From: Grace Ockwell
Sent: Thursday, 24 September 2015 11:43 a.m.
To: [redacted]
Cc: Kristy Rusher
Subject: Contract Specifications
Attachments: Tocher, Gordon, LGOIMA Con 3612 Rural Section 5B Technical Specs.pdf

Hi Gordon,

Thank you for your email and phone call.

Please find attached a copy of the Technical Specifications. Let me know if this is not what you are looking for.

Kind regards,

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REPAIR OF POTHOLES - SEALED

1.1 SCOPE

The inspection, reporting, programming and repair of potholes on sealed roads.

1.2 DEFINITION

A pothole is defined as where surface attrition has occurred over an area exceeding 70 mm in diameter but not exceeding 1m^2, and the basecourse aggregate is exposed, or where the defect exceeds 15 mm in depth in asphaltic concrete.

A pothole can also be a pavement failure, which has yet to be programmed and repaired, or any failure adjacent to the channel.

1.3 LEVEL OF SERVICE

HML There shall be no potholes.

S1 There shall be no potholes exceeding 30 mm in depth or 120 mm in diameter. There shall be no more than 1 pothole per centreline kilometre sized between 70 mm and 120 mm in diameter.

S2 There shall be no potholes exceeding 30 mm in depth or 200 mm in diameter. There shall be no more than 2 potholes per centreline kilometre sized between 70 mm and 200 mm in diameter.

End of Seal There shall be no potholes within 20 metres.

1.4 INTERVENTION LEVEL

The Contractor shall identify and repair all potholes >70 mm in diameter.

1.5 RESPONSE TIME

That all works are completed for both the timeliness and quality parameters as specified in this document or as defined by the Engineer.

1.6 ROUTINE WORKS

Routine works shall include:

(a) Inspections, marking, scheduling and prioritising of areas requiring repair.
(b) The repair of all potholes to meet the nominated Level of Service.
(c) Reporting progress of repairs to the Engineer.

1.7 REPAIR

The repair shall be such that it matches the structural and textural integrity of and lasts for the life of the surrounding pavement or the contract maintenance period, whichever is greater.

1.7.1 Surface Profile

The finished surface of the repair shall match the adjacent surface, in respect of profile and surfacing material, have no sharp ridges and shall be such that it does not allow water to

pond nor is higher than the adjacent pavement by more than 5 mm when measured by a 2m straightedge. The surface shall be waterproof and shall not flush.

1.8 PERFORMANCE CRITERIA

Routine Works:
That all potholes are repaired to meet the nominated level of service. That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

REPAIR OF SURFACE DEFORMATION

2.1 SCOPE

The inspection, reporting, programming and repairing of surface deformation, including depressions, wheel path rutting and settlement.

2.2 DEFINITION

Deformation is defined as an area that holds water to a depth of 15 mm or greater when the surrounding area is drying or a hump or hollow that deviates more than 15 mm from a 2m straightedge.

2.3 LEVEL OF SERVICE

Repair of surface deformations shall be carried out on sealed roads as specified by the Engineer.

2.4 RESPONSE TIME

That all works are completed for both the timeliness and quality parameters as specified in this document or as defined by the Engineer.

2.5 ROUTINE WORKS

Routine works shall include:

(a) Inspections, marking, scheduling and prioritising of areas requiring repair.

(b) Proposed programme of work to be submitted to the Engineer for approval prior to commencing work.

(c) Reporting progress of repairs to the Engineer.

2.6 ORDERED WORKS

Repair of Surface Deformations as directed by the Engineer. The repair shall be such that it matches the structural and textural integrity of and lasts for the life of the surrounding pavement or the contract maintenance period whichever is greater.

2.6.1 Surface

The final surfacing shall be of the same type and texture as the surrounding pavement.

2.6.2 Surface Profile

There shall be no depressions in the finished surface that will allow water to pond.

The surface shape of repairs shall be such that the existing road crossfall is maintained, the deviation when measured with a two metre straightedge shall not be greater than 5 mm, both within the repair and between the existing pavement and the repair, and there shall be no sharp ridges.

2.6.3 Methods of Repair

One of the five following methods shall be used for repairs:

(a) Polymer Seal

Where surface failure is more severe alligator cracking but has no associated rutting or shoving, the repair shall be with two coat polymer modified binder chip seal. The chip sizes of grade 4 on bottom and

grade 6 on top will generally be appropriate. The bitumen application should be designed to reflect the texture of the surface being sealed and the traffic volume. If this is a pre-seal repair, care in the bitumen application will reduce risk of flushing in new seal.

(b) Coldmix Reshaping

Reinstatement of acceptable shape with coldmix placed and compacted on the existing surface.

(c) Two Coat Chipseal

A two coat chipseal meeting TNZ Specification over the area requiring repair.

(d) Hotmix Reshaping

Reinstatement of acceptable shape with asphaltic concrete placed and compacted on the existing surface with emulsion and grit seal of the edges of the patch.

(e) Rip and Remake

Removal of existing surfacing materials, followed by placement and compaction of unbound basecourse to acceptable shape, and two coat chip sealing or premix to match existing surface where the surrounding road is surfaced with premix.

2.6.5 Coldmix Reshaping Method

Design of Coldmix

Refer to TNZ Specification, C1, Clause 13.

Preparation of Surface

Areas to be treated shall be free from excess moisture and prepared by removing any grit, dirt, detritus or other deleterious matter prior to the application of an emulsion tack coat.

Tack Coat

A tack coat of quick breaking emulsion shall be applied prior to placing any coldmix material. Tack coat shall be applied to a dry surface and shall have “broken” just before coldmix is placed.

2.6.6 Construction

General

As per specified in TNZ HM/13.

Coldmix material shall be constructed so that upon completion of work a uniformly dense and stable layer, which does not weave or creep under the action of compaction equipment or road traffic, is produced.

Segregation and resultant hungry and fatty patches will not be acceptable.

Compaction equipment employed shall be appropriate for the shape of the surface being corrected. Drum and plate dimensions shall be so chosen that edge compaction is attained without bridging.

Prior to sealing, the repair shall be proof tested with a Clegg Hammer, one test per 20 square metres or part thereof. All Clegg results shall be greater than 60.

Areas where tack coat has not been covered with coldmix material shall also be treated with sand or grit to prevent pick up.

2.6.7 Additional Requirement for Correcting Deformations in Asphaltic Concrete Surfaces

To ensure satisfactory jointing of the new asphaltic concrete layer with the adjacent layer, it may be necessary to remove some of the old surfacing material from around the perimeter of the area to be reshaped. Joints shall be prepared to provide a true line and vertical face by cutting the perimeter with a saw or similar. Straight line final treatment boundaries shall be established by the Contractor in accordance with the clause relating to the Extent of Repair above, prior to cutting. The depth of material to be removed shall be such that a finishing layer of the required thickness can be constructed over the entire area of reshaping.

Where the depth of deformation is greater than the thickness of the surfacing coat, it will be necessary to construct a levelling course before the waterproof coat is applied.

There shall be no areas which pond water before the waterproof coat is applied. All repairs on asphaltic concrete roads are to be joint sealed on completion.

2.7 PERFORMANCE CRITERIA

Routine Works

That all routine works are carried out in accordance with this specification and the Basis of Payment.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

REPAIR OF EDGEBREAK

3.1 SCOPE

The inspection, reporting, programming and repair of edge break in sealed pavements.

3.2 DEFINITION

Edge break is defined as fretting or breaking of the edge of the bituminous surface such that seal loss encroaches into the carriageway by more than 50 mm from the nominal seal edge or onto the white line.

3.3 LEVEL OF SERVICE

HML There shall be no edgebreak.

S1 & S2 Repair of edgebreak shall be carried out as specified by the Engineer.

3.4 INTERVENTION LEVEL

The Contractor shall identify and repair all edgebreak >50mm on HML roads.

3.5 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

3.6 ROUTINE WORKS

Routine works shall include:

(a) Inspections, marking, scheduling and prioritising of areas requiring repair.

(b) The repair of edgebreak on HML roads to meet the nominated Level of Service.

(c) Reporting progress of repairs to the Engineer.

3.7 REPAIR

If required shoulder maintenance shall be undertaken prior to edge break repair commencing in accordance with TS 5.

3.7.1

Surface Shape

Edge break repairs shall be carried out so that upon completion of the work a stable repair, which does not weave or creep under the action of compaction equipment or road traffic, is produced. The finished surface shape shall be a continuation of the adjacent sealed surface and shall not hold surface water.

3.8 ORDERED WORKS

The repair of edgebreak on all other roads except HML roads.

3.9 PERFORMANCE CRITERIA

Routine Works:

That all edge break on HML roads is repaired to meet the nominated level of service.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

SEALED PAVEMENT REPAIRS

4.1 SCOPE

The inspections, reporting, programming and repair to the pavement structure in sealed pavements, where a failure has occurred.

4.2 DEFINITION

A failure is defined as any area within the road formation width that has deformed as a result of surfacing, pavement or subgrade failure resulting in shoving/heaving or rutting, or if waterproofing is lost and pavement integrity is threatened.

Priority 1 Failure to be repaired immediately for safety reasons
Priority 2 Failure to be repaired in current month
Priority 3 Failure to be repaired in next month
Priority 4 Failure to be monitored

4.3 LEVEL OF SERVICE

Repair of failures shall be carried out on sealed roads as specified by the Engineer.

4.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

4.5 ROUTINE WORKS

The Routine works shall include:

(a) Inspections, marking, scheduling and prioritising of areas requiring repair.
(b) Proposed design of repairs to be submitted to the Engineer for approval prior to commencing work.
(c) Proposed programme of work to be submitted to the Engineer for approval prior to commencing work.
(d) Reporting progress of repairs to the Engineer.

4.5.1 Design

The Contractor shall propose the pavement design for all sealed pavement repairs in accordance with the Austroads Pavement Design Manual. The proposed design shall include quantity and type of makeup metal, depth of repair and if required binder type and application rate. The written approval of the Engineer must be given before works commence on site. If, once on site, the Contractor believes the proposed design needs to be changed they should propose a new design for the Engineers approval.

4.6 ORDERED WORKS

The repair of all failures to meet the nominated Level of Service. Repairs shall consist of:

(a) Digout Repair
(b) Stabilise and 2 coat chip seal
(c) Joint Sealing
(d) Crack Sealing
(e) Mill and Fill Repairs

(f) Strip and Resurface
(g) Watercutting for Removal of Flushing

4.6.1 Digout Repair

All repairs shall comply with TNZ C4:1995 clauses 5 8, 9, 10, 11 and 12.

The subgrade shall be proof tested with a Scala Penetrometer for up to 1 metre below subgrade level. If the CBR is less than 4 the Engineer shall be notified before proceeding.
Prior to sealing, the digout repair shall be proof tested with a Clegg Hammer, one test per 20 square metres or part thereof. All Clegg results shall be greater than 60.
Surfacing shall have a minimum depth of 40mm Asphalt, and the edges shall be joint sealed.

4.6.2 Stabilise and 2 coat chip seal

Where in situ stabilisation is the approved repair method, the area shall be scarified to the required depth and all large lumps greater than 75 mm diameter shall be disposed of. Following addition of any required make up metal and the stabilising agent, or any combination of agents, the area shall be pulverised and mixed to a depth of 250 mm and compacted.

Prior to sealing, the digout repair shall be proof tested with

(a) A Nuclear Densometer, one test every 20 square metres or part thereof. Air voids shall be less than 20%. Or
(b) A Clegg Hammer, one test every 20 square metres or part thereof. All Clegg results shall be greater than 40.

4.6.3 Joint Sealing

All repairs on asphaltic concrete roads are to be joint sealed on completion.

Maintenance

The Contractor shall remove excess sand/grit the day following the application of the joint sealant.
Any joint sealant not adhering to the existing surface shall be replaced during the defects liability period.

4.6.4 Mill and Fill Repairs

Asphaltic concrete and occasionally chip seal areas where failure has occurred within the top 70 mm shall be milled out and filled with asphaltic concrete to match the surrounding surface levels. Repairs on chip seal roads shall be

texturised within one month of completion. Over the winter period this may be deferred if approved by the Engineer.

4.6.5 Strip and Resurface

Pavement areas where failure has occurred within the top 100 mm shall be stripped and resurfaced with a minimum of 40mm Asphalt, to match the surrounding surface levels. The edges shall be joint sealed.

4.6.6 Watercutting for Removal of Flushing

The Contractor shall remove flushing by way of Watercutting, taking care not to damage the existing pavement surface. The Contractor will repair any damage to the pavement surface at their own cost.

All wastewater is to be contained and disposed of offsite at an approved dumpsite.

All noise level requirements must be met during the Watercutting operation.

Once Watercutting has been completed the Contractor shall reinstate all pavement markings affected by the operation.

4.6.7 Sealing

The repair shall be sealed with a two coat chip seal to match the surrounding surface texture within 48 hours of completion. The seal shall overlap the existing seal by between 100-150 mm and upon completion shall present a waterproof surface with a tidy appearance of rectangular shape. Ragged edges will not be acceptable. The sand circle diameter of the final chip sealed surface shall be less than or equal to 170 mm.

4.6.8 Additional Requirement for Pavement Repairs in Asphaltic Concrete Surfaces

Joints shall be prepared to provide a true line and vertical face by cutting the perimeter with a saw or similar. TNZ M10 Asphaltic concrete surfacing shall be constructed after application of a first coat Grade 5 chip seal. The depth of asphaltic concrete shall be minimum 30 mm. All repairs on asphaltic concrete roads are to be joint sealed as per this specification.

4.6.9 **Crack Sealing**

Crack Sealing shall be undertaken using the Clean and Fill method. This includes the use of a crack jet machine which blows hot compressed air into the crack.

Materials

The crack sealant shall have a minimum softening point of 70°C. The needle penetration at 25°C shall be less than 150 mm, the torsional recovery at thirty minutes shall be a minimum of 85% and the ball resilience shall be greater than 50%.

Preparation of Surface

The cracks shall be pressure cleaned, dried and any loose material removed. An approved crack primer shall be applied if required.

Application of Crack Sealant

The edges of all patches and cracks less than 5 mm wide shall be treated as follows. The Engineer shall be notified of cracks over 5 mm.

Testing

The Contractor shall supply recently achieved softening point, needle penetration, torsional recovery, and ball resistance test results. All tests shall be carried out by an approved laboratory and shall be furnished at least one week prior to commencing the joint sealing work.

One 2-litre sample of joint sealant shall be taken for testing by the Contractor twice during the contract to ensure that the sealant conforms to this specification.

Laboratory results shall be forwarded to the Engineer as soon as they become available.

4.6.10 **Surface Profile**

There shall be no depressions in the finished surface that will allow water to pond. The surface shape of repairs shall be such that the existing road cross fall is maintained, and the deviation when measured with a 2 m straightedge shall not be greater than 5 mm, both within the repair and between the existing pavement and the repair.

The profile of the repair shall be such that it matches the structural and textural integrity of and lasts for the life of the surrounding pavement or the contract maintenance period whichever is greater.

4.6.11 **Excavation Log Report**

When any excavation is made in the road the Contractor is expected to record the details of pavement layers and the subgrade properties of the section of road being repaired. The information required is a basic description of the

material in visible layers that make up the road structure and thickness of those layers and an assessment of the natural ground upon which the road was constructed. Location is to be identified by road name, route position and side of road. Layer thickness is to be to the nearest 10 mm for the top layer and to the nearest 50 mm for the other layers. A sample log sheet is provided in Appendix 6.22.

4.7 PERFORMANCE CRITERIA

Routine Works

That all routine works are carried out in accordance with this specification and the Basis of Payment.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

MAINTENANCE OF UNSEALED SHOULDERS

5.1 SCOPE

The inspection, reporting, programming and repair of unsealed shoulders adjacent to a sealed pavement.

5.2 DEFINITION

Unsealed shoulders are defined as the metal area from edge of seal to the surface water channel even if it is more than a distance of 1.5 metres from the seal edge including feather edges, tapers and cutouts.

Edge rutting is defined as a deformation, which results in a difference in level between the nominated edge of seal, and the adjacent unsealed shoulder, or a loss of cross-sectional shape within the shoulder.

Defects include rutting, scour or edgebreak to a depth of greater than 30 mm, or build up of material >30 mm or such that the adjacent sealed carriageway does not allow water to shed.

5.3 LEVEL OF SERVICE

HML There shall be no edge rutting or build-up of material >30mm.

S1 & S2 Repair of edge rutting shall be carried out as specified by the Engineer.

5.4 INTERVENTION LEVEL

The Contractor shall identify and repair edge rutting on HML roads >30 mm and ponding >10 mm.

5.5 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

5.6 ROUTINE WORKS

The Routine works shall include:

(a) Inspections, marking, scheduling and prioritising of areas requiring repair.
(b) Repairs on HML roads
(c) Proposed programme of ordered work to be submitted to the Engineer for approval prior to commencing work.
(d) Reporting progress of repairs to the Engineer.

Maintenance of Unsealed Shoulders, Feather Edges and Tapers on HML Roads

The Contractor shall maintain all unsealed shoulders within the scheduled road lengths including feather edges, tapers and cutouts to ensure that they are maintained in an even and compacted condition.

Widths and Crossfalls

The existing widths and crossfalls of the shoulders, feather edges, tapers and cutouts shall be maintained.

Shoulder Maintenance

(a) All shoulder material used shall conform to the material specification in the contract documents or shall be an approved equivalent material.

(b) Shoulder material shall not encroach onto the sealed pavement at any time except during maintenance operations. Shoulder material shall be maintained level with the edge of the adjacent sealed carriageway at all times within the tolerances specified in clause 5.3 above

(c) For grassed shoulders an even vegetation cover shall be maintained within the performance criteria given in TS20.

Reinstatement or Replacement of Edge Marker Posts, Marker Pegs, RRPM's and Signs

The Contractor shall reinstate, or replace, all removed disturbed or damaged edge marker posts including route position pegs, culvert marker pegs, bridge and hazard markers, RRPM's and signs to the appropriate Dunedin City Council Standards if they have been affected by the shoulder maintenance works.

5.7 ORDERED WORKS

(a) Repair of unsealed shoulders on S1 and S2 roads as directed by the Engineer.

(b) Shoulder Dressing – Aggregate from Milners Pit shall be applied to unsealed shoulders and feather edge. The dressing shall be applied 40mm thick, and extend for 500mm from the seal edge. The dressing shall be compacted into the batter slope of the pavement aggregates to choke the shoulders and feather edges in order to prevent rutting and metal migration by vehicles which may inadvertently travel over the shoulders and feather edges.

5.8 PERFORMANCE CRITERIA

Routine Works:

That all unsealed shoulders on HML roads are repaired to meet the nominated level of service.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

STORMWATER STRUCTURES

6.1 SCOPE

The inspection, reporting, programming, cleaning and repair of stormwater structures including maintenance of culvert marker pegs.

6.2 DEFINITION

Stormwater structures are any man-made structures constructed to collect and/or channel stormwater including:

- Culverts < 2.0m∅
- manholes
- slot drains
- soak pits
- silt traps
- surface water channels
- road surface water channels within 5 m of culvert inlets and outlets including vehicular access culverts
- pipes from mudtanks and catchpits to the discharge point into a reticulated stormwater system, open drain, side drain or natural watercourse.
- Plate crossings
- inlet and outlet structures
- vehicular access culverts
- mudtanks
- catchpits
- sumps
- grates
- roadside drains
- subsoil drains
- kerb and channel
- sealed channels
- cutouts
- flumes
- sock drains
- culvert marker pegs
- bridge deck drainage including channels and outlets

All the above facilities located within legal road are included for maintenance purposes.

6.3 LEVEL OF SERVICE

At any time at least 95% of mudtanks shall have available 90% of their grate waterway area clear of debris.

At least 95% of mudtanks, catchpits and sumps shall have at least 150 mm below the level of the outlet invert level clear of debris/detritus.

At least 95% of culverts shall have at least 90% of their waterway area clear of debris/detritus throughout the entire length of the structure including 5m upstream and downstream.

At least 95% of lined channel, sealed channel, plate crossings and kerb and channel shall have at least 90% of the waterway area clear of debris/detritus over a length of 5 m either side of the structure.

At least 95% of all other Stormwater Structures shall have 90% of the waterway area clear of debris/detritus.

All under road culverts shall be marked at the inlet end by an orange marker peg with a Council approved referencing system.

6.4 INTERVENTION LEVEL

The Contractor shall, as soon as the fault is identified:

- Clean all mudtank grates with <90% clear waterway area
- Clean all mudtanks, catchpits and sumps with <150mm below the level of the invert
- Clean any culvert with <90% of its waterway area clear

6.5 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

6.6 ROUTINE WORKS

Routine works shall include:

(a) Inspections, marking, scheduling and prioritising of structures requiring repair.
(b) Proposed programme of work to be submitted to the Engineer for approval prior to commencing work.
(c) Reporting progress of repairs to the Engineer.
(d) Maintenance of surface water channels where able to be undertaken in conjunction with routine surface and shape maintenance operations.
(e) Cleaning of all stormwater structures. These are deemed to be clean when 90% of the waterway area is clear of debris throughout the entire length of the structure.
(f) Replacing missing or broken culvert marker pegs with an orange marker peg with a Council approved referencing system on the culvert marker peg as per TNZ M/14 Specification.
(g) Inspection and reporting on the condition of all mudtanks culverts including vehicular crossing culverts on a 6 monthly basis. One in August, another in March.
(h) Inspection of culverts after an Emergency Event.

Included shall be an initial six month cycle to bring all stormwater structures up to specification, zone by zone – once a zone is complete from then on they must be maintained to the specified level of service.

During each cleaning cycle the Contractor should locate each new culvert inlets by GPS with a maximum error of 5m and reference with the approved Council referencing system and providing details of culvert diameter, length, material type and any ordered works required.

Stormwater structures shall be cleaned, where possible, in conjunction with each inspection. Foreign matter shall be removed from stormwater structures so that the normal water flow is maintained. Such foreign matter shall include all litter, rubbish, debris, detritus and vegetation.

All debris jammed within structures must be removed. Care shall be taken to ensure stormwater structures or their linings are not damaged during cleaning operations. This includes excessive cleaning of watertables causing water to pond. Damage arising from the Contractor's methods of work shall be remedied at the

Contractor's expense.

Work is to be programmed on a zone basis. A culvert list is provided in Appendix 6.9a and a mudtank list is provided in Appendix 6.9b.

The channel area within 5 m of culvert inlets and outlets shall be cleaned. Culvert inlet and outlet structures, such as headwalls, and the areas immediately adjacent to these, shall also be cleaned.

The inverts of sumps and manholes, their gratings, covers, seatings and outlet pipes shall be cleaned to the first outlet point or manhole in a reticulated system. Care shall be taken during cleaning not to push any debris into any other outlet pipes.

6.7 ORDERED WORKS

The repair or replacement of structural components of the stormwater system complying with the relevant Dunedin City Council Standards.

The cleaning and formation of surface water channels, outside the areas defined in 6.6 above, with machinery other than a grader including the disposal of the cleanings. Any works required to stormwater systems in private property.

6.8. PERFORMANCE CRITERIA

Routine Works:

That all stormwater structures are maintained to meet the nominated level of service.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

REPAIR OF POTHOLES - UNSEALED

7.1 SCOPE

The inspection, reporting, programming and repair of potholes on all unsealed roads

7.2 DEFINITION

Potholes are defined as holes in the surface of the pavement, with a depth greater than 20 mm and/or a diameter exceeding 200 mm.

7.3 LEVEL OF SERVICE

HML There shall be no potholes.

U1 There shall be no potholes exceeding 35 mm in depth or 400 mm in diameter. There shall be no more than 5 potholes per 200 centreline metres sized between 200 mm and 400 mm in diameter.

U2 There shall be no potholes exceeding 45 mm in depth or 400 mm in diameter. There shall be no more than 5 potholes per 200 centreline metres sized between 200 mm and 400 mm in diameter.

Bridge Approaches There shall be no potholes for a distance of 20 metres from the abutment on any approach.

End of Seal There shall be no potholes within 20 metres.

7.4 INTERVENTION LEVEL

The Contractor shall repair all potholes > 200mm in diameter or >20 mm in depth as soon as they are identified.

7.5 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

7.6 REPAIR

The repair shall be such that it matches the structural and textural integrity of and lasts for the life of the surrounding pavement or the contract maintenance period whichever is greater.

Surface Profile

The finished surface of the repair shall be constructed to the same crossfall and gradient as the adjacent pavement. The finished surface shall be such that it does not allow water to pond and there shall be no discernible difference in texture, density or surface level at the joint between the existing pavement and the completed repair.

7.7 PERFORMANCE CRITERIA

Routine Works

That all potholes are repaired to meet the nominated level of service.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

UNSEALED SURFACE AND SHAPE MAINTENANCE

8.1 SCOPE

The inspection, reporting, programming and maintenance of the surface profile on an unsealed carriageway.

8.2 DEFINITION

The unsealed road carriageway includes the running surface, shoulders, feather edges, cutouts and surface water channels where they can be maintained by a grader.

Defects include corrugations greater than 15 mm from crest to trough and rutting greater than 30 mm measured in any direction with a 2.0 m straight edge without moving any loose aggregate.

Surface and shape maintenance is any work required in the top 100 mm of an unsealed road/pavement.

8.3 LEVEL OF SERVICE

HML There shall be no surface or shape defects.

U1 There shall be no corrugations exceeding 25 mm from crest to trough or rutting exceeding 50 mm. There shall be no more than 10m per 200 centreline metres of corrugations between 15 mm and 25 mm. There shall be no more than 10m per 200 centreline metres of rutting between 25 mm and 40 mm. Depth of loose maintenance gravel on the running surface shall not exceed 40 mm loose depth.

U2 There shall be no corrugations exceeding 25 mm from crest to trough or rutting exceeding 50 mm. There shall be no more than 20m per 200 centreline metres of corrugations between 15 mm and 25 mm. There shall be no more than 10m per 200 centreline metres of rutting between 30 mm and 50 mm. Depth of loose maintenance gravel on the running surface shall not exceed 40 mm loose depth.

8.4 INTERVENTION LEVEL

The Contractor shall repair all corrugations and rutting >15 mm and 30 mm respectively as soon as they are identified.

8.5 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

8.6 ROUTINE WORKS

Routine works shall include:

(a) Inspections, marking, scheduling and prioritising of areas requiring repair.
(b) The maintenance of unsealed pavements to meet the nominated Level of Service.
(c) Reporting progress of repairs to the Engineer.
(d) Maintenance of surface water channels where able to be undertaken in conjunction with routine surface and shape maintenance operations.

8.7 REPAIR

Maintenance of Running Surface

The Contractor shall maintain the running surface, feather edges, tapers, cutouts and surface water channels and shall ensure that the maintenance aggregate is maintained in a smooth and compacted condition and that the cutouts and surface water channels are maintained to ensure adequate drainage and to prevent ponding of water. The cutouts and surface water channels should be cleaned and maintained with the grader wherever possible. If the Contractor believes a new cut-out is required he should notify the Engineer and gain approval before proceeding. No extra payment will be made for the installation of new cutouts in conjunction with a routine grading cycle.

All roads must be graded at least every six months as a minimum to prevent vegetation growing within the pavement.

8.7.1 Transition from Unsealed to Sealed Carriageway

Where the unsealed carriageway changes to a sealed carriageway, a smooth transition shall be maintained between the two surfaces over a 20m section within the unsealed carriageway. The sealed carriageway shall be kept free of all maintenance aggregate during surface and shape restoration

8.7.2 Widths and Crossfalls

The existing widths and crossfalls of the running surface, feather edges, tapers and surface water channels shall be maintained or widened if possible to achieve the minimum specified width of 5.0 metres. Crossfalls shall be maintained between 6% & 8% with a maximum superelevation of 12.5%.

8.7.3 **HML Roads** Compaction (using a static or vibrating roller and water cart as necessary) will be required in conjunction with all grading operations on HML roads to provide a tightly bound surface free of defects and loose aggregate. Further roads may be added to this category after pavement reshaping works.

8.7.4 Maintenance Operation

During any maintenance of the running surface the following requirements shall be adhered to:

(a) The length of road where the running surface is being disturbed by grading or other means, and which produces a windrow of loose material, shall not exceed 4.0 km.

(b) The height of the windrow of loose material shall not exceed that which will allow an average vehicle to negotiate and cross over without bottoming.

(c) Surface and shape maintenance shall be undertaken in accordance with this specification within 48 hours of the placement of maintenance aggregate.

8.7.5 Ponding of Water

The running surface, shoulders, feather edges, cutouts and surface water channels shall be maintained so that no water

ponds.

8.8 ORDERED WORKS

Dust Suppression

This work will be carried out as per instruction from the Engineer. The Contractor shall be responsible for the application of a dust suppression product approved by the Engineer and in accordance with the Otago Regional Council Regional Plan, and the manufacturer's recommendations.

8.9 PERFORMANCE CRITERIA

Routine Works:

That all surface and shape maintenance repairs meet the nominated level of service.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

UNSEALED PAVEMENT RESHAPING/HEAVY MAINTENANCE

9.1 SCOPE

The inspection, reporting, programming and undertaking of works of areas where reshaping/heavy maintenance is required to maintain the asset at its least life time cost. This work will usually be undertaken to bring the road up to HML standard.

9.2 DEFINITION

Pavement reshaping/heavy maintenance is any work required below the first 100 mm of an unsealed pavement to correct for poor geometric shape, drainage or sight restriction. This will generally be to bring a road or section of road up to HML standard.

Heavy maintenance also includes digouts as required to remove soft subgrade material.

9.3 LEVEL OF SERVICE

Pavement reshaping/heavy maintenance shall be carried out within the time period specified by the Engineer.

9.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

9.5 ROUTINE WORKS

The Routine works shall include:

(a) Inspections, scheduling and prioritising of areas requiring reshaping/heavy maintenance.
(b) Proposed programme of work to be submitted to the Engineer for approval prior to commencing work.
(c) Reporting progress of repairs to the Engineer

9.6 ORDERED WORKS

Ordered works shall include construction of all or any part of the proposed programme of works as authorised by the Engineer.

9.6.1

Materials

All materials shall comply with the requirements of Section 5.1.29, Materials.

Unsealed Digouts

Unsealed digouts may be required where the subgrade has failed or a spring is surfacing under the carriageway. The Contractor should propose the design, including depth, materials, drainage and geogrid or geotextile if required. The Engineer must approve the design before work commences.

9.6.2

Transition from Unsealed to Sealed Carriageway

Where the unsealed carriageway changes to a sealed carriageway, a smooth transition shall be maintained between the two surfaces over a 20m section within the unsealed carriageway. The sealed carriageway shall be kept free of all maintenance aggregate during surface and shape restoration.

9.6.3

Pavement Reshaping Operation

(a) The length of road where the surface is being disturbed by

the reshaping/heavy maintenance works shall not exceed 1.0 km.

(b) The height of the windrow of loose material shall not exceed that which will allow an average vehicle to negotiate and cross over without bottoming.

(c) On completion of the day's activities the carriageway shall be returned to a reasonable trafficable standard for the full width free of all windrow material and large stones >75 mm dia.

9.6.4 Surface Profile/Drainage

The surface profile shall be constructed to DCC standard details as specified by the Engineer. There shall be no depressions in the finished surface or drainage path/watertable that will allow water to pond.

9.7 PERFORMANCE CRITERIA

Routine Works

That all routine works are carried out in accordance with this specification and the Basis of Payment.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

SUPPLY AND PLACE MAINTENANCE AGGREGATE

10.1 SCOPE

The inspection, reporting, programming and management of the supply, cartage, placement and compaction of maintenance aggregate on unsealed roads.

10.2 DEFINITION

Maintenance aggregate is defined as specified in section 5.1.29, Materials.

A clay or bare patch is defined as where surface attrition has occurred over an area exceeding 0.5 square metres where the subgrade is exposed.

10.3 LEVEL OF SERVICE

Maintenance aggregate shall be placed as required to maintain a dense and trafficable running surface.

HML There shall be no clay patches

U1, U2 There shall be no clay patches exceeding $3m^2$. There shall be no more than 2 clay patches per 200 centreline metres sized between $0.5m^2$ and $3m^2$

10.4 INTERVENTION LEVEL

The Contractor shall repair all clay patches > $0.5m^2$ as soon as they are identified.

10.5 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

10.6 ROUTINE WORKS

Routine allowance of aggregate is based on a total annual volume of 28,000 m^3

Routine aggregate may consist of the following sizes AP 40, AP30 and AP20. Blending of aggregate is acceptable as long as the blend meets the specification or is approved by the Engineer prior to use.

The Contractor shall manage the routine allocation of aggregate throughout the year, however, if extra aggregate over this allowance is required the Engineer may authorise additional aggregate. The Contractor shall include routine metalling in their programmes so that the Engineer can be satisfied that this function is being managed properly.

Maintenance aggregate shall be placed to the required depth, true to grade and crossfall of the existing pavement without segregating. Surface and shape maintenance shall be undertaken in accordance with TS8 within 48 hours of the placement of maintenance aggregate.

HML Roads

Compaction (using a static or vibrating roller and water cart as necessary) will be required to provide a tightly bound surface free of defects and loose aggregate for all applications of aggregate on HML roads.

The selection of aggregate is at the Contractors discretion after

consultation with the Engineer and consideration of the weather condition and existing surface requirements. The Engineer may intervene if inappropriate aggregate is used.

10.7 ORDERED WORKS

The Engineer may authorise the use of AP 65 and AP 40 where the clay subgrade is visible through the pavement surface.

AP 65 must be rolled (using a static or vibrating roller and water cart as necessary) within 30 minutes of its being placed on the carriageway and must be covered with AP40, AP30 or AP20 maintenance aggregate immediately on completion of compaction.

10.8 PERFORMANCE CRITERIA

Routine Works

That all maintenance aggregate is placed to meet the nominated level of service.

That the quantity of aggregate used is managed to meet the total annual volume specified.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

SIGHT RAILS, GUARDRAILS AND HANDRAILS

13.1 SCOPE

The inspection, reporting, programming, cleaning and maintaining of all sight rails, guardrails and handrails including the removal of graffiti.

13.2 DEFINITION

Sight rails, guardrails and handrails are defined as including:

- timber sight rails on wooden posts
- timber sight rails on steel standards
- plastic barriers
- mesh fences
- W-section guardrails
- timber handrails
- steel handrails

13.3 LEVEL OF SERVICE

At least 95% of all sight rails, guardrails and handrails shall be in a clean, upright and intact condition at any one time.

13.4 INTERVENTION LEVEL

The Contractor shall repair and clean all sight rails, guard rails and handrails as soon as a fault is identified.

13.5 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

13.6 ROUTINE WORKS

Routine works shall include:

(a) Cleaning, painting and refitting of undamaged components
(b) All sight rails, guardrails and handrails are to be inspected and detailed fault reports submitted to the Engineer
(c) All painted sight rails, guardrails and handrails shall be repainted every two years
(d) All graffiti shall be removed within 24 hrs of notification or identification
(e) An initial six month cycle to bring all sight rails, guardrails and handrails up to specification, zone by zone – once a zone is completed from then on they must be maintained to the specified level of service.
(f) Checking and tightening of tension cables on guardrails.

13.7 ORDERED WORKS

Ordered work shall include replacement of damaged or missing components and construction of new sight rails, guard rails and handrails. New sight rails are to conform with Road and Traffic Standards Series 5 Figure 3 and guardrails to the Transit NZ Bridge Manual.

13.8 PERFORMANCE CRITERIA

Routine Works:

That all sight rails, guardrails and handrails are maintained to meet the nominated level of service.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

Ordered Works
That all ordered works are completed for both specified timeliness and quality parameters.

BRIDGE MAINTENANCE

14.1 SCOPE

The inspection, reporting, programming and repairs to all bridges as listed in Appendix 6.4 (Bridge List).

14.2 DEFINITION

Bridge maintenance is defined as the maintenance of all:

- Road Bridges
- Pedestrian Bridges
- Pipe or Box Culverts with a waterway area $\geq 3.5\ m^2$
- Animal or pedestrian underpasses situated on a legal road.

Note: Animal underpasses are maintained by the property owner but should be inspected and any defects reported that may affect the carriageway.

14.3 LEVEL OF SERVICE

All bridges are to be maintained clean with clear drainage systems.

(Refer to TS6 for level of service for stormwater structures, TS13 for level of service for sight rails, guardrails and handrails and TS19 for level of service for signs.)

14.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

14.5 ROUTINE WORKS

Routine works shall include:

(a) Inspections of all bridges in conjunction with routine network inspections by an experienced worker who has completed the TNZ Bridge Inspection and Maintenance Procedures Course, reporting on:
- Condition of bridge approaches, sight rails, guardrails, kerb rails, deck drainage, deck surface and waterway
- Adequacy of signs, roadmarking and bridge end markers
- Visual appearance including overhanging vegetation
- Any other aspect which may affect the integrity or safety of the structure

(b) Scheduling and prioritising the cleaning and/or repair of components.

(c) Cleaning of decks, drainage systems, handrails, guardrails, kerb rails, sight rails and bridge end markers to remove all debris including dirt, moss and lichen at least once per year, or as required.

(d) Proposed programme of ordered work to be submitted to the Engineer for approval prior to commencing work.

14.6 ORDERED WORKS

Ordered works may include:

- Painting
- Minor upgrading work

- Replacement of substandard components
- Removing any vegetation or debris obstructing the waterway.

14.7 PERFORMANCE CRITERIA

Routine Works:

That all bridges are maintained to meet the nominated level of service.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

STREET CLEANING / LITTER COLLECTION – EXCLUDING CENTRAL ACTIVITY AREA

16.1 SCOPE

The inspection, reporting, programming and cleaning of nominated areas within legal road.

16.2 DEFINITION

Street cleaning is defined as the removal of all debris, detritus, loose aggregate, litter, sand, grit, dirt, leaves, bottles, cans, cigarette butts, graffiti and other unsightly or deleterious material (including vomit, blood and urine).

Litter is defined as any refuse, detritus, debris, rubbish, dead animals, animal remains, glass, metal, garbage, or waste matter.

An intersection is defined as the area where two or more roads meet. The area of the intersection includes 25 metres of each road measured from the intersection of the centrelines of each road.

16.3 LEVEL OF SERVICE

That the Contractor shall undertake the cyclical cleaning as specified and any further special cleans as directed by the Engineer.

16.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

16.5 ROUTINE WORKS

Routine works shall include

- Inspections, scheduling and prioritising areas requiring cleaning.
- Proposed programme of work to be submitted to the Engineer for approval prior to commencing work.
- Reporting progress of cleaning to the Engineer.

16.5.1 Zone Cleaning

Once every month, at least 3 weeks apart, on the roads identified in Appendix 6.15, all surface areas within the road reserve, boundary to boundary, are to be free of litter, glass, debris, dirt, leaves etc following cleaning, including exposed gratings, side entry mudtanks, slot crossings and under plate crossings. This includes hand cleaning or washing where machine sweeping has been unable to clean.

16.5.1a Cycleway cleaning on Portobello Road

Remove detritus etc along cycleway once per month, two weeks after monthly zone clean.

16.5.2 Cleaning of Shopping Areas

Three times per week, on the roads identified in Appendix 6.17, all surface areas within the road reserve, boundary to boundary, including intersections, are to be free of litter, glass,

debris, leaves etc following cleaning, including exposed gratings, side entry mudtanks, slot crossings and under plate crossings. This includes hand cleaning where machine sweeping has been unable to clean.

16.5.3 Urgent Response Cleaning

The Contractor shall provide a 24 hour a day 7 days a week service to pick up miscellaneous refuse, including collection and disposal. Maximum dimension of refuse is 60 litres or 20 kg. Maximum length of time for each job is 4 hours from the time of arrival on site.

16.5.4 Intersection Sweeping

Once every second month all intersections identified in Appendix 6.18 are to be swept free of debris including under all plate crossings through slot crossings and mudtank gratings. This includes hand sweeping if necessary to remove and dispose of all loose material.

The Contractor should note the level of service required for stormwater structures in TS6.

16.5.5 Identifying Other Works

The Contractor shall identify any trip hazards, safety issues or other maintenance works discovered whilst undertaking his cyclic cleaning and report them to the Engineer.

16.6 ORDERED WORKS

Ordered work requested at the Engineer's discretion may include the following:

- Sweeping of nominated intersections by mechanical sweepers accompanied by hand sweeping if necessary to remove and dispose of all loose material
- Sweeping of nominated sealed road edges to remove and dispose of all loose sealing chip or other material
- Additional street cleaning may be requested prior to special events such as public holidays or town events in any area specified by the Engineer
- Repainting street furniture
- Any other cleaning works as requested by the Engineer.

16.7 PERFORMANCE CRITERIA

Routine Works:

That all street cleaning meets the nominated level of service.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

FOOTPATHS/TRAFFIC ISLANDS/VEHICLE & DROP CROSSINGS

17.1 SCOPE

The inspection, reporting, programming, maintenance & replacement of footpaths, drop & driveway crossings and traffic islands as directed by the Engineer.

17.2 DEFINITION

A footpath including drop crossing is defined as any facility specifically constructed for the safe passage of pedestrians alongside a road or State Highway, or a walkway between roads as identified in Appendix 6.6, within Dunedin City.

A vehicle crossing is defined as the section of the accessway between the edge of the carriageway and the property boundary.

A traffic island is a roundabout, pedestrian refuge or any structure that separates traffic lanes.

17.3 LEVEL OF SERVICE

Repairs shall be carried out within the period specified by the Engineer. Any dangerous area identified by the Engineer, Contractor or CSA shall be made safe within 4 hours of notification.

There shall be no potholes > 10 mm deep or 150 mm in diameter.

17.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

17.5 ROUTINE WORKS

Routine works shall include

(a) The regular inspection of all footpath areas at a frequency to ensure that there are no potholes > 10 mm deep or 150 mm in diameter are found on the footpath.

(b) The inspection of footpath areas as required to identify areas of surface displacement >10 mm or where water may pond. These areas shall be prioritised and reported to the Engineer.

(c) The inspection of paved footpaths once a month to identify areas of surface displacement >2 mm, joint gaps >3 mm or where water may pond. These areas shall be prioritised and reported to the Engineer.

17.6 ORDERED WORKS

Ordered works shall include:

(a) The repair/replacement of concrete footpath.

(b) The repair/replacement of AC/Slurry footpaths.

(c) The repair of Gravel Footpaths.

(d) The repair/replacement of drop crossings.

(e) The repair/replacement of vehicle crossings.

(f) Repair by hot mix overlay.

All ordered works shall comply with the requirements of DCC's Engineering Standards and Guidelines (Refer Clause 5.1.31) and the Standard Drawings provided in Appendix 6.23.

17.7 PERFORMANCE CRITERIA

Routine Works

That all routine works are carried out in accordance with this specification and the Basis of Payment.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

KERB & CHANNEL and LINED CHANNEL

18.1 SCOPE

The inspection, reporting, programming, repair, and construction of new kerb & channel and lined channel as directed by the Engineer.

18.2 DEFINITION

Channel includes slip formed and pre cast concrete (vertical and low profile) kerb and channel, stone kerb blocks, cast in-situ, lined channel and asphalt dish channel.

18.3 LEVEL OF SERVICE

The work shall be carried out to the specified standard within the period specified by the Engineer.

18.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

18.5 ROUTINE WORKS

Routine works shall include:

(a) Inspections, marking, scheduling and prioritising of areas requiring repair.

(b) Reporting progress of repairs to the Engineer.

18.6 ORDERED WORKS

Repair and New Construction

(a) The repair of all channels to meet the nominated Level of Service.

(b) New channel shall be constructed so that the profile, line and grade conforms with existing channel, ensuring that no ponding occurs and that water may flow freely, and that the profile is a uniform one for both line and grade. This work includes any concrete bedding, haunching and jointing. Refer DCC Standard Drawing see Appendix 6.23.

(c) Asphalt channel shall be constructed to a minimum width of 1.0 metre.

(d) The adjoining road pavement, footpath and berm shall be reinstated with new materials.

(e) If required a 100 mm diameter underchannel drain including filter sock shall be installed. This work includes any connections to existing drains, mudtanks or manholes.

(f) Any channel to be replaced shall be broken out and disposed of off site. The limits of the work shall be defined by transverse saw cutting to ensure a clean construction joint.

(g) The Contractor is to identify all existing connections into the channel, gain permits for any alterations and reinstate to DCC Standards.

18.7 PERFORMANCE CRITERIA

Routine Works:

That all routine works are carried out in accordance with this specification and the Basis of Payment.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time

and quality.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

MAINTENANCE OF SIGNS

19.1 SCOPE

The inspection, reporting, programming, repair and replacement of traffic signs, and various road hardware.

19.2 DEFINITION

Traffic signs and road hardware are defined as the following:
Total number of signs & EMP's are recorded in Appendix 6.05

- Traffic regulatory signs
- Regulatory parking signs
- Permanent warning signs
- Chevron Boards
- Edge Marker Posts
- Bridge end markers
- Posts, Poles and mounting hardware
- Street name signs
- Destination signs
- Facility signs
- Hazard markers
- Motorist service signs
- Amenity signs

19.3 LEVEL OF SERVICE

That at least 95% of traffic signs, EMP's, posts, and road hardware are to be maintained in a clean, vertical condition and facing the correct direction at any one time.

That all ordered works are completed for both specified timeliness and quality parameters

19.4 RESPONSE TIME

The Contractor shall immediately initiate the replacement of any sign or road hardware identified as missing or damaged. The Contractor shall have sufficient stock of all standard signs to enable replacement to be undertaken within the response times stated below.

Sign Type	**HML Roads**	**All Other Roads**
All Regulatory Signs	24 hours	2 days
Hazard Warning Signs	24 hours	2 days
All other Signs	48 hours	7 days
Edge Marker Posts	24 hours	7 days

19.5 ROUTINE WORKS

Signs shall be maintained in accordance with TNZ C18 and C20.

Routine Maintenance shall include:

(a) Inspections, marking, scheduling and prioritising of signs requiring repair.

(b) Proposed programme of work to be submitted to the Engineer for approval prior to commencing work.

(c) Reporting progress of repairs to the Engineer.

(d) Preparation, cleaning and painting of posts, poles, signs and EMP's. Preparation to include removal of dirt, grime and flaking/heavily oxidised paint. Cleaning of the signs shall be as detailed in section 408 of NZS S414:1977 and any amendments thereof. Painting shall consist of one coat high gloss acrylic.

(e) Maintaining and straightening poles, posts, signs and EMP's to within 3º off the vertical and to the correct

orientation.

(f) Removal of nails, staples, posters, graffiti or any unauthorised attachment from posts, poles and signs.

(g) Re-erecting (including cleaning if required) of undamaged posts, poles and signs, and shall include for the supply of additional fixings where required.

(h) Repairs, replacement or partial replacement of signs or road hardware.

(i) Replacing faded signs.

(j) The maintenance of the asset register through RAMM.

19.6 ORDERED WORKS

Ordered works shall consist of:

- Re-sitting of existing signs or road hardware.
- Installation of new signs and road hardware.

All signs shall be installed in accordance with Appendix 6.28 and to the relevant standard(s) given below:

- TNZ C/20:1995 Erection and Maintenance of Traffic Signs, Chevrons, Markers and Sight Rails.
- TNZ C/18:1995 Maintenance of Edge Marker Posts
- TNZ M/14:2002 Specification of Edge Marker Posts
- NZS 3631:1978 NZ Timber Grading Rules
- NZS 5414:1977 Specification for the Construction of Traffic Signs
- TNZ Manual of Traffic Signs and Markings
- RTSZ Guidelines for Street Name Signs
- DCC Bylaws

19.7 PERFORMANCE CRITERIA

Routine Works:

That all routine works are carried out in accordance with this specification and the Basis of Payment.

That where the Engineer or CSA instruction provides a specific response time, the repairs are satisfactorily completed to time and quality.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

VEGETATION CONTROL

20.1. SCOPE

The inspection, reporting, programming and control of vegetation by chemical and/or non-chemical methods including physical removal and mowing.

20.2. DEFINITION

Vegetation is defined as any plant growth including woody shrubs and trees.

Weed is defined as any plant growth exceeding 100mm high or 100mm x 100mm.

A one cut width is defined as a single pass of a mower, which has a minimum boom cutting width of 1.5metres.

Noxious Plants include:

- Barberry *Berberis glaucocarpa*
- Blackberry *Rubus fruticosus*
- Bomarea
- Broom *Cystisus scoparius, Teline monspesulana*
- Boneseed *Chrysanthemoides monilifera*
- Boxthorn *Lycium ferocissimum*
- Gorse *Ulex spp.*
- Hawthorn (under 2m high) *Crataegus monogyna*
- Hemlock *Conium maculatum*
- Montpellier Broom *Teline monspessulana*
- Nodding Thistle *Carduus nutans*
- Cape Ivy *Senecio Angulayus*
- Old Mans Beard *Clematis Vitalba*
- Privet *Ligustrum lucidum, L. sinense*
- Pampas *Cortaderia selloana, C jubata*
- Ragwort *Senecio jacobaea*
- Spiny Broom *Calicotome spinosa*
- Sweet Brier *Rosa rubiginosa*
- Whire Edged Nightshade *Solanum marginatum*
- Wild Ginger *Hedychium, gardnerianum, flavescens*
- Wilding pines (under 2m)
- Woolly Night Shade *Solanum mauritianum*

The Vegetation Envelopes are as illustrated in Appendix 6.24.

20.3. LEVEL OF SERVICE

That the work shall be carried out within the areas defined in the appendices and at the stated State Highway locations such that at any time at least 95% of the rural area by centreline kilometre complies with the specified standards as nominated below.

The State Highway locations are as follows:

- SH 1: From Whites Road (Kilmog) to northern boundary of city (Tumai)
- SH 1: From Gladfield Road (East Taieri) to Southern boundary of city (Waipori River Bridge)
- SH 86: Full Length (SH 1 to airport)
- SH 87: From Dukes Rd (Mosgiel) to city Boundary (Tiroiti)

20.3.1 **Unsealed Shoulders**

Vegetation height to be maintained within tolerances below and as illustrated in Appendix 6.24.

Road category	Standard Type	Grass Height Tolerances (mm)
All Roads	2	50 – 200 max

The seal edge and surface of all carriageways shall be kept clear of encroaching vegetation growth at all times.

20.3.2 **Edge Marker and Sign Posts**

The area surrounding edge marker posts, signposts culvert marker posts, bus shelters, seats and roadside furniture shall be treated to provide vegetation control as illustrated in Appendix 6.24. Vegetation shall not exceed 200 mm in height in the specified control area.

20.3.3 **Bridge End Markers**

The area surrounding bridge end markers at bridge abutments shall be treated to ensure clear driver visibility of the markers.

20.3.4 **Guardrails, Sight rails and Culvert Headwalls**

The area surrounding guardrails, sight rails and culvert headwalls shall be treated by appropriate chemical or mechanical means to provide vegetation control as illustrated in Appendix 6.24. Vegetation shall not exceed 200 mm in height in the specified control area.

20.3.5 **Surface Water Channels, Side Drains and Culvert Waterways**.

All surface water channels, side drains, cut-out drains and culvert waterways shall be maintained to the grass heights specified in Clause 20.3.1. All culvert inlet and outlet drains shall be treated to the adjacent fence line, or to a minimum of five metres from the culvert, whichever is the lesser.

If any surface water channel, side drain or cut out becomes subject to erosion, the treatment of the vegetation may be modified after consultation with the Engineer to assist in the rehabilitation and stabilisation of the drainage path.

The Contractor should note the requirements of TS6 Stormwater Structures when undertaking vegetation control adjacent to culverts.

20.3.6 **Kerb and Channel, Footpaths (sealed and unsealed) and Paved Areas**.

Any weed encroaching over the kerb face, appearing in construction cracks between kerbs, pavement, footpath, edge strip, barrier walls, the pavement itself, or any other concrete structure, shall be removed.

20.3.7 **Visibility and Road Hazards**

Roadside vegetation, which encroaches into the vegetation envelope or vegetation control area, illustrated in Appendix 6.24, shall be within the tolerances described above.

Any other vegetation outside the envelope provided in Appendix 6.24, which presents a safety hazard to road users or operators of all vehicle types, by restricting visibility, shall be trimmed.

After trimming vegetation there shall be no obvious cut lines or tear marks visible, and trimmings must be removed.

Special width cut areas may be required for safety visibility on vertical and horizontal curves, intersections, railway crossings and at private vehicle crossings, where cut areas may extend to the legal boundary.

If vegetation on roads through scenic reserves or where significant trees on other roads encroach into the vegetation envelope, these shall not be cut unless ordered by the Engineer. If the Contractor has any doubt the situation should be discussed with the Engineer prior to any work proceeding.

Vegetation is to be controlled to ensure sufficient intervisibility between vehicles, cyclists and pedestrians to allow drivers to stop safely, if need be.

Sufficient intervisibility is defined as: a sightline clear of vegetation between 600 mm and 2.4m higher than the carriageway surface for a minimum of 60m where speed limits are 50 km/h and for 120m where speed limits are higher. For reference see Transit New Zealand Manual of Traffic Signs and Markers Part 1: Traffic Signs.

20.3.8 **Amenity Mowing**

Three categories of amenity mowing are defined as:

Type 1 - Vegetation height to be maintained between 30mm and 100mm. All cuttings must be picked up and disposed of off-site by the Contractor.
Type 2 - Vegetation height to be maintained between 50mm and 200mm
Type 3 - Vegetation height to be maintained between 50mm and 300mm
Type 4 – Vegetation height to be maintained between 100 mm and 300 mm.

The locations are provided in Appendix 6.26.

The frequency of cuts required shall relate directly to the growing conditions. The cutting frequencies given in Appendix 6.26 are a guide to the Contractor only and do not necessarily represent the required frequency of grass cutting under this contract, no warranty is offered as to the accuracy of this

information.

20.3.9 Traffic Islands / Roundabouts

Any vegetation encroaching over the kerb face, appearing in construction cracks between kerbs, pavement, edge strip or barrier walls shall be removed. Planting within the island must be maintained and must not exceed 600mm in height. Grassed traffic islands should be mowed to meet the Type 1 Specification for Amenity Mowing.

20.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

20.5. ROUTINE WORKS

Routine works shall include:

(a) All works described in level of Services above, and this section (20.5).
(b) Inspecting, reporting and programming vegetation control works.
(c) Reporting progress of control to the Engineer.
(d) Vegetation control shall be carried out in accordance with the following specification and to the nominated level of service.
(e) Treatment of Noxious Plants

20.5.1 Chemical Vegetation Control

Control of vegetation by the use of chemicals shall be in accordance with all relevant Acts, regulations and Bylaws.

All operators must hold a current NZQA Advanced Growsafe qualification and be in possession of training certificates for the type of works specified.

The preferred herbicides to be used for the contract are:

- Glyphosate
- Metsulfuron

Hormonal or arsenic weed killers shall not be used. Other chemicals may be used with the Engineers approval.

A suitable wetting / sticking agent and antidrift agent shall be used. A penetrant may also be used in conjunction with the above when required.

The Contractor shall be responsible for ascertaining the type, location and extent of any limitations on spraying near horticultural blocks in the vicinity of the Contract and regulate his activities accordingly.

20.5.2 Noxious Plants

All noxious plants within the legal road reserve shall be treated with Tordon Brushkiller or suitable method approved by the ORC and DCC, including an anti-drift wetting agent and a coloured dye to show where spraying has been undertaken.

The Contractor shall **not** spray gorse, broom or hawthorn forming a 'live' hedge unless directed by the Engineer to do so.

20.5.3 **No-Spray Areas**

No-Spray areas are detailed in Appendix 6.25

As reasons for property occupiers requesting "No Spray" on their frontages range from moral objection to medical susceptibility, it is critical that no violation of the "No Spray" list occurs. Accordingly any justified complaint of any such violation may result in a deduction of $1000 for each infringement. Any claim from property occupiers arising from a violation shall be the Contractors sole responsibility.

20.5.4 **Restrictions**

Chemicals are not to be used:

- Within 500 metres of schools, play centres, kindergartens or community activity centres an hour before and after they are in use.
- After 3.00 pm in Urban areas.
- At weekends or statutory holidays.
- Near shops, bus stops, walkways between 7.00 am and 7.00 pm.
- When wind speed exceeds 10 km/hr.

The treatment method used shall not damage the road structure or road furniture. The use of open flame is not permitted.

20.5.5 **Advertisement**

Public Notice is to be prepared by the Contractor and forwarded to the Council allowing it to be placed in the Otago Daily Times "DCC Notice Board" of the intention to apply herbicides at least one week prior to work commencing in any area and once again every month during spraying season. The advert should include details of where spraying will take place. No spray work is to be undertaken until the Engineer holds a copy of the appropriate advertisement.

20.5.6 **Resident Notification**

A small number of residents are severely allergic to any chemicals and DCC has an agreement to inform them of any spraying undertaken within a 5 km radius of their property. The contact details for these residents will be supplied to the Contractor who shall give them at least 7 days notice of the intention to spray near their homes. The Contractor is expected to cooperate with any reasonable request to adjust the programme.

There are also a small number of commercial produce

properties that should be contacted prior to spraying their property frontages. The contact details for these businesses will be supplied to the Contractor who shall give them at least 7 days notice of the intention to spray near their properties.

20.6. ORDERED WORKS

Ordered works shall consist of:

- Additional mowing as ordered by the Engineer.
- Removal of roadside trees as ordered by the Engineer.
- Other vegetation control as ordered by the Engineer.

20.7. PERFORMANCE CRITERIA

Routine Works:

That all vegetation control meets the nominated level of service.

That where the Engineer or CSA instruction provides a specific response time, the work is satisfactorily completed to time and quality.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

BEE & WASP NEST ERADICATION

21.1 SCOPE

The inspection, reporting and eradication of bee and wasp nests from within the road reserve.

21.2 DEFINITION

Bee and wasp eradication is defined as where the Contractor discovers in his normal operations a bee or wasp nest within the road reserve, or is notified by the CSA or the Engineer, he is required to carry out eradication.

21.3 LEVEL OF SERVICE

That the work shall be carried out the same day of identification of the nest, or when requested by the Engineer.

21.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

21.5 ROUTINE WORKS

Routine works shall include:

21.5.1 Inspections

During the course of normal maintenance operations, in particular vegetation control operations, the Contractor is expected to inspect for nests within the road reserve.

21.5.2 Eradication

The Contractor shall eradicate all bee and wasp nests found within the road reserve.
For bee nests an apiarist should be contacted in the first instance for removal.
The eradication agent should be approved by the Engineer prior to use.

21.5.3 Reporting

The Contractor shall report on all nests eradicated including the date, time, their approx. size and location.

21.6 PERFORMANCE CRITERIA

That where the Engineer or CSA instruction provides a specific response time, the nest is satisfactorily eradicated to meet that time.

SURFACE GRITTING

22.1 SCOPE

The inspection, reporting and carrying out of surface gritting on sealed roads and the removal of grit afterwards.

22.2 DEFINITION

Surface gritting is defined as the placement of grit or C.M.A. on roads affected by frost, ice, snow, bleeding or spillage to allow the safe passage of traffic.

22.3 LEVEL OF SERVICE

All frost, ice, snow, bleeding or spillage affected areas of the carriageway shall have been treated and the spread of grit or C.M.A. shall be even and consistent across the normal traffic lane or lanes and in just sufficient quantity to provide motor vehicles with reasonable traction subject to prudent driving.

22.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

22.5 ROUTINE WORKS

Routine works shall include:

22.5.1

Inspections

Inspections will be required throughout the duration of the contract when weather conditions are such that gritting may be required.

Daily early morning inspections of the listed arterial, collector and bus routes are to be carried out to determine the frost gritting needs during the winter period. It is expected that daily inspections will start in the last week in May each year and continue through to the first week of September. The exact commencement and completion dates will be agreed with the Engineer.

On days of heavy frost or snow more than one inspection may be required and the Engineer may request further roads to be inspected. The listed roads are provided in Appendix 6.29.

22.5.2

Management & Reporting

(a) During the winter period the road condition status should be updated daily in the Dunedin City Council Road Conditions Website and inform the Engineer in the format provided in Appendix 6.29.

(b) The Contractor shall keep accurate and legible records of all inspections, gritting or C.M.A applications and grit removal in electronic format, forwarded daily to the Engineer. In addition to this program the Contractor shall keep weighbridge dockets for all grit supplied and be able to show where this grit has been placed.

22.5.3 ORDERED WORKS

Frost Gritting

Gritting is required where frost, ice, or snow affects the carriageway. The Contractor is responsible for deciding the

extent of grit cover required to make a section of the carriageway safe. However as a guide it is expected that the application rate will be in the order of 0.65t of grit per lane km. The Engineer may direct the application rate be altered if in their opinion the application rates are not correct. Grit spreading shall be undertaken with a mechanical spreader with which the width and volume of grit spreading can be controlled and recorded. The grit to be used on frost will be ”DCC Frost grit” as per Appendix 6.41.

Frost gritting on all routes must be completed before **7.30 am.**

The Contractor shall have the plant, equipment and resources available to undertake frost gritting at any time during the duration of the contract, not just during the winter season.

22.5.4 **Grit Removal**

All grit is to be removed from the shoulders, footpaths, kerb and channel, water channel, mudtanks and all road surfaces within **96** hours of the grit **first** being applied. Even if grit has been applied on all subsequent days and may be required the next day the grit must be removed. This is to reduce the chance of the grit accumulating into windrows, eliminating roadmarkings and being carried into the stormwater system by rain. The Contractor should remove grit if it is starting to windrow or is eliminating roadmarkings at any time.

On completion of the grit removal, the footpath, carriageway including parking lanes, kerb and channel, traffic islands, medians, water channel, mudtanks and roadmarkings shall be clear of grit.

22.5.5 **C.M.A.**

CMA will be typically applied in liquid form on an “as and when instructed” basis, in conjunction with existing mechanical measures such as gritting. In certain situations CMA may also be applied as a granular/grit mixture, where treatment of accumulated snow and ice is a priority. The product is to be stored, mixed and applied in accordance with the supplier’s instructions and latest TNZ best practice.

The Contractor shall note that specific mixing plant will be required.

22.6 Ordered works shall also include:

(a) Surface gritting for **bleeding or spillage** as directed by the Engineer.

(b) **Footpath gritting**. The Engineer may request a limited number of footpaths to be gritted by exception.

22.7 PERFORMANCE CRITERIA

Routine Works:
That all routine works are carried out in accordance with this specification.

Ordered Works:
That all ordered works are completed for both the specified timeliness and quality parameters.

That where the Engineer or CSA instruction provides a specific response time, the works are satisfactorily completed to time and quality.

MAINTENANCE OF BUS SHELTERS

23.1 SCOPE

The inspection, reporting, programming, cleaning and repair of bus shelters, bus stop seats not in shelters, and timetable stands.

23.2 DEFINITION

Bus shelters and bus stop seats established and under control of the Dunedin City Council on behalf of the Otago Regional Council and TNZ and as defined in the tables in Appendix 6.7.

23.3 LEVEL OF SERVICE

That at all times all bus shelters, bus stop seats and timetable stands shall be maintained in a clean and safe condition in accordance with this specification.

23.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

23.5 ROUTINE WORKS

Routine works shall include:

(a) Inspections, reporting and programming of repairs to be carried out at a minimum of a monthly frequency.

(b) All interiors and exteriors, including the floor areas, associated seats, to be free of all dirt, debris, detritus, litter, faeces, broken glass, graffiti, posters, cobwebs and other matter. The Councils expectation is that this standard will be achieved by waterblasting of the shelters (excluding removal of graffiti and broken glass), at least once per month.

(c) The removal of litter shall include any within a 5m radius of the shelter or seat.

(d) If the graffiti cannot be removed by hand the affected area should be cleaned and repainted in the standard colour to match existing. If the bus shelter has a mural the affected area should be cleaned as much as possible and the Engineer advised. All reported graffiti is to be removed within 24 hours.

(e) The Contractor as ordered works can undertake minor structural repairs up to the value of $1,000 without consultation with the Engineer. The Contractor shall identify and report any structural or other major repairs needed to the Engineer within one week of inspection.

(f) The Contractor will be supplied with a Bus Shelter database for use during the period of the Contract. The database shall be maintained and updated each month by the Contractor.

23.6 ORDERED WORKS

Ordered works shall include the following:

(a) Major structural repairs of bus shelters.

(b) Repainting of bus shelters and bus stop seats with acrylic paint, colour to match existing Black Bean (B14C40) or Black (??) including the seats if painted, inside and

outside, but excluding the exterior roof.

Repainting of the murals on the bus shelters is undertaken by others.

23.7 PERFORMANCE CRITERIA

Routine Works

That all routine works are carried out to meet the nominated level of service.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

MAINTENANCE OF UTILITY SERVICE COVERS

24.1 SCOPE

The inspection, reporting, programming, and repair of utility service covers.

24.2 DEFINITION

Utility service covers are any covers for utility services including, manholes, valves, hydrants, meters, stopcocks, gas and other service covers.

Structural repair is any repair needed for reasons of ride, hazard or preseal repair.

24.3 LEVEL OF SERVICE

That at any time at least 95% of covers shall conform to the specified level of service.

24.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

24.5 ROUTINE WORKS

The Contractor shall identify and report any structural repairs needed to the Engineer within one week of inspection clearly identifying the utility service owner.

24.6 ORDERED WORKS

Ordered works shall include the following:

(a) Repair of utility service covers as specified by the Engineer. Repairs are to be carried out in accordance with the standard drawings provided in Appendix 6.23 and with any relevant utility specifications.

(b) Within two days of completion of the works the Contractor shall notify the following:

- The Operations Supervisor in the DCC Water Department;
- The Drainage Reticulation Supervisor in the DCC Drainage Department, so that the works can be checked for compliance. Any remedial work required must be carried out within one day of notification.

24.7 PERFORMANCE CRITERIA

Routine Works

That all routine works are carried out to meet the nominated level of service.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

SNOW CLEARING

25.1 SCOPE

The inspection, reporting and clearing of snow.

25.2 DEFINITION

Snow clearing is the removal of snow from the carriageway to allow the safe passage of traffic.

25.3 LEVEL OF SERVICE

All snow affected areas of carriageway shall have been inspected and either closed or cleared as quickly as possible to provide a safe network for motorists.

25.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

25.5 ROUTINE WORKS

Routine works shall include:

25.5.1 Inspections

The Contractor is to monitor weather forecasts and inspect any roads where it is possible that they may be affected by snow. On days of heavy snow more than one inspection may be required.

25.5.2 Reporting

The Contractor shall keep accurate and legible records of all inspections including the time and locations inspected. If any roads require closure the Contractor is to immediately initiate this and report the details by updating the DCC web page and informing the Engineer.

The Contractor will supply a database for use during the period of the Contract. The database shall be maintained and updated each month by the Contractor.

25.5.3 Snow Clearance

Roads that, historically, have been affected by snow are listed in Appendix 6.29. The response time for these roads is:

- Area A – 24 hours
- Area B – 48 hours
- Area C – 72 hours

The measurement of time begins once, the snow has stopped falling, or at an agreed time with the Engineer.

The Contractor is to mobilise all plant necessary to clear snow from the carriageway. The Contractor is to take care not to damage street furniture and markings such as edge marker posts, RRPM's and Long Life road markings. If in the opinion of the Engineer the Contractor has not taken all due care the Contractor will be required to reinstate damaged furniture and markings at their own cost.

25.6 PERFORMANCE CRITERIA

Routine Works

That all routine works are carried out to meet the nominated level of service.

WALKWAYS

26.1 SCOPE

The inspection, reporting, programming and repair of sealed and unsealed walkways.

26.2 DEFINITION

Walkways established and under control of Dunedin City Council are defined in Appendix 6.6.

26.3 LEVEL OF SERVICE

Walkways shall be maintained in accordance with Technical Specification Numbers 6, 13, 15, 16, 17, 18, 19, 20 and 21.

That at any time at least 95% of walkways (by audit section) shall conform to the specified level of service.

26.4 RESPONSE TIME

That all works are completed for both the specified timeliness and quality parameters.

26.5 REPAIR

Routine Works

(a) All routine works are those detailed in Technical Specifications 6, 13, 15, 16, 17, 18, 19, 20 and 21.

(b) The Contractor will be supplied with a Walkway database for use during the period of the Contract. The database shall be maintained and updated each month by the Contractor.

Ordered Works

Repairs to pavement, stormwater structures and pedestrian facilities in accordance with the Technical Specifications.

26.6 PERFORMANCE CRITERIA

Routine Works

That all routine works are carried out in accordance with this specification and the Basis of Payment.

Ordered Works

That all ordered works are completed for both specified timeliness and quality parameters.

30 FOOTPATH RESURFACING

A1. Scope of Contract

A.1.1 Location of Works

The site of works for year 1 is detailed in Appendix 41.

A.1.2 Description of Works

The work includes but is not limited to:

- Preparation of all footpaths prior to resurfacing.
- Reconstruction of footpaths.
- Supply and placement of slurry seal.
- Supply and placement of asphalt surfacing.
- Completion of RAMM sheets for each site.

A2. Testing and Examination of Materials

In addition to their commitment to sample and provide test results, the Contractor shall provide any labour required to assist the Engineer to inspect, examine and test any materials. The Contractor shall have no claim for the cost of this assistance or costs of any delay resulting from such testing. The Engineer may condemn any materials at any time if they do not comply with this Specification.

The Contractor shall arrange for and undertake all material testing under the specification. Copies of all test results shall be supplied to the Engineer. The Engineer may carry out random verification testing. Should any such verification test fail to meet specified requirements the Contractor shall bear the costs of the testing and any subsequent testing.

The minimum conforming testing frequency and required tests are as follows:

ASPHALT		
Grading and Binder Content	lots <100m2	2 Samples
	lots 100 - 400m2	3 Samples
	lots >400m2	4 Samples

SLURRY		
Grading and Binder Content	lots <100m2	2 Samples
	lots 100 - 400m2	3 Samples
	lots >400m2	4 Samples

BASECOURSE	
Grading	1 Test per production

A3. Contractor's Establishment and Working Area

The Contractor shall make arrangements with the appropriate landowner, territorial authority or service authority concerning an area for establishment, power, water and sanitary facilities subject to local body by-laws and the approval of the Engineer.

The Contractor's site establishment shall not interfere with:

(i) Traffic movements or visibility of vehicles.
(ii) Pedestrian thoroughfare.
(iii) The work of any service authority.
(iv) Access to adjacent properties.
(v) The road, structure, drainage facilities, etc.

A4. Stockpile Sites

The Contractor shall nominate all intended material stockpile sites for approval by the Engineer.

Each site shall be left in a safe and tidy condition, with all excess material removed and the area levelled.

The Certificate of Practical Completion will not be issued until the stockpile sites are returned to a condition that is satisfactory to the Engineer. This means that

stockpile sites must be left in a condition the same as or better than before they were used.

A5. Bitumen Nuisance

The Contractor is required to monitor all new sealing/surfacing and to ensure that adequate measures are taken to prevent bitumen tracking problems and/or remedy promptly any problems that do arise.

A6. Services Identification and Relocation

The Contractor shall contact all relevant service authorities and identify and locate all services within each site.

In consultation with the service provider and the Engineer, those services requiring to be relocated shall be identified and the extent and cost of relocation agreed.

On instruction from the Engineer, the Contractor shall organise with the service provider for the work to be undertaken, for the agreed price.

The services likely to be affected include: underground water mains, underground gas mains, underground telecommunication cables and survey marks.

The Contractor should allow for working around existing services and the dusting and compaction around these services within each site.

A7. Public Notification

The Contractor shall arrange operations so that disruption of access to properties adjacent to the works is kept to a minimum. Prior to commencement of work (72 hours minimum) written advice shall be given by the Contractor to all property occupiers adjacent to the site and/or likely to be affected. The Contractor is to supply a draft letter to the Consultant for approval. The letter must include:

- Explanation of work.
- Date of disruption.
- Contract number.
- Contractor's name.
- Information pertaining to site specific controls (eg. bitumen tracking, children, parking etc).

- Access restrictions.

Commencement of work on site is deemed to be from the start of marking out repairs.

The Contractor shall respond to all other enquiries relating to the programme as required by the Engineer.

As well as the general notification to the public, the Contractor shall identify any specific users who may be affected (eg. Foundation for Blind, etc).

A8. RAMM and As-Built Drawings

The Contractor shall provide RAMM information for each site on the sheet provided for that purpose. RAMM records shall be included with the Contractor's monthly claims.

The Contractor shall provide As-Built drawings, updated for each site on a copy of the construction drawings provided.

Practical completion will not be issued until the final RAMM information and any requested As-Built drawings have been submitted to and accepted by the Engineer.

B. Pre-surfacing Preparation

B1. Scope

Prior to resurfacing work the footpaths shall be repaired and brought up to a standard suitable for the construction of resurfacing.

B2. General

The Contractor is required to inspect each site and prepare a programme of work and submit it to the Engineer for approval prior to work starting.

Preparation of work at each site shall be completed not less than two weeks prior to resurfacing work proceeding.

On completion of preparation works the Contractor shall advise the Engineer, so that an inspection may take place prior to resurfacing.

B3. Property Trees and Shrubs

Cutting back, trimming and/or removal of overhanging vegetation (trees and shrubs) have been programmed to be completed by others (Property Owners) prior to commencement of work under this contract.

No trimming and/or removal of property vegetation shall be carried out by the Contractor unless specifically authorised in writing by the Engineer and will then be carried out as a Variation to the Contract.

The Contractor shall be responsible for the protection of trees growing along the grass margin or in the vicinity of the works.

The Contractor shall contact the DCC Parks Officer (Trees) (phone 477-4000) prior to any excavation work in the area and before any trimming or cutting of the tree roots or canopy.

B4. Edge Trimming and Removal

The Contractor shall cut back and remove the grass berm to the edge of the original footpath pavement and surfacing. All debris shall be removed to waste.

B5. Timber Edging

Timber edging shall be constructed as per Dunedin City Council standard drawing, Footpath Edge Details, AM – 009 Rev E.

D.3.3. Reinstate Grass Verge

Where necessary a nominal allowance of 75mm of topsoil shall be allowed to reinstate any grass verge. The soil shall be screened to remove all rocks and be free from weeds or organic materials. The area shall be compacted flush with the surrounding surface and sowed with grass seed.

B6. Weed Control

Following the removal of all overgrowing property vegetation and berm edges, herbicide shall be applied to the area of footpath to be resurfaced (excluding paths to be reconstructed) to provide both knock down and 6-12 months residual vegetation control. Particular attention shall be given to pavement edges to produce even edge alignments pleasing to the eye.

The Contractor shall nominate in his tender the chemicals he proposed to use, the total mix content, including surfactants, the mix proportions and the proposed rate of application.

The Contractor shall apply the herbicide sufficiently in advance of the balance of the footpath repairs to ensure a “knockdown” of all vegetation is achieved.

No spraying shall be carried out in the vicinity of schools, kindergartens, bus stops or other places of public or private assembly when they are being used or when children are moving to or from these facilities.

The work shall be carried out under the supervision of a Registered Chemical Applicator using competent experienced persons.

Unless approved in writing by the Engineer, no spray vehicles shall be driven on the footpath or berm.
The Contractor should comply at all times with the Water Supplies Protection Regulations 1971 when mixing chemicals.

B7. Cleaning and Preparation of the Surface for Pre-levelling

On completion of weed-spraying and prior to applying pre-levelling materials the existing surface shall be swept free of loose stone, dirt and vegetation, disposing of accumulated material.

Asphaltic concrete pre-level shall be applied to uneven or low areas of footpath to produce uniform path crossfall that does not hold water.

The pre-level area shall be tack coated with CRS-1 Emulsion and smoothed with TNZ M/10 Specification for Asphaltic Concrete.

All construction of Asphaltic Concrete shall be in accordance with TNZ P/9 Specification for Asphaltic Concrete Paving.

B8. Footpath and Driveway Digouts

Digouts shall be saw cut and excavated to allow a basecourse depth of not less that 75mm (150mm at driveways) of B40 material over a firm and dry subgrade.

A basecourse finished level 30mm below finished footpath surfacing level.

Prior to resurfacing the basecourse area shall be sprayed with herbicide in accordance with this specification.

Extra basecourse may be required where poor quality subgrade is encountered.

The digout shall be resurfaced with a minimum of 30mm of asphaltic concrete in accordance with TNZ P/9 Specification for Asphaltic Concrete Paving.

All digouts shall be fully reinstated immediately.

Asphaltic concrete surfacing shall be Table 2 in accordance with TNZ M/10 Specification for Asphaltic Concrete.

For all slurry and asphalt overlay sites the relevant surfacing shall be applied full length (on top of completed digout sections).

B9. Strip and Resurface

Sites requiring strip and resurface treatment are usually larger patches or whole blocks which are badly cracked or deformed.

Sections should be stripped of their existing surface then levelled with a minimum 50mm AP20 material before being finished with a maximum constructed depth of asphalt of 30mm achieving a crossfall of 3-4% towards the road.

For asphalt overlay sites the resurfacing of the balance of the site shall tie in to these strip and resurface sections.

For slurry overlay sites the slurry surface shall be applied full length (on top of strip and resurface sections).

B10. Crack Sealing

Pavement cracks shall be cleaned to remove dirt, dust and other deleterious matter and sealing with either:

(i) A suitable proprietary bandage type crack sealer.

(ii) Polymer modified emulsified asphaltic binder and grit. The Polymer shall be added to the emulsified asphaltic binder at a dosage rate of between 3 and 5% of the volume of asphalt cement and in accordance with the Polymer Manufacturer's recommendations.

B11. Removal of Tree Roots

When approved by the Engineer, buried tree roots protruding and forming ridges along footpath surfaces, shall be saw-cut each side of the path and removed to waste. Pavement reinstatement shall be as detailed in this specification.

The Contractor shall contact the DCC Parks Officer (Trees) (phone 477-4000) prior to any excavation work in the area and before any trimming or cutting of the tree roots or canopy.

B12. Moss and Lichen Removal

All moss or lichen shall be removed prior to resurfacing.

B13. Broken Stormwater Pipes

Damaged and broken property stormwater pipes that prevent resurfacing being performed are to be sawcut and replaced with 80mm class D uPVC pipe suitably

connected at the property boundary. If broken the kerb and channel shall be repaired with concrete prior to resurfacing.

B14. Control of Bitumen Run-off

In accordance with the above, the Contractor shall take measures as defined below to control bitumen product run-off.

(a) Before proceeding with sealing work at any site the Contractor shall assess the risk of bitumen product run-off and if necessary adjust the sealing programme to ensure work is carried out only in suitable conditions.

The Contractor shall give consideration to the effects on adjoining surface water channels, gutters, and stormwater systems including run-off into the harbour, natural watercourses or other environmentally sensitive areas, and shall assess the practicality of providing suitable entrapment measures in the event of run-off.

(b) Notwithstanding (a) above, the Contractor shall, in the event of run-off, provide the means, materials and resources necessary to as far as practical prevent contamination of the surrounds.

In the event of run-off the Contractor shall provide means of entrapment such as gritting, or dusting out of gutters and channels and plugging of sumps and mudtanks. No disturbance of drainage systems will be permitted without prior approval of the Dunedin City Water and Waste Services Department Manager.

(c) On completion of sealing and until the emulsified asphalt binder has reached a stable condition which will not be affected by rainfall, the Contractor shall monitor the site and take immediate protective and/or remedial action in the event of run-off.

Notwithstanding that the above precautions may have been taken, the Contractor shall notify the Engineer of any occurrence which may give rise to contravention of Section 15 or Section 17 of the Resource Management Act 1991 and clean up any run-off immediately it occurs and reinstate to original condition any areas affected.

The Contractor shall also notify the Dunedin City Water and Waste Services Manager of any run-off into the stormwater system.

The Contractor shall also notify the Water Resources Manager, Otago Regional Council of any pollution of watercourses or harbour.

Non run-off shall be permitted to be discharged into the foul sewer system.

C. Footpath Reconstruction

Some sites will need to be fully reconstructed by excavation and replacement of the pavement and surfacing.

Sections should be excavated and trimmed to a satisfactory subgrade level then backfilled with B40 material.

The basecourse aggregate should be compacted to a minimum depth of 75mm (150mm for driveways) over a sound subgrade. This depth may be increased if the subgrade is weak.

Prior to resurfacing the basecourse area should be sprayed with herbicide.

The contractor should ensure the basecourse is finished to a minimum level of 30mm below the final seal surface. The final surface shall be 30mm mix 10.

The asphalt surfacing shall be constructed in accordance with this specification.

C1. Tactile Pavers

General
Tactile Pavers shall be laid in the position and as detailed in the drawing and also in accordance with DCC Standard Plan RS 012 sheets 1,2.

The contractor shall make good at their own expense any pavers that are damaged as a result of negligence, inappropriate handling or storage.

Dust
Dust with a topsize of 5mm shall be used as bedding coarse beneath the pavers and shall be laid in two layers. A 20mm layer shall be laid and compacted. The remaining 5mm shall then be loose laid on top for the pavers to be bedded into.

Tolerances
Tactile Pavers shall be laid flush with no uneven, protruding or disjointed edges.

The following **maximum** tolerances are allowable:

(a) Step in height between 2 adjacent pavers or between pavers and asphalt; 2mm
(b) Joint gap between adjacent pavers; all gaps shall be less than 3mm, 95% shall be less than 2.5mm. No more than 5% shall be under

1.5mm. The ideal joint size is 2.0mm to 2.5mm and more than 70% of all joints shall be within this range.

(c) Deviation of the finished surface from a 5m template of the correct surface profile; 6mm as per NZTA P9 specification.

(d) No Area of the finished surface shall be shaped to allow the ponding of water.

(e) The layer of compacted paver bedding sand or AP20 basecourse must conform with NZTA P9 Specification.

(f) The maximum gap between asphalt and pavers is 3mm.

(g) Straightness of paver gridlines (in plan view) is 6mm over any length.

(h) The paver gridlines must not be above or below the asphalt general level by more than 2mm as measured by an 800mm straight edge.

D. Slurry Surfacing

D1. Slurry Seal

The slurry shall conform to the scheduled requirements of either ISSA A143 "Recommended Performance Guidelines for Polymer Modified Micro-Surfacing", or ISSA A105 "Recommended Performance Guidelines for Emulsified Asphalt Slurry Sealed Surfaces" or an equivalent New Zealand Standard.

D2. Slurry Properties

When tested by NZS 4402 : 1986 Test 2.8.1 the grading of the aggregate shall fall within the envelope for Type II slurry as defined below.

ISSA Type II Slurry

Sieve Aperture Size	% Passing by Weight
9.5mm	100
4.75mm	90-100
2.36mm	65-90
1.18mm	45-70
600µm	30-50
300µm	18-30
150µm	10-21
75µm	5-15

Residual asphalt content as a percentage of the dry aggregate weight shall be 8.5-10.5%.

D3. Slurry Seal Construction

Weather Limitations
Slurry seal shall not be applied if air or pavement temperatures are below approx. 10°C or if there is any possibility that the slurry will freeze before it has cured. No slurry seal shall be placed if rain is imminent.

Manufacture of Slurry Seal
The Contractor's Quality Plan should describe the means of achieving the design mix preparation.

Application
Prior to application, all kerbs and service covers shall be masked as to provide protection from bituminous materials. Some property walls and

concrete driveways may also require masking. The slurry seal shall remain essentially constant in composition and texture. Streaks such as those caused by oversized aggregate shall not be left in the finished surface. The use of Hessian drags and hand squeegees shall be approved.

Final Appearance

The cured slurry seal shall have a consistent texture and colour with no scars, streaks or uneven joints, adhere firmly to the surface and have a uniform skid resistance and texture satisfactory to the Engineer.

E. Asphalt Surfacing

The laying of the asphalt shall be in accordance with NZTA P/9 Specification except hand laying of footpath areas is approved.

The asphalt shall be laid with a crossfall of 2 – 4%. The minimum thickness of asphalt shall be 30mm of Mix 10 for strip and resurface and 15mm of Mix 6 for overlays.

Prior to laying of asphalt the existing surface shall be tack coated with CRS-1 (CQ-60) emulsion. All care shall be taken to ensure that exposed surfaces are not coated with bitumen. Any over-spray shall be removed by the Contractor at their expense.

All joints between old asphalt and new shall be crack sealed using emulsion and Blackhead grit.

Asphalt work shall be carried out such that the finished levels shall not adversely affect access or egress at vehicle entrances or increase stormwater run-off to private property. Areas that are likely to cause vehicle scraping shall be referred to the Engineer, following which a digout may be authorised as detailed in this specification.

E1. Finishing Around Service Covers

All service covers are to be checked for level and adjusted as necessary to suit the finished surface level. It is not permitted to alter the shape of the finished surface to accommodate a service cover/bollard at a level outside the allowed tolerances.

The Contractor shall mark on their copy of the Services Plan (sheet 1) that covers were adjusted and use this record as the basis of payment. In addition, covers that are altered should be marked with a green paint stripe. Ones not needing alteration should be marked with a red stripe.

Service covers shall be positioned with edges square to the boundary.

The Contractor is responsible for notifying the appropriate Service Authority as to when this work is being done.

The Contractor shall allow to meet the requirements of the relevant service owner when altering the level of service covers.

F. Raising of Service Covers General

Prior to resurfacing the Contractor shall inspect all service covers within the area to be resurfaced and, in particular, each property shall be checked for its water Toby valve location. The Contractor shall contact Mr David Dewhirst prior to work being undertaken and for inspection of works. The address of any property where a Toby cover cannot be found shall be reported to the Dunedin City Council Water Department on 474 3520 to arrange for inspection and location.

Prior to resurfacing construction the Contractor shall locate and mark by the use of offset pegs or markers the position of all service covers.

The Contractor shall be responsible for the protection of public utilities both above and below ground. Utility surface boxes and markers are to be protected from bitumen contamination and cleared off on completion of the work.

On completion of resurfacing any service cover 10mm or greater below the finished surface level is to be raised flush with the finished surface level and the surface reinstated to the same standard as the newly constructed adjacent surface.

Telecom Limited is a nominated sub-contractor for the raising of Telecom Service Covers. The Contractor shall arrange for Telecom Limited to carry out the work within the Contractor's construction programme.

Citigas covers shall be raised in accordance with the general requirements for raising water valve covers.

Service covers shall be raised in accordance with the service authorities requirements, copies of which are appended in the appendices. Service covers shall be adjusted to not be a trip hazard. Covers shall be no higher or greater than 5mm deeper than finished surface level.

All water Toby covers shall be left accessible at all times. All covers that require level adjustment shall be temporarily barricaded from the public by either a cone or barricade until raised. Covers adjustments must be completed within four days following completion of sealing. Refer appendices.

On completion of resurfacing all covers shall be opened and closed to confirm access to the valve and to ensure that no slurry has entered into the surface box.

Provision is made in the Schedule of Prices for the Contractor to provide rates for raising Service Covers of the following general sizes.

(i) (S) small – water toby small valve cover or similar size including plastic water boxes

(ii) (M) medium – fire hydrant size

(iii) (L) large – manhole size and all Telecom covers.

30 FOOTPATH RESURFACING

30.1 Scope of Contract

30.1.1 Location of Works
The site of works for year 1 is detailed in Appendix 41.

30.1.2 Description of Works
The work includes but is not limited to:

- Preparation of all footpaths prior to resurfacing.
- Reconstruction of footpaths.
- Supply and placement of slurry seal.
- Supply and placement of asphalt surfacing.
- Completion of RAMM sheets for each site.

30.2 Testing and Examination of Materials
In addition to their commitment to sample and provide test results, the Contractor shall provide any labour required to assist the Engineer to inspect, examine and test any materials. The Contractor shall have no claim for the cost of this assistance or costs of any delay resulting from such testing. The Engineer may condemn any materials at any time if they do not comply with this Specification.

The Contractor shall arrange for and undertake all material testing under the specification. Copies of all test results shall be supplied to the Engineer. The Engineer may carry out random verification testing. Should any such verification test fail to meet specified requirements the Contractor shall bear the costs of the testing and any subsequent testing.

The minimum conforming testing frequency and required tests are as follows:

ASPHALT		
Grading and Binder Content	Lots <100m^2	2 Samples
	Lots 100 – 400 m^2	3 Samples
	Lots >400 m^2	4 Samples

SLURRY		
Grading and Binder Content	Lots <100m^2	2 Samples
	Lots 100 – 400 m^2	3 Samples
	Lots >400 m^2	4 Samples

BASECOURSE	
Grading	1 Test per production

30.3 Contractor's Establishment and Working Area

The Contractor shall make arrangements with the appropriate landowner, territorial authority or service authority concerning an area for establishment, power, water and sanitary facilities subject to local body by-laws and the approval of the Engineer.

The Contractor's site establishment shall not interfere with:

- Traffic movements or visibility of vehicles.
- Pedestrian thoroughfare.
- The work of any service authority.
- Access to adjacent properties.
- The road, structure, drainage facilities, etc.

30.4 Stockpile Sites

The Contractor shall nominate all intended material stockpile sites for approval by the Engineer.

Each site shall be left in a safe and tidy condition, with all excess material removed and the area levelled.

The Certificate of Practical Completion will not be issued until the stockpile sites are returned to a condition that is satisfactory to the Engineer. This means that stockpile sites must be left in a condition the same as or better than before they were used.

30.5 Bitumen Nuisance

The Contractor is required to monitor all new sealing/surfacing and to ensure that adequate measures are taken to prevent bitumen tracking problems and/or remedy promptly any problems that do arise.

30.6 Services Identification and Relocation

The Contractor shall contact all relevant service authorities and identify and locate all services within each site.

In consultation with the service provider and the Engineer, those services requiring to be relocated shall be identified and the extent and cost of relocation agreed.

On instruction from the Engineer, the Contractor shall organise with the service provider for the work to be undertaken, for the agreed price.

The services likely to be affected include: underground water mains, underground gas mains, underground telecommunication cables and survey marks.

The Contractor should allow for working around existing services and the dusting and compaction around these services within each site.

30.7 Public Notification

The Contractor shall arrange operations so that disruption of access to properties adjacent to the works is kept to a minimum. Prior to commencement of work (72 hours minimum) written advice shall be given by the Contractor to all property occupiers adjacent to the site and/or likely to be affected. The Contractor is to supply a draft letter to the Consultant for approval. The letter must include:

- Explanation of work.
- Date of disruption.
- Contract number.
- Contractor's name.
- Information pertaining to site specific controls (eg. bitumen tracking, children, parking etc).
- Access restrictions.

Commencement of work on site is deemed to be from the start of marking out repairs.

The Contractor shall respond to all other enquiries relating to the programme as required by the Engineer.

As well as the general notification to the public, the Contractor shall identify any specific users who may be affected (eg. Foundation for Blind, etc).

30.8 RAMM and As-Built Drawings

The Contractor shall provide RAMM information for each site on the sheet provided for that purpose. RAMM records shall be included with the Contractor's monthly claims.

The Contractor shall provide As-Built drawings, updated for each site on a copy of the construction drawings provided.

Practical completion will not be issued until the final RAMM information and any requested As-Built drawings have been submitted to and accepted by the Engineer.

30.9 Pre-surfacing Preparation

30.9.1 Scope

Prior to resurfacing work the footpaths shall be repaired and brought up to a standard suitable for the construction of resurfacing.

30.9.2 General

The Contractor is required to inspect each site and prepare a programme of work and submit it to the Engineer for approval prior to work starting.

Preparation of work at each site shall be completed not less than two weeks prior to resurfacing work proceeding.

On completion of preparation works the Contractor shall advise the Engineer, so that an inspection may take place prior to resurfacing.

30.9.3 Property Trees and Shrubs

Cutting back, trimming and/or removal of overhanging vegetation (trees and shrubs) have been programmed to be completed by others (Property Owners) prior to commencement of work under this contract.

No trimming and/or removal of property vegetation shall be carried out by the Contractor unless specifically authorised in writing by the Engineer and will then be carried out as a Variation to the Contract.

The Contractor shall be responsible for the protection of trees growing along the grass margin or in the vicinity of the works.

The Contractor shall contact the DCC Parks Officer (Trees) (phone 477-4000) prior to any excavation work in the area and before any trimming or cutting of the tree roots or canopy.

30.9.4 Edge Trimming and Removal

The Contractor shall cut back and remove the grass berm to the edge of the original footpath pavement and surfacing. All debris shall be removed to waste.

30.9.5 Timber Edging

Timber edging shall be constructed as per Dunedin City Council standard drawing, Footpath Edge Details, AM – 009 Rev E.

30.9.6 Reinstate Grass Verge

Where necessary a nominal allowance of 75mm of topsoil shall be allowed to reinstate any grass verge. The soil shall be screened to remove all rocks and be free from weeds or organic materials. The area shall be compacted flush with the surrounding surface and sowed with grass seed.

30.9.7 Weed Control

Following the removal of all overgrowing property vegetation and berm edges, herbicide shall be applied to the area of footpath to be resurfaced (excluding paths to be reconstructed) to provide both knock down and 6-12 months residual vegetation control. Particular attention shall be given to pavement edges to produce even edge alignments pleasing to the eye.

The Contractor shall nominate in his tender the chemicals he proposed to use, the total mix content, including surfactants, the mix proportions and the proposed rate of application.

The Contractor shall apply the herbicide sufficiently in advance of the balance of the footpath repairs to ensure a "knockdown" of all vegetation is achieved.

No spraying shall be carried out in the vicinity of schools, kindergartens, bus stops or other places of public or private assembly when they are being used or when children are moving to or from these facilities.

The work shall be carried out under the supervision of a Registered Chemical Applicator using competent experienced persons.

Unless approved in writing by the Engineer, no spray vehicles shall be driven on the footpath or berm.
The Contractor should comply at all times with the Water Supplies Protection Regulations 1971 when mixing chemicals.

30.9.8 Cleaning and Preparation of the Surface for Pre-levelling

On completion of weed-spraying and prior to applying pre-levelling materials the existing surface shall be swept free of loose stone, dirt and vegetation, disposing of accumulated material.

Asphaltic concrete pre-level shall be applied to uneven or low areas of footpath to produce uniform path crossfall that does not hold water.

The pre-level area shall be tack coated with CRS-1 Emulsion and smoothed with TNZ M/10 Specification for Asphaltic Concrete.

All construction of Asphaltic Concrete shall be in accordance with TNZ P/9 Specification for Asphaltic Concrete Paving.

30.9.9 Footpath and Driveway Digouts

Digouts shall be saw cut and excavated to allow a basecourse depth of not less that 75mm (150mm at driveways) of B40 material over a firm and dry subgrade.

A basecourse finished level 30mm below finished footpath surfacing level.

Prior to resurfacing the basecourse area shall be sprayed with herbicide in accordance with this specification.

Extra basecourse may be required where poor quality subgrade is encountered.

The digout shall be resurfaced with a minimum of 30mm of asphaltic concrete in accordance with TNZ P/9 Specification for Asphaltic Concrete Paving.

All digouts shall be fully reinstated immediately.

Asphaltic concrete surfacing shall be Table 2 in accordance with TNZ M/10 Specification for Asphaltic Concrete.

For all slurry and asphalt overlay sites the relevant surfacing shall be applied full length (on top of completed digout sections).

30.9.10 Strip and Resurface

Sites requiring strip and resurface treatment are usually larger patches or whole blocks which are badly cracked or deformed.

Sections should be stripped of their existing surface then levelled with a minimum 50mm AP20 material before being finished with a maximum constructed depth of asphalt of 30mm achieving a crossfall of 3-4% towards the road.

For asphalt overlay sites the resurfacing of the balance of the site shall tie in to these strip and resurface sections.

For slurry overlay sites the slurry surface shall be applied full length (on top of strip and resurface sections).

30.9.11 Crack Sealing

Pavement cracks shall be cleaned to remove dirt, dust and other deleterious matter and sealing with either:

A suitable proprietary bandage type crack sealer.

Polymer modified emulsified asphaltic binder and grit. The Polymer shall be added to the emulsified asphaltic binder at a dosage rate of between 3 and 5% of the volume of asphalt cement and in accordance with the Polymer Manufacturer's recommendations.

30.9.12 Removal of Tree Roots

When approved by the Engineer, buried tree roots protruding and forming ridges along footpath surfaces, shall be saw-cut each side of the path and removed to waste. Pavement reinstatement shall be as detailed in this specification.

The Contractor shall contact the DCC Parks Officer (Trees) (phone 477-4000) prior to any excavation work in the area and before any trimming or cutting of the tree roots or canopy.

30.9.13 Moss and Lichen Removal

All moss or lichen shall be removed prior to resurfacing.

30.9.14 Broken Stormwater Pipes

Damaged and broken property stormwater pipes that prevent resurfacing being performed are to be sawcut and replaced with 80mm class D uPVC pipe suitably connected at the property boundary. If broken the kerb and channel shall be repaired with concrete prior to resurfacing.

30.9.15 Control of Bitumen Run-off

In accordance with the above, the Contractor shall take measures as defined below to control bitumen product run-off.

(a) Before proceeding with sealing work at any site the Contractor shall assess the risk of bitumen product run-off and if necessary adjust the sealing programme to ensure work is carried out only in suitable conditions.

The Contractor shall give consideration to the effects on adjoining surface water channels, gutters, and stormwater systems including run-off into the harbour, natural watercourses or other environmentally sensitive areas, and shall assess the practicality of providing suitable entrapment measures in the event of run-off.

(b) Notwithstanding (a) above, the Contractor shall, in the event of run-off, provide the means, materials and resources necessary to as far as practical prevent contamination of the surrounds.

In the event of run-off the Contractor shall provide means of entrapment such as gritting, or dusting out of gutters and channels and plugging of sumps and mudtanks. No disturbance of drainage systems will be permitted without prior approval of the Dunedin City Water and Waste Services Department Manager.

(c) On completion of sealing and until the emulsified asphalt binder has reached a stable condition which will not be affected by rainfall, the Contractor shall monitor the site and take immediate protective and/or remedial action in the event of run-off.

Notwithstanding that the above precautions may have been taken, the Contractor shall notify the Engineer of any occurrence which may give rise to contravention of Section 15 or Section 17 of the Resource Management Act 1991 and clean up any run-off immediately it occurs and reinstate to original condition any areas affected.

The Contractor shall also notify the Dunedin City Water and Waste Services Manager of any run-off into the stormwater system.

The Contractor shall also notify the Water Resources Manager, Otago Regional Council of any pollution of watercourses or harbour.

Non run-off shall be permitted to be discharged into the foul sewer system. 30.10 Footpath Reconstruction

Some sites will need to be fully reconstructed by excavation and replacement of the pavement and surfacing.

Sections should be excavated and trimmed to a satisfactory subgrade level then backfilled with B40 material.

The basecourse aggregate should be compacted to a minimum depth of 75mm (150mm for driveways) over a sound subgrade. This depth may be increased if the subgrade is weak.

Prior to resurfacing the basecourse area should be sprayed with herbicide.

The contractor should ensure the basecourse is finished to a minimum level of 30mm below the final seal surface. The final surface shall be 30mm mix 10.

The asphalt surfacing shall be constructed in accordance with this specification.

30.10 Footpath Reconstruction

30.10.1 Tactile Pavers

30.10.2 General

Tactile Pavers shall be laid in the position and as detailed in the drawing and also in accordance with DCC Standard Plan RS 012 sheets 1,2.

The contractor shall make good at their own expense any pavers that are damaged as a result of negligence, inappropriate handling or storage.

30.10.3 Dust

Dust with a topsize of 5mm shall be used as bedding coarse beneath the pavers and shall be laid in two layers. A 20mm layer shall be laid and compacted. The remaining 5mm shall then be loose laid on top for the pavers to be bedded into.

30.10.4 Tolerances

Tactile Pavers shall be laid flush with no uneven, protruding or disjointed edges.

The following **maximum** tolerances are allowable:

(a) Step in height between 2 adjacent pavers or between pavers and asphalt; 2mm
(b) Joint gap between adjacent pavers; all gaps shall be less than 3mm, 95% shall be less than 2.5mm. No more than 5% shall be under 1.5mm. The ideal joint size is 2.0mm to 2.5mm and more than 70% of all joints shall be within this range.
(c) Deviation of the finished surface from a 5m template of the correct surface profile; 6mm as per NZTA P9 specification.
(d) No Area of the finished surface shall be shaped to allow the ponding of water.
(e) The layer of compacted paver bedding sand or AP20 basecourse must conform with NZTA P9 Specification.
(f) The maximum gap between asphalt and pavers is 3mm.
(g) Straightness of paver gridlines (in plan view) is 6mm over any length.

(h) The paver gridlines must not be above or below the asphalt general level by more than 2mm as measured by an 800mm straight edge.

30.11.1 Slurry Seal

The slurry shall conform to the scheduled requirements of either ISSA A143 "Recommended Performance Guidelines for Polymer Modified Micro-Surfacing", or ISSA A105 "Recommended Performance Guidelines for Emulsified Asphalt Slurry Sealed Surfaces" or an equivalent New Zealand Standard.

30.11.2 Slurry Properties

When tested by NZS 4402 : 1986 Test 2.8.1 the grading of the aggregate shall fall within the envelope for Type II slurry as defined below.

30.11.3 ISSA Type II Slurry

Sieve Aperture Size	% Passing by Weight
9.5mm	100
4.75mm	90-100
2.36mm	65-90
1.18mm	45-70
600µm	30-50
300µm	18-30
150µm	10-21
75µm	5-15

Residual asphalt content as a percentage of the dry aggregate weight shall be 8.5-10.5%.

30.11.4 Slurry Seal Construction

30.11.5 Weather Limitations

Slurry seal shall not be applied if air or pavement temperatures are below pprox.. 10°C or if there is any possibility that the slurry will freeze before it has cured. No slurry seal shall be placed if rain is imminent.

30.11.6 Manufacture of Slurry Seal

The Contractor's Quality Plan should describe the means of achieving the design mix preparation.

30.11.7 Application

Prior to application, all kerbs and service covers shall be masked as to provide protection from bituminous materials. Some property walls and concrete driveways may also require masking. The slurry seal shall remain essentially constant in composition and texture. Streaks such as those caused by oversized aggregate shall not be left in the finished surface. The use of Hessian drags and hand squeegees shall be approved.

30.11.8 Final Appearance

The cured slurry seal shall have a consistent texture and colour with no scars, streaks or uneven joints, adhere firmly to the surface and have a uniform skid resistance and texture satisfactory to the Engineer.

30.12 Asphalt Surfacing

The laying of the asphalt shall be in accordance with NZTA P/9 Specification except hand laying of footpath areas is approved.

The asphalt shall be laid with a crossfall of 2 – 4%. The minimum thickness of asphalt shall be 30mm of Mix 10 for strip and resurface and 15mm of Mix 6 for overlays.

Prior to laying of asphalt the existing surface shall be tack coated with CRS-1 (CQ-60) emulsion. All care shall be taken to ensure that exposed surfaces are not coated with bitumen. Any over-spray shall be removed by the Contractor at their expense.

All joints between old asphalt and new shall be crack sealed using emulsion and Blackhead grit.

Asphalt work shall be carried out such that the finished levels shall not adversely affect access or egress at vehicle entrances or increase stormwater run-off to private property. Areas that are likely to cause vehicle scraping shall be referred to the Engineer, following which a digout may be authorised as detailed in this specification.

30.12.1 Finishing Around Service Covers

All service covers are to be checked for level and adjusted as necessary to suit the finished surface level. It is not permitted to alter the shape of the finished surface to accommodate a service cover/bollard at a level outside the allowed tolerances.

The Contractor shall mark on their copy of the Services Plan (sheet 1) that covers were adjusted and use this record as the basis of payment. In addition, covers that are altered should be marked with a green paint stripe. Ones not needing alteration should be marked with a red stripe.

Service covers shall be positioned with edges square to the boundary.

The Contractor is responsible for notifying the appropriate Service Authority as to when this work is being done.

The Contractor shall allow to meet the requirements of the relevant service owner when altering the level of service covers.

30.13 Raising of Service Covers General

Prior to resurfacing the Contractor shall inspect all service covers within the area to be resurfaced and, in particular, each property shall be checked for its water Toby valve location. The Contractor shall contact Mr David Dewhirst prior to work being undertaken and for inspection of works. The address of any property where a Toby cover cannot be found shall be reported to the Dunedin City Council Water Department on 474 3520 to arrange for inspection and location.

Prior to resurfacing construction the Contractor shall locate and mark by the use of offset pegs or markers the position of all service covers.

The Contractor shall be responsible for the protection of public utilities both above and below ground. Utility surface boxes and markers are to be protected from bitumen contamination and cleared off on completion of the work.

On completion of resurfacing any service cover 10mm or greater below the finished surface level is to be raised flush with the finished surface level and the surface reinstated to the same standard as the newly constructed adjacent surface.

Telecom Limited is a nominated sub-contractor for the raising of Telecom Service Covers. The Contractor shall arrange for Telecom Limited to carry out the work within the Contractor's construction programme.

Citigas covers shall be raised in accordance with the general requirements for raising water valve covers.

Service covers shall be raised in accordance with the service authorities requirements, copies of which are appended in the appendices. Service covers shall be adjusted to not be a trip hazard. Covers shall be no higher or greater than 5mm deeper than finished surface level.

All water Toby covers shall be left accessible at all times. All covers that require level adjustment shall be temporarily barricaded from the public by either a cone or barricade until raised. Covers adjustments must be completed within four days following completion of sealing. Refer appendices.

On completion of resurfacing all covers shall be opened and closed to confirm access to the valve and to ensure that no slurry has entered into the surface box.

Provision is made in the Schedule of Prices for the Contractor to provide rates for raising Service Covers of the following general sizes.

(i) (S)small – water toby small valve cover or similar size including plastic water boxes

(ii) (M)medium – fire hydrant size

(iii) (L)large – manhole size and all Telecom covers.

31.0 KERB & CHANNEL RENEWALS

31.1 Scope of Contract

31.1.1 Location of Works

The site of works for year 1 is detailed in Appendix 42.

31.1.2 Description of Works

The work includes but is not limited to:

- Survey and design.
- Excavation of existing kerb & Channel.
- Construction of new kerb & channel/dish channel.
- Excavation & Construction of existing footpaths.
- Supply and placement of asphalt surfacing.
- Reinstatement of carriageway.
- Completion of RAMM sheets for each site.

31.2 Testing and Examination of Materials

All materials testing shall be carried out at the contractors expense in accordance with the standard NZTA Specifications unless modified in this specification. All laboratory testing of aggregates is to be to NZS 4407 unless otherwise stated. All laboratory testing shall be carried out by an IANZ accredited laboratory with an accreditation for the particular test.

In addition to their commitment to sample and provide test results, the Contractor shall provide any labour required to assist the Engineer to inspect, examine and test any materials. The Contractor shall have no claim for the cost of this assistance or costs of any delay resulting from such testing. The Engineer may condemn any materials at any time if they do not comply with this Specification.

The Contractor shall arrange for and undertake all material testing under the specification. Copies of all test results shall be supplied to the Engineer. The Engineer may carry out random verification testing. Should any such verification test fail to meet specified requirements the Contractor shall bear the costs of the testing and any subsequent testing.

The contractor must supply a copy of all laboratory test reports for acceptance testing, both conforming and non conforming, to the engineer. The contractor shall instruct the laboratory to send duplicate copies of all test reports directly to the engineer, as well as the contractor. This is consistent with the intent of the Aggregate & Quarry Association NZ that acceptance testing be a transparent process between contractors and clients.

This information shall be supplied at least three (3) days in advance of the time that the materials are required for inclusion into the works. This is to permit the engineer to study the results and/or carry out any additional testing that he may require without causing any delay to the work. If the engineer is unable to accept the materials due to their non conformance with specification, then any costs in preparing conforming materials is at the contractor's expense.

The minimum conforming testing frequency and required tests are as follows:

Asphalt Surfacing		
Grading, Binder Content	lot per day	1 sample
Marshall Stability and Flow, Ricies SG, void Content	lot per day	1 sample

Basecourse		
Grading, Proportion of crushed faces, sand equivalent	^{3} 1500m³ Lots>1500m³	4 Samples
Weathering/Crushing Resistance	per 2000m³	1 sample
Field Compaction Testing	per Site	min 3 Tests

Sub-base		
Grading	^{3} 2000m³ Lots>2000m³	4 Samples
CBR (laboratory)	Min 3 tests per lot	
Field Compaction Testing	per Site	min 3 Tests

31.3 Dump Areas and Private Property

The Contractor is to provide and manage any off site dump areas.

The Contractor shall make their own arrangements with any landowner in respect of use of private property outside the defined limits of the Contract Works and shall be completely responsible for any consent co++++3.sts, damage or claims for compensation arising from such use. If required, and before the expiry of the Defects Liability period the Contractor shall submit a letter from any property owner concerned certifying that all claims for compensation for damage due to the Contractor's operation have been discharged to the owner's satisfaction.

31.4 Contractor's Establishment and Working Area

The Contractor shall make arrangements with the appropriate landowner, territorial authority or service authority concerning an area for establishment, power, water and sanitary facilities subject to local body by-laws and the approval of the Engineer.

The Contractor's site establishment shall not interfere with:

(vi) Traffic movements or visibility of vehicles.
(vii) Pedestrian thoroughfare.
(viii) The work of any service authority.
(ix) Access to adjacent properties.
(x) The road, structure, drainage facilities, etc.

31.5 Stockpile Sites

The Contractor shall nominate all intended material stockpile sites for approval by the Engineer.

Each site shall be left in a safe and tidy condition, with all excess material removed and the area levelled.

The Certificate of Practical Completion will not be issued until the stockpile sites are returned to a condition that is satisfactory to the Engineer. This means that stockpile sites must be left in a condition the same as or better than before they were used.

31.6 Cultural Artefacts

If at any stage during the contract period, human skeletal remains or artefact/historical material is discovered, then work shall stop immediately and the Engineer is to be notified.

31.7 Stormwater Collection

Any stormwater runoff collected from a disturbed area is to be treated by a silt retention method, such as a silt fence or secured hay bales, before discharge to a water body, until the Works completion.

31.8 Services Identification and Relocation

The Contractor shall contact all relevant service authorities and identify and locate all services within each site.

In consultation with the service provider and the Engineer, those services requiring to be relocated shall be identified and the extent and cost of relocation agreed.

On instruction from the Engineer, the Contractor shall organise with the service provider for the work to be undertaken, for the agreed price.

The services likely to be affected include: underground water mains, underground gas mains, underground telecommunication cables and survey marks.

The Contractor should allow for working around existing services and the dusting and compaction around these services within each site.

31.9 Public Notification

The Contractor shall arrange operations so that disruption of access to properties adjacent to the works is kept to a minimum. Prior to commencement of work (72 hours minimum) written advice shall be given by the Contractor to all property occupiers adjacent to the site and/or likely to be affected. The Contractor is to supply a draft letter to the Consultant for approval. The letter must include:

- Explanation of work.
- Date of disruption.
- Contract number.
- Contractor's name.
- Information pertaining to site specific controls (eg. bitumen tracking, children, parking etc).
- Access restrictions.

Commencement of work on site is deemed to be from the start of marking out repairs.

The Contractor shall respond to all other enquiries relating to the programme as required by the Engineer.

As well as the general notification to the public, the Contractor shall identify any specific users who may be affected (eg. Foundation for the Blind, etc).

31.10 RAMM and As-Built Drawings

The Contractor shall provide RAMM information for each site on the sheet provided for that purpose. RAMM records shall be included with the Contractor's monthly claims.

The Contractor shall provide As-Built drawings, updated for each site on a copy of the construction drawings provided.

Practical completion will not be issued until the final RAMM information and any requested As-Built drawings have been submitted to and accepted by the Engineer.

31.11 Co-ordination of Road Signs & Marking

Pavement markings and traffic signs will be undertaken by the Dunedin City Council Signs and Markings Contractors and are not part of this contract.

(a) Forward Programme

Not less than 5 days prior to proposed commencement of work at any site or group of sites, the contractor shall provide the appropriate Dunedin City Council Contract Supervisor (for roadmarking & for signs) in writing (by e-mail) with a weekly forward programme, noting all site supervisors names and contact details.

The Council's Roadmarking contractor shall be copied in on the notification.

The contact details are as follows:

DCC Contract Supervisor	(Roadmarking)	Bruce Wood (03) 474 3464 027 433 1824
DCC Contract Supervisor	(Signs)	Peter Hughes (03) 474 3330

Further to this, the contractor shall give a minimum of three working days written notice to the DCC Contract Supervisor's, Council's Roadmarking Contractor and the engineer of any amendments to the programmed works.

Offsetting of Road Marking

The Contractor shall offset any road marking that will be affected by the kerbing work or associated overlay work.

31.12 Survey, Design & Setting Out

It shall be the contractor's responsibility to design and set out the works to meet the Site Specific Requirements.

The Contractor is required to carry out design work to verify that the kerb gradients are within acceptable limits (minimum grade considered to be 1 in 300), that driveway break-over angles are not excessive, that effects of any footpath adjustments on boundary fences are not unreasonable and that the design is workable and practical. The design is to eliminate existing plate crossings and raised bed crossings wherever possible.

31.13 Concrete Construction

31.13.1 General

Concrete shall comply with the requirements of NZS 3109: 1987 "Specification for Concrete Construction" for the grades of concrete shown on the drawings, except where upgraded by the specification. Where not otherwise stated, concrete shall be ordinary grade with a minimum specified strength of 20MPa at 28 days in accordance with NZS 3109:1997.

The contractor shall be responsible for employing effective methods of placing, protecting and curing concrete to the profiles shown on the drawings. Inspection of any such work by the engineer will not relieve the contractor of this responsibility. Concrete not placed in accordance with this specification or which is otherwise defective, shall be removed within the limits assigned by the engineer and replaced by the contractor without further payment.

31.13.2 Setting Out

The new kerb and channel shall be constructed to the line and grades of the existing kerb and channel and shall be raised to tie in as much as possible with the crossfall of the existing carriageway and footpath. Final

desirable crossfalls shall be in the range of 2-4% for carriageway and 2-4% for footpaths or as indicated otherwise.

The contractor shall arrange for all kerb lines to be verified, confirmed and approved before the kerbs are constructed. The contractor shall bear the cost of any remedial work if approval is not granted prior to the kerbs being constructed.

31.13.3 Excavation

Prior to the commencement of any excavation the contractor shall sawcut the existing carriageway pavement 400mm outside the channel lip or as indicated in the typical cross sections and the asphalt footpath 350mm behind the back of kerb unless indicated otherwise. On completion of the excavation the contractor shall arrange for the engineer to inspect the subgrade. If in the opinion of the engineer the subgrade material is unsuitable, it shall be removed and replaced with suitable material.

Any extra sawcut required outside the limits specified, to remove and reinstate existing carriageway/footpath damaged by the contractor as a result of their operations shall be the contractor's responsibility.

The rate for constructing kerb and channel shall include excavate to waste.

31.13.4 Bluestone Block Removal

The Client wishes to retain any bluestone blocks for use on future Council projects. Bluestone blocks in the kerb and channel excavation area are to be removed to the North Taieri Yard and neatly stockpiled. The North Taieri Yard (Known as Milners Pit) is located on Milners Road.

31.13.5 Fill

The construction and compaction of aggregate shall be carried out in accordance with NZTA B2 Specification for Basecourse Construction. The metal shall be compacted until a surface suitable to take chipseal or asphalt is achieved.

31.13.6 Drainage During Construction

During the execution of the work, the contractor shall maintain the entire area within the limits of the contract in such a way that no ponding or ingress of water occurs and adequate drainage shall be provided at all times.

Any damage to the work which, in the opinion of the engineer, is caused by the contractor not having provided adequate drainage shall be repaired by the contractor at his own expense.

31.13.7 Materials

Cement shall be fresh ordinary Portland cement, complying with NZS 3122. Aggregate shall comply with NZS 3121, with coarse aggregate having a nominal maximum of 19.0mm. If requested, samples and test certificates for concrete materials be made available to the engineer prior to placing concrete.

31.13.8 Concrete Construction

Kerbing may be machine laid or cast insitu and shall be constructed on compacted base metal. The finished kerbing shall be true to line and level. The line of kerbs shall be straight between tangent points and on curves shall sweep around without kinks in a true arc to the radius, or as directed.

The contractor shall match neatly into existing kerb and channel and shall provide pedestrian and vehicle crossings.
Concrete to be placed in formwork shall have a maximum slump of 10mm.

Construction joints shall be provided in the kerb and channel at 3m intervals. Construction shall be floated as opposed to plastered.

The kerbing shall be laid to the tolerances specified in NZS 3109:1997.

31.14 Surface Finish

31.14.1 General
Defective areas not meeting the standard set out below shall be repaired to the specified standard, at the contractors expense.

31.14.2 Exposed Surfaces
Concrete surfaces, shall match existing texture and colour unless otherwise specified.

All surfaces shall be smooth and comply with Finish F.4 in NZS 3114:1980 New Zealand Standard for the Specification for Concrete Surface Finishes.

31.14.3 Exposed Surfaces (Trafficked)
The pedestrian and vehicle trafficked concrete surface shall have a surface finish complying with Class U2 of NZS 3114:1980 New Zealand Standard for the Specification for Concrete Surface Finishes.

31.14.4 Hidden Surfaces
The surface finish on all concrete surfaces cast against formwork, but not exposed to view shall comply with Finish F.1 in NZS 3114. Unformed surfaces shall comply with Finish U.1.

31.15 Protection of Unset Concrete

The contractor shall take every precaution to ensure that accidental or wilful damage is not caused to unset concrete. Isolated patching of damaged sections will not be permitted. The contractor will be required to construct complete sections of damaged concrete or subsections between joints.

31.16 Dropped Kerb Crossings

Dropped kerb crossings shall be reconstructed in existing locations or as directed by the engineer. They shall be constructed to a cross section as defined on the DCC standard Plans and be the same length as exists or at a length directed by the engineer. The contractor shall allow for the provision of drop crossings to be constructed within his scheduled kerb and channel construction rate.

Where directed by the Engineer, redundant dropped kerb crossings shall be replaced with standard kerb and channel. The adjacent footpath area shall be adjusted to match the new kerb height. The footpath shall be constructed in accordance with this specification.

The contractor shall maintain access for residents at all times as requested.

31.17 Heavy Duty Crossings

Heavy duty crossings shall be constructed in accordance with DCC Standard Plan.

31.18 Stormwater Connections
The contractor shall connect all house stormwater pipes to the new kerb and channel except the redundant pipes as specified.

Where required, replacement stormwater pipes shall be replaced with 80mm (internal) class D uPVC pipe suitably connected at the property boundary or as specified. Outlets shall be placed in position in conjunction with the laying of the kerb and channel where practical.

Where outlets are placed by cutting or leaving a section of kerb, the length of the section shall be no less than 100mm on either sides of the outlet or kerb adapter. On completion the surface finish colour and texture shall match the adjacent kerb.

Where the stormwater pipe renewal is across a footpath which is not scheduled to be resurfaced, the contractor shall sawcut the footpath 100mm (min) on either side of the pipe unless directed otherwise by the engineer. Following the pipe renewal the footpath shall be resurfaced with material to match the existing surface, the repair finished profile shall match the general profile of the adjacent area.

The following alterations shall be made to stormwater connections:

(a) Existing stormwater pipe connected to new kerb and channel.
(b) Existing stormwater pipe renewed form the back of footpath or property boundary to new kerb and channel. The contractor shall provide sawcut, excavation and reinstatement of trench.
(c) Existing stormwater pipes adjusted and renewed from inside property boundaries. Where existing brick or concrete wall is to be drilled into to allow raising of stormwater pipes, the contractor shall ensure that:
    - Drill hole diameter is as minimum as possible.
    - The wall is epoxy grouted to seal around the pipe, if the fence is painted it shall be made good.
    - All excavations are backfilled and the area is reinstated to a condition similar or better.
(d) Existing stormwater pipes that are connected directly to the stormwater main shall meet DCC Water & Waste Services specification.

The rate for kerb and channel shall include all stormwater connections except where scheduled as full replacement to the property boundary/back of footpath construction, whichever is specified.

31.19 Broken Stormwater Pipes

Damaged and broken property stormwater pipes that prevent resurfacing being performed are to be sawcut and replaced with 80mm (internal)class D uPVC pipe suitably connected at the property boundary. If broken the kerb and channel shall be repaired with concrete prior to resurfacing.

32 RESEALS

32.1 SCOPE OF CONTRACT

32.1.1 Location of Works
The site of works for year 1 is detailed in Appendix 43.

32.1.2 Description of Works
The work includes but is not limited to:

- Preparation of all carriageways prior to resurfacing.
- Resealing and 2nd coat sealing in accordance with NZTA P/17 of various sections within the Dunedin city Urban area.
- Completion of RAMM sheets for each site.
- Liaison with DCC's Road Marking Contractor.

32.2 Testing and Examination of Materials
All material testing shall be carried out at the contractors expense in accordance with the Standard NZTA specifications unless modified in this specification. All laboratory testing of aggregates is to be to NZS 4407 unless otherwise stated. All laboratory testing shall be carried out by an IANZ accredited laboratory with an accreditation for the particular test.

In addition to their commitment to sample and provide test results, the Contractor shall provide any labour required to assist the Engineer to inspect, examine and test any materials. The Contractor shall have no claim for the cost of this assistance or costs of any delay resulting from such testing. The Engineer may condemn any materials at any time if they do not comply with this Specification.

The Contractor shall arrange for and undertake all material testing under the specification. Copies of all test results shall be supplied to the Engineer. The Engineer may carry out random verification testing. Should any such verification test fail to meet specified requirements the Contractor shall bear the costs of the testing and any subsequent testing.

The minimum conforming testing frequency and required tests are as follows:

SEALING CHIP		
Size, Shape, Grading U& Cleanness	Lots <100m^3 Lots 100-400m^3 Lots >400m^3	2 Samples 3 Samples 4 Samples
Weathering/Crushing Resistance	Per 100m^3	1 Sample
Polished Stone Value	Per production run	1 Sample

BITUMEN		
Penetration and Durability NZTA M1: 2011		1 Sample
Emulsified Asphalt Binder – Residual Bitumen 68-70%		1 Sample

32.3 Contractor's Establishment and Working Arae
The Contractor shall make arrangements with the appropriate landowner, territorial authority or service authority concerning an area for establishment, power, water and sanitary facilities subject to local body by-laws and the approval of the Engineer.

The Contractor's site establishment shall not interfere with:

(xi) Traffic movements or visibility of vehicles.
(xii) Pedestrian thoroughfare.
(xiii) The work of any service authority.
(xiv) Access to adjacent properties.
(xv) The road, structure, drainage facilities, etc.

32.4 Stockpile Sites

The Contractor shall nominate all intended material stockpile sites for approval by the Engineer.

Each site shall be left in a safe and tidy condition, with all excess material removed and the area levelled.

The Certificate of Practical Completion will not be issued until the stockpile sites are returned to a condition that is satisfactory to the Engineer. This means that stockpile sites must be left in a condition the same as or better than before they were used.

32.5 Bitumen Nuisance

The Contractor is required to monitor all new sealing/surfacing and to ensure that adequate measures are taken to prevent bitumen tracking problems and/or remedy promptly any problems that do arise.

32.6 Services Identification and Protection

The Contractor shall locate all services within each site and allow for working around and protection of these services within each site.

32.7 Public Notification

The Contractor shall arrange operations so that disruption of access to properties adjacent to the works is kept to a minimum. Prior to commencement of work (72 hours minimum) written advice shall be given by the Contractor to all property occupiers adjacent to the site and/or likely to be affected. The Contractor is to supply a draft letter to the Consultant for approval. The letter must include:

- Explanation of work.
- Date of disruption.
- Contract number.
- Contractor's name.
- Information pertaining to site specific controls (eg. bitumen tracking, children, parking etc).
- Access restrictions.

Commencement of work on site is deemed to be from the start of marking out repairs.

The Contractor shall respond to all other enquiries relating to the programme as required by the Engineer.

As well as the general notification to the public, the Contractor shall identify any specific users who may be affected (e.g. Foundation for the Blind, etc).

32.8 RAMM and Testing

The Contractor shall provide RAMM and testing information for each site on the sheet provided for that purpose. RAMM records shall be included with the Contractor's monthly claims.

RAMM records and testing results shall be included with the Contractor's monthly claims.

Practical completion will not be issued until the final RAMM information and any requested As-Built drawings have been submitted to and accepted by the Engineer.

32.9 Co-ordination of Road Signs and Marking

Pavement markings and traffic signs will be undertaken by the Dunedin City Council Signs and Markings Contractors and are not part of this contract.

(a) Forward Programme
Not less than 5 days prior to proposed commencement of work at any site or group of sites, the contractor shall provide the appropriate Dunedin City Council Contract Supervisor (for roadmarking & for signs) in writing (by e-mail) with a weekly forward programme, noting all site supervisors names and contact details.

The Council's Roadmarking contractor shall be copied in on the notification.

The contact details are as follows:

DCC Contract Supervisor	(Roadmarking)	Bruce Wood	(03) 474 3464 027 433 1824
DCC Contract Supervisor	(Signs)	Peter Hughes	(03) 474 3330

Further to this, the contractor shall give a minimum of three working days written notice to the DCC Contract Supervisor's, Council's Roadmarking Contractor and the engineer of any amendments to the programmed works.

(b) Marking Out
The contractor shall tag all existing roadmarking prior to resurfacing, if markings are unable to be tagged the contractor shall offset them.

(c) Notification of Completion of Reseal
The contractor shall then give immediate written notice to the DCC Contract Supervisors, Council's Roadmarking Contractor and the Engineer when sites have been completed and swept.

Temporary traffic control signage including temporary speed restrictions and roadworks signage (i.e "No Road Marking" TW – 2.8) signs shall not be removed from the site until new signs and markings have been installed.

The contractor may anticipate completion of these signs and markings works within seven working days of notification to the DCC Contract Supervisors. In the event of the required signs and markings not being complete within the seven working days of notification, the contractor may claim for rental of roadwork signs at an agreed rate.

32.10 Site Extent Setting Out

It shall be the contractor's responsibility to set out the works based upon the information supplied. Sealing

32.11 Removal of Raised Pavement Markers
On road sections where raised pavement markers have been installed they shall be removed. Replacement markers shall be placed by others following sealing.

Any repairs required to the surface due to removal of markers shall be the Contractor's responsibility and shall be completed prior to sealing operations.

32.12 Sealing Chips
The sealing chips to be used at each site shall be the grade specified in Schedule A.

Sealing Chips shall comply with the NZTA M/6 specification.

For sites where sealing chips are specified to be High Polished Stone Value (HPSV), chips are to have a minimum polished stone value (PSV) of 55 when tested in accordance with BS 812 Part 114.

Prior to commencement of work at these sites the Contractor shall forward recent test results in accordance with BS 812 Part 114 indicating the polished stone value.

The source of sealing chips to be used is to be nominated on the Schedule of Information Required from Tenderers.

32.13 Emulsified Asphaltic Binder

Emulsified Asphaltic Binder shall be CRS-2 Emulsion with a minimum residual Asphaltic Bitumen content of 68-70%.

Emulsified Asphaltic Binder sealing in accordance with the specification shall only be carried out during the period between the 1st day of October and the 15th day of March or the due date for completion, whichever is the earlier, and shall comply with the provisions of the Resource Management Act 1991.

While it is Council's intention for all sites to resealed with an emulsified binder, the engineer may approve the use of cutback binder at some sites if the contractor can provide relevant technical reasons.

For tender pricing purposes, polymer modified emulsion shall contain 6% polymer.

32.14 Control of Bitumen Run-off

The Contractor shall take measures as defined below to control bitumen product run-off.

(a) Before proceeding with any sealing work at any site the Contractor shall assess the risk of bitumen produce run-off and if necessary adjust his sealing programme to ensure work is carried out only in suitable conditions.

The Contractor shall give consideration to the effects on adjoining surface water channels, gutters, and stormwater systems including run-off into the harbour, natural watercourses or other environmentally sensitive areas, and shall assess the practicality of providing suitable entrapment measures in the event of run-off.

(b) Notwithstanding (a) above, the Contractor shall, in the event of run-off, provide the means, materials and resources necessary to as far as practical prevent contamination of the surrounds.

In the event of run-off the Contractor shall provide means of entrapment such as gritting, or dusting out of gutters and channels and plugging of sumps and mudtanks. No disturbance of drainage systems will be permitted without prior approval of the Dunedin City Council Drainage Manager.

(c) On completion of sealing and until the emulsified asphalt binder has reached a stable condition which will not be affected by rainfall, the Contractor shall monitor the site and take immediate protective and/or remedial action in the event of run-off.

Notwithstanding that the above precautions may have been taken, the Contractor shall notify the Engineer and the Contract and Asset Manager, Dunedin City Council of any occurrence which may give rise to contravention of Section 15 or Section 17 of the Resource Management Act 1991 and clean up any run-off immediately it occurs and reinstate to original condition any areas affected.

The Contractor shall also notify the Dunedin City Drainage Manager of any run-off into the stormwater system.

The Contractor shall also notify the Water Resources Manager, Otago Regional Council of any pollution of watercourses or harbour.

No run-off shall be permitted to be discharged into the foul sewer system.

32.15 Performance Measures

Table 2 in NZTAP/17: 2012 applies with the following variations:

The average value of chip retention for each section will be 98%.

The minimum value of chip retention for any test (not necessarily randomly located) will be 90%.
The chips shall be in shoulder to shoulder contact lying on their flat and shall not be overlapping any adjacent chip.

32.16 Loose Chip & Removal of Surplus Chips

The contractor shall ensure that each individual site complies with clause 7.3 NZTA P17: 2012, in addition to this the removal of chip from sites should be afforded high priority to match the expectation of the public. It is expected that the Contractor will be proactive in checking sites and make allowances to sweep sites more than once.

32.17 Sweeping Period – Contractors Obligations

All sites shall be subject to a minimum 6 week sweeping period from the date of sealing when follow up sweeping may be required. The engineer shall be notified at the commencement of this period.

The Contractor shall be fully liable for sweeping and the removal of chip within this period.

Four weeks after the sealing date, the contractor shall notify the DCC Assistant Contract Supervisor (Suzanne Donaldson, Ph 474 3281 or 027 284 7101) that the site meets specification and is ready to be inspected.

Following formal notification the DCC Assistant Contract Supervisor will inspect the site before the end of the six week sweeping period and will approve the handover of sweeping and chip removal tasks to the DCC maintenance contractor subject to compliance with clause 7.3 NZTA P/17:2012 and conformation that the second sweep has occurred. From approval date, the contractor shall be released from any liability in relation to surplus chips.

Any approval or handover of sweeping and chip removal tasks does not relieve the contractor of any liability relating to surfacing, excessive chip loss, material or construction defects.

32.18. Dry Lock Coat

The Contractor may identify high stress areas where a dry lock coat may be applied in accordance with NZTA P4. Pre-approval is required before using this technique.

33 AREA WIDE PAVEMENT TREATMENT

33.1 Scope of Contract

33.1.1 Location of Works

The site of works for year 1 is detailed in Appendix 44.

33.1.2 Description of Works

The work includes but is not limited to:

- Shape correction works by granular overlay, stabilisation or asphalt overlay
- Sealed and asphalt concrete dish channel construction
- Kerb and channel renewals
- Surfacing using sealing chip
- Reconstruction or resurfacing of footpaths
- Liaison with Dunedin City Council Water and Waste Services Department
- Completion of RAMM sheets for each site

33.2 Testing and Examination of Materials

All materials testing shall be carried out at the Contractor's expense in accordance with the standard NZTA Specifications unless modified in this specification. All laboratory testing of aggregates is to be to NZS 4407 unless otherwise stated. All laboratory testing shall be carried out by an IANZ accredited laboratory with an accreditation for the particular test.

In addition to their commitment to sample and provide test results, the Contractor shall provide any labour required to assist the Engineer to inspect, examine and test any materials. The Contractor shall have no claim for the cost of this assistance or costs of any delay resulting from such testing. The Engineer may condemn any materials at any time if they do not comply with this specification.

The Contractor shall arrange for and undertake all material testing under the specification. Copies of all test results shall be supplied to the Engineer. The Engineer may carry out random verification testing. Should any such verification test fail to meet specified requirements the Contractor shall bear the costs of the testing and any subsequent testing.

The Contractor must supply a copy of all laboratory test reports for acceptance testing, both conforming and non conforming, to the engineer. The Contractor shall instruct the laboratory to send duplicate copies of all test reports directly to the Engineer, as well as the contractor. This is consistent with the intent of the Aggregate & Quarry Association NZ that acceptance testing be a transparent process between contractors and clients.

This information shall be supplied at least three (3) days in advance of the time that the materials are required for inclusion into the works. This is to permit the Engineer to study the results and/or carry out any additional testing that he may require without causing any delay to the work. If the Engineer is unable to accept the materials due to their non conformance with specification, then any costs in preparing conforming materials is at the Contractor's expense.

The minimum conforming testing frequency and required tests are identified in the appendices.

33.3 Dump Areas and Private Property

The Contractor is to provide and manage any off site dump areas.

The Contractor shall make their own arrangements with any landowner in respect of use of private property outside the defined limits of the Contract Works and shall be completely responsible for any consent costs, damage or claims for compensation arising from such use. If required, and before the expiry of the Defects Liability period the Contractor shall submit a letter from any property owner concerned certifying that all claims for compensation for damage due to the Contractor's operation have been discharged to the owner's satisfaction.

33.4 Contractor's Establishment and Working Area

The Contractor shall make arrangements with the appropriate landowner, territorial authority or service authority concerning an area for establishment, power, water and sanitary facilities subject to local body by-laws and the approval of the Engineer.

The Contractor's site establishment shall not interfere with:

(xvi) Traffic movements or visibility of vehicles.
(xvii) Pedestrian thoroughfare.
(xviii) The work of any service authority.
(xix) Access to adjacent properties.
(xx) The road, structure, drainage facilities, etc.

33.5 Stockpile Sites

The Contractor shall nominate all intended material stockpile sites for approval by the Engineer.

Each site shall be left in a safe and tidy condition, with all excess material removed and the area levelled.

The Certificate of Practical Completion will not be issued until the stockpile sites are returned to a condition that is satisfactory to the Engineer. This means that stockpile sites must be left in a condition the same as or better than before they were used.

33.6 Bitumen Nuisance

The Contractor is required to monitor all new sealing/surfacing and to ensure that adequate measures are taken to prevent bitumen tracking problems and/or remedy promptly any problems that do arise.

33.7 Cultural Artefacts

If at any stage during the contract period, human skeletal remains or artefact/historical material is discovered, then work shall stop immediately and the Engineer is to be notified.

33.8 Stormwater Collection

Any stormwater runoff collected from a disturbed area is to be treated by a silt retention method, such as a silt fence or secured hay bales, before discharge to a water body, until the Works completion.

33.9 Services Identification and Relocation

The Contractor shall contact all relevant service authorities and identify and locate all services within each site.

In consultation with the service provider and the Engineer, those services requiring to be relocated shall be identified and the extent and cost of relocation agreed.

On instruction from the Engineer, the Contractor shall organise with the service provider for the work to be undertaken, for the agreed price.

The services likely to be affected include: underground water mains, underground gas mains, underground telecommunication cables and survey marks.

The Contractor should allow for working around existing services and the dusting and compaction around these services within each site.

33.10 Public Notification

The Contractor shall arrange operations so that disruption of access to properties adjacent to the works is kept to a minimum. Prior to commencement of work (72 hours minimum) written advice shall be given by the Contractor to all property occupiers adjacent to the site and/or likely to be affected. The Contractor is to supply a draft letter to the Contractor for approval. The letter must include:

- Explanation of work.
- Date of disruption.
- Contract number.
- Contractor's name.
- Information pertaining to site specific controls (eg. bitumen tracking, children, parking etc).
- Access restrictions.

Commencement of work on site is deemed to be from the start of marking out repairs.

The Contractor shall respond to all other enquiries relating to the programme as required by the Engineer.

As well as the general notification to the public, the Contractor shall identify any specific users who may be affected (e.g. Foundation for Blind, etc).

33.11 Logging of Exising Pavement Layers

During any excavation of the existing pavement, the Contract shall complete the form in the appendices for logging the depths and types of materials encountered. This information should be submitted to the Engineer with the monthly claim. The log will be used by the DCC to build up records of existing pavement. Excavations may be from digouts, trenches, kerb and channel excavation etc.

33.12 RAMM and As-Built Drawings

The Contractor shall provide RAMM information for each site on the sheet provided for that purpose. RAMM records shall be included with the Contractor's monthly claims.

The Contractor shall provide As-Built drawings, updated for each site on a copy of the construction drawings provided.

Practical completion will not be issued until the final RAMM information and any requested As-Built drawings have been submitted to and accepted by the Engineer.

33.13 Co-ordination of Road Signs & Marking

Pavement markings and traffic signs will be undertaken by the Dunedin City Council Signs and Markings Contractors and are not part of this contract.

(a) Forward Programme

Not less than 5 days prior to proposed commencement of work at any site or group of sites, the contractor shall provide the appropriate Dunedin City Council Contract Supervisor (for roadmarking & for signs) in writing (by e-mail) with a weekly forward programme, noting all site supervisors names and contact details.

The Council's Roadmarking contractor shall be copied in on the notification.

The contact details are as follows:

DCC Contract Supervisor	(Roadmarking)	Bruce Wood	(03) 474 3464 027 433 1824
DCC Contract Supervisor	(Signs)	Peter Hughes	(03) 474 3330

Further to this, the contractor shall give a minimum of three working days written notice to the DCC Contract Supervisor's, Council's Roadmarking Contractor and the engineer of any amendments to the programmed works.

Offsetting of Road Marking
The Contractor shall offset any road marking that will be affected by the works.

33.14 Survey, Design & Setting Out

The Contractor shall be responsible for the following relevant stages of the work:

- Preliminary investigation of the physical work objectives, the formulation of and agreement with the client of the outline principals and details of the physical works, the confirmation of the budgets and estimates.
- Site surveying.
- Assessment of pavement testing results (testing will be carried out by a third party unless agreed otherwise).
- The design of the work to comply with appropriate accepted engineering standards.
- The identification and resolution of all factors and issues that may impact on the physical works, including but not limited to underground services, Resource Consent issues, Health and Safety issues, bus and heavy vehicle routes, disruptions to road user levels of service, public relations, etc. It is accepted that some of these issues will require action by the Client and in such cases the Contractor shall identify the issue and advise and assist the Client on

procedures and actions for resolution. The Contractor shall be responsible for applying for any required resource and building consents that may be required for any of the projects. The cost of the consents shall be a direct charge to the client.

- Submission of reports for the preliminary, design and construction phases of the work.
- The provision of all drawings, documentation, schedules etc and the updating of the same to ensure the proper progress of physical works contracts.
- Progress and financial reporting throughout the period of the work.
- Electronic updates of construction drawings to form as-built drawings, in .dwg format, at the completion of the work.
- A comprehensive descriptive and statistical summary of the work completed under the Contractor's control, eg the total physical dimensions of work completed and the physical factors relating to each project. This includes the completion of RAMM Update Sheets for each completed roading project. This must be supplied at the time of issue of the Certificate of Practical Completion. The appropriate DCC RAMM sheets will be supplied to the Contractor.
- Allow for suitable monitoring of sites during defects liability period and take action as required.

33.14.1 General Requirements

The Contractor is required to be conversant with all appropriate NZTA standards, relevant legislation, nationally accepted guidelines and procedures for roading work and up-to-date developments in roading technology, and other standards referred to in the design briefs.

The Contractor shall adhere to all mandatory requirements and shall seek the Client's prior approval where any departure from normally accepted engineering guidelines and procedures are proposed.

The Client requires all roading works to be undertaken in a cost effective manner and it is a specific part of the Contractors brief that this is given a high priority.

When formulating the fundamental principles to be applied to physical works the Contractor is required to investigate and recommend solutions which are cost effective when taking an overall view of the short and long-term requirements of the road.

It is a requirement that the Contractor give full regard to the wider implications of the proposed roading works. By way of example, if a section of the project works creates problems with the road drainage, drainage from private property, or pedestrian/vehicular access in or out of properties, it is a requirement that the Contractor identify these issues and take full account of them in the design to ensure that any loss of service is mitigated. If a potential loss of service cannot be sensibly accommodated within a design then the Contractor must advise the Client of this immediately, together with a recommended solution. As part of the process the Contractor shall satisfy himself that all matters such as conflict with existing services, programming of works with other identifiable works in the same road section, agreements to enter private land etc are identified and properly dealt with.

33.14.2 Design Standards:

The project designs shall be carried out in accordance with current best practise and standards including, but not limited to;

- ARRB – Sealed Local Roads Manual
- Austroads Pavement Design manual
- Austroads Guide to Traffic Engineering Practice
- NZTA standard roading specifications
- AS/NZS 1158: Road Lighting
- The Manual of Traffic Signs and Markings
- Relevant Dunedin City Council standards including Standard Roading Plans and details

It is expected that the Contractor should hold up-to-date copies of all these standards and guidelines and be thoroughly familiar with their contents.

Given the possible constraints imposed by the environment at some sites, it is likely some departure from these standards may be required. Any departure which lies outside this brief shall be fully documented in the preliminary phase report for the Project Managers consideration.

33,14,3 Phases of the Work and Documentation
In addition to the monthly reporting requirements named above, the Contractor shall provide to the Client a concise summary report of each of the following phases of each physical works contract:

a) Preliminary phase, ie the investigation and assessment phase, including the preparation of preliminary plans and estimates up to the commencement of final design. This report (two (2) copies of report and plans) is to be submitted to the Client before final design commences. The Contractor should allow 10 working days for the Client to consider and provide comment back to the Contractor.

b) Design phase up to the commencement of physical works. This report is to be submitted to the Client 10 days before physical work is programmed to commence.

The intention of this documentation is to provide a summary of the significant technical factors of each contract for record purposes. The summaries are therefore required to address matters such as site investigations, design principles and non-standard engineering solutions. Matters of routine and financial progress will be reported elsewhere and are not required to be recorded in the summary.

The Contractors attention is drawn to the additional consultation that some projects may require prior to the final design concept being confirmed as outlined in Appendix A: Project Briefs. It can also be reasonably expected that some changes to the design requirements may occur after consideration of the preliminary report. Changes after that time should be infrequent and minor. The costs of such changes should be allowed for in the tendered sum.

33.14.4 Preliminary Phase Design Requirements
In the preliminary phase, the Contractor is to consider the proposed design brief and assess the technical and cost effective works required to achieve the intentions of the brief. The Contractor shall prepare a report, preliminary plans and estimates to present to the client in accordance with this specification.

As part of the initial phase of the project, the Contractor shall arrange with the Project Manager for a combined walkover of the project site to view and discuss in detail, the intentions of the project, and agree on construction details, drainage issues, extent of work etc. The Contractor shall note that while the project brief indicates the intended limits of the project, the walkover may highlight the need to extend the limits of construction in some areas to ensure acceptable tie ins

of the new work to the existing. Tenderers shall ensure that their tender prices allow for this situation.

These reports, plans and estimates must be submitted to the Client before detailed design work is committed. The Client must have the opportunity to comment if the proposed works do not satisfy the intention of the Contractor's brief, or if other significant issues have arisen, but the acceptance or otherwise of the Contractor's proposals does not remove the Contractor's overall responsibility and accountability for the work.

The Contractor shall advise at this preliminary stage if he considers that the proposed necessary works and the budget are in conflict with each other, and if so, his proposal to ensure that the work is maximised without exceeding the budget. Any changes to the schedule of works require the approval of the Client.

33.14.5 Schedule of Quantities for Physical Works

Schedules shall be provided for the physical works, and it is expected that the design and the measure of the quantities should be sufficiently detailed that they truly reflect the measure of the proposed works. Any possible variation resulting from the final measure must be able to be accommodated within the agreed contract project budget.

The Contractor shall include in the contract documents a plan and a completed schedule of the signs and markings, which are to be installed for each project. These schedules will not be priced as part of the works as this signs and markings work will be undertaken by the Client's signs and markings maintenance contractor.

33.14.6 Survey / Design of Critical Areas of Construction:

For tendering purposes it shall be assumed that a full survey will be required for all of the scheduled sites.

The Contractor shall carry out the necessary surveys which ensure the inclusion of all existing features of the site such as kerb lines, service covers, signs, road markings, power poles, cable markers, accesses/driveways, drainage points, mud-tanks, site boundaries, fences, house numbers, plantings, etc and must be sufficient as a base plan for the physical works. The Contractor shall carry out a visual inspection of all drainage structures to determine the true condition of the structure (eg will the culvert need replacing or not).

As part of the design phase the Contractor is required to identify areas where design/geometric details may conflict with site constraints and/or involve alterations to private property. Survey and design for such areas are to be undertaken to ensure that tendered works are workable and practical, eg extending surveys back into driveways to ensure no bottoming-out of vehicles, effects of footpath adjustments on boundary fences and their foundations. It is critical that there are no unforeseen complications regarding drainage and sight lines in the final designs. The design must also take into account whether the sites are on bus routes or on recognised heavy and over-dimension vehicle routes and how the proposed improvements may affect that use.

This process is required in order to minimise the occurrence of designs needing clarification or reworking once the physical work commences, and where property alterations are involved, to allow time for the Client to negotiate and agree details of any changes required.

The Contractor is to note that one of the performance measures against which he will be measured will be the completeness of the physical works documents (ie: contract changes / variations arising from the Contractor failing to consider and include basic details in the tender documents.)

33.14.7 Liaison with Council Departments

In addition to the overall requirements regarding underground services, the Contractor shall liaise with the Council's Water Department, Waste Services Department and Community and Recreational Services Department to ascertain general and particular requirements for each project of physical work. The liaison shall be undertaken prior to final design in order that the requirements can be built into the project. If the Contractor cannot reasonably resolve issues with the Council departments directly, then the matter shall be referred to the Project Manager by the Contractor.

The Contractor should also advise the Client of any further Council department or other authority that he considers should be consulted on any particular project.

33.14.8 As-built Documentation

On completion of the physical works, and prior to authorisation of the final payment, all final electronic as-built drawings and details shall be lodged with and approved by the Client. It should be noted that scanned drawings of hand written notes on construction drawings will not be considered sufficient. As-built documentation also includes the submission of all relevant RAMM Update sheets to the Client. RAMM data shall be supplied in electronic or hard copy form as agreed by the DCC. Templates will be provided to the Contractor.

Drainage and Earthworks

33.15 Exposure of Subgrade

During all construction the Contractor shall be responsible to ensure that the subgrade, subbase and basecourse layers are protected from the weather by suitable means utilising cambering, compaction and drainage.

Should any soft areas develop the Contractor shall dig these out, drain and backfill these at their own cost.

33.16 Cut to Waste

This item includes for trimming of vegetation and general earthworks operation.
Excavations shall be true to line and grade. The bottom of excavations shall be trimmed to provide a sound foundation for granular material. Shoulders and batters shall be benched where required in accordance with NZTA F/1. Excavated pavement aggregate which is contaminated with surface detritus and/or organic material shall not be re-used on surfaces to be sealed. Clean aggregate may be re-used for construction of pavement layers, if specific approval is granted from the Engineer.

33.17 Cut to Fill

During excavation clean aggregate, free from deleterious material, soil or plastic clay shall be placed and compacted as fill.

Where fill is to be used for cut to fill, it shall be homogeneous and compacted to optimum water content and maximum density as determined by NZS 4402:1987, Test 4.1.1. Determination of the Dry Density / Water Content Relationship, NZ Standard Compaction.

33.18 Excavation

Excavation shall be true to line and grade. All excavations within or joining onto the existing seal shall be saw cut at an agreed offset from road centreline. This offset will be agreed with the Engineer or his Representative at the initial site meeting. The bottom of excavations shall be

trimmed to provide a sound foundation for granular material. Shoulders and batters shall be benched where required in accordance with NZTA F/1. Benches shall be formed to allow water to flow away from the road formation. Excavated pavement aggregate which is contaminated with surface detritus and/or organic material shall not be re-used on surfaces to be sealed. Clean aggregate may be re-used for construction of pavement layers.

33.19 Stripping

Vegetation and topsoil/clay material between the existing granular pavement material and the existing water channel shall be removed.

The finished trimmed surface shall be true to line and grade and provide a sound foundation for granular material.

33.20 Permits

The Contractor is responsible for obtaining all permits from regulatory authorities for the drainage works. All costs associated with the obtaining of the permit and negotiation with the regulatory authority shall be included in the tender.

All costs required by the Regulatory authority with regard to any element of the connection that they must undertake shall be included in the tender.

33.21 Connections

Sump-Stormwater drain connections shall be laid on a constant straight grade to the same specifications as that for stormwater drains.

“As built” positions of the Y-connections into the stormwater drains shall be accurately measured and recorded by the Contractor, prior to backfilling.

Sump connections shall be tested as per the DCC requirements for stormwater drains.

33.22 Trench Excavations

Trenching shall be carried out in accordance with NZS 4452:1986.

Trenches shall be excavated true to line and grade. Trench width shall not be wider than the pipe diameter plus 300mm.

The sides of the trench shall be adequately protected to avoid collapse and excavation material other than clean granular basecourse material shall be loaded onto trucks and carted to waste.
The bottom of the trench shall be trimmed to, and maintained at, the correct levels and grades to receive the granular bedding material.

Bedding of pipes shall be on granular material complying with NZS 4452:1986.

33.23 Backfilling

Backfilling material shall be clean granular basecourse material. Under no circumstances shall topsoil, silt, or clay be placed in the backfill.

Any subsidence occurring during the Defects Liability period shall be made good at the Contractor’s expense and as soon as such subsidence occurs.

All backfill shall be thoroughly compacted. The degree of compaction shall be monitored by the Clegg hammer at the final height where the minimum reading achieved shall be 45 Units prior to sealing of the trench.

33.24 Subsoil Drains

Subsoil drains shall be 100mm diameter HDPE drainage pipes surrounded by filter material, unless specified otherwise, and have either the trench wrapped in geotextile fabric or the pipe shall be in filter tube.

Subsoil drains shall be constructed in accordance with the requirements of NZTA F/6.

Drains shall be laid to discharge to the mudtank or surface water channel or as defined by the Engineer.

The Contractor shall allow for the existing pavement to be sawcut, excavated, subsoil drain installed as detailed and the road surface reinstated as necessary to achieve discharge.

33.25 Geotextile

The geotextile shall be Maccaferri Bidim A19, A44 cloth, or similar approved by the Engineer. The geotextile shall be installed in accordance with the manufacturer's instructions.

33.26 Geogrid

The geogrid shall be Tensar SS40, SS30 or a similar approved geogrid that will provide same or better pavement strength.

Any design and the associated cost required to substantiate the pavement strength by using an alternative geogrid shall be at the contractor's expense.

The geogrid shall be installed in accordance with the manufacturer's instructions.

33.27 Digout Repairs

The perimeters of dig-outs shall be marked in conjunction with the Engineer at the initial site walkover.

Digouts shall be saw cut, excavated and reinstated in accordance with the site specific details for each site.

There may be other areas requiring digout repairs that have not been marked. The Contractor shall notify the Engineer for an approval prior to carrying out any additional repairs.

All granular construction shall be carried out in accordance with NZTA B/2 specification.
Asphalt concrete construction shall be in accordance with NZTA P/9 specification, except where hand laying is approved.

33.28 Scarification of Existing Seal Surface

The underlying seal shall be either punctured or lightly scarified to avoid trapping moisture in the new pavement layer. Scarifying depth should be limited to just breaking through the seal layer with minimal disturbance to the underlying basecourse. Individual scarifying tynes scoring the seal should be between 1.0-1.5 metres apart.

33.29 Traversable Headwalls

The Contractor shall allow for cutting the pipes or purchasing pre-cut pipes.

Concrete shall be Ordinary Grade with a minimum specified strength of 17.5MPa. The surface finish shall comply with NZS 3114:1987 with surface finish class U5, shallow texture broom finish.

The Contractor shall be responsible for employing effective methods of placing, protecting and curing concrete to the profiles shown on the drawings. Inspection of any such work by the Engineer will not relieve the Contractor of this responsibility. Concrete not placed in accordance with this specification or which is otherwise defective, shall be removed within the limits assigned by the Engineer and replaced by the Contractor without further payment.

Inlet and outlet structures shall be insitu or as otherwise stated on the drawings and shall be traversable or approved equivalent. The structure shall have a side slope of 6:1 or otherwise shown on the drawings and connected to the culvert as shown in the drawings. The structure shall be placed parallel to the road centreline.

33.30 Rock Fill Construction
Rock fill and benching shall be constructed in accordance with NZTA F/1.

Aggregate for rock fill shall be 150mm all-in broken rock, with a grading such that no more than 10% passes 75µm and 70% of the rocks are between 100mm and 150mm diameter.

33.31 Gabion Construction

33.31.1 General
Gabions shall be 1m x 1m x 2m baskets, constructed one basket high unless otherwise agreed.

The Contractor is advised that retaining walls/gabion walls that exceed 1.5m in height are subject to the requirements of the Building Act.

33.31.2 Materials
Gabion baskets shall be by Maccaferri Gabions NZ Ltd, or other supplier approved by the Engineer, and shall be constructed of heavily galvanised steel mesh.

The fill shall be durable dense rock, between one and two times the diameter of the dimensions of the mesh. Stone that can pass through the mesh shall not be used.

33.31.3 Construction
The Contractor shall construct gabions in accordance with the manufacturer's specification.

Gabions shall be constructed correctly tensioned, fill shall be fully compacted, and the completed gabions shall be without deformation.

33.31.4 Foundations
The Contractor shall construct foundations for the gabions in accordance with the manufacturer's specification. The base of the foundations shall grade away from the centreline of the road to ensure drainage of the gabions.

The excavation shall not adversely affect the integrity of the existing pavement. Any repairs to damage to the existing pavement shall be at the Contractor's cost.

The Contractor shall arrange for the Engineer to inspect the foundation. At least 24 hours notice shall be given. The Engineer will approve the foundation or will require additional work to be undertaken.

33.31.5 Back-filling
The Contractor shall construct backfill between the gabions and the existing road with fill material which is free draining and thoroughly compacted. The Contractor shall ensure that backfill material does not migrate through the gabions.

33.31.6 Rock Filled Water Channel

Rock shall be between 150mm and 200mm in diameter with no clay content.

The rock shall be placed on both sides of the channel to the level of the underside of the AP65 pavement layer and laid to provide a minimum of voids.

33.31.7 Guardrail Barriers and Terminals

The Contractor shall construct guardrail barriers and terminals in accordance with NZTA M/23 Specification for Road Safety Barrier Systems and the manufacturer's instructions.

For tendering purposes the guardrail shall be a semi rigid W Section or Thrie beam that meets or exceeds Test Level 3. The terminal ends shall be an X-350 or equivalent.

Unbound Granular Pavement

33.32 Extent of Work

The scope of work in this section of the specification includes the supply, laying and compacting of rockfill, granular fill, sub-base and basecourse aggregates.

33.33 Materials

33.33.1 Rockfill

Rockfill shall consist of angular material having broken faces with 90 per cent of the material having an even grading between 100mm and 300mm in diameter. The balance shall comprise only sufficient smaller rock particles to fill the interstices without compromising the positive interlock between rock faces.

When tested in accordance with test 3.10 of NZS 4407:1995 under a load of 100kN, the material shall produce less than 10% fines passing a 2.36mm sieve size. When tested in accordance with test 3.11 of NZS 4407: 1991 the material shall have a Weathering Quality Index of AA, AB or BA.

The material shall be systematically placed and compacted so that the minimum volume of void space is present on completion.

33.33.2 Granular Fill

Granular fill may be crushed or uncrushed, free of non-mineral matter and shall have a crushing resistance greater than 100kN. The materials shall be well graded and 100% by mass shall pass the 100mm standard sieve and no more than 50% by mass shall pass the 4.75mm sieve.

33.33.3 AP 65 Sub-base Aggregate

The AP65 subbase aggregate shall comply with the following:

The aggregate may be crushed or uncrushed but shall comply with the requirements of NZTA M4 in all respects except those for proportion of broken faces and grading.

Sand equivalent shall be in excess of 40.

Broken faces between sieves 19.0mm and 65mm shall be a minimum of 30%.

Grading Limits Standard Sieve Aperture Size	% Passing By Weight
65mm	100
37.5mm	60-85
19.0mm	45-65
9.5mm	30-50
4.75mm	20-40
2.36mm	10-25
1.18mm	8-20
0.075mm	0-5

33.33.4 Basecourse Aggregate

The basecourse aggregate shall comply with all requirements of NZTA M/4.

33.33.5 AP20 Basecourse

AP20 basecourse shall be general quality 20mm top size evenly graded aggregate with no clay content.

33.33.6 Running Course

The running course shall be supplied by the Contractor and shall comply with the requirements of Clause 11, NZTA B/2.

33.34 Construction of Unbound Granular Pavement Course

33.34.1 AP 65 Sub-base Aggregate Construction

Sub-base aggregate shall be constructed as detailed in this specification and in accordance with NZTA B/2 except as modified below.

Satisfactory initial test results shall be provided to the Engineer prior to any subbase material being placed on the road.

Where there are tapers, either transverse or longitudinal, the sub-base aggregate shall be constructed from full depth to a depth as thin as practicable.

Prior to placing of basecourse, all subbase in shoulders shall be shaped to profile and batters compacted. In areas where it is not practicable to construct a subbase layer with the material specified, the work shall be completed as part of the basecourse construction.

33.34.2 Basecourse Aggregate Construction

Basecourse aggregate shall be constructed as detailed in the drawings and in accordance with NZTA B/2.

No basecourse material shall be placed on the job until at least initial test results have demonstrated the material complies with the contract requirements.

Where there are tapers, either transverse or longitudinal, the basecourse aggregate shall be constructed from full depth to a depth as thin as practicable.

Compaction shall take into account the need to avoid disturbance or damage to the subgrade.

Following complete compaction of the basecourse layer, running course may be laid. The running course is to be used for holding and locking the surface and shall not be used to in any way modify the basecourse grading.

Prior to sealing the surface shall have been fully cured with the running course having been placed at least 5 days prior to the sealing, and it can be shown that no further compaction is taking place. This curing time may be reduced by approval from the Engineer if there is strong factual evidence or compelling reasons presented by the Contractor that supports a reduced curing time.

Prior to sealing, the basecourse water content shall be at a suitable level which will allow sealing to proceed without undue risk of road performance being affected by excess water in the basecourse. This shall not exceed 65% of basecourse saturation unless authorised in writing by the Engineer. Prior to sealing sufficient traffic or passes of a pneumatic tyred roller in combination with the drag broom, shall pass over the roadway to produce a suitable surface for sealing, as defined below.

Management of traffic over the surface under running courses shall ensure full and even compaction and curing of the surface.

The surface ready for sealing shall:

- Have a tight uniform dense stable surface free of contaminants.
- Be at the optimum moisture content.
- Be fully cured (the Contractor shall detail in his methodology how this will be achieved for the full length to be sealed).
- Comply with the specified dimensional tolerances and roughness.

All surplus running course that is not incorporated into the mosaic surface or has fatted up and is adhered to the surface shall be completely removed. The Contractor shall not attempt to fill the upper basecourse layer voids with fines through excessive watering. The final finish is the responsibility of the Contractor and any failures shall be repaired at their cost.

At least 24 hours prior to sealing the Contractor shall have provided the Engineer with results to the top of the basecourse showing levels, crossfalls and quantities have been achieved.

The Engineer shall have the power under this Contract to stop any sealing operation if in his /hers opinion, the constructed works are not in a suitable state to seal or the conditions are such that there is a risk that an acceptable finished job may not be achieved.

33.34.3 Running Course Construction

Running course shall be placed and constructed to section 10 of NZTA Specification B/2 and conform to the following tests from this specification:

e Aperture	Percent Passing
19mm	100
4.75mm	0-60
0.6mm	0-23
0.075mm	0-8

The Clay Index of the fraction passing the 0.075mm sieve shall not be greater than 3 when the aggregate is tested according to NZS 4407:1991 Test 3.5 Clay Index Test. This requirement is waived where the percentage passing 0.075mm sieve is less than 1.5% and the percentage passing the 0.15mm sieve is less than 2.0%.

The Contractor shall provide the Engineer with a minimum of one particle size distribution and clay index test from each source. The grading may be varied, but only by prior approved written request to the Engineer which details how the proposed running course will fit in with the basecourse used to produce the desired surface finish.

It is noted that at no time shall excess running course be used, the running course is to be placed so that it 'hides' the basecourse mosaic at the surface. Should excess running course be evident, the Engineer reserves the right to require all basecourse to be removed and new basecourse construction be undertaken at the Contractors cost.

Running course shall be placed at a rate of $1m^3$ per $200m^2$.

33.34.4 Finished Surface Shape

Clause 7.7 of B/2 refers. The finished surface shall have a NAASRA roughness value not exceeding an average of 60. No Individual reading shall exceed 70.

Roughness Noncompliance

Failed roughness test shall be treated as follows:

(i) Isolated Sections Failing Maximum
Failed areas shall be made good and re-tested at Contractor's expense until satisfactory.

(ii) Total Road Fails Mean (NAASRA>70)
The Contractor shall rip the seal, reshape the pavement and reseal the full section of works to an acceptable standard. The sealed surface shall be retested at the Contractor's expense until satisfactory.

In-situ Pavement Cement Stabilisation

33.35 Scope

The work covered in this specification includes the breaking down and recovering of material from the upper layer(s) of the existing road pavement, increasing the pavement width by addition of imported material (if necessary), supply, transport and mixing-in of stabilising agents and water; and compacting, trimming and curing of the stabilised material to achieve a stabilised basecourse layer. Work shall be in accordance with NZTA B/5.

33.35.1 Imported Natural Materials

Imported material may be required to supplement the stabilised material for shape correction and widening purposes. Approval shall be sought for the Engineer prior to the laying of any imported materials.

33.36 Stabilising Agents

33.36.1 Cement Stabilising Agents

Cement shall comply with the specification and for tendering purposes be applied at a rate of 2% by weight.

33.36.2 Confirmation of Mix Design

The mix design specified is based on designs completed on similar sections of road in previous years. Prior to physical work commencing, the Contractor is to obtain samples and then complete the following testing as per the requirements of the Wirtgen Cold Recycling Manual, November 2004 Appendix 2:-

Cement %	Number of UCS Test
1	2
2	2
3	2

The results of the testing shall be forwarded to the Engineer at least five working days before establishing on site who will then confirm the final mix design for each site.

33.36.3 Briquettes for Unconfined Compressive Strength Test

The briquettes for the UCS test shall be prepared with mould size of 150mm diameter x 127mm high and shall include all material passing the 37.5mm sieve.

First Coat Sealing.

33.37 Standard Specifications

The following NZTA Standard Specifications shall apply.

NZTA M/6 Sealing Chip
NZTA P/3 First Coat Sealing

33.38 Bituminous Sealing Materials

Asphaltic bitumen shall be 180/200 penetration grade bitumen conforming to NZTA specification M/1.

Spraying temperatures and the addition of diluents shall all be within the range specified by NZTA Specification P/3. The percentage of kerosene shall be confirmed with the Engineer prior to the commencement of work and will be adjusted to suit the prevailing conditions.

Sampling and testing shall be carried out as specified in NZTA P/3 specification.

The Contactor shall supply test certificates from an IANZ accredited laboratory certifying that the bitumen used on the contract fully conforms with all aspects of NZTA M/1 for a 180/200 penetration grade bitumen (including all ‘durability testing’), and sealing chips to NZTA M/6.

It remains the Contractor’s responsibility to produce a final sealed surface which is acceptable to the Engineer and meets this specification, including such features as but not limited to, chip coverage and take, water proofing, texture across full width of road and seal life (minimum 3 years for a two coat first coat seal).

33.39 Sealing Chips

Sealing chips shall comply with the M/6 specification.

The Contractor, if required by the Engineer, shall supply proof that any or all nominated sources of sealing chips are capable of producing chips that meet all the requirements of this specification.

For sites where sealing chips are required to meet minimum Polished Stone Value (HPSV), chips are to have a minimum polished stone value (PSV) of 55 when tested in accordance with BS 812 Part 114.

Prior to commencement of work at these sites, the Contractor shall forward recent test results in accordance with BS 821 Part 114 indicating the polished stone value.

33.40 Inspections Prior to Sealing

The Contractor shall give the Engineer 48 hours notice of the intervention to seal. All proposed areas to be sealed shall be approved by the Engineer. Failure to provide 48 hours notice will deem it appropriate for the Engineer to issue a stop work notice, until such time as the Engineer is available to inspect the site. No claims for standing time can be made by the Contractor in this instance.

The pre-sealing requirements shall be in accordance with Clause 12 of NZTA B/2.

Immediately prior to sealing the base course surface finish, as distinct from the surface shape, shall be such that when swept presents a tightly consolidated surface where:

- The large aggregate is exposed to the surface,
- Held in place with a matrix of smaller, aggregates which are in turn,
- Held firmly in place by fine material,
- So the large aggregate (+20mm) is almost in shoulder to shoulder contact;
- With bonding sufficient that the matrix will not displace under normal trafficking or sweeping.

The standard of sweeping shall be sufficient to remove all loose aggregates, dirt, dust, silt and other deleterious matter.

33.41 Seal Design

The Contractor shall supply to the Engineer, at least 3 days prior to sealing, their proposed seal design for the Engineers acceptance. The seal design shall be site specific which acknowledges such items as: time of year, prepared surface texture, weather conditions, and sealing chip size/shape. To provide the required waterproofing, the minimum residual bitumen application rate for a first coat two coat seal shall be 1.90 l/m^2.

In addition the seal design shall meet the following specific requirements.

33.41.1 Sealing Binder

Bituminous binders shall be 180/200 penetration grade bitumen and conform with TNZ M/1 unless otherwise agreed.

Minimum Asphaltic Composition (either A or B)	
(A) • 100 parts 180/200 penetration asphaltic cement • 6 parts lighting kerosene • Adhesion agent in accordance NZTA M/13 • 1 part automotive gas oil	(B) • Equivalent quick breaking emulsified asphalt. The contractor must supply details of the emulsion to be used, and all information pertaining to methodology pre and post sealing using emulsion.
Special Requirements	

<u>Emulsion only:</u> For the full 12 hrs after first coat sealing with emulsion, traffic shall be restricted to a maximum of 30km/hr, and be under fulltime manual traffic control management. During this time the line that traffic travel through the site will be varied with the careful placement of cones so that even compaction of sealing chips by vehicles across the full width of seal is achieved.
<u>Cutback only:</u> For the full 6 hrs after first coat sealing with cutback, traffic shall be restricted to a maximum of 30km/hr, and be under fulltime manual traffic control management. During this time the line that traffic travel through the site will be varied with the careful placement of cones so that even compaction of sealing chips by vehicles across the full width of seal is achieved.

33.41.2 Texture Range to be achieved

To provide water drainage from the road surface and to meet skid resistance requirements a minimum texture depth is necessary. To enable a second coat seal to be constructed in the future which does not require a void fill treatment, a maximum texture requirement is similarly necessary. To satisfy these requirements the texture of the sealed surface until the completion of the defects liability period shall fall within the sand circle range of 160 to 210mm.

Surface Preparation Prior to Asphalt Overlay

33.42 Milling

33.42.1 Transistions

At the ends of work and at intersections the seal should be milled out to enable the asphalt to tie into the existing carriageway to the extent that the gradient of the taper is not steeper than 1 in 100 and constructed to form a smooth transition between the two permanent levels. Tapers shall provide surface and quality characteristics of the overlay.

33.42.2 Shoulder Buildup

The Contractor shall minimise any adverse effect the overlay may have on break over angles at vehicle entrances by milling.

Council permit a build-up of up to 20mm above lip of channel after overlay. If the new overlay is to exceed this, the Contractor should allow to mill out next to the kerb and channel.

All milling being considered should be referred to the Engineer.

33.42.3 Mill and Fill

Areas where test results have shown future weakness and need for strengthening have been nominated for 30mm or 40mm mill and fill. In most cases this will be into existing seal or asphalt, but may be into the upper basecourse layer.

The Contractor shall allow in their price for the surface to be milled to the required depth, tack coat and TNZ M/10 Mix 15 asphalt to be laid. In general the minimum width of the milling is 1m wide. It is noted that some areas identified in the site-specific details may not be milled. Marking out for milling will be done at the first site visit with the Engineer.

33.43 Bandaging and Crack Sealing

Pavement cracks shall be cleaned to remove dirt, dust and other deleterious matter prior to crack sealing.

The crack shall be sealed with a hot polymer/rubberised bitumen sealant with superior bondage, flexibility and waterproofing. The characteristics of the product shall be similar to that of "Super Sealing - Crack sealing" (www.supersealing.com.au)

33.44 Control of Bitumen Run-off (Tack Coats)

The Contractor shall take measures as defined below to control bitumen product run-off.

Before proceeding with any sealing work at any site the Contractor shall assess the risk of bitumen product run-off and if necessary adjust his sealing programme to ensure work is carried out only in suitable conditions.

The Contractor shall give consideration to the effects on adjoining surface water channels, gutters, and stormwater systems including run-off into the harbour, natural watercourses or other environmentally sensitive areas, and shall assess the practicality of providing suitable entrapment measures in the event of run-off.

Notwithstanding (a) above, the Contractor shall, in the event of run-off, provide the means, materials and resources necessary to as far as practical prevent contamination of the surrounds.

In the event of run-off the Contractor shall provide means of entrapment such as gritting, or dusting out of the gutters and channels and plugging of sumps and mudtanks. No disturbance drainage systems will be permitted without prior approval of the Dunedin City Council Drainage Manager

On completion of sealing and until the emulsified asphalt binder has reached a stable condition which will not be affected by rainfall, the Contractor shall monitor the site and take immediate protective and/or remedial action in the event of run-off.

Notwithstanding that the above precautions may have been taken, the Contractor shall notify the Engineer, and the Contract and Asset Manager, Dunedin City Council of any occurrence which may give rise to contravention of Section 15 or section 17 of the Resources Management Act 1991 and clean up any run-off immediately after it occurs and reinstate to original condition any areas affected.

The Contractor shall also notify the Dunedin City Council Drainage Manager of any run-off into the stormwater system.

The Contractor shall also notify the Water Resources Manager, Otago Regional Council of any pollution of watercourses or harbour.

No run-off shall be permitted to be discharged into the foul sewer system.

33.45 Digout Repairs

The perimeters of dig-outs shall be marked out in conjunction with the Engineer at the initial site walkover.

In the event of subsequent digout areas being identified the contractor shall notify the Engineer for an approval prior to carrying out any additional repairs.

Digouts shall be saw cut and excavated to 400mm and reinstated with 250mm AP65 and 110mm M4-40 AP40 and 40mm mix 15 asphalt. Existing pavements less than 400mm shall be reinstated to march existing depth.

All granular construction shall be carried out in accordance with TNZ B/2 Specification.
Asphaltic Concrete construction shall be in accordance with TNZ P/9 Specification, except that hand working of asphalt it permitted.

Asphalt Surfacing/Overlay

33.46 Cleaning and Preparation of the Surface for Prelevelling

Any weeds evident on the surface of the carriageway shall be weed sprayed with suitable approved weed-killer. On completion of the weed spraying and prior to applying the levelling course, the existing surface shall be swept free of loose stone, dirt and vegetation, disposing of accumulated material

A levelling course of asphaltic concrete shall be applied to uneven or low areas of carriageway to produce a surface with uniform crossfall that does not hot water. Pre-levelling areas shall be defined and confirmed by the Engineer prior to starting work on site.

The levelling course shall comprise Mix 10 asphaltic concrete, over a CRS-1 emulsion tack-coat, in accordance with TNZ M/10 Specification for Asphaltic Concrete.

All construction of asphaltic concrete shall be in accordance with TNZ P/9 Specification for Asphaltic Concrete Paving.

33.47 Removal of Raised Pavement Markers (RRPM's)

On road sections where raised pavement markers are present they shall be removed before resurfacing. Replacement markers will be installed by others following sealing.

Any repairs required to the surface due to the removal of markers shall be the Contractor's responsibility and shall be completed prior to sealing operations.

33.48 Asphalt

The Contractor shall construct an asphaltic concrete overlay at specified locations, in accordance with TNZ P/9 Specification for Asphaltic Concrete Paving.

The scheduled overlay is a compacted depth over existing high spots and must comply with TNZ M/10.

Prior to laying of asphalt the existing surface shall be tack coated with CRS-1 (CQ-60) emulsion unless a membrane seal has been specified. All care shall be taken to ensure that exposed services are not coated with bitumen. Any over-spray shall be removed by the Contractor at their expense.

All joints between old asphalt and new shall be crack sealed using emulsion and Blackhead grit.

The Contractor's Quality Plan shall determine the methodology to be used for confirming compacted depths and laying temperatures. These records shall be forwarded to the Engineer for completed projects with each claim.