MANUKAU CITY COUNCIL QUALITY ASSURANCE MANUAL

FOR
INSPECTION & RELEASE
OF SUBDIVISIONS &
LAND DEVELOPMENT
PROJECTS

Te Kaunihera o
MANUKAU
City Council

Reviewed and Revised October 2007

INTRODUCTION

This document supersedes the 1992 edition of Manukau City Council Quality Assurance Manual for Inspection & Release of Subdivisions and Land Development Projects. It is a Controlled Document (refer to the provisions stated in this section) and it is the Developer/ Consultants responsibility to ensure that they are referring to the most current edition of the QAM.

The document remains unique to the specific requirements of the Manukau City Council while reflecting relevant Acts, Regulations and other Governmental Guidelines that govern development throughout the city.

The document is aimed at providing a clear, structured and practical set of requirements and procedures to assist developers, planners, consultants and contractors within the development industry.

DISCLAIMER

The QAM shall be read in conjunction with relevant legislation and any Council approved policies or documentation including the MCC District Plan and Engineering Quality Standards.

All due care has been taken in producing these Guidelines and its consistency with relevant legislation and standards however if any inconsistency is noted Council will provide the necessary clarifications. Council does not guarantee the completeness of the information contained within the QAM and does not accept any loss or damage that may result from the use of the QAM.

Council reserves the right to deviate from particular aspects of the QAM for any Subdivision or Development where it deems to be warranted.

The Developer (or its Consultants) is responsible for ensuring that all works are designed and constructed in accordance with the QAM.

DOCUMENT CONTROL PROVISIONS

Controlled Document

The Quality Assurance Manual (QAM) for Manukau City Council is a **controlled document** with the latest edition available free (PDF format) via Manukau City Council's website.

Manukau City Council will always retain the copyright for the QAM and will retain the Master Copy.

QAM should always be used in conjunction with the Engineering Quality Standards (EQS). It is the Developer and/or Consultant's responsibility to ensure that they are referring to the latest edition of the QAM and EQS.

Document Amendment Control

Quality Assurance Manual (QAM) for Manukau City Council is a "living" document and will be subject to changes / revisions from time to time, to maintain relevance to Council's policies, evolving best practices and procedures and changing industry standards.

Suggestions for changes to the QAM will be welcomed and may be initiated externally or within the Council.

To maintain the integrity of the document, the following protocol will apply to the proposed changes.

- Make request / proposals for change on the "QAM Amendment Request Form".
- Submit the completed form to the Manukau City Council. Council will then consider the request.
- All requests for amendments will be acknowledged within two weeks of receipt and responded to within six months, giving the reasons for adoption or rejection.
- No changes will be implemented until the Officer has endorsed the amendment. The QAM will then be updated and reissued as a New Edition.

Abbreviations

ACENZ – Association of Consulting New Zealand

ARC – Auckland Regional Council

CCC – Code of Compliance Certificate

CQP – Construction Quality Plan

EMP – Environmental Management Plan

EQS – Engineering Quality Standards

IANZ – International Accreditation New Zealand

LTNZ – Land Transport New Zealand

MANARC – Manukau Approved Requirements

MCC – Manukau City Council

NZS – New Zealand Standards

QAM – Quality Assurance Manual

RMA – Resource Management Act

TMP – Traffic Management Plan

TNZ – Transit New Zealand

QEST – Quality Management (Transit TQS System), Environmental Management (ISO 9000-2000), Occupational Health & Safety (AS/NZ 4801)

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1 General Requirements and Procedures

Manukau City Council has had a Quality Assurance Manual (QAM) in place since the 2nd of June 1992. Quality assurance procedures are mandatory for all physical works in Manukau. The quality assurance system adopted by the Manukau City Council is based on the Quality principles specified in Transit New Zealand Quality Standards 1 (TQS 1), ISO 9000 Systems and New Zealand Contractors Federation – QEST (Integrated Management System). The Developer shall ensure that all development and subdivision work within Manukau City complies with the quality assurance requirements specified in the QAM or an equivalent approved Quality Assurance System. Where the Developer or Developer's Consultant is not using the QAM, they need to apply to Council for approval of their equivalent quality assurance system.

1.1 Objectives

The objectives of this Quality Assurance Manual (QAM) are to:

- Ensure assets which are to be vested to Manukau City Council are constructed to the correct quality standards and meet current design standards including the Manukau City Council Engineering Quality Standards (EQS).
- Ensure all resource consent and engineering drawing approval requirements are met.
- Streamline the inspection and approval process for subdivisions and development projects.
- Provide user-friendly documentation which details all inspections required and clarifies the submission requirements in regard to the completed works (i.e. as-built drawings, RAMM data, checklists, Certificate of Practical Completion).
- Clarify the actions required of the Developer's Contractor and Developer's Consultant to ensure that completed work complies with the resource consent requirements including approved Engineering drawings and relevant Council standards.

1.2 Preconstruction Meeting

The Developer's Consultant and the Council Representative must jointly attend any preconstruction site meeting (refer - section 2).

1.3 Inspection Policy

The inspection policy of Manukau City Council is to ensure adequate inspections are carried out in accordance with the resource consent and QAM requirements. These inspections include:

- On-going inspections as required during the course of the works
- a final inspection at completion, prior to the issue of the 224c certificate
- an inspection at the end of the defects liability period conducted by the Developer's Consultant

As part of the Council's function under the Resource Management Act 1991 (RMA) monitoring of the resource consent is required. Proposed inspections for the RMA monitoring will be covered at the preconstruction meeting and in the Construction Quality Plan.

The Council is committed to making the inspection process as transparent as possible by providing Developers with as much advance information as possible. The QAM outlines the minimum inspections that will be carried out by the Council Representative, the Developer's Consultant and those inspections required to be undertaken by the Contractor.

1.3.1 Inspections during the Course of Works

The Council Representative shall carry out inspections at critical stages for the development project. These stages will be notified by the Council Representative and the Developer's Consultant in accordance with the Construction Quality Plan (refer – section 1.14). In addition, as a general guideline, for a major project, construction monitoring by a Council Representative will occur approximately once a week, with more frequent visits required if there are a number of activities being carried out or there are compliance concerns.

If concerns arise the Developer's Consultant will be notified in writing/email and more frequent visits by the Council Representative shall occur until Council is satisfied that the quality assurance requirements are being complied with.

On occasions, other Council Representatives (Manukau Parks, Manukau Water Limited, MCC Roading, MCC Stormwater or other Council Representatives) may also carry out site visits.

For minor projects there will be usually one inspection for each phase of work.

The QAM sets out the inspection responsibilities of the Chartered Professional Engineer or Registered Professional Surveyor acting for the Developer or Consent Holder.

1.3.2 Final Inspections (Prior to issue of the 224c Certificate)

The Developer's Consultant and the Council Representative must jointly carry out the final inspection for each type of asset and complete the QAM checklist under Appendix 1. The final inspection should confirm that all site works have been completed, and any outstanding works have been bonded prior to the issue of the 224c certificate.

The final inspection is to be carried out by the Developer's Consultant, the necessary Council and Contractor's representatives.

In addition to the final inspection, quality assurance and as built documentation must be provided prior to the issue of the 224c certificate in accordance with the QAM requirements.

1.4 Application for Issue of 224c Certificate

When the Developer's Consultant is of the opinion that all the works have been constructed in accordance with the resource consent conditions, engineering standards and drawings, and all documentation as outlined in Appendix 5 is complete and clearly indexed in a file, the Developer's Consultant can apply to the Council for 224c approval by forwarding the completed file along with a letter to the Council.

1.5 Documentation Requirements

On completion of the project the Developer's Consultant is required to provide all completed QAM documentation including the checklists, as-builts, RAMM data certification, the final inspection and the Barter Invoice (refer – section 8).

1.6 Post Construction Safety Audit

When a subdivision is connected to a primary road, a post construction safety audit on the approved design, as outlined in the resource consent, is to be conducted by the Council Network Manager prior to opening the road to public use. The Developer's Consultant shall arrange for this audit with the Council's Network Manager.

1.7 Defects Liability Period

The defects liability period for assets to be vested to Council shall commence when the final inspection has been approved. The defects liability period shall be as stated in section 1.72 unless otherwise specified in the resource consent.

The Developer's Consultant/Contractor shall remedy defects arising before the end of the defects liability period. All assets to be vested to Council shall be free of any defective workmanship or materials.

The Developer's Consultant/Contractor shall not be liable for fair wear and tear and vandalism during the defects liability period.

The Council Representative may direct the Developer's Consultant/Contractor to rectify any defect, prior to the expiry of the defects liability period. Where necessary the Council Representative shall arrange for the right of entry.

If the Developer's Consultant/Contractor fails to complete the remedial works within a reasonable time the Council shall be entitled, after giving the Developer's Consultant/Contractor notice, to employ others to carry out such remedial work. The Council shall be entitled to recover the cost of such work from the Developer's Consultant/Contractor.

1.7.1 Defects Liability Certificate

The Developer's Consultant shall issue to the Council and to the Contractor a Defects Liability Certificate for the assets vested to Council when:

(a) The defects liability period has expired; and

(b) The Contractor has remedied any omissions or defects.

The Developer's Consultant completes the Defects Liability Certificate (refer – Appendix 6) at the end of the defects liability period.

1.7.2 Defects Liability Period

The length of the defects liability period unless otherwise specified in the resource consent is as follows:

Asset*s*	**Defects Liability Period (months)**
Road	12
Parks	Refer to Section 7
Stormwater	12
Stormwater Ponds	24
Water Supply and Wastewater	Refer to Manukau Water Limited requirements

1.8 Bonds for Uncompleted Work

Council may consider taking a financial bond for uncompleted/defective works to allow for the issue of the 224c certificate, if assets to be vested to Council will be upgraded within the defects liability period.

1.9 Staged Work

On occasions it may be essential to stage the work. In such cases, the assets that become operational prior to the general completion date must be separately documented as-built and QAM documentation, and must have a separate Completion Certificate before a connection to the existing public reticulation will be permitted.

1.10 Emergency Procedure

The Council Representative is to be informed without delay if, during the course of construction works, any situation arises whereby the safety of public or private property or the operation of any public facility is endangered. The Council Representative may instruct the Developer's Consultant to carry out such remedial measures to remove the danger. Any work so ordered is to be done at the expense of the Developer. If the work is not commenced within reasonable time of the issuing of the instruction, the Council Representative may arrange for the required work to be carried out at the Developer's expense. Should any emergency arise which requires immediate attention, the Council Representative may order the work to be carried out and recover the costs from the Developer.

1.11 Damage

All damage to existing roads, utility services, private property, or disturbance of survey boundary marks as a result of new works shall be remedied as specified by the Council Representative at the Developers expense.

1.12 Fees Payable

Council fees relating to any application are based on reimbursement of Council costs for administration, inspections and set managing the QAM requirements.

The application is lodged with an initial deposit. The first invoice is made at the time s105 conditions are set. Balance of the cost must be paid prior to the release of the 224c certificate. Other invoices may be raised from time to time if needed. For large projects, invoices may be raised monthly.

There may also be a further invoice immediately prior to the release of any bond monies. In the case of large projects with significant costs incurred after the issue of the 224c certificate, there may be more than one invoice during the term of the bond.

1.13 Approved Engineering Drawing Amendments

Any changes to approved engineering drawings must be approved by the Council Representative in accordance with Appendix 2.

1.14 Construction Quality Plan and Approved Engineering Drawings

A Construction Quality Plan is to be developed in a manner that is appropriate to the size and scope of works. This will clearly demonstrate how periodic inspections and testing of the works in progress shall be carried out to ensure compliance with the resource consent and approved engineering drawing requirements. The basic outline of a Construction Quality Plan is in Appendix 3. The Construction Quality Plan is to be

prepared by the Developer's Consultant and submitted to the Council Representative at the Preconstruction meeting.

1.15 Environmental Management Plan

An Environmental Management Plan is to be prepared in accordance with the resource consent requirements. It will clearly demonstrate how the Developer will meet its obligations under the Resource Management Act 1991, MCC District Plan and the resource consent. The Developer's Consultant shall submit the Environmental Management Plan to Council for approval at the Preconstruction meeting.

Where the works require Resource Consent from the ARC, the Developer shall obtain resource consent and supply a copy of the conditions to the Council.

1.16 Other Consents

It is the Developer's responsibility to obtain all other necessary consents, statutory and non-statutory approvals from all land owners, utility operators and other third parties.

1.17 Amendments to the Quality Assurance Manual

The Quality Assurance Manual (QAM) for Manukau City Council is a "living" document and will be subject to changes / revisions from time to time, to maintain relevance to Council's policies, evolving best practices and procedures and changing industry standards.

Suggestions for changes to the QAM will be welcomed and may be initiated externally or within the Council.

To maintain the integrity of the document, the following protocol will apply to the proposed changes.

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- Submit the completed form to the Manukau City Council. Council will then consider the request.
- All requests for amendments will be acknowledged within two weeks of receipt and responded to within six months, giving the reasons for adoption or rejection.
- Amendments to the QAM will be implemented upon endorsement from the QAM Forum and reissued quarterly. The updated QAM will be posted electronically on the Manukau City Council website.

2 Preconstruction

2.1 Attendance

The Developer's Consultant is to arrange a preconstruction meeting which is to be attended by all parties involved in the proposed project activity. In the case of staged projects, the Council Representative will clarify in writing whether additional preconstruction meetings are required.

The Council Representative will be responsible for notifying the affected Council officers/representatives of the meeting by giving at least two working days notice.

2.2 Timing of Meeting

It is expected that in most circumstances the meeting will be held at least one working day prior to the commencement of the work. For larger subdivisions or where there are complex development issues, more lead-time should be allowed prior to commencement of the work.

The preconstruction meeting will always be held after the issue of relevant consents and engineering drawing approvals.

2.3 Meeting Chair

The Developer's Consultant will chair the meeting.

2.4 Preconstruction Meeting Checklist

The Developer's Consultant will complete the *Preconstruction Meeting Checklist (PRE)* with relevant comments as the meeting progresses. If there are any Council issues they must be resolved prior to work commencing. The Council Representative will otherwise confirm that there are no objections to the agreed work programme proceeding, and the Council Representative and Developer's Consultant will jointly sign the preconstruction meeting checklist.

The Developer's Consultant must forward a copy of the checklist to Council within 1 working day of the preconstruction site meeting. The Council Representative will be responsible for circulating a copy to affected Council officers or other Council Representatives.

3 Earthworks

3.1 Developer's Consultant Responsibilities

The Developer's Consultant is to check all work complies with the resource consent conditions including the approved engineering drawings, Construction Quality Plan (CQP), Environmental Management Plan (EMP), Engineering Quality Standards (EQS), MANARC and other relevant Council Standards. Items to be checked for compliance during works in progress are to include but are not limited to:

(a) Health and Safety requirements including site safety and environmental assessments, compliance with Traffic Management Plan

(b) Compliance with all ARC consents

(c) Compliance with programme of works

(d) Subsoil drainage: size, type, retaining walls (not covered by building consent process), buttress drains

(e) Compliance with Erosion and Sediment Controls

(f) Inspection by Contractor of the consent document and erosion and sediment control plan.

(g) Managing Geotechnical Engineers and ensuring that geotechnical completion report is compiled and submitted to Council

(h) Ensuring stability of stripped areas

(i) Provision of As-built drawings and as built geotechnical reports.

(j) Fixing soil tests positions

(k) Construction equipment

(l) Testing and ensuring any rework is carried out as required and the Contractor notified of results

(m) Records of machinery working – wet days, interruptions

(n) Ensuring recommendations in the geotechnical report carried out.

(o) Bulk earthworks are completed correctly

(p) Soil is not contaminated with unwanted materials e.g. hydrocarbons, heavy metals, chemicals pollutants, herbicides, pesticides and asbestos etc. Ensuring recommendations in the resource consent are carried out.

(q) Roads are cut to subgrade stage and unsuitable material and/or topsoil re-spread or disposed off

(r) Alignments to overland flow path and floor level restrictions are checked.

(s) Design levels and gradients are adhered to

(t) Reserve areas are ripped prior to topsoiling subject to geotechnical limitations

(u) Trees are adequately protected in accordance with the Resource Consent and District Plan requirements

(v) Appropriate depth and quality of approved topsoil.

(w) Final contour check, stormwater detention and quality features checked against specifications

3.2 Council Responsibilities

Council is involved in the monitoring of earthworks to ensure the conditions of the resource consent including approved Engineering drawings and standards are met as well as the recommendations of the geotechnical assessment. Council will also monitor the following:

(a) Complaints

(b) Risks to public safety

(c) Noise – Compliance with the Resource Consent & District Plan

(d) Dust or smoke – Compliance with the Resource Consent and District Plan

(e) Adjacent neighbour's property protected

(f) Works on Reserves or future Reserves

(g) Permission to place unsuitable material on Reserves or other agreed areas

(h) Refer to Resource Consent for specific features/trees and/or vegetation to be protected

(i) Erosion and sediment controls

(j) Compliance with the agreed working hours

(k) Compliance with Traffic Management Plans (TMP's) / Road Opening Notices (RON's).

4 Stormwater

The quality assurance checklist issued at the preconstruction meeting will be either the combined type for 'infill' developments or separate forms for 'greenfield' developments.

4.1 Developer's Consultant Responsibilities

The Developer's Consultant is to check all work complies with the resource consent conditions including the approved engineering drawings, Construction Quality Plan (CQP), Environmental Management Plan (EMP), Engineering Quality Standards (EQS), MANARC and other relevant Council Standards. Items to be checked for compliance during works in progress are to include but are not limited to:

(a) Pipes are laid in correct line and level.

(b) Design is approved and amendments to the design (if any) are approved and attached with the compliance

(c) Trench safety and Excavation Supervisor/Labour Department notified

(d) Pipe specification compliance

(e) Pipe grade and alignment

(f) Pipe bedding and surround - undercut and hardfill replacement where necessary

(g) House connections, "London Junctions", and ramped risers, laid correctly

(h) Backfilling to specifications
    (i) Excavation material
    (ii) Hardfill
    (iii) Compacted excavated material

(i) Manhole construction, connections and leads to MCC Standards including: benching; mastic sealing of joints; step rungs; concrete lid; cast iron frame and cover; lids and throats painted blue.

(j) As-built information and quality assurance information such as testing, video inspection and certification as required under section 8.4.

(k) Reinstatement of all roads, footpaths, berms, parks, public property in accordance with the RON and EQS requirements.

(l) Reinstatement of all private property in accordance with the property owner's requirements.

(m) *Stormwater Quality Assurance Checklist (QS1)* is completed

4.2 Council Responsibilities

Apart from a final formal inspection and testing on completion of the works, Council will make periodic inspections at random intervals to ensure that Council standards are being observed and in particular check:

(a) Pipes sizes, quality and material

(b) Depth of bedding and surround where applicable

(c) Connections to and construction of manholes, stormwater structures and stormwater quality devices

(d) Safety provisions for completed structures

(e) Verify Consultants Construction Quality Plan is demonstrated

5 Water Supply and Wastewater

Refer to Manukau Water Limited requirements.

6 Roading

Roading includes but is not limited to: earthworks, testing of the subgrade, the carriageway construction including under channel drains, catchpits, culverts, kerb and channel, pavement construction and testing, road sealing, footpaths, pram crossings, vehicle crossings, private ways, street lighting, traffic controls, signage, road markings, access lot and right-of-way construction, bridges, retaining walls, erosion control devices, traffic islands, bus-bays, parking areas, safety barriers, guardrails, and berms. The responsibilities of the Developer's Consultant, Council and Network Manager are outlined below.

6.1 Developer's Consultant Responsibilities

The Developer's Consultant is to check all work complies with the resource consent conditions including the approved engineering drawings, Construction Quality Plan (CQP), Environmental Management Plan (EMP), Engineering Quality Standards (EQS), MANARC and other relevant Council Standards. Items to be checked for compliance during works in progress are to include but are not limited to:

(a) Health and safety requirements including site safety, environmental assessments and compliance with the Traffic Management Plan

(b) Road Opening Notices are obtained as required for works on existing roads and Council property.

(c) Preparation of subgrade and the *Subgrade Checklist (QR1)* is completed

(d) Ensure all utility service trenches are installed at correct position and corridor and are appropriately backfilled. Liaise with the Contractor over timing and sequence of service installation. Also ensure services are protected, ducts are marked, survey pegs are checked for damage, concrete paths and drives are reinstalled, trenches are backfilled properly, berms are restored and plinths and surface markers are checked.

(e) Under channel drains and subsoil drains construction and the *Underchannel Drains and Subsoil Drains Checklist (QR8)* is completed

(f) Preparation of sub-base and the *Sub-base Checklist (QR2)* is completed

(g) Pavement Formation tests are to be conducted, which will include stringing road for level and shape prior to basecourse application.

(h) Kerb and channel and surface work construction and the *Kerb and Channel and Surface Channel Checklist (QR9)* is completed

(i) Preparation of basecourse and the *Basecourse Checklist (QR3)* is completed

(j) Benkelman Beam test prior to sealing.

(k) Sealing and Paving and the *Pavement Surfacing Checklist (QR4)* is completed

Surfacing will be either:

(i) Two coat chipseal;
(ii) Membrane seal coat and asphalitc concrete;
(iii) Interlocking Block Pavers
(iv) Concrete

(i) For two coat chipseal: check binder type and temperature, additives, design application rate, chip size, moisture, and membrane seal coat application rate. During spraying check actual application for binder, chip coverage and rolling.

(ii) For membrane seal coat and asphaltic concrete: check asphaltic concrete, binder type and temperature, additives, design application rate, chip size, moisture, and membrane seal coat application rate. During spraying check actual application for binder, chip coverage and rolling. coat plus blinding layer, bitumen prime coat and repairs to membrane coat.

(iii) For asphaltic concrete check that correct machinery is on site including paver, steel wheel, and rubber tyre rollers. During operation, check mix temperature, compacted depth, and surface finish. The final surface finish shall be 0 to 10mm proud of the lip of the channel.

(iv) Interlocking Block Pavers: check to ensure the following:

- Basecourse layer to be checked for Level and Shape by stringing.
- Basecourse to be Benkleman Beam tested prior to laying block pavers (to ensure strength compliance)
- Bedding and jointing sand complies with specifications.
- Bedding sand should have uniform moisture content during block paver laying
- Channel or edge restraint adjacent to block pavers to have square edge
- MANARC approved pavers used and laid to approved standards
- Block pavers to be laid above the designed finished level to ensure that the final compacted level meets design
- Infill wedges to have plan dimensions in two perpendicular directions not less than 50mm. Small gaps

to be filled after compaction using matching coloured concrete of an equivalent strength of the adjacent pavers. Infill concrete to be placed to the full depth of the paving layer.

(v) Concrete: check the following:

- Subgrade for level and strength
- Placement and compaction of bedding material, placement of mesh and chairs
- Supply, depth and strength of concrete
- Dampness of bedding prior to pouring concrete
- Control joints, curing process, surface finish and test samples where necessary.

(l) Installation of retaining walls or other erosion control devices and the *Retaining Walls and Erosion Control Device Checklist QR13* is completed

(m) Berms are inspected for depth, level, quality of topsoil, preparation for grass sowing, seed quality and successful grass strike and *the Berm Checklist QR15* is completed.

(n) Installation of Safety barriers and guardrails and of the *Safety Barriers and Guardrails Checklist QR12* is completed

(o) Installation of private ways, vehicular crossings, right-of-way or access lot construction and *Private Ways and Vehicle Crossings Checklist QR10* is completed

(p) Installation of bridges and *Bridges Checklist QR14*

(q) Installation of footpaths, pram crossings *and Footpaths and Pram Crossings Checklist QR11* is completed

(r) Installation of street lighting and *Street lighting Checklist QR16* is completed

(s) Installation of traffic controls and *Traffic Controls Checklist QR5* is completed

(t) Installation of signage and *Signage Checklist QR7* is completed

(u) Installation of road markings and *Road Marking Checklist QR6* is completed

(v) As-built information for the components of roading assets is collected, recorded and submitted to meet the Council requirements.

6.2 Council Responsibilities

Council's regulatory function is a combination of random inspections of the above works to ensure adherence to Manukau City Council Standards, and more formal acceptance tests of:

(a) Subgrade

(b) Sub-base on completion

(c) Basecourse on completion prior to sealing and paving (quality of surface)

(d) Sealing and paving during and upon completion
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(e) Completed carriageway including carriageway surface, foot paths, pram crossings, vehicle crossings, berms, bridges, retaining walls, erosion control devices, traffic islands, bus-bays, parking areas, sub-soil drainage, surface water channel, kerb and channel, roading drainage, safety barriers, guardrails, street lighting, traffic controls, signage and road markings

(f) Verify Developer's Consultant's construction quality plan is in operation

(g) The Council Representative shall conduct a visual inspection of the completed carriageway including carriageway surface, kerb and channel, foot paths, pram crossings, vehicle crossings, private ways, street lighting, traffic controls, signage, road markings, access lot and right-of-way construction, bridges, retaining walls, erosion control devices, traffic islands, bus-bays, parking areas, safety barriers, guardrails and berms prior to 224c and taking over assets by the MCC Network Manager.

6.3 MCC Network Manager Responsibilities

Conduct a post construction safety audit of the intersections for all subdivisions connecting to a primary road as outlined in the Resource Consent.

7 Parks

Parks include street trees and gardens as well as reserves that are to be vested to Council.

7.1 Parks Development Standards

All Parks works shall be done in accordance with the Manukau City Council Parks Development Standards.

The following specifications establish the minimum performance standards for all work associated with Manukau Parks in Manukau City and must be read in conjunction with all other pertinent standards, policies and resource consent conditions required by Manukau City Council.

- MCC Tree Policy
- MCC Draft Landscape Development Standards

7.2 Developer's Consultant Responsibilities

Developer's Consultant is to check all work complies with the resource consent, the approved engineering drawings, Construction Quality Plan (CQP), Engineering Quality Standards (EQS), MANARC, Parks Development Standards and other relevant Council Standards. Quality Assurances Checklists to be completed are as follows:

(a) Pre-Defects Liability Period Street Trees and Gardens (QP1)

(b) Post Defects Liability Period Street Trees and Gardens (QP2)

(c) Pre-Defects Liability Period Reserves (QP3)

(d) Post Defects Liability Period Reserves (QP4)

7.3 Council's Responsibilities

Apart from a final formal inspection on completion of the works, Council will make periodic inspections at random intervals to ensure that Council standards are being adhered to.

8 Documentation

Before the works can be finally approved, a final site inspection is required to confirm all works have been completed and any previously outstanding or relocated works have been attended to. In addition to the physical works all QAM documentation also must be completed.

This section describes completion documentation requirements of Council. In the case of minor projects, the Developer's Consultant will be sent only those forms and checklists that are considered essential for Council records.

For works carried out under the Engineering Drawing Approval process, or for staged work that requires a proposed public piped service, the QAM documentation will include Quality Assurance Manual Checklists; as built drawings, Practical Completion Certificate and Barter Invoice for stage or completed section of work.

8.1 QAM Completion Documents

The Developer's Consultant shall complete the QAM completion documentation as specified in the Appendix 5.

The Developer's Consultant/Developer shall keep complete records of works in progress to ensure quality assurance. These shall include photographs, quality test data and Developer's Consultants inspection records. The Councils Representative may request copies of these records to verify the work completed.

Quality Assurance Records that may be requested include but are not limited to:

- Site photos
- Subgrade test records
- Compaction/Density test records
- Aggregate grading test records
- Concrete test data
- Asphaltic Concrete test data
- Benkleman Beam tests

Roading

- A photograph record for each road, per 500m length of roading, of both underchannel drains showing exposed.
- Perforated drain, filter sock, nearby backfill, trench depth to subgrade.

- A record for each road and footpath construction giving evidence of bedding and pavement thickness.
- A record of undercut areas with chainages verified, and if of black sand, verifying geotextile protection of underchannel drains.

Stormwater:

- Pipe manufacturers test data for pipes including date of manufacture.
- Compaction of backfill test data in road carriageway or where required
- Benkleman beam testing of trench reinstatement in road carriageway
- Compaction/Earthwork test data for stormwater quality ponds.
- Video inspection of all pipes under road carriageways, in proximity of buildings and elsewhere at Council's discretion

Water Supply and Wastewater:

- Refer to Manukau Water Limited Requirements

Parks:

- Plant Supplier information
- Plant installation details – pot mix fertiliser, watering etc.

8.2 QAM Checklists

QAM checklists are to be completed and submitted as required. In the case of larger projects, checklists and subsequent acceptance of remedial works may be the subject of correspondence. Such correspondence should be attached directly to the respective final checklist.

8.3 Final Site Inspection and Release

The Developer's Consultant and the Council Representative will carry out a final inspection of the works and check that all works are completed (or bonded for) and that the whole site is left in a neat and tidy condition. All the items in the *Final Site Inspection and Release Checklist (QFIN)* shall be completed by the Council's Representative prior to bond release.

8.4 As-built Drawings and RAMM Data

8.4.1 As-built Drawings

The Developer's Consultant is required to submit to Council, as-built drawings in hard copy or digital format for all works constructed prior to acceptance and final inspection. The drawings are to be clearly marked "As Built" and certified by a Chartered Professional Engineer or Registered Professional Surveyor. Correct street names and lot numbers are to be shown on the drawings.

- As built drawings for all roading works as specified in Appendix 11
- As built drawings for all stormwater works as specified in Appendix 12

8.4.2 RAMM Data

The Developer's Consultant is responsible for collecting RAMM data of the completed works using specified RAMM Data Collection Forms. The Developer's Consultant then forwards the RAMM data to the Council Representative for review. If the data is deemed insufficient it is returned to the Developer's Consultant for correction. The Developer's Consultant shall correct the data or arrange with the Council Representative to collect the data at the Developer's Consultant's expense.

8.5 Bonding

8.5.1 Subdivisions

In the case of subdivisions, Council may exercise discretion and allow bonding for specific uncompleted works to allow for the issue of the 224c certificate. Bonding arrangements are not generally entered into for utility services to lots or provision of as-Built drawings, assets that relate to public use of assets Health and Safety (i.e. streetlights), incomplete assets where any adverse affects may result (i.e. stormwater devices) or Geotechnical Completion Records, will include multiplier and GST.

The Conditions of Receipt of Cash Bond Form (Appendix 7) must be completed for all cash bonds, whether specific or general lot bonds. The form is to be signed by the developer. The maximum cash bond is $25,000.

For cash bonds exceeding $25,000 a formal bond document is required.

The formal bond document is prepared by Council's solicitors in consultation with the applicant's solicitors.

A valuation of the uncompleted works to be bonded for shall be prepared by the Developer's Consultant, and submitted on the *Councils bond application form, ref RCP/054,* to the Team Leader Resource Compliance for approval. Bond figures will have the following multipliers added to their total, relating to the time frames applied for

- 3 Months multiplier of 1.3
- 6 Months multiplier of 1.5

- 12 to 24 Months multiplier of 2.0.

The sum set against each scheduled specific item for which a bond sum is agreed, shall be accepted on the basis that it is indicative of the likely cost net of GST. In the event that Council has to complete the construction or reconstruction of all or any of the scheduled bonded items (including bond items for the defects liability period), then the Council will recover the costs of that work from the total bond monies held in relation to the scheduled items.

The consent-holder's liability shall not be limited to the amount of any bonds and the Council will invoice the consent-holder to recover any shortfall should bond monies be depleted.

Formal bond that must be retained for specified maintenance periods may be used for other items only where the need for retaining the bond for the specified maintenance period has lapsed. Council may therefore invoice for works while bond monies are still held.

8.5.2 Release of Bonds

The release of bonds is arranged by the Council Representative and also requires the "sign-off" of the affected Asset Manager's Representative. The Developer's Consultant shall provide a completion certificate and as-builts prior to the release of the bonds.

8.6 Test Results

Results of all quality assurance tests, including, road subgrade and pavement tests, water pressure and flow tests, disinfection test results, CCTV logs and pump station commissioning test reports are to be submitted with the completion or completed documentation.

8.7 Geotechnical Completion Report (GCR)

Three hard copies and one pdf version of the GCR is required with the QAM documentation which will shall comply with EQS requirements. The consent conditions or approval may require further copies. It is recommended that the draft GCR is forwarded to the Council Representative for comment well ahead of the QAM submission.

Bound into the Geotechnical Completion Report (where such a report is required) shall be a certificate in the general form of Appendix B of NZS 4404.

8.8 Warranties

Warranties from external suppliers, such as for pumps and street furniture, which are not covered by MANARC Standards must be supplied.

8.9 Producer Statements

The Developer's Consultant shall provide a copy of the Contractor's Producer Statements for all works.

8.10 Completion Certificate

On completion of all the construction work on site Council requires the Developer's Consultant to formally submit a completion certificate in the form of Appendix 9 before the release of the 224c certificate.

In addition, Council requires formal inspections, quality assurance records and Code of Compliance Certificates (CCC) for all works covered by building consents.

Developer's Consultant should as a matter of course keep inspection reports of other site inspections.

8.11 Utility Services

The Developer's Consultant shall provide a certificate from the utility operators (telecommunications, power, gas, etc.) showing that all lots have been serviced.

8.12 Details of Limited Servicing

Details of any lot limitations arising from reduced levels lot connections or pressure constraints of water supply must be documented for Council to assist in the drafting of consent notices and/or referencing the information in the Property Information Register.

8.13 Right of Entry Release

Where works are carried out on lots owned by other parties including existing reserves, evidence that the affected landowners have approved the completed works, including any remediation works is to be provided at the time of application for 224c.

8.14 Barter Invoice

In accordance with the Council's Tax Policy Manual, land contributions with associated fixed capital works are charged with GST at a rate of zero percent.

An example of the Barter Invoice is contained in Appendix 8. It must be provided when new public assets or land is to vest with Council.

8.15 Survey Sheet Showing Coordinates of Lot Boundaries

An A3 print is required in the QAM documentation in the case of subdivisions.

8.16 Current Copy of Deposited Plans

Prints are required in the QAM documentation in the case of subdivisions.

8.17 Agreements

Include copies of relevant agreements to which Council is a party (such as Heads of Agreement for roading works to which Council will contribute financially) in the QAM completion documentation.

8.18 Operating Maintenance Manuals

Manuals prepared for the operation of pump stations or other relevant equipment, the maintenance of any public facility such as a stormwater quality pond, or other Council assets that will have a continuing operating or maintenance regime which needs to be documented, must form part of the QAM completion documentation.

9 Ownership of Assets

Manukau City Council takes ownership of roading and parks and reserve land, including assets located on that land when the Certificates of Title have been issued (The date of ownership is recorded as the date of registration by LINZ of the 224c Certificate.)

Ownership of Stormwater, Water and Wastewater Services assets will transfer under a development/subdivision consent process or Engineering Works Application (EWA) process when Council has received satisfactory completion QAM documentation including As-Built drawings and the Completion Certificate and the connection has been made.

For practical administration purposes the date of vesting of land and buried utility services may both be taken as the date of registration of the 224c certificate.

9.1 224c Certificate

The 224c Certificate will be issued by Council when the following have been completed:

(a) All Engineering construction work required as a condition of approval has been completed to Council's satisfaction. Council may agree to accept a bond in lieu of completion of portions of the construction work

(b) Payment of the bonds for uncompleted works where applicable.

(c) Payment of all fees and other charges, e.g. reserves contribution, financial contributions, inspection and administration charges etc.

(d) "As-Built" drawings and QAM documentation received, checked and approved by Council for all works.

(e) Approval of Survey Plan.

(f) QAM documentation including As-built drawings; RAMM data and operation and maintenance manuals are presented to the Council.

(g) Manukau Water approvals, including as-built drawings, etc.

(h) All other conditions of approval.

9.2 Post Construction Safety Audit

When a subdivision is connected to a primary road, a post construction safety audit on the approved design is to be conducted by the Network Manager prior to opening the road to public use, as outlined in the resource consent.

9.3 Defects Liability Period

The Developer's Consultant shall issue to the Council and to the Contractor a Defects Liability Certificate for the assets to be vested to Council when:

(a) The Period of Defects liability has expired; and

(b) The Contractor has remedied any minor omissions or minor defects.

Appendix 1
Quality Assurance Manual Checklists

QUALITY ASSURANCE CHECKLISTS

Te Kaunihera o MANUKAU City Council

Number	Section	Type of Checklist	Checklist Completed		
			Yes	No	Not Applicable
QPRE	Preconstruction	Preconstruction			
QS1	Stormwater	Final Inspection and Test			
QR1	Roading	Subgrade			
QR2	Roading	Sub-base			
QR3	Roading	Basecourse			
QR4	Roading	Pavement Surfacing			
QR5	Roading	Traffic Controls			
QR6	Roading	Road Markings			
QR7	Roading	Signs			
QR8	Roading	Subsoil Drainage			
QR9	Roading	Kerb and Channel and Surface Work			
QR10	Stormwater	Catchpits			
QR11	Stormwater	Culverts			
QR12	Roading	Private Ways and Vehicle Crossings			
QR13	Roading	Footpaths and Pram Crossing			
QR14	Roading	Safety Barriers and Guardrails			
QR15	Roading	Retaining Walls and Erosions Control Devices			
QR16	Roading	Bridges			
QR17	Roading	Berms			
QR18	Roading	Street Lighting			
QP1	Parks	Pre-Defects Liability Period for Street Trees and Gardens			
QP2	Parks	Post-Defects Liability Period for Street Trees and Gardens			
QP3	Parks	Pre-Defects Liability Period for Reserves			
QP4	Parks	Post Defects Liability Period for Reserves			
QFIN		Final Site Inspection and Release			

QPRE

QUALITY ASSURANCE CHECKLIST
PRECONSTRUCTION MEETING

Te Kaunihera o MANUKAU City Council

Developer's Consultant File No……
Scheme Plan No……
Proposal No ……
Site Address……

Check		Yes	No	N/A	Comments
Present					
Developer's Consultant					
Council Representative					
Council Parks Representative					
Manukau Water Limited Services Engineer(s)					
Council Roading Engineer					
ARC					
Others (specify)					
Check		**Yes**	**No**	**N/A**	**Comments**
1	Status of Engineering Approval				
a	*All Approved*				
b	*Specify*				
c	*Traffic Restriction drawing completed and approved*				
2	All building, retaining wall, resource and landowners consents obtained				
3	Council is advised of name of Engineering Representative				
4	Council is advised of work commencement date				
5	Contractor's work program distributed				
6	List of proposed Subcontractors distributors				
7	ARC				
a	Informed of commencement date of works				
b	Sediment control consent obtained				

Check		Yes	No	N/A	Comments
c	Stormwater discharge consent obtained				
d	Any other consents obtained				
8	Confirm				
a	Approvals of clearing of scrub, trees and disposal obtained				
b	Fire permits obtained				
c	Any special resource consent conditions (i.e. protected trees, protection of existing reserves or waterways, landscape plan approval) identified				
d	Contractor has a copy of ARC and Council resource consents & geotechnical assessment (also building consents where appropriate)				
9	Health and Safety Plan in place				
10	Construction Quality Plan and Quality Assurance System Approved				
11	Environmental Management Plan				
12	Need for work on existing utilities				
a	*Water*				
b	*Wastewater*				
c	*Stormwater*				
d	*Electricity*				
e	*Gas*				
f	*Telecommunications*				
13	Insurances in place				
14	Current rights of entry for any work outside development boundary obtained				
15	Materials agreed (MANARC approved)				

QPRE

QUALITY ASSURANCE CHECKLIST
PRECONSTRUCTION MEETING CHECKLIST

Te Kaunihera o MANUKAU City Council

Check		Yes	No	N/A	Comments
16	For construction work on existing roads				
a	*Traffic management plan approved by Network Manager*				
b	*Road Opening Notice Application approved*				
c	*Open excavation permit for road crossing*				
d	*Contact person at Council*				
17	All approvals obtained from necessary parties (i.e. Manukau Water Limited, Watercare, other utility operators, etc.)				
20	Contractor Approval				
a	*Approved Licensed Contractor (ALC) for water connections*				
b	*Approved Licensed Contractor for wastewater and stormwater connections, diversions & renewals of public wastewater and stormwater lines*				
21	Approx. commencement date				
22	Approval to start work				

Organisation	Printed Name/Qualification	Signed	Date
Developer's Consultant:			
Council Rep:			
Manukau Water Rep.			

A copy of this signed checklist is to be sent by facsimile to the Council Representative associated with the development within one working day of the meeting by the Developer's Consultant.

Note 1: Throughout the QAM documentation, a check of a "No" box means the action is still required.

Note 2: It is encouraged that brief written comments are made against any item in a checklist

Note 3: Manukau City Council Contact Person for TMP's and RON's:

Name: _____

Phone Number: _____

QS1

QUALITY ASSURANCE CHECKLIST
STORMWATER
FINAL INSPECTION AND TEST

Te Kaunihera o MANUKAU City Council

STORMWATER FINAL INSPECTON AND TEST CHECKLIST

SP No/Name _____

Address _____

Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

OBJECTIVE: Final inspection and test on stormwater reticulation prior to Council taking over works and being declared "Public Drains".

PRE-MEETING TASKS
(Consultant/contractor to verify full compliance with Health and Safety Requirements)

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Flush out all lines			
	2	Check all manholes			
	3	All backfilling completed and lines tided up			
	4	Provide Developer's Consultant with as-built information			
Developer's Consultant	1	As-builts completed, checked and given to Council			
	2	Confirm 1-3 above completed by Contractor			
	3	Arrange inspection with Manukau Water Limited			
Council Representative	1	Confirm as-builts received or on site			
	2	Inspect all manholes			
	3	Inspect all inlet & outlet structures			
	4	Inspect secondary flowpaths			
	5	Check open watercourses at boundary upstream			
	6	Silt pond monitor			

NB/- Inspection of stormwater quality ponds undertaken by Environmental Services

QS1

QUALITY ASSURANCE CHECKLIST
STORMWATER
FINAL INSPECTION AND TEST

Te Kaunihera o MANUKAU City Council

SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
BRS Representative _____
Manukau Water Ltd Rep. _____
Others (specify) _____

POST SITE MEETING TASKS

Organization	Item No	Action Required	Yes	No	N/A
Contractor	1	Attend to any items arising from the final inspection and test site meeting			
Developer's Consultant	1	Observe contractor completing item above and advise Council			
	2	Connection to existing stormwater			
	3	CCTV of lines nominate by Manukau Water Limited (Min 10%)			
	4	Arrange for "Schedule of Assets" and copy of Barter Tax Invoice to Manukau Water Limited			
Council Representative	1	Check as-builts against design			
	2	Floor level restriction			
	3	Others			

TESTING APPROVED

Organisation	Printed Name/Qualification	Signed	Date
Manukau Water Limited Representative:			

QS1

QUALITY ASSURANCE CHECKLIST
STORMWATER
FINAL INSPECTION AND TEST

Te Kaunihera o MANUKAU City Council

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Party to Accept	Acceptance	
				Approved	Date

FINAL SIGN OFF

Item No	Action Required	Yes	No	N/A
1	Check asbuilt against design			
2	Any abandoned lines recorded on asbuilts			
3	Schedule of new assets received and checked against asbuilts			
4	Copy of Barter Tax Invoice received and checked for reasonableness			
5	Opus sign off / road reinstatement			
6	Connection to existing utility (signed ALC form)			
7	Check resource consent for any "MCC" contributions to any lines for coding purposes and that these are **NOT** included on Barter Tax Invoice			

NB/- All of the above **must** be completed before Manukau Water Limited Representative to give formal sign off.

Organisation	Printed Name/Qualification	Signed	Date
Developer's Consultant:			
Manukau Water Limited Representative:			

QR1

QUALITY ASSURANCE CHECKLIST
SUBGRADE

Te Kaunihera o MANUKAU City Council

SUBGRADE CHECKLIST

SP No/Name _____

Proposal Number _____
Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: Check is required to ensure subgrade strength and shape is suitable for the design depth of pavement

PRE- INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	String subgrade and check that design pavement depth is within required tolerances			
	2	Check subgrade for soft areas and mark out areas of concern			
	3	Set-out super-elevation			
Developer's Consultant	1	Arrange soil tests			
	a	*Soaked CBR*			
	b	*Scala Penetrometer*			
	c	*Benkelman Beam*			
	d	*Lime Sensitivity*			
	e	*Proof Rolling*			
	f	*Other and send for Council approval*			
	2	Confirm design depth			
	3	Confirm any subgrade improvement procedures with the Contractor			
	a	*Proof rolling inspection*			
	b	*Areas referenced*			
	c	*Material used*			
	d	*Filter cloth type used*			
	e	*Stabilization (Lime, KOBM, Calcicon, Cement)*			
	4	Confirm improvements by proof rolling/other tests			
	5	String subgrade			
	6	Observe shape and consistency of subgrade			

QR1

QUALITY ASSURANCE CHECKLIST
SUBGRADE

Organisation	Item No	Action Required	Yes	No	N/A
	7	Check subgrade shape allows for a minimum of 100mm of metal between underside of kerb and channel and top of underchannel drain			
	8	After checking the above, arrange for an inspection by a Council Representative. Advise Contractor of the time of inspection			
	9	Developer's Consultant to submit all testing documentation, string check lists, as-builts and subgrade information to the Council Representative			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organization	Item No	Action Required	Yes	No	N/A
Council Representative	1	Confirm design and subgrade improvements where required			
	2	Ensure testing and as-built information is adequate			
	3	String subgrade and confirm surface criteria			
	4	Check underchannel drains construction			
	5	All information filed within Roading Quality Assurance File for Contract/Subdivision			
	6	Agreement to proceed with metal			
	a	*Whole*			
	b	*Part*			
	c	*Further inspections required*			
	d	*Developer's Consultant to check any remedial work required*			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

QR1

QUALITY ASSURANCE CHECKLIST
SUBGRADE

SUBGRADE CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR2

QUALITY ASSURANCE CHECKLIST
SUB-BASE

Te Kaunihera o MANUKAU City Council

SUB-BASE CHECKLIST

SP No/Name _____

Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: Final inspection on sub-basecourse is required prior to lying of basecourse

PRE- INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Ensure sub-base course material meets all requirements prior to delivery. Source test results submitted to the Developer's Consultant			
	2	On-site material is tested and approved, and then test results are submitted to the Developer's Consultant			
	3	Construction to EQS standards and compaction test results submitted to the Developer's Consultant. Contractor to arrange for all testing with an International Accreditation New Zealand (IANZ) Laboratory			
	4	Contractor to string line every 20m to ensure construction within EQS tolerances. Check sheet given to Developer's Consultant			
Developer's Consultant	1	Recheck Contractor submitted test results source and field tests meet all requirements			
	2	Recheck Contractor stringing every 20m to confirm EQS tolerances			
	3	Confirm compaction test results, surface shape and finish meet EQS			
	4	After checking the above, arrange for an inspection by a Council Representative. Advise Contractor of the time of inspection			
	5	Developer's Consultant to provide all testing documentation, string check lists, as-built sub-basecourse information and submit it to Council Representative			

QR2

QUALITY ASSURANCE CHECKLIST
SUB-BASE

Te Kaunihera o MANUKAU City Council

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organization	Item No	Action Required	Yes	No	N/A
Council Representative	1	Confirm material and construction meets specification			
	2	Ensure testing and as-built information is adequate			
	3	Check stringing sheet to ensure restring is at maximum 20m centres			
	4	All information filed within Roading Quality Assurance File for Contract/Subdivision			
	5	Agreement to proceed with basecourse			
	a	*Whole*			
	b	*Part*			
	c	*Further inspections required*			
	d	*Developer's Consultant to check any remedial work required*			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

SUB-BASECOURSE CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR3

QUALITY ASSURANCE CHECKLIST
BASECOURSE

Te Kaunihera o MANUKAU City Council

BASECOURSE CHECKLIST

SP No/Name _____

Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: Final inspection on basecourse and surface is required prior to approval and sealing

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Supply Developer's Consultant with grading curves for basecourse			
	2	Place and compact metal to design depth			
	3	Check any visual movement and advise Developer's Consultant			
	4	Pre-string check			
Developer's Consultant	1	Confirm sub-base level prior to basecourse being laid			
	2	Confirm 1 to 4 above completed by Contractor			
	3	Pre-string check			
	4	Correct quality and grades of metal			
	5	Visual check on surface appearance			
	6	Arrange for Benkleman Beam tests			
	7	Advise Council Representative of time of Benkleman Beam test			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:
Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organization	Item No	Action Required	Yes	No	N/A
Council Representative	1	Benkleman Beam testing			
	2	String basecourse surface			
	3	Confirm sealing design and agreement to proceed			

QR3

QUALITY ASSURANCE CHECKLIST
BASECOURSE

Te Kaunihera o MANUKAU City Council

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

BASECOURSE CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR4

QUALITY ASSURANCE CHECKLIST
PAVEMENT SURFACING

Te Kaunihera o MANUKAU City Council

PAVEMENT SURFACING CHECKLIST

SP No/Name _____

Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: Final inspection is required for carriageway pavement surface

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Arrange date and requirements with Sub-Contractor and advise Developer's Consultant			
Developer's Consultant	1	Confirm design (i.e. thickness and grade of AC, grade of brick pavers depth, reinforcing and strength of concrete, colour surface)			
	2	Advise Council of when top course is ready for surfacing (i.e. broomed for membrane seal, ready for concrete pour or paver laying). Note: where surfacing is a two stage operation such as AC over membrane, Council Representative attendance is to be requested for each stage			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:
Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organization	Item No	Action Required	Yes	No	N/A
Council Representative	1	Confirm pavement type			
	2	Observe brooming and check metal surface			
	3	Approval of seal for:			
	a	*Two coat chipseal*			

QR4

QUALITY ASSURANCE CHECKLIST
PAVEMENT SURFACING

Organization	Item No	Action Required	Yes	No	N/A
	b	*One coat membrane or first coat chipseal*			
	c	*Second coat chipseal*			
	d	*AC 30mm/35mm (delete one)*			
	e	*Pavers (MANARC APPROVED)*			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

PAVEMENT SURFACING CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

SEALING OPERATION NOTES

It is important that the Developer's Consultant and Council Representatives are on site for the sealing operation so that the following items can be checked during the course of the works.

1 Chip or Membrane Seal
(a) dry basecourse
(b) dusting up of swept surface
(c) binder type and temperature, application rate and chip size, channel protected

2 Asphaltic Concrete
(a) channel clean of sweepings
(b) adequately dry chip seal
(c) priming at lip of channel and patching
(d) blinding, dry chipping, compacted depth, surface appearance, 10mm $\pm$5mm proud of the lip of the channel
(e) special instructions if emulsion coat is less than 10 days old

3 Concrete
(a) age/slump of ready mix

Developer's Consultants to complete a separate Pavement Surfacing Checklist for each sequence of operation, (i.e. separate checklist required for membrane seal and AC). Additionally, separate checklists are required if the project is stage in terms of the chainages completed.

QR5

QUALITY ASSURANCE CHECKLIST
TRAFFIC CONTROLS

Te Kaunihera o MANUKAU City Council

TRAFFIC CONTROLS CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: Final inspection of traffic controls is required prior to opening and at the end of the defects liability period to ensure controls are safe, complete and suitable for Council to take over

This inspection covers all traffic signs (including street name signs), road markings, roundabout islands, traffic islands, pedestrian crossings, speed humps and traffic signals.

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Ensure all matters agreed at previous inspections have been completed			
	2	Ensure traffic signals and belisha beacons are working correctly			
Developer's Consultant	1	Ensure appropriate community board approvals have been obtained and the traffic restriction drawing has been fully complied with			
	2	Ensure approval of adjacent land owners has been obtained for all structures such as bus shelters			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:
Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organization	Item No	Action Required	Yes	No	N/A
Council Representative	1	Confirm traffic controls are as per approved Engineering drawings			
	a	*Layout*			
	b	*Dimensions*			

QR5

QUALITY ASSURANCE CHECKLIST
TRAFFIC CONTROLS

Organization	Item No	Action Required	Yes	No	N/A
	c	*Size*			
	d	*Visibility*			
	e	*Overall compliance with requirements of TNZ/LTNZ Manual of Traffic Signs and Markings (MOTSAM)*			
	2	Confirm height and location of speed humps is as per approved Engineering drawings			
	3	Confirm workmanship on all traffic islands is acceptable and dimensions comply with approved Engineering drawings			
	4	Confirm traffic signals are fully operational and electronically compliant. Ensure the TMU completes site audit checklist prior to Council handover. This checklist includes, but is not limited to:			
	a	*Phasing, controller acceptable*			
	b	*Poles, detector loops in correct location*			
	c	*Pedestrian push buttons and detectors all work*			
	5	Confirm quality of workmanship on all traffic controls			
	6	Confirm all matters agreed at previous inspections have been completed			
	7	Confirm traffic restriction drawings are complied with			
	8	As-built information complies with Council requirements and is submitted to the Network Manager			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

TRAFFIC CONTROLS CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR6

QUALITY ASSURANCE CHECKLIST
ROAD MARKINGS

Te Kaunihera o MANUKAU City Council

ROAD MARKINGS CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: Final inspection of road markings is required prior to opening and at the end of the maintenance period to ensure road markings are safe, complete and suitable for Council to take over.

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Ensure road marking is done correctly			
Developer's Consultant	1	Ensure appropriate community board approvals have been obtained and the traffic restriction drawing has been fully complied with			
	2	Ensure approval of adjacent land owners has been obtained for all structures such as bus shelters			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:
Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organization	Item No	Action Required	Yes	No	N/A
Council Representative	1	Confirm road markings are as per approved Engineering drawings			
	a	*Layout*			
	b	*Dimensions*			
	c	*Size*			
	d	*Visibility*			
	e	*Overall compliance with requirements of TNZ/LTNZ Manual of Traffic Signs and*			

QR6

QUALITY ASSURANCE CHECKLIST
ROAD MARKINGS

Organization	Item No	Action Required	Yes	No	N/A
		Markings (MOTSAM)			
	2	Confirm quality of workmanship on all road markings			
	3	Confirm all matters agreed at previous inspections have been completed			
	4	Confirm traffic restriction drawings are complied with			
	5	As-built information complies with Council requirements and is submitted to the Network Manager			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

ROAD MARKINGS CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR7

QUALITY ASSURANCE CHECKLIST
SIGNAGE

Te Kaunihera o MANUKAU City Council

SIGNAGE CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: Final inspection of signs is required prior to opening and at the end of the defects liability period to ensure signs are safe, complete and suitable for Council to take over

This inspection covers all traffic signs (including street name signs), road markings, roundabout islands, traffic islands, pedestrian crossings, speed humps and traffic signals.

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Ensure all works comply with approved Engineering drawings and 3m clearance to underside of fingerboard signs			
	2	Ensure all matters agreed at previous inspections have been completed			
Developer's Consultant	1	Ensure approval of adjacent land owners has been obtained for all structures such as bus shelters			
	2	Ensure approval of street names before erection of signs			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:
Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organization	Item No	Action Required	Yes	No	N/A
Council Representative	1	Confirm road markings and signs are as per approved Engineering drawings			
	a	*Layout*			
	b	*Dimensions*			
	c	*Size*			

QR7

QUALITY ASSURANCE CHECKLIST
SIGNAGE

Organization	Item No	Action Required	Yes	No	N/A
	d	*Visibility*			
	e	*Overall compliance with requirements of TNZ/LTNZ Manual of Traffic Signs and Markings (MOTSAM) including visibility to signs*			
	2	Confirm quality of workmanship on all signs, posts and other fixtures is acceptable (i.e. posts are firmly in place, painting is completed, etc)			
	3	Confirm all matters agreed at previous inspections have been completed			
	4	Confirm traffic restriction drawings are complied with			
	5	As-built information complies with Council requirements and is submitted to the Network Manager			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

SIGNS CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR8

QUALITY ASSURANCE CHECKLIST
SUBSOIL DRAINAGE

Te Kaunihera o MANUKAU City Council

SUBSOIL DRAINAGE CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: Check is required on subsoil drainage to verify that the materials are acceptable and constructed to TNZ and MCC specifications

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm subsoil drainage requirements (i.e. materials, bedding, backfill etc). Note all road edges, except where free draining pavements are adjacent surface water channels (rural). Provide material tests			
	2	Ensure offset survey pegs are in place and dimensions of trench excavation are to specification			
	3	Ensure all subsoil drains and underchannel drain outlets are connected to catchpits, etc as specified			
	4	Construction to TNZ and MCC specifications			
	5	Confirm all road edging profiles and concrete strength			
	6	Ensure base preparation is to the specified level and well compacted			
	7	Set-out and string lines are thoroughly checked. Pram crossings and vehicle crossings are set-out and profile is verified at these transitions			
	8	Ensure protection of wet/green concrete (i.e. that proper systems are in place)			
	9	Backfilling behind kerbs prior to near by compaction			
	10	For rural environment ensure surface water channel construction meets all requirements. Refer to EQS R16			
Developer's Consultant	1	Confirm design and specification meet MCC requirements			
	2	Recheck Contractor submitted test			

QR8

QUALITY ASSURANCE CHECKLIST
SUBSOIL DRAINAGE

Organisation	Item No	Action Required	Yes	No	N/A
		results of materials (confirmed profiles, etc)			
	3	Confirm inspection times (i.e. subsoil trench prior to backfilling, string line check of kerb line etc)			
	4	Monitoring inspections during construction to ensure compliance with TNZ and MCC specifications (i.e. materials, adequate plant, concrete depth, environmental conditions, experienced operators and good on-site QA)			
	5	After works are complete, carry out an inspection with the Contractor to confirm everything is within specification			
	6	Book in final surface water channel, kerb and channel inspection with Council Representative (can be co-ordinated with overall final roading inspection) and provide them with all testing documentation, quality assurance checklists, and as-built surface water channels/kerb information, etc			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

QR8

QUALITY ASSURANCE CHECKLIST
SUBSOIL DRAINAGE

Te Kaunihera o MANUKAU City Council

SUBSOIL DRAINAGE CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR9

QUALITY ASSURANCE CHECKLIST
KERB AND CHANNEL AND SURFACE CHANNEL

Te Kaunihera o MANUKAU City Council

KERB AND CHANNEL AND SURFACE CHANNEL CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: The purpose is to check that the surface channel and the kerb and channel drainage materials are acceptable and constructed to TNZ and MCC specifications

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Ensure offset survey pegs are in place and dimensions of trench excavation are to specification			
	2	Ensure all subsoil drains and underchannel drain outlets are connected to catchpits, etc as specified			
	3	Construction to TNZ and MCC specifications			
	4	Confirm all road edging profiles and concrete strength			
	5	Ensure base preparation is to the specified level and well compacted			
	6	Set-out and string lines are thoroughly checked. Pram crossings and vehicle crossings are set-out and profile is verified at these transitions			
	7	During a concrete pour, ensure any required markings (i.e. service crossings and survey plaques) are installed			
	8	Expansion joints are installed as required			
	9	Contractor to ensure quality control checks are undertaken (i.e. dips of concrete depth, slump tests, dockets verifying concrete strength (25MPa) and environmental conditions). These and any material testing are to be submitted to the Developer's Consultant			
	10	Ensure protection of wet/green concrete (i.e. that proper systems are in place)			
	11	Backfilling behind kerbs prior to near by compaction			
	12	For rural environment ensure surface water channel construction meets all			

QR9

QUALITY ASSURANCE CHECKLIST
KERB AND CHANNEL AND SURFACE CHANNEL

Organisation	Item No	Action Required	Yes	No	N/A
		requirements. Refer to EQS R16			
Developer's Consultant	1	Confirm design and specification meet MCC requirements			
	2	Recheck Contractor submitted test results of materials (confirm profiles, etc)			
	3	Monitoring inspections during construction to ensure compliance with TNZ and MCC specifications (i.e. material, adequate plant, concrete depth, environmental conditions, experienced operators and good on-site QA)			
	4	After works are complete, carry out an inspection with the Contractor to confirm everything is within specification			
	5	Book in final surface water channel, kerb and channel inspection with Council Representative (can be co-ordinated with overall final roading inspection) and provide them with all testing documentation, quality assurance checklists, and as-built surface water channel/kerb information, etc			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

QR9

QUALITY ASSURANCE CHECKLIST
KERB AND CHANNEL AND SURFACE CHANNEL

Te Kaunihera o MANUKAU City Council

KERB AND CHANNEL AND SURFACE CHANNEL CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR10

QUALITY ASSURANCE CHECKLIST
CATCHPITS AND CATCHPIT LEADS

Te Kaunihera o MANUKAU City Council

CATCHPITS AND CATCHPIT LEADS CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: The purpose is to check that the catchpit and catchpit lead materials are acceptable and constructed to TNZ and MCC requirements for a 100 year design life

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm drainage requirements (i.e. materials, bedding, backfill etc). Provide material tests. Refer to EQS D3 and D4			
	2	Pre-planning to ensure no conflicting services/duct installations. Road opening notice for crossing across existing carriageways is acquired and a notifiable works notice is sent to Occupational Safety and Health (OSH)			
	3	Inquire whether an ALC Connection is required to the existing system			
	4	Ensure setting out is accurate and offsets understood by drain layers. Confirm recessed (used on primary roads and specific intersections) or standard catchpits are properly located			
	5	Ensure OSH regulations are being carried out (i.e. trench supports)			
	6	Ensure correct pipe sizes and material class are delivered to site			
	7	All culverts/catchpit leads are sighted and approved by the Developer's Consultant prior to backfilling			
	8	Construction to TNZ and MCC specifications. Compacted hardfilling of all road crossings and pipe crossings			

QR10

QUALITY ASSURANCE CHECKLIST
CATCHPITS AND CATCHPIT LEADS

Te Kaunihera o MANUKAU City Council

Organisation	Item No	Action Required	Yes	No	N/A
	9	Contractor to ensure quality control checks are undertaken (i.e. verification of materials, compaction, sighting line, plastering connections, verifying bedding, and side fill depth). These and any material testing are to be submitted to the Developer's Consultant			
	10	Verify inlet and outlet protection of culverts under the road			
Developer's Consultant	1	Confirm design and specification meet MCC requirements			
	2	Recheck Contractor submitted test results of materials. Confirm specification, design life of 100 years, etc are met			
	3	Confirm inspection times (i.e. pipelines prior to backfilling, sighting of line and verifying joints)			
	4	Monitoring inspections during construction to ensure compliance with TNZ and MCC specifications (i.e. materials, compaction, health and safety, adequate plant, experienced drain layers and good on-site QA)			
	5	After works are complete carry out an inspection with the Contractor to confirm everything is within specifications			
	6	Book in final road drainage inspection with Council Representative (can be co-ordinated with overall final roading inspection) and provide them with all testing documentation, quality assurance checklists and as-built road drainage information, etc			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

QR10

QUALITY ASSURANCE CHECKLIST
CATCHPITS AND CATCHPIT LEADS

Te Kaunihera o MANUKAU City Council

Organization	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

CATCHPIT AND CATCHPIT LEAD INSPECTION

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR11

QUALITY ASSURANCE CHECKLIST
CULVERTS

Te Kaunihera o MANUKAU City Council

CULVERTS CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: The purpose is to check that the road drainage materials are acceptable and constructed to TNZ and MCC requirements for a 100 year design life

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm drainage requirements (i.e. materials, bedding, backfill etc). Provide material tests. Refer to EQS D3 and D4			
	2	Pre-planning to ensure no conflicting services/duct installations. Road opening notice for crossing across existing carriageways is acquired and a works notice is sent to Occupational Safety and Health (OSH)			
	3	Inquire whether an ALC Connection is required to the existing system			
	4	Ensure setting out is accurate and offsets understood by drain layers. Confirm recessed (used on primary roads and specific intersections) or standard catchpits are properly located			
	5	Ensure OSH regulations are being carried out (i.e. trench supports)			
	6	Ensure correct pipe sizes and material class are delivered to site			
	7	All culverts/catchpit leads are sighted and approved by the Developer's Consultant prior to backfilling			
	8	Construction to TNZ and MCC specifications. Compacted hardfilling of all road crossings and pipe crossings			

QR11

QUALITY ASSURANCE CHECKLIST
CULVERTS

Organisation	Item No	Action Required	Yes	No	N/A
	9	Contractor to ensure quality control checks are undertaken (i.e. verification of materials, compaction, sighting line, plastering connections, verifying bedding, and side fill depth). These and any material testing are to be submitted to the Developer's Consultant			
	10	Verify inlet and outlet protection of culverts under the road			
Developer's Consultant	1	Confirm design and specification meet MCC requirements			
	2	Recheck Contractor submitted test results of materials. Confirm specification, design life of 100 years, etc are met			
	3	Confirm inspection times (i.e. pipelines prior to backfilling, sighting of line and verifying joints)			
	4	Monitoring inspections during construction to ensure compliance with TNZ and MCC specifications (i.e. materials, compaction, health and safety, adequate plant, experienced drain layers and good on-site QA)			
	5	After works are complete carry out an inspection with the Contractor to confirm everything is within specifications			
	6	Book in final road drainage inspection with Council Representative (can be co-ordinated with overall final roading inspection) and provide them with all testing documentation, quality assurance checklists and as-built road drainage information, etc			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

QR11

QUALITY ASSURANCE CHECKLIST
CULVERTS

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

CULVERT INSPECTION

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR12

QUALITY ASSURANCE CHECKLIST
PRIVATE WAYS AND VEHICLE CROSSINGS

Te Kaunihera o MANUKAU City Council

PRIVATE WAYS/ VEHICLE CROSSING CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: The purpose is to check that private ways/vehicle crossing materials are acceptable and constructed to Council requirements

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm private way/vehicle crossing requirements (i.e. materials, reinforcing, bedding, and location). Provide material tests. Refer to EQS 6.B.5 and 6.B.10			
	2	Ensure that private ways shall have stormwater drainage provided so that the maximum "run of water" does not exceed approximately 90m. Refer to details as per R12 Residential, R12 Service Trench and R17 Rural of the EQS			
	3	Ensure all service crossings and ducts are installed and backfilled with hardfill			
	4	Ensure all topsoil/unsuitable material is excavated. Identify any known soft areas. Developer's Consultant to approve base prior to bedding and boxing			
	5	All set-out is accurate (verify offsets to legal boundaries) and vehicle crossings are set-out as per EQS R9 Residential, R10 Non-Residential/Business and R23 for Rural			
	6	Boxing is set-out accurately, with 3% crossfall. All straight, curved edges are aesthetically smooth. Reinforcing installed as required			
	7	Construction to MCC standards. For concrete works, expansion joints installed at 4m maximum spacing			
	8	Contractor to ensure quality control checks are undertaken (i.e. verification of materials, compaction, boxing, bedding, concrete strength and depth, etc). These			

QR12

QUALITY ASSURANCE CHECKLIST
PRIVATE WAYS AND VEHICLE CROSSINGS

Te Kaunihera o MANUKAU City Council

Organisation	Item No	Action Required	Yes	No	N/A
		and any material testing are to be submitted to the Developer's Consultant			
Developer's Consultant	1	Confirm design and specification meet MCC requirements			
	2	Recheck Contractor submitted test results of materials. Confirm specification, etc are met			
	3	Confirm inspection times (i.e. base prior to boxing and after boxing)			
	4	Monitoring inspections during construction to ensure compliance with MCC specifications (i.e. concrete placement and broom finish, experienced concrete workers and good on-site QA)			
	5	After all works are complete carry out an inspection with the Contractor to confirm everything is within specification			
	6	Book in final private way/vehicle crossing inspection (once swept clean) with Council Representative (can be co-ordinated with overall final roading inspection) and provide them with all testing documentation, quality assurance checklists and as-built private way/vehicle crossing information, etc			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

QR12

QUALITY ASSURANCE CHECKLIST
PRIVATE WAYS AND VEHICLE CROSSINGS

Te Kaunihera o MANUKAU City Council

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

PRIVATE WAYS/VEHICLE CROSSING INSPECTION

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR13

QUALITY ASSURANCE CHECKLIST
FOOTPATHS AND PRAM CROSSINGS

Te Kaunihera o MANUKAU City Council

FOOTPATH/PRAM CROSSING CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: The purpose is to check that the footpath and pram crossing materials are acceptable and constructed to MCC requirements

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm footpath requirements (i.e. materials, bedding, location etc). Provide material tests. Refer to EQS			
	2	Ensure that if footpath is adjacent to kerb, concrete depth increased to 110mm and width to a minimum of 1.6m			
	3	Ensure all service crossings are installed and backfilled with hardfill (i.e. streetlight ducts)			
	4	Ensure all topsoil/unsuitable material is excavated. Note any known soft areas. Developer's Consultant to approve base prior to bedding and boxing. Ensure that Pram crossings subgrade is tested to a TNZ F/1 standards and refer to EQS R8			
	5	All set-out is accurate (verify offsets to legal boundaries) and vehicle crossings are set-out (refer to separate QAM sheet)			
	6	Boxing is set out accurately, with 3% crossfall footpath and lines, curves are aesthetically smooth			
	7	Construction to MCC standards. Expansion joints installed			
	8	Contractor to ensure quality control checks are undertaken (i.e. verification of materials, compaction, boxing, verifying bedding, dockets of concrete strength, depth of concrete). These and any material testing is to be submitted to the Developer's Consultant			

QR13

QUALITY ASSURANCE CHECKLIST
FOOTPATHS AND PRAM CROSSINGS

Te Kaunihera o MANUKAU City Council

Organisation	Item No	Action Required	Yes	No	N/A
Developer's Consultant	1	Confirm design and specification meet MCC requirements (i.e. tactile pavers)			
	2	Recheck Contractor submitted test results of materials. Confirm specification, etc are met.			
	3	Confirm inspection times (i.e. base prior to boxing and after boxing)			
	4	Monitoring inspections during construction to ensure compliance with MCC specifications (i.e. concrete placement and broom finish, experienced concrete workers and good on-site QA)			
	5	After all works are complete carry out an inspection with the Contractor to confirm everything is within specification			
	6	Book in final footpath inspection (once swept clean) with Council Representative (can be co-ordinated with overall final roading inspection) and provide them with all testing documentation, quality assurance checklists and as-built footpath information, etc.			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

QR13

QUALITY ASSURANCE CHECKLIST
FOOTPATHS AND PRAM CROSSINGS

Te Kaunihera o MANUKAU City Council

FOOTPATH/ PRAM CROSSING CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR14

QUALITY ASSURANCE CHECKLIST
SAFETY BARRIERS AND GUARDRAILS

Te Kaunihera o MANUKAU City Council

SAFETY BARRIERS/GUARDRAILS CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: The purpose is to check safety barrier/guardrail materials are acceptable and constructed to Council and TNZ requirements

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm barrier requirements (i.e. materials, test level, guardrail, size, foundation, location). Provide material tests. Refer to relevant TNZ and manufacturers specifications. For concrete barriers, approved lifting system (reid swift lift)			
	2	Confirm barrier or guardrail locations with the Developer's Consultant. End treatments and connections to other structures confirmed			
	3	Ensure all underground services are identified and required permits are obtained			
	4	Ensure foundation material is suitable and excavated to specification			
	5	Contractor to ensure quality control checks are undertaken (i.e. verification of materials, location, foundation requirements). These and any material testing are to be submitted to the Developer's Consultant			
Developer's Consultant	1	Confirm design and specification meet MCC requirements			
	2	Recheck Contractor submitted test results of materials. Confirm specification, etc are met			
	3	Confirm inspection times (i.e. setting out)			

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QUALITY ASSURANCE CHECKLIST
SAFETY BARRIERS AND GUARDRAILS

Te Kaunihera o MANUKAU City Council

Organisation	Item No	Action Required	Yes	No	N/A
	4	Monitoring inspections during construction to ensure compliance with Council specifications (i.e. location, aesthetics, smooth curves, foundation, connections, experienced barrier and guardrail installers and good on-site QA)			
	5	After all works are complete carry out an inspection with the Contractor to confirm everything is within specification			
	6	Book in final barrier/guardrail inspection with Council Representative (can be co-ordinated with overall final roading inspection) and provide them with all testing documentation, quality assurance checklists and as-built barrier/guardrail information, etc			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

QR14

QUALITY ASSURANCE CHECKLIST
SAFETY BARRIERS AND GUARDRAILS

Te Kaunihera o MANUKAU City Council

SAFETY BARRIERS/GUARDRAIL CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR15

QUALITY ASSURANCE CHECKLIST
RETAINING WALLS AND
EROSION CONTROL DEVICES

Te Kaunihera o MANUKAU City Council

RETAINING WALL/EROSION CONTROL DEVICE CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name_____ Chainage_____

OBJECTIVE: The purpose is to check retaining walls/erosion control devices are acceptable and constructed to MCC, TNZ and manufacturers requirements

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm retaining/erosion control requirements (i.e. materials, geogrids, filter fabrics, foundation, subsoil drainage, location). Provide material tests. Refer to relevant TNZ and manufacturers specifications			
	2	Confirm retaining wall and /or erosion control devices with the Developer's Consultant			
	3	Ensure all underground services are identified and permits if required are obtained. Earthworks to OSH standards For walls >1m ensure permits/structural inspections etc, are completed. Ensure Code of Compliance Certificates (CCC) for all works covered in the building consents are followed.			
	4	Ensure foundation material is suitable and excavated to specification, and that subsoil drainage is installed as required			
	5	Contractor to ensure quality control checks are undertaken (i.e. verification of materials, location, foundation requirements). These and any material testing are to be submitted to the Developer's Consultant			
Developer's Consultant	1	Confirm design and specification meet MCC requirements. Refer to EQS, TNZ and manufacturers specification. Ensure consent obtained for wall >1m high,			

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QUALITY ASSURANCE CHECKLIST
RETAINING WALLS AND
EROSION CONTROL DEVICES

Te Kaunihera o MANUKAU City Council

Organisation	Item No	Action Required	Yes	No	N/A
		handrails, etc			
	2	Recheck Contractor submitted test results of materials. Confirm specification, etc are met			
	3	Confirm inspection times (i.e. setting out etc)			
	4	Monitoring inspections during construction to ensure compliance with specifications. (i.e. Chartered Professional Engineer to confirm foundation, etc for walls > 1m high, visual, subsoil drainage, foundation, connections, experienced retaining wall installers and good on-site QA). Ensure Code of Compliance Certificates (CCC) for all works covered in the building consents are followed.			
	5	After all works are complete, carry out an inspection with the Contractor to confirm everything is within specification			
	6	Book in final retaining wall/erosion control devices inspection with Council Representative (can be co-ordinated with overall final roading inspection) and provide them with all testing documentation, building consents, quality assurance checklists and as-built retaining wall/erosion information, etc			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

QR15

QUALITY ASSURANCE CHECKLIST
RETAINING WALLS AND
EROSION CONTROL DEVICES

Te Kaunihera o MANUKAU City Council

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

RETAINING WALL/ EROSION CONTROL DEVICE CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR16

QUALITY ASSURANCE CHECKLIST
BRIDGES

Te Kaunihera o MANUKAU City Council

BRIDGE CHECKLIST

SP No/Name _____
Contract No/Name _____

Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: The purpose is to check that the bridge materials are acceptable and constructed to TNZ, MCC, NZ, and manufacturer's requirements

Pre-Inspection Tasks

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm requirements (i.e. materials, height, foundation, location,). Provide material tests. Refer to TNZ Bridge Manual and manufacturers specifications. Ensure 100 year design life is met			
	2	Confirm design with the Developer's Consultant on-site. - Overall dimensions/footpaths. - Drainage system/Lighting - Design loadings (i.e. max overlay depths) - Waterway protection/consents			
	3	RAMM information: - General Info, Bridge Superstructure, Bridge Beam, Bridge Brace, Bridge Deck, Bridge Foundation, Bridge Protection, Bridge Restriction, Bridge Services are all as per RAMM			
	4	Ensure all underground services are identified and required permits are obtained. Ensure all ducts are installed as required			
	5	Ensure all work is certified by a Structural Chartered Professional Engineer			
	6	Contractor to ensure quality control checks are undertaken (i.e. verification of materials, location, foundation requirements, depths, compaction, etc). These and any material testing are to be			

QR16

QUALITY ASSURANCE CHECKLIST
BRIDGES

Organisation	Item No	Action Required	Yes	No	N/A
		submitted to the Developer's Consultant			
	7	Contractor to fully reinstate and ensure all erosion control measures meet required standards. Ensure Code of Compliance Certificates (CCC) for all works covered in the building consents are followed.			
	8	Contractor to obtain approval for opening bridge to traffic			
Developer's Consultant	1	Confirm design and specification meet MCC requirements and TNZ Bridge Manual. Ensure the Contractor is experienced			
	2	Recheck Contractor submitted material test results of materials (i.e. confirm specifications, etc)			
	3	Confirm all inspection times - Note would need CM4-5 supervision as per Association of Consulting Engineers New Zealand (ACENZ)			
	4	Monitoring inspections during construction to ensure compliance with specifications (i.e. foundation, materials, experienced/certified staff and good on-site QA). Ensure Code of Compliance Certificates (CCC) for all works covered in the building consents are followed.			
	5	After all works are complete, carry out an inspection with the Contractor to confirm everything is within specification. Carry out a TNZ Bridge Inspection Report (in the inspection manual)			
	6	Book in final bridge inspection with Council Representative (to be co-ordinated with overall final roading inspection) and provide them with all testing documentation, quality assurance checklists and as-built information, and a signed producer statement from a Chartered Professional Engineer as required, etc			

Final Inspection & Test Site Meeting

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

QR16

QUALITY ASSURANCE CHECKLIST
BRIDGES

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

BRIDGE CERTIFIED

Organisation	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR17

QUALITY ASSURANCE CHECKLIST
BERMS

Te Kaunihera o MANUKAU City Council

BERM CHECKLIST

SP No/Name _____
Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: The purpose is to check that the berm is fully reinstated and constructed to MCC requirements

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm berm requirements (i.e. crossfall, grassing). Provide material tests. Refer to EQS 6.B.2.6			
	2	Ensure all lighting, utility boxes and lids are all complete and backfilled			
	3	Ensure all kerb and channel and footpath works are complete and surplus materials removed			
	4	Topsoil shall be spread and compacted to EQS requirements 6.B.5.5. Ensure topsoil is graded so that there are no ridges adjacent to the kerb and channel, footpath and no ponding areas			
	5	The grass seed shall be a perennial Rye/Clover mixture grass seed and sown at a rate of 1kg per 30m^2 as per EQS 6.B.5.5			
	6	Contractor to ensure quality control checks are undertaken (i.e. verification of materials, environmental conditions, grass seed)			
Developer's Consultant	1	Confirm design and specification meet MCC requirements			
	2	Recheck Contractor submitted test results of materials. Confirm specification, etc are met			
	3	Confirm inspection times (i.e. base prior to boxing and after boxing)			
	4	Monitoring inspections during construction to ensure compliance with MCC specifications (i.e. concrete			

QR17

QUALITY ASSURANCE CHECKLIST
BERMS

Organisation	Item No	Action Required	Yes	No	N/A
		placement and broom finish, experienced concrete workers and good on-site QA)			
	5	After all works are complete, carry out an inspection with the Contractor to confirm everything is within specification			
	6	Book in final berm inspection with Council Representative (once all work is completed) and provide them with all quality assurance checklists and as-built berm information			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

BERM CERTIFIED

Organization	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QR18

QUALITY ASSURANCE CHECKLIST
STREETLIGHITING

Te Kaunihera o MANUKAU City Council

STREET LIGHTING CHECKLIST

SP No/Name _____
Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: The purpose is to check streetlights are acceptable and constructed and installed to MCC, TNZ and manufacturers requirements

PRE-INSPECTION TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Confirm Design meets AS/NZS 1158 (i.e. Spacing/Position, Materials, lighting and light spill), MCC Council Public Lighting Design Standard and EQS			
	2	Certificate of Electrical Compliance for streetlights			
	3	Confirm all materials used are MANARC approved (poles/lanterns)			
	4	Ensure landscaping plan does not interfere with lighting design when landscaping is matured (i.e. trees)			
	5	Confirm Set out is accurate (verify offset and boundaries)			
	6	Laying of Cable is done an approved contractor			
	7	Reinstatement of Ground (topsoil, footpath etc)			
Developer's Consultant	1	Confirm design and specification meet MCC requirements			
	2	Recheck Contractor submitted test results of materials. Confirm specification, etc are met			
	3	Certificate of Electrical Compliance for			

QR18

QUALITY ASSURANCE CHECKLIST
STREETLIGHITING

Organisation	Item No	Action Required	Yes	No	N/A
		streetlights			
	4	After all works are complete, carry out an inspection with the Contractor to confirm everything is within specification			
	5	Book in streetlight inspection with Council Representative (once all work is completed) and provide them with all quality assurance checklists and as-built street light information			

FINAL INSPECTION & TEST SITE MEETING

In Attendance:

Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Council Representative	1	Testing, QA sheets and as-built information are adequate and complete for historic records			
	2	100% visual check of the final product to ensure all within specification			
	3	All information filed within Roading Quality Assurance File for Contract/Subdivision			

ITEMS TO BE PROVIDED / CORRECTED

No.	Action Required	Party to Action	Acceptance	
			Approved	Date

STREET LIGHT CERTIFIED

Organization	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

QP1

QUALITY ASSURANCE CHECKLIST
PRE-DEFECTS LIABILITY PERIOD
STREET TREES AND GARDENS

Te Kaunihera o MANUKAU City Council

PRE-DEFECTS LIABILITY PERIOD STREET TREES AMD GARDENS CHECKLIST

SP No/Name _____
Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

OBJECTIVE: The purpose of Inspection of street trees and gardens is to determine the start of Consultant defects liability period and expected standards at end of defects liability period

PRE – MEETING TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Complete all works as indicated on Manukau Parks Approved Consent drawings and to all Consent conditions			
	2	Ensure design and specification of all Street Tree and Street Garden works are in accordance with MCC Parks Development Standards			
	3	Provide copy of Manukau Parks Approved Consent drawings and Conditions, and any other relevant information necessary for site inspection (e.g. street lighting plan)			

PRE – DEFECTS LIABILITY PERIOD SITE INSPECTION

In Attendance

Contractor _____
Developer's Consultant _____
Parks Representative _____
Others (Specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Parks Representative	**1**	100% visual check to ensure all completed Street Tree and Street Garden works are in accordance to MCC Parks Development Standards			

QP1

QUALITY ASSURANCE CHECKLIST
PRE-DEFECTS LIABILITY PERIOD
STREET TREES AND GARDENS

Te Kaunihera o MANUKAU City Council

Organisation	Item No	Action Required	Yes	No	N/A
	2	All information recorded on MCC Parks database			
	3	Ensure all pre defects liability period amendments are outlined and documented between the Contractor and Manukau Parks			

ITEMS TO BE PROVIDED / CORRECTED

No	Action Required	Acceptance	
		Approved	**Date**

DEFECTS LIABILITY PERIOD

3 Months 1 Year 2 Years Not Applicable

Start of Defects Liability Period _____ End of Defects Liability Period _____

Organisation	Printed Name/Qualification	Signed	Date
Contractor			
Developer's Consultant			
Parks Rep			

QP2

QUALITY ASSURANCE CHECKLIST
POST DEFECTS LIABILITY PERIOD
STREET TREES AND GARDENS

Te Kaunihera o MANUKAU City Council

POST DEFECTS LIABILITY STREET TREES AMD GARDENS CHECKLIST

SP No/Name _____ **OBJECTIVE**
Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

OBJECTIVE: The purpose of final inspection of street trees at end of defects liability period is to ensure the areas suitable for Council to take over

PRE – MEETING TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Ensure amended Street Tree and Street Garden works comply with MCC Parks Development standards as agreed at pre-maintenance inspection			
	2	Ensure all completed Street Tree and Street Garden works are in accordance with MCC Parks Development Standards			
	3	Provide copy of Manukau Parks Approved Consent drawings and Conditions, and any other relevant information necessary for final site inspection (e.g. approved amended plans)			

FINAL SITE INSPECTION

In Attendance:
Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Parks Representative	**1**	100% visual check of the completed works to ensure all works are in accordance with MCC Parks Development Standards			
	2	100% visual check to ensure all amended works are in accordance with MCC Parks Development Standards			

QP2

QUALITY ASSURANCE CHECKLIST
POST DEFECTS LIABILITY PERIOD
STREET TREES AND GARDENS

Te Kaunihera o MANUKAU City Council

ITEMS TO BE PROVIDED / CORRECTED

No	Action Required	Acceptance	
		Approved	Date

HANDOVER

Street Trees and Street Gardens are now acceptable for handover to Council for on-going maintenance.

Council to take over maintenance as from _____

Organisation	Printed Name/Qualification	Signed	Date
Contractor			
Developer's Consultant			
Parks Rep			

QP3

QUALITY ASSURANCE CHECKLIST
PRE-DEFECTS LIABILITY PERIOD
RESERVES

Te Kaunihera o MANUKAU City Council

RESERVES CHECKLIST

SP No/Name _____
Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

OBJECTIVE: The purpose for the Inspection of reserves is to determine the start of Consultant defects liability period and expected standards at end of defects liability period

PRE – MEETING TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Complete all works as indicated on Manukau Parks Approved Consent drawings and to all Consent conditions			
	2	Ensure design and specification of all Reserves works are in accordance with MCC Parks Development Standards			
	3	Provide copy of Manukau Parks Approved Consent drawings and Conditions, and any other relevant information necessary for site inspection (e arborists report)			

FINAL SITE INSPECTION

In Attendance:
Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Parks Representative	**1**	100% visual check to ensure all completed Reserves works are in accordance to MCC Parks Development Standards			

QP3

QUALITY ASSURANCE CHECKLIST
PRE-DEFECTS LIABILITY PERIOD
RESERVES

Organisation	Item No	Action Required	Yes	No	N/A
	2	All information recorded on MCC Parks database			
	3	Ensure all pre-defects liability period amendments are outlined and documented between the Contractor and Manukau Parks			

ITEMS TO BE PROVIDED / CORRECTED

No	Action Required	Acceptance	
		Approved	**Date**

DEFECTS LIABILITY PERIOD

3 Months 1 Year 2 Years Not Applicable

Start of Defects Liability Period _____ End of Defects Liability Period _____

Organisation	Printed Name/Qualification	Signed	Date
Contractor			
Developer's Consultant			
Parks Rep			

QP4

QUALITY ASSURANCE CHECKLIST
POST DEFECTS LIABILITY PERIOD
RESERVES

Te Kaunihera o MANUKAU City Council

RESERVES CHECKLIST

SP No/Name _____
Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

OBJECTIVE: The purpose of the final inspection of reserves at end of defects liability period is to ensure that the areas are suitable for Council to take over

PRE – MEETING TASKS

Organisation	Item No	Action Required	Yes	No	N/A
Contractor	1	Ensure amended Reserve works comply with MCC Parks Development standards as agreed at pre-maintenance inspection			
	2	Ensure all completed Reserves works are in accordance with MCC Parks Development Standards			
	3	Provide copy of Manukau Parks Approved Consent drawings and Conditions, and any other relevant information necessary for final site inspection (e.g. approved amended plans)			

FINAL SITE INSPECTION

In Attendance:
Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Organisation	Item No	Action Required	Yes	No	N/A
Parks Representative	**1**	100% visual check of the completed works to ensure all works are in accordance with MCC Parks Development Standards			

QP4

QUALITY ASSURANCE CHECKLIST
POST DEFECTS LIABILITY PERIOD
RESERVES

Organisation	Item No	Action Required	Yes	No	N/A
	2	100% visual check to ensure all amended works are in accordance with MCC Parks Development Standards			

ITEMS TO BE PROVIDED / CORRECTED

No	Action Required	Acceptance	
		Approved	**Date**

HANDOVER

Reserves are now acceptable for handover to Council for on-going maintenance.

Council to take over maintenance as from _____

Organisation	Printed Name/Qualification	Signed	Date
Contractor			
Developer's Consultant			
Parks Rep			

QFIN

QUALITY ASSURANCE CHECKLIST
FINAL SITE INSPECTION AND RELEASE

Te Kaunihera o MANUKAU City Council

SP No/Name _____
Contract No/Name _____
Developer/Applicant _____
Developer's Consultant _____
Contractor _____

Sub-Contractor _____
Date _____

Road Name _____ Chainage _____

OBJECTIVE: Final inspection of total development site to ensure all works are completed or bonded for prior to acceptance by Council.

FINAL FIELD INSPECTION SITE MEETING

In Attendance:
Contractor _____
Developer's Consultant _____
Council Representative _____
Others (specify) _____

Item No	Action Required	Yes	No	N/A
1	**Check all items which failed previous inspections**			
a	Earthworks			
b	Drainage			
	Wastewater			
	Stormwater			
c	Water Reticulation			
d	Roading			
e	Parks			
2	**General**			
a	Surplus material removed			
b	Drainage reticulation topsoiled and grassed			

QFIN

QUALITY ASSURANCE CHECKLIST
FINAL SITE INSPECTION AND RELEASE

Te Kaunihera o MANUKAU City Council

Item No	Action Required	Yes	No	N/A
c	Manhole lids level with surrounding area/clear of boundaries			
d	Carriageway and berms clear of rubbish			
e	Grass take on topsoiled berms			
f	Water reticulation, boxes and kerb markings are in place			
g	Check concrete paths vehicle crossings & drives for cracks			
h	Channel swept and catchpits empty of debris			
i	Road surface acceptable			
j	Fences erected where required			
k	Warning sign at end of stage roads			
l	Restoration after telecommunication, electricity, gas, etc.			
m	Right of entry releases			
n	Uncompleted items to be bonded for			
o	See details of Bond Schedule			

ITEMS TO BE PROVIDED / CORRECTED

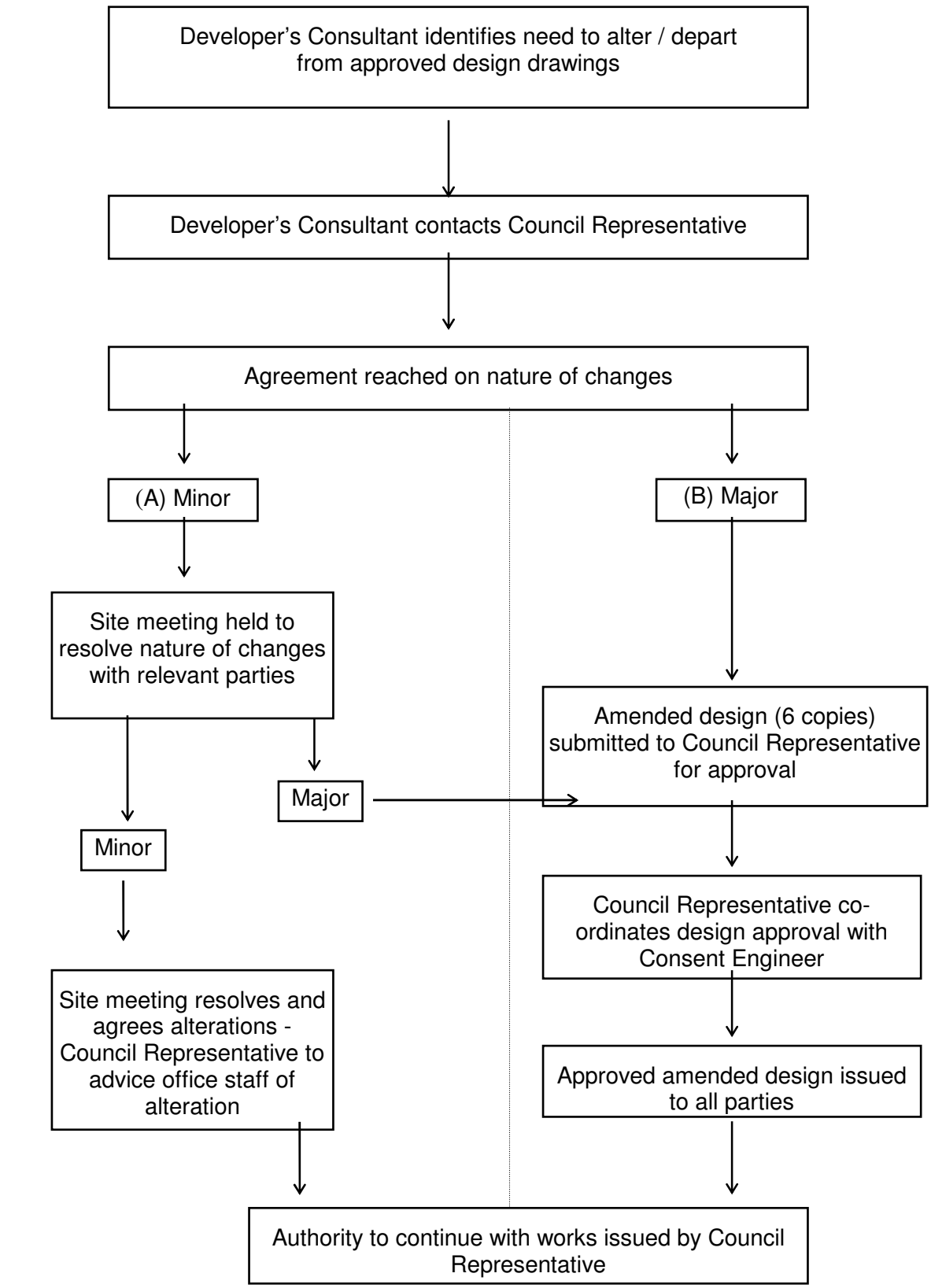
No.	Action Required	Party to Action	Acceptance	
			Approved	Date

FINAL INSPECTION SITE INSPECTION CERTIFIED

Organization	Printed Name/Qualification	Signed	Date
Contractor:			
Developer's Consultant:			
Council Rep:			

Appendix 2
Procedure to Amend Approved Engineering Drawings

PROCEDURE TO AMEND APPROVED ENGINEERING DRAWINGS



Appendix 3
Construction Quality Plan

CONSTRUCTION QUALITY PLAN

Te Kaunihera o MANUKAU City Council

Purpose

The purpose of this document is to detail the on going inspection that is to be provided by the Developer's Consultant. Council wish to ensure that the assets that will be vested meet the quality and design life requirements for these assets.

Responsibility

Construction Quality Plan is required under Section 1 of the QAM. It is to be submitted by the Developer's Consultant to the Council Representative at the preconstruction meeting. Work on site shall not commence until this plan is accepted by the Council Representative.

The amount of time the Developer's Consultant needs to spend on quality assurance in accordance with their quality plan will depend on:

(a) The Contractor's workmanship and previous experience, and the Developer's Consultant /Contractor relationship.

(b) The Developer's Consultant ensuring observation/inspection and records of Works in Progress will be sufficient and complete for Council verification purposes (if requested), and to provide Council with a certificate stating that the works have been completed in accordance with sound and accepted engineering principles and the conditions of the Resource Consent and approved drawings (or approved amendments thereto) shown on the Manukau City Council and/or Manukau Water stamped approved plans.

(c) The scope and complexity of the project.

Requirements

The Construction Quality Plan shall include the following details for the on going inspection of the development:

- A brief description of the scope of the project
- Contractor(s) and all contact details
- Developer's Consultant and all contact details
- Whom from the consultancy will be carrying out inspections
- Confirm the Developer's Consultant duties will include confirming compliance with the Health & Safety policy and procedures for the site. Records of site safety audits are to be retained by the Developer's Consultant.

- Relevant experience and training of the person(s) who will carry out inspections

- State the expected number or frequency of inspections the Developer's Consultant will carry out during the course of the project. Include any checklists that will be used. Checklists may need to be inspection specific.

- Note that these inspections and checklists are to meet or exceed the requirements stated in the QAM under following sections:

    - Earthworks
    - Stormwater
    - Water Supply and Wastewater
    - Roading
    - Parks
    - Appendices

- State the documentation and filing procedures for these inspection records. A record is to be retained of each inspection. Depending on the scope of project, records of weather, site conditions, work completed since last inspection, work in progress, personnel on site, plant on site, materials on site, problems/delays, instructions given are typical requirements for site visit records. Complex projects may require a summary breakdown to be kept for each asset grouping to ensure that essential inspections are not missed.

- Records of set out inspections for agreed alignments of pipe networks and road or kerb alignments/levels must be retained by the Developer's Consultant. The plan must include the blank forms to be used. It is suggested that best practice is that the Contractor is required to countersign these.

- State how instructions to Contractors will be recorded (for variations and rework). Note that the Council Representative must be consulted and Council Representative agreement confirmed to any variation or to any non-compliance adjudged not requiring rework.

- State any proposals for regular site meetings.

- State what quality assurance procedures and documentation will apply to Contractors activities. For example, letters of Engineering approval related to water supply require contract conditions include a requirement that at the end of each day's work, there is a written record of the location and specification of the pipes & fittings placed, confirmations that all pipes were laid with clean bore and pipe ends capped or plugged.

- State that the Council Representative will be notified at least 24 hours prior to any of the following milestone events:
- Commencement of work by any new work group on site

Earthworks

- Commencement of work
- Season and Christmas closedowns
- Final contours prior to top soiling

Stormwater

- Commencement of work
- Commencement of work on a stormwater quality device

Water Supply and Wastewater

- Refer to Manukau Water Limited Requirements.

Roading

- Commencement of work
- Date of commencement of any undercut work, cement or lime stabilisation, supply of each basecourse type, kerbing, construction of footpaths, erection of streetlights

Parks

- Commencement of street planting

The above notifications may be via site meetings for the larger projects, otherwise by e-mail or the preconstruction meeting. The above list excludes the inspections that QAM requires. The Council Representative may elect to come to site on the day of the above milestones.

Appendix 4
Environmental Management Plan

ENVIRONMENTAL MANAGEMENT PLAN

Contract	Date
Site	Location **RP** **to** **RP**

In order that the Developer's Consultant and the Contractor meet their obligations under the Resource Management Act 1991 the Developer's Consultant shall prepare an Environmental Management Plan for Manukau City Council to approve prior to commencing work. Sediment and pollution control shall comply with:

- ARC TP 90 Silt and Sediment Control
- ARC guidelines on drill slurry control.

Where the works require Resource Consent from the ARC, the Developer's Consultant will have obtained resource consent and supplied a copy of the conditions and any silt and sediment control plan to the Manukau City Council.

Please indicate how you intend to avoid or mitigate any potential effects on the environment:

Avoid / Minimise / Mitigation (tick where applicable):

	Item				
a.	General	Minimise disturbance ☐	Stage Construction ☐	Stabilise exposed areas rapidly ☐	Perimeter controls ☐
b.	Works in or near a watercourse that is constantly flowing. Y/N	Clean water diversion/sand bagging and pumping ☐	Work in dry weather only and keep construction duration short. ☐	Short sections only disturbed. ☐	Stabilise stream bed with bedding material at end of each day. ☐
c.	Works in a drain/ overland flow path that are normally dry. Y/N	Work in dry weather only. ☐	Clean water diversion ☐	Short sections only disturbed ☐	Silt fence across flow paths below work ☐
d.	Works near a piped system Y/N	Ensure existing system continues to operate ☐	Protect inlets/ stumps by geofabric filters or *Enviropods* ☐	'dry' clean contaminated hard surfaces ☐	Perimeter controls
e.	Stockpile of metal/ soil Y/N	Temporary only (1 day) ☐	Clear of flow paths ☐	Silt fence around perimeter ☐	Keep topsoil and subsoil separate ☐

ENVIRONMENTAL MANAGEMENT PLAN

f.	Areas of exposed earth Y/N	Spread topsoil and grass as soon as possible ☐	Spread mulch to resist erosion ☐	Contour drains to minimise long lengths of slope ☐	Divert water ☐
g.	Steep slopes Y/N	Diver water ☐	Grass filter strip below ☐	Contour drains to minimise long lengths of slope. ☐	Hydroseed and mulch ☐
h.	Materials damaging to the environment concrete/ lime/ petroleum based products Y/N	Work in dry weather only ☐	Have plastic cover available ☐	Runoff diversion ☐	
i.	Removal of contaminated soil (i.e. asbestos) Y/N	Work in dry weather only ☐	Have plastic cover available ☐	Runoff diversion ☐	
j.	Working near trees Y/N	Keep excavation clear of drip line ☐	If root cutting is unavoidable trim any roots cut neatly to minimise infection ☐	Consult arborist on significant trees ☐	Any salvaged plants to be kept wet and replanted asap ☐
k.	Over compaction of soils Y/N	Avoid working in wet weather ☐	Minimise size and movements of machinery ☐	Compaction relief of topsoil at end of job ☐	Confine vehicle movements to vicinity of works ☐
l.	Other	Remove rubbish from site ☐			

..... Developer's Consultant

/ / Date

..... Council Representative

/ / Date

Appendix 5
Quality Assurance Completion Documentation Index

QUALITY ASSURANCE COMPLETION DOCUMENTATION INDEX

Te Kaunihera o MANUKAU City Council

Section 8 of the QAM Manual clarifies these submission references. The references on this index sheet are to the thumb index sheet separators in the ring binder used for the QAM documentation submission for larger projects.

Ref	Form/Item	Completed √	Comment
1	CORRESPONDENCE Including letter of request for s224c addressing all s105 resource consent conditions.		
2	QUALITY ASSURANCE RECORDS		
2.1	Works in Progress Records		
2.2	Preconstruction Meeting		
2.3	Quality Assurance Checklists (Appendix 1)		
2.4	Stormwater and Wastewater Final Inspection		
2.5	Water Supply Final Inspection		
2.6	Subgrade Final Inspection	.	
2.7	Basecourse Final Inspection		
2.8	Final Inspection of Carriageway Pavement Surface		
2.8	Catchpits / Kerb & Channel / Footpaths / Berms Inspection		
2.9	Traffic Controls Inspection		
2.8	Road Markings Inspection		
2.9	Traffic Controls Inspection		
2.10	Road Markings Inspection		
2.11	Final Inspection		
2.12	As-built Drawings		
2.13	RAMM Data		

QUALITY ASSURANCE COMPLETION DOCUMENTATION INDEX

Ref	Form/Item	Completed √	Comment
3	FINAL AS-BUILTS (Inc Overland Flow Path Details)		
4	BOND RECORDS		
5	TEST RESULTS		
6	GEOTECHNICAL COMPLETION REPORTS (May be held in Front Cover)		
7	WARRANTIES, PRODUCER STATEMENTS, CERTIFICATE OF STREETLIGHT ILLUMINATION, ETC.		
8	COMPLETION CERTIFICATES & CODE OF COMPLIANCE CERTIFICATES		
9	UTILITY SERVICES DETAILS		
10	DETAILS OF LIMITED SERVICING		
11	RIGHT OF ENTRY RELEASE		
12	BARTER INVOICE		
13	SURVEY SHEET SHOWING CO-ORDINATES (A3)		
14	CURRENT COPY OF DEPOSITED PLANS		
15	AGREEMENTS (eg. Heads of Agreement, Cost Sharing Agreements)		
16	OPERATING / MAINTENANCE MANUAL		

Appendix 6
Defects Liability Certificate

DEFECTS LIABILITY CERTIFICATE

Te Kaunihera o MANUKAU City Council

Contract No/Name…….....

Developer/Applicant…….

Developer's Consultant…….……

Contractor…….....

Sub-Contractor…….…….

Date of Expiration of Defects Liability Period.....……...……

Location……...…

Job Description……...…

……..

……..

Asset Description……

I, _____ being a Chartered Professional Engineer or Registered Professional Surveyor on the IPENZ Civil Practice College Register under the provisions of the Chartered Professional Engineer Act 2002, or a Registered Professional Surveyor on the Institute of Professional Surveyors List, acknowledge that the Period of Defects Liability has expired and that all of the defects identified during the final inspection and those that have occurred within the Period of Defects Liability have been remedied

_____

Chartered Professional Engineer or Registered Professional Surveyor

Date _____

This form is completed by the Developer's Consultant and forwarded to the Council and Contractors.

Appendix 7
Cash Bond Receipt Conditions

CASH BOND RECEIPT CONDITIONS

THE MANUKAU CITY COUNCIL acknowledges:

a. Receipt of the cash bond (receipt No. interim/final)
b. That such sum is to be held by it as a cash bond for uncompleted subdivisional works on the conditions set out below.

The Owner described below for himself his successors and assigns, confirms and ratifies that the conditions set out below are the conditions upon which the cash bond has been lodged and covenants to complete the work listed in the Schedule by the date specified.

CONDITIONS

1. If the Owner completes all the work listed in the Schedule below to the satisfaction of the Council by the date specified, the sum shall be refunded to the Owner in full.

2. If the Owner does not complete all the work listed in the Schedule by the specified date the Council may enter onto the land and carry out or cause to be carried out the uncompleted work and recover the cost from the cash bond.

3. The Council is not however, obliged to carry out all or any of the uncompleted work and if it chooses to carry out any uncompleted work it does so without prejudice to the exercise of any other rights, remedies, or powers which it may have against the Owner.

4. Any bond monies remaining after payment of the costs of completing the works and confirming compliance will be returned to the Owner. An invoice will be issued in due course for those costs.

5. Outstanding fees must be paid prior to the last release of Bond Monies.

DATED the day of 20

SCHEDULE

THE OWNER

RESOURCE CONSENT NO:

THE WORK

THE DATE FOR COMPLETION OF THE WORK

CASH BOND RECEIVED $

CASHIER (Receipt to Acct 950/71010/R37)

SIGNED by the OWNER
In the presence of: _____

THIS BOND FORM IS NOT APPLICABLE FOR NON SUBDIVISIONAL WORKS.

Appendix 8
Barter Invoice – Developer Tax Invoice

BARTER INVOICE
FOR DEVELOPER TAX INVOICE
GST REGISTERED APPLICANT

Company name: _____

Address: _____

GST No: _____ Date: _____

Issued to **Manukau City Council**

Dr to: _____ (Developer)

For barter with **Manukau City Council** of roading, reserve, drainage, watermain included in SP_____ subdivision / development located at _____

LT Plan No(s): _____

Land to vest as road, accessway &/or service lane:
_____ m^2 @ $ _____ m^2 _____(incl GST)

Land to vest as reserves:
_____ m^2 @ $ _____ m^2 _____(incl GST)

Construction cost:	Carriageway	$ _____plus GST	_____(incl GST)
	Concrete works	$ _____plus GST	_____(incl GST)
	Wastewater	$ _____plus GST	_____(incl GST)
	Stormwater	$ _____plus GST	_____(incl GST)
	Stormwater Ponds	$ _____plus GST	_____(incl GST)
	Water reticulation	$ _____plus GST	_____(incl GST)
	Streetlighting	$ _____plus GST	_____(incl GST)
	Structures	$ _____plus GST	_____(incl GST)
	Total		_____(incl GST)

I verify these are full and actual costs.

_____
Chartered Professional Engineer or Registered Professional Surveyor

Date _____

Appendix 9
Completion Certificate

COMPLETION CERTIFICATE

ISSUED BY:.....
(Suitably qualified professional)

TO: .....
(Local Authority)

COPY TO BE SUPPLIED TO:.....

IN RESPECT OF: .....
(Description of work)

AT: .....
(Address)

…… has been engaged by .....
(Developer's Consultants Firm) *(Owner/Principal)*

to provide construction observation, review and certification services in respect of the above work. My qualifications and experience related to this work are:

.....
.....

I am familiar with the conditions of consent to the works, and the specification and drawings as granted and approved by :……
(*Local Authority)*

As an independent professional I or personnel under my control have carried out regular observations, inspections and testing of the work and based upon these regular observations, inspections and tests, information supplied by the Contractor during the course of the works and the Contractor's certification upon completion of the works (copy attached) I BELIEVE ON REASONABLE GROUNDS that the works other than those outstanding works listed below, have been completed in accordance with the above consent and that good, normally acceptable Engineering design and construction implementation practices have been undertaken. I Believe on Reasonable Grounds that the work has been carried out to the standard as required by the Manukau City Council. Details of the regular observations, inspections and testing are attached.

..... Date .....
(Signature suitably qualified Professional)

..... Member CPENG RPS
(Professional Qualifications)

.....
(Address)

Current Policy of Professional Indemnity Insurance : Yes / No

Outstanding Works

Appendix 10
Producer Statement – Contractor's Completion Certificate

PRODUCER STATEMENT
CONTRACTOR'S COMPLETION CERTIFICATE

ISSUED BY:.....
(Contractor)

TO: .....
(Developer's Consultant)

TO BE SUPPLIED TO: .....
(Developer)

IN RESPECT OF: .....
(Description of work)

AT:.....

.....
(Address)

…….has contracted to .....
(Contractor) *(Principal/developer)*

to carry out and complete certain work in accordance with a contract, titled Contract No.....for…… ("The Contract")

I…….. a duly authorised representative of .....
(Duly Authorised Agent) *(Contractor)*

hereby certify that.....
(Contractor)

has carried out and completed works, other than those outstanding works listed below, in accordance with the resource consent conditions, the approved Engineering Plans, EQS and all other relevant Council Standards.

……..…….. Date: .....
(Signature of Authorised Agent on behalf of)

……..…..
(Contractor)

……

……..……..
(Address)

Outstanding Works.....

Appendix 11
Roading As-built Requirements

ROADING AS-BUILT REQUIREMENTS

INTRODUCTION

This specification sets out requirements of Manukau City Council (MCC) for preparing "As-Built" information by Contractors, Developers, Developer's Consultants and other parties involved in undertaking the renewal of an existing asset or creating a new asset.

The following is a list of the main categories of capital projects undertaken within MCC network:

- New Roading Projects
- Rehabilitation and Realignment of Existing Roads
- Intersection Improvements
- Traffic Signals
- Land Development (subdivisions)
- Roading Maintenance Works
- Stormwater/Drainage Services
- Traffic Signs
- Traffic Controls
- Street Lighting
- Street Furniture
- Structures

ASSET DEFINITIONS

Creation of New Assets (New capital works only)

This asset group is used to cover the creation of new assets to provide or improve the level of service or provide a commercial return.

This asset group applies to one or more of the following works:

- Works which create an asset or component that did not exist in any shape or form, or
- Works, which upgrade an asset component beyond its original capacity or service potential.

Examples of such work include:

- New land development
- Extension of an existing road infrastructure
- New bridges
- New footpaths or street furniture

Asset Renewals (Replacement and Rehabilitation works only)

This asset group covers works required to restore an asset component to ensure that the required level of service can be delivered.

This asset group applies to work being undertaken on an existing asset

PROCEDURE

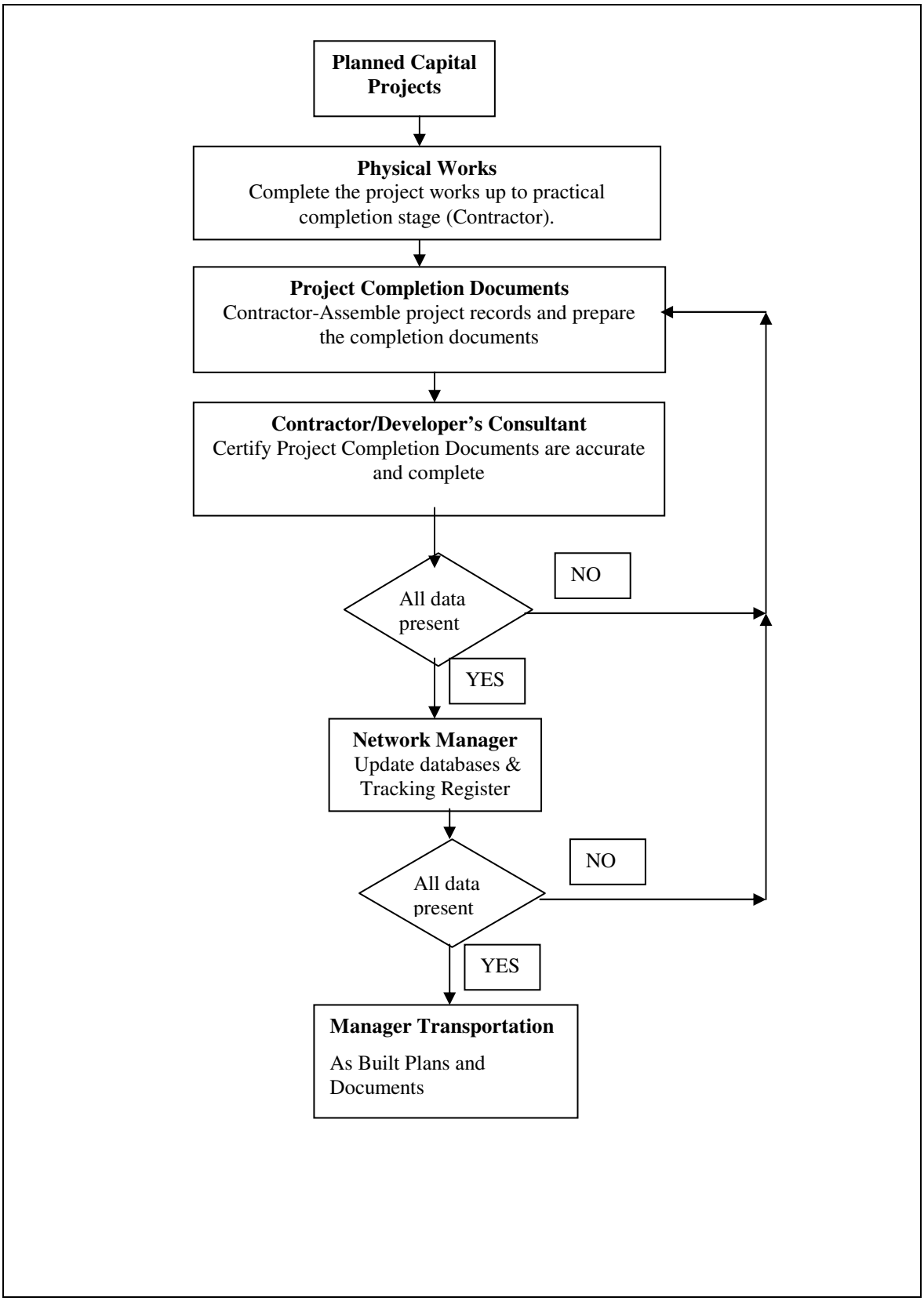
The provision of "As-Built Drawing and Asset Data" is an important phase for effective asset management. Specifications for all capital works need to include data collection and handover arrangements.

The provisions of "As-Built Drawings and Asset Data" requirements for all capital projects undertaken on behalf of MCC need to be incorporated in contract clauses. Suggested clauses may include the following:

- At the completion of all MCC generated capital projects (new and renewal works) the Contractor shall submit to the Infrastructure and Waste Manager all required Roading As-Built Drawings and Associated Asset Data at the component level in a format as specified in the As-Built Specification.
- All As-Built drawings and associated information are to be submitted to the Transportation Manager and approved prior to the issue of the Practical Completion Certificate for all new works and renewal works.
- The Network Manager shall ensure that all information has been received prior to the issue of Practical Completion Certificate for new works. For renewals MCC or its authorised Representative (Developer's Consultant or Contractor) shall ensure that all information has been received prior to issue of Practical Completion Certificate.
- On completion of each project, the Network Manager shall submit a report on the status of project and updated asset inventory/tracking register to the Manager Infrastructure and Waste.

The "As Built" drawings and data approval process is outlined in Figure 2.0.

Figure 2.0: Capital Projects As-Built Drawings and Asset Data Approval Process



Handover Procedures – New Assets to be vested

Capital projects, such as Land Development where the asset is to be vested to Council, As-Built and asset data requirements must be submitted by the Developers or Developer's Consultants prior to the request for the *"Practical Completion Certificate".*

The following are the requirements:

- At the completion of each subdivision all vested assets (Roading) As-Built Drawings and associated asset data at the component level must be submitted in a format as stated in this specification.
- All as built drawings and associated information must be submitted and approved by the Transportation Manager prior to approval of the "224c Certificate".
- The Network Manager shall ensure that all information has been received prior to issue of the "224c Certificate".

Handover Procedures – Renewal Projects

Capital projects where an existing asset is being upgraded the asset data requirements must be submitted by the Developer's Consultant or Contractor prior to the request for the *"Practical Completion Certificate".*

The following are the requirements:

- At the completion of each project, all the components that are being upgraded or that are being affected by the upgrade shall have As-Built Drawings and associated asset data at the component level and must be submitted in a format as stated in this specification.
- All As-Built drawings and associated information must be submitted and approved by the Manager Infrastructure and Waste prior to approval of the "Practical Completion Certificate".
- The Network Manager shall ensure that all information has been received prior to issue of the "Practical Completion Certificate".

AS BUILT DRAWING REQUIREMENTS AND STANDARDS

Requirements

"As-Built" requirements are usually included in the following documents depending upon the nature of work involved:

- Professional Services Contract
- Physical Works Contracts
- Subdivision Approvals
- Development Approvals
- Airspace/Subsoil Approvals
- Construction and Maintenance Agreement
- Stormwater/Water/Drainage Contracts

The general requirements for "As-built" information include:

- Final construction drawings showing roading details such as layout and construction details. Construction plans should be submitted according to the requirements as specified in MCC Engineering Quality Standards.
- Drawing details showing traffic management details such as traffic islands, signals, pedestrian crossings, road marking.
- RAMM data sheets providing road inventory, resurfacing, geometry, stormwater, water, wastewater and structures within the road reserve (Refer Appendices).
- Certification by a Chartered Professional Engineer or Registered Professional Surveyor guaranteeing the accuracy of the plans for new works.
- All roading "As-Built" drawings (new/renewal and vested assets) must contain the information shown in Data Standards Table.

Technical Drawing Standards

The as built drawings shall be provided in A3 size with the following details.

Drawing Standard

All drawings shall comply with AS/NZS 1100 Technical Drawing Standard

Title Page

The following general information shall be provided on the block sheets:

- Title
- Plan Number
- Contract and subdivision Number
- Scale
- Date
- North Directional Arrow sign
- Engineers Approval
- Engineer/Developer's Consultant/Surveyor's certification and name

Copies of Documents

- 3 Copies of A3 As Built drawings
- Digital AutoCAD DXF in electronic format
- 2 copies of RAMM data sheets

As-Built Certification

The paper copies of the As-Built drawings must include a signed statement by the Chartered Professional Engineer or Registered Professional Surveyor in the following manner:

I certify and guarantee that these as-built drawings are an accurate record of the works undertaken and that the survey is within the required tolerances.

Signed:……

Chartered Professional Engineer or Registered Professional Surveyor

Date:

Name:

Address:

Contact Phone

Email:

ASSET ATTRIBUTES DATA REQUIREMENTS

All roading asset attribute information shall be provided for all MCC generated capital (new/renewal works) projects and vested assets from the developer at the time that the 'As-Built" drawings are provided to Council.

The roading asset attribute shall be submitted according to the requirements in the following tables:

Data Standards		
Asset Type/Class	**Methodology**	**Attributes**
Bridges	▪ Record X ,Y& Z Coordinates ▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ ▪ Show cross and longitudinal sections of bridge	As per RAMM Inventory Sheets
Culverts/Catchpits	▪ Record X,Y & Z coordinates for catchpit OR upstream and downstream invert level of culverts ▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ	As per RAMM Inventory Sheets
Footpaths & Accessway	▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ ▪ Show typical cross section of footpath (scale 1:50)	As per RAMM Inventory Sheets
Kerb and Channel	▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ	As per RAMM Inventory Sheets
Pavement • Surface • Base-course • Sub-base	▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ ▪ Show typical cross sections of pavement (scale 1:50) and longitudinal sections of carriageway centre line surface (scale 1:500 or 1000)	As per RAMM Inventory Sheets
Safety Furniture	▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ	As per RAMM Inventory Sheets

Data Standards		
Asset Type/Class	**Methodology**	**Attributes**
Street Furniture	▪ Record X & Y coordinates ▪ Plot in Mt Eden Circuit coordinates	As per RAMM Inventory Sheets
Street Lights	▪ Record X & Y coordinates ▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ	As per RAMM Inventory Sheets
Structures • Retaining Walls • Underpass	▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ	As per RAMM Inventory Sheets
Traffic Signs	▪ Record X & Y coordinates ▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ	As per RAMM Inventory Sheets
Traffic Signals	▪ Record X & Y coordinates ▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ ▪ Show typical cross sections of traffic signal (Scale 1:50)	As per RAMM Inventory Sheets
Traffic Controls • Roundabout • Island • Pedestrian Refuge	▪ Plot in Mt Eden Circuit Coordinates in terms of NZGD 1949 unless NZGD2000 approved by LINZ ▪ Show typical cross sections of traffic signal (Scale 1:50)	As per RAMM Inventory Sheets

Note:

- X and Y coordinates are to be submitted for all polylines (such as pavement, footpath, carparks etc.) at the start and end displacements for each section or treatment length (for example at each change point where width varies more than 1m for carriageway and 0.5m for footpath)
- Every new asset is to be linked to an existing asset that is correctly recorded in GIS coverage. If an existing asset is not shown in GIS, or incorrectly recorded than a proper As-Built drawing is to be submitted for existing and new assets to ensure the connectivity.

Roading Details – Requirements

Depending upon the nature of physical work the following details shall be provided on the 'As –Built' drawings:

- Road geometry showing carriageway dimensions and alignments
- New kerb and channel
- Footpath alignments
- Driveways
- Pavement construction for new road carriageway and footpath construction. This shall include metal source, depth of base course and sub base, undercutting, remedial treatment for poor strength
- All existing site features with an overlay of new works to ensure that changes could be easily identified
- Sub-grades and details of the bitumen and stone used for the road and footpath surfacing
- Surfacing types such as asphalt, concrete, chip seal, slurry, interlocking brick pavers, etc
- Property boundaries/Property numbers
- Road /footpath typical cross sections
- Survey boxes/stations
- Parking bays/Bus Bays

Traffic Details

These include:

- Traffic islands and roundabouts details
- Traffic signals including pole numbers/mast arms, aspects, underground ducting, Toby boxes, chambers, detector loops, cabinets and phasing details.
- Pedestrian crossings
- On-street parking signs and road markings
- All road markings and signs
- Road inventory and street furniture's
- Barriers and guard rails
- Landscaping features within the road reserves
- All public utility services equipment on public roads
- Bus shelters/bus stops

SPATIAL DATA

Spatial information includes Point Feature or Node Coordinates

For all point assets (manhole, valve etc) and non-asset nodes (e.g. nodal change, end of line) X, Y and Z (Z refer to lid level) coordinates must be submitted. Similarly X and Y coordinates are required for all polylines and linear assets at the start and end or at each change point (for example curved pipe installed at the cul de sac, X and Y coordinates are to be submitted to the centre of the pipe at each change point).

All "As-Built" drawings, coordinates and features attributes are to be recorded in digital data requirements for each of the assets.

Accuracy

All data must be plotted in Mt Eden Circuit Coordinates in term of New Zealand Geodetic Datum 2000 approved by Land Information New Zealand (LINZ)

Council will require all the graphical data to be located and plotted to the following accuracy:

X and Y Coordinates	± 100mm
Z coordinates	± 10 mm (e.g. manhole cover, hydrant lid level)
Invert Levels	± 10 mm

As-Built drawings shall show all private roads and routes (such as road within major complex or forestry roads etc.) within any subdivision or development. No attribute information is required for private roads and routes.

For measurements on RAMM sheets the following accuracy is required:

Spatial Location Accuracy:

Road Centreline distance	± 500mm per kilometre
Offset distance	± 100mm per kilometre

As-built Measurements:

Length and Width	± 100mm
Depth or vertical measurement	± 10 mm (e.g. manhole cover, hydrant lid level)
Reduced levels or Invert Levels	± 10 mm

Appendix 12
Stromwater As-built Requirements

STORMWATER AS-BUILT REQUIREMENTS

1. REQUIREMENTS

FORMAT OF FILE	• Mapinfo tables • ArcGIS Shape Files • Autocad DWG or DXF (version 12-2000) • Excel Spreadsheet (XYZ data scheduled for all points and line-ends – Excel spreadsheet only) • ArcInfo E00 files Other formats may be used, contact the Engineer.
PROJECTION SYSTEM	File to be projected in Local Circuit (Mt Eden Circuit) NZ Transverse Mercator (NZTM)
HEIGHT DATUM	Height/level measurements to be recorded in terms of LINZ Datum 2000 or failing that 1949.
AUTOCAD USERS	Line/polyline depicting pipes, drains or other polyline/line assets to be objects not dimensions. All asset-related drawing objects must be created in model space; no paper space data is to be included. File names must not have spaces in them. Where a space is required an underscore must be used. File or layer names must not be longer than 30 characters.
OTHER NOTES	Points where pipe attributes change must be indicated with co-ordinate points. Preferred scale of plans is 1:500, with exploded details as required. A2 size plans required Emailed files must be in DXF format or MAPINFO tables
DELIVERY METHOD	Deliver to Relevant Manukau Water Staff Any questions direct them to Asset Data Engineer, Manukau Water on 09-2625499.

The As-Built will be produced electronically and the Contractor will supply them to Council in an appropriate format on suitable media (eg: CD/DVD/FD/E-Mail if total size is less than 3MB). The 3 sets of hardcopies will also be provided on A3 paper, each utility SW / SS / WS / Roading / Pumpstations / Parks & Reserves will be provided on separate sheets of A3 size paper.

2. THE AS-BUILT PLANS SHALL SHOW

(a) Title boundaries (and their information source), road names and **north arrow.**

(b) Main offset distances from the lot boundaries to enable location of all assets.

(c) Contract name and number.

(d) The month and year of construction.

(e) The name and address of the company that carried out the construction works and the name of the Contract Supervisor.

(f) The name and address of the consultant supervising the works.

(g) Any underground services not previously marked on services plans. The Contractor shall note where it was encountered that the existing utility services differed from the council's utility services plans.

(h) Final contour and overland flowpath.

(i) Certification by a Chartered Engineer or Registered Surveyor that the information supplied on the As-Built is accurate within normal acceptable engineering and surveying tolerances. The Principal will accept As-built Plans prepared by a person holding a NZ Certificate in Engineering and/or Surveying provided the person is working under the direction of a Chartered Engineer or Registered Surveyor.

(j) Internal pipe / culvert diameter in millimetres.

(k) Pipe material, Class, Connections

(l) Manufacturer of pipes, valves, manholes and all other fittings, etc.

(m) Parallel distance of house connections and fittings from 2 nearest lot boundaries.

(n) Type, Size (Diameter) and Material of all fittings. If the arrangement of multiple fittings is not clearly legible, the contractor must "explode" the portion of the drawing to show the detail of the fitting configuration.

(o) Pipes and fittings are to be marked as new or existing. Pipelines and manholes that are made redundant as part of the works must be marked as such.

(p) Schedule of co-ordinates of any Manholes, Connections, Inlets/Outlets and Catchpits.

(q) Co-ordinates, lid levels invert levels and depth to LINZ Datum of manholes and outfall structures, and distances from two adjoining boundaries.

(r) Pipes and manholes removed or abandoned.

(s) System to be Coloured in blue (water supply in green, wastewater in red).

3. AS BUILT PLANS QUALITY CHECKLIST

General

- ☐ Plan ID
- ☐ Date
- ☐ Data As Built sheets
- ☐ Street Names and Property ID
- ☐ Abandoned / Replaced (assets clearly identified)
- ☐ Overland flowpath (location, direction, section view and material)
- ☐ Structures (wetlands, ponds and treatment devices) shown

Invert Levels supplied for:

- ☐ Pipes (upstream/downstream)
- ☐ Services (customer end)
- ☐ Manholes (upstream/downstream)
- ☐ Open Channels
- ☐ Subsoil Drains

Coordinates supplied for:

- ☐ Services (customer end)
- ☐ Manholes
- ☐ Catchpits
- ☐ Inlets
- ☐ Outlets
- ☐ Soakage Trenches
- ☐ Subsoil drains
- ☐ Open channels

Pipelines

- ☐ Pipe Diameters
- ☐ Pipe Lengths
- ☐ Pipe Materials and class
- ☐ Rear Boundary
- ☐ Left hand boundary
- ☐ Right hand Boundary
- ☐ Front Boundary

Manholes

- ☐ Manhole ID
- ☐ Lid Level
- ☐ Depth

Service Connections

- ☐ Distance from downstream manhole
- ☐ Materials
- ☐ Pipe length
- ☐ Diameter

Note: SERVICE CONNECTION IS A LENGTH OF PUBLIC PIPELINE BETWEEN A PUBLIC STORMWATER PIPE AND PRIVATE CONNECTION POINT.

Please continue over the page……..

Catchpits

- ☐ Catchpit ID
- ☐ Catchpit type
- ☐ Connection Pipe
- ☐ Lead length

Inlets & Outlets

- ☐ Inlets/Outlets ID
- ☐ Location – private, public
- ☐ Structure Type

Soakage Trenches

- ☐ Length
- ☐ Width
- ☐ Depth
- ☐ Soakage Media
- ☐ Structure Type

Subsoil Drains

- ☐ Location
- ☐ Ownership (public/private)
- ☐ Pipe Diameter
- ☐ Pipe Length
- ☐ Pipe Material
- ☐ Downstream MH ID (or discharge point)

Open Channels

- ☐ Upstream Outlet ID (start)
- ☐ Downstream – Inlet ID (finish)
- ☐ Channel Lining Material
- ☐ Channel Length
- ☐ Channel Width

Channel Device

- ☐ Site Plan
- ☐ Surface Area
- ☐ Top Water Level
- ☐ Outlet Invert

Comments_____
_____
_____

Signature _____ **Date** _____

Note: ON COMPLETION OF AS BUILTS PLEASE ENSURE THE AS BUILT CHECKLIST IS ATTACHED AND MARKED OFF BEFORE SUBMITTING

4. SCHEDULE OF STORMWATER ASSETS

Proposal / Application Number _____ **File Reference** _____

Property Address _____

Please tick the category that applies to this application

□ Assets are vested in Manukau City Council *(Resource Consent)*

□ Assets are gifted to Manukau City Council *(Direct Approval or Building Consent)*

□ Paid for by Manukau City Council *(Capital Works or Cost Share Arrangement))*

New Assets

ASSET	UNIT	NUMBER	RATE	TOTAL
1200 mm diameter line	M		$	$
1050 mm diameter line	M		$	$
900 mm diameter line	M		$	$
825 mm diameter line	M		$	$
750 mm diameter line	M		$	$
675 mm diameter line	M		$	$
600 mm diameter line	M		$	$
525 mm diameter line	M		$	$
450 mm diameter line	M		$	$
375 mm diameter line	M		$	$
300 mm diameter line	M		$	$
225 mm diameter line	M		$	$
150 mm diameter line	M		$	$
100 mm diameter line	M		$	$
Manholes	Each		$	$
Service Connections	Each		$	$
Inlets	Each		$	$
Outlets	Each		$	$
Cesspits	Each		$	$
Stormwater Ponds	LS		$	$
Other (list below)			$ $ $	$ $ $
			SUBTOTAL NEW	**$**

Please continue over the page……..

Abandoned Assets

ASSET	UNIT	NUMBER	RATE	TOTAL
			$	$
			$	$
			$	$
			$	$
			SUBTOTAL ABANDONED	**$**

Monetary Contributions By Council

ASSET	UNIT	NUMBER	RATE	TOTAL
			$	$
			$	$
			$	$
			$	$
			SUBTOTAL MONETARY CONTRIBUTIONS	**$**

Total

** **Subtotal New** *minus* **Subtotal Abandoned** *minus* **Subtotal Monetary Contributions**	**$**

** Where a Barter Tax Invoice is being produced, this is the total to be recorded on the invoice

AGREED

Developer / **Developers Representative** (signature) _____

_____ _____ _____

Name Company Date

Manukau Water Limited (signature) _____
on behalf of Manukau City Council

_____ _____

Name Date

5. CERTIFICATE OF ACEPTANCE
STORMWATER ASSETS

Manukau City Council
Manager Development and Enforcement
Private Bag 76917
Manukau

Proposal Number: _____

File Reference Number: _____

Address: _____

Job Name (if applicable) _____

As-built number _____

I _____ hereby declare that Manukau Water Limited have tested and inspected all new stormwater assets for the above development and can confirm that they have been built in accordance with the approved plans (or subsequent approved amendments) and have met all the appropriate stormwater conditions of the Resource Consent.

NB/ **-** Please refer to final sign off document for any incomplete works for Council to sign off.

Manukau Water Limited Representative:

Signed _____

Name _____

Date: _____

Appendix 13
RAMM Data Collection Sheets

RAMM DATA COLLECTION SHEETS

To be completed for <u>each</u> road.

Te Kaunihera o MANUKAU City Council

Road Name _____ Subdivision _____

SP No _____

Start Name _____ End Name_____

Length _____ Width _____

BASECOURSE LAYER (LAYER 1)

Date Completed _____ Length _____

Depth _____ Width _____

Aggregate Grading _____ Offset (From LHS) _____

Source (Quarry) _____

Aggregate Type Basalt / Greywacke/Other _____

SUB-BASE LAYER (LAYER 2)

Date Completed _____ Length _____

Depth _____ Width _____

Aggregate Grading _____ Offset (From LHS) _____

Source (Quarry) _____

Aggregate Type Basalt / Greywacke/Other _____

SUB-GRADE (LAYER 3)

Test Date _____ Length _____

CBR _____ Width _____

Type _____ Offset (From LHS) _____

Stabilised Yes / No

Method (Agent) _____

Depth _____

UNDERCUT (LAYER 4)

Location _____ Length _____

Width _____ Offset (From LHS) _____

Depth _____ Backfill Material_____

RAMM DATA COLLECTION SHEETS

To be completed for <u>each</u> road.

Te Kaunihera o MANUKAU City Council

SURFACING DETAILS – DEVELOPMENT/SUBDIVISION

ASPHALTIC CONCRETE

MEMBRANE SEAL

Road Name _____

Displacement Start _____ Start Name_____

End _____ End Name_____

Date _____ Material_____

Width _____ Offset (from LHS)_____

Aggregate Size _____ Depth_____

Area Sealed _____ Aggregate Source_____
(Company and Quarry)

Binder Type & Grade _____

Cutter Type _____ Quantity _____pph

Spray Temp _____°C Litres at spray temperature _____

Residual Application Rate _____l/m^2

Sealing Notes _____

SURFACING

Date _____ Material _____

Function _____ Depth_____

Binder Type & Grade _____

Binder Rate _____ Aggregate Size _____

Aggregate Source _____
(Company and Quarry)

Contractor _____

Mix Temperature in Material _____°C

Surfacing Notes _____

RAMM DATA COLLECTION SHEETS

To be completed for <u>each</u> road.

Te Kaunihera o MANUKAU City Council

SURFACING DETAILS - DEVELOPMENT/SUBDIVISION

CHIP SEALING

Road Name _____

Displacement Start _____ Start Name _____

End _____ End Name _____

Date _____ Material _____

Width _____ Offset (from LHS) _____

Aggregate Size _____ Depth _____

Area Sealed _____ Aggregate Source _____
(Company and Quarry)

Binder Type and Grade _____

Cutter Quantity _____ Cutter Type _____

Adhesion Quantity _____ Adhesion Type _____

Additive Quantity _____ Additive Type _____

Flux Quantity _____

Spray Temp _____ ^{o}C Litres at spray temperature _____

Residual Application Rate _____ l/m^{2}

Sealing Notes _____

Appendix 14
Definitions

DEFINITIONS

Definitions

As Built Drawing – a drawing that depicts the final installed configuration.

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

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

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

Engineer - the Engineer, his deputy or assistant or any other officer or other person appointed by the Council to control the Engineering work of the District.

Consent Holder - an individual or organization on whose name the consent is issued by the council.

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

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

DEFINITIONS

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

(a) The division of an allotment –

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

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

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

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

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

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

Appendix 15
QAM Amendment Request Form

QAM AMENDMENT REQUEST FORM

Attention The Development Officer
Quality Assurance Manual
Manukau City Council
Private Bag 76917
Manukau City

This form may be reproduced for the purposes of submission of a proposed amendment without breaching copyright.

REQUESTOR'S DETAILS

Name ……

Organisation ……

Address ……

PRPOSED AMENDMENT DETAILS

Part

Section

Details ……

……

……

Please use separate sheet for further details if required

REVIEW

Comments ……

Approved / Not Approved …….. **Date** ……

Returned to Applicant …….. **Date** ……