FOREWORD

The Code is a guide on various development standards required by the Council. The Code sets out the technical engineering criteria for approving the design and construction of developments. Whether vested with Council or maintained in private ownership, new or upgraded assets must be constructed to the Council's standards.

This 2025 Code is a revision of the former Code of Practice for Land Development 2012. It has been updated in association with the preparation of the Wellington City 2024 District Plan Change 1 (Omnibus Plan Change), July 2025.

Wellington Water publishes the Regional Standard for Water Services, ensuring a consistent method of design and implementation of water assets across the Wellington region. The Council's Water Services Bylaw requires all connections, installations, maintenance, repair works, and any other work on or around public water services infrastructure to be in accordance with the Standard.

Alternatives to the construction standards set out in this Code will not be permitted.

However, it is not the intention of the Council to stifle innovation and ingenuity of design. Where the outcome will be an overall net benefit, proposed alternative solutions for infrastructure design should be negotiated with the Council to ensure that the Code's basic requirements are met.

Reference to this Code of Practice is contained in the Council's District Plan. The requirements of this Code of Practice are enforceable under the Resource Management Act 1991, the Building Act 2004 and the relevant Wellington City Council bylaws.

CONTENTS

APPENDICES

RELATED DOCUMENTS

The following documents are either referred to or have been used to produce this code.

NEW ZEALAND STANDARDS:

- AS1111:2015 – ISO metric hexagon bolts and screws
- AS 1112:2000 - ISO metric hexagon nuts
- AS 1397:2011 - Steel sheet and strip - Hot-dipped zinc-coated or aluminum/zinc-coated
- AS 1418:2002 - Cranes (including hoists and winches)
- AS 1627:2005 - Metal finishing - Preparation and pre-treatment of surfaces
- AS 4089:1993 - Priming paint for steel, single component, general purpose
- AS 3735:2001 - Concrete structures for retaining liquids
- AS NZS 1158: 2020 - Road lighting - Lighting for roads and public spaces
- AS NZS 1664:1997 – Aluminum structures – Limited state design
- AS NZS 1665:2004 - Welding of aluminum structures
- AS NZS 1734:1997 – Aluminum and aluminum alloys – Flat sheets, coiled sheet and plate
- AS NZS 2312:2014 - Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
- AS NZS 3725:2007 - Loads on buried concrete pipes.
- AS NZS 3750:2008 - Paints for steel structures
- AS NZS 4455:12008 - Masonry units and segmental pavers
- AS/NZS 4600:2018 - Cold-formed steel structures
- AS NZS 4680:2006 - Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
- AS.NZS 1554:2011 - Structural Steel Welding Set
- NZS 1170:2011 - Structural Design
- NZS 1254:2010 – PVC piles and fittings for stormwater and surface water applications
- NZS 2280:2020 - Ductile iron pipes and fittings
- NZS 3101:2006 - Concrete structures standard - The design of concrete structures
- NZS 3103:1991 - Specification for sands for mortars and plasters
- NZS 3104:2021 - Specification for Concrete Production
- NZS 3105:2014 - Approval and test specification - Electrical portable outlet devices
- NZS 4058:2007 - Specification for precast concrete drainage and pressure pipes

- NZS 3109:1997 - Concrete construction
- NZS 3111:2009 - Methods of test for water and aggregate for concrete
- NZS 3112.2:1986 - Methods of test for concrete - Tests relating to fresh concrete
- NZS 3114:1987 - Specification for concrete surface finishes
- NZS 3121:2015 - Specification for water and aggregate for concrete
- NZS 3122:2009 - Specification for Portland and blended cements (General and special purpose)
- NZS 3404 1 & 2:1997 - Steel Structures Standard
- NZS 3501:1976 - Specification for copper tubes for water, gas, and sanitation
- NZS 3604:2011 - Timber Framed Buildings
- NZS 4158:2003 - Thermal-bonded polymeric coatings on valves and fittings for water industry purposes
- NZS 4210:2001 - Masonry construction: Materials and workmanship
- NZS 4229:2013 - Concrete masonry buildings not requiring specific engineering design
- NZS 4230:2004 - Design of reinforced concrete masonry structures
- NZS 4402:1986 - Methods of testing soils for civil engineering purposes
- NZS 4404:2010 - Land development and subdivision Infrastructure
- NZS 4431:2022 - Code of practice for earth fill for residential development
- NZS 4442:1988 - Welded steel pipes and fittings for water, sewage and medium pressure gas
- AS/NZS 4671:2019 - Steel reinforcing materials
- NZS 4672:2007 - Steel pre-stressing materials
- AS/NZS 1158.6:2004 - Code of practice for road lighting
- NZS 6801:2008 - Acoustics - Measurement of sound
- NZS 6802:2008 - Assessment of environmental sound
- NZS 6803:1999 - Acoustics - Construction noise
- NZS 4522:2010 - Specification for underground fire hydrants and surface box frames and covers
- NZS 7601:1978 - Specification for polyethylene pipe (Type 3) for cold water services
- NZS 8630:2004 - Tracks and outdoor visitor structures
- SNZ HB 44:2001 - Subdivision for people and the environment
- SNZ PAS 4509:2003 - New Zealand Fire Service Fire Fighting Water Supplies Code of Practice
- ISO 14713:2017 - Protection against corrosion of iron and steel in structures

BRITISH STANDARDS:

- BS 10:2009 - Specification for flanges and bolting for pipes, valves, and fittings
- BS EN 1011.1:2009 & .2:2001 - Welding. Recommendations for welding of metallic materials.
- BS 1560-3.2:1989 - Circular flanges for pipes, valves and fittings (Class designated). Steel, cast iron and copper alloy flanges. Specification for cast iron flanges
- BS 5154:1991 - Specification for copper alloy globe, globe stop and check, check and gate valves
- BS 5896:2012 - Specification for high tensile steel wire and strand for the pre-stressing of concrete
- NZS/BS 5163:2004 - Specification for predominantly key-operated cast iron gate valves for waterworks purposes

WAKA KOTAHI/NEW ZEALAND TRANSPORT AGENCY SPECIFICATIONS:

- TNZ Standard Specification F2:2008- Subsoil drain construction
- TNZ Standard Specification M1:2006 - Asphaltic Bitumen's
- TNZ Standard Specification M4:2006 - Basecourse Aggregate.
- TNZ Standard Specification M6:2019- Sealing Chips.
- TNZ Standard Specification M10:2020 - Specification for Asphaltic Concrete
- NZTA M26 Specification for Lighting Columns
- NZTA M30 Accepted Luminaires List
- TNZ Standard Specification P3:1998- First Coat Sealing
- TNZ Standard Specification P4:1998 - Resealing. A guide to Road Design (Austroads 2021)
- Traffic Control Devices Manual
- Safe System Audit Guidelines for Transport Projects 2022
- Austroads Guide to Traffic Management, 2020
- Clay Brick and Paver Institute Design Manual 1989

STATUTES:

- The Local Government Act 1974 and 2002
- The Resource Management Act 1991
- The Public Works Act 1981
- The Soil Conservation and Rivers Control Act 1941
- The Construction Contracts Act 2002
- The Plumbers Gasfitters and Drainlayer's Act 2006
- The Telecommunications Act 2001
- The Electricity Act 1992
- The Gas Act 1992
- The Building Act 2004
- The Health and Safety in Employment Act 1992
- The Environment Act 1986
- The Conservation Act 1987
- Reserves Act 1977
- Climate Change Response Act 2002
- Energy Efficiency and Conservation Act 2000
- The Fencing Act 1978
- Land Drainage Act 1908
- Traffic Control Devices Rules 2004
- Utilities Access Act 2010

OTHER DOCUMENTS:

- Wellington City Wellington City Council District Plan 2024
- Wellington City Council bylaws
- Wellington City Council's Code of Practice for Working on the Road August 2006.
- Wellington City Council's Our Natural Capital Plan - Biodiversity Strategy and Action Plan 2015
- Guide to Geometric Standards for Rural Roads, 1985, prepared by New Zealand
- Counties Association for the National Roads Board New Zealand

- CBPI Design Manual 1, Clay segmental Pavements – A Design and Construction
- Guide for Sites Subjected to Vehicular and Pedestrian Traffic
- Wellington City Council's Te Whai Oranga Poneke Open Space and Recreation Strategy 2023
- Wellington City Council's Ngā Wāhanga Ātea me Ngā Aaronga Whakarato Open Space Categories and Provision Targets 2023
- Wellington City Council's Toitū te marae a Tāne - Restoration planting techniques
- Wellington City Council's Toitū te marae a Tāne - Restoration planting sites
- GWRC Publication Getting Riparian Planting Right in the Wellington Region, 2014
- GWRC publication Fish-Passage Guide 2021
- Wellington City Council's A Guide to Working Around Trees 2013
- Wellington City Council's Open Space Access Plan (2016)
- Wellington City Council's Play Spaces Policy 2017
- Wellington City Council's Outer Green Belt Management Plan (2019)
- Wellington City Council's Northern Reserves Management Plan (2008)
- Wellington City Council's Verges Policy
- Wellington Water's Regional Standard for the Design of Water Services
- Wellington Water's Regional Specification for Water Services
- Greater Wellington Regional Council's Guide for Land Disturbing Activities in the Wellington Region 2021

DEFINITIONS

Unless the context indicates otherwise all definitions are the same as the 2024 District Plan, except the following additional definitions:

"ALTERNATIVE SOLUTIONS"	means options that achieve the bottom-line standards Council require. Council will consider alternative solutions that meet these bottom-line standards and are fit for purpose. Previously these standards have been met with traditional techniques.
"APPROVED"	means approved by the respective Council Representative.
"CHARTERED PROFESSIONAL ENGINEER"	means a qualified Engineer registered as a current and competent practitioner within a specific field of engineering discipline under the Chartered Professional Engineers Act of New Zealand 2002.
"CONTRACTOR"	means the party undertaking work for Council or the party whose quotation/tender has been accepted by the Council.
"COUNCIL"	means the Wellington City Council.
"COUNCIL REPRESENTATIVE"	means the delegated Council officer for that aspect of the development.
"DISTRICT PLAN"	means the 2024 District Plan as defined by the Resource Management Act, 1991.
"EPHERMERAL STREAM"	means a stream that flows only during and after rain events.
"GWRC"	means the Greater Wellington Regional Council.
"GEOTECHINCAL DESIGNER"	As defined in NZS 4431:2022: The authorized representative of the organization undertaking the earthworks design (including earthworks specification). The geotechnical designer shall be an engineer and/or engineer geologist who holds a currented chartered registration under the Chartered Professional Engineers of New Zealand Act 2002, or equivalent as appropriate. Currently, the Chartered Professional Engineer (CPEng) and Professional Engineerining geologist (PEngGeol) quality marks are registered as assessed and administrated by Engineering New Zealand.

"PROFESSIONAL ENGINEERING" **"GEOLOGIST"**	Professional Engineering Geologist (PEngGeol) with a Chartered Registration as assessed and administrated by Engineering New Zealand.
"PROFESSIONAL CHARTERED" **"GEOTECHNICAL ENGINEER"**	means a qualified Engineer registered as a current and competent practitioner within the specific field of geotechnical engineering discipline under the Chartered Professional Engineers Act of New Zealand 2002.
"SQEP"	a suitably qualified and experienced practitioner (SQEP), under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NES)
"INTERMITTENT STREAM"	A stream that runs above ground for only part of the year.
"RURAL LAND"	As defined by the 2024 District Plan
"SUBDIVIDER"	means either the person/s who are the registered proprietors of the land to be subdivided in terms of the Resource Management Act or in the case of development without subdivision means the person/s who are the registered proprietors of the land in respect of which construction works are to be or a being undertaken.
"SUBDIVISION"	means the Subdivision of land as defined in the Resource Management Act, Section 218.
"URBAN LAND"	means any land not defined as Rural Land.

PART A. GENERAL SUBDIVISION PRACTICE

CONTENTS

A.1 GENERAL

This Code provides a guide for development and subdivision in Wellington City. It integrates sustainable principles of land development intending to enhance water quality, minimise land disturbance, preserve native vegetation and minimise impervious surfaces where groundwater will not adversely affect earthworks and infrastructure integrity.

The Council is committed to operating safe and efficient infrastructure systems. In line with Councils Vision, we aim to increase the resilience of these systems to earthquakes and other natural disasters, including adapting to climate change. The Council's Wellington's Towards 2040 Strategy positions Wellington as an internationally competitive city with a strong and diverse economy, high quality of life and healthy communities without compromising the environment. It will achieve the Towards Wellington 2040 Strategy goals through maintaining and developing smart and connected networks and by managing networks and resources prudently to ensure resilient and sustainable use. As such this Code contributes to achieving these goals through requiring engineering standards and best environmental practices for earthworks, open space, roading and stormwater.

The Regional Water Standard manages water and drainage assets.

Through requiring assets to be designed and built to engineering standards the Code provides the cornerstone of public health and safety. The provision of adequate potable water supplies and treatment and disposal of wastewater are not open to alternative solutions as these services must be compliant, as a minimum, with the following legislation:

- Resource Management Act 1991
- Building Act 1991
- Local Government Act 2002
- Land Drainage Act 1908
- Health Act 1956
- Soil Conservation and Rivers Control Act 1941
- Civil Defence Emergency Management Act 2002
- Health and Safety at Work Act 2015
- Water Services Act 2021

This Code has been written to complement the District Plan by providing more detailed technical standards necessary for the construction of subdivisions and land development.

Note that District Plan requirements are not repeated in this document. The subdivider should consult both documents to confirm all requirements. Should there be a

discrepancy between the District Plan and this Code; the District Plan must take precedence.

The primary purpose of this Code is to provide a standard technical document for all users. It is intended for planners, designers and developers servicing the land development industry and for work done on behalf of the Council for asset construction, relocation, replacement and renewal.

The procedures and standards used for rural subdivisions must be as for urban subdivisions, except as may be modified in the relevant chapters. There may be instances where an objective can be best achieved by a means not anticipated by this Code. In this situation, a departure from the Design Guides or the Code is justifiable if it can be demonstrated that the proposed design solution better satisfies the associated design objective.

A.2 FEES AND DEPOSITS

The following fees are required in connection with the engineering development of the subdivision.

A.2.1 INSPECTION FEE

An inspection fee is required to cover the cost of Council inspections of the engineering plans, specifications and the works.

A.2.2 EXTRA INSPECTION / SUPERVISION OF WORKS

Where extra inspections may be desirable because of the magnitude of the works and associated supervision required, the Council may appoint and employ an Inspector for this purpose and charge the costs of their services to the Subdivider.

A.2.3 LEGAL AND ASSOCIATED COSTS

Any legal and associated costs in connection with the granting of easements, caveats, the uplifting of same, dedication, laying off of under-width streets, declaration of public drains, etc.

A.2.4 OTHER FEES THAT MAY FALL OUT OF THESE MACHINATIONS

All other fees that may fall out of these machinations include relevant Corridor Access Request (CAR) fees.

Wellington City Council imposes access fees to access their network and corridor for any works. The Wellington City Council network teams control this access through work access permits (WAP) and as such a Corridor Access Fee (CAR) processing fee will be imposed for

access to the WCC network and corridor for any land development including truck crossings.

These fees are divided into 3 separate fee structures depending on the work being undertaken and assessed by the Corridor Access Team.

- Major
- Minor
- Project Preliminary

Other fees may be imposed where relevant by the Corridor Team e.g. late notification, Non-compliance, date extensions etc. A full list of fees can be requested from the Corridor Access Team at any stage by e-mail customercompliance@wcc.govt.nz

A.3 QUALITY OF WORK

Plans and construction must be designed, supervised and certified by suitably qualified persons in the related area of expertise.

The Council requires the design, construction and certification of any development to be overseen by a Chartered Professional Engineer (civil or structural), or Registered Professional Surveyor, or suitably qualified alternative.

All drawings and plans submitted for approval must be in accordance with the current Wellington City Council Drawing and As-built Specification.

A.3.1 DESIGN FIELDWORK

Although electronic data relating to Councils networks is available and is useful in the feasibility stage of a design, the final design must be based on information confirmed by carrying out topographical surveys, levelling (in particular accurate manhole inverts) and field checks/investigation (i.e. manhole inspections).

A.4 ENGINEERING APPROVALS AND NOTIFICATIONS

The Approval and Notification of the appropriate Council Representatives is required at various stages of the subdivision.

The appropriate Council Representative and stages of the subdivision are summarised in Table 1 with Benkelman Beam tests.

Roading As-built Plan should be approved by the Council Data Analysts team. Where notification is required, work on the next stage must not commence until the Council

Representative has been notified and had a 3 working day period to inspect the work.

Where approval is required during the construction work an inspection will be made within 2 days, not including weekends or public holidays, or as soon thereafter as possible. On no account must the next stage of construction commence until the work has been passed as being satisfactory.

Stage	Council Representative for:		
	Roads and Earthworks	***Drainage***	**Water**
Water right consent application		Approval required	
Proposed construction details	Approval required	Approval required	Approval required
Drainage permit		Approval required	
Initial commencement	Notification Required	Notification Required	Notification Required
Re-commencement (after a 6 month lapse of work)	Notification Required	Notification Required	Notification Required
Commencing Silt retention structures	Notification Required	-	-
Commencing Subsoil Drainage	Notification Required	-	-
Commencing earthworks	Notification Required	-	-
Obtain "Street Opening Notice" for trenching in existing road land	Notification Required	-	-
Completion of drains and water mains (prior to backfill)	-	Notification Required	Approval required
Completion of road subgrade	Notification Required	-	-
Completion of kerb and channel subgrade	Notification Required	-	-
Testing of drains / water mains	-	Approval required	Approval required
Connection to existing drains / water mains	-	Notification Required	Notification Required
Benkelman beam testing of basecourse	Approval required	-	-
Completion of footpath subgrade	Notification Required	-	-
Road surface preparation for sealing	Notification Required	-	-
Berm areas prior to soil and sowing	Notification Required	-	-

Stage	Council Representative for:		
	Roads and Earthworks	***Drainage***	**Water**
As Built Plans	Approval required	Approval required	Approval required
Final completion of subdivision	Approval required	Approval required	Approval required

Table 1: Summary of Engineering Approvals and Notifications.

A.5 DETAILS OF SUBDIVISION

A.5.1 PROPOSED CONSTRUCTION DETAILS

As a minimum, the details required of any proposed construction are:

a. Specifications for carrying out the work.

b. Detailed calculations for pavement design, water main pipe size, stormwater and wastewater pipe sizes, together with associated supporting information where appropriate.

c. The Name(s) and Employer(s) of the person(s) who will be supervising the construction work.

d. An erosion and sediment control plan identifying sediment and erosion hazards and the proposed management controls during and post-construction.

e. A contact name and telephone number in case any emergencies arise in the course of the subdivision.

f. Sets of construction plans of the work as required.

NOTE: Further construction requirements may be required – refer to each chapter of this document.

For Earthworks, Roading and Open Spaces: plans must be drawn in accordance with the "Basic Plan Standards and Details" in Appendix A and must include the following information:

i. Earthworks – Extent and depth of cut and fill, surface and subsoil drainage, erosion and sediment control prior to, during and after construction.

ii. Roading – Formation, subgrade drainage, metalling, kerb and channelling, sealing, footpath construction, treatment of areas outside the carriageway.

iii. Open space concepts including street tree planting proposal (individual trees or mass planted shrubs and trees) including plant species, new well-located and configured reserves, and connections to existing reserves and track networks.

iv. Vegetation and natural features – Any bush or other vegetation, landforms, outcrops, streams or other natural features.

v. Other Services – All power and telecommunication cables, lighting standards, gas mains and any of their ancillary works.

vi. Existing services – All existing services (live and abandoned) not being altered must be clearly shown by their location and depth.

For Drainage and Water: refer sections D and E and the Wellington City Council Drawing and as-built Specification – Water and Drainage Networks.

A.5.2 LEVELS OF CONSTRUCTION DETAILS

Levels shall be used in terms of the NZVD2016. Levels shall be taken from an approved benchmark unless written dispensation is granted. Care shall be taken to ensure the origin level used is accurate. This can be critical in terms of water supply pressures and drainage pipe levels. A description of the origin used, and its level shall be given.

Coordinates provided to Council should be in terms of NZTM2000.

Council will require the source of all data used for the design to be documented on submitted plans and documents.

Further level information and conditions relating to drainage works is documented below.

A.6 BASIC CONSTRUCTION PLAN STANDARDS AND DETAILS

A.6.1 DRAUGHTING STANDARD: EARTHWORKS AND ROADING

A.6.1.1 All drawings and plans submitted for approval must be in accordance with the current version of the Asset Management Data Standard (AMDS) available from the NZTA website.

A.6.1.3 Plan Numbering

Plans must be numbered and dated.

Amendments must be numbered, dated and detailed.

Plans must be clearly legible.

A.6.1.4 Plan Information

The following information is required on all plans:

a. a North point.

b. a legend.

c. Existing and proposed boundaries.

d. Positions and levels of control points or survey marks used in surveys must be shown.

e. Contours clearly showing the land formation. The contours must be at appropriate vertical intervals (preferably not more than 2 m) covering all the land affected by the proposed subdivision. On small proposals, which do not involve earthworks, lesser topographic detail is acceptable.

A.7 AS-BUILT DETAILS

As-Built drawings are required prior to the issue of a Certificate of Practical Completion or a certificate under section 224(c) of the Resource Management Act.

Upon completion of work Council must receive detailed As-Built drawings of all assets to be vested in Council, for three waters connections to Council mains, cut and fill areas (including depths) and final land contours.

All drawings and plans submitted for approval must be in accordance with the Council's current Drawing and As-built Specification.

The following requirements apply to as-built plans:

a. Documents are to be submitted electronically and to comply with the Wellington City Council Transport Asset Information requirements.

b. As-Built data and drawings can be supplied in digital format aligned to the current AMDS geometry and attribute specifications. A PDF of the Issued For Construction (IFC) and As-Built drawings are required.

c. General information to be shown on as-builts includes:

- A north point
- A legend
- Drawing title
- Property boundaries
- Plan scale(s) and date
- Lot numbers and house numbers
- Appropriate legend
- House/building locations - where appropriate

- Kerb lines
- Name of premises served – if known
- Name of company and person who prepared the land survey and as-built plans

g. All co-ordinates must be in terms of New Zealand map grid, NZTM2000 (New Zealand Transverse Mercator), to ±0.1m.

h. Construction plans are not acceptable as as-built plans.

i. Long sections must be drawn with the high point of the drain on the right side of the sheet.

j. All horizontal distances from adjacent property boundaries are to be measured to ±0.1m.

k. Each service or feature must be distinguished by a different legend as shown on the Standard Engineering Detail Sheets.

Also to be submitted with the as-built plans are:

- Detailed drawings at an appropriate scale of all structures requiring a drawing for the structure to be built. Examples are: headwalls, overflows structures, pump stations, valve chambers, secondary intakes, retaining walls. These drawings must include reinforcing drawings if appropriate. Detail drawings may be a copy of the construction drawings amended as appropriate.
- All relevant design calculations.
- Comments/information about ground conditions encountered.
- Digital photographs may be submitted with the as-built, images should have EXIF location and metadata enabled and organization who contributed the images included in the document folder name.
- Date of installation or construction and expected life for all assets and their components.
- Maintenance manuals, plans and/or guarantees for assets and their components, particularly street furniture.
- Utility connections as per design specifications from the National Utility code.
- Council also requires all as built plans for all utility connections e.g. water, power, gas. these must be to the National Utility code requirements. These utility as-built plans also need to be submitted to the Corridor Access Team (CAR) if a CAR has been opened to connect to these utilities within the WCC roading corridor, berm or reserve.

Where Roading services have been constructed a certificate must be supplied stating the following:

- The New Zealand map grid co-ordinates of all service covers and survey marks: these must be also shown on the plans.
- Existing services – All existing services (live and abandoned) must be clearly shown by their location and depth. Any underground wrongly recorded or unidentified buried objects found during construction phase are to be recorded in the UAR https://nzuar.org.nz/login
- That all services have been constructed in accordance with Council's Code of Practice for Land Development.
- The plans must be drawn in accordance with the "Basic Plan Standards and Details" in Appendix A.

NOTE: Each section further details as-built requirements for each specific asset, under as-built Requirements and WCC Transport Asset Information requirements.

A.8 CERTIFICATION

A drainage permit will not be issued until construction plans have been approved. In the case of subdivisions, Sections 223 and 224(c) certificates will not be given until as-builts have been received and approved.

As-built drawings must be certified as being accurate and within acceptable engineering and survey tolerances by a Chartered Professional Engineer or Registered Professional Surveyor. This certification will be required for all completed work.

The survey work and preparation of as-built plans must be carried out by the subdivider. Before submission, all data and drawings are to be updated to as-built status to reflect any changes between design and construction.

The receipt and Council's acceptance of as-built plans does not absolve the subdivider of any responsibility for their accuracy. In the event of an asset detail not being provided or incorrect, or an asset not being in the position shown on the as-built plan, it must be the responsibility of the subdivider to provide or locate the asset for the owner of the property as per the Asset Information Requirements. Any work initiated by Council to rectify problems arising will be at the expense of the subdivider.

For minor works associated with development, the Council may accept as-built plans, of suitable quality, from registered drain layers and /or technically qualified persons.

Other resource consents may be required and the responsibility for identifying and obtaining those is entirely the Subdivider.

A.9 TESTING

All testing must be arranged and paid for by the subdivider.

All work required to be tested and approved must have been pre-tested by the subdivider and proved to be satisfactory before the request is made for official testing.

All test results are to be forwarded to Council for record in vesting these assets to Council. File formats as specified in the relevant Asset Information Requirements or As-Built Specification document.

A.10 CONNECTION TO EXISTING ROADS AND SERVICES

Where the underground services extend into the existing road corridor the work must be carried out in accordance with the WCC Code of Practice for Working on the Road. This will require a Corridor Access Request to be obtained and associated fees paid.

Physical works in excess of 28 calendar days will require a preliminary Corridor Access Request (CAR).

Any development more than 28 days in duration MUST apply to WCC Corridor Access team for a Preliminary CAR (Corridor Access request) this will be assessed and conditions set to form the bases to access the WCC road network and corridor. After a preliminary CAR has been submitted and approved a subsequent CAR will need to be submitted where the Preliminary conditions are taken into account and form the basis of the final works submission request. All Corridor Access requests (CARs) incur a relevant fee and must be paid in accordance with WCC terms and conditions failure to pay will result in access to the network being removed until full payment has been made.

A.11 SURVEY MARKS

Survey marks must be provided in the kerb. The distance between them should not exceed 50 metres.

The marks must be galvanized iron bolts with a head diameter of 25 mm, and a minimum length of 100mm.

These survey marks are primarily for reference to underground services and to locate the kerb in terms of the New Zealand map grid co-ordinates; NZTM (New Zealand Transverse Mercator).

Care is to be taken to preserve or relocate all survey marks and height control benchmarks.

The Subdivider is to ensure that data for historical survey marks are accurately recorded including newly installed survey marks to meet AMDS specifications.

A.12 RETICULATION OF UTILITY SERVICES

Underground services must be located to achieve the clearances dictated in the Wellington Water Regional Standard for Design of Water Services.

To ensure the safety of people, operating valves and opening manholes should be located outside the traffic lanes in the road reserve. Where possible, services must not cross over lots other than the one served.

For road lighting power reticulation refer below.

A.13 CONFIRMATION OF UTILITY SERVICES

All utility service authorities/owners must be contacted at the start of the design process to establish the location of any / all services within the design area.

If a service authority has services in the design area, copies of their service plans are to be obtained. Any services near the proposed design area are to be shown on the proposal plan.

The accurate position of services that are potentially in conflict with the network must be confirmed as part of the design process; by digging test holes and /or using ground-penetrating radar, depth finding locators, hydro excavating etc.

A.14 CONSULTATION WITH UTILITY AUTHORITIES

Prior to submitting a design to Council utility authorities/owners of services within the design area are to have been consulted to gain their clearance. They may have requirements for working near their service or additional information.

If a conflict has been established, there may need to be further consultation to discuss modifying or shifting of service – this must be carried out as part of the design process.

The consultation is to include the option of the service authority amending their utility service during construction.

A.15 DAMAGE

The subdivider must immediately make good any damage caused by their work whatsoever unless approved otherwise by the Council Representative.

The Corridor Access Request (CAR) process will impose penalty fees to address damage caused by the Subdivider work.

The WCC Network and Corridor team will impose relevant non-compliance, stop work, and inspection fees to any damage caused to the WCC network, corridor or berm.

A.16 INSURANCE

Where work is to be carried out on a dedicated road or other land not owned by the subdivider, the following insurance provisions must apply.

a. The subdivider must be responsible to ensure that Public Liability insurance is arranged in the joint names of the subdivider and the Council, for a minimum amount of $2,000,000 indemnifying the parties in respect of any one claim or series of claims arising out of the same occurrence.

b. The policy must be extended to cover all insurable risks normally applicable to subdivision/road work and including vibration and removal of support.

c. The policy must have attached either:

    i. A cross Liabilities/Joint Insured clause or,

    ii. Appropriate wording which states that the policy will be construed as though a separate policy had been issued to each of the joint insurers.

A.17 EMERGENCY PROCEDURES

If during construction works any situation arises where the security of public or private property or the operation of any public facility is endangered, likely injury to persons, or damage to the environment, the subdivider must take action to rectify the situation immediately and notify the appropriate authority without delay.

Council Corridor Access Request Manager must be notified immediately and the Council Corridor Manager must also be notified immediately without delay.

A.18 SITE TIDY UP

Upon completion of the work, the subdivider must leave the site in a clean and tidy condition.

This includes the following:

- Carriageways and footpaths are to be swept of all loose material.
- Kerb and channel and stormwater sumps are to be free from all loose material
- Earthworks stabilized to minimise erosion via overland flowpaths
- Cleaning of oil spills and liquids to limit the likelihood of these entering stormwater networks
- Any loose material on hard surfaces or other incidental rubbish to be removed from the site

- Site completion with finished photos must be uploaded to the Corridor Access Request (CAR) including the stamped Code of Compliance Certificate (CCC).

Site completion finished photos must be uploaded to the CAR that was opened to conduct all relevant works within the WCC network and corridor including all Council assets. This includes the final approved stamped CCC and any other relevant documentation that maybe requested by the WCC Corridor Assets Team.

A.19 MAINTENANCE PERIOD

The subdivider must repair any deficiencies that are due to the negligence of the Subdivider or their contractors.

The maintenance period for all WCC roads and corridors is 24 months any identified defects must be remedied, and the maintenance period (24 months) will start again from the date of remediation.

In addition to the above, the subdivider must maintain the other aspects of the works for 24 months.

PART B. EARTHWORKS DESIGN AND CONSTRUCTION

CONTENTS

OBJECTIVES

OBJECTIVES

Earthworks are the removal, relocation or deposit of earth (which includes any substance constituting the land such as soil, clay, sand and rock) from a natural or constructed land formation. Turf farming, ground cultivation and quarrying are excluded from the definition of earthworks.

The objective of this chapter of the code is to ensure the following criteria are achieved:

- stability of land,
- geotechnical soundness and resilience of any development,
- control of the sediment generated by the works,
- restriction of erosion and run off from the works,
- control of the amount of sediment entering receiving environments,
- control of surface water flows both during and after construction,
- no undue nuisance from silt, dust, noise or disposal of vegetation.

B.1 DESIGN BASIS

The design and construction of mass earthworks must be in accordance with the requirements of NZS 4431:2022, “Code of Practice for Earth Fill for Residential Development” guided by, but not limited to NZS 4404:2010 Land Development and Subdivision Engineering and SNZ HB 44:2001, Subdivision for People and the Environment. The geotechnical designer shall evaluate the stability of the site and adjoining land during and after the construction of engineered fill. The geotechnical designer shall consider what temporary works will be required to achieve the design and allow for them in the stability analysis. The geotechnical designer shall ensure that an adequate factor of safety is achieved at all stages and, where needed, shall recommend appropriate mitigations in the earthworks design and earthworks specifications. See NZS 4431:2022 for further information.

B.2 SILT, SEDIMENT, EROSION AND STORMWATER CONTROL

Erosion and sedimentation are two related processes:

- Erosion is the wearing away of the land surface by running water, wind, ice, or other agents, including processes such as gravitational creep and landslides. Any reduction of erosion will reduce the quantity of sediment generated.
- Sedimentation is the settling of sediment out of the water column as a result of sediment entering waterways.

Erosion and sediment control measures are used to minimise the effects of earthworks on receiving environments.

Principles of Erosion and Sediment Control;

1. Appropriately integrate the development into the site.

2. Integrate erosion and sediment control issues into site and construction planning.

3. Develop effective and flexible Erosion and Sediment Control Plans (ESCP) based on anticipated soil, weather and construction conditions.

4. Minimise the extent and duration of soil disturbance.

5. Control water movement through the site.

6. Minimise soil erosion.

7. Promptly stabilise disturbed areas.

8. Maximise sediment retention on the site.

9. Maintain all ESCP measures in proper working order at all times.

10. Monitor the site and adjust ESCP practices to maintain the required performance standard.

A significant reduction in erosion on a site will result in less sediment being generated, requiring treatment and/or lost through the control measures than if reliance is solely placed on sediment control.

The erosion of soil and sediment from vegetation removal and earthworks is a problem throughout the Wellington Region.

All projects involving land disturbance must incorporate erosion and sediment controls as an integral part of land development. Activities in or near waterbodies require a range of control measures and resource consent.

Approved erosion and sediment controls must be in place before earthworks commence, be maintained during the construction and only be removed once the site is fully stabilised to protect it from erosion.

Due to the increased rate of runoff brought about by the removal of vegetation and earthworks particular care must be taken to control surface water including stormwater.

Muddy or dirty water must be captured and treated before it drains into any watercourse or stormwater system.

Silt and sediment entering a waterbody can cause problems several kilometres downstream. The most obvious is a colour change. Sediment can change flow patterns, cause flooding, and

also affect the health of aquatic ecosystems by smothering insects and other creatures.

It is required that best management practices are in place during the construction period of the development, including at site entrances and exits, to control all dust, silt and sediment generated by the works as to not discharge and cause nuisance away from the site or enter a water body or to the stormwater network.

To reduce the risk of erosion, the maximum area of vegetation stripped land being earthworked at any one time (including both cut and fill areas) must be kept to a minimum.

Land must be stabilised be it through revegetation or sealed as soon as possible.

All earthworked surfaces must be hydro-seeded as soon as practicably possible. No bare earth must be left exposed longer than necessary.

Appropriate controls must be in place to cope with anticipated runoff when the land is exposed to erosion. This must include suitable controls over any stockpiled topsoil or other fill material.

Adequate measures must be taken during the construction period to prevent excessive water logging of surface materials yet to be worked and to prevent fill material from being eroded and re-deposited at lower levels.

GWRC’s document, “Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region” 2021 must be used as guidelines.

B.3 DUST CONTROL

All areas of major dust sources including roads must be kept damp during dry periods, or hydro-seeded or adequately stabilized in advance of anticipated dry periods, to minimise public nuisance from dust. A Dust Management Plan may be required for sites of larger earthworks.

B.4 SITE PREPARATION

Reference must be made to GWRC's Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region 2021 before any earthworks are commenced.

Before any earthworks commence Site Management Plans which include plan drawings, timelines and layouts must be produced to the satisfaction of the Council. These are to be updated regularly with the details of the controls that are in place and must be available upon request. All areas of cut and fill should be clearly defined in the Site Management Plans and marked on site. Details of plans and requirements before work commences on site are included in resource consent conditions.

It is favoured that a combination of control measures are investigated and used for optimum management of erosion and siltation. Adequate provision should be made for the control of

erosion, surface water runoff and siltation prior to, during and after construction, as covered in section B.2 “Silt, Sediment, Erosion and Stormwater Control”.

Large projects must be programmed for earthworks in self-contained stages which can be largely completed within one earthworks season.

Adequate fencing or barriers should also be provided around trees or other features that are to be protected.

Earthworks must only commence after permission is granted from Council.

The site is to be adequately fenced/barricaded to safeguard other persons and private (or public) property both above and/or below the site and to prevent sediment from leaving the site.

All rubbish, vegetation, debris etc., must be removed from earthwork areas prior to topsoil stripping.

All earthwork areas must be stripped of all topsoil and any soft or organic material.

Special care should be taken to ensure that organic materials and areas of old uncompacted fill are not overlain by other soils.

Stripping must be carried out as a specific operation with areas being stripped in large enough increments to ensure that there is an adequate margin of stripped ground beyond any current cutting or filling operation.

All stripped material must be deposited in temporary stockpiles or permanent dumps, in locations where there is no possibility of these materials being unintentionally covered over or incorporated into structural fills.

Stockpiles and building materials must not be stored on the footpath or within the road reserve without permission from Council.

All temporary stockpiles must be covered with tarps or similar to minimise losses.

Stockpiles must not be located within an overland flow path.

B.5 SITE WATER MANAGEMENT

Surface water flows can be controlled using swales, ponds, perimeter bunds, pipes or pumps.

Where possible, the permanent stormwater system should be designed so it can be

constructed at an early stage in the project and be used to collect runoff from the site during construction in conjunction with silt and sediment control measures. This includes creating ponds for sediment control during construction which are used for on-going stormwater quantity and quality control after development.

Where surface water could erode batters or affect their internal instability through soakage into the soil, open interceptor drains must be constructed in permanent materials. Benches in batter faces must be sloped back and graded longitudinally to reduce spillage of stormwater over the batter.

Water from stormwater systems must not flow into a fill or onto the ground near the toe or sides of fill or cut batters.

To prevent the problems of surface springs, scouring at the toe of fills, and saturated soil stability problems, it is essential that permanent subsoil drains be constructed in the valley floor and to other potential wet areas before fill being placed.

These drains must be constructed as a public drain in accordance with Section D.

B.6 FILL BATTERS

All fill batters must be no steeper than 2 horizontal to 1 vertical with a bench of a minimum width of 2 meters every 8 meters of vertical height, with a fall inwards of 1 in 10 and longitudinally along the bench of 1 in 100 minimum to 1 in 20 maximum discharging to a point clear of the filling in such a manner as to prevent scouring. The top or toe of the batter must be at least 3 meters from a boundary or building. This is in accordance with NZS4431: 2022 Code of Practice For Earth Fill For Residential Development.

Fill batters steeper than this will require specific assessment from the geotechnical designer, e.g. high strength rockfill, reinforced earth.

The top edge of batters must also be at least 1 meter from the kerb face or back edge of sealed path or 2 meters where it is anticipated that individual paths will be cut down the batter. The total height of fill batters must generally be not higher than 15 meters.

B.7 FILL MATERIAL

The geotechnical designer shall prepare the earthworks specification for the project that will ensure quality of fill material, and quality controls to ensure suitability before the placing of fill commences. If the material used is potentially contaminated the required testing and results shall be reviewed by a SQEP. The earthworks specification shall use the definitions and classifications as documented in NZS 4431:2022.

The majority of soil types, other than organic materials, are potentially suitable for fillings under controlled conditions. However, because some clay soils are likely to undergo shrinkage and swelling when subjected to seasonal or other changes in water content, a special examination of swelling and shrinkage characteristics must be made in the case of highly plastic soils.

B.8 COMPACTION OF FILL

Fill must be placed in a systematic and uniform manner with near horizontal layers of uniform thickness (not greater than 250 mm) of material being deposited and compacted progressively across the fill area.

Before any loose layer of fill is compacted, the water content must be suitable for the compaction required and must be as uniform as possible.

Fill batter faces should be compacted as a separate operation or overfilled and cut back.

Where testing shows that the compaction achieved is below the specified minimum, all material represented by the test must be further compacted or removed as necessary and re-compacted, until the required standard has been met.

Any compacted layer which has deteriorated after an interruption in the earth moving operation must be re-compacted before further material is placed over it.

The minimum acceptable dry densities must be as shown in *Table 2: Minimum Acceptable Dry Densities*.

Position of fill	**Minimum acceptable dry density (As a percentage of the Maximum Dry Density[1])**
Within 0.6 metres (vertical measurement) of the road subgrade and extending to the outer edges of the footpaths	100

[1] The maximum dry density shall be determined by NZS 4402 Test 4.1.1 except that the soil water content shall be adjusted directly from the material water content to the compaction water content without prior drying.

Within 1 metre (vertical measurement) of the finished surface of all fill areas and within 3 metres (horizontal measurement) of all batter faces.	97
Elsewhere in the fill	Refer to Appendix A of 4431:2022 for acceptance criteria

Table 2: *Minimum Acceptable Dry Densities*

If cohesion-less soils are encountered and another test method would be more appropriate NZS 4431:2022 must be used as a guide.

B.9 INSPECTION OF FILL

Work is to be signed off by the Certifying Engineer as defined in 4431:2022 at least at the following times: (see also section 5.2 of NZS 4431:2022)

a. After any part of the existing ground has been finally stripped and prepared and before the placing of any fill on that ground,

b. After any drain has been installed and before the drain is covered by fill,

c. Such other times as the Certifying Engineer considers necessary to enable an assessment of the general standard of earthworks and to be reasonably satisfied that:

   i. Fill is not placed over soft or organic material

   ii. All areas of existing ground showing seepage or potential seepage emission have relief drains provided

   iii. Unsuitable material is not incorporated into the fill

   iv. The compaction operations are systemic, the moisture content of the fill material appears on visual inspection to be suitable and the degree of compaction appears to be consistent and satisfactory.

B.10 TESTING OF FILL

Testing must be carried out and documented with respect to the following considerations and in accordance with:

a. The frequencies in 4431:2022, see Appendix A.

b. Testing must be more frequent as noted in section 5.3.6 of 4431:2022.

c. The location of tests must be in a random manner to cover the whole area of the fill.

d. All field and laboratory test data must be recorded in a systematic manner that will allow the results to be identified and allow the calculations to be checked at a later date, if necessary. All control tests results must have recorded the time, date, location and reduced level. Test results relating to sections of fill that have been subsequently removed or reworked and recompacted must be noted accordingly.

e. All field and laboratory test data must be provided with the application for Council certification and may form part of the final geotechnical completion report.

B.11 CUTS

Cut batters must be stable except for minor fretting and when in favorable ground conditions, not be steeper than 1.0 horizontal to 1.5 vertically. Steeper cut batters are generally not acceptable and as a minimum, will need engineering input from suitably qualified and experienced geotechnical designer larger cuts must as a minimum contain a 2.0 meter bench every 8 meters of vertical height.

An area must be provided at the top of cut batters that are steeper than 1 to 1 for the softer surface material to be cut back to a 1 to 1 batter or a 2 horizontal to 1 vertical batter when in fill.

The extent of this area must be as follows:

a. 1 m for batters up to 5 m in height

b. 2 m for batters between 5 and 10 m in height

c. 3 m for batters between 10 and 20 m in height

The top or toe of a cut batter must be at least 2 meters from a boundary or building unless supported by structure.

Buildings at the top of a cut batter must be beyond a 45 o line from the toe of the batter and buildings at the toe of a cut batter must be beyond a 45o line from the top of the batter or side of the hill unless there is adequate walling or a suitable qualified engineer certifies otherwise. The toe of a cut batter must also be at least 0.3 meters from the kerb face or back edge of a sealed footpath, but an additional allowance may be required for sight distance on a curve.

B.12 ROCKFALL PROTECTION

Rockfall protection may be required for some cut slopes and should be in accordance with the Rockfall: Design considerations for passive protection structures, dated October 2016.

B.13 RETAINING WALLS/STRUCTURES

All retaining walls are required to be constructed in line with the New Zealand Building Code. And when engineering input is required, the design must be in accordance with the Earthquake Geotechnical Engineering Practice, Module 6. Earthquake resistant retaining wall design. All engineering design work and certifications must be undertaken by a Suitably Qualified Chartered Professional Engineer (CPEng).

All retaining walls must be designed for a 50 year or indefinite life period. All retaining walls must meet the New Zealand Building Code requirements for their design life.

Mechanically stabilized earth walls or slopes are likely to require both Building Consent and Resource Consents approval as such please ensure you seek advice from Council around these consenting requirements.

B.14 LOADING AND SPILLAGE

Where practicable, all loading must be carried out within the site.

Site specific measures must be taken to keep the streets safe and clear of mud and debris.

Adequate washing facilities or properly designed vehicle rumble pads must be provided at all times on the construction site so that all vehicles are free from mud and debris when they pass onto the public streets. Where considered necessary properly formed, sealed or paved exit ways must be constructed from the washing-down facilities to the public streets. Any wash water, or other sediment laden water, must not be discharged to the stormwater system or waterbody without effective pre-treatment. Please refer to Greater Wellington Regional Council's Guide for Land Disturbing Activities in the Wellington Region 2021 for treatment methods and design requirements for dischargers. Noting that specific consent conditions may apply to the site.

B.15 CONSTRUCTION MANAGEMENT

Construction Management Plans (CMP) may be be required prior to any work commencing on the site and must be developed and certified by a Chartered Professional Engineer and submitted to the Council for certification. The purpose of this CMP is to ensure adequate controls are in place for any temporary works and earthworks so as to decrease the risk of instability to an acceptable level.

Construction noise must be assessed against any relevant noise rules in the 2024 District Plan. NOISE-R3 manages Construction noise generally.

B.16 DURATION OF EARTHWORKS

The work must be programmed so that the duration of earthworks, between commencing and finishing, on any one stage/area must not exceed six months unless otherwise consented.

B.17 PLANTING

Areas of fill including batters and areas of cut but not including cut batters must be prepared with topsoil. The minimum depth for topsoil is 300mm. This will depend on the soil and species to be planted.

Those areas along with any other areas that have been disturbed, including cut batter faces, must then as a minimum be sown or preferably hydro-seeded with grass as soon as a satisfactory strike is achieved and where ground conditions allow growth.

Ideally, the site will also be planted with native species. See section F for guidance on this matter.

Specific planting may be required for certain locations e.g. close to or over underground services, riparian planting in drainage situations and adjacent to open space. See section E.1 for guidance on this matter.

B.18 CERTIFICATION OF SUITABILITY OF ENGINEERED FILL AND CUTS

The Council requires certification of the suitability of engineered fill and cuts for residential development. Certification must be submitted and approved by the Council upon completion of the earthworks – refer to appendix B for a copy of the certificate. Both of which, if applicable to the site, may be required as part of the Geotechnical Completion Report (GCR, NZS 4404-2010). This is requirement will be outlines in the consent requirements

B.19 AS-BUILT REQUIREMENTS

Council requires the following information concerning earthworks construction.

1. Extent and depth of fill in the form of lines joining all points of equal depth of fill at appropriate vertical intervals of 1 metre (or as appropriate).

2. Plans must also show the type of fill material areas of cuts and any areas where buildings or foundations will require a specific design together with any fill areas of low density not complying with this Code.

3. The position, type and size of all subsoil drains and their outlets must also be shown.

4. Where earthworks have been carried out a certificate of land suitability for residential development must be supplied along with a report of the inspections and testing carried out. A recommended form of the certificate, Standard Form A/1, is in Appendix A. The type

of residential development that earth fills must be capable of properly supporting are residential buildings of timber or concrete block work conforming with the requirements of NZS 3604 or NZS 4229. Dimensions and other information relating to the earthworks must be provided.

PART C. ROAD DESIGN AND CONSTRUCTION

CONTENTS

OBJECTIVES

The objectives of the Roading chapter of this Code are:

- To achieve a sustainable, effective, safe and appealing roading corridor that provides for the needs of all road users, including cyclists, micro mobility users, pedestrians, vehicles, adjoining property owners, utility companies and other service providers
- To ensure transport routes are physically resilient to natural and major disasters
- To increase public amenity through the provision of landscaped street environments, and the provision of street furniture; and
- To support the goals to provide a highly efficient interconnected road and street system that is easy to use, cyclist and pedestrian-friendly while minimising any adverse environmental effects associated with the activity.

GENERAL PERFORMANCE CRITERIA

Any constructed road needs to:

- be appropriate for its position in accordance with the District Plan One Network Framework.
- be of sound structure,
- Design pavement for a 25-year service life,
- provide a suitable skid-resistant, waterproof running surface for traffic,
- manage surface and subsoil water so that long term pavement performance is assured,
- maximise the opportunities to dispose of runoff at source and minimise the area of impermeable surfaces associated with roading subject to there being no adverse effect.

Having regard for the following criteria:

- limit the ongoing maintenance costs of assets,
- provide for stormwater drainage and utility services,
- be durable and robust.

Provided the previous criteria are met, low impact design solutions may be proposed with appropriate engineering details that will enable the Council to assess the viability of the proposal.

Any development connects into or impacts on the Council's existing assets (roading, footpath, drainage etc) must not be based on the premise that the Council's assets can be reconfigured to satisfy the

requirements of the development. It is essential that the subdivider surveys the lines, levels and other relevant characteristics of the Council's affected assets in the vicinity and determines how the development will best connect with these assets, without requiring alteration to the Council's assets.

Discussions must be held with the Council upfront to identify if there are any proposed future Council works that will affect the development works.

It is unacceptable to expect users of the Council's assets to be compromised in the interests of the new development.

C.1 ROAD DESIGN

C.1.1 Road categories

Roading categories must be as per the NZ Transport Agency Waka Kotahi One Network Framework classifications and as discussed in the District Plan or as per any relevant conditions of consent.

C.1.2 Road Widths

Road widths must either achieve those specified in Table 1-INF: Design of Roads – One Network Framework in the District Plan, or achieve the widths stipulated in any related conditions of resource consent granted by the Council.

All berms, kerb extensions and traffic islands must have sufficient space to allow positioning of necessary signs and other street furniture for adequate vehicle clearance.

C.1.3 Roading Network Pattern

Roading patterns must conform to the operative District Plan which the Council has for the area and as per relevant conditions of resource consent granted by the Council.

C.1.3.1 Roading Design Principles

Public roads, private roads, driveways, service lanes and access ways, shall be laid out to fit in with the general roading requirements of the locality and the topography/natural landform in which they are situated. They shall conform to the operative District Plan which the Council has for the area and have character and appearance in keeping with that role.

Due regard shall also be made for any road widening or upgrading proposals which the Council may have. Cut and fill shall be kept to a minimum to avoid earthworks altering the natural land form and removal of natural features, i.e. landform and vegetation.

Except for motorways, the design of all roads and intersections shall provide for the safe and

convenient movement of pedestrians and cyclists.

All roads classified Main Streets and Activity Streets or above shall be suitable for use as a bus route.

Key aspects that should be considered in developing the roading pattern are as follows:

1. The length of any single road segment that forms a cul-de-sac shall not exceed 200m, except that where topography absolutely precludes interconnection, this may be extended up to 400m with the approval of the Council,

2. The length of any combination of continuous local road segments with only a single exit shall not exceed 500m,

3. Streets that are approximately parallel with an average separation of 200m or less shall be connected by streets at intervals no greater than 600m,

4. Collector roads that provide access to the central city are permitted to serve no more than 500 household units each. Sub-collector roads that provide access to the central city are permitted to serve no more than 150 household units each.

5. Access paths of 2.1m minimum width shall connect approximately parallel streets (with an average separation of 200m or less) and cul-de-sac heads at intervals no greater than:

    a. 200m where one street is or could be on a bus/train route, or

    b. 300m in remaining cases.

6. Areas where residential subdivisions have aggregated to 150 household units or more shall be provided with a convenient and direct through route at least 11.0m in kerb to kerb width.

    Where demand will be less, a narrower width may be acceptable. This route should be located to ensure traffic does not unnecessarily divert to other residential streets when seeking to access the subdivision. Nor should the route be designed to be so attractive as to divert people from outside the immediate area to travel through the subdivision as a means to get to some other place. This route should be designed to provide a highly accessible bus route for the subdivision where 90 percent of the subdivision’s households lie within 400m walking distance of the route.

    Other suburban facilities that are likely to attract significant groups of people (schools, shops etc.) should be sited on the route but certainly within 200m walking distance of the route.

7. All footpaths and walkways, where provided, shall apply the principles of “Crime Prevention

through Environmental Design" (CPTED) to their design.

The Council may consider variations from the requirements in this section where it is satisfied that the variations are justified in terms of the following criteria:

The need for pedestrians, cyclists, public transport and frontage activity is likely to be permanently lower than would normally be required,

Design is constrained by topography or existing development,

Where compromises are desirable in order to maintain integrity of the network, to establish effective connections or maintain continuity along a route

C.1.4 Walking Network

Care should be taken to ensure a street environment is designed for safe and convenient use by pedestrians. (Refer Traffic Calming Measures Section C.1.9).

Development of land in regard to the roading pattern should include a plan showing pedestrian movement related to key features such as bus stops, schools and shopping areas, and between parallel streets and where pedestrian routes can be significantly shortened.

Footpath width and number must be provided in accordance with Table 1-INF: Design of Roads – One Network Framework in the District Plan, or achieve the widths stipulated in any relevant conditions of resource consent granted by the Council.

The preferred design of a road crossing location would provide a median island of a minimum of 2.0m width with a maximum crossing distance of 5.0m of carriageway on either side of the road.

In the vicinity of high pedestrian trafficked areas such as schools, commercial centres, bus stops and hospitals, footpaths and crossings should be of a higher standard. In these locations, the minimum footpath width should be 3.5m.

C.1.5 Cycling Facilities

Cycling networks must be provided as per the District Plan or as per resource consent conditions.

Provision for cyclists must be in accordance with Table 1-INF: Design of Roads – One Network Framework in the District Plan, or achieve the widths stipulated in any relevant conditions of resource consent granted by the Council.

C.1.6 Public Transport

The design of the development of urban land must maximise the convenient access of public transport.

To achieve this requirement, in areas where residential subdivisions have aggregated to 150 household units or more a plan must be produced to demonstrate public transport accessibility.

Elements in this plan will include the following:

1. The provision of a continuous through route classified as a Local Street M5 P4 or higher, for public transport to use.

   Roads must be designed and built to withstand the heavier traffic associated with being a public transport route. Council Pavement Engineer will assess the details of the road design in relations to the location of the bus stops and GWRC routes.

   This requirement may be varied in the case of the land development being located near a railway line.

2. High transport intensity land uses (such as schools, tertiary institutions, hospitals, medical facilities, shopping areas, retirement villages and community facilities) should be located with frontages along the public transport route.

3. Land development should be otherwise designed to maximise the number of sites within 400m walking distance of a designated public transport stop.

4. Land development that does not have a frontage on the public transport route must be provided with convenient access to that route. Road or suitably designed walkways access must be provided to the public transport route at intervals not exceeding 200m.

C.1.7 Tree Planting (Design)

Trees must be planted as described in the Table 1-INF: Design of Roads – One Network Framework and Table 2-INF: Street Trees in the District Plan, or as stipulated in any relevant conditions of resource consent granted by the Council.

Where topography and soils permit, permeable surfaces, rain gardens, soak pits or similar vegetated channels are required for street planting and the retention and dissipation of stormwater run-off and enhancement of biodiversity and amenity. These measures must be located in the same berm as Street Trees, as detailed in Table 1: INF: Design of Roads in the District Plan.

Consideration shall also be given to positioning trees to avoid conflict with underground utilities, and overhead services such as street lighting, overhead cabling and street signs.

C.1.8 Water Quality and Quantity

Runoff from roads contains contaminants from vehicles (zinc, copper and aluminosilicates from tyres and brakes of vehicles and sulphur from the fuel) and PCB's from road materials and maintenance. Contaminants also come from paint, fuel, and other spillages on the road. Road run-off is also heavily influenced by surrounding land use (especially unpainted galvanised iron roofs) and activities more than by variation and loadings in traffic. The sources of contaminants are diffuse.

In Wellington and Porirua Harbours there is data showing ecotoxic contaminants carried by stormwater in bottom sediments at concentrations that exceed guidelines for aquatic life.

Roads are recipients and conveyors of stormwater and contaminants from adjacent and often extensive contributing areas. Roads, whilst not the sole source of contaminants, may be the most appropriate place to treat stormwater.

Sediment and associated contaminants in stormwater can be removed by a range of treatments, including directing runoff to vegetated swales and infiltration trenches along the road corridor, through to interceptor and treatment structures

The Council seeks to promote low impact design to both improve water quality and curb peak runoff volumes.

Permeable or porous paving, and retention and detention devices may be effective means for controlling peak flows of road runoff. Details for the design of these devices can be found in the Wellington Water document Water Sensitive design for Stormwater Treatment Device Design Guideline 2019.

C.1.9 Traffic Calming Measures for Residential Areas

Carriageway and alignment of traffic calming measures must discourage motorists from travelling above the design speed provided in the District Plan

The design speed environment is related to the classification of that street and is a result of the design required under Table 1 – INF: Design of Roads – One Network Framework in the District plan, or any relevant conditions of consent granted by the Council.

All speed control devices must be signposted (including the negotiation speed) and provided with appropriate lane marking.

C.1.9.1 Control of vehicle speeds

Traffic calming measures may be required to ensure the design speed cannot be significantly exceeded and/ or to discourage through traffic.

Maximum vehicle speed reduction can be achieved using traffic calming devices which shift vehicle paths laterally (slow points, bends, roundabouts, street narrowing, median islands), (Refer to drawing R-45-703 Central Islands, Kerb Extensions and Chicanes in Appendix B), or vertically (humps, platform intersections, platform pedestrian crossings, school crossings, and bicycle crossings). (Refer to drawing R-45-702 Standard Speed Hump Details in Appendix B).

Slowing devices should be located at distances not exceeding those prescribed in Section C.1.3 and should be designed to ensure the correct speed environment is produced. Allowance for increased speeds due to a downhill gradient as shown in Section C.1.3 should be made.

Speed reduction can be assisted by involving the design of the whole street environment, including pedestrian amenity, planting, and street furniture in creating a visual environment conducive to lower speeds such as (but not limited to) the elements covered by section C.4.

The maximum carriageway gradient, on which speed humps are permitted, is 1 in 12 (8%).

C.1.9.2 Visibility Requirements

Adequate critical site distances are to be provided such that in a potential conflict, evasive action can be taken by either party. The sight distances are determined by the design speed for the street and are stated in District Plan

Night time visibility of street features must be adequate. Speed control devices particularly,

should be well provided for in terms of street lighting,

All speed control devices shall be signposted (including the negotiation speed) and provided with appropriate lane marking.

C.1.9.3 Specific Design Details of Speed Control Parameters

Speed control devices must be designed for their normal use by motor cars, but with provision (such as mountable kerbs) for larger vehicles.

Design of speed control devices must comply with the following parameters:

- The speed at slow points of bends and length of the street between slow points or bends – refer to Table: 3
- Effect of downhill gradient on speed – refer to Table: 4
- The radius of Slow Points (Bend to be 45◦ deflection or more) – refer to Table: 5
- Deflection Angle for Design Of 20 Km/h Bends – refer to Table:6
- Design of 20/Km/H Street Narrowing – refer to Table: 7
- Design of 20km/H Plateau Or Platform Areas – refer to Table: 8

Speed at slow point	**Length of street (m) to limit maximum speed to (km/h):**					
	25	30	35	40	45	50
20	40	75	100	120	140	155
25		45	60	80	10	135
30			45	65	80	115
35				50	65	100
40					55	80
45						60

Table 3: *Speed at slow points of bends and length of street between slow points or bends.*

Gradient (%)	**Increase in speed (km/h)**
< 5	0
5 – 10	5
> 10	10

Gradients should not exceed 20%

Table 4: *Effect of downhill gradient on speed*

Design speed (km/h)	Radium of continuous bend (m)	Radius of isolated bend of chicane (m)
20	15	10
25	20	15
30	30	20
35	50	30
40	90	40
45	105	50
50	120	60

Table 5: *Radius of Slow Points (Bend to be 45 deflection° or more)*

Carriageway width	Single Bend	Chicane (two reverse bend)
3.5	60°	30° - 30°
5.0 – 5.5	70°	45° - 45°
6.0 – 6.5	80°	55° - 55°
7.0 – 7.5	90°	60° - 60°

Table 6: *Deflection Angle for Design of 20 Km/h Bends*

Number of Lanes	Carriageway width (m)
Single Lane	2.5
Two Lanes	4.5 (over minimum length of 3m

Table 7: *Design of 20/Km/h Street Narrowing*

Height	Ramp Slope
75mm to 150mm	1 in 15 (6.7%)

Table 8: *Design of 20/Km/h Plateau or Plateau Areas*

C.1.10 Intersections

Intersections within the residential areas should be primarily T-junctions for safety reasons. The design of these must be as per the district plan.

The kerb line radius at intersections should be kept as short as possible consistent with likely vehicle and pedestrian usage, but in any case must not be more than 4.0m. Major intersections such as the junction of secondary collector roads with primary collector roads or greater, must be specifically designed to provide to provide safe provision for walking and cycling and to allow for bus and heavy vehicle usage.

Where practical the gradient within 30m of intersections in local roads should not exceed 1 in 10 (10%) and should preferably be less than 1 in 33 (3%).

Also, where practical, intersections on all other roads should not exceed 1 in 50 (2%) and preferably be less than 1 in 100 (1%).

Grading at intersection approaches must take into account the provisions of *Guide to Road Design – Part 4: Intersections and Crossings – General* (Austroads 2020)

Minimum sight distances must accord with Table 6 – INF: Minimum Sight Distances at New Intersections in the District Plan, or any relevant conditions of resource consent granted by the Council.

Standard wheelchair and pram-friendly kerb ramps must be provided at all road intersections, refer to drawing R-24-727 in Appendix B.

C.1.11 Turning Requirements

A turning facility must be provided at the end of all no exit roads.

Turning circles at the end of residential cul-de-sacs must have a minimum kerb radius of 7.0m, while industrial and commercial cul-de-sacs must have a minimum kerb radius of 12.5m.

Turning areas of other shapes for difficult situations are acceptable if it can be shown they will work satisfactorily.

Examples of turning areas are given in drawings R-9-705, R-9-706 and R-9-707 in Appendix B.

C.1.12 Gradients

Gradients must achieve the requirements in Table 1 _INF: Design of Roads – one Network Framework in the District Plan, or as approved under a resource consent issued by Wellington

City Council.

Gradients must be minimised at intersections as described above.

Bus route gradients must be not steeper than an average of 1 in 15, (6.7%), measured over 200m; and an instantaneous maximum of 1 in 12, (8.3%). Approval may be considered for steeper gradients in special circumstances.

C.1.13 Horizontal Curves

Horizontal curves must be as per Table 4 _+ INF: Road Vertical and Horizontal Curves in the district plan, or any relevant conditions of resource consent granted by the Council.

Extra widening shall be provided in accordance with tables 11 & 12.

Radius (m)	**Widening for a two lane pavement width of:**		
	6.0m	7.0m	8.0m
30 – 40	1.75	1.25	0.75
40 – 50	1.50	1.00	0.50
50 – 80	1.25	0.75	0.00
80 – 150	1.00	0.50	0.00
150 - 200	0.75	0.00	-

Table 11: Widening On Horizontal Curves for Primary, Collector, and sub-collector roads (50km/h design speeds)

Radius (m)	**Widening for a two lane pavement width of:**
	5.5m
15 - 20	2.00
20 – 25	1.60
25 – 30	1.30
30 – 40	1.10

40 – 50	0.80
50 – 60	0.70
60 – 80	0.60
80 – 100	0.40
100 – 200	0.20
200 – 200+	0.00

Table 12: Widening On Horizontal Curves for Local roads (less than 50km/h design speeds)

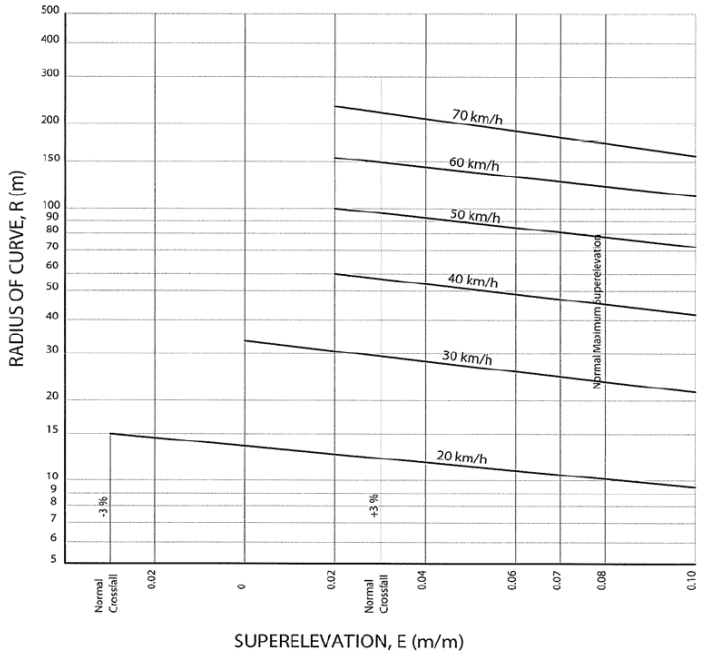
C.1.14 Vertical Curves

Vertical curves must be as per Table 4 _+ INF: Road Vertical and Horizontal Curves in the District plan, or any relevant conditions of resource consent granted by the Council must be as per the District Plan.

C.1.15 Superelevation

Superelevation and runoff lengths must be derived from the following:

- Graph 1: Radius of Curve vs. Superelevation
- Equation 2: calculating Radius of Curve
- Table 14: Determining friction factor(f), knowing Speed (V)
- Table 15: Superelevation Table
- Equation 3: Calculating Runoff length
- Table 16: Deriving suitable values of G (%), knowing Speed
- Table 17: Runoff lengths for pavement widths up to 7m



Graph 1 – Radius of Curve vs. Superelevation

Radius of curve can be calculated using the following formula:

Equation 2:

$$R = \frac{V^2}{127(e+f)}$$

where:

R = Radius of curve (metres)
V = speed (km/h)
e = Superelevation rate *(m/m)* – from table 15
f = friction factor (dimensionless) – from table 14

NOTE: Negative crossfall should not be used where this is avoidable.

Speed – v (Km/h)	10	20	30	40	50	60	70
Friction factor (dimensionless)	0.26	0.24	0.22	0.20	0.18	0.16	0.16

Table 14: *Determining friction factor (f), knowing Speed (V)*

For circular curves used without transitions:

- Use 60% to 66% of the maximum Superelevation at the tangent points
- Use 90% of the maximum Superelevation at the ¼ and ¾ points, and

- The maximum Superelevation at the ½ point.

NOTE: Intended for use in urban roads. For higher speeds use NZ Transport Agency Waka Kotahi guidelines which can be used for any design speed.

Radius	Principal Streets			Collector Streets						Local Streets					
R (m)	*Super (e m/m)*	*Friction (f)*	*Speed (v km/h)*	*Super (e m/m)*		*Friction (f)*		*Speed (v km/h)*		*Super (e m/m)*		*Friction (f)*		*Speed (v km/h)*	
15				0.07	0.12	0.14	0.09	20		0.06	0.12	0.15	0.09	20	
20				0.07	0.12	0.09	0.04	20		0.06	0.12	0.10	0.04	20	
25				0.07	0.12	0.21	0.16	30		0.06	0.12	0.22	0.16	30	
30	0.08	0.16	30	0.07	0.12	0.17	0.12	30		0.05	0.12	0.19	0.12	30	
35	0.08	0.12	30	0.07	0.12	0.13	0.08	30		0.05	0.12	0.15	0.08	30	
40	0.08	0.10	30	0.07	0.12	0.11	0.20	30	40	0.05	0.12	0.13	0.20	30	40
45	0.08	0.20	40	0.06	0.12	0.10	0.16	30	40	0.05	0.10	0.11	0.18	30	40
50	0.07	0.18	40	0.06	0.12	0.19	0.13	40		0.05	0.08	0.20	0.17	40	
60	0.07	0.14	40	0.06	0.12	0.15	0.09	40		0.04	0.06	0.17	0.15	40	
70	0.07	0.11	40	0.06	0.12	0.12	0.16	40	50	0.04	0.05	0.14	0.13	40	
80	0.07	0.18	50	0.05	0.12	0.11	0.13	40	50	0.04		0.12		50	
90	0.06	0.16	50	0.05	0.12	0.17	0.10	50		0.04		0.18		50	
100	0.06	0.14	50	0.05	0.12	0.15	0.16	50	60	0.03		0.17		50	
120	0.06	0.10	50	0.05	0.10	0.11	0.14	50	60	0.03		0.13		50	
140	0.05	0.15	60	0.04	0.10	0.16	0.10	60		0.03		0.11		50	
160	0.05	0.13	60	0.04	0.09	0.14	0.15	60	70	0.03		0.09		50	
180	0.05	0.11	60	0.04	0.06	0.12	0.15	60	70	0.03		0.08		50	
200	0.04	0.15	70	0.04		0.15		70		0.03		0.07		50	
250	0.04	0.12	70	0.03		0.13		70		Normal chamber		0.11 max		50	
300	0.03	0.14	80	0.03		0.10		70							
350	0.03	0.11	80	0.03		0.08		70							
400	0.03	0.10	80	0.03		0.07		70							
500	0.03	0.07	80	Normal Chamber		0.11 max		70							
600	Normal chamber	0.11 max	80					70							

Table 15: *Superelevation*

Note: Use 1st column of lower values of Superelevation in densely built-up areas. Use 2nd column with sharp curves in hilly but more open spaces.

Runoff length can be calculated using the following formula:

Equation 3:

$$L = \frac{100We}{G}$$

where:

L = Runnoff Length (metres)
W = Pavement Width (metres)
e = Superelevation rate *(m/m)* – from Table 15
G = Percentage Difference in Longitudinal Grade between the pavement edges – from Table 16

Speed – (Km/h)	**20**	**30**	**40**	**50**	**60**	**70**	**80**
Suitable Values of G - %	1.95	1.80	1.65	1.50	1.35	1.20	1.10

Table 16: *Deriving suitable values of G (%), knowing Speed*

Or using table 17

Superelevation Rate (e m/m)	**Minimum Runoff Length L metres for Speed (km/h) of:**						
	20	30	40	50	60	70	80
0.06	22	23	25	28	31	35	38
0.07	25	27	30	33	36	41	45
0.08	29	31	34	37	42	47	51
0.09	32	35	38	42	47	53	57
0.10	36	39	42	47	52	58	64
0.12	43	7	51	56	62	70	76
Absolute Minimum	20	20	25	25	30	30	35

Table 17: *Runoff lengths for pavement widths up to 7m*

NOTE: for pavement widths 7m to 10m multiply the above runoff lengths by 1.2
For pavement widths 10m to 14m multiply the above runoff lengths by 1.5

Theoretical superelevation requirements may require adjustments to ensure flowing kerb profiles.

Generally, the best results are obtained from a graphical plot of each kerb profile using a horizontal/vertical scale ratio of the order of 10 to 1. The ruling profile gradient is to be redeveloped along the shortest or inside kerb. Generally, superelevation is added to the inside kerb profile to obtain the profile of the outside kerb, and with the simple horizontal curves. Two-thirds of the maximum superelevation is applied at the tangent points.

For existing situations, superelevation on curves of arterial and principal roads must be designed for the 85th percentile of the actual observed speed at the particular location (refer to the Austroads 'Guide to Road Design Part 3: Geometric Design').

Horizontal and vertical curves in the same direction may be connected with large radius curves in place of straights, with superelevation maintained around the curve combination.

Reverse curves are to be separated by a sufficient length of straight to allow for a satisfactory rate of superelevation reversal.

Alignment and profiles of kerbs at intersecting roads require detailing to permit the accurate location of stormwater sumps, and to check crossfalls.

C.1.16 Pavement Design

Pavement designs must be determined in accordance with the procedures outlined in the Austroads 'Guide to Pavement Technology Part 2: Pavement Structural Design'.

This manual is broadly based, and covers the assessment needed for the design of flexible and rigid pavements as well as overlays and gives guidance to the economic comparisons of alternative pavement designs by utilising pavement design tools such as CIRCLY or similar tools.

Where existing roads are to be reconstructed, designs shall be based on the worst case scenario of the underlying subgrade.

Pavement composition shall be related to the availability of materials and knowledge of their performance.

C.1.17 Safety Audit

A safety audit must be carried out for all roads to be vested in the Council, except for service lanes. The safety audit is to be conducted in accordance with the NZTA Safe System audit guidelines for transport projects.

A full Waka Kotahi safety audit process must be undertaken for all vested roads.

Members of the proposed safety audit team must be qualified and experienced in safety audit work. The Council may also nominate an additional person as a member of the team.

A copy of the safety audit must be supplied to the Council, together with any comments on the report's recommendations.

The Council will not accept roads for vesting until it is satisfied that all issues raised in the audit have been adequately resolved.

C.2 CARRIAGEWAY CONSTRUCTION

C.2.1 Crossfall

The normal camber or crossfall must be 1 in 33 (3%).

C.2.2 Subgrade

CBR tests must be carried out to confirm whether or not the subgrade is satisfactory.

Subject to correlation by laboratory tests, dynamic cone penetrometer tests (Scala-penetrometer) may be used to determine subgrade CBR values using industry standard correlation charts.

Actual CBR values shall be used in the pavement design calculations.

Soft areas must be brought up to strength and retested.

Subsoil drains are required to drain any wet areas and also under the kerb and channel as indicated in C.2.4.

C.2.3 Basecourse Layer

Basecourse must extend 300mm behind the kerb face (or 150mm behind the back of the kerb where a wider kerb profile is used).

All basecourse must be to Waka Kotahi/NZTA Standard Specification, M/04 or M/05 (Wellington 1) 1984.

Material used for choking the surface to obtain a clean stone mosaic surface must be kept to a minimum and must be free of clay.

Basecourse layer thickness shall be determined form the pavement design process in C.1.16.

C.2.4 Kerb and Channel

Kerb and channeling is required on both sides of sealed carriageways in order to achieve the following:

- Collection and control of roading stormwater run-off. **Note:** discharge of stormwater to kerb and channel may require a drainage permit
- Demarcation between trafficked and non-trafficked areas within the road reserve
- The alignment of the kerb and channel must have a minimum horizontal radius of 3.0m in layby areas. This is for the machine kerb and channel truck cleaning needs.

The Council's standard 135mm near vertical face kerb profile must be used to achieve these outcomes.

However, there are situations where mountable kerbs may be more appropriate. Situations include:

- Traffic islands that require vehicles to deviate
- Designated turning areas where larger vehicles need additional space
- High speed roads, greater than 70km/h, where a mountable kerb may be safer

For situations in which mountable kerbs are used, the following needs must be satisfied:

- Provision must be made to ensure all adjoining property stormwater is discharged to an approved stormwater system, not to the surface channels within the road reserve
- Street sumps must have overflow capacity equivalent to the overflow capacity of conventional standard kerb sumps
- Critical sumps where overflow may discharge onto a private property must also have the same on-street storage capacity as standard kerb critical sumps
- Carriageway widths must be sufficient to accommodate on-street parking to avoid driver concern that vehicles will be side-swiped
- Footpath pavements alongside mountable kerbs must be constructed to the strength of heavy-duty vehicle crossings to withstand vehicle use.
- Berm areas adjoining mountable kerbs should include trees or other physical features to discourage parking or maneuvering on the berm
- Driveways must be clearly defined, without using carriageway or footpath markings, to allow compliance with parking regulations

RTS 14 (Guidelines for Facilities for Blind and Vision-impaired Pedestrians) highlights the importance of full height kerbs to vision impaired pedestrians.

"*Overseas research has shown that the full vertical upstand of a kerb is the single most*

reliable cue for blind and vision-impaired people in detecting roads". Any use of mountable kerbs must take this into consideration.

The standard profiles for both the standard and the mountable kerbs are shown on drawing R-22-700.

Subsoil drains must be placed under kerb and channel for a length of 15m from the sump on the high side. Where the sump is located in the valley position, the subsoil drains must extend 15m on both sides. Refer to drawings R-39-749 and R-39-750, in Appendix B, for details of a subsoil drain.

The kerb and channel foundation must be formed with a basecourse complying with C.2.3 above and must be compacted in layers not exceeding 100mm in loose thickness to achieve a Clegg Impact Value, CIV, of not less than 25. Alternatively, compaction of the basecourse may be assessed using a Scala-Penetrometer and must be considered satisfactory provided there is not less than 4 blows per 50mm of penetration.

Kerb and channeling must be laid in one operation in accordance with the profile in drawing R-22-700, in Appendix B. Construction joints are required at 6.0m intervals maximum and must comprise a tow 20mm cut in the open face of the kerb and channel. Construction joints must align with construction joints in adjacent surfaces (eg concrete footpaths).

Concrete must have a minimum compressive strength of 20MPa at 28 days and must be constructed in accordance with the requirements of NZS 3109: 1997.

In-situ boxed and precast kerb and channeling to the profiles shown on drawing R-22-700, in Appendix B, may be used where it is not practical to slipform or extrude the concrete. Construction joints are required at 6.0m intervals maximum and must comprise a shallow 20mm cut in the open face of the kerb and channel.

All kerbing around traffic islands must be of a mountable type. Refer to drawing R- 22-700, in Appendix B.

Standard disability and wheelchair friendly kerb ramps must be provided at all road intersections. Refer to drawing R-24-727, in Appendix B.

For details on vehicle kerb crossings refer to Section C.5.1.

For new roads and public carparks runoff must be directed from the road surface or car park to water sensitive design treatment devices. When designing these devices consideration shall be given to the Wellington Water document Water Sensitive Design for Stormwater Treatment Devices Design Guidelines, the relevant policies and rules in the Three Waters chapter of the

District Plan, any relevant structure plan, stormwater strategies or relevant conditions of resource consent.

Refer to the Drainage section for more detail where porous/semi-porous paving, soak pits or similar vegetated channels may be used.

C.2.5 Sumps

The Wellington City Council standard (single) sump has a design inlet capacity of 25 litres/sec.

The Council's standard sump grate provides protection for any cyclists while at the same time delivering the design inlet flows.

Sumps, double sumps and half boxes must be constructed in accordance with drawings in Appendix B.

The lead from a private sump will remain a private lead. The length of this lead from the sump to a public main should be as short as practical and must not exceed 5.0m in length.

For maintenance and renewal purposes, the Council requires all sump grates and frames to be to the standard dimensions shown on the drawings.

Sumps must be built so that the grating is 70mm below the line of the entry channel.

C.2.5.1 Sump Location in Carriageway

Sumps must be located in carriageways at:

1) Intervals governed by the design contributory flows but not exceeding 100m

2) Intersections at the upstream tangent point (may have to be positioned further upstream to accommodate a pedestrian ramp)

3) Changes of direction, gradient, or superelevation in the channel where there could be a tendency for the water to leave the channel,

4) Where water would leave a public road and flow onto a private road or property,

5) Any other point required to eliminate surface ponding.

6) Where at the downstream end of the kerb extensions, such as for laybys, raised pedestrian platforms and pedestrian crossings in drawing R-45 -703 to prevent ponding in the channel.

Sumps must not be located in front of a property where the property's frontage is narrow. A minimum 4.0m length of standard kerb must exist in front of every such property to provide for future kerb crossing purposes.

Sumps must not be in front of a driveway vehicle crossing.

C.2.5.2 Discharge of Sumps

Public sumps must discharge via a minimum 225mm diameter pipe into either:

1) A stormwater manhole, or

2) A clearly defined open watercourse, with adequate erosion control and protection to prevent scour, or

3) Provided that the lead does not exceed 3.0m in length, through a saddle into a pipe of diameter no less than the diameter of the sump lead, or

4) Where conditions allow, sumps may discharge to soak pits or similar vegetated channels as specified.

Note: Connections to a stormwater network (manhole or pipe) require a Public Drainage permit. Work near or in watercourses, or a discharge into a watercourse will require a consent from GWRC and/or the Council.

Any connection other than a minimum 225mm diameter outlet pipe will be at the discretion of the Wellington Water.

C.2.5.3 Connections to Sumps and Sump Leads

Connections into public sumps or public sump leads are not permitted.

C.2.5.4 Types of Sumps

The Council's standard single sump is detailed in drawing R-41-740, in Appendix B. A sump has one chamber, one baffle, one grating, one cleaning eye and one minimum 225mm diameter sump lead.

High flow areas may require the use of new 'super sumps'. Prior to installing these, discussion with the Council is required.

C.2.5.4.1 Duplicate Sumps

Two independent sumps and leads must be provided in critical situations to provide surplus capacity in the event that one of the sumps (including its lead), becomes blocked. Such situations may include low spots where any concentration of runoff could cause flooding, especially of private property.

Each sump of a duplicate set must have a minimum capacity of 25 litres/sec.

C.2.5.4.2 Double Sumps

A double sump comprises, two single sumps back-to-back connected via a single minimum 225mm lead, with one of the sumps discharging via a 300mm lead to the outfall.

Double sumps (or duplicate sumps and leads) must be provided:

a. Where a single sump has insufficient intake capacity,

b. On grades steeper than 1 in 12 (8.3%),

c. Where two sub-catchments meet.

Attention is drawn to the necessity for providing adequate stormwater disposal at the end of cul-de-sacs where single sumps are frequently inadequate and there are often a large number of kerb crossings within a short distance. Kerb crossings immediately before or over a sump usually prevent the sump from operating as designed. In these situations, double sumps may be more effective and should be provided.

C.2.5.4.3 Deflector Sump Tops

On grades steeper than 1 in 20, a deflector sump top and a vane in the channel, drawing R-41-747, in Appendix B, must be used on:

a. Single sumps,

b. The first sump of duplicate sumps,

c. The first grating of double sumps.

C.2.5.5 Cleaning Eyes

Cleaning eyes are integral to Wellington City Council standard sumps. Cleaning eyes are detailed on drawing R-41-743, in Appendix B.

Any proposed alterations to the sewer and/or stormwater networks, including variations to the above clauses, must be approved by Wellington Water.

C.2.6 Traffic Islands

All kerbing around traffic islands must be of a mountable type. Refer to drawing R- 22-700, in Appendix B.

Traffic islands must be designed in accordance with the 'Guide to Traffic Management – Intersections, Interchanges and Crossings Management – Part 6 (Austroads 2020).

The minimum island widths must be determined using Table 18.

Functional Required	Minimum width (m)
To shelter a crossing vehicle	7.0
Median with turn lane	3.0
Pedestrian refuge	2.5
Signal or lighting poles	2.0
Small sign	1.2

Table 18: *Minimum Traffic Island Widths*

The mountable face must be painted white.

Traffic islands may be:

- Infilled with exposed aggregate,
- Surfaced in permanent materials, such as a concrete footpath type pavement, as specified in section below.

C.2.7 Acceptance of Pavement Prior to Sealing

Before sealing takes place the pavement must be Benkelman Beam tested in accordance with Waka Kotahi/NZTA T/01.

The deflections must not exceed Table 19: Maximum Pavement Deflection.

The Roadway classifications are to align with the District Plan ONF classifications.

Roadway (One Network Framework)	Maximum Deflection (mm)
Transit Corridor	0.55 mm
Urban Connector	0.8 mm
Main Street	0.8 mm
Local Roads	1.0 mm
Cul-de-sacs	1.0 mm
Service Lanes	1.0 mm
Driveways	1.0 mm
Proposed bus route	0.8 mm

Table 19: *Maximum Pavement Deflection*

A sample Benkelman Beam Test Record report form is included in Appendix B.

C.2.8 Sealing / Paving

C.2.8.1 General

All road surfaces should generally be sealed with a grade 4 chip seal and overlaid with an asphaltic concrete surface unless approved otherwise by the Council's Roading Engineer. Pervious paving may be considered on a case-by-case basis.

C.2.8.2 Chip Seal

The basecourse surface must be inspected and passed by the Council's Roading Engineer prior to any first coat sealing being carried out.

A clean dry stone mosaic surface must exist before the first coat seal is applied and the chip seal should be applied only during warm dry settled weather between 1 November and 28 Febuary. Chip sealing outside these dates shall be carried out only with the Asphalt paving should be done between 1 October and 30 March.

On no account must sealing or paving or preparatory work be carried out if there is not to be warm (i.e. not less than 10°C) settled weather for the next 48 hours.

A sample Sealing Report is included in Appendix B.

First coat seal must be applied using a bitumen cut-back binder at 1.8 - 2.0 L/m^2 covered with a grade 4 sealing chip.

Sealing must be carried out in accordance with the Waka Kotahi/NZTA specifications M/01,

M/06, M/13, P/03, P/04 and Q/1.

Further to clause 26 of the Waka Kotahi/NZTA specification P/03, the subdivider must control traffic such that the full width of new seal is trafficked evenly.

The Polished Stone Value (PSV) must be a minimum of 59 for all sealing chip.

C.2.8.3 Asphaltic Concrete

Asphaltic concrete paving must be carried out in accordance with the Waka Kotahi/NZTA specifications M-10.2020.

Asphaltic concrete mixes must conform to the mix types and designs as stated in Tables 3.1 and 3.5 of the M-10.2020 specifications.~~;~~

Immediately prior to the Asphaltic Concrete surface work:

- a strip 600mm wide and adjacent to each channel must be sprayed with
- an approved ground sterilising weed killer at the manufacturer's recommended rate of application
- the chip seal surface must be clean and have a tack coat of 0.3L/m^2 of
- residual bitumen applied by spraying

Asphaltic concrete must be laid with a paving machine and compacted to a minimum depth of 40mm.

For private ways and residential cul-de-sacs and parking areas, excluding bus stops, the minimum depth of asphalt paving may be reduced to 30mm, using mix 10.

C.2.9 Pavers

Interlocking Concrete Block Paving

The use of interlocking block paving may be approved on local roads, service lanes and private rights-of-way.

Paving must be designed and constructed to the manufacturer's proven specifications and must comply with NZS 3116:2002 'Concrete Segmental and Flagstone Paving'.

Blocks must have a thickness not less than 80mm. Blocks must have nominal thickness, strength characteristics, dimensional tolerances and skid resistance which comply with the

guidelines in the NZS 3116: 2002 and must be specific to the in-service situation in which they are used.

A water proofing membrane must be applied over the road formation and subsoil drains installed to divert surface water penetration away from the carriageway into adjacent sumps or drainage structures.

Where interlocking block pavements are installed, 24 month maintenance periods must be specified whereby the contractor must be responsible for correcting all defects during this period.

NOTE: The use of clay brick paving for road surfaces will not be approved.

C.2.10 Pervious Paving

As discussed above pervious paving will be considered on a case-by-case basis. In all cases, a minimum of 15 metres of the new road, full width kerb to kerb including driveway must be sealed prior to connecting to the existing roading network.

Where pervious paving is approved to be utilised, consideration should be given to the Wellington Water document Water Sensitive Design for Stormwater Treatment Devices Design Guidelines 2019, the relevant policies, and rules in the Three Waters chapter of the District Plan, any relevant Structure Plans, Stormwater Strategies or relevant conditions of resource consent.

C.2.11 Special Surfaces

The roads of the Commercial and Mixed Use Zones and General Industrial Zone, as defined the District Plan, may have specific finishes required.

The roads of the CBD and suburban centres may have specific finishes required. For further information and standards refer to the Council’s operative Public Spaces Design Guide.

C.2.11 Rural Road Construction

Construction must be as for urban roads except as may be indicated otherwise on the drawing R-9-708, in Appendix B, and as below.

For developments in which water tables, side drains and culverts are used for the collection and management of stormwater runoff, design calculations and a management plan showing how the water will be collected channeled/dissipated and discharged must be submitted for the approval of Wellington Water.

Culvert inlets must be identified with an off-set marker post as shown in drawing R-12-785 in Appendix B.

While generally taking into regard property boundaries, there may be cases where the Council will consider allowing fencing to encroach into road reserve. As a minimum, fences should not be closer than:-

- 5m from the carriageway, or,
- 3m from roadside drains.

C.3 FOOTPATH CONSTRUCTION

C.3.1 General Requirements

Design and construction of all footpaths, pedestrian accessways, steps, footbridges and amenity tracks must meet the following requirements:-

- All pedestrian facilities must be durable and require a minimum of maintenance,
- All surfaces must be adequately drained so as to prevent ponding, and designed and built so they do not cause runoff problems for adjoining properties,
- Lighting must be provided for all walkways except amenity tracks, Security hazards for users must be avoided.
- Accessways must be well lit and where possible should have a clear line- of-sight between streets,
- All walking surfaces must provide minimum in service slip resistance of not less than British Pendulum Value BPN 50 measured on a wet surface,
- Timber on footbridges, boardwalks and steps may be accepted by the Council provided the surfaces have securely fastened wire netting to provide slip resistance or some other approved treatment,
- Gravel surfaces may be accepted on amenity tracks.

C.3.2 Footpath design

Public footpaths must where appropriate, accommodate the access and mobility requirements of AS/NZS 4121, Design for Access and Mobility – Buildings and Associated Facilities.

Footpaths widths are administered by the District Plan, or relevant conditions of resource consent granted by the Council. Footpaths must be at least 100mm higher than the edge of the adjacent carriageway.

Where practical, consideration should be given to pavements sloped in such a way that they drain to a pervious surface to allow the water to infiltrate.

The pipe between the back of the footpath and the boundary may be made from an approved plastic, but beneath the footpath and to the kerb and channel must be galvanised steel or cast iron with approved steel kerb adaptors.

C.3.3 Widths

The minimum public footpath width must be as specified in Table 1 INF in the District Plan and measured from the back of the kerb where applicable.

Footpaths are to be widened at shopping areas. Footpaths must also be widened at pedestrian kerb ramp locations to ensure there is an adjacent 1.2m width of footpath that is not ramped. The increased width must be achieved with a 3m long splay beyond each side of the ramp.

Driveways and footpath widths shall be as specified in accordance with the ONF. Footpaths are to be widened at shopping areas and at any other high pedestrian trafficked areas.

C.3.4 Gradients

Gradients must be no steeper than 1 in 5 (20%) or with intermittent steps and then no steeper than 1 in 6 (16.7%) between flights of steps.

A handrail as per drawing R-19-760 in Appendix B is required on all footpaths steeper than 1 in 7 (14.3%).

C.3.5 Crossfall

The crossfall must be between 1 in 50 (2%) and 1 in 33 (3%) to ensure drainage. As per the above, the preference is that the path drains to a pervious area but if this is not possible it should drain to the kerb.

C.3.6 Concrete Footpaths

Footpaths alongside new roads must be constructed in concrete.

Concrete footpath foundations must be formed with a compacted basecourse material with a minimum depth of 75mm and complying with Waka Kotahi/NZTA Standard Specification, M/04: 1995 (Wellington 1) AP20 basecourse. The sub-base material must be compacted to achieve a Clegg Impact value, CIV, of not less than 25.

Concrete must have a minimum 28-day compressive strength of 20MPa and must be given a light brush surface finish. The concrete must be 150mm thick with 665 mesh in industrial

streets, 115mm thick in residential cul-de-sac turning areas, and 100mm thick elsewhere. Transverse construction joints must be formed at spacing not greater than 6.0m.

C.3.7 Other Footpath Materials

New footpaths are to be constructed in concrete however there may be circumstances in which asphalt, pervious pavement or feature pavements are appropriate.

Construction of footpaths in materials other than concrete is subject to the approval of the Council's Roading Engineer.

In these situations, subject to adequate subgrade strength as approved by the Roading Engineer, asphalt footpaths must be constructed as follows:

a. For arterial, primary collector, secondary collector, local roads and cul-de-sacs asphalt footpath construction consists of a compacted AP20 basecourse depth of 75mm, and compacted asphalt depth of 25mm, finished level with the top of the kerb,

b. Around residential turning areas and in industrial streets, asphalt footpath construction consists of a compacted AP40 basecourse depth of 150mm and 200mm respectively, and compacted asphalt depth of 25mm, finished level with the top of the kerb.

A tack coat of bitumen emulsion must be applied to the compacted basecourse surface and all sloped/vertical faces to be in contact with the asphalt, at a residual bitumen rate of 0.3L/m^2 prior to the asphalt paving.

The asphaltic concrete must be Mix 6.

Asphaltic concrete mixes for footpath construction must comply with the Waka Kotahi/NZTA specification P/09 "Construction of Asphaltic Concrete Paving" and conform to the mix design properties in Table 22:

Mix	Application	Specified Marshall Flows	Air Voids %	Minimum Compaction Index	Minimum vMA (voids mineral aggregates)
6	Footpaths	35	3.0 – 4.0	0.09	17

Table 22: *Footpath Asphaltic Concrete mix and design*

C.3.7.1 Interlocking Concrete Block Paving

Footpaths constructed in interlocking concrete block paving must be designed and constructed to the manufacturer's proven specifications and must comply with NZS 3116:2002 'Concrete Segmental and Flagstone Paving'.

Blocks must:

- have a proven abrasion resistance,
- have a skid resistance not less than a British Pendulum Value of 50 using a RAPRA 4S rubber foot on a wet surface,
- have a thickness not less than 60mm, and not less than 80mm at heavy duty crossings, around residential turning areas and in industrial streets,
- be appropriate for the situation.

Where interlocking block pavements are installed, a 24 month maintenance period must be specified whereby the contractor must be responsible for correcting all defects during this period.

C.3.7.2 Clay Brick Paving

Clay brick paving is not to be used for new subdivision development. The use of clay brick paving will only be approved when upgrading existing clay brick paved footpaths.

C.3.8 Steps

Concrete steps must be constructed in accordance with drawing R-17-763, in Appendix B.

The maximum rise between landings must not exceed 2.5m.

A stormwater channel must be provided alongside steps and landings, which must drain to a sump and thence by pipe to an approved discharge outlet.

C.3.9 Pedestrian Accessways

Pedestrian accessways should be constructed where they would provide pedestrians with a significantly shorter route between different roading locations and where areas of interest are involved such as schools, shops, reserves and bus routes.

Such land is to be vested in the Council as either a pedestrian accessway or as a Reserve.

Pedestrian accessways must be constructed in concrete.

The minimum boundary to boundary width must be 2.1m.

The gradients and construction must be as for footpaths, except that the minimum surface width must be 1.5m.

Where stormwater is likely to flow along the accessways an adjacent stormwater channel must be provided, outside the 1.5m width, which must drain to a sump and thence by pipe to an approved discharge outlet.

Both sides of a pedestrian accessway must be bounded by a fence in accordance with the Council's standard, see drawing R-19-760 in Appendix B in accordance with CPTED safety requirements..

Note that Recreation Tracks are covered in the Open Spaces section of this document.

C.3.10 HANDRAILING

Handrailing is required on the outer edge of roads or footpaths where there is a:

- drop due to a retaining wall, or,
- drop due to a batter face greater than 2.0m vertical height and steeper than 1.5 horizontal to 1.0 vertical, or,
- footpath gradient steeper than 1 in 7 (14.3%).

Any constructed barrier needs to be compliant with the New Zealand Building Code Clause D1.

Designers should note that in some situations a more substantial barrier will be required to meet the requirements of the Building Act.

Handrailing must be constructed in accordance with drawing R-19-760 in Appendix B.

Handrail posts must be embedded at least 800mm into firm, stable and level ground, and backfilled with 500mm compacted basecourse capped with a 300mm concrete backfill.

Specific design is required where the ground is neither level, stable, nor firm, and for situations in which the handrail may be subjected to higher loads.

C.4 ROAD AMENITY AND BERM CONSTRUCTION

Road design must provide a high standard of visual amenity. The design proposal must include a landscaping plan which provides for vegetation, street furniture and road elements, and which takes into account the following:

- the desirability of a visually attractive and comfortable street environment,
- provision of street trees that will remain healthy and able to mature in the
- space and location provided (note that the district plan outlines acceptable street tree locations, sizes and species) which do not obstruct the drivers sightlines and pedestrians visibility splays
- safety for road users, with the avoidance of unnecessary visual and physical obstacles,
- security for pedestrians,
- the potential for roadside landscaping treatments to influence vehicle speeds,
- the need to minimise on-going maintenance requirements,
- protection of services.

When an existing street is extended into or through a new subdivision, its streetscape (road width, footpaths, street trees, etc.) should also be continued or improved.

The Centres and Mixed Use Zones (as defined in the District Plan) have special requirements and standards for street furniture. For more information discuss with the Council roading team.

C.4.1 Berm Design

Berms provide a range of ecological and functional services:

- Provides, protects and maintains biodiversity and habitat
- Location for gas, electrical and telecommunication utilities
- Reduces the visual impart of the road as it softens hard surfaces

No utility, including planting, can monopolize the berm space. Preference for some services to be back against the boundary

Infrastructure and utility services should be planned at the same time as the street planting, so tree and a garden planting does not, and is not, compromised by the provision of services.

Planting and utilities provision should be designed to respond to the local road geometry and road reserve design.

Berms must be adequately designed, constructed, and prepared by the subdivider as outlined in Section C1.6 and Table C1.

Layout plans and locations of street planting provisions must be discussed with the Council in

the planning stages prior to the lodging of finalised plans.

Appropriate planting must be included in accordance with the District Plan Table 2 – INF Street Trees

Trees and other planting must be positioned to minimise obstruction of vehicular accessways and provide good visibility for the travelling public.

In streets with retaining walls (those below the road in particular) there is likely to be limited space in the berm for utilities and trees. Alternative location and design proposals will be considered at the discretion of the Council.

Berms, tree pits swales and rain gardens will be sufficient width to allow for adequate growth of plants and ease of maintenance. It is important to provide adequate means for tree growth and ongoing tree health, at the same time allowing for the infiltration of water. For guidance on the design of these devices refer to the Wellington Water document Water Sensitive Urban Design Stormwater Treatment Devices Design Guidelines.

Street planting proposals and considerations will be assessed through the resource consent process.

As-built plans are required for all street planting features, including tree pits, rain gardens and swales.

A 24-month maintenance period must be specified whereby the contractor must be responsible for ensuring an adequate grass strike, maintaining and mowing the berm, and correcting all defects during this period. Where trees or amenity planting is carried out in the berm, a 36-month maintenance period must be specified (refer Tree Planting (Construction) section below).

Street furniture must be robust and durable and meet the Council's standards and specifications where available.

C.4.2 Street Planting (Construction)

Trees must be planted in public roads as per the District Plan Table 2 INF. Street planting must not obstruct drivers sightlines at intersections and private vehicle accesses.

At tree planting locations, suitable topsoil depth will be provided (minimum 600mm, actual determined by tree type, size and soil condition) across the complete berm width and along the berm length twice the distance of the width. (i.e if the berm is 1.5m wide, topsoil to a suitable depth for tree planting will be provided that is 1.5m wide and 3m long).

All street tree planting must be carried out in the following manner with appropriate detail provided to ensure:

- planting is well planned and integrated into the rest of the street environment in such a way that it can continue to mature without disturbance to other road infrastructure (both above and below ground) and minimum ongoing maintenance
- street trees must be of a nature so as to provide suitable clearance from the carriageway without regular pruning, and so as not to obstruct sightlines
- best practice planting specification are used (for example, the ground is properly prepared, plants are in good health etc)

A complete list of all landscaping in the road reserve (including for example tree species and numbers, irrigation equipment, tree stakes, square metre areas and species/numbers of any planting other than street trees such as amenity type planting or grass) must be provided

Planting in traffic islands is unlikely to be accepted.

Planting on berms, other than street trees will need to be maintained by the adjacent property owner as per Council's Verges Policy.

All road berm areas to be grassed must be topsoiled to a lightly compacted minimum depth of 75mm, and sown with grass.

C.4.2.1 Site Preparation

Given the generally modified nature of soil in subdivisions it is essential that a suitable tree planting pit be prepared. The approach shall be to have:

a. Ground free from debris and rubbish;

b. Ground cultivated to a depth of 1 m and a width of 1 m to break up any compaction, fracture subsoil, and afford drainage to hard rock areas;

c. Sides of planting holes crumbled and not smooth;

d. Topsoil incorporated into the upper level of planting holes;

e. Each tree fertilised with an appropriate amount of slow release fertiliser, as per the manufacturer's recommendations;

f. Final planted depth consistent with finished ground level;

g. Each tree adequately staked to withstand movement in natural wind conditions and to meet the Council standards;

h. Trees secured with expandable ties at approximately 1/3 of their height or as high as required to support the tree (to be checked every 6 months) or anchored below ground with a root ball anchor;

i. Soil firmed sufficiently to force any air pockets from planting holes;

j. Trees watered immediately following planting;

k. The entire planted area or tree pit area must be covered with bark mulch to a depth not less than 100mm and across the berm width and length twice the distance of the width.

l. Staking uniformly low and visually consistent throughout the subdivision stage. Ground-treated timber stakes should only be used if the stakes are to be removed once the trees are stable, that is at the end of a maintenance period.

C.4.2.1 Tree Sizes

Trees must be between 1.0m and 1.5m in height (planted) and preferably in Pb 40 – Pb 95 containers at the time of planting. Trees shall be sound, healthy, vigorous, and free of any defects (relative to the species). Trees must be well-hardened before planting to ensure that they survive and thrive in Wellington's exposed environment.

C.4.2.2 Tree Types

Prior to purchase of plants, the District Plan Table 3 INF must be consulted to determine suitable species.

C.4.2.3 Positioning of trees and other vegetation

Positioning will depend on street design detail.

A minimum of one tree per allotment fronting a public road shall be planted. Trees will be located centrally within the berm width. The planting locations for these trees may be a mixture of lineal planting along the street (minimum of 4 street trees per 100m) as well as tree planting in groups in strategic locations.

Other types of planting will be positioned to ensure appropriate space for the plants to mature without interfering with the functioning of the street (i.e maintaining traffic site lines, avoiding pedestrian trip hazards etc) and to minimise ongoing maintenance requirements.

Where possible, trees and underground services should be located away from each other. Where two berms on each side of the road is not possible, then ducts must be provided.

C.4.2.4 Planting

Planting must take place in the season that optimizes growing conditions and maximises plant establishment.

Those contractors involved in planting and maintenance should be competent horticultural/ arboricultural practitioners and therefore follow accepted industry standard procedures for planting. Establishment and initial maintenance are critical to the long-term viability of the planting.

When planting vegetation other than street tree, holes are to be dug at least twice the diameter and 100mm deeper than the height of the container the plant is supplied in. The plant must be positioned in the hole at the depth it was container grown, and backfilled with topsoil, progressively lightly compacted to surrounding finished soil level.

A proven root guard material for trees must be placed to line the sides of the hole to a depth of 750mm. In areas of tree groups, the root guard material may alternatively extend around the perimeter of the area.

The resident subsoil in the bottom of each hole is to be thoroughly broken up to a depth of 250mm to allow percolation of water.

The planting medium is to be high quality loam, free from roots, weeds, and other rubbish and from gravel and stones greater than 20mm in diameter.

Low vegetation close to walkways or the street edge should be below the level of a driver’s eye-line and not interrupt sightlines.

Generally, when a high vegetation tree matures it should be at least 2.0m above ground level to maintain motorist and pedestrian sightlines.

C.4.2.5 Staking

Each tree must have a minimum of two stakes (generally not less than 1.2m) located 50mm away from the base and driven securely into the ground with one on the prevailing windward side of the plant and the other opposite.

The stake must protrude at least 600mm above ground.

An approved cloth tie must be used to attach the stem to the stake. Stakes are to be removed once the tree is established or after three years (whichever is sooner).

C.4.2.5 Maintenance

A 36 month maintenance period is required for all trees and planting in the road reserve. During this period minimum requirements are:

- Plants must be watered and cared for to ensure they are still healthy during and at the end of the maintenance period. A watering schedule must be provided and implemented.
- Top up mulching as required.
- Check and replace stakes as required
- Weeding if necessary
- Formative pruning as necessary by a suitably qualified and experienced arborist to achieve a well-structured canopy.
- If tree fails to thrive or form correctly, or dies, record death, replace tree and begin three-year period again.
- Refer also to Section A.18.

C.4.3 Road Lighting

Lighting is required on public roads and pedestrian access ways. The lighting is to meet all requirements of the AS/NZS 1158 "Road Lighting" Standard, including design to an appropriate lighting category and WCC Street Lighting Technical requirement for Lighting Design (ver 4 20 Sept 2021).

Street lighting equipment (poles, outreach arms and lanterns) is to be consistent with the types and sizes commonly in use by the Council and must be on the NZTA M30 list of accepted luminaire and M26 Specification for lighting columns.

Underground power supply reticulation is to be provided and must meet all the requirements of the network provider.

The Council does not supply power to, and does not maintain, lighting equipment on private ways. The subdivider is to make arrangements directly with an energy retailer for power supplies to lighting on-driveways.

Lighting is not normally required for rural situations. However, roadside delineator posts in accordance with the Waka Kotahi/NZTA Traffic Control Devices Manual are to be provided.

C.4.4 Road Name Signs

Road name signs must be mounted on 60mm O.D. galvanized steel posts painted or finished in white.

Signs are to be manufactured and erected in accordance with drawing R-44-780 in Appendix B.

Road name signs must be erected at all road intersections. “No Exit” signs must accompany them if applicable.

Council requires all road names signs for new roads and private street to be installed by the developer during construction, this includes “No Exit” signs when required.

For each T intersection, both a double-sided name plate indicating the side road, and a single sided name plate indicating the through road, must be mounted on a single pole in the berm of the through road and opposite the side road.

To minimise future maintenance obligations, entrance signs to subdivisions must not be erected.

C.4.5 Trenching / Services

Trenching work in legal road must be carried out in accordance with the Council’s operative Code of Practice for Working on the Road. This requires a “Road Works Notice” to be obtained and any associated fees paid.

C.4.6 Concrete Mowing Strips

All poles, sign posts, light standards, power transformers, boxes etc. set in the grass berm must be surrounded with a concrete mowing strip.

The mowing strip must be flush with the finished berm level and provide a 150mm wide concrete surround to the base of the item.

C.4.7 Road Markings

Road markings, including reflective raised pavement markers (RRPMs), if required, must be installed in accordance with the following NZTA/Waka Kotahi documents:

- Traffic Control Devices Rules Ministry of Transport 2004,
- Traffic Control Devices Rules Ministry of Transport 2004

- NZTA/Waka Kotahi Traffic Control Devices Manual
- Raised Reflective Pavement Markers are to be installed.

Road marking paint and its application must be in accordance with the NZTA/Waka Kotahi TCD specifications.

Broken yellow lines are a legal restriction and must be approved through the Traffic Resolution (TR) process. Additionally, restrictions such as stop, give way and any parking restrictions must also be approved under Traffic Resolution to formalise the restrictions.

C.4.8 Special Items

The following items are considered special items and will require discussion with Council prior to starting design and construction:

- Bollards
- Rubbish Bins
- Bus Stop Shelter
- Seating
- Fencing
- Traffic Regulatory and Warning Signs.

C.5 DRIVEWAYS

For Driveways Level 1 to Level 3, the District Plan Transport Chapter Standards provide details on widths and design of driveways. For driveways exceeding level 3, refer to the District Plan Table INF 1

Note that the construction of driveways with public infrastructure in them is usually not acceptable due to issues with future maintenance access and reinstatement. Maintenance requirements for services in driveways will remain with the driveway owners.

Driveway stability within road reserve must be checked by a qualified Engineer in particular within cut and fill areas.

C.5.1 Entrance / Exit (Vehicle Crossing)

The entrances/exits of driveways are to be positioned in a safe location. Refer to District Plan requirements in the Infrastructure Chapter.

All entrances to driveways must be constructed as a footpath crossing facility giving priority to pedestrians. This will require the vehicle crossing to:

- Be at a right angle to the footpath,
- Not affect the grade, crossfall, colour and texture of the footpath.

There are two types of vehicle crossing:

1. **Light duty vehicle crossing**: for up to five on-site carparks.
2. **Heavy duty vehicle crossing**: for six or more on-site carparks, or at least one heavy vehicle parking or loading area.

Vehicle crossings may be constructed either in conjunction with the original kerb and channel installation, or at a later stage once vehicle access locations have been determined, or as and when crossings require modifications.

Construction details for both light and heavy-duty crossings are shown on plan number R-24-721. This plan allows for a number of options, depending on the extent of the works required, and whether the crossing is light duty or heavy duty.

A minimum of 1000mm footpath width at 2%-3% crossfall shall be provided between the back of the vehicle crossing ramp and the back of the footpath. Where it is not possible to achieve this, the Council's Transport Consents team should be contacted.

Where a grass berm separates the footpath from the kerb, the crossing ramp may extend from the kerbline to the front edge of the adjacent footpath.

The splay length along the kerbline, either side of the crossing, must be 500mm.

In situations where excessive road camber, kerb height, or footpath crossfall exist, approval may be given for more extensive work to modify the surrounding features to achieve a functional vehicle crossing. These vehicle crossings should be checked using Drawing R-24-720 "Vehicle scraping Mitigation"

Modifications may include:

- Raising the channel (refer drawing R-24-722)
- Lowering the footpath (refer drawing R-24-723)

Note - Both these situations require detailed design and the approval of the Council's Transport Consents Team.

C.5.2 Minimum Widths

Up to Driveway Level 3, the District Plan Table TR-9 provides details on widths. For driveways exceeding Level 3, refer to the District Plan Table INF 1

All trafficable surfaces must comply with the ground clearance template in AS/NZS 2890.1 :2004 Parking Facilities Part 1: Off-street car parking Appendix B.

C.5.2.1 Maximum Gradients

Up to Driveway Level 3, the District Plan Table TR-9 provides details on gradients. For driveways exceeding Level 3, refer to the District Plan Table INF 1

Another acceptable solution is to demonstrate that trafficable surfaces comply with the ground clearance template in AS/NZS 2890.1 :2004 Parking Facilities Part 1: Off-street car parking Appendix B.

Carpark gradients shall be as per the District Plan Standard Transport Chapter.

C.5.3 Crossfall

The crossfall must be 1 in 33 (3%) for sealed driveways or 1 in 22 (4.5%) for unsealed driveways to provide sufficient slope for stormwater discharge into the adjacent kerb and channel without ponding.

C.5.3.1 Turning Areas

The requirement for providing driveway maneuvering areas to enable vehicles to exit a site in a forward direction is specified in the District Plan Transport Chapter. Refer to drawings Drwg R-9-705, 706 and 707 for design specifications. Drwg R-9-706 Standard Turning Areas for Streets and Driveways used by Heavy Vehicles.

C.5.4 Kerb and Channel & Stormwater

Kerb and channel is used to confine stormwater runoff to the private way, and to protect the edge of the private way.

Standard kerb and channel or similar stormwater control feature e.g. dished channel must be constructed on both sides (where stormwater outlets are on both sides) or standard kerb and channel on one side and standard kerb (or similar support edging) only on the other.

Suitable provision must be made for the disposal of stormwater from the driveway.

Driveway stormwater control is required where the private paved area exceeds 30 square metres (30m2) and results in stormwater leaving the paved area in a concentrated flow across the public footpath.

No stormwater must discharge onto neighbouring property (including legal road and other Council land), except as noted above.

Where available, stormwater control must connect into the stormwater main.

In rural situations where the access to a private way crosses the street drainage channel a minimum 300mm internal diameter reinforced concrete pipe culvert must be installed.

The culvert must be laid with the invert level aligned with the design invert level of the drainage channel.

Where soils, topography and slope permit, runoff must be directed from the driveway/parking area to a pipe, stormwater network, rain gardens, soak pits or similar vegetated channels. Contact WCC Plumbing and Drainage Officers for approval.

C.5.5 Aggregate Depths

As a general guide for residential use:

- Driveway Level 1 – compacted basecourse depth of 100mm.
- Driveway Level 2 and 3 – compacted basecourse depth of 150mm.

These depths are based on the subgrade having a minimum soaked CBR strength of 7. Subgrade improvement may be necessary to achieve this strength. These values shall be used as guide only and specific design may be required.

Basecourse depths for non-residential use must be determined by specific design.

C.5.6 Sealing / Paving

Driveways and footpaths must be sealed or paved for their entire lengths, except where approved by the WCC Roading and Transport Engineer.

Material must not be “tracked out” from unsealed driveways/parking areas to the public footpath or road.

The carriageway may be surfaced with one of the following methods except that where a

private way has a gradient steeper than 1 in 8 (12.5%) the carriageway must not be surfaced in sealing chips:

a. A suitable bitumen cut-back binder covered with Grade 4 sealing chip followed by a second coat seal, consisting of a suitable bitumen cut-back binder covered with grade 3 sealing chip. Both grades are to be in accordance with Waka Kotahi/NZTA specification M/06.

b. A minimum thickness of 30mm of asphaltic concrete on a basecourse primed with bitumen at a residual rate of 0.3L/m2. The asphaltic concrete must comply with Waka Kotahi/NZTA specification M/10, Mix 10.

c. An interlocking block paving designed and laid to manufacturer's specifications and in accordance with NZS 3116: 2002.

d. Porous/semi-porous paving may be used where drainage is provided for and soils and slope allow. The successful implementation of porous paving depends on individual circumstances; the final decision rests with the Council's Roading Engineer.

e. Residential driveways may be constructed in 100mm of reinforced concrete with a 28 day compressive strength of 20MPa. The reinforced concrete must be placed on a 75mm compacted basecourse layer, or 150mm of unreinforced concrete on the same base.

f. Non-residential driveways constructed in concrete must be specifically designed.

g. Residential driveways carrying more than an estimated 100 vehicle movements/day constructed in concrete must be specifically designed.

In rural situations only, where the street carriageway is not sealed and is unlikely to be sealed in the near future, the private way may remain unsealed. Otherwise, the first 15m of the private way must be sealed.

On unsealed driveways, those sections of driveway where the grade is greater than 1 in 8 (12.5%) the private way must be sealed.

Sealing should be carried out only during warm dry settled weather between 1 October and 15 March. If a suitable adhesion or emulsion agent is used, sealing may be carried out outside these dates. On no account must sealing or paving or preparatory work be carried out if there is not to be warm (i.e. not less than 10◦C) settled weather for the next 48 hours. A report must be provided for each day's sealing activity. Refer sample proforma Sealing Report in Appendix B.

C.5.7 Guard Rail or Fence

A guard rail and / or fence is required where a danger or hazard would otherwise be presented for vehicle occupants, pedestrians, neighbours, or to the public.

The barrier must be designed and of sufficient strength to resist the vehicle loads as indicated in standard AS/NZS1170:2002 Part 1 “Structural Design Actions” for vehicles for direct impact.

C.5.8 Parking Areas

The dimensions and gradients of parking areas must meet District Plan Transport Chapter Standards.

For stormwater control, refer to C.5.4 Kerb and Channel and Stormwater above.

C.6 AS-BUILT REQUIREMENTS

Council requires the following information concerning new road construction.

Dimensions and other information relating to Transportation shall be provided for all assets within the road reserve, accessway or service lane:

1. Length, width and number of lanes within the carriageway section
2. Total area of parking bays and bus bays within the carriageway to the nearest 0.1m2.
3. The total area at intersections less the area associated with length x width, to the nearest 0.1m2.
4. The total area associated with the traffic islands within the carriageway section, to the nearest 0.1m2.
5. Road names - of the road constructed and any other roads intersecting
6. Designated public transport stops, including location, bus routes, shelters, seats, bins, pads, timetables, signs, sign mounting, road marking, bus lanes, park and ride sites, and any pedestrian through paths leading to railway stations.
7. Pedestrian and cycle movements related to key features such as bus stops, schools and shopping areas. Road crossing locations should be identified in the plan including any median islands.
8. Traffic calming measures; showing street design and layout including; bends, vertical curves, junctions and the control of vehicle speeds both laterally (slow points, roundabouts, street narrowing, median islands), vertically (humps, platform

intersections, platform pedestrian crossings, school crossings, and bicycle crossings), signposting (including the negotiation speed), and lane marking.

9. Footpaths, accessways, amenity tracks, kerb ramps for prams and disabled people, vehicle crossings, lighting, steps, safety rails.

10. All signage

11. Street furniture, including litter bins, bollards, sign posts, pedestrian and cycle movements, designated public transport stops and other lane markings, street and/or path lights, trees, signal areas paved area

12. Details of kerb and channel, subsoil drains, intakes, sumps (including capacity) and leads.

13. Gradients on the inside kerb, horizontal curves, vertical curves, and super-elevation

14. Road reserves assets including, grass berms, rain gardens, soak pits or similar vegetated channels etc, mowing strips and Trenching/Services.

Benkelman Beam test report prior to sealing the road pavement, refer to clause above.

Road pavement Sealing report, refer to clause above

Certificates of the concrete strength of all concrete used in the footpaths.

All information is required to be entered into the council RAMs database. A proforma for this information can be obtained from council.

PART D. WASTEWATER, STORMWATER, AND WATER SUPPLY NETWORK DESIGN AND CONSTRUCTION

The following documents manage water services requirements (water supply, stormwater and wastewater):

- Wellington Water Regional Standard for Water Services December
- Wellington Water Regional Specification for Water Services December
- Wellington Water Sensitive Design for Stormwater Treatment Device Design Guideline 2019
- Wellington Water Managing Stormwater Runoff Version 3
- WCC Water Services Bylaw 2024

Special Areas to note:

- WCC has adopted the Wellington Water minimum requirements regarding building over pipes. This is now a last resort and will likely be declined in most cases
- WSUD is now required by GWRC for all areas of roading and parking that require GWRC consent. Early engagement with GWRC is recommended to ensure that this is allowed for in initial designs
- Shared services are a last resort. Individual services are preferred due to ongoing maintenance issues for council/Wellington Water.
- The previously acceptable practice of making roads and services private where they don’t meet this code will not be acceptable. Private roads and services of a lesser standard will likely be declined.

PART E. OPEN SPACES

CONTENTS

E OPEN SPACES

E.1 Scope

Where community specific guidelines are available these shall be taken into consideration throughout the design and construction of subdivisions and development.

This section sets out requirements for the design and construction of landscape and planting for land development and subdivision. Part F applies to all landscape areas requiring planting and revegetation whether in road reserves, swales, rain gardens, ponds/wetlands, recreation reserves, or other public reserves, and private land.

Design and construction shall be undertaken in accordance with the requirements of Part 7, Landscape of NZS 4404:2010 except as amended and extended for Wellington City Council requirements in the clauses below, and any Wellington City Council guidelines and specifications relating to landscape and reserves Developments shall comply with Section 7 Landscape of NZS 4404:2010 except as modified by this document.

E.2 Objectives

Communities are enhanced through public access to, use of and visibility of a connected network of green open spaces throughout residential areas. Refer to Te Whai Oranga Poneke Open Space and Recreation Strategy 2023, and Ngā Wāhanga Ātea me Ngā Aaronga Whakarato Open Space Categories and Provision Targets 2023 for comprehensive information, values and management direction for Wellingtons open spaces.

Please see below for further references to current operative Council policy, standards and documents that must be considered.

E.3 General

Consultation with Wellington City Council's Parks, Sport and Recreation unit is required on all landscape matters in potential reserves prior to the design phase and development plan approvals. This includes consulting on the potential to create new reserve land and/or improve existing reserves. Public land for reserves shall only be created and vested in Council where there is an identified need in consultation with Wellington City Council's Parks, Sport and Recreation unit.

All landscaping and built assets in reserves and landscaping road reserves to be vested to Council shall be maintained by the developer for a minimum period of 3 years from the time of planting or installation. A developer's agreement or reserves agreement will outline how the reserves will be maintained within this period and the condition they shall be in at the end of

this period.

E.3.1 Approval

Consultation with the Council on landscape design and construction at an early stage, and prior to submission of any engineering designs for acceptance, is required.

New planting plans are to be signed off by the Council's Parks, Sport and Recreation unit prior to planting or establishment of planting areas.

Consultation with the Council on landscape design and construction at an early stage, and prior to submission of any engineering designs for acceptance, is required. New planting plans are to be signed off by the Council's Parks, Sport and Recreation unit prior to planting or establishment of planting areas.

E.3.2 Environmentally responsive design

Landscape design has application throughout the subdivision and development process. Landscape design should be considered in the early stages of a development and at this initial concept stage it is important to establish objectives for overall landscape design involving the appropriate professionals to assess the natural systems, vegetation, and landscape features. This includes consideration of protecting, maintaining, and restoring existing natural ecosystems, vegetation, and landscape features; responding to the surrounding landscape character and context; and cultural and heritage elements; and contributing to ecological and habitat biodiversity. Provision of amenity open space and access is required to make open space connections, access to and location of watercourses, and provision of reserves and streetscape to provide a framework of coherence and amenity.

E.3.3 Reserves and land protection covenants

Wellington City Council's requirements for new reserve provisions should be determined prior to the initial design stage through consultation with the Council's Parks, Sport and Recreation unit. When assessing reserve provision and development proposals the Council will consider:

- Alignment with the Wellington City Council's Te Whai Oranga Poneke Open Space and Recreation Strategy 2023
- Open Space provision targets as set out in Wellington City Council's Ngā Wāhanga Ātea me Ngā Aaronga Whakarato Open Space Categories and Provision Targets 2023
- Filling existing gaps in reserve provisions
- Access to existing reserves

- Encouraging improvement of existing reserves and track networks
- Development designs that are sympathetic to the existing landscape character of the area
- Development designs that will provide recreational benefit to the community and/or District
- Preserving existing lookout and observation points
- Protecting heritage features and sites
- Protecting and enhancing sites of ecological importance
- Securing reserve land at the subdivision stage(s) of development.

Council may request recreation, landscape, heritage or ecological assessments for consideration.

If new reserve land is considered appropriate, layout plans showing proposed location of reserves are required to be approved by Council's Parks, Sport and Recreation unit prior to an application for an outline development plan, a plan change, a resource or building consent or a connection to Council services being lodged.

All reserve provision and development proposals should be approved in principle by Council's Parks, Sport and Recreation unit prior to any public consultation.

Detailed development plans for all future reserves shall be submitted with applications for subdivision consent, and no work is to be carried out on site before approval of the development plans from Council's Parks, Sport and Recreation unit. No work is to be carried out until development contributions have been calculated and agreed with Council. Council agreements relating to individual stages of development will allow work to commence on those stages.

All reserve development shall be completed in accordance with the plans acceptable to Council's Parks, Sport and Recreation unit. 'As-built' plans shall be provided for all reserves. Development may include earthworks, drainage, irrigation, planting, paths, structures (such as seating, tables, lighting, rubbish bins, fencing, barriers, signs, and play equipment) and facilities (such as toilets and changing sheds) as agreed with Council's Parks, Sport and Recreation unit.

E.3.4 Ecological, functional, and aesthetic opportunities

Planting provides a range of ecological, functional, and aesthetic opportunities for

environmental enhancement:

a. Ecological:

   i. Provides, protects, and maintains terrestrial biodiversity and habitat

   ii. Reduces the amount of sediment and pollutants entering waterways

   iii. Maintains and enhances water quality and habitat

   iv. Reduces surface water flooding

   v. Increases stability and contributes to erosion control

   vi. Supports carbon sequestration

   vii. Supports ecosystem functioning including nutrient recycling, water retention, purification, and sediment control

   viii. Provides wildlife habitat value;

b. Functional:

   i. Defines space

   ii. Provides shade, shelter, and privacy

   iii. Screens unsightly outlooks and provides visual barriers

   iv. Ameliorates sound and reduces pollution

   v. Assists driver recognition of road link and place context (vi) Reduces glare and reflection and provides urban cooling

   vi. Assists in the control of erosion

   vii. Creates physical barriers

   viii. Provides recreation and amenity value

   ix. Provides edible species

   x. Provides opportunities for enhancing health, and should not be detrimental to it;

c. Aesthetic:

   i. Frames views

   ii. Emphasises landform and landscape features

   iii. Provides visual unity in the environment

   iv. Reduces the visual impact of the roadway

v. Softens hard surfaces and bleak areas

vi. Provides colour, form, and texture

vii. Provides visual lineage within and between regions

viii. Provides identity and environment.

E.3.5 Landscape and planting opportunities

Opportunities for landscaping are diverse, ranging from specimen tree planting to planting associated with existing indigenous vegetation, traffic management devices, riparian margins, wetlands, swales, rain gardens, ponds, reserves, and specific landscape features in the development.

E.3.6 Streams

Developers should consider the ‘day lighting’ of streams that are now piped to enhance amenity values and improve water quality.

A riparian native vegetated buffer system must be created along all perennial and intermittent streams. The buffer should be clearly marked on plans.

Limits of disturbance of the buffer will be established during application, construction and post development stages.

Reference should be made to the relevant direction and requirements of the National Policy Statement for Freshwater Management 2020, the National Environmental Standards for Freshwater 2020 and GWRC’s Natural Resources Plan.

E.4 Design

Planting and other landscaping shall be appropriate to and compatible with the local environment. The design layout and plant species selection shall be based on the consideration of the following:

i. Ability of plants to thrive on the site

ii. Height of plants at time of maturity and future shading impacts

iii. Size of planting areas, including road berms, to be compatible with plant species

iv. To be sympathetic to the existing landscape character of the area

v. Provide for long-term sustainable management.

Planting and other landscaping features shall be easily maintainable and minimise overall life

cycle costs inclusive of establishment, irrigation, maintenance and replacement.

E.4.1 Location

Landscaping and planting should be designed to respond to the overall environmental context such as vegetation and water bodies, cultural and heritage elements, local road geometry, stormwater and reserve design, and utilities placement. Planting may include specimen trees, edible gardens, rain gardens, swales, and other amenity garden features.

Infrastructural services should be planned at the same time as the landscape design so that tree and garden planting location does not compromise the integrity and efficient operation of services. If particular landscape conditions or objectives are required for a subdivision or development then these will need to be taken into account prior to undertaking detailed engineering design.

Detailed development plans showing distances of trees from paths, structures and underground services shall be provided for the approval of Council's Parks, Sport and Recreation unit so as to reduce the potential for future conflicts between trees and infrastructure. All trees and vegetation planted near high voltage transmission lines must comply (including when maturity is reached) with the Electrical (Hazards from Trees) Regulations 2003. All new trees in reserves and road reserves require the approval of Council's Parks, Sport and Recreation unit.

E.4.2 Reserve location and layout

Reserve location and layout design shall take into account adjoining land uses and areas to ensure there is an appropriate provision of recreation assets and landscaping in accordance with Wellington City Council's Te Whai Oranga Poneke Open Space and Recreation Strategy 2023 and Ngā Wāhanga Ātea me Ngā Aaronga Whakarato Open Space Categories and Provision Targets 2023.

The design of access routes into and through a reserve should ensure linkages with existing networks, consider future developments both of the reserve and adjoining areas, take into account topography, and shall follow CPTED principles.

E.4.3 Existing vegetation and trees

Where there is existing vegetation and/or trees in an area proposed as reserve, Council's Parks, Sport and Recreation unit shall decide whether they are to be removed or retained prior to development and Arboricultural and/or Ecological assessments shall be provided on Council's request to inform this decision. Vegetation and/or trees to be removed or retained shall be identified on the development plans.

All existing vegetation and trees to be retained shall be cordoned off to protect the root zone and vegetation, prior to the commencement of construction and the cordon shall remain in place until

completion of construction. Council's Working Around Trees guide sets out the requirements for tree protection.

Existing trees to be retained are to be protected by temporary fencing in a circle with a radius equal to the maximum crown extension (drip line) if there is to be any earthworks, construction or vehicles operating in the vicinity. A qualified person shall be used to determine the protected area and supervise construction. At no time shall anything be deposited in the root zones of protected vegetation and trees. If installation is required under existing vegetation trenchless technology should be considered, if this is not practicable advice from a suitably qualified person should be sought to minimise damage to the vegetation.

A tree or vegetation plan and construction methodology shall be supplied to Council's Parks, Sport and Recreation unit including:

a. Position and design of temporary protective fencing or other methods of protection;

b. Arboricultural maintenance required;

c. Methods of protection of the tree and root zone where construction is to occur near the root zone and tree canopy;

d. Maintenance required for long term health and stability of the tree or vegetation.

E.4.4 Native Forest and Shrubland Protection

Fencing, with approval and guidance from Council, should be constructed to exclude domestic stock. For small forest remnants, this fencing should be placed 5-6 m away from the forest edge and a protective buffer zone planted.

Pest animal control such as possum, rodent, mustelid, goat or pig control may be required. Seek advice from Council's Parks, Sport and Recreation unit about the best methods of control.

Weed control may be required if there is a substantial weed problem in the forest remnant and should be carried out prior to fencing and/or further planting.

Weeds must be carefully identified, and advice sought from Council for the best methods of control.

E.4.5 Riparian Buffers

Although reduction of contaminants is a widely recognised function of riparian buffers, they also contribute significantly to other aspects of water quality and physical habitat. Habitat alterations, especially channel straightening and removal of riparian vegetation, continue to impair the ecological health of streams more often and for longer time periods than contaminants.

Generally, the provision of a 10m minimum buffer width is recommended, with narrower or wider options being considered appropriate as indicated by site constraints or opportunities.

Species planted must be Wellington eco-sourced natives or appropriate species from a Council approved source.

Riparian planting must occur from late autumn (May) to early spring (Sept).

When choosing plants, consideration must be given to the stream bank substrate and topography, as well as to the different parts of the stream bank e.g. stream edge (frequently damp, prone to erosion), flood area (stream flat and lower slop prone to regular flooding), back wetland or spring (areas wet for much of the year), slope (drier conditions).

Larger plants must be planted away from the stream edge. Shrubs, like manuka and hebe are suited to the mid bank area, and plants that can cope with wet soils and occasional flooding, like cabbage trees and toetoe, can be planted near the stream edge.

Plants should be spaced 0.9 m apart and be at least size PB3 or PB5 for planting next to stream edge.

Weed control will be required for the first 36 months or until a closed canopy is established as per the Maintenance Period clause in Section A. Weed control will be carried out in accordance with GWRC's document "Getting Riparian Planting Right in the Wellington Region" 2014.

Land disturbance, vegetation removal and establishment in riparian margins may require consent from GWRC under the Natural Resources Plan.

E.4.6 Species selection

In selecting species for planting, take into account the overall composition, low maintenance, and longevity. All new trees in reserves and road reserves require the approval of the Council's Parks, Sport and Recreation unit.

The spacing of trees and plants should ensure a coherent design. The following matters shall be considered:

a. Suitability of eco-sourced native plants for revegetation planting of the ecological region to protect the local biodiversity;

b. Suitability to environmental conditions, for example climate, ground moisture, wind, and shade;

c. Tolerance to high foot traffic use where appropriate;

d. Pest and disease resistance, invasive or recognised as a pest plant under the National Pest Plant Accord (refer to http://www.biosecurity.govt.nz/nppa);

e. Non-suckering habit;

f. Final height, form, and longevity;

g. Maintenance requirements;

h. Safety such as toxicity of leaves, flowers, seeds, and bark in areas likely to be used by young children, and impairments to pedestrians;

Plant species on the road should be selected to avoid interfering with sight lines inconsistent with the target operating speed. The mature size of any tree or garden planting is to be assessed for each planting location and relative to the surrounding street environment.

E.4.7 Quality control

All plants shall be sound, healthy, vigorous, and free of any defects which may be detrimental to plant growth and development. In addition plants should have vigorous root and branch systems and plants supplied in pots should not be root bound. To ensure that plants adapt and thrive once planted they should be ‘hardened off’ prior to planting. Only species adapted to the site conditions shall be planted. Biodegradable plant protectors/guards are only to be used (no plastic).

E.4.8 Landscaping structures

Landscaping structures include (but are not limited to) sculptures, walls, fences, screens, bollards, tree cages, entranceways, and posts. The materials should be robust to suit their purpose and ideally reflect the local character. The design of the landscape structure shall be considered as an integral part of the development and surroundings to fulfil both functional and aesthetic requirements. Durability and maintenance requirements shall be considered. Structures shall not:

a. Inappropriately limit safe sight lines;

b. Be a hazard to pedestrians, people with disabilities, cyclists, or vehicle traffic.

E.4.9 Fencing of reserves

When adjacent to private property both sides of a pedestrian access track to a reserve must be bounded by a fence in a way that retains visual permeability and to maintain overlook from residential properties. Where there is existing native vegetation at the boundary fencing may not be required and if required must be designed and installed to minimise disturbance and enable vegetation survival and growth.

The permanent fencing of common boundaries of any reserve including esplanade, reserve accessways, and road boundaries, may be required. Wellington City Council's Parks, Sport and Recreation unit may specify that one or both of the following options apply:

a. A fencing covenant is registered on all titles of properties with a common boundary to reserve land, indemnifying the Wellington City Council against all costs of erection and maintenance of fences on common boundaries;

b. There is a specific fencing design for the reserve or boundary type.

Gates and bollards will be required where there is vehicle access to reserves. Design and installation specifications must be consistent with the Council's Street and Public Space Design Manual and be approved by the Council's Parks, Sports and Recreation unit.

E.4.10 Planting period and irrigation

Planting programmes where possible shall occur in the season that optimises growing conditions for plants and trees and maximises plant establishment.

Depending on the location and season of planting, Council's Parks, Sport and Recreation unit may require provision for temporary irrigation of plants and/or grass. Provision for watering during the establishment of plants or grass may be required for these areas if not otherwise irrigated.

E.4.11 Reserve Tracks

Reserve tracks predominantly provide access to and within reserve areas so that residents can enjoy using reserves safely. They are generally shared tracks (walking and cycling) and can provide walking/cycling connectivity for neighbourhoods. The track network throughout Council's Parks and Open Spaces is extensive and varies in style dependent on the track category, expected use, park type, character, topography and location.

The Wellington City Council Open Space Access Plan (2016) should be referenced in all track proposals. Council's Te Whai Oranga Poneke Open Space and Recreation Strategy 2023, Council's Ngā Wāhanga Ātea me Ngā Aaronga Whakarato Open Space Categories and Provision Targets 2023, Council's Outer Green Belt Management Plan 2019, and Council's Northern Reserves Management Plan 2008 all refer to reserve track networks.

Tracks must be designed and laid out in accordance with the Council Requirements specified in Council's tracks standards and NZ HB 8630:2004 Tracks and Outdoor Visitor Structures.

Any services in reserves must be buried and follow walking or access tracks except where otherwise agreed with Councils Parks, Sport and Recreation.

Open spaces including playing fields and reserves must allow for access for future maintenance.

Lighting will not normally be necessary.

The minimum boundary to boundary width for reserve entrances that are specifically provided for a recreation track entrance must be 10m. Wider boundary to boundary width may be required depending on terrain, such as a steeper site.

Pedestrian accessways which are part of the transport network are generally hard surface paths, providing pedestrians and/or cyclists with a significantly shorter route between different roading locations and where areas of interest are involved such as schools, shops, reserves and bus routes. They can be located in reserves and other public open spaces. Guidance for these is provided in the Transport section of this document.

E.4.12 Playgrounds

Playgrounds for public use must be to the requirements of NZS 5828:2015 Playground equipment and surfacing.

SNZ HB 5828.1:2006 General Playground Equipment and Surfacing Handbook

SNZ HB 5828.2:2006 Supervised Early Childhood Facilities playground

Equipment and Surfacing Handbook

All facilities, such as types and sizes of playground fittings, and associated equipment, are to be consistent with materials used by the Council and in accordance with the Council requirements detailed in Council's Wellington Play Spaces Policy 2017.

E.4.13 Reserve Car Parking

Car parks provided in parks and reserves are to be compliant with Council's Roading Specification.

Where soils, topography and slope permit, run off must drain through permeable or porous paving or be directed from the car park to rain gardens, swales or similar vegetated channels. These channels with provisions for infiltration or detention can either:

- Percolate to the ground where capability is available and is satisfactory to Wellington Water
- Temporarily store run off and release at a slower rate to the public stormwater system

However, overflows from the channel must drain to an approved outfall.

E.4.14 Reserve Furniture

Reserves furniture must be robust, durable and functional.

All furniture location, design and installation must be consistent with the Council's Street and Public Space Design Manual and be approved by the Council's Parks, Sports and Recreation unit.

The following items are considered special items and will require discussion with Council prior to starting design and construction:

- Seats
- Reserves signs
- Picnic tables
- Parks bins
- Street frontage fencing.

E.4.15 Sports field facility development

New sports field facility designs are to be signed off by the Council's Parks, Sport and Recreation unit before resource consent is issued.

E.4.16 Utility Services

All utility services, including reservoirs, must be placed underground, except where it is not practicable to do so. Where buildings or above-ground cabinets are proposed these shall be placed at the edges of road frontage to minimise effects to the park access and amenity.

Utility services must be located so as not to restrict areas useable for outdoor activities or required for future facilities or tree planting.

Any disturbance of the existing site during installation of a utility must be made good immediately after completion.

Requirements of the Reserve Act 1977 and any relevant Wellington City Council Reserve Management Plan must be met when proposing or installing utilities and infrastructure services in a reserve. Reference should also be made to relevant chapters of the Energy, Infrastructure and Transport Section of the District Plan for requirements for network utilities and other infrastructure services.

Where utility infrastructure is located in a reserve to vest, easements for the utilities must be created at the time of vesting.

Where new utility infrastructure will be located in an existing reserve, the Reserves Act 1977 easement process will apply.

E.5 Construction and maintenance

E.5.1 Introduction

There are minimum construction and maintenance standards and recommended procedures to be followed to ensure that all landscaping is to an acceptable standard prior to final inspection and release of the bond, if a bond is required.

It is the developer's responsibility to ensure that the landscaping meets the required standards at the termination of the maintenance period. The developer is responsible (and may be bonded) for the routine maintenance and replacement of the planting including dead wooding, weed control, mulching, replacing dead trees, shrubs, and plants, and watering for a defined period from the time of acceptance of as-built landscape plans by Wellington City Council or issue of a s. 224 completion certificate under the Resource Management Act.

Sign-off for practical completion shall be obtained from the Wellington City Council at the end of the maintenance period. Maintenance and plant replacement shall be undertaken until sign-off. Prior to sign-off, grass and planting areas shall have a fully established sward of grass or planting coverage without any visible gaps. There should be no weeds present in the planting areas, and weed species should consist of no more than 5% of grass areas. All trees should be in good health, structure, form and be free of disease.

E.5.2 Soil and fertility

The developer shall be responsible for the supply and spreading of soil. Topsoil should be correctly stored and handled when stripped and respread. A soil test shall be undertaken to determine the composition and type of fertiliser to be applied to the area being developed. A proprietary fertiliser or soil ameliorant suited to the species shall be applied where the existing soil is deficient in minerals and nutrients, plants are showing signs of lack of fertility, or to ensure maximum health and vigour.

Application rates and type of fertiliser or soil ameliorant should be selected according to species and soil fertility.

E.5.3 Weeds and litter control

At the end of the maintenance period there shall generally be no weeds within 2 m of any tree planting or in garden beds. Weeds should be controlled in an appropriate manner. When hoeing/pulling weeds care shall be taken to avoid damage to plants and their roots. The soil shall not be mixed with mulch when removing weeds. Any spraying should be kept to a

minimum near swales, rain gardens, ponds, riparian margins, and adjacent properties.

All areas once established shall be kept free of litter and debris, including paper, plastic, stones, bricks, bottles, glass, cans, and other forms of inorganic matter.

E.5.4 Planting grass areas

E.5.4.1

Grass areas and berms shall be formed after all other construction has been completed. The grass areas and berms shall incorporate not less than 100 mm compacted thickness of friable weed and stone free topsoil (generally made up of a compositions of approximately 1 – 5% sand, 7 – 16% humus or organic material, and no more that 30% weight in clay) placed over a base material capable of allowing root penetration and sustaining growth. The maximum slope for grass areas intended to be mown is 1:5.

E.5.4.2

Heavily compacted soils shall be ripped to a depth of 300 mm with rip lines 1 m apart, and rolled, before any laying of topsoil. The ground profile shall be smooth and free of ruts and depressions prior to grassing. Ripping to decompact soils should not be undertaken within the dripline of trees to be retained. Grass areas and berms shall be graded to edges (for example, pavement or footpath) allowing for approximately 15 mm of settlement.

E.5.4.4

The area for grass seeding shall be free of all weed species. Grass seed mix shall be in accordance with the Wellington City Council’s Parks, Sport and Recreation unit requirements.

E.5.4.5

A sward coverage of not less than 90% shall be achieved within 1 month of sowing, and before completion documentation shall be provided for processing by Wellington City Council. All established grass shall be mown to a range specified by the Wellington City Council’s Parks, Sport and Recreation unit. All grass edges shall be maintained in a neat and tidy manner.

The type of grass planted will depend on the use of the area, soil or sand type, irrigated or not and shaded or not. Guidance and approval on the varieties and situations in which to be used must be sought from Council.

E.5.5 Mulch

E.5.5.1

Mulch shall be applied to tree and garden areas to conserve moisture and reduce weed growth, except in riparian margins. Typically mulch will be cambium grade bark mulch, clean, free of sawdust and dirt, and with individual pieces no larger than 100 mm; mulched trees/branches that have no viable seeds; or stone mulches. Mulch for planting beds shall be a uniform 100 mm in final depth.

Where deemed required, robust timber edging to be included on gardens and mulched areas in order to prevent mulch/soil los/creep onto walkways etc. Mulched areas timber edging to be maintained at 100 mm minimum. Assessment to be made by Parks Planner or Parks Officer.

Before mulching soil should be damp to a depth of 300 mm. Mulching should be carried out on an ongoing basis to all garden beds and juvenile trees to maintain specified depth at end of maintenance period.

E.5.5.2

Mulch shall only be spread after the soil surface is levelled off to remove bumps and hollows. Weeds and grass are to be removed prior to mulching. Plants shall not be damaged or buried during the mulching process. Where it is known that bark mulch affects certain species or will be lost due to wind, slope of the land, or for some other reason, alternative mulches shall be considered and used.

E.5.5.3

Mulch shall be evenly spread at the base of the trunk and shall not be stacked into a volcano shape.

E.5.5.4

Mulch should be free of all contamination including non organic debris, pest plants, noxious (as specified under the Otago Regional Council Regional Pest Management plan 2019), contaminants, stumps, branches, and construction debris

E.5.6 Specimen tree planting

E.5.6.1

Specimen trees are defined as trees with a trunk diameter of 25 mm to 100 mm when measured at 1400 mm above ground level. Larger trees can be used with the approval of Wellington City Council’s Parks, Sport and Recreation unit.

Those contractors involved in specimen tree planting and maintenance should be competent horticultural/ arboricultural practitioners and therefore follow accepted industry standard

procedures for tree planting. Establishment and initial maintenance are critical to the long-term viability of the specimen tree.

E.5.6.2

Specimen trees shall be sound, healthy, vigorous, and free of any defects (relative to the species). Specimen trees are to be a minimum of PB 95 (planter bag of 95 pint capacity approximately 54 L) grade when planted. A recommended minimum height for specimen trees is 2.5 m at the time of planting to aid early establishment unless the local conditions of a site require consideration of alternatives, for example, an exposed site may require small, well-hardened trees. Specimen trees between 1.5 – 2.5 m may be allowed with the approval of Wellington City Council's Parks, Sport and Recreation unit.

E.5.6.3

Given the generally modified nature of soil in subdivisions it is essential that a suitable tree planting pit be prepared. The approach shall be to have:

a. Ground free from debris and rubbish;

b. Ground cultivated to a depth of 1 m and a width of 1 m to break up any compaction, fracture subsoil, and afford drainage to hard rock areas;

c. Sides of planting holes crumbled and not smooth;

d. Topsoil incorporated into the upper level of planting holes;

e. Each tree fertilised with an appropriate amount of slow release fertiliser, as per the manufacturer's recommendations;

f. Final planted depth consistent with finished ground level;

g. Each tree adequately staked to withstand movement in natural wind conditions and to meet Wellington City Council's Parks, Sport and Recreation unit standards;

h. Trees secured with expandable ties at approximately 1/3 of their height or as high as required to support the tree (to be checked every 6 months) or anchored below ground with a root ball anchor;

i. Soil firmed sufficiently to force any air pockets from planting holes;

j. Trees watered immediately following planting;

k. Trees radially mulched to a distance of 500 mm or to drip line, whichever is the greater

area and a depth of 100 mm; and

l. Staking uniformly low and visually consistent throughout the subdivision stage. Ground-treated timber stakes should only be used if the stakes are to be removed once the trees are stable, that is at the end of a maintenance period.

m. The minimum width of new verges that incorporate street tree planting shall be no less than 1.8m in width in order to provide the new trees with a suitable rooting environment and increases the their likelihood of becoming successfully established without disrupting the surrounding infrastructure.

E.5.6.4

The onus is on the developer to ensure that trees are protected during the further development of the subdivision (that is, the construction of dwellings/buildings) and during the defined maintenance period.

E.5.6.5

Newly planted trees, where appropriate, shall incorporate a suitable and sustainable form of physical support. This support can consist of below ground anchor systems (preferred when planting large grade trees in very high profile situations) or wooden stakes. If wooden stakes are employed, the local climatic conditions shall be assessed and this will determine the dimensions of the supports, though as a guide tree stakes should not exceed 1/3rd of the height of the tree being planted. Options for tree staking include a single stake positioned on the windward side of the tree (only to be used in relatively sheltered areas) two opposing stakes or three stakes in a triangle formation (to be used on large grade trees).

The newly planted tree shall be attached to the wooden stakes using a suitable tie which shall be at least 50mm in width and of a semi-permanent webbing construction made from a biodegradable product such as hessian or an acceptable equivalent. Each tie should be taut, but should not pull the tree towards the stake. The intention is to keep the tree in place while permitting the top to move freely, such crown movement will encourage increases in stem diameter and root development.

E.5.6.6

Providing a suitable rooting environment is crucial to successful tree establishment. Ensuring a newly-planted tree has sufficient good quality, uncompacted soil increases the trees likelihood of becoming successfully established without disrupting the surrounding infrastructure. Certain specialist design features may reduce the soil volumes required within the pit itself, such as interconnected pits, or incorporation of root paths to nearby uncompacted soil.

Achieving sufficient soil volume on sites where the planting area is subjected to loading such as car parking, footpaths, roads above tree roots requires a system of below ground support. Two of the most commonly used methods are structural soils and below-ground, pre-engineered cells. Structural soils are appropriate where other, non-structural soil is also readily available to the tree. For example, trees planted within a parking area adjacent to a soft landscape area, where tree roots can grow freely beneath the hard surfacing, but have access to adjacent uncompacted soil. Pre-engineered cells filled with suitable soil may be necessary in more urban areas where tree roots have fewer opportunities to access soil beyond the tree pit. The use of either approach requires specialist knowledge and advice should be sought from the manufacturer/supplier before being included in the tree pit design.

E.5.7 General amenity planting

Before topsoil is added all stripped and graded ground intended for planting should be cultivated to a depth appropriate to the plant species including a sufficient depth to break up any compaction. There should be friable topsoil for shrubs and ground cover appropriate to the depth of the root ball.

E.5.8 Revegetation planting

All planting must take place from late autumn (May) – early spring (Sept).

Species will depend on the location and a species list will be approved as part of the landscape plan. Council's Toitū te marae a Tāne Restoration Planting Techniques must be referenced for site type identification and methodologies.

For site specific species lists, Council's Toitū te marae a Tāne Restoration planting sites must be referenced.

Minimum depth for topsoil is 300mm. This will depend on soil and species to be planted.

Minimum depth for mulch is 100mm. Mulch is to be of organic material and of composition that is unlikely to be blown away.

Guidance and approval on ground preparation and mulching must be sought from Council.

Plant stakes may be required depending on size, type and location of plants.

Any planting next to existing mown grass areas must be marked to avoid damage while it establishes.

In-fill planting may be required throughout the maintenance period.

All planting must be a minimum of 1.5m from track edges.

Any development near (i.e. within the drip line), or involving, an existing public tree must adhere to the Council's Working Around Trees guide and must not be carried out without prior approval from Wellington City Council's Parks, Sport and Recreation unit.

Failure to observe any of the rules will result in a substantial financial penalty that increases with each occurrence as per Council's Working Around Trees guide / District Plan.

Weed control will be required for the first 36 months or until a closed canopy is established.

Dead plants must be replaced throughout the maintenance period to maintain vegetation density and achieve canopy closure.

All planting must be supplied and carried out in accordance with horticultural best practice.

Plants must be eco-sourced from the Wellington area with species appropriate to the area being planted. Professional advice must be taken where necessary.

E.5.9 Landscape/Amenity Planting

Landscape/amenity planting in some open spaces, such as reserve entrances and neighbourhood parks will be required for amenity, to create a more coherent space and to reduce maintenance requirements.

Landscape/amenity planting areas and species must be discussed with and agreed on with Council's Parks, Sport and Recreation unit.

Landscape/amenity planting will generally be Wellington eco-sourced indigenous plants, selected for each site and will consider site characteristics, CPTED principles, windbreak shelter and summer shade for areas such as playgrounds, and the use and ongoing maintenance of the overall site.

E.5.10 Swales, rain gardens, wetlands, and riparian margins planting

Swales, rain gardens, wetlands, and riparian margins should have site specific planting plans prepared by a suitably qualified person and submitted to Wellington City Council for approval of designs. Access shall be provided if future removal and maintenance is required.

E.5.11 Pruning

E.5.11.1

Trees should be selected and located to minimise ongoing pruning costs and requirements. All pruning of street trees shall be undertaken by a suitably qualified arborist. All pruning shall be undertaken to recognised arboricultural practices. Pruning of amenity trees shall comply with

AS 4373:2007 – Pruning of amenity trees.

Pruning should be carried out on shrubs to maintain a high standard of presentation, display, and plant vigour. Paths, roads, and all other accessways should be kept clear of excess growth. Pruning may also be necessary to ensure signs are not obscured. Where appropriate pruning should allow for adequate sight visibility to ensure the safety of road users. However there are situations where planting should be used to restrict visibility and slow traffic or frame views.

E.5.11.2

All weak, dead, diseased, and damaged growth should be removed, and pruning carried out to maintain the desired shape and size. Pruning should not be carried out during leaf burst or leaf fall. The following pruning techniques (for shrubs) should be employed where appropriate:

a. Tips to be pinched or purged as appropriate for species to give desired shape and size;

b. Form pruning of young plants to ensure compact form and shape;

c. Undercutting of groundcovers at edges generally;

d. Plants are to be pruned so that they do not smother neighbouring plants.

E.5.12 Maintenance

E.5.12.1

Planting period and irrigation Landscape plans shall ensure that future maintenance requirements have been considered so that ongoing costs are minimised. The maintenance period will vary depending on the nature type of planting and should be covered in specifications and as required by Wellington City Council's Parks, Sport and Recreation unit.

The developer shall:

a. Remove from the area all temporary services, machinery, and surplus materials that have been used for the construction, and leave the site in a tidy condition;

b. Clean all paths and surrounding areas;

c. Remove all plant labels;

d. Clear and weed all channels;

e. Ensure that all damaged, vandalised, stolen, or dead plants are replaced to maintain

numbers and unity of display;

f. Ensure that amenity planting beds are cleaned to remove prunings, dead or damaged leaves, and any other object or material, including retail attachments such as labels. The edges of the beds shall be left evenly shaped and sloped.

Land to be vested for reserves purposes shall as a minimum meet the following general requirements:

a. The land is to be free of noxious weeds and other specified vegetation identified.

b. All previous fences, farm utilities, building remains, and rubbish are to be removed or disposed of to the satisfaction of the Wellington City Council's Parks, Sport and Recreation unit;

c. Land to be mown shall be accessible to suitable mowing equipment, and is to have an established turf type seed grass cover;

d. Drainage reserves, ponds, lakes, channels, and streams requiring maintenance shall have suitable access for machinery;

e. All boundaries are to be surveyed and clearly pegged or fenced where required;

f. There will be no encroachments from adjacent private landowners onto public reserves;

g. Any rights of way or easements are to be formalised at no cost Wellington City Council;

h. Any proposed landscape planting or furniture/structures shall be completed.

E.5.12.2 Maintenance period

Generally, the maintenance period for new reserves shall be minimum three years from receiving section 224c certification, noting that some aspects, such as revegetation and landscape planting, may require an establishment period of 5 years. The maintenance required during this period shall be outlined in a Maintenance Agreement/Reserves Agreement between the developer and Wellington City Council's Parks, Sport and Recreation unit that shall be established prior to obtaining section 224c certification. The Maintenance Agreement/Reserves Agreement shall ensure that all new reserve and road reserve areas are managed in accordance with Wellington City Council's maintenance standards. At a minimum, the maintenance period shall include the following requirements:

a. all new assets, including irrigation, shall be kept in good working order and be free of

defects or disrepair.

b. turf, specimen trees and vegetation shall be maintained to an acceptable standard as specified by Wellington City Council's Parks, Sport and Recreation unit which will include:

- Grassed areas are to be attended to obtain a good strike,
- Any massed areas of shrubs and trees are to be kept in a healthy state, which is weed free and the mulch is to be topped up as required to maintain the specified depth. Irrigation (temporary and/or permanent) may be required.
- Any areas of revegetation or riparian buffer planting are to be kept weed free and the mulch is to be topped up to maintain the specified depth.
- Any plant failures/deaths must be replaced on an annual basis throughout the maintenance period. Only established vegetation will be considered compliant at the end of the maintenance period.
- The establishment measure of revegetation or riparian buffer planting is 80% canopy cover.

a. the reserves shall be kept in a tidy condition and to not have any loose litter or collections of refuse.

b. health and safety plans shall be provided for all contractors undertaking maintenance in the reserves or road reserves.

APPENDIX A. EARTHWORKS DESIGN AND CONSTRUCTION

CONTENTS

FORM 1 CERTIFICATE OF EARTHWORKS

SUBDIVISION:
…….
(Description of land development/subdivision)

SUBDIVIDER: ……..…….
(Owner / Developer)

LOCATION: …….
(Address)

ISSUED BY: ……..…….
(Approved suitably qualified design professional)

COMPANY/FIRM: ……..…….....
……

(Name and address of firm)

Hereby confirm that: 1. I am a Certifier as per defination in 4431:2022 ; and was retained by the Subdivider to supervise the earthworks on the above subdivision. 2. The attached plan/s No(s):……..show/s the extent of the fill and shows the Lot numbers:……..…… affected by the fill.

3. The earth fills shown have been placed in accordance with the Wellington City Council Code of Practice for Land Development, including NZS 4431:2022. The extent of my inspections during construction, and the results of all tests carried out are described in my report dated …… copy attached and Statement of Suitablity as per Appendix D of NZS 4431:2022.

4. The filled ground is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 3604 and NZS 4229 providing that:

   1) ……..

   2) ……..

   3) ……..

   This certification does not remove the necessity for the normal inspection and design of foundations as would be made in natural ground.

5. I confirm that all un-retained cuts have been completed in accordance with Council's Code of Practice for Land Development for earthworks (Part B).

6. I am satisfied that all un-retained cuts slopes and batters are considered stable with respect to the

future use, and that the risk of instability is low as reasonably practicable.

7. I am satisfied that all ground, both original and earthworked, are not subject to erosion, subsidence or slippage and do not pose a significant risk from a natural hazards perspective, as per the provisions of section 106 of the Resource Management Act 1991., provided that:

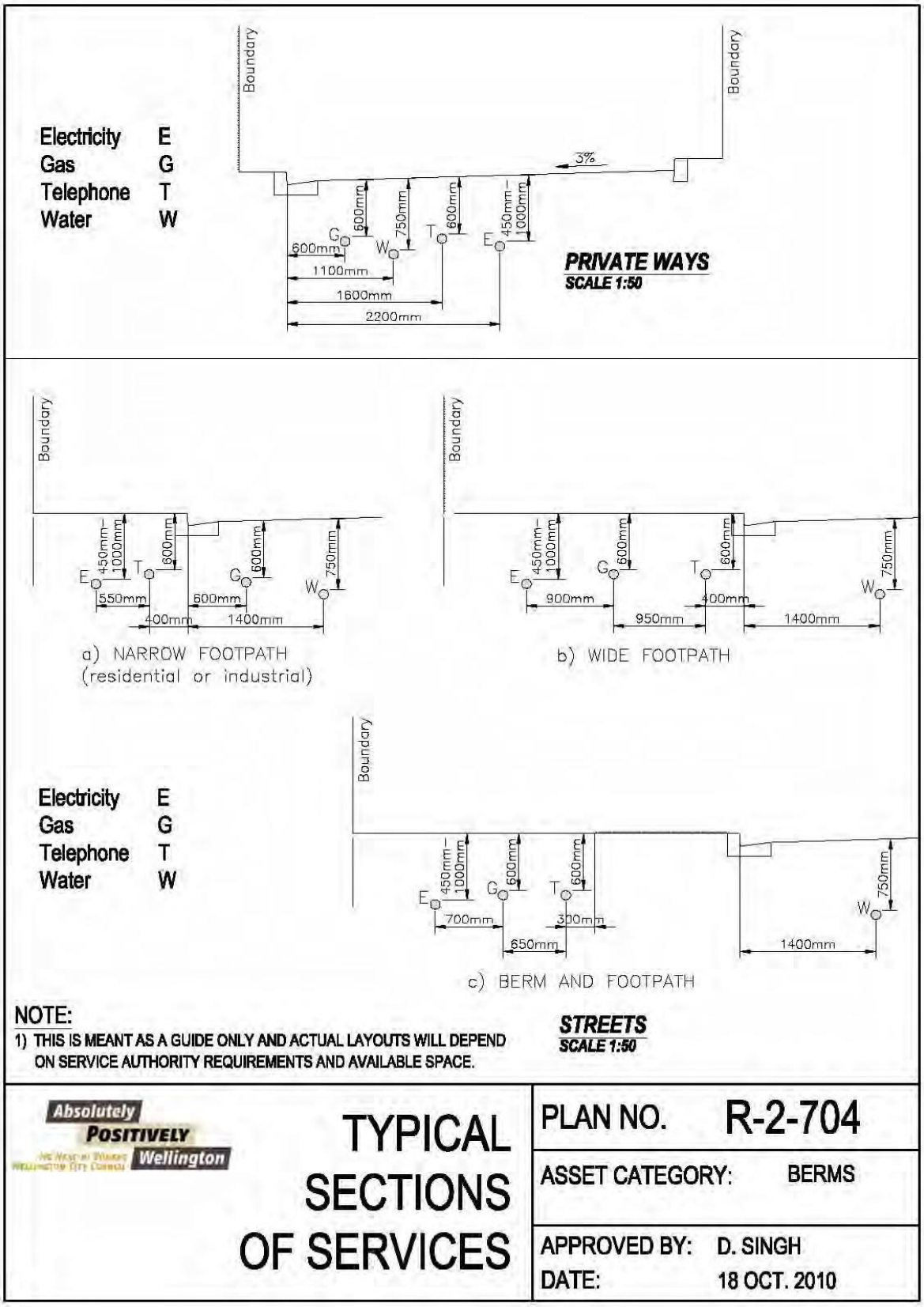
i)…….
ii)……..

SIGNATURE: …… DATE: …….

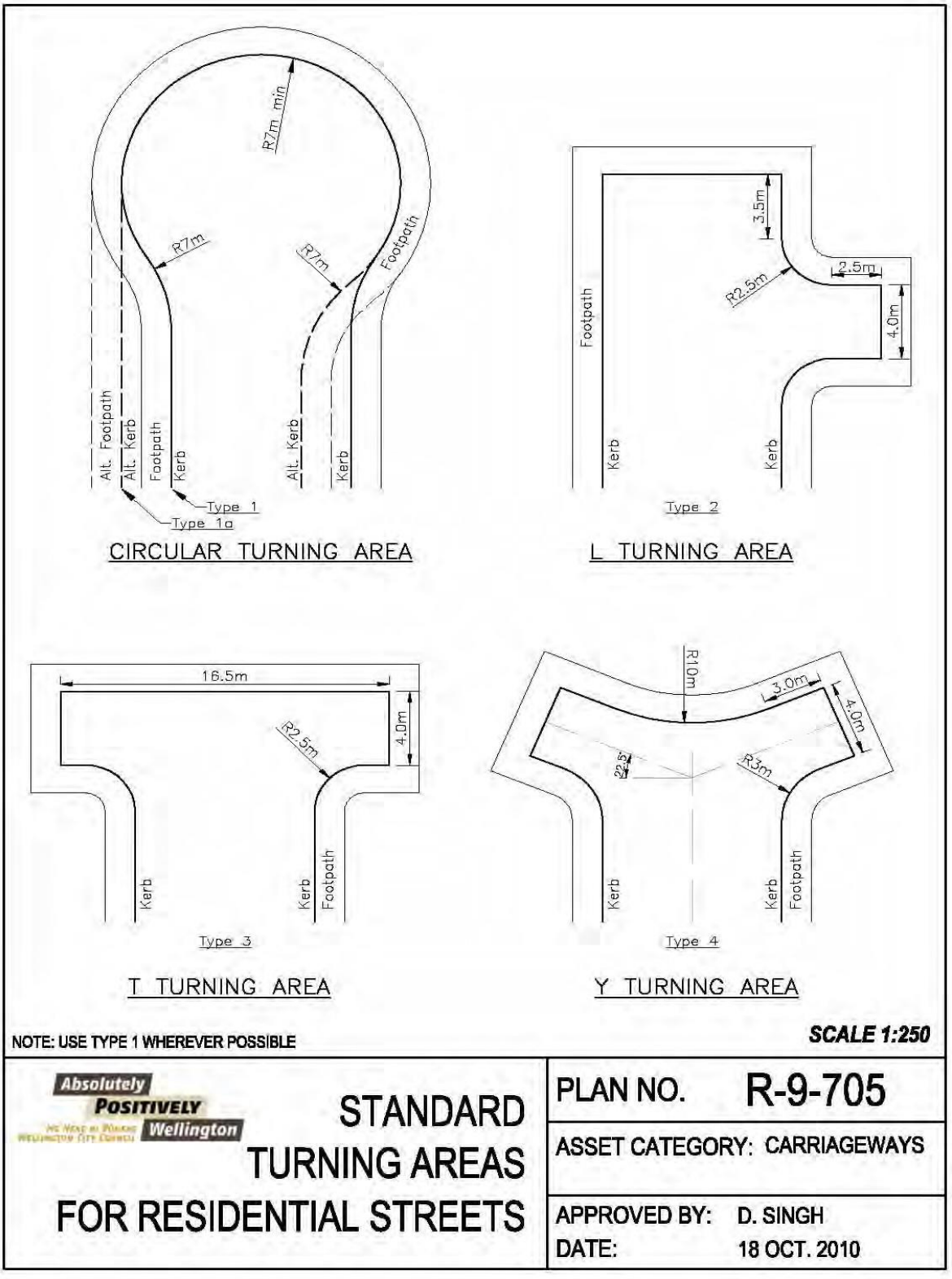
APPENDIX B. ROAD DESIGN AND CONSTRUCTION

CONTENTS

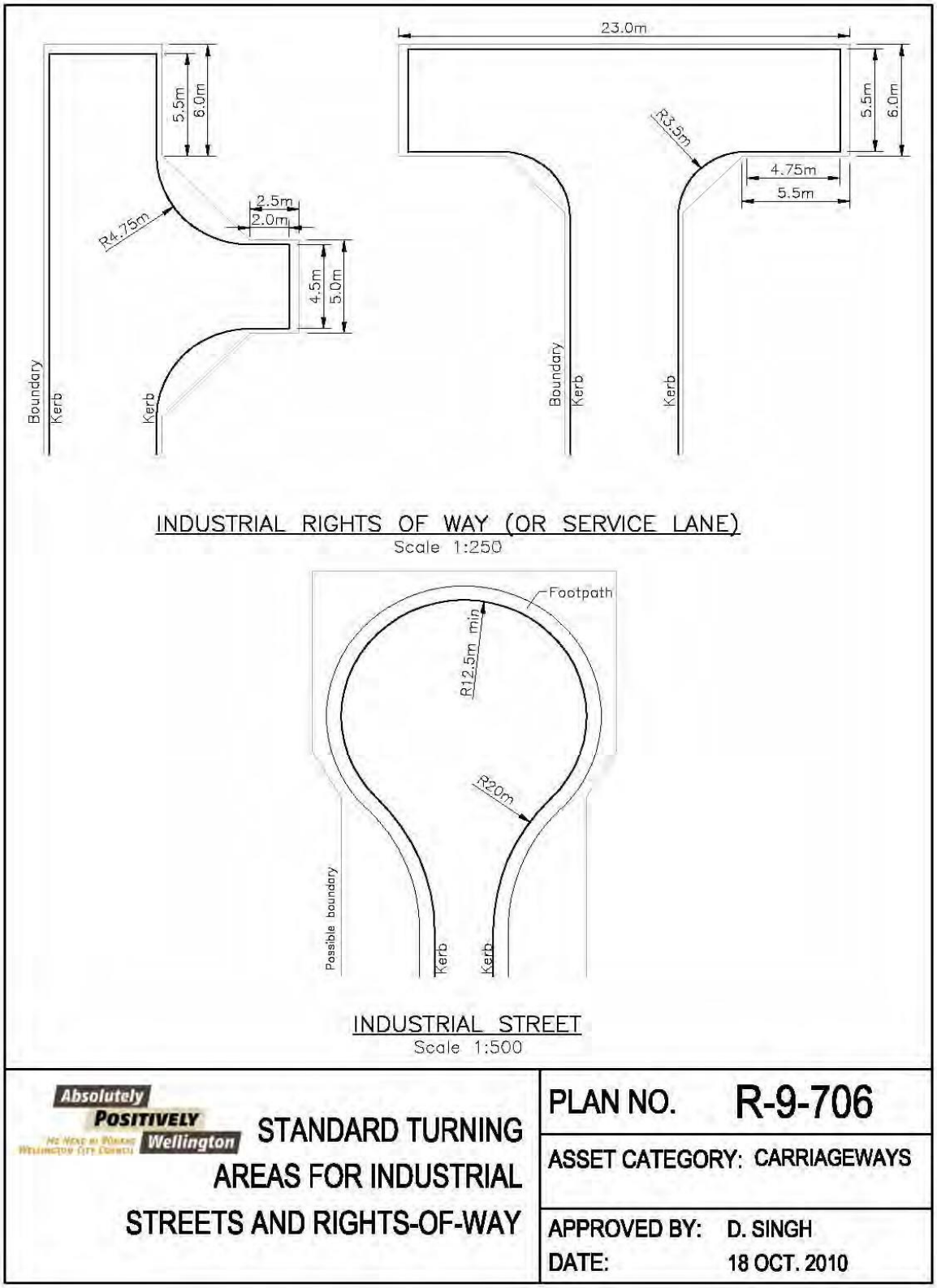
Drwg R –2- 704 Typical Sections of Services



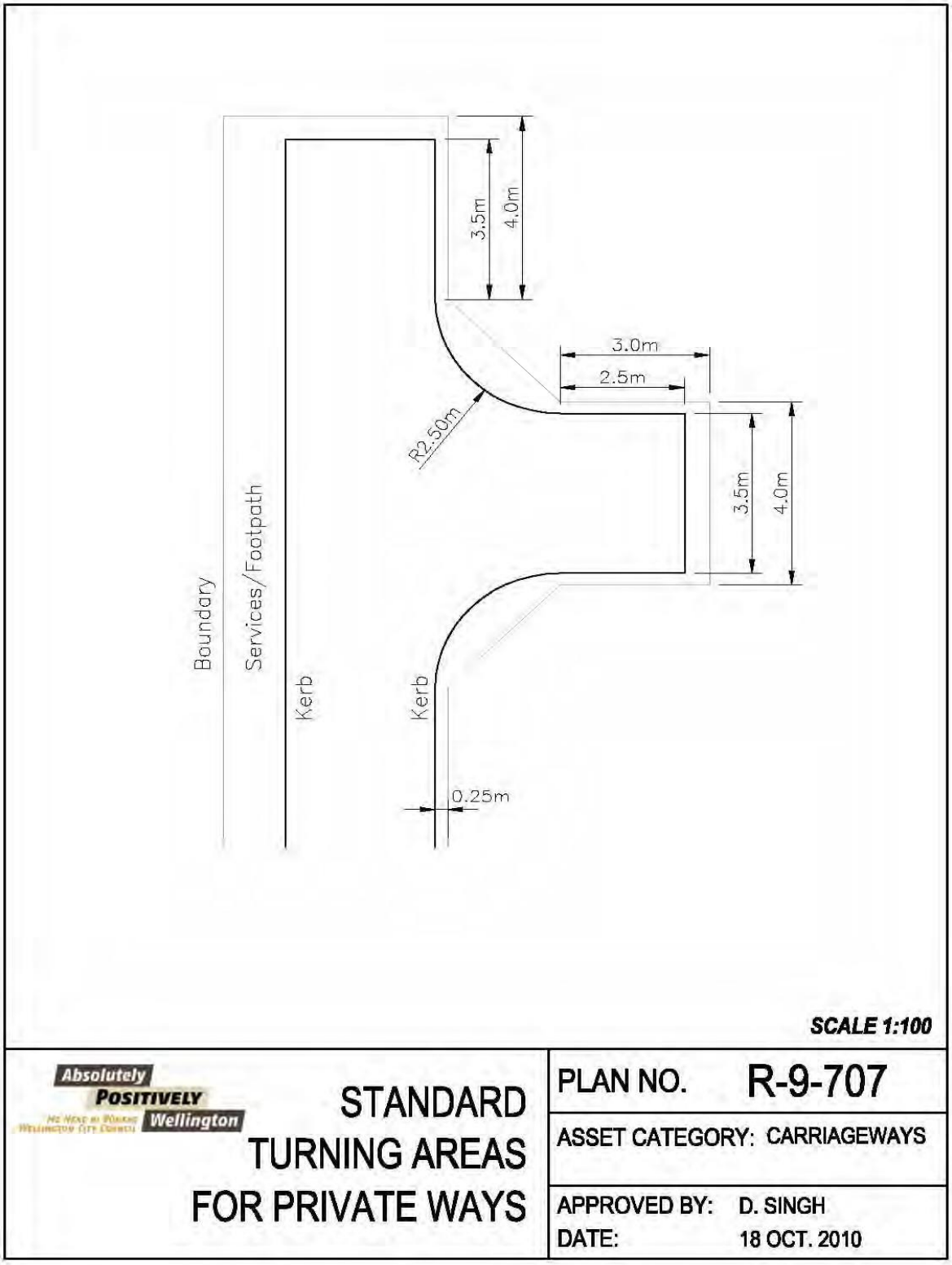
Drwg R –9- 705 Standard Turning Areas for Residential Streets



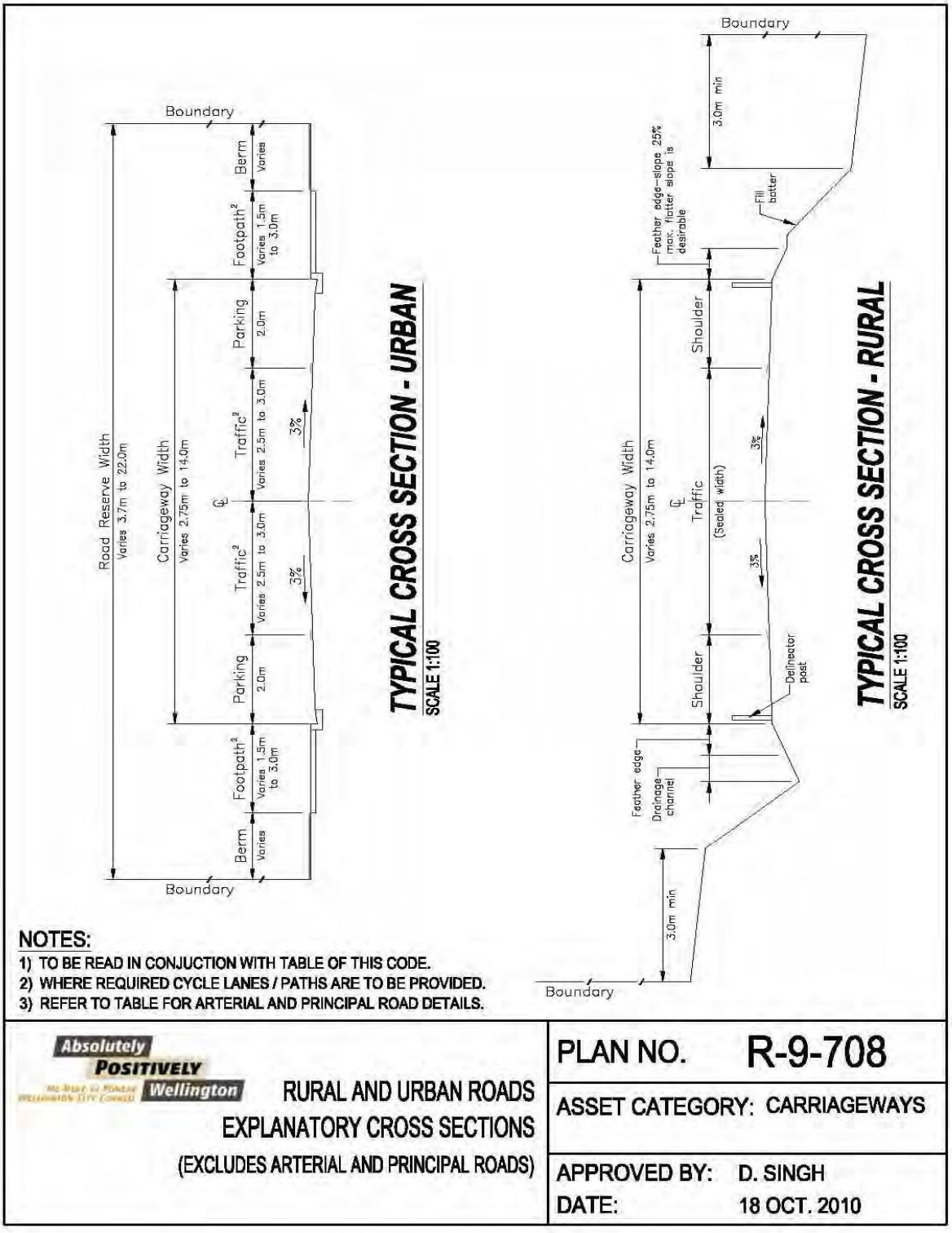
Drwg R –9- 706 Standard Turning Areas for Industrial Streets and Driveways



Drwg R –9- 707 Standard Turning Areas for Driveways

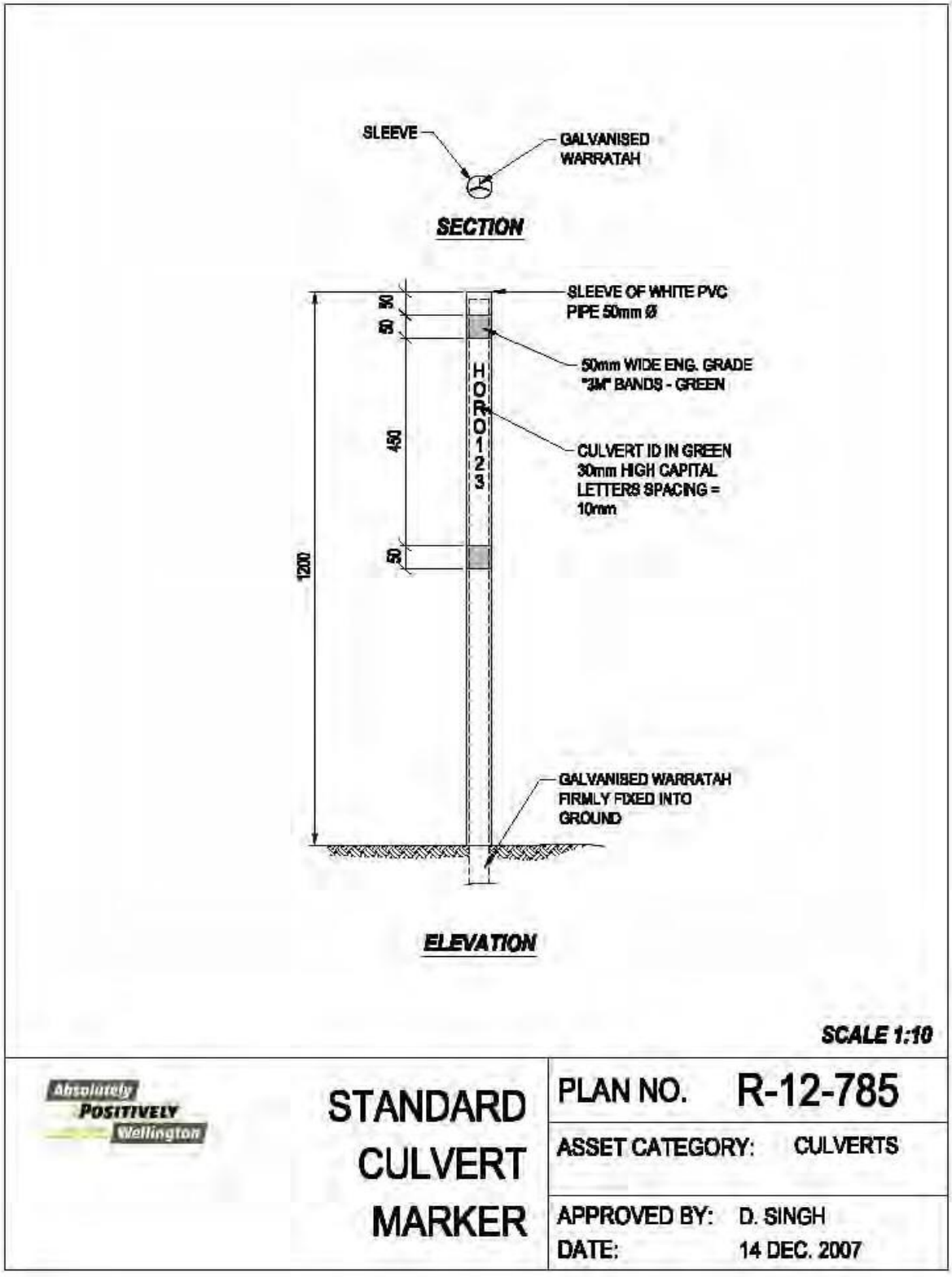


Drwg R –9- 708 Rural and Urban Roads Explanatory Cross- sections

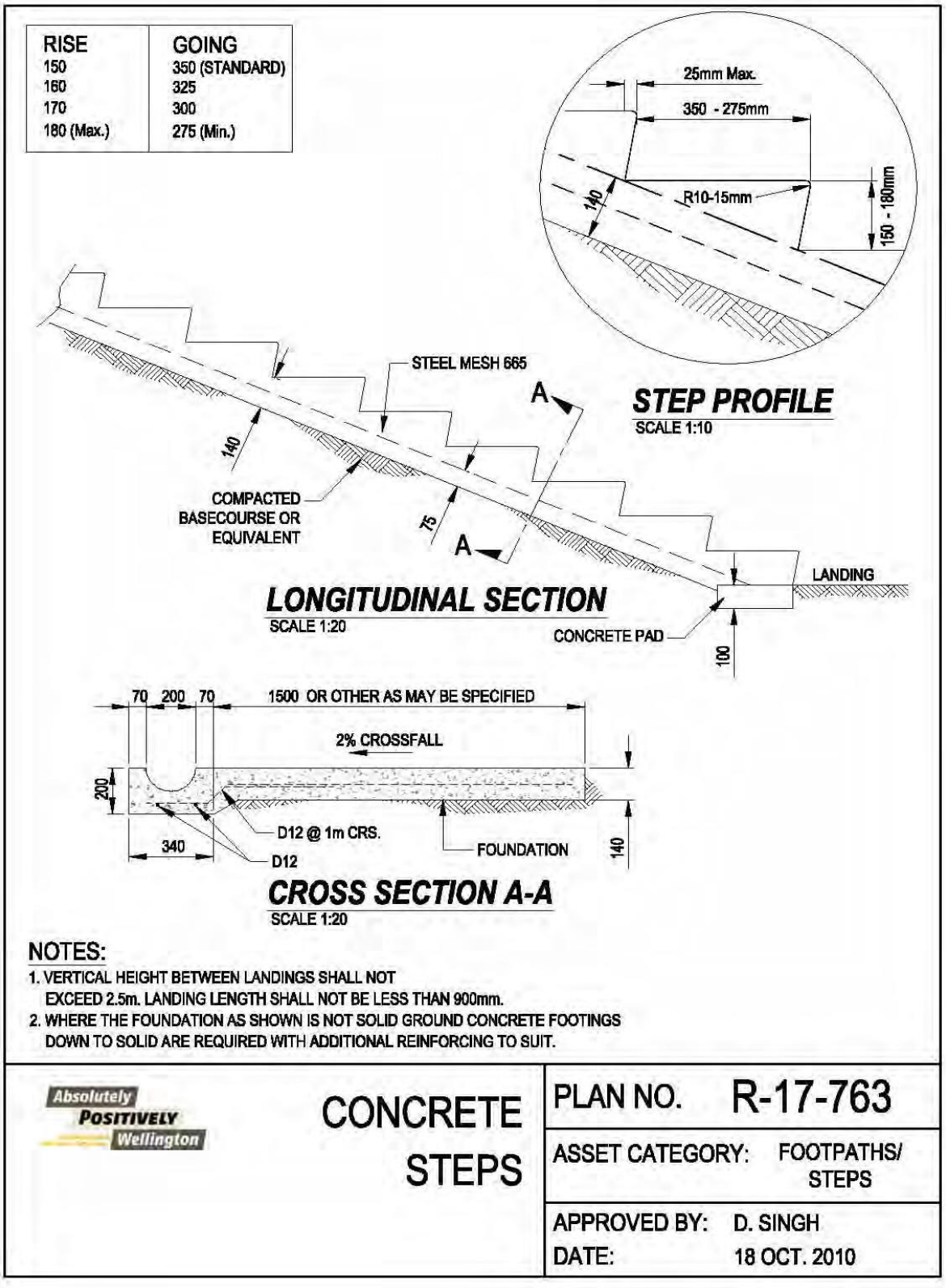


NOTE Variation in the boundary to boundary width will be required to accommodate minimum tree planting requirements.

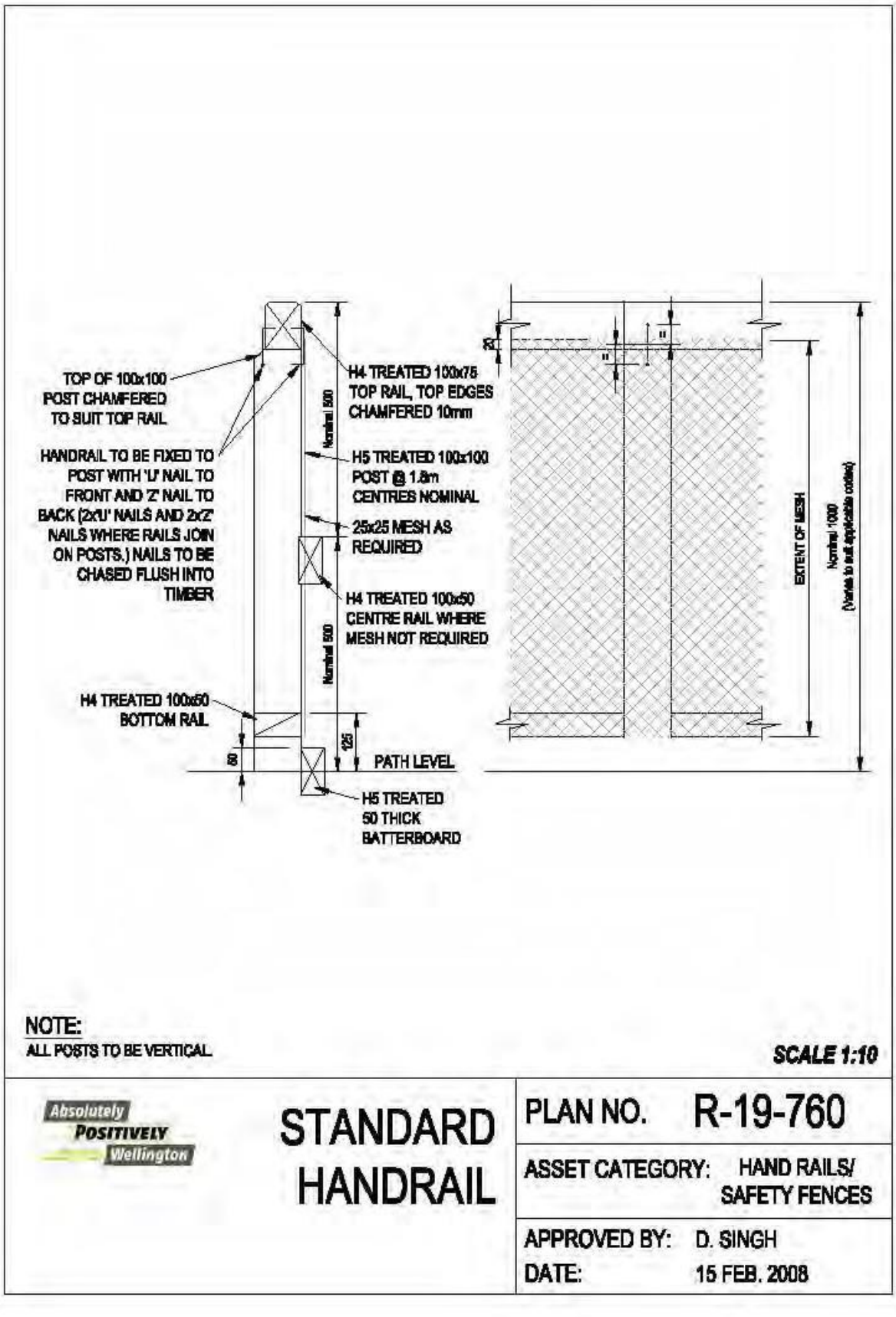
Drwg R –12-785 Standard Culvert Marker



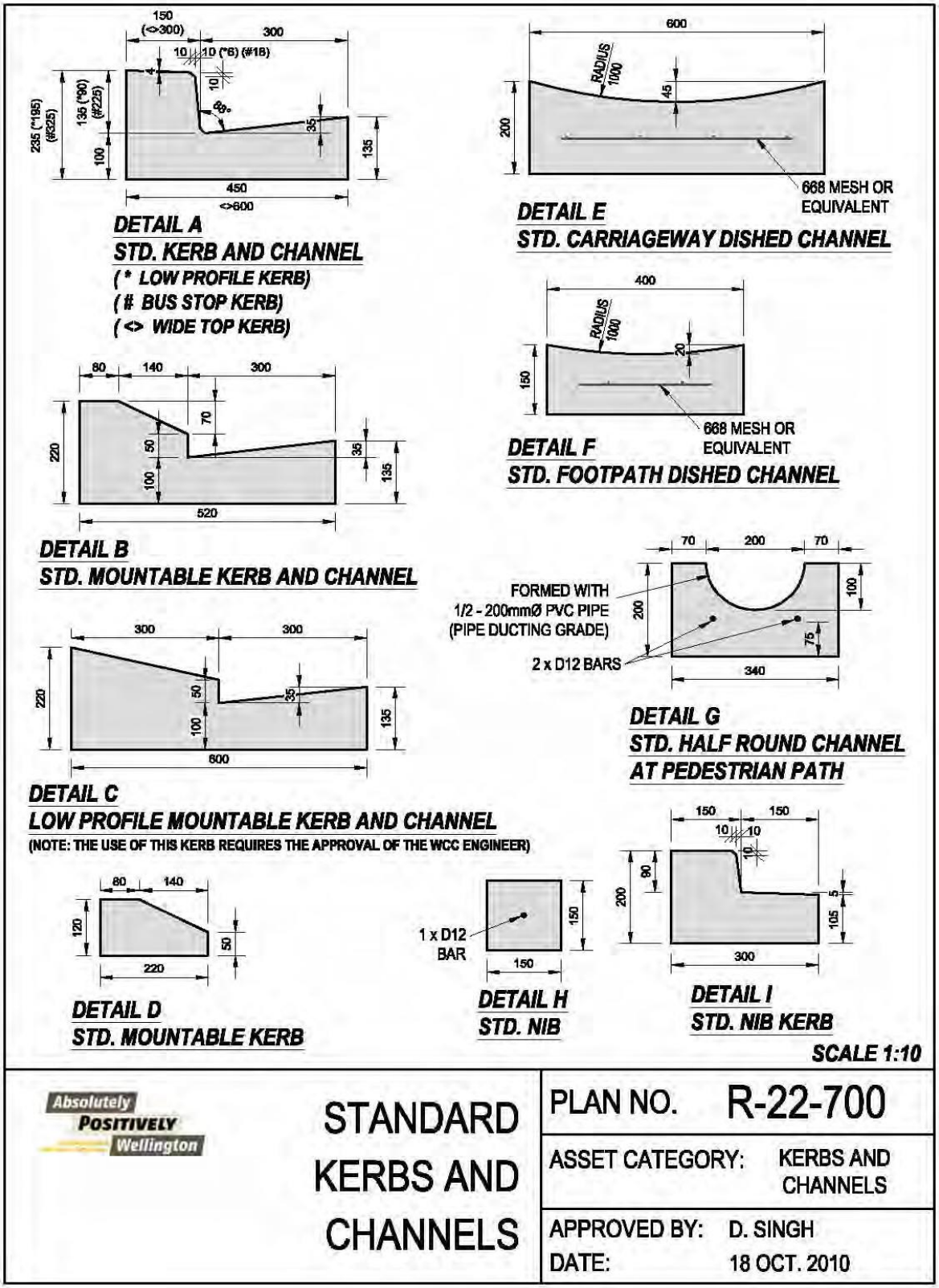
Drwg R –17-763 Concrete Steps



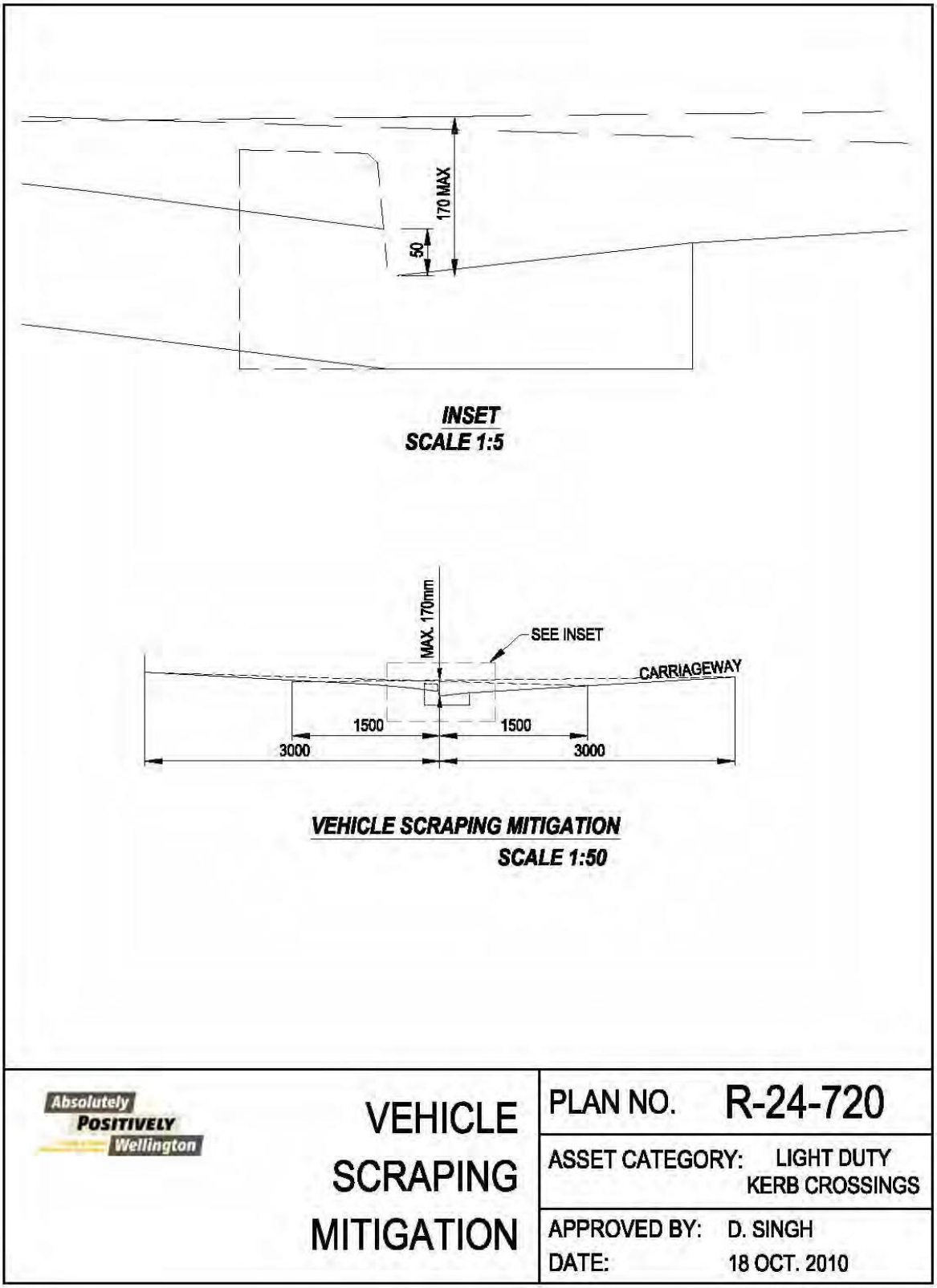
Drwg R –19-760 Standard Handrail



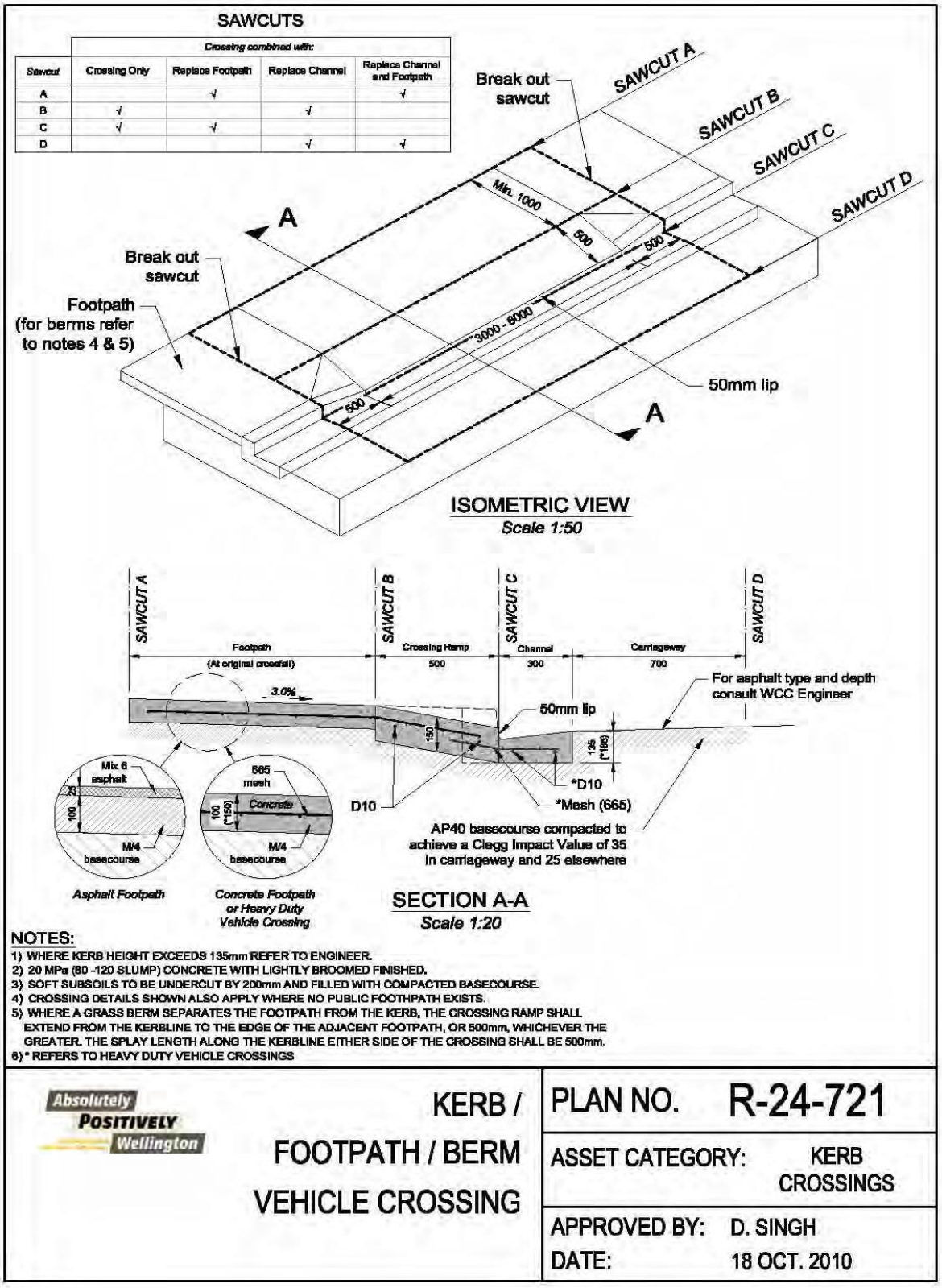
Drwg R –22-700 Standard Kerbs and Channels



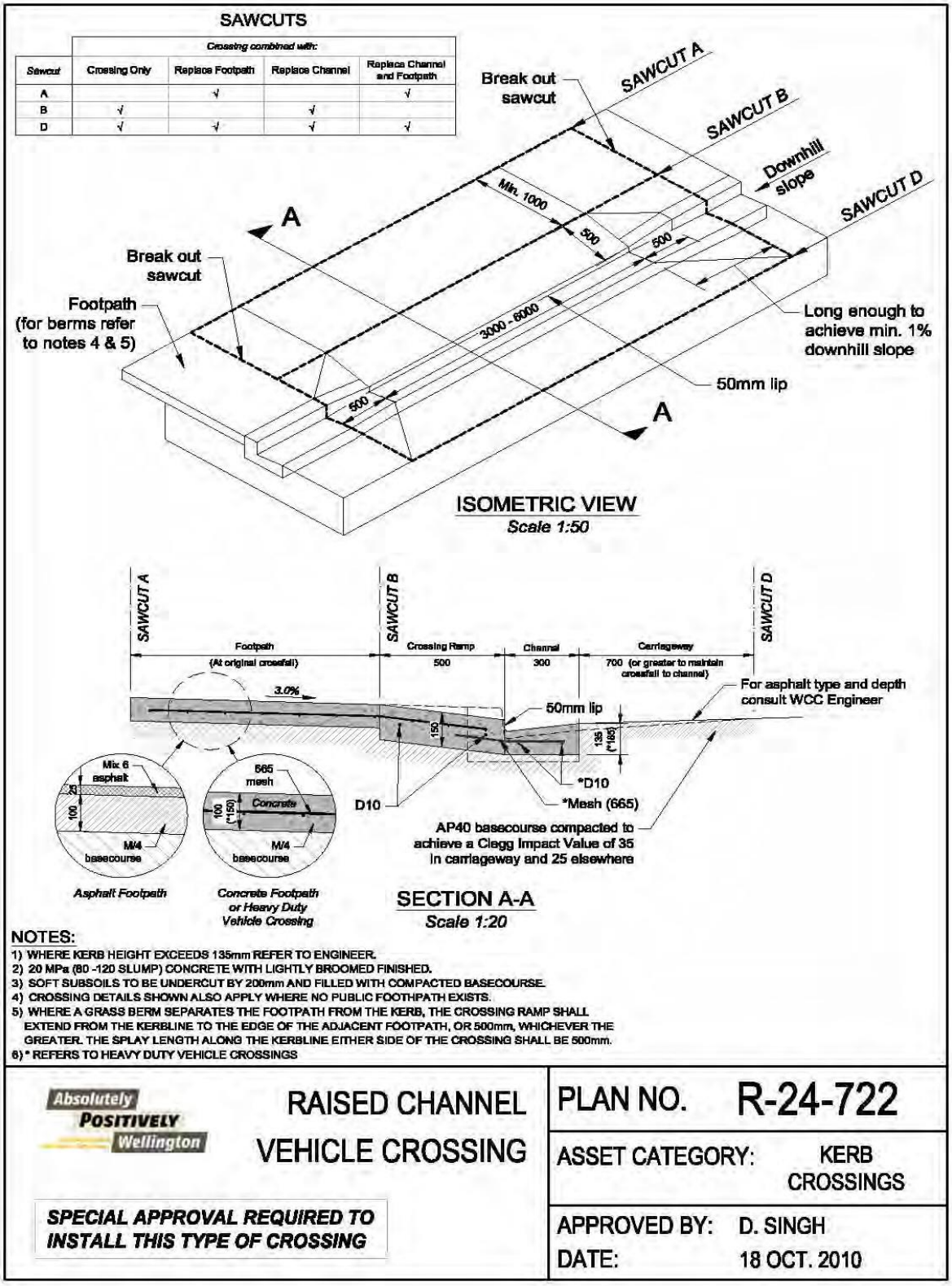
Drwg R –24-720 Vehicle Scraping Mitigation



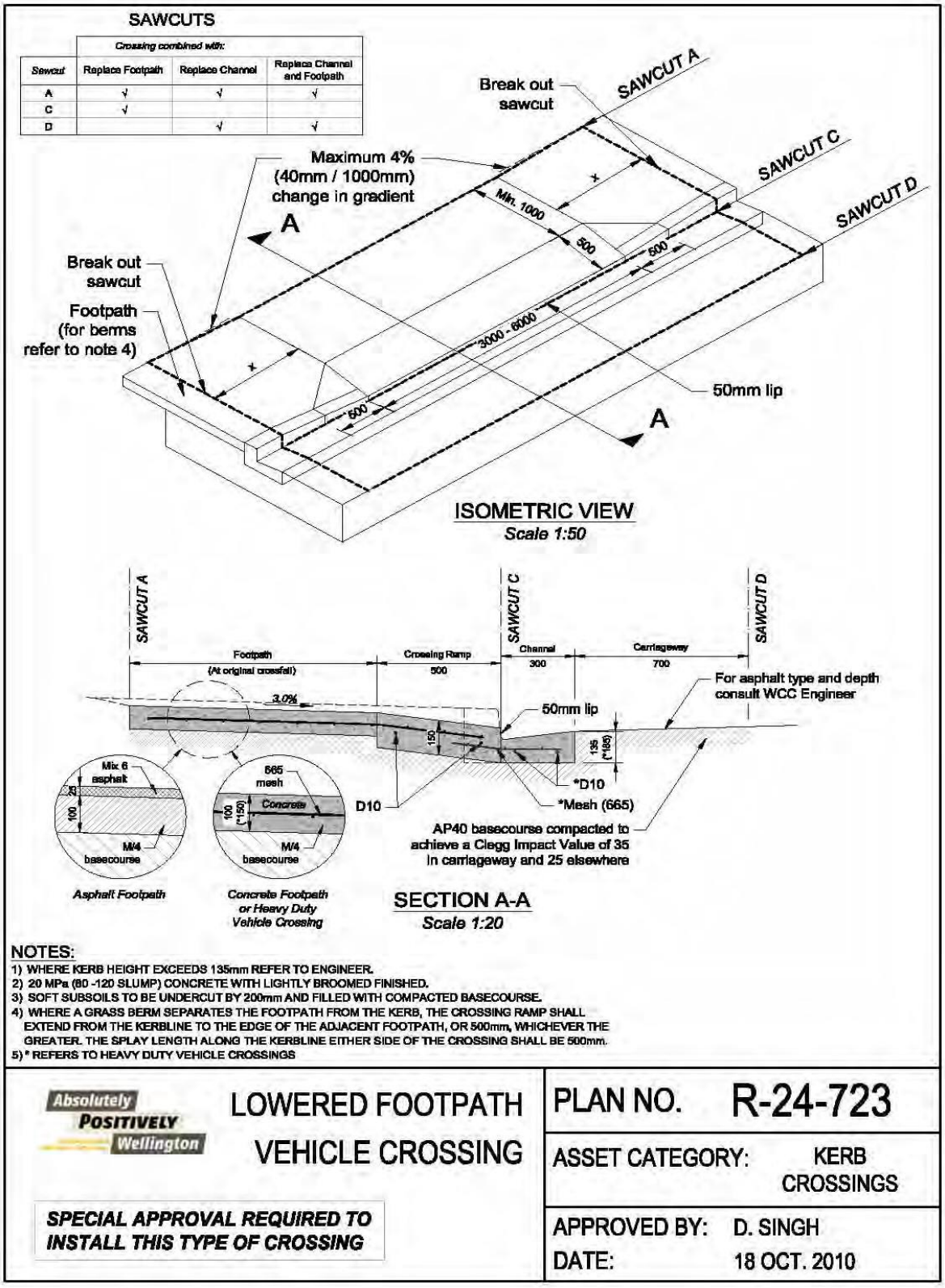
Drwg R –24-721 Kerb / Footpath / Berm Vehicle Crossing



Drwg R –24-722 Raised Channel Vehicle Crossing



Drwg R –24-723 Lowered Footpath Vehicle Crossing



NOTES:

1) WHERE KERB HEIGHT EXCEEDS 135mm REFER TO ENGINEER.
2) 20 MPa (80 -120 SLUMP) CONCRETE WITH LIGHTLY BROOMED FINISHED.
3) SOFT SUBSOILS TO BE UNDERCUT BY 200mm AND FILLED WITH COMPACTED BASECOURSE.
4) WHERE A GRASS BERM SEPARATES THE FOOTPATH FROM THE KERB, THE CROSSING RAMP SHALL EXTEND FROM THE KERBLINE TO THE EDGE OF THE ADJACENT FOOTPATH, OR 500mm, WHICHEVER THE GREATER. THE SPLAY LENGTH ALONG THE KERBLINE EITHER SIDE OF THE CROSSING SHALL BE 500mm.
5) * REFERS TO HEAVY DUTY VEHICLE CROSSINGS

Absolutely POSITIVELY Wellington

LOWERED FOOTPATH VEHICLE CROSSING

PLAN NO. R-24-723

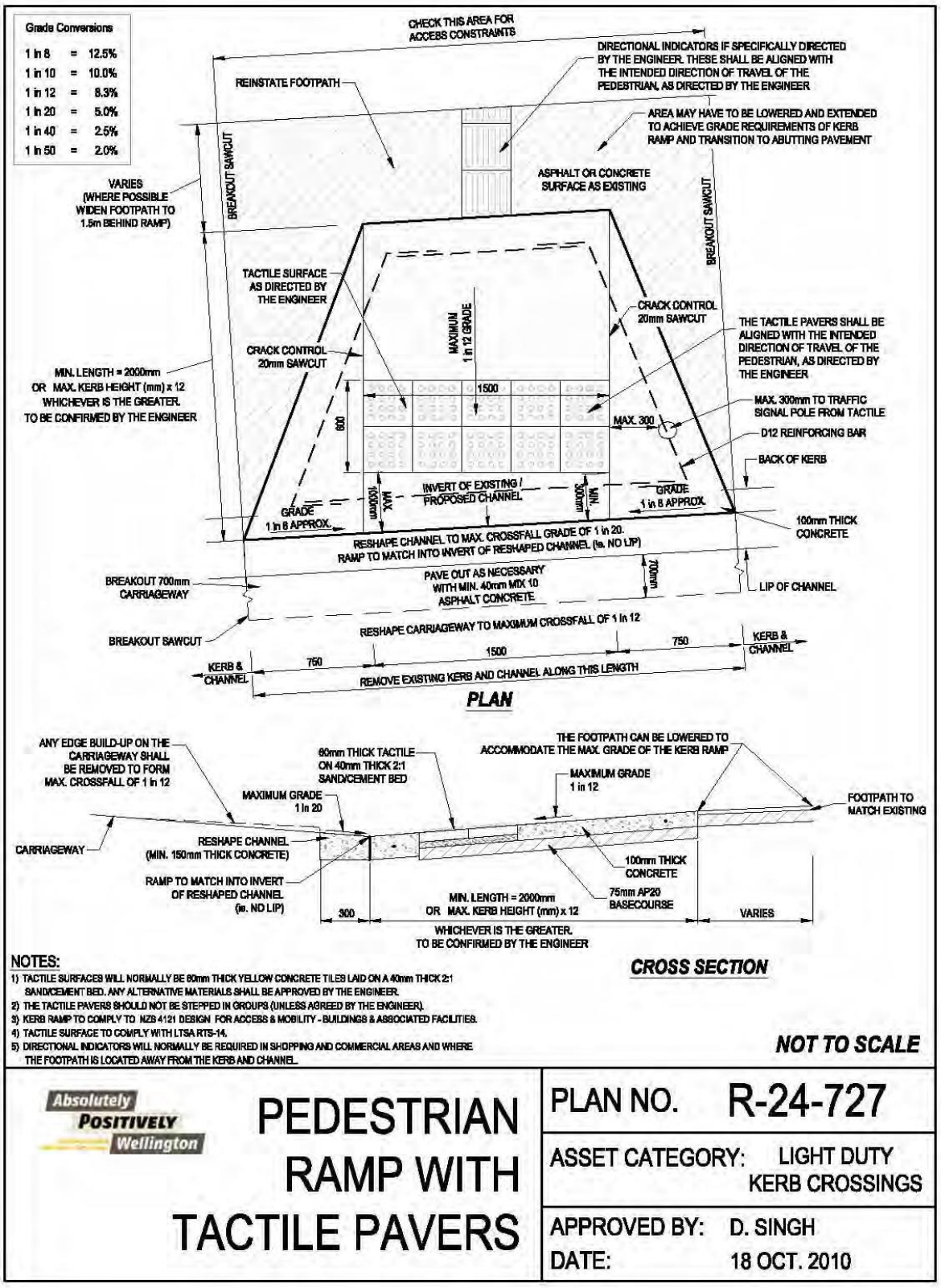
ASSET CATEGORY: KERB CROSSINGS

APPROVED BY: D. SINGH

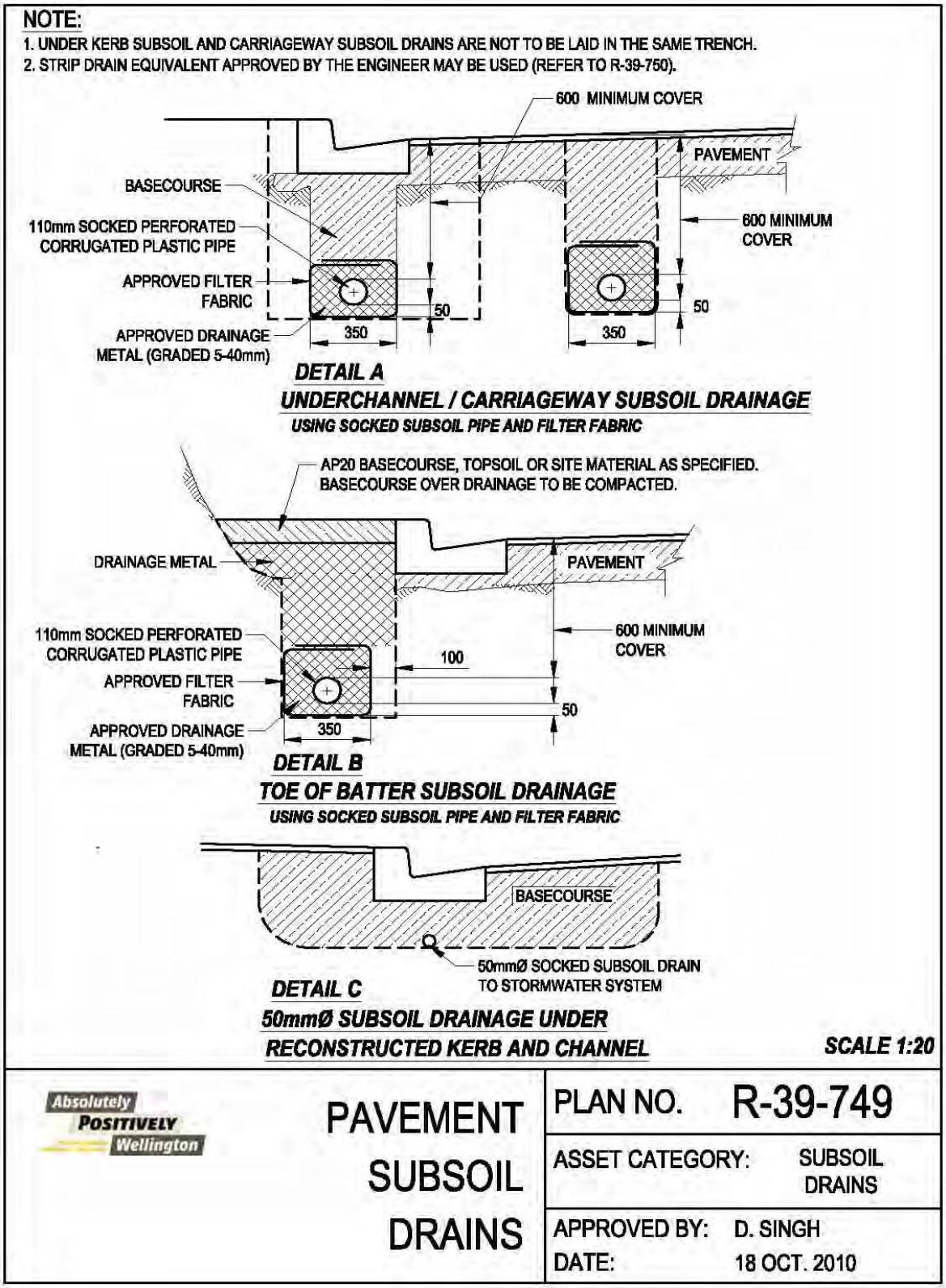
DATE: 18 OCT. 2010

SPECIAL APPROVAL REQUIRED TO INSTALL THIS TYPE OF CROSSING

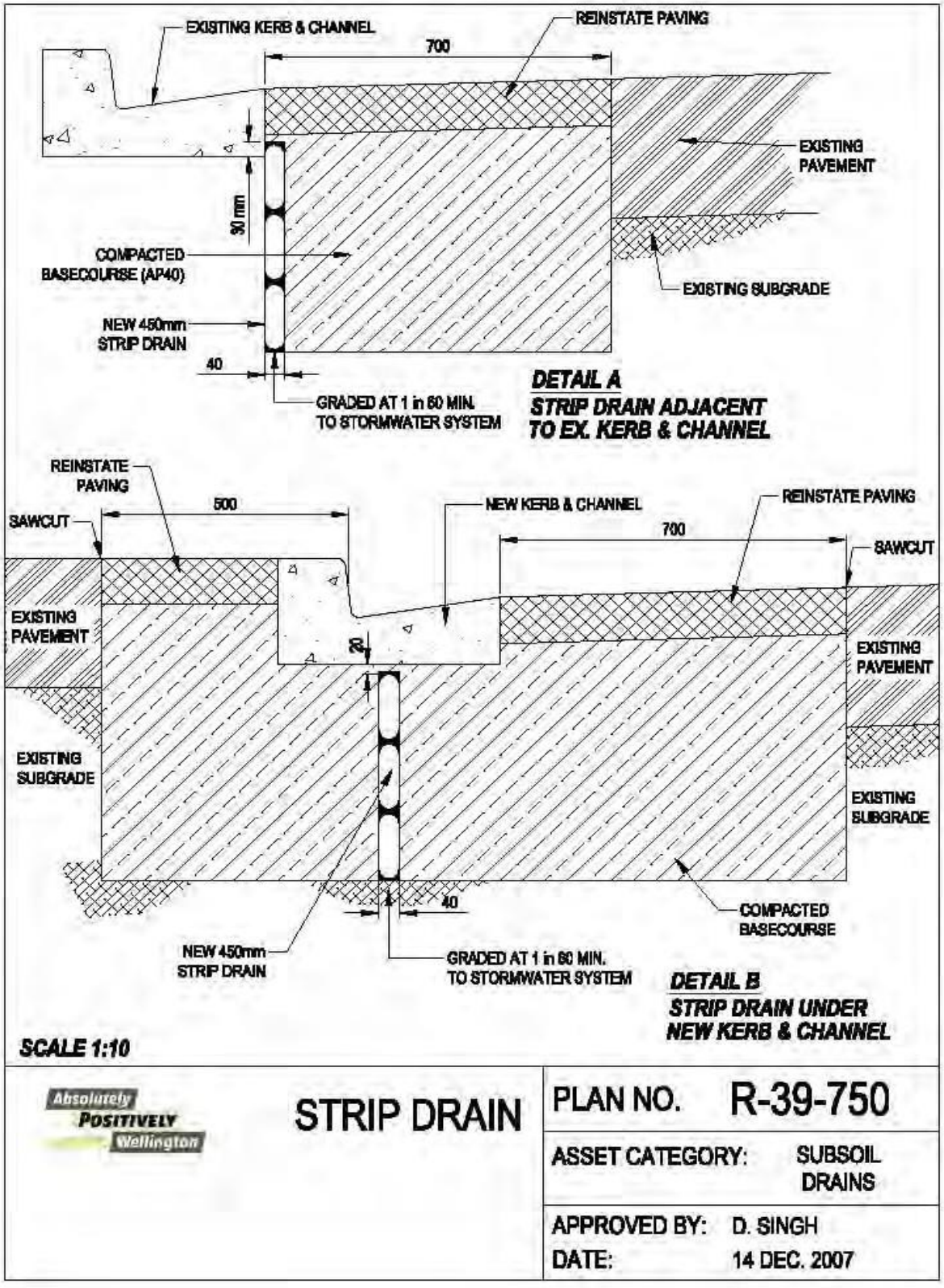
Drwg R –24-727 Pedestrian Ramp with Tactile Pavers



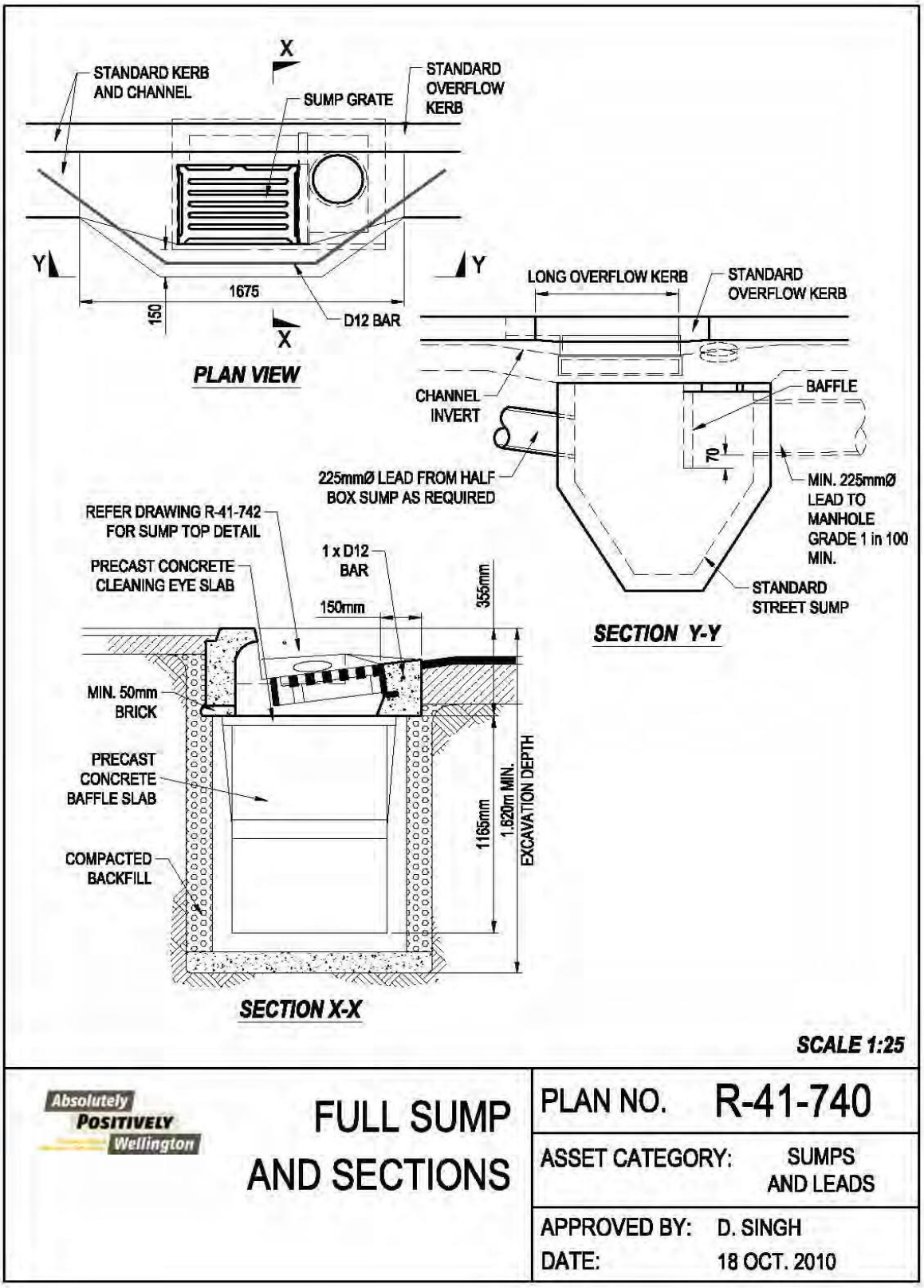
Drwg R –39-749 Pavement Subsoil Drains



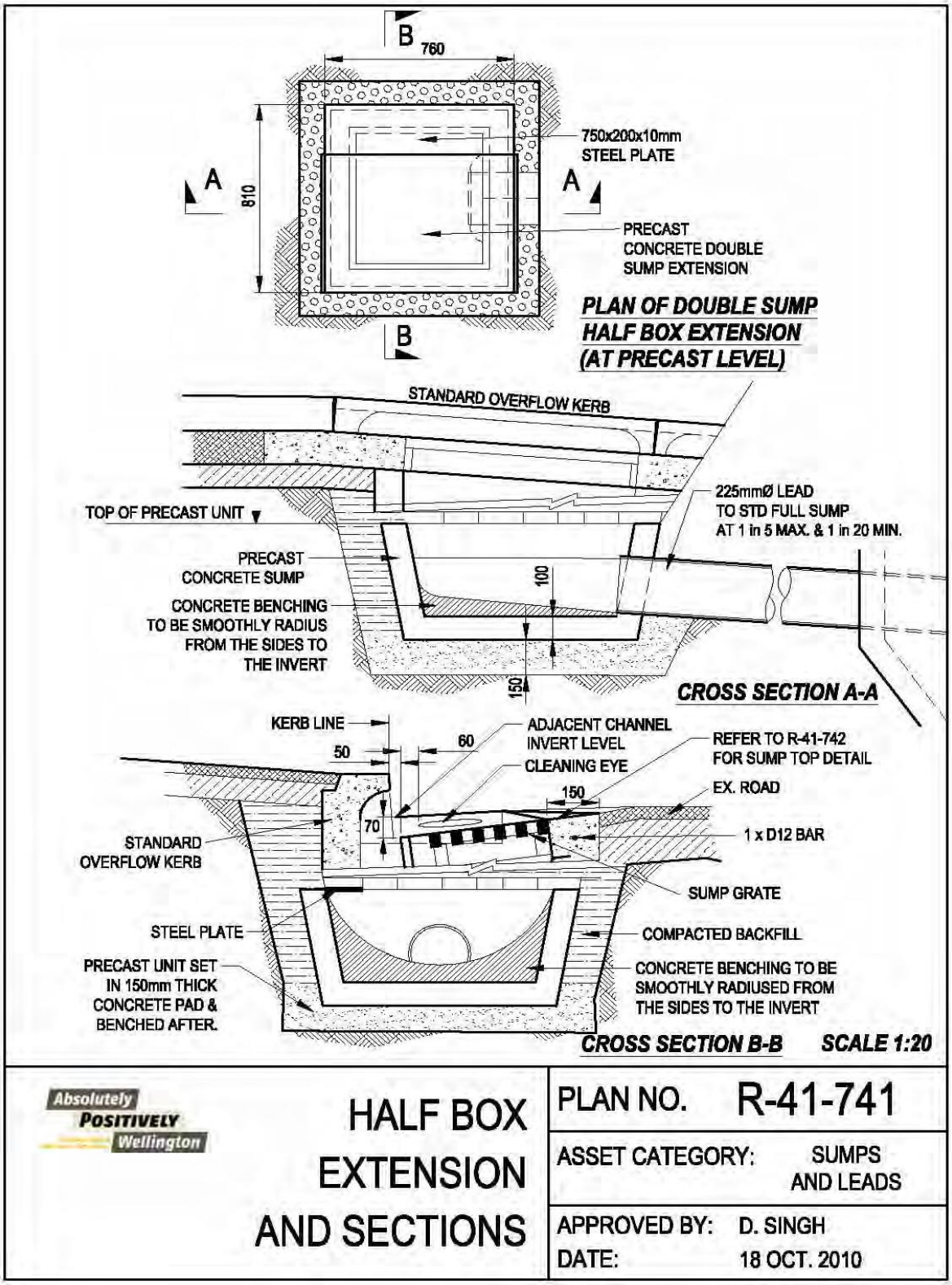
Drwg R –39-750 Strip Drains



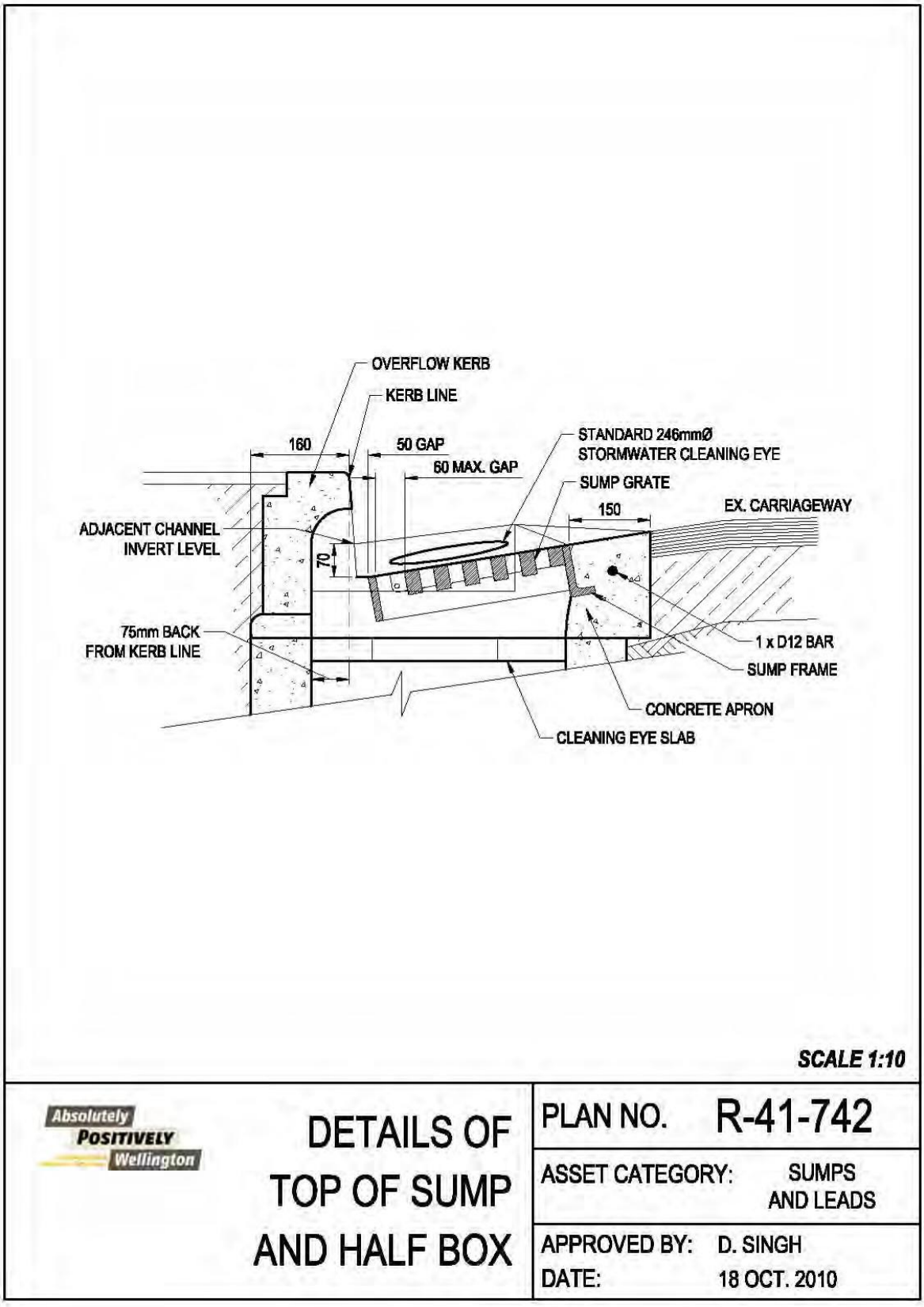
Drwg R –41-740 Full Sump and Sections



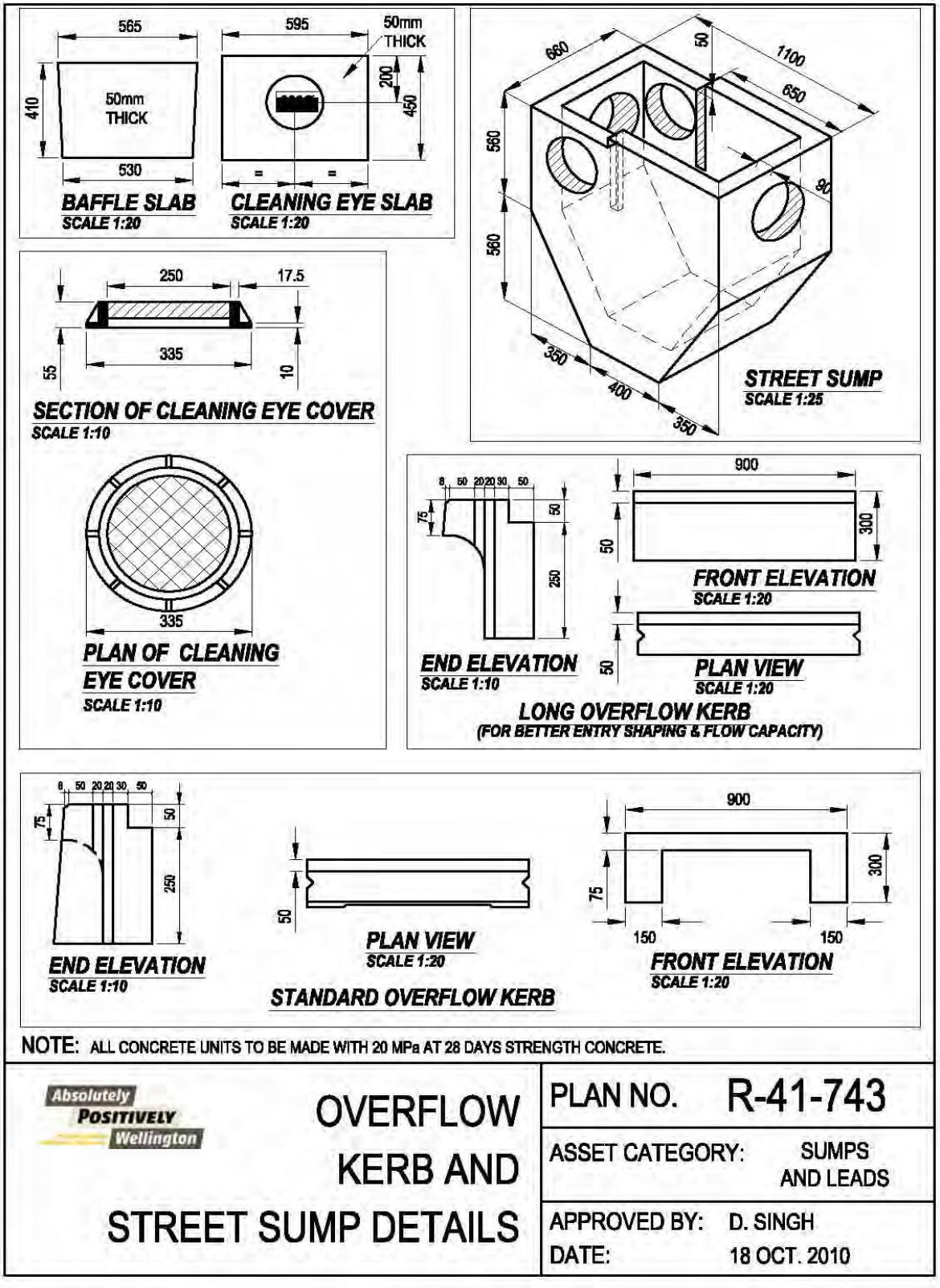
Drwg R –41-741 Half Box Extension and Sections



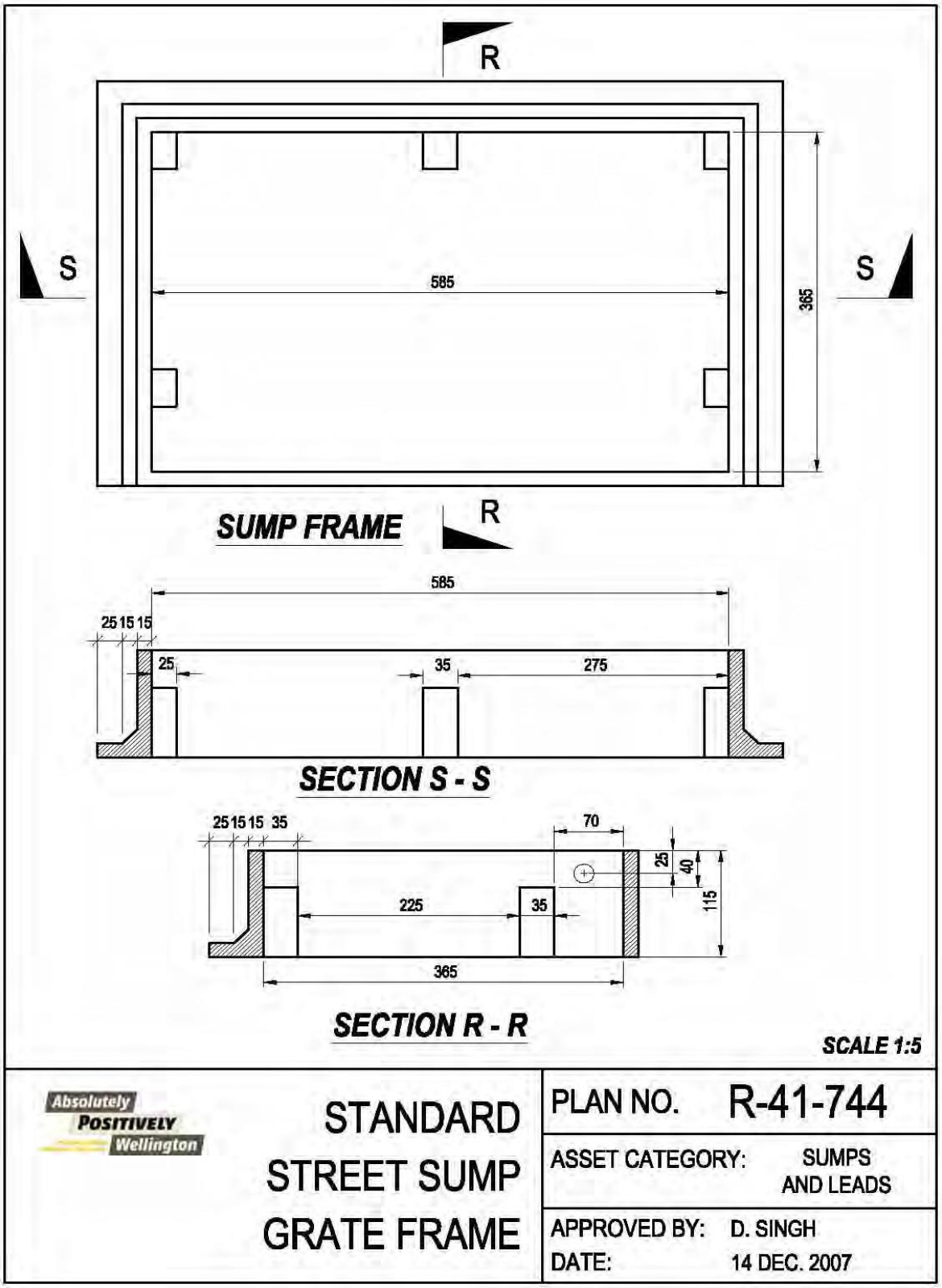
Drwg R –41-742 Details of Top of Sump and Half Box



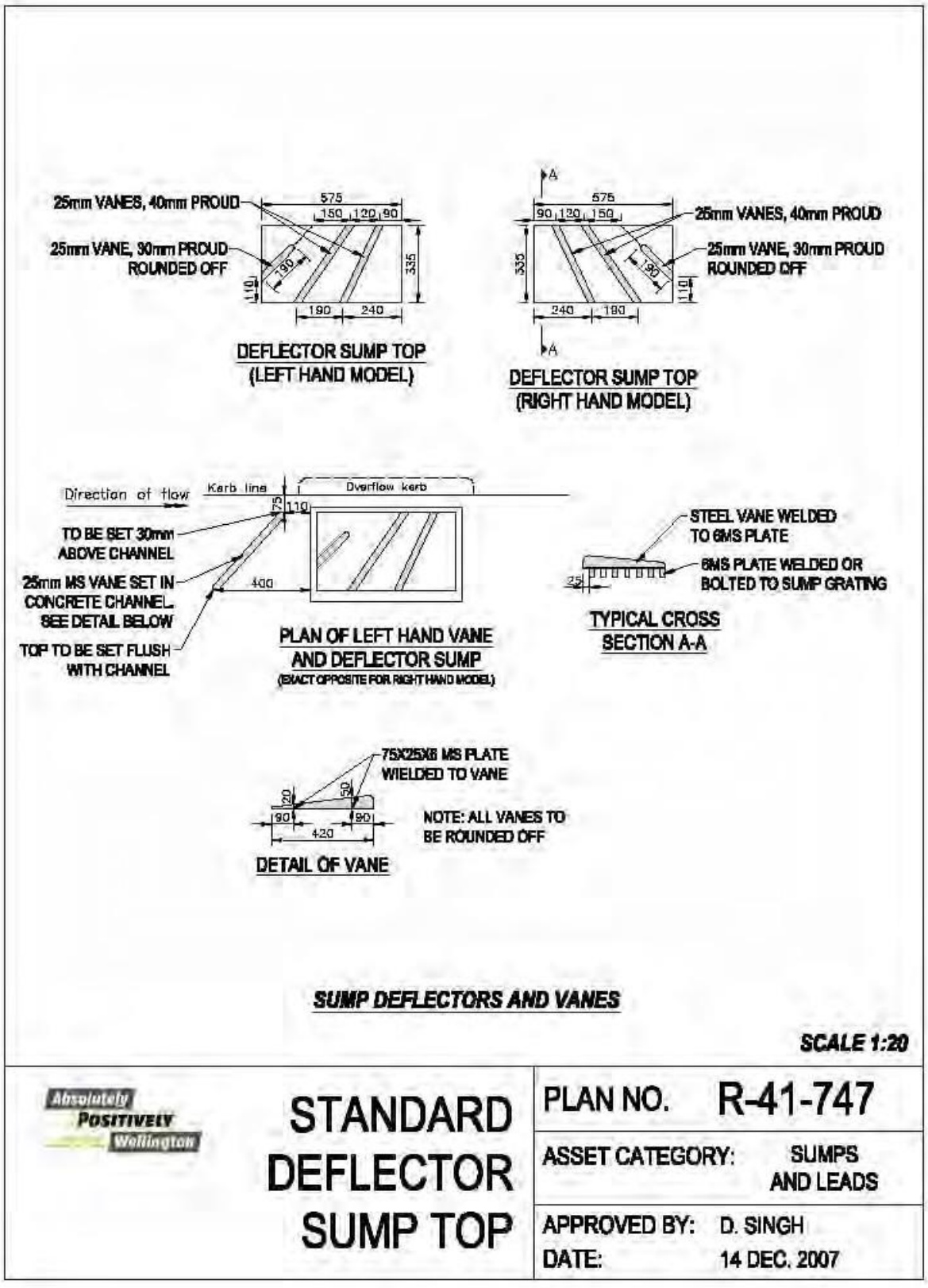
Drwg R –41-743 Overflow Kerb and Street Sump Details



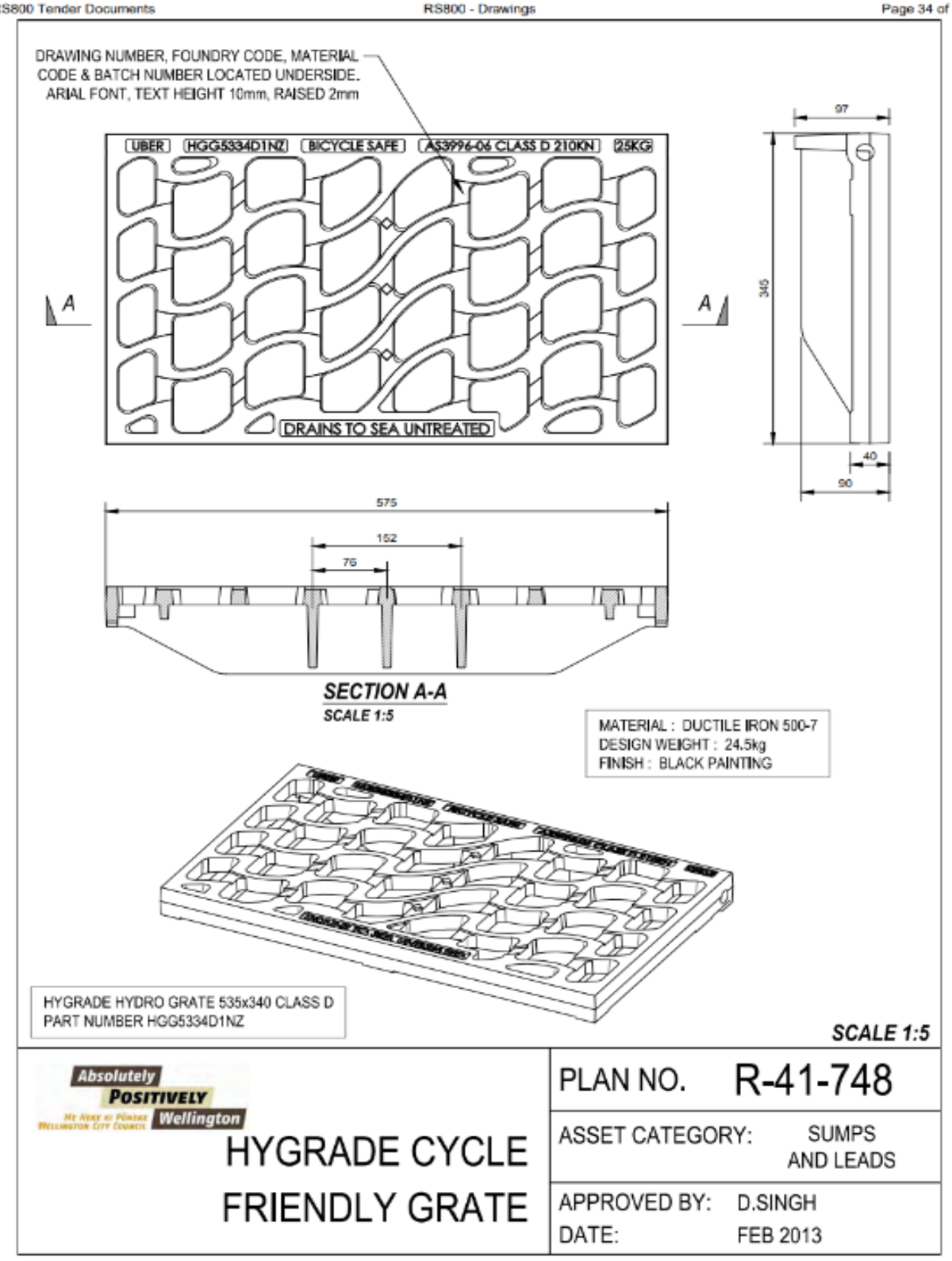
Drwg R –41-744 Standard Street Sump Grate Frame



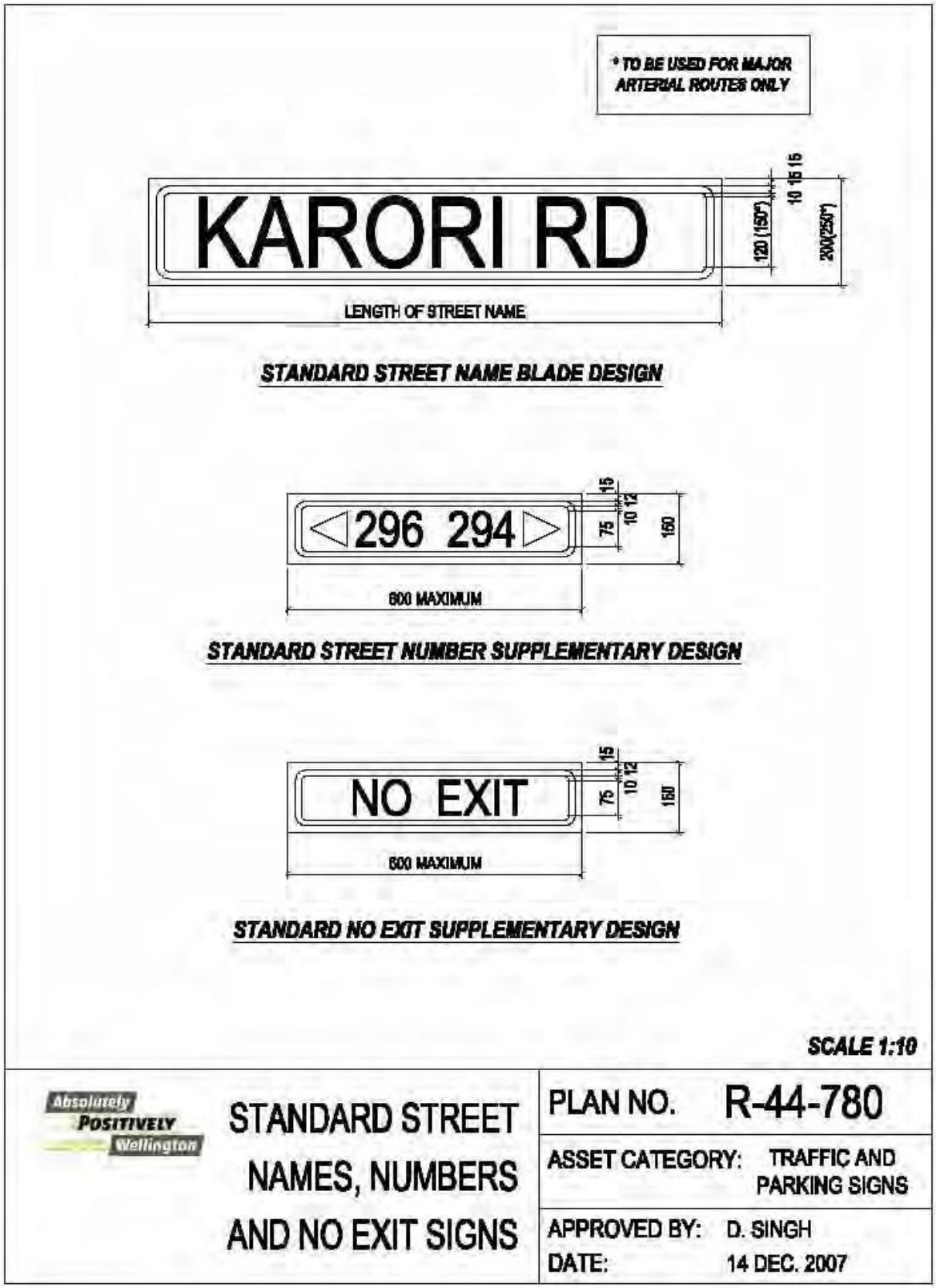
Drwg R –41-747 Standard Deflector Sump Top



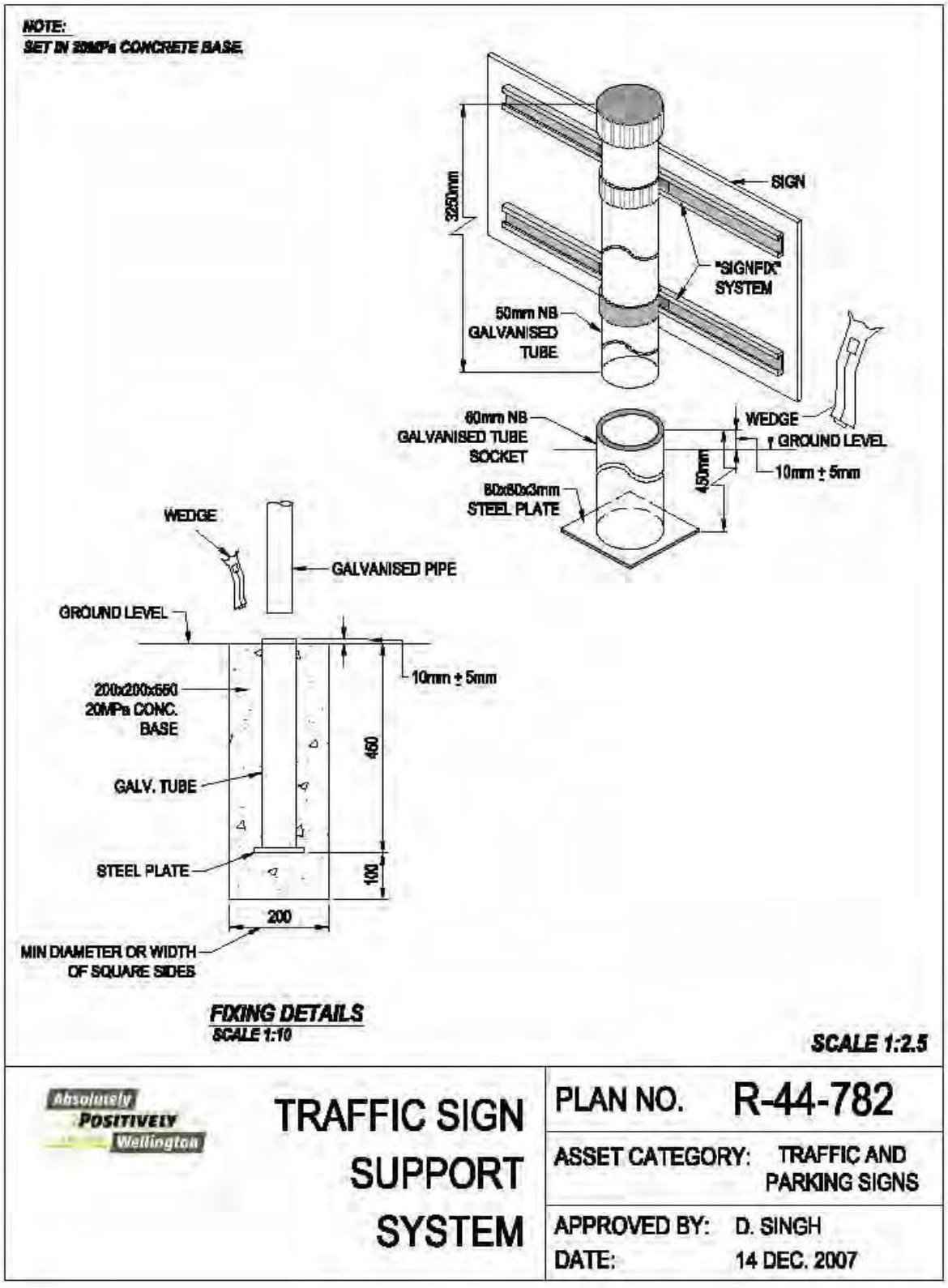
Drwg R –41-748 Hygrade Cycle Friendly Grate



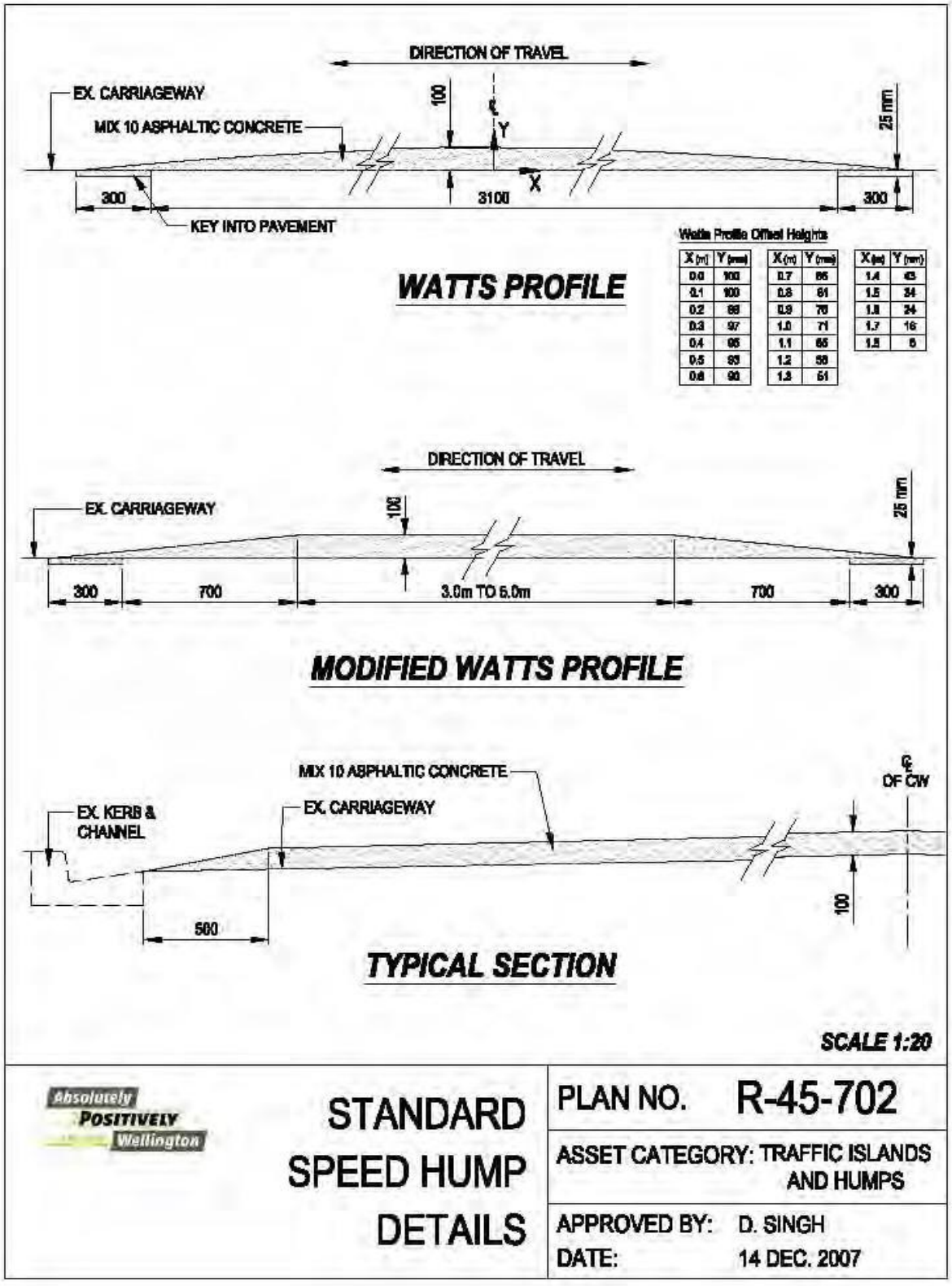
Drwg R –44-780 Standard Street Names, Numbers, and No Exit Signs



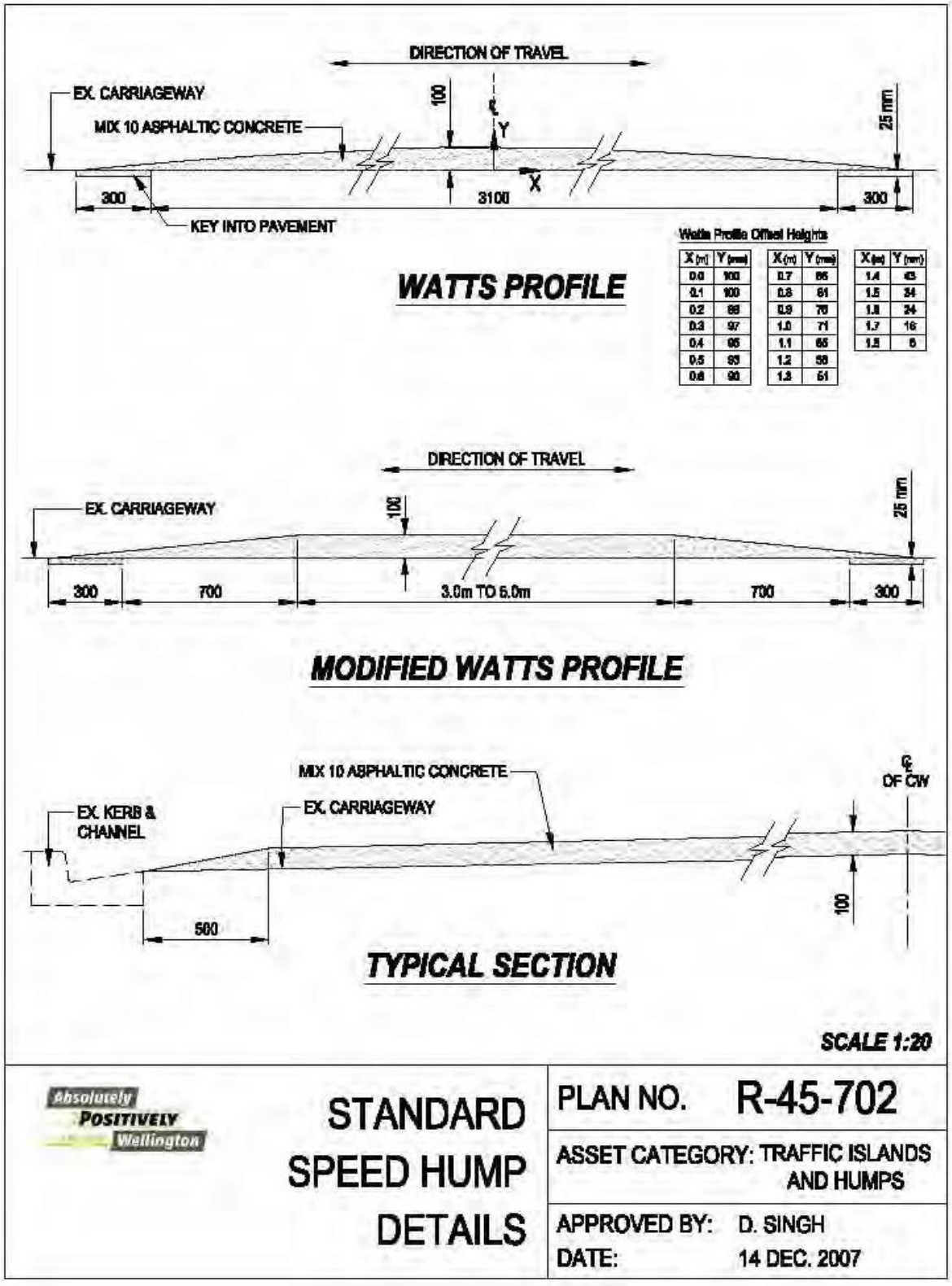
Drwg R –44-782 Traffic Sign Support System



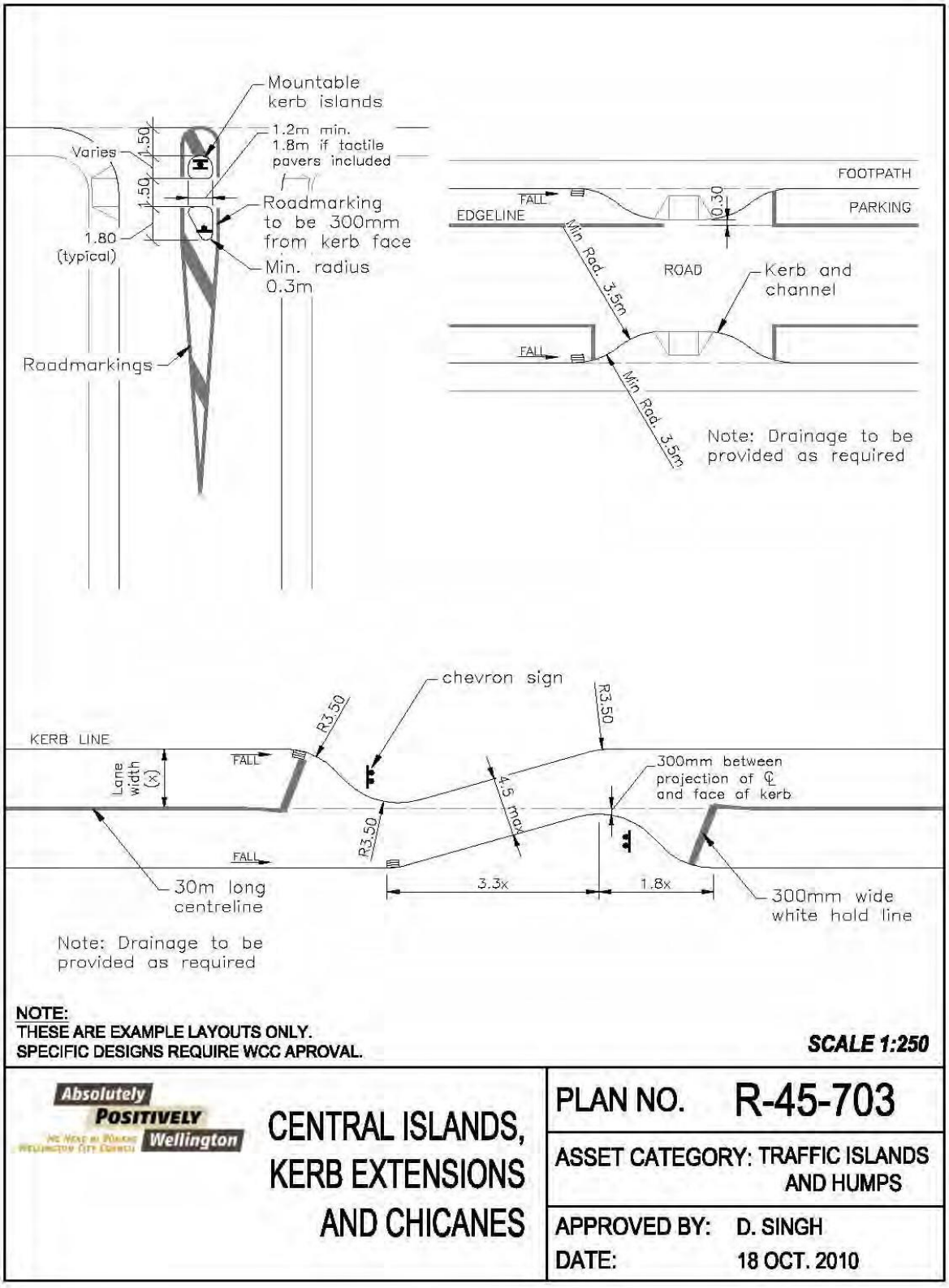
Drwg R –45-702 Standard Speed Hump Details



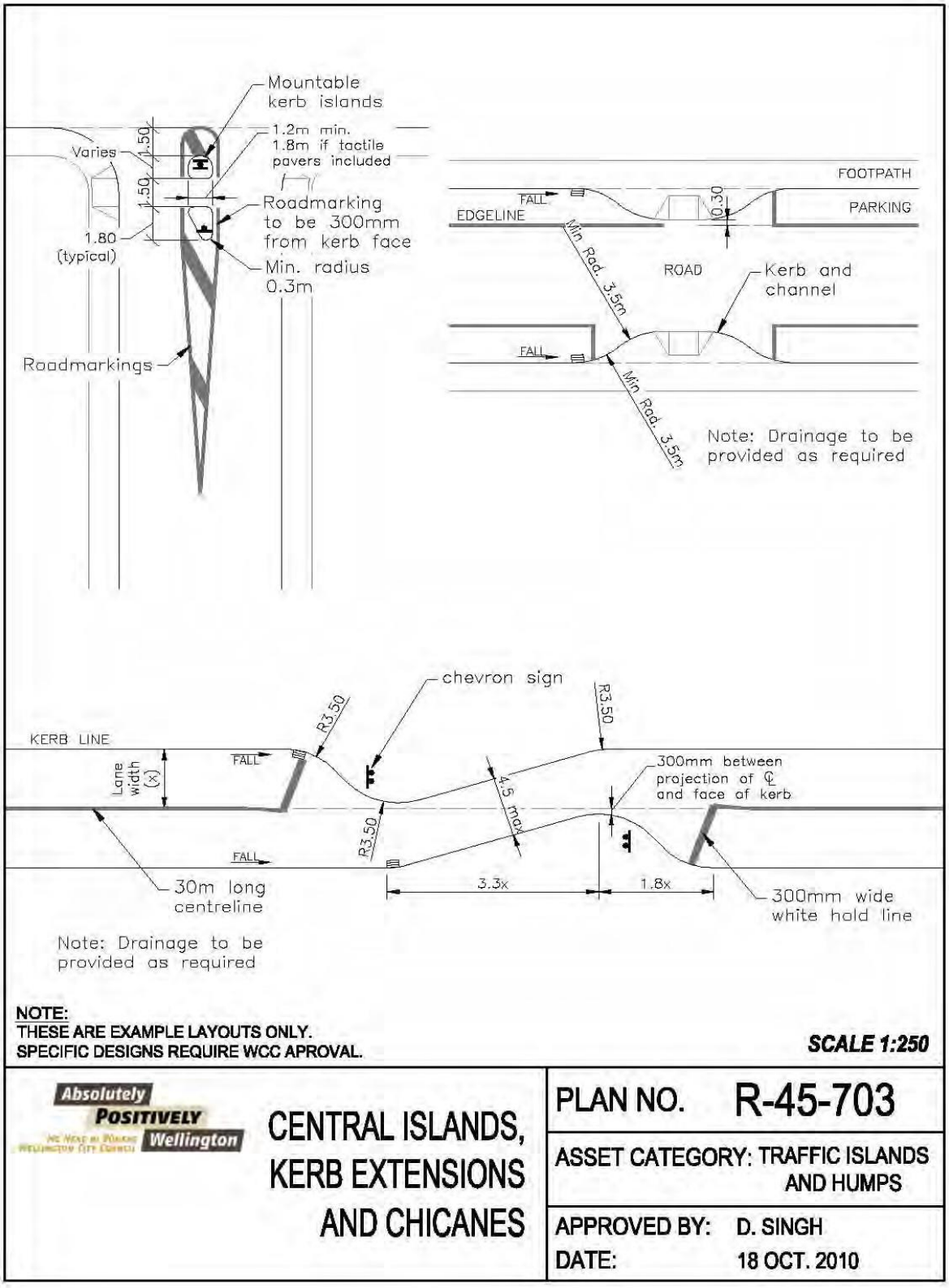
Drwg R –45-702 Standard Speed Hump Details



Drwg R-45-703 Central Islands, Kerb Extensions and Chicanes



Drwg R-45-703 Central Islands, Kerb Extensions and Chicanes



Sealing Report

Road and Location_____ Date_____
Air Temperature Start_____ Finish_____ Surface Condition_____
Starting Time_____ Finishing Time_____
Weather_____
Binder Type_ AGO(%)_ KERO(%)_ Precoating: Yes/No
Additives_ Chip Size_ Source_
Rolling Equipment_____
Details of Samples_____

Tank No	Distance			Width	Area	Tank Dip			Spray Rate		Spray Temp	Binder at 15°C
	From	*To*	*Metres*			*Start*	*Finish*	*Total*	*Actual*	*Target*		

Total Chips Used:_ Comments

Benkelman Beam Test Record

Street and Location:_____

Date:_____Test Load:_____Tested By: _____

Pavement Temperature/Tyre Pressure:_____

(Details of location of test points and general information about the street are to be noted on the basis of this form).

Test Point	Lane	Distance from Kerb	Deflection Readings			Description of Test Point
			Intermediate	*Final*	*Difference*	