

2010
(Version 1)

Hauraki District Council Engineering Manual



Hauraki District Engineering Manual

Prepared by



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INTRODUCTION

This Engineering Manual has been prepared to set out the required standards for any engineering work undertaken within the Hauraki District Council area.

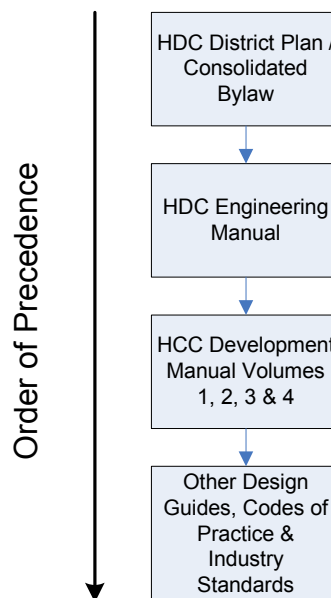
This manual is to be read in conjunction with the Hamilton City Development Manual Volumes 1, 2, 3 & 4 (August 2010).

The manual sets out variances from the existing Hamilton City Development Manual (HCCDM) and/or additional design standards or technical specifications that are required in subdivision and contract works in the district council's area. This Manual has precedence over the HCCDM.

This manual follows the same numbering system used in the HCCDM in order to provide for consistency and ease of use. Not all parts have additional or changed requirements. Where this manual does not make specific requirements the HCCDM requirements apply.

Where there is any discrepancy between this manual and the Council's District Plan or Consolidated Bylaw, then these documents shall have precedence over this manual.

Any ambiguities between documents should be addressed to the District Council.



Alternative designs, materials and construction methods may be considered provided they are based on best practice and all design calculations and supporting documentation are supplied for review. HDC reserves the right to refuse alternative options. Alternative designs may be subject to consideration through the Resource Consent Process.

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VOLUME 1: SUBDIVISION PROCESS

PART 1 - PLANNING

1.0 RELATIONSHIP BETWEEN DISTRICT PLAN AND ENGINEERING MANUAL

This Hauraki District Council Engineering Manual 2010, Version 1, has been incorporated by reference in the Hauraki District Plan.

As such, it sets out the minimum engineering standards to be achieved by Permitted, Controlled and Restricted Discretionary Activities, provides guidance for assessing any Discretionary and Non Complying Activities and provides a trigger point for activity status.

However, as stated in section 8.1.1(5) of the District Plan:

“In some cases adherence to the manual has the potential to result in development that may be bland in character and design. Council wishes to promote innovation and flexibility in the design and servicing of subdivision and development acknowledging that this can lead to subdivisions and developments that are more responsive to the local environment and achieve quality urban design outcomes. Provision is made for developers to depart from the Engineering Manual requirements where it can be demonstrated that required standards of performance will still be met and that the desired environmental outcomes will result.”

This is to be facilitated by providing for application for a Restricted Discretionary Activity resource consent to be made where it is not possible or desirable to comply with the minimum standard set out in the manual as follows (8.1.4(2)):

“Where a permitted or controlled activity cannot comply with any one of the following District Wide Performance Standards (listed in Sections 8.2 – 8.5), then a resource consent as a Restricted Discretionary Activity is required, (unless an alternative activity status is specified in the standard). The matters over which the Council has restricted its discretion are specified within each District Wide Performance Standard (8.2 – 8.5).”

Applications for Discretionary and Non Complying Activities need to address the relevant engineering standards and either show that those set out in the manual are to be complied with, or show how alternatives will achieve the performance standard required and the desired environmental outcomes.

1.2 RESOURCE CONSENT PROCESS

1.2.1 General

Other than amendments to cross lease, company lease or unit titles, to provide for new buildings and additions to existing buildings, all subdivision proposals require a Resource Consent.

The Consents Section of the Planning & Environmental Services Department processes all Resource Consent applications.

1.2.2 – Resource Consent Application

Information required for an application is as follows:

Information to accompany any subdivision application shall be provided as is applicable to the situation, but shall be in accordance with Sections 88 and 92 and the 4th Schedule to the Resource Management Act. In addition, the following information and explanation shall be shown on the subdivision plan, or included in an accompanying report as the case may require.

- Existing and proposed easements
- Existing and proposed amalgamation conditions.
- How the proposed subdivision complies with the subdivision rules and performance standards specified in the District Plan. Where the subdivision does not comply, the manner in which the assessment criteria, objectives and policies are met.
- A plan drawn accurately to a suitable metric scale showing:
 - All the land being subdivided, the legal description and Certificate of Title boundaries of the land and the area and dimensions of all new lots
 - The position of all new boundaries
 - The location and areas of new reserves to be created, including esplanade reserves or esplanade strips to be set aside
 - The location and area of land to vest in Council as road
 - The location and areas of any part of the bed of a river or lake which is required to be shown on a survey plan as land to be vested in the Crown
 - Contours and spot heights to show the general fall of the land and appropriate grade of roads or access.
 - Copies of the current Certificate of Title for the land being subdivided.
 - The nature and standard of existing and proposed network utility services such as roading, sewage disposal, stormwater, land drainage, electricity supply, water supply and telecommunication supply.

- Where services are not available, evidence of how effluent disposal within the boundaries of the lots is to be achieved and how potable water is to be supplied.
- Geotechnical report from a geotechnical engineer (where required)
- Proposed road names (if required)
- Five copies of the subdivision report and five full scale copies of the scheme plan along with a good quality A4 reduction shall be supplied.

Additional full scale copies are required in the following situations:

- | | |
|--|---------|
| • Amalgamation of Lots | 1 extra |
| • Waiver of Esplanade Reserve | 1 extra |
| • Land abutting a Railway or State Highway | 1 extra |

Where the subdivision abuts a railway or State Highway, information on consultation undertaken with the agency responsible for the works and the results of that consultation shall be supplied.

After an application is lodged an initial assessment is carried out and the application is either rejected (under Section 88(3) of the Resource Management Act (RMA), suspended for further information under Section 92 of the RMA or received for processing.

The decision on the need for notification or limited notification is also made at this time.

Figure 1 below shows the processing path for applications that can be dealt with on a non-notified basis.

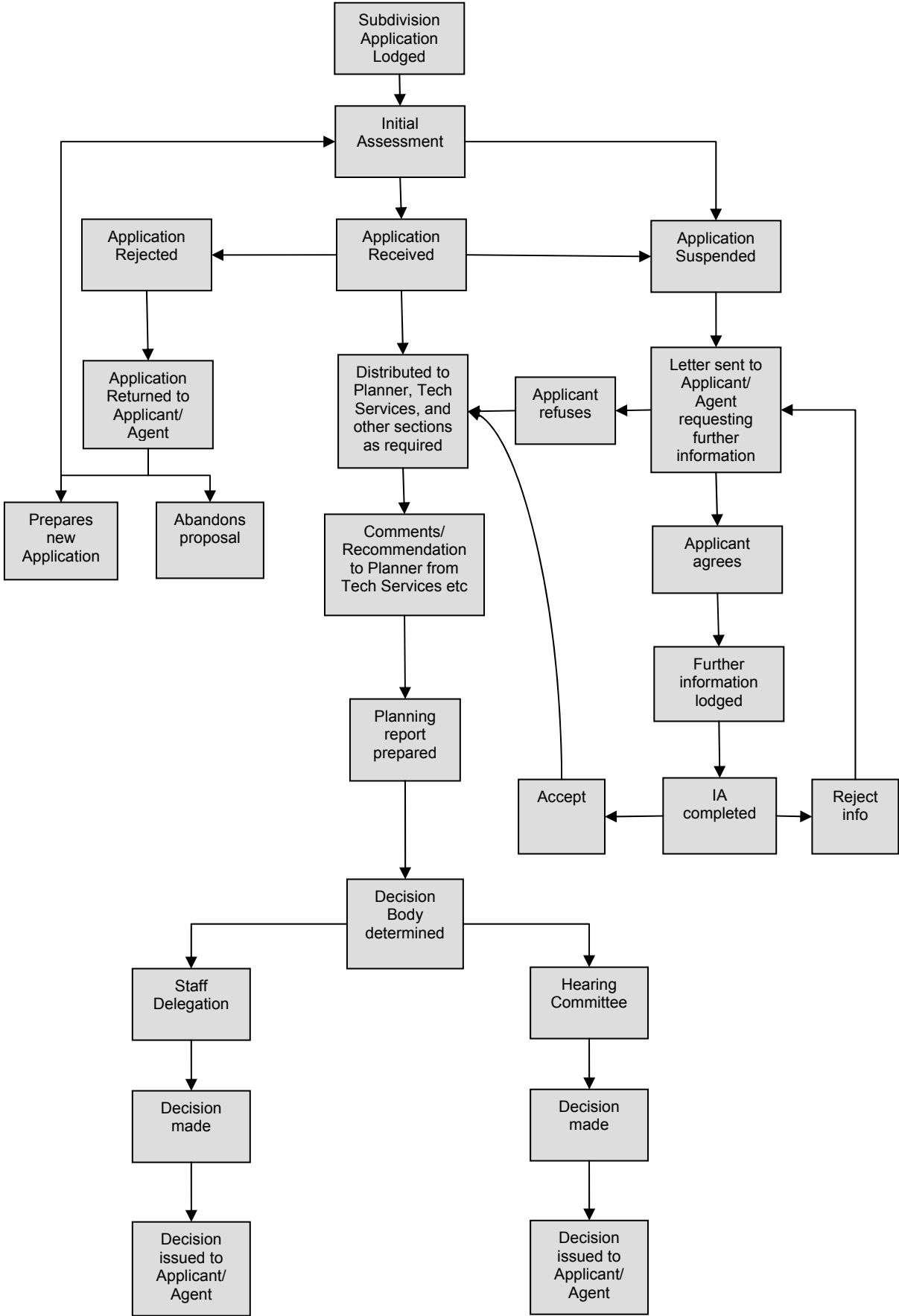


Figure 1: Consent Process

1.3 RELATIONSHIPS BETWEEN DEVELOPER, DEVELOPER'S REPRESENTATIVE AND COUNCIL

Within Hauraki District Council certain responsibilities in respect of subdivision processes are as follows:-

Consents section

- manages the Resource Consent Application process
- co-ordinates the engineering design approval process
- manages the 223 Certification process
- manages the 224(c) Certification process
- manages the issue of other subdivision certificates if required
- manages the Post-Consent processes (the collection (and refund) of any bonds to be held) if required.

Technical Services

- advises Planning Group on appropriate engineering requirements as part of the Consent Application process
- audits the engineering plans
- audits the physical work
- advises the Planning Group of the Practical Completion Certificate as part of the 224(c) certification process.

1.4 POST-CONSENT PROCEDURES

1.4.2 Objections

The Consent holder may object to any or all of the conditions set out in the Consent, provided that notification of such action is lodged with Council within 15 working days from the date of receipt of the Consent.

The process for dealing with an objection to a condition is shown in figure 2

1.4.3 Hearings by Hearing Committee

This Committee is comprised of a number of elected Councillors who have delegated powers to resolve planning issues put before them.

Hearings are generally held by the Committee –

- for major/complex proposals

- for proposals seeking to significantly depart from the rules, objectives and policies
- for proposals/objections recommended for refusal by Planner
- for notified/limited notified applications

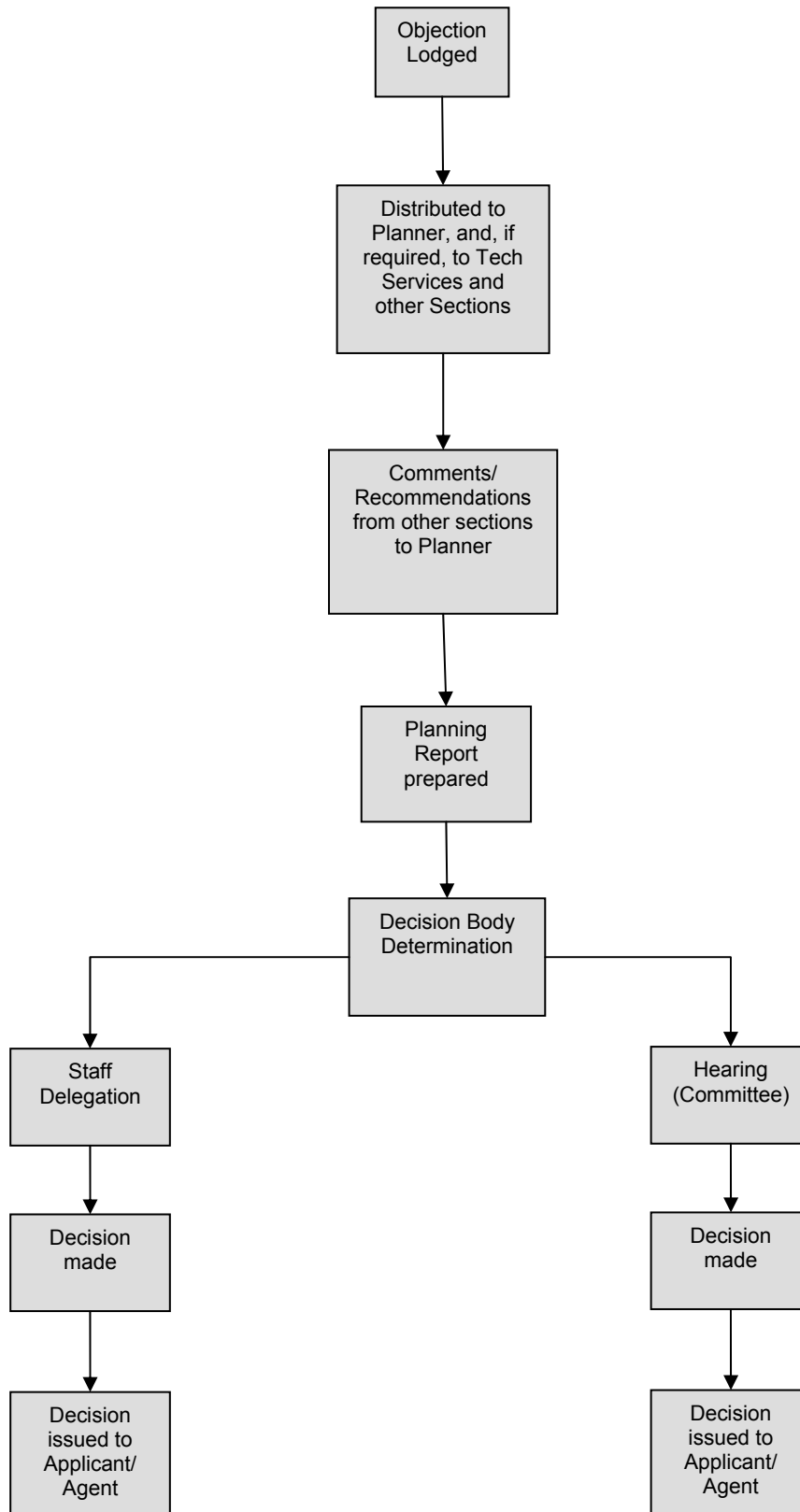


Figure 2: Objection Process

1.4.4 Environment Court

Under Sections 120 and 358 of the Resource Management Act, appeals can be made to the Environment Court against certain decisions or objections. It is recommended that advice should be sought from legal counsel before entering into this procedure.

1.4.5 Financial Contributions/Development Contributions

The District Plan sets out the circumstances under which financial contributions may be payable. Financial Contributions may be in the form of land, works or cash, and are imposed, as condition of resource consent, to mitigate the effects of developments

A development contribution (under the Local Government Act) is a contribution of cash made to Council by a developer towards providing infrastructure to enable growth in the District. Development contributions may be charged by Council upon the submission by a developer of a resource consent, a building consent or a request for a service connection. The Local Government Act (LGA) 2002 makes provision for territorial authorities such as Hauraki District Council to recover the cost of growth related infrastructure.

The required development contribution will be advised as a note on the subdivision consent, which will be accompanied by an invoice for the amount, at the ruling rates at the date that the consent was granted. Where a development contribution is not paid within 30 days of the date of issuing a consent or authorisation, the amount payable shall be that stated in the consent or authorisation, plus an additional finance charge.

The finance charge shall be calculated for each year or part thereof that the contribution remains unpaid from a date 30 days after the issuing of the consent or authorisation. The annual charge shall be calculated by multiplying the contribution amount payable by Council's one year fixed interest borrowing rate as at 1 July in each year, plus a margin of one per cent.

The finance charge shall be compounded annually.

The development contribution is required to be paid before the issue of the 224(c) certificate.

1.4.7 Road Names

The Developer shall submit proposed road names with the Resource Consent application if possible. All names will be assessed using the road naming policy.

Three names for each public or private road being constructed must be forwarded in order of preference to the Council with the application for resource consent. A brief explanation of the reasons for the selection shall also be submitted. The Council's decision on the acceptance of the road name will be notified to the applicant. In general, road names that currently exist in the Hauraki District Council Roading network will not be permitted.

Council will arrange any necessary authority for the regulatory signage and marking. All costs associated with the gazetting and implementation of the traffic services are to be paid by the consent holder.

PART 2 - PHYSICAL WORKS MANAGEMENT

2.3.12 Connection to Existing Services

The Developer shall apply to Council a minimum of 10 working days before a connection can be made to the Council's system.

VOLUME 2: DESIGN GUIDE

PART 1 – GENERAL

1.3 SURVEY BENCH MARKS.

The Developer shall provide for the extension of the town's survey benchmark network to ensure that there is at least one benchmark within 500 metres of any point measured by road centreline.

The benchmark must comprise a brass or stainless steel pin set into a substantial block of concrete (kerb and channel is suitable). The top of the brass or stainless steel pin shall be accurately levelled ($\pm 5\text{mm}$) in relation to Tararu Datum and a drawing showing the location of the benchmark and its reduced level supplied to the Technical Service Manager, Hauraki District Council.

Attention is drawn to the requirement for co-ordination of all features. All co-ordinates are to be presented in New Zealand Transverse Mercator Projection (NZTM2000).

The vertical datum used (either Tararu or Auckland 1946) is to be indicated, however Tararu is preferred.

PART 2: EARTHWORKS AND LAND STABILITY

2.5.1 Preliminary Site Evaluation

a) Drainage

Sub-soil drainage installations within road corridors are not subject to approval under the Building Act 2004 therefore Building Consents are not required.

PART 3 – ROAD WORKS

3.1 INTRODUCTION

This section sets out the general roading standards for the design of roads and private-ways (Right of Ways) within Hauraki District.

Table 3.1 (Urban/ Rural Road and Access Standards for the Hauraki District) of this Manual details minimum road and private access standards adopted by Hauraki District Council.

3.1.2 Exclusion

Hauraki District Council has adopted a departure in roading standards from the standards outlined in the Hamilton City Development manual and Table 3.1 as detailed in the Hauraki DC Addendum for the remote urban settlements of **Waikino, Karangahake and Mackaytown**. These departures are based on the current level of service requirements with the aim to retain the existing constrained character within these settlements.

The following departures in standards adopted are:

- A target minimum seal width of 5m (4m absolute in constrained situations as approved by the HDC Manger of Engineering Services).
- Kerb and channel road edge treatment is not required.
- Provision for parking is not required.
- Foot path installation is not required.
- Minimum clear zone width requirements are to match actual localised operating speeds.
- Minimal clearing of roadside berms is required.
- Entrance control to meet minimum District Plan requirements
- Street Lighting is not required except for the flag lighting of intersections
- Throat island installation at intersections is not required.
- Painted centreline marking is required only where seal widths exceed 5m.
- Road edge delineation using marker posts shall be installed.
- All horizontal and vertical alignment shall meet minimum AustRoads geometric requirements.

Refer to Table 3.2: Urban Road Standards for the Settlements of Waikino, Karangahake and Mackaytown.

Refer to Table 3.3: Existing General District Urban (Town) Road Standards detailing individual town road target standards.

Current practice design standards adopted by Council are:

- “Rural Road Design - A Guide to the Geometric Design of Rural Roads” - Austroads (AP-G1/03)
- “Intersections at Grade” - Austroads Guide to Traffic Engineering Practice – Part 5 (AP-G11.5/05)
- National Code of Practice for Utilities’ Access to Transport Corridors 2010

3.2 ROAD CLASSIFICATION

The Hauraki District Council Road Hierarchy Classification, as described in the Hauraki District Council Land Transport Asset Management plan, is:

- a) Rural**
 - State Highways
 - Arterial
 - Collector
 - Local

- b) Urban**
 - State Highways
 - Arterial
 - Collector
 - Industrial
 - Town Centre
 - Local

3.4 PARKING

3.4.1 General

Refer to standard drawing HDC 307 for parking standard.

3.5 ROAD, CARRIAGEWAY AND FORMATION WIDTHS

3.5.2 Carriageway Parking

Carriageway widths shall not be less than those shown in Table 3.1 (HDC version).

3.6 ROAD GEOMETRY

3.6.1 Road Alignment

Geometric design for rural roads, including gradients, super elevation and road widening shall be in accordance with the Austroads publication "Guide to Geometric Design for Rural Roads".

3.6.2 Visibility Requirement

a) Intersection Spacings

The location of intersections shall be chosen to ensure adequate spacing and sight distance is available for all vehicle movements.

Intersection design shall be in accordance with Austroads "Intersections at Grade" (Part 5). Safe Intersection Sight Distance (SISD) shall be provided at any intersection, in accordance with Table 6.3 (AustRoads).

b) Road/ rail Crossings

Where a railway and a road intersect on the same level, no building or other obstruction which may block the sight lines shall be permitted within an area bounded by lines connecting points 37m along the roadway in each direction from the centreline of the nearest railway track to points 135m along the nearest railway track measured in each direction from the centreline of the nearest roadway.

Subject to agreement with the relevant controlling authority and subject to conditions as may be agreed, the Council may agree to waive or vary this requirement, through the Resource Consent Process, if in its opinion the requirements would be unreasonable or inappropriate in the particular circumstances.

3.6.6 Cul de sac heads

Turning heads will be required at the end of all no-exit rural roads in accordance with Austroads Rural Road Design.

3.7 ROAD PAVEMENT

3.7.7 Concrete Block Paving

Hauraki DC will not accept gobi block pavement treatment without an approved storm water surface runoff design.

3.9 FOOTPATHS

3.9.2 Footpath Width

Hauraki DC has adopted a 1.4m minimum footpath width.

3.9.3 Concrete Footpaths

On the Hauraki Plains (particularly Ngatea) the footpath concrete depth shall be increased to 150mm. The granular bedding depth shall increase to 100mm. All foot paths in the Plains shall be reinforced with 665 mesh with 30mm minimum cover to all steel. Steel to be located in the tension zone.

Footpaths must match evenly into formed private entrance drop down aprons.

Council, at their discretion, may allow decorative foot path designs on larger scale residential subdivision. These decorative designs shall be submitted for approval by the Engineering Services Manager

3.9.7 Non - Concrete Footpaths/ Walkways

The Engineering Services Manager may approve alternative footpath surfacing to the same minimum standard.

3.11 VEHICLE CROSSINGS

The five different vehicular entrance types connecting private access-ways with the district roads are:

- Class A: Standard Articulated Vehicle Crossing in the Rural Area (refer to diagram HDC 301).
- Class B: Standard Rural Vehicle Crossing for all activities that do not require a Class A entrance nor are residential activities in the Rural Area (refer to diagram HDC 302).
- Class C: Standard Vehicle Crossing for residential activities in Rural Area, Low Density Residential, Reserve (Active) and Reserve (Passive) zones (refer to diagram HDC 303).

- Class D: Standard Commercial / Industrial Vehicle Entrance for non residential activities in the Urban Area (refer to diagram TS 306 – HCCDM)
- Class E: Standard Residential Vehicle Entrance for residential activities in the Urban Area (excluding the Low Density Residential and Reserve (Active) zones (refer to diagram TS 306 - HCCDM).

Sight line requirements from individual entrances onto adjoining roads shall be in accordance with the following table and Diagram HDC304:

| Speed Environment (km/h) | From a vehicle entrance generating up to and including 40 vehicle movements per day | From a vehicle entrance generating more than 40 vehicle movements per day | |
|--------------------------|---|---|-------------|
| | | Rural Areas | Urban Areas |
| 40 | 40m | 70m | 60m |
| 50 | 60m | 90m | 80m |
| 60 | 80m | 115m | 105m |
| 70 | 100m | 140m | 130m |
| 80 | 130m | 175m | 165m |
| 90 | 160m | 210m | |
| 100 | 200m | 250m | |
| 110 | 240m | 290m | |
| 120 | | 330m | |

Table 3.4: Minimum Sight Lines from Access

Entrance separation requirements shall be in accordance with:

- Diagram HDC 305: Vehicle Access-way Separation Diagram ≤ 50 km/h
- Diagram HDC 306: Vehicle Access-way Separation Diagram > 50 km/h

Vehicular entrances onto State Highways will require NZTA approval for location and design.

The maximum 'roll over' difference in grades at the junction of an entrance with a road is 1 in 7 (14%).

3.12 BERMS

The installation of rocks and stones as an amenity feature within the road berm requires the approval of the Engineering Services Manager.

3.16 INTERNAL ACCESS

Hauraki DC internal access standards are detailed in the following Tables:

- Table 3.1 (HDC): Urban/ Rural Road and Access Standards for the Hauraki District
- Table 3.2 (HDC): Urban Road and Access Standards for the settlements of Waikino, Karangahake and Mackaytown

Pavement edge treatments other than kerb and channel, shall be the appropriate of the following:

- Low side of the cross-fall:
 - Hand formed shallow dished drain
 - Timber edging adjacent for sealed pavements. A sub soil drain shall be installed in the berm where impermeable soils are encountered
 - 3 to 1 metalled feather edge slope with the water channel invert 100mm below the upper pavement layer
- High side of the cross-fall:
 - Timber edging adjacent for sealed pavements. A sub soil drain shall be installed in the berm where impermeable soils are encountered
- Pavement design shall be in accordance with Volume 2 Part 3, clause 3.16

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APPENDICES TO PART 3 – ROAD WORKS

HAURAKI DISTRICT ROAD AND ACCESS STANDARDS

Table 3.1 Urban / Rural Road and Access Standards for the Hauraki District Council

Table 3.2 Urban Road and Access Standards for the Settlements of Waikino, Karangahake and Mackaytown

DISTRICT ROADING STANDARD DRAWINGS

- HDC301 Class A: Standard Articulated Vehicle Crossing in the Rural Area
- HDC302 Class B: Standard Rural Vehicle Crossing for all activities that do not require a Class A Crossing nor are residential activities in the Rural Area
- HDC303 Class C: Standard Vehicle Crossing for residential activities in Rural Area, Low Density Residential, Reserve (Active) and Reserve (Passive) zones
- HDC304 Minimum Access Sight Line Requirements
- HDC305 Urban Vehicle Accessway Separation Diagram ≤ 50 km/h
- HDC306 Rural Vehicle Accessway Separation Diagram > 50 km/h
- HDC307 Car Manoeuvring and Parking Dimensions

ADDITIONS TO STANDARD HCCDM DRAWINGS

TS 311 : A two coat seal surfacing treatment can be adopted if the existing pavement has a chip coat seal (A 200mm minimum seal overlap)

TS 336/ 372 : An approved PVC rail system can alternatively be used instead of metal piping

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TABLE 3.1: Urban/ Rural Road and Access Standards for the Hauraki District
Urban Areas¹

(fred#441009)

| Road Classification | | Lots / Dwellings served | Maximum Length (m) ² | Legal Road Width (m) | Widths (m) ¹¹ | | | | | Minimum Total Seal Width ¹¹ (m) | Foot Path | Maximum Gradient ^{4,5} | Minimum Kerb Radius (m) | Pavement Marking Treatment | Pavement Surfacing | Amenity Treatment |
|---------------------|---------------------------------|-------------------------|---------------------------------|----------------------|---------------------------------|---------------------|----------------------|----------------------|-----------------------------|---|-----------|---|---------------------------|---------------------------------------|--------------------|-------------------|
| Hierarchy | Description | | | | Lane Details | Service strip (min) | Sealed Shoulder | Parking | Total Seal Width | | | | | | | |
| Internal Accessways | Residential | Access leg | 1 | 3.5 | 1 x 2.8 2 x 2.4 | 2 x 0.35 2 x 0.6 | 2.8 4.8 | 2.8 4.8 | 1 x 1.4 ⁶ | 12.5% Standard 12.5 - 20% Specific Design | R=6m | Concrete/ AC/ 2 coat seal ⁷ | Refer to relevant section | | | |
| | | Internal Access | 2 to 4 5 to 8 | | | | | | | | | | | 60 100 | | |
| | Low Density Residential | Access leg | 1 | 6 | 1 x 2.8 ³ 2 x 2.4 | 2 x 0.35 2 x 0.6 | 2.8 4.8 | 2.8 4.8 | R=6m | | | | | | | |
| | | Internal Access | 2 to 3 4 to 8 | | | | | | | 200 | | | | | | |
| | Industrial Township/Town Centre | Internal Access | 1 to 2 | 50 30 | 6 3.5 | 1 x 3.5 1 x 2.8 | 2 x 1.25 2 x 0.35 | 3.5 2.8 | 3.5 2.8 | 5% | | | | | | |
| Public Roads | Roads | Service lane | | 10 | 2 x 3.0 | Nil | Nil | 6 | 6 | Nil | 10% | R=12m | Centreline only | 2 Coat seal | | |
| | | Cul de sac (no exit) | | 15 | | | | | | | | | | | | |
| | | Local | | | 20 | 2 x 3.5 | Nil | 2 x parallel parking | 12 | 12 | 2 x 1.4m | 5% | R=15m | Centreline and edge lines | A/C | |
| | | Industrial (local road) | | | | | Nil | 2 x parallel parking | 12 (plus for angle parking) | 12 | 8 | 10% | R=20m | 2 Coat seal/ (A/C to reduce noise) | | |
| | | Town Centre | | | | | 2 x 2.5 parking | 12 | 11 | 8% | | | | | | |
| | | Collector | | | | | | | | | | | | | | |

Rural Areas¹

| Road Classification | | Lots / Dwellings served | Traffic Volume (ADT) | Maximum Length (m) | Minimum Legal Road or Accessway Width (m) | Widths (m) ¹¹ | | | | | Alignment | | | | Feather Edge Pavement Slope (width) | Sealing the High Side of Horizontal Curves ¹² | Clear zone Requirements ⁸ | Turning Facility (No exit roads) | Pavement Marking Treatment | Delineation | Pavement Surfacing | | | | | | | | |
|---------------------|-----------------|-------------------------|----------------------|--------------------|---|--------------------------|----------------------|--------------------|--------------------|--|---|--------------------------|---------------------------------|-------------------------|-------------------------------------|--|--------------------------------------|----------------------------------|----------------------------|---------------------------|--------------------|---|-----|----|------------------|---------------|-----|---------------------------|--|
| Hierarchy | Description | | | | | Formation Width | Lane Details | Sealed Shoulder | Total Seal Width | Minimum Total Seal Width ¹¹ (m) | Minimum horizontal Radius (m) | HCV Tracking Widening | Maximum Gradient ^{4,5} | Maximum Super-elevation | | | | | | | | | | | | | | | |
| Internal Accessways | Access leg | 1 | | 500 | 6 | 2.8 | 1 x 2.8 ³ | 2.8 ^{4,9} | 2.8 ^{4,9} | Yes | 12.5% Standard 12.5 - 20% Specific Design | 2 coat seal ⁹ | | | | | | | | | | | | | | | | | |
| | Internal Access | 2 to 3 4 to 5 | 1000 | | | | | | | | | | 9 | 4.8 | 2 x 2.4 | 4.8 ^{4,9} | | | | | | | | | | | | | |
| Public Roads | Local Road | < 300 | | 20 | 15 | 10 | 2 x 2.5 | 2 x 0.5 | 6 | 5 | 15 | Yes | 12.50% | 10% | 4 to 1 (2.0m) | Yes (0.5m) | Yes | Painted Centreline | Edge marker posts only | 2 coat seal ¹⁰ | | | | | | | | | |
| | Collector Road | 300 to 700 | | | | | | | | | | | | | | | | | | | 12 | 7 | 6.5 | 20 | 5 to 1 (2.5m) | Yes (1.0m) | Yes | Centreline and edge lines | Edge marker posts and centreline raised pavement markers |
| | | 700 to 1000 | | | | | | | | | | | | | | | | | | | 13 | 8 | | | | | | | |
| | | 1000 to 2500 | | | | | | | | | | | | | | | | | | | 14 | 9 | | | | | | | |
| Arterial Road | > 2500 | | 16 | 2 x 3.5 | 2 x 1.5 | 10 | 7.5 | 25 | 8% | 8% | 6 to 1 (3.0m) | | | | | | | | | | | | | | | | | | |

NOTES

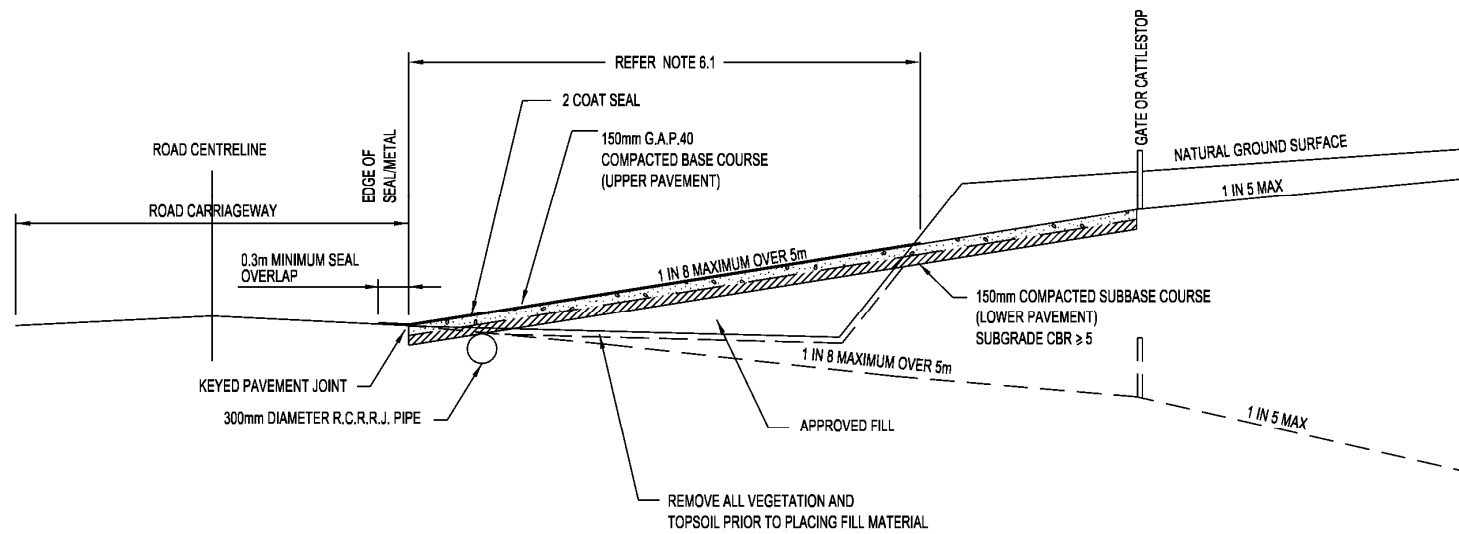
- These standards exclude Karangahake, Mackaytown & Waikino. The specific requirements for these towns are addressed in Volume 2 Part 3 & Table 3.2
- Traffic calming measures are required where the length exceeds 50 m or there is no clear line of sight. Design to be approved by the HDC Engineering Service Manager.
- Passing lane are required at 100m maximum spacings or at appropriate locations not exceeding 50 m where there is no clear line of sight.
- Where accessway gradients exceed 12.5%, specifically approved surfacing is required.
- The first 5m of the entrance shall have a maximum gradient of 12.5% (1 in 8).
- A pedestrian strip 1.4m wide shall be incorporated for pedestrian access. Concrete surfacing is acceptable, however, alternative surface treatments may be utilised with specific approval of the HDC Engineering Services Manager. These must minimally be to the same standard.
- Alternative pavement and surfacing designs can be considered with specific approval of the Council through the Resource Consent process
- Refer to NZTA Draft State Highway Geometric Design manual for details (clear zone recovery widths are based on 85%ile design speeds).
- This is required for the first 20m only (where off a sealed road) to prevent tracking of metal onto the road
- Some local roads may be metalled with the specific approval of the Council through the Resource Consent process
- Dispensations for a reduction in seal width below the target requirement must be approved by the Council through the Resource Consent process
- Sealing of the high side of a horizontal curve on a local road is optional. Should it be sealed then the minimum width is 0.3m.

TABLE 3.2: Urban Road and Access Standards for the Settlements of Waikino, Karangahake and Mackaytown

| | Road Classification | | Lots / Dwellings served | Maximum Length (m) ¹ | Legal Road Width (m) ¹¹ | Minimum Width (m) | | | Foot Path | Alignment | | | | Minimum Feather Edge Pavement Slope (width) | Sealing the High Side of Horizontal Curves | Clear zone Requirements (m) | Turning Facility (No exit roads) | Centreline Pavement Marking Treatment ⁷ | Road Edge Delineation | Centreline Raised Pavement Markers | No Passing Lines | Street Lighting | Kerb and channel urbanising ⁶ | Pavement Surfacing |
|----------------------|---------------------|----------------------|-------------------------|---------------------------------|------------------------------------|-------------------|---------------|----------------|----------------------|-------------------------------|-----------------------|----------------------------------|-------------------------|---|--|-----------------------------|----------------------------------|--|-----------------------|------------------------------------|------------------|-------------------------------|--|---------------------------|
| | Hierarchy | Description | | | | Lane Details | Service strip | Seal Width | | Minimum horizontal Radius (m) | HCV Tracking Widening | Maximum Gradient ^{4, 5} | Maximum Super-elevation | | | | | | | | | | | |
| Internal Access-ways | Residential | Access leg | 1 | | 3.5 | | | | | | | 12.5% Standard | | | | | | | | | | | 2 coat seal ^{8, 9} | |
| | | Accessway | 2 to 4 | 60 | | 1 x 2.8 | 2 x 0.35 | 2.8 | | | Yes | 12.5 - 20% Specific Design | | | | | | | | | | | | |
| | | | 5 to 8 | 100 | 9 | 2 x 2.4 | 2 x 0.6 | 4.8 | 1 x 1.4 ³ | | | | | | | | | | | | | | | |
| Public Roads | Roads | Cul de sac (no exit) | | | 15 | 2 x 2.5 | | 5 ² | | | Yes | 12.5% | 10% | 4 to 1 (1.6m) ¹³ | | 2 | Yes | | | | | Intersection flag lights only | No (Possibly considered in constrained situations) | 2 coat seal ¹⁰ |
| | | Local | | | | | | | | | | | | | | | | | | | | | | |
| | | Collector | | | 20 | 2 x 3.0 | | 6 | | | | | | 4 to 1 (2.0m) | Yes (0.5m) | | | Yes | Marker posts only | | | | | |

NOTES

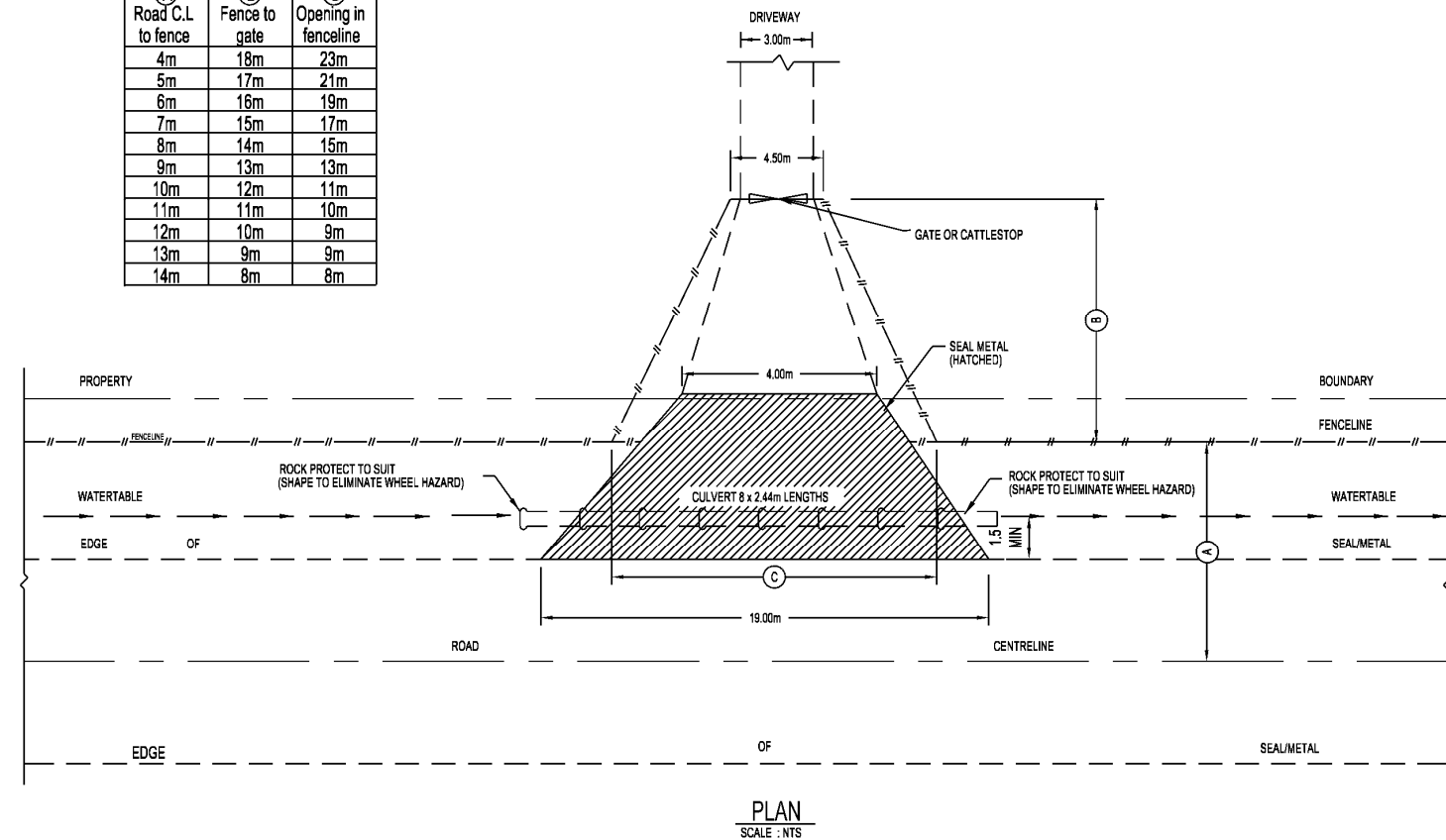
- 1 Traffic calming measures are required where the length exceeds 50 m or there is no clear line of sight. Design to be approved by the HDC Manager of Engineering Services.
- 2 A minimum seal width of 4.4m is acceptable in constrained topographical situations with specific approval from the Council through the Resource Consent Process
- 3 A pedestrian strip 1.4m wide shall be incorporated for pedestrian access. Concrete surfacing is acceptable, however, alternative surface treatments may be utilised with specific approval of the Council through the Resource Consent process.
- 4 Where accessway gradients exceed 12.5%, specifically approved surfacing is required.
- 5 The first 5m of the entrance shall have a maximum gradient of 12.5% (1 in 8).
- 6 Throat island installations not required
- 7 No painted centreline marking is required for seal widths less than 5.0m
- 8 Alternative pavement and surfacing designs can be considered with specific approval of the Council through the Resource Consent process. These must be minimally to the same standard.
- 9 This is required for the first 20 m only (where off a sealed road) to prevent tracking of metal onto the road
- 10 Some local roads may be metalled with the specific approval of the Council through the Resource Consent process
- 11 There are a number of existing roads with legal road widths of 10m and 15m. These widths will be retained. The legal road width shown in Table 3.2 refers to any future roading development.
- 12 Sealing of the high side of a horizontal curve on a cul de sac or local road is optional. Should it be sealed then the minimum width is 0.3m.
- 13 A 3 to 1 feather edge pavement slope may be utilised with the specific approval of the Council through the Resource Consent process



VEHICLE CROSSING LONGSECTION
SCALE: NTS

GATE & FENCE SETOUT TABLE

| (A) Road C.L to fence | (B) Fence to gate | (C) Opening in fenceline |
|-----------------------------|-------------------------|--------------------------------|
| 4m | 18m | 23m |
| 5m | 17m | 21m |
| 6m | 16m | 19m |
| 7m | 15m | 17m |
| 8m | 14m | 15m |
| 9m | 13m | 13m |
| 10m | 12m | 11m |
| 11m | 11m | 10m |
| 12m | 10m | 9m |
| 13m | 9m | 9m |
| 14m | 8m | 8m |



PLAN
SCALE: NTS

NOTES:

- 1.0 GENERAL:
 - 1.1 All works shall be constructed in accordance with the following notes and to the satisfaction of the Engineering Services Manager or his representative. Additional requirements to those shown on this drawing may be necessary for a particular location and will be determined on site.
 - 1.2 Any work undertaken in the road reserve will require a street opening permit and traffic management plan to be submitted for approval 10 working days before work commences. Any enquiries regarding this procedure may be directed to the Business Unit Administrator, on 07-862 8609.
 - 1.3 The construction of the vehicle entrances will require a vehicle crossing permit. Please contact the Business Unit Administrator, on 07-862 8609 to proceed with the application of the permit 5 working days before commencement of any work on the entrances.
 - 1.4 The constructor shall be responsible for road works signage while undertaking work on the road carriageway. All signage shall be in accordance with NZTA handbook for Temporary Traffic Control And Safety At Roadworks sites.
 - 1.5 The constructor shall be responsible for the cost of repairs to any Underground Utility Service damaged during construction. Any damage shall be rectified to the satisfaction of the relevant Asset Manager.
 - 1.6 A Class A Vehicle Crossing is deemed to be adequate to accommodate a 10m long vehicle with a maximum radius of 9.0m.
- 2.0 LOCATION:
 - 2.1 Entrance locations shall be where approved by HDC or NZTA if located on a State Highway.
 - 2.2 Minimum entrance sight distances are:

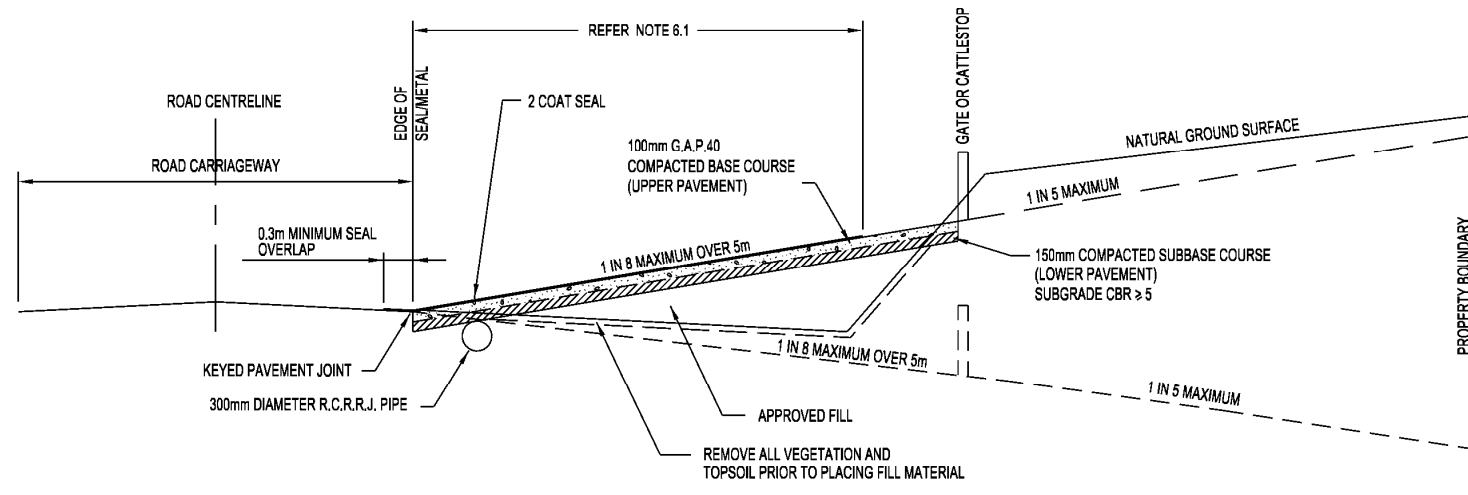
| Speed Environment (km/h) | From vehicle entrance generating up to and including 40 vehicle movements per day | From vehicle entrance generating more than 40 vehicle movements per day |
|--------------------------|---|---|
| 40 | 40m | 70m |
| 50 | 60m | 90m |
| 60 | 80m | 115m |
| 70 | 100m | 140m |
| 80 | 130m | 175m |
| 90 | 160m | 210m |
| 100 | 200m | 250m |
| 110 | 240m | 290m |
| 120 | | 330m |

- 2.3 Refer to HDC DM diagram HDC 306 for rural accessway minimum entrance separation distances.
- 3.0 CULVERT:
 - 3.1 If an entrance crosses a Council drain the Contractor shall obtain written approval with culvert sizing from the Hauraki District Council Drainage Asset Manager prior to commencement of construction.
 - 3.2 If an entrance crosses a natural watercourse a resource consent may be required from the Waikato Regional Council (Environment Waikato).
 - 3.3 If an entrance crosses a small drain, watercourse or water table a culvert shall be installed.
 - 3.4 If the entrance crosses a watertable or small drain (less than 2m wide by 1m deep) A 300mm diameter minimum Reinforced Concrete Rubber Ring Joint (RCRRJ) Class 4 or its equivalent pipe shall be installed. Concrete capping is required where cover <0.25m.
 - 3.5 Any unsuitable bedding material including vegetation, topsoil and peat shall be removed and replaced with 100mm pit sand or G.A.P. 40 or its equivalent if required.
 - 3.6 All culverts shall be laid straight at a constant grade between 1.5 and 8.5m from the pavement edge. Socket end shall always be uphill.
- 4.0 LOWER PAVEMENT:
 - 4.1 150mm nominal depth approved GAP 65 subbase course. Additional undercut and backfill as required where soft spots occur. Reduce the depth to 80mm and backfill with GAP 40 if concrete surfacing is adopted.
 - 4.2 Alternative subbase materials can be used (quarry strippings/brownrock) with pavement design approval by the HDC Engineering Services Manager.
 - 4.3 The subbase course depth shall be increased from 80mm to 150mm within the Hauraki Plains where concrete surfacing is proposed.
 - 4.4 Full depth pavement to extend to gate/cattle stop.
- 5.0 UPPER PAVEMENT:
 - 5.1 150mm nominal depth approved GAP 40 base course constructed above the subbase course layer where a sealed/AC surface is proposed.
 - 5.2 No base course installation is required if a concrete entrance is proposed. A minimum 150mm concrete depth is required.
- 6.0 SURFACING:
 - 6.1 A chip sealed pavement shall adopt a Grade 3 and 5 two coat seal.
 - 6.2 A minimum of a prime coat seal is required if AC surfacing is proposed.
 - 6.3 Within the Hauraki Plains all concrete surfaced entrances shall be reinforced with 665 mesh, adopting 30mm cover, within the tension zone.
 - 6.4 The surfacing shall extend the lesser of the distance to the property boundary or 5m from the edge of seal.
 - 6.5 No additional surfacing (sealing) over the base course material is required, if the entrance is off a metal road.

**CLASS A: STANDARD ARTICULATED VEHICLE CROSSING
IN RURAL AREA**

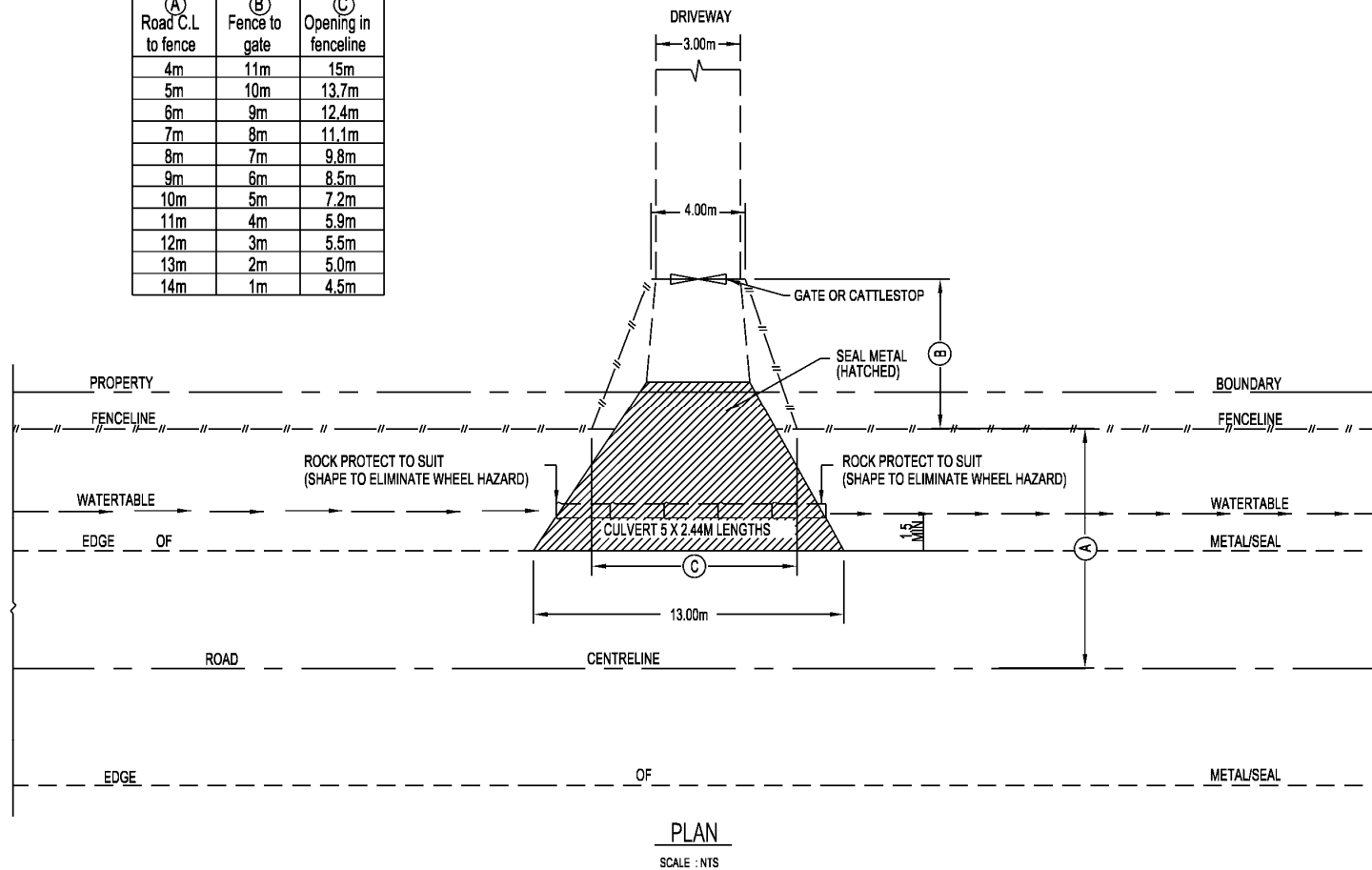
HAURAKI DISTRICT COUNCIL

HDC - 301



GATE & FENCE SETOUT TABLE

| (A) Road C.L. to fence | (B) Fence to gate | (C) Opening in fenceline |
|------------------------|-------------------|--------------------------|
| 4m | 11m | 15m |
| 5m | 10m | 13.7m |
| 6m | 9m | 12.4m |
| 7m | 8m | 11.1m |
| 8m | 7m | 9.8m |
| 9m | 6m | 8.5m |
| 10m | 5m | 7.2m |
| 11m | 4m | 5.9m |
| 12m | 3m | 5.5m |
| 13m | 2m | 5.0m |
| 14m | 1m | 4.5m |



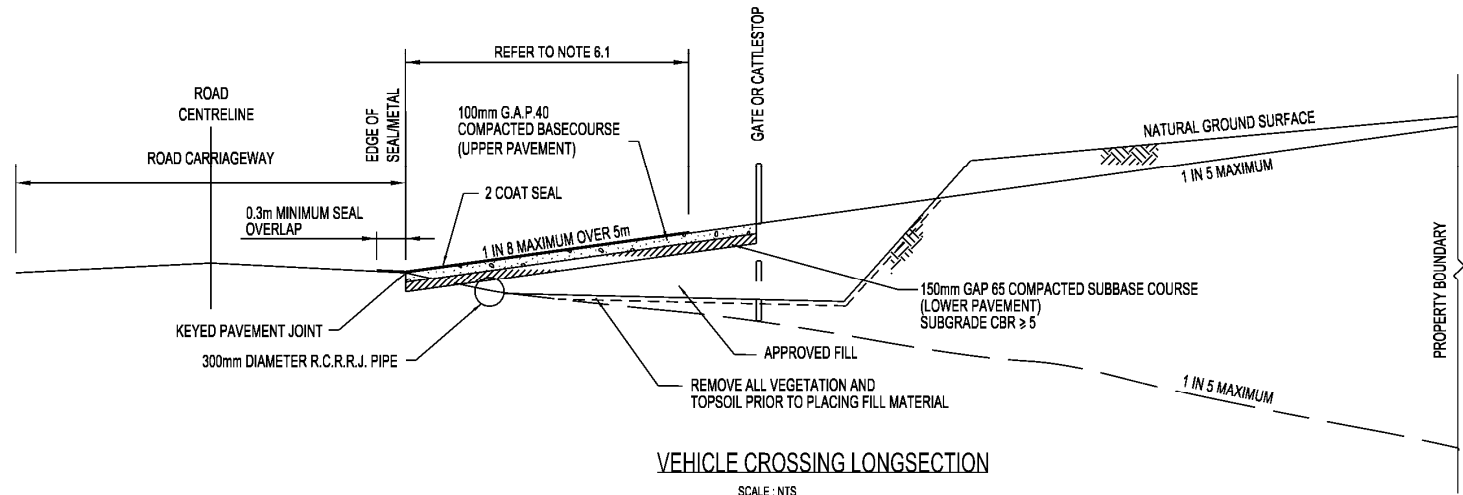
NOTES:

- 1.0 GENERAL:**
- All works shall be constructed in accordance with the following notes and to the satisfaction of the Engineering Services Manager or his representative. Additional requirements to those shown on this drawing may be necessary for a particular location and will be determined on site.
 - Any work undertaken in the road reserve will require a street opening permit and traffic management plan to be submitted for approval 10 working days before work commences. Any enquiries regarding this procedure may be directed to the Business Unit Administrator, on 07-862 8609.
 - Vehicle entrances construction will require a vehicle crossing permit. Please contact the Business Unit Administrator, on 07-862 8609, to proceed with the application of the permit 5 working days before commencement of any work on the entrances.
 - The constructor shall be responsible for road works signage while undertaking work on the road carriageway. All signage shall be in accordance with NZTA handbook for Temporary Traffic Control And Safety At Roadworks sites.
 - The constructor shall be responsible for the cost of repairs to any Underground Utility Service damaged during construction. Any damage shall be rectified to the satisfaction of the relevant Asset Manager.
 - A Class B Vehicle Crossing is deemed to be adequate to accommodate a 10m long vehicle with a maximum radius of 9.0m.
- 2.0 LOCATION:**
- Entrance locations shall be where approved by HDC or NZTA if located on a State Highway.
 - Minimum entrance sight distances are:
- | Speed Environment (km/h) | From vehicle entrance generating up to and including 40 vehicle movements per day | From vehicle entrance generating more than 40 vehicle movements per day |
|--------------------------|---|---|
| 40 | 40m | 70m |
| 50 | 60m | 90m |
| 60 | 80m | 115m |
| 70 | 100m | 140m |
| 80 | 130m | 175m |
| 90 | 160m | 210m |
| 100 | 200m | 250m |
| 110 | 240m | 290m |
| 120 | | 330m |
- Refer to HDC DM diagram HDC 306 for rural accessway minimum entrance separation distances.
- 3.0 CULVERT:**
- If an entrance crosses a Council drain the Contractor shall obtain written approval with culvert sizing from the Hauraki District Council Drainage Asset Manager prior to commencement of construction.
 - If an entrance crosses a natural watercourse a resource consent may be required from the Waikato Regional Council (Environment Waikato).
 - If an entrance crosses a small drain, watercourse or water table a culvert shall be installed.
 - If the entrance crosses a watertable or small drain (less than 2m wide by 1m deep) A 300mm diameter minimum Reinforced Concrete Rubber Ring Joint (RCRRJ) Class 4 or its equivalent pipe shall be installed. Concrete capping is required where cover <0.25m.
 - Any unsuitable bedding material including vegetation, topsoil and peat shall be removed and replaced with 100mm pit sand or G.A.P. 40 or its equivalent if required.
 - All culverts shall be laid straight at a constant grade between 1.5 and 8.5m from the pavement edge. Socket end shall always be uphill.
- 4.0 LOWER PAVEMENT:**
- 150mm nominal depth approved GAP 65 subbase course. Additional undercut and backfill as required where soft spots occur. Reduce the depth to 80mm and backfill with GAP 40 if concrete surfacing is adopted.
 - Alternative subbase materials can be used (quarry strippings/brownrock) with pavement design approval by the HDC Engineering Services Manager.
 - The subbase depth shall be increased from 80mm to 150mm within the Hauraki Plains where concrete surfacing is proposed.
 - Full depth pavement to extend to gate/cattle stop.
- 5.0 UPPER PAVEMENT:**
- 100mm nominal depth approved GAP 40 base course constructed above the subbase course layer where a sealed/AC surface is proposed.
 - No base course installation is required if a concrete entrance is proposed. A minimum 150mm concrete depth is required.
- 6.0 SURFACING:**
- A chip sealed pavement shall adopt a Grade 3 and 5 two coat seal.
 - A minimum of a prime coat seal is required if AC surfacing is proposed.
 - Within the Hauraki Plains all concrete surfaced entrances shall be reinforced with 665 mesh, adopting 30mm cover, within the tension zone.
 - The surfacing shall extend the lesser of the distance to the property boundary or 5m from the edge of seal.
 - No additional surfacing (sealing) over the basecourse material is required, if the entrance is off a metal road.

CLASS B: STANDARD RURAL VEHICLE CROSSING FOR ALL ACTIVITIES THAT DO NOT REQUIRE A CLASS A CROSSING NOR ARE RESIDENTIAL ACTIVITIES IN THE RURAL AREA

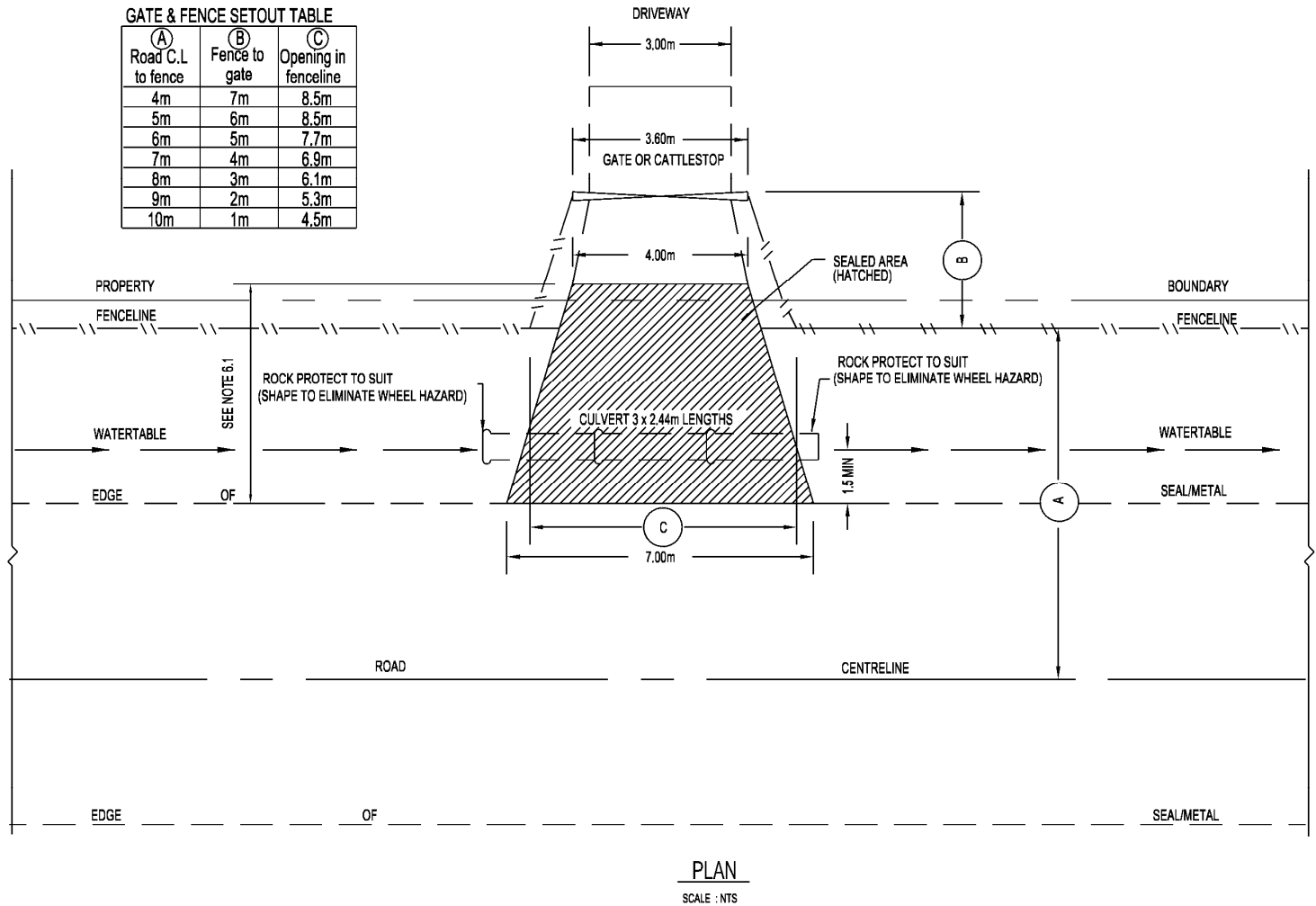
HAURAKI DISTRICT COUNCIL

HDC - 302



GATE & FENCE SETOUT TABLE

| (A) Road C.L. to fence | (B) Fence to gate | (C) Opening in fenceline |
|------------------------------|-------------------------|--------------------------------|
| 4m | 7m | 8.5m |
| 5m | 6m | 8.5m |
| 6m | 5m | 7.7m |
| 7m | 4m | 6.9m |
| 8m | 3m | 6.1m |
| 9m | 2m | 5.3m |
| 10m | 1m | 4.5m |



NOTES:

1.0 GENERAL:

- All works shall be constructed in accordance with the following notes and to the satisfaction of the Engineering Services manager or his representative. Additional requirements to those shown on this drawing may be necessary for particular location and will be determined on site.
- Any work undertaken in the road reserve will require a street opening permit and traffic management plan to be submitted for approval 10 working days before work commences. Any enquiries regarding this procedure may be directed to the Business Unit Administrator, on 07-862 8609.
- Vehicle entrance construction will require a vehicle crossing permit. Please contact the Business Unit Administrator, on 07-862 8609 to proceed with the application of the permit 5 working days before commencement of any work on the entrances.
- The constructor shall be responsible for road works signage while undertaking work on the road carriageway. All signage shall be in accordance with NZTA handbook for Temporary Traffic Control And Safety At Roadworks sites.
- The constructor shall be responsible for the cost of repairs to any Underground Utility Service damaged during construction. Any damage shall be rectified to the satisfaction of the relevant Asset Manager.
- A Class C Vehicle Crossing is deemed to be adequate to accommodate a 5m long car turning into a property at a radius of 7.5m.

2.0 LOCATION:

- Entrance locations shall be where approved by HDC or NZTA if located on a State Highway.
- Minimum entrance sight distances are:

| Speed Environment (km/h) | From vehicle entrance generating up to and including 40 vehicle movements per day | From vehicle entrance generating more than 40 vehicle movements per day |
|--------------------------|---|---|
| 40 | 40m | 70m |
| 50 | 60m | 90m |
| 60 | 80m | 115m |
| 70 | 100m | 140m |
| 80 | 130m | 175m |
| 90 | 160m | 210m |
| 100 | 200m | 250m |
| 110 | 240m | 290m |
| 120 | | 330m |

- Refer to HDC DM diagram HDC 306 for rural accessway minimum entrance separation distances.

3.0 CULVERT:

- If an entrance crosses a Council drain the Contractor shall obtain written approval with culvert sizing from the Hauraki District Council Drainage Asset Manager prior to commencement of construction.
- If an entrance crosses a natural watercourse a resource consent may be required from the Waikato Regional Council (Environment Waikato).
- If an entrance crosses a small drain, watercourse or water table a culvert shall be installed.
- If the entrance crosses a watertable or small drain (less than 2m wide by 1m deep) A 300mm diameter minimum. Reinforced Concrete Rubber Ring Joint (RCRRJ) Class 4 or its equivalent pipe shall be installed. Concrete capping is required where cover <0.25m.
- Any unsuitable bedding material including vegetation, topsoil and peat shall be removed and replaced with 100mm pit sand or G.A.P. 40 or its equivalent if required.
- All culverts shall be laid straight at a constant grade between 1.5 and 8.5m from the pavement edge. Socket end shall always be uphill.

4.0 LOWER PAVEMENT:

- 150mm nominal depth approved GAP 65 subbase course. Additional undercut and backfill as required where soft spots occur. Reduce the depth to 80mm and backfill with GAP 40 if concrete surfacing is adopted.
- Alternative subbase materials can be used (quarry strippings/brownrock) with pavement design approval by the HDC Engineering Services Manager.
- The subbase depth shall be increased from 80mm to 150mm within the Hauraki Plains where concrete surfacing is proposed.
- Full depth pavement to extend to gate/cattle stop.

5.0 UPPER PAVEMENT:

- 100mm nominal depth approved GAP 40 base course constructed above the subbase course layer where a sealed/AC surface is proposed.
- No base course installation is required if a concrete entrance is proposed. A minimum 150mm concrete depth is required.

6.0 SURFACING:

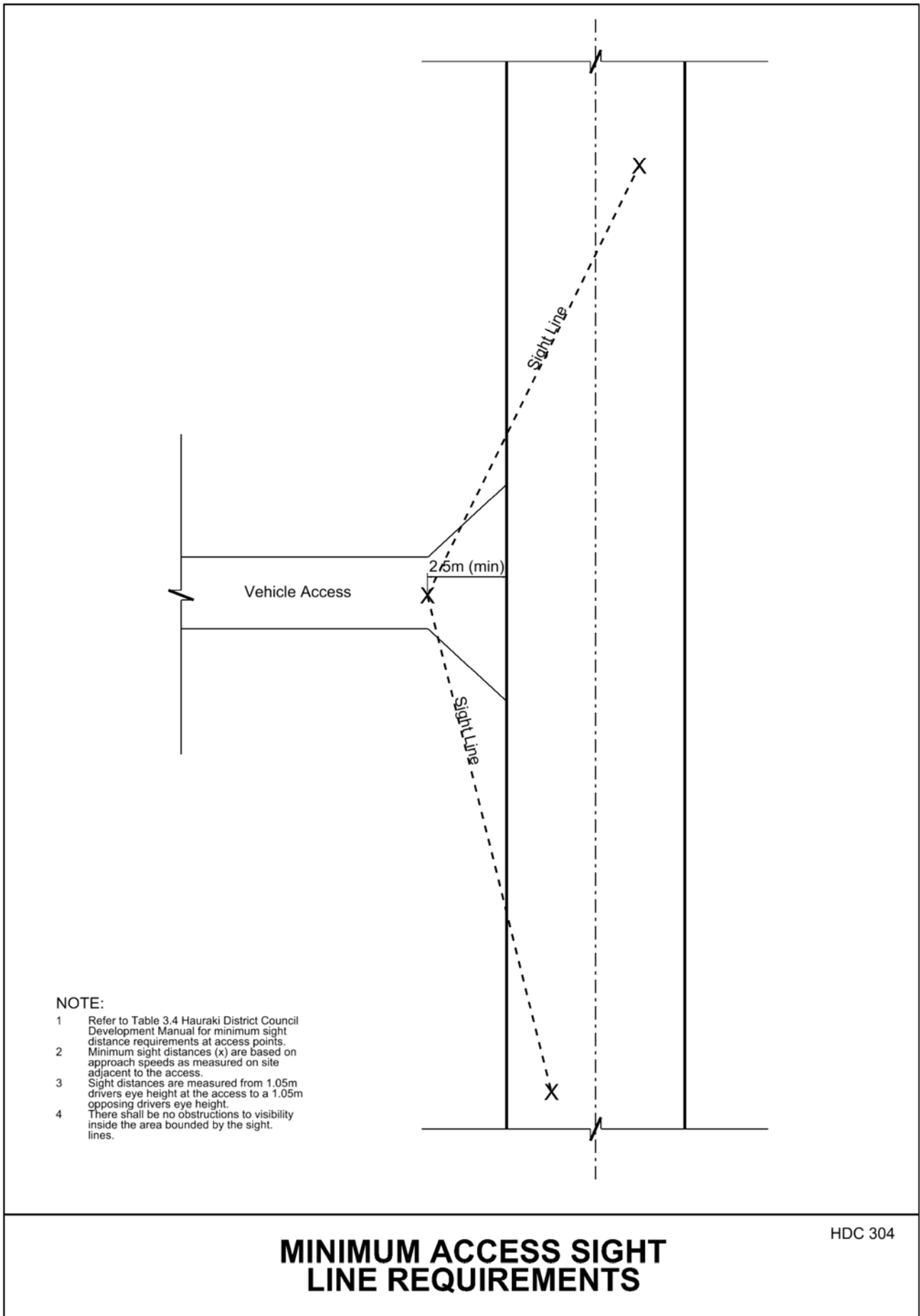
- A chip sealed pavement shall adopt a Grade 3 and 5 two coat seal.
- A minimum of a prime coat seal is required if AC surfacing is proposed.
- Within the Hauraki Plains all concrete surfaced entrances shall be reinforced with 665 mesh, adopting 30mm cover, within the tension zone.
- The surfacing shall extend the lesser of the distance to the property boundary or 5m from the edge of seal.
- No additional surfacing (sealing) over the basecourse material is required, if the entrance is off a metal road.

CLASS C: STANDARD VEHICLE CROSSING FOR RESIDENTIAL ACTIVITIES IN RURAL AREA, LOW DENSITY RESIDENTIAL, RESERVE (ACTIVE) AND RESERVE (PASSIVE) ZONES

HAURAKI DISTRICT COUNCIL

HDC - 303

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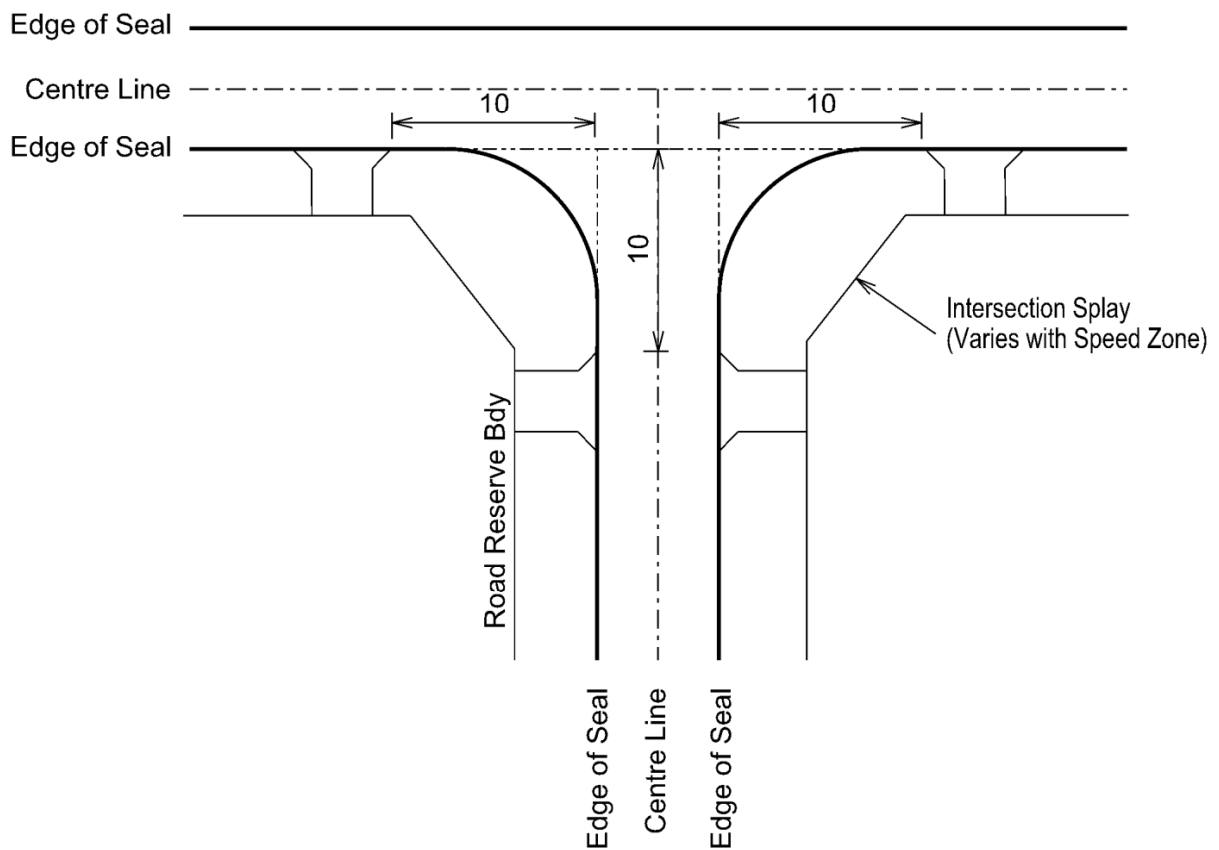


NOTE:

- 1 Refer to Table 3.4 Hauraki District Council Development Manual for minimum sight distance requirements at access points.
- 2 Minimum sight distances (x) are based on approach speeds as measured on site adjacent to the access.
- 3 Sight distances are measured from 1.05m drivers eye height at the access to a 1.05m opposing drivers eye height.
- 4 There shall be no obstructions to visibility inside the area bounded by the sight lines.

MINIMUM ACCESS SIGHT LINE REQUIREMENTS

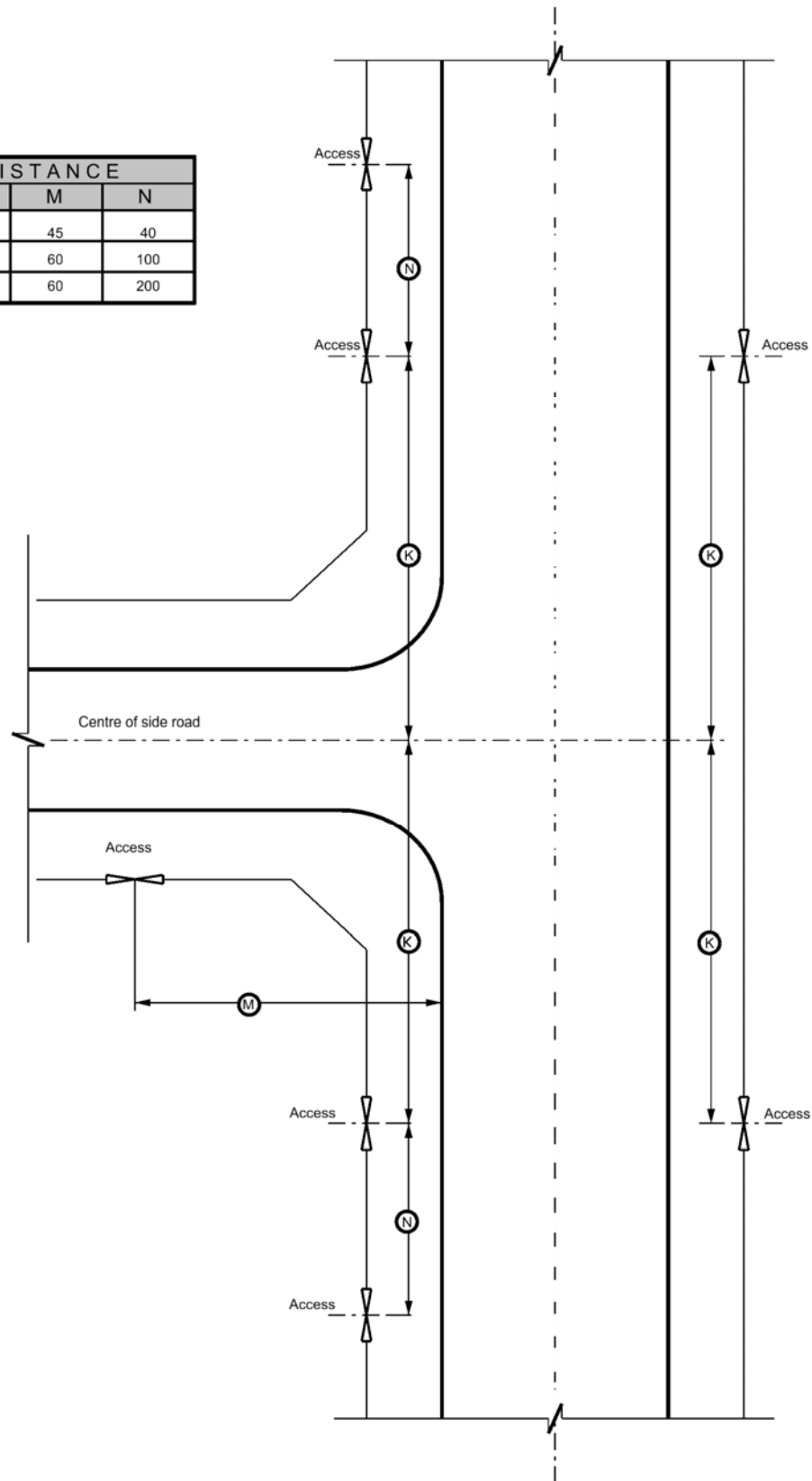
HDC 304



**VEHICLE ACCESSWAY
SEPARATION DIAGRAM ≤ 50 km/h**

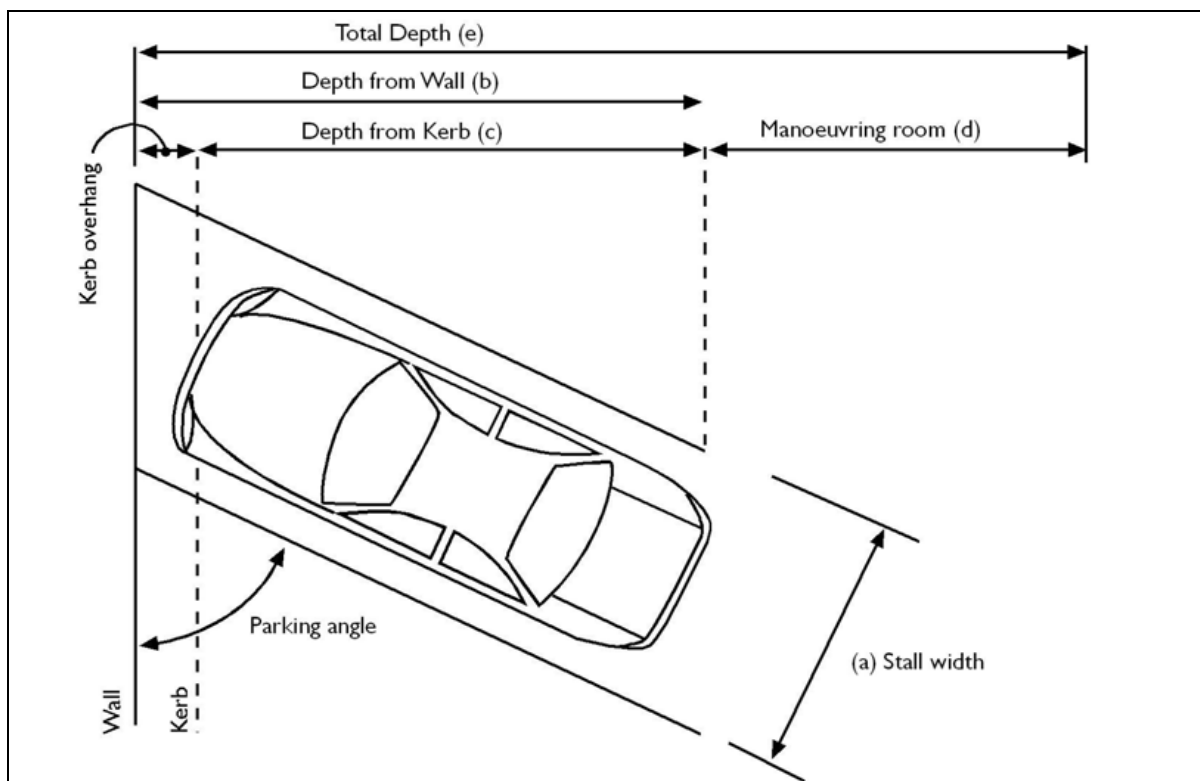
HDC 305

| SPEED LIMIT | DISTANCE | | |
|-------------|----------|----|-----|
| | K | M | N |
| 70 | 100 | 45 | 40 |
| 80 | 120 | 60 | 100 |
| 100 | 200 | 60 | 200 |



RURAL VEHICLE ACCESSWAY SEPARATION DIAGRAM > 50km/h

HDC 306



| Type of Parking | | Stall Width (a) | Stall Depth | | Aisle Width (d) | Total Depth (e) | |
|--------------------------------|----------|-----------------|---------------|---------------|-----------------|-----------------|----------|
| Parking Angle | Type | | From wall (b) | From kerb (c) | | one row | two rows |
| ALL MEASUREMENTS ARE IN METRES | | | | | | | |
| 0° | Parallel | 2.4 | See note 1 | | 3.5 | 5.9 | 8.3 |
| 30° | Nose in | min 2.4 | 4.2 | 4.0 | 3.5 | 7.7 | 11.9 |
| 45° | Nose in | min 2.4 | 4.9 | 4.5 | 3.5 | 8.4 | 13.3 |
| 60° | Nose in | 2.4 | 5.4 | 4.9 | 4.5 | 9.9 | 15.3 |
| | | 2.5 | | | 4.1 | 9.5 | 14.9 |
| | | 2.6 | | | 3.5 | 8.9 | 14.3 |
| | | 2.7 | | | 3.5 | 8.9 | 14.3 |
| 75° | Nose in | 2.4 | 5.4 | 4.9 | 6.6 | 12.0 | 17.4 |
| | | 2.5 | | | 6.3 | 11.7 | 17.1 |
| | | 2.6 | | | 5.2 | 10.6 | 16.0 |
| | | 2.7 | | | 4.6 | 10.0 | 15.4 |
| 90° | Nose in | 2.4 | 5.1 | 4.6 | 8.7 | 13.8 | 18.9 |
| | | 2.5 | | | 7.7 | 12.8 | 17.9 |
| | | 2.6 | | | 7.0 | 12.1 | 17.2 |
| | | 2.7 | | | 6.8 | 11.9 | 17.0 |

- 1 Parallel parking spaces (Parking angle = 0) shall be 6.0m long, except where one end of the space is not obstructed, in which case the length of a space may be reduced to 5.0m.
- 2 Minimum aisle and accessway widths shall be 3.0m for one way flow, and 5.5m for two way flow. Recommended aisle and accessway widths are 3.5m for one way flow, and 6.0m for two way flow.
- 3 Maximum kerb height = 150mm
- 4 Stall depth computed from 90 percentile vehicle dimensions. A 200mm separation from walls has been added.
- 5 Aisle width from MoT Traffic Engineering Section analysis.

HDC307

CAR MANOEUVRING AND PARKING DIMENSIONS

PART 4: STORMWATER DRAINAGE

4.1 INTRODUCTION

Stormwater treatment requirements vary across the District. As a guideline, it is generally as follows:

- Plains Towns: direct connection into council drainage network
- Paeroa: either direct connection to drainage network (including kerb in some locations) or connection via detention (temporary storage).
- Waihi / Whiritoa: direct connection into drainage network, connection via detention or in-ground soakage

This must be considered as a guide only and each subdivision / building consent will be required to address the discharge of stormwater. Only persons approved by HDC may undertake this design.

For rural areas that are within the Hauraki District Drainage areas, any new drains must be covered by an easement.

4.2 GENERAL

An arrangement for disposal of stormwater must be made for each lot created by subdivision, by soakage, detention or stormwater reticulation system. The manner of disposal shall not have adverse effect on ground water or cause disturbance to any river, lake, wetland or surrounding areas. Percolation tests may be required to determine the suitability of soils for establishment of a soakage system.

Stormwater flow attenuation may be necessary on some developments, generally by detention of stormwater runoff, designed to meet water quantity and/or quality goals.

Resource Consents or Discharge Permits may be required by Environment Waikato for stormwater discharge into the ground, or rivers or streams.

4.6 DESIGN REQUIREMENTS

Minimum clearances from underground services are detailed in Volume 2, Part 3, drawing DG 302 as detailed in the Hamilton City Council Development manual. Refer also to Table 5.1 NZS 4404:2010 for typical dimension details. Where these clearances cannot be achieved, approval shall be obtained from the Engineering Services Manager.

4.6.3 Rainfall

Hauraki District Council currently utilises the rainfall values generated by NIWA in their HIRDS application. This is available on NIWA's website.

Hauraki District Council requires a climate change factor of 1.2 (20%) to be provided for in the design of any stormwater devices that are to become a public asset.

4.14 MANHOLE

4.14.6 Step Irons and Steps

Steps are to be located on the down-stream side of the manhole.

4.21 STORMWATER DISCHARGE FROM PRIVATE LAND

Connections to kerb and channel are not allowed unless specifically approved.

PART 5: WASTEWATER DRAINAGE

5.4 CALCULATION OF FLOWS

Figure 5.1- 2.2: The water consumption typical rate adopted for Hauraki DC is 220 litre per person per day.

Figure 5.3 - The minimum gradient for main line shall be 0.75% unless approved otherwise by Council.

5.5 LOCATION OF PIPES

If sewer pipes are located in the road/private-way carriageway then these shall be installed clear of longitudinal vehicle wheel tracks.

5.10 PIPELINE CONSTRUCTION

5.10.2 Requirements for Building Near or Over Drainage Pipelines

HDC does not generally permit building over drainage pipelines. Specific approval is required.

5.12 MANHOLES

5.12.1 General

600mm diameter manholes can be used with a maximum depth to invert of 1.0m. These are to be dry chambers.

Specific approval is required for a 150mm connection onto a 150mm pipeline.

Manhole lid rings are to be used to a maximum depth of 150mm. For depths over 150mm, manhole risers shall be installed.

5.13 CONNECTIONS

5.13.1 General

Drop connections within a manhole are to be constructed with internal drops only; external drops are not permitted unless special approval is granted by the HDC Engineering Services Manager. Refer drawing HDC 501.

5.18 TESTING

All wastewater manholes (excluding sealed dry chambers, are to be tested using the low pressure air test as per HCC's BIA Verification Method E1/VM1 Section 8.0 or AS/NZS 3500.2:2003. Test requirements are set out in Volume 3 Part 4 Section 16.

5.19 PUMPING STATIONS

The pump stations shall be designed generally in accordance with the requirements of WSA04 and this manual.

5.19.3 Pumps, Rising Main, Delivery Point and Overflow

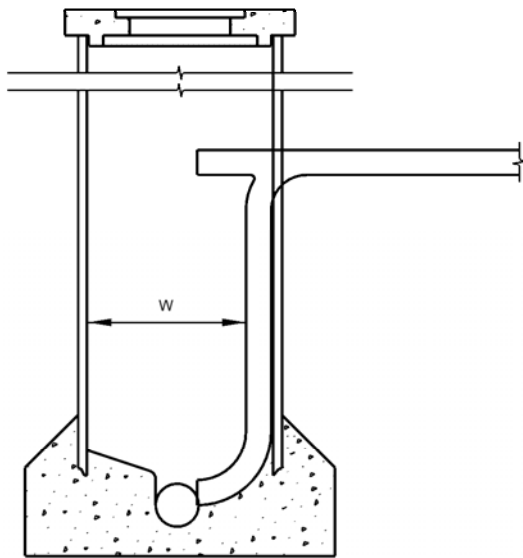
Pumps shall be Flygt or Grundfos. The make to be confirmed by the Manager Engineering Services prior to design.

APPENDICES TO PART 5 – WASTEWATER DRAINAGE

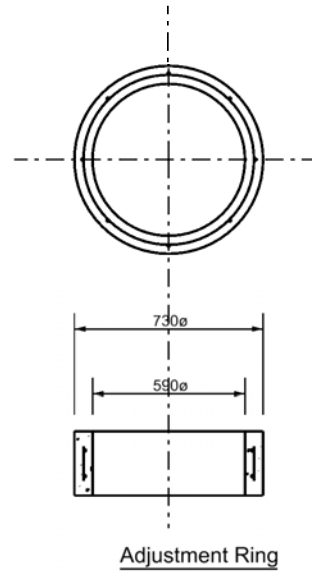
DISTRICT WASTEWATER STANDARD DRAWINGS

HDC501 District Drop Manhole And Shallow Manhole Structure

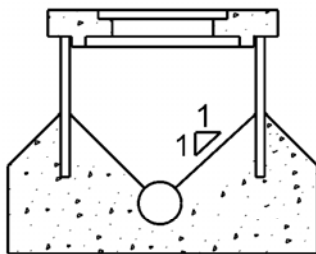
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W = 1050 minimum

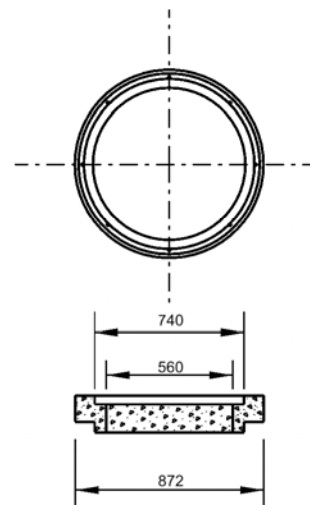


Adjustment Ring



600 Ø SHALLOW CHAMBER

(To be used only on pipe sizes of 100mm to 150mm and where depth of invert is less than 1000mm)



TOP SLAB FOR 600 Ø SHALLOW CHAMBER

Not To Scale

DISTRICT COUNCIL DROP MANHOLE AND SHALLOW CHAMBER DETAILS

HDC 501

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PART 6 – WATER SUPPLY

6.5 RETICULATION LAYOUT

A typical network layout shall be in accordance with HDC 604.

Where fire fighting standards require a water main of a minimum of 100mm nominal bore fitted with fire hydrants (principal main), it shall be laid on one side of all through-streets and one side of every cul-de-sac to the head of the cu-de-sac, subject to the requirements for hydrant spacing and required flow.

6.7 INTERSECTIONS

At street intersections, two 45 degree bends are preferred rather than single 90 degree bends so that valves can be located in grass berms wherever possible. Refer Drawing DCS 604.

6.13 CONNECTIONS TO PRIVATE PROPERTY

6.13.1 Point of Supply to Consumer

The toby/water meter shall be located within 500mm of the boundary inside the road reserve wherever possible. Where this is not practical, the toby may be located within 300mm inside the lot boundary. In this case, and where a kerb exists, a 'V' is to be chiselled into the top of the kerb directly opposite the toby valve, to indicate the valve location.

In rural areas where a restricted supply is provided, the installation shall be as per Drawing HDC603.

6.13.4 Connections for fire fighting

Refer the district council's Water Supply Bylaw (Part 5: section 3.6).

PART 7 – STREET LANDSCAPING

7.3 Means of Compliance

7.3.2.1 Species

Preferred plant species for the Hauraki District are:

- Roses
- Kahikatea
- Cordaline
- Flaxes
- Carex
- Hebes
- Prunus
- Magnolia

VOLUME 3 – Standard Technical Specifications

PART 3 – ROADING PROJECTS

SECTION 2 : TESTING

2.1 SCALA PENETROMETER

2.1.4 Vehicle Crossings

Scala penetrometer subgrade strength testing is not required on low volume entrances.

2.3 BENKELMAN BEAM TEST

Hauraki DC will accept alternative pavement deflection testing i.e. FWD - Falling Weight Deflectometer (FWD)

SECTION 11 : BERM FEATURES

11.10 CONCRETE FOOTPATHS & VEHICLE CROSSINGS

When installing a vehicle crossing at a location that has an existing footpath, the footpath must be cut-out and removed unless it can be proven that the footpath has been constructed to vehicle crossing standards.

SECTION 13 : ROAD OPENINGS AND REINSTATEMENTS

13.1 GENERAL

- All work within the road reserve shall comply with the Code of Practice for Working in the Road (SNZ HB 2002:2003).
- Work within the road reserve shall comply with NZTM COPTTM Level 1.

SECTION 18 : AS BUILT PLANS AND ASSET DETAILS

18.2 AS BUILT PLANS

The following additional As Built data is required for all new road construction that will be taken over by Council:

- Completed RAMM road data collection forms. These blank spread sheets can be obtained from Council
- Completed SLIMM street light data forms from the power authority

As-Built plans and associated data shall be sent to:

In the case of all resource consent applications:

Planning and Environmental Services Department
PO Box 17
Paeroa 3600

For all other work:

Technical Services
PO Box 17
Paeroa 3600

E-mail electronic files to: -

asbuilts@hauraki-dc.govt.nz, include in the sub heading:

HDC Resource Consent Number, Subdivision name and stage number or as appropriate.

PART 4 – STORMWATER AND WASTEWATER

Section B: Construction Specification

11.0 MANHOLES

11.1 MANHOLE TYPES

All joints in wastewater manholes are to be wrapped with Densotape to further ensure water tight joints.

11.6 MANHOLE TOPS

All manhole lid frames to be epoxied on to the manhole top to ensure water tight joints.

18.0 TESTING

18.4 MANHOLE TESTING

All wastewater man holes (excluding sealed dry chambers), are to be tested.

23.0 CONSTRUCTION OF DRAINS IN RURAL AREAS WITHIN THE HDC DRAINAGE DISTRICTS

23.1 All drains shall be constructed in accordance with HDC400.

Section C: Works Completion and Clearance

1.0 AS BUILT PLANS

As-Built plans and associated data shall be sent to:

In the case of all resource consent applications:

Planning and Environmental Services Department
PO Box 17
Paeroa 3600

For all other work:
Technical Services
PO Box 17
Paeroa 3600

E-mail electronic files to: -

asbuilts@hauraki-dc.govt.nz, include in the sub heading:

HDC Resource Consent Number, Subdivision name and stage number or as appropriate.

4.0 DATUMS AND UNITS OF MEASUREMENT

All levels to be in terms of Tararu (preferred) or Auckland 1946 datum.

Projection co-ordinates shall be:

New Zealand Transverse Mercator 2000 (NZTM2000)

Geographic co-ordinates shall be:

New Zealand Geodetic Datum 2000 (NZGD2000)

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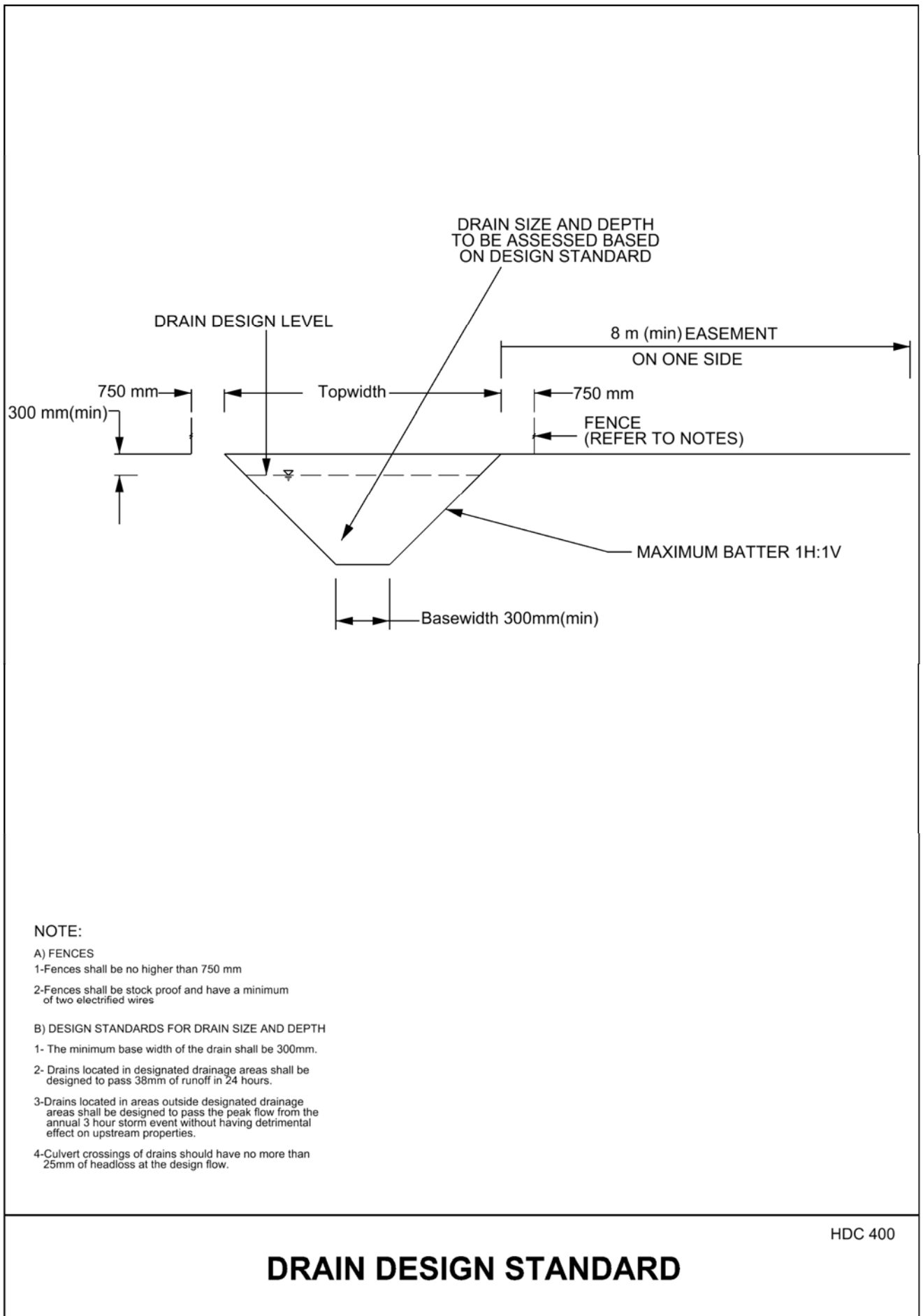
APPENDICES TO PART 4 – Stormwater & Wastewater

HAURAKI DISTRICT DRAINAGE STANDARDS

HDC400 : Land Drain Standard

ADDITIONS TO STANDARD HCCDM DRAWINGS

- TS 400.2: External drop structures are not preferred and are thus subject to specific approval of the Engineering Services Manager, HDC
- TS 400.4: End cap on London Junction
- TS 410: See 5.10.2 Volume 3



NOTE:

A) FENCES

- 1-Fences shall be no higher than 750 mm
- 2-Fences shall be stock proof and have a minimum of two electrified wires

B) DESIGN STANDARDS FOR DRAIN SIZE AND DEPTH

- 1- The minimum base width of the drain shall be 300mm.
- 2- Drains located in designated drainage areas shall be designed to pass 38mm of runoff in 24 hours.
- 3-Drains located in areas outside designated drainage areas shall be designed to pass the peak flow from the annual 3 hour storm event without having detrimental effect on upstream properties.
- 4-Culvert crossings of drains should have no more than 25mm of headloss at the design flow.

HDC 400

DRAIN DESIGN STANDARD

PART 5 – WASTEWATER PUMP STATIONS

SECTION A : ACCEPTABLE FITTINGS AND MATERIALS

2.0 PUMP STATION MATERIALS

2.5 ACCESS LIDS

Approved Aluminium lids are suitable

2.6 GUIDE RAILS

Rails may be galvanized instead of stainless steel

2.7 GUIDE RAIL BRACKETS

Flygt or approved hot dipped galvanised

2.10 RISER PIPES

- ABS (Acrylonitrile Butadiene Styrene) Pressure Rating PN10 with solvent welded joints.

2.11 RISING MAINS

- PE100 Polyethylene pipe manufactured to AS/NZS 4130:2003, pressure rating PN12.5

2.15 PUMPS

See Vol 2 Part 5: 5.19.3

3.0 ELECTRONIC COMPONENTS APPROVED EQUIPMENT LIST

Pump station construction to be as per HCC Technical Specifications. Part 5

Level control:

- All pump stations are to have an Ultrasonic level controller. Siemens 7MI5221-1BB11 or equivalent .

HDC preference for the control cabinet is the Multitrode DOL control cabinet supplied by Applied Instruments Group. This control cabinet is supplied already fabricated as a complete unit ready to be connected to the pump station equipment and telemetry.

Alternative control cabinet designs must be submitted to the Utilities Manager for approval.

| Description | Supplier | Model /Size /Type | Comments |
|-----------------------------|----------------|--|---|
| Outer cabinet | Local | Size 1133W x 1300H x 400D with 2 doors on a 300mm high vented base | Powder coated aluminium with window for KWH meter. 3 point lockable rise & fall swing handle door catch. Wind stays for doors |
| Inner SWB cabinet | Schneider | Prisma G plus 1050W with 300w duct | |
| SWB Components | | | |
| Description | Supplier | Model /Size /Type | Comments |
| Main incoming MCB | Schneider | NSX100/160 (36 to 50KA) depending on location | Fitted with door mount lockable handle & TM40D trip unit |
| Generator Change over SW | Kraus & Naimer | KG41 BT 934 NZ0002-VE2840H | 4 pole required to break the Generator Neutral |
| Generator Inlet plug | PDL | 56AI532 | 32 amp |
| MCB for surge arrestors | Schneider | 25833 | 3 pole 25amp 6KA |
| MCB for mains sensing | Schneider | 25826 | 3 pole 2 amp 6KA |
| MCB for 230v controls | Schneider | 25801 | 1 pole 6 amp 6KA |
| RCCB for light & plug | Schneider | 23358 | 1 Pole 40 amp RCCB |
| MCB for light | Schneider | 25802 | 1 pole 10 amp 6KA |
| MCB for plug | Schneider | 25803 | 1 pole 10 amp 6KA |
| MCB for heater | Schneider | 25801 | 1 pole 6 amp 6KA |
| SWB plug | Hager | HSN010DA | |
| SWB heater | Unipro | 17752 | 15 watts |
| Heater thermostat | Schneider | 08998 | |
| Motor MCB x 2 | Schneider | GV2 ME10 4 -6.3A | Motor Protection (range to suit pump motor) |
| Motor contactor x 2 | Alan Bradley | 100C09VA10 | |
| Auxiliary contact x 2 | Alan Bradley | 100KFC20 | |
| Motor Overload x 2 | Alan Bradley | 193EECB Electronic | Range to suit pump motor |
| Current transducers x 6 | Schneider | 16415 TI 50/5 | |
| Power Factor Isolation x 2 | Schneider | LCIK0610U7 | |
| Power Factor Correction x 2 | Metalect | polymer capacitor | Range to suit pump motor |
| Pump sockets x 2 | PDL | 56SO716 | seven pin 2 pins for pump protection sensors |
| | | | |
| Description | Supplier | Model /Size /Type | Comments |
| Rail terminals | Schneider | AS1 Fuse435U5X | |
| Battery charger | Alan Bradley | 1606XLP90B | 90W 12V |
| Batteries | Yuasa | Gel Cells | |
| MOA Switches x 2 | Kraus & Naimer | CG4-A211-623 VE21V | |

| | | | |
|----------------------------------|--------------|-----------------|--|
| 1000V fuses for megger tests x 2 | Weidmuller | WS16/2 | |
| Local pump run light x 2 | Schneider | MG 18321 | Green |
| Pump running on back up | Schneider | MG 18320 | Red |
| Overload reset button | Schneider | 8032 | |
| Relays x 2 | Omron | G2R-2-Sni-AC240 | Back up system & high level back up |
| | | | |
| Pump overload reset modules x 2 | Alan Bradley | 193ERR | |
| | | | |
| surge arrestors x 4 | M-System | MAKF-240 | relay type interfaced with MultiSmart Controller |
| Failsafe backup controller | MultiTrode | SAFE-FSP | |
| Failsafe 3 sensor probe | MultiTrode | FS0.5/3-10 | hi level to Failsafe back up controller |
| Failsafe single sensor probe | MultiTrode | FS0.2/1-10 | hi level to MultiSmart |
| MultiSmart Pump Controller/RTU | MultiTrode | MSM-3MP | includes automatic IRT function and CT input for each phase for each motor |
| Ultrasonic level transmitter | Siemens | 7ML5221-1BB11 | |
| 4-20mA signal protector | M-System | | multismart end |
| 4-20mA signal protector | M-System | | level transmitter end |

Section B: Construction Specification

8.0 ELECTRICAL SPECIFICATIONS

Specs as per HCC Development Manual Part 5: Section B. Refer to HDC preference regarding the Switch board and control cabinet (Vol 3 Part 5 Section A: 3.0)

PART 6 – WATER SUPPLY

SECTION A : ACCEPTABLE FITTINGS AND MATERIALS

2.0 PIPE MATERIALS

2.1 WATERMAINS 300 MM AND LARGER

Materials for large diameter pipelines will be specifically approved and or specified by HDC. The specification shown below for spiral welded pipe, ductile iron pipe PVC-O, uPVC, mPVC and MDPE are indicative of what is likely to be approved.

P 9 or PN 10 class PVC water mains may be used at the discretion of HDC.
uPVC water mains may be used at the discretion of HDC.

All welding of MDPE pipes must be carried by a suitably qualified tradesperson.

All private water installations must be reviewed by approved Council staff.

2.2 WATERMAINS 250MM DIA

PE pipe material type is acceptable by HDC

2.3 WATERMAINS 150MM AND 200MM DIA

MDPE and uPVC material types are acceptable by HDC.

2.7 WATERMAINS 100MM DIAMETER

Specifications generally in accordance with other diameters

5.0 FIRE HYDRANTS

5.1 FIRE HYDRANT

Short pattern screw down allowed.

7.0 WATER METERS

7.1 WATER METER MARKERS

Water meter markers shall be installed for all new water meters as per HDC 602.

SECTION B : PIPE INSTALLATION

1.0 INTRODUCTION

Water reticulation services are to be installed by persons who hold a National Certification in Water Reticulation or a reticulation service person who has been approved by Engineering Services Manager.

SECTION E : VALVE AND FIRE HYDRANT INSTALLATION

9.0 VALVE AND HYDRANT MARKERS

A valve marker plate is to be located adjacent to the valve location, i.e. on fence behind the valve. The valve plate shall be as per drawing HDC601.

Alternative markings and locations may be accepted by the Engineering Services Manager.

SECTION F – INSTALLATION OF SERVICE CONNECTIONS

2.0 SCOPE

iii. Hauraki District Council Consolidated Bylaw 2008

3.0 CONNECTIONS TO CUSTOMERS

3.1 GENERAL

All water supplies shall be metered.

3.2 POINT OF SUPPLY TO CONSUMER

All connections shall be metered

4.0 CONNECTIONS TO INDUSTRIAL/COMMERCIAL USERS

Refer to HDC Consolidated Bylaw Part 5: Water Supply for sizing limits

5.0 FIREMAIN CONNECTIONS

Refer to HDC Consolidated Bylaw Part 5: Water Supply for sizing limits

SECTION G – SHUT DOWN PROCEDURES

2.0 SCOPE

Refer to HDC Consolidated Bylaw Part 5: Water Supply

SECTION H – DISINFECTION AND FLUSHING

3.0 DISINFECTANT

Disinfection using Calcium Hypochlorite is not approved by HDC.

SECTION I - MISCELLANEOUS

6.0 CONNECTION TO THE EXISTING WATERMAIN

Connections to existing watermain are to be carried out by council approved personnel only.

SECTION J – WORKS COMPLETION AND CLEARANCE

1.0 AS-BUILT PLANS

As-Built plans and associated data shall be sent to:

In the case of all resource consent applications:

Planning and Environmental Services Department
PO Box 17
Paeroa 3600

For all other work:

Technical Services
PO Box 17
Paeroa 3600

E-mail electronic files to: -

asbuilts@hauraki-dc.govt.nz, include in the sub heading:

HDC Resource Consent Number, Subdivision name and stage number or as appropriate.

4.0 DATUMS AND UNITS OF MEASUREMENT

All levels to be in terms of Tararu (preferred) or Auckland 1946 datum.

Projection co-ordinates shall be:

New Zealand Transverse Mercator 2000 (NZTM2000)

Geographic co-ordinates shall be:

New Zealand Geodetic Datum 2000 (NZGD2000)

APPENDICES TO PART 6 – WATER SUPPLY

HAURAKI DISTRICT COUNCIL WATER STANDARD DRAWINGS

HDC601 Typical Valve Marker Plate

HDC602 Typical Water Meter Marker

HDC603 District Connection Installation

HDC604 Typical Network Layout

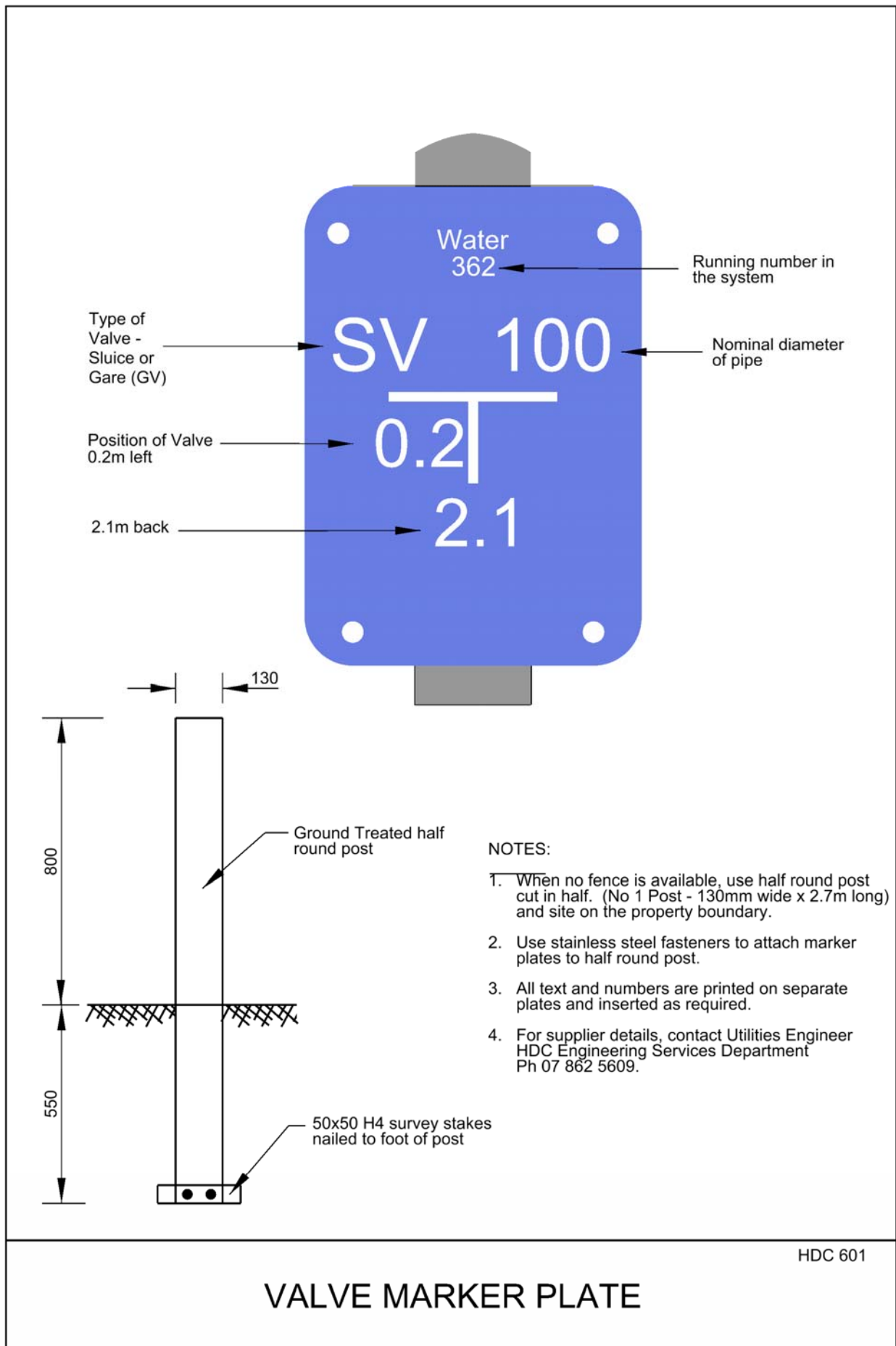
ADDITIONS TO STANDARD HCCDM DRAWINGS

TS 626 : Fire Service quick connection (i.e. plastic cover and anchor block) should be installed.

TS 629 : A 63mm diameter rider main shall be extended up the proposed Internal Access if the Internal Access services more than 3 individual Lots.

TS 632 : Low flow/ combination meters are required

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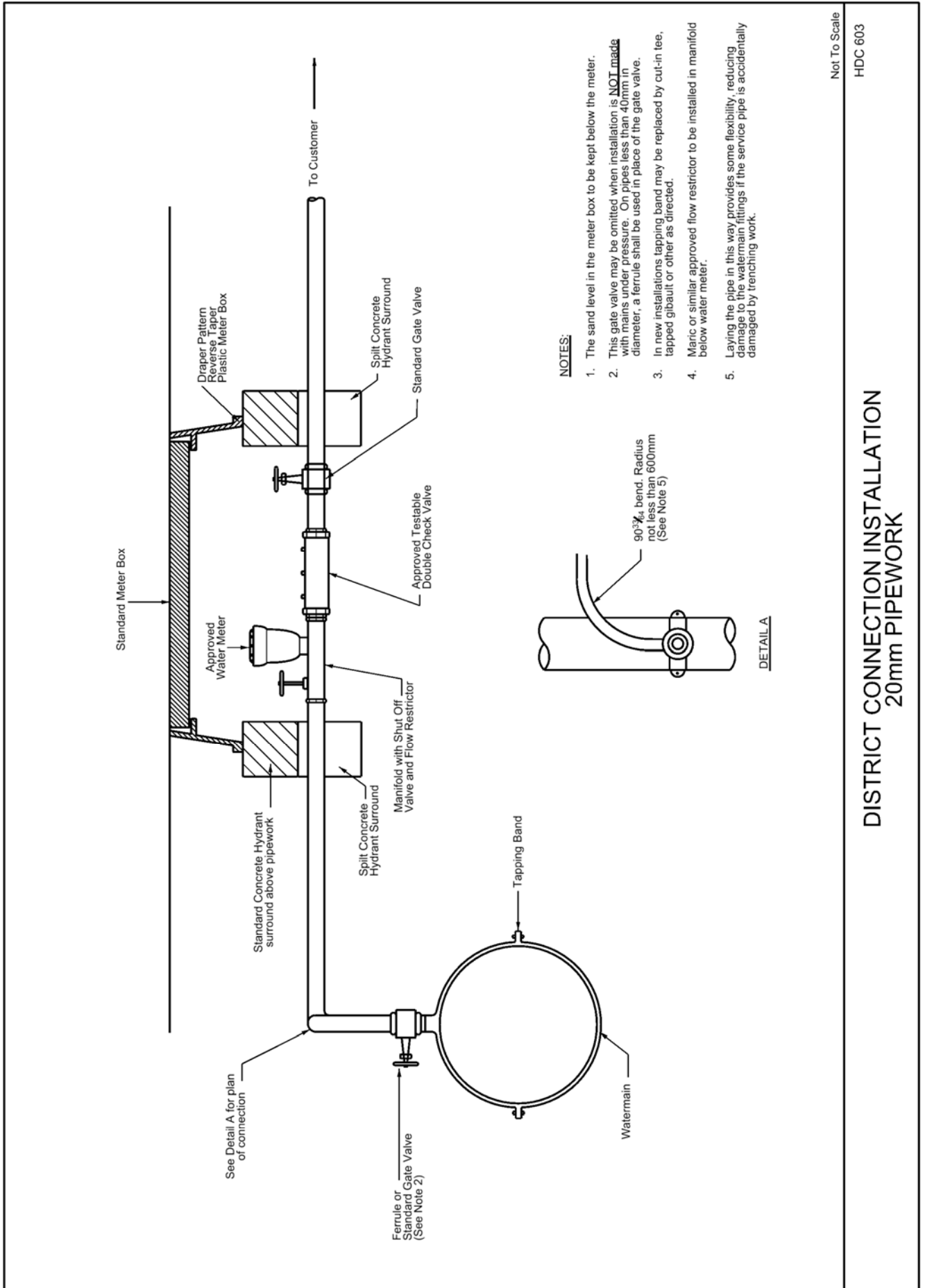


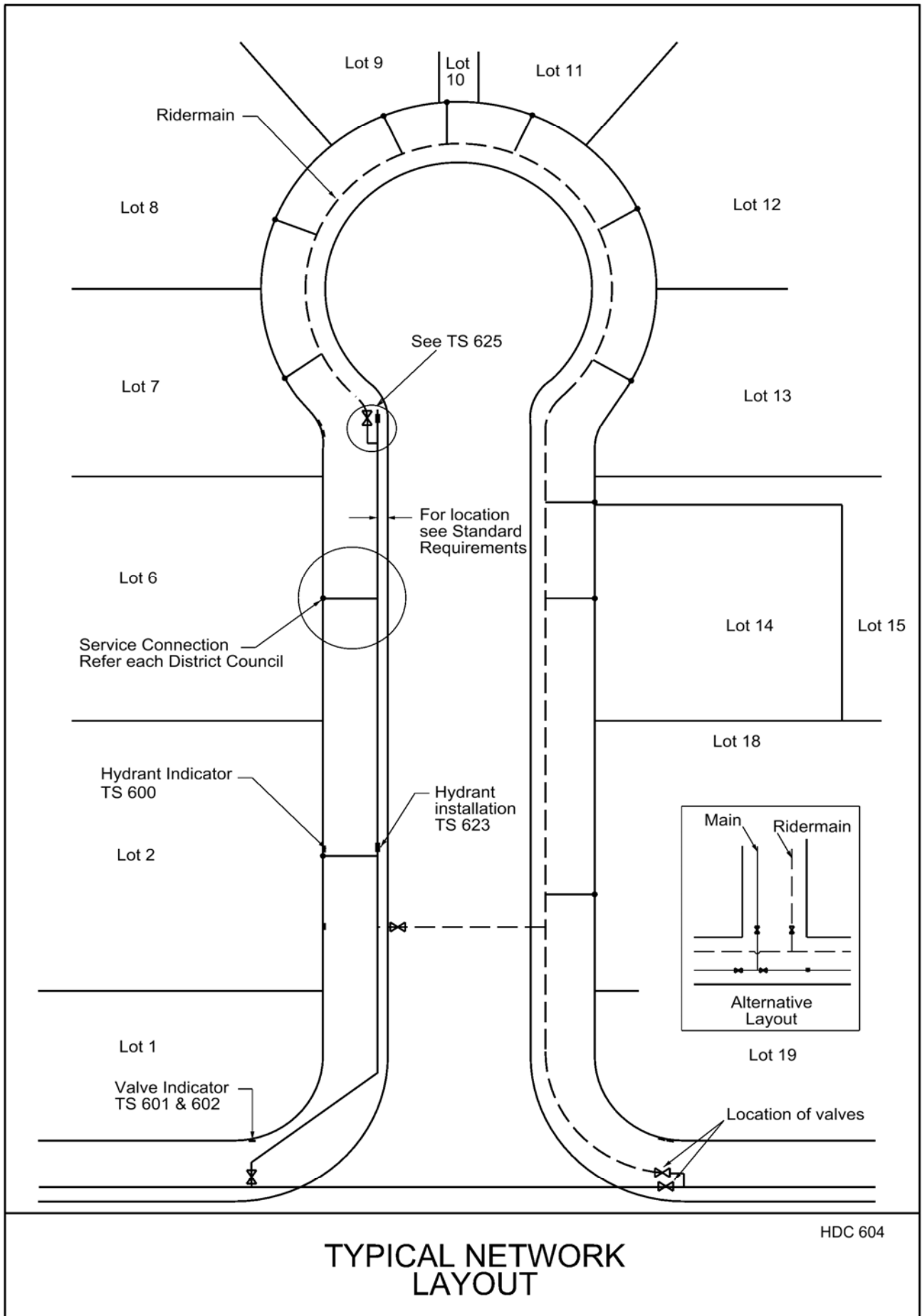
NOTES

1. White plastic - 3mm thick
2. To be installed on fence above the water meter
3. When no fence is available, use half round posts cut in half (No.1 Post - 130mm wide x 2.7m long) and site on the property boundary.

HDC 602

WATER METER MARKER





TYPICAL NETWORK LAYOUT

HDC 604

PART 7 : LANDSCAPE WORKS

SECTION 1 : PLANTING

11.0 MAINTENANCE REQUIREMENTS

11.1 DEFECTS LIABILITY PERIOD

The planting defects period shall be 12 months.

SECTION 2 : GRASSING AND TURFING

3.0 FERTILISERS

Other fertilisers can be used (i.e. Nitrophoska Blue) as approved, by the HDC Parks and Reserve Manager.

4.0 SOWING

Other seed mixes can be used as approved by the HDC Parks and Reserve Manager.

Brush harrowing is not required.

5.0 ESTABLISHMENT OF SOWN AREAS

Cutting the grass from 60mm to 40mm is current practise for some fields within the Hauraki District. The cutting criteria for newly grassed areas shall be as approved by the HDC Parks and Reserves Manager.

VOLUME 4 – Quality Systems for Land Development

PART 5 : WASTEWATER RETICULATION

4.1 GENERAL

Council's Role includes random audits of a sample of the Works for compliance. The role also includes inspection of stages of construction and witnessing and acceptance of:

- a) All pressure testing
- b) All connections to existing infrastructure
- c) The final inspection prior to 224 (c) approval.

The Engineer shall carry out the following checks on all Works to certify quality and compliance:

- a) Before pipelaying commences check that pipes are correct line and level to join existing mains and joining procedures are agreed
- b) Design and re-design compliance
- c) Trench safety – OSH
- d) Pipe specification compliance including size, quality and use of approved materials
- e) Foundation conditions suitable – undercut and hardfill replace where necessary
- f) Pipe grade and alignment with specified tolerances
- g) Pipe bedding and surround correctly placed and compacted
- h) House connections, London junctions, and ramped risers laid and located correctly both horizontally and vertically
- i) Bulk backfilling and surface reinstatement to specifications
- j) Manhole construction, to HCC Technical Specification, including: connections and leads, benching, precast base, Expandite BM100 sealing

strip, denso tape or similar on outside of joints, rungs, concrete lid, cast iron frame and cover, hardfill to underdrops, surface levels conform etc.

- k) No debris in pipelines
- l) All QA checklists and test certificates completed, checked for compliance and submitted to Council as the work progresses
- m) Council present to witness required testing and for final inspection

As-built information logged and trench width noted for deep pipelines

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Checklist 4.1

Hauraki District Council - Utilities

WASTEWATER PIPE LAYING CHECKLIST

| | | | | | |
|--|-------------------------------|----|----|----|----|
| Location: | to | to | to | to | to |
| Pipe Laying Checks | Pipe length (MH To MH) | | | | |
| Pipe size, quality, approved materials confirmed | | | | | |
| <ul style="list-style-type: none"> • Set out checked <ul style="list-style-type: none"> - Surveyors name • Control points identified | | | | | |
| <ul style="list-style-type: none"> • Foundation support <ul style="list-style-type: none"> - penetrometer results available - if under cutting required, note chainage | | | | | |
| Record daily level check and confirm on grade | | | | | |
| <ul style="list-style-type: none"> • Bedding type and surround material | | | | | |
| <ul style="list-style-type: none"> • Bulk Backfill material | | | | | |
| <ul style="list-style-type: none"> • Bulk backfill compaction (results from pipe to ground level attached) | | | | | |
| <ul style="list-style-type: none"> • CCTV pipe inspection | | | | | |
| <ul style="list-style-type: none"> • Alignment – control points identified | | | | | |
| <ul style="list-style-type: none"> • No Debris in pipelines | | | | | |
| <ul style="list-style-type: none"> • Service connections | | | | | |
| All service connections in place, capped and staked | | | | | |
| <ul style="list-style-type: none"> • Connections correctly located horizontally and vertically | | | | | |
| <ul style="list-style-type: none"> • Connections to main correctly formed | | | | | |
| <ul style="list-style-type: none"> • As-built measurements taken | | | | | |

Signature of Contractor

Date

Checklist 4.2

Hauraki District Council - Utilities

MANHOLE CHECKLIST

| | | | | | |
|------------------|--|--|--|--|--|
| Location: | | | | | |
|------------------|--|--|--|--|--|

MH number

Manhole Construction Checklist

| | | | | | |
|--|--|--|--|--|--|
| <ul style="list-style-type: none"> • Manhole size, quality, approved materials checked | | | | | |
| <ul style="list-style-type: none"> • Set out /orientation | | | | | |
| <ul style="list-style-type: none"> • Sealing strip between risers | | | | | |
| <ul style="list-style-type: none"> • Denso tape outside of joints (where ground water likely during year.) | | | | | |
| <ul style="list-style-type: none"> • Benching <ul style="list-style-type: none"> - Height - alignment - Curved channel for intersection pipes - Benching not flatter than 1 in 3 - half pipe lining | | | | | |
| <ul style="list-style-type: none"> • Flexible joints | | | | | |
| <ul style="list-style-type: none"> • Cutting and plastering of connections | | | | | |
| <ul style="list-style-type: none"> • Access details per drawings | | | | | |
| <ul style="list-style-type: none"> • Step irons including epoxy to outside recesses | | | | | |
| <ul style="list-style-type: none"> • Bedding type and surround | | | | | |
| <ul style="list-style-type: none"> • Bulk backfill compaction (results attached) | | | | | |
| <ul style="list-style-type: none"> • No debris in pipelines | | | | | |
| <ul style="list-style-type: none"> • Invert of pipes in and out | | | | | |

Signature of Contractor

Date

Checklist 4.3

Hauraki District Council - Utilities

TRENCH BACKFILL COMPACTION TEST SUMMARY (attach individual test reports)

Location: _____

Plan No. : _____

From MH _____ to MH _____

Acceptance Criteria:

.....

Tests by: (attached)

Analysis of Results

.....
.....
.....

- Trench backfill completed satisfactorily
- Trench backfill requires remedial work

Signature of Engineer

Checklist 4.5

Hauraki District Council - Utilities

FINAL INSPECTION FOR WASTEWATER DRAINAGE

Location: _____

Plan No: _____

Pre-Meeting Tasks

| Developer to verify prior to meeting: | Developer Checklist | | WWS Rep Pass |
|---|---------------------|----|-----------------|
| | | WW | |
| 1) Checklists 4.1, 4.2 ,4.3 completed | | | |
| 2) All lines flushed out | | | |
| 3) All required CCTV inspections carried out, reviewed and any remedial work completed. | | | |
| 4) All manholes checked (e.g. infiltration, plastering) | | | |
| 5) All backfilling complete and tidied up | | | |
| 6) Pressure tests of pipeline and manholes completed and witnessed | | | |
| 7) Final as-built plans attached for approval | | | |
| 8) Inspection arranged with Council | | | |
| Site Meeting | | | |
| 1) Inspect all lines | | | |
| 2) Inspect all manholes | | | |
| 3) All manholes and set to level | | | |
| 4) Works on third party land completed to satisfaction of owner | | | |
| 5) Wastewater pumping station | | | |
| 10) Remedial work required | | | |

Signature of Developer

Signature of WWS Rep

Date

Date

PART 6 – WATER SUPPLY

6.1 GENERAL

Council's Role includes random audits of a sample of the Works for compliance. The role also includes inspection of stages of construction and witnessing and acceptance of:

- a) All pressure testing and sterilization
- b) All thrust blocks, valves, hydrants and other specials
- c) The final inspection prior to 224 (c) approval.

The Engineer shall carry out the following checks on all works to certify compliance:

- i) Position and depth of pipeline relative to boundary conforms with approved drawings
- ii) Type, class, size of pipes and fittings confirms to HDC Engineering Manual — Acceptable Products (Volume 3)
- iii) Before pipe laying commences check that pipes are at correct level and alignment to join existing mains and jointing procedures are agreed.
- iv) Thrust blocks installed where required. Check adequacy of bearing.
- v) Correct bedding and surround
- vi) Backfilling to specifications
- vii) All QA checklists and test certificates completed, checked for compliance and submitted to Council as the work progresses
- viii) No debris in pipelines
- x) Ensure that Contractor carried out successful pre-test prior to advising Council of formal test.
- xi) Council present to witness required testing and for final inspection
- xii) As-built information logged.

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Checklist 6.1

Hauraki District Council - Utilities

WATER RETICULATION PIPE LAYING CHECKLIST

| | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|
| Location: | To | To | To | To | To |
| | From | From | From | From | From |
| Name of qualified water service person: | | | | | |

Pipe Laying Checks

| | | | | | |
|---|---|---|---|---|---|
| • Pipe size, quality, approved materials checked. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Set out checked (control points) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Foundation support - penetrometer results available - if under cutting required, note chainage | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> |
| • Alignment and cover. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Bedding type and backfill material (results available for road crossings and driveways). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • All service connections in place. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Connections, meter and Meter Box correctly located horizontally and vertically. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Hydrants and valves positioned correctly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Thrust blocks installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • No debris in pipelines. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • As-built measurements taken. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Pressure and disinfection tests witnessed and passed by Council representative. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Bacto sample taken and passed by Council representative PRIOR to connection to the live Council main. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Connection to live main by Council (unless specifically approved). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Signature of Contractor

Date

Checklist 6.3

Hauraki District Council - Utilities

FINAL INSPECTION FOR WATER RETICULATION

| |
|------------------|
| Location: |
| Plan No: |

Pre-Meeting Tasks

| Developer to verify prior to meeting: | Developer Check | HDC Rep Check |
|---|--------------------------|--------------------------|
| 1) All lines flushed out | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) All backfilling complete and tidied up | <input type="checkbox"/> | <input type="checkbox"/> |
| 3) Checklists 6.1 and 6.2 completed | <input type="checkbox"/> | <input type="checkbox"/> |
| 4) Pressure and disinfection tests completed and witnessed | <input type="checkbox"/> | <input type="checkbox"/> |
| 5) Bacto test completed and passed | <input type="checkbox"/> | <input type="checkbox"/> |
| 6) Final as-built plans attached for a inspection arranged with Council | <input type="checkbox"/> | <input type="checkbox"/> |
| 7) Connected to existing supply by Council | <input type="checkbox"/> | <input type="checkbox"/> |
| Site Meeting | | |
| 1) Valves and hydrants correctly marked | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) Toby boxes installed correctly | <input type="checkbox"/> | <input type="checkbox"/> |
| 3) All valves checked on/off | <input type="checkbox"/> | <input type="checkbox"/> |
| 4) Remedial work required | <input type="checkbox"/> | <input type="checkbox"/> |

Signature of Developer

Signature of WWS Rep

HAURAKI DISTRICT COUNCIL OFFICES

*For all customer service enquiries 24 hours a day telephone
07 862 8609 or 0800 734 834 (from within the District)*

*Council offices are open 8.00am to 4.30pm Monday to Friday,
excluding public holidays*



PRINCIPAL OFFICE, PAEROA

William Street

P O Box 17

Paeroa

Ph: (07) 862 8609

Ph: 0800 734 834 (from within the District)

Fax: (07) 862 8607



PLAINS SERVICE CENTRE

Orchard West Road

Nga tea



WAIHI SERVICE CENTRE

92 Seddon Street

Waihi