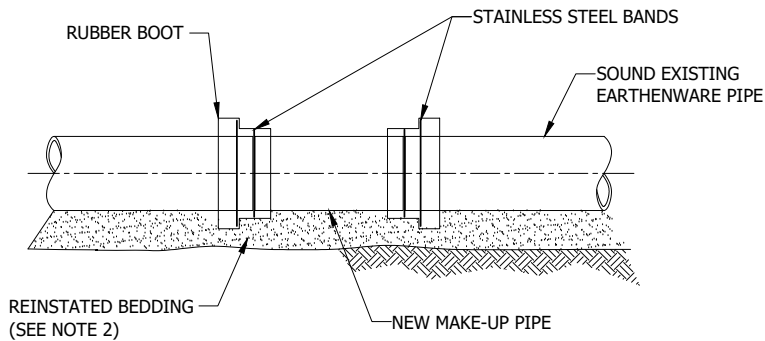


**FLEXIBLE COUPLING METHOD**

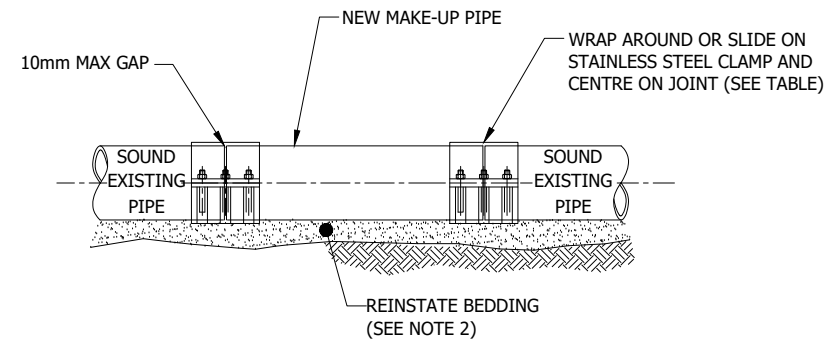


**SLIP COUPLING METHOD**

SS WRAP AROUND CLAMPS	
DN	MIN CLAMP LENGTH EITHER SIDE OF PIPE CUT OR DAMAGE
100 - <200	75
>200 - <300	100
>300 - 600	150



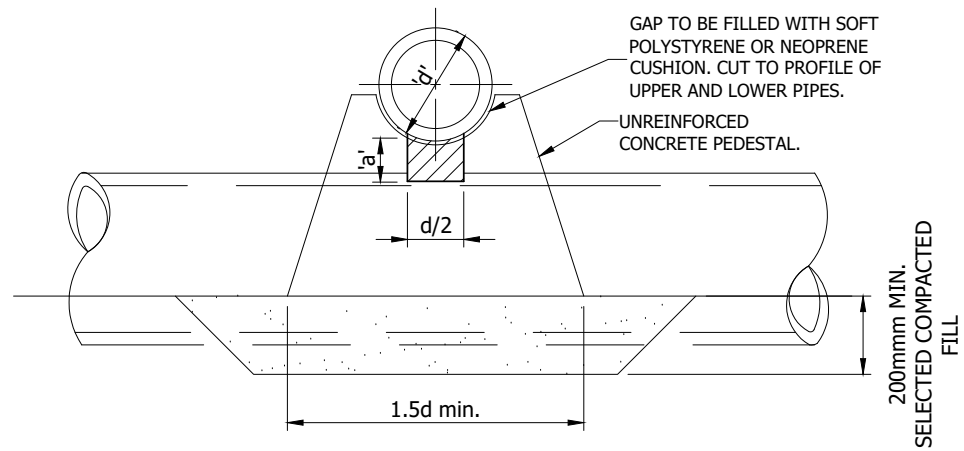
**FLEXIBLE COUPLING METHOD  
EARTHENWARE PIPES**



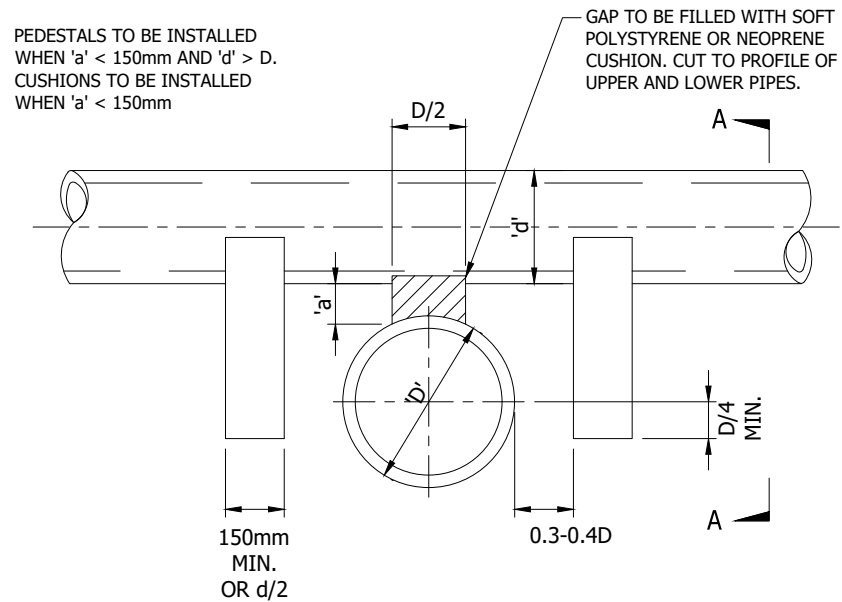
**STAINLESS STEEL REPAIR CLAMP METHOD**

**GENERAL NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. PLACE EMBEDMENT UNDER AND AROUND ALL INSTALLED PIPE SECTIONS AND SPACERS AND COMPACT TO MAINTAIN GRADE AND MINIMISE SETTLEMENT.
3. FLEXIBLE COUPLINGS TO HAVE GRADE 316 SS CLAMPS AND SHEAR BANDS TO BE IN ACCORDANCE WITH AS 4327
4. SLIP COUPLINGS TO BE AS SPECIFIED BY PIPE MANUFACTURER.
5. A SINGLE REPAIR CLAMP MAY BE USED FOR REPAIR WHERE APPROVED. MINIMUM CLAMP LENGTH EITHER SIDE OF THE DAMAGE AS SHOWN ON THE TABLE.
6. FLEXIBLE COUPLINGS AND STAINLESS REPAIR CLAMPS ARE NOT APPLICABLE TO RIBBED PIPE.
7. THOROUGHLY CLEAN SURFACE OF EXISTING PIPE BEFORE INSTALLING CLAMPS OR COUPLINGS



**SECTION A-A**



**ELEVATION**



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

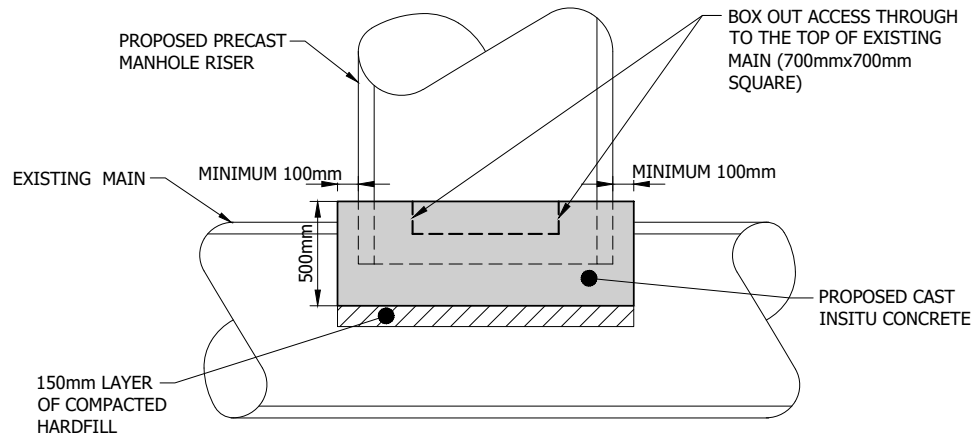
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

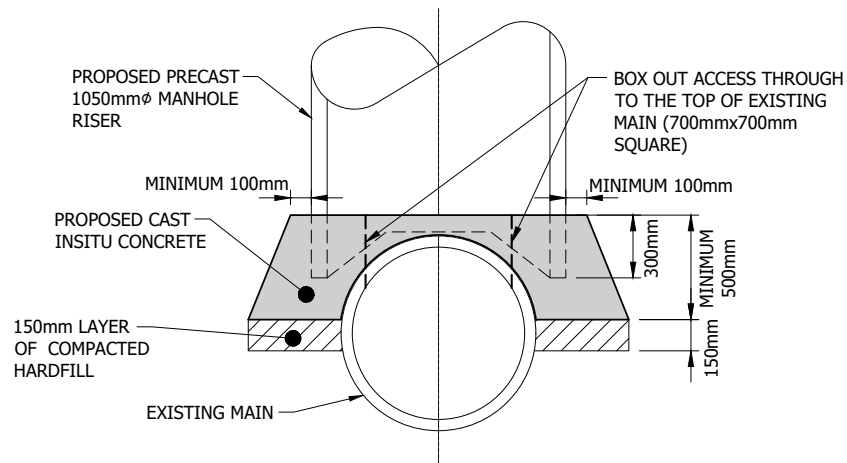
CLOSE PIPE CROSSING SUPPORT DETAIL

WS 206

DEC 2018



**SIDE ELEVATION**



**FRONT ELEVATION**

PIPE TO RISER SIZE RANGE	
PIPE SIZE	RISER SIZE
600 $\phi$ TO 825 $\phi$	1050 $\phi$ MANHOLE
900 $\phi$ TO 1200 $\phi$	1200 $\phi$ MANHOLE
1200 $\phi$	1350 $\phi$ MANHOLE
1350 $\phi$ +	1050 $\phi$ MANHOLE CAST INTO PIPE

**GENERAL NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. CHIMNEY MANHOLES ARE ONLY SUITABLE FOR PIPES 600mm $\phi$  OR GREATER
3. PIPES SMALLER THAN 1350 $\phi$  HAVE THE RISER STRADDLING THE PIPE AS DETAILED. PIPES 1350 $\phi$  AND GREATER HAVE THE RISER CAST INTO THE PIPE SOFFIT



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

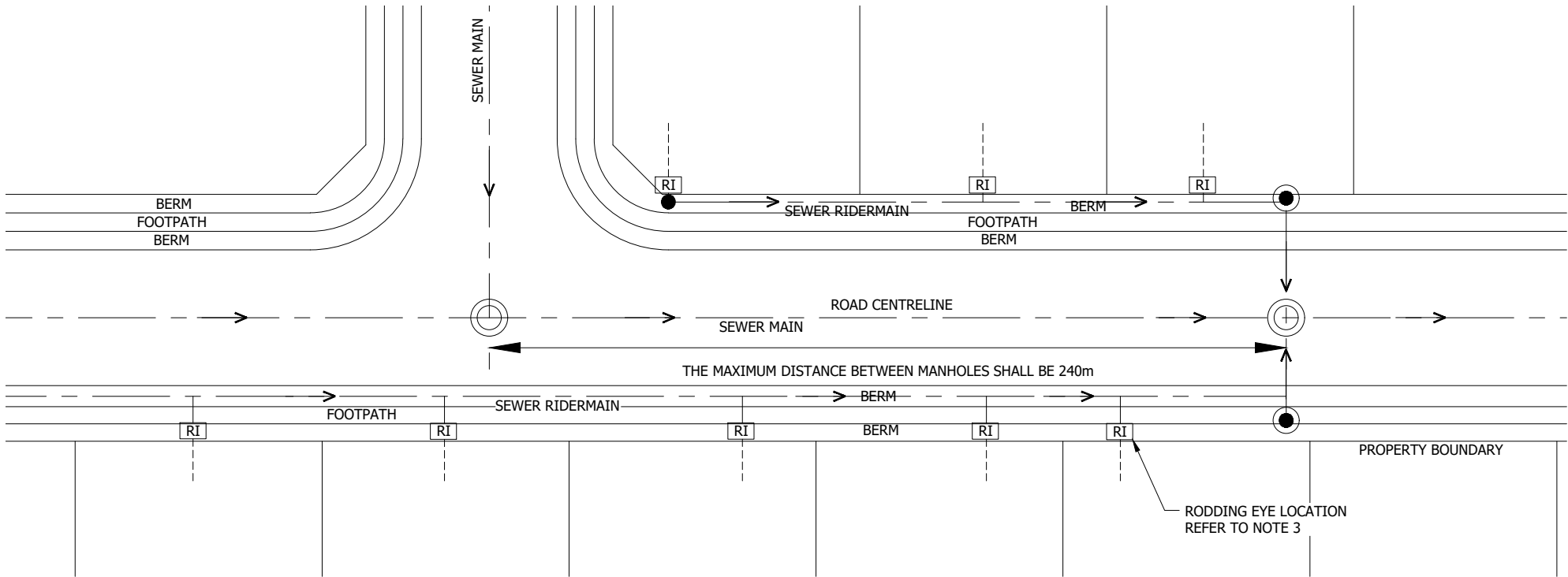
HASTINGS DISTRICT COUNCIL

NOT TO SCALE









STANDARD CHIMNEY MANHOLE DETAIL

WS 207

DEC 2018



**LEGEND**

-  SEWER MANHOLE
-  MAINTENANCE SHAFT (POO PIT)
-  TERMINAL MAINTENANCE SHAFT
-  RODDING EYE
-  SEWER MAIN
-  LATERAL CONNECTION
-  LATERAL CONNECTION PRIVATE
-  FLOW DIRECTION

**GENERAL NOTES:**

1. LOCATE SEWERS AS SHOWN IN DESIGN DRAWINGS. GENERAL POSITION IS ALONG THE CENTRELINE.
2. SEWER RIDERMAINS ARE TO BE INSTALLED WHEN THE SEWER MAIN IS >2.5m DEEP
3. RODDING EYE ACCESS BOXES ARE TO BE INSTALLED AS CLOSE TO THE PROPERTY BOUNDARY AS PRACTICAL AND BE EASILY ACCESSIBLE AT ALL TIMES.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

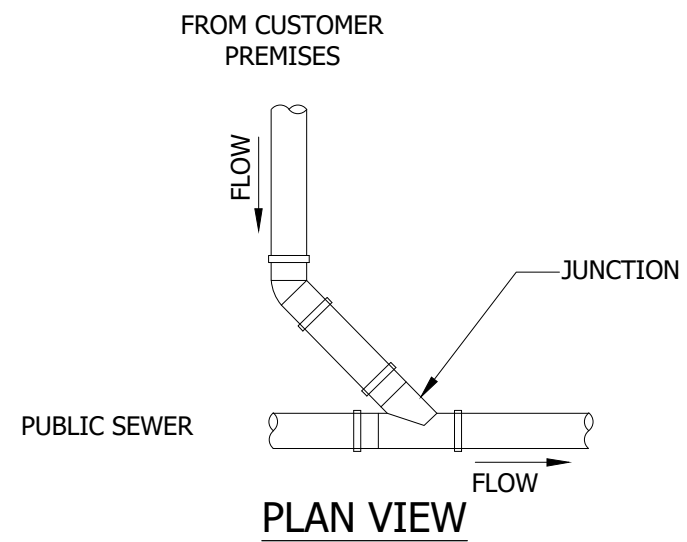
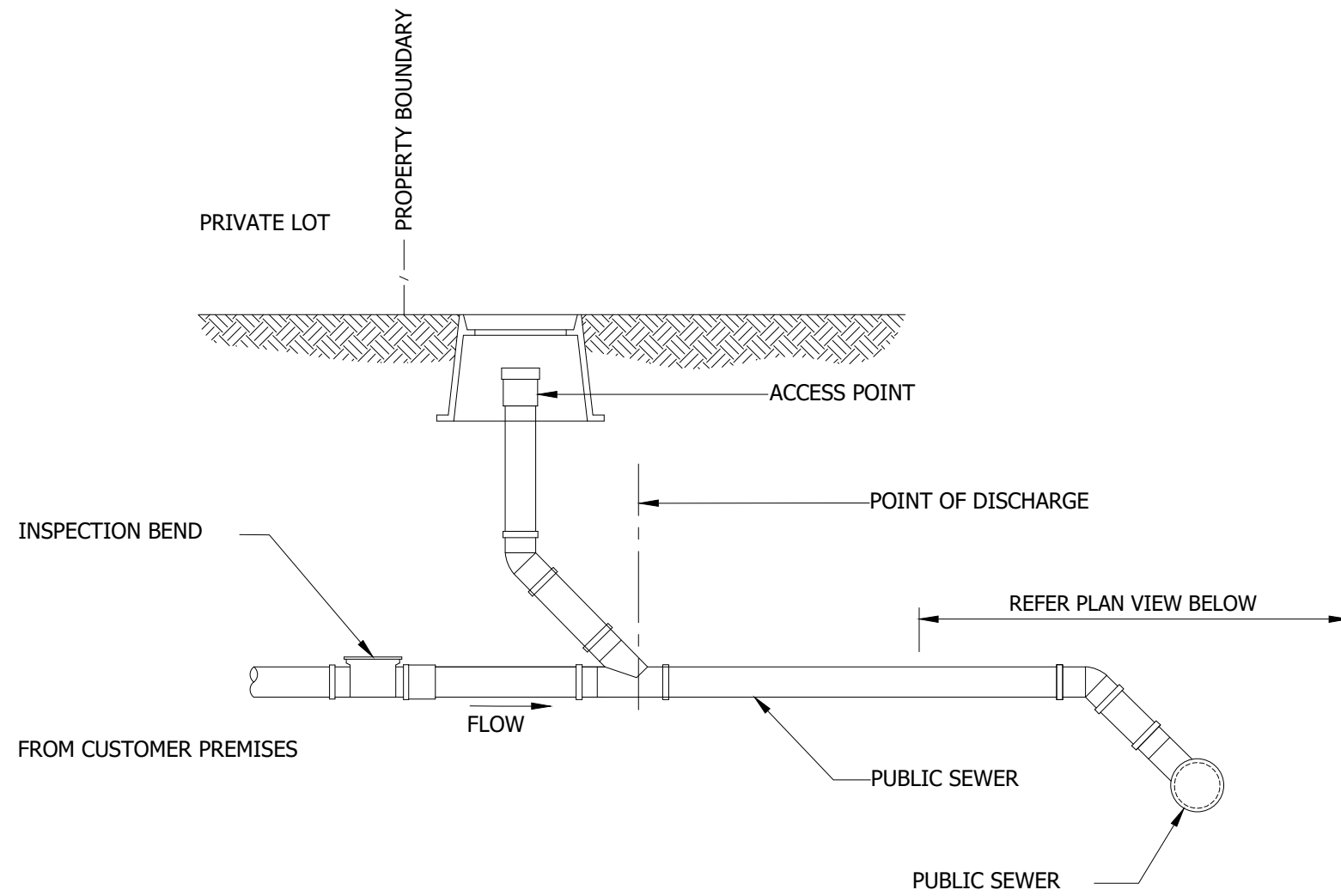
HASTINGS DISTRICT COUNCIL


NOT TO SCALE

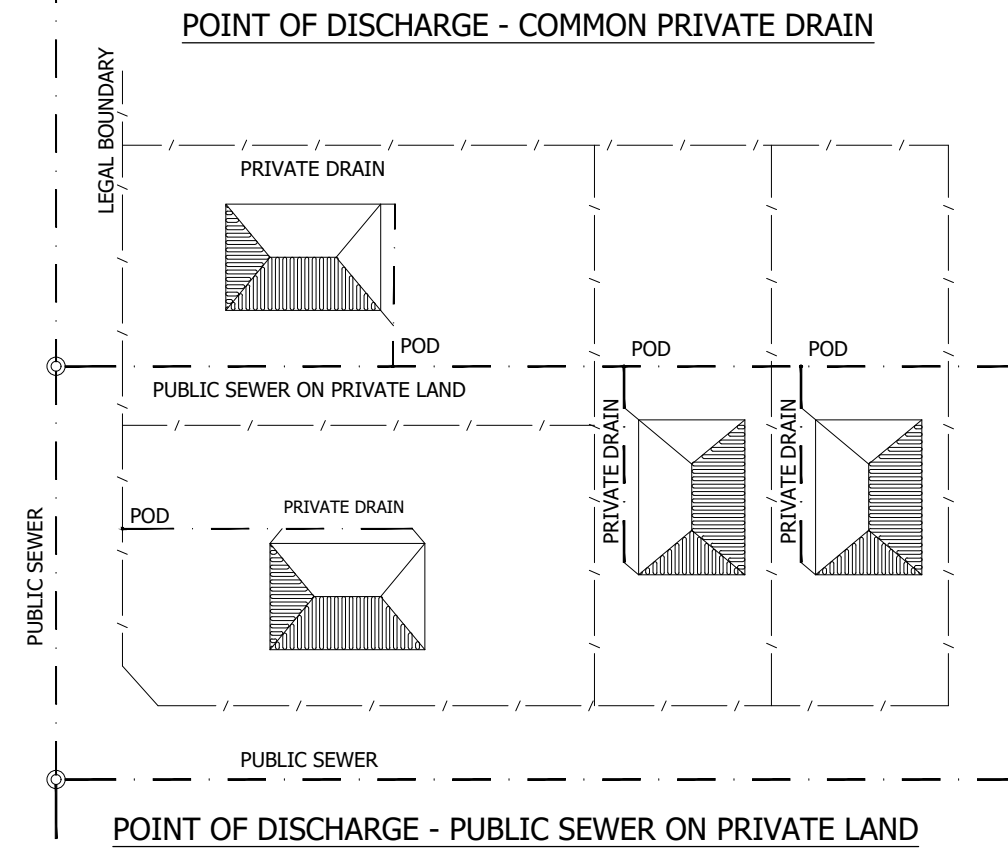
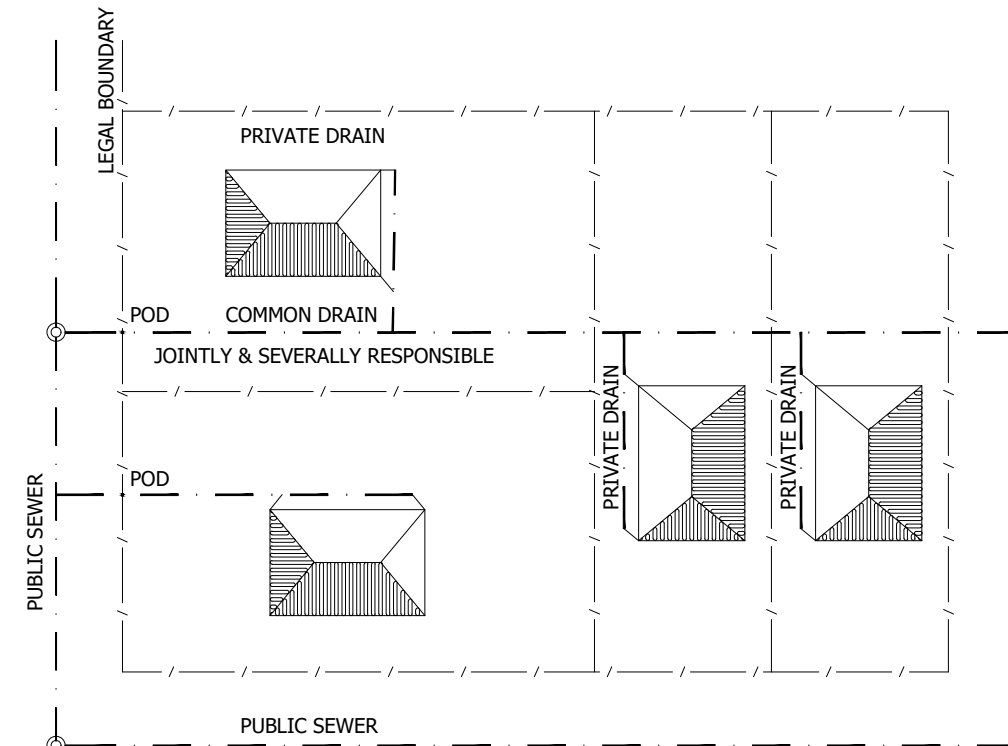
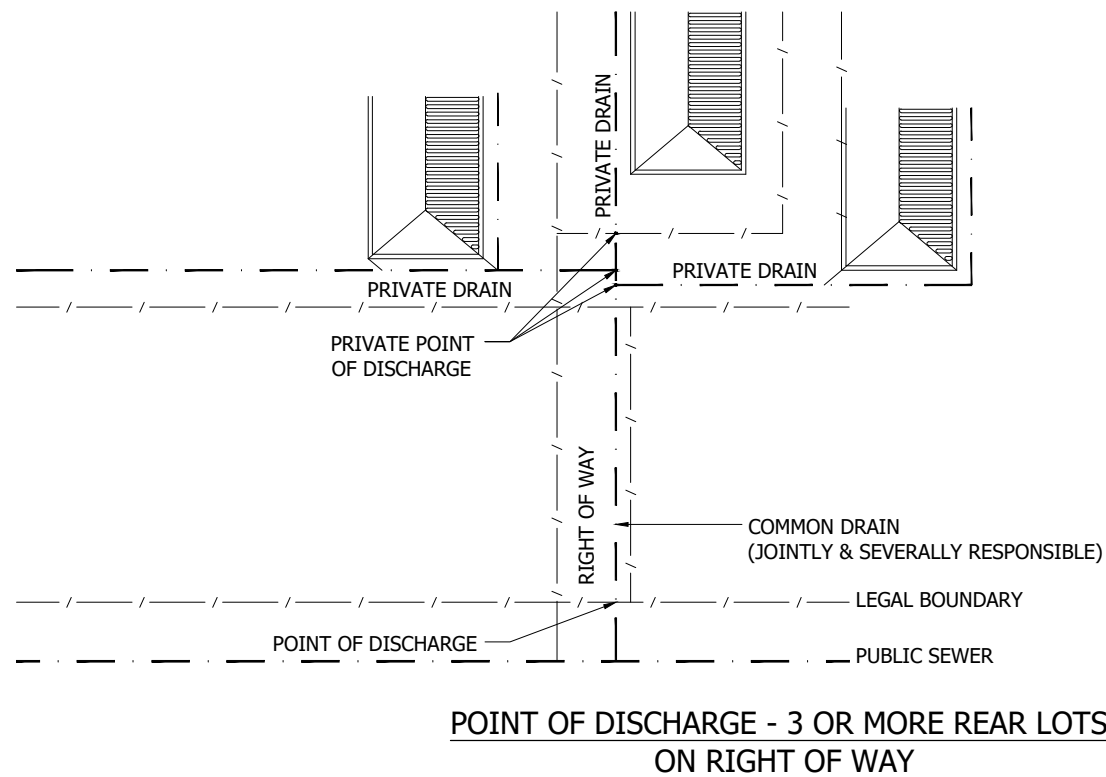
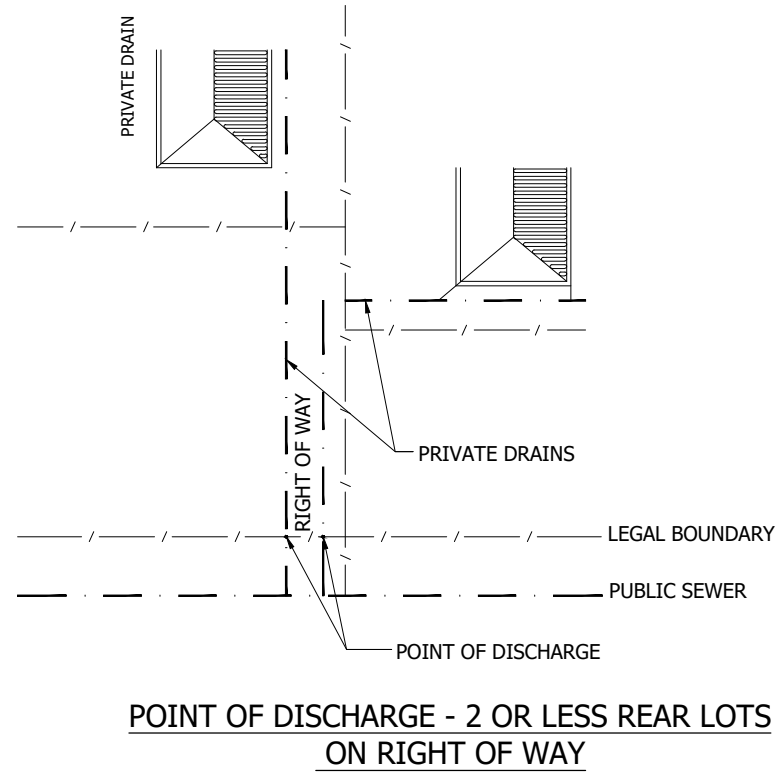
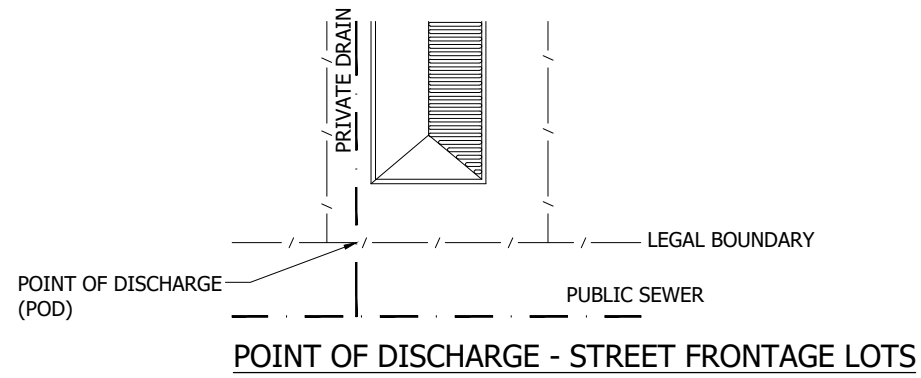
TYPICAL SEWER RETICULATION LAYOUT


WS 301

DEC 2018

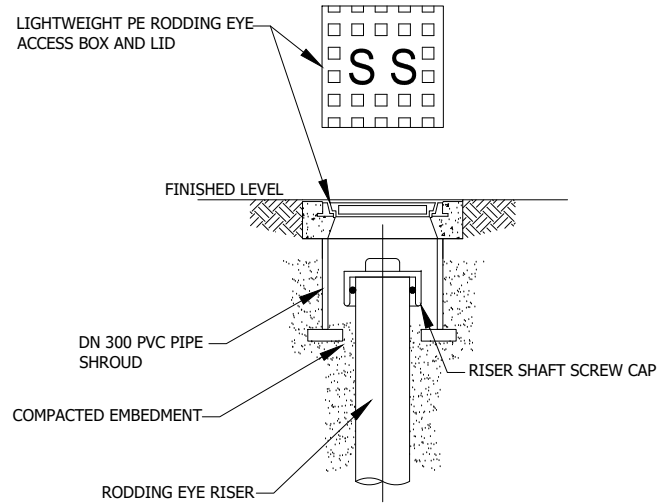


 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	SEWER POINT OF DISCHARGE DETAIL	WS 301A
		JAN 2019

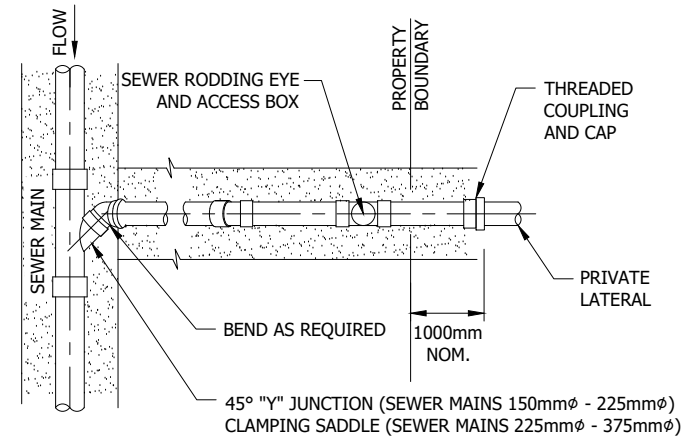


 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaptation of the whole or substantial part of the work in two or three dimensions is an infringement of copyright</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	TYPICAL SEWER RETICULATION CONNECTION LAYOUTS	WS 301B
		JAN 2019

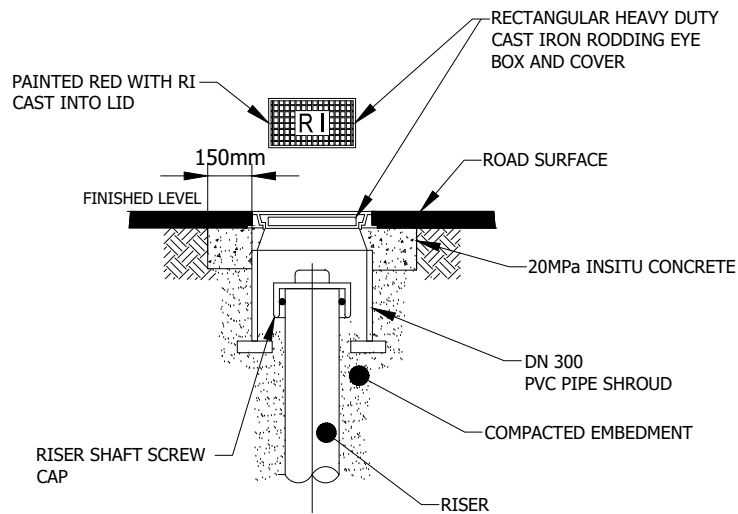




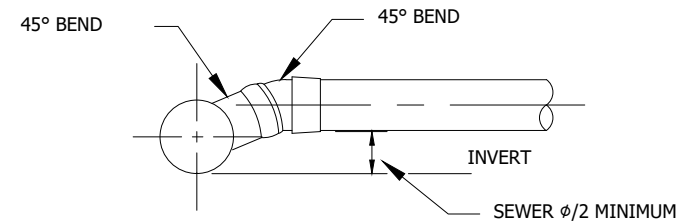
**NON TRAFFICABLE SEWER RODDING EYE ACCESS BOX - DETAIL**




**SEWER LATERAL CONNECTION**

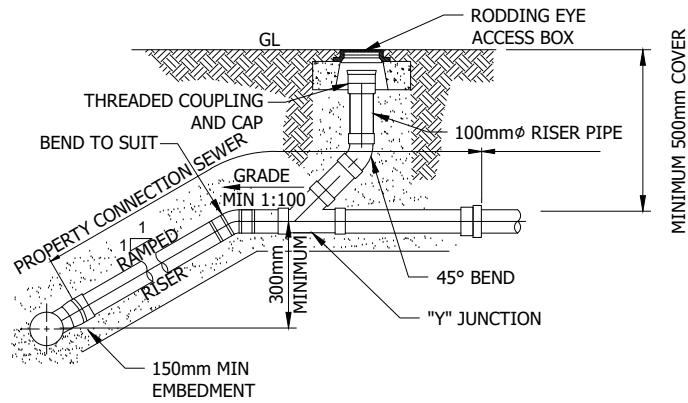


**TRAFFICABLE SEWER RODDING EYE ACCESS BOX - DETAIL**

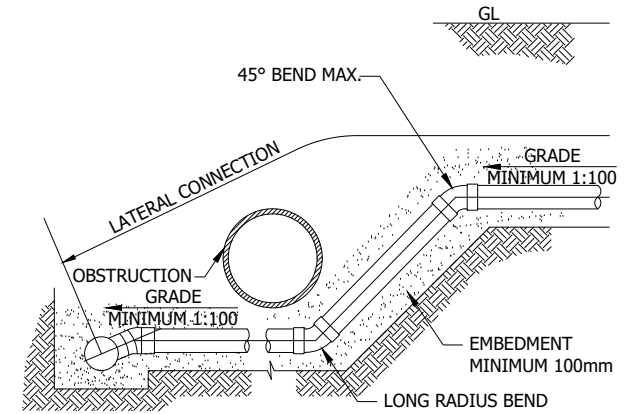


**MINIMUM LEVEL CONNECTION DETAIL - ELEVATION VIEW**

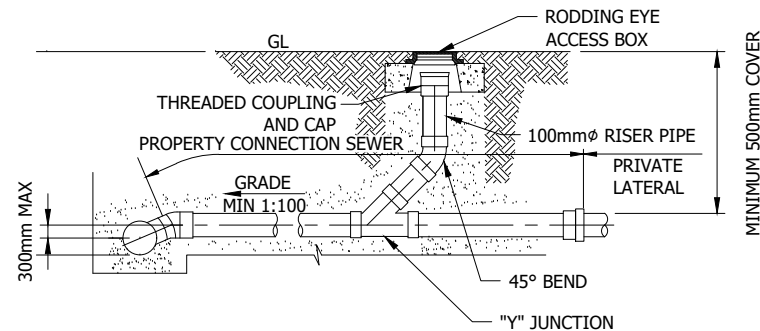
 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	TYPICAL SEWER CONNECTION, RODDING EYE AND ACCESS BOX	WS 302A
		JAN 2019



**SLOPED LATERAL CONNECTION AND RODDING EYE  
(VERTICAL DROP > 300mm)**



**TYPICAL LATERAL CONNECTION  
AROUND OBSTRUCTION**



**STANDARD LATERAL CONNECTION AND RODDING EYE  
(UP TO 300mm VERTICAL DROP)**



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

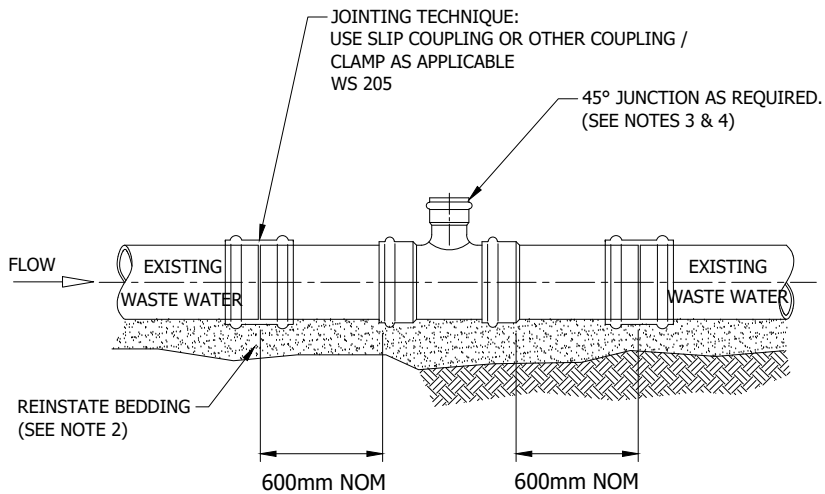
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

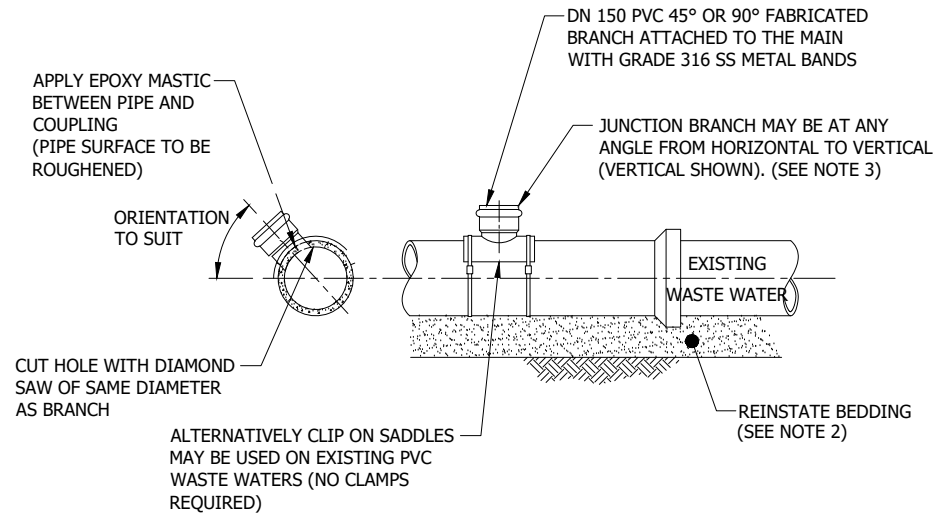
TYPICAL SEWER CONNECTION, RODDING EYE  
AND ACCESS BOX

WS 302B

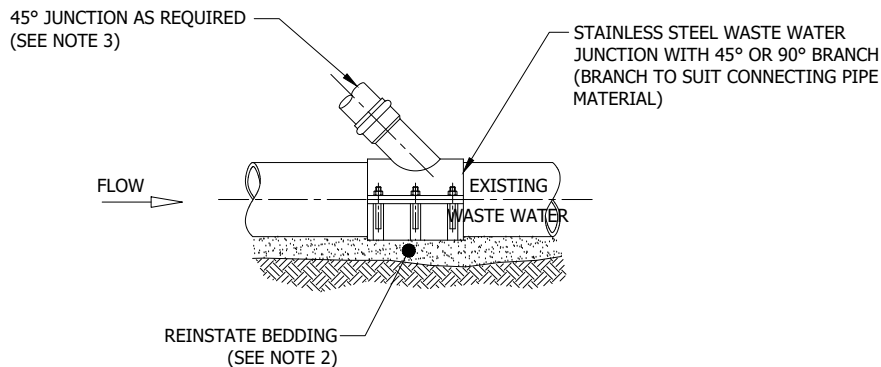
JAN 2019



**INSERTION OF JUNCTION INTO EXISTING WASTE WATER  
PLAN VIEW**



**CONNECTION OF PVC SADDLE TO EXISTING WASTE WATER**



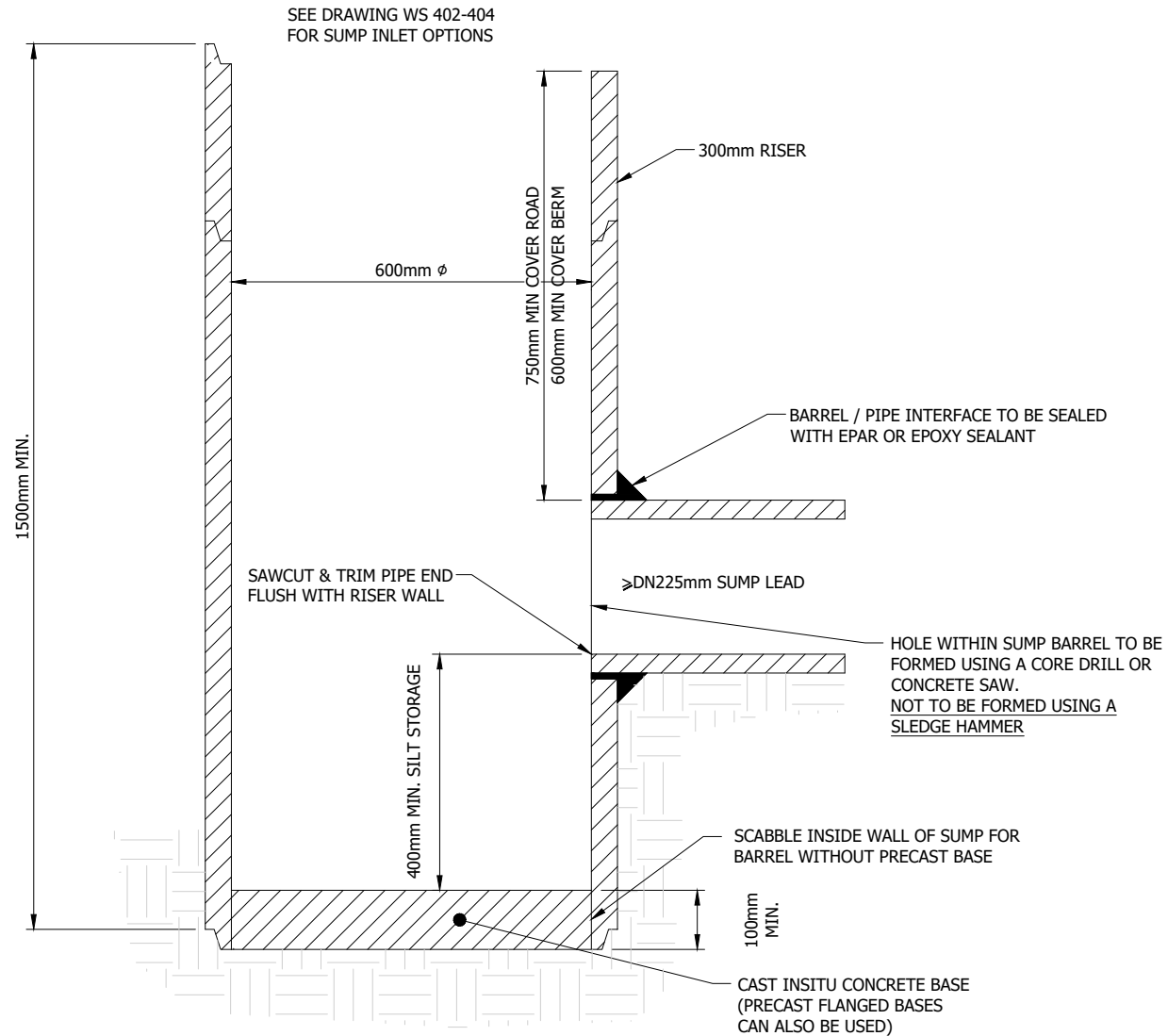
**CONNECTION OF STAINLESS STEEL WASTE WATER  
JUNCTION TO EXISTING WASTE WATER PLAIN WALL  
PLAN VIEW**

**CLAMP-ON BRANCH INSTALLATION PROCEDURE:**

- a. PLACE CLAMP-ON BRANCH ON PIPE AND MARK THE INSIDE SHAPE OF THE JUNCTION BRANCH ON MAIN PIPE.
- b. REMOVE CLAMP AND CUT HOLE USING APPROPRIATE TYPE OF HOLE SAW.
- c. ALIGN JUNCTION BRANCH WITH CUT HOLE. POSITION CLAMPS AND TIGHTEN TO REQUIRED TORQUE.

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. PLACE EMBEDMENT UNDER AND AROUND ALL INSTALLED PIPE SECTIONS AND SPACERS AND COMPACT TO MAINTAIN GRADE AND MINIMISE SETTLEMENT.
3. ENSURE MINIMUM GRADE REQUIREMENTS ARE MET WHEN BRANCH LAID HORIZONTAL.
4. WHERE AVAILABLE A SP-SP JUNCTION MAY BE INSERTED DIRECTLY INTO EXISTING WASTE WATER AND COUPLED.
5. THOROUGHLY CLEAN SURFACES OF EXISTING PIPE BEFORE CONNECTING CLAMPS OR COUPLINGS.



**TYPICAL SUMP BARREL AND OUTLET PIPE**

**NOTE:**

1. ONLY FACTORY FORMED RISERS WITH INTERLOCKING RINGS SHALL BE USED
2. ENSURE ALL REINFORCEMENT EXPOSED AS A RESULT OF MAKING THE PENETRATION IS COVERED AND PROTECTED AGAINST CORROSION.
3. SUMP LEADS TO BE EQUAL TO OR GREATER THAN 225mm AT 1:200 UNLESS OTHERWISE SPECIFIED.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

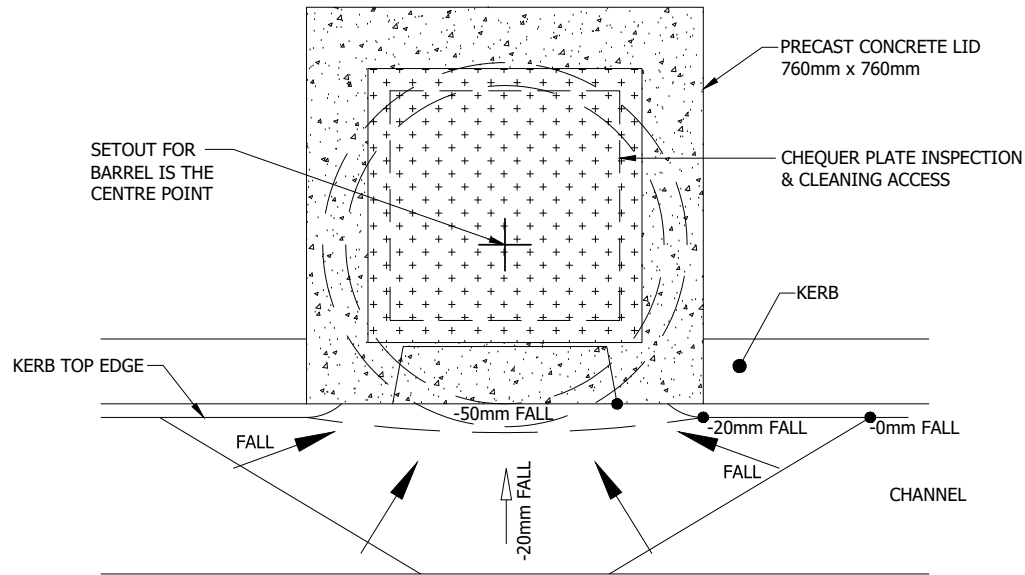
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

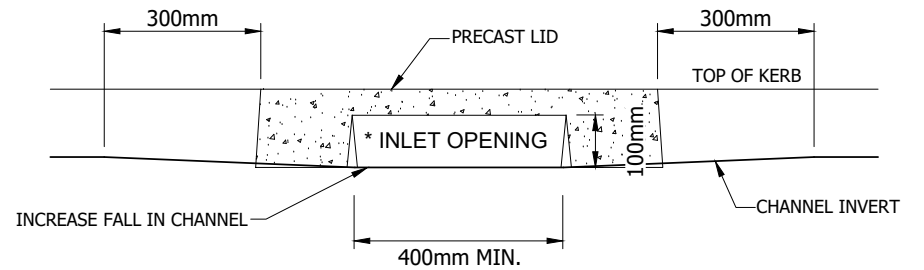
TYPICAL SUMP BARREL AND OUTLET PIPE

WS 401

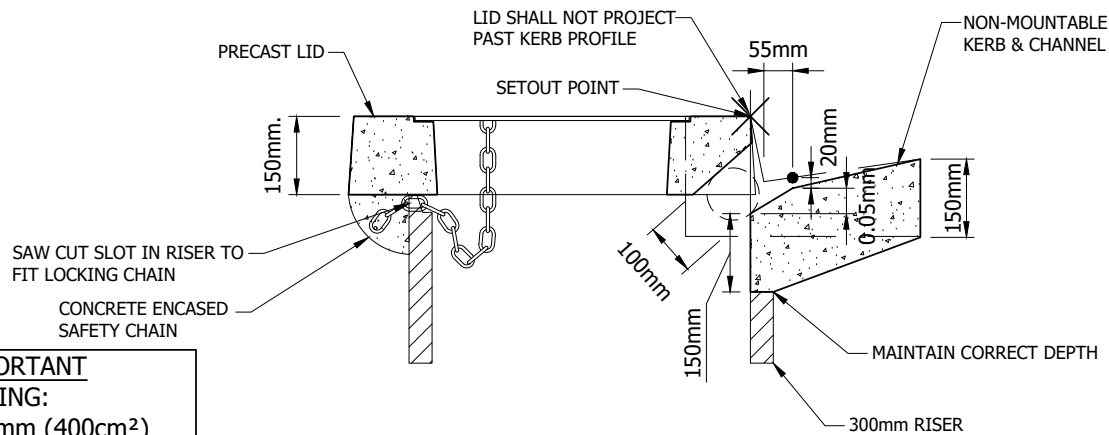
DEC 2018



PLAN




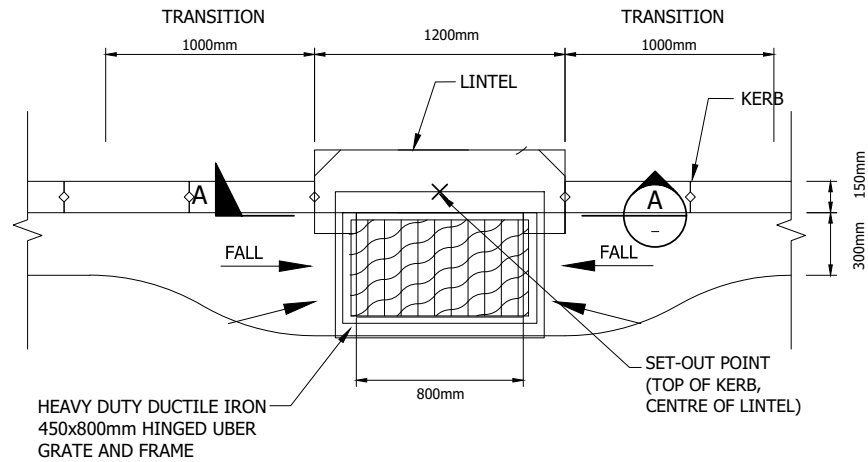
FRONT ELEVATION



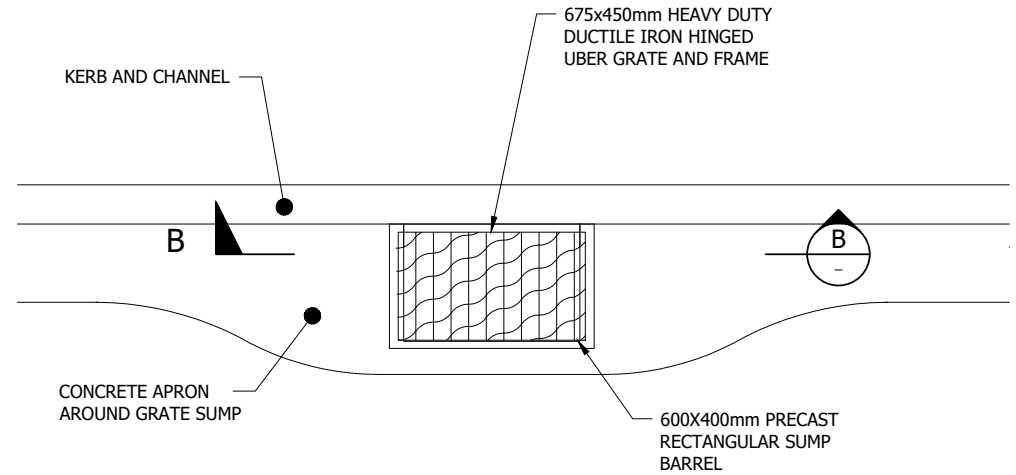
SECTION

**IMPORTANT**  
 \* INLET OPENING:  
 MIN. 100x400mm (400cm<sup>2</sup>)  
 OPENING, SAWCUT SUMP  
 BARREL TO ACHIEVE CORRECT  
 OPENING & SMOOTH OFF  
 WITH CONCRETE

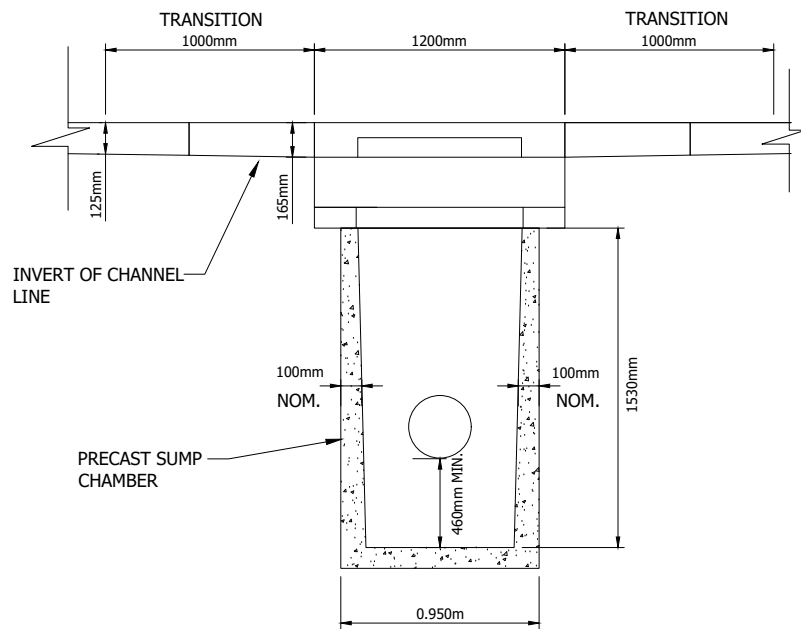
 © Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	BACK SUMP LID DETAIL	WS 402
		DEC 2018



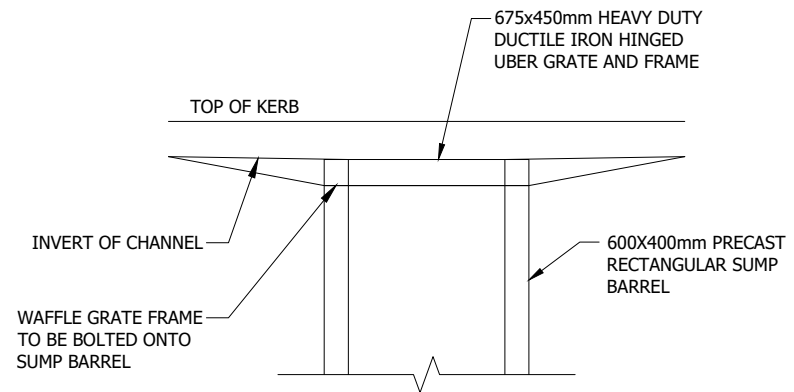
**PLAN - TYPICAL HIGH CAPACITY GRATE SUMP WITH BACK ENTRY LINTEL**



**PLAN - STANDARD UBER SUMP GRATE**



**SECTION A-A**



**SECTION B-B**

**GENERAL NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. SEE WS 401 FOR PIPE CONNECTIONS AND MINIMUM SUMP DEPTHS
3. TRANSITION LENGTH MAY VARY



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

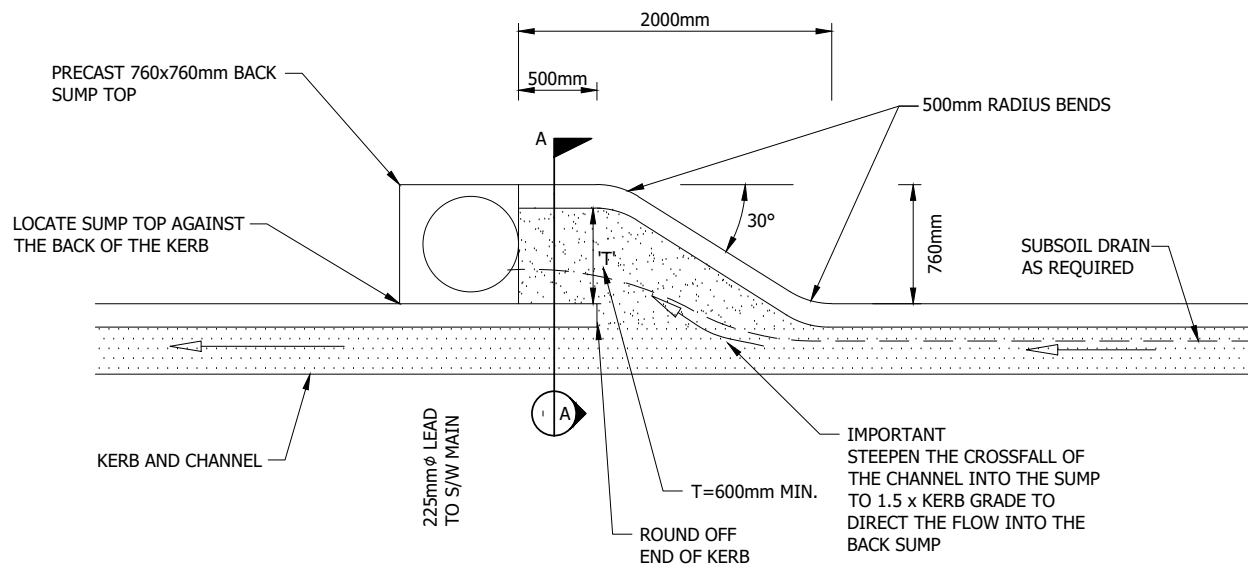
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

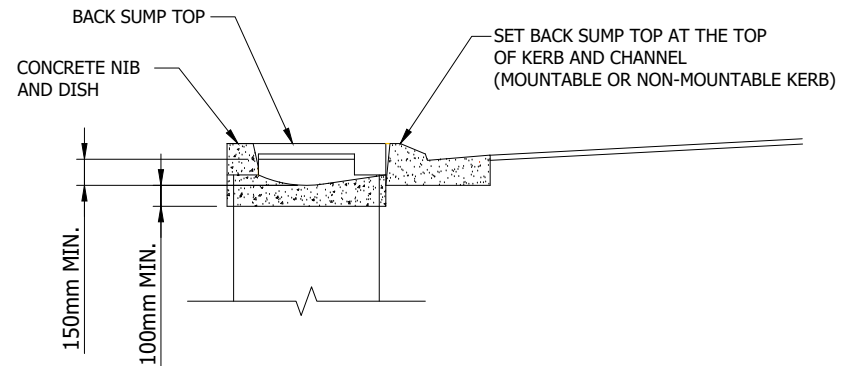
GRATE SUMP LID DETAIL  
STANDARD AND HIGH CAPACITY

WS 403

DEC 2018



PLAN - RHS



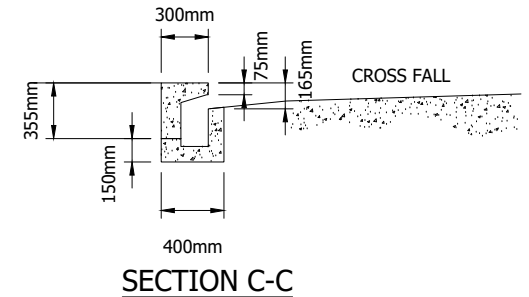
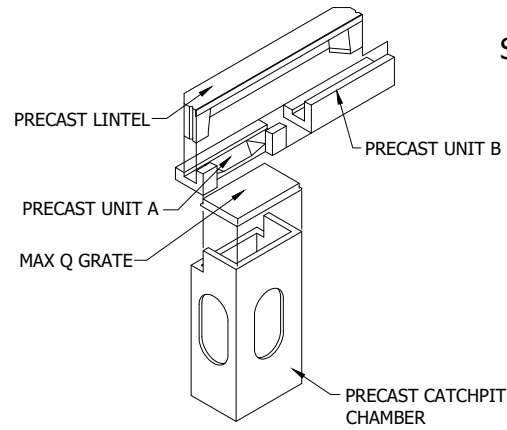
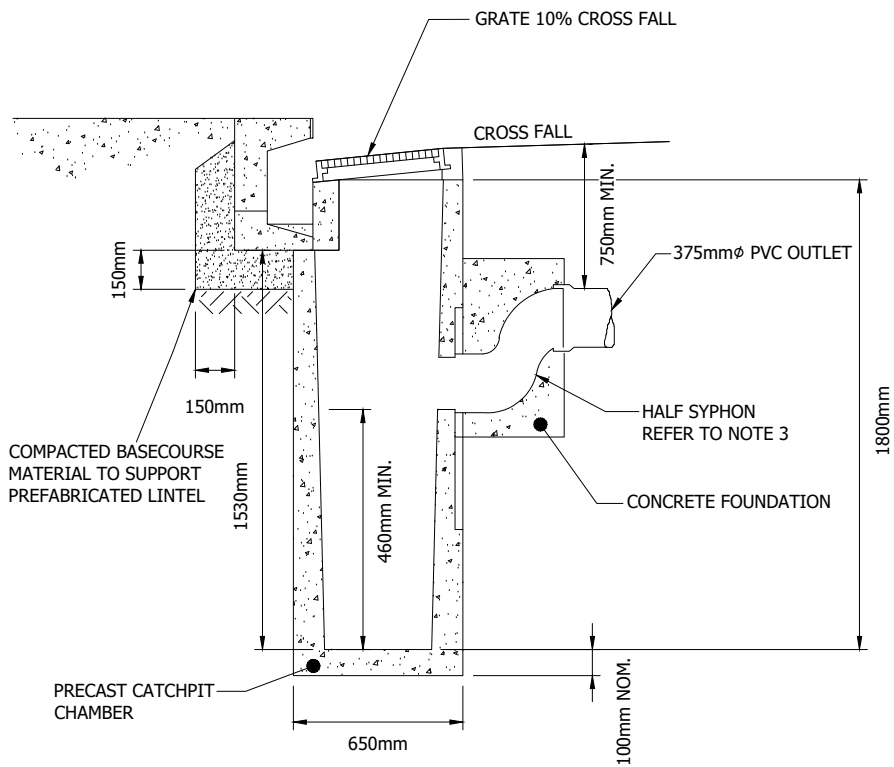
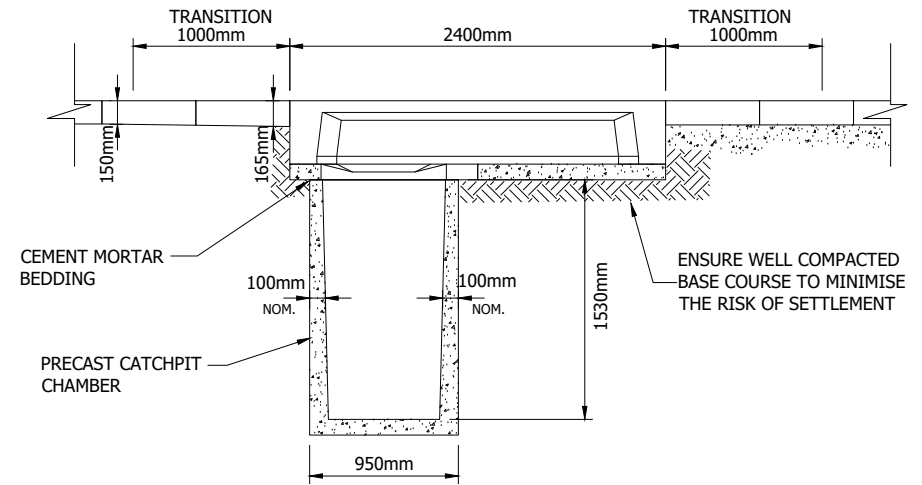
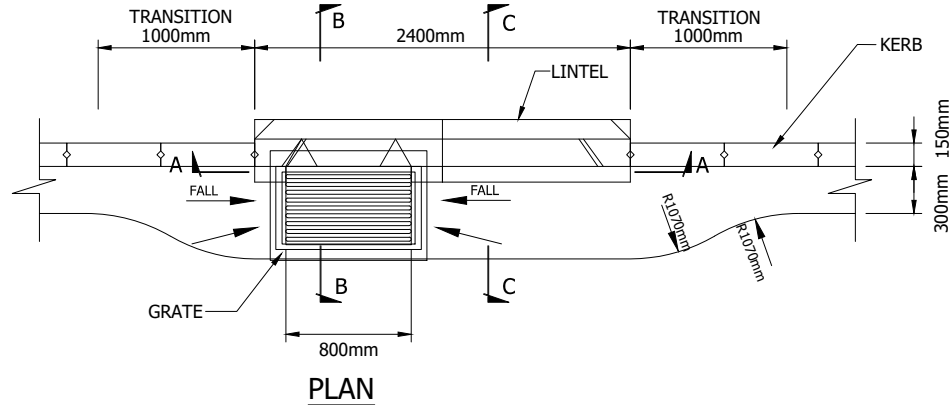
SECTION A-A

GENERAL NOTES:

1. DIVERTED BACK SUMPS ARE TO BE USED WHEN THE LONGITUDINAL GRADE ALONG THE KERB AND CHANNEL IS 5% OR GREATER
2. THE DIVERTED BACK SUMP CAN BE INSTALLED ON THE LEFT OR RIGHT-HAND SIDE OF THE ROAD. FOR THE LEFT-HAND INSTALLATIONS THE STANDARD DETAIL IS TO BE MIRRORED.
3. REFER TO WS 401 & WS 402 FOR SUMP INLET BARREL AND PIPE CONNECTION DETAILS

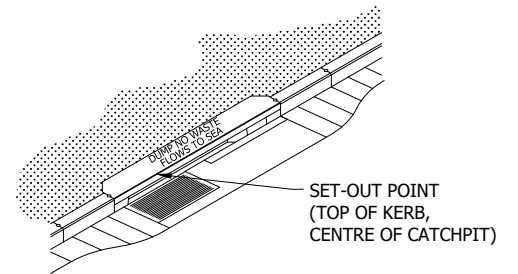
© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright


HASTINGS DISTRICT COUNCIL	NOT TO SCALE
DIRVERTED BACKSUMP DETAIL	WS 404
	DEC 2018



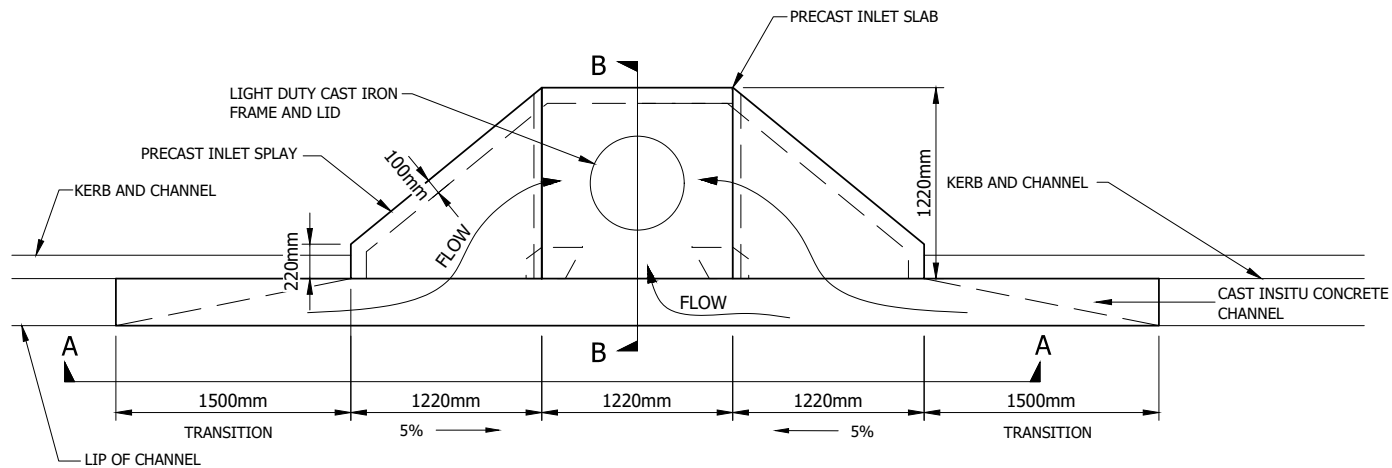
**MAX PIT NOTES**

1. CONCRETE TO 20MPA
2. CATCHPIT TO BE 1.8M DEEP
3. HALF SYPHON TO BE USED AS DIRECTED BY THE ENGINEER
4. GRATES SHALL BE MAX Q 800X500
5. TRANSITION - KERB HEIGHT CHANGES FROM 125 TO 165
6. PRECAST UNITS A AND B WITH LINTEL CAN BE RETROFITTED TO EXISTING CATCHPIT
7. TRANSITION LENGTH MAY VARY

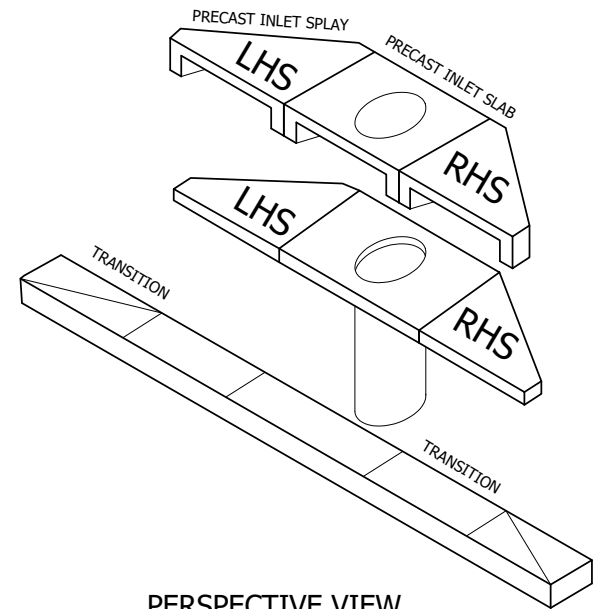


 © Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	STANDARD MAX-PIT DETAIL	WS 405
		DEC 2018

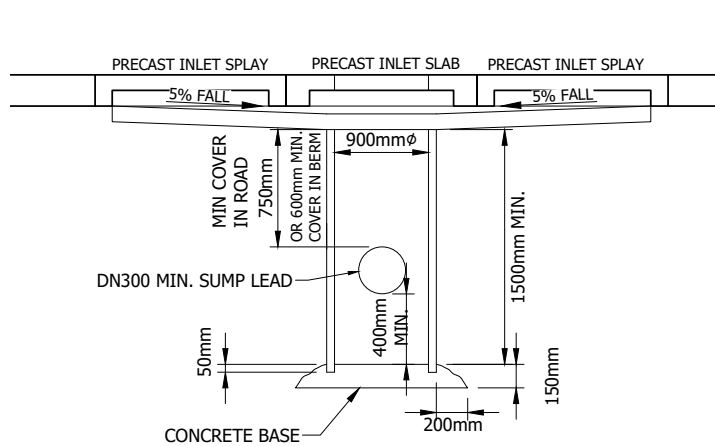




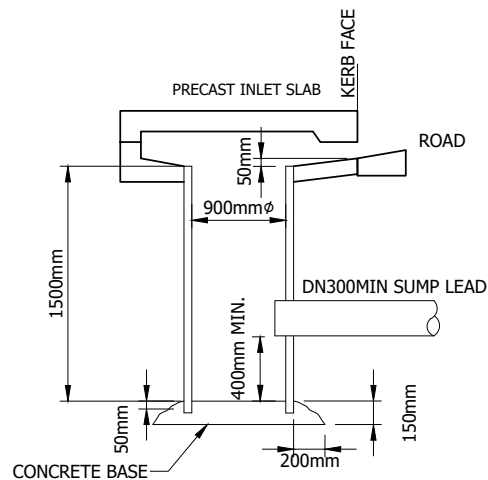
PLAN - TYPICAL DOUBLE SPLAY SUMP



PERSPECTIVE VIEW



SECTION A-A



SECTION B-B

NOTE:  
SPLAY SUMPS MAY BE INSTALLED USING SINGLE LHS SPLAY, SINGLE RHS SPLAY OR DOUBLE SPLAY. THE SPLAY ARRANGEMENT REQUIRED IS BASED ON INLET REQUIREMENTS AND ROAD PROFILE.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

HASTINGS DISTRICT COUNCIL

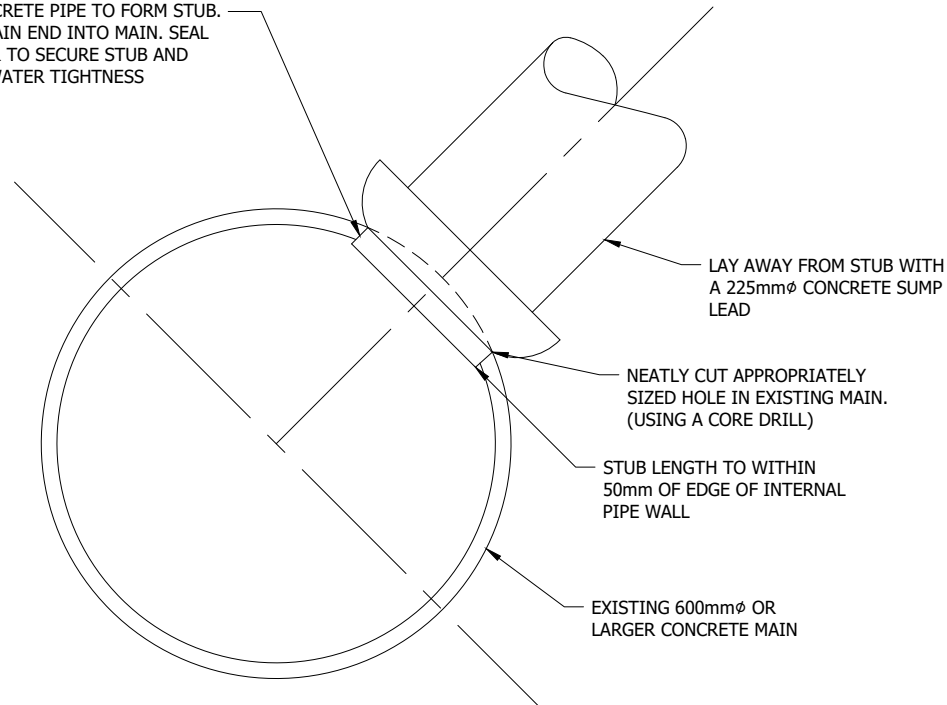
NOT TO SCALE

STANDARD SPLAY SUMP DETAILS

WS 406

DEC 2018

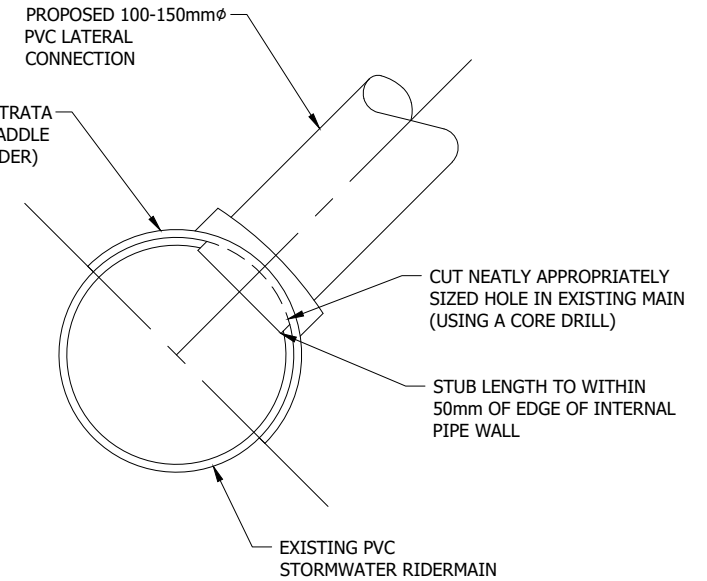
TRIM CONCRETE PIPE TO FORM STUB.  
INSERT PLAIN END INTO MAIN. SEAL  
WITH EPAR TO SECURE STUB AND  
PROVIDE WATER TIGHTNESS



**TYPICAL SUMP DETAIL - CONCRETE PIPES  
(TRUNK S/W MAIN)**

PROPOSED 100-150mmØ  
PVC LATERAL  
CONNECTION

PROPOSED STRATA  
CLAMPING SADDLE  
(SPECIAL ORDER)



**TYPICAL LATERAL DETAIL - PVC PIPE  
(STORMWATER RIDERMAIN)**

**GENERAL NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. DIRECT CONNECTIONS TO EXISTING STORMWATER MAINS ARE TO ONLY BE MADE ON MAINS THAT ARE 600mmØ OR GREATER
3. ENSURE ALL REINFORCEMENT EXPOSED AS A RESULT OF MAKING PENETRATION IS COVERED AND PROTECTED AGAINST CORROSION
4. OTHER DIRECT CONNECTIONS BY APPROVAL AND SPECIFIC DESIGN ONLY



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

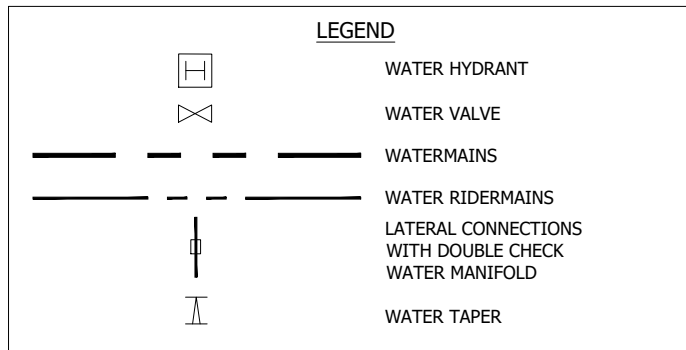
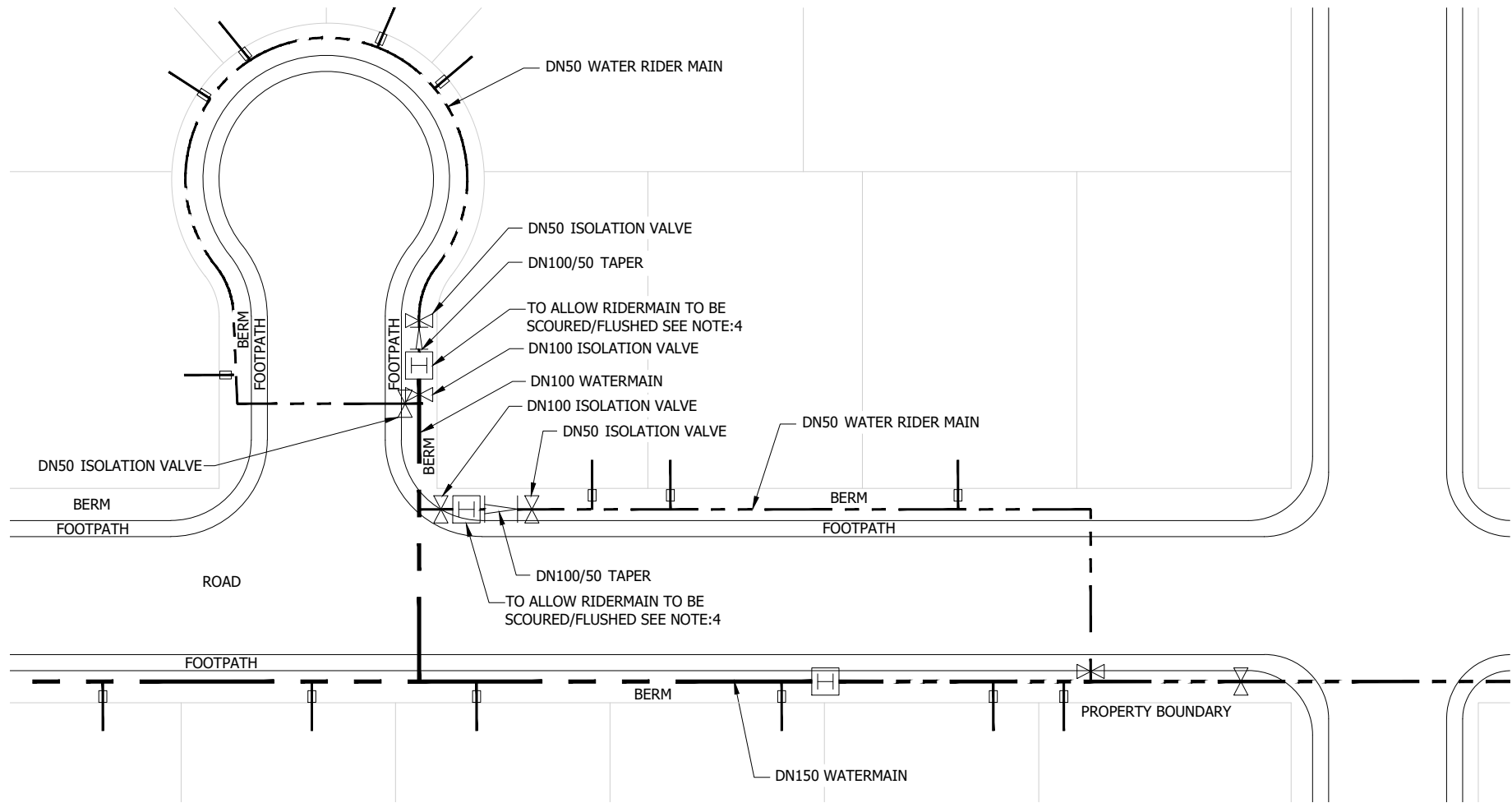
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

DIRECT SUMP/LATERAL CONNECTION

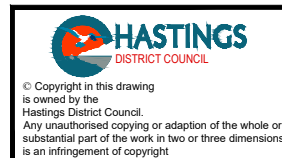
WS 407

DEC 2018

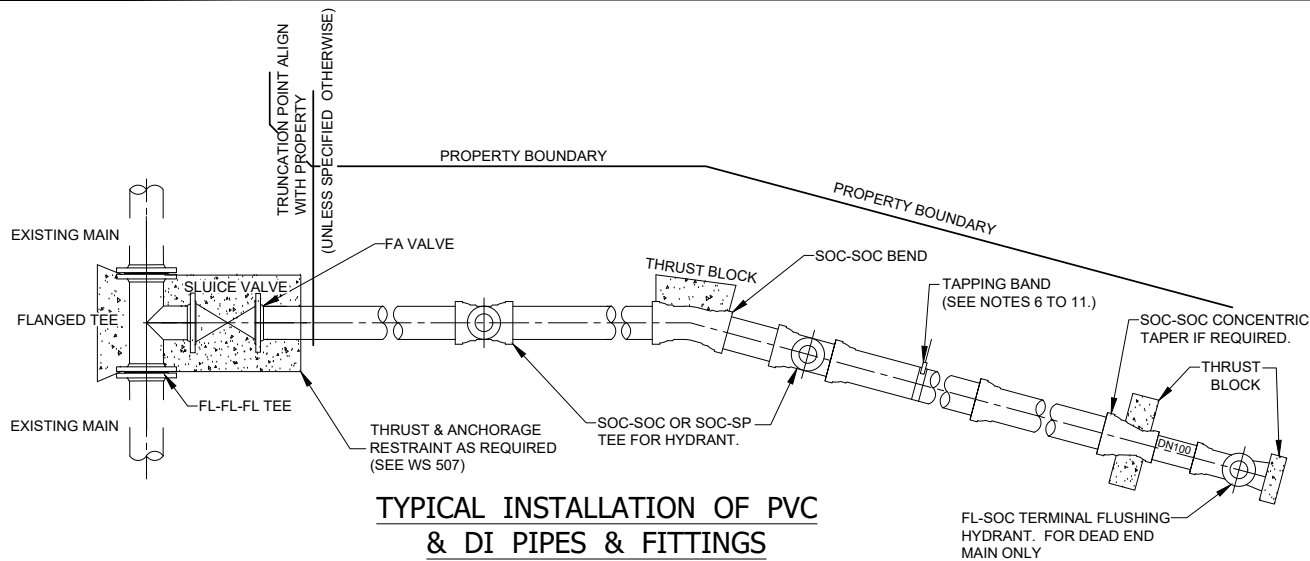


**GENERAL NOTES:**

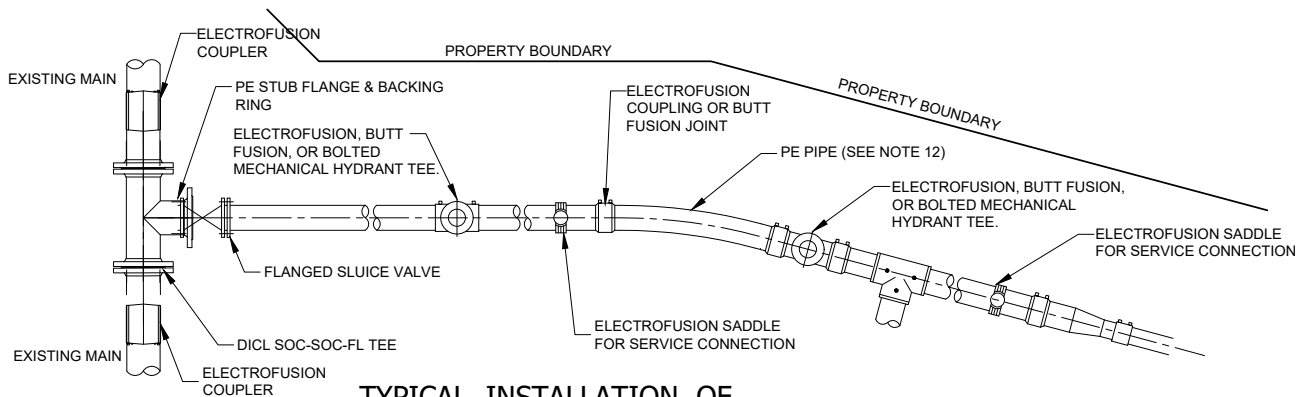
1. LOCATE WATERMAINS AS SHOWN IN DESIGN DRAWINGS. PREFERRED ALIGNMENT IS IN THE GRASS BERM.
2. WATER MANIFOLD BOXES ARE TO BE INSTALLED AS CLOSE TO THE PROPERTY BOUNDARY AS PRACTICAL AND BE EASILY ACCESSIBLE AT ALL TIMES.
3. ALL COMMERCIAL AND INDUSTRIAL CONNECTIONS ARE TO BE METERED.
4. VALVES AND HYDRANTS ON WATER RIDER MAINS ARE TO BE LOCATED AS SHOWN WITHIN THE CUL-DE-SAC TO ALLOW FOR FLUSHING
5. FINAL PIPE SIZING AND ARRANGEMENT TO BE IN ACCORDANCE WITH APPROVED DESIGN DRAWINGS



HASTINGS DISTRICT COUNCIL		NOT TO SCALE
TYPICAL WATER RETICULATION LAYOUT PLAN		WS 501
		DEC 2018



**TYPICAL INSTALLATION OF PVC & DI PIPES & FITTINGS**



**TYPICAL INSTALLATION OF PE PIPES & FITTINGS**

**NOTES:**

1. ALL DIMENSIONS IN MILLIMETRES.
2. INSTALL PIPEWORK PARALLEL TO PROPERTY BOUNDARIES.
3. WRAP BOLTED CONNECTIONS WITH A DENSO SYSTEM.
4. WHERE MAINS ARE 300 DIA OR LARGER BYPASSES SHOULD BE INSTALLED FOR ALL MANUAL SLUIICE VALVES.

**PVC PIPE**

6. USE PRE-TAPPED CONNECTORS ON DN 100 & DN 150 NEW MAIN INSTALLATIONS TO AS/NZS4793.
7. USE TAPPING BANDS FOR CONNECTIONS TO EXISTING MAINS AND NEW MAINS >DN 150.
8. SERIES 2 PVC PIPE COMPATIBLE WITH DI FITTINGS.
9. TAPPING BANDS ON PVC PIPE TO BE FULL CIRCLE CLAMPING.
10. WHERE PVC FITTINGS ARE USED, A PROTECTIVE MEMBRANE IS REQUIRED BETWEEN FITTING AND THRUST BLOCK. PVC FITTINGS TO BE USED ONLY ON PVC PIPE. DI SPIGOTS NOT TO BE INSERTED INTO PVC SOCKETS
11. MAXIMUM SIZE OF DRILLED HOLES FOR SERVICE CONNECTIONS IN PVC PIPE TO BE 30% DN OR 50mm (LOWER VALUE TO BE USED) LARGER HOLES CAN BE USED FOR UNDER PRESSURE TAPPING.

**PE PIPE**

12. PE PIPE MAY BE COLD BENT TO MINIMUM RADIUS OF 25 x (OD), STAKES OR OTHER SOURCES OF POINT LOADS SHALL NOT BE USED TO ASSIST IN BENDING THE PIPE.
13. MAKE ALLOWANCE DURING CONSTRUCTION FOR EXPANSION AND CONTRACTION OF PE PIPE DUE TO TEMPERATURE CHANGES.
14. BUTT WELDING IN ACCORDANCE WITH AS/NZS2033. BUTT WELDING IN TRENCHES IS NOT PERMITTED.
15. ALL MECHANICAL COUPLINGS TO BE SELF-RESTRAINING.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

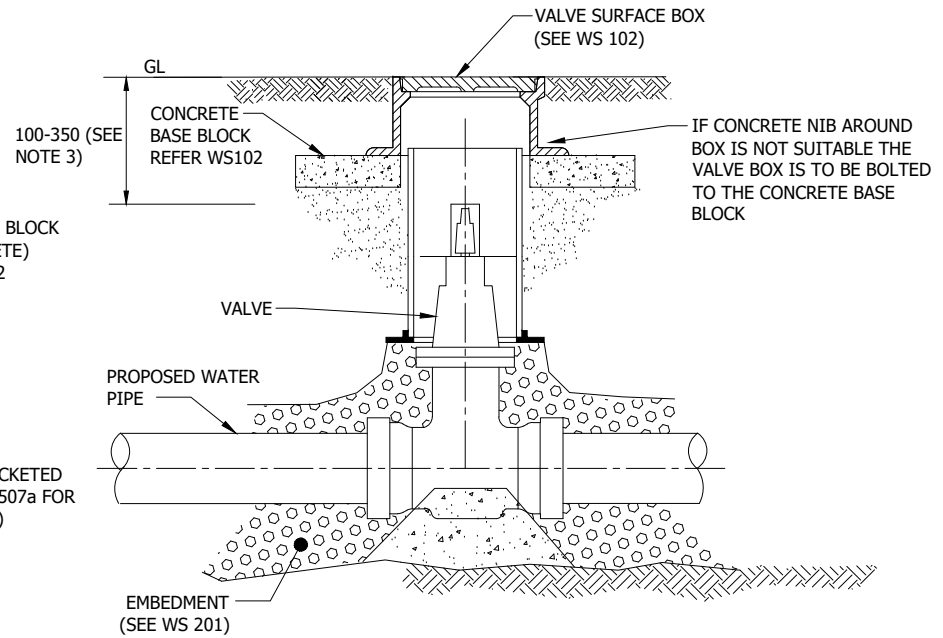
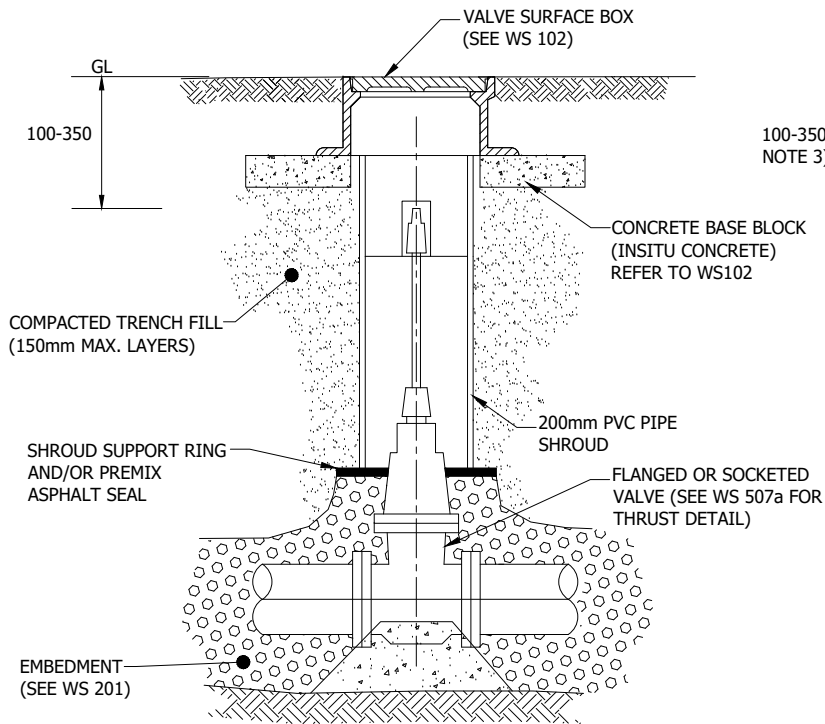
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

TYPICAL PIPE AND FITTING INSTALLATION

WS 502

DEC 2018




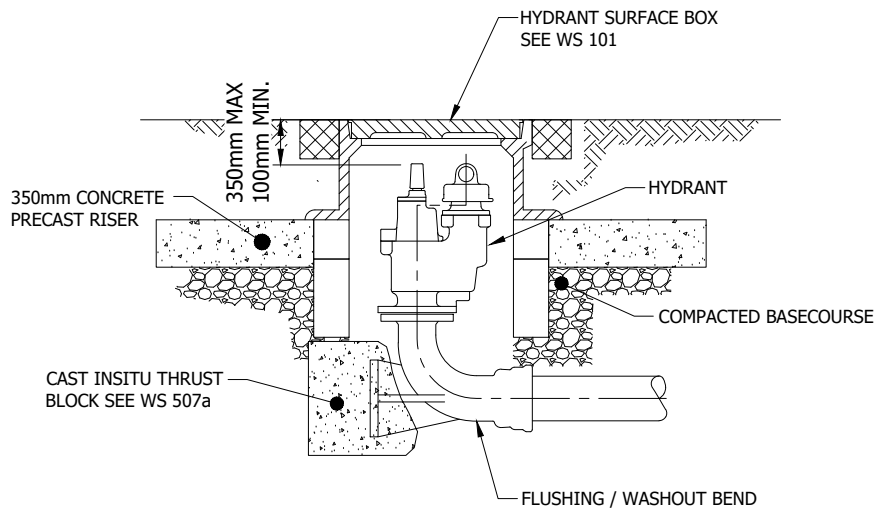
VALVES AT STANDARD DEPTHS

VALVES DEEPER THAN STANDARD DEPTH

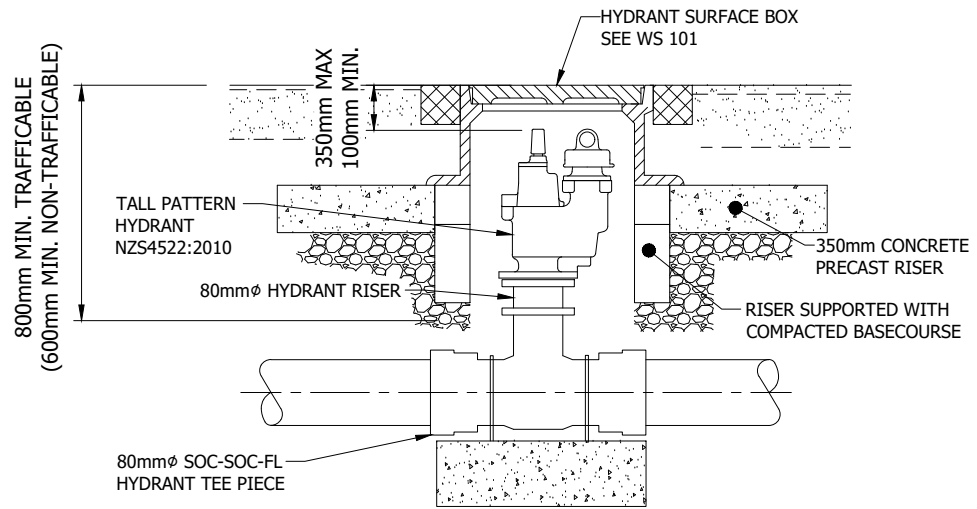
GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. TO PREVENT TRANSFER OF TRAFFIC LOADS TO THE MAIN, ENSURE SHROUD AND SUPPORT RINGS DO NOT COME INTO CONTACT WITH THE VALVE.
3. INSTALL AN EXTENSION SPINDLE WHERE DISTANCE FROM THE SURFACE TO THE VALVE SPINDLE EXCEEDS 350mm.
4. VALVES THAT ARE CUT INTO EXISTING PIPELINES WHERE A VALVE AND HYDRANT ARE INSTALLED INLINE WITH EACH OTHER A MINIMUM 600mm LONG SPOOL PIECE IS TO BE INSTALLED BETWEEN THE FITTINGS.

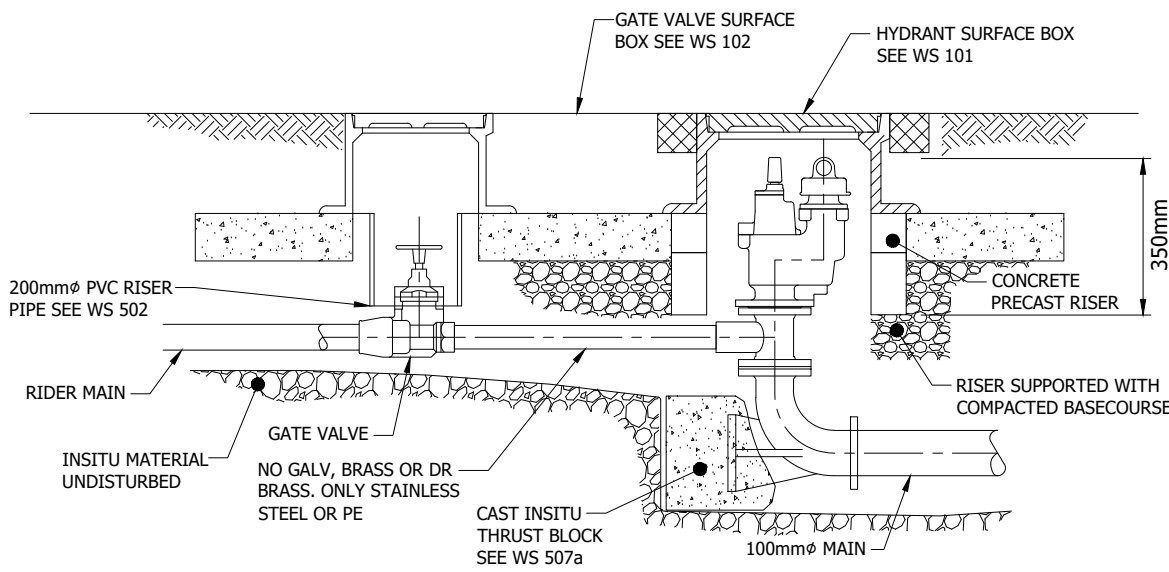
 <small>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.</small>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	TYPICAL VALVE DETAIL	WS 503
		DEC 2018



**TERMINAL HYDRANT DETAIL**




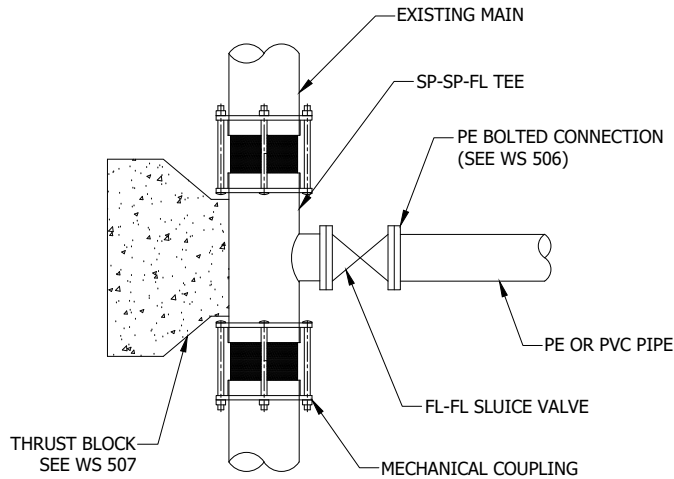
**STANDARD HYDRANT DETAIL**



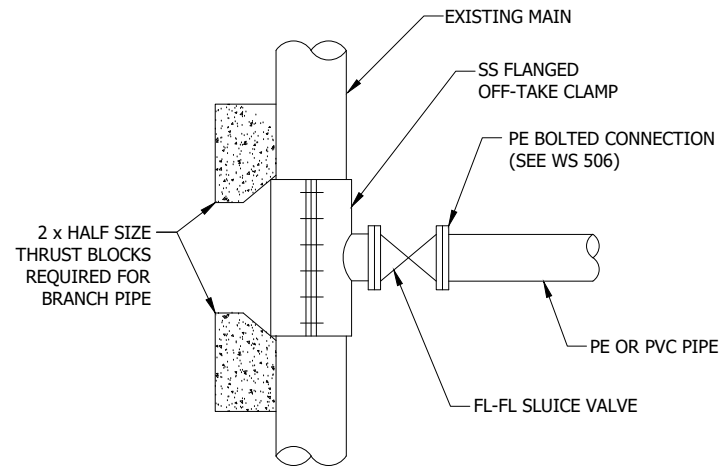
**TERMINAL HYDRANT DETAIL WITH RIDER MAIN**

- GENERAL NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
  2. HYDRANT TO BE DN80 UNLESS OTHERWISE SPECIFIED.
  3. WHERE A VALVE AND HYDRANT ARE INSTALLED IN LINE WITH EACH OTHER ENSURE A MINIMUM 600mm LONG SHORT IS TO BE INSTALLED BETWEEN THE FITTINGS

 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	HYDRANT DETAILS	WS 504
		DEC 2018

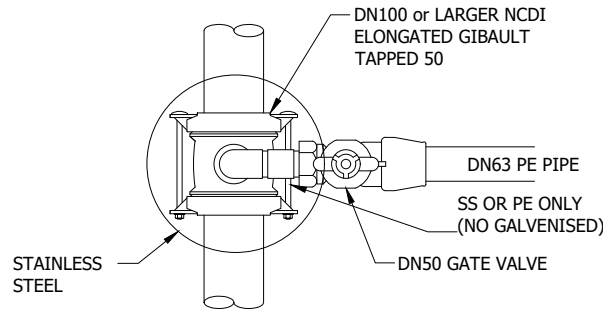


**CUT-IN CONNECTION METHOD**  
(USING MECHANICAL COUPLINGS)

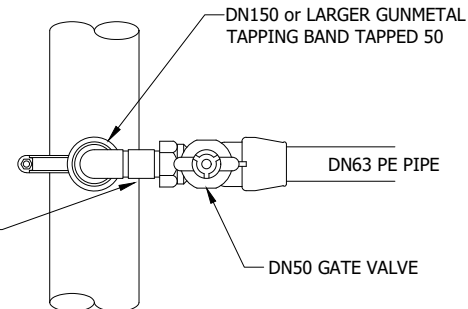


**UNDER PRESSURE CONNECTION METHOD**  
(USING SS FULL WRAP FLANGED OFFTAKE)

**CONNECTION METHODS FOR OFFTAKE  $\geq$ DN 100 DI, PVC AND PE PIPE**



**DN63 TAKE-OFF  $\geq$ 100mm**



**DN63 TAKE-OFF  $\geq$ 150mm**

**CONNECTION METHOD FOR DN 63 PE PIPE**

**NOTES**

1. S/S OFF-TAKE CLAMP TO BE GRADE 316 S/S AND OF FULL WRAP CONFIGURATION.
2. PE ELECTROFUSION (EF) FITTINGS TO BE CLASS PN 16.
3. BACKING FLANGES FOR PE STUB FLANGES TO BE MANUFACTURED FROM 316 SS.BOLTS, NUTS & WASHERS TO BE SS GRADE 316.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

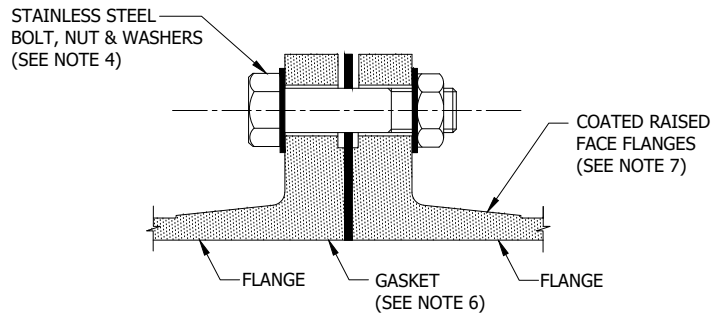
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

TYPICAL CONNECTIONS TO EXISTING MAINS

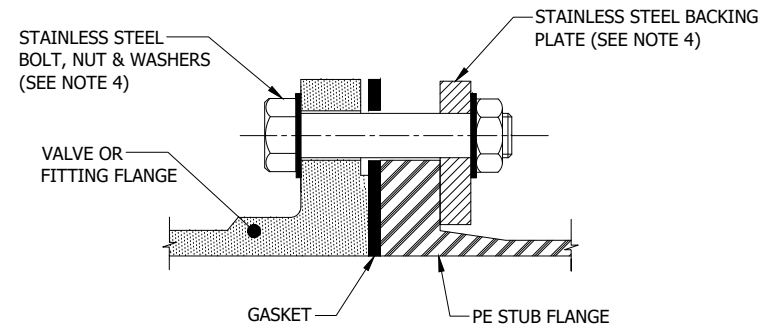
WS 505

DEC 2018



(RAISED FACE FLANGES SHOWN)

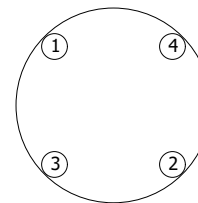
**CORROSION PROTECTION PROCEDURE  
FOR FUSION BONDED COATED  
DUCTILE IRON FLANGES  
WITH STAINLESS STEEL BOLTS**



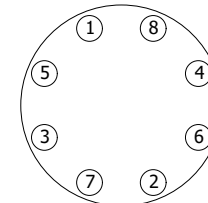
**PE BOLTED CONNECTION DETAIL**

**NOTES**

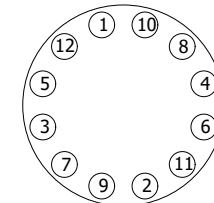
1. ALL DIMENSIONS IN MILLIMETRES.
2. SLEEVE UNCOATED DUCTILE IRON FLANGES. USE SS BOLTS (SEE NOTE 4) APPLY TWO LAYERS OF SLEEVING OVER ALL BURIED BITUMEN COATED DUCTILE IRON FLANGES.
3. WHERE FLANGES ARE COATED WITH FUSION BONDED EPOXY OR NYLON THEY DO NOT REQUIRE SLEEVING, USE ONLY STAINLESS STEEL BOLTS (SEE NOTE 4) TAKE CARE TO PREVENT DAMAGE TO THE FLANGES' PROTECTIVE COATING.
4. STAINLESS STEEL BOLT SYSTEM. ALL STAINLESS STEEL BOLTS, NUTS, WASHERS AND BACKING PLATES. TO BE MANUFACTURED FROM 316 GRADE MATERIAL. COAT THE THREADED SECTIONS OF ALL STAINLESS STEEL BOLTS WITH AN ANTI-SIEZE LUBRICANT RECOMMENDED BY THE BOLT MANUFACTURER.
5. VERIFY THE INTEGRITY OF EACH INSULATED FLANGED JOINT AFTER ASSEMBLY.
6. USE SPECIAL HIGH RESISTIVITY (LOW CONDUCTIVITY) GASKET MATERIAL. NOT ALL ELASTOMERS ARE NON CONDUCTIVE.
7. ROUGHEN COATED RAISED FACE FLANGE SURFACES BEFORE ASSEMBLY. PERFORATION OF THE COATING DOES NOT MATTER ON THE CONTACT FLANGE FACES.
8. TIGHTENING SEQUENCE SHOWN FOR AS 4087 FLANGES <DN450, LARGER SIZES TO FOLLOW SIMILAR PRINCIPLE.
9. BOLT TORQUE AS PER MANUFACTURES GUIDELINES.



4 BOLTS



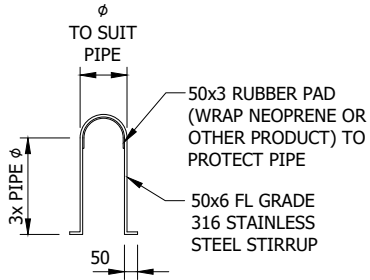
8 BOLTS



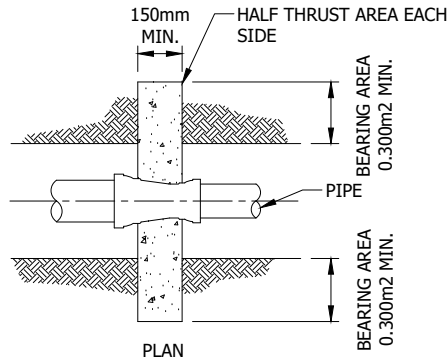
12 BOLTS

**TIGHTENING SEQUENCE**

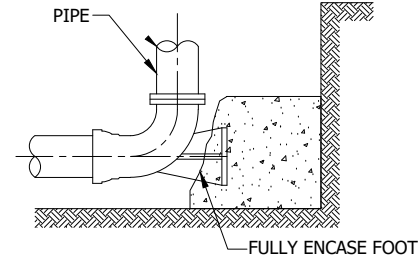




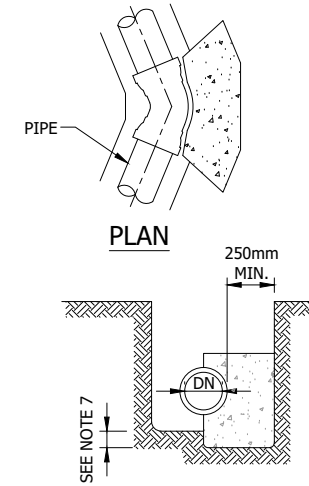
**STRAP DETAIL - SOCKETED VALVE RESTRAINT DETAIL**



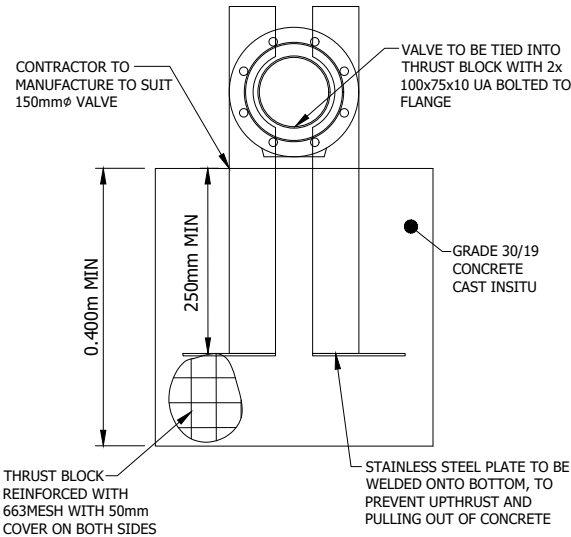
**TAPER THRUST BLOCK (FOR HORIZONTAL THRUST)**



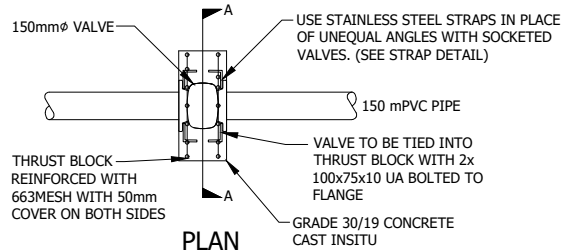
**FLUSHING/WASHOUT BEND THRUST BLOCK (FOR HORIZONTAL THRUST) (MINIMUM REQUIRED THRUST AREA)**



**THRUST BLOCK FOR BENDS**



**SECTION AA**




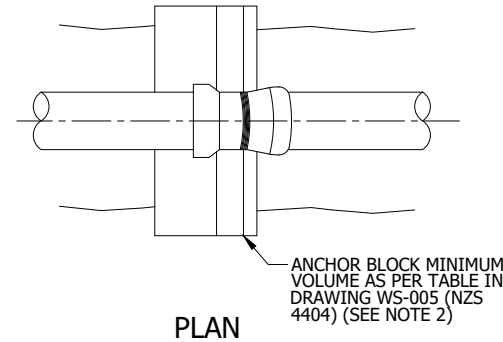
**VALVE THRUST RESTRAINT**

NOTE:  
 - ANGLES AND STRAPS SPECIFIED ARE SUITABLE FOR UP TO  $\phi$ 200 VALVES ONLY. FOR  $>$ DN200 REFER TO DESIGN DRAWINGS  
 - UA HOT DIP GALVANISED  
 - ALL BOLTS AND ANGLES TO BE STAINLESS STEEL

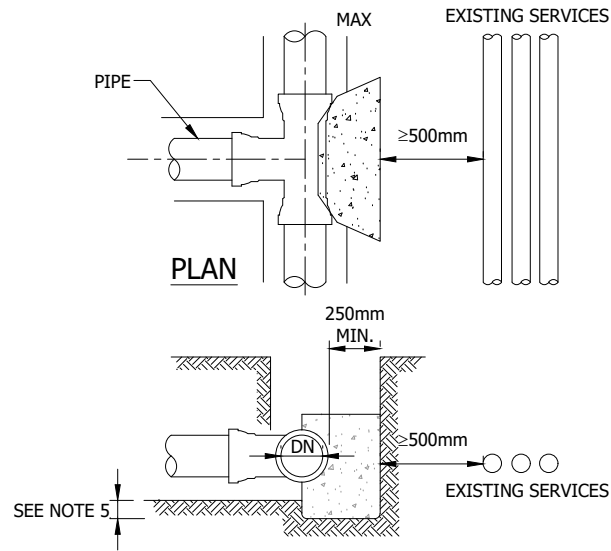
**GENERAL NOTES:**

- DIMENSIONS ARE ALL IN MILLIMETERS (mm)
- CAST THE THRUST AREA OF ALL THRUST BLOCKS AGAINST A CLEAN FACE OF UNDISTURBED NATURAL SOIL. THRUST BLOCKS NOT TO INTERFERE WITH OTHER SERVICES.
- CONTACT THE ENGINEER IF SOILS ARE:
  - VERY SOFT, SOFT, FIRM CLAY, SILTY CLAY OR SILT.
  - LOOSE CLEAN SAND.
  - UNCOMPACTED FILL OR REFUSE.
  - A GEOTECHNICAL ASSESSMENT AND INDIVIDUAL DESIGN IS REQUIRED FOR THESE SOILS.
- WHEN POURING CONCRETE AGAINST FITTINGS PLACE A MEMBRANE OF POLYETHYLENE, PVC OR FELT BETWEEN THE FITTINGS AND JOINTS TO BE CLEAR OF CONCRETE TO PREVENT DAMAGE TO THE FITTING. JOINTS TO BE CLEAR OF CONCRETE.
- CONCRETE SHALL BE KEPT CLEAR OF BOLTS AND FLANGES OR GIBBALT JOINTS TO ALLOW FITTINGS TO BE REMOVED WITHOUT INTERFERING WITH ANCHOR BLOCKS.
- FINISHED THRUST BLOCKS APPROXIMATELY 100mm ABOVE THE TOP OF THE FITTING OR BEARING PAD AND EXTEND TO THE FLOOR OF THE TRENCH OR DEEPER IF NECESSARY TO ACHIEVE THE REQUIRED THRUST AREA. MAXIMUM ENCASEMENT TO BE 180°.
- THRUST BLOCK REINFORCEMENT AS SPECIFIED IN DESIGN DRAWINGS.
- THRUST RESTRAINT DETAILS TO MULTIPLE FITTINGS REQUIRE SPECIFIC DESIGN.
- THRUST BLOCK SIZING / BEARING AREAS ARE TO BE DETERMINED BY THE ENGINEER.

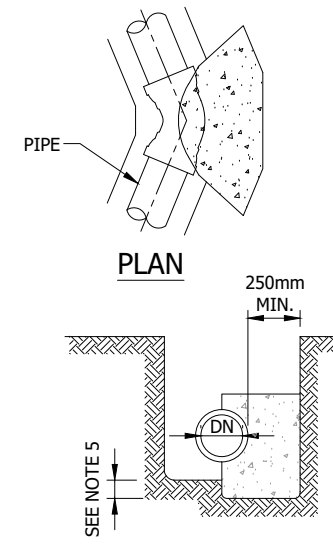
 © Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	TYPICAL THRUST BLOCK DETAILS	WS 507A
	SHEET 1	JAN 2019



PLAN  
VERTICAL BENDS



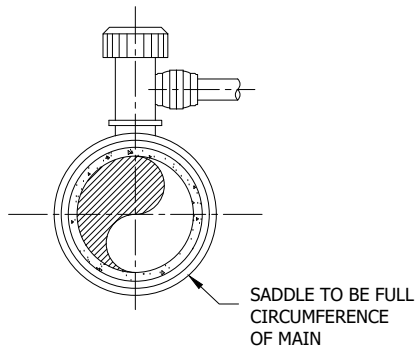
ELEVATION  
THRUST BLOCK FOR TEES  
(FOR HORIZONTAL THRUST)



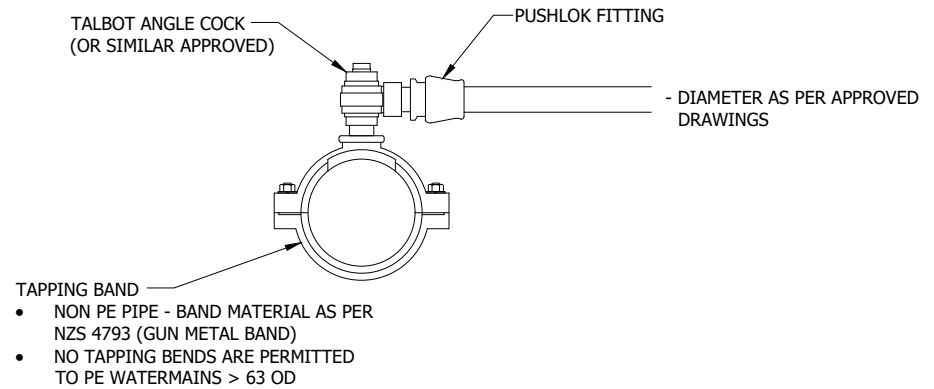
ELEVATION  
THRUST BLOCK FOR BENDS  
(FOR HORIZONTAL THRUST)

GENERAL NOTES:

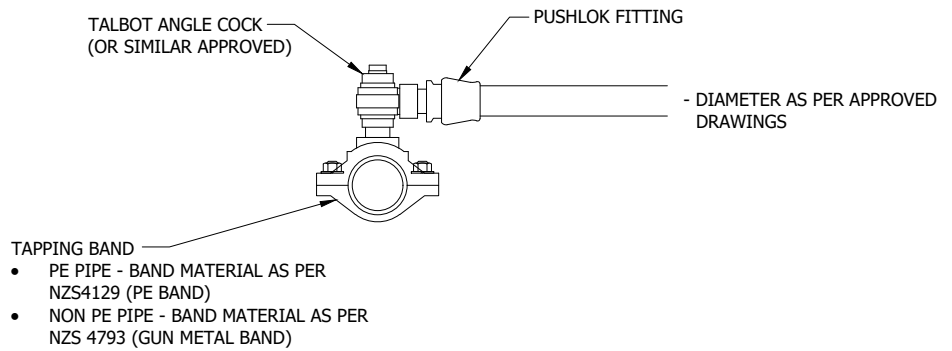
1. CAST THE THRUST AREA OF ALL THRUST BLOCKS AGAINST A CLEAN FACE OF UNDISTURBED NATURAL SOIL. THRUST BLOCKS NOT TO INTERFERE WITH OTHER SERVICES.
2. CONTACT THE ENGINEER IF SOILS ARE:
  - VERY SOFT, SOFT, FIRM CLAY, SILTY CLAY OR SILT.
  - LOOSE CLEAN SAND.
  - UNCOMPACTED FILL OR REFUSE.
  - A GEOTECHNICAL ASSESSMENT AND INDIVIDUAL DESIGN IS REQUIRED FOR THESE SOILS.
3. WHEN POURING CONCRETE AGAINST FITTINGS PLACE A MEMBRANE OF POLYETHYLENE, PVC OR FELT BETWEEN THE FITTINGS AND JOINTS TO BE CLEAR OF CONCRETE TO PREVENT DAMAGE TO THE FITTING. JOINTS TO BE CLEAR OF CONCRETE.
4. CONCRETE SHALL BE KEPT CLEAR OF BOLTS AND FLANGES OR GIBALT JOINTS TO ALLOW FITTINGS TO BE REMOVED WITHOUT INTERFERING WITH ANCHOR BLOCKS.
5. FINISHED THRUST BLOCKS APPROXIMATELY 100mm ABOVE THE TOP OF THE FITTING OR BEARING PAD AND EXTEND TO THE FLOOR OF THE TRENCH OR DEEPER IF NECESSARY TO ACHIEVE THE REQUIRED THRUST AREA. MAXIMUM ENCASEMENT TO BE 180°.
6. THRUST BLOCK REINFORCEMENT AS SPECIFIED IN DESIGN DRAWINGS.
7. THRUST RESTRAINT DETAILS TO MULTIPLE FITTINGS REQUIRE SPECIFIC DESIGN.
8. THRUST BLOCK SIZING / BEARING AREAS ARE TO BE DETERMINED BY THE ENGINEER.



**ELECTROFUSION TAPPING SADDLE**  
(PE PIPE)




TALBOLT FITTINGS  
**TYPICAL CONNECTIONS OFF 100-200mm $\phi$  WATERMAINS**

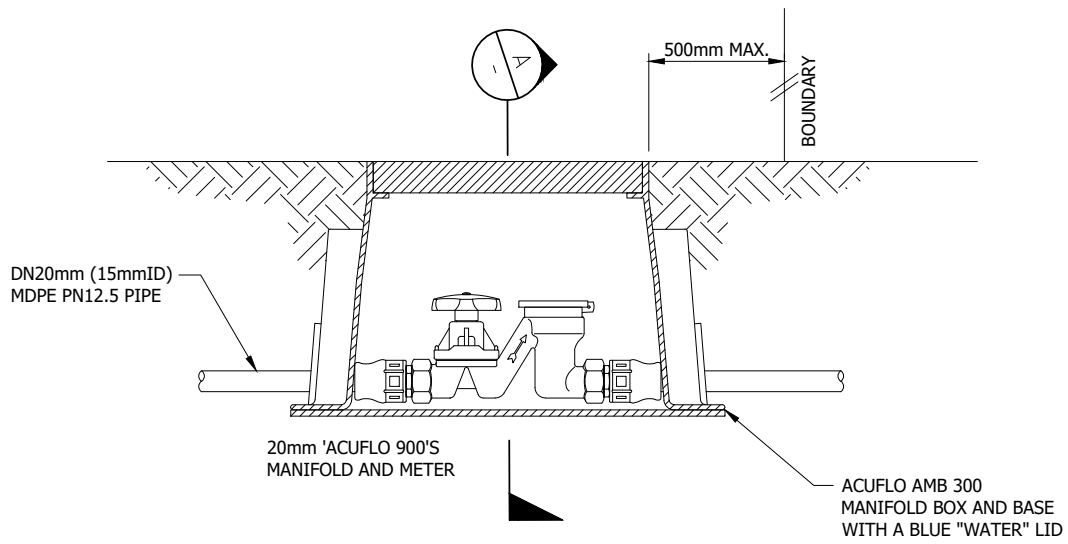


TALBOLT FITTINGS  
**TYPICAL CONNECTIONS OFF DN50 RIDERMAINS**

**GENERAL NOTES:**

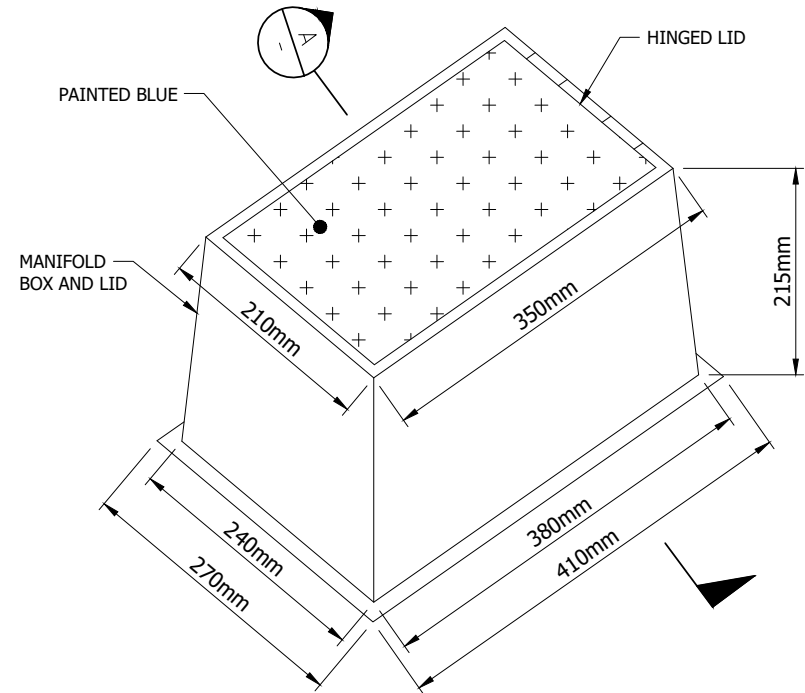
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL PRODUCTS TO COMPLY WITH NZS 4129, THIS WILL REQUIRE FULL BODY COMPRESSION FITTINGS FOR PE.
3. MATERIAL FROM THE MAIN TO MANIFOLD - POLYETHYLENE PIPE AS DETAILED IN THE CONTRACT SPECIFICATION.
4. IN-LINE STOP COCK VALVE REQUIRED, TALBOLT PUSHFIT, OR FERRULE TYPE.
5. WHERE POSSIBLE LAY SERVICE CONNECTIONS AT RIGHT ANGLES TO WATER MAIN. WHERE NOT POSSIBLE, LAY MARKING TAPE ON TOP OF THE CONNECTION PIPEWORK, WHERE FEASIBLE.
6. TALBOT ANGLE COCK, FERRAL AND TAPPING BAND SHALL BE GUNMETAL MATERIAL.
7. SELF TAPPING SADDLES ARE NOT PERMITTED.
8. CONNECTIONS OFF TRUNK MAINS ARE NOT PERMITTED. TRUNK MAINS 300mm $\phi$  AND GREATER.
9. CONNECTION OFF MAINS BETWEEN 200-300mm $\phi$  ARE TO BE CONFIRMED BY HDC.
10. USE HOLE SAWS RATHER THAN DRILL BITS FOR MAKING CONNECTIONS AS PER THE PVC GUIDELINES.

 <small>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright</small>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	TYPICAL SERVICE CONNECTIONS FROM MAINS	WS 508
		DEC 2018



STANDARD CONNECTION USING ACUFLO BOX & BASE

ALL CONNECTIONS MUST HAVE A MINIMUM DOUBLE CHECK BACKFLOW. HIGHER RISK PROPERTIES MAY REQUIRE A HIGHER BACKFLOW PROTECTION STANDARD



TRAFFICABLE MANIFOLD BOX AND LID

GENERAL NOTE:

1. WHERE THE PROPOSED MANIFOLD BOX IS POSITIONED WITHIN A VEHICLE CROSSING OR OTHER AREAS THAT ARE LIKELY TO BE TRAFFICKED, THE TRAFFICKABLE MANIFOLD BOX AND LID AS DETAILED IS TO BE USED.



© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright

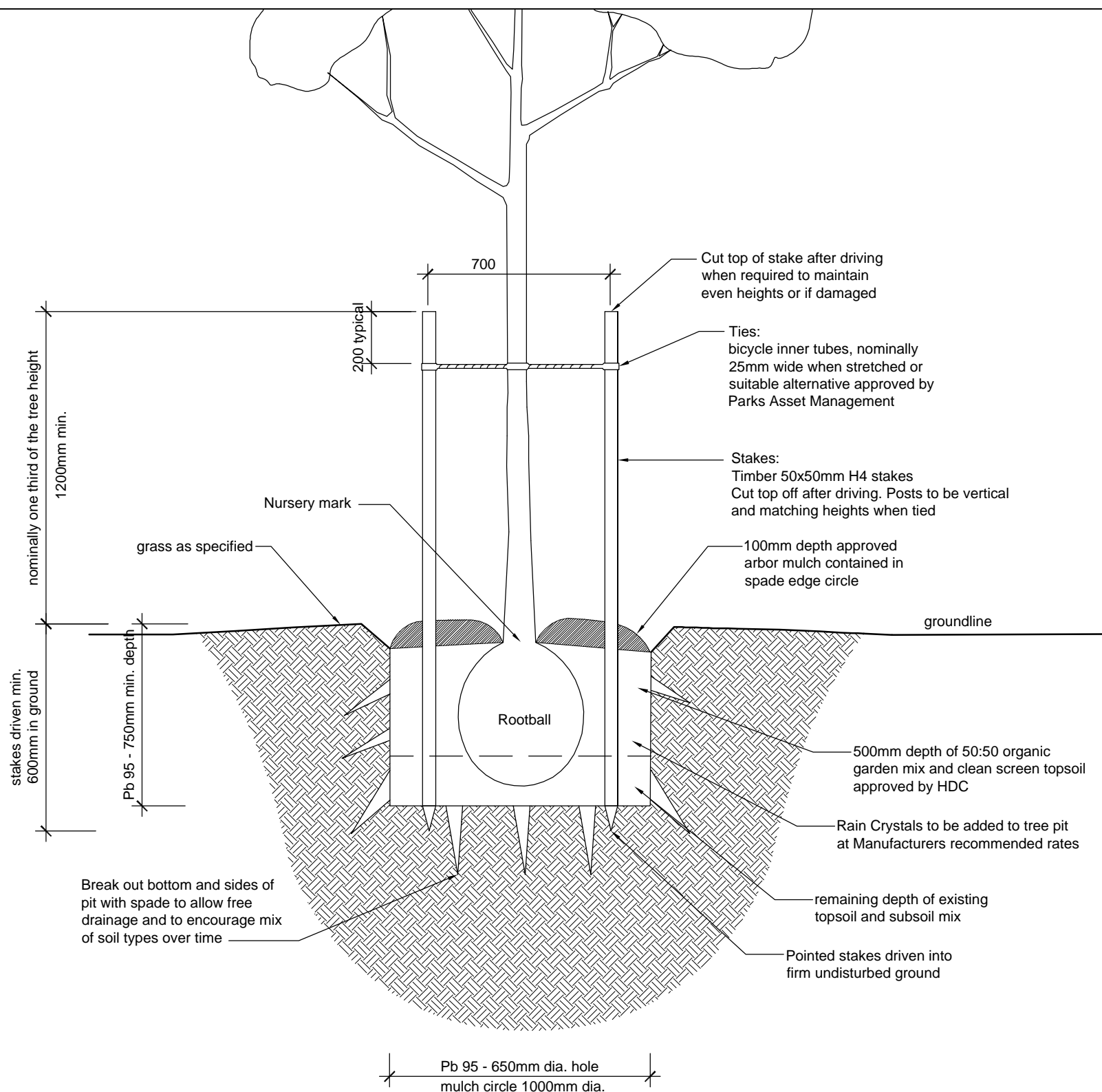
HASTINGS DISTRICT COUNCIL

NOT TO SCALE

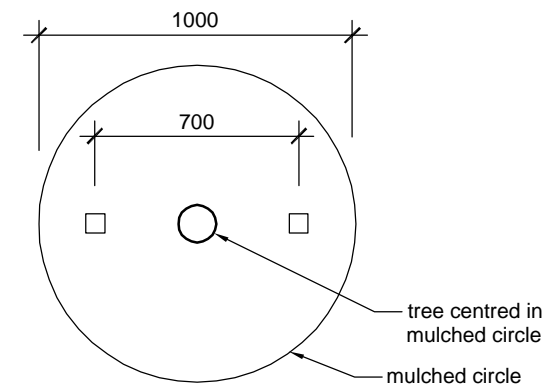
MANIFOLD BOX AND FITTINGS

WS 509

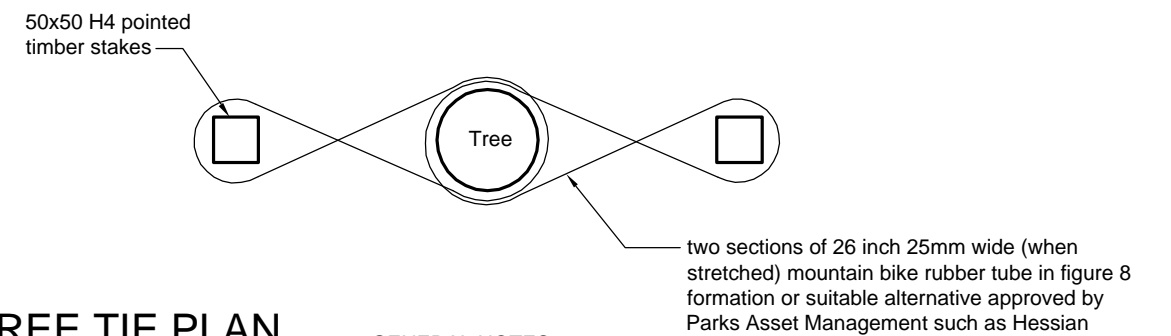
DEC 2018



**TREE PLANTING IN GRASS**  
**SECTION/ELEVATION**  
 scale 1:20



**TREE PLANTING PLAN**  
 scale: nts



**TREE TIE PLAN**  
 scale: nts

**GENERAL NOTES**

All trees shall be planted to the following performance standard

Target spacing for trees is one tree every 20m on both sides of carriageway but adjusted as necessary for driveways and street lights

All underground services to be accurately located prior to any excavation of tree pits

Two stakes per tree typically 1800mm long but 1500mm stakes may be used on shorter trees where approved by Parks Asset Management

All stakes to be driven until firm and then cut to consistent height. All stakes shall be vertical & perpendicular when tied

Steel central stake/pipe to support taller whippy trees where required

Tree tying heights and stake orientation to be confirmed with Parks Asset Management for each tree planting project

Stakes used in Town Centres tree planting to be stained black with minimum two coats

3 No. 10g Grow Tabs at base of root ball mixed in with approved organic garden mix are required at time of planting and these can be obtained from HDC on request

Rain Crystals are required at time of planting to manufacturers recommended rates and these can be obtained from HDC on request.

No tree shall be planted within 5m of any streetlight

**TREE SPECIFICATION**

Trees shall be single leader and no branches lower than 1.5m from the top of the rootball.

Tree size to be PB 95 of best nursery stock, of good health, of good form and root structure and true to name and size specified.

Trees with poor root development will be rejected.



**GENERAL NOTES**

All trees shall be planted to the following performance standard

Target spacing for trees is one tree every 20m on both sides of carriageway but adjusted as necessary for driveways and street lights

Trees less than 1250mm from edge of any hard infrastructure eg kerb, footpath require an HDC precast concrete tree pit

Precast concrete tree pits available from HDC or suitable alternative root control system approved by Parks Asset Management such as root barrier or alternative shaped pit

All underground services to be accurately located prior to any excavation of tree pits

Two stakes per tree typically 1800mm long but 1500mm stakes may be used on shorter trees where approved by Parks Asset Management

All stakes to be driven until firm and then cut to consistent height. All stakes shall be vertical & perpendicular when tied

Steel central stake/pipe to support taller whippy trees where directed by Parks Asset Management

Tree tying heights and stake orientation to be confirmed with Parks Asset Management for each tree planting project

Stakes used in Town Centre tree planting to be stained black with minimum two coats

3 No. 10g Grow Tabs at base of root ball mixed in with approved organic garden mix are required at time of planting and these can be obtained from HDC on request

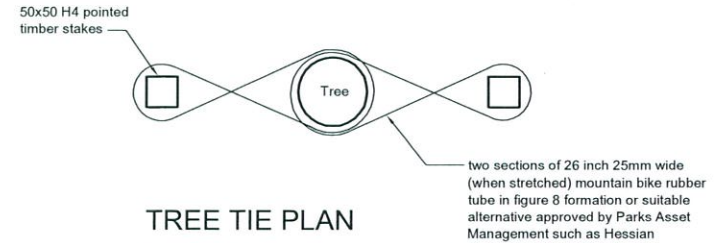
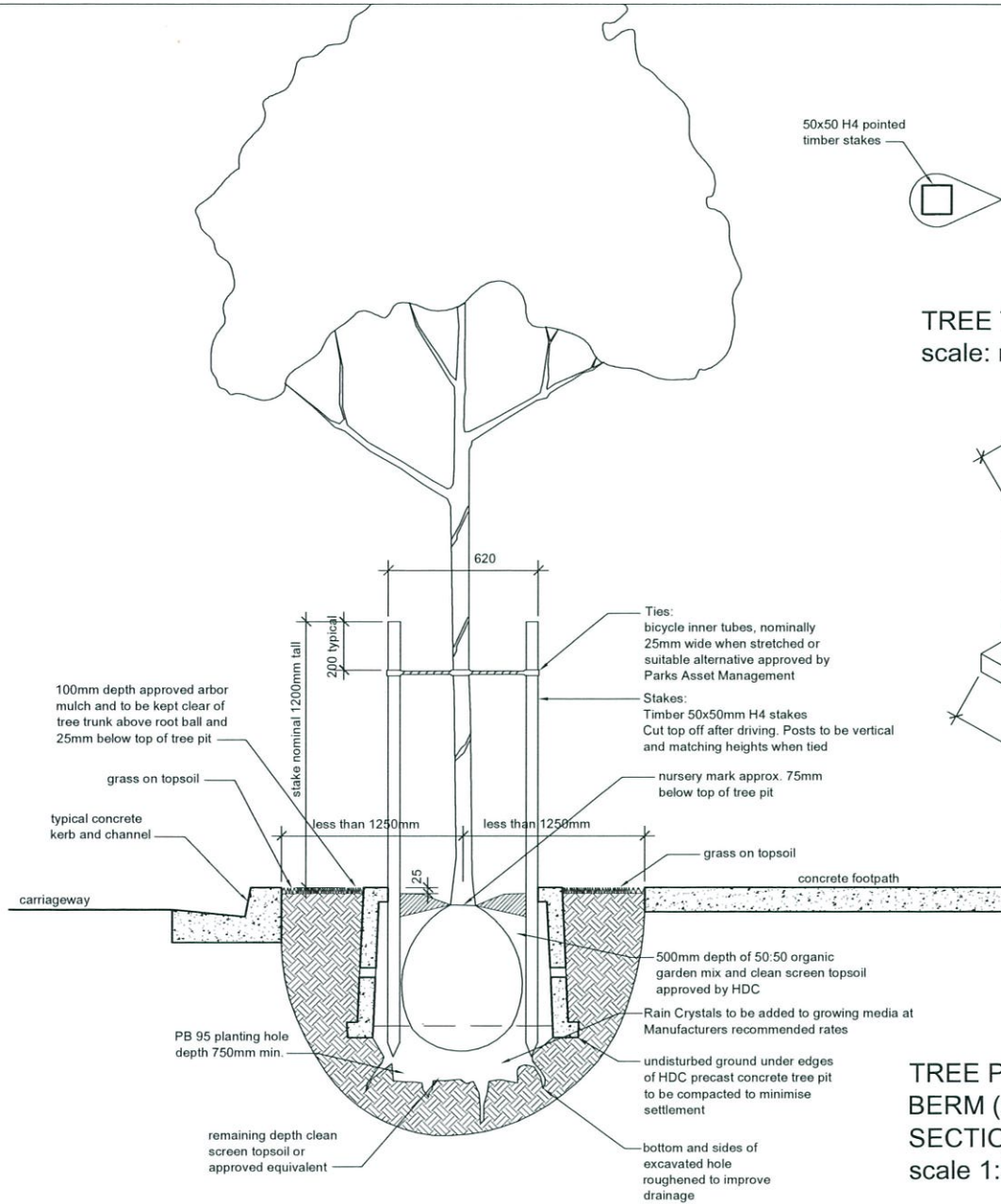
Rain Crystals are required at time of planting to manufacturers recommended rates and these can be obtained from HDC on request.

No tree shall be planted within 5m of any street light

**TREE SPECIFICATION**  
Trees shall be single leader and no branches lower than 1.5m from the top of the rootball.

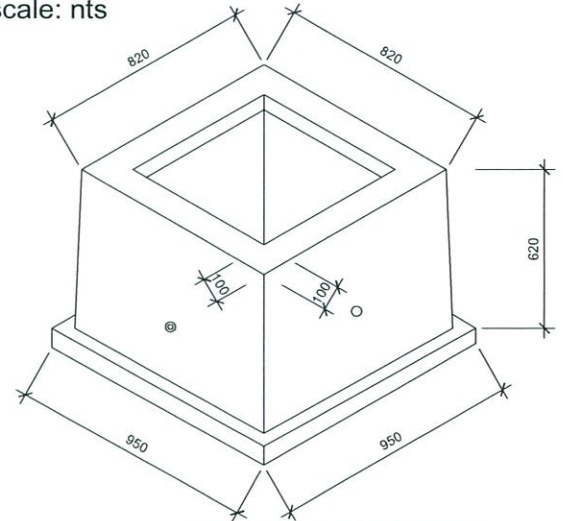
Tree size to be PB 95 min. of best nursery stock, of good health, of good form and root structure and true to name and size specified.

Trees with poor root development will be rejected.



**TREE TIE PLAN**

scale: nts



**PRECAST CONCRETE TREE PIT AXO VIEW**  
scale 1:20

**TREE PIT IN NARROW GRASS BERM (2.5m max. width typical) SECTION/ELEVATION**  
scale 1:20

# Street Lighting Code of Practice



Revision 20/01/2016

Trim ref: PRJ14-87-0030

## Contents

1	Street Lighting Code of practise .....	4
1.1	Introduction .....	4
1.2	Codes, Regulations and Standards.....	4
1.3	Road classification and lighting category .....	5
1.4	Luminaires .....	6
1.5	Auckland Transport LED Approved Luminaire List.....	7
1.6	General considerations .....	8
1.7	Lighting Columns .....	11
2	Electrical requirements.....	13
2.1	Installation .....	13
2.2	Connection to Network.....	13
2.3	Electrical connections and isolation .....	13
2.4	Luminaires on Unison poles.....	13
2.5	Luminaire Control .....	13
2.6	Internal wiring in column .....	13
2.7	Earthing .....	14
2.8	Safe working distances .....	14
2.9	Personal Protective Equipment (PPE).....	14
2.10	Approvals.....	14
2.11	Checklist.....	15
3	Appendix A - Luminaire requirements .....	16
3.1	Introduction .....	16
3.2	Access requirements for AT HID approved list.....	16
3.3	Auckland Transport Approved HID Luminaire Requirements .....	16
3.4	Approved Luminaire Assessment Methodology .....	18
3.5	Performance and Acceptance Testing .....	19
4	Appendix B Street light column design.....	21
4.1	Overview.....	21
4.2	Typical Column Terminology.....	21
4.3	Column Design .....	21
4.4	Lighting Column Evaluation Methodology .....	27
5	Appendix C Lighting Design Checklist.....	31
5.1	Design Checklist.....	31
6	Appendix D Standard Drawings Set.....	33





# 1 Street Lighting Code of practise

## 1.1 Introduction

This document provides a guide to those who become involved in the management and design of public lighting installations. The underlying standards provide the detail required to achieve the standard of street light installation Hastings District Council expect on the network.

Hastings District Councils objective is to ensure that the public lighting network is attractive, of good quality, easy to maintain, and cost effective. The purpose of public lighting is to provide a safe environment for pedestrians and vehicles and to discourage crime.

### **This guide includes but is not limited to:-**

Roads.

Pedestrian Crossings.

Pedestrian and Cycle Paths.

Public Precincts (e.g. Shopping Precincts)

Outdoor Car parks (within road reserve).

Steps, Stairs, Ramps, Subways and Footbridges (within road reserve).

### **It excludes:**

Building Interiors.

Building Facades.

Signs.

Indoor car parks

Sports fields

Council Parks

Where clauses differ from existing standards, the requirements of this document shall apply.

It should also be noted that:

Lighting other than street lighting in a designated public road may require Resource and Building Consents.

This document will be subject to periodic review.

## 1.2 Codes, Regulations and Standards

The codes, regulations and standards referenced in this document shall be the latest version complete with all amendments.

All works are to be carried out in accordance with all relevant statutes, bylaws and regulations and in particular:

- 1 The Electricity Act 1992, Electricity Regulations 2010, the relevant Electrical Codes of Practice (ECP) referred to in this, and relevant Standards referenced in ECP3.
- 2 New Zealand Radio Interference Notices 1958 and 1985 and Radio (Television) Interference Notice 1961.
- 3 Health and Safety Employment Act 1992.
- 4 Health and Safety Amendment Act 2001 and regulations
- 5 Relevant Statutory Acts, Regulations and Bylaws.
- 6 The requirements of Network Supplier's Health and Safety Standards (NHSS)
- 7 AS/NZS3000 – Australia/New Zealand Wiring Rules
- 8 AS/NZS1158 – Road Lighting
- 9 AS/NZS 7000 - 2010 Overhead Line Design.
- 10 NZ Transport Agency Infrastructure Design Standard (IDS) M30:2014 Specification and Guidelines for Road Lighting Design.

### 1.3 Road classification and lighting category

The Road Classification/Sub-Category shall be specified by Hastings District Council who reserves the right to change a road's lighting hierarchy classification.

The "Right Light Guide" is found on the following web site <http://www.rightlight.govt.nz/road-lighting/category-selection>. This should be used to establish the lighting classification of a road when no other information is available.

The Road Classification/Sub-Category must be confirmed by Hastings District Council Transportation Asset Manager before the design process commences.

The lighting standards as set out in AS/NZS 1158 are adopted for the District's roads and pedestrian areas. Applied locally, this is typically summarised in the following table:

Description	Operating Characteristics	Category
Roads in Urban CBD Centres	High/very high vehicle and pedestrian traffic + Moderate/low vehicle speeds	V3
Public activity areas in CBD and other high risk areas	Generally pedestrian movement only	P6
Regional & District Arterial roads (L1 & L2)	Moderate/high vehicle speed/traffic + Low to High pedestrian volume	V3
Collector Roads (L3)	Low/moderate vehicle speed/traffic + Low pedestrian volume	V4
Local Residential Roads (L4 & L5)	Low traffic + Pedestrian/cycle traffic only	P4
High risk Pathways/Cycleway	Pedestrian/cycle traffic only	P2

Description	Operating Characteristics	Category
Low risk Pathways/Cycleway	Pedestrian/cycle traffic only	P4

**Table 1: Hastings District Council Lighting Categories**

Access ways must be lit to the appropriate P Category as set out in the current version AS/NZS1158 3.1 which classifies access ways as Pathways (including cycle ways).

Where Access ways are bordered by wooden fencing, being the residential property boundary, careful consideration must be given to Spill Light over these adjoining residential properties. Check with Hastings District Council that the lighting classification road is correctly determined and agreed before proceeding with lighting designs.

Other spaces (e.g. public precincts, transport terminals, etc.) shall be classified in accordance with the current version of AS/NZS 1158.part 3.1.

## 1.4 Luminaires

### 1.4.1 Streetlight conversion to LED

The Hastings District Council is converting all streetlights to LED type luminaires (proposed time frames between 2016 and 2022). All replacement LED luminaires shall be from the Auckland Transport (AT) Approved List of luminaires. Refer to Appendix A.

Where “in fill” luminaires are required the proposed luminaires has to be approved by the asset manager. The lighting design scheme will meet the respective requirements of either AS/NZS1158.1.1 or AS/NZS1158.3.1 as appropriate.

### 1.4.2 New Streetlights

All new installations shall be designed using one of the LED luminaires on the Auckland Transport (AT) approved luminaire and poles list and the lighting design shall comply with requirements set out in this Code of Practice and the current version of:-

- 1 AS/NZS 1158.1.1 - For roads where the needs of vehicular traffic dominate (Category V) lighting.
- 2 AS/NZS 1158.3.1 – For roads where the needs of pedestrian traffic dominate (Category P) lighting.
- 3 AS 4282 – For control of the obtrusive effects of lighting.

Where there are existing overhead power lines supporting luminaires lighting columns supplementing the road light from the other side of the road should be considered.

## 1.5 Auckland Transport LED Approved Luminaire List

Road Lighting Auckland Transport - HID Approved List - (AT-HALL)					
<b>Category V</b>					
Manufacturer	Model Name/Number	NZ Supplier	Road category	Date Approved	Notes
AEC	KAOS1	Tech Light	V	31/10/2011	
AEC	KAOS2	Tech Light	V	31/10/2011	
Schröder	Ambar2	Betacom	V	31/10/2011	
Schröder	Ambar3	Betacom	V	31/10/2011	
<b>Category P</b>					
Manufacturer	Model Name/Number	NZ Supplier	Road category	Date Approved	Notes
AEC	KAOS1	Tech Light	P	31/10/2011	
Schröder	Ambar2	Betacom	P	31/10/2011	
Schröder	Nano	Betacom	P	31/10/2011	
<b>Pedestrian Crossing ( Zebra )</b>					
Manufacturer	Model Name/Number	NZ Supplier	Road category	Date Approved	Notes
AEC	KAOS 1 OPSX/OPDX	Tech Light	Ped	31/10/2011	
Schreder	Amber /Ped	Betacom	Ped	23/07/2014	CosmoPolis lamp - low CCT (2900k) and low CRI (65) compared to MH lamp. (AS/NZS 1158.4)
<b>LED Luminaires Approved list - (AT - LALL)</b>					
Manufacturer	Model Name/Number	NZ Supplier	Road category	Date Approved	Notes
CREE Lighting	LEDway	Advanced Lighting Technologies	P & V	31/10/2011	
CREE Lighting	Edge Round	Advanced Lighting Technologies	P & V	31/10/2011	
CREE Lighting	Edge Square	Advanced Lighting Technologies	P & V	31/10/2011	
CREE Lighting	SLM	Advanced Lighting Technologies	P & V	1/01/2013	
AEC	LEDin	Tech Light	P & V	31/10/2011	
AEC	A2	Tech Light	P	1/01/2013	
Sylvania	Street Led	Aesthetics	P	29/01/2014	Must have aero screen visor and be CRT = 4,000K
CREE Lighting	XSP1	Advanced Lighting Technologies	P & V		
Cree Lighting	XSP2	Advanced Lighting Technologies	V		
Kim Lighting	Kim Warp9	Spectratech	P		On C list subject to restrictions and levy into fund. >\$1900.
Philips (Indal)	Stela 2	Kendelier Lighting	P		Interim approval for subdivisions
AEC	Italo 1	Techlight	P	17/06/2014	
AEC	Italo 2	Techlight	P & V	17/06/2014	
AEC	Italo 3	Techlight	V	17/06/2014	
Schreder	TECO 1	Betacom	P	1/01/2015	5068 Optic only
Schreder	TECO 2	Betacom	V	1/01/2015	5068 Optic only
Betacom	GL520	Betacom	P	17/07/2014	
LED Roadway Lighting	LRL NXT_S	Energylight	P	28/11/2014	

## 1.6 General considerations

### 1.6.1 In Ground lights

Installation of in ground up lights are only permitted on approval of the Asset Manager and shall also meet the following minimum requirements:

- 4 AS/NZS 60598.1: 2003;
- 5 In trafficable areas, the luminaire shall not present a tripping or slip hazard.
- 6 Impact resistance of IK10.
- 7 Ingress protection of IP 68.
- 8 Anti-glare attachments to be positioned to limit the upward light to passing traffic.

### 1.6.2 Lighting design

The lighting design shall comply with requirements set out in this Code of Practice and the current version of:-

- 1 AS/NZS 1158.1.1 - For roads where the needs of vehicular traffic dominate (Category V) lighting.
- 2 AS/NZS 1158.3.1 – For roads where the needs of pedestrian traffic dominate (Category P) lighting.
- 3 AS 4282 – For control of the obtrusive effects of lighting.

Lighting design shall take into consideration section 1.4.4.

#### 1.6.2.1 Luminaire Spacing and Column Height

The lighting design shall maximise the spacing between luminaire positions optimising the mounting height, luminaire type and lamp output.

For category P3 and P4 roads (subdivisions) one of the primary objectives is to reduce the Luminaire power to 30W and below. However, to allow some flexibility, an increase in the Luminaire Wattage to improve the Lighting Column spacing is permissible, but should be limited to a maximum of 35 Watts..

#### 1.6.2.2 Spill Lighting and Glare Control (Obtrusive light)

The lighting design shall minimise the impact on the neighbouring properties and environment with regard to glare and spill light.

Requirements aimed at minimizing the obtrusive effects of Public Lighting are addressed in the current version of AS/NZS 1158 Lighting for Roads and Public Spaces covering Vehicular Traffic (Category V) and Pedestrian Area (Category P) Lighting.

For new designs HDC is currently assessing the luminous Intensity @ Gamma 80 with view to limiting the light output to 600 Cds. As part of the design submission the luminous intensity must be considered and the Gamma 80 lumines recorded in the submission.

Further guidance is provided in AS 4282 – Control of the obtrusive effects of lighting.

In addition the following criteria shall apply;

The maximum tilt for a luminaire shall be 5 degrees from the horizontal, tilts up to 10 degrees from the horizontal may be used in exceptional cases at the discretion of HDC.

The Threshold Increment (TI) along the road shall be no greater than 10% with the pedestrian traffic lights included in the calculation as well as the adjacent street lights.

Note: External screens are not to be used.

### **1.6.3 .Bollard Luminaires**

The use of must be pre-approved by Hastings District Council. A recognised possible application would be for narrow walkways between residential boundaries where the spill light limits can't be achieved using column mounted luminaires.

The maximum luminous intensity in any normal viewing direction shall not exceed 500 cd/m<sup>2</sup>.

### **1.6.4 Trees and Road Lighting Luminaires**

#### **1.6.4.1 Where trees are existing**

For mature tree-lined roads, if single sided, poles should be located on the road side opposite the trees. If there are trees on both road sides, lighting columns on each side may be required located midway between trees, having long outreach arms to reach out under the canopy. HDC has a standard pole and outreach arm suitable for these streets. Careful pruning will be necessary to allow the light to pass under the tree canopy to the road. Consultation with the power and telecommunications utilities is required if there is overhead reticulation.

Lighting Columns should be located at least 5m from the centre of any tree. Care should be taken to place street light columns where the tree root structure can't interfere with underground cabling or other underground services unless tree pits are used to confine the root structure.

#### **1.6.4.2 For new roading installations**

Where there are areas of new planting proposed, consideration should be given to the potential impact of shadows from road lighting when the trees are mature. Care should be exercised when selecting the species of trees and positioning them in relation to street lights.

In new subdivisions lighting column positions must be located to provide the correct lighting levels in accordance with AS/NZS 1158 and this Code of Practice. Only then should trees be located to create the future daytime aesthetics and shall not be within the minimum distance requirements of the lighting columns.

Consider the use of 6 metre pole heights in treed subdivisions which will result in an additional columns/luminaires but will better distribute light onto the road from under the tree canopy.

There is no simple single solution applicable for all roads or streets, which already have existing trees, but there should be a high level of coordination between the trees and the placement of lighting columns to provide an acceptable urban landscape.

### **1.6.5 Central management System**

The Hastings District Council operates a central management system to control the street lights on the network. All luminaires shall be fitted with a Telematics LCU 123/DALI/NFC programmed with the Hastings District Council radio frequency(458.168750 MHz) (compliant with ANSI C136.41:2013)

### **1.6.6 Road Lighting in Rural Areas**

Road lighting in Rural Areas is addressed in AS/NZS 1158. Since the ambient light and sky glow in Rural Areas is significantly less than that in built-up areas, the impact of obtrusive light must be given careful consideration to limit spill light.

AS 4282-1997 (Control of the Obtrusive Effects of Outdoor Lighting) will be used as a guide in these areas.

The following design guidelines apply:

Keep road lighting to the minimum applicable standard at intersections and road terminations.

Minimize lighting beyond these areas (intersections and terminations). Only provide sufficient lights such that a pedestrian walking along the road always has a light in view, (marker light) for orientation and guidance.

Priority shall be given to roads that are designated for traffic detours from main highways.

### **1.6.7 Safety and Security Lighting**

Following the principles of Crime Prevention through Environmental Design (CPTED), lighting is considered one of a number of measures to be taken to reduce the risk of crime, improving safety levels on local roads and public spaces. Particular attention shall be given to the current version of AS/NZS 1158.Part 3.

### **1.6.8 Pedestrian Crossing Lighting**

#### **1.6.8.1 Pedestrian crossings**

Pedestrian Crossings shall be lit in accordance with the current version of AS/NZS 1158.Part 4. Luminaires with specifically designed photometric distributions shall be used.

At an un-signalised pedestrian crossing AS/NZS allows the use of a Belisha disc or a flashing Belisha beacon. Hastings District Council will specify which is appropriate for the specific crossing.

#### **1.6.8.2 Pedestrian Crossings at Traffic Signal Controlled intersections**

Where there are defined Pedestrian Crossing Routes at Traffic Signal Controlled intersections the following lighting design criteria shall apply in addition to those of AS/NZS11581.1 (Category V) and AS/NZS1558.3.1 (Category P):

Lighting Classification – Category V1 and V2 – Minimum 20 Lux Horizontal Point Illuminance

Lighting Classification – Category V3 and V4 – Minimum 10 Lux Horizontal Point Illuminance

Lighting Classification – Category P - Minimum 10 Lux Horizontal Point Illuminance

### **1.6.9 Local Area Traffic Management Devices (including roundabouts)**

#### **1.6.9.1 Devices intended to slow traffic.**

(Category P roads only. Slows traffic and regulates its flow.)

3.5 lux horizontal point illuminance. Note this is not additional to road lighting.



#### **1.6.10 Devices intended to deter traffic.**

(Category P roads only. Devices intended to slow and deter through traffic.)

Reflective devices. Installed in accordance with the Manual of “Traffic Signs and Markings”

Hastings District Council shall determine whether Local Area Traffic Management Devices are “slowing” or “detering” traffic and should be agreed before design begins.

#### **1.6.11 Adjacent Access Routes**

Where the primary area to be lit is accessed by a road, path or similar that is also required to be lit, the access way shall be lit to the same standard with lighting systems of similar appearance and quality as those in the primary area.

#### **1.6.12 Design Solutions Based on Alternative Standards**

Road lighting design solutions utilising computer calculations based upon CIE standards are acceptable provided that clear correlation is supplied to prove equivalence with the current version of AS/NZS 1158 requirements for the specific project parameters.

#### **1.6.13 Equipment & Components Warranties**

Electrical equipment and components shall be manufactured to comply with the applicable New Zealand or International Standards and shall be readily available as spare parts. These components shall be incorporated into the luminaire or column, be protected against the ingress of dust and moisture to the appropriate Ingress Protection (IP) level and be easily accessible for repair or replacement. Warranties on these components shall be the manufacturers’ standard warranty, but no less than 10 years, and be applicable from the date of hand-over of the installation to Hastings District Council.

#### **1.6.14 Energy Efficiency**

The installation shall be designed for economic use of energy, applying the following principles:

1. All LED Luminaire drivers shall be fitted with a DALI control interface with a minimum of 100,000 hours design life.
2. Electronic control ballasts shall be used for HID luminaires up to and including 150w
3. Power Factor  $\geq 0.95$  lagging/leading
4. High efficacy lamps.

Note: Electronic ballasts are more efficient than magnetic ballasts and prolong the life of the lamp by regulating the lamp voltage to within close tolerances.

### **1.7 Lighting Columns**

All new street light columns must be selected from the Auckland Transport approved list and comply with the “Street Lighting Column Specification and Assessment Methodology” Appendix B.

#### **1.7.1 Lighting column AT Approved List**

Hastings District Council – Lighting Column Approved List (AT - LCAL) adopted from Auckland Transport. In addition the use of lighting columns must be approved by the Transportation Asset Manager.

Street Light Columns. Approved List					
Manufacturer	Model Name/Number	NZ Supplier	Road Category	Date Approved	Notes
Vicpole	Vicpole 6m; 8m	ADLT	P		
HiSpec	HiSpec slim square 6m; 8m; 10m	HiSpec	P subdivisions	3/03/2014	Subdivisions only.
Kendellier	Round steel tapered 6m; 8m	Kendellier		3/03/2014	
Spunlite	Octagonal 6m; 8m; 10m; 12m	Spunlite	P & V	3/03/2014	
Steelgal	Octagonal tapered steel columns supplied in sections 6m; 8m; 10m; 12m; 14m Tamaki round steel column; AT MFP pole (Elliott Street style) Approved flange and shear base mounting plus double outreach arms for each size pole.	Steelgal	P & V	3/03/2014	Approval extended to double outreach arms and flange and shear base mounting for each pole size. 26 May 14.
CSP Pacific Ltd	Octagonal tapered steel columns supplied in sections 6m; 8m; 10m; 12m; 14m Tamaki round steel column; AT MFP pole (Elliott Street style) These size poles approved for flange and shear base mounting.	CSP Pacific Ltd	P & V	3/03/2014	
GESS	Tamaki round steel column; AT MFP pole (Elliott Street style)	GESS	P & V	3/03/2014	

Within new Sub-divisions, Lighting Columns shall be located as follows;

1. at the common boundary between adjacent Property Lots ;
2. on the “build-line” i.e. corner of a building within the road reserve; which is particularly relevant in c. below
3. The location of the first Lighting Column turning into a street should be on the drivers left side in order to provide improved visual guidance - note this location shall not be greater than 15m into this street, measured from the kerb-line of the street that vehicles have turned in from.
4. In accordance with the lighting design

However, care should be used to avoid lighting columns being positioned on footpaths in a way that obstructs pedestrians. For this reason, the preferred position of street lighting columns is clear of footpaths and where this is not possible - towards the back edge of footpaths. A clear 1.5m minimum footpath space should be allowed.

## 2 Electrical requirements

### 2.1 Installation

Each street light position is an Installation as defined in AS/NZS3000.

All work shall be carried out in accordance with the Electricity Regulations 2010, AS/NZS3000 and the applicable Electrical Codes of Practice. The most recent amendments must be used.

### 2.2 Connection to Network

Each streetlight shall be connected to the Unison network via an approved streetlight point of supply. Each streetlight shall be controlled by Unison via ripple relay, pilot wire or other means. Breach joints are not allowed as part of a new design. Streetlight cable type shall be as follows:

#### 2.2.1 State Highway and Main Carriageways

Cable size 3C 6mm<sup>2</sup> N/S, with 3.2mm PVC sheath for cable that is direct buried

Cable manufactured to AS/NZS 4961 Voltage rating -0.6/1.0kV

#### 2.2.2 Non-main carriageways and subdivisions

Cable size 4mm<sup>2</sup> copper twin conductor and earth PVC TPS

Cable manufactured to AS/NZS 5000.2 Voltage rating -450/750V

### 2.3 Electrical connections and isolation

At the base of each pole between 600 mm and 900 mm above ground level a fuse board shall be installed inside the pole to meet the requirements of AS/NZS 3000 with a neutral and, earth bar to comply with the requirements of an installation. A, 6 Amp HRC fuse link, shall connect each light to the incoming supply MCB's are not permitted. Refer to Standard Engineering Drawings.

### 2.4 Luminaires on Unison poles

In areas where the Unison network is overhead and HDC has installed luminaires on Unison poles, each luminaire shall be connected to an approved controlled Unison streetlight point of supply. The fuse carrier shall be a 20 Amp Michaud K223. The HRC fuse link shall be 6 amps or 10 amps fusing characteristic gG 120 kA.

### 2.5 Luminaire Control

HDC is in the process of changing the control of all road lights to a Tele-Management control and management System. During the process of changing the network from switched circuits and photocell control there will be a mix of several controls. HDC will advise the control type to be used in any particular area at time of design approval. (As the programme develops all stakeholders will be kept up to date)

### 2.6 Internal wiring in column

The cable from the fuse board at the base of the column to the luminaire shall be 2 C/E 2.5mm<sup>2</sup> circular TPS . Refer to Standard Engineering Drawing – Street Lighting Earthing Details.

## 2.7 Earthing

Each pole shall be earthed by means of 10 mm<sup>2</sup> copper insulated wire exothermically welded to a 16 mm diameter copper bonded steel earth rod 300 mm from the pole base. Sherlock connectors are approved for burying. The connector shall be buried 300 mm below the pavement surface. AS/NZS 3000. Refer to Standard Engineering Drawing (SED) – Street Lighting Earthing Details

### 2.7.1 Connection of street lights at traffic control cabinets

Refer to Standard Engineering Drawing (SED) – Traffic Signal / Street Light Combination Electrical Schematic.

## 2.8 Safe working distances

Maintaining safe distance from electric lines and cables at all times is mandatory. EPC 34 and the Safety Manual – Electrical Industry (SM-EI) part 2 and 3 sets out the minimum approach distances for approved qualified staff with current work competencies.

## 2.9 Personal Protective Equipment (PPE)

All personnel working on the Hastings District Council Street light network must wear the appropriate PPE on all sites at all times.

## 2.10 Approvals

All proposed changes or additions to the public lighting network must be approved prior to construction. The following information is required for the review:-

- 1 A Lighting Design Report and Lighting Design Plan(s) scaled to 1:500– the minimum requirement of which is outlined in Appendix D.
- 2 Electronic copy of the lighting design plan showing luminaire positions. Documentation in accordance with the relevant AS/NZS1158 part and the current version of AS/NZS1158.1.2 to show compliance.
- 3 Lighting sub category used in the design. E.g. V2, P4 etc. These must be recorded on each lighting plan.
- 4 Category V roads - Luminance calculations from Perfectlite together with illuminance diagrams from AGI32 - illustrating relevant contours for the lighting sub-category with illuminance and point illuminance values necessary to demonstrate compliance.
- 5 Category P roads - Illuminance diagrams from AGI32 illustrating relevant contours for the lighting sub-category with illuminance and point illuminance values necessary to demonstrate compliance.

The following Tables – V Category Roads and P Category Roads – defines the Lighting Technical Parameters that shall be provided.

## V Category Roads

Parameter	Symbol	Notes
Average Carriageway Luminance	L	Straight sections
Overall Uniformity	Uo	Straight sections
Longitudinal Uniformity	UL	Straight sections
Threshold Increment %	TI	Straight sections
Surround (verge) Illumination Ratio	Es	Straight sections
Point Illuminance	Eph	Intersections, Pedestrian Crossings, Pedestrian Refuges and Defined Pedestrian Crossing Routes at Signalised Crossing
Illuminance (Horizontal) Uniformity	UE1	Intersections and Pedestrian Refuges only
Vertical Illuminance	EPV	Pedestrian Crossing

## P Category Lighting

Parameter	Symbol	Notes
Average Horizontal Illuminance	Eh	
Point Horizontal Illuminance	Eph	
Illuminance (Horizontal) Uniformity	UE2	
Point Vertical Illuminance	Epv	
Luminous Intensity at Gamma80	Cds	For maximum Luminaire Watts used in the design

### 2.11 Checklist

The Checklist attached as Appendix A must be completed when submitting a proposed lighting design for approval.

## 3 Appendix A - Luminaire requirements

### 3.1 Introduction

The Hastings District Council will not undertake approval of new luminaires for inclusion on the AT HID approved list. Contact Auckland Transport if approval is required.

### 3.2 Access requirements for AT HID approved list

This specification outlines the requirements that a Road Lighting Luminaire shall meet for inclusion on the Auckland Transport – HID Approved Luminaire List (AT-HALL). The approval criteria of new Luminaires onto AT-HALL comprises of three parts:

- 1 Compliance with the most up-to-date version of the Australia/New Zealand Standard for the Lighting of Roads and Public Spaces – AS/NZS1158, Part 6
- 2 Additional criteria specific to Auckland Transport listed below in Sections 3.2 and 3.3.
- 3 Achieving a “Pass” mark from the new Road Lighting Evaluation Form obtainable from AT.

### 3.3 Auckland Transport Approved HID Luminaire Requirements

#### 3.3.1 Luminaire Compliance and Design Features

The current version AS/NZS1158 Part 6 outlines the requirements for design, construction, performance and testing of road lighting Luminaires. Luminaires that are to be used by Hastings District Council shall be compliant with this standard and with this specification document and have an expected design life of 20 years minimum.

All approved Luminaires shall utilise Flat Glass (FG) or Curved Tempered Glass (CTG). No “bowl” style luminaires will be considered for standard road lighting projects.

For special projects, Luminaires will be considered on a case by case basis. However compliance with AS/NZS1158, Part 6 will be a minimum requirement.

Luminaires will be reviewed against each item listed on this specification and if determined to be non-compliant, they will not be considered for inclusion on AT-HALL.

#### 3.3.2 Material

The material of the luminaire housing shall be in accordance with the current version of AS/NZS 1158 Part 6. It is preferred that luminaires utilize an aluminium alloy having a copper content of not greater than 0.1%.

#### 3.3.3 Testing

Testing in accordance with ISO9227 where additional surface treatments have been applied, shall be provided to demonstrate compliance with that standard.

Saline mist testing shall be for a minimum of 1000 hours.

#### 3.3.4 Tool-less Entry

Tool-less entry is required for the luminaire electrical compartment for maintenance purposes. Additionally for ease of maintenance, a “quick disconnect control gear assembly”.

### **3.3.5 Internal Tilt Mechanism**

The luminaire shall have an internal tilt mechanism so that the luminaire can be adjusted between 0° and -15° (minimum). No external bracket or adaptors shall be required to provide a 0° (zero) tilt of the Luminaire in relation to the road surface. This allows the luminaire to be installed on existing road lighting columns that have a tilt angle to the bracket arm.

### **3.3.6 Ingress Protection (IP)**

The luminaire shall be exposed to weather conditions and as such should be have an IP66 rating, for both the optical and control gear compartments.

### **3.3.7 Remote Luminaire Control - Telemetry**

The luminaire shall have room to incorporate telemetry control components within the luminaire body or bracket arm without compromising the IP66 rating.

### **3.3.8 Photocell Compatibility**

Road lighting luminaires shall be capable of incorporating photocells without compromising the IP66 rating. The Hastings District Council current approved photocell is the Zodian SS12A and variants thereof .

### **3.3.9 Upgrade ability**

The luminaire shall be designed to enable the light engine to be replaced and/or upgraded. The IP66 rating of the complete luminaire shall not be compromised as a result of either replacement of upgrade of the luminaire components.

### **3.3.10 Warranty**

A minimum ten (10) year warranty from the date of on-site installation shall be offered by the Luminaire supplier for the housing/glass/seal and reflector of the Luminaire and a five (5) year warranty for all Electronic Control Gear/Ballast/Driver.

### **3.3.11 Quality Assurance and Electrical Safety**

A Suppliers Declaration of Conformity is a statement from the supplier that the luminaire is electrically safe and that the supplier takes responsibility for the safety of the product. It is a requirement that all luminaires have a Suppliers Declaration of Conformity.

### **3.3.12 ISO 9001 Registered**

The International Organization for Standardization 9000 Family of standards refer to quality management systems, ISO 9001 lists the requirements to meet the standard. Over one million organizations are registered with ISO 9001 and it is requirement that all luminaire manufactures are independently verified.

### **3.3.13 Sustainability**

The luminaire shall comply with the RoHS Directive which sets restrictions on the use of six hazardous substances in electric equipment. The restricted substances are;

- 1 Lead
- 2 Mercury
- 3 Cadmium
- 4 Hexavalent chromium
- 5 Polybrominated biphenyls
- 6 Polybrominated diphenyl ether.

### 3.3.14 International Dark-Sky Association (IDA)

The luminaire shall be IDA accredited or be able to demonstrate that it complies with the principles of IDA which is the limitation of light pollution from outdoor luminaires in respect to glare, sky glow (light directed above the horizontal into the sky) and light trespass (illuminating unwanted areas like private property).

### 3.4 Approved Luminaire Assessment Methodology

HID Road Lighting Luminaire manufacturers and suppliers shall supply supporting documentation and IES/CIE files identifying their best performing road lighting Luminaires.

Optical performance will be assessed in accordance with the most up-to-date versions of AS/NZS 1158 1.1 and 3.1 respectively for Category V and P roads – Table 1.

Summary of AS/NZS 1158 Design Categories as @ November 2011				
Vehicle Category Roads				
	Average Carriageway Luminance (cd/m <sup>2</sup> )	Average Illuminance (lux)	Overall Uniformity (min/avg)	Longitudinal Uniformity (min/avg)
V1	1.5	15	0.33	0.3
V2	1.0	10	0.33	0.3
V3	0.75	7.5	0.33	0.3
V4	0.5	5	0.33	0.3
Pedestrian Category Roads				
	Average Illuminance (lux)	Point Horizontal Illuminance (lux)	Horizontal Uniformity (max/avg)	
P3NZ	1.3	0.22	10	
P4	0.85	0.14	10	

Table 1: Summary of AS/NZS1158 Light Technical Parameters, Lighting Categories V and P



Each Luminaire will be reviewed against the criteria within this specification and be compliant with all requirements in order to be considered for inclusion on the AT-HALL.

Once the Luminaire has been placed on the AT-HALL, it may be subjected to random product testing at Hastings District Council discretion. Failure to meet and maintain the requirements laid out in this specification and assessment methodology document may result in the Luminaire being removed from the AT-HALL.

### 3.5 Performance and Acceptance Testing

All road lighting Luminaires for consideration will be assessed based on its optical performance on the “test road” and its performance against Luminaires already on the Approved Luminaire List. The test road sets out a typical roadway topology for Category V and P roads.

- 1 Road Lighting Category V
- 2 Overall Carriageway width (Kerb to Kerb) = 12m
- 3 Number of Lanes: 2 (one in each direction)
- 4 2m Footpath and 1.5m Grass Berm
- 5 Road Luminaire mounting height - 12m, complete with 2m Outreach Arm
- 6 Setback: Luminaire suppliers choice
- 7 Road lighting Column Arrangement: Luminaire suppliers’ choice between Single Sided, Staggered and Opposite.
- 8 Luminaire Tilt Angle = 0 Deg
- 9 Maintenance Factor (MF): High Pressure Sodium = 0.75, Metal Halide – 0.75 and Cosmopolis – 0.8
- 10 Road Lighting Category P3NZ and P4
- 11 Overall Carriageway width (back of footpath to back of footpath) = 20m
- 12 Number of Lanes: 2 (one in each direction)
- 13 1.5m Footpath and 2m Grass Berm
- 14 Road Luminaire mounting height - 8m, complete with 2m Outreach Arm
- 15 Setback: Luminaire suppliers choice
- 16 Road lighting Column Arrangement: Luminaire supplier’s choice between Single Sided, Staggered and Opposite.
- 17 Luminaire Tilt Angle = 0 Deg
- 18 Maintenance Factor (MF): High Pressure Sodium = 0.78, Ceramic Metal Halide – 0.67 and Cosmopolis – 0.7

The following “Minimum Rated Lamp Lumens” shall be used for the replacement of existing Lamps within street lighting network as part of ongoing Maintenance.

Lamp Source / Watts		Minimum Lumen Output	Comments
High Pressure Sodium	50	4400	
	70	6600	
	100	10700	

Lamp Source / Watts		Minimum Lumen Output	Comments
	150	17500	
	250	33200	
	400	56500	
	600	90000	
Metal Halide	35	3200	GE Streetwise lamp
	50	5000	GE Streetwise lamp
	70	7640	GE Streetwise lamp
	100	10700	GE Streetwise lamp
	150	16300	GE Streetwise lamp
	250	25000	GE TT
	400	41000	GE TT
CosmoPolis	45	4725	
	60	6800	
	90	10450	
	140	16500	
Elite	210	24150	Colour Temp = 3000K
	315	38700	Colour Temp = 3000K

Table 2: Table of Minimum Rated Lamp Lumens

## 4 Appendix B Street light column design

### 4.1 Overview

This document specifies the minimum requirements for the standard design of street lighting columns intended for use in Hastings District Council transportation network.

This document should be read in conjunction with the current version of the Hastings District Council Code of Practice (HDCCOP) and the current issues of the Hastings District Council HID and LED Road Lighting Luminaire Specification and Assessment Methodologies.

### 4.2 Typical Column Terminology

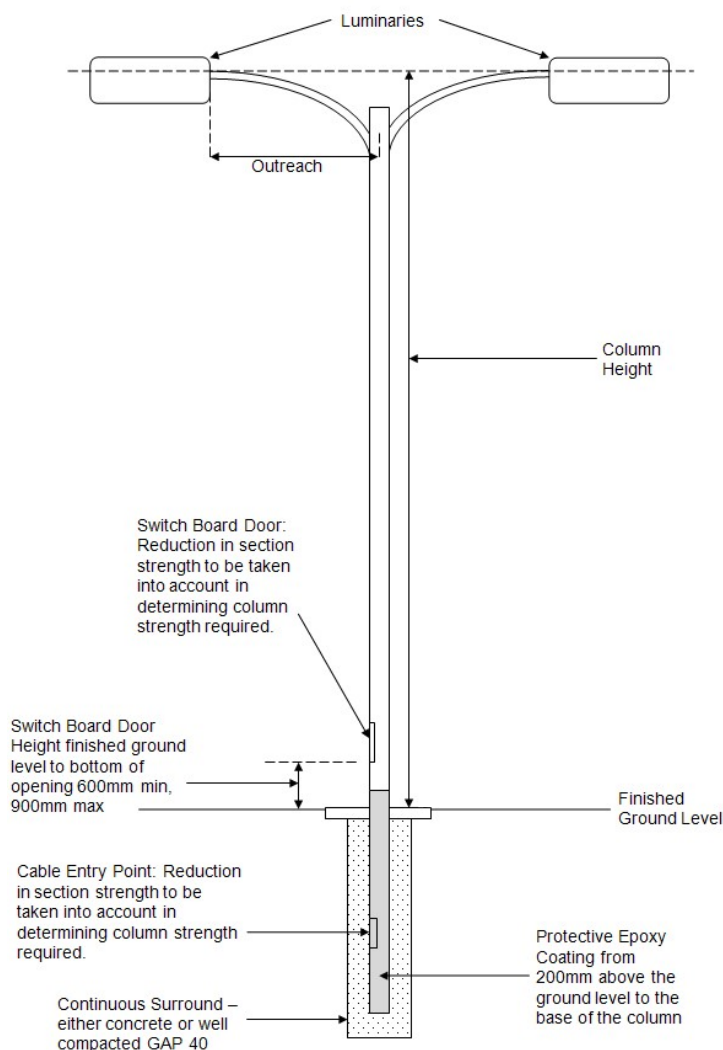


Figure 1 – Terminology – Not to Scale

### 4.3 Column Design

All lighting columns must have a minimum 50 year design life and shall be manufactured by Hastings District Council approved suppliers. The design requirements for columns shall be in accordance with the Australian/New Zealand Standard AS/NZS 4676 "Structural design requirements for utility services poles" and AS/NZS 4677 "Steel Utility Service Poles".

Design of components for strength will be subject to specific design by the suppliers.

All construction is to comply with the New Zealand Building Code and the appropriate New Zealand Standards.

#### 4.3.1 Standard Columns

All lighting columns shall be constructed to a standard length of 6.0m, 8.0m, 10.0m, 12.0m or 14.0m from ground to the tip of the bracket arm and have a maximum bracket arm outreach length as specified in Table 1 unless otherwise approved by Hastings District Council.

Each column shall be designed to take the load of a standard luminaire as outlined in Table 1 below;

Nominal Column Height (m)	Maximum Bracket Arm Outreach (m)	Luminaire Mass (kg)	Luminaire Sail Area (m <sup>2</sup> )
14.0*	4.0	15.0	0.15
12.0	4.0	15.0	0.15
10.0	3.0	10.0	0.12
8.0	2.0	9.0	0.10
6.0*	1.0	8.0	0.10

**Table 1 - Table of Standard Column Heights and Associated Bracket Arm Lengths, Mass and Sail Areas**

\*Appropriate for single outreach only.

Standard Columns shall have a Curved Outreach Bracket Arm with a 5° upward tilt.

The minimum spigot diameter shall be 42mm.

The minimum thickness of steel plate used in any structural column element shall not be less than 2.0mm. Special requirements from AS/NZS 4676 apply if the thickness of steel used in any structural elements of the column is less than 3.0mm.

#### 4.3.2 Wind Loadings

The column shall be designed to an Importance Level of 2 with 50 years Design Life and safely sustain the appropriate loads as set out in the current version of AS/NZS 1170.2 “Structural design actions - Wind actions”. Refer to Table 2 below.

Wind loadings are assumed to be non-directional, i.e. the worst orientation of the light column is considered. Specific design considering wind direction, with respect to the orientation of the lighting column, may be warranted in special cases, but this is considered not generally necessary.

Wind pressures are based on design wind speeds for each wind zone as per Section 5 of AS/NZS 3604 “wind bracing demand” and are calculated in accordance with AS/NZS 1170.2.

The minimum drag coefficient is taken as for a smooth round shape (CD = 1.2). Other shapes will require modification with the appropriate modification factor in accordance with Table E4 of AS/NZS 4676.

The frontal area of luminaires shall be taken from the orientation that results in the greatest wind exposed surface and the force on these is assumed to act at the top of the column. The frontal area shall include all other attachments, motifs etc., which are not part of the main lighting column structure.

Allowance shall also be made for the additional forces due to wind on a 1.0m<sup>2</sup> fixed sign or, for a single outreach, one 0.9m x 1.8m banner, and for a double outreach, two 0.9m x 1.8m banners, mounted 2.5m above ground level. Columns may be fitted with either a sign or banner(s) but not both.

### Hastings District Council Region – Wind Speed Design Factors

$$V_{sit,\beta} = V_R M_d (M_{z,cat} M_s M_t)$$

Description	Factors	AS/NZS 1170.2:2002 Reference Clauses
Regional Gust Wind Speed, VR	45 m/s (Design Life 50 years, Region A)	Table 3.1 – Regional Wind Speeds
Wind Directional Multipliers, Md	1.0 (Any direction)	Table 3.2 – Wind Direction Multiplier
Terrain/Height Multiplier, Mz,cat	Terrain Category 2, Site elevation 0m; Mz,cat	Clause 4.2 – Terrain/Height Multiplier
Shielding Multiplier, Ms	1.0	Clause 4.3 – Shielding Multiplier
Topographic Multiplier, Mt	1.0	Clause 4.4 – Topographical Multiplier

**Table 2 - Table showing all factors to determine site wind speed**

#### 4.3.3 Minimum Column Strengths

Steel Column Strengths are based on the requirements of AS/NZS 3404 “Steel Structures Standard” and AS/NZS 4600 “Cold-Formed Steel Structures”.

Steel sections strength requirements apply to the base of the column (at the top of the concrete footing) i.e., not necessarily at the ground surface.

Minimum section modulus requirements must take into account any service opening near the critical location at the base. Locations of openings other than at the base should also be considered.

#### 4.3.4 Deflection and Vibration

The complete assembly (e.g. column, outreach and luminaire) shall be designed to minimise deflection and vibration.

To account for fatigue, the lateral liner deflection of the column shall not exceed  $h_p/15$ , where  $h_p$  is the height of a column above ground level.

#### **4.3.5 Dynamic Response Check**

##### **4.3.5.1 Translational Response**

Dynamic response of a light column may subject the structure and fixtures to excessive acceleration and forces. Where structures have natural frequencies less than 1Hz, Section 6 of AS/NZS 1170.2 requires dynamic analysis to be carried out.

The dynamic response of a light standard may be in a number of vibrational modes, including fundamental translational (lateral) cross wind and along and response as well as torsional response, particularly where the fixtures are eccentric and have high mass.

The dynamic analysis of a wind sensitive structure is outside the scope of this document and specialist design will be required where the structure is deemed to be wind sensitive.

##### **4.3.5.2 Torsional Response**

The torsional response may be combined with the translational response.

As with the translational response, Section 6 of AS/NZS 1170.2 requires dynamic analysis to be carried out for structures with natural frequencies less than 1Hz.

#### **4.3.6 Switchboard – Door Cavity Opening**

The door cavity opening shall be positioned to permit safe access for maintenance, i.e.:

1. Not facing the street.
2. Not facing the property boundary behind the column.
3. Fixings shall be vandal and child resistant and shall require a specialised tool to open

The door cavity opening shall be a standard size of 300mm x 150mm and the base of the door cavity opening shall be located between 600mm and 900mm above finished ground level to provide safe and easy access for maintenance.

The door cavity opening shall be prevented from being opened by unauthorised persons, by the use of fasteners requiring a specific tool to gain access to the switchboard.

#### **4.3.7 Shear Base Columns**

Shear base columns are only to be installed in speed zones of 70km/h or greater. All other speed zones shall utilize flange base or ground planted columns.

#### **4.3.8 Foundation Design**

Footings for lighting columns may be classified into two broad groups, namely direct planted footings and pad footings.

Direct planted footings are simply an extension of the pole, which relies primarily on varying the length of the extension (i.e. the embedment depth) and its projected area to engage the required resistance of the foundation to overturning and sliding. This type is widely used for foundations with a bearing strength between 100kPa and 240kPa.

Pad footings are usually constructed from concrete and rely primarily on their mass and the distribution of this mass to provide the required stability. For this type of footing, the

embedment depth is not as critical a factor in the overturning resistance of the pole but may be a major consideration in generating resistance to sliding.

#### 4.3.9 Material Properties

The design properties of the footing and foundation materials shall be determined in accordance to Section 6 of AS/NZS 467 “footings and foundations”.

#### 4.3.10 Embedment Depth (Direct Planted Footings)

The embedment depth of directly planted poles shall be calculated in accordance AS/NZS 4676, taking due account of the mechanical properties of the particular foundation materials.

The embedment depth should not be less than 0.5m in any soil.

The top 0.5m of any pile foundation shall be ignored when determining capacity.

#### 4.3.11 Concrete Footings

Concrete footings may be used as an alternative to direct-planted footings where drilling is impracticable due to either extreme hardness or softness of the foundation material or the inaccessibility of the site, or some combination of these.

Base fixing bolts shall be designed in accordance with AS/NZS 4676 and consideration must be given to cable access and future maintenance

#### 4.3.12 Fabrication and Installation

This section details the requirements for finishes and their application, as solutions considered satisfactory by Hastings District Council. Alternative products and processes may be submitted for approval for specific projects and/or for future incorporation in this document.

Surface preparations, coatings and repairs shall be in accordance with AS/NZS 2312 “Guide to the Protection of Structural Steel against Atmospheric Corrosion by the use of Protective Coatings” and be performed by one of the companies approved for that system to meet the minimum warranty period.

Final coating is optional. However, all columns, complete with mitred and curved outreach arms, shall be finished, both internally and externally, in one of the following forms:

1. Hot dipped galvanised mild steel – painted or unpainted
2. Stainless steel (316 grade) – painted or unpainted

Contact Hastings District Council regarding other clear acrylic coatings

#### 4.3.13 Standards

The following standards are applicable to this section

AS/NZS 2312 [Guide to the Protection of Structural Steel against Atmospheric Corrosion by the Use of Protective Coatings](#).

AS/NZS 4680 Hot-Dip Galvanised (Zinc) Coatings on Fabricated Ferrous Articles.

AS/NZS 3750.9 Paints for steel structures - [Organic zinc-rich primer](#).

AS/NZS 3750.15      Paints for steel structures - [Inorganic zinc silicate paint](#).

AS/NZS 1554.1      Structural Steel Welding - Part 1: Welding of Steel Structures.

#### **4.3.14 Repair of Damage to Surfaces**

Corrosion protection which has been damaged by welding, erection or other causes shall be rectified before the column is put into use.

The damaged area shall be prepared and must be dry and clean, free from dirt, grease, loose or heavy scale of rust, before the corrosion protection is applied. The corrosion protection shall be applied as soon as practicable and before noticeable oxidation of cleaned surfaces occurs. Damaged zinc coating shall be resorted by application of an equivalent thickness of a suitable zinc paint conforming to AS/NZS 4680, AS/NZS 3750.9 or AS/NZS 3750.15 or with thermal zinc spray.

#### **4.3.15 In-Ground Section of all Columns**

Structural steel sections should not make direct contact with ground. All sections must be embedded in, or bear on, concrete, or be otherwise protected. Concrete poured around steel structures must be continuous and not cast in sections.

All lighting columns shall, on top of the all-over galvanisation, be covered in an extra epoxy protective coating from 200mm above the ground level to the base of the column.

Bare, untreated metal is not acceptable.

##### **4.3.15.1 Alternatives**

Where alternative materials or paint finishes are required to those described above the applicant shall submit full details of the proposed process and materials for review with the submission.

#### **4.3.16 Warranty**

Providing the coating applicator has been certified by the paint supplier as an approved provider of the proposed coating system, a copy of the coating applicator's certification that the galvanising and/or paint has been applied in accordance with the coating manufacturer's specification shall be provided before installation of the columns.

If the applicator does not possess the necessary "certified applicator" status, then the paint supplier shall monitor the work and provide the required certification.

Materials and paint finishes of columns, and luminaire bodies shall be unconditionally guaranteed against fair wear and tear for a minimum of 10 years, commencing from the date of hand-over of the installation to Hastings District Council.

#### **4.3.17 Quality Control**

All welds and welding processes must comply with the current standards outlined in AS/NZS 1554.

Hastings District Council may nominate an inspector to insure the quality of the lighting column including, but not limited to; the quality of steel, welds, and protective coating. Upon request by Hastings District Council the manufacturer shall supply Hastings District Council with any certificates to insure the quality of the column.



#### 4.3.18 Protection

Structural members shall be adequately protected during handling and transport to minimise damage to the corrosion protection. The columns shall be individually wrapped in heavy duty polythene, or similar method of protection, to protect the equipment from damage. The protective wrapping shall not remain in place for any extended period of time, e.g. during site storage, as damage to the paint finish is likely to occur.

Components which are transported in nested bundles should be separable without damage to other components or their coatings. Consideration should be given to the use of lifting beams with appropriately spaced lifting points and slings, or to lifting with properly spaced fork-lift tines.

The column wrapping shall be applied whilst the column is installed and stood upright in the excavation, and the wrapping shall be removed upon completion of installation

Any damage caused prior to the hand-over to Hastings District Council shall be repaired as new with all warranties remaining intact. Where the damage is considered too severe the contractor shall, upon written instruction from Hastings District Council, or their representative, replace the damaged equipment with new at no cost to Hastings District Council.

#### 4.3.19 Excavation and Backfill

All excavation and backfilling shall be carried out in accordance with the contract specification.

#### 4.3.20 Mowing Strip

The installation of a mowing strip is not required.

### 4.4 Lighting Column Evaluation Methodology

Any column not on the approved list may be evaluated by request to be put on the approved list by successfully meeting the criteria of the two part evaluation checklist. Part A is an initial evaluation checklist and if all of Part A requirements is satisfied, the Part B assessment is undertaken. If the column passes Part B, it shall be placed on the Approved list.

If the lighting column passes “Part B” then it shall be placed on the “Approved List” at the discretion of Hastings District Council. It is recommended that the supplier of the lighting column, under evaluation of Part B, pays Hastings District Council a fee of \$1000 to undertake the evaluation. This will demonstrate the commitment of the supplier to the quality, performance and support of the product.

#### 4.4.1 Lighting Column Evaluation Methodology Part A: Initial Evaluation Checklist

Column Manufacturer	
Model Name/Number	
Cost Per Unit	

	<b>Initial Evaluation Checklist</b>	<b>Yes</b>	<b>No</b>
--	-------------------------------------	------------	-----------

1	<b>Height and Outreach Length</b> The column must have a nominal height and a maximum outreach arm as outlined in Table 1 of this specification.	<input type="checkbox"/>	<input type="checkbox"/>
2	<b>Tilt Angle</b> The outreach arm must have an upward tilt angle of 5°.	<input type="checkbox"/>	<input type="checkbox"/>
3	<b>Permanent Design Load</b> The column must be designed to take the load of a standard luminaire as outlined in Table 1 of this specification.	<input type="checkbox"/>	<input type="checkbox"/>
4	<b>Wind Design Load</b> The column design must comply with the latest standards set out in AS/NZS 1170.2 and must be designed to take the load on a 1.0m <sup>2</sup> sign attached 2.5m above ground level.	<input type="checkbox"/>	<input type="checkbox"/>
5	<b>Structural Steel Thickness</b> The minimum steel thickness for the in ground section of the column with a nominal height greater than 10.0m must not be less than 3.0mm. Other structural elements of the column must not be less than 2.0mm.	<input type="checkbox"/>	<input type="checkbox"/>
6	<b>Steel Properties</b> All structural steel used to manufacture the column must comply with the standards set out in NZS 3404.	<input type="checkbox"/>	<input type="checkbox"/>
7	<b>Deflections</b> The column must be designed to have a maximum deflection of no more than ±3.0°.	<input type="checkbox"/>	<input type="checkbox"/>
8	<b>Dynamic Response</b> The dynamic response of the column must comply with Section 6 of AS/NZS 1170.2	<input type="checkbox"/>	<input type="checkbox"/>
9	<b>Switchboard Door Cavity Opening</b> The base of the switchboard door cavity opening must be located between 600mm and 900mm above finished ground level and must require a special tool to open.	<input type="checkbox"/>	<input type="checkbox"/>
10	<b>Protective coating</b> The entire column, both internally and externally, must be galvanized or otherwise protected by an Hastings District Council approved coating system.	<input type="checkbox"/>	<input type="checkbox"/>

11	<b>Base Section</b>  The base section of the column must, on top of the overall galvanisation, have an approved extra protective coating from 200mm above ground level to the base of the column.	<input type="checkbox"/>	<input type="checkbox"/>
12	<b>Welding</b>  All welding on the column must comply with AS/NZS 1544.	<input type="checkbox"/>	<input type="checkbox"/>
13	<b>Design Life</b>  The column must have a minimum design life of 50 years.	<input type="checkbox"/>	<input type="checkbox"/>

Note: If any column submitted does not comply fully with the above points please provide all the necessary information (i.e. design calculations or manufactures warranty) for alternative design consideration.

New Zealand Distributer;

Company Name: \_\_\_\_\_

Contact Name: \_\_\_\_\_ Position: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Email Address: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

#### 4.4.2 Lighting Column Evaluation Methodology Part B: Detailed Independent Assessment

Verification of Initial Evaluation Checklist		
1	Height and Outreach Length	Pass/Fail
2	Tilt Angle	Pass/Fail
3	Permanent Design Load	Pass/Fail
4	Wind Design Load	Pass/Fail
5	Structural Steel Thickness	Pass/Fail
6	Steel Properties	Pass/Fail
7	Deflections	Pass/Fail
8	Dynamic Response	Pass/Fail
9	Switchboard Door Cavity Opening	Pass/Fail
10	Protective coating	Pass/Fail
11	Base Section	Pass/Fail

12	Welding	Pass/Fail
13	Design Life	Pass/Fail
Identify any issues with Column		
Recommend Column for Hastings District Council Approved Column List		Yes / No

Assessment Completed By;

Company: \_\_\_\_\_

Contact Name: \_\_\_\_\_ Position: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Email Address: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## 5 Appendix C Lighting Design Checklist

### 5.1 Design Checklist


Initial Considerations		
A holistic approach to the lighting design has been considered.		<input type="checkbox"/>
A night site visit (where applicable) has been completed identifying features such as CCTV cameras, trees and neighbouring properties.		<input type="checkbox"/>
Area Classification		
An appropriate lighting sub category classification has been agreed with Hastings District Council for all roads with the design scheme.		<input type="checkbox"/>
The lighting classification/sub category for each road is:		
Light Source		
Define which Light Source has been utilised in the design - LED, Ceramic Metal Halide or High Pressure Sodium. Note:- Generally LED luminaires, included on the AT approved list, must be used in all new designs both P category and V category roads.		<input type="checkbox"/>
Light Source for each road is:		

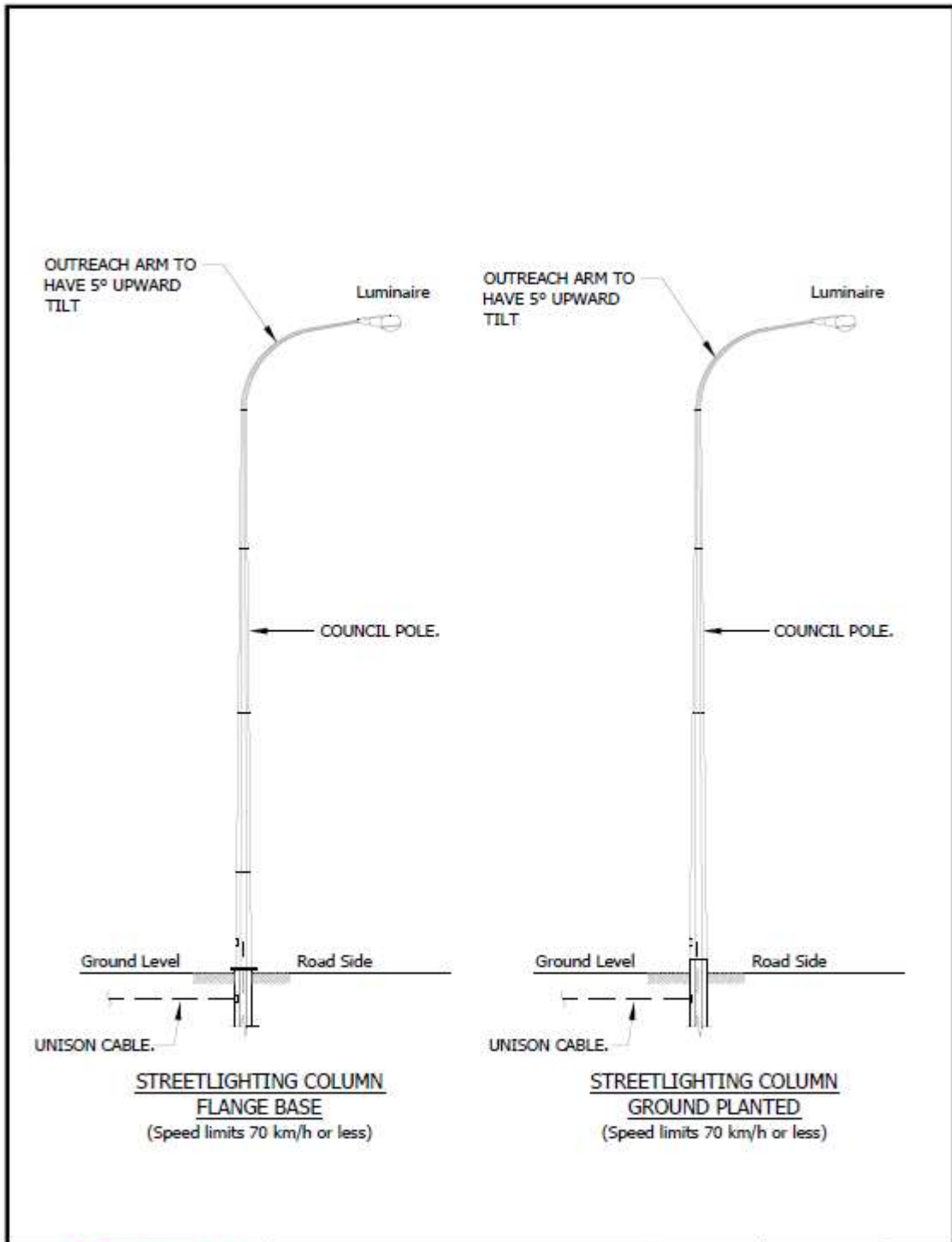
Luminaire Selection	
<p>Only luminaires included on the Hastings District Council (HDC) HID (Appendix A) and LED (Appendix B) Road Lighting Specification Approved Lists shall be used in the design scheme.</p> <p>Alternative luminaires may be submitted for approval on a specific project, however these will have to be assessed against the standard in Appendix A and Appendix B and must be approved by Hastings District Council before design begins.</p>	<input type="checkbox"/>
Lighting Column	
<p>Only Lighting Columns on the Hastings District Council (HDC) Lighting Column (Appendix C) Specification Approved List shall be used in the design</p>	<input type="checkbox"/>
<p>Alternative Lighting Columns may be submitted for approval on a specific project, however these will have to be assessed against the respective standard in Appendix C and must be approved by Hastings District Council before design begins.</p>	
Electrical Considerations	
<p>Electrical reticulation has been specified (where applicable).</p>	
<p>Prepared By:     Date:</p> <p>Checked by:     Date:</p>	


## 6 Appendix D Standard Drawings Set

DRAWING SET INDEX		
PLAN No.	TITLE	VERSION
SL001	STREET LIGHTING - DEMARCATION POINT	A
SL002	TYPICAL SHEAR BASE DETAIL (EXPLODED VIEW) SPEED LIMIT GREATER THAN 70km/hr	A
SL003	STREET LIGHTING - EARTHING DETAIL	A
SL004	STREET LIGHTING - ELECTRICAL CONNECTIONS	A
SL005	STREET LIGHTING ELECTRICAL CONNECTION OF STREET LIGHT ON UNISON POLE	A
SL006	STREET LIGHTING PEDESTRIAN CROSSING POLE	A

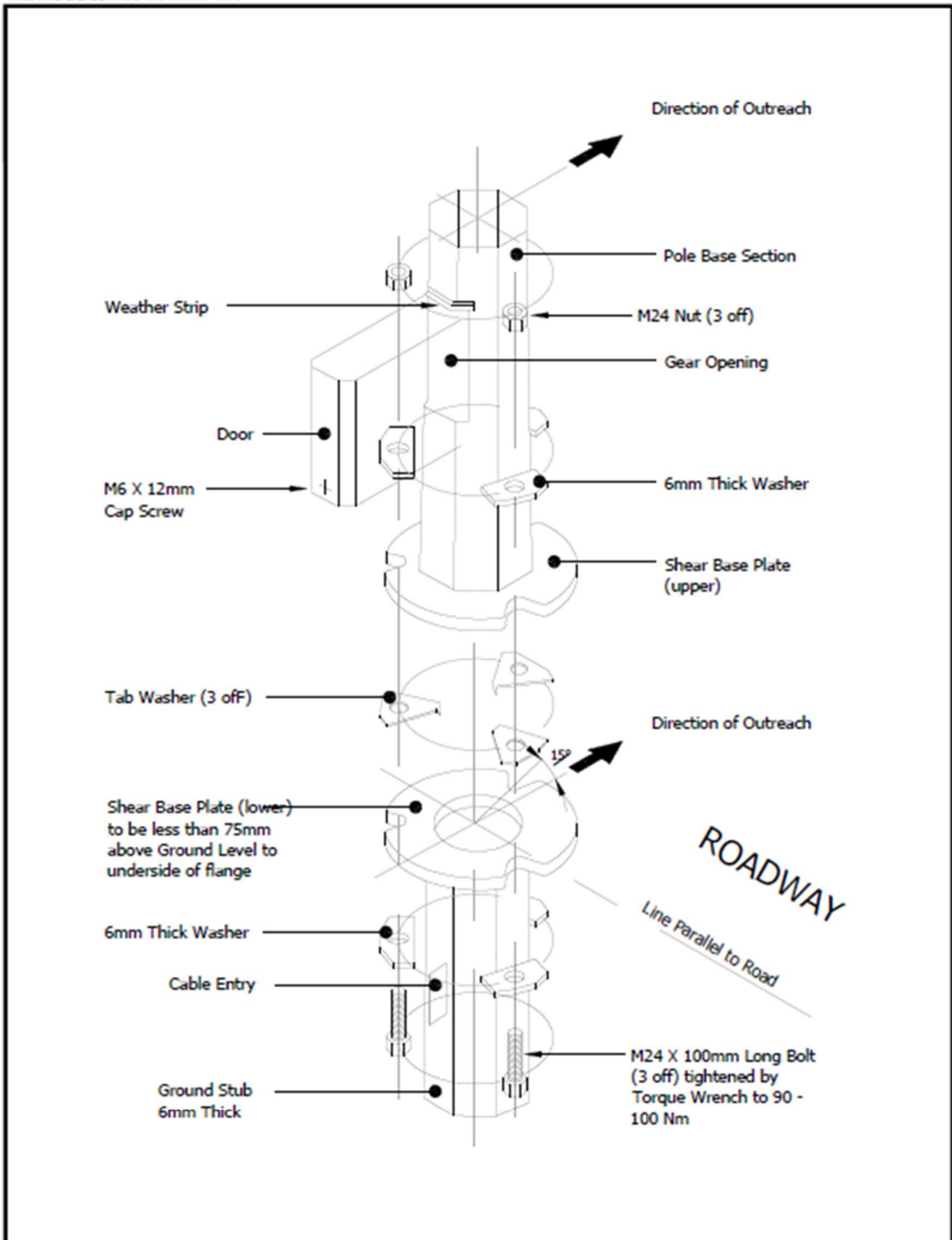
  


 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaptation of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.</p>	HASTINGS DISTRICT COUNCIL	SCALE: NOT TO SCALE
	DRAWING INDEX	TRIM Ref: SL000
		ISSUED: OCT 2015

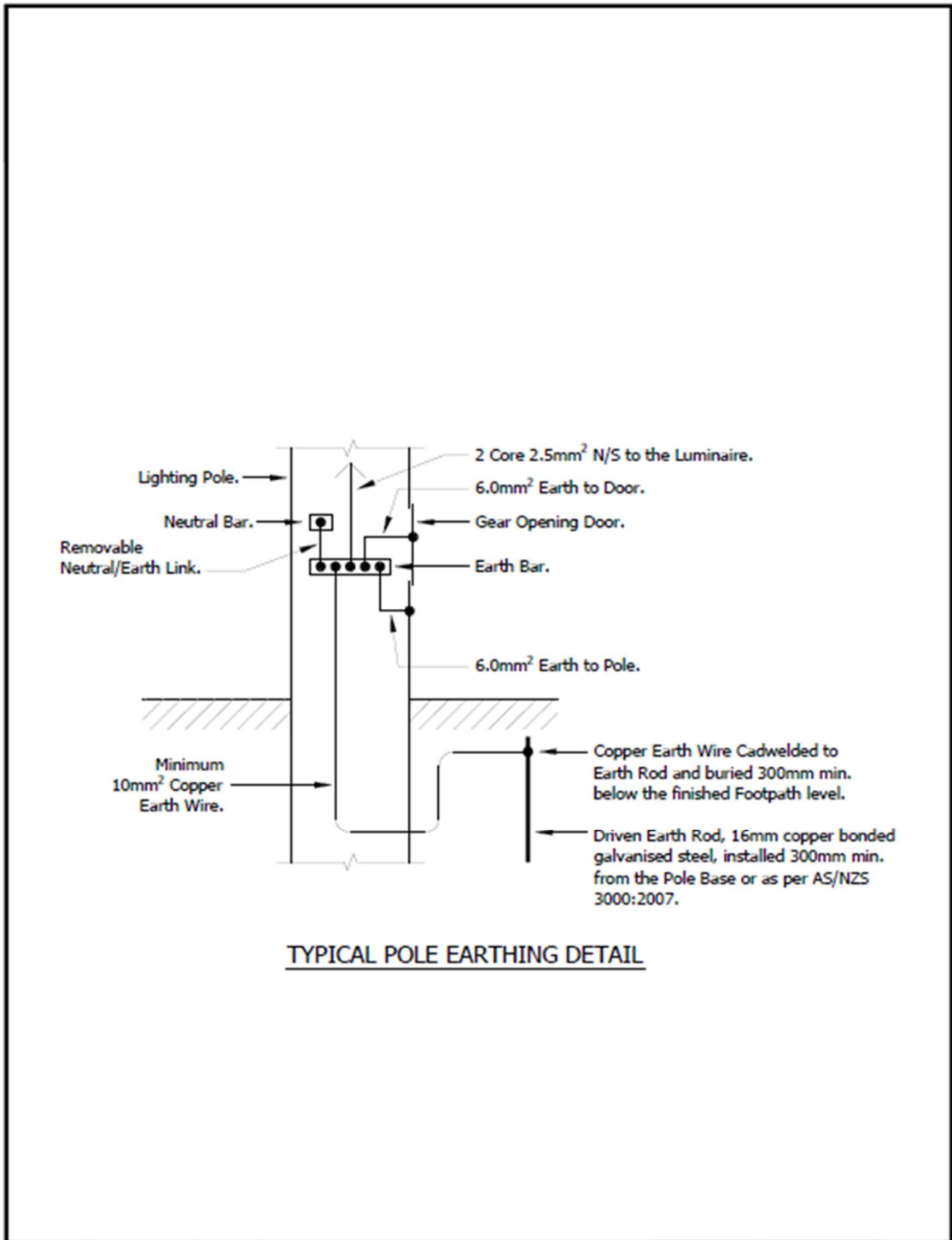


 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaptation of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	STREET LIGHTING - DEMARCATION POINT	SL001
		OCT 2015




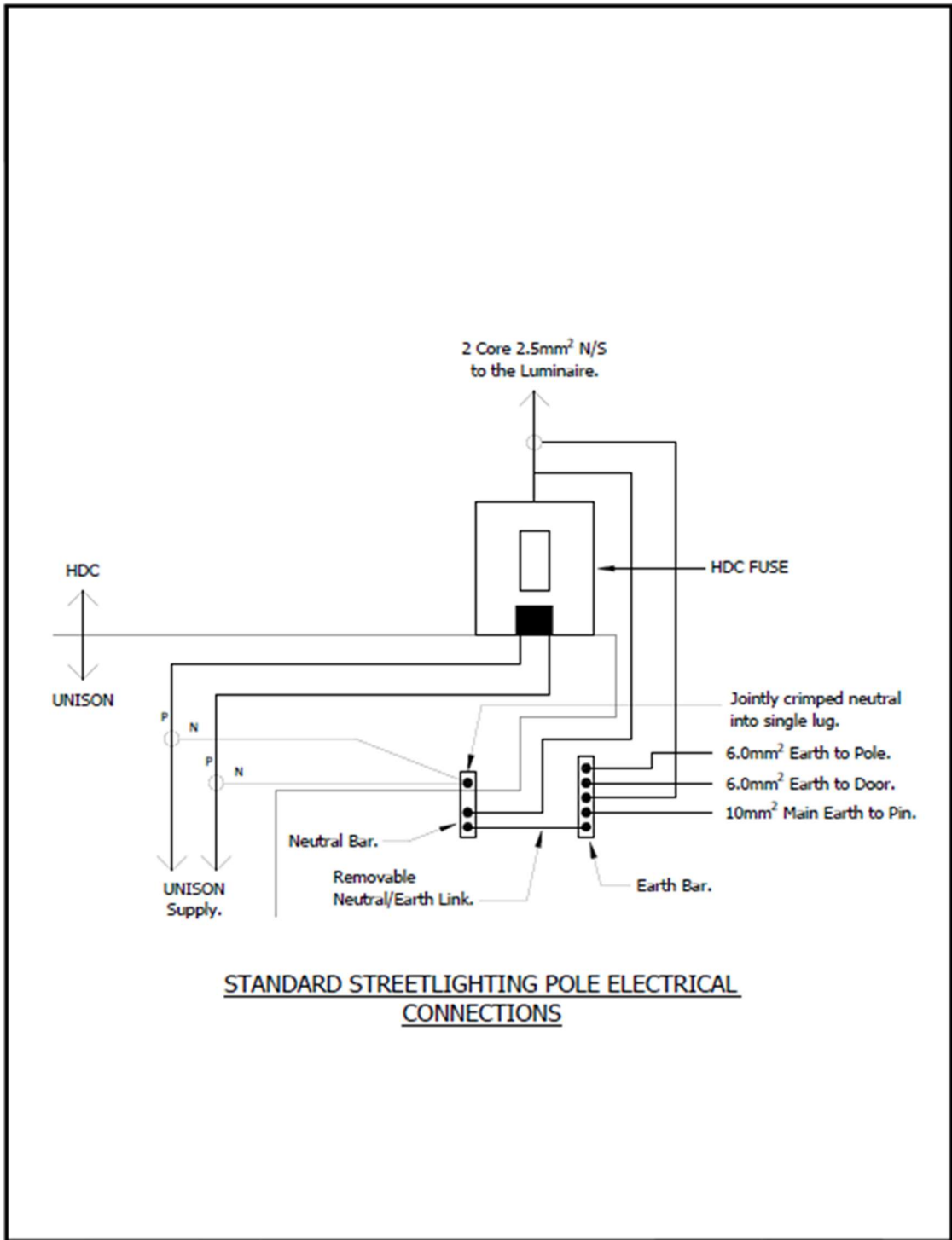


 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaptation of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	TYPICAL SHEAR BASE DETAIL (EXPLODED VIEW) SPEED LIMIT GREATER THAN 70km/hr	SL002
		OCT 2015



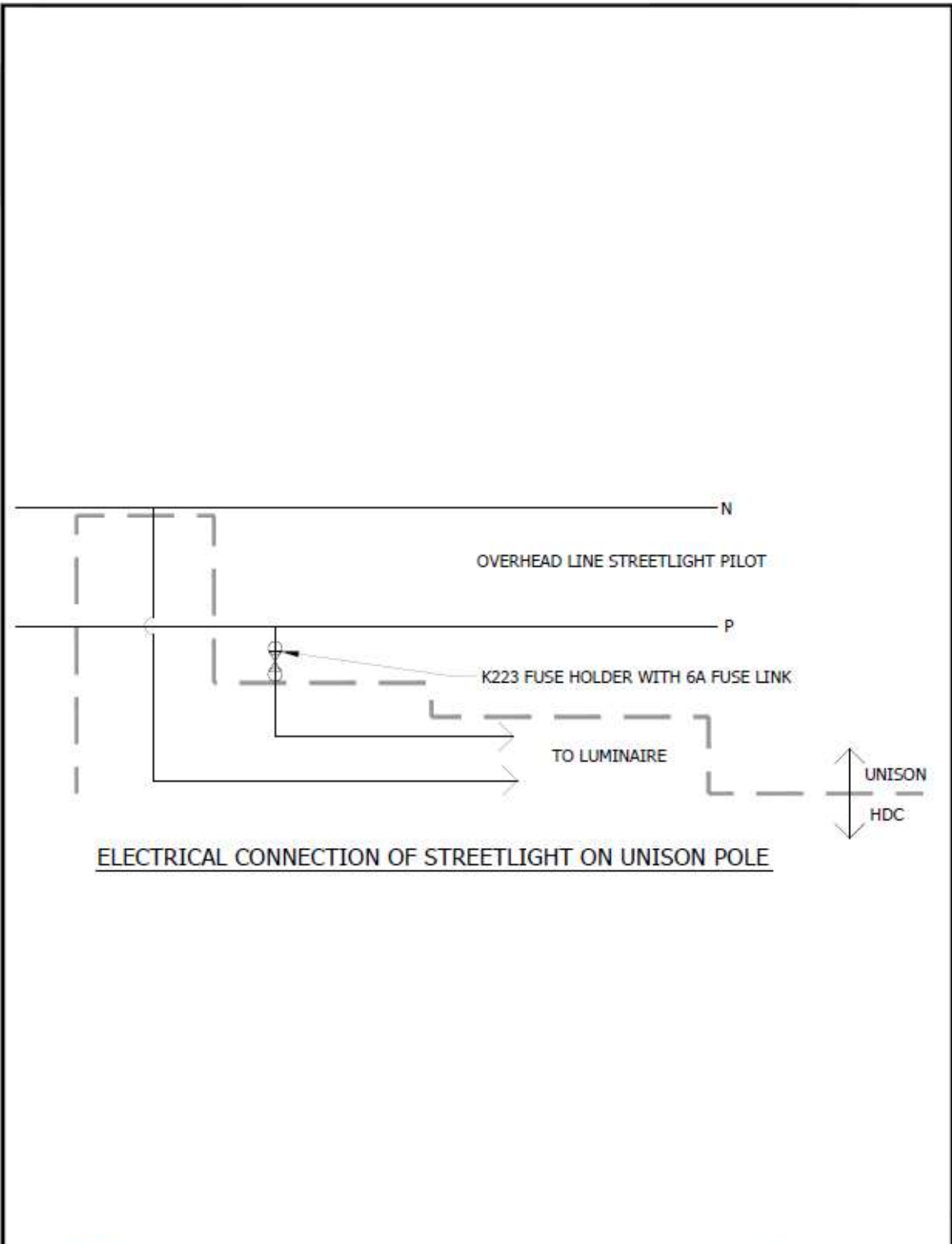
TYPICAL POLE EARTHING DETAIL

 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adoption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	STREET LIGHTING - EARTHING DETAIL	SL003
		OCT 2015



**STANDARD STREETLIGHTING POLE ELECTRICAL  
CONNECTIONS**

 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adoption of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.</p>	HASTINGS DISTRICT COUNCIL	NOT TO SCALE
	STREET LIGHTING ELECTRICAL CONNECTIONS	SL004
		OCT 2015



 <p>© Copyright in this drawing is owned by the Hastings District Council. Any unauthorised copying or adaptation of the whole or substantial part of the work in two or three dimensions is an infringement of copyright.</p>	<b>HASTINGS DISTRICT COUNCIL</b>	<small>SCALE:</small> <b>NOT TO SCALE</b>
	<b>STREET LIGHTING ELECTRICAL CONNECTIONS OF STREETLIGHT ON UNISON POLE</b>	<small>TRIM Ref:</small> <b>SL005</b>
		<small>ISSUED:</small> <b>OCT 2015</b>

