

PRACTICE NOTE FOR ROADING CONSTRUCTION

Supplementary guidance to the
QLDC Land and Subdivision
Code of Practice

August 2020



Scope of Work

This practice note provides guidance for the construction of carriageways and shoulders, including subgrade, subbase, metalcourse and base course. In addition, it covers testing requirements.

QLDC SEAL SEASON

QLDC Land Development and Subdivision Code of Practice 2018 v1.1 (Code of Practice) clearly defines the allowed sealing season, namely **sealing operations cease on 15 May and recommence on the 15 September** due to the climatic conditions experienced in Otago. QLDC may agree to extensions if conditions and treatments allow. (See 2020 Covid-19 Specification). This document summarises the requirements that are detailed in the code of practice.

Pavement Subgrade - TNZ F/1: 1997

Subgrade formation is the most important stage of any road formation, as this forms the base of the load bearing structure, namely the road pavement, which is expected to be able withstand the dynamic loads imposed upon it by traffic.

As such there are parameters surrounding the allowable material to be used in the subgrade formation, the surface finish condition along with the trimmed surface gradients, and the subgrade strength testing, all in accordance with the conditions as recommended by the Code of Practice TNZ F/1, and NZS 4404:2010.

QLDC inspection of the subgrade involves the consideration of the QLDC Subgrade Inspection Form. The aspects of this form closely follow the recommendations of the Code of Practice TNZ F/1 & NZS 4404:2010 and are considered by the QLDC inspector and the road construction Contractor.

Test results must be supplied to the QLDC inspector prior to the inspection being passed and prior to work being allowed to progress to the next stage.

No tolerance on the subgrade level that reduces the depth of construction will be allowed. Unsuitable foundation soils shall be removed to meet design requirements.

Ordinary traffic shall not be permitted to traverse the excavated subgrade surface. The Contractor's operations shall not cause pugging or sponging of the subgrade, both of which will affect the way the subgrade reacts to water, which in turn will affect the bearing capabilities of the subgrade material. Nor shall the construction traffic be allowed to disturb the subgrade surface, creating undulations in the surface which may disturb any of the allowable tolerances in the subbase material thickness above. These layer thickness tolerances will be discussed further in the subbase section below. Contractors shall match site conditions with their plant selection and construction techniques e.g. layer depth, to ensure this does not occur.

The finished subgrade shall be trimmed, rolled and finished in accordance with the requirements of clause 11 of TNZ F/1: 1997

Where the Design Consultant considers that oversize materials compromises the ability to achieve the specified compaction or the finishing requirements of TNZ F/1, Section 10 and 11, then the requirements of Table 2 of the TNZ F/1 shall apply.

SUBGRADE TESTING REQUIRED

Testing of the subgrade, utilising the following test methods, is required on all roads:

SITE SPECIFIC SCALAS (10M ALTERNATING LANE)

SOAKED CBR RESULTS

PROOF ROLLING (DOCUMENTED)

Deflection testing of the subgrade is mandatory on roads classified as Primary Collector and above and is considered optional on roads below Primary Collector classification or at the discretion of the designer (it is the designer's responsibility to provide target deflections):

BENKELMAN BEAM TESTING OR FALLING WEIGHT DEFLECTOMETER

The rationale behind these requirements is to ensure that finished pavement meets performance expectations when testing is undertaken at the basecourse level and that the pavement design inputs are validated.

PLEASE NOTE:

When applying for Engineering Acceptance, the Design Consultant will provide QLDC with the granular design information. This granular pavement design will include the following:

ASSUMED SUBGRADE TYPE BASED ON-SITE TESTING

CBR VALUES USED TO DESIGN THE PAVEMENT LAYER THICKNESS

ASSUMED DEFORMATION OF SUBGRADE

CONFIRMATION THAT THE DESIGN LOADS INCLUDE THOSE LOADS IMPOSED BY ANY CONSTRUCTION TRAFFIC (INCLUDING TRAFFIC DESIGN CALCULATIONS)

The Design Consultant along with the Contractor shall be responsible for checking the actual subgrade bearing and deflection to ensure it complies with the design specifications. If it is found to be different from that assumed, or the subgrade conditions change during excavation, the Consultant and Contractor shall discuss any subgrade improvements that could be applied and advise QLDC of any proposed subgrade improvement methodology for acceptance.

For irregular unsuitable subgrade areas, the Design Consultant shall instruct the Contractor to remove the unsuitable material and shall clearly outline the extents of the material to be removed. The Consultant shall provide the Contractor with the following information: area and depth excavated and marked on the plan; CBR and description of the unsuitable material; CBR and description of material at base of unsuitable material excavation. This information shall be submitted to QLDC prior to the inspection being signed off.

Prior to the inspection by QLDC, the Consultant shall ensure that all of the required tests have been conducted, as listed in the above sections and have the written results available to submit to the QLDC inspector prior to the inspection form being completed. Failure to produce the required written test results will result in a failed inspection.

DEFECT LIABILITY PERIOD

All roads are covered by at least one-year defects liability period whereby the performance of the completed road is closely monitored. Defects liability will be extended where required for any agreed exceptions from the CoP or where it is considered to be a risk of early failures.

If a second coat chip seal is required, the Defect liability will be extended to 12 months from the second coat seal date. During the defects liability period, the Contractor and Designer are to inspect the site a minimum of every 8 weeks, defects which appear during this time are to be remedied within 7 days of identification. Council may notify the Developer of any defects during this period.

Reasons for defect failure must be clearly understood and the proposed remediation must be relayed to Council for acceptance prior to remediation taking place. Liability for defects will remain the developers' until QLDC accept the remediation.

QLDC will undertake an inspection prior to the end of the defects liability period to identify outstanding defects.

Details of any identified defect will be passed to the developer to address as per the above process. Once all defects are resolved, QLDC will issue a certificate stating that defect liability period has come to an end.

LINE MARKING

Any line marking required must receive two coats with the 2nd coat carried out within 24 hours of the first coat.

Pavement Subbase Metalcourse - TNZ B/2: 2005

Subbase material shall be placed in layers thin enough to ensure requisite compaction and CBR standards are achieved. Subbase shall be compacted in accordance with TNZ B/02 specification to achieve a mean of 95% of maximum dry density (MDD) and a minimum of 92% MDD. TNZ B/2 limits the minimum thickness of this layer to 2.5 times the size of the largest particle size, in this case 65mm, (2.5x 65 = 162.5mm). It also defines the expected tolerances in the road constructed widths.

TNZ B/2 also clearly defines the pavement tolerances expected between the pavement centreline and pavement edge which are measured on site by the use of stringlines at 20m intervals or by a total station survey conducted on site which will give a surface profile.

TNZ B/2 and NZS 4404:2010 define the allowable minimum compaction tolerances as measured by a Nuclear Densometer (NDM). This test will also consider the moisture content and air void percentages of the pavement layer which all contribute to the overall compaction achieved. NZS 4404:2010 covers this test along with the California Bearing Ratio Test in detail to clearly outline the expected performance of the pavement layers.

All of the test results and stringline profiles are to be provided to the QLDC inspector at the time of the AP65 inspection.

The sub-base metalcourse surface shall be maintained smooth, compact and true to grade and in such a condition that there is adequate drainage at all times.

The finished compacted surface shall be within the following tolerances of design: -25mm, +5mm, as specified in TNZ B/2: 2005. It shall be uniform and dense in texture and shall not have segregated areas.

The finished compacted surface shall nowhere have depressions that hold water and there shall be no point on the surface that will vary more than 30mm either from a 3m straight-edge laid parallel to the centre of the road, or from a camber board placed at right angles to the centreline.

SUB-BASE TESTING REQUIREMENTS - MANDATORY BASECOURSE TESTING REQUIREMENTS

1) NUCLEAR DENSOMETER (NDM)

2) STRINGLINE OR TOTAL STATION GRID

3) MATERIALS PROPERTIES

The Contractor shall provide QLDC in total a minimum of two conforming sets of acceptance test results for the subbase from each aggregate source at the start of the project. One additional set for each 1,000m³ required over 2,000m³ for subbase. Test methods which can be used are outlined below depending on the project.

Spreader test/Mat Test in accordance with NZS 4407:2015, Test 2.4.6 (Stockpile Sampling) and/or NZS 4407:2015, Test 2.4.7 (freshly spread layers)

And/or

If stockpiled on site, in accordance with NZS 4407:2015, Test 2.4.6.3.2 (Machine stockpile)

The Design Consultant shall investigate any tests that fail, including retesting if required. The QLDC inspector shall be notified of the outcome of the investigation for acceptance.

Pavement Basecourse - TNZ M/4: 2005 TNZ B/2

The basecourse layer is normally comprised of AP40 material as defined in TNZ M/4:2006. TNZ B/2 defines the expected compaction requirements, pavement layer tolerances between the pavement centreline and pavement edge and crossfall tolerances.

TNZ B/2 also has clear expectations of the finished layer, namely a mosaic finish which will allow an acceptable bond between the swept surface and the surface finish being applied.

As this layer is the one that the surfacing layer is applied to, it is important to achieve a correct surface shape and consistent surface profile as any imperfections will reflect through the surface layer and will affect the ride roughness of the road in general.

The above two layers, test results and condition are considered during the pre-seal inspection conducted by the QLDC inspector. The form 'Basecourse & Pre Seal Inspection' is considered during this inspection and is signed by the QLDC inspector, Developer Representative and the Sealing Contractor Representative.

The material shall be placed in uniform layers by a suitable method to avoid segregation. It shall be compacted to a uniformly dense, stable condition in which it does not wave or creep under rolling.

The finished compacted surface shall be within the following tolerances from design. -5mm, +15mm at any point on the general surface, ± 5 mm of design level at concrete channel edges and existing sealed edges in accordance with TNZ B/2: 2005.

The finished surface shall have no depressions that hold water.

The finished surface just prior to sealing or surfacing shall be uniform in texture, have no segregated areas, excess dust, or excess moisture. It shall be tightly compacted and present a clean stone mosaic that remains bound when swept.

BASECOURSE TESTING REQUIREMENTS

Acceptance will be measured by the mandatory testing requirement outlined below. The method applicable and values to be obtained will be specified.

1) NUCLEAR DENSOMETER TESTING

2) BENKELMAN BEAM

3) NAASRA

Any road longer than 150m in length is subjected to a NAASRA test which measures the ride roughness of the road. This will directly affect the safe use and performance of the road surface and surface drainage. The average and maximum readings shall exclude values affected by intersecting streets, platforms and road humps.

4) MATERIALS PROPERTIES

The Contractor shall provide QLDC in total a minimum of two conforming sets of acceptance test results for each aggregate source at the start of the project. One additional set for each 500m³ required over 1,000m³ for basecourse. Test methods which can be used are outlined below depending on the project.

Spreader test (pavement additives) / Mat Test (granular layers) in accordance with NZS 4407:2015, Test 2.4.6 (Stockpile Sampling) And/or NZS 4407:2015, Test 2.4.7 (freshly spread layers)

And/or

If stockpiled on site, in accordance with NZS 4407:2015, Test 2.4.6.3.2 (Machine stockpile)

ROAD TO BE SWEEPED AT TIME OF INSPECTION; HOWEVER, THIS MAY NOT BE FOR A PERIOD OF LONGER THAN 24 HOURS PRIOR TO SEAL.

BASECOURSE ACCEPTANCE CRITERIA

Acceptance will be measured by one of the methods outlined below.

1) BY NUCLEAR DENSOMETER

Individual readings with the nuclear densometer in the backscatter mode shall be completely as per the requirements of NZTA B2 specification i.e. minimum of 5 tests per 1000m²

No readings shall be lower than the specified minimum as found in TNZ B/2: 2005.

2) BY BENKELMAN BEAM

Benkelman Beam testing is specified in the NZTA T/I document, which sets out equipment and test method requirements.

Beam testing shall commence with a test 5m beyond the extent of work, then at 10m intervals in the wheel path in both lanes. In each case the final reading shall also be beyond the end of the work. The readings beyond the work should not form part of the calculation.

At least 95% of all tests shall comply with the standards appropriate to the road type as per the Code of Practice Table 3.4. In addition, no test shall give deflections greater than 25% above the specified maximum.

IF THE DESIGN CONSULTANT REQUIRES TIGHTER CONTROLS THIS SHALL BE SPECIFIED IN THE CONTRACT DOCUMENTATION.

Surfacing

Prior to placing the surfacing layer (except for cast in situ concrete roads) deflections shall be tested by the Benkelman beam method or Falling Weight Deflectometer.

Table 3.4 provides deflection requirements for flexible pavements with flexible surfacing. At least 95% of all tests shall comply with the standards appropriate to the road type. Table 3.4 shall be considered as a minimum standard for deflections. In addition, no test shall give deflections greater than 25% above the specified maximum.

Where an asphaltic surfacing is proposed it is the designer responsibility to ensure that the pavement deflections are appropriate to support the surfacing.

The New Zealand guide to pavement evaluation and treatment design, table 13, provides guidance on curvature and deflection constraints for thin asphaltic overlays based on fatigue behaviour. Designers may find this information helpful.

Surface Chipseals

All chip seals will require a second coat seal including any required line marking in the following seal season, usually within 12 months of the initial seal. A single coat or two coat first coat is not considered to be fully waterproof and therefore leaves the pavement susceptible to the freeze/thaw conditions in the district.

A polymer modified seal should be designed to meet the district's challenging environmental conditions and fluctuations in temperatures.

When there is a second coat required to be undertaken by the developer, the defects liability period for the second coat will be extended to 12 months beyond the second coat seal date.

THERE ARE TWO OPTIONS AVAILABLE FOR COMPLETION OF THE SECOND COAT SEAL, DEPENDING ON THE OWNERSHIP OF THE ROAD AND MUST BE AGREED PRIOR TO ISSUE OF 224C

1

Independently by the developer this includes private roads and rights of way. A bond will be required if this work will occur post-224C certification to ensure it is completed within the next available sealing season following the first coat application. Details of the second coat seal shall be provided to Council on completion via the Roothing Asset data provision/RAMM update sheet process. Council will retain 5% of the bond for 12 months following completion of the second coat to cover any defects occurring within that period.

2

For Council-vested roads, the work maybe completed as part of the Councils annual sealing programme and the developer shall cover costs to the Council for undertaking this work. The developer shall provide payment to Council to cover the cost of this work prior to 224C certification for subdivision.

For either option, the developer is responsible for undertaking the second coat pre-reseal repairs as per 3.4.10. These should be identified and rectified within the defect liability period.

Basis of calculating the estimated costs for a second coat will be based on the average cost of current QLDC reseal rate including a small contingency for contract Preliminary and General and design costs.

The binder application rate shall be designed to suit the conditions and chip size, refer to 'Chip sealing in New Zealand'

[HTTPS://WWW.NZTA.GOV.T.NZ/RESOURCES/CHIPSEALING-NEW-ZEALANDMANUAL/CHIPSEALING-IN-NEW-ZEALAND/](https://www.nzta.govt.nz/resources/chipsealing-new-zealandmanual/chipsealing-in-new-zealand/)

Surface Laying of Asphalt Concrete

After any rain event the pavement should be allowed to dry out prior to the application of any membrane surface. This could be a 48 hour period in a big event.

SURFACING DESIGN

The Contractor shall supply to the Design Consultant and QLDC details of aggregate grading, residual binder content, details of any polymers used and other relevant information for the material to be used seven days prior to the commencement of work. Once applied to the pre-seal surface, a stand down period of 48hrs will be enforced. This is to allow time for the emulsion coat to harden and to allow a good adhesion of this coat to the pavement surface. An inspection by the QLDC Inspector will occur during this period to ensure that the entire surface has been covered and that no areas have been missed or damaged.

TACK COAT

The base and edges of all areas to be covered by the asphaltic concrete, except prime coats, but including membranes shall be tack coated with a bitumen emulsion complying with NZTA M/10 and uniformly applied at a residual application rate of 0.15 l/m². The surface prior to tack coating shall be clean and free of surface water, dust, sand, grit or any other material that could impair the adhesion of the tack coat. The application of the tack coat shall consider truck access to the paver and possible tracking by truck wheels which could damage the tack coat surface finish.

Note, all carriageway areas that include asphalt must have a membrane seal. The only areas which do not require a membrane seal are footpaths.

ASPHALTIC CONCRETE

Conditions for laying asphalt surfacing over a flexible pavement as described above, are defined in NZTA M10:2014. This code defines the tolerances for all of the components which comprise the asphalt layer. This includes the aggregates used, mineral fillers and binders which all affect the viscosity of the surfacing layer being applied.

The mix designations, namely AC10, AC14, AC20 and AC28 which are used for medium to heavy traffic loads and DG7, DG10, DG14 and DG20 which are for light to medium traffic loads, are all clearly defined.

In addition, NZTA M10:2014 regulates the supply, transport and application, inclusive of the maximum deviation allowed from the design thickness, of all paving material layers which will include the minimum and maximum temperature parameters which are of great importance here in Otago and relate to the performance of the surfacing layer over the lifetime of the road asset.

Whilst the NAASRA test is recommended to be conducted at the pre-seal stage of the road, it is common and accepted that it can be conducted once the road has been paved and the final surfacing layer has been applied. This however does pose a certain amount of risk to the contractors involved as it can be difficult to establish at what stage the failure has occurred if the NAASRA results come in and an issue is identified. The acceptance criteria for the NAASRA testing is discussed in detail below.

JOINTS

No uncompleted longitudinal or transverse joints shall be left unprotected and exposed to traffic over night. All joints against existing asphaltic concrete shall be bandaged on the completion of the work.

ACCEPTANCE CRITERIA

NAASRA

The Contractor shall undertake NAASRA testing on the carriageway where specified, namely on all roads 150m or longer. The average and maximum readings shall exclude values affected by intersecting streets, platforms and road humps.

The Contractor may carry out their testing at any time. For possible remedial purposes, it may be prudent to conduct this test at the pre-seal stage at the basecourse level. The Contractor shall supply to the Design Consultant and QLDC sufficient information to confirm all performance criteria have been achieved as part of the RAMM data required by QLDC.

The finished surface shall give a smooth ride with an average NAASRA roughness count of not more than 60mm/km and a maximum count of not more than 70mm/km for new work.

The finished surface shall be 5mm above channel fenders or concrete kerbs and shall not hold water and there shall be no point where the general surface varies more than 5mm from a 3m straightedge laid longitudinally, with a cumulative total of all visible gaps of not more than 10mm, or more than 5mm from a 1m straight-edge laid transversely, including across service boxes and joints.

Summary of Code of Practice stage requirements

ENGINEERING ACCEPTANCE

The following is to be provided to QLDC at Engineering Acceptance application stage:

Granular Pavement Design (based on assumed CBRs).

Mix Design preferably endorsed by sealing contractor. Note, this must be agreed with QLDC Property and Infrastructure and must demonstrate that this mix design is in accordance with the local climatic conditions within the region i.e. site specific.

Waterproof chipseal membrane is to be specified under asphalt surfacing and must take into account the local region climatic conditions and construction traffic and proposed construction timeframes.

Seal design for chipseals - preferably endorsed by sealing contractor.
Note, this must be agreed with QLDC.

PRE-CONSTRUCTION / INSPECTION

The following is to be provided to the QLDC Inspector at time of inspection:

Reviewed/confirmed pavement and seal designs based on testing. The Contractor shall supply to the Design Consultant and QLDC details of aggregate grading, residual binder content, details of any polymers used and other relevant information for the material to be used seven days prior to the commencement of work.

Lab test result sheets should be provided to the inspector at time of inspection.

NAASRA results.

224C APPLICATION

The following is to be provided to QLDC with the 224C application:

The QLDC RAMM Roadway Asset Register spreadsheet must be completed and can be found via the below website under the Asset Registers/Specification as per schedule 1D.

The technical data and inspection results required for completion of the spreadsheet can be found in the pavement and seal designs and in the seal run sheets from the Contractor.

Asbuilt pavement and seal details.

<https://www.qldc.govt.nz/planning/resource-consents/land-developments-and-subdivisions/>

Requirements and Notes Relating to these Criteria

When applying for Engineering Acceptance, the Design Consultant will provide QLDC with the granular design information. This granular pavement design, will include the following:

ASSUMED SUBGRADE TYPE BASED ON-SITE TESTING

CBR VALUES USED TO DESIGN THE PAVEMENT LAYER THICKNESS

ASSUMED DEFORMATION OF SUBGRADE

CONFIRMATION THAT THE DESIGN LOADS INCLUDE THOSE LOADS IMPOSED BY ANY CONSTRUCTION TRAFFIC (INCLUDING TRAFFIC CALCULATIONS)

The Design Consultant along with the Contractor shall be responsible for checking the actual subgrade bearing and deflection to ensure it complies with the design specifications. If it is found to be different from that assumed, or the subgrade conditions change during excavation, the Consultant and Contractor shall discuss any subgrade improvements that could be applied and advise QLDC of any proposed subgrade improvement methodology for acceptance.

For irregular unsuitable subgrade areas, the Design Consultant shall instruct the Contractor to remove the unsuitable material and shall clearly outline the extents of the material to be removed. The Consultant shall provide the Contractor with the following information: area and depth excavated and marked on the plan; CBR and description of the unsuitable material; CBR and description of material at base of unsuitable material excavation. This information shall be submitted to QLDC prior to the inspection being signed off.

Prior to the inspection by QLDC, the Consultant shall ensure that all of the required tests have been conducted, as listed in the above sections and have the written results available to submit to the QLDC inspector prior to the inspection form being completed. Failure to produce the required written test results will result in a failed inspection.

DEFECT LIABILITY PERIOD

All roads are covered by at least one-year defects liability period whereby the performance of the completed road is closely monitored. Defects liability will be extended where required for any agreed exceptions from the CoP or where it is considered to be a risk of early failures.

If a second coat chip seal is required, the Defect liability will be extended to 12 months from the second coat seal date. During the defects liability period, the Contractor and Designer are to inspect the site a minimum of every 8 weeks, defects which appear during this time are to be remedied within 7 days of identification. Council may notify the Developer of any defects during this period.

Reasons for defect failure must be clearly understood and the proposed remediation must be relayed to Council for acceptance prior to remediation taking place. Liability for defects will remain the developers' until QLDC accept the remediation.

QLDC will undertake an inspection prior to the end of the defects liability period to identify outstanding defects.

Details of any identified defect will be passed to the developer to address as per the above process. Once all defects are resolved, QLDC will issue a certificate stating that defect liability period has come to an end.

LINE MARKING

Any line marking required must receive two coats with the 2nd coat carried out within 24 hours of the first coat.

Appendix 1 - Subgrade Test form



Subgrade Inspection

This is a note for the Councils use and cannot be relied upon by any 3rd party.

Resource Consent #:	
Development/Developer:	
Stage (if applicable):	
Location e.g. road:	
Developer's Engineer:	
Developer's Consultant:	
Council Representative:	
Date:	

Advice Note: The observations recorded below are a reflection of the site at the time of the visual inspection only & may not identify any subsurface issues.

CHECKLIST:	YES	NO	N/A	COMMENTS
Proof rolls passed with no soft spots immediately evident	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Subgrade appears to be free from oversize material (>75mm)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Subgrade appears to be free from roots and organic material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
The finished subgrade is trimmed, rolled and finished in accordance with the requirements of Clause 11 of TNZ F/1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Subgrade strength testing (penetrometer and/or Benkelman beam and/or Clegg Hammer) to confirm compacted material is within the approved pavement design parameters.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Approval to proceed to next stage

Select

Developer Representative Signature:

Council Representative Signature:

Appendix 2 – Basecourse & Pre-seal Inspection Form




Basecourse & Pre-seal Inspection

Resource Consent #:	
Development/Developer:	
Stage (if applicable):	
Location:	
Developer's Consultant:	
Sealing Contractor Representative:	
Council Representative:	Select
Date:	

Objective: Final inspection is required for carriageway pavement surface.

CHECKLIST:	YES	NO	N/A	COMMENTS
Depth of base course layers as per design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
AP65 – Sub base 95% mean, minimum 92% relative compaction of sub base achieved in accordance with TNZ B/2 & NZS4404 as determined by NDM and test results submitted for all roads – material certifications provided to council prior to sealing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
AP40 – Base Course 98% mean, minimum 95% relative compaction of base course achieved in accordance with TNZ B/2 & NZS4404 as determined by NDM and test results submitted for all roads – material certifications provided to council prior to sealing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Pavement max deflections permitted by Benkelman Beam testing and test results submitted for all roads Cul-de-sac 2.0mm Minor Residential 2.0mm Sub-collector 1.6mm Collector 1.2mm Arterial 1.0mm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Finished surface level (RL) will be in accordance with engineer accepted plans submitted - to be confirmed by consultant As-builts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
K&C / islands etc protected from bitumen spray	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Surface temp > 10° degrees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Basecourse & Pre-seal Inspection Form Page 2

Surface swept and clean of fines and running course or areas available to allow the inspection to occur (optional as the inspector will sweep as required)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Evidence of a crossfall check of the AP65 layer in the form of String sheets or Survey As Builts to be provided to the inspector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
String line test @ 20m intervals witnessed by council representative for AP40 or similar ie smart level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Free of bumps, surface shape and finish in accordance with TNZ B/2, variation over a 3m straight edge < 10mm. (Note : Roads longer than 150m will require NAASRA roughness testing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Confirm Surface Seal type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Depth to finish surface level appropriate for Seal Surface ie. A/C or Chip Seal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Tightly compacted, non-glazed, clean stone mosaic surface that remains bound when swept. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
No water saturated areas. Degree of saturation is in accordance with TNZ B/2 and is an absolute maximum of 80% (check if water content is likely to have changed significantly since testing i.e. sustained period of rain, and if so further testing may be necessary).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Herbicide weed spray applied 600mm to each edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
AC pre levelling required – (1% of total road surface)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Match to existing is OK. Chip seal overlap. AC key-in full depth along entire joint.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Paving lay plans provided to Council representative prior to sealing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Approval to proceed to next stage

Select

Sealing Contractor Signature

Developer Representative Signature

Council Representative Signature

Appendix 3 – Inspection and Test Plan (Resurfacing)

Inspection and Test Plan - Resurfacing									
This is a summary sheet of all testing and inspections over the construction process. Please complete and attach test result sheets									
Site Location:									
ITP Prepared By:		ITP Accepted by:							
Date:		Date:							
ITP Reference Number	Activity Description & Checklist	QLDC COP - Reference	Chainage	Testing Requirements	Acceptance Criteria	Hold Point	Completed & Accepted		Notes
1.0 Subgrade									
1.1	Proof rolls passed with no soft spots immediately evident	Section 3.4.5		Loaded vehicle sufficient in size and weight to undertake proof rolling i.e. loaded 6 wheel truck, loaded water cart etc	Proof roll plan showing runs with loaded vehicle and where any soft spots were identified and rectified	Mandatory Hold Point			
1.2	Subgrade appears to be free from roots and organic material	Section 3.4.5, 1.8.5		Visual inspection	Inspection with QLDC Inspector				
1.3	Subgrade Surface	Section 3.4.5		NZTA F1 i.e. shape, uniformity and compaction	String Sheets				
1.4	Subgrade strength testing	Section 3.4.5		Benkleman Beam testing, Falling Weight Deflectometer and/or Scala	Test Results	Mandatory Hold Point			
2.0 Sub-base									
2.1	Nuclear Densometer testing	Section 3.4.7		95% mean, minimum 92% relative compaction of sub base achieved in accordance with TNZ B/2	Test Results	Mandatory Hold Point			
2.2	Material Properties - Subbase	Section 3.4.2.2		Grading, Crushing Resistance Sand Equivalent		Mandatory Hold Point			
2.3	Evidence of a crossfall check of the AP65 layer in the form of String sheets or Survey As Built to be provided to the inspector	Section 3.4.7		NZTA B2	String Sheets	Mandatory Hold Point			
3.0 Basecourse									
3.1	Deflection testing prior to surfacing	Section 3.4.11		Maximum deflections table 3.4	Test Results	Mandatory Hold Point			
3.2	Material Properties - Basecourse	Section 3.4.2.3		NZTA M4 Specifications	Test Results	Mandatory Hold Point			
3.3	Nuclear Densometer testing	Section 3.4.8.1		NZTA B/2 specification density requirements to achieve a mean of 98% MDD and a minimum of 95% MDD. Average dynamic roughness, when measured over a length of 100m, of less than 60 NAASRA counts/km for any three consecutive results and no individual value greater than 70 within the extent of the re-surfacing area		Mandatory Hold Point			
3.4	Roughness	Section 3.4.3.2			Test Results				
3.5	Evidence of a crossfall check of the AP40 layer in the form of String sheets or Survey As Built to be provided to the inspector - as per NZTA B2 specification	Section 3.4.8			String Sheets	Mandatory Hold Point			

4.0 AC Surfacing							
	Prestart Documentation as per NZTA M10 Specification i.e. Mix Designs, Paver Laying Plans etc	Section 3.4.12	Job Mix Formula, Production Sampling and Testing, Contractors Quality Plan	Documents accepted by QLDC	Mandatory Hold Point		
4.1	Confirm Membrane Type	Section 3.4.4		Acceptance by QLDC			
4.2	Preseal inspection prior to sealing	Section 3.4.5, 1.8.5		Inspection with QLDC Inspector	Mandatory Hold Point		
4.3	Herbicide weed spray applied 600mm to each edge	Section 3.4.10		Inspection with QLDC Inspector			
4.4	AC pre levelling required – (1% of total road surface)	NZTA M/10		Inspection with QLDC Inspector			
4.5	Compaction - Air voids/Density	NZTA M/10	Either density testing or cores for lots over 30t and nominal thickness over 30mm or nominal thickness greater than 3x the mix size	Test Results			
4.6	Match to existing is OK. Chip seal overlap. AC key-in full depth along entire joint.			Inspection with QLDC Inspector			
4.7	Laying Sheets			Records			
5.0 Chip Seal Coat							
5.1	Seal Design (including materials test certificates)	Section 3.4.4		Documents accepted by QLDC	Mandatory Hold Point		
5.2	Preseal inspection prior to sealing	Section 3.4.5, 1.8.5		Inspection with QLDC Inspector	Mandatory Hold Point		
5.3	Spray Sheets			Records			