

6. ROAD CONSTRUCTION

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6. ROAD CONSTRUCTION

6.A MINIMUM REQUIREMENTS

- 6.A.1** The road hierarchical system shall provide a clear physical distinction between each type of road based on function, convenience, traffic volume, vehicle speed, public safety and amenity. The design period for roads shall not be less than 25 years, for which projected traffic flows will be made available on request.
- 6.A.2** In circumstances where road design is required for over dimensioned loads refer to the Road Design Specifications for Overdimension Loads.
- 6.A.3** The person undertaking the subdivision development shall have designed a roading network that provides vehicle access to each building site, links to the existing roading network and is able to accommodate the predicted volume and the type of vehicle movements associated with the subdivision.
- 6.A.4** Where the upgrading of an existing, or construction of a proposed arterial road is required as a result of the intended subdivision, the maximum contribution, payable by the Developer, shall be as in the District Plan.
- 6.A.5** Where improvements to the existing roading network are required as a result of the intended subdivision, contributions shall be made in terms of the resource consent.
- 6.A.6** The Developer undertaking the subdivision shall ensure the following:
- Traffic Management is carried out as per Transit New Zealand's Code of Practice for Temporary Traffic Management (COPTTM).
 - A Road Opening Notice (RON) is obtained from the Manukau City Council Network Manager for work on existing road zone.

- Upon construction completion, independent safety audits are conducted by the Manukau City Council Network Manager for arterial roads in accordance with Land Transport New Zealand (LTNZ) TFM9 – Road Safety Audit Procedures for Projects. The safety audits are conducted to ensure the road zone is safe prior to public use of the Council asset.

6.B MEANS OF COMPLIANCE

6.B.1 Design Standards

- 6.B.1.1** Unless otherwise demonstrated and approved under resource consent, the legal road width, carriageway width and grades shall be in accordance with the District Plan.

6.B.2 Geometrical Design

- 6.B.2.1** Gradients of all roads shall comply with those shown in the District Plan. In particular cases, steeper gradients may be permitted over short lengths, but Council reserves the right to impose special conditions of construction.

Grades shall be as long as possible with vertical curves provided to comply with Transit New Zealand Standards.

- 6.B.2.2** Normal crossfall shall be 3% for urban roads, and 4% for rural roads in both directions from the crown. However, when widening an existing carriageway or in steep terrain crossfalls may vary from 2% to 4% in urban roads, and 5% in rural roads from the crown, coupled with a lateral shift in crown position of up to one quarter of the effective road width. Single crossfall carriageways shall be permitted on service roads.

- 6.B.2.3** Superelevation shall be applied to curves on all roads as shown on Table A and shall be calculated from Transit New Zealand Standards.

- 6.B.2.4** The minimum longitudinal grade of kerb and channel shall be 1 in 200 and be parallel on

Table A

Zoning	Road Type	Max. Super
Urban	7.8m width & above	3%
Rural	all roads exceeding 400m length	8%

both sides of the road other than on transitions into superelevation.

- 6.B.2.5** Minimum curve radius shall be designed to reflect the intended road use and anticipated traffic speed. Where radii are to be restricted these should be addressed with the lodgement of the resource consent.

At intersections the kerblines shall be as on Drawing R8 and cul-de-sac turning circles as on Drawing R3. Specific design will be required at major intersections and roundabouts to meet the B-train tracking curve requirements.

- 6.B.2.6** The standard formation, crossfall and position of services shall be as detailed on Drawing R5. Variations from standard crossfall may be permitted in steep terrain or widening of existing carriageways in accordance with Table B. Berm crossfalls in excess of 8% will be considered on a specific design basis with site access subject to individual design.

Table B

Asset Description	Possible Max Range of Crossfall
Berm	2% to 8%
Footpath	2%

- 6.B.2.7** Cut and fill batters to roads shall generally be a maximum slope of 1:5 commencing 600mm beyond the road boundary as shown on Drawing R5. Where circumstances dictate that a steeper grade is necessary, a geotechnical assessment of the slope shall be provided together with specific access design. Any retaining wall and footing shall also be clear of the road boundary. Batter drains shall be installed within private property on all cut batters steeper than 1:10. Installation shall be subject to field inspection and confirmation.

- 6.B.2.8** Where road marking and signs are required as an integral part of the roading function, it is the Developer's responsibility to install signs and road markings and to provide satisfactory design drawings of signs and road markings in accordance with the following documents, or as directed by Manukau City Council:

- Manual of Traffic Signs and Markings (MOTSAM) (TNZ/LTSA) Part I: Traffic Signs: 1998; Part II: Markings: 2004; and subsequent amendments.

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MOTSAM – Road Marking drawings which are to include “No Stopping At All Times” (NSAAT) Zones are to be submitted with Resource Consent Applications.

NSAAT Zones are to be marked along the edge of the seal on one side of all roads with a width of less than 7.8m. For cul-de-sacs shown on Drawing R3, NSAAT Zones are to be marked along the edge of the seal on one side of the approach and along the edge of the seal of the turning head.

- Manukau City Council Road and Traffic Information Signs Policy and Guidelines: October 2003.
- Transit NZ - P/12, Specification for Pavement Markings: April 1994.
- Land Transport Rule: Traffic Control Devices 2004.
- Manukau City Council Operative District Plan - Parking bays as per Chapter 8 & 9
- Austroads - Part 5, Intersections at Grade

The Developer is to submit as-built plans in accordance with the Manukau City Council Quality Assurance Manual (QAM) requirements.

All road marking contractors must comply with Transit New Zealand Total Quality Standards 1 (TNZ TQS 1).

- 6.B.2.9** Guardrails shall be constructed in accordance with Drawing R25. In circumstances where driven piles are not feasible (i.e. due to services) steel posts shall be installed in accordance with Drawing R26.

6.B.3 Structural Design of Pavement

- 6.B.3.1** Principal and arterial roads shall be designed in accordance with the Austroads and TNZ New Zealand Supplement. All other pavements shall be designed in accordance with the following:

The California Bearing Ratio (CBR) design curves in Drawing R6. The minimum metal depth over a natural subgrade shall be no less than that obtained using Drawing R6 for the design subgrade strength and road type.

The maximum deflection criterion is given on Drawing R6. It is recommended that at each phase of construction (i.e. subgrade, sub-base, and basecourse) beam readings be taken; using the Benkelman Beam Method (TNZ T/1).

- 6.B.3.2** Where the insitu subgrade strength is less than a CBR of 3, the subgrade shall be strengthened using stabilization or undercutting.

Where the designer wishes to use stabilisation as a method to improve the subgrade strength, the subgrade or sub base may be stabilised with cement, lime, KOBM, calcium or bitumen or a combination of these. The minimum depth to be stabilized shall be not less than a compacted depth of 200mm.

Alternatively, the designer may wish to improve the subgrade by undercutting and replacing the subgrade with a higher quality selected material.

Where a sand layer is used to improve the subgrade strength the minimum compacted layer thickness shall be 300mm and the sand material shall comply with MANARC Standards.

Where a subgrade improvement layer is utilised (either granular or stabilised subgrade improvement) then Drawing R7 can be utilised to determine the appropriate improved subgrade CBR for use in Drawing R6. The minimum metal depth for improved subgrades for type A roads shall be 250mm (150 subbase and 100 basecourse) and for type B, C and D roads shall be 300mm (150 subbase and 150 basecourse).

- 6.B.3.3** The following information shall be submitted in conjunction with the Engineering design drawings for approval:

- All soil test information obtained is to provide a basis for pavement design, with a reference to origin of design method. Where substantial cuts and/or fills are anticipated, the range of insitu and soaked CBR's are to be aligned with the Geotechnical Investigation Report,
- Copy of design calculations used to determine pavement thickness,

- If a stabilising agent is to be used, the designer shall submit a range of relevant test results and calculations, including the percentage used of the stabilising agent and an indication of the likely insitu and soaked CBR value to be achieved by the stabilisation.

6.B.3.4 Manukau Approved Requirements (MANARC) approved AP40 basecourse shall be used on roads with carriageway widths of up to and including 7.8m and to the minimum depths shown on Drawing R6.

TNZ M/4 basecourse shall be used on roads with carriageway widths of greater than 7.8m to the minimum depths shown on Drawing R6.

MANARC approved AP65 sub-base shall be used for the balance of the pavement design depth.

Notwithstanding the above, any non-complying or non-approved material must be submitted to Manukau City Council for MANARC approval prior to its intended use.

6.B.3.5 All subsoil drains shall be 110mm in diameter, made of slotted PVC or Polyethylene with a filter sock and shall have a graded filter around the pipe. The pipe shall be connected to catchpits 100mm above the outlet pipe. They shall be installed along all kerb lines, including medians, roundabouts and where applicable traffic control islands, as shown on Drawing R11, R18 and in accordance with TNZ F/2, F/5 and F/6 Specifications. Additional subsoil drainage may be required as identified in the Geotechnical Investigation Report.

6.B.3.6 Where wet/soft areas are encountered during road construction at or below subgrade level, suitable drainage shall be provided connecting to the under channel system. Extensive areas requiring drainage shall be subject to special design with appropriate input from the Developer's Geotechnical Engineer. In such areas, consideration should be given to the use of a suitable geotextile cloth in accordance with TNZ F/7 Specifications.

6.B.4 Kerbing, Catchpits and Traffic Islands

6.B.4.1 Kerb and channel as shown on Drawing R11 shall be provided on both sides of the carriageway in all urban subdivisions. In roads with a single crossfall, kerb and channel on one side and a concrete edging strip on the other will be permitted.

Mountable kerbing as detailed in Drawing R11 or another optional profile may be used on cul-de-sacs with carriageway widths of 5.4m or less.

6.B.4.2 Catchpits shall be constructed as on Drawing D4, recessed in the berm, except for the following:

- Where recessed catchpits are not feasible, catchpits shall be constructed as on Drawing D3.
- Cycle safe catchpit grates shall be required by Council in specific areas where catchpits are in the direct path of cyclists.
- Where a standard catchpit, as shown on Drawing D3 and D4 does not meet intake capacity requirements, other approved catchpits may be considered on a specific design basis with the Council Representative's approval. e.g. MANARC approved catchpit as on Drawing MD-21.

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Use of other catchpits shall consider downstream effects of the discharge, installation and renewal cost, and maintenance.

Catchpits shall be located as follows:

- On roads having a carriageway up to and including 10.8m, generally they shall have a maximum channel run of 90m. On all roads with carriageways greater than 10.8m, they shall have a maximum channel run of 60m.
- On the high side of intersections, located at the kerblines tangent point.
- At changes of gradients or direction in the channel (e.g. at an intersection

where both channels fall towards the intersection and where super-elevation is required).

- The recessed catchpits shall be located in the berm clear of footpaths, cycleways, vehicle crossings and a minimum of 1m clear upstream of pram crossings.
- Where practicable, new catchpits shall be located in the middle third of the property (except where an overland flow path exists) given consideration to possible future vehicle crossings. New vehicle crossing locations shall be repositioned away from existing catchpits or the existing catchpit shall be relocated and rebuilt by the developer at their own expense.
- A double catchpit or other approved catchpit to minimise the risk of ponding shall be provided at cul-de-sac ends where there is a low point and at the lowest point in sag vertical curves for all roads.

Catchpits shall be connected to the primary stormwater system by a 225mm diameter connection to an adjacent manhole. If the adjacent stormwater system is larger than 600mm in diameter and the manhole is not conveniently located, the catchpit lead may be saddled directly to the pipe.

Secondary overland flow paths shall be provided from all low points along the road.

Prior to final acceptance, the effectiveness of the channels and catchpits may be tested by flooding the channel. Any ponding of water in the channel shall render the work unacceptable.

- 6.B.4.3** Precast traffic islands are to be used where the size of the traffic islands is less than 4m² and there are no pram crossings required. Precast traffic islands shall be fixed to the pavement with cement mortar. The cement mortar shall have an approved adhesive additive and be

applied with a minimum thickness of 25mm. Precast traffic islands shall comply with the requirements shown on Drawing MR-18 of MANARC.

All traffic islands greater than 4m² shall have kerb configurations as shown on Drawing R18.

All traffic islands shall have red oxide coloured concrete infill unless directed otherwise by the Council Representative. The concrete infill must be made by mixing 8kg of red oxide with the specified concrete.

6.B.5 Footpaths, Cycleways, Special Vehicle Lanes, Crossings and Berms

6.B.5.1 Footpaths shall be provided on both sides of the street with the exception of a short cul-de-sac servicing up to 15 units, for which one footpath is acceptable. Footpaths should not abut the kerb on roads for safety reasons unless approved by the Engineer.

Footpaths shall be constructed of concrete, with minimum 28 day strength of 20 MPa and with a minimum thickness of 100mm on 25mm of compacted AP20 or equivalent. Footpath width shall be 1.4m minimum and is to be 2m wide in high usage areas. Non-residential/business footpaths shall be constructed with a minimum thickness of 150mm.

Where approved by the Engineer, in special circumstances when the proposed footpath is to be located adjacent to the kerb it shall be increased in width to 1.6m minimum, including the kerb width and in thickness to 110mm.

Off-road cycleways and shared cycle/pedestrian paths shall be constructed of concrete, with minimum 28 day strength of 20 MPa and with a minimum thickness of 100mm on 25mm of compacted AP20 or equivalent.

Preferably, on-road cycleways shall be constructed of asphaltic concrete, but fine grade chipseal (either grade 5 or grade 4/6 two coat) is also acceptable. They shall be a green coloured surface as detailed in the Manukau

C3

Arrangements should be made early for the installation of services with the relevant network utility operators to avoid damage to footpaths, berm grassing and the like caused by late installation.

Table C*

Footpath/Cycleway Type	Width (min)
Pedestrian Footpath (low usage)	1.4m
Pedestrian Footpath Adjacent to Kerb (low usage)	1.6m
Pedestrian Footpath (high usage)	2.0m
On Road Cycle Lane (arterial roads)	1.5m
Off Road Cycle Lane	1.5m
Shared Cycle/Pedestrian Paths	3.0m

**Table C provides minimum requirements only. For specific footpath and cycleway requirements refer to Manukau City Council Cycling and Walking Strategy, Manukau City Council Standard for Cycleway Construction Maintenance, Barrier Free Manukau and the District Plan.*

City Council Cycling and Walking Strategy, Manukau City Council Standard for Cycleway Construction Maintenance, Barrier Free Manukau and the District Plan where coloured surfaces are required.

Footpaths and cycleways shall be provided within the transport network in accordance with Table C, the Manukau City Council Cycling and Walking Strategy, Manukau City Council Standard for Cycleway Construction Maintenance, Barrier Free Manukau and the District Plan.

6.B.5.2 Where special vehicle lanes are required, they shall be provided within the transport network in accordance with the Standards for Special Vehicle Lane Signage, Road Marking & Road Surface Colouring of Priority Lanes - Drawings. They shall have appropriate signage, pavement markings and coloured surfacing. Special Vehicle Lanes include the following:

- Bus lanes;
- Bus only lanes - urban and motorway off and on ramps;
- Transit lanes - urban;
- High Occupancy Vehicle (HOV) Lanes.

6.B.5.3 Pram crossings shall comply with the requirements of Drawing R8. They shall be located at all intersections to facilitate pedestrian movement as required. They shall be placed so that users have an unobstructed view of the traffic approaching from any direction and shall have a maximum grade of 1:8. The edge of the crossing is to be finished flush with the existing channel (no lip, maintain common surface).

All new or upgraded pram crossings require tactile ground surface indicators (tactile indicators). They should comply with the following construction requirements:

Warning indicators should be installed across

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Guidelines for installing pedestrian facilities for people with visual impairment are contained in RTS 14 LTNZ.

the path of travel and at right angles to the hazard or ramp.

- The crossing point shall be orientated such that the leading edge of the crossing is perpendicular to direction of travel.
- The edge of the indicators should be set back 300mm from the crossing line or kerb face.
- Warning indicators should extend the full width of the ramp and be a minimum of 600mm deep.
- The tile colour should be 70% high contrast to the surrounding surface. It is recommended that the colour should be a standard safety yellow unless otherwise specified.
- Warning indicators must also be included at median refuge islands and at grade for public vehicle entrances. Consideration should be given to including tactile directional indicators (Type C) in complex areas to indicate direction of travel.

They are to be designed in accordance with Drawing R8, RTS 14 LTNZ, NZS4121: 2001 Design for Access and Mobility – Buildings and Associated Facilities and are to comply with the requirements of the Disabled Persons Act, Building Act, Council's Disability Policy and Action Plan and the Barrier-Free Manukau document.

6.B.5.4 Vehicle crossings shall be provided as detailed on Drawings R9 and R10 if intended locations are known at the time of subdivision. Vehicle crossings shall be installed clear of catchpits, street trees, traffic signals, streetlights, bus shelters, pram crossings, traffic signs, or street furniture unless a consent from Council has first been obtained.

Vehicle crossings shall intersect with the carriageway at an angle between 45° and 90°

C5

Drawing R10A shall be used as the design template to ensure the 90 percentile car can travel across a vehicle crossing without grounding.

and shall comply with the minimum and maximum widths as shown in Table D. This rule also applies to vehicle crossings shared by more than one property.

Mountable kerbs shall be cut out prior to placement of concrete for all vehicle crossings.

Residential and non-residential/business crossings shall be as detailed on Drawings R9 and R10. The maximum gradient of the vehicle accessway within the private property boundary adjoining the vehicle crossing shall not exceed 1:5 for residential and 1:8 for non-residential/business. For curved ramps and driveways, the gradient is measured along the inside radius. Where the vehicle crossing exits onto to a primary road and is used by heavy vehicles, the first 15m of the crossing shall be approximately at the same level as the primary road.

For rural vehicles crossings, where the road has no kerb and channel, the vehicle crossing shall be constructed in accordance with Drawing R23 and Table D.

For large non-residential or business complexes vehicle crossings may take the form of a standard carriageway. This is generally termed an “at grade” crossing and each will be subject to special design and approval.

The following minimum separation distances shall apply to vehicle crossings serving non-residential/business activities:

- 3 metres between vehicle crossings as measured at the kerb.
- 1.5 metres between the vehicle crossing and the applicant’s side of property boundary as measured at the kerb and perpendicular to the kerb. This provision shall not apply in respect of vehicle crossings shared by adjoining properties.

Ensure the location of a vehicle crossing will not have an adverse effect on the approaches or

Table D

Vehicle Crossing Design	Minimum Width of Crossing ^A	Maximum Width of Crossing ^B	Total Width of Crossing at Kerb
Residential Vehicle Crossing 1 Unit	2.5m	4.5m	Width at boundary plus 3m
Residential Vehicle Crossing 2-4 Units	2.7m	4.5m	Width at boundary plus 3m
Residential Vehicle Crossing 5 - 15 Units	4.5m	6.0m	Width at boundary plus 3m
Non-Residential Activities: One way Two way	3.0m 6.0m	6.0m ^C 9.0m	Width at boundary plus 4.6m
Crossing Serving rear lots Business 5 and 6 zone	6.0m	9.0m	Width at boundary plus 4.6m
Rural Vehicle Crossing Design	3.0m		

^A As measured at the boundary or back of the footpath. Minimum widths may be increased as a condition of resource consent.

^B The maximum width measured at the boundary or back of the footpath.

^C The maximum width may be increased to 9m where the crossing is required to accommodate the tracking path of large heavy vehicles and to ensure compliance.

departures from an intersection with a regional arterial or national route as measured from the projected road boundary.

A vehicle crossing permit is required for all new vehicle crossings. Redundant vehicle crossings shall be removed at Council's discretion.

- 6.B.5.5** Berms shall be spread with 100mm compacted depth of topsoil. The topsoil shall be graded from kerb top to footpath edge so as not to hold water on the surface of the path. The berms shall be sown with a perennial Rye/Clover mixture grass seed. The mixture shall be sown at a rate of 1kg per 30m².

For street landscaping guidelines refer to section 8 of the EQS and the Manukau City Council Tree Policy.

6.B.6 Carriageway Acceptance

- 6.B.6.1** Immediately prior to surfacing the pavement, Benkelman Beam tests shall be carried out by the Developer at no cost to Manukau City Council.

A section of road shall be accepted as complying with the deflection requirements based on the following:

- Not more than 5% of the tests shall exceed the maximum as set out in Drawing R6,
- No single result shall exceed the maximum allowable by more than 50%,
- An area of excessive deflection shall not exceed 5m².

- 6.B.6.2** If the section of road fails to achieve the above required standard of deflection, the Developer shall carry out additional tests on the sub-base and basecourse to confirm that:

- The actual thickness of pavement agrees with the design thickness as determined by the CBR tests.

- The grading and quality parameters of metal conform to MANARC requirements.
- The pavement is of suitable density.

Any subsequent beam or laboratory tests shall be arranged and paid for by the Developer.

6.B.6.3 If beam readings are within 25% of design criteria and all requirements of 6.B.6.2 have been met, Council may permit the Developer to surface the road, provided that agreement has first been reached on a suitable bond.

6.B.7 Carriageway Surfacing

6.B.7.1 Urban roads with a carriageway width of 7.8m or less must be surfaced with a membrane seal and 30mm of Mix 10 asphaltic concrete. Carriageways greater than 7.8m in width shall be surfaced with a membrane seal and 35mm of Mix 14 asphaltic concrete. For rural roads (i.e. roads that do not require kerb and channel as part of the carriageway) with carriageways less than or equal to 7.8m, a sealed width of two coat chipseal may be used.

All signalized intersections shall have a structural AC pavement that extends 10m beyond the limit lines of the intersection as shown in Figure 7.1. The structural AC pavement shall have a minimum thickness of 125mm, including a surfacing layer of 35mm of Mix 14 asphaltic concrete or 35mm of SMA 10. The pavement shall have a design life of 25 years.

6.B.7.2 The following standard shall be adhered to when surfacing roads:

For Asphalt Roads:

- **Asphaltic Concrete** - Mix 14 and Mix 10 as per section 6.B.7.1 and TNZ M/10 and P/9 (and notes). For arterial roads an AC 14 designed in accordance with the Austroads Pavement Reference

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The Developer is responsible to upgrade the entire signalized intersection to EQS standards even if they are only adding one new leg to the intersection.

However, Council may consider taking a financial contribution in lieu of upgrading the intersection.

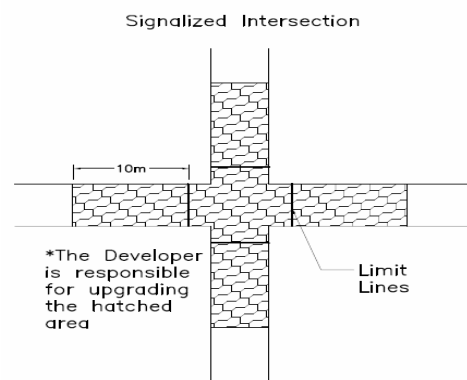


Figure 7.1

Group (APRG) Report No. 18.

A membrane seal using asphaltic binder or emulsion and grade 4 chip, with the requirement that the seal coat comprises a minimum of 1.0 L/m² of residual penetration grade bitumen, shall be laid prior to surfacing with asphaltic concrete of 50mm or lesser thickness.

For Chip Seal Roads:

- **First Coat** - 80/100 bitumen as per TNZ M/1 and P/3 and grade 3 chips as per TNZ M/6.
- **Second Coat** - 80/100 or 180/200 for rural roads, penetration bitumen as per TNZ M/1 and P/4. Chips sized to have Average Least Dimension (ALD) between 30% and 50% of first chip coat.

Where asphaltic concrete is to be used on a road, the final surface shall be 10mm ±5mm proud of the lip of the channel. The basecourse level shall be flush with the channel for a chipseal surface.

On cycle routes, road surfacing shall be finished flush with stormwater grates, service access covers and concrete drainage channel.

6.B.7.3 Local roads 7.8m wide or less may be constructed with interlocking paving blocks in accordance with Drawing R13. Interlocking paving blocks, including entry threshold treatments, are not to be used on roads greater than 7.8m wide.

6.B.8 Service Lanes

6.B.8.1 Where required and dimensioned by the resource consent, the Developer shall provide and form a service lane to facilitate delivery of supplies. The service lane shall have a commercial vehicle crossing at the entrance, adequate stormwater disposal and have pavement designed to a Class D standard as on Drawing R6. The service lane may have a

single crossfall.

6.B.9 Parking Bays/Pedestrian Accessways

6.B.9.1 Parking bays shall be constructed to the same standard as the adjacent road pavement. It is recommended that the surface of the parking bay be treated differently from that of the street to differentiate its use. A dish channel constructed to Drawing D10 shall only be used for recessed parking bays.

6.B.9.2 Pedestrian accessways shall be as short as possible, with a clear line of sight through their length, and be generally constructed in accordance with Drawing R14. Provision shall be made for disposal of stormwater flowing down the length of the accessway and across the road footpath.

6.B.9.3 The accessway detail on Drawing R14 represents a minimum standard. Alternative specific designs for both the path and fencing are encouraged to enhance the subdivision.

6.B.9.4 All accessways shall contain access barriers as shown in Drawing R22.

6.B.10 Private Ways

6.B.10.1 Private ways shall generally be formed as on Drawing R12 and 12A or R17. Alternative pavement construction will be permitted provided the minimum structural criteria for a Type A Road on Drawing R6 are met. The full length of private way shall have an all weather surface. If the CBR of the subgrade is less than 7 then specific design of the private way is required.

All concrete is to be 20 MPa and constructed in accordance with NZS 3109 with a broom finish.

Residential private way construction shall comply with the following:

- For private ways serving only 2 residential units, construct carriageway only (common services are excluded)

for the row).

- Surface material shall be concrete over the width of the private way. Asphaltic pavement, permeable pavers or cobblestone alternative may be used in place of concrete, with specific design and approval.

6.B.10.2 Where necessary, stormwater drainage shall be provided so that the maximum “run of water” does not exceed 90m. Catchpits shall be constructed with a minimum dimension of 450cm x 450cm. The spacing of catchpits or other stormwater runoff collection facilities on steep driveways shall be specifically designed to ensure that water is collected efficiently. There shall be a minimum of 1 catchpit per private way.

A catchpit is to be provided at the low point if the private way slopes away from the carriageway or at the reserves boundary if the private way slopes to road reserve.

Secondary overland flow paths shall be provided from all low points along the road.

6.B.10.3 A standard vehicle crossing shall be provided for each residential private way in accordance with the plan dimensions of Drawing R9 and the same structural standard as Drawing R12. Non-residential/business crossings shall be constructed as shown on Drawing R10.

6.B.10.4 Rural private ways shall be constructed in accordance with Drawing R17.

6.B.10.5 Non-residential/business private ways shall generally be formed as on Drawing R20. Alternative pavement construction will be permitted provided the private ways meet the structural criteria for the appropriate road on Drawing R6.

6.B.10.6 For private ways that are greater than 70 metres long, passing bays shall be provided every 50m and are to be 15m long. Typically the carriageway width should increase to 5.5m over a 5m long taper at both ends with a 5m long

bay to stop between tapers.

6.B.10.7 The crossfall shall not be greater than 5% as per Drawing R12. The maximum crossfall for manoeuvring the vehicle (i.e. at right angles to the direction of movement) is 8%. This relates to access points off private ways, garage entrances or any point where a vehicle turns off the private way. This may result in flatter sections of a steep driveway at these locations.

6.B.10.8 The longitudinal gradient shall not be greater than 1:5 without resource consent. However a gradient of 1:4.5 may be allowed for short lengths (less than 10m) at Manukau City Council's discretion provided good transitional geometry for manoeuvring vehicles can be obtained. The surface must have an exposed aggregate concrete finish.

6.B.11 Street Lighting and Traffic Signals

6.B.11.1 Street lighting shall be installed in accordance with Manukau City Council Public Lighting Design Standard.

As part of the Engineering plan approval, satisfactory design drawings for public lighting are to be prepared in accordance with the current Manukau City Council Public Lighting Design Standard.

Where as a requirement of the resource consent, street lighting is to be provided in the private way, it shall comply with the current Manukau City Council Public Lighting Design Standard and shall have a separate metered supply.

6.B.11.2 Traffic signal cabinets shall be recessed on the property boundary. Only TSC4 compliant controllers shall be used. Traffic signal equipment and equipment installation are to meet the requirements of the National Specification for the Installation and Modification of Traffic Signals.

6.B.12 Working in the Road

6.B.12.1 Any person wanting to install services in any

road reserve must comply with the Code of Practice for Working in the Road. This document has been produced by the Road Controlling Authorities in the Auckland Region in conjunction with utility operators working as the Auckland Utility Operators Group (AUOG).

Module 1 of the Code of Practice for Working in the Road is in three parts covering:

- Site Construction,
- Technical Drawing for Trench Reinstatement,
- Material Specifications.

The Code of Practice is available from the Manukau City Council Customer Service Centre, Ground Floor, Kotuku House, Manukau City Centre.

6.B.12.2 A Road Opening Notice (RON) is required for working on utilities in the road.

All utility service covers and manhole covers shall be designed to support vehicular traffic loading and shall be installed flush with the finished footpath and carriageway surface.

The utility owner/operator is responsible for the ongoing maintenance, replacement, protection and relocation of the utility services within the road.

6.B.13 **Definitions**

As Built Plan - a plan that depicts the final installed configuration.

Bus Lane - a lane reserved by a marking or sign installed at the start of the lane and at each point at which the lane resumes after an intersection, for the use of:

- (a) buses; and
- (b) cycles and motorcycles, unless either or both are specifically excluded by the signs.

Carriageway - area of road reserve provided for the movement of vehicles or parking of vehicles.

Council - the Manukau City Council, or any committee, sub-committee, or person to whom the Council's powers, duties and discretions under the District Plan have lawfully been delegated.

Developer - an individual or organization having the financial responsibility for the development project and includes the owner.

Council Representative - the Council Representative, officer or other person appointed by the Council to approve the Engineering work of the District.

Footpath - so much of any road, pedestrian accessway or public reserve as is laid out or constructed by authority of the Council primarily for pedestrians; and may include the edging, kerbing and channelling thereof.

Geotechnical Engineer - means a Chartered Professional Engineer (CPEng) or an Engineering Geologist with recognized qualifications and experience in geotechnical Engineering, and experience related to the development.

Parking Bays (within roads or proposed roads) - means parking spaces and associated

manoeuvring areas formed completely or partially outside of the standard carriageway of a road or proposed road (as defined by the kerb) which are accessed directly from the road.

Pedestrian Accessways - paths between two roads. They do not include paths on reserves.

Private Way - has the meaning ascribed to it by Section 315 of the Local Government Act 1974 and means anyway or passage whatsoever over private land within the City, the right to use which is confined or intended to be confined to certain persons or classes of persons, and which is not thrown open or intended to be open to the use of the public generally. It may comprise separately owned entrance strips subject to rights of way or a separate lot which is jointly owned and used by adjacent lots or an area reserved for common access in a cross lease, company lease or unit title subdivision.

RAMM – a computer-based maintenance system including an inventory, which helps to manage the maintenance and rehabilitation of pavements and related features. RAMM stands for Road Assessment and Maintenance Management.

Road - the whole of any land within the City and which immediately before the commencement of Part XXI of the Local Government Act 1974 was a road or street or public highway, or is laid out by the Council as a road or street after the commencement of this Act, or is vested in the Council for the purpose of a road as shown on a deposited survey plan, or is vested in the Council as a road or street pursuant to any other enactment. It excludes service lanes.

Road Opening Notice - The notice to undertake works in the road or service lane.

Service Lane - any lane laid out or constructed and vested as a service lane either by the authority of the Council or the Minister of Lands for the purpose of providing the public with a side or rear access for vehicular traffic to

any land.

Special Vehicle Lane - a lane defined by signs or markings and restricted to a specified class or classes of vehicle; and includes a bus lane, a transit lane, a cycle lane, and a light-rail vehicle lane.

Subdivision - has the meaning ascribed to it in Section 218 of the Resource Management Act 1991 and means:

(a) The division of an allotment –

(i) By an application to a District Land Registrar for the issue of a separate certificate of title for any part of the allotment; or

(ii) By the disposition by way of sale or offer for sale of the fee simple to part of the allotment; or

(iii) By a lease of part of the allotment which, including renewals, is or could be for 20 years or longer; unless that part of the allotment is in the coastal marine area, and that lease is allowed for a term of 20 years or longer by a coastal permit or by a rule in a regional coastal plan; or

(iv) By the grant of a company lease or cross-lease in respect of any part of the allotment; or

(v) By (the deposit of a unit plan, or) an application to a District Land Registrar for the issue of a separate certificate of title for any part of a unit on a unit plan; or

(b) An application to a District Land Registrar for the issue of a separate certificate of title in circumstances where the issue of that certificate of title is prohibited by section 226, and the term “subdivision” has a corresponding meaning.

Transit Lane - a lane reserved for the use of the following (unless specifically excluded by a sign installed at the start of the lane):

(a) passenger service vehicles;

(b) motor vehicles carrying not less than the number of persons (including the driver) specified on the sign;

(c) cycles;

(d) motorcycles.

6.B.14 Legislation, Regulations, Standards and Guidelines

The following documents, amongst others will be used, as far as conditions permit, to arrive at a comprehensive, safe and practical management and design of the Manukau City Council road network:

Legislation, Regulations, Standards and Guidelines

1.0	New Zealand Government	(NZG)
2.0	Manukau City Council	(MCC)
3.0	Auckland Regional Council	(ARC)
4.0	Auckland Regional Transport Authority	(ARTA)
5.0	Land Transport New Zealand	(LTNZ)
6.0	Transit New Zealand	(TNZ)
7.0	Standards New Zealand	(NZS)
8.0	Standards Australia	(AS)
9.0	Austrroads	
10.0	ARRB Group	
11.0	Bus Priority Initiatives Steering Group	
12.0	Association of Local Government Engineering New Zealand Incorporated - Ingenium	
13.0	The New Zealand Local Authority Traffic Institute	(TRAFINZ)
14.0	The Institute of Professional Engineers of New Zealand	(IPENZ)
15.0	Institute of Civil Engineers	(ICE)
16.0	Project Management Institute	(PMI)
17.0	American Association of State Highway and Transportation Officials	(AASHTO)

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
1.0	New Zealand Government				www.govt.nz
	Biosecurity Act 1993	ST		1993	E
	Building Act 2004	ST		2004	E
	Building Regulations 2004	ST		2004	E
	Civil Defence and Emergency Management Act 2002	ST		2002	E
	Construction Contracts Act 2002	ST		2002	E
	Construction Contracts Regulations 2003	ST		2003	E
	Crown Entities Act 2004	ST		2004	E
	Electricity Act 1992	ST		1992	E
	Energy Efficiency (Energy Using Products) Regulations 2002	ST		2002	E
	Fencing Act 1978	ST		1978	E
	Gas Act 1992	ST		1992	E
	Getting there - on foot, by cycle: A strategy to advance walking and cycling in New Zealand transport 2005	G		2005	http://www.transport.govt.nz/business/land/getting-there/index.php
	Health and Safety In Employment Amendment Act 2002	ST		2002	E
	Health and Safety Regulations 1995	ST		1995	E
	Heavy Motor Vehicle Amendment Regulations (No 2) 2004	ST		2004	E
	Heavy Motor Vehicle Regulations 1974	ST		1974	E
	Historic Places Act 1993	ST		1993	E
	Land Drainage Act 1908	ST		1908	E
	Land Transport Act 1998	ST		1998	E
	Land Transport Management Amendment Act 2004	ST		2004	E
	Litter Act 1979	ST		1979	E
	Local Government (Auckland) Amendment Act Commencement Order 2004	ST		2004	E
	Local Government Act 2002	ST		2002	E
	National Energy Efficiency and Conservation Strategy 2001			2001	www.eeca.govt.nz

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
	New Zealand Transport Strategy		NZTS		www.beehive.govt.nz/nzts
	New Zealand Urban Design Protocol				
	Privacy Act 1993	ST		1993	E
	Public Works Act 1981	ST		1981	E
	Railways Act 2005	ST		2005	E
	Resource Management Act 1991	ST		1991	E
	Road Safety to 2010	G		Oct 2003	E
	Summary Offences Act 1981	ST		1981	E
	Telecommunications Act 2001	ST		2001	E
	Traffic Amendment Regulations (No 2) 2004	ST		2004	E
	Traffic Regulations 1976	ST		1976	E
	Transit New Zealand Act 1989	ST		1989	E
	Transport Act 1962	ST		1962	E
	Transport Regulations (vehicular traffic road closure) 1965	ST		1965	E
2.0	Manukau City Council				
2.1	MCC Documents available electronically: www.manukau.govt.nz/councilpubs.htm				
	A Manukau Economic Development Strategy	ST		1997	H/E
	Annual Plan 2005 – 2008	ST			E
	Bus Stop, Bus Shelter Policy and Guidelines	ST			E
	Cycling and Walking Strategy 2005 - 2015	G		2005	E
	Doing it Right - A Property Owners Guide to Building and Developing in Manukau	G		2005	H/E
	Engineering Quality Standards	ST	Various	Various	E
	Heavy Haulage Routes	G			H
	Long Term Council Community Plan 2003 - 2013	ST			E
	Manukau Approved Requirements (MANARC)	ST			E
	Manukau City Consolidated Bylaws	ST			E

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
	Manukau Operative District Plan	ST		2002	E
	MCC Disability Policy and Action Plan	G			E
	Proposed MCC Speed Limits Bylaw in the Consolidated Bylaw	ST		2004	E
	Taking People Places - Passenger Transport Strategic Plan	ST			E
	Te Tiriti O Waitangi Charter	ST			E
	Tomorrow's Manukau	ST			E
	Treaty of Waitangi Toolbox	ST			E
	Tree Policy 2005	ST		2005	H/E
2.2	Other MCC Documents available in hard copy:				
	As Built Specifications for Roading Assets	ST			H
	Asset Development Contribution Policy	G			H/E
	Barrier Free Manukau - Principles, Issues and Solutions	G			H
	Black Spots	G			H
	Clevedon Roads Strategy Study	G			H
	Community Safety and Crime Prevention Plan	G			H
	Flat Bush Town Centre	G			H
	Guidelines on Microcellular Sites	G			H
	Local Area Traffic Management Policy and Guidelines 2003	G		2003	H
	Manukau City Council Public Lighting Design Standard	ST			H
	Manukau City Council Road and Traffic Signs Policy 2003	P		2003	H
	Manukau Town Centres Strategy	G			H
	MCC Road Safety Management System	ST			H
	MCC Road Safety Plan 2004 - 2007	ST			H
	MCC Traffic Signal Specifications	G			H
	Pedestrian Facility Policy 2002	P		2002	H
	Road Maintenance Contract Specifications	ST			H
	Road Safety Audit - Policies, Principles and Process	G			H

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
	Special Events Guidelines for Road Usage	G			H
	Standard Specification for Professional Services	ST			H
	Streetlight Maintenance Contract Specifications	ST			H
	Southern Sector Strategy Study	G			H
	Transport Asset Management Plan	ST			H
	Whitford Roads Strategy Study	G			H
3.0	Auckland Regional Council (ARC)				
3.1	ARC Policy Documents (Standards)				www.arc.govt.nz
	Auckland Bus Priority Initiatives to 2003				
	Auckland Regional Cycling Strategy	G	2002		H/E
	Auckland Regional Ferry Strategy – Final Draft	G			H/E
	Auckland Regional Freight Strategy - Draft	G	2005		E
	Auckland Regional Walking Strategy	G	2002		
	Auckland Regional Growth Strategy 1999	G			H/E
	Auckland Regional Holdings				
	Auckland Regional Land Transport Strategy 2003	G			H/E
	Auckland Regional Passenger Transport Plan Part 1	G			H/E
	Auckland Regional Passenger Transport Plan Part 2	G			H/E
	Auckland Regional Plan: Air, Land and Water	ST			H/E
	Auckland Regional Plan: Coastal	ST			H/E
	Auckland Regional Plan: Sediment Control	ST			H/E
	Auckland Regional Policy Statement	ST			H/E
	Auckland Regional Safety Plan	G			H/E
	Auckland Regional Travel Management Strategy	G			H/E
	Passenger Transport Action Plan	G			H/E
	Riparian Management Zones: A Strategy for the Auckland Region	G			H/E
	Travel Demand Management Strategy	G			H/E

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
3.2	Technical Publications (Guidelines Refer ARC Website for further information)				
	4 - Selection of stormwater treatment volumes for Auckland 1992	G	TP-4	1992	H
	10 - Design guideline manual : stormwater treatment devices 2003	G	TP-10	2003	H
	90 - Erosion and sediment control : guidelines for land disturbing activities in the Auckland region 1999	G	TP-90	1999	H
	108 - Guidelines for stormwater runoff modelling in the Auckland Region	G	TP-108		H
	112 - Auckland Engineering Lifelines Project – final report stage one November 1999	G	TP-112	1999	H
	116 - Auckland Engineering Lifelines Project – stage one report July 1997 : Part 1: Hazard Information Part 2: Network Utility Information 1997	G	TP-116	1997	H
	130 - Coastal hazard strategy : coastal erosion management manual 2000	G	TP-130	2000	H
	145 - Auckland Engineering Lifelines Group : priority emergency routes : Auckland region : version 1.0 2001	G	TP-145	2001	H
4.0	Auckland Regional Transport Authority (ARTA)				www.arta.govt.nz
	Your cycleway guide for the Auckland Region 1				E
	Your cycleway guide for the Auckland Region 2				E
5.0	Land Transport New Zealand (LTNZ)				www.ltnz.govt.nz
5.1	LTNZ Manuals and Procedures (Standards)				
	PFM1 Programme and Funding Manual	ST	PFM1	2 nd edition 1/11/04	H
	PFM2 Project Evaluation Manual	ST	PFM2	Amendment 8	H

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
				1/10/04	
	PFM3 Competitive Pricing Procedures - Volume 1 Physical Works and Professional Services	ST	PFM3	Amendment 39 30/06/02	H
	PFM5 Evaluation Procedures for Alternatives to Roothing	ST	PFM5	Amendment 3 01/03/03	H
	PFM6 RAMM Road Condition Rating and Roughness Manual	ST	PFM6	July 1997	H
	PFM7 Local Authority RAMM Database Operation Manual	ST	PFM7	July 1997	H
	TFM1 Standards and Guidelines Manual	ST	TFM1	Amendment 2 12/8/98	H
	TFM4 Competitive Pricing Procedures - Volume 2 Public Passenger Transport	ST	TFM4	July 2002	H
	TFM9 Road Safety Audit Procedures for Projects	ST	TFM9	25/11/04	H
5.2	LTNZ Documents (Guidelines)				
	A New Zealand guide to the treatment of crash locations - A Companion guide to the Austroads GTEP Part 4: Treatment of Crash Locations.	G		Dec 2004	E
	Accident Investigation Monitoring System Coding Manual	ST		V2.0, Jan 1994	H
	Crash Analysis System, (CAS) - A crash analysis tool	ST		2003	
	Cycle Network and Route Planning Guide	G		2004	H/E
	Fact Sheet Series	G	Various		E
	New Zealand On-Road tracking curves	G			H
	Passenger Transport Funding Procedures	G		1/07/04	E
	RTS 1 - Guidelines for the implementation of traffic controls at crossroads (1990)	G	RTS 1	1990	E
	RTS 2 - Guidelines for street name signs (1990)	G	RTS 2	1990	E
	RTS 3 - Guidelines for establishing rural selling places (1992)	G	RTS 3	1992	E
	RTS 4 - Guidelines for flush medians (1991)	G	RTS 4	1991	E
	RTS 5 - Guidelines for rural road markings and delineation	G	RTS 5	1992	E

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
	(1992)				
	RTS 6 - Guidelines for visibility at driveways (1993)	G	RTS 6	1993	E
	RTS 7 - Advertising signs and road safety: design and location guidelines (1993)	G	RTS 7	1993	E
	RTS 8 - Guidelines for safe kerblines protection (1993)	G	RTS 8	1993	E
	RTS 9 - Guidelines for the signing and layout of slip lanes (1993)	G	RTS 9	1993	E
	RTS 10 - Road signs and markings for railway level crossings	G	RTS 10	2000	E
	RTS 11 - Urban roadside barriers and alternative treatments (1995)	G	RTS 11	1995	E
	RTS 13 - Guidelines for service stations (1996)	G	RTS 13	1996	E
	RTS 14 - Guidelines for facilities for blind and vision-impaired pedestrians (2003)	G	RTS 14	2003	E
	RTS 15 - Guidelines for urban-rural speed thresholds	G	RTS 15		E
	Research Report Series	G	Various	Various	H
	Speed Limits New Zealand - Guidelines for setting speed limits and procedures for calculating speed limits (2003)	G	RTS 17	2003	
	Safety Audit Procedures for Existing Roads Report RA97/623S	G		12/98	H
	Traffic Note Series	G	Various	Various	E
6.0	Transit New Zealand (TNZ)				www.transit.govt.nz
	Standards and Guidelines Manual Section 2.2: Geometric Design/Traffic Management Section 2.3: Pavement Design Section 2.5: Project and Contract Management Section 2.6: Quality Assurance Section 2.7: Environmental and Resource Planning Section 2.8: State Highway Operations	G	SP/M/021	V1: Amendment 4 July 04	E

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
	Section 2.10: Structures Section 2.11: Asset Management Section 2.12: Administration				
	All TNZ Specifications	SP	Various	From Date of Issue	E
	All TNZ Notes to Specifications	G	Various	From Date of Issue	E
	Bridge Inspection and Maintenance Manual	SP	SP/M/016	July 2001	H
	Bridge Manual	G	SP/M/022	Second Edition 2003 amended July 2005	H/E
	Bridge Overweight Rating and Posting Weight Limits Assessment	G	SP/M/018	June 2002	H
	Chipsealing in New Zealand	G		2005	H
	Code of Practice for Temporary Traffic Management (COPTTM)	ST	SP/M/010	Third Edition June 2004	H
	Contract Procedures Manual	G	SM021	Version 7 March 2005	E
	Cost Estimation Manual	G	SM014	Issue 2 May 2003	E
	Guidelines for Highway Landscaping	G	SP/M/020	Version 1 Amendment 1 Sept 2003	H
	Guidelines for Sampling and Testing of Stabilised Materials During Construction	G		Draft April 2000	E
	Highway Surface Drainage - A Design Guide for Highways with a Positive Collection System	G		NRB 1997	H
	Manual of Traffic Signs and Marking (MOTSAM) Part 1: Traffic Signs Part 2: Markings Part 3: Motorways and Expressways	ST		Edition 4 Sep 1998 Edition 3 update July 2004 Provisional Issue	H H E

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
				June 2004	
	New Zealand Supplement to the Austroads Guide to Traffic Engineering Practice Part 14: Bicycles	G	SP/M/025	Provisional Issue Mar 2005	E
	New Zealand Supplement to the Austroads Pavement Design Guide	G		May 2000	E
	Overdimension Vehicle Route Maps	G	SP/M/017	Issue 1 Sep 2002	H
	Overweight Permit Manual	G	SP/M:OPM	Issue 1 1995 Amended Dec 2004	H/E
	Overweight Permit Route Maps	G	SP/M:OPRM	Issue 1 1994 (with amendments)	H
	Planning Policy Manual	G	SP/M/001	Issue 1 December 1999	H
	Project Management Manual	G	SM011	Issue 3 July 2005	E
	Risk Management Process Manual	G	AC/Man/1	Version 3 Sept 2004	E
	State Highway Asset Management Manual	G	SM020	Reissued August 2000	E
	State Highway Construction Contract Proforma Manual	G	SM031	Issue 5 March 2005	E
	State Highway Control Manual	G	SM012	Version 4 Sept 2004	E
	State Highway Database Operation Manual	G	SM050	Reissued July 2004	E
	State Highway Geometric Design Manual	G	SP/M/024	Dec 2000	E
	State Highway Maintenance Contract Proforma Manual	G	SM032	Issue 5 March 2005	E
	State Highway Safety Management System Manual	G	SP/M/002	Issue 3 July 2003	H/E
	State Highway Stakeholder Agreement Proforma Manual	G	SM033	Issue 1 July 2004	E
	State Highway Traffic Volumes	G		Current	E
	Statement of Intent	G		Current version	
	TQS1 Certification Information	G		May 2005	E
	TQS1 Registration List (for Local Authorities)	G		May 2005	E
	Traffic Monitoring for State Highways	G	SM052	Version 1 May 2004	E

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
	Transit New Zealand Miscellaneous Reports	G		Various	H/E
	Transit Quality Standard TQS1	ST	SP/M/033	Second Edition June 2005	H/E
	Transit Quality Standard TQS2	ST	SP/M/034	Second Edition June 2005	H/E
	Waste and Energy Policy	G	SP/M/023	August 2003	E
7.0	Standards New Zealand (NZS)				www.standards.co.nz
	AS/NZS 1158.0:1997 Road Lighting Introduction	ST	AS/NZS 1158:1997	1997	H
	AS/NZS 1428.4:2002 Design for access and mobility - Tactile indicators	ST	AS/NZS 1428.4:2002	2002	H
	NZS 3116:2002 Concrete Segmented Paving	ST	NZS 3116:2002	2002	H
	NZS 3910:2003 Conditions of Contract for Building and Civil Engineering	ST	NZS 3910:2003	2003	H
	NZS 4121:2001 Design for access and mobility: Buildings and associated facilities	ST	NZS 4121:2001	2001	H
	NZS 4402 Series Methods of Soil Testing for Engineering Purposes	ST	NZS 4402 series	Current	H
	NZS 4404:2004 Land Development and Subdivision Engineering	ST	NZS 4404:2004	2004	H
	NZS 6701:1983 Code of Practice for Road Lighting	ST	NZS 6701:1983	1983	H
	NZS 6803:1999 Acoustics - Construction Noise	ST	NZS 6803:1999	1999	H
	SNZ HB 4360:2000 Risk Management for Local Government	ST	SNZ HB 4360:2000	2000	H
8.0	Standards Australia (AS)				www.standards.com.au

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
	AS 4817 - 2003 Project Performance Measurement Using Earned Value	G	AS 4817-2003	2003	H
	AS 4915 - 2002/Amdt 1 - 2005 Project management - General Conditions	G	AS 4915-2002/Amdt 1-2005	Amendment 1 2005	H
9.0	Austrroads				www.austrroads.com.au
	Guide to Stabilisation in Roadworks	G	AP-60/98	1998	H
	Guide to Traffic Engineering Practice Part 1 - Traffic Flows	G	AP-11.1/88	1988	H
	Guide to Traffic Engineering Practice Part 2 - Roadway Capacity	G	AP-11.2/88	1988	H
	Guide to Traffic Engineering Practice Part 3 - Traffic Studies	G	AP-G11.3/04	2004	H
	Guide to Traffic Engineering Practice Part 4 - Treatment of Crash Locations	G	AP-G11.4/04	2004	H
	Guide to Traffic Engineering Practice Part 5 - Intersections at Grade	G	AP-11.5/05	2005	H
	Guide to Traffic Engineering Practice Part 6 - Roundabouts	G	AP-11.6/93	1993	H
	Guide to Traffic Engineering Practice Part 7 - Traffic Signals	G	AP-G11.7/03	2003	H
	Guide to Traffic Engineering Practice Part 8 - Traffic Control Devices	G	AP-11.8/88	1988	H
	Guide to Traffic Engineering Practice Part 9 - Arterial Road Traffic Management	G	AP-11.9/88	1988	H
	Guide to Traffic Engineering Practice Part 10 - Local Area Traffic Management	G	AP-11.10/04	2004	H
	Guide to Traffic Engineering Practice Part 11 - Parking	G	AP-11.11/88	1988	H
	Guide to Traffic Engineering Practice Part 12 - Roadway Lighting	G	AP-G11.12/04	2004	H

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
	Guide to Traffic Engineering Practice Part 13 - Pedestrians	G	AP-11.13/95	1995	H
	Guide to Traffic Engineering Practice Part 14 - Bicycles	G	AP-11.14/99	1999	H
	Guide to Traffic Engineering Practice Part 15 - Motorcycle Safety	G	AP-11.15/99	1999	H
	Rural Road Design: A Guide to the Geometric Design of Rural Roads	G	AP-G1/03	2003	H
	Urban Road Design: A Guide to the Geometric Design of Major Urban Roads	G	AP-G69/02	2002	H
	Integrated Asset Management Guidelines for Road Networks	G	AP-R202/02	2002	H
10.0	ARRB Group				www.arrb.com.au
	Sealed Local Roads Manual: Guidelines to good practice for the construction, maintenance and rehabilitation of pavements	G	SEA002	Revised and expanded August 2005	H
	Selection and Design of Asphalt Mixes - APRG Report 18	G		Updated 2002	H
	Unsealed roads manual: Guidelines to good practice	G	USR001	Revised August 2000	H
11.0	Bus Priority Initiatives Steering Group				
	Standards for Special Vehicle Lane Signage, Road Marking and Road Surface Colouring of Priority Lanes - Drawings	G		April 2005	H – Contact MCC
12.0	Ingenium (Association of Local Government Engineering New Zealand Incorporated)				www.ingenium.org.nz
	Creating Customer Value from Community Assets	G			H
	International Infrastructure Management Manual	G			H
	New Zealand Contract Management Manual	G			H
	NZ Asset Depreciation and Valuation Guidelines	G			H
13.0	TRAFINZ (The New Zealand Local Authority Traffic Institute)				www.trafinz.org.nz

	Document Title	Document Type	Document Ref No	Latest Version & Amendment No	Format
	Guide to Pedestrian Crossing Facilities 2001	G		August 2001	E
14.0	IPENZ (The Institution of Professional Engineers New Zealand)				www.ipenz.co.nz
	National Specification for the Installation and Modification of Traffic Signals (Signals NZ User Group SNUG)	ST		Dec 2004	www.ipenz.org.nz/snug/
15.0	ICE (Institution of Civil Engineers)				www.ice.org.uk
16.0	PMI (Project Management Institute)				www.pmibookstore.org
17.0	AASHTO (American Association of State Highway and Transportation Officials)				http://transportation.org/aashto/home.nsf
18.0	New Zealand Heavy Haulage Association (NZHHA)				
	Road Design Specification for Overdimension and Overweight Loads	G		Aug 2006	http://www.yellow.co.nz/sites/9102/docs/Guidelines.pdf