Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

30 March 2022

[redacted]

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Request for Official Information responded to under the Local Government and Official Information and Meetings Act 1987 (LGOIMA) – reference: OIR 2122-209

I refer to your information request we received on 2 March 2022 for the following:

1. ***Do contracts with local roading contractors that KCDC engages have templated standards for quality and delivery of repairs to local roads around Kapiti that they must meet?***

Council engages contractors to undertake repairs to local roads around Kāpiti through our Road Maintenance Contract. The general conditions of contract are 3917:2013. The Contract Specification provides the templated standard relating to the quality and delivery of repairs, which is supported by the NZTA HM series of maintenance specifications.

2. ***Who or which organisation is responsible and qualified to certify that contractors have met the quality repair standards that are set in the contracts for each repair?***

Council staff are typically responsible for certifying contractors' work. These staff are trained and qualified as required to undertake their respective functions. From time-to-time specialist consultants or Engineers to the contract are used where these skills are not available using Council staff.

3. ***Are you able to provide a template or schedule of the contract that is used to communicate to roading contractors the requirements for quality and lifetime expectation of repairs?***

The expectations of repairs relating to road maintenance activities are defined in section 9 to 54 of the Contract Specifications, these are attached as requested.

4. ***Can you please provide the schedule that communicates penalties should repairs not be fit for purpose or deteriorate at an unacceptable rate as defined in the contract?***

The contract management team promotes a collaborative working environment that pursues quality outcomes; however this is underpinned on the principle that non-conforming works are corrected at the contractors' cost. Where remedies are not undertaken in a reasonable time, then penalties are imposed.

When penalties are required, then the contract references to Specification 7 – Performance Criteria and Appraisal of Contractors Performance, and Appendix 1 – Key Performance Indicators. These contract references are attached as requested.

Please contact me directly should you wish to discuss this further.

Ngā mihi

Glen O'Connor
Access & Transport Manager
Te Kaiwhakahaere Putunga Waka

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

ROAD MAINTENANCE 2018 to 2021

Contract 2018/C178

VOLUME 2: CONTRACT SPECIFICATIONS and APPENDICES

April 2018

Contents

9 Asphaltic Concrete Paving (Maintenance)

9.1 Scope

The work to be executed under this Specification consists of the supply of materials and construction of asphaltic concrete surfaces associated with maintenance works. Shape correction of carriageways and thin asphaltic concrete overlays are covered by Sections 21 and 55

9.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ M/01:2011	Roading Bitumens
TNZ HM/13: 2006	Depressions
NZTA M10:2014	Dense Graded and Stone Mastic Asphalt

9.3 Materials

9.3.1 Bitumen

The bitumen shall be penetration grade bitumen complying with the requirements of TNZ M/01.

9.3.2 Asphaltic Concrete

Asphaltic Concrete Mixes shall comply with the requirements of NZTA M10.

Asphaltic Concrete Mix 6 (Footpath) shall comply with the requirements of NZTA DG7 except that the Mix Grading Envelope shall be as follows:

Aggregate Grading Sieve Size	**Percent Passing by Mass Including Filler**
9.5mm	100
4.75mm	89-100
2.36mm	56-72
1.18mm	37-53
600µm	29-41
300µm	19-31

Aggregate Grading Sieve Size	Percent Passing by Mass Including Filler
150µm	12-18
75µm	4-10
Effective Binder Content (% by Mass of total mix)	7.5-9.0

9.4 Compliance with Mix Properties

From time to time the Engineer may require a sample of asphaltic concrete mix from the plant or from the Contractor prior to laying, or from the laid mix. The Contractor shall assist with sampling in accordance with NZTA M10, or as directed.

All samples taken and tested for Bitumen Content and Aggregate Grading shall be within the tolerances indicated in NZTA M10.

Any sections of pavement that fail to meet these requirements shall be replaced by the Contractor at the Contractor's expense.

9.5 Paving (Carriageways and Footpaths)

9.5.1 Preparation

Existing paving shall be saw cut at the limits of the work for breakout. Any material excavated shall be removed from the site and disposed of.

9.5.2 Surface Requirements

The final surface shall be of a uniform texture confirming to the line and grade of the surrounding pavement.

The tolerances for surface finish for Carriageway Paving shall be $\pm$ 5mm for level at a point, and 5mm departure from a 3m straightedge or template in any direction. In addition the surface shall not pond water.

The compaction effort achieved on the finished paving with a thickness of 25mm or more may be determined using a Nuclear Densometer or by coring. Air voids are to be within the limits specified in NZTA M10.

The Contractor shall be responsible for ensuring adequate air voids in all paving surfaces and shall submit relevant test results to the Engineer, in accordance with the Contractor's Quality Plan, and upload results into the RAMM Dispatch.

Nuclear Densometer testing shall be completed for every 100m^2 of paving completed.

9.5.3 Application of Tack Coat

The surface on which the tack coat is to be laid shall be dry and any loose material, dust, clay or foreign matter shall be removed.

All surfaces against which asphaltic concrete is to be placed shall be coated with a film of tack coat.

Tack coat shall be sprayed at a residual application rate of 0.3l/m^2 at 15^{o}C. Use of a watering can for spraying tack coat is unacceptable.

Every necessary precaution shall be taken to ensure that no roadmarkings, or markers, street furniture, fences, cars, buildings, surface of kerbing or channelling, which are to remain exposed and visible, will become discoloured by the tack coat. Where discolouration occurs the affected items shall be made good at the Contractor's expense.

9.5.4 Laying of Asphaltic Concrete

No asphaltic concrete shall be placed on the carriageway when the surface is not thoroughly dry, when the weather is foggy, wet, or when rain is threatening, or when the air temperature in the shade is below 10^{o}C.

Following preparation work the Contractor shall place and compact the appropriate asphaltic concrete to the depth indicated on the Dispatch.

For carriageways the paving shall be flush with the existing road surface and shall match the surrounding road contours. Crowning of the newly paved area will not be permitted.

For footpaths maximum and minimum allowable paving thicknesses as follows:

Mix Number	Minimum Thickness	Maximum Thickness
6 (Footpath)	25mm	40mm

Where requested by the Engineer the Contractor shall use a suitable Paving Machine for laying the asphaltic concrete.

9.5.5 Bandage Sealing of Joints

All joints shall be sealed with a 100mm wide polymer bandage. The bandage shall be placed immediately after paving.

9.5.6 Service Covers

Any service covers within the works area shall be left accessible, adjusted and repainted in accordance with Section 43.

10 Chipsealing (Maintenance)

10.1 Scope

The work to be executed under this Specification consists of the supply of materials and construction of chip seal surfaces associated with maintenance works.

10.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ M/01:2011	Roading Bitumen's
TNZ M/06:2011	Sealing Chip
NZTA Sealing Manual	Chipsealing in New Zealand, NZTA, 2005
BCA E/2:1997	Specification for Performance of Bitumen Distributors

10.3 Design

Chipseals shall be designed in accordance with NZTA Sealing Manual. Other design methods may be considered, provided the Contractor can provide evidence of satisfactory performance.

The chip size shall be selected to match the existing surface texture as closely as possible.

10.4 Materials

10.4.1 Bitumen

The bitumen or emulsified bitumen shall comply with the requirements of TNZ M/01.

10.4.2 Sealing Chip

The sealing chip shall comply with the requirements of TNZ M/06.

10.5 Construction

10.5.1 Surface Preparation

The surface shall be cleaned of lichen, dirt, dust and other organic or deleterious matter by sweeping and spraying of other approved methods as appropriate.

10.5.2 Binder Application

Binder shall be sprayed on to the prepared surface at the design application rate using a bitumen distributor meeting the requirements of BCA E/2:1997. Where the individual area to be sealed is

less than 30m², a non–certified distributor may be used provided a uniform application of binder is achieved.

10.5.3 Chip Application

Sealing Chip shall be spread in a uniform layer over the binder at the rate calculated in the design.

10.5.4 Rolling

Rolling shall be carried out with PTR rolling equipment.

10.5.5 Removal of Surplus Chips

Surplus sealing chip shall be removed from site and disposed of. The surface shall continue to have surplus sealing chip removed as required until the end of the maintenance period.

11 Concrete Construction

11.1 Scope

The work to be executed under this Specification includes the supply of materials, placing and finishing of concrete works.

11.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

NZS 3103:1991	Specification for Sands for Mortars and Plasters
NZS 3104:2003	Specification for Concrete Production
NZS 3109:1997	Concrete Construction
NZS 3114:1987	Specification for Concrete Surface Finishes

11.3 Materials

11.3.1 Concrete

Concrete shall be High Grade concrete complying with the requirements of NZS 3104:2003. Site mixed concrete or rapid set concrete shall not be used except in exceptional circumstances and then only with the approval of the Engineer.

Concrete used shall have a minimum 28-day compressive strength of 20 MPa unless otherwise specified.

Black oxide must be added to all concrete mixes, over 1 m^3 in volume, at a quantity of 2kg/m^3 to dull the visual appearance of the white concrete unless otherwise specified by the Engineer.

The Engineer may require fibre reinforced concrete to control thermal and other cracking mechanisms

Concrete slump shall not exceed 100mm $\pm$ 10mm.

15 min rapid set concrete shall not be used where expansion/hydration may push up the surrounding surface.

11.4 Testing

Testing will be carried out in accordance with NZS 3109:1997.

11.5 Formwork

Formwork shall comply with the requirements of NZS 3109:1997.

11.6 Finishing

Finishing of exposed concrete surfaces shall meet the requirements of both NZS 3109:1997 and NZS 3114:1987 Table 2 Class U5 Shallow Textures.

The tolerances for surface finish for the concrete surface shall be ± 10mm for level at a point, and 5mm departure from a 3m straightedge of template in any direction. In addition the surface shall not pond water.

11.7 Construction Joints

Transverse construction joints shall be formed in footpaths and driveways at intervals not exceeding 4m. Wherever possible crack control joints should line up with adjacent construction joints.

11.8 Clean-up

The worksite shall be left in a clean and tidy condition. All waste shall be removed from site and disposed of. Any spilt concrete or concrete splashes shall be cleaned up as soon as is practical, and before the concrete sets.

12 Mortar

12.1 Scope

The work to be executed under this Specification includes the supply of materials and the manufacture of mortar.

12.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

NZS 3103:1991	Specification for Sands for Mortars and Plasters
NZS 3109:1997	Concrete Construction

12.3 Materials

12.3.1 Mortar Sand

Mortar sand shall comply with the requirements of NZS 3103:1991.

12.3.2 Cement

Cement used for the manufacture of mortar shall comply with the requirements of NZS 3109:1997.

12.3.3 Water

Water used for the manufacture of mortar shall comply with the requirements of NZS 3109:1997.

12.4 Manufacture

Sand and cement shall be mixed in the appropriate proportions to a stiff homogenous mixture with just enough water to enable the mortar to be used for the intended purpose.

Ratios of sand and cement shall be as follows:

Type	**Proportions**
General use	2 parts sand 1 part cement

Mortar is not an acceptable method of repair of kerb breaks or around stormwater outlets. A repair can be made using “rockbond” (that is keyed-in) or a similar approved product, or by cutting out a section of kerb and replacing.

13 Sump Cleaning

13.1 Scope

The work to be executed under this Specification includes the cleaning of sumps, soakpits and enviropods.

The Contractor is advised there are some areas within the network that require Traffic Management over and above Level 1 requirements (including the State Highway in 50 and 70km/hr areas). It is up to the Contractor to satisfy themselves of the traffic management requirements to fulfil the obligations under this contract.

This Specification covers all sumps within the road reserve, or areas outside road reserve such as car parks, service lanes, accessways, pedestrian areas, off road carparks, and parks and reserves. It also includes inset sumps and sumps associated with watertables.

It is expected that all sumps tops are kept clean under routine maintenance and sumps with detritus covering the grate should be clean by routine maintenance staff.

The work to be executed under this Specification consists of the cleaning of sumps, soakpits and enviropods within the Contract Area.

13.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/20 : 2006	Detritus and Slip Removal
TNZ HM/21 : 2006	Drainage Systems

13.3 Plant and Equipment

The major plant items for this work shall be purpose built machinery capable of removing by suction the contents of stormwater sumps, including foul water, litter and other debris, and sediment built up within the sump chamber(s). The removed contents shall be collected, transported and disposed of to a landfill consented to take the material, with minimum collection and in-transit spillage.

When cleaning by machine is not possible, equipment for manual cleaning may include small pumps (petrol or generator driven) to remove the water, pumps or hand tools to remove the chamber sediment and debris, and a water source to complete the cleaning of the chamber walls. Means of removing the solid contents to a disposal site consented to receive this material will also be required.

13.4 Cleaning

The purpose of the sump cleaning activities required under this contract is to maintain sumps in a condition that allows collection and free passage of stormwater runoff. This will involve maintaining sump tops clear of leaves and other debris, cleaning floatables from the sump itself, including the overflow kerb, and emptying sediment build-up from the floor of the sump chamber.

When cleaning sumps, all litter, floatables, debris and foul water shall be removed from the sump pit floor, including from behind the baffle (cleaning eye side) and in the outlet. All debris and obstructions shall be cleared from the overflow kerb, sump grate and frame, cleaning eye and adjacent 5m of kerb channel length each side of the sump. Care shall be taken to ensure that the walls and floor of the sump are not damaged by the cleaning process.

The overflow kerb, sump grate, frame and top 400mm of the pit walls should be washed after the sump pit is emptied.

13.4.1 Sumps

All sumps other than enviropod sumps, Wellington City Council type sumps, and sumps on the critical list shall be cleaned annually.

13.4.2 Critical Sumps

Critical sumps listed in Appendix 2 shall be cleaned every 6 months.

This list is to be added to when further problem area sumps are identified. Any such sumps shall be discussed with the Engineer prior to adding them to the list.

Where storm watches or warnings have been issued by the Met Service the Contractor shall inspect and if necessary clear critical sumps, sump tops and adjacent channels for a distance of up to 5 metres and other road drainage facilities as determined as being critical.

During and after significant rainfall, critical drainage system components shall similarly be inspected and checked to ensure uninterrupted flow. All critical drainage components shall be inspected and cleared within one week following a storm event, with priority given to the critical sumps.

13.4.3 Enviropod Sumps

When cleaning Enviropod sumps the following procedure must be used:

- Vacuum clean Enviropod bag with sucker truck with rubber hose so as not to damage the bag.
- Remove stainless steel ring and bag and put in leak-proof container.
- Replace bag in sump with new bag and ring.
- Dismantle rings from used bags and wash bags at Council Depot wash bay.
- Reassemble bag and ring and store for next time.
- Additional bag and rings will be supplied by the Council.

Enviropod listed in Appendix 2 shall be cleaned every 3 months.

13.4.4 Soakpits

Soak pits listed in Appendix 2 shall be cleaned annually.

13.4.5 Wellington City Type Trapped Sumps

Wellington City type trapped sumps listed in Appendix 2 shall be cleaned every 6 months, with both chambers to be cleaned.

13.4.6 Clean Up

The Contractor shall clean up any spillages of foul water or other debris cleared from the sump and leave the site in a clean and tidy condition. The Contractor shall ensure the grates and cleaning eyes have been replaced carefully and are properly seated.

13.5 Responsive Services

Except in storm situations where the drainage system is unable to cope with the volume of runoff, all reported unexpected channel and sump blockages shall be cleaned within the response times in Section 1.

First response to flooding will include assessing the situation, and taking the necessary action to remove any blockages to the channels, sumps, or culvert inlets. If sump leads are blocked, the Council Operations Depot should be advised, through the call centre, so they can jet the pipe.

Special attention is to be paid around cleaning of sumps that can potentially flood residential properties and businesses. Any flooding of properties/businesses as a result of blocked sumps shall be the Contractor's responsibility.

The Contractor shall be available for cleaning activities associated with emergency situations.

13.6 Programming

The Contractor shall include in its programme the cleaning requirements set out in this contract, which will:-

- Ensure all sumps are cleaned and emptied to meet specified timeframes
- Identify critical sump and channel cleaning activities
- Allow for cleaning activities in response to trigger events

The programme shall be presented in the format specified in Section **Error! Reference source not found.**. The programme shall identify all cyclic cleaning activities and any event trigger cleaning activities such as cleaning related to seasonal influences, where such can be identified in advance. Once the programme has been accepted by the Engineer, the Contractor shall ensure all programmed activities scheduled for the month are completed in the month.

The Contractor is required to clean all sumps at least once per year, WCC and some sumps to be cleaned 6 monthly, and enviropods that are to be cleaned quarterly, Critical sumps listed in

Appendix 2, require grate/overflow kerb cleaning on receipt of heavy rain watches/warnings and after heavy rain has occurred.

13.7 Damage Reporting

The Contractor shall check, identify and record any damage during cleaning. Damage commonly occurring is as follows:-

- Broken or badly corroded grating
- Broken or damaged frame
- Broken or deformed apron
- Broken or deformed back entry kerb (overflow kerb)
- Damaged sump floor and/or walls
- Plastering to outlet lead broken
- Blocked sump leads

13.8 Recording and Reporting

The Contractor shall use Pocket RAMM to enable recording of work completed and RAMM asset condition assessment during the cleaning process.

The Contractor shall, for the purpose of both claiming and updating the Council's databases, record in RAMM, the asset location and type (e.g. single sump, double sump, back to back single sumps etc.), and classification of each sump cleaned, and the timing and nature of the work done. The Contractor shall note any repairs that are required to the sump or leads, and report these to the Engineer through RAMM.

The Contractor shall also report achievement monthly against the annual programme to enable the Engineer to monitor progress.

The Contractor shall also report any sumps that are more than 80% full so that these can be monitored for adding to the critical list.

13.9 Performance Criteria

The key performance criteria includes:

- No ponding as a result of blocked sumps or surface detritus on top of the grate, at all times; and
- All sumps and associated pipes are clear and at least 90% functional at all times.
- All sumps shall be cleaned at frequencies listed in Appendix 2.
- No flooding of residential properties or businesses is to occur as a result of blocked sumps

14 Sweeping (Kerb & Channel, Dish Channel and Carriageway)

14.1 Scope

The work to be executed under this Specification includes cleaning of carriageways and carriageway channels. Where cycleways are within the carriageway the scope of this Specification includes the sweeping and cleaning the cycleway.

While the majority of sweeping is on the road network, this Specification includes all sweeping within the road reserve, or areas outside the road reserve such as on and off street carparks, service lanes, accessways and pedestrian areas, and reserve roads.

The Contractor is advised there are some areas within the network that require Traffic Management in excess of Level 1 requirements (including the State Highway in 50 and 70km/hr areas). It is up to the Contractor to satisfy themselves of the traffic management requirements to fulfil the obligations under this contract.

14.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/20 ; 2006	Detritus and Slip Removal

14.3 Plant and Equipment

The major plant items for this work shall be purpose built machinery capable of sweeping and removing by suction, carriageway and channel debris including loose chip, leaves, litter and other debris, and sand and sediment built up within the channel invert and across the carriageway. The removed contents shall be collected, transported and disposed of at a disposal site consented to receive this material with minimum collection and in-transit spillages.

Water shall be used to suppress dust during sweeping, all brooms/vacuum are to be operational, and the vehicle shall travel at an appropriate speed to sufficiently achieve required standards.

14.4 Cleaning

14.4.1 Sweeping and Suction Cleaning

Detritus that is on carriageways, carriageway channels, along cycleways within the road carriageway and along the sections of State Highway included in the contract, shall be swept and removed. Collected matter shall be transported to be disposed of at an appropriate off-site disposal facility consented to receive this material.

The Contractor shall pay particular attention to the removal of surface detritus where it is or could be a hazard, such as at intersections. Channel sweeping shall include the sweeping of all channels to a minimum width of 300mm to remove all litter and loose stones.

Areas where the mechanical sweeper is unable to sweep properly, including awkward corners, around parked cars, etc, the Contractor shall sweep by hand. To enable the channel to be properly cleared, where obstructions occur, the Contractor shall lift any such obstacles (vehicle/pedestrian crossing ramps/grates) from the channel. On completion of sweeping, the Contractor shall replace vehicle/pedestrian crossing ramps/grates etc in a serviceable position.

Particular attention shall be paid to sweeping around traffic islands, roundabouts, sump offsets, pedestrian crossing islands, etc.

When sweeping, the Contractor must ensure that the top of sumps is included.

Slip removal is not covered by this Specification, however where slip material is spread thinly rather than amassed, then it is covered by this Specification and shall be collected as the cleaning machine makes its pass. The Contractor's plant shall be capable of handling these situations.

14.4.2 Beach Sand

Windblown beach sand is a regular occurrence along some of the coastal roads. Sand built up within the carriageway confines shall be collected, removed and disposed of by the Contractor at the same frequency that roads are swept.

14.4.3 Standards

Carriageway and channel debris, sand and sediment removed.

14.4.4 Sweeping Timing and Frequency

The Contractor shall include in its programme the cleaning requirements set out in this Contract. This is the Council Level of Service and no additional sweeps shall be programmed unless requested by the Engineer.

The programme shall be presented in the format specified in Section **Error! Reference source not found.**. The programme shall identify all cyclic cleaning activities and any event trigger cleaning activities such as cleaning related to seasonal influences, where such can be identified in advance. Once the programme has been accepted by the Engineer, the Contractor shall ensure all programmed activities scheduled for the month are completed in the month.

A schedule of roads with the required frequency of sweeping is included in Appendix 3. There is a list of roads that require sweeping monthly.

Roads classified (ONRC) as regional, arterial, and the roads listed in Appendix 3 – shall be swept monthly. All other roads, carparks, service lanes, etc shall be swept quarterly.

14.4.5 Clean Up

The Contractor shall clean up any windrows or spillages of collected debris and leave the site in a clean and tidy condition.

14.5 Recording and Reporting

The Contractor shall use Pocket RAMM to enable recording of work completed and RAMM asset condition assessment during the cleaning process.

The Contractor shall note any repairs that are required to the sump or leads, and report these to the Engineer through RAMM.

The Contractor shall also report achievement monthly against the annual programme to enable the Engineer to monitor progress.

The Contractor shall also report any sumps grates and channels that are covered with detritus so as to hinder stormwater flows so that these can be monitored for adding to the critical list.

15 Pedestrian Area Drainage Cleaning and Maintenance

15.1 Scope

The work to be executed under this Specification includes cleaning of pedestrian area drainage facilities principally in highly trafficked pedestrian areas such as shopping areas.

Cleaning and maintenance of private drainage facilities or drainage facilities on private land is excluded from this Specification.

15.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/21	Drainage Systems

15.3 Types of Drainage Facilities

The main types of pedestrian area drainage facilities that are included in this Specification are as follows:

- Slot drains
- Surface channels
- Associated sumps or receiving chambers

Other areas may be instructed under this contract, such as pedestrian accessways, and reserves etc.

This Specification extends to removal of floatables from carriageway sumps adjacent to highly trafficked pedestrian areas.

15.4 Drainage and Channel Cleaning

A high level of cleaning of pedestrian area drainage facilities will be required around shopping centres and other highly trafficked pedestrian areas. Drainage facilities in these areas are to be cleaned regularly to ensure no surface ponding occurs in the run off collection area.

Cleaning of pedestrian area drainage outside highly trafficked pedestrian areas will be in response to customer enquiries, instruction from the Engineer, to the Contractor's approved programme of sump cleaning, or on the Contractor's initiative should such a need be identified by the Contractor.

Slot drains are the metal/plastic/concrete grill drains and narrow aperture drains normally located within areas used by pedestrians, although at times they may also be in carriageway areas. An example of one type of slot drain is the 'Arco' drain.

Slot drains need to be carefully and regularly cleaned to ensure narrow opening are not blocked with small items such as gravel and cigarette butts. Slot drains need to be able to function efficiently and effectively in all rainfall situations to avoid flooding of associated areas and adjoining properties.

Methods to be employed to clean drainage facilities are at the discretion of the Contractor, however the method must not cause damage to the asset nor shift the blockage problem to the next section of the drainage network.

The channels/pits beneath the slot drains need to be regularly cleaned to keep them free of sediment deposits that might prevent them from working at full capacity in heavy rainfall conditions. In a channel type receiver the depth of sediment should not be greater than 10mm. In a pit type receiver, the cleaning requirements for a sump are to apply. When channels and pits are cleaned, the outlet leads must also be checked by flushing the water to ensure they are not restricted or blocked.

15.5 Drainage and Channel Maintenance

The Contractor is responsible for ensuring that grates are securely fastened at all times. Loose grates will cause trip hazards should they become dislodged.

The Contractor will be held responsible for any damage caused to the asset through careless operations by the Contractor. Examples of careless operations include breakages through rough or forceful handling of the plastic, concrete, or cast iron grates.

15.6 Pedestrian Area Sump and Pit Cleaning

Sumps must be checked, cleaned and emptied at regular intervals to ensure they operate effectively and at optimum capacity during periods of rain. Sumps and leads must not be blocked with debris (due to insufficient cleaning) which can cause flooding of adjacent areas or private property.

Sump tops, including the grate, overflow kerb and adjacent 1 m length of inflow channel to the sump must be kept clear of letter and debris at all times. The surface of the water in the sump must also be kept clear of litter and debris.

All sump tops in pedestrian areas must be checked and cleared of debris following a period of significant rain, within the following times:

- 24 hrs. Critical sumps, sump tops etc.
- 48 hrs. Other sumps, sump tops etc.

Significant rain has the effect of washing litter and debris along channels and on to sump tops causing them to become obstructed.

Pedestrian area sumps must be emptied on a regular basis to ensure the sediment level is never higher than 150mm below the bottom of the sump baffle plate.

When emptying sumps, all debris and foul water shall be removed from the sump pit floor, including behind the baffle or in the outlet. The Contractor shall then check that the cleaning eye can be removed and that the sump lead is working. This should be done by filling the sump up with

water and checking to see if the level in the sump quickly drops back to a level that coincides with the bottom of the sump lead/outlet. If the sump lead is restricted or blocked the Contractor is responsible to remove anything obstructing the first 500mm of the lead from the sump.

15.7 Adjacent Carriageway Sump Floatables

Floatables likely to block sump leads are most likely to be found in highly trafficked pedestrian areas. These floatables include cans, plastic drink bottles and similar items. Sumps in the carriageway adjacent to highly trafficked pedestrian areas shall have not more than 50% of the water surface covered in floatables.

15.8 Frequency of Cleaning

The Contractor is required to clean all pedestrian sumps at least once per year, although additional cleaning may be required as a result of heavy rain.

15.9 Reporting

The Contractor shall use Pocket RAMM to enable recording of work completed and RAMM asset condition assessment during the cleaning process.

The Contractor shall record in RAMM, the date and brief details of all pedestrian area drainage cleaning works carried out. In particular, the timing and location of each sump cleaned shall be reported in RAMM.

The Contractor shall report in RAMM all faults with pedestrian area drainage facilities identified by the Contractor, including but not limited to:

- Broken grates
- Restricted or blocked outlet lead
- Cleaning eyes that have been covered up or otherwise unable to be opened.

The Contractor shall also report any sumps grates and channels that are covered with detritus so as to hinder stormwater flows so that these can be monitored for adding to the critical list.

15.10 Clean Up

All collected litter, sediment, foul water etc. shall be transported away from the site with no in-transit spillage, then disposed of at an appropriate off-site disposal facility consented to receive this material.

The Contractor shall ensure that once the pedestrian area drainage cleaning and maintenance tasks have been completed, the drainage facility and its surrounding area is left odour free and in a clean and tidy condition.

16 Pedestrian Area Sweeping and Cleaning

16.1 Scope

The work to be performed under this Specification consists of cleaning of pedestrian areas. This work is generally minimal and only instructed upon request.

The Scope of this Specification includes all public pedestrian areas with a list of required areas to be cleaning in Appendix 3.

16.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/20:2006	Detritus and Slip Removal

16.3 Sweeping

16.3.1 Pedestrian Areas

Detritus including detritus on footpaths shall be swept and removed. Collected matter shall be disposed of at an appropriate off-site disposal facility consented to receive this material.

Sweeping and cleaning of low profile pedestrian footpaths will generally be in response to enquiries from the public, from the Engineer, or at the Contractor's initiative following observation or fault finding surveys.

16.3.2 Pavement Litter

From time to time there will be a need to clean litter requiring removal methods other than sweeping, from pedestrian areas. These litter types include but are not limited to:

- Chewing gum
- Human and animal fouling
- Bird droppings
- Glass (including broken glass)
- Accident debris
- Spillages
- Other litter that cannot be swept

16.3.3 Segmental Pavers

Sweeping of segmental pavers with broom and section units can remove locking infill sand between the pavers. Loss of locking sand causes the pavers to loosen, and the pavers either break of otherwise become dislodged. As the choice of sweeping and cleaning equipment is the Contractor's responsibility, the degree to which the sand will required re-nourishment will depend on the extent to which the selected equipment removed the locking sand.

The Contractor shall re-nourish paver infill sand to ensure that at all times the depth of the sand is within 10mm of the top surface of adjacent pavers.

Sweeping of segmental pavers will therefore include re-nourishment of the locking sand. It will also include the reporting in RAMM of any broken, missing or dislodged pavers.

16.3.4 Beach Sand

Windblown beach sand is a regular occurrence along some of the coastal roads. Sand built up within the footpath confines shall be collected, removed and disposed of by the Contractor.

16.4 Cleaning

16.4.1 Cleaning Methods

The choice of clean up method is at the Contractor's discretion. There are propriety items available in the market for removing sticky items such as chewing gum. There are also hot water blasting methods available for chewing gum removal, as well as removal of concentrations of bird droppings. Whichever method is adopted, care needs to be taken to ensure the pavement surfacing is not damaged in the clean-up process, that any segmental paver infill sand lost in the cleaning process is replaced as part of the cleaning process, and that all residue is collected and removed from site. Residue must not be washed into and disposed of through the stormwater system.

16.4.2 Paver Steam Clean

The segmental pavers in Main Street, Otaki, will be steam cleaned four times per year. Work shall be carried out between the hours of 8:00pm and 5:00am. Mahara Place will be done twice a year.

The Contractor must advise the Engineer 5 Days prior to a programmed clean, so that business owners can be informed.

All steps shall be taken so shop entrances (under doorways) are not flooded during operations.

16.5 General

16.5.1 Cleaning Standards

The cleaning standard for high profile areas is best described as the standard generally acceptable to the public.

Sweeping and cleaning of low profile pedestrian footpaths will generally be in response to enquiries from the public, from the Engineer, or at the Contractor's initiative following observation or fault finding surveys.

16.5.2 Sweeping and Cleaning Frequency

The Contractor shall carry out its sweeping and cleaning programme in order to achieve an acceptable standard to the public.

16.5.3 Recording and Reporting

The Contractor shall record in RAMM the timing, location and classification of each footpath sweeping and cleaning routine carried out. Where segmental pavers are involved, recording and reporting will include the locking sand re-nourishment carried out, and the location of any missing, broken or dislodged pavers.

16.5.4 Clean Up

The Contractor shall clean up any windows or spillages of collected debris and leave the site in a clean and tidy condition.

17 Vegetation Control – Weedspraying

17.1 Scope

The work to be executed under this Specification consists of the chemical control of "hard surface" vegetation.

The Contractor is advised there are some areas within the network that require Traffic Management in excess of Level 1 requirements. It is up to the Contractor to satisfy themselves of the traffic management requirements to fulfil the obligations under this Contract.

17.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

Section 2	Contract Management and Planning
Section 3	Safety and Temporary Traffic Management
Section 4	Customer Service and Communication
Section 5	Fault Finding
NZS 8904 :2004	Management of Agrichemical
Regional Air Quality Management Plan	Wellington Regional Council publication "Regional Air Quality Management Plan for the Wellington Region" Publication no. WRC/RP-G-00/6 ISBN 0909016747 dated 8 May 2000 The Proposed Natural Resources Plan for the Wellington Region has been notified and therefore must be considered in conjunction with the operative plan.

17.3 Relevant Legislation

This following list sets out legislation, particularly applicable to the Works covered by this Specification. This list is not necessarily comprehensive. It is the Contractor's responsibility to be aware of and comply with all current applicable legislation, standard, codes of practice and their amendments:-

- Local Government Act 2002
- Resource Management Act 1991

- Health and Safety at Work Act 2015
- Health Act 1956
- Biosecurity Act 1993
- Hazardous Substances and New Organisms Act 1996 (HSNO Act)
- Reserves Act 1977
- NZS 8409:2004 Management of Agrichemical
- Electricity (Hazards from Trees) Regulations 2003
- Greater Wellington Regional Council Air Quality Management Plan
- Greater Wellington Regional Council Proposed Natural Resources Plan
- EPA Approval for the Chemicals used.

17.4 Areas to be Weedsprayed

The following specifies the extent of hard surface weedspraying in the Contract Area:-

- Hard surface weedspraying shall be carried out in the Contract Area on all roads, footpaths, service lanes, pedestrian access paths, kerbs and channels, watertables, accessways and car parks including residential and shopping areas and rural areas
- For berm areas, weedspraying will be carried out at the base of poles, road signs, EMPs, and berm structures but only where it is evident that householders are not keeping these areas trimmed
- Weedspraying along footpaths will be undertaken to eliminate growth in joints or cracks or grass/weeds encroaching onto the path
- Weedspraying along the edge of footpaths, kerbs or banks will only be undertaken if the householder is not maintaining/beautifying the site. Utmost care shall be taken not to damage planting and maintenance undertaken by residents
- For pedestrian access paths, weedspraying will be along the adjoining fence lines, entrance barriers and in the pathway, as necessary to control growth
- When weedspraying along fence lines, care must be exercised to ensure no damage is caused to adjoining properties
- In water tables and roadside channels, weedspraying shall be carried out to prevent growth from impeding water flow, including spraying culvert outlet/inlet area to a length of 3m
- Spraying of bridges, structures, guardrails, and sightrails within the confines of the road reserve, including embankments and walls

- Spraying of lichen on carriageways or footpaths, where instructed

17.5 Extent of Weedspraying Areas

The extent of weedspraying for each of the asset types is as follows:-

Asset Type	Extent of Weedspraying
Roads, Service Lanes and passing and parking bays which are incorporated in the road (These may be sealed or unsealed).	The full width of the paved surface, and a control zone extending 300mm from both edges or to the adjacent assets, whichever is closer. (Except for rural road fence lines adjacent to farms, where an uncontrolled strip of at least 150mm is required on the road side of the fence.) Control zone of 500mm along unsealed shoulders of carriageways Traffic islands, which includes the raised border adjacent to the road and hard surfaces between the borders Constructed kerb and channels (including sump tops), and 300mm control zone alongside the kerb, or to adjacent asset, whichever is closer. This includes the top of kerb to stop grass overhanging the kerb, and directly in front of the channel to ensure no growth at the seal join Marker Posts, Sign Posts, Poles, guardrails, and sightrails adjacent to roads, including a control zone of 300mm around each post.
Water tables (water channels next to roads, which are usually not sealed or concreted), including culverts.	This includes the full width of the water table and a control zone of 300mm each side or to the adjacent asset whichever is closer. Culvert inlet/outlet areas shall be sprayed to a length of 3m and around sightrails.
Footpaths adjacent to roads, pedestrian accessways, access paths	The full width of the asset, and a control zone extending 300mm from both edges and including any storm water drains, or to adjacent assets whichever is closer. Adjacent marker posts, sign posts, and handrail posts, including a control zone of 300mm around each post.

Asset Type	Extent of Weedspraying
Banks adjacent to roads, footpaths, water tables, car parks.	A control zone of 300mm up banks alongside water tables. A control zone of 300mm up banks alongside constructed footpaths or kerbs, in addition to the control zone of those assets. Note that a higher control zone up banks is required where necessary to stop overhanging growth obstructing an adjacent asset, or to control unwanted growth or plant type.
Off street car parks	All sealed, unsealed or paved surfaces of the parking area Adjacent footpaths Kerb and channels Control zone up to 300mm adjacent to assets only where necessary to control rank weed growth.

It is noted that Kāpiti Coast has Kikuyu grass prominent in a number of areas and spraying needs to be effective to ensure there is no encroachment of grass onto sealed areas, pedestrian areas, overhanging kerbs/channels, and into the road corridor. Kikuyu grass is to be correctly contained from growing over footpaths and roads. Current footpath and road width is to be maintained and spraying should be programmed after programmed roadside vegetation trimming.

17.6 Materials

The Contractor will select herbicides for application in accordance with the current industry Guidelines. Herbicides shall only be used for their approved purpose. Chemicals are to be disposed of in accordance with the Safety Data Sheet, HSNO Act and NZS 8904:2004.

The following herbicides are pre-approved for use in this Contract:

Trade Name	Use
G2, Roundup, Re-new, Glyphosate 360 etc. (Active Ingredient 36% Glyphosate)	For the use of general weed control
Escort (Active Ingredient 60% Metsulfuron)	For the control of noxious weeds as listed where the retention of grass species (in close proximity) is not an issue
Pulse (Active Ingredient Organo Silicone penetrate)	For use as a wetting agent

17.7 Dilution and Mixing

No water can be drawn from hydrants.

The drawing of water must take place at the Contractor's depot where the Contractor has in place precautions to ensure "cross connection" cannot occur. A permit can be issued to allow water to be drawn at Council Depots.

17.8 Regulatory Requirements

The Contractor shall comply with the requirements of the NZS 8409:2004 and any subsequent amendments with regard to:-

- Maintaining a daily log book
- Cleanliness and appearance of Contractor's vehicles
- Storage and disposal of chemicals
- Application methods
- Complying with manufacturer's recommendations; and
- Qualification

The Contractor shall comply with the Wellington Regional Council's requirements for Land Based Application of Agrichemical Sprays and Powders which are contained in the "Regional Air Quality Management Plan for the Wellington Region". The Contractor responsible for weedspraying must hold a Registered Chemical Applicator's Growsafe Certificate and all employees spraying in these areas must hold a current Growsafe Standard Certificate.

Note that compliance also includes public notification of the weed control work by the Contractor according to circumstances.

17.9 Preparation

Generally hard surface weedspraying areas will require little preparation in advance of spraying. However, at times it will be prudent to close crop vegetation prior to spraying, principally to avoid unsightly dead stalks after the spray has become effective.

17.10Frequency

The Contractor shall do three sprays over all roads, footpaths, carparks, service lanes, accessways at the times specified below:

Spring spray –November/December

Summer spray – January/February

Autumn spray – May/June

It is expected that three sprays per annum will be effective in killing unwanted growth throughout the district.

Once the Contractor commences a weedspraying round it shall ensure it has adequate resources available to continue the round to completion without undue breaks.

If the Contractor fails to achieve control, the Engineer may require the uncontrolled area to be resprayed at the Contractor's cost, within 10 Working Days of the request.

17.11 Noxious Weed Round

The Contractor shall undertake an annual spray of noxious and pest plants on the road reserve and in particular blackberry, gorse, lupin, pampas, Japanese honeysuckle, banana passionfruit, convolvulus, blue morning glory, English ivy, periwinkle, tutsan, montbretia, buddleia, Himalayan honeysuckle, barberry, bamboo, wilding pines, and agapanthas (unless being maintained by property owner).

This shall be carried out before blackberry is fruiting, around December.

17.12 No Spray Zone

A list of sites where residents have accepted responsibility to maintain the vegetation adjacent their properties is included in Appendix 4.

The Contractor shall not spray vegetation outside these properties, unless instructed by the property owner or instructed by the Engineer.

17.13 Spraying Signage

In addition to and in reinforcement of the Wellington Regional Council's requirements for land based application of Agrichemicals Sprays and Powders, the following will apply:-

- All public areas, other than on roads and service lanes where weed control is carried out shall be signposted for a minimum of 12 hours immediately after application
- The Contractor shall be responsible for supplying the signs, erecting them and their retrieval.
- Signs shall be located generally as follows:-
    - For car parks - at entrances
    - For road reserve areas - at public access points.

The Contractor shall ensure that the signs are retrieved within 24 hours after application.

When weedspraying is being carried out on or alongside public roads, vehicles associated with the treatment shall display prominent signs (front and back) advising treatment is in progress.

Additionally, an advertisement will be placed in the Kāpiti Observer 2 Working Days prior to work commencement.

17.14Vegetation Conditions and Weather

It is the Contractor's responsibility to continually monitor vegetation conditions and weather when spraying.

Weedspraying shall not commence when conditions will not meet the manufacturer's recommended conditions (e.g. target plant moisture content, dust, rain, wind) or when weather will result in undue chemical drift or run-off.

No weedspraying shall be undertaken when wind speed exceeds 10 knots (19 kph), or under conditions that may cause spray drift.

Weedspraying shall not be carried out adjacent to schools, kindergartens, playgrounds or similar places when children are in the grounds. The Contractor shall also programme work to avoid times when children are on their way to and from schools and kindergartens.

The Contractor shall at all times take into account likely public demand and conditions that may prevail at peak periods, and programme and execute the works accordingly. The Engineer reserves the right to restrict certain activities to defined periods outside of peak times, including timing around public events.

17.15Methods of Application

The choice of plant and equipment to be used for weedspraying rests with the Contractor. The plant and equipment chosen shall be purpose built, fit for purpose, code compliant, and appropriately licensed. Plant and equipment used in built up areas shall be appropriately silenced.

The method of application to be used for weedspraying shall be via direct application, such as wet spray methods.

Any method of control is subject to all appropriate precautionary measures (in accordance with best industry practice) being taken in the interest of safety to persons and plantings. For example, to confine herbicide to the target area at the lowest effective concentration the Contractor may consider using foam jet nozzles and/or other similar products.

In the event of any uncertainty over product or equipment use, or what is an appropriate control method at any site, the Contractor shall seek the advice of the Engineer. The Engineer's decision shall be binding.

17.16Standards

Within 2 months of vegetation spraying, all weeds in the target area shall be either dead or in an advanced stage of dying, from which they will not recover.

17.17Care of Public

The Contractor shall ensure that the public is provided with protected access past the spraying process at all times.

The Contractor shall ensure company identification is evident, including signage stating "Weedspraying" on all vehicles and will be responsible for investigating and resolving public complaints directly.

17.18Clean up

The Contractor shall clean up any spillages of sprays, wetting agents or dyes, and shall remove all signage on completion of the works.

18 Vegetation Control – Cutting

18.1 Scope

The work to be executed under this Specification consists of the control of general vegetation by cutting and trimming.

The work includes general growth control along road and pedestrian networks. Work may include manual and mechanised mowing, trimming, pruning, mulching, raking, clean-up and disposal of vegetation. The objective is:

- To provide safe access for vehicles and pedestrians along the travelled route
- To provide unimpeded line of sight for motorists, pedestrians and other users of the road and pedestrian networks
- To remove fallen trees and branches within the road corridor

18.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ C/21: 1997	Vegetation Control

18.3 Resources

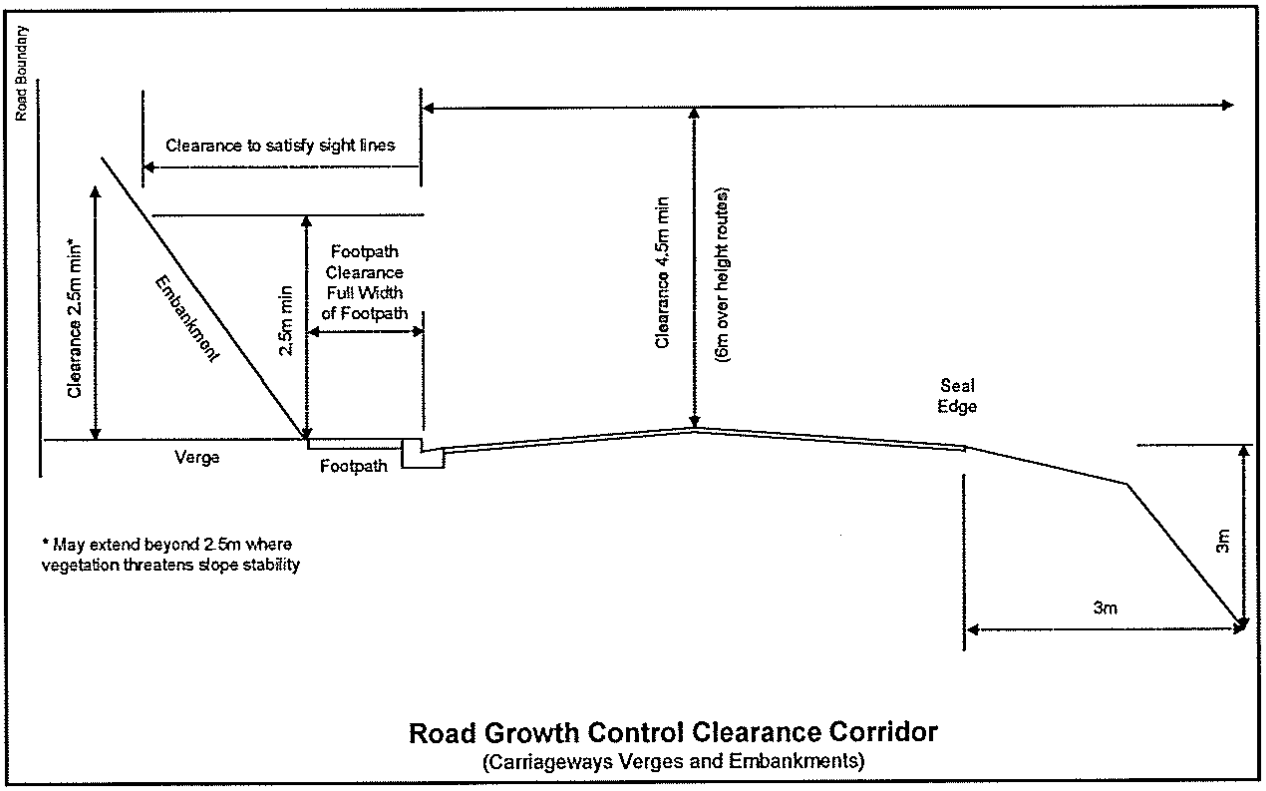
The extent of work includes road side mowing of all roads listed in the Schedule of Rural Roads contained in Appendix 4, and all other vegetation trimming to ensure no vegetation intrudes into the specified envelope.

The Contractor shall supply all necessary plant and equipment to fulfil the vegetation cutting and trimming requirements of this contract. This includes a range of heavy and light plant including tractor mounted flail mowers for rural and urban embankment moving, mulchers/chippers, trucks and trailers etc. plus all hand help equipment such as chainsaws, scrub bars, line trimmers etc.

The Contractor's personnel shall be suitably qualified and experienced to perform the tasks required of the contract. All personal protective equipment, barriers and signs etc. shall be provided and used to ensure each activity is carried out safely, without incident, personal injury or damage to property.

18.4 Vegetation Control Envelope

The Contractor shall maintain trimming envelopes as follows (refer Diagram below):



Rural areas- The envelope to be kept clear of all vegetation is defined as being bounded by line 2m from the outside edge of the carriageway or edge line, and 4.5m above the road surface. Where the roadside fence is closer than 2m to the edge of the carriageway, the envelope will only extend as far as the fence, although vegetation behind guardrails, sightrails and bridge rails shall be maintained 2m from the carriageway or structure. Where vegetation has previously been cleared, or requires clearing, further than 2m from the road to provide sight lines around the inside of curves, or at intersections, this area is to be included in the envelope.

Urban areas - The envelope to be kept clear of all vegetation is defined as being bounded by the line of the back of the footpath or driveway, or 2m behind the kerb, whichever is greater, and 4.5m above the road surface and 2.5m above the berm. In addition, no vegetation is to be allowed to block light from streetlights falling on any paved or concreted area.

General Requirements - The Contractor must ensure that sight lines are maintained. This may require the Contractor to cut vegetation outside of the specified vegetation envelope.

No vegetation shall be allowed to grow above 0.5m above the ground level within the envelope defined above (rural only), at any time.

The maximum height of freshly trimmed vegetation within the specified envelopes shall not exceed 50mm above the ground surface.

No trees and shrubs shall be allowed to intrude into the specified envelopes, or to block light from streetlights from falling on any paved or concreted surface.

Specimen trees within the envelope may be allowed to remain at the Engineer's discretion. Where trimming is required it shall be undertaken under the direct control of a qualified arborist.

All vegetation is to be cut cleanly. Any branches that are not cut cleanly on the first cut are to be sawn off at the extent of any splitting.

All trimmed vegetation shall be picked up, removed from site and disposed of at the Contractor's expense.

All equipment shall be fitted with spark arresters and operated in a manner that will minimise the risk of starting a fire.

Growth Clearance around Road Signs/Street Signs/Traffic Signals-The Contractor shall remove growth around road/street signs and traffic signals so that Road Signs and Traffic Controls are clearly visible from the following distances:

Operating Speed (km/hr.)	Visibility Distance (m)
50	70
60	90
70	110
90	150
100	170

18.5 Treatment of Stumps

Where the Contractor is required to treat tree stumps they shall be stumped to 100mm of ground level. Tree species shall be treated one part Garson to 20 parts Diesel, or other appropriate recognised stump control method. The mixture shall contain Land mark dye so treated stumps can be identified.

18.6 No Cut Zone

A list of sites where residents have accepted responsibility to maintain the vegetation adjacent their properties is included in Appendix 4

The Contractor shall not cut vegetation outside these properties, unless instructed by the Engineer.

18.7 Care of Public Assets

The Contractor shall ensure that the public is provided with protected access past the vegetation cutting activities at all times. Both the people and property shall be protected from any materials thrown from flail mowers or other such cutting or trimming equipment.

The Contractor shall also be aware of utility services such as surface mounted power cables, gas, water, stormwater, and sewer mains or laterals. Any damage to these utilities caused by operations of the Contractor shall be the Contractor's responsibility.

18.8 Standards

The Contractor shall ensure clearances are maintained at all times to the specified standards. Rural verges / berms are to be cut generally four to six times per year to maintain vegetation heights that comply with the Specification.

The Contractor shall ensure that detritus from mowing or trimming operations is cleared from surface water channels and does not block culverts or stormwater structures.

18.9 Recording and Reporting

The Contractor shall record and report in RAMM the location of all vegetation cutting jobs to facilitate auditing and monthly payments, and update job status.

18.10 Clean-up

The Contractor shall leave each vegetation cut and trimming site in a clean and tidy condition. This includes the removal of any litter that may have been exposed by the vegetation cutting. Any cut vegetation and litter that can be removed, shall be disposed of at an appropriate disposal facility.

19 Digout Repairs

19.1 Scope

The work to be executed under this Specification consists of the supply of materials and construction of localised pavement repairs. Rotomilling and removal of asphaltic concrete are covered by separate specifications.

The extent of work includes, but is not limited to:

- Inspecting the network to identify failed areas, marking the area, and recording in RAMM.
- Logging profile of existing road at the perimeter of the excavation and loading into RAMM
- Complete CBR testing on subgrade and recording in RAMM.
- Establishing the most cost effective method of repair.
- Prioritising and programming repair.
- Reinstating road markings.
- Update records in RAMM upon completion of works.

All digout repairs must be approved by the Engineer prior to work being undertaken.

All digouts are to be resurfaced the same day and not left unsealed overnight unless approved by the Engineer.

19.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/12/2006	Digouts
TNZ M/4:2004	Basecourse Aggregate
TNZ F/07:2003	Geotextiles
TNZ B/2:2005	Construction of Unbound Granular Pavement Layers
TNZ P/12:2000	Specification for Pavement Marking
Section 1	Asphaltic Concrete Paving (Maintenance)
Section 10	Chipsealing (Maintenance)

Section 30	Installation of Subsoil Drains
Section 43	Service Cover Adjustment and Replacement
Austroads NZ Supplement 2007	Pavement Design – A Guide to the Structural Design of Road Pavements NZ Supplement

19.3 Design

The Contractor shall undertake the repair of surface defects using the procedures and methods as described in TNZ HM/12 as modified by this Specification.

Where required the design of pavement repairs shall be carried out using Austroads NZ Supplement 2007.

The Contractor shall ascertain and record the reason(s) for the failure occurring and ensure that the repair method is appropriate to the specific circumstance. This shall include undertaking CBR testing of the subgrade using the Scala penetrometer method or approved alternative and photographing and logging the pavement layers. All data shall be loaded into RAMM.

19.4 Materials

19.4.1 Basecourse

AP40 basecourse shall comply with the requirements of TNZ M/04.

19.4.2 Asphaltic Concrete

Asphaltic concrete shall comply with Section 1.

19.4.3 Geotextiles

Geotextiles shall comply with TNZ F/07 and be approved by the Engineer.

19.5 Construction (Sealed Pavements)

19.5.1 Excavation

Where excavations are likely to coincide with underground services, the Contractor shall check for cables using cable locators, and dig exploratory holes to accurately determine service locations following marking out by the relevant service authority.

Edges shall be sawcut to a depth of 100mm or to the depth of the excavation whichever is lesser. Ragged edges will not be permitted.

Excavation shall be carried out to the depth stated on the appropriate dispatch. The excavation must be sloped to provide improved support for the vertical joint. Where the Contractor encounters any soft spot, lean mix concrete or concrete, the Engineer shall be notified immediately, to determine whether additional depth is required, including use of geotextiles. Where approved by the Engineer in writing the Contractor shall excavate the 'soft spot' to the depth agreed. Where the depth of excavation is deeper than 300mm, approval must sought by the Engineer before

commencing. Concrete or lean mix concrete shall not be excavated without specific approval in writing from the Engineer.

The subgrade shall have a CBR value of no less than 10. Should the subgrade CBR be less than 15, then further treatment such as undercutting to an overall depth of 500mm, geotextile fabric or insitu stabilisation may be required, as directed by the Engineer.

The presence of excess ground water shall be brought to the Engineer's attention. At the request of the Engineer, subsoil drainage shall be installed in accordance with Section 30.

The excavation shall be cleaned of all loose material. The bond between the adjacent sealed surface and the existing material outside the repair area shall not be disturbed. The sides of the excavation are to slope slightly inwards and the bottom of the digout is to slope parallel to the road surface camber.

Where required by the dispatch the subgrade shall be inspected and approved by the Engineer prior to backfilling.

19.5.2 Backfilling

Where approved by the Engineer, lay subsoil drains, slope subgrade towards the outer pavement edge and compact subgrade.

Where required, adjust service covers to suit proposed carriageway profiles. Alteration of service covers shall be carried out in accordance with Section 43.

Basecourse complying with TNZ M/04 shall be placed in layers of uniform thickness not exceeding 100mm and compacted in accordance with TNZ B/2 to provide dense stable layers that do not weave or creep under the action of construction equipment or road traffic.

Where directed by the Engineer, the M/04 basecourse shall be stabilised with up to 2.5% cement.

Where the prepared surface cannot be sealed immediately, and will be exposed to traffic, with the approval of the Engineer, the Contractor may use bitumen bound basecourse.

Compaction of backfill shall be such that either a minimum of 7 blows per 50mm of penetration on a Scala Penetrometer or a minimum Clegg Hammer reading of 35 is achieved. Results shall be uploaded to RAMM.

The finished surface of the basecourse is to have a smooth mosaic finish that is free from deleterious matter with a tightly bound surface.

19.5.3 Surfacing

Surfacing of digouts shall be carried out using either asphaltic concrete or chipseal. Where the Engineer required the final surface to be chipseal it shall be notified to the Contractor.

The Contractor shall achieve a surface finish which is consistent both geometrically and texturally with the surrounding pavement.

Asphaltic concrete surfacing shall be in accordance with Section 9, Asphaltic Concrete Paving (Maintenance).

All joints shall be bandaged sealed with an approved rubberised sealant.

All completed digouts shall be waterproof, with an emulsion and grade 5 chip applied prior to surfacing, with any loose chip swept up and removed prior to sealing.

Chipseal surfacing shall be in accordance with Section 10, Chipsealing (Maintenance).

All loose chip must be removed prior to the reinstatement of roadmarkings. All roadmarkings must be reinstated and lose chip must be completely removed from site prior to the removal of temporary traffic control.

All roadmarkings must be reinstated in accordance with P/12:2000 within 48 hours of completing the first coat seal, or when required the second coat seal. All RRPMs are required within 72 hours of completing the sealing requirements.

No alligator cracking, scabbing, stripping or flushing shall result from the repair. Any unsatisfactory work will be required to be re-done at the Contractor's expense.

19.6 Construction (Unsealed Pavements)

19.6.1 Excavation

Where excavations are likely to coincide with underground services, the Contractor shall check for cables using cable locators, and dig exploratory holes to accurately determine service locations following marking out by the relevant service authority.

Excavation shall be carried out to the depth stated on the appropriate dispatch. The excavation must be sloped to provide improved support for the vertical joint. Where the Contractor encounters any soft spot, lean mix concrete or concrete, the Engineer shall be notified immediately, to determine whether additional depth is required, including use of geotextiles. Where approved by the Engineer in writing the Contractor shall excavate the 'soft spot' to the depth agreed. Where the depth of excavation is deeper than 300mm, approval must sought by the Engineer before commencing. Concrete or lean mix concrete shall not be excavated without specific approval in writing from the Engineer.

The subgrade shall have a CBR value of no less than 10. Should the subgrade CBR be less than 15, then further treatment such as undercutting to an overall depth of 500mm, geotextile fabric or insitu stabilisation may be required, as directed by the Engineer.

The presence of excess ground water shall be brought to the Engineer's attention. At the request of the Engineer, subsoil drainage shall be installed in accordance with Section 30.

The excavation shall be cleaned of all loose material. The bond between the adjacent sealed surface and the existing material outside the repair area shall not be disturbed. The sides of the excavation are to slope slightly inwards and the bottom of the digout is to slope parallel to the road surface camber.

Where required by the dispatch the subgrade shall be inspected and approved by the Engineer prior to backfilling.

19.6.2 Backfilling

Where approved by the Engineer, lay subsoil drains, slope subgrade towards the outer pavement edge and compact subgrade.

Where required, adjust service covers to suit proposed carriageway profiles. Alteration of service covers shall be carried out in accordance with Section 43.

Basecourse complying with TNZ M/04 shall be placed in layers of uniform thickness not exceeding 100mm and compacted in accordance with TNZ B/2 to provide dense stable layers that do not weave or creep under the action of construction equipment or road traffic.

Where directed by the Engineer, the M/04 basecourse shall be stabilised with up to 2.5% cement.

Compaction of backfill shall be such that either a minimum of 7 blows per 50mm of penetration on a Scala Penetrometer or a minimum Clegg Hammer reading of 35 is achieved.

The finished surface of the basecourse is to have a smooth mosaic finish that is free from deleterious matter with a tightly bound surface.

On completion the finished surface of the repair shall match the general profile of the adjacent surface such that it does not allow water to pond and so it matches the adjacent surface, including reinstatement of bunds and watertables.

19.7 Clean up

On completion of the repair, the site shall be left in a clean and tidy condition. The affected area around the repair shall be swept clean. All waste material shall be removed from site and disposed of.

19.8 Records

All quality assurance records, pavement layer log, and subgrade test results must be uploaded onto RAMM at the completion of the repair.

20 Permanent Repair of Potholes

20.1 Scope

The work to be executed under this Specification consists of the permanent repair of potholes in sealed surfaces.

20.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/19:2006	Potholes
TNZ M/04:2004	Basecourse Aggregate
Section 1	Asphaltic Concrete Paving (Maintenance)
Section 10	Chipsealing (Maintenance)
Section 43	Service Cover Adjustment and Replacement

20.3 Design

The Contractor shall undertake the repair of surface defects using the procedures and methods as described in TNZ HM/19 as modified by this Specification.

20.4 Materials

20.4.1 Basecourse

AP40 basecourse shall comply with the requirements of TNZ M/04.

20.4.2 Asphaltic Concrete

Asphaltic concrete shall comply with Section 1.

20.4.3 Plant Mix

Cold mix or Plant mix can only be used as a temporary repair, at the Contractor's expense. Asphalt is required as a permanent repair.

20.5 Definition

A pothole in a **sealed** road is:

- Where surface attrition has occurred over an area exceeding 70mm in diameter but not exceeding 1m^2 in area and the basecourse aggregate is exposed, or where the defect exceeds 30mm in depth in structural asphaltic concrete, or

- Where surface attrition has occurred over an area exceeding 70mm in diameter, but not exceeding 1m² in area and the underlying pavement is exposed, or
- Any area around a service cover that has become loose or lost material, or
- A pothole that has been temporarily patched.

20.6 Inspections

All roads are to be inspected for potholes as per Section 5.

20.7 Response Times

Response times shall meet the requirements of Section 1. It is expected that as a minimum, a weekly pothole run will be completed to achieve the required response times.

20.8 Construction

20.8.1 Preparation

Any temporary patching material, and any distressed material in the immediate area surrounding the pothole shall be excavated. Excavated material shall be removed from site and disposed of.

In paved areas the sides of the excavation shall be trimmed as near as possible to vertical while avoiding damage to the adjacent pavement. All loose and fractured material shall be removed.

In chip sealed areas where the basecourse is exposed the sides of the excavation shall be trimmed to a battered slope. Excavation shall be to a firm base with all loose material removed.

The excavation of the repair area shall be carried out in such a manner that the integrity of the adjacent surfaces is not disturbed.

If the pothole is situated in a large distressed section of pavement the Contractor shall carry out a temporary repair of the pothole but mark out and programme the distressed area for a digout repair.

20.8.2 Service Covers

Any service covers within the works area shall be left accessible, adjusted and repainted in accordance with Section 43.

20.8.3 Backfilling

The Contractor is responsible for selecting the method of backfilling the pothole.

When making this selection the Contractor shall ensure the pothole is built up with material similar to the underlying material and in sealed pavements topped off with a minimum 30mm asphaltic concrete complying with Section 9. Joints shall be sealed immediately after paving with a bitumen and dune sand bandage. Any cracks within 500mm of the pothole shall also be sealed with a similar bandage.

Where the Contractor wishes to use alternative materials the written approval of the Engineer shall be obtained prior to incorporating them into the Contract Works.

The finished surface of the repair shall be flush and match the general profile of the adjacent surfaces, have no sharp edges and shall not pond water.

20.8.4 Roadmarkings

All roadmarkings are to be reinstated within 48 hours

20.9 Records

Each pothole shall be recorded in RAMM and quality assurance records uploaded onto RAMM.

21 Hand Shape Correction

21.1 Scope

The work to be executed under this Specification consists of the supply of materials and hand shape correction of carriageway surfaces with asphaltic concrete.

21.2 References

Standard Specifications are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

Section 9	Asphaltic Concrete Paving (Maintenance)

21.3 Materials

21.3.1 Asphalt

Asphalt shall comply with the requirements of Section 9

21.4 Construction

21.4.1 Paving

Hand shape correction shall be carried out in accordance this Specification with particular care being given to the sand sealing of any joints with the adjacent surfaces. A tack coat of 0.3 l/m^2 shall be applied prior to applying asphaltic concrete.

No alligator cracking, scabbing, stripping or flushing shall result from the repair. Any unsatisfactory work will be required to be re-done at the Contractor's expense.

21.4.2 Tolerances

The tolerances for surface finish for the hand shape correction, shall be ±8mm for level at a point, and 5mm departure from a 3m straightedge or template in any direction. In addition the surface shall not pond water.

The edges of the hand shaping shall not exceed 5mm where Mix 6 is used, or 8mm where Mix DG7 is used. Mix 6 shall only be used on the carriageway upon written instruction from the Engineer.

21.4.3 Roadmarkings

All roadmarkings are to be reinstated within 48 hours

21.4.4 Clean-up

On completion of the shape correction, the site shall be left in a clean and tidy condition. The affected area surrounding the works shall be swept clean. All waste material shall be removed from site and disposed of.

22 Rotomilling

22.1 Scope

The work to be executed under this Specification consists of the supply of materials, rotomilling and reinstatement of the carriageway surface.

22.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

Section 9	Asphaltic Concrete Paving (Maintenance)
Section 43	Service Cover Adjustment and Replacement
Sections 55	Asphaltic Concrete Paving (Resurfacing)

22.3 Materials

22.3.1 Asphaltic Concrete

Asphaltic Concrete shall comply with Section 9 or Section 54 depending on the area.

22.4 Construction

22.4.1 Equipment

Rotomill

The rotomill shall be an industry standard automatic pavement profiling machine which has been specifically designed for this purpose.

The profiler shall be fitted with an appropriate means of cutting depth control capable of cutting asphaltic concrete to a depth of 50mm in one pass.

Sweeping Equipment

Mechanical or suction brooms used for sweeping operations shall have adequate means for dust suppression.

22.4.2 Rotomilling

The Contractor shall rotomill the existing surface to the nominated depth.

Longitudinal grades shall follow the general grade of existing channels or other grades as specified by the Engineer.

Transverse levels shall generally be determined by the specification of a final pavement crossfall.

22.4.3 Surface Finish

The milled surface shall be uniform in texture, appearance and general finish. Irregularities not securely bonded to the underlying pavement layer shall be removed. Tracks left by the cutting teeth shall not vary in depth by more than 5mm.

The milled surface shall be swept clean of all loose material.

The depth of the cut shall be within $\pm$ 5mm of the specified depth.

22.4.4 Temporary Ramps

Prior to opening the milled surface to traffic and at the completion of each day's milling or where it is proposed to leave the surface unpaved the Contractor shall construct temporary ramps on to the milled surface and around service covers. The ramps shall have a minimum length of 500mm and shall be constructed with approved asphaltic concrete or coldmix and shall be adequately compacted.

22.4.5 Reinstatement of Surface

Where required reinstatement of the surface shall be carried out to either Section 9 or Sections 55, depending on the area.

All service covers shall be adjusted in accordance with Section 43.

22.4.6 Clean up

On completion of the works, the site shall be left in a clean and tidy condition. The affected area around the works shall be swept clean. All waste material shall be removed from side and disposed of.

23 Permanent Repair of Edgebreak

23.1 Scope

The work to be executed under this Specification consists of the permanent repair of edgebreak in sealed surfaced.

23.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/14	Edgebreaks
TNZ M/04:2004	Basecourse Aggregate
Section 1	Asphaltic Concrete Paving (Maintenance)
Section 10	Chipsealing (Maintenance)

23.3 Design

The Contractor shall undertake the repair of surface defects using the procedures and methods as described in TNZ HM/14 as modified by this Specification.

23.4 Materials

23.4.1 Basecourse

AP40 basecourse shall comply with the requirements of TNZ M/04.

23.4.2 Asphaltic Concrete

Asphaltic Concrete shall comply with Section 1.

23.4.3 Chipseal

Chipseal shall comply with Section 10.

23.5 Definition

An edgebreak is where:

- The edge of the carriageway is fretting or breaking away such that seal loss encroaches into the carriageway by more than 100mm from the nominal seal edge.
- Surface attrition has occurred adjacent to a channel over an area exceeding 70mm wide and 100mm in length.

Generally, edgebreaks formed at the entrance to properties without kerb and channel/dish channel are the property owner's responsibility. The Engineer may however instruct it to be repaired.

Note that temporary edgebreak repairs may have been carried out previously using a coldmix patch. The temporary repair is considered a holding measure only. It does not eliminate the edgebreak.

23.6 Construction

23.6.1 Preparation

The area immediately surrounding the edgebreak shall be excavated to remove distressed and temporary patch material.

In asphaltic concrete areas the sides of the excavation shall be trimmed as near as possibly to vertical while avoiding damage to the adjacent pavement. All loose and fractured material shall be removed.

In chipsealed areas where the basecourse is exposed the sides of the excavation shall be trimmed to a battered slope. Excavation shall be to the required depth with all loose material removed.

The excavation of the repair area shall be carried out in such a manner that the integrity of the adjacent surfaces is not disturbed.

The Contractor must ensure that the edge of the repair forms a consistent line with the adjoining sections of carriageway.

23.6.2 Backfilling

The Contractor is responsible for selecting the method of back filling the edgebreak.

As a general principle, the edgebreak shall be built up with material similar to the underlying material with a surfacing that matches the adjacent surfacing.

Where the surfacing is asphaltic concrete the edgebreak repair will include a minimum 30mm of asphaltic concrete that complies with Section 00. Joints shall be sand sealed.

Where the repair is being surfaced with a chipseal there will be an overlap of 100mm onto the existing seal. An appropriate tack coat shall be used.

Where the Contractor wishes to use alternative materials they shall obtain written approval from the Engineer prior to incorporating them into the works.

All loose chip must be removed prior to reinstatement of roadmarkings. All roadmarkings must be reinstated and lose chip must be completely removed from site prior to the removal of temporary traffic control.

The finished surface of the repair shall be flush with the adjacent pavement, have the same profile and crossfall, have no sharp edges or lips and shall not pond water pond on the surface.

23.6.3 Roadmarkings

All roadmarkings are required within 48 hours of surfacing. All RRPMs are required within 72 hours of completing the sealing requirements

23.6.4 Clean up

On completion of the edgebreak repair, the site shall be left in a clean and tidy condition. The affected area around the repair shall be swept clean. All waste material shall be removed from site and disposed of.

24 Crack Sealing

24.1 Scope

The work to be executed under this Specification consists of the supply of materials and crack sealing of pavement.

24.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/11:2006	Surfacing's
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

24.3 Definitions

- Alligator Cracking - also known as chicken wire or block cracking, and includes all polygon shaped cracking, irrespective of the size of the polygon.
- Isolated Cracking - includes all longitudinal, transverse and diagonal cracks.
- Slippage Cracks - occur in thin asphaltic concrete surfacing. They are usually crescent shaped and point in the direction of the thrust of the wheels on the pavement.

24.4 Design

The Contractor shall undertake the repair of surface defects using the procedures and methods as described in TNZ HM/11 as modified by this Specification.

24.4.1 Bandage Type Crack Sealing

Bandage type crack sealing shall be used where the proposed resurfacing is a chipseal.

After filling the crack with sealant, a 75mm ± 10mm width and 4mm ±1mm thick bandage seal shall be applied on top of the crack as shown below.

24.5 Materials

24.5.1 Crack filler

Crack filler shall comply with the requirements of ASTM D6690.

24.5.2 Sand

The sand used for blinding the sealed cracks shall be washed, clean, sharp and comply with the following grading.

Sieve Size	% Passing
4.75mm	100
2.36mm	75-80
1.18mm	40-45
600µm	10-15
300µm	5-10
150µm	0-5

24.6 Construction

The Contractor shall pay particular attention to:

- crack filling so that it is completed to a sufficient width to ensure that the crack is fully covered with sealing product.
- ensure that the final surface texture matches the existing and that no bleeding or flushing occurs during the Contract period.

24.6.1 Bandage Type Crack Sealing

The Contractor shall thoroughly clean the crack and the adjacent pavement using appropriate pressure cleaning prior to filling the crack.

Where required by the manufacturer of the crack filler an appropriate primer shall be applied to all surfaces prior to the application of the crack filler.

The crack shall be filled with a hot pour crack filler, extending either side of the crack to form a 75mm wide bandage 4mm thick.

An evenly spread layer of blinding sand shall be applied over the completed bandage.

24.6.2 Clean up

On completion of the repair, the site shall be left in a clean and tidy condition. The affect area around the repair shall be swept clean. All waste material shall be removed from site and disposed of.

25 Waterblasting of Carriageway

25.1 Scope

The work to be executed under this Specification consists of the supply of materials and waterblasting of carriageways to restore texture.

25.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ T/03:1981	Texture by the Sand Circle Method Measurements
TNZ P/12: 2000	Pavement Marking
TNZ P/14:1995	Raised Pavement Markers Installation
TNZ P/26:2003	Improvement of Macrotexture by Use of High Pressure Water and Grooving

25.3 Definitions

Where there are flushing and bleeding surface defects waterblasting can be used as a treatment. Flushing and bleeding are defined as excessive binder rise resulting in reduced skid resistance, generally along wheel tracks.

25.4 Plant and Materials

The plant used for waterblasting shall be capable of effectively removing excess binder from the carriageway without compromising the stability of the existing surface. It is anticipated that water pressures in the order of 140 – 275 MPa (20,000 – 40,000 PSI) will be required to carry out the work.

The Contractor shall select the most appropriate pressure for each site such that the performance criteria are met and the there is no damage or lifting of the seal. Lifting of the seal shall be repaired at the Contractor cost.

25.5 Construction

25.5.1 Performance Criteria

Surfaces that have been treated by waterblasting shall exhibit an end result texture that complies with TNZ P/26.

The minimum level of testing required to determine the texture depth of the retextured sites will be as described by the standard test procedure for measurement of texture by sand circle method TNZ

T/03. A minimum of one test per 50m² of waterblasting shall be carried out by the Contractor and reported to the Engineer.

25.5.2 Containment of Contaminants

The Contractor shall ensure that contaminants and water generated by the operation, are adequately contained, collected, removed from site and properly disposed of at an approved facility. This includes, but is not limited to the removal from channels of all material that is contaminated by the water used for bitumen removal.

The Contractor shall not permit any contaminants or contaminated water to enter the stormwater system.

25.5.3 Water Recycling

Where possible, a water recycling unit should be provided so that minimal water is used and is able to be recycled.

25.5.4 Removal of Waste Material

The Contractor shall remove and dispose of all waste materials from the site upon completion of each day's work and leave the site in a clean and tidy condition. This will be at the Contractor's cost.

25.5.5 Roadmarking

Where any repair is carried out under this Specification that removes or damages any roadmarking the Contractor shall offset or otherwise record the location of and replace the roadmarking in accordance with TNZ P/12 or TNZ P/14 as appropriate.

All roadmarking shall be replaced within 48 hours of the completion of waterblasting.

26 Bridge Maintenance

26.1 Scope

The work to be executed under this Specification consists of undertaking superficial inspections on an annual basis or after significant storm events as defined in the TNZ Bridge Inspection and Maintenance Manual.

26.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

Bridge Manual	TNZ Bridge Inspection and Maintenance Manual
NZTA S6:2017	Bridges and other significant highway structures inspection policy
AS 2082:2007	Timber - Hardwood - Visually stress-graded for structural purposes
NZS 3640:2003	Chemical preservation of round and sawn timber

26.3 Definition

For the purposes of this contract the term “bridges” shall include all pedestrian bridge structures and culverts in the network that have a waterway area greater than 3.4 m^2 or walls higher than 1.5m. All culverts meeting this criteria are listed in the bridge inventory in Appendix 5.

26.4 Extent of Work

The extent of work includes both routine bridge and nominated structures maintenance and includes but is not limited to:

- Inspection of bridges at least once per year and after significant storm events, reporting maintenance required, and recording maintenance activities in RAMM.
- Prioritising and programming of work.
- Completing all maintenance work.
- Updating RAMM records upon completion of work.
- Execution of routine bridge maintenance works including removal of debris, maintenance of decks, maintenance of handrails, guardrails, wheel guards and the like and routine waterway maintenance including the removal of any build-up of debris within 10m of the upstream or downstream sides of the bridge.

- Routine cleaning of reflective end marker posts and sight boards.
- Cleaning of loose metal and debris from bridge decks.
- Cleaning of bridge drainage systems.
- Replacement of reflective end posts and sight boards.

Structural maintenance is specifically excluded.

26.4.1 Routine Cleaning

All bridges shall be cleaned at least once per year.

Routine cleaning consists of:

- Cleaning decks of metal and other debris.
- Cleaning drainage systems to a standard which allows the unobstructed flow of stormwater.
- Cleaning handrails, guardrails, kerb rails, sight rails to remove all dirt, moss and lichen to a standard typically achieved by a water blaster.
- Cleaning bridge end reflectors.
- Removing vegetation from overhanging the structure, from obscuring sight rails, end posts, and signs.

26.5 Technical Standards

The technical standards shall be as defined in the TNZ Bridge Inspection and Maintenance Manual and NZTA S6:2017 or as modified by this Specification. In particular the Contractor shall ensure:

- Any issues relating to safety, bridge end markers, delineation or handrails shall be addressed as a priority.
- That the superficial inspections are undertaken after any significant storm events in accordance with the procedures in the manual for superficial inspections and that these inspections are appropriately recorded.
- That the Engineer is notified immediately of any structural fault that the inspections may have identified.
- That where timber is used, it is either:

  For Bearers and Decking Planks:

  Hardwood meeting the requirements of AS 2082:2000 or No. 1 framing grade Radiata pine, preservative treated to NZS 3640:2003 H3 for above ground and H4 in below ground situations.

  For Guardrails, Handrails, Wheelguards and Running Deck:

No. 1 framing grade Radiata pine, preservation treated to NZS 3640:2003 H3. Timber shall be rough sawn and chamfered as required.

- That all timber is continuously separated from other materials using a layer of two ply bituminous sheet damp proof course (Malthoid or equivalent).
- All deck planks including running deck planks shall be kept secured at all times to ensure they do not move.
- That any minor build-up of debris including scrub and trees in the waterway immediately under the bridge and around piers and abutment piles is removed. All material removed shall be disposed of away from the bridge site. The contract also includes the removal of large trees and other material built up or lodged on or around piers. A need to organise clearance of any large build-ups of vegetation or silt shall be brought to the attention of the Engineer immediately.
- Any other observations made by the Contractor, such as scouring and undermining of piers, abutments, etc., shall also be brought to the attention of the Engineer.
- All vegetation growing around the bridge structure shall be kept cut back for 5m from any bridge member.

26.6 Instructed Works

All bridges are inspected for structural integrity by others. There will be some work generated through these inspections that will instructed through the Road Maintenance Contract, at rates agreed by both parties or scheduled rates if applicable. If rates cannot be agreed, work will go out for tender.

26.7 Annual Inspection

All bridges (includes culverts greater than 3.4 m^2 and retaining walls > 1.5m high) shall be inspected annually and a report on each structure outlining routine work completed, with any work completed uploaded to the asset, and an asset condition assessment provided to the Engineer. Pocket RAMM, and RAMM Assessment shall be used for this Work.

Minor works shall be completed at the time of inspection, including clearing drainage etc, which shall be allowed for in the monthly rate.

Culvert marker numbering shall be re-marked at the time of the annual inspection and included in the annual culvert inspection/clean monthly rate.

27 Kerb and Channel

27.1 Scope

The work to be executed under this Specification consists of the supply of materials and reconstruction of kerb and/or channel and installation of new kerb and/or channel of various profiles.

27.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ M/04:2004	Basecourse Aggregate
Section 1	Asphaltic Concrete Paving (Maintenance)
Section 11	Concrete Construction
Section 19	Digout Repairs
Section 30	Installation of Subsoil Drains
Section 35	Footpath Repairs and Reconstruction
Section 51	Pedestrian Kerb Ramps
Drawing KCDC-RD-001	Standard Kerb and Channel Details
Drawing KCDC-RD-006 and 007	Residential and Heavy Duty Vehicle Crossings

27.3 Design

27.3.1 Types of Kerb and Channel

The types of kerb and channel detailed in this Specification are as follows:

- Machine extruded (slip form) including:
    - Kerb and channel
    - Mountable kerb and channel
    - Kerb only

    - Dish channel

- Boxing formwork including:
    - Kerb and channel
    - Mountable kerb and channel
    - Kerb only
    - Channel only
    - Dish channel

Kerb and/or channel shall be laid at a minimum grade of 1:200 unless determined otherwise and notified to the Contractor by the Engineer in writing.

An asphaltic concrete channel can be used as an alternative, upon instruction by the Engineer.

27.3.2 Pedestrian Ramps at Intersections

At intersections the new kerb shall be lowered to provide pedestrian ramps complying with the requirements of Section 51. The position of the ramp shall be determined in consultation with the Engineer.

27.3.3 Matching Adjacent Levels

Where the kerb and/or channel is being raised or re-laid particular care shall be taken to ensure that the new level is set such that water will flow from the adjacent carriageway into the channel. Under no circumstances will water be permitted to flow parallel to the kerb and/or channel before reaching the channel.

27.4 Materials

27.4.1 Concrete

Concrete shall comply with the requirements of Section 11.

27.4.2 Basecourse

AP40 basecourse shall comply with the requirements of TNZ M/04.

27.4.3 Asphalt

Asphaltic concrete shall comply with the requirements of Section 1.

27.4.4 Footpath

Footpath shall comply with the requirements of Section 35.

27.4.5 Subsoil Drain

Subsoil drains shall comply with the requirements of Section 30.

27.5 Construction

27.5.1 Excavation and Subbase Preparation

Where excavations are likely to coincide with underground services, the Contractor shall check with cable locators and dig exploratory holes to accurately determine service locations following marking out by the relevant service authority.

From time to time the Contractor will encounter cases where a service has been cast into the base of the existing kerb and/or channel. Where this occurs the Contractor shall carefully remove the existing concrete without causing damage to the service.

Edges shall be sawcut to a depth of 100mm or to the depth of the excavation whichever is the lesser. Ragged edges will not be permitted.

Excavation behind the kerb shall extend a minimum 200mm behind the back of the kerb to a nominal depth of 450mm below the carriageway.

Whenever the existing channel is to be removed, the carriageway in front of the channel lip shall be excavated a minimum width of 600mm to a nominal depth of 450mm. The Contractor shall only excavate enough material to ensure that the required depth of basecourse is achieved under the new kerb and/or channel. If the existing basecourse beneath the new works proves to be sound then it shall be trimmed and dressed with a minimum 100mm compacted depth of new basecourse to bring it to level of the underside of the new concrete works.

The existing basecourse or subbase (if the full depth is excavated) shall be compacted such that either a minimum of 7 blows per 50mm of penetration on a Scala penetrometer or a minimum Clegg hammer reading of 30 is achieved.

The tolerances for surface finish for the subgrade shall be $\pm$10mm for level at a point, and 8mm departure for a 3m straightedge or template in any direction. In addition the surface shall not pond water.

Where the Contractor encounters any soft spot they shall immediately notify the Engineer. Where approved by the Engineer in writing the Contract shall excavate the soft spot to the depth agreed with the Engineer.

All waste material, including any old kerb and channel shall be removed from the site and disposed of.

27.5.2 Base Preparation

The kerb and/or channel base shall be formed by placing and compacting a 200mm minimum layer of AP40 basecourse complying with the requirements of TNZ M/04.

Compaction shall be such that either a minimum of 7 blows per 50mm of penetration on a Scala penetrometer or a minimum Clegg hammer reading of 30 is achieved. All test results shall be loaded into RAMM against the asset.

The tolerances for surface finish for the subgrade shall be ±10mm for level at a point, and 8mm departure for a 3m straightedge or template in any direction. In addition the surface shall not pond water.

The finished surface of the basecourse shall have a smooth mosaic finish that is free from deleterious matter with a tightly bound surface and shall be at a level such that the kerb and/or channel can be constructed to the required levels.

Where requested by the Engineer and where the new kerb and/or channel exceeds 10m in length and passes or ends at a sump the Contractor shall install a 100mm socked perforated pipe on the subbase ensuring that it flows to a sump.

27.5.3 Placing and Finishing

Extruded Kerb and Channel, Kerb Only, Mountable Kerb and Channel and Dish Channel

The profile to be extruded shall be selected by the Engineer and shall be formed using a suitable kerbing machine with a mould of the required profile for the production of continuous cast in situ kerb and/or channel.

The machine shall be capable of producing tight dense concrete and shall lay 5mm minimum thickness plaster coating on the exposed surfaces of the kerb and/or channel. The tolerances and finish shall comply with the requirements of Section 11.

Where required vehicular crossings and pedestrian ramps shall be formed in the kerb by lowering the kerb height prior to the concrete setting. Kerb outlets/stormwater connections shall be inserted in the appropriate places.

Construction joints shall be formed at no more than 6m centres along the new kerb or channel. Crack induced joints will not be accepted and will be required to be fixed at the Contractors expense.

The surface shall be protected during the initial set so that the required finish is achieved.

Cast In-situ Kerb and Channel, Kerb only, Dish Channel and Channel only

The profile to be constructed shall be selected by the Engineer and shall be formed by using formwork and placing concrete meeting the requirements of Section 11.

Where required vehicular crossings and pedestrian ramps shall be formed in the kerb by lowering the kerb height prior to the concrete setting.

Construction joints shall be formed at no more than 6m centres along the new kerb or channel.

Heavy Duty Kerb and Channel

Heavy duty kerb and channel shall comply with 'Cast In-situ Kerb and Channel, Kerb only, Dish Channel and Channel only' with the inclusion of 1 D12 bar centrally located in the kerb section above the channel.

27.5.4 Reinstatement Works

Reinstatement works abutting existing carriageway and footpaths shall be shaped to form a smooth transition from the new works to the existing surfaces within allowable longitudinal and crossfall gradients.

Once the concrete has set, the basecourse shall be brought up to the level of the underside of the proposed surface layer.

Reinstatement on both sides of the kerb and channel is included in the scheduled rates

27.5.5 Footpath Reinstatement

Reinstatement of the footpath shall be full footpath width unless determined otherwise and notified to the Contractor by the Engineer in writing. The reinstatement shall comply with the requirements of Section 35.

27.5.6 Carriageway Reinstatement

Reinstatement of the carriageway, in front of the channel lip shall comply with the requirements of Section 19, and include an emulsion and G5 chip (rolled and loose chip removed) prior to asphaltic concrete reinstatement.

27.5.7 Asphalt Channel

An asphaltic concrete channel can be constructed as per the above methodology, generally in rural areas or areas without kerb and channel. Asphalt channels are an alternative to concrete and are formed to stop water entering properties, and to channel the flow of water. Asphalt channels are a similar profile to dish channels and sides are formed using compacted M/4 basecourse, with a 40mm asphaltic concrete (and tack coat – 1 litre/ m^2) applied to the unsealed surface.

28 Sump Maintenance

28.1 Scope

The work executed under this Specification consists of the supply of material and repair to existing standard and footpath sumps. All works are to be carried out under the supervision of a registered drainlayer.

28.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/21:2006	Drainage Systems
Section 11	Concrete Construction
Section 12	Mortar
Section 29	Sump Installation
Drawing KCDC-SW-001	Single Standard Sump
Drawing KCDC-SW-002	Double Standard Sump

28.3 Design

The design of pre-cast components for sumps shall comply with the requirements of Drawing KCDC-SW-001 or KCDC-SW-002. Footpath sumps differ from standard sumps in that their grate is smaller and more suitable for pedestrian areas.

28.4 Materials

28.4.1 Precast Units

Precast units shall comply with the requirements of Drawing KCDC-SW-001 or KCDC-SW-002, or for footpath sumps, modified to accommodate the footpath grate and frame.

28.4.2 Concrete

Concrete shall comply with the requirements of Section 11.

28.4.3 Mortar

Mortar shall comply with the requirements of Section 12.

28.5 Construction

28.5.1 Replacement of Entire Sump Tops

Replacement of entire sump tops shall consist of the replacement of the frame, grate, and concrete apron. The components shall be assembled in accordance with Drawing KCDC-SW-001 or KCDC-SW-002, or for footpath sumps, modified to accommodate the footpath grate.

28.5.2 Sump Grates

The Contractor when required to replace a missing sump grate shall first check that the old grate is not in the bottom of the sump or in the nearby location. In the event that a sump grate is located and recovered in a serviceable condition the Contractor shall reinstall the old unit. Reinstallation shall consist of fitting the grate to the frame.

In the event the missing sump grate is unable to be found, is unrecoverable, or damaged beyond repair the Contractor shall replace the missing sump grate ensuring that the new grate fits the existing frame. All new sump grates located on identified cycle routes, or routes known to be popular with cyclists shall be cycle friendly.

Where the Contractor is unable to source a grate to fit the frame arrangements shall be made to have an appropriate grate manufactured. Replacement shall consist of fitting the replacement grate to the frame.

28.5.3 Damaged Aprons

In the event of a damaged apron, the apron must be replaced in order to protect the integrity of the pavement. Removal of the damaged apron must be carried out by saw cutting around the required area and then construction with concrete, ensuring that the shape of the apron complies with Drawing KCDC-SW-001 or KCDC-SW-002 (or for pedestrian area footpath sumps, modified to accommodate the footpath grate and frame) and the concrete with Section 11. Existing serviceable components may be reused.

28.5.4 Broken Frames

Where the existing frame is broken the Contractor shall replace the frame with one that complies with KCDC-SW-001 (or for pedestrian area footpath sumps, modified to accommodate the footpath grate and frame). In order to remove the broken frame the Contractor will need to remove the existing concrete apron and construct a new apron that complies with Section 11 and Drawing KCDC-SW-001 or KCDC-SW-002 (or for pedestrian area footpath sumps, modified to accommodate the footpath grate and frame). Existing serviceable components may be reused.

28.5.5 Overflow Kerbs

Where the existing overflow kerb is to be replaced it shall be replaced with a new precast unit that complies with Drawing KCDC-SW-001 or KCDC-SW-002 in such a manner that it is true to line and level and all joints are neatly mortared to the existing sump top and the adjacent kerb and channel.

28.5.6 Damaged Sump Floors and/or Walls

Where replacement of the sump floor is required to maintain waterproofness of the sump the Contractor shall carefully remove the existing floor ensuring that sufficient material is removed to allow the new floor to key in at least 50mm under the walls.

The new floor shall be a minimum of 150mm thick and shall be keyed in under the walls by a minimum of 50mm.

Where the walls of the sump require repair to ensure waterproofness of the sump the damage shall be carefully mortared to provide a smooth surface on the inside of the sump.

Where the sump floor or walls are sufficiently damaged to require replacement of the entire sump written approval from the Engineer is required. The sump replacement is to be carried out in accordance with Section 29. All subsoil drains and sump leads are to be reinstated.

28.5.7 Reinstatement

The surfaces around the Works shall be reinstated to match the existing surface where required. The scheduled rate includes reinstatement of an area 200mm wide.

28.5.8 General

On completion of the work, all flow paths including leads, overflow kerbs and baffle plate undersides shall be checked for blockages. Any concrete spill or other material inhibiting flow shall be removed. All waste material, including but not limited to any old sump grates, concrete and broken frames etc. shall be removed from the site and disposed of at an appropriate disposal facility.

29 Sumps Installation

29.1 Scope

The work executed under this Specification consists of the supply of materials and installation of standard and footpath sumps and sump leads. All works are to be carried out under the supervision of a registered drain layer.

29.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/21:2006	Drainage Systems
Section 11	Concrete Construction
Section 12	Mortar
Section 19	Digout Repairs
Section 30	Installation of Subsoil Drains
Drawing KCDC-SW-001	Single Standard Sump
Drawing KCDC-SW-002	Double Standard Sump

29.3 Materials

29.3.1 Sump Components

Sump Components shall comply with the requirements of Drawing KCDC-SW-001 or KCDC-SW-002. Footpath sumps differ from standard sumps in that their grate is smaller and more suitable for pedestrian areas.

29.3.2 Concrete

Concrete shall comply with the requirements of Section 11.

29.3.3 Mortar

Mortar shall comply with the requirements of Section 12.

29.3.4 Stormwater Leads

Concrete sumps leads, to the correct class as per the manufacturer's specification in relation to available cover, shall be used. Concrete sump leads shall be Class 4.

29.4 Construction

29.4.1 Excavation

Where a sump is to be installed the Contractor is to identify and locate any existing utility services in the area of excavation. In the event that a utility service is encountered, excavation, protection and reinstatement in and around the utility must be handled in accordance with the utility service provider's requirements.

The edges of the area to be excavated, where a paved surface is encountered, shall be saw cut to a depth of 100mm or to the depth of the excavation whichever is the lesser. Ragged edges will not be permitted.

Where the Contractor strikes 'lean mix concrete, or concrete while carrying out the excavation they shall immediately notify the Engineer. Concrete or lean mix concrete shall not be excavated without specific approval in writing.

The excavation shall be cleaned of all loose material. The bond between the adjacent sealed surface and the existing material outside the repair area shall not be disturbed. The sides of the excavation are to slope slightly inwards.

All waste material shall be removed from site and disposed of.

29.4.2 Excess Ground Water

In the event excess ground water is encountered during excavation it shall be brought to the attention of the Engineer. At the request of the Engineer subsoil drainage coil shall be installed in accordance with Section 30.

29.4.3 Sump Installation

The sump shall be a standard street sump, (or footpath sump for pedestrian areas) unless otherwise specified, and be assembled in place on a well compacted foundation to the configurations set out on Drawing KCDC-SW-001 or KCDC-SW-002 (or for footpath sumps, modified to accommodate the footpath grate and frame).

Sumps shall be accurately positioned so that the grate and overflow kerb block fit neatly into the kerb and channel, or other surroundings as appropriate. Sumps shall be set flush and true top grade and alignment with the adjacent kerb and channel or other inflow source. Rectangular pits shall be orientated with the longer side parallel to the kerb and the overflow kerb. All sump components shall be fully supported and sealed with mortar to ensure that the assembled sump is water tight.

Backfilling around the sump shall be carried out in such a manner that the assembled sump does not shift on the foundation. Reinstatement of the pavement around the sump shall comply with Section 19.

29.4.4 Pipe Installation and Connections to Manholes

Sump leads, manholes and connections to sumps/manholes shall be installed to meet the requirements of the Kāpiti Coast District Council Subdivision and Development Principles and Requirements: 2012

A flexible joint shall be allowed for at both connection to the sump and the manhole (within 750mm) if plastic pipes are used, or a flexible joint at the manhole only (within 750mm) of concrete pipes are being used.

Payment for sump leads will be for length installed, not whole pipes.

29.4.5 Clean up

On completion of the work, all flow paths including leads, overflow kerbs and baffle plate undersides shall be checked for blockages. Any concrete spill or other material inhibiting flow shall be removed.

30 Installation of Subsoil Drains

30.1 Scope

The work to be executed under this Specification consists of the supply of materials and construction of subsoil drains.

30.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

NZTA F2:2013	Pipe Subsoil Drain Construction
TNZ F/05:2000	Corrugated Plastic Pipe Subsoil Drain Construction
TNZ F/06:2003	Fabric Wrapped Aggregate Subsoil Drain Construction
TNZ M/04:2004	Basecourse Aggregate

30.3 Design

Subsoil drainage shall be installed to the required line, grade, width and depth as required by the Engineer.

30.4 Materials

All materials used shall comply with the relevant Specifications provided in Section 30.2.

30.5 Construction

30.5.1 Excavation

Wherever subsoil drains are to be installed the Contractor is to identify and locate any existing utility services in the area of excavation. In the event that a utility service is encountered, excavation, protection, and reinstatement in and around the utility must be handled in accordance with the utility service provider's specification.

Where the subsoil drain is not being installed as part of other works the edges of the trench shall be sawcut to the depth of the adjacent surfacing or 100mm whichever is the lesser. Ragged edges will not be permitted.

Excavation shall be carried out to achieve a minimum cover of 600mm. The bottom of the trench shall be to the same grade as the carriageway except where the carriageway grade is less than 1 in

100. Where this occurs the depth of the trench shall be increased so that a grade of 1 in 100 minimum is achieved.

The bottom of the trench shall be constructed so that no localised ponding of water occurs.

All waste material shall be removed from the site and disposed of.

30.5.2 Connections to Sumps and Manholes

Connections to sumps and manholes shall be made by neatly breaking a hole through the wall of the unit and inserting the drain. The end of the drain shall be flush with the inside of the unit wall and the surrounding hole sealed with mortar complying with the requirements in Section 12.

30.5.3 Laying of Pipe

The laying of the pipe shall comply with the relevant Specifications provided in Section 30.2.

30.5.4 Backfilling

Backfilling of the trench shall comply with the relevant Specifications provided in Section 30.2.

30.5.5 Geotextile

Where required by the Engineer a geotextile shall be provided at the interface between the filter material and the adjacent material and shall be wrapped over the filter material with sufficient overlay to prevent ingress of other material.

30.5.6 Clean up

On completion of the works all waste material shall be removed from site and disposed of. The site shall be left in a clean and tidy condition.

31 Stormwater Connections

31.1 Scope

The work to be executed under this Specification consists of the supply of materials and installation of stormwater connections which discharge to the kerb and channel. There are three scenarios covered by this Specification as follows:

- Repairs to existing stormwater connections
- Replacement of existing stormwater connections as a result of footpath reconstruction

Council is moving toward a galvanised steel stormwater pipe (125mm x 75mm x 5mm rectangular hollow section), which will be utilised were possible (new subdivisions, footpath/kerb upgrades etc). Maintenance of existing stormwater connections will continue on a like for like repair basis.

31.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/21: 2006	Drainage Systems
Section 11	Concrete Construction
Section 12	Mortar
Section 35	Footpath Repairs and Reconstruction
Drawing KCDC-RD-012	Stormwater Outlet on Kerb and Channel
AS/NZS 3500.3:2003	Plumbing and Drainage – Stormwater Drainage

31.3 Design

The design of stormwater connections shall be carried out to ensure that the following conditions are met:

- There shall be no backfall on the replaced section
- There shall be no ponding of water on the replaced section

Where replacement back into private property is required, the property owner shall be consulted and agreement reached on the level of reinstatement to the existing surfaces prior to works commencing.

31.4 Materials

31.4.1 Pipe

Rectangular galvanised steel pipe used for new stormwater connections shall have the following properties:

- 125mm x 75mm x 5.0mm wall thickness

75mm or 100mm PVC stormwater (to SN 16) approved pipes shall be utilised for maintenance of existing stormwater connections as agreed with the Engineer.

31.4.2 Outlet Kerb Adapters

Standard approved PVC kerb adapters (round to rectangular) shall be used for kerb outlet stormwater connections when existing pipes are being utilised. The end of the rectangular section shall be cut flush with the face of kerb.

Galvanised rectangular 125mm x 75mm x 5.0mm stormwater pipes will be used when new stormwater connections are being installed. The end of the rectangular section shall be cut flush with the face of kerb.

31.4.3 Fittings

Outlet kerb adaptors shall be used for connection of the rectangular section to existing PVC pipes.

31.4.4 Slot Drains

Slot drains are to be “Arco” type drains or similar

31.4.5 Concrete

Concrete shall comply with the requirements of Section 11.

31.4.6 Mortar

Mortar shall comply with the requirements of Section 12.

31.5 Replacement

31.5.1 Excavation

Where relaying of the stormwater connection requires the Contractor to enter private property for the purposes of relaying the drain they shall obtain the permission of the property owner prior to works commencing

All existing paved surfaces for breakout purposes shall be sawcut to the required depth.

The Contractor shall excavate the existing stormwater connection taking particular care that the pipe is cut neatly either on the boundary or at the back of the existing/proposed footpath and that the replacement pipe will fall to the kerb.

Where the Contractor is unable to achieve fall to the kerb within the distance between the boundary and the kerb, it may be necessary to relay the pipe back into private property.

31.5.2 Installation

The Contractor shall ensure that the new or re-laid pipe does not have backfall. The invert of the pipe at the kerb face shall be the same level as the invert of the kerb channel at the point of exit. Where the Contractor is unable to replace the pipe on the existing line without the pipe back-falling the Engineer shall be contacted for approval to extend the pipe.

The newly laid pipe shall be firmly supported over its entire length before any backfilling is placed around it. Particular attention shall be paid to firmly supporting the pipe in the area behind the kerb.

Siphon type systems shall not be used under any circumstances.

Under no circumstances shall the completed stormwater system hold water.

Installation shall comply with Drawing KCDC-RD-012

31.5.3 Connection to Existing Pipe

Connection to the existing pipe shall be carried out using approved PVC connectors.

31.5.4 Reinstatement Works

The cut kerb around the newly laid pipe shall be carefully and neatly repaired using a 500m long section of concrete complying with Section 11.

The cut footpath around the newly laid pipe shall be reinstated with either asphaltic concrete, or concrete, to match the existing footpath surface. Any trenching in unpaved areas such as grass berms etc, shall be reinstated to match the surrounding finish. The finished site shall be left clean and tidy and all waste shall be removed from site and disposed of.

31.6 Maintenance

31.6.1 Repair of Kerb around Stormwater Outlet

Where repair to the kerb is required at the end of the stormwater outlet, the Contractor shall carefully remove a minimum length of 500mm of kerb to enable the installation of a kerb adaptor.

The new kerb adaptor shall be installed using concrete complying with Section 11

The finished site shall be left clean and tidy and all waste shall be removed from site and disposed of. The pipe and outlet shall be checked and cleared of any residual concrete spillages etc.

31.6.2 Slot Drains

Any slot drains that are damaged should be brought to the Engineers attention for possible replacement.

32 Unsealed Watertables

32.1 Scope

The work to be executed under this Specification consists of the supply of materials and maintenance and construction of unsealed water tables.

32.2 Design

The profile of the unsealed watertable shall be at least 200mm in depth and at least 500mm in width and shall fall to an outfall or culvert.

32.3 Construction

The Contractor shall be note that:

- Surface water channels shall be kept free of detritus and debris at all times.
- Surface water channels shall be uniformly graded and not hold more than 20mm depth of water after rainfall.
- Surface water channels shall be graded to suitable discharge points in such a way that no erosion is initiated nor should there be any threat to the pavement structure.
- All piped vehicle crossings must be cleared so that they do not to hold water. Pipe under the residential vehicle crossings is the property owner's responsibility, unless material from the adjacent Council surface water channel has caused a blockage.
- The Contractor shall note that in a number of areas the surface water channel has been partially filled with drainage metal and/or boulders to address safety concerns. Prior to any drainage maintenance or improvements in such areas the Contractor shall consult with the Engineer and agree on the most appropriate management strategy.

32.3.1 Forming and Maintaining Watertables

Watertables shall be formed and maintained using appropriate mechanical equipment. The invert of the channel shall generally be parallel to the edge of the seal except where it enters a culvert or outfall. The gradient of the invert shall generally follow the gradient of the adjacent edge of seal. Ponding in the watertable should be minimised by avoiding invert flat spots and negative fall.

Unless approved by the Engineer no spreading of material within the road reserve is permitted. All trimmed or excavated material shall be removed from site and disposed of in approved locations, or a landfill facility.

32.3.2 Rock Fill

Where instructed, clean rounded stones (100mm to 200mm grading) shall be placed in the watertable to stop scouring.

33 Road Shoulder Maintenance

33.1 Scope

The work to be executed under this Specification consists of the supply of materials and maintenance of road shoulders. The work required by this section does not include:

a) vegetation control on grassed shoulders
b) chemical control of side slopes and surface water channels
c) improvements to shoulders and surface water channels
d) maintenance of grassed shoulders and swales

The Contractor shall inspect all road shoulders within the Contract, prepare schedules of maintenance including location and priority work in order to meet the response times and submit the schedule to the Engineer.

33.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/16:2006	Shoulder Maintenance

33.3 Maintenance

The Contractor shall be responsible for the maintenance of shoulders on all roads using the procedures and methods as described in TNZ HM/16, as modified by this Specification.

The Contractor shall maintain all road shoulders, side slope and surface water channels (gravel and grassed) within the schedule lengths as follows:

a) all material used whether aggregate or topsoil, shall be an equivalent material.
b) the existing widths and crossfall shall be maintained as agreed with the Engineer.
c) material shall not encroach onto the sealed carriageway at any time except during maintenance operations. Prior to completing maintenance activities all loose material must be removed from sealed surfaces.
d) for vegetated areas (e.g. grassed areas) an even and mowable vegetation cover shall be maintained.
e) high shoulder removal by mechanical means to remove ponding water
f) all maintenance aggregate must be evenly graded aggregate with a maximum size of 40 mm.

Shoulders shall be maintained as follows:

a) shoulder material shall be maintained in an even shape, and where material is added, it shall be compacted using suitable compaction plant. Depth of loose material shall not exceed 20 mm loose depth.
b) shoulders shall be maintained so a build-up of material adjacent to the edge of seal that prevents water draining from the sealed surface does not form.
c) to reduce the long term costs of shoulder maintenance, the Contractor shall allow vegetation growth on existing shoulders. Existing vegetated shoulders must not be removed except to prevent ponding of water on the sealed surface immediately adjacent to the edge of seal.
d) shoulders must have adequate load carrying capacity and material quality equivalent to that of the adjoining carriageway pavement.

34 Stormwater Culverts

34.1 Scope

The work to be executed under this Specification consists of the supply of materials and construction of Stormwater Culverts.

34.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/21:2006	Drainage Systems
Section 19	Digout Repairs
Section 42	Culvert Markers

34.3 Definition

For the purposes of this Specification stormwater culverts are defined as any pipe or structure having a cross sectional area less than 3.4m² primarily designed for the transfer of water from one side of the road to the other.

34.4 Culvert Cleaning

The purpose of culvert cleaning is to ensure unobstructed flow into the culvert, though the culvert and over the first 5m of the culvert inlet/outlet. The activities involved in culvert cleaning include removal of built-up sediment, and any debris or other deposited matter which may impede flow.

The Contractor must ensure that:

- All blockages shall be cleared within the required response times.
- No erosion shall occur as a consequence of a failure on the Contractor's part to maintain stormwater structures.
- No pavement failures shall occur as a consequence of a failure on the Contractor's part to maintain the stormwater structures.
- All culverts shall have at least 90% of their cross sectional area clear at all times and the Contractor shall pay particular attention to culvert entry and exits.
- All structures shall have at least 90% of their cross sectional area clear at all times, including sump tops.

- Culvert markers are maintained and in place.

34.5 Design

The culvert shall:

- Be positioned in such a manner that the discharge will not cause problems for adjacent landowners downstream of the outlet.
- Incorporate an appropriate means of fish passage when collecting or channelling water from a natural watercourse.
- Shall not be perched when collecting of channelling water from a natural watercourse.
- Wherever possible, be laid with a cover of not less than 600mm.
- Have a minimum diameter of 300mm where there is no specific design.
- Have intakes and outlets designed to accept the design flow without scour or erosion of the pipe surrounds.

34.6 Materials

34.6.1 Pipe

Pipe sizes shall comply with the culvert design, be of a suitable size for the upstream catchment and shall be a minimum of 300mm in diameter where there is no specific design.

Concrete culverts will be to the correct class, as per the manufacturers specification in relation to available cover are to used. HDPE pipes shall be to an SN 16 specification, or Farmtuff uPVC (or an approved alternative) may be considered.

Payment for culverts will be for length installed, not whole pipes.

34.7 Construction

34.7.1 Excavation

Where excavations are likely to coincide with underground services, the Contractor shall check with cable detectors and dig exploratory holes to accurately determine service locations following marking out by the relevant service authority.

Edges shall be sawcut to a depth of 100mm of to the depth of the excavation whichever is the lesser. Ragged edges will not be permitted.

Unsuitable material under culverts and drainage structures shall be excavated, removed and backfilled in accordance with the Engineer's instructions.

All waste material including old culverts and associated inlet and outlet structures shall be removed from the site and disposed of.

34.7.2 Pipe Laying

Pipes shall be laid and backfilled in accordance with the NZTA F2 and TNZ F/3, F/05 and F/06 specifications.

34.7.3 Inlet Structures

Where appropriate inlet structures shall be precast units constructed in accordance with manufacturer's specifications.

34.7.4 Outlet Structures

Where appropriate outlet structures shall be precast units constructed in accordance with manufacturer's specifications. Other forms of outlet structure require the approval of the Engineer. Particular care shall be taken to ensure that scour downstream of the culvert is minimised.

A culvert sock may be placed on the pipe outlet upon the Engineers instruction.

34.7.5 Pavement Reinstatement

Pavement reinstatement shall generally be in accordance with Section 19.

34.7.6 Culvert Markers

Installation of Culvert Markers complying with Section 42 is required.

All culverts shall have in place culvert markers numbered as per the RAMM database. A schedule of culverts and culvert markers will be provided to the Contractor upon contract award. Culvert markers shall match existing culvert markers, being light green colour with black numbers. Numbers shall be marked on the culvert marker with a black permanent felt tip marker using a stencil of similar to ensure numbers are clear and tidy.

34.8 Annual Inspection

All stormwater culverts shall be inspected annually and a report on each structure outlining routine work completed, with any work completed uploaded to the asset, and an asset condition assessment provided to the Engineer. Pocket RAMM shall be used for this Work.

Minor works shall be completed at this time, including clearing inlets/outlets of debris up to 0.5m^3, which shall be allowed for in the monthly rate.

Culvert marker numbering shall be re-marked at the time of the annual inspection and included in the annual culvert inspection/clean monthly rate.

35 Footpath Repairs and Reconstruction

35.1 Scope

The work to be executed under this Specification consists of the supply of materials and construction of asphaltic concrete and concrete footpath repairs and reconstruction.

This Specification shall apply to footpaths adjacent carriageways, in accessways, carparks, reserves, and service lanes, with applicable rates in the schedule of prices to apply to all of these areas.

Reinstatement up to 200mm from the Works shall be included in the scheduled rate.

35.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ M/04:2004	Basecourse Aggregate
AS/NZS 1428.4:2009	Design for access and mobility
RTS 14	Guidelines for facilities for blind and vision-impaired pedestrians
Section 1	Asphaltic Concrete Paving (Maintenance)
Section 11	Concrete Construction
Section 30	Installation of Subsoil Drains
Section 31	Stormwater Connections
Section 43	Service Cover Adjustment and Replacement
Section 45	Topsoil and Grass Seed
Drawing KCDC-RD-001	Standard Kerb and Channel Details
Drawing KCDC-RD-002	Footpath Construction

35.3 Design

Footpaths shall comply with Drawing KCDC-RD-002 with allowance for matching and connecting to the adjacent footpath. Final footpath crossfall shall be between 2% and 3.5% towards kerb and channel unless otherwise directed by the Engineer.

For footpaths, pedestrian kerb ramps shall be placed at every intersection unless instructed otherwise by the Engineer. The Engineer will determine whether tactile pavers shall be used.

35.4 Materials

35.4.1 Basecourse

AP20 Basecourse shall comply with the requirements of TNZ M/04.

35.4.2 Asphalt

Asphaltic concrete shall comply with Section 1.

35.4.3 Concrete

Concrete shall comply with Section 11.

35.4.4 Stormwater Connections

Stormwater connections shall comply with Section 31

35.5 Footpath Repair Construction

35.5.1 Excavation

Where excavations are likely to coincide with underground services, the Contractor shall check with cable locators, and dig exploratory holes to accurately determine service locations following marking out by the relevant service authority.

Edges shall be sawcut to a depth of 100mm or to the depth of the excavation whichever is the lesser. Ragged edges will not be permitted.

Excavation shall be carried out to the depth stated on the appropriate dispatch. Where the Contractor encounters any soft spot, concrete, or lean mix concrete the Engineer shall be immediately notified. Where approved by the Engineer in writing the Contractor shall excavate the soft spot to the depth agreed. Concrete or lean mix concrete shall not be excavated without specific approval in writing from the Engineer.

The presence of excess ground water shall be brought to the Engineer's attention. At the request of the Engineer subsoil drainage shall be installed in accordance with Section 30.

Where required the subgrade shall be inspected and approved by the Engineer prior to backfilling.

The existing footpath is to be excavated to a nominal depth of 100mm below the underside of the proposed finished surface level, allowing for placement of the top surface (concrete or asphaltic concrete) to the height of the finished surface level, including but not limited to:

a) Any material required to correct excessive crossfall.

b) Any material required for trimming the area behind the proposed footpath to achieve required contours. For footpaths, these areas shall generally be to a grade suitable for mowing with a domestic mower.

Where in the course of excavation the Contractor determines that the underlying sub-base exposed by the excavation works will not permit the subbase to be compacted to the required standard the Engineer shall be notified of these concerns. Where approved in writing by the Engineer the Contractor shall excavate and replace with basecourse complying with TNZ M/04 such additional material as determined by the Engineer.

Where the existing footpath base is satisfactory, consisting of well graded granular material that can be compacted to the required standard, the existing cross fall is correct and approval in writing has been given by the Engineer, it may be neatly trimmed to a nominal depth of 50mm.

Where the Contractor encounters tree roots in the course of the excavation they shall be neatly cut with a saw and treated with pruning paint.

All growth overhanging the footpath is to be neatly trimmed vertically in line with the back of the footpath to a height off 3m. The Contractor shall liaise with adjacent property owners to confirm trimming the growth prior to commencement.

35.5.2 Backfilling

Where approved by the Engineer, lay subsoil drains, slope subgrade towards the kerb and channel and compact subgrade.

Where required, adjust service covers to suit proposed footpath profiles. Alteration of service covers shall be carried out in accordance with Section 43.

TNZ M/04 basecourse complying with TNZ M/04 shall be placed in layers of uniform thickness not exceeding 100mm and compacted to provide dense stable layers that do not weave or creep under the actions of construction equipment. The basecourse shall be shaped to allow for the extra depth and surface shape at vehicle crossings.

Compaction shall be such that either a minimum of 7 blows per 50mm of penetration on a Scala Penetrometer or a minimum Clegg Hammer reading of 25 is achieved.

The finished surface of the basecourse shall have a smooth mosaic finish that is free from deleterious matter and shall have a tightly bound surface.

35.5.3 Surfacing

Asphaltic Concrete

Surfacing shall be carried out using asphaltic concrete. Asphaltic concrete surfacing shall comply with Section 9. Unless otherwise instructed the asphaltic concrete depth of the footpath shall be 25mm

The finished profile of the asphaltic concrete repairs shall transition smoothly within the permissible longitudinal and crossfall grades towards the abutting surfaces.

A well compacted surface shall be achieved with asphaltic concrete supplied and placed at the correct temperature and methodology, including in accessways. Any unsatisfactory finishes shall be replaced at the Contractors expense.

Concrete

Concrete surfacing shall comply with Section 11. Unless otherwise instructed the concrete depth of the footpath shall be 100mm and the concrete shall be unreinforced.

Where concrete cannot be discharged directly from the mixer to the prepared area, it may be pumped or barrowed. Care needs to be take that any in-transit segregation of the mix is rectified.

The finished profile of the concrete repairs shall transition smoothly within the permissible longitudinal and crossfall grades towards the abutting surfaces.

The concrete surface must have a first class broomed surface finish (U5 finish - NZS 3114: 1987) free of any bony patches.

Transverse construction joints shall be formed in footpaths at intervals not exceeding 4m. Wherever possible crack control joints should line up with adjacent construction joints.

Black oxide must be added to all concrete mixes, over 1 m^3 in volume, at a quantity of 2kg/m^3 to dull the visual appearance of the white concrete unless otherwise specified by the Engineer.

35.5.4 Vertical Displacement (trip hazard)

Where a vertical displacement of more than 10mm exists, the Contractor shall place an asphaltic concrete ramp with a slope of 1:10 to provide a smooth transition between slabs until such time as a permanent repair can be programmed. Rockbond, or similar, will be considered as an alternative but need to be keyed-in.

Grinding can also be used, and the Contractor can programme bulk trip hazards for application of this treatment, with the approval of the Engineer.

35.5.5 Associated Works (Drainage and Retaining)

Associated works may be required, such as dish channels, timber edging, retaining walls, slot drains, etc, and shall be brought to the attention of the Engineer so that agreement by both parties can be reached prior to work commencement.

Steps should be taken to protect surrounding assets such as services, drainage systems, edging, and retaining structures.

35.5.6 Topsoiling

Where required, grassed areas adjacent to the completed footpath or accessway, etc, shall be topsoiled and sown in accordance with Section 45.

35.5.7 Clean-up

On completion of the work the site shall be left in a clean and tidy condition. All excavated material and other waste shall be removed from site and disposed of.

36 Segmental Pavers

36.1 Scope

The work to be executed under this Specification consists of the supply of materials and installation of segmental pavers in footpaths and areas subject to traffic loading.

Reinstatement up to 200mm from the Works shall be included in the scheduled rate.

36.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

AS/NZS 4455.2:2010	Masonry Units, Pavers, Flags and Segmental retaining Wall Units – pavers and flags
NZS 3116:2002	Concrete Segmental and Flagstone Paving
TNZ M/04:2004	Basecourse Aggregates
Section 11	Concrete Construction
Section 30	Installation of Subsoil Drains
Section 31	Stormwater Connections
Section 35	Footpath Repairs and Reconstruction

36.3 Materials

36.3.1 Pavers

Segmental pavers shall comply with the requirements of AS/NZS 4455 or NZS 3116 and shall have a block thickness of not less than 80mm. The colour and shape shall be determined by the Engineer.

36.3.2 Bedding Sand

Bedding sand shall comply with the requirements of NZS 3116.

36.3.3 Joint Filling Sand

Joint filling sand shall comply with the requirements of NZS 3116.

36.3.4 Concrete

Concrete shall comply with the requirements of Section 11.

36.3.5 Subsoil Drainage

Subsoil drains shall comply with the requirements of Section 30.

36.3.6 Stormwater Connections

Stormwater connections shall comply with the requirements of Section 31.

36.4 Construction

36.4.1 Basecourse Preparation

Where segmental pavers are to be used as a trafficked surface the base on which the pavers are to be laid shall be formed by placing and compacting a 200mm minimum layer of AP40 basecourse complying with the requirements of TNZ M/04.

Compaction shall be such that either a minimum of 7 blows per 50mm of penetration on a Scala Penetrometer or a minimum Clegg Hammer reading of 25 is achieved on a footpath, or 35 on a road.

The tolerances for surface finish for the base shall be $\pm$ 10mm for level at a point and 8mm departure from a 3m straight edge or template in any direction. In addition the surface shall not pond.

The finished surface of the basecourse shall have a smooth mosaic finish that is free from detritus matter with a tightly bound surface and shall be at a level such that the sand base and pavers can be constructed to the required levels.

Any subsoil drainage required shall be constructed in accordance with Section 30.

Where segmental pavers are to be used in a footpath or other area not subject to traffic loadings bedding will need to comply with NZS 3116 and Section 35 with appropriate tolerances made for the thickness of the segmental pavers.

36.4.2 Concrete Edging Strips

Where required by the design the Contractor shall construct 100mm wide and 150mm deep concrete edging strips at each end of the area to be paved.

The edging strips shall be reinforced with one D12 reinforcing bar placed centrally within the edging strip.

Longitudinal edging strips, 150mm deep, are to be constructed adjacent to building and other structures at the back of the footpath. The width shall be determined by the requirements to minimise the cutting of blocks.

The edging strips shall be level with the adjacent surfacing with an allowable tolerance of $\pm$ 2mm.

36.4.3 Sand Base

The bedding sand shall be spread to a uniform thickness on top of the prepared basecourse using screed boards, following the final design profile. The depth of the layer shall be such that the average depth after compactions is 30mm.

36.4.4 Laying Segmental Pavers

Where possible, existing pavers shall be cleaned and re-used

Segmental pavers shall be laid progressively in the same pattern as the adjacent pavers, or in a pattern requested by the Engineer. The minimum gap between the units shall be 2mm. The maximum gap allowed between the units or parts of the units shall be 3mm.

36.4.5 Cutting of Segmental Pavers

To maintain the pattern adjacent to other features the Contractor shall neatly cut the segmental pavers using an appropriate method. The gap between the cut edge of the pavers and the adjoining feature shall not be more than 4mm.

36.4.6 Compaction of Segmental Pavers

Following the laying of the segmental pavers, the pavement shall be fully compacted and the segmental pavers brought to design level by not less than two passes of a suitable plate compactor. Compaction shall proceed as closely as possible following the laying and prior to trafficking. A suitable method shall be used to protect the surface and edges of the segmental pavers from damage or chipping caused by the plate compactor.

36.4.7 Joint Filling of Segmental Pavers

Following compaction of the pavement the Contractor shall broom sand over the segmental pavers to ensure that all joints are filled with sand. To ensure maximum filling of the joints, both the joint and the sand shall be as dry as possible when the sand is spread. Excess joint filling sand shall be removed once all the joints are filled.

36.4.8 Reinstatement

Joining to existing pavement shall ensure a smooth and even transition (within the permissible longitudinal and crossfall gradients) from the new works to the abutting pavement.

Any excavation shall be reinstated to match the surrounding surface.

On completion of the work, all waste material shall be removed from site and disposed of. The site shall be left in a clean and tidy condition.

37 Batter boards and Timber Edging

37.1 Scope

The work to be executed under this Specification consists of the supply of materials and construction of batter boards and timber edges alongside footpaths.

Reinstatement up to 200mm from the Works shall be included in the scheduled rate.

37.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

NZS 3640:2003	Chemical Preservation of Round and Sawn Timber

37.3 Design

Batter boards / retaining walls with a height greater than 500mm will require specific design to ensure that they are fit for purpose.

37.4 Materials

37.4.1 Posts and Pegs

Posts shall be 100mm x 100mm Number 1 Framing Grade H5 treated Pinus Radiata. Batter board pegs shall be H5 treated Pinus Radiata.

37.4.2 Batter boards

Batter boards shall be either Number 1 Framing Grade 50mm x 200mm or Number 1 Framing Grade 50mm x 150mm or Number 1 Framing Grade 50mm x 100mm H5 treated Pinus Radiata. The scheduled rate shall be applied in multiples of 100mm.

37.4.3 Timber Edge Pegs

Timber edge pegs shall be 50mm x 50mm x 300mm H5 treated Pinus Radiata

37.4.4 Timber Edge

Timber edge shall be 100mm x 25mm H5 treated Pinus Radiata

37.4.5 Hardware and Fixings

All fittings and fixings shall be 304 Grade stainless steel

37.5 Construction

37.5.1 Batter boards / Retaining walls

Maintenance of batter boards shall be carried out on a “like for like” basis. If the repair required is as a result of foundation failure, the Engineer shall be informed, and the repairs shall be as directed by the Engineer.

All new construction shall be approved by the Engineer.

Posts shall be firmly embedded into original ground to at least 1.8 times the depth of the material to be supported. Typically the replacement post shall be embedded in a 300mm (min) diameter hole. Posts shall be set into the hole using rammed AP20 basecourse complying with the requirements of TNZ M/04. The basecourse shall extend for the bottom of the hole to 300mm from the surface. The top 300mm of the hole shall be filled with concrete complying with Section 11.

Post spacing shall not exceed 2m.

Batter boards shall be installed in such a manner that the top of the batter board is between 25mm and 50mm above and parallel to the adjacent surface.

37.5.2 Timber Edge

A timber edge shall be constructed along the edge of the footpath, or accessway etc., where support of the new surface is required.

The timber edge shall be flush with the paving and shall be supported at not less than 1.5m intervals with timber edge pegs. Joints shall only be made at posts.

37.5.3 Clean-up and Reinstatement

On completion of the work, all waste material shall be removed from site and disposed of. The site shall be left in a clean and tidy condition and surfaces reinstated to match the surface prior to work commencing.

38 Guardrails, End Terminals, and Wire Rope Posts

38.1 Scope

The work to be executed under this Specification consists of the supply, delivery, assembly and installation of the materials required and the work necessary to maintain AASHTO G4 Type W-Beam Road Safety Barrier Systems.

38.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/17:2006	Barrier Repairs
NZTA M23:2009	Road Safety Barrier Systems
TNZ M/17P:1989	W-Section Bridge Guardrail
AS/NZS 3845:1999	Road Safety Barrier Systems

38.3 Materials

Materials used in the installation of G4 W-Beam Road Safety Barrier Systems shall comply with the requirements of AS/NZ 3845 and NZTA M23.

38.4 End Terminals

Leading end terminals shall be a CSP X-350 system complete, with trailing end terminals a BCT type system. Both systems shall meet manufacturers specifications.

38.5 Wire Rope Posts

Wire rope replacement posts shall be either part of a CSP Brifen Wire Rope Safety Barrier or a CSP Armorwire Cable Barrier System. Damaged posts are to be replaced to manufacturers specifications.

38.6 Design

The design of road safety barrier systems shall comply with NZTA M23 and TNZ M/17P.

38.7 Maintenance

Routine maintenance shall include painting (usually leading/trailing ends only) where applicable to maintain the asset in a clean tidy condition free of loose flaking paint, dirt, grime and graffiti.

The Contractor shall meet the following criteria:

- No guardrails are horizontally misaligned by more than 300mm or with more than 10m of continuous damage at any one location or cable support posts damaged for longer than five Days. All damage shall be reported to the Engineer immediately.
- All guardrails shall be thoroughly cleaned once each year.
- Maintenance shall include the removal or painting over of graffiti.

38.8 Construction

Installation of road safety barrier systems shall be carried out in accordance with the requirements of AS/NZS 3845 and the manufacturer's requirements.

39 Sight Rails

39.1 Scope

The work to be executed under this Specification consists of the supply of materials and maintenance/replacement of timber sight rails.

39.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

RTS 5	Guidelines for Rural Road Marking and Delineation
TNZ C/20:2003	Erection and Maintenance of Traffic Signs, Chevrons, Markers & Sight Rails
Section 11	Concrete Construction

39.3 Definition

Sight rails in the context of this Specification comprise of the posts and rails.

39.4 Design

Sight rails shall be designed and laid out in accordance with RTS 5 and TNZ C/20 and in particular the taper, delineation and distance from the pavement edge. It should be noted that RTS 5 discourages the use of sight rails over other methods of delineation.

Particular care is required to ensure the timber used and the layout complies with the standard specification.

39.5 Sign Rail Requirements

Rails are to be continuous along the length of the sight rail.

Sight rails must have adequate strength and rigidity and comply with RTS 5 and TNZ C/20.

39.6 Materials

All materials shall comply with TNZ C/20.

Paint shall be a white acrylic and shall be a propriety product suited to the intended application.

39.7 Construction

39.7.1 Excavation of Post Holes

Where excavations are likely to coincide with underground services, the Contractor shall check using a cable locator and dig exploratory holes to accurately determine service locations following marking out by the relevant service authority.

39.7.2 Setting of Posts

For maintenance work, replacement posts shall be installed on a like for like basis.

The setting of posts shall comply with RTS 5 and TNZ C/20.

All new sight rail installations, and maintenance works associated with failure of the existing foundation, will require details of the support system (post embedment/bolted connections etc.) to be approved by the Engineer.

39.7.3 Fitting of Rails

Rails shall be fitted in the configurations as set out in RTS 5 and TNZ C/20.

39.7.4 Painting

All exposed timber shall be primed and then painted with 2 coats of white acrylic paint in accordance with the manufacturer's instructions.

39.7.5 Inspection, Maintenance, Reporting

All sight rails are to be inspected once every two years and painted with a moss retardant paint. 50% of the sight rails shall be inspected and painted each year.

The Contractor shall use Pocket RAMM for recording the inspection, condition assessment, work completed on each sight rail and progress against programme.

39.7.6 Clean up

On completion of the handrail work, all waste material shall be removed from site and disposed of. The site shall be left in a clean and tidy condition.

40 Signs

40.1 Scope

This Specification covers the inspection, installation, maintenance, night conspiquity survey and replacement of all traffic signs and supports owned by the Principal, on its streets, carparks, accessways, reserves, and service lanes.

The extent of work shall include, but not be limited to, the inspection, prioritising and programming, of the repair and maintenance of traffic signs. The objective is to provide a consistent uniform standard of regulatory, permanent warning, advisory and amenity signage.

The Works will generally comprise the following:-

- Inspection of all signs to identify signs requiring repairs or replacement.
- The Contractor shall be proactive identifying faults and carrying out repairs and shall not wait for an SR to be sent. No additional payment wil be made for attending SR's.
- Repairs to, replacement and the remounting of any and all damaged signs and supports (including foundations and sockets where appropriate)
- Removing illegal roadside signage as directed by the Engineer (and store for 3 months)
- Supply and installation of the appropriate traffic signs as directed by the Engineer
- Cleaning all signs

40.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

Traffic Control Devices Rule 2004	Traffic Control Devices Rule 2004 and amendments
TCD Manual	Traffic Control Device Manual
MOTSAM	NZTA Manual of Traffic Signs and Markings
RTS 2	Guidelines for street name signs
TNZ C/20:2003	Erection and Maintenance of Traffic Signs, Chevrons, Markers & Sight Rails
TNZ P/24:2008	Traffic Signs Performance based specification

RSMA Compliance Standard for Traffic Signs	Road Safety Manufacturer's Association Compliance Standard for Traffic Signs
Section 2	Contract Management and Planning
Section 3	Safety and Temporary Traffic Management
Section 4	Customer Service and Communication
Section 5	Fault Finding
Section 46	Callout Response
AS/NZS 1906 :part 1 – 2017, part 4 - 2010	Retro Reflective Materials and Devices for Road Traffic Control Purposes
NZ 3640:2011	Chemical preservation of round and sawn timber
Drawing KCDC-RD-013	Street Signs
Drawing KCDC-RD-014	Regulatory Traffic Signs
Drawing KCDC-RD-015	Street Name Plate Specifications

All work under this Specification shall comply with the relevant Standard Specifications, Acts, Guidelines, Codes of Practice and the like as modified by this Specification.

40.3 Materials

40.3.1 Traffic Sign Poles

Standard traffic sign poles are to be white 60mm (or 76mm) diameter fluted aluminium poles (grade 6261 T6). All poles are to be fitted with top caps to match the pole colour.

Timber posts shall be building grade or No. 1 framing grade timber, dried to 20-24% moisture content and treated in accordance with NZS 3640 for Hazard Class H4.

The timber posts shall be primed and finished with two coats of high gloss paint for all that is above ground level.

Generally, aluminium poles are used in the urban environment and wooden poles in the rural environment.

Poles / posts higher than 3.25m above ground level supporting signs of area greater than 0.5m^2 are subject to specific design in accordance with RSMA Compliance Standard for Traffic Signs.

40.3.2 Pedestrian Crossing Poles

Pedestrian crossing poles are to be 76mm diameter galvanised mild steel and the exterior polyester powder coated black with 300mm bands of Hi-Intensity white reflective sheeting with 300mm gaps between the bands.

The pole shall be installed so that the top of the pole is 2.4m above ground level.

40.3.3 Sockets

All sockets shall be safety sockets that sit flush with the ground surface.

Sockets are to be aluminium (grade 6261 T6) with a wall thickness of 5.0mm and an internal core bore diameter such that a snug fit is achieved between the socket and pole.

400mm sockets can be used to accommodate short half size poles (for signage on islands etc.), and 600mm sockets for larger full height poles.

Proprietary sign sockets may only be used on instruction, or with written approval, from the Engineer.

40.3.4 Signs

All signs shall comply with the requirements of the Traffic Control Devices Rule 2004 and amendments.

Sign Substrate

All sign substrates shall be manufactured from 2mm 5251 H34 hardness marine grade aluminium sheeting and shall incorporate an appropriate mechanism for attaching the sign to the pole.

The current approved mechanism is Sign Fix or an approved alternative channel. The channel is to end on substrate between 10mm and 40mm from the edge of the substrate and must be riveted to the substrate in such a manner that the rivets do not puncture the reflective sheeting.

Substrates for street nameplates shall be either 2.0mm aluminium incorporating an appropriate mechanism for attaching the sign to the pole or extruded Aluminium I section.

Reflective Sheeting

The reflective sheeting shall be in accordance with the requirements of the Traffic Control Devices Rule 2004 and amendments and shall be either Class 2 (Engineering Grade) or Class 1 (Hi Intensity Grade) retro reflective sign face material as defined in AS/NZ 1906. Where the Traffic Control Devices Rule provides for more than one reflective sheeting type the Contractor shall refer the matter to the Engineer for a decision.

All signs shall be High Intensity reflective, excepting parking signage that will be Engineering Grade reflective.

Reflective sheeting for street nameplates and supplementary shall be High Intensity Grade.

All reflective sheeting shall be applied to substrates by an approved applicator and shall have either a 7 or 10 year warranty and have the manufacturer's details including the date of manufacture and contact details for repair indicated on the reverse side of the sign.

Street Name Plate Dimensions

Component	Road Category	Substrate Height	Substrate Length	Lettering
Street Name Plate	All	225mm	To suit message	120mm upper/lower case series Mod E uncondensed

A maximum length of double sided street name plates shall be 1300mm, otherwise two single sided blades shall be used.

Fittings and Fixings

Signs shall be attached to poles using Sign Fix or an approved alternative bracket(s) or 19mm Sign Fix or an approved alternative banding as appropriate.

All fittings used to support and fix signs to posts or supports shall be stainless steel or aluminium as specified. No fixings, screws or bolts are permitted to penetrate the face of the sign.

For Street Name signs the brackets supplied with the sign shall be either:

- Ended mounted signs - complete with Signfix OSBSGNFX, or equivalent, slide on brackets complete with grub screws.
- Mid mounted signs – complete with Signfix OSBMNZ, or equivalent, slide on brackets complete with grub screws.

All new signs shall include the cost of required brackets/fixings as part of the rate.

40.4 Installation of New Signs

40.4.1 Placement of Poles and Signs

Poles and signs shall be positioned in accordance with the requirements of the Traffic Control Devices Manual and MOTSAM.

The lateral clearance between the edge of the sign and the kerb face shall be a minimum of 300mm. To achieve this, poles shall be located as follows:

a) Signs erected parallel to the kerb and channel shall have their poles placed a minimum of 400mm from the kerb face and, were possible, be placed away from marked angled carparking spaces.

b) Signs erected perpendicular to the kerb and channel shall have their poles placed a minimum of 500mm from the kerb face. Signs can be placed at the back of the footpath when room is available and sightlines are sufficient, with the Engineers approval.

Where the above clearances are unable to be met or where the placement of the pole will unduly obstruct the footpath the matter shall be referred to the Engineer for specific instruction prior to installation. A clear footpath width of 1.0m should be maintained at all times.

40.4.2 Sockets

Sockets shall be set in a minimum 200mm x 200mm x 600mm deep (for 600mm sockets) or 200mm x 200mm x 400mm deep (for 400mm sockets) in-situ 20MPa concrete base with the top of the socket 10mm above the finished surface level (for grub screw sockets) or flush with the surrounding surface (for safety sockets). The edges of all reinstatement shall be saw cut, rectangular and shall match the existing surrounding pavement material in texture, colour, line and level with the exception of poles installed in interlocking block pavements where the surface shall be exposed aggregate concrete.

During installation of the socket the public shall be protected from any protrusion above the surrounding footpath level or uneven surface.

No 15 min rapid set concrete shall be used where expansion/hydration may push up the surrounding surface.

40.4.3 Height of Signs

Signs shall be mounted on either 1.2m (for installation in islands etc.) or longer poles to accommodate the sign size (refer to the Engineer), and shall have a clearance from the ground to the underside of the sign of 2.3m (including any supplementary plates) or 2.5m over a shared pedestrian cycle path unless otherwise instructed .

40.4.4 Size of Signs

Sign sizes shall comply with referenced standards and specifications and be one of the scheduled signs.

40.5 Sign Maintenance

40.5.1 General

This Section of the Specification covers minor and miscellaneous works that may be required from time to time on the signage asset.

All damaged signs shall be replaced with a scheduled size sign, where appropriate, and not with a non-standard sign size or a like for like basis with the existing sign..

19mm signfix, or an approved alternative, strapping only shall be used.

40.5.2 Turn and Tighten

Sign fixings may become loose allowing the sign to rotate or move on the pole. Where this occurs the Contractor shall realign the sign and:

a) Tighten or replace brackets or banding that fixes the sign to the pole, and/or

b) Realign the sign and replace or tighten the wedge/grub screw.

40.5.3 Relocate Sign / Sign and Pole

The Engineer may request the Contractor to relocate an existing sign from one pole to another, or to relocate the pole and sign to another location.

The Contractor shall take care to ensure that the sign and/or pole are not damaged when dismantling, transporting, storing, and reinstalling the sign. Any sign or pole that is damaged by the Contractor shall be replaced at the Contractors cost.

40.5.4 Chemical Wash of Sign and Pole

Cleaning shall be undertaken as required and in accordance with the recommendations in the RSMA Compliance Standard for Traffic Signs 2008. An annual wash of all signs shall be undertaken.

Chemical washing of signs and poles, shall be carried out to the satisfaction of the Engineer. Care shall be taken to ensure that any product or method used will not damage the sign or pole.

Chemical washing shall be done once every two years and include the back of the sign. The Contractor must ensure that products used do not damage the sign, brackets or pole.

40.5.5 Wooden Post Painting

The Contractor must paint all wooden posts with a moss retardant paint once every two years.

40.5.6 Remove Socket of Fixed Pole

Where required the Contractor shall cut the socket or fixed pole below ground level. The resulting hole shall be back filled, compacted, trimmed and resurfaced to match the surrounding pavement surface.

40.5.7 Other Repairs

From time to time it may be possible to repair existing signs without the need to replace them. Such repairs may include straightening of corners, panel beating or replacing directional or large signs panels and tightening of directional or large signs.

All work shall be carried out in a tradesman like manner to bring the sign to an as new condition.

40.5.8 Recycling

Signs, brackets, poles and posts shall be recycled were possible. Where signs are removed, all usable components shall be stored at the Contractors Depot and re-used as appropriate.

40.6 Night Survey

A night survey shall be undertaken annually to visually determine sign reflective conspiquity and effectiveness. The results of the survey shall be reported to the Engineer including when the survey is done for each road. Any signs requiring replacement will be programmed as per Section 2. . This survey is to be completed and reported to the Engineer by 1 October each year. RAMM Patrol shall be used for this purpose.

40.7 Audit

The Engineer shall undertake random audits of signs, EMPs and roadmarkings from time to time to ensure the roads are safe to drive at night.

40.8 Reporting

The Contractor shall submit before/after photos for all repairs completed through RAMM.

41 Edge Marker Posts

41.1 Scope

The work to be executed under this Specification consists the inspection, supply, maintenance, cleaning, reinstatement or replacement of edge marker posts (EMP).

Where damage is caused to edge marker posts by a Subcontractor, for example a vegetation Contractor, the responsibility will fall onto the Contractor to replace the edge marker post.

41.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ C/18:1995	Maintenance of Edge Marker Posts
MOTSAM	Manual of Traffic Signs and Markings
TCD Manual	Traffic Control Devices Manual
RTS 5	Guidelines for Rural Road Marking and Delineation
RSMA Compliance Standard for Traffic Signs 2008	

41.3 Maintenance

The Contractor shall be responsible for the maintenance of edge marker posts using the procedures and methods as set out in TNZ C/18 and the above referred to standards and guidelines, as modified by this Specification irrespective of the ground condition.

The Contractor shall:

- Ensure EMPs comply with the requirements of MOTSAM.
- Clean to remove road grime, salt spray, moss, lichen etc. Cleaning shall be undertaken as required and in accordance with the recommendations in the RSMA Compliance Standard for Traffic Signs 2008 and completed on a two yearly cyclic cleaning programme.
- Ensure that no two consecutive posts are missing at any time.
- Ensure on curves that at least three consecutive posts are visible at night using dipped headlights.

- Install all posts in compliance with the relevant provisions of the Manual of Traffic Signs and Markings and TCD Manual. All old EMPs shall be removed prior to installation of new EMPs.

- Report on cyclic cleaning against programme

41.4 Night Survey

The Contractor shall undertake an annual night survey to visually determine EMP reflective conspiquity, including both front and rear reflectors. This survey is to be completed and reported to the Engineer by 1 October each year.

41.5 Audit

The Engineer shall undertake random audits of Signs, EMPs and roadmarkings from time to time to ensure the roads are safe to drive at night.

42 Culvert Markers

42.1 Scope

The work to be executed under this Specification consists of the supply, installation and maintenance of culvert markers.

42.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

MOTSAM	Manual of Traffic Signs and Markings
TCD Manual	Traffic Control Devices Manual

42.3 Materials

All culverts shall have a culvert marker installed numbered as per the RAMM database.

A schedule of culverts and culvert markers will be provided to the Contractor upon the award of the Contract. Culvert markers shall match the existing culvert markers, being a light green colour with black numbers.

Culvert numbers shall be marked on the culvert marker with a black permanent felt tip marker using a stencil or similar to ensure numbers are clear and tidy.

Culvert Markers shall be checked and cleaned when the annual culvert inspection is undertaken. At that time the culvert numbers shall be remarked.

43 Service Cover Adjustment and Replacement

43.1 Scope

The work to be executed under this Specification consists of the supply of materials, alteration to the level of service covers and reinstatement. The following types of service covers and covered by this Specification:

- Manholes
- Lamp Hole Cleaning Eye
- Fire Hydrants
- Water Valves
- Water Tobies, Manifold Boxes and Water Meter Boxes
- Other Service Covers
- Telecommunication chambers / pits

43.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/15:2006	Service Covers (Maintenance Specification)
KCDC SDP	KCDC Subdivision and Development Principles and Guidelines: 2012
Section 1	Asphalt Concrete Paving (Maintenance)
Section 11	Concrete Construction
Section 21	Hand Shape Correction
Drawing KCDC-CM-004 to 008	Drawings providing details for manholes
Drawing KCDC-WS, WW, SW- various	Drawing providing details for hydrants, inspection holes etc

Service cover adjustment shall be carried in accordance with the references as modified by this Specification.

The Contractor may need to refer to the requirements of the various service cover owners where the service cover is not an asset belonging to the Council.

43.3 Materials

43.3.1 Concrete

Concrete shall comply with the requirements of Section 11.

43.3.2 Covers

New covers (manhole, lamphole cleaning eyes, manifold boxes, hydrant boxes) shall comply with the requirements of the KCDC SDP and the KCDC Standard Drawings.

43.3.3 Other Service Covers

Other service covers shall comply with the requirements of the appropriate service authority.

43.4 Construction

The Contractor shall pay particular attention to:

- Achieving a waterproof interface between the service cover and the surrounding pavement;
- Pavement compaction immediately adjacent to the service cover; and
- Achieving a pavement texture which is consistent with that of the adjacent pavement.

43.4.1 Tolerances

All service covers shall be raised so that they are level with the adjacent surfaces.

Tolerances for surface finish for all service covers shall be as follows:

Work Type	Tolerance
General Maintenance	+2mm ± 2mm
Preseal Preparation	+7mm ± 2mm
Shape Correction	+2mm ± 2mm

Risers and service covers shall be firmly held in place and able to withstand the applied load without further settlement or rocking.

The reinstated pavement shall match the cross fall and texture of the existing pavement. In addition the surface shall not pond water.

Note: If the carriageway surface is depressed in the area immediately adjacent to the service cover the depressed area shall be repaired in accordance with Section 21.

43.4.2 Saw cutting

The pavement around the service cover shall be saw cut to the depth required to remove the existing cover. Saw cutting shall be carried out so that a neat square/rectangle is formed with one edge parallel to the road edge.

43.4.3 Separation of Frames and Centres

The Contractor shall separate service cover frames and centres when they are removed for raising and clean the surfaces between the two.

43.4.4 Cleaning of Keyways

The Contractor shall clean all keyways so that the appropriate cover lifting tools can be used.

43.4.5 Manhole Cover Adjustment and Replacement

Construction methods for raising manhole frames and lids, manhole slabs and manhole walls shall comply with the requirements of KCDC SDP and KCDC Standard Drawings.

All service covers and frames shall be separated when they are removed for raising. Any frames and covers that cannot be separated or are damaged while being separated shall be replaced. Any covers or frames found to be damaged shall be replaced

Where possible, frames shall be raised using precast adjustment rings. Where the lift is less than the height of a precast adjustment ring, packing may be used.

The total amount of packing including any existing packing shall not exceed 100 mm.

Where the amount of packing required would exceed 100 mm, then the frame shall be removed and a precast adjustment ring placed between the frame and the lid. The total amount of adjustment rings between the lid and frame shall not exceed 300 mm.

Where 300 mm of adjustment rings are used, the Engineer may request that a precast riser be used. The lid would then be removed and the walls raised.

Wooden blocks, wedges, compo, homemade concrete blocks, broken masonry (concrete block wall) pieces, or hot-mix shall not be used as packing.

Care shall be taken to ensure that the service is in an operable condition free of spilt concrete and other debris when the Contractor leaves the site.

43.4.6 Lamphole Cleaning Eyes

Construction methods for raising lamphole cleaning eyes shall comply with the requirements of the KCDC SDP and the KCDC Standard Drawings.

Where the block has been or it is intended to be raised by more than 100mm the Contractor shall insert a section of pipe to extend the existing pipe work to the underside of the proposed block position.

Care shall be taken to ensure that the service is in an operable condition when the Contractor leaves the site.

43.4.7 Fire Hydrants

Hydrant surface blocks shall be firmly bedded and accurately positioned and when finished the top surface shall be flush with the surrounding road surface within a tolerance of +2mm ± 2mm.

At least three blocks shall be used in every case, one surface and two bottom blocks. Wood, concrete or bricks shall not be used to make small adjustments in surface levels. If the road is resurfaced then all three blocks are to be removed, bedding raised and the blocks repositioned to the new road level.

Fire hydrants must be exposed as a priority immediately after being covered by the resurfacing operation.

Care shall be taken to ensure that the service is in an operable condition when the Contractor leaves the site.

All fire hydrants shall have their road markings reinstated within 24 hours of raising.

43.4.8 Water Valves

Valve surface blocks shall be firmly bedded and accurately positioned and when finished the top surface shall be flush with the surrounding road surface within a tolerance of +2mm ± 2mm.

At least three blocks shall be used in every case, one surface block and two bottom blocks. Wood, concrete or bricks shall not be used to make small adjustments in surface levels. If the road is resurfaced then all three blocks are to be removed, bedding raised and the blocks positioned to the new road level.

A 150mm piece of PVC pipe shall be inserted in the centre opening of the blocks for easy use of the valve key.

Care shall be taken to ensure that the service is in an operable condition when the Contractor leaves the site.

43.4.9 Water Tobies and Manifold Boxes

Where toby or manifold boxes are damaged the Contractor shall advise KCDC Water Services, before replacing the damaged item.

Existing toby boxes and manifold boxes shall be removed from the ground.

Where toby boxes are raised or replaced, suitable length of 100mm or 125mm diameter PVC pipe is to be inserted over the tap stem ensuring that there is enough clearance for the tap to be turned when the toby box is installed.

Water tobies and manifold boxes shall be firmly bedded and accurately positioned and when finished the top surface shall be flush with the surrounding surface within a tolerance of +2mm ± 2mm.

Care shall be taken to ensure that the service is in an operable condition when the Contractor leaves the site.

43.4.10 Telecommunication Chamber / Pit

The Contractor shall liaise with the respective telecommunication company where work is to be carried out on a telecommunication chamber / pit or other telecommunication assets on the site. Any adjustments to these assets must be done by a contractor certified to do so.

43.4.11 Other Service Covers

Raising of other service covers shall comply with the requirements of the service owner. Care shall be taken to ensure that the service is in an operable condition when the Contractor leaves the site.

43.4.12 Service Covers in Footpaths

Where service covers are being adjusted in footpaths in conjunction with other works such as footpath renewals, and minimal work is required to undertake adjustments, the appropriate footpath service adjustment rate is to apply.

43.5 Clean up

All waste shall be removed from site and disposed of. On completion of the raising, the site shall be left in a clean and tidy condition.

44 Roadmarking, RRPMs, and Fire Hydrant Markings

44.1 Scope

The Work to be executed under this Specification consists of the maintenance and renewal of roadmarking, raised reflective pavement markers (RRPMs), and fire hydrant markings.

44.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ M/07:2009 2017	Road Marking Paints
TNZ M/12:2007	Raised Pavement Markers
TNZ M/20:2003 T12:2013	Long Life Roadmarking Materials
TNZ P/12:2000	Pavement Marking
TNZ P/14:1995 T18:2011	Raised Pavement Marker Installation
TNZ P/22:2006	Reflectorised Pavement Marking
NZTA p33:2017	Coloured Surfacings
NZTA/NZRF T/08:2008	Roadmarking Paint Applicator Testing
NZTA T16:2009	Determination of Retroreflectivity
RTS 4	Guidelines for Flush Medians
RTS 5	Guidelines for Rural Road Marking and Delineation
TCD Rule	Traffic Control Devices Rule
TCD Manual	Traffic Control Devices Manual
MOTSAM	Manual of Traffic Signs and Markings

AS/NZS 2009:2006	Glass Beads for Pavement Marking Materials
New Zealand Roadmarkers Federation Technical Guidelines	

Roadmarking shall be carried in accordance with the references as modified by this Specification.

A valid Certificate of Compliance in accordance with NZTA T/08 is required prior to any work commencement and annually thereafter

44.3 Standards

The Contractor must apply the most current standard of road marking.

Where roadmarking symbols, lettering and lines standards have changed since the pavement was last remarked, the Contractor must apply the most current standard.

44.4 Design

The design and set out of the road markings shall comply with relevant sections of the TCD Manual (soon to supersede MOTSAM) and MOTSAM, Part 2 – Marking.

44.5 Materials

44.5.1 Paint

Road marking paint shall be Class C complying with the requirements of TNZ M/07.

Where instructed by the Engineer to apply Type D beads, they shall conform to AS/NZS 2009 Glass Beads for Pavement Marking Materials.

44.5.2 Long Life Roadmarkings

If requested, long life roadmarking material shall comply with the requirements of TNZ M/20.

44.5.3 Raised Pavement Markers

Raised pavement markers shall comply with the requirements of TNZ M/12.

44.5.4 Coloured Surfacing

Coloured surfacing shall comply with NZTA P33.

Coloured surfacing shall consist of a pigmented polyurethane, epoxy or similar resin, and shall have the specified coloured aggregate broadcast, or entrained in it to act as the wearing course. The product shall have skid resistance at least equal to the adjacent road surface (as measured by the British Pendulum method) and have a life expectancy (able to be demonstrated by trials of from existing jobs) with regard to presence, colour retention and skid resistance of at least 5 years.

44.6 Programming of Works

44.6.1 Road Remarking

Roads that are classified as regional, arterial, and primary collectors will be remarked annually.

All other roads in the network (secondary collectors, access roads, car parks or service lanes) will be remarked every two years. 50% of these markings shall be remarked each year.

Remarking of all hydrants, including painting hydrant lids, yellow triangle, kerb marks, and checking blue RRPM is in place will be completed every two years. 50% of these markings shall be remarked each year.

By September each year, the Engineer will provide the Contractor with:-

- Information setting out the Council's resurfacing programme for the following 12 months
- The road remarking budget for the next 12 months.

The Contractor shall develop an annual programme of remarking to be submitted to the Engineer for approval, based on the above, and the following:-

- Section or corridor consistency (consistent roadmarking retro-reflectivity along main routes). Maintaining corridor consistency may have the effect of either accelerating or delaying the optimal remarking frequency of recently resurfaced and remarked carriageway sections
- Exclusion of lengths for which resurfacing is programmed over the next year, unless instructed otherwise by the Engineer.
- Budget constraints

The Engineer shall review the programme and advise of their acceptance or otherwise. The Engineer's approval of the programme is required before remarking can commence.

Each year the Engineer will review the schedule of roads for remarking. These reviews may result in the promotion of remarking frequency for some roads, and the demotion of remarking frequency for others. This process is expected to continue as traffic patterns and other factors affecting the lifecycle of the markings change. The Contractor will be required to adjust the approved remarking programme to accommodate these changes.

Annual roadmarking, and associated activities, shall only be carried out in favourable weather conditions generally during the period of 1 October to 30 April each year.

44.6.2 Night Survey

The Contractor shall conduct an annual night time survey of the RRPMs to identify where items are missing or have lost their reflectivity. This survey is to be completed and reported to the Engineer by 1 October each year. The programme shall indicate RRPM numbers that require replacement so that alignment with budgets can be achieved.

44.6.3 Roadmarking Response Times

The Contractor shall submit the proposed roadmarking annual programme to the Engineer prior to 1 October each year. The programme shall outline by street, the markings within each RAMM length to be remarked, and the expected remarking dates. The Engineer will review the programme and advise the Contractor of any concerns.

The inventory of roadmarkings was uploaded into RAMM at the start of each road. Some have been updated with actual route position of the roadmarkings. The Contractor shall be permitted to record the updated roadmarking quantities at the start of each road except for any regulatory marking e.g. no stopping, bus stops etc, Stops, Giveway, etc.

The Contractor will be required to use Pocket RAMM to correctly record the actual location of the regulatory markings when remarking is undertaken. The claim for marking or remarking any road markings will not be accepted unless this is updated.

The Contractor shall arrange the Work to minimise public inconvenience and also to avoid conflict with other works that may at any time be under construction. The Contractor shall also note certain road working hour restrictions, including working around businesses, and plan working timeframes accordingly.

The Engineer may require amendments to the programme from time to time to maintain the overall network standards, or if there are concerns relating to other matters (e.g. access, conflicting uses, excessive public inconvenience etc.).

The Engineer may also instruct additional markings to be included as additional works to the programme, in the form of a contract instruction. The Contractor shall complete the work within the stated timeframe and claim via a RAMM dispatch.

New road markings shall be completed in 10 Working Days from instruction.

44.7 Construction

44.7.1 Removal of Existing Markings

Environment Protection

The Contractor is to ensure that no solid matter can enter any stormwater system or waterway as a result of the removal of road markings. This could require the placement of filters or similar on sumps etc., and their removal and making good on completion of the task.

Paint Removal

Where paint removal is required by the Engineer, existing paint markings shall be removed by one of the following methods. Paint removal by any other method will require the approval of the Engineer.

- Water Blasting

  The Contractor shall remove the existing paint using a high pressure waterblaster. Care shall be taken to ensure that:

- Water does not penetrate the bituminous pavement surfacing and enter the pavement basecourse.
- The existing bituminous pavement surface is not damaged by the removal of either the chipseal or excessive material from the bitumen layer.

- Abrasive Blasting

  The Contractor shall remove the existing paint using appropriate abrasive blasting methods followed by the removal of the abrasive detritus from the pavement surface.

  Care shall be taken to ensure that the underlying pavement surface is not damaged.

- Black Paint

  The Contractor shall remove the existing paint by painting over with black paint. Note this is a temporary measure only and unless there is exceptional circumstances the Engineer will require the Contractor to complete the removal process by either water blasting or abrasive blasting at a later time. The Contractor will also be required to maintain an adequate covering of black paint such that the existing markings remain covered. Any costs associated with the temporary use of black paint shall be borne by the Contractor.

No additional payment will be made for removal of long life markings, or markings that are harder to remove.

Raised Pavement Markers

Where required by the Engineer the Contractor shall carefully remove existing raised pavement markers taking care to ensure that the underlying pavement surface is not damaged.

Clean up

All detritus resulting from the Contractor's operations shall be removed from the pavement surface and disposed of.

Repair of Damaged Pavement Surface

Where the pavement surface has been damaged by actions of the Contractor, the surface shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

44.7.2 Installation of Paint Roadmarkings

Installation of painted roadmarkings shall be carried out in accordance with TNZ P/12.

Reflectorised and non reflectorised paint shall be applied to achieve a new marking DFT (over the old marking, of over the unmarked surface) of 180 microns minimum. Reflectorised paint shall contain type B beads, which shall be applied at a rate no less than 275 gm/m^2.

The Contractor may achieve the required DFT in one or more passes.

44.7.3 Installation of Long Life Roadmarkings

Installation of long life roadmarkings shall be carried out in accordance with TNZ M/20, upon instruction of the Engineer.

44.7.4 Installation of Raised Pavement Markers

Installation of raised pavement markers shall be carried out in accordance with TNZ P/14.

44.7.5 Installation of Coloured Surfacings

Installation of coloured surfacing treatments shall be in accordance with NZTA P33 and the manufacturer's specifications.

44.8 Verification

The Contractor shall provide the Engineer with copies of test certificates for all paint deliveries supplied by the paint manufacturer to the Contractor, for the paint to be used on the contract.

The Engineer will undertake random sampling of paints carried on the Contractor's roadmarking plant and equipment. These samples will be laboratory tested and compared with laboratory results of equivalent samples obtained directly from the manufacturer.

The Engineer may also do random testing of markings to measure dry film thickness of the most recent paint film and in addition, for reflectorised paints, the bead application rate.

If it is found that the Contractor is carrying non-complying paint on the roadmarking plant and equipment, the Engineer will:-

- Recover from the Contractor all costs associated with sampling and testing of the non-complying paint, or non-complying paint film thickness
- Require the markings carried out on the approved programme for the month in which the faulty markings were applied, to be remarked approximately 6 months later with complying paint, to the correct dry film thickness, all rework at the Contractor's expense.

44.9 Recording and Reporting

Following each month's roadmarking and RRPM works, the Contractor shall claim for work completed via RAMM. In addition, for roadmarking, the Contractor shall supply in electronic format, a schedule of the work claimed detailing the type of marking marked/remarked by RAMM carriageway length, and the locations of the marking/remarking within that length. No claim will be accepted without the completed schedule.

45 Topsoil and Grass

45.1 Scope

The work to be executed under this Specification consists of the supply and placement of topsoil, and the application of grass seed.

Scheduled rates for topsoil and grass shall only be used for excavations and reinstatement for areas beyond 200mm from Works where additional excavation was approved by the Engineer.

45.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

KCDC SDP	KCDC Subdivision and Development Principles and Guidelines: 2012

45.3 Materials

45.3.1 Topsoil

Topsoil may be naturally occurring or may be manufactured. Topsoil shall be free from refuse, material toxic or otherwise deleterious to plant growth, weeds, subsoil, woody vegetation and stumps, roots, brush, stones, clay lumps or similar objects.

Topsoil shall meet the following requirements:

a) The pH of the material shall be between 5.5 and 7.6.

b) The organic content shall be between 2% and 20%.

c) The grading envelope shall be as follows:

Sieve Size	Percentage Passing by Mass
50mm	100
25mm	85-100
6.3mm	65-100
75µmm	20-80

The Contractor may alter the composition of the topsoil with approved materials to meet the above requirements. Materials used to alter the composition of the topsoil may include recycled of

composted materials. Materials used to alter the composition of the topsoil shall not contain any material that is deleterious to the soil structure, plant growth or seed germination.

45.3.2 Grass Seed

Grass seed shall be a hardwearing mix coated seed and shall comply with the KCDC SDP.

45.3.3 Construction

Topsoil shall be compacted to a minimum depth of 75mm to the desired finished level. Fertiliser shall be spread and mixed if required. Grass seed shall be sown at the manufacturer's recommended application rate. The Contractor shall water the area on a needs basis to ensure the development of good grass cover.

46 Callout Response

46.1 Scope

The work to be executed under this Specification consists of the provision of a 24/7 callout service to assess service failures where the service failure is likely to result in harm to the public if not dealt with straight away, attend to the initial response required and to make the site safe.

The Contractor shall provide 24/7 on-call resources and systems to attend to callout responses. Resources include rostered labour, adequate plant, materials, barricades, signs, lights, tools, equipment, communication systems, and access to Pocket RAMM to create and update Dispatch on site, etc. to respond to callouts within response times listed in Section 1.

The Contractor is to provide and have available the necessary plant, vehicles, equipment and operators required to make the reported hazard safe. The Contractor shall provide the rostered operator with a cell phone which shall remain operable throughout the roster. Staff on callout outside normal working hours shall be selected so that incidents in any part of the District can be reached within 30 minutes of notification.

46.2 Payment

After hour's callouts (4.00pm to 7.30am) will be paid as Dayworks for the actual time only with time commencing from the callout notification until such time the site is made safe. After hours callouts will include travelling to/from home of up to 30 minutes in each direction. For multiple callouts at one time (such as flooding), time shall be split accordingly and travel to/from home will only be paid once.

Payment on a Dayworks basis shall continue until the site is made safe and basic access e.g. one lane traffic is restored unless the Engineer approves otherwise. The extent of work on callout is listed in clause 46.3.

Any remaining clear up or restoration shall be at scheduled rates.

All Callouts and works done during business hours (7.30am to 4.00pm) shall be paid at scheduled rates, or covered under routine maintenance. No additional payment will be made to scope out work required or travelling time.

Minimum employment contract payments, night rates, or public holiday payments shall not be made.

46.3 Service Requirements

Callout responses may include (but are not limited to):

- Installation of warning signs, barrier, etc
- Remove and dispose of debris < 0.5 m^3 (slips, rocks, branches etc)
- Fallen trees and branches
- Snow, ice, and bitumen bleeding responses

- Flooding (signage, detours, remove blockage etc)
- Temporary pavement repair (fill pothole with asphaltic concrete mix)
- Clean up of spillages of solid and liquid material on carriageway and footpath surfaces.

Attendance to callout response sites may involve:

- Removal of hazard as appropriate
- Barricading of hazard to close access as appropriate
- Barricading to provide safe access past the hazard as appropriate

The Council's Call Centre/After Hours operators will obtain information from the caller to assess whether a callout is required or not. These include both public and Engineer identified hazards.

The Contractor shall provide at least one truck and operator, communications equipment, access to Pocket RAMM at the callout site, appropriate hand tools, chainsaws, barricades, warning signs and lights etc, and materials required to address or clean up as appropriate to make the Callout response site safe.

Securing the safety of a Callout response site requires implementation of a solution that, if not a permanent solution, will at least endure until such time as a permanent solution is implemented. For example, placing cones that can be readily moved by the public is not considered an adequate solution for securing the safety of a site.

The Contractor shall collect and report appropriate information so that the full nature of the incident is recorded, audited and cost recovery can be sought from any negligent parties. This shall include photos uploaded using Pocket RAMM.

The Contractor is responsible for raising a Dispatch in RAMM and updating it as more information becomes available.

In situations where the Contractor has received an alert to a Callout, after attending to the hazard (refer Section 1, for response times), the Contractor shall call back the person reporting the Callout and advise them of the response outcome. If the Callout relates to an asset that is not the Council's property (egg utility asset) the Contractor shall attend to the Callout, make it safe as appropriate, and report the matter to the utility owner.

Where a Callout response site is made safe but will require further work towards a permanent solution, any further holding measures to maintain the safety of the site are the Contractor's responsibility, unless agreed otherwise by the Engineer. Removal of any temporary measure (egg signage, barricades, etc) on completion of the Callout response is also the Contractor's responsibility.

Each Callout response shall be entered and claimed via RAMM, including the upload of the associated service request into the relevant Dispatch and photos of the site.

47 Slip Removal

47.1 Scope

The work to be executed under this Specification consists of the removal of slips from carriageways, footpaths and road reserve.

47.2 Service Requirements

Slips will generally be notified to the Contractor as a Callout response. The Contractor is required to complete the initial response to slips as a Callout response as defined in Section 46. Once made safe and basic traffic control measures are in place, any works becomes planned work at scheduled rates.

Any slip which in the opinion of the Contractor may cause further damage to council assets or private property if it is removed shall be made safe as a callout response and referred to the Engineer.

Slips from road reserve onto private property or covering motor vehicles or other private facilities shall be made safe as a callout response and referred to the Engineer before they are removed. In most instances these slips will require approval from the Engineer and from appropriate insurance companies or property owners prior to removal.

Where necessary the Contractor shall arrange for the temporary repair of, or the making safe of, all services prior to the removal of the slip.

Where a slip covers part of the footpath and/or carriageway the Contractor shall remove all material including trees, root balls and vegetation from the carriageway or footpath surface and dispose of the removed material to an approved landfill.

The extent of the slip removal shall be such that all material that covers surfaces that existed prior to the slip is removed from the site. No material, including trees/root balls, shall be pushed over banks or left on site. Material pushed over banks will be removed at the Contractor's expense.

Where washing down of hard surfaces is required by the Engineer or there has been sufficient rainfall or water flowing past the site to carry material into stormwater systems the Contractor shall arrange to have downstream sumps that are affected cleaned in accordance with Section 28

Prior to restoring service to normal use:

- The slip face shall be free of:
    - Overhanging material likely to cause further slips
    - Loose material on the slip face likely to cause further slips.
- The footpath shall be:
    - Swept free of loose material
    - Safe for pedestrians

- The carriageway, including the adjacent channel shall be:
    - Swept free of loose material
    - Safe for vehicular traffic

48 Vehicle Crossings

48.1 Scope

The work to be executed under this Specification consists of the supply of equipment, material and installation and maintenance of vehicle crossings. There are three scenarios covered by the Specification as follows:

a) Replacement of existing vehicle crossings as a result of other works

b) Installation of new vehicle crossings as a result of kerb and channel works

c) Installation of new vehicle crossings on an as required basis

Vehicle crossings are generally the property owner's responsibility, so work is only to be programmed at the Engineer's request. Pipes under driveways are also the responsibility of the property owner.

48.2 References

Standard Specifications are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

Section 9	Asphaltic Concrete Paving (Maintenance)
Section 11	Concrete Construction
Section 19	Digout Repairs
AS/NZS 1428.4.1:2009	Design for access and mobility – Part 4.1: Means to assist the orientation of people with vision impairment
RTS 14	Guidelines for facilities for blind and vision-impaired pedestrians
Drawing KCDC-RD-005	Residential Vehicle Crossing
Drawing KCDC-RD-006	Commercial/Industrial Heavy Duty Vehicle Crossing
Drawing KCDC-RD-007	Takapuna Crossing

48.3 Types of Crossings

The type of crossings will comprise the following:

- Residential Vehicle Crossing.

- Commercial/Industrial Heavy Duty Vehicle Crossing.
- Takapuna Crossing (Engineer approval only)

Construction shall conform to the KCDC Standard Drawings referenced above.

48.4 Design

It is the Contractors responsibility to set out and construct vehicle crossings using the Standard Drawing details, whilst also given consideration to ensuring scraping issues do not result from their work.

Where ramps are being installed on the footpath or road care must be taken to ensure compliance with the requirements set out in AS/NZS 1428.4.1 and RTS 14.

48.5 Materials

48.5.1 Asphalt

Asphalt shall comply with the requirements of Section 1.

48.5.2 Concrete

Concrete shall comply with the requirements of Section 11.

48.6 Construction

48.6.1 Excavation

Where excavations are likely to coincide with underground services, the Contractor shall check using cable locators and dig exploratory holes to accurately determine service locations following marking out by the relevant service authority.

Edges shall be saw cut to a depth of 100mm or to the depth of the excavation whichever is the lesser. Ragged edges will not be permitted.

The limits of the excavation will be determined by the grade requirements defined as shown on Drawings KCDC-RD-005 to KCDC-RD-007.

Wherever new crossings are constructed across existing footpaths, where possible the channel should be left undisturbed, and only the kerb removed. Where the channel is to be disturbed, the carriageway in front of the lip of the channel shall be excavated to the dimensions shown. This is to allow for adequate compaction when backfilling with basecourse in front of the lip of the channel.

If the existing basecourse beneath the new works proves to be sound then it shall be trimmed and dressed with a minimum thickness of 75mm compacted new basecourse to bring it to the level of the underside of the new concrete works.

The subbase is to be compacted such that either a minimum of 7 blows per 50mm of penetration on a Scala penetrometer or a minimum Clegg Hammer reading of 35 is achieved.

48.6.2 Installation

Vehicle crossings shall be installed in accordance with the requirements KCDC-RD-005 to KCDC-RD-007, as appropriate.

The Contractor shall notify the Engineer 24 hours before pouring concrete, and the Engineer is to have the opportunity to inspect the finished formwork prior to pouring concrete.

Transverse construction joints shall be formed in vehicle crossings at intervals not exceeding 4m. Wherever possible crack control joints should line up with adjacent construction joints.

Black oxide must be added to all concrete mixes, over 1 m^3 in volume, at a quantity of 2kg/m^3 to dull the visual appearance of the white concrete unless otherwise specified by the Engineer.

Where new pavement surfaces abut existing surfaces the transition from the new to the existing shall be smooth and even and within permissible cross fall and longitudinal grading.

Reinstatement of areas adjacent will be made in accordance with Section 19. Reinstatement up to 200mm from the crossing shall be included in the scheduled rate.

Joints around asphaltic concrete reinstatement shall be bandage sealed.

All berm areas adjacent to the crossing must be reinstated in accordance with Section 45 and be mowable using a domestic mower.

48.7 Clean up

On completion, the site shall be left in a clean and tidy condition. All waste shall be removed from site and disposed of.

49 Mountable Kerb

49.1 Scope

The work to be executed under this Specification consists of the supply of materials and installation of mountable kerb (either extruded or blocks).

49.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

Section 11	Concrete Construction
Section 12	Mortar
Section 50	Traffic Island Infill
Drawing KCDC-RD-001	Kerb and Channel Details
Drawing KCDC-RD-011	Pedestrian Refuge Detail

49.3 Materials

49.3.1 Mountable Kerb

Mountable kerb shall comply with the requirements of Standard Drawing KCDC-RD-001, or kerb blocks can be utilised. Low mountable kerbs are not permitted.

49.3.2 Mortar

Mortar shall comply with the requirements of Section 12.

49.4 Construction

Construction shall be to Drawing KCDC-RD-011. Alternatively, mountable kerb blocks will be laid on a bed of concrete and the Contractor shall mortar the joints between blocks using mortar complying with Section 12

Where required the Contractor shall place a concrete infill behind the mountable kerb blocks complying with the requirements of Section 11.

Reinstatement up to 200mm from the Works shall be included in the scheduled rate.

50 Traffic Island Infill

50.1 Scope

The work to be executed under this Specification consists of the maintenance of existing islands and supply of materials and construction of exposed aggregate concrete infill for the traffic islands.

The Principal reserves the right to agree an alternative type of infill to concrete, examples including coloured concrete, gardens or plain concrete.

50.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

Section 11	Concrete Construction
Section 40	Signs
Drawing KCDC-RD-011	Pedestrian Refuge Detail

50.3 Materials

50.3.1 Concrete

Concrete shall comply with the requirements of Section 11.

50.3.2 Sign Sockets

Sign sockets shall comply with the requirements of Section 40 as appropriate.

50.4 Maintenance

Existing islands are to be programmed for cleaning and repainting kerb blocks/extruded kerb white every two years.

50.5 Construction

Prior to placement of concrete the Contractor shall install appropriate sign sockets at each end of the traffic island. The sign sockets shall be safety sockets and installed before the concrete pour so that the top of the socket is flush with the proposed finished surface level.

The thickness of the concrete infill shall be a minimum of 100mm.

The tolerances for surface finish of the concrete infill shall be ± 10mm for level at a point, and 5mm departure from a 3m straight edge or template in any direction. In addition the surface shall not pond water.

50.6 Clean up

On completion of the works, the site shall be left in a clean and tidy condition. Any spilled concrete, along with any other waste material, shall be removed from site and disposed of.

Slurry washed of exposed aggregate concrete shall be contained within the site and removed off site.

51 Pedestrian Kerb Ramps

51.1 Scope

The work to be executed under this Specification consists of the supply of material and construction of pedestrian kerb ramps.

51.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

NZS 4121:2001	Design for Access and Mobility: Buildings and Associated Facilities
AS / NZS 1428.4.1: 2009	Design for Access and Mobility Part 4.1: Means to assist the orientation of people with vision impairment
RTS 14	Guidelines for Facilities for Blind and Vision Impaired Pedestrians
Section 11	Concrete Construction
Section 35	Footpath Repairs and Reconstruction
TNZ M/04:2004	Basecourse Aggregate
Drawing KCDC-RD-003	Footpath and Pedestrian Ramp Layout
Drawing KCDC-RD-004	Typical Pedestrian Kerb Ramps

51.3 Design

Pedestrian kerb ramps shall comply with the requirements for kerb ramps contained in NZS 4121, tactile ground surface indicators contained in AS/NZS 1428.4.1 and RTS 14, and Drawing KCDC-RD-003 and KCDC-RD-004. The dimensions and location shall be approved by the Engineer prior to work commencing.

51.4 Materials

51.4.1 Concrete

Concrete shall comply with the requirements of Section 11 and shall be placed at to a thickness of 100mm.

51.4.2 Tactile Surfacing

Tactile pavers shall be 300mm x 300mm x 60mm yellow and shall be approved by the Engineer.

51.5 Construction

51.5.1 Saw Cutting

Existing footpath surface shall be sawcut to the required depths at the limits of the works, or as otherwise marked out on site by the Engineer.

51.5.2 Excavation

Where excavations are likely to coincide with underground services, the Contractor shall check with cable locators, and dig exploratory holes to accurately determine service locations following marking out by the relevant service authority.

Edges shall be sawcut to a depth of 100mm or to the depth of the excavation whichever is the lesser. Ragged edges will not be permitted.

Excavation shall be carried out to the depth specified or instructed. Where the Contractor encounters any soft spot, concrete, or lean mix concrete the Engineer shall be immediately notified. Where approved by the Engineer in writing the Contractor shall excavate the soft spot to the depth agreed. Concrete or lean mix concrete shall not be excavated without specific approval in writing from the Engineer.

The presence of excess ground water shall be brought to the Engineer's attention. At the request of the Engineer subsoil drainage shall be installed in accordance with Section 30.

Where required the subgrade shall be inspected and approved by the Engineer prior to backfilling.

The existing footpath is to be excavated to a nominal depth of 100mm below the underside of the proposed finished surface level, allowing for placement of the top surface (concrete or asphaltic concrete) to the height of the finished surface level, including but not limited to:

a) Any material required to correct excessive crossfall.

b) Any material required for trimming the area behind the proposed footpath to achieve required contours. For footpaths, these areas shall generally be to a grade suitable for mowing with a domestic mower.

Where in the course of excavation the Contractor determines that the underlying sub-base exposed by the excavation works will not permit the subbase to be compacted to the required standard the Engineer shall be notified of these concerns. Where approved in writing by the Engineer the Contractor shall excavate and replace with basecourse complying with TNZ M/04 such additional material as determined by the Engineer.

Where the existing footpath base is satisfactory, consisting of well graded granular material that can be compacted to the required standard, the existing cross fall is correct and approval in writing has been given by the Engineer, it may be neatly trimmed to a nominal depth of 50mm.

Where the Contractor encounters tree roots in the course of the excavation they shall be neatly cut with a saw and treated with pruning paint.

All growth overhanging the footpath is to be neatly trimmed vertically in line with the back of the footpath to a height off 3m. The Contractor shall liaise with adjacent property owners to determine the most appropriate method of trimming the growth prior to commencement.

All excavated materials are to be removed from site and disposed of.

51.5.3 Preparation of Base

The base shall be constructed to a depth of 100mm using AP40 basecourse complying with the requirements of TNZ M/04 to a nominal depth of 100mm below the finished surface level.

The compacted base shall be considered satisfactory when a Clegg Hammer reading of 25 is achieved.

The finished surface of the base shall form a tightly bound, smooth stone mosaic surface, which is not prone to ravelling.

51.5.4 Concrete

Prior to concrete being poured the set out and compliance with AS/NS 1428 must be approved by the Engineer to confirm compliance with disability standards.

Concreting shall be carried out in accordance with Section 11.

Transverse construction joints shall be formed in vehicle crossings at intervals not exceeding 4m. Wherever possible crack control joints should line up with adjacent construction joints.

Black oxide must be added to all concrete mixes, over 1 m^3 in volume, at a quantity of 2kg/m^3 to dull the visual appearance of the white concrete unless otherwise specified by the Engineer.

51.5.5 Tactile Ground Surface Indicators

Tactile ground surface indicators shall be installed in accordance with AS/NZS 1428.4.1 and RTS 14.

51.5.6 Footpath Reinstatement

Footpath reinstatement shall be carried out in accordance with Section 35. Reinstatement up to 200mm is included in the scheduled rate.

51.5.7 Asphaltic Concrete Reinstatement

Joints around asphaltic concrete reinstatement shall be bandage sealed as per the Standard Drawings.

Reinstatement up to 200mm from the crossing shall be included in the scheduled rate.

51.5.8 Clean up

On completion of the work the site shall be left in a clean and tidy condition. All waste material shall be removed from site and disposed of.

52 Installation of Rip Rap

52.1 Scope

This Specification covers the installation of Rip-Rap for the protection of unsupported slopes and stream banks. For small quantities, the Principal will supply the Rip-Rap.

52.2 References

ASTM C88 - 05	Standard test method for soundness of aggregates by use of sodium sulphate or magnesium sulphate
NZS 4407: 1991	Methods of sampling and testing road aggregates

52.3 Materials

When not supplied by the Principal, rock shall be clean, hard, angular quarried rock (unweathered greywacke or similar) with a specific density of not less than 2.6 tonnes/ m^3. Rocks are to be generally square, rectangular or oval in general cross section with the least dimension of the rocks being not less than half of the greatest dimension. River and river weathered boulders are not acceptable.

The Contractor must advise the Engineer of the source of the rock prior to placement. A sample of the rip rap is to be made available to the Engineer for inspection and approval prior to placement.

Rock must comply with the following criteria. Test results shall be provided to the Engineer for approval on request prior to delivery of any rip rap.

Test	Criteria
Specific Gravity (NZS 4407: 1991 Test 3.7.2)	Not less than 2.6 tonnes/ m^3
Abrasion Resistance (NZS 4407: 1991 Test 3.12)	500 revolutions with loss not greater than 20% of weight

Where required by the Engineer the rock shall also meet the following criteria (where freeze thaw cycles might be of concern)

Test	Criteria
Sodium Sulphate Soundness (ASTM C88-05)	Cycles with loss not greater than 12% by weight

52.4 Placement of Rip Rap Bund/Wall

52.4.1 Design

The Engineer will provide the design for the rip rap, including rock size/grading, geotextile, revetment toe and bank profiles/dimensions.

52.4.2 Resource Consent

When working in streams or where work may affect streams, the Contractor shall comply with any resource consent conditions.

52.4.3 Construction

The surface to be treated with rip rap shall be scaled and excavated (or filled) to the design profile to allow easy placement of the rock.

Rock shall be placed with a maximum face slope of 1 vertical to 1.5 horizontal.

At a minimum, one layer of rock shall be embedded or buried under the existing ground level to form the toe to provide a key for the rip rap into the base of the slope.

All rock is to be placed on a heavyweight non-woven geotextile fabric, which acts as a filter to prevent washing of fines from behind the rip rap bund. Care shall be taken in rock placement so as not to puncture the fabric. A thin layer of smaller stones may be placed over the fabric as protection prior to placement of the rip rap.

Where the rip rap is to be placed to a vertical height greater than 2m, the bank shall be benched with 0.5m benches at 1.5m vertical intervals to provide a stable platform for the rip rap.

52.4.4 Clean up

On completion of the work, all disturbed surfaces adjacent to the limits of the rip rap and used for access shall be returned to their former condition, and the site left clean and tidy. Any stream protection or diversion works shall be removed and the stream returned to its original course, or as required by any Resource Consent condition.

53 Maintenance Grading and Metalling

53.1 Scope

The work to be executed under this Specification consists of the maintenance of unsealed pavements and includes the supply, cartage and laying of maintenance aggregate for unsealed roads including preparation of the surface prior to laying.

53.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ HM/23:2006	Unsealed Pavements

The works shall comply with the references as modified by this Specification.

53.3 Extent of Work

Maintenance grading shall be completed on all unsealed roads within the network. A schedule of all unsealed roads within the network is included in Appendix 6. The extent of work includes, but is not limited to:

- Inspection of unsealed roads and recording in RAMM.
- Prioritising and programming work.
- Maintenance grading in accordance with this Specification.
- Removal of all corrugations, rutting and potholes prior to the final grading, or placing of aggregate.
- Supply and spreading aggregate over the trafficable width of the road
- Maintenance of drainage channels, bunds, watertables and cut-outs.
- Updating records in RAMM upon completion of works.

53.4 Specific Requirements

53.4.1 Grading

The grading shall be such that the existing road shape and trafficable width shall be maintained, and where possible improved, with crossfall from centreline on straight sections of road nominally between 4% and 6% and on curves nominally not less than 4% and not more than 10%. A hollow crown or flat across the centre of the road will not be acceptable.

Roads shall be graded from berm to berm to leave a smooth transition for surface water flows between the crown of the road and the water table. Any bunds that are in place to allow longitudinal water flow down the road, and to stop water flowing over banks, shall be protected and left in place.

Sufficient passes are to be made to leave the surface in a satisfactory and trafficable condition with the running course evenly distributed over the whole of the road surface. Following grading the road surface shall be rolled.

The surface shall be cut in localised areas to eliminate corrugations, rutting, potholes and other irregularities and the aggregate so removed shall be bladed back to its original position.

There shall be a smooth transition between the graded pavement and intersections, ungraded sections of pavement, sealed pavements, bridge decks and private driveways.

During grading operations bunds and drainage channels or cut-outs leading off ponded water in low or flat sections of road shall be maintained clear of excess vegetation and windrowed metal. Should this aspect be neglected the Contractor will be required to remedy the problem at short notice, as traffic hazards can result.

Corrugations shall not exceed 30mm crest to trough over a total of > 250m, within any 1km of road.

No grading shall continue during heavy rainfall when surface water is present on the road or during extended dry periods, unless warranted by overriding considerations.

Grading Frequency

Each road shall be graded at regular intervals, as shown in the Appendix 6. The Contractor shall programme the work on the basis of the minimum grading cycles. The Engineer may request additional grading, as warranted.

It is expected that the standard of grading should be sufficient to last between rounds. If the Engineer considers the grading round is not to the required standard, or if the preparation of the surface prior to grading/placing metal has not been correctly carried out, deficient areas are to be re-graded at the Contractors expense.

Equipment (all plant and equipment)

To complete this work the Contractor must provide:

- Road graders, inclusive of an operator, that have an operational weight of 13-15 tonnes and a minimum power output 93 kilowatts.
- Rollers inclusive of an operator , that have an operational weight of at least 12 tonnes
- Water carts, inclusive of driver (if required due to dry conditions)

- Transportation of all required equipment and plant.

53.4.2 Metalling

Wearing Course for unsealed pavements shall be a 40mm basecourse aggregate approved by the Engineer. 20mm aggregate shall not be used.

Delivery and pre-spreading of basecourse can be undertaken if corrugated, rutted and potholed areas are marked first so they can be cut/ripped prior to blending metal into these areas.
Appropriate signage and speed restrictions shall be put in place advising of loose metal. Pre-spreading of loose metal shall not be done more than 24 hours before grading.

The annual allocation of aggregate shall be applied generally at 50m^3/km/year. Dockets shall be supplied, and uploaded into the RAMM dispatch.

53.4.3 Seal Extensions

The Engineer may request a finishing grade to be completed, in conjunction with a grading round, to allow for a seal extension on a specific length of unsealed carriageway. Additional work required (over and above the normal grade) will be negotiated and paid as Dayworks under the relevant rates.

54 Asphaltic Concrete Paving (Resurfacing)

54.1 Scope

The work to be executed under this Specification consists of the supply of materials and construction of asphaltic concrete surfacing.

The following are covered:

1. Asphaltic concrete shape correction
2. Thin asphaltic concrete overlays
3. Structual asphaltic overlays

Asphaltic concrete paving may include

1. Asphaltic concrete
2. Stone mastic asphalt
3. Asphaltic concrete/ membrane seal
4. Open graded porous asphalt

54.2 References

Standard Specifications, Acts, Guidelines, Codes of Practice and the like are referred to in abbreviated form. For convenience full titles of those referred to in this Specification are given below:-

TNZ M/01:2017	Roading Bitumens
NZTA M10:2014	Dense Graded and Stone Mastic Asphalt
NZTA MR09	Pre-surfacing Repairs
RNZ E/2	Specification for the Performance of Bitumen Distributors
TNZ P/11:2007	Specification for Open Graded Porous Asphalt
Section 4	Customer Service and Communication
Chipsealing in New Zealand	Chipsealing in New Zealand, NZTA 2005
Section 22	Rotomilling

Section 43	Service Cover Adjustment and Replacement
Section 44	Roadmarking, RRPMs and Fire Hydrant Markings

All work carried out shall comply with the appropriate specification or standard as modified by this Specification.

54.3 Treatment Lengths

Each year before 1 July, the Engineer will provide the Contractor with a list of confirmed resurfacing treatment lengths and their selected treatment solution, for that year and, where available, an indicative list for the following year.

From this list, the Contractor shall develop the pre-reseal programme of works to be completed 1 month prior to resurfacing.

54.4 Activities

Included within the requirements are:-

- Ascertaining that all necessary preparation maintenance work has been undertaken and is satisfactory
- Liaising with relevant service authorities including the passenger transport operator(s)
- Delivery of appropriate letters to adjoining properties
- Rotomilling
- Sweeping the surface prior to resurfacing
- Application of tack coat
- Application of chip seal if required, rolling, and excess chip removal
- Paving
- Sweeping and removal of surplus material after paving
- Reinstatement of roadmarking, RRPMs and service covers
- Maintenance during maintenance period

54.5 Paving and Sealing Period

Except with the written approval of the Engineer, the placing of asphaltic concrete paving (other than repair works) shall be limited to the following seasons:-

- Paver laying of asphaltic concrete shape correction mixes shall only be carried out during favourable weather during the period 1 October to 30 April.

- Paver laying of asphaltic concrete wearing course mixes may be carried out during favourable weather during the period 1 November to 31 March.

- Paver laying of asphaltic concrete base paving mixes may be carried out during favourable weather at any time of the year.

- Grader laid asphaltic concrete shall only be carried out during favourable weather, between 1 November and 31 March.

54.6 Programming of Works

54.6.1 Programmes

Resurfacing works are required to be entered into RAMM as Dispatches. Each Dispatch shall have an Approved Estimate prior to commencing the works. The Contractor shall identify resurfacing works within the Contractors programmes.

54.6.2 Intention to Reseal

The Contractor shall give the Engineer a minimum of 48 hours' notice of its intention to resurface in any location. The Engineer shall be advised in advance of resurfacing proposed on any day (including any changes to the Contractor's programme) so that they can be in attendance. If the Contractor's programme is changed for any reason then the Contractor shall immediately notify the Engineer.

54.6.3 Roadmarkings and Service Cover Adjusting

Roadmarking and the adjusting of service covers shall be completed in accordance with the timeframes set out in the relevant specifications. Where the Contactor does not have the appropriate authorisation to adjust a particular service cover they shall make arrangements with the appropriate service authority for the cover to be adjusted.

The Contractor shall pay particular attention to ensure service covers are not lost under the new surfacing. Prior to the resurfacing operation, all service covers shall be marked and offset referenced for subsequent relocation. During the resurfacing operation, all service cover lids shall be painted or otherwise covered with an appropriate debonding agent.

For new asphaltic concrete surfacing, the Contractor shall form a small pothole of approximately 70mm diameter in the new surface over each service cover, to assist with locating it for service cover raising. For fire hydrants under new asphaltic concrete surfacing, the following additional steps shall be taken before the Contractor leaves the Site for the day:

- The Contractor shall consider whether or not a traffic hazard would exist if the fire hydrant lid were to be fully exposed. Factors to be considered include depth and visibility of pothole, peak traffic volumes, width of carriageway, mix of traffic using the site, etc.

- If it is considered the fully exposed hydrant lid would not present a traffic hazard, the Contractor shall fully expose the hydrant lid (the NZ Fire Service prefers hydrant lids to be fully exposed)

- If it is considered the fully exposed hydrant lid would present a traffic hazard, the small pothole shall remain, and a temporary (48 hour) yellow hydrant marking shall be painted on the new surface above the hydrant lid to assist the Fire Service locate it should it need to access the hydrant before the service cover is raised

- Where the 70mm pothole is to be retained, then before the newly laid surface has been compacted, the Contractor shall spade cut new asphaltic concrete above the perimeter of the hydrant lid, leaving the asphaltic concrete on the lid intact (except for the 70mm diameter pothole). This will assist breaking out the new surface in the event the hydrant is required to be accessed before the service cover is raised.

- All hydrant service covers are to be adjusted to the finished surface level of the carriageway within 48 hours of the surfacing operation, and the associated roadmarkings reinstated within 1 hour of the service cover raising.

54.7 Design

54.7.1 Treatment Section and Design

Information Supplied

The list shall contain the following information:

a) The street name to be sealed

b) The start name of the section to be sealed

c) The end name of the street to be sealed

d) The traffic volume of the section to be sealed

e) Information from RAMM on the existing top surface for each section.

Contractor Confirmation

The Contractor shall inspect each site, carry out such investigations that may be required to assess the suitability of the sites, or part thereof, for paving, perform the detailed designs of the selected treatments and provide the Engineer with a report of the findings. Where the Contractor recommends a change to the Engineer's proposed resurfacing the Contractor shall include reasons for the recommendation in their report to the Engineer.

The Engineer shall not be bound to accept the Contractor's recommendations.

54.7.2 Mix Design

Design of Mixes

The Contractor shall supply to the Engineer a copy of all mix designs. Mix design testing shall be carried out in a laboratory accredited by International Accreditation New Zealand (IANZ) for appropriate tests.

Mix design shall generally be carried out in accordance with NZTA M10.

Design of Mixes Incorporating Reclaimed Asphalt Pavement (RAP)

Separate mix designs shall be prepared for all mixes containing RAP. Binder in RAP shall be included as binder in the total mix. Alterations to the proportion of RAP by more than 20% of the amount of RAP shall constitute a design change.

Mixes shall generally comply with the design and manufacture requirements specified elsewhere in this Specification.

Rejuvenating agent, if required in mixes incorporating recycled asphaltic concrete shall be low volatility oil capable of combining with bitumen to counteract hardening and produce lower viscosity grade of binder. Rejuvenating agents shall comply with recognised standards for such materials.

Asphalt Mixes Containing not more than 15% of RAP by Mass of Total Mix

RAP in proportions up to 15% by mass of the total mix shall be permitted in all mixes.

Asphalt Mixes Containing more than 15% but not more than 30% of RAP by Mass of Total Mix

Where approved by the Engineer, RAP in proportions greater than 15% but not exceeding 30% may be used in asphaltic concrete mixes. Allowance may be made for increase in binder stiffness due to hardened binder in RAP by one of the following alternative treatments:

- Use of bitumen one class lower in viscosity than that otherwise specified.

- Periodic sampling of representative samples of RAP and determination of the appropriate class of new bitumen of amount of rejuvenating oil required in order to achieve a bitumen viscosity equivalent to that of the class otherwise specified.

Asphalt Mixes Containing more than 30% of RAP by Mass of Total Mix

Asphalt mixes containing more than 30% RAP shall only be accepted where the Contractor can demonstrate suitable manufacturing plant and quality control procedures to ensure consistent mix production of hot mixed asphaltic concrete to a standard not less than otherwise specified.

Asphalt Mixes Containing other Recycled Materials

The Contractor is encouraged to offer innovative mix designs for the consideration of the Engineer and supplier. These mixes may include the use of recovered materials such as granulated rubber and glass as fillers.

54.8 Materials

54.8.1 Tack Coat

The bitumen and emulsified bitumen used for tack coating shall comply with the requirements of NZTA M10.

54.8.2 Asphaltic Concrete

Asphaltic Concrete mixes shall comply with the requirements of NZTA M10.

In addition to the requirements of NZTA M10, the following requirements shall be met:

- The grading shall fall wholly within the Mix Specification Envelope for each mix type
- Mixes shall conform to properties within the limits as set in NZTA M10.

54.8.3 Reclaimed Asphalt Pavement (RAP)

Reclaimed asphaltic concrete pavement (RAP) shall be obtained from milling excavation of existing asphaltic concrete. RAP shall be crushed and screened as necessary to ensure a maximum size no greater than the maximum size of asphaltic concrete being produced and to achieve a reasonably well graded, free flowing and consistent product.

RAP shall be free of foreign material such as unbound granular base, broken concrete, crumbed rubber or other contaminants. Asphalt containing tar shall not be used.

RAP shall be place in separate stockpiles prior to use.

54.9 Testing Regime

The minimum testing regime acceptable in relation to paving and sealing materials shall be:

- Mix Design
    - A full mix design for each type of asphaltic concrete used.
    - Prior to use in the contract works, and
    - Annually thereafter.

The Engineer will approve the Job Mix Formula (JMF) for each mix type prior to use of the mix.

- Grading and bitumen content:
    - Every 200 tonnes delivered to site.
- Marshall Air Voids Test
    - Every 1000 tonnes delivered to site.
- Nuclear Densometer (Troxler) results:

- One per 100 square metres laid.

- For all other mixes:
    - A full mix design before use and every 10,000 tonnes thereafter.

Where testing indicates that the mix is not compliant with the currently approved JMF the Engineer may request that a full mix design is completed and a new JMF approved prior to further mix being placed.

After the initial JMF has been approved by the Engineer and where the Contractor can demonstrate to the Engineer that their Quality Control systems for asphaltic concrete design, production and delivery provide surety of the mix quality delivered to the site, the Engineer may, at their sole discretion, permit the test results carried out as part of the Contractor quality testing regime for the production and delivery of asphaltic concrete to be sufficient for determining mix compliance with the JMF.

54.10 Construction

54.10.1 Paving Equipment

Asphaltic shape correction shall be placed by means of either:

a) A self-propelled paving machine fitted with a longitudinal profiling beam with a minimum length of 9m capable of spreading and finishing the mix to line, grade and cross section without the use of forms or side supports. The paving machine shall be capable of laying courses in thicknesses from 10mm to 100mm and shall be fitted with suitable heating control devices. The screed shall strike off the mix to the elevation and cross section required and shall produce a smooth and uniform texture without segregation, tearing, shoving or gouging.

b) A self-propelled long wheel base grader fitted with a blade that is straight and true and with non-treaded tyres.

c) Other equipment specifically approved by the Engineer in writing.

Thin asphaltic concrete overlays approved shall be placed by means of either:

a) A self-propelled paving machine fitted with a longitudinal profiling beam with a minimum length of 9m capable of spreading and finishing the mix to line, grade and cross section without the use of forms or side supports. The paving machine shall be capable of laying courses in thicknesses from 10mm to 100mm and shall be fitted with suitable heating control devices. The screed shall strike off the mix to the elevation and cross section required and shall produce a smooth and uniform texture without segregation, tearing, shoving or gouging.

b) Other equipment specifically approved by the Engineer in writing.

54.10.2 Rollers

Rollers used in the construction of asphaltic concrete layers shall comply with the requirements of NZTA M10.

54.10.3 Preparation of Surface for Paving

Immediately prior to the new paving being applied, the existing surface shall be swept clean of grit, dirt, detritus and other deleterious matter. The sweepings are to be removed from the site and disposed of.

All raised pavement markers shall be removed from the existing surface.

Where the Contractor becomes aware of defects in the existing surface, they shall be repaired in accordance with the appropriate Specifications.

At the limits of the new paving works the Contractor shall cut back the existing pavement to the depth of the new paving to ensure that the joint between the two surfaces deviates by no more than 5mm under a 3m straight edge.

Any vehicular crossing that is likely to scrape after the finished surface has been compacted shall be cut out in such a manner that the scraping will be eliminated.

54.10.4 Tack Coat

Tack coat shall be applied to the cleaned surface prior to placement of the asphaltic concrete.

Tack coat shall comply with the requirements of TNZ M/01. The type and breaking rate shall be suitable for the climatic and surface conditions and shall be fully broken free of surface water and intact before the commencement of asphaltic concrete spreading.

Unless otherwise directed by the Engineer in writing the tack coat shall be applied to provide a uniform application rate of residual binder of 0.3 litres/m^2.

Precautions shall be taken to protect kerbs, channels, adjoining structures, traffic and parked vehicles, and street furniture from tack coat spray.

54.10.5 Delivery of Asphaltic Concrete

The following table outlines the required temperatures for delivery of asphaltic concrete to the site.

Road Surface Temperature[1] ^oC	Minimum Mix Temperature ^oC	Range of Mix Temperature[2] ^oC
	Thickness of Layer, mm	

[1]Surface temperature should generally be that applicable to the coolest area of the pavement (shaded area).
[2]Maximum temperatures apply when placing thick layers to avoid excessive displacement under rolling.

	<30	30-40	41-100	>100
5-10	See note	See note	145	135-150
10-15	150	145	140	130-145
15-25	150	145	135	125-140
>25	150	145	130	120-135

Placing asphaltic concrete in thin layers under cool conditions may adversely affect the result due to increased difficulty in achieving proper compaction, effective joints and good surface finish. Additional attention should be paid to issues of mix workability, asphaltic concrete temperature, compaction techniques and any influence from additional cooling due to wind or moisture.

The Contractor shall conduct paving operations to ensure that the paver speed matches the rate of delivery in order to minimise the number of times the paver is required to stop.

54.10.6 Ambient Conditions for Placing

The surface on which the asphaltic concrete is to be placed shall be essentially dry and free from puddles.

Asphalt shall not be placed when the pavement temperatures is less than 10°C.

54.10.7 Joints

General

Joints shall be provided as follows:

- Longitudinally, if the width of the pavement is such that more than one paving run is required.
- Transversely, after the completion of each days paving operations, or where a delay in paving operations allows asphaltic concrete to cool and adversely affects placing and elsewhere if a break in a longitudinal run is required.

The location of joints shall be planned before work commences and the number of joints shall be minimised by adopting good paving practice.

Longitudinal Joints

Longitudinal joints in the wearing course shall coincide with the traffic lane lines unless otherwise agreed in writing by the Engineer. Longitudinal joints shall be offset from layer to layer by not less than 150mm provided no joint is placed directly below a trafficked wheel path.

Where asphaltic concrete is placed against the edge of a preceding lane that has not cooled below a 100°C it shall be constructed as a hot joint. Hot joints shall be constructed by leaving a 150mm strip of asphaltic concrete unrolled along the free edge until the adjoining lane is placed and then the unrolled strip simultaneously with the material in the adjoining lane.

Where asphaltic concrete is placed against the edge of the preceding lane that has not cooled below 60°C it shall be considered a warm joint. Warm joints shall be constructed by rolling the full width of the first lane being placed, prior to placing the adjoining lane.

Where asphaltic concrete is placed against the edge of the preceding lane that has cooled below 60°C it shall be considered a cold joint. Asphalt placed against a cold edge should overlap the previous edge by 25mm to 50mm. The overlap should be pushed back using lutes, immediately after spreading, to form a slight ridge that is compacted with a steel wheel roller.

Transverse Joints

Transverse joint shall be offset by not less than 2m in adjoining paver runs and from layer to layer. The method used to form the joint shall be as for longitudinal joints.

Sealing Joints

All joints shall be sealed with 100mm polymer bandage.

54.10.8 Compaction Standards and Surface Finish

Asphalt shall be uniformly compacted so that the air voids in the compacted asphaltic concrete comply with NZTA M10. The paver shall not get too far ahead of rolling to ensure adequate compaction is achievable.

There shall be no depressions in the finished surface that will allow water to pond. The finished surface shall be flush with the lip of the channel.

The tolerance for surface finish shall be $\pm$5mm for level at a point and 5mm departure from a 3m straight edge or template in any direction. In addition the surface shall not pond water and shall meet the requirements for roughness detailed in the section headed Target Roughness in this Specification.

Where mat density is measured by NDM only qualified operators shall be used.

For shape correction over chipseal, the shape correction course shall be placed to give zero thickness over high spots and to fill depressions until the pavement meets the requirements for roughness detailed in this Section headed Target Roughness in this Specification.

For shape correction over existing asphaltic concrete the shape correction course shall be placed to give 25mm thickness over high spots and to fill depressions under the pavement meets the requirements for roughness detailed in the section headed Target Roughness in this Specification.

For thin asphaltic surfacing the layer thickness shall be nominated by the Engineer and shall meet the requirements for roughness detailed in the section headed Target Roughness in this Specification.

54.10.9 Care and Protection of Assets and Property

The Contractor shall take all necessary measures to protect assets and property affected by the surfacing operations. This includes, but is not limited to, protecting footpaths, kerbs and channels, surrounding road markings, street furniture, vehicles and other private property, from overspray, tracked oils and other contaminants from the surfacing operations.

54.10.10 Target Roughness (NAASRA)

The Engineer shall determine the ONRC to be used in the determination of the target roughness value after consultation with the Contractor.

The target roughness (both urban and rural) will generally be determined from the following table:

One Network Road Classification (ONRC)	Target Roughness
Arterial	<= 100 NAASRA
Primary Collector	<= 100 NAASRA
Secondary Collector	<= 110 NAASRA
Access Road	<= 120 NAASRA
Low Volume	<= 140 NAASRA

54.10.11 Service Covers

Any service covers within the works area shall be left accessible, adjusted and repainted in accordance with Section 43 within 48 hours of surfacing being complete.

54.10.12 Reinstatement of Road Markings

Reinstatement of road markings shall be carried out in accordance with the requirements of TNZ P/12 and TNZ P/14 as appropriate.

All paved surfaces shall be marked as follows:

Marking Type	Treatment
School Pedestrian Crossings	One initial marking with beaded paint within 24 hours followed by a second marking with beaded paint within 1 month.
Other Pedestrian Crossings	On initial marking with beaded paint within 24 hours followed by a second marking with beaded paint within 1 month.
Limit Lines	On initial marking with beaded paint within 24 hours followed by a second marking with beaded paint within 1 month.
Fire Hydrant Markings	One initial marking with beaded paint within 24 hours or re-exposing the hydrant, followed by a second marking with beaded paint within 1 month.
All Other Markings	Replace RRPMs and one initial marking with beaded paint within 24 hours followed by a second marking with beaded paint within 1 month.

Notes:
School Pedestrian crossings are defined as those outside schools or where the crossing is predominantly used by school children. They shall have road marking in place between the hours of 8.00am and 9.30am and between the hours of 2.30pm and 4.00pm.

Marking of fire hydrants following asphalting is a fire safety issue. The pavement surface over the partially covered hydrant shall be painted with a holding coat that will last at least 48 hours in which time the hydrant will have been raised to match the new surface. The hydrant shall be painted with beaded paint within 24 hours of raising. The fire hydrant markings following raising including the circle, the lid cover, kerb mark, triangle and installation of the RRPM.

The Contractor shall supply to the Engineer proof that the final markings have been laid within the appropriate timeframes.

From time to time the Engineer may require the Contractor to reinstate road markings in new locations. Where this occurs the Engineer shall forward to the Contractor a plan showing where the new markings are required.

54.11After Care of Surfacing Works

The Contractor is required to provide after care to the completed surface. This may include but is not be limited to:-

- Dealing with and making good scraping vehicle crossings
- Removal of protective covers
- Removal of any material chips that may have fallen into sumps.

54.12 Clean-up

The Contractor is responsible for making good any damage caused as a result of surfacing operations, including EMP replacement, vegetation damage, berm damage, kerb & channel and footpath damage etc.

All sites are to be left in a clean and tidy condition.

54.13 Reporting

The Contractor shall supply maintenance inspection reports following resurfacing at the following intervals:

1. One month after sealing has been completed
2. Twelve months after sealing has been completed

Reports shall include details of the condition of the new surfacing including any defects, whether all service covers have been adjusted and whether all road marking has been reinstated including the second coat, the proposed remedial actions and the expected completion date of any remedial actions. The report shall also note all customer enquires received and a summary of the customer's issues and the total number of times the street has been swept.

54.13.1 RAMM Resurfacing Records

The Contractor shall supply the Engineer with all the information required to complete a RAMM Resurfacing Record within 48 hours of the seal being completed. The following table shows the information required from the Contractor to complete a RAMM Carriageway Surfacing Record. Note, all terminology is in accordance with the RAMM Manual.

Each truckload of asphaltic concrete delivered to the site shall have a docket for that load of asphaltic concrete. Each docket shall be numbered and include the weight of the asphaltic concrete, the time it was loaded onto the truck, and the temperature of the mix at the plant. These dockets shall be retained by the Contractor and be uploaded into RAMM.

Column Name	Type	Description	To be Supplied by the Contractor
c_surface_id	serial(5)	The unique number of the surfacing	N
road_id	integer(5)	Road identification code	N
start_m	integer(5)	Surfacing start displacement (m) from road origin	Y
end_	integer(5)	Surfacing end displacement (m) from road origin	Y
start_name	char(25)	Name of the road or feature at the start of the surfacing section	Y
end_name	char(25)	Name of the road or feature at the end of the surfacing section	Y
surface_date	date	Date surfacing placed	Y
removed_date	date	Date the surface was removed	Y
surf_width	decimal(3,1)	Width of surfacing in metres to 1 decimal place e.g. 8.6	Y
surf_offset	decimal(3,1)	Dist. from LHS of c/way to LHS of surface in metres	Y
life	smallint(5)	Estimated/design life of surfacing in years	N
surf_material	char(5)	See manual for list of valid codes	Y
ovlay_depth	smallint(3)	Depth of overlay or 0 for seal	Y
chip_size	smallint(2)	Grade of chip or top size aggregate in mix in mm	Y

Column Name	Type	Description	To be Supplied by the Contractor
chip_2nd_size	smallint(2)	Grade of 2nd chip used on 2 coat seals	Y
pave_source	char(20)	Source of aggregate for chips or mix	Y
surf_binder	char(4)	Binder type	Y
flux	smallint(1)	Amount of flux in binder	Y
cutter	smallint(20)	Amount of Cutter in binder	Y
cutter_type	char(4)	Amount Type of Cutter used	Y
adhesion	decimal(2,1)	Amount of adhesion agent in binder	Y
surf_adhesion	char(4)	Type of adhesion agent used	Y
additive	smallint(2)	Amount of additive in binder	Y
surf_additive	char(4)	Type of polymer additive used in binder	Y
rate	decimal(3,2)	Residual App. Rate in l/m^2 or % of binder content in mix	Y
sealed_area	integer(8)	The total area covered by the seal (m)	Y
contract_item	char(10)	The contract number under which the sealing was performed	Y
organisation	char(3)	Organisation code	N
surf_spec	char(10)	Details if the end user specification	N
polished_stone	smallint(2)	Polished stone value (PSV)	Y
average_dim	decimal(4,2)	Average least dimensions (ALD) units in mm	Y
notes	char(60)	General comments	Y
added_on	date	The date the row was added	N
added_by	char(8)	The logname of the person who added this row	N
chgd_on	date	The date this row was last changed	N

Column Name	Type	Description	To be Supplied by the Contractor
chgd_by	char(8)	The logname of the person who last changed this row	N

54.13.2 Sealing Records

In addition to the RAMM Record, the Contractor shall supply the Engineer with the following information:

Information Required	Description	To be Supplied by the Contractor
Dispatch Number	The RAMM Dispatch Number	Y
Area of Hand Spray	The area of hand spraying carried out in square metres	Y
Tanker Dip Readings at Start and End of Job	The record of tanker dips for each job	Y
Ground Temp	The surface temperature prior to sealing	Y
Ambient Air Temp	The ambient air temperature prior to sealing	Y

7 Performance Criteria and Appraisal of Contractor's Performance

7.1 Scope

This Specification:-

- Details the Engineer's methodology for assessing the Contractor's performance.
- Presents the Performance Measures and Targets the Engineer will use to assess this performance.
- Details the methodology the Engineer will apply to adjust payment to reflect this performance.
- Allowance of a monthly joint inspection to determine programming and physical works compliance to Specification.

7.2 General

The performance criteria that apply to this Contract are those criteria set out in the Specification for the various activities or as confirmed in the Basis Payment.

In addition to the to the various elements of the Contract that performance criteria apply the Key Performance Indicators (KPIs) in Appendix 1 is an indication of the values and drivers considered by the Principal as important to the proper and efficient management of the Contract and Works Programme. However, with the agreement of the Contractor and the Engineer these KPIs may be added to or varied to recognise additional values key to the Contractor's operation and goals.

Monthly measurement and rating of KPIs and adoption of partnering philosophies will be the main tools to monitor, assess and give feedback on the Contractor's performance in meeting the Contract requirements. However, this does not preclude formal notices of action, remedy or termination in accordance with the General Conditions of Contract. Such actions will however only be considered as necessary after all other processes and protocols have been considered.

7.3 Deductions

An overall performance review will be carried out monthlyin accordance with the criteria in Appendix 1, with an assessment of either "Not Met" or "Achieved" assigned to each KPI. A 5% random carriageway length by ORNC classification will be exported out of RAMM and a joint inspection will be undertaken by both parties to determine Programming and Physical Works compliance to Specification and relevant programming.

The table in Appendix 1 is divided into three sections being:

1) Administration
2) Programming

3) Physical Works

In all three sections, if the Contractor's overall performance is less than the specified acceptance criteria (ie not met), a deduction from the monthly payment claimed will be made. Where a KPI contains multiple acceptance criteria, non-compliance against any single one of these criteria will result in the total deduction amount for that KPI being deducted.

No bonus payments shall be paid. Bonus/penalty for pre-seals

7.4 Appraisal of Contractor's Performance

(i) The Contractor's performance will be appraised throughout the term of the Contract, including:

(a) Reference and measuring against KPIs as noted above (monthly).
(b) Audit or testing of works completed and certified as completed to standard (Practical Completion).
(c) As works progress;
(d) Six monthly by the Engineer. (This includes for measurement against the Contractor's methodology statements and Contractor Quality Plans and monthly KPI ratings.) and
(e) Annually through works and systems audit. (This includes for measuring against Contractor methodology statements and Quality Plan, as well as review of monthly and quarterly reports and audit results.)

(ii) Consideration of the following key criteria:

(a) The Contractor's ability to work together with the Principal, Engineer and staff to execute the Contract Works within the terms and spirit of these Contract Documents.

(b) The standard to which each category of work has been carried out to the technical requirements of the Contract and within the response times stated.

(c) The level of satisfaction of the public as measured by response and comment received regarding the Contractor's activities.

(d) Level of compliance with the approved Quality Plan, ie results from systems audit of the Quality Plan.

(iii) The overall performance of the Contractor will be considered throughout the initial three-year period to determine the Contractor's suitability to continue with the Contract Works for the any contract extensions.

All assessments carried out as noted above will be forwarded to the Contractor in draft form for review and comment and registration of acceptance or disagreement as applicable before final writing and filing to Contract.

7.5 Non-Compliance Reports (NCRs)

NCRs are a tool to assist the Engineer, and the Contractor monitor the Contractor's compliance with the contract Specifications and intents.

Should the Engineer identify an action, response or output which does not comply with the Contract, or a lack of action, response or output or a series of actions, inactions, responses or outputs required by the contract, the Engineer may issue the Contractor with an NCR, or the Contractor will self generate a NCR. This summarises the details of the identified non-compliance, or series of non-compliances. The Contractor shall respond through a corrective action response outlining the cause of the non-conformance and steps taken to correct it.

The Contractor shall acknowledge the issue of an NCR and may request the Engineer within five Days of the receipt of an NCR to:-

- Reconsider the issue of the NCR

In each such case, the Contractor is required to provide documented evidence to support this request. Failure to provide such documented evidence will result in no reconsideration of individual NCRs.

Information from NCRs will be collated as a data source for performance assessment.

7.6 Performance Reporting

7.6.1 Reporting Performance Results

Prior to adjustment of payments, the Engineer will provide information from the performance assessment and consequent calculated payment deductions proposed to the Contractor. The Contractor shall present results of this performance assessment, as well as assessment against additional criteria nominated in the CQP, to the Contract Administration Team within the Contractor's monthly report as outlined in Activity Section 1 'Contract Management and Planning'.

7.6.2 Agreeing Performance Results

The Contractor may request the Engineer to reconsider any Non-Compliance Report. The Contractor may also request the Engineer, through the Contractor's monthly report, to review the performance assessment taking into account any evidence the Contractor has provided that is contrary to the performance assessment results or proposed payment adjustment.

Should the Contractor request a review in accordance with this section, the Engineer will review the performance assessment and payment adjustment proposed to ensure the assessment has been carried out in accordance with this Specification. The Engineer shall document their findings and forward a copy to the Contractor prior to the next scheduled monthly meeting. Should discussions at this meeting not result in agreement, the matter shall be resolved in accordance with the dispute resolution procedure detailed in the 'Conditions of Contract'.

Note that any deductions will be agreed at the monthly meeting, as per the process outlined in Section 7 Performance Criteria and Appraisal of Contractor's Performance, and will be applied the following month to which the adjustments apply.

7.7 Performance Improvement

The objective of the performance monitoring described in this Specification is to achieve and to demonstrate the achievement of the overall contract objectives. These objectives, in turn,

contribute to the Council Levels of Service defined in the Council Activity Management Plan. The objective of the payment adjustments for specified items is to ensure required performance.

The Council expects that any performance under-achievement, and the reasons underlying this under-achievement, will be clearly identified in an open and transparent manner in keeping with the collaborative management intent of this contract. Further, the Council expects that the Contractor will implement initiatives in a timely manner to improve performance so that the Performance Targets and the contract objectives are achieved.

APPENDIX 1

Monthly Assessment Non Performance Deductions

KPI's	Lump Sum Deduction	Acceptance Criteria	Not Met / Achieved	Deduction
1) Administration				
Monthly Report	$[redacted] LS deduction/month	Monthly report received 3 Days prior to the programmed monthly meeting with required information (progress reporting, expenditure, administrative, safety and traffic, issues arising etc) as per the Section 2 of the Specification.		
Contract Management and Planning	$[redacted] LS deduction/month	As per section 2 of the Specification – Contract works co-ordination, planning, programming, progress monitoring and reporting meets the required standard. Work programmes are current and contain relevant information, RAMM inventory data is maintained and current, and budgets are being well managed.		
Health and Safety	$[redacted] LS deduction/month	As per section 3 of the Specification – No issues arising from any Health and Safety incidents, correct PPE evident, and the Contractor Health and Safety Plan is current and being applied correctly.		
Traffic Management	$[redacted] LS deduction/month	As per section 3 of the Specification – All closures are to a compliant standard with no complaints received, audits are being undertaken and good results achieved, TMP current and on site, property access protected, and no delays are experienced.		
Customer Service and Communication	$[redacted] LS deduction/month	As per section 4 of the Specification – No public or Council generated complaints received, notifications distributed correctly, signage is in place as required, and good overall communication with Council is evident.		
Contract Quality Assurance	$[redacted] LS deduction/month	As per section 6 of the Specification – No issues arising from any Quality incidents, all documented procedures are being adhered too,		

KPI's	Lump Sum Deduction	Acceptance Criteria	Not Met / Achieved	Deduction
		self-audits are evident, correctly trained staff are being utilised, documentation is current and available, and the Contractor Quality Plan is current and being applied correctly. No non-conformances received.		
Environmental	$[redacted] LS deduction/month	No issues arising from any Environmental incidents, No spillages have occurred, environmental protection in place, correct PPE evident, and the Contractor Environmental Plan is current and being applied correctly.		
Subcontractor Compliance	$[redacted] LS deduction/month	All Subcontractors compliant with Contract requirements and their subcontract agreements.		
Inspection Test Plan	$[redacted] LS deduction/month	All required testing, and frequency, is compliant to the inspection test plan and records available and current.		
2) Programming				
Fault Finding	$[redacted] LS deduction/month	As per section 5 of the Specification – Roads surveyed at the required frequency and all faults captured, recorded and programmed accurately.		
Response Times	$[redacted] LS deduction/month	All faults and programmed work responded to on time, as per Contract response times under Section 1 of the Specification.		
Service Requests	$[redacted] LS deduction/month	Service Request response times are 80% compliant, communication with customer is evident and the issue made safe or resolved, RAMM information imputed, aligned and current, Service Requests are being managed correctly, and weekly reporting evident, as per Section 4 of the Specification.		
RAMM	$[redacted] LS deduction/month	Estimate accepted for all work, excepting emergency works. All information captured (description, photos, notes), correct SOR items claimed and within 10% of Estimate. Maintenance Cost Data processed		

KPI's	Lump Sum Deduction	Acceptance Criteria	Not Met / Achieved	Deduction
		and current, as-builts achieved, and all RAMM data captured for all work outputs, as per Section 2 of the Specification.		
Routine Maintenance	$[redacted] LS deduction/month	Routine Maintenance is being programmed (and undertaken) correctly and minimum faults are evident on the Network.		
Completion Date	$[redacted] LS deduction/month	All Contract achievement dates are benchmarked (and achieved), including surfacing, grading, vegetation, pre-seal repairs, annual remarking, etc.		

KPI's	Deduction Per Month	Unit	Acceptance Criteria	Not Met / Achieved	Deduction Payment
3) Physical Works					
Stormwater structures Maintenance	$[redacted] LS deduction per month	LS deduction / month	Routine Maintenance is being undertaken as per SOP/BOP item 5.1, including programming, inspections, maintenance, and all requirements met.		
Bridge/Structures Maintenance	$[redacted] LS deduction per month	LS deduction / month	Routine Maintenance is being undertaken as per SOP/BOP item 5.2, including programming, inspections, maintenance, and all requirements met.		
Traffic Services Maintenance	$[redacted] LS deduction per month	LS deduction / month	Routine Maintenance is being undertaken as per SOP/BOP item 5.3, including programming, inspections, maintenance, and all requirements met.		
Drainage Maintenance	$[redacted] LS deduction per month	LS deduction / month	Routine Maintenance is being undertaken as per SOP/BOP item 5.4, including programming, inspections, maintenance, and all requirements met.		

KPI's	Deduction Per Month	Unit	Acceptance Criteria	Not Met / Achieved	Deduction Payment
Callout Response	$[redacted] LS deduction per month	LS deduction / month	All emergency events attended within the required timeframe, the correct plant utilised, and records available, as per the Section 46 of the Specification		
Sump Cleaning	$[redacted] LS deduction per month	LS deduction / month	All sumps cleaned, including WCC type, Enviropods, Soakpits, and Critical Sumps responded to as per the Section 13 of the Specification		
Kerb and Channel Sweeping	$[redacted] LS deduction per month	LS deduction / month	Roads are swept at the correct frequency to the correct standard, around islands, under grates, around parked cars etc, as per Section 14 of the Specification		
Sealed Pavement Maintenance	$[redacted] LS deduction per month	LS deduction / month	All sealed pavements are being maintained to the appropriate standard, including inspecting, programming and repair of deficiencies, so that minimal deficiencies are evident		
Unsealed Pavement Maintenance	$[redacted] LS deduction per month	LS deduction / month	All unsealed pavements are being maintained to the appropriate standard, including inspecting, programming and repair of deficiencies, so that minimal deficiencies are evident.		
Footpath Maintenance	$[redacted] LS deduction per month	LS deduction / month	All footpaths are being maintained to the appropriate standard, including inspecting, programming and repair of deficiencies, so that minimal deficiencies are evident.		
Carparks/Service Lanes/Accessways	$[redacted] LS deduction per month	LS deduction / month	All carparks/service lanes/accessways are being maintained to the appropriate standard, including inspecting, programming and repair of deficiencies, so that minimal deficiencies are evident.		

KPI's	Deduction Per Month	Unit	Acceptance Criteria	Not Met / Achieved	Deduction Payment
Surfacing	$[redacted] LS deduction per month	LS deduction / month	All surfacing is completed within the stated timeframes, including completion of pre-seal repairs. All mix designs and certifications are in place and current, and roadmarking/service cover raising timeframes are met.		
Water and Drainage Reinstatements	$[redacted] LS deduction per month	LS deduction / month	All water and drainage reinstatements are completed within stated timeframes and to the correct standard, and reporting and claiming is accurate.		
Traffic Services Maintenance	$[redacted] LS deduction per month	LS deduction / month	All traffic services (signs, sightrails, guardrails, EMP's, Culvert Markers, etc) are being maintained to the appropriate standard, including inspecting, programming and repair of deficiencies, so that minimal deficiencies are evident.		
Roadmarking	$[redacted] LS deduction per month	LS deduction / month	All roadmarking is completed within the correct timeframe and to the correct standard, including annual remarking, hydrants, RRPM's, and instructed work.		
Vegetation	$[redacted] LS deduction per month	LS deduction / month	All vegetation activities are undertaken to the correct standard and frequency, as per Sections 17 and 18 of the Specification. No weeds are evident (weedspraying) and the vegetation control envelope (cutting) is within specification. No complaints received.		
Quality of completed work	$[redacted] LS deduction per month	LS deduction / month	All work is completed to the correct specification standard, and the correct plant is being utilised.		

Consideration will be given by the evaluation team when completing the monthly assessment of compliance against KPIs listed in section 3 above, to determine if the specified acceptance criteria is reasonable and applicable. If any component of acceptance criteria is not achieved the full deduction amount shall be applied.