



FNQROC DEVELOPMENT MANUAL

CP1

CONSTRUCTION PROCEDURES

Version No. 11/19

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GENERAL	1
CP1.01 INTRODUCTION.....	1
REQUIREMENTS PRIOR TO CONSTRUCTION	2
CP1.02 GENERAL REQUIREMENTS	2
CP1.03 CONSTRUCTION INSPECTIONS.....	2
CP1.04 INSPECTION AND TEST PLAN	2
CP1.05 CONTRACTOR'S EROSION & SEDIMENT CONTROL PLAN.....	3
CP1.06 CONSTRUCTION SECURITY BOND	5
CP1.07 COMMENCEMENT OF WORK	6
CP1.08 DOCUMENTATION TO BE PROVIDED PRIOR TO PRE-START MEETING	6
CP1.09 PRE-START MEETING	7
REQUIREMENTS DURING CONSTRUCTION	9
CP1.10 GENERAL REQUIREMENTS ^{TRC, MSC}	9
CP1.11 PUBLIC NOTICES / PROJECT SIGNAGE	10
CP1.12 DOCUMENT CONTROL.....	11
CP1.13 EROSION AND SEDIMENT CONTROL.....	11
CP1.14 NOISE	11
CP1.15 PARKS & ENVIRONMENTALLY SIGNIFICANT AREAS.....	12
CP1.16 INSPECTION AND TESTING	12
CP1.17 APPLICATION FOR COUNCIL TO COMPLETE PRIVATE WORKS ^{CRC}	12
CP1.18 APPLICATION FOR APPROVAL TO DRAW WATER FROM COUNCIL MAINS.....	13
ACCEPTANCE OF WORKS	15
CP1.19 INTRODUCTION.....	15
CP1.20 DEFECTS LIABILITY BOND.....	15
CP1.21 "AS CONSTRUCTED" SUBMISSION	16
CP1.22 COMPLIANCE CERTIFICATIONS	17
CP1.23 MANAGEMENT PLANS, OPERATION AND MAINTENANCE MANUALS.....	17
CP1.24 "AS CONSTRUCTED" DIGITAL DATA AND DRAWINGS	17
CP1.25 PROJECT DOCUMENTATION.....	18
CP1.26 "WORKS ACCEPTANCE" INSPECTION	20
CP1.27 EARLY PLAN APPROVAL AND BONDING OF UNCOMPLETED WORKS ^{Cook}	21
CP1.28 APPROVAL OF PLAN OF SURVEY	23
FINAL ACCEPTANCE OF WORKS	24
CP1.29 "FINAL ACCEPTANCE" INSPECTION.....	24

- APPENDIX A – INSPECTION AND TEST REQUIREMENTS**
- APPENDIX B – SEWER MAINS INSPECTION AND TEST PLAN TEMPLATE**
- APPENDIX C – WATER MAINS INSPECTION AND TEST PLAN TEMPLATE**
- APPENDIX D – PUMP STATION INSPECTION AND TEST PLAN TEMPLATE**
- APPENDIX E – SECURITY LODGEMENT FORM**
- APPENDIX F – INSPECTION CERTIFICATE FOR WITNESS / HOLD POINT**
- APPENDIX G – WORKS ACCEPTANCE INSPECTION CHECKLIST**
- APPENDIX H – FINAL ACCEPTANCE INSPECTION CHECKLIST**
- APPENDIX I – PUMP STATION COMMISSIONING CHECKLIST**
- APPENDIX J – STATEMENT OF COMPLIANCE “AS CONSTRUCTED”
DOCUMENTATION**
- APPENDIX K – EXAMPLE OF SURVEYOR’S CERTIFICATION OF “AS
CONSTRUCTED” WORKS**
- APPENDIX L – AS CONSTRUCTED DATA SEWER PROPERTY CONNECTION
BRANCHES**
- APPENDIX M – AS CONSTRUCTED DATA SUBMISSION FORM**
- APPENDIX N – PERMANENT SURVEY MARK COORDINATION REQUEST FORM**
- APPENDIX O – DELETED**
- APPENDIX P – “AS CONSTRUCTED” DIGITAL DATA AND DRAWING STANDARDS**

GENERAL

CP1.01 INTRODUCTION

1. This section of these Operational Works Manual details the minimum requirements acceptable to the Council associated with developments involving Operational Works defined as any works to be constructed that are subject to Council Approval. Typically, this involves the construction of Water Supply, Sewerage, Stormwater, Roadworks and Public Open Space associated with Development, Reconfiguration or other approvals.
2. This manual does not apply to works or services under the control of other authorities (i.e. works within State controlled road corridor). Separate approvals may be required from the other relevant authorities.
3. The section has been divided into four subsections as follows:
 - a. Requirements Prior to Construction
 - b. Requirements During Construction
 - c. Acceptance of Works
 - d. Final Acceptance of Works

REQUIREMENTS PRIOR TO CONSTRUCTION

CP1.02 GENERAL REQUIREMENTS

1. Prior to the construction of any works associated with a development approval which requires operational works approval by Council the Designer responsible for the design of the works must first obtain an approval of the design, construction drawings and specifications from Council. The procedures to be undertaken in order to achieve approvals are outlined in detail in Section AP1 of this Manual.

CP1.03 CONSTRUCTION INSPECTIONS

1. Prior to construction of the works the Consulting Engineer who is a Registered Professional Engineer Queensland (RPEQ) is to be engaged to be responsible for the provision of inspection services in accordance with a Council approved Inspection and Test Plan (ITP) and to exercise reasonable skill and diligence in order to ensure that the operational works requiring approval are executed in accordance with:
 - a. Council's development permit conditions;
 - b. Council's relevant policies and local laws;
 - c. This Manual, Council approved drawings, specifications and relevant Australian Standards;
 - d. Good engineering practice; and
2. Inspections may be carried out by the Consulting Engineer or a delegate who shall be a suitably qualified/experienced person approved by the consulting engineer.
3. The Consulting Engineer is required to certify that all works have been carried out in accordance with the development approval and to the FNQROC minimum Standards prior to Works Acceptance.

CP1.04 INSPECTION AND TEST PLAN

1. The Contractor is to prepare an ITP (endorsed by the RPEQ) identifying the following items:
 - a. Element of work
 - b. Tests and checks required
 - c. Standard required to meet
 - d. Frequency of testing
 - e. Contractor's responsibility
 - f. Consulting Engineer's responsibility
 - g. Council's responsibility
 - h. Asset data recording requirements

Refer to CP1.16 for the requirements of the Inspection and Test Plan.

2. The Consulting Engineer in undertaking Construction Inspections shall:
 - a. Allocate competent and experienced staff to site inspection and testing;

- b. Provide sufficient site presence, dependent on the contractor's progress and workmanship, and in accordance with the ITP, to be reasonably satisfied that the works meet the design, specification and performance requirements.
- c. Inspect and confirm acceptability of works as complying with the design intent and in accordance with the Council's requirements prior to requesting a Council inspection.

CP1.05 CONTRACTOR'S EROSION & SEDIMENT CONTROL PLAN

1. Prior to construction commencing the contractor shall prepare an Erosion and Sediment Control Plan (ESCP) to manage the site during construction and the defect liability period.
2. The plan shall be consistent with the approved Erosion and Sediment Control Strategy (ESCS) and shall take into consideration the Contractor's proposed construction methodology and program.
3. The Contractor may propose an alternate construction methodology that differs from the approved ESCS. In this instance the Contractor shall discuss and obtain approval from the Consulting Engineer for the alternate strategy prior to submitting to Council.
4. The Contractor's ESCP shall be prepared by person or persons meeting the following criteria:
 - a. Six years or more field experience in civil engineering construction practices;
 - b. Educated in erosion and sediment control practice through regular industry sponsored seminars, publications, etc.;
 - c. An understanding of Rainfall Hydrology and an ability to calculate rainfall runoff; and
 - d. An understanding and ability to calculate open channel flows and velocities.
5. A copy of the Contractor's current approved ESCP is to be retained on site by the Contractor's Representative.
6. The Contractor's ESCP shall be submitted to the Consulting Engineer for review and approval prior to the pre-start meeting.
7. The Consulting Engineer is to review the ESCP for compliance with the approved ESCS. Any amendments required to ensure ESCS compliance are to be incorporated by the Contractor prior to approval. The Consulting Engineer will issue a copy of the approved ESCP to the Council prior to the pre-start meeting.
8. It is the Contractor's responsibility to ensure that the ESCP is updated and amended to reflect any changes in the construction methodology and programme.
9. All amendments to the Contractor's ESCP shall be approved by the Consulting Engineer and a copy of the revised approved ESCP issued to Council.
10. The Contractor's ESCP shall consist of the following:
 - a. A layout plan detailing the measures to be employed during construction. On larger sites where works are to be progressively constructed a plan shall be provided for each stage of works;
 - b. A layout plan detailing the measure(s) to remain in place from the commencement of the defects liability period;
 - c. A written description of the sequencing of works or construction program;

- d. An inspection and test plan for monitoring erosion and sediment control measures during the construction and the defects liability period;
- e. Details of all Erosion and Sediment Control measures to be used. The Contractor may adopt standard details developed by other, e.g. IEAust (Qld) "Soil Erosion and Sediment Control – Engineering Guidelines of Queensland Construction Sites"; and
- f. The name of the person within the Contractor's organization who has the authority and responsibility for implementing, monitoring, updating or amending the Plan.

11. The Contractor's ESCP shall address the following issues:

Minimising Disturbance

- a. Limiting the exposure time and size of disturbed areas to a minimum
- b. Allow for the use of existing vegetation as buffer zones

Control of Runoff

- c. Sizing of structures, channels, catch drain and diversion drains for appropriate storm events.

	Design Life	ARI
Non-erosive design capacity	0-6 months	1 year
	6-12 months	2 years
	12-24months	5 years
	24months +	10 years
Structural Stability	0-6 months	5 year
	6-12 months	10 years
Temporary culvert crossing		1 year

- d. Diverting clean water runoff around disturbed areas
- e. Dividing the site into smaller more manageable drainage areas
- f. Early installation of temporary drainage works
- g. Early installation of permanent drainage system and protection works.

Erosion Control

- h. Protecting service trenches and hard engineering structures (eg. driveways, kerbs, etc.) from erosion caused by runoff
- i. Prompt revegetation of disturbed areas
- j. Installing structures in drainage channels to slow flow velocity and encourage settlement of soil particles
- k. Protection of disturbed areas from wind erosion (dust suppression)

Sediment Control

- l. Locating stockpiles clear of drainage paths and protecting stockpiles from traffic, runoff and wind erosion
- m. Minimising number of site access points
- n. Stabilising site access points to prevent vehicles transporting materials off site
- o. Intercepting drainage from disturbed areas and installing sediment barriers to slow the velocity of flow and allow fine particles to settle.

- p. Diverting larger contaminated flows to sediment traps to allow soil particles to settle or be treated prior to release into receiving waters
- q. Protecting partially constructed drainage structures from sediment infiltration

Revegetation

- r. Progressive stabilisation and rehabilitation of completed works.
- s. Providing protection to revegetation works on steep batters during establishment period.

Inspection, Clean out and Maintenance

- t. The inspection, clean out and maintenance regime is to take into account the duration that the site will be disturbed and the timing of construction. If the site is disturbed (i.e. rehabilitation works are not complete) during the period December to May (wet season) a more rigorous inspection, clean out and maintenance regime will be required than for a site, which is disturbed during the period June to November.

CP1.06 CONSTRUCTION SECURITY BOND

1. Prior to construction of the works commencing the developer is required to lodge a security bond in cash or unconditional Bank Guarantee to the value of 5% of the estimated cost of the construction of the works prepared and certified by the Consulting Engineer.
2. A bank guarantee should include:
 - a. A binding contractual relationship between Council and the guaranteeing bank.
 - b. Specific requirements for renunciation of the guarantee.
 - c. Require adequate notice of renunciation.
3. The bond is to be accompanied by Council's Security Lodgement Form (**Appendix E**) clearly identifying the purpose of the bond together with the Consulting Engineer's certification of the value of the works.
4. The bond is required to provide security to Council in the event that costs are incurred as a result of the following:
 - a. Protection of on-street works from damage by contractors, sub-contractors and suppliers.
 - b. Repairs to on-street works resulting from damage caused by contractors, subcontractors and suppliers.
 - c. Protection and repair of existing Council services (i.e. sewerage connections, water connections etc).
 - d. Non-compliance with the approved Erosion and Sediment Control Plan during construction.
 - e. Failure to provide adequately for traffic.
 - f. Urgent action required by Council to resolve unsafe construction or emergency repairs required to protect persons and/or property from consequential damages.

5. Any costs incurred by Council in responding to the above circumstances will be recovered from the Security Bond.
6. At the completion of the works and the commencement of the Defects Liability period, the construction security bond shall be returned to the developer or may be substituted for the defects liability bond.

CP1.07 COMMENCEMENT OF WORK

1. A Notice of Intention to Commence Works is to be issued to Council by facsimile or email seven (7) days prior to the intended date for commencement of the works. No works will be permitted to commence until the following information is provided:
 - a. Name, address and telephone number (including after hours contact) of the Consulting Engineer for the works;
 - b. Name, address and telephone number (including after hours contact) of the Contractor(s) and major sub-contractor(s) for the works;
 - c. Name and telephone number of the person to be contacted in regard to any matter arising from the construction of the works;
 - d. Intended date of commencement of works, and contract period;
 - e. An invitation to the relevant Council Representative to attend the pre-start meeting and confirmed by phone or email a minimum of 24 hours prior;
 - f. A request to Council to confirm that environmentally significant areas and/or trees which are to be preserved in accordance with any Tree Preservation Declaration, have been identified and adequately protected;
 - g. Location of Project Sign (if required); and
 - h. Inspection and Test Plan (refer CP1.16).

This submission will form notification of the date of the "Pre-Start" meeting.

CP1.08 DOCUMENTATION TO BE PROVIDED PRIOR TO PRE-START MEETING

1. The following documents (to a standard acceptable to Council) are required to be submitted and accepted by Council prior to pre-start meeting:
 - a. Evidence of Public Liability Insurance
 - b. Proof of payment of Portable Long Service Leave Levy (PLSL)
 - c. Contractors Erosion and Sediment Control Plan
 - d. Traffic Management Plan
 - e. Construction Security Bond
 - f. Safety Plan
 - g. Evidence that all fees and charges have been paid
 - h. Cultural Heritage Management Plan (if applicable)
2. A Site Safety Induction is to be undertaken for each Council representative at initial attendance on-site (prior to initial inspection)

3. Evidence of Concurrence Agency, Service Authority or adjoining landowner consents/approvals is to be provided to Council prior to commencing. any elements of works affecting/involving those parties
4. The project specific inspection and Test Plans endorsed by the RPEQ.
5. Any engineering plans or reports required to be supplied prior to the pre-start meeting as set out in the Operational Works Approval.
6. A copy of the 'For Construction' drawings inclusive of any amendments required by the Operational Works approval (pdf & electronic e-transmit AutoCAD files)
7. A Pavement Design (if not supplied at Operational Works including records of geotechnical tests indicating subgrade CBR's, adopted traffic load, requirements for subsoil drainage and subsoil drainage design. Design to be certified by a RPEQ geotechnical engineer.

CP1.09 PRE-START MEETING

1. A pre-start meeting is to be held prior to the commencement of works. The meeting is to be attended by Consulting Engineer, the Contractor's Representative, any relevant Specialist Consultants and Councils representative.
2. Items to be considered at this meeting will include but not be limited to the following:
 - a. Review of relevant conditions of development approval and discussion of any issues including conditions of the Development Permit and Operational Works approvals that are considered important and relevant to the attending parties.
 - b. Review of Council's construction requirements;
 - c. Discuss the Contractor's Erosion and Sediment Control Plan approved by the Consulting Engineer;
 - d. A review of the processes for, monitoring, compliance assessment and auditing of the ESCP;
 - e. Inspection and identification of parks and environmentally significant areas and/or trees for preservation;
 - f. Site access conditions;
 - g. Identification of areas to be left undisturbed;
 - h. Evidence of compliance with the Workplace Health and Safety Act; including site safety inductions, site safety plans, notifications;
 - i. Review of Inspection and Test Plan including a notice of nominated Hold / Witness points;
 - j. Relevant provisions of any other Acts;
 - k. Traffic Management Plan;
 - l. Location of Project Sign (if required); and
 - m. Issued plans for construction are the latest approved plans
3. The pre-start meeting is a Hold Point and works may not proceed until the meeting is held and any further requirements identified during the conduct of the meeting are satisfied

4. Council may require that subdivisions in difficult terrain or environmentally sensitive areas to have all road centrelines pegged prior to the pre-start meeting. This is to occur at least two weeks prior to any construction activity taking place so Council can visit the site with Engineers and Contractors representatives to view first hand ramifications of such construction activities as stormwater drainage points, proposed earthworks areas, clearing etc. Council reserves the right to amend the design in consultation with Engineers should any problems arise as a result of the inspection. This preliminary site visit should be arranged prior to or in conjunction with the pre-start meeting.

REQUIREMENTS DURING CONSTRUCTION

CP1.10 GENERAL REQUIREMENTS TRC, MSC

1. The general requirements during the construction of the project are as follows:
 - a. Work may only proceed subsequent to Council being issued with all the relevant documentation set out in CP 1.09.
 - b. No work shall commence on any existing road open to the public unless specifically approved by Council.
 - c. No work may be carried out on nor machinery driven above or near existing water and sewerage pipes without a Work Method Statement being submitted by the Contractor and approved by Council.
 - d. Any damage to existing services under the control of Council or another Authority must be notified immediately and made good by the relevant Authority at the Contractor/Developer's expense prior to acceptance of the works.
 - e. Use of Council services, (eg water from existing mains), is subject to approval by Council and payment of appropriate fees.
 - f. Work involving the use of machinery of any description shall only be carried out on the site 7.00 am to 6.00 pm, Monday to Friday and 7.00 am to 1.00 pm Saturdays, with no work to be carried out on Sundays or Public holidays. (In certain circumstances Council may approve works outside these hours. All applications for changes to working hours must be in writing). For emergent or complaint response issues, dust suppression and sedimentation control may occur outside these hours. Council is to be notified as soon as possible in this instance.
 - g. Pumping stations, electrical switchboards, access covers, compounds and associated equipment installed during construction shall be padlocked when left unattended.
2. The Developer, Contractor and Consulting Engineer shall take all necessary steps, in accordance with the provisions of the Workplace Health and Safety Act, to ensure safety of the public in regard to construction activities. In particular, work on roadways shall be signed in accordance with Queensland Department of Main Roads "Manual of Uniform Traffic Control Devices". Council will require submission of plans indicating traffic control proposals and a program of work for sites involving the travelling public.
3. No public road may be closed, traffic diverted from public roads, or traffic diverted elsewhere without the prior approval of the Council, the District Superintendent of Traffic (if required) and public advertising of the proposed diversion must be carried out. Proposals to divert traffic shall include full details of the alternative route and proposed signing.
4. Works shall not be undertaken on any adjoining private properties without the prior written consent of the relevant registered proprietor. A written acceptance (by the registered proprietor) of the completed works shall be submitted to Council upon finalisation of the works.
5. If connections or alterations to Council mains are required, the Council Engineer shall be given a minimum of twenty (20) working days notice of the Contractor's requirements. (Council's notification requirements are to be noted on the Project Drawings / Specification).

CP1.11 PUBLIC NOTICES / PROJECT SIGNAGE

1. Where as a condition of approval, Council requires the posting of a public notice prior to the commencement of works, the developer is required to post a notice in the Public Notices section of the local newspaper advising of the following:
 - a. Name of developer
 - b. Name of the project
 - c. Street address of the site
 - d. Project managers name and contact detail
 - e. Consulting engineers name and contact number
 - f. Contractors name and contact number
 - g. Other specialist consultant contact numbers (e.g. geotechnical, landscaping, architects, hydraulic etc)

2. Where as a condition of approval, Council requires a project sign(s) to be erected on the sites' frontages to constructed roads and any other location as required. The sign shall contain the following information:
 - a. An overall concept plan of the development showing the stage or works about to commence construction.
 - b. Name of Developer.
 - c. Name of the Project.
 - d. Street address of the site.
 - e. Project Manager's name and contact number.
 - f. Consulting Engineer's name and contact number.
 - g. Contractor's name and contact number.
 - h. Other Specialist Consultants (geotechnical, landscaping, architects, hydraulics etc) names and contact numbers.

3. Material and size of the sign shall be as follows:
 - a. Made of a weatherproof material.
 - b. Not less than 1200mm x 900mm.

4. Position of the sign on the land:
 - a. The sign must be place on, or within 1.5m of, the road frontage of the land.
 - b. The sign must be mounted at least 300mm above ground level.
 - c. The sign must be positioned so that it is visible from the road.

5. The lettering on the sign:
 - a. Each item listed above must start on a new line.
 - b. The minimum lettering height shall be 50mm in height.

CP1.12 DOCUMENT CONTROL

1. A copy of the approved Project Drawings, Specification and Operational Works Approval shall be kept on the job site at all times during construction.
2. Should amendments be required to Engineering Plans and/or Specifications during construction, the Consulting Engineer shall ensure that Council and any other person or organisation who has previously been issued a set of plans that maybe affected by this amendment e.g. Registered Surveyor, public service authority. . is in receipt of two (2) copies of all amended drawings and/or specifications. When approved, Council shall stamp these plans for approval as operational works plans. Any amended drawings and/or specifications shall be submitted with an accompanying letter outlining the amendment together with any supporting information.
3. Submissions with a full complement of supporting documentation will expedite Council's approval time frame.
4. All amendments shall be issued to Council for approval prior to the works being undertaken.

CP1.13 EROSION AND SEDIMENT CONTROL

1. The Consulting Engineer shall ensure that the construction contract contains provisions requiring the Contractor to implement the approved Erosion and Sediment Control Strategy and to prepare and implement an Erosion and Sediment Control Plan complying with the approved Strategy.
2. The Contractor shall ensure that all reasonable measures are taken to protect nearby properties from dust pollution erosion, siltation or sediment transport.
3. Council reserves the right to order whatever action deemed necessary and appropriate at the time to prevent environmental harm, including ordering temporary cessation of work in extreme cases.
4. As Erosion and Sediment Control is also an issue of public amenity and safety, the developer shall be responsible for any costs arising from dust or water pollution generated by its development.

CP1.14 NOISE

1. The requirements of the Council's local laws regarding Noise Nuisances (if applicable) shall apply to the development works.

CP1.15 PARKS & ENVIRONMENTALLY SIGNIFICANT AREAS

1. In cases where the subject land or the adjacent land is an existing or proposed Park, Bushland Reserve, declared Tree Preservation area, or area otherwise declared by Council as environmentally significant, the following general precautions shall be mandatory.
 - a. The areas shall be clearly pegged, flagged, (and fenced if ordered by Council) inspected and approved by Council Officers.
 - b. The approved design, or Certificate of Approval for tree clearing issued pursuant to Tree Preservation By-laws (if applicable) shall have identified any unavoidable intrusion into such areas and nominated work practices such as maximum widths of disturbance, nominated access routes, methods and timing of rehabilitation, which shall be strictly adhered to.
2. Council shall be notified immediately the Consulting Engineer is aware of any damage or disturbance beyond the approved limits. Rehabilitation of this damage or disturbance shall be to the satisfaction of Council.

CP1.16 INSPECTION AND TESTING

1. During the construction phase, the Consulting Engineer shall be responsible for undertaking the minimum number of required inspections and tests in accordance with the approved Inspection Test Plan (ITP).
2. There are a number of major inspections that are mandatory Hold Points (H) for the Consulting Engineer and Hold Points or Witness Points for Council. These will be included in the ITP and can be found in **Appendix A**. Appendix B, C and D contain Inspection and Test Plan Templates. The contractor's ITP is to be based on these templates and updated with project specific testing requirements.
3. Any proposed changes to the ITP must be notified to and accepted by Council prior to the affected works commencing.
4. The submitted Inspection and Test Plan is to be implemented by the Consulting Engineer. The test results and the certification that the plan has been followed are to be submitted with the "As Constructed" documentation.
5. Council will, on a random basis, call upon the Consulting Engineer to provide evidence of conformance with the approved ITP in the form of diary records, site visit reports etc.
6. During construction, Council reserves the right to conduct audit inspections of any or all of the works without prior notification. These inspections do not release the Consulting Engineer from his responsibility to check the Contractor's work.
7. For the RPEQ's test inspections and Hold/Witness points, a "Certificate of Inspection" will record the inspections. If requested, a copy is to be provided to Council for each Hold Point / witness point inspection.
8. For Council Hold/Witness points, the RPEQ's information will include as a minimum the details contained within **Appendix F**.

CP1.17 APPLICATION FOR COUNCIL TO COMPLETE PRIVATE WORKS^{CRC}

1. Unless otherwise approved, Council requires any connections and alterations to Council's live sewer or water mains associated with developments to be completed by Council workforce at

the Developer's expense. This is termed Private Works and the connection will not be made until payment is received.

2. Sewer and water mains are considered to be live once the Defects Liability period has been commenced. All work on live sewers and water mains must be carried out by Council workforce or by the Contractor with Council approval and subsequent supervision.
3. Alterations and connections to existing Council sewer and water mains, resulting from the development (including cutting in of new sewer property connections) are to be completed prior to commencement of the Defects Liability period. In these cases separate applications should be made for the alterations and the connections.

The procedure is as follows:

- a. Application should first be made in writing five business days prior to work commencing to enable Council to provide staff to operate valves and isolate pump stations as necessary and to supervise the Contractor's work. The nature and extent of works shall be clearly identified on copies of the approved plans submitted with the application.
 - b. An estimated cost of the supervision shall be agreed prior to notice being given. The estimated cost and a signed undertaking to pay the actual cost of the work when completed shall accompany the notice.
 - c. Council will require a deposit in line with Council's adopted Fees and Charges Register before the work commences.
 - d. When the Contractor has been approved by Council to make an alteration or connection, the Consulting Engineer is to co-ordinate the work and the process for inspection and payment.
4. **Contractors are not permitted to operate Council's infrastructure unless written approval has been obtained from Council.** The placement and removal of plugs within live sewers must be done under direct supervision of Council's Inspector.
 5. All works completed by Council's workforce at the Developer's expense is to form part of the Contractor's As-Constructed submission.(Refer CP 1.21)
 6. Council reserves the right, on the advice of its Inspector, to stop, or take over a connection being undertaken by a Contractor, if in the Inspector's opinion the Contractor is incapable of completing the connection work in a reasonable time without causing damage to Council's infrastructure or undue inconvenience to the public. Any work carried out by council will be at the contractors cost.

CP1.18 APPLICATION FOR APPROVAL TO DRAW WATER FROM COUNCIL MAINS

1. The drawing of construction water from Council's mains must be approved and the relevant fees paid in advance. Application for approval should be made, on the prescribed form. The attached form shall include Council's endorsements on the form that the relevant fee has been paid.
2. Permission to draw water shall be subject to the following conditions:
 - a. Backflow prevention
 - b. Water may only be taken between the hours of 8.00am and 4.30pm.
 - c. Must be through a metered connection or metered standpipe.

- d. The approval shall be limited to the days and dates nominated in Council's notice of approval.
- e. Water may only be taken from the approved hydrant point.
- f. A copy of this approval is to be held by the driver of any vehicle taking water covered by this approval.
- g. Council may withdraw this approval at any time, such notice shall be in writing and will become effective immediately.
- h. The applicant is responsible for the cost of the reinstatement of damages to Council property caused by the taking of water covered by this permit.

ACCEPTANCE OF WORKS

CP1.19 INTRODUCTION

1. For works requiring Council approval a "Defects Liability" period is a period of twelve months minimum after the works have been accepted as complete by Council. During the Defects Liability Period, it is the responsibility of the Developer to rectify any works found to be defective due to design faults or found to exhibit faults attributed to the performance of the construction activities in terms of quality and conformance with the design and specifications.
2. The following are required to be completed prior to Council acceptance of works:
 - a. Completed "As Constructed" submission lodged with Council a minimum five (5) days prior to the "Works Acceptance" Inspection or early plan sealing inspection for bonding of uncompleted works and being to Council satisfaction
 - b. Satisfactory "Works Acceptance" Inspection.
 - c. All documentation outlined in section CP1.25(2) submitted to and accepted by Council.
 - d. All appropriate documentation to be completed by the Consulting Engineer and retained for records purposes. This consists of the "Works Acceptance Inspection Checklist" (**Appendix G**), the certified "Inspection and Testing Plan" and all test results and records for the works.
 - e. Compliance Certification has been issued by Council or private certifier for construction of any buildings or building works forming part of the operational works approval.
 - f. Satisfactory commissioning and acceptance of any water pump station, reservoir or sewerage pump station.
3. Following the satisfactory completion of all of the above matters, the Consulting Engineer shall make a written request for acceptance of the works and commencement of the "Defects Liability" period and release of any uncompleted works bond held.
4. The date of the works acceptance shall be the date of issue of the Works Acceptance Certificate and shall be taken as the date all documentation outlined in CP1.25 has been approved and conditions of the operational works and development approval have been met. Works acceptance will not be backdated to the date of the works acceptance inspection. The assets will become Council's at the date on the works acceptance certificate
5. Prior to making application for works acceptance the Consulting Engineer must confirm that all non-compliant work is rectified by the Contractor. Any non-compliances found by Council must be rectified prior to Council's issue of a Works Acceptance Certificate. It is the responsibility of the consultant to monitor the contractors work to the extent necessary such that any deviations from the design are approved prior to making application for works acceptance, alternatively the consultant instruct the Contractor to rectify the work.

CP1.20 DEFECTS LIABILITY BOND

1. Council requires a bond, in an amount of 5% of the value of the works, which is kept for the period of twelve months or until the works are finally accepted.
2. The bond is to be submitted with Council's Security Lodgement Form (**Appendix E**) clearly identifying the purpose of the bond together with the Consulting Engineer's certification of the value of the works.

3. The Construction Security Bond lodged prior to construction may be used for the purposes of the Defects Liability bond subject to Council's approval.

CP1.21 "AS CONSTRUCTED" SUBMISSION

1. "As Constructed" documentation serves two distinct functions:
 - a. Evidence that "As Constructed" works have been checked against the approved design, to support certification by the Consulting Engineer responsible for the design that design philosophies and criteria have been achieved.
 - b. Recording: To provide an accurate record of the "As Constructed" services.
2. Information required for the checking function must be presented in a form which allows ready comparison between design and "As Constructed" data by experienced engineering staff, whereas information required for the recording function must be presented in a form which allows ready and unambiguous interpretation and understanding by a wide range of users including engineers, maintenance and tradespersons, and the general public.
3. "As Constructed" documentation in accordance with these requirements is essential in order to achieve acceptance of development works and commencement of the "Defects Liability" period and is required to be forwarded to Council a minimum of five (5) days prior to the "Works Acceptance" inspection or early plan sealing inspection for bonding of uncompleted works.
4. The following items must be submitted as part of the "As Constructed" submission:
 - a. Electronic copy of the updated Management Plans, Operation and Maintenance Manuals, and Environmental Management Plans where these have been amended or not previously provided to Council (where applicable).
 - b. Asset valuation report in a format acceptable to council and certified by an RPEQ.
 - c. An electronic copy of the Council Approved Final Engineering Drawings in the same electronic format as the As Constructed data – PDF and DWG file.
 - d. Where applicable, Pump Station RTU number and pump station identifier to be obtained from Council
 - e. Electronic copy of the Council Approved Landscaping and Parks embellishments drawings.
 - f. Electronic copy of park / landscaping irrigation system drawings.
 - g. Electronic copy of design plans for building/structure and copy of Structural Certificate.
 - h. "As Constructed" digital data and drawings of services and infrastructure including works completed by Council for the Contractor under a Private Works Agreement
 - i. Digital Ground Model data to the requirements of council in an appropriate format (e.g. DWG or as nominated by the Council).
 - j. Any necessary information required for Council's asset management records (As identified in Appendix P).
 - k. Certification of installed playground equipment to relevant Australian Standards.
 - l. Works carried out on mains, whether or not they are a part of the original project design or for a future stage.

CP1.22 COMPLIANCE CERTIFICATIONS

1. With the implementation of these minimum standards, it is Council's intention to expedite the approval and checking process by reducing the level of checking from rigorous detailed checking to checking on an audit basis. In doing so, Council requires that the "As Constructed" documentation be supported by appropriate certifications in accordance with the requirements noted herein.
2. All "As Constructed" works including the Sewerage Property Connection branches, must be surveyed by a Registered Surveyor, who shall certify the details upon completion of the project. The certification must note that the "As Constructed" survey data represents the true and accurate location of the relevant construction element presented in the data, relative to all appropriate survey datums. (i.e. the exact location in space of each construction element/entity). The Registered Surveyor's certification must accompany the "As Constructed" submission to Council. An example of an acceptable Registered Surveyor's (Consulting) Certification is attached. **(Appendix K)**
3. All "As Constructed" works must also be certified by the Consulting Engineer responsible for the works. The certification must note that the design intent and function of the proposed works have not been compromised by the constructed works. To this extent, the Consulting Engineer will be responsible for determining whether the "As Constructed" details that exceed the tolerances for construction does not compromise the design intent and/or operational effectiveness of the infrastructure.
4. It is recognised that in some circumstances, the tolerances for construction are exceeded. In these instances, the Consulting Engineer will be responsible for performing confirmation design calculations to ensure that the original design intent and function are not compromised.
5. Further, should the "As Constructed" details indicate a change to the design intent or function of the works, revised design calculations shall be provided by the Consulting Engineer to indicate the acceptability of the proposed change relative to Council's requirements. Council's approval of the change is required prior to the formal acceptance of the works.
6. The Consulting Engineer shall be responsible for the completion of the "Statement of Compliance - As Constructed works, which satisfies the requirements for Certification. **(Appendix J)**

CP1.23 MANAGEMENT PLANS, OPERATION AND MAINTENANCE MANUALS

1. Where works comprise pump stations, reservoirs, treatment plants etc., Operations and Maintenance Manuals for all components of the works shall be provided. Operating and Maintenance Manuals shall include spare parts lists, Process and Instrumentation diagram, electrical documentation and any other relevant information. Maintenance Manuals and procedures are also required for drainage structures which incorporate Gross Pollutant Traps, interceptor devices etc. The Maintenance procedures should indicate recommended frequencies for maintenance/cleaning functions in wet and dry seasons.
2. Management plans are necessary for where there is any future maintenance required to ensure sustainability of that feature, i.e. waterways, bio retention basins etc.

CP1.24 "AS CONSTRUCTED" DIGITAL DATA AND DRAWINGS

1. This section of the manual covers the four main elements that will comprise the total submission of the "Digital Data and Drawings" component of the "As Constructed" submission for the "Acceptance of Works". The four main components are:-
 - a. Survey Datum.

- b. "As Constructed" Digital Ground Survey.
- c. "As Constructed" Drawings.
- d. "As Constructed" Attribute Information.

The submission will also be accompanied with the relevant Consulting Engineer's Certification or Registered Surveyor's Certification and the As Constructed Data Submission Form.

Requirements for Digital Data and Drawings are contained within Appendix P

CP1.25 PROJECT DOCUMENTATION

1. Development works will not be accepted until construction records have been certified as being completed by the Consulting Engineer and accepted by Council.
2. A complete copy of the following documents shall be provided to Council for acceptance prior to the "Works Acceptance"
 - a. Inspection and Test Plan certified by the Consulting Engineer
 - b. "Works Acceptance" Inspection Checklist
 - c. "As Constructed" Submission in accordance with 1.21
 - d. Compliance Certifications in accordance with 1.22
 - e. Management Plans, Operation & Maintenance Manuals in accordance with 1.23
 - f. "As Constructed" Digital Data And Drawings in accordance with 1.24
 - g. Water and sewerage inspection certificates including pump station and reservoir commissioning certificate.
 - h. Digital copy of CCTV survey for Sewer and Stormwater with Engineering Report and Certification (note S4.26 exception for Tablelands Regional Council)
3. Copies of all test results required to confirm compliance with Council's Standard Specifications shall be assembled and retained as a part of the project documentation within the Consulting Engineer's record storage facilities. While not a complete listing, the following details some major records to be included:
 - a. Fill compaction test results
 - b. Subgrade CBRs
 - c. Subgrade replacement material quality, thickness and locations *
 - d. Subgrade replacement material compaction test results *
 - e. Subsoil drain filter media quality statements (or gradings where required)
 - f. Subbase course and base course material quality statements and thicknesses
 - g. Subbase course and base course compaction test results
 - h. Prime or primer seal spray and application rates

- i. AC core test results
- j. Sewer pressure test records
- k. Grading to sewer bedding quality statements
- l. Grading to water main bedding quality statements
- m. Water main pressure test records
- n. Pump Station commissioning and test certification by Council (sewer and water) including wet-well, pumps and switchboard*
- o. Any concrete testing required by the technical specifications
- p. Pipework material quality statements for all pipework material (water, sewer, stormwater, etc.)
- q. Geofabric material quality statements
- r. Digital copy of CCTV survey for Sewer and Stormwater with Engineering Report and Certification
- s. Any other testing results or statements required to conform with this manual.
- t. Any other job specific testing carried out or ordered by the Consulting Engineer, if used

* *Where required to be used.*

4. The Consultant should prepare a letter to Council requesting acceptance of a pump station for the purpose of achieving "Works Acceptance" for the subdivision. The letter should include/enclose:
- a. The pump station allotment number, as it appears on the survey plan
 - b. The name of the pump station identifier and RTU number.
 - c. Copy of approved design drawings.
 - d. Copy of as-constructed drawings (can be preliminary).
 - e. Copy of completed pre-commissioning checklist.
 - f. Details of any non-conformances and uncompleted works.
 - g. Rectification plan if required.
 - h. Copy of Inspection and Test Plan.
 - i. Copy of Process and Instrumentation Diagram (P&ID)
 - j. Certification by the Consultant for structural design, buoyancy and compliance with design drawings and FNQROC Development Manual.
 - k. Request that Council make application to Ergon for connection of power accompanied with a locality plan with street names showing the PS location to attach to the application.
 - l. Evidence that an application for commissioning a sewerage pump station has been lodged

The information to be provided to Council shall include as a minimum the requirements of the Pump Station Commissioning Checklist (CP1 Appendix D). The following pump information shall also be provided to Council:-

- Pump Manufacturer, Model, Type, and Impeller diameter (as a cut sheet)
 - Rating of the motor;
 - Weight of the pump and motor;
 - Manufacturer's Performance curve as a cut sheet;
 - Curves with at least four points plotted of the actual performance established in the field, or similar supervised works certificate plotted with the manufacturer's pump curve;
 - KWH/1000 litres pumped;
 - Complete wiring diagrams and details (if not Council standard);
 - Mechanical details and parts list of pump and motor;
 - Maintenance catalogue showing also daily, weekly, monthly and annual maintenance requirements;
 - A complete set of the manufacturers recommended spares delivered to Council.
5. Should any of the above test results fail to meet specification the Consulting Engineer shall include in the record, details of retesting/rectification carried out.
6. The construction record should be retained in a logically assembled and bound document including a table of contents confirming completeness and presented to Council on completion of the works.
7. Site specific as-constructed drawings for pump stations and reservoirs must be prepared and included with the works acceptance documentation. The drawings must be prepared in accordance with the requirements set out in Appendix P

CP1.26 "WORKS ACCEPTANCE" INSPECTION

1. The "Works Acceptance " inspection requires attendance by:
- a. The Consulting Engineer for the project.
 - b. The Contractor.
 - c. Council's nominee/s.
2. It is the responsibility of the Contractor and the Consulting Engineer to ensure the necessary requirements of the works are to an acceptable standard (as defined in approved design and construction documentation) prior to the conduct of a "Works Acceptance" inspection.
3. The general requirements to be met prior to Council's "Works Acceptance" inspection of the works are as follows:
- a. The site is clean, tidy, free of rubbish, rocks, sticks, unauthorised stockpiles, etc;
 - b. Allotment earthworks and site grading to be free draining and in accordance with the approved Design
 - c. Relevant Erosion and Sediment Control measures are in place
 - d. Integrity of environmentally significant areas is maintained

- e. All Sewers flushed and gravity sewers inspected by CCTV
 - f. Valve boxes and manhole tops visually located and not covered
4. Prior to requesting a "Works Acceptance" inspection, the Consulting Engineer is responsible for confirming:
- a. that the approved works have been completed
 - b. Any non-compliant issues or defects noted during the construction process, have been rectified to Council satisfaction
 - c. the above listed items are in accordance with the approved drawings, Council's technical specifications and accepted engineering and landscaping practice.
 - d. Project documentation listed in CP1.25 has been submitted.

Failure to do so may result in cancellation of the inspection and/or the incurring of a reinspection fee.

5. Further to the above, and prior to the "Works Acceptance" inspection, the Consulting Engineer shall be responsible for the completion of the "Works Acceptance" Inspection Checklist (**Appendix G**) as appropriate to the works being constructed.
6. The completed checklist shall be presented to the relevant Council Officer prior to the "Works Acceptance" inspection. Council Officer will not undertake a detailed check of all items raised in the checklist, but will examine some aspects of the works on an audit basis. The original of the completed checklist shall be retained with the records for the project upon completion of the works.

CP1.27 EARLY PLAN APPROVAL AND BONDING OF UNCOMPLETED WORKS Cook

1. For subdivision works Council may, at its discretion, approve the bonding of uncompleted works to enable early approval of survey plans. Council may consent to the early approval of survey plans provided the following conditions have been met:
- a. Early plan sealing requests will only be considered for those stages of development nominated in the development plan. Parts of a stage will not be considered for early plan approval.
 - b. There are no significant external infrastructure works to be undertaken as part of that stage of development, which are required to service the proposed lots to achieve works acceptance. For example early plan approval may be suitable for internal stages, as part of a larger multi-stage development. The first stage of such a development is likely to **not** be suitable as most initial stages of a larger development are contingent upon being serviced with significant external infrastructure. Notwithstanding there may be circumstances where even internal stages of a larger development are not suitable for early plan approval because significant external infrastructure requirements can be triggered at various stage milestones of the development.
 - c. The developer must disclose to the purchaser of any lot proposed for early plan approval that the lot they are purchasing is subject of an early plan approval and therefore all services may not be available until the outstanding works are complete.
 - d. The developer must enter into a deed of agreement with Council. This deed ensures that the works to be completed are legally secured by conditions and a bond. A template for this deed of agreement is contained in **Appendix Q**. Council is to be provided with an original and two copies of the Deed. These documents are to be

executed and attached prior to lodging with Council. Satisfactory evidence of the items required under clause 3 below is to be attached into the Deed and the copies of the Deed.

2. Council will only consider early plan approval requests for those stages of development nominated in the development plan. Parts of a stage will not be considered for early plan approval
3. Prior to the submission of any early plan approval request, the following matters must be completed to the satisfaction of Council:
 - a. Engineering plans have been approved
 - b. All survey pegs placed
 - c. All lot preparation work and earthworks on lots have been completed in accordance with the requirements of these Guidelines, with finished surface levels, the degree of compaction achieved and geotechnical assessments required on any of the lots submitted and approved by Council.
 - d. Roads have been constructed up to subgrade.
 - e. All lot stormwater systems constructed.
 - f. All sewerage reticulation, within allotments shall be completed by the Developer and accepted by Council Officers.
 - g. Satisfactory evidence is to be provided to Council of a negotiated agreement with Service providers for telecommunications cabling, reticulation of electricity and the provision of street lighting and gas service providers for provision of gas (if applicable).
 - h. All outstanding rates are paid.
 - i. All works within lots must be fully completed and no further disturbance required on the lots.
 - j. Appropriate erosion and sediment control measures are in place for all disturbed areas.
 - k. All other works including external water, external sewer, water reticulation, landscaping etc are included in a bonafide contract between the developer and a contractor to be completed within 90 days.
 - l. All contributions required by the conditions of approval shall be paid prior to approval of survey plans (Headworks, Drainage and Traffic Contributions to Council, Contributions to service providers, Department of Main Roads Contributions, etc).
 - m. "As Constructed" information provided for all services located within lots (i.e. sewer, water and stormwater)
 - n. Building approval for all buildings/structures which form part of the approved operational works, e.g. Pump Stations.
 - o. Provision of evidence of public liability cover with interest of Council noted.
4. Upon confirmation that the above matters have been completed, the Applicant or Engineer shall submit the deed of agreement to Council containing the following:
 - a. Development/Subdivision Permit
 - b. Security Lodgement Form (**Appendix B**) to be completed clearly indicating that the purpose of the bond is for uncompleted works.
 - c. Fully priced schedule of outstanding works including the cost of preparation of the "As Constructed" submission.

- d. Unconditional Bank Guarantee to the value of 1.5 times the estimated value of the uncompleted works as certified by the Engineer. A bank guarantee must contain a binding and unconditional contractual relationship between Council and the guaranteeing bank.
 - e. Certification from the Engineer, that the works on each lot have reached a stage acceptable to Council and that the outstanding works are programmed for completion within 90 days.
 - f. All bonds submitted shall be clearly identified as to the particulars of the site and, the purpose of the bond.
 - g. "Contribution Payment" Form to be completed clearly noting all required contributions associated with the Development.
5. Council will require an Uncompleted Works inspection to ensure that the on-lot works and all associated documentation have been completed to Council's satisfaction. Council will require five (5) days' notice and payment of the required inspection fee in advance of any inspection.

CP1.28 APPROVAL OF PLAN OF SURVEY

1. Where operational works are associated with the reconfiguration of land or creation of new titles the Applicant is required to submit plan of survey which accords with the proposal plan approved by Council, suitable for deposit in the office of the Registrar of Titles and duly certified by a Registered Surveyor (Consulting Cadastral), together with 4 copies of the plan, and a completed application form for approval of survey plans, building units, or group titles plan within 2 years from the date of approval of engineering drawings and specifications for subdivisions involving works.
2. Where the survey plans differ from the approved proposed plan, details of any changes are to be provided with the application.
3. The application form and plans, certificate(s) of compliance for any water, sewer reticulation and stormwater drainage system (including CCTV survey), together with the relevant fee are to be lodged with Council.
4. Upon being satisfied that the plan of survey conforms with the approval granted, and all required works have been carried out, or adequate security in accordance with Council's policy for bonding of uncompleted works is provided and all outstanding rates, contributions and charges have been paid, Council will note its approval on the plan of survey and return the plan of survey to the Applicant for lodgement in the Titles Office.
5. The Applicant is required to submit the plan of survey to the Titles Office within 6 months of Council approval of the plan. Failure to do so will require the plan of survey to be resubmitted to Council for re-approval.

FINAL ACCEPTANCE OF WORKS

CP1.29 "FINAL ACCEPTANCE" INSPECTION

1. The "Final Acceptance" inspection will generally confirm the matters raised in the "Final Acceptance" Inspection checklist (**Appendix H**) and any other matters outstanding relevant to the works. The Checklist is to be completed by the Consulting Engineer prior to the conduct of the "Final Acceptance" Inspection. Failure to do so may result in cancellation of the inspection and/or the incurring of a reinspection fee.

CP1.30 GENERAL REQUIREMENTS

1. During the defects liability period, it is the responsibility of the Developer to rectify any works found to be defective or found to exhibit faults attributed to the design of the works and/or the performance of the construction activities in terms of quality and conformance with the design and specifications.

Once a period of twelve months minimum has elapsed from Council's acceptance of the works "Works Acceptance", a "Final Acceptance" inspection is to be arranged with Council. Payment of an appropriate Inspection Fee may be required.

2. The "Final Acceptance " inspection is to be attended by:
 - a. Council's nominee/s.
 - b. The Consulting Engineer for the project.
 - c. The Contractor.
3. The Consulting Engineer for the works shall be responsible for ensuring that Council's requirements for acceptance of the works are satisfied prior to requesting a Final Acceptance inspection.
4. Council's requirements for final acceptance of the works comprise the following:-
 - a. No outstanding payments are due to Council or other Authorities from the development
 - b. Completion of the "Final Acceptance " Inspection Checklist (**Appendix H**)
 - c. Satisfactory "Final Acceptance" Inspection by relevant Council Officers.
 - d. All conditions of the approvals for as constructed drawings, works acceptance and plan sealing have been completed to the satisfaction of Council.
5. Following a satisfactory Final Acceptance inspection, the Consulting Engineer shall submit a written request to Council for Final Acceptance of the works and release of the Defects Liability bond. Council will, upon confirmation that no outstanding payments arising from the development are due to Council, confirm acceptance of the works, and arrange for the release of the Defects Liability bond.

APPENDIX A

Inspection And Test Requirements

Elements of Work	Consulting Engineer's Responsibility	Council's Responsibility
<p>Clearing and Grubbing Location</p> <p>Allotment Filling Quality of Material Compaction Alignment</p>	<p>HOLD POINT Upon completion of survey, inspect defined limits of clearing.</p> <p>Examine and assess all test results.</p> <p>Examine and assess all test results.</p>	<p>WITNESS POINT Joint inspection of defined limits and tree removal if considered warranted.</p> <p>Visit site for random audit inspections if considered warranted.</p> <p>Visit site for random audit inspections if considered warranted.</p> <p>Visit site for random audit inspections if considered warranted.</p>
<p>Subgrade Compaction CBR Tests (if ordered) Horizontal and Vertical Alignments Profile Embankments</p>	<p>Routinely visit site. HOLD POINT Attend during proof rolling.</p> <p>Examine and assess all test results.</p> <p>HOLD POINT Where CBR tests dictate an alternative pavement design, the council approval of a revised pavement design shall form a hold point.</p> <p>Routinely visit site. Examine and assess all test results and cross section geometry.</p> <p>Routinely visit site. HOLD POINT Attend during completion of trimming and removal of soft spots.</p> <p>Routinely visit site. HOLD POINT Attend during placement of fill.</p>	<p>Visit site for random audit inspections HOLD POINT Joint inspections during proof rolling.</p> <p>Assess all test results.</p> <p>HOLD POINT Where CBR tests dictate an alternative pavement design, the approval of a revised pavement design shall form a hold point.</p> <p>Visit site for random audit inspections Assess all test results and cross section geometry.</p> <p>Visit site for random audit inspections HOLD POINT Joint inspections during trimming and removal of soft spots.</p> <p>WITNESS POINT Visit site for random audit inspections if considered warranted</p>
<p>Subgrade Replacement Material Quality Compaction (a) For on site material (b) For graded material Profile & Depth</p>	<p>HOLD POINT Make sufficient routine visits to assess quality of materials. HOLD POINT Examine and assess all test results.</p> <p>HOLD POINT Make sufficient routine visits to assess that operations will achieve a sound compacted layer HOLD POINT Examine and assess all test results.</p> <p>HOLD POINT Examine and assess all test results.</p>	<p>WITNESS POINT Visit site for random audit inspections if considered warranted.</p> <p>WITNESS POINT Visit site for random audit inspections if considered warranted.</p> <p>WITNESS POINT Visit site for random audit inspections if considered warranted.</p>
<p>Building/Structures</p>	<p>Ensure Council Approval of all building/structures</p>	<p>Inspect and ensure compliance</p>

Elements of Work	Consulting Engineer's Responsibility	Council's Responsibility
<p>Sub-base Layer</p> <p>Material Quality</p> <p>Compaction</p> <p>Profile & Depth</p>	<p>Routinely visit site. Examine and assess all test results.</p> <p>Routinely visit site. HOLD POINT Attend during proof rolling. Examine and assess all test results.</p> <p>Routinely visit site. HOLD POINT Attend at completion of final preparation. Examine and assess all test results and cross section geometry.</p>	<p>WITNESS POINT Visit site for random inspections if considered warranted.</p> <p>WITNESS POINT Visit site for random inspections if considered warranted.</p> <p>HOLD POINT Joint inspection on completion of final preparation.</p>
<p>Base Layer</p> <p>Material Quality</p> <p>Compaction</p> <p>Horizontal and Vertical Alignments (a) With no Kerb & Channelling (b) With Kerb & Channelling</p> <p>Profile</p>	<p>Routinely visit site.</p> <p>Routinely visit site. HOLD POINT Attend during proof rolling Examine and assess all test results and cross section geometry.</p> <p>Routinely visit site. Examine and assess all test results and cross section geometry.</p> <p>Routinely visit site. HOLD POINT Attend at completion of final preparation.</p>	<p>Visit site for random audit inspections</p> <p>Visit site for random audit inspections HOLD POINT Joint inspections during proof rolling.</p> <p>Visit site for random audit inspections</p> <p>Visit site for random audit inspections HOLD POINT Joint inspection on completion of final preparation.</p>
<p>Surfacing</p> <p>Material Quality</p> <p>Compaction and Thickness</p> <p>Horizontal & Vertical Alignments</p> <p>Profile</p>	<p></p> <p></p> <p></p> <p>HOLD POINT Undertake a Pre-seal Inspection.</p>	<p>WITNESS POINT Visit site for random inspections if considered warranted</p> <p>WITNESS POINT Visit site for random inspections if considered warranted</p> <p>WITNESS POINT Visit site for random inspections if considered warranted</p> <p>HOLD POINT Undertake a Pre-seal Inspection</p>

Elements of Work	Consulting Engineer's Responsibility	Council's Responsibility
Subsoil Drains Pipe Filter Material Cleaning Joints and Markers Geofabric	Routine inspections of Contractors Performance and progress of works. Routine inspections of Contractors Performance and progress of works. Routine inspections of Contractors Performance and progress of works. Routine inspections of Contractors Performance and progress of works.	Visit site for random inspections if considered warranted Visit site for random inspections if considered warranted Visit site for random inspections if considered warranted Visit site for random inspections if considered warranted
Kerb and Channel Material Quality Horizontal & Vertical Alignments	HOLD POINT Inspect foundations prior to kerb placement Inspect completed kerb. Water test where appropriate.	HOLD POINT Visit site for inspection HOLD POINT Visit site for inspection
Road Crossing Conduits Location Markers	Routine inspections of Contractors Performance. Routine inspections of Contractors Performance.	Visit site for random inspection is considered warranted. Visit site for random inspection is considered warranted.
Stormwater Drainage Location of Structures SL & IL at Structures Material Quality (Bedding, Concrete, Pipes) Manholes Drain lines Backfilling 'Cast Insitu' Reinforced Concrete Work	HOLD POINT Sufficient visits to assess compliance and to view progress and works. HOLD POINT Sufficient visits to assess compliance and to view progress and works. HOLD POINT Sufficient visits to assess compliance and to view progress and works. HOLD POINT Visual inspection prior to placement of structure/s after bedding sand. HOLD POINT Sufficient visits to assess compliance and to view progress and works. HOLD POINT Sufficient visits to assess compliance and to view progress and works. HOLD POINT Sufficient visits to assess compliance and to view progress and works. HOLD POINT Inspect reinforcement and formwork prior to concrete pour	 WITNESS POINT Visit site for inspection prior to laying of pipe and bedding. HOLD POINT Visit site for inspection prior to backfilling. WITNESS POINT Inspect reinforcement and formwork prior to concrete pour

Elements of Work	Consulting Engineer's Responsibility	Council's Responsibility
<p>Landscaping</p> <p>Grass establishment</p> <p>Tree Planting</p> <p>Irrigation</p> <p>(a) Pipelines (b) Pressure Testing Pipelines (c) Performance Testing</p>	<p>Routine inspections of Contractors Performance.</p> <p>Routine inspections of Contractors Performance. Confirm all affected areas are topsoiled, grassed and maintained.</p> <p>WITNESS POINT Witness and approve pressure and performance test.</p>	<p>Visit site for check at defects liability inspection.</p>
<p>Soil and Water Quality</p>	<p>HOLD POINT Examine and approve contractors ESCP for compliance with ESCS. ESC Measures for works area are in place prior to works commencing on this section or stage. Randomly audit and inspect ESC measures for compliance with contractors ESCP.</p>	<p>WITNESS POINT Visit site for inspection if considered warranted.</p>
<p>Sewerage Reticulation</p> <p>Location MH's & HC's IL at MH & HC's</p> <p>Backfilling</p> <p>SP Boundary Set Out</p> <p>Material Quality (Bedding, Concrete, Pipes)</p> <p>Manholes, Maintenance Shafts & Benching</p> <p>Hydrostatic Testing of Manholes</p> <p>Pipelines</p> <p>Thrust/anchor blocks</p> <p>Trunk Infrastructure</p>	<p>Routine inspections</p> <p>Routine inspections and review of field information</p> <p>Routine inspections of Contractors Performance . HOLD POINT Visual inspection after excavation prior to bedding.</p> <p>Routine inspections of Contractors performance. Review of field measurements.</p> <p>Assess all test results.</p> <p>Routine inspections</p> <p>HOLD POINT Witness hydrostatic testing of manholes.</p> <p>HOLD POINT Witness pressure test of lines .</p> <p>HOLD POINT Visual site inspection of anchor/thrust blocks prior to concrete pour.</p> <p>HOLD POINT Pre-connection visual inspection of trunk lines.</p>	<p>WITNESS POINT Visual inspection after excavation prior to bedding. Visual inspection of lines prior to backfill.</p> <p>WITNESS POINT Witness hydrostatic testing of manholes.</p> <p>HOLD POINT Visual inspection after excavation prior to bedding. HOLD POINT Witness pressure test of lines.</p> <p>WITNESS POINT Visual site inspection of anchor/thrust blocks prior to backfill.</p> <p>HOLD POINT Pre-connection visual inspection of trunk lines.</p>

Elements of Work	Consulting Engineer's Responsibility	Council's Responsibility
Water Reticulation		.
Location	Routine inspections of Contractors Performance. Review of field measurements	.
SP Boundary Set Out	Routine inspections of Contractors Performance. Review of field measurements	.
Valves, Hydrants, Scours, Bends	Routine inspections of Contractors Performance. Review of field measurements	
Depth	Routine inspections of Contractors Performance. Review of field measurements	
Material Quality (Bedding, Concrete, Pipes)	Assess all test results.	
Pipelines	<p>HOLD POINT Visual inspection after excavation prior to bedding.</p> <p>HOLD POINT Witness pressure test of lines.</p> <p>HOLD POINT Witness chlorine swabbing of lines – pre-amalgamation DSC area.</p> <p>HOLD POINT Disinfection (if directed) / flush of pipeline</p>	<p>WITNESS POINT Visual inspection after excavation prior to bedding.</p> <p>HOLD POINT Witness pressure test of lines.</p> <p>WITNESS POINT Disinfection / flush of pipeline</p>
Thrust/anchor blocks	HOLD POINT Visual site inspection of anchor/thrust blocks prior to concrete pour.	WITNESS POINT Visual site inspection of anchor/thrust blocks prior to backfill.
Backfilling	Routine inspections of Contractors Performance . HOLD POINT Visual site inspection prior to backfill	Visual inspection of lines prior to backfill. WITNESS POINT Visual site inspection prior to backfill

Elements of Work	Consulting Engineer's Responsibility	Council's Responsibility
<p>Pump Stations and Valve Chambers</p> <p>Excavation</p> <p>Foundation Inspection</p> <p>Base slab reinforcement, formwork and water stop</p> <p>Reinforcement and formwork</p> <p>Materials testing</p> <p>Hydrostatic Testing</p> <p>Electrical and SCADA equipment</p> <p>Lifting chain</p> <p>Pump testing and Station Commissioning</p>	<p>Routine inspections of Contractor's performance</p> <p>WITNESS POINT. Confirm water table level and founding condition</p> <p>WITNESS POINT Inspect foundation prior to placing formwork / reinforcement</p> <p>HOLD POINT Inspect reinforcement, water stop and formwork prior to concrete pour.</p> <p>HOLD POINT Inspect reinforcement and formwork prior to concrete pour.</p> <p>Assess all test results.</p> <p>HOLD POINT Witness hydrostatic test.</p> <p>WITNESS POINT. Review switchboard test certification. Inspect installation</p> <p>WITNESS POINT Review certification of lifting chain.</p> <p>HOLD POINT Witness pressure and draw down testing of pumps.</p> <p>HOLD POINT Inspection against commissioning checklist.</p>	<p>WITNESS POINT Inspect foundation prior to placing formwork / reinforcement</p> <p>Visual inspection of reinforcement, water stop and formwork prior to concrete base pour.</p> <p>Visual inspection of reinforcement and formwork prior to concrete pour</p> <p>WITNESS POINT Visual inspection of concrete prior to stripping of formwork.</p> <p>WITNESS POINT Review materials testing.</p> <p>HOLD POINT Witness hydrostatic test.</p> <p>HOLD POINT ¹ Witness factory acceptance testing of switchboards prior to delivery to site (¹At receiving council's discretion)</p> <p>WITNESS POINT Review certification of lifting chain.</p> <p>HOLD POINT Witness pressure and draw down testing of pumps.</p> <p>HOLD POINT Inspection against commissioning checklist.</p>

Elements of Work	Consulting Engineer's Responsibility	Council's Responsibility
Prior to Acceptance of works for "Defects Liability Period"	<p>Forward "As Constructed" submission to Council with Registered Surveyors and Consulting Engineers certification attached.</p> <p>Finalise all other Documentation in accordance with Construction Procedures.</p> <p>Complete "Defects Liability" Inspection Checklist prior to joint inspection with Council</p>	<p>Council to accept and conduct Audit checks of As Constructed Drawings and advise any requirements.</p> <p>Council Inspector to accompany Consulting Engineer and Contractor and to advise any requirements.</p> <p>When completed advise in writing of acceptance of works for commencement of "Defects Liability Period"</p>
During "Defects Liability Period"	<p>Consulting Engineer to confirm all minor omissions and defects have received suitable attention and to examine and approve site prior or asking for "Final Acceptance of works" Inspection</p>	<p>Council to advise Consulting Engineer of any defects</p>
Prior to Final Acceptance of works.	<p>Consulting Engineer to accompany Council Inspector and to note any requirements</p>	<p>Council Inspector to accompany Consulting Engineer and Contractor and to advise any requirements.</p> <p>When completed advise in writing of final acceptance of works.</p>

TEST REQUIREMENTS

Construction Activity	Verification Requirement		Minimum Test Frequency	Specification Requirement	Minimum No. of Tests
	Description	Test Required			
SEWER MAIN CONSTRUCTION					
Embedment	Compaction		WSA02-2014		
Trench Fill	Compaction		WSA02-2014		
Gravity Pipes	Air Pressure and Vacuum		Table S6.2, Operational Works Specification S6 "Sewerage Reticulation", FNQROC Development Manual		
	Deflection		WSA02-2014		
	CCTV Inspection		WSA02-2014		
Manholes	Vacuum or Hydrostatic		Clause S6.26, Operational Works Specification S6 "Sewerage Reticulation", FNQROC Development Manual		
SEWER PUMP STATION CONSTRUCTION					
Embedment	Compaction		WSA04-2005 36.3		
Backfilling	Compaction		WSA04-2005 36.3		
Switchboards	Electrical Testing		WSA04-2005 36.9		
WATER MAIN CONSTRUCTION					
Embedment	Compaction		WSA03-2002 19.3		
Trench Fill	Compaction		WSA03-2002 19.3		
Pipes	Pressure		Clause S5.28, Operational Works Specification S5 "Water Reticulation", FNQROC Development Manual		
Disinfection (if directed)	Bacteriological		WSA03-2002 19.5		
STORMWATER DRAINAGE CONSTRUCTION					
Excavation	Compaction	RDD	Q141B/Q140A/Q143 or	1/50m ²	95% SRDD
			AS 1289.5.3.1 or		
			AS 1289.5.4.1		
		MDD	Q141A or	1/RDD	n/a
AS 1289.5.1.1 or					
AS 1289.5.7.1					

Construction Activity	Verification Requirement		Minimum Test Frequency	Specification Requirement	Minimum No. of Tests		
	Description	Test Required					
STORMWATER DRAINAGE CONSTRUCTION (cont'd)							
Bedding/Haunch (RCP, RCBC or similar)	Material Quality	Grading	Q103A or AS 1289.3.6.1	1/material type	Table 19.2.6, MTRS04	n/a	
		Linear Shrinkage	Q106 or AS 1289.3.4.1				
	Compaction (Cohesive)	RDD	Q141B/Q140A/Q143 or AS 1289.5.3.1	Under trafficable area 1/side/50m Elsewhere 1/side/100m	Table S4.1, Operational Works Specification S4 "Stormwater Drainage", FNQROC Development Manual	2	
			MDD	Q141A or Q142E			1/material type
	Compaction (Cohesionless)	Density Index	Q132B or AS 1289.5.6.1	Under trafficable area 1/side/50m Elsewhere 1/side/100m		2	
			Min/Max Dry Density	AS 1289.5.1.1 or AS 1289.5.5.1		1/material type	n/a
	Backfill (RCP, RCBC or similar)	Material Quality	Grading	Q103A or AS 1289.3.6.1	1/material type	Table 19.2.3, MRTS04	n/a
			Linear Shrinkage	Q106 or AS 1289.3.4.1			
Compaction (Design Trench Width ≤ 4m)		RDD	Q141B/Q140A/ Q143 or AS 1289.5.3.1 or AS 1289.5.4.1	Under trafficable area 1/300mm lift/50m Elsewhere 1/900mm lift/100m	Table S4.1, Operational Works Specification S4 "Stormwater Drainage", FNQROC Development Manual	1 (between structures)	
			MDD	Q110A or AS 1289.5.1.1 or AS 1289.5.7.1			1/material type
				1/RDD			

Construction Activity	Verification Requirement		Minimum Test Frequency	Specification Requirement	Minimum No. of Tests
	Description	Test Required			
STORMWATER DRAINAGE CONSTRUCTION (cont'd)					
Backfill (RCP, RCBC or similar) (cont'd)	Compaction (Design Trench Width > 4m)	RDD	Q141B/Q140A/Q143 or	Under trafficable area 1/300mm lift/200m ²	1 (between structures)
			AS 1289.5.3.1 or		
			AS 1289.5.4.1	Elsewhere 1/900mm lift/400m ²	
		MDD	Q141A or	1/material type	
AS 1289.5.1.1 or AS 1289.5.7.1	1/RDD				
Backfill (In-Place Structures other than RCP, RCBC or similar)	Material Quality	Grading	Q103A or	1/material type	100% < 50mm
			AS 1289.3.6.1		2 ≤ IP ≤ 12
		Plasticity index	Q105 or		
	AS 1289.3.3.1				
	Compaction	RDD	Q141B/Q140A/Q143 or	2/500mm lift	2
			AS 1289.5.3.1 or AS 1289.5.4.1		
MDD		Q141A or AS 1289.5.1.1 or AS 1289.5.7.1	1/material type 1/RDD	n/a	
Backfill (Stabilised Sand)	Material Quality	Stabilised sand shall comprise sand meeting the requirements of Table 19 MRS11.04 in an intimate mixture of 12 parts sand and 1 part of either Type GP or GB cement		Table 19.2.5, MRTS04	n/a
Bedding/Haunch/Backfill/Overlay (Buried Metal Corrugated Structures)	Material Quality	All materials shall be in accordance with the manufacturer's recommendations. Evidence of these recommendations and subsequent compliance shall be incorporated with the Contractor's quality records.		As per manufacturer's recommendations.	
	Installation	Installation shall be in accordance with the manufacturer's recommendations. Evidence of these recommendations and subsequent compliance shall be incorporated with the Contractor's quality records		As per manufacturer's recommendations.	

Construction Activity	Verification Requirement		Minimum Test Frequency	Specification Requirement	Minimum No. of Tests
	Description	Test Required			

STORMWATER DRAINAGE CONSTRUCTION (cont'd)

Stormwater Drainage System	CCTV Inspection	Clause S4.26, Operational Works Specification S4 "Stormwater Drainage", FNQROC Development Manual			
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ROAD CONSTRUCTION

Ground Surface Treatment	Compaction	RDD	Q141B/Q140A/Q143 or AS 1289.5.3.1 or AS 1289.5.4.1	1/2500m ²	>0.3m below pavement subgrade - 95% SRDD	3
			MDD			
Embankment (Road)	Compaction	RDD	Q141B/Q140A/Q143 or AS 1289.5.3.1 or AS 1289.5.4.1	1/200mm lift/2500m ² or 1/500m ³	>0.3m below pavement subgrade - 95% SRDD	3
			MDD			
Embankment (Concentrated Operations – Gullies etc)	Compaction	RDD	Q141B/Q140A/Q143 or AS 1289.5.3.1 or AS 1289.5.4.1	1/200mm lift/500m ² or 1/100m ³	>0.3m below pavement subgrade - 95% SRDD	3
			MDD			

Construction Activity	Verification Requirement		Minimum Test Frequency	Specification Requirement	Minimum No. of Tests
	Description	Test Required			

ROAD CONSTRUCTION (cont'd)

Subgrade (General)	Material Quality	CBR	Q113C (soaked)	Representative each material and 1 test per 500m carriageway or part thereof	97% MDD 100% OMC	n/a	
	Compaction	RDD	Q141B/Q140A/Q143 or AS 1289.5.3.1 or AS 1289.5.4.1	1/1000m ²	97% SRDD	3	
			MDD	Q141A or AS 1289.5.1.1 or AS 1289.5.7.1		1/RDD	n/a
				AS 1289.5.7.1			
Subgrade (Turnouts and Entrances)	Compaction	RDD	Q141B/Q140A/Q143 or AS 1289.5.3.1 or AS 1289.5.4.1	1/100m ²	97% SRDD	1	
			MDD	Q141A or AS 1289.5.1.1 or AS 1289.5.7.1		1/RDD	n/a
				AS 1289.5.7.1			
	Material Quality	All materials shall be sourced from a Quality Assured material supplier and the results of the manufacturer's testing to assure quality of the product shall be incorporated with the Contractor's quality records			MRTS05 Section 7.2 "Type 2 Unbound Material"		
Pavement Layers (General)	Compaction	RDD	Q141B/Q140A/Q143 or Q141A or	1/500m ²	100% SRDD	4	
			AS 1289.5.3.1	2/500m ²		8	
			AS 1289.5.3.1	1/500m ² (2/500m ² if using AS1289.5.8.1)		4 (8)	
		MDD	Q141A or AS 1289.5.1.1 or AS 1289.5.4.2	1/material type/5000m ²		n/a	
AS 1289.5.4.2	as required						

Construction Activity	Verification Requirement		Minimum Test Frequency	Specification Requirement	Minimum No. of Tests	
	Description	Test Required				
ROAD CONSTRUCTION (cont'd)						
Pavement Layers (Turnouts and Entrances)	Compaction	RDD	Q141B/Q140A/Q143 or	1/100m ²	100% SRDD	1
			Q141A or	2/100m ²		
			AS 1289.5.3.1	1/100m ² (2/100m ² if using AS1289.5.8.1)		
		MDD	Q141A or	1/material type		n/a
			AS 1289.5.1.1 or AS 1289.5.4.2	as required		
Structural Concrete	Compressive Strength		AS 1012.1	1 sample of 2 cylinders for each 15m ³ or part thereof placed in an essentially continuous manner	Table S7.1, "Concrete Classes", FNQROC Development Manual	1 sample per casting day
			AS 1012.3.1			
			AS 1012.8.1			
			AS 1012.9			
			AS 1012.12.1			

Table 19.2.3 - Select Backfill Properties		
MRTS04		
AS SIEVE SIZE (mm)	Percent (by mass) Passing Sieve	
	Gravel †	Loam
37.5	100	100
9.5	60 – 85	100
2.36	25 - 70	70 – 100
0.425	10 – 40	10 – 40
0.075	3 - 30	3 - 30
Other Properties Linear Shrinkage	8 maximum	6 maximum

† Material of size greater than 2.36mm shall be stone

Table 19.2.5 - Sand Properties		
MRTS04		
Property	Natural Sand	Blended and Manufactured Sand
Percent passing 6.7mm AS sieve	100	100
Percent passing 0.075mm AS sieve (maximum)	5	20
Plasticity Index (maximum)	5	10

Table 19.2.6 – Grading Limits for Bedding Material	
MRTS04	
AS SIEVE SIZE (mm)	% Passing By Mass
19	100
2.36	30 – 100
0.425	15 – 70
0.075	Mar-30
Other Properties Linear Shrinkage	6 maximum

APPENDIX B

Sewer Mains Inspection And Test Plan Template

INSPECTION AND TEST PLAN – SEWER MAIN LAYING

ITP to be completed by Consulting Engineer

Developer:		Consultant Engineer:		Consultant Engineer Representative:	
Project:		Contractor:		Contractor Site Representative:	
Description:		Sub-contractor:		Witness, Hold & Surveillance points added to ITP	
		Field Tester:			
Location:		ITP Prepared by:		Council Representative:	
		Date / /			

No	Construction/Inspection Activity	Inspection Procedure & Acceptance Criteria	Contractor	Consulting Engineer	Council *	Record	Comment
1	Pre start/Site establish	Pre-Start Meeting Checklist. Site establishment visual check. Checklist completed. (S1)	I	H	H	Checklist S1	
2	Approved materials on Site and delivered	Visual check approved materials. Quantity and condition. Checklist completed (S2)	I	I	S	Checklist S2	
3	Excavation and pipe laying	Visual and dimensional check to FNQROC Standards. Checklist completed. (S3)	I	H	W	Checklist S3	
4	Maintenance Shafts	Visual and dimensional check to FNQROC Standards. Checklist completed (S4)	I	H	S	Checklist S4	
5	Survey of main in easement	Survey of pipe location before backfill	I	I	S		
6	Anchor/Thrust Blocks	Visual and dimensional check to FNQROC Standards. Checklist completed.	I	H	H		
7	Embedment and Trench Fill	Visual check and compaction testing to FNQROC Standards	I	H	W	Compaction test results	
8	Surface fittings	Visual and dimension check to FNQROC Standards (S5)	I	I	S	Checklist S5	
9	Testing	Pressure/vacuum, deflection and compaction tests to FNQROC Standards	I	H	W	Test Results	
10	Pre-Connection Inspection	Visual inspection to all parties standards (S6) Flow Management procedures as per Job Specific Schedule Letter	H	H	H	Checklist S6	
12	Restoration	Visual inspection against photographs. Clearance letter from Council/property owner	I	W	S	Clearance letter	

Symbol	Legend	No	Amendment	Date	Reviewed	Validation
I	Inspection					I certify that the works have been constructed in accordance with FNQROC Standards and the Inspection and Test Plan Consulting Engineer Date / /
H	Mandatory Hold Point					
W	Witness Point					
S	Surveillance					

* Council reserves the right to vary these requirements at any time ** Council's written approval MUST be obtained prior to varying these requirements

SEWER CHECKLIST S1
PRE-START AND SITE ESTABLISHMENT

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:										CONSULTING ENGINEER:										
Date from: to:			PIPE TYPE:				SIZE:			CLASS:			CONTRACTOR:							
			SITE						DATE SITE 1:		SITE 2:		SITE 3:		SITE 4:		SITE 5:		SITE 6:	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD			COMMENT				Signatures					
1.1	Plan current and on site																			
1.2	Pre construct report inc. photographs																			
1.3	Road opening requirements																			
	Fees paid							Council Requirements												
	Traffic mgt plan implemented																			
1.4	Environmental Management Plan on site and implemented																			
1.5	Safe Work Plan on site and implemented																			
1.6	Receiving sewer located																			
1.7	Property entry agreement																			
1.8	Main laying Specification on site																			
1.9	Footways to finished levels							If laying in road reserve												
1.10	Survey pegs in place							Registered surveyor												
1.11	Job set out/level sheets																			
1.12	All services located																			
1.13	All services marked							'Dial Before You Dig', Services Search, and Relevant Authorities												
1.14	Main layer holding relevant accreditation on site																			
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:												
COMMENT:																				

SEWER CHECKLIST S2 APPROVED MATERIALS ON SITE AND DELIVERED												
* CLAUSE AND DRAWING NO. REFER TO FNQROC DEVELOPMENT MANUAL												
PROJECT:						CONSULTING ENGINEER:						
Date from: to:			PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:			
			DAY				DATE DAY 1:	DAY 2:	DAY 3:	DAY 4:	DAY 5:	DAY 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD	COMMENT		Signatures	
2.1	Delivery Inspection											
2.2	Pipe type and size to current plan							Current Plan				
2.3	Bedding material											
2.4	Trench fill											
2.5	Fittings											
2.6	Surface Fittings											
2.7	Pre Cast chambers											
2.8	Mortar / Plaster											
2.9	Pipe laying accessories											
VARIATIONS AND CHANGES:							SITE INSTRUCTIONS:					
COMMENT:												

SEWER CHECKLIST S3 – PAGE 1 OF 2
EXCAVATION AND PIPELAYING

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:								CONSULTING ENGINEER:					
Date from:		PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:					
to:		DAY						DATE DAY 1:	DAY 2:	DAY 3:	DAY 4:	DAY 5:	DAY 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD	COMMENT		Signatures		
3.1	Environmental Management Plan on site and implemented												
3.2	WH&S Plan on site and implemented												
3.3	Services exposed												
3.4	Clearance from Services												
3.5	Trench width mm												
3.6	Trench depth to design level												
3.7	Trench shoring/Plating												
3.8	Trench drainage												
3.9	Pipe Embedment												
	Compaction												
	Bedding mm												
	Surrounds/sides mm												
3.10	Pipe laid to grade												
3.11	Jointing to Standards												
3.12	Concrete												
	Trench stops in place												
	Bulkheads in place												
3.13	Property Connection Sewers to Standard												
	Identification tape												
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:					
COMMENT:													

SEWER CHECKLIST S3 – PAGE 2 OF 2
EXCAVATION AND PIPELAYING

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:						CONSULTING ENGINEER:											
Date from: to:			PIPE TYPE:			SIZE:			CLASS:			CONTRACTOR:					
			DAY			DATE DAY 1:		DAY 2:		DAY 3:		DAY 4:		DAY 5:		DAY 6:	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD				COMMENT				Signatures	
3.14	Trench Fill																
	Material																
	Compaction																
	Compaction test							NATA Certified lab									
3.15	Terminal Maintenance Shaft to Standard																
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:									
COMMENT:																	

**SEWER CHECKLIST S4
MAINTENANCE SHAFTS**

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:						CONSULTING ENGINEER:					
Date from: to:		PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:			
		CHAMBER				DATE CH 1:	CH 2:	CH 3:	CH 4:	CH 5:	CH 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD	COMMENT	Signatures	
4.1	Finished Surface Levels Supplied										
4.2	Drainage requirements										
4.3	Base										
	Placement										
	Channels										
	First shaft section										
4.4	Pre cast chamber										
	Shaft assembled in correct order										
	Step iron location and spacing										
	Sealing										
	Offset cone located correctly										
	Minimum one make up ring										
	Cover and frame										
4.5	In-situ chamber										
	Reinforcement							Plan Specification			
	Cover										
	Concrete type to Specification										
	Step iron location and spacing										
	Dimension check										
	Cover and frame										
4.6	Plastering/rendering										
4.7	Benching										
VARIATIONS AND CHANGES:							SITE INSTRUCTIONS:				
COMMENT:											

**SEWER CHECKLIST S5
SURFACE FITTINGS**

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:						CONSULTING ENGINEER:					
Date from: to:		PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:			
		SITE				DATE SITE 1:	SITE 2:	SITE 3:	SITE 4:	SITE 5:	SITE 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD		COMMENT	Signatures
5.1	Surface boxes and surrounds to finished levels										
5.2	Surface box lids hinged in direction of traffic flow										
5.3	Shroud pipes assembled to Standards										
5.4	Fitting bolts protected to Standards										
5.5	Correct depth to Spindle tops										
5.6	Correct depth to Hydrant lugs										
5.7	Spindle retaining disc in place										
5.8	Indicator plates in place										
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:			
COMMENT:											

**SEWER CHECKLIST S6
PRE-CONNECTION INSPECTION**

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:										CONSULTING ENGINEER:								
Date from: to:				PIPE TYPE:			SIZE:			CLASS:			CONTRACTOR:					
				SITE						DATE SITE 1:	SITE 2:	SITE 3:	SITE 4:	SITE 5:	SITE 6:			
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD			COMMENT			Signatures				
6.1	WAC compiled																	
6.2	Compaction and concrete tests																	
6.3	Vacuum/Air test results																	
6.4	Deflection Test Results																	
6.5	CCTV Inspection																	
6.6	Junction tracer tape in place																	
6.7	Surface boxes and surrounds level																	
6.8	Terminal Mtce Shaft/Rodding Points to Standard																	
6.9	Chambers sized to Standard																	
6.10	Cover and frame to Standard																	
6.11	Minimum one make up ring																	
6.12	Chamber step irons to Standard																	
6.13	First shaft section																	
6.14	Channels to Standard																	
6.15	Benching to Standard																	
6.16	Sealing to Standard																	
6.17	Site restored satisfactorily																	
VARIATIONS AND CHANGES:									SITE INSTRUCTIONS:									
COMMENT:																		

APPENDIX C

Water Main Inspection And Test Plan Template

INSPECTION AND TEST PLAN – WATER/RECYCLED WATER MAIN LAYING

ITP to be completed by Consulting Engineer

Developer:		Consultant Engineer:		Consultant Engineer Representative:					
Project:		Contractor:		Contractor Site Representative:					
Description:		Sub-contractor:		Witness, Hold & Surveillance points added to ITP					
		Field Tester:							
Location:		ITP Prepared by:							Reviewed by:
		Date / /		Date / /		Date / /			
No	Construction/Inspection Activity	Inspection Procedure & Acceptance Criteria			Contractor	Consult. Engineer	Council *	Record	Comment
1	Pre-start/Site establish	Pre-Start Meeting Checklist. Site establishment visual check. Checklist completed. (W1)			I	H	H	Checklist W1	
2	Approved materials on Site/delivered	Visual check approved materials. Quantity and condition. Checklist completed (W2)			I	I	S	Checklist W2	
3	Excavation & Pipe Laying	Visual and dimensional check to FNQROC Standards. Checklist completed. (W3)			I	H	W	Checklist W3	
4	Chambers	Visual and dimensional check to FNQROC Standards. Checklist completed (W4)			I	I	S	Checklist W4	
5	Survey of main in easement	Survey of pipe location before backfill			I	I	S		
6	Anchor/Thrust Blocks	Visual and dimensional check to FNQROC Standards. Checklist completed.			I	H	W		
7	Embedment and Trench Fill	Visual check and compaction to FNQROC Standards			I	H	W	Compaction test results	
8	Surface fittings	Visual and dimension check to FNQROC Standards. Checklist completed (W5)			I	I	S	Checklist W5	
9	Disinfection	Disinfection to FNQROC Standards			I	H	W	Test Results	
10	Testing	Pressure test and Compaction test to FNQROC Standards			I	H	H	Test Results	
11	Pre-connection inspection	Visual inspection to FNQROC Standards. Checklist completed (W6, W7) Isolation procedure as per Job Specific Letter			H	H	H	Checklist W6, W7	
12	Dual water flow test property service/s (main to meter)	Flow test of drinking water system. Lock and tag meter ball valve. Flow test of recycled water system. Lock and tag meter ball valve.			I	W	H	Test results	
13	Restoration	Visual inspection against photographs. Clearance letter from Council/property owner			I	W	S	Clearance letter	

Symbol	Legend	No	Amendment	Date	Reviewed	Validation
I	Inspection					I certify that the works have been constructed in accordance with FNQROC Standards and the Inspection and Test Plan Consulting Engineer Date / /
H	Mandatory Hold Point					
W	Witness Point					
S	Surveillance					

* Council reserves the right to vary these requirements at any time

** Council's written approval MUST be obtained prior to varying these requirements

**WATER CHECKLIST W1
PRE-START AND SITE ESTABLISHMENT**

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:						CONSULTING ENGINEER:					
Date from: to:		PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:			
		SITE				DATE SITE 1:	SITE 2:	SITE 3:	SITE 4:	SITE 5:	SITE 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD	COMMENT		Signatures
1.1	Plan current and on site										
1.2	Pre construct report inc. photographs										
1.3	Property Entry Agreement										
1.4	Road opening requirements										
	Fees paid										
	Traffic mgt plan implemented										
1.5	Environmental Management Plan on site and implemented										
1.6	Wh&S Plan on site and implemented										
1.7	Main laying Specification on site										
1.8	Footways to finished levels										
1.9	Survey pegs in place							Registered surveyor			
1.10	Job set out										
1.11	All services located							'Dial Before You Dig', services search and Relevant Authorities			
1.12	All services marked										
1.13	Main layer holding relevant accreditation on site										
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:			
COMMENT:											

WATER CHECKLIST W2 APPROVED MATERIALS ON SITE AND DELIVERED												
										* CLAUSE AND DRAWING NO. REFER TO FNQROC DEVELOPMENT MANUAL		
PROJECT:							CONSULTING ENGINEER:					
Date from: to:			PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:			
			SITE				DATE SITE 1:	SITE 2:	SITE 3:	SITE 4:	SITE 5:	SITE 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD		COMMENT		Signatures
2.1	Delivery Inspection											
2.2	Pipe type and size to current plan											
2.3	Polyethylene sleeving & accessories											
2.4	Marking tape											
2.5	Bedding material											
2.6	Trench fill											
2.7	Fittings											
2.8	Surface Fittings											
2.9	Pre Cast chambers											
2.10	Pipe laying accessories											
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:				
COMMENT:												

WATER CHECKLIST W3 – PAGE 1 OF 2
EXCAVATION AND PIPE LAYING

* CLAUSE AND DRAWING NO. REFER TO
 FNQROC DEVELOPMENT MANUAL

PROJECT:								CONSULTING ENGINEER:											
Date from: to:				PIPE TYPE:				SIZE:				CLASS:				CONTRACTOR:			
				DAY				DATE DAY 1:		DAY 2:		DAY 3:		DAY 4:		DAY 5:		DAY 6:	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD				COMMENT				Signatures			
4.1	Environmental Management Plan on site and implemented																		
4.2	Traffic Management Plan on site and implemented																		
4.3	Services exposed																		
4.4	Clearance from Services																		
4.5	Trench width mm																		
4.6	Trench depth mm																		
4.7	Trench shoring																		
4.8	Excavation prior to placement of backfill											COUNCIL HOLD POINT							
4.9	Sleeving																		
	Pipe and/or Fitting clean																		
	Sleeving overlapped & sealed																		
	Sleeving Ends sealed																		
4.10	Laying																		
4.11	Pipe Embedment																		
	Compaction																		
	Bedding																		
	Surround																		
	Overlay																		
	Testing																		
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:											
COMMENT:																			

WATER CHECKLIST W3 – PAGE 2 OF 2
EXCAVATION AND PIPE LAYING

* CLAUSE AND DRAWING NO. REFER TO
 FNQROC DEVELOPMENT MANUAL

PROJECT:						CONSULTING ENGINEER:									
Date from: to:			PIPE TYPE:			SIZE:			CLASS:			CONTRACTOR:			
			DAY			DATE DAY 1:	DAY 2:	DAY 3:	DAY 4:	DAY 5:	DAY 6				
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD			COMMENT		Signatures		
4.12	Pipe joints														
	Witness mark														
	Deflection limits														
	Restrained joints														
4.13	Valves, Hydrants & Surface fittings installed														
	Shroud assembly														
	Valve anchorage														
4.14	Marking tape														
	Correct location														
	Connected to fittings														
4.15	Concrete														
	Trench stops in place														
	Bulkheads in place														
	Thrust blocks in place														
	Embedment & Encasement in place														
4.16	Trench fill														
	Material														
	Compaction														
	Compaction Testing														
VARIATIONS AND CHANGES:								NATA Certified Lab							
								SITE INSTRUCTIONS:							
COMMENT:															

**WATER CHECKLIST W4
CHAMBERS**

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:										CONSULTING ENGINEER:											
Date from: to:				PIPE TYPE:			SIZE:			CLASS:			CONTRACTOR:								
				CHAMBER						DATE CH 1:		CH 2:		CH 3:		CH 4:		CH 5:		CH 6:	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD				COMMENT				Signatures					
5.1	In-Situ Chamber																				
	Formwork – correct sizing																				
	Formwork – correct levels																				
	Reinforcement																				
	Conduits																				
5.2	Pre Cast Chamber																				
	Size to Standards																				
	Base slab to Standards																				
	Base levelled																				
5.3	Reduced Size Chamber																				
5.4	Scour Chamber																				
5.5	Ladders / handrails / step irons																				
5.6	Puddle Flanges																				
5.7	Sealing							Manufacturer Specification													
5.8	Drainage																				
5.9	Metal access cover																				
5.10	Operational access																				
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:													
COMMENT:																					

**WATER CHECKLIST W5
SURFACE FITTINGS**

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:						CONSULTING ENGINEER:					
Date from: to:		PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:			
		SITE				DATE SITE 1:	SITE 2:	SITE 3:	SITE 4:	SITE 5:	SITE 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD		COMMENT	Signatures
6.1	Surface boxes and surrounds to finished levels										
6.2	Surface box lids hinged in direction of traffic flow										
6.3	Shroud pipes assembled to Standards										
6.4	Fitting bolts protected to Standards										
6.5	Correct depth to Spindle tops										
6.6	Correct depth to Hydrant lugs										
6.7	Spindle retaining disc in place										
6.8	Indicator plates in place										
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:			
COMMENT:											

WATER CHECKLIST W6
PROPERTY SERVICE INSTALLATION

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:							CONSULTING ENGINEER:					
Date from: to:		PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:				
		SITE				DATE SITE 1:	SITE 2:	SITE 3:	SITE 4:	SITE 5:	SITE 6:	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD	COMMENT		Signatures	
7.1	Plumber holding relevant accreditation on site							AS/NZS3500				
	Property boundaries located							AS/NZS3500				
7.2	Install property service (main to meter) - Drinking Water							AS/NZS3500				
7.3	Install property service (main to meter) - Recycled Water							AS/NZS3500				
7.4	Drinking water riser is plain copper							AS/NZS3500				
7.5	Recycled water riser is coloured lilac							AS/NZS3500				
7.6	Drinking water riser has correct ball valve							AS/NZS3500				
7.7	Recycled water riser has correct ball valve							AS/NZS3500				
7.8	Risers are a minimum 300mm apart							Meter Fit Policy				
7.9	Drinking Water non-return valve fitted											
7.10	Termination of property service as per standard							AS/NZS3500				
7.11	Embedment and trench fill – drinking water property services							AS/NZS3500				
7.12	Embedment and trench fill – recycled water property services							AS/NZS3500				
7.13	Clearances from other services							AS/NZS3500				
7.14	Plumbers Compliance Certificate supplied drinking water property service/s							AS/NZS3500				
7.15	Plumbers Compliance Certificate supplied for recycled water property service/s							AS/NZS3500				
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:				
COMMENT:												

**WATER CHECKLIST W7
PRE-CONNECTION INSPECTION**

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:										CONSULTING ENGINEER:											
Date from: to:				PIPE TYPE:			SIZE:			CLASS:			CONTRACTOR:								
				SITE						DATE SITE 1:		SITE 2:		SITE 3:		SITE 4:		SITE 5:		SITE 6:	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD				COMMENT				Signatures					
8.1	WAC compiled																				
8.2	Compaction and concrete tests																				
8.3	Pressure test results											COUNCIL HOLD POINT									
8.4	Marking tape in place & tested																				
8.5	Surface boxes and surrounds level																				
8.6	Indicator plates in place																				
8.7	Fitting box lids positioned correctly																				
8.8	Hydrant lugs positioned correctly																				
8.9	Fitting bolts protected to Standard																				
8.10	Min 100mm max 200mm to hydrant lugs																				
8.11	Shroud assembly to Standard																				
8.12	Min 100mm max 350mm to top spindle																				
8.13	Extension spindle in place (if req.)																				
8.14	Spindle retaining disc in place (if req.)																				
8.15	Chambers sized to Standards																				
8.16	Chamber ladder or step irons to Standards																				
8.17	Chamber drainage adequate & to Standards																				
8.18	Scour outlet protected from erosion																				
8.19	Site restored satisfactorily																				
8.20	Chemical Analysis report																				
VARIATIONS AND CHANGES:										SITE INSTRUCTIONS:											
COMMENT:																					

APPENDIX D

Pump Station Inspection And Test Plan Template

INSPECTION AND TEST PLAN – WATER/SEWAGE PUMP STATION

ITP to be completed by Consulting Engineer

Developer:		Consultant Engineer:		Consultant Engineer Representative:				
Project:		Contractor:		Contractor Site Representative:				
Description:		Sub-contractor:		Witness, Hold & Surveillance points added to ITP				
		Field Tester:						
Location:		ITP Prepared by:		Reviewed by:		Council Representative		
		Date / /		Date / /				Date / /
No	Construction/Inspecti on Activity	Inspection Procedure & Acceptance Criteria		Cont-ractor	Consult. Engineer	Council *	Record	Comment
1	Pre-start/Site establish	Pre-Start Meeting Checklist. Site establishment visual check. Checklist completed. (PS1)		I	H	H	Checklist PS1	
2	Approved materials on Site/delivered	Visual check approved materials. Quantity and condition. Checklist completed (PS2)		I	I	S	Checklist PS2	
3	Excavation	Visual inspection to FNQROC Standards. Checklist completed. (PS3)		I	I	S	Checklist PS3	
4	Foundations	Visual and dimensional check to FNQROC Standards.		I	W	W	Checklist PS4	
5	Base slab	Visual inspection to FNQROC Standards.		I	H	I	Checklist PS4	
6	Reinforcement and formwork	Visual inspection to FNQROC Standards.		I	H	W	Checklist PS4	
7	Anchor/Thrust Blocks	Visual and dimensional check to FNQROC Standards.		I	H	H		
8	Embedment and Backfill	Visual check and compaction to FNQROC Standards		I	H	H	Compaction test results	
9	Electrical/Scada	Review certification and visually check installation to FNQROC standards.		I	W	I	Certification	
10	Lifting Chain	Review certification.		I	I	I	Certification	
11	Surface fittings	Visual and dimension check to FNQROC Standards. Checklist completed (PS6)		I	I	S	Checklist PS5	
12	Disinfection	Disinfection to FNQROC Standards		I	H	H	Test Results	
13	Testing	Pressure test and Compaction test to FNQROC Standards		I	H	H	Test Results	
14	Pre-connection inspection	Visual inspection to FNQROC Standards. Checklist completed (PS6) Isolation procedure as per Job Specific Letter		H	H	H	Checklist PS6	
15	Commissioning of System	Visual and dimensional check to FNQROC Standards and, where required, removal of RPZD.		I	H	H	PS Commiss. Checklist	

PUMP STATION CHECKLIST PS1
PRE-START AND SITE ESTABLISHMENT

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:										CONSULTING ENGINEER:										
Date from: to:				PIPE TYPE:			SIZE:			CLASS:			CONTRACTOR:							
				SITE						DATE SITE 1:	SITE 2:		SITE 3:		SITE 4:		SITE 5:		SITE 6:	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD			COMMENT				Signatures					
1.1	Plan current and on site																			
1.2	Pre construct report inc. photographs																			
1.3	Property Entry Agreement																			
1.4	Road opening requirements																			
	Fees paid																			
	Traffic mgt plan implemented																			
1.5	Environmental Management Plan on site and implemented																			
1.6	Wh&S Plan on site and implemented																			
1.7	Receiving sewer located																			
1.8	Specification on site																			
1.9	Footways to finished levels																			
1.10	Survey pegs in place							Registered surveyor												
1.11	Job set out																			
1.12	All services located							'Dial Before You Dig', services search and Relevant Authorities												
1.13	All services marked																			
1.14	Contractors holding relevant accreditation on site																			
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:												
COMMENT:																				

PUMP STATION CHECKLIST PS2 APPROVED MATERIALS ON SITE AND DELIVERED												
										* CLAUSE AND DRAWING NO. REFER TO FNQROC DEVELOPMENT MANUAL		
PROJECT:							CONSULTING ENGINEER:					
Date from: to:			PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:			
			SITE				DATE SITE 1:	SITE 2:	SITE 3:	SITE 4:	SITE 5:	SITE 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD	COMMENT		Signatures	
2.1	Delivery Inspection											
2.2	Types and sizes to current plan											
2.3	Marking tape											
2.4	Bedding material											
2.5	Trench fill											
2.6	Fittings											
2.7	Surface Fittings											
2.8	Pre Cast chambers											
VARIATIONS AND CHANGES:							SITE INSTRUCTIONS:					
COMMENT:												

PUMP STATION CHECKLIST PS3 – PAGE 1 OF 2
EXCAVATION

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:						CONSULTING ENGINEER:					
Date from: to:		PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:			
		DAY				DATE DAY 1:	DAY 2:	DAY 3:	DAY 4:	DAY 5:	DAY 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD	COMMENT	Signatures	
4.1	Environmental Management Plan on site and implemented										
4.2	Traffic Management Plan on site and implemented										
4.3	Services exposed										
4.4	Clearance from Services										
4.5	Trench width mm										
4.6	Trench depth mm										
4.7	Trench shoring										
4.8	Excavation prior to placement of backfill								COUNCIL HOLD POINT		
4.9	Embedment										
	Compaction										
	Bedding										
	Surround										
	Overlay										
	Testing										
VARIATIONS AND CHANGES:							SITE INSTRUCTIONS:				
COMMENT:											

PUMP STATION CHECKLIST PS3 – PAGE 2 OF 2
EXCAVATION AND PIPE LAYING

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:								CONSULTING ENGINEER:											
Date from: to:				PIPE TYPE:				SIZE:				CLASS:				CONTRACTOR:			
				DAY				DATE DAY 1:		DAY 2:		DAY 3:		DAY 4:		DAY 5:		DAY 6	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD				COMMENT				Signatures			
4.10	Valves, Hydrants & Surface fittings installed																		
	Shroud assembly																		
	Valve anchorage																		
4.11	Marking tape																		
	Correct location																		
	Connected to fittings																		
4.12	Concrete																		
	Trench stops in place																		
	Bulkheads in place																		
	Thrust blocks in place											COUNCIL HOLD POINT							
	Embedment & Encasement in place																		
4.13	Trench fill																		
	Material																		
	Compaction																		
	Compaction Testing							NATA Certified Lab											
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:											
COMMENT:																			

PUMP STATION CHECKLIST PS4 – PAGE 1 OF 2
CHAMBERS

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:										CONSULTING ENGINEER:										
Date from: to:			PIPE TYPE:				SIZE:			CLASS:			CONTRACTOR:							
			CHAMBER						DATE CH 1:		CH 2:		CH 3:		CH 4:		CH 5:		CH 6:	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD			COMMENT			Signatures						
	Finished surface levels supplied																			
5.1	Base																			
	Placement																			
	Channels																			
	First shaft section																			
5.2	In-Situ Chamber																			
	Formwork – correct sizing																			
	Formwork – correct levels																			
	Reinforcement																			
	Cover																			
	Concrete type to Specification																			
	Step iron location and spacing																			
	Dimension check																			
	Cover and frame																			
	Conduits																			
5.3	Pre Cast Chamber																			
	Shaft assembled in correct order																			
	Step iron location and spacing																			
	Sealing																			
	Offset cone located correctly																			
	Minimum one make up ring																			
	Cover and frame																			
VARIATIONS AND CHANGES:										SITE INSTRUCTIONS:										
COMMENT:																				

PUMP STATION CHECKLIST PS4 – PAGE 2 OF 2 CHAMBERS									
5.4	Ladders / handrails / step irons								
5.5	Sealing							Manufacturer Specification	
5.6	Drainage								
5.7	Security Grate lid								
	Plastering/rendering								
	Benching								
5.8	Operational access								
VARIATIONS AND CHANGES:							SITE INSTRUCTIONS:		
COMMENT:									

**PUMP STATION CHECKLIST PS5
SURFACE FITTINGS**

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:						CONSULTING ENGINEER:					
Date from: to:		PIPE TYPE:		SIZE:		CLASS:		CONTRACTOR:			
		SITE				DATE SITE 1:	SITE 2:	SITE 3:	SITE 4:	SITE 5:	SITE 6:
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD	COMMENT		Signatures
6.1	Surface boxes and surrounds to finished levels										
6.2	Surface box lids hinged in direction of traffic flow										
6.3	Shroud pipes assembled to Standards										
6.4	Fitting bolts protected to Standards										
6.5	Correct depth to Spindle tops										
6.6	Correct depth to Hydrant lugs										
6.7	Spindle retaining disc in place										
6.8	Indicator plates in place										
VARIATIONS AND CHANGES:								SITE INSTRUCTIONS:			
COMMENT:											

**PUMP STATION CHECKLIST PS6
PRE-CONNECTION INSPECTION**

* CLAUSE AND DRAWING NO. REFER TO
FNQROC DEVELOPMENT MANUAL

PROJECT:										CONSULTING ENGINEER:											
Date from: to:				PIPE TYPE:			SIZE:			CLASS:			CONTRACTOR:								
				SITE						DATE SITE 1:		SITE 2:		SITE 3:		SITE 4:		SITE 5:		SITE 6:	
ITEM	DESCRIPTION	1	2	3	4	5	6	MINIMUM STANDARD				COMMENT				Signatures					
7.1	WAC compiled																				
7.2	Compaction and concrete tests																				
7.3	Vacuum/air test results											COUNCIL HOLD POINT									
	Deflection test results																				
	CCTV Inspection																				
7.4	Marking tape in place & tested																				
7.5	Surface boxes and surrounds level																				
7.6	Indicator plates in place																				
7.7	Chambers sized to Standards																				
7.8	Chamber ladder or step irons to Standards																				
7.9	Chamber drainage adequate & to Standards																				
	Benching to Standard																				
	Sealing to Standard																				
7.10	Scour outlet protected from erosion																				
7.11	Site restored satisfactorily																				
VARIATIONS AND CHANGES:									SITE INSTRUCTIONS:												
COMMENT:																					

APPENDIX E

Security Lodgement Form

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

SECURITY LODGEMENT FORM

This sheet must be completed prior to the acceptance of any bond by Council.

Development Name:

Stage: File No.:

Applicant:

Consultant:

Purpose of Bond:

Construction Security Uncompleted Works Defects Liability

.....
.....

Uncompleted Works Bond Assessment

Estimated time to complete bond works (not greater than 90 days)days

Current Contract Completion date

Anticipated Completion date

Consulting Engineer's estimated value of uncompleted works \$.....

Bond Value (apply Factor 1.50) \$.....

Construction/Defects Liability Bond Assessment

Consulting Engineer's estimated value of completed works \$.....

Construction/Maintenance Bond Value (apply Factor 0.05)(min \$1,000.00) \$.....

Council shall retain any interest accrued on cash monies paid to Council and held in trust fund by Council..

Consulting Engineer:

Signature: RPEQ No.:

Date:

APPENDIX F

Inspection Certificate For Witness/Hold Point

FNQROC DEVELOPMENT MANUAL

Council
(INSERT COUNCIL NAME)

INSPECTION CERTIFICATE FOR WITNESS/HOLD POINT

This certificate registers evidence that the works as noted herein have been inspected by the Council officer noted below and were found to be satisfactory.

Development Name: File No.....

Development Location:

Consulting Engineer:

Contractor:

Works being Inspected / Tested / Witnessed:

.....
.....
.....
.....

Defaults/Corrective Action Required

.....
.....
.....
.....
.....

Defaults Corrected: Y N N/A

Council Inspector Signature

Name of Inspector

Date of Inspection:

APPENDIX G

Works Acceptance Inspection Checklist

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

WORKS ACCEPTANCE INSPECTION CHECKLIST

DEVELOPMENT NAME: File No:

DEVELOPMENT LOCATION:

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
ALLOTMENT DRAINAGE		
The works have been finally inspected and:		
a) Concrete catch drains constructed in approved location and to a satisfactory standard.		
b) Field Inlets constructed in approved location and to a satisfactory standard.		
c) Overland flow path constructed to correct profile.		
d) Pipework has been visually inspected and is satisfactory ie., – alignment and grade – free of debris and siltation – no visual sign of trench subsidence – outlets are satisfactory		
e) Lots not provided with Allotment Drainage can be drained to the kerb and channel.		
STORMWATER DRAINAGE SYSTEM		
The works have been finally inspected and:		
a) Pipe layout is as per plan or approved amendments with respect to pipe size, levels and location.		
b) Pipework has been visually inspected and is satisfactory, ie., – alignment and grade – free of debris and siltation – pipe joints satisfactory – lifting plug holes sealed – no visible sign of trench subsidence – no damaged pipes		
c) Gully pits and manholes have been constructed to the correct standards, ie., – correct type of grate or cover – lintels – side entry slots – benching (no water ponding) – grates are satisfactorily seated in frames – weepholes provided to bedding material – no damaged structures – converter slabs/sections mortar bedded – correct drops through gullies/manholes – all lids/grates finished to match surface level		
d) All density tests to backfill are available and satisfactory.		
e) Material gradings are available for bedding material and satisfactory.		
f) Outlet/Inlet structures are satisfactorily constructed and are free from scour or siltation.		

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

WORKS ACCEPTANCE INSPECTION CHECKLIST

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
g) All manhole and gully pit pipe connections are mortared flush with the walls and no pipe reinforcement is exposed.		
h) Open cut channels have been finally inspected are satisfactory, ie., – cut to design profiles – lining of channel is to the required thickness and reinforcement, with appropriate weepholes		
i) Overland flow, the works have been finally inspected and appropriate flow paths are provided and clear of obstruction.		
j) Outlets and outfalls have been constructed to control discharge flow in accordance with the plans.		
k) Subsoil drainage discharges to gullies or other approved points of discharge.		
l) All grassing requirements to channels, swales, outlets, inlets etc have been completed.		
m) CCTV inspections of stormwater pipes ^{TRC}		
WATER QUALITY		
The works have been finally inspected and:		
a) Water Quality structures have been constructed in accordance with approved engineering drawings		
b) Structures are free of debris and sediment		
EROSION AND SEDIMENT CONTROL		
The works have been finally inspected and:		
a) Control structures required until the site is stabilised in accordance with the Contractor's ESCP are in place		
b) Structures are free of debris and sediment		
EARTHWORKS		
The works have been finally inspected and:		
a) Toe of batters not on Council road reserve except as approved.		
b) Retaining walls clear of road reserve except as approved.		
c) Retaining walls constructed in accordance with drawings.		
d) Batter slopes constructed in accordance with drawings.		
e) Batter slopes stabilised against erosion.		
f) Interim drainage constructed in accordance with drawings.		
g) All areas disturbed by the works have been rehabilitated.		
h) Allotment levels are as per the design plans		
i) Verge levels are as per the design plans		

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

WORKS ACCEPTANCE INSPECTION CHECKLIST

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
SEWER RETICULATION		
The works have been finally inspected and:		
a) Pipe layout is as per the plan or approved amendments with respect to pipe size, levels, and location.		
b) Pipework has been visually inspected and is satisfactory, ie: – pipework flush with internal walls of manhole – alignment and grade – flexible joints – line flushed and clean – no visible sign of trench subsidence – A density test of backfill are available and satisfactory. – CCTV survey results submitted and satisfactory		
c) Manholes and Maintenance Shafts have been constructed to the correct standards, ie., – cast in situ – benching – curvature satisfactory – no ponding – profile satisfactory – no weeps (free of infiltration) – concrete work – no honey combing – covers – covers checked to be gas tight – correct type – imprint in accordance with standards – depth of cover surround – depth of top slab – location – relative to lot boundaries – 50-75mm proud of finished surface level.		
d) Material gradings for bedding material are available and satisfactory.		
e) Pressure test results are available and satisfactory.		
f) Manhole hydrostatic test all satisfactory.		
g) All property connection branch markers located.		
h) Sewerage connection Private Works fees paid		
i) On site Sewer Report Provided (if applicable)		
j) PUMP STATION – refer separate PS Checklist		
WATER RETICULATION		
The works have been finally inspected and:		
a) Pipe layout and services fixtures (valves and hydrants) is as per the plan or approved amendments with respect to pipe size and location.		

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

WORKS ACCEPTANCE INSPECTION CHECKLIST

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
b) Pipework has been pressure tested in accordance with Council's requirements and test results are available and satisfactory.		
c) Pipework has been chlorinated in accordance with Council's requirements.		
d) There are no visible signs of trench subsidence or leaks.		
e) Valves and hydrants have been inspected and are satisfactory, ie., – location – sets and surrounds correctly installed to prevent ingress of soil, etc. – mortar packing to boxes correctly completed – depth to top of hydrant or valve stem within limits – dust caps to hydrants – colour of marker plate correct – direction of flow indicated – marking plates correctly installed – size of plate correct		
f) Material gradings for bedding material are available and satisfactory.		
g) Water supply connection Private works fees paid.		
h) PUMP STATION – refer separate checklist		
ROAD PAVEMENTS		
The works have been finally inspected and:		
a) Plan layout and geometry of road system is in accordance with the drawings.		
b) Finished levels at crown and channel are at design levels.		
c) Crossfalls are to the approved plan.		
d) AC is satisfactory with regard to finish and thickness.		
e) Joints in the seal (especially where various development stages apply) are flush.		
f) The sealed surface is free of blemishes.		
g) All compaction test, material quality (CBR), material grading, AC core tests are satisfactory and available.		
h) Ponding of stormwater does not occur.		
SEGMENTAL PAVERS (Where constructed)		
The works have been finally inspected and:		
a) All pavers have been correctly laid to pattern, within allowable tolerance, compacted, and the joints filled.		
b) Bedding sand for pavers drains to subsoil drainage.		
c) Pavers adjacent to concrete kerb and channel, edge restraints etc have been cut and laid in accordance with all relevant requirements.		

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

WORKS ACCEPTANCE INSPECTION CHECKLIST

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
CONCRETE WORKS		
The works have been finally inspected and:		
a) The correct type has been used to all locations in accordance with drawings.		
b) Ponding of stormwater does not occur.		
c) Transitions and connection to existing construction are smooth and to a satisfactory standard of workmanship.		
d) Service conduit markers have been placed to kerb face.		
e) Lip and back of kerb are flush with the roadway and footpath respectively.		
f) All channelisation works and medians have been satisfactorily completed.		
g) Infill treatment of medians has been inspected and found satisfactory. Any landscaping has been completed to standard.		
h) Subsoil drains have been provided (including under medians).		
i) Appropriate expansion and contraction joints provided		
j) Subsurface finish is to approved design and within tolerances		
FOOTPATHS		
The works have been finally inspected and:		
a) Profiles are as per plan.		
b) Footpath has been topsoiled and satisfactory.		
c) Footpaths have been stabilised/turfed..		
d) All service fixtures (such as valves etc.) 25mm above the surrounding footpath.		
e) Concrete footpaths have been constructed to Council		
f) Pram ramps constructed as required.		
g) Footpaths to be free of rock and loose stones.		
BIKEWAYS		
The works have been finally inspected and:		
a) Location and width are as per the drawings.		
b) Kerb ramps and crossings are constructed.		
c) Safety rails and signs have been installed where required.		
LIGHTING		
The works have been finally inspected and:		
a) Lighting has been installed and is operating as per approved design		
b) If lighting is yet to be installed, or made operational, copy of service agreement has been provided from the lighting/energy provider and all uncompleted works have been adequately guarded.		
FENCING AND FEATURES		
The works have been finally inspected and:		

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

WORKS ACCEPTANCE INSPECTION CHECKLIST

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
a) All fences including approved entrance features have been constructed within allotments. Survey pegs are visible.		
b) Specifically approved entrance features are constructed in accordance with the drawings.		
c) Entrance features and fences have satisfied Building Approvals (if required).		
d) Sound attenuation fences and/or mounds are constructed on private property and in accordance with the drawings where required.		
BUILDING/STRUCTURE		
The works have been finally inspected and:		
a) Council approval for building/		
b) Building/Structure		
OTHER		
a) Approvals for completed works received from applicable referral agencies		
b) Street name signs, traffic signs and pavement marking have been installed.		
c) Works have not resulted in problems on neighbouring properties. Clearance letters from property owners are available where applicable.		
d) All boundaries of Subdivision/Development have been inspected to ensure works as constructed will not affect adjoining properties.		
e) All necessary testing to ensure the quality of the work has been carried out and results are available.		
f) Consulting Engineer's compliance certificate is completed (refer AP1 – Appendix A)		
g) "As Constructed" submission has been provided to Council and is to Councils satisfaction		
h) All allotment boundaries, easements etc, have been pegged.		
i) All test results and records have been compiled and stored in the Record Storage facilities of the Consulting Engineer's office and a copy forwarded to Council.		
j) All operating Manuals, maintenance procedures, mechanical warranties etc have been submitted to Council.		
k) Parkland is in a mowable condition where practical and free of rock and loose stones.		
l) Irrigation systems have been provided, are operating as designed and AS CON drawings provided.		

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

WORKS ACCEPTANCE INSPECTION CHECKLIST

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
<p>INSPECTOR'S SIGNATURE:</p> <p>NAME:</p> <p>SIGNATURE: DATE:....././.....</p> <p>CONSULTING ENGINEER: RPEQ No: DATE:...../...../.....</p>		

APPENDIX H

Final Acceptance Inspection Checklist

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

FINAL ACCEPTANCE INSPECTION CHECKLIST

DEVELOPMENT NAME:File No.....

DEVELOPMENT LOCATION:

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
STORMWATER DRAINAGE SYSTEM		
a) Pipework has been visually inspected and is satisfactory, ie., – free of debris and siltation – pipe joints satisfactory with no deflection or movement – no visible sign of trench subsidence – no exposed reinforcing steel to cut pipe ends		
b) Gully pits and manholes have been visually inspected and are satisfactory, ie., – no ponding – no excessive cracking or distress of reinforced concrete works – clear of silt and debris – all mortar is in place, no excessive spalling, flaking or cracking – no visible sign of subsidence		
c) overland flow paths clear		
WATER QUALITY		
a) Water Quality Structures have been visually inspected and are satisfactory, ie., – free of debris and siltation – no cracking or distress of concrete at fixing points – fasteners are secure – structures have not misaligned due to excessive loads – no corrosion at any location evident		
ALLOTMENT DRAINAGE		
a) Concrete catch drains have been visually inspected and are satisfactory, ie., – clear of silt and debris – no damage or cracking – overland flow path profile maintained		
EARTHWORKS/SITE WORKS		
a) All batter slopes stable and no distress exhibited.		
EROSION AND SEDIMENT CONTROL		
a) Site has been visually inspected and has no obvious signs of erosion or sediment deposits and has achieved 80% grass cover		
b) Erosion and sediment control measures no longer required have been removed and rehabilitation works completed.		
WATER RETICULATION		
a) No visible signs of trench subsidence.		

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

FINAL ACCEPTANCE INSPECTION CHECKLIST

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
b) Valves and hydrants have been inspected and are satisfactory, ie., <ul style="list-style-type: none"> - no leaks - valve and hydrant markings - no damage 		
SEWERAGE RETICULATION		
a) No visible signs of trench subsidence.		
b) Pipework has been visibly inspected and is satisfactory, ie., <ul style="list-style-type: none"> - alignment satisfactory - clear of silt and debris (flushed) - no ponding - pipework not oval or compressed 		
c) Manholes/structures have been visually inspected and are satisfactory, ie., <ul style="list-style-type: none"> - benching no signs of cracking, spalling ok - no weeping or infiltration - no ponding or disposition of solids. 		
d) PCB markers have been visually located		
ROADWORKS		
a) Road pavement has been visually inspected and satisfactory, ie., <ul style="list-style-type: none"> - no damage to Wearing Course - no ponding - clear of siltation and debris 		
b) Kerb and channel has been visually inspected and is satisfactory, ie., <ul style="list-style-type: none"> - no excessive cracking or distress to concrete works - no ponding - service conduit markers ok - no differential settlement or dislocation of pavement surface and concrete kerb and channel. 		
c) Linemarking and road signage satisfactory.		
BUILDING/STRUCTURE		
a) Building/Structure Inspected		
MISCELLANEOUS		
a) Footpaths and concrete works satisfactory.		
b) Bikeways and associated works satisfactory.		
c) Street name signage satisfactory.		
d) Alternative pavement surfacing (eg pavers, stamped concrete) is satisfactory.		
e) Street lighting has been installed and is operating as per the approved design.		
f) Landscaping has been provided for a minimum 13 week period and is in an acceptable condition for handover to Council.		

FNQROC DEVELOPMENT MANUAL

Council

(INSERT COUNCIL NAME)

FINAL ACCEPTANCE INSPECTION CHECKLIST

ITEM	VERIFICATION (Yes/No/NA)	COMMENT
OTHER MATTERS		
a) Specific matters in relation to the site.		
<p>INSPECTOR'S SIGNATURE:</p> <p>NAME:</p> <p>SIGNATURE:.....DATE:...../...../.....</p> <p>CONSULTING ENGINEER:</p> <p>SIGNATURE..... RPEQ No:DATE:...../...../.....</p>		

APPENDIX I

Sewerage And Water Pump Station Commissioning Checklists

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

REQUIREMENTS BY CONTRACTOR

The following checklist is required to be fully completed, signed and returned to Council before a joint commissioning is considered. Please note: in the event of a commissioning being abandoned due to works not completed or operational, Council will recover costs incurred.

STATION NAME: _____ **STATION NO:** _____

- Ergon Power available Yes No
- Provision of sufficient water for all testing purposes Yes No
- Fresh water discharge flushing system operating as per design Yes No
- Ancillaries (GPO's, lighting etc) tested and working correctly Yes No
- Pre commission switchboard test completed Yes No
- Station telemetry points list supplied Yes No
- Established telemetry communications and verified inputs locally Yes No

VERIFICATION OF AS CONSTRUCTED LEVELS AND OPERATION.

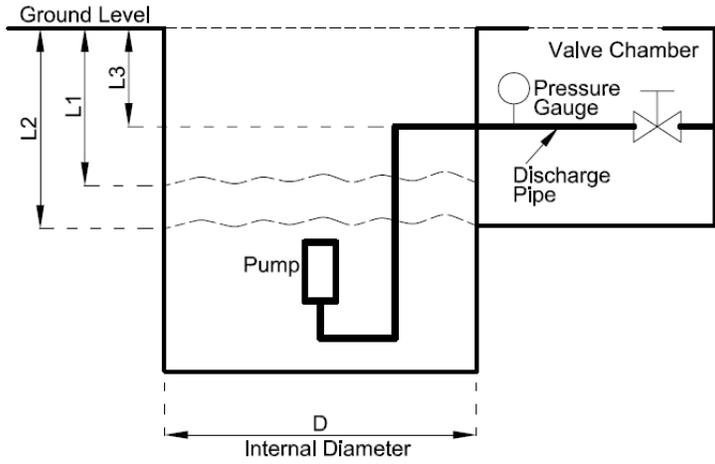
Note: Levels taken from top of well cover down

Setting/Alarm	Measurement	Operational function (contractor to verify correct operation)
Spill alarm	m	Yes <input type="checkbox"/> No <input type="checkbox"/>
H/L back up pump 2 start	m	Yes <input type="checkbox"/> No <input type="checkbox"/>
H/L back up pump 1 start	m	Yes <input type="checkbox"/> No <input type="checkbox"/>
Probe high level alarm	m	Yes <input type="checkbox"/> No <input type="checkbox"/>
H/L pump cut out/ Transfer	m	Yes <input type="checkbox"/> No <input type="checkbox"/>
Duty pump cut-in	m	Yes <input type="checkbox"/> No <input type="checkbox"/>
Duty pump cut out	m	Yes <input type="checkbox"/> No <input type="checkbox"/>
Probe low level alarm (indication only)	m	Yes <input type="checkbox"/> No <input type="checkbox"/>
Level settings according to design		Yes <input type="checkbox"/> No <input type="checkbox"/>

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

PROCEDURE FOR PERFORMANCE TESTING OF PUMPS

Contractor to complete for all pumps :-



General Sewerage Pump Station Well

Date _____
 Pump No _____
 Pump _____ make/model: _____
 Electric motor kw _____ SPEED _____ RPM
 Serial no: = _____

Measure inside diameter of well:- D = _____ m

Measure L3 = _____ m

Pump duty head H = _____ m

Pump duty flowrate Q = _____ L / S

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

(A) QUICK CHECK OF PUMP GENERAL CONDITION - HEAD TH1 (AT VALVE CLOSED)

L1 , L2 - operating levels
 Run pump for one minute with the delivery valve open.
 Close the valve.
 Read L1 in meters at the beginning of one minute.
 Read L2 in meters at the end of this minute.
 Read AMP meter.
 Read pressure gauge (HD) in meters at the end of one minute.
 Record :

L1	L1 = m
L2	L2 = m
Delivery Gauge reading HD	HD = m
Height Correction HC = L2 – L3	HC =m
Total head TH1 = HD + HC	TH1 =m

Check TH1 against the pump curve at no flow condition
 Check AMPs on pump curve

(B) QUICK CHECK OF INFLOW Q1 (IF INFLOW BLOCKED OFF - GO TO (C))

L1 , L2 - operating levels
 Switch off the pump and keep the delivery valve closed.
 Read L1 in meters at the beginning of one minute.
 Read L2 in meters at the end of this minute.

L1	L1 = m
L2	L2 = m

Calculate flowrate Q1 during this minute

Q1 = l/s

(C) NORMAL FLOWRATE Q2 TEST (VALVE OPEN)

L1 , L2 - operating levels
 Run pump for one minute with the delivery valve open.
 Read L1 in meters at the beginning of one minute.
 Read L2 in meters at the end of this minute.
 Read AMP meter.
 Read HD in meters at the end of one minute.
 Record :

(C) L1	L1 = m
--------	--------------

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

Cont. L2 L2 = m
 Delivery Gauge reading HD HD = m
 Height Correction HC = L2 – L3 HC =m
 Total head TH2 = HD + HC TH2 =m

Calculate flowrate Q2 during this minute

Q2 = l/s

Check AMPs on pump curve

(D) QUICK CHECK OF INFLOW AGAIN Q2 (IF INFLOW BLOCKED OFF GO TO (E))

L1 , L2 - operating levels
 Switch off the pump and keep the delivery valve closed.
 Read L1 in meters at the beginning of one minute.
 Read L2 in meters at the end of this minute.

L1 L1 = m
 L2 L2 = m

Calculate flowrate Q3 during this minute

Q3 = l/s

(E) SUMMARY

If inlet is blocked off for the time of the test the duty head H and duty flowrate Q should be similar to TH2 and Q2.

If inlet is not blocked off for the time of the test the duty head should be similar to TH2 and duty flowrate should be similar to :

$$Q D = Q2 + (Q1 + Q3)/2$$

End of testing of pumps

Pressure gauges calibrated according to QA requirements:- Yes No

Pump performance satisfactory:- Yes No

Test performed by :- _____

Pump performance results as compared to tender offer satisfactory? Yes No

General Contractor Comments:

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

All information has been supplied and verified ready for Commissioning //

_____ Signed (Contractor)	_____ / / Date
------------------------------	----------------------

Print name

Note: The telemetry is to be fully ready for commissioning

COUNCIL use only

Level information and Operational function satisfactory	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Pump performance results as compared to tender offer satisfactory	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Pump motor information readings satisfactory	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Telemetry commissioned satisfactorily	Yes <input type="checkbox"/>	No <input type="checkbox"/>

General Council Comments:

All information has been supplied and verified at Contractor Pre-commissioning

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

/ /

 Signed (Council)

 Date

 Print name

Commissioning of Civil Works

Item	Complete	Date / Initials	Council Audit
Management			
1. Verify that consultant has provided all documentation. (as constructed details, operating manuals, Process and Instrumentation Diagram (P&ID), test results etc)			
If NO then close audit.			
Concrete			
1. Verify that the concrete slab is 300mm above the finished surface level.			
2. Verify that the pump station concrete works is as designed e.g. Cast in-situ.			
3. Verify that there is no damage to any exposed concrete surface.			
4. Verify that drainage of the site is away from the Pump Station.			
5. Verify that the surface dimensions of the top slab are in accordance with the design drawings.			
6. Verify that the below ground concrete structures are dimensionally correct and in accordance with the design drawings.			
7. Verify no seepage through the concrete structure.			
8. Verify the verticality of the structure is within tolerance in accordance with sewer specifications.			
9. Verify that all chamfers are provided in accordance with the design drawings.			
10. Verify that the pump well benching has been provided in accordance with design drawings.			
11. Verify that the specified coating to the internal walls has been applied in accordance with the FNQROC Development Manual.			

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

Item		Complete	Date / Initials	Council Audit
12.	Thickness of internal coating tested (µm)			
OH&S				
1.	Verify that ladder access to dry wells only, meets OH&S requirements.			
2.	Verify that ladder access to valve chamber meets OH&S requirements.			
3.	Verify that all ladders are provided with the extension above the FSL.			
4.	Verify that the ladders have non-slip treads.			
5.	Have safety cages been specified in accordance with Australian Standards.			
6.	Verify that safety cages have been installed in accordance with the design drawings.			
7.	Verify that adequate distance between wet well opening and switchboard is in accordance with OH&S requirements and the FNQROC Development Manual.			
8.	Verify that adequate set down areas for the covers has been provided in accordance with OH&S requirements.			
9.	Verify that no overhead cables restrict access via crane trucks.			
10.	Verify Full Risk Assessment has been performed and permanent operational/ maintenance risks identified			
11.	Verify that all signage pertaining to those risks is in place			
12.	Facility Name and contacts signage			
13.	Standby Emergency Generator – cover, refueling, manuals			
14.	Adequate access, maneuver and parking for maintenance vehicles			
Products & Materials				
1.	Verify that all products incorporated on the project are included on the list of approved products for Council.			
2.	Verify that all markings as required by Council specification are visible on the covers.			
3.	Verify that the covers and frames are greased in accordance with the manufacturer's requirements.			
4.	Verify that the covers are gas tight			

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

Item	Complete	Date / Initials	Council Audit
5. Verify that the interchangeable multi part covers have lifting lugs on the beams for removal and covers have clockwise lifting key holes.			
6. Verify that council approved penstock stuffing box is installed.			
7. Wet well covers are to be in accordance with the FNQROC Development Manual			
8. Wet well covers are to be lockable			
Pipes and Fittings			
1. Verify that the valves are anticlockwise closing.			
2. Verify that there is only one inlet pipe to the pump station.			
3. Verify that pumps are clear of all inlet pipework.			
4. Verify that adequate supports have been provided for the valves.			
5. Are valve extension spindles required.(includes penstock).	/NA		
6. Verify that there is sufficient clearance for maintenance.			
7. Are adequate supports provided in accordance with Council standard drawings.	/NA		
8. Verify that DICL pipe work has been provided to correct nominal diameter DN.			
9. Verify that adequate supports for vertical pipe work has been provided in accordance with FNQROC Development Manual (i.e. vibration not noticeable when pumps operating).			
10. Verify that all gate valves operate through the full range and are left in the open position.			
11. Verify that a flap valve has been installed on the valve chamber drain if required by the design e.g. when overflow levels higher than valve pit base.			
12. Verify that bleeders have been installed on the NRV's and NRV's have counterweights.			
13. Verify that probe stilling tube has been installed as per Council standard			
14. Verify that the Council specified coating for all valves has been applied.			
15. Verify that the Council specified coating for the pipe work has been applied.			
16. Verify that the pipe work for the in coming sewer is in accordance with the design drawings including dropper pipe.			

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

Item	Complete	Date / Initials	Council Audit
17. Verify that the specified bolting system on the flanges has been used.			
18. Verify that all valves can be removed through the available cover opening.			
19. Verify that a flanged dismantling joint has been provided to allow ease of removal of valves in accordance with standard drawings.			
20. Has the consultant submitted completed project ITP containing all signatures.			
21. Verify all steel metalwork has been Hot Dipped Galvanized.			
22. Verify all bolts are 316 stainless steel with 308 nuts.			
23. Verify that the emergency pump out pipework has been installed.			
24. Verify that either rising main air releases or scours are provided at the pump station.			
Other Services			
1. Verify that the water service has been fitted with an approved back flow prevention device.			
2. Verify that a 25mm water service has been provided.			
3. Verify that all conduits through the walls have been sealed to prevent odour escaping.			
4. Verify that electricity is below ground, not above.			
5. Verify that the sealed access track is in accordance with the design drawings and the FNQROC Development Manual.			
6. Verify that adequate site drainage has been provided.			
7. Verify that wet well washers have gate valves and regulators fitted if fitted.			
Restoration.			
Verify that the site restoration has been completed.			
Testing.			
1. Verify that pump well infiltration test passed.			
2. Verify that pump draw down tests passed.			
3. Verify rising main has been tested.			

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

Item	Complete	Date / Initials	Council Audit
4. If pump station has been constructed as open cut, verify compaction standard under pipes.			
5. Verify that Factory Acceptance Testing of the switchboard was completed			
Mechanical Equipment.			
1. Verify that the guide rails comply with the standard drawings.			
2. Verify that the lifting chain complies with Council specification.			
3. Verify that the Pump footstool has been secured to wet well floor with appropriate chemical anchors & have 316 S/S bolts.			
4. Are wet well washers specified on design drawings.			
5. Verify that they meet the Council specified requirement.			
6. Verify that pumps can be fully removed from pump station without disconnecting the guide rails.			
Electrical Equipment.			
1. Verify that the Station Identification plate has been fitted to the electrical cabinet.			
2. Verify that the telemetry antenna has adequate protection in accordance with Council specification.			
3. Verify that lighting within the switchboard has been provided.			
4. Verify that the Council locks fitted to switchboard and operational.			
5. Verify that quick link generator connectors provided.			
6. Verify that the Process and Instrumentation Diagram is in switchboard cabinet			
Security.			
1. Verify that the security fencing has been installed in accordance with the design drawings.			
2. Verify that Council keyed locks installed.			
3. Verify that the switchboard meter cabinet has been fitted with Ergon Locks.			
Have all NCR items been resolved (including any raised as a result of this audit)?			
If YES Issue Acceptance of Works., and close audit.			

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
SEWERAGE PUMP STATIONS^{CRC}

Item	Complete	Date / Initials	Council Audit
Would outstanding NCR items impact on the ability to operate the pump?			
If YES then close audit (wait for NCRs to be resolved).			
Has Operations authorized the pumps to remain on?			
If YES record the name of the person who authorized this. NAME.....			
Lift Station			
1. Has discharge pit been lined in accordance with the FNQROC Development Manual			
2. Has benching been completed			
Overflow			
1. Verify overflow has been constructed to design drawings and FNQROC Development Manuals including levels.			
2. Verify flap valves are in place and operational.			
3. Verify covers are in place and are to class specified.			
4. Verify Overflow can be accessed for maintenance.			

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
WATER SITES

REQUIREMENTS BY CONTRACTOR

The following checklist is required to be fully completed, signed and returned to Council before a joint commissioning is considered. Please note: in the event of a commissioning being abandoned due to works not completed or operational, Council will recover costs incurred.

SITE NAME RESERVOIR: _____ **SITE NAME P/S:** _____

- Ergon Power available Yes No
- Provision of sufficient water for all testing purposes Yes No
- Fresh water discharge flushing system operating as per design Yes No
- Ancillaries (GPO's, lighting etc) tested and working correctly Yes No
- Pre commission switchboard test completed Yes No
- Station telemetry points list supplied Yes No
- Established telemetry communications and verified inputs locally Yes No

VERIFICATION OF AS CONSTRUCTED LEVELS AND OPERATION.

Note: Levels taken from floor level

Setting/Alarm	Measurement	Operational function (contractor to verify correct operation)	
Overflow level	m		
High Level alarm	m	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Fill stop level	m	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Fill request level	m	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Low level alarm	m	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Very Low Level Alarm	m	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Level settings according to design	Yes	No <input checked="" type="checkbox"/>	NA

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
WATER SITES

Commissioning of Civil Works

Item	Complete	Date / Initials	Council Audit
Management			
1.	Verify that consultant has provided all documentation. (as constructed details, operating manuals, process and instrumentation diagram, test results etc)	<input type="checkbox"/>	
2.	Consultants have supplied O&M manuals – incorporating all drawing both electrical & mechanical.	<input type="checkbox"/>	
3.	Consultants have supplied test results including performance pump curves	<input type="checkbox"/>	
	If NO then close audit.	<input type="checkbox"/>	
Concrete			
1.	Verify that there is no damage to any exposed concrete surface.	<input type="checkbox"/>	
2.	Verify that drainage of the site is away from the structures.	<input type="checkbox"/>	
3.	Verify that the below ground concrete structures are dimensionally correct and in accordance with the design drawings.	<input type="checkbox"/>	
4.	Verify no seepage through the concrete structure.	<input type="checkbox"/>	
5.	Verify the verticality of the structure is within tolerance in accordance with SEWL specifications.	<input type="checkbox"/>	
6.	Verify that all chamfers are provided in accordance with the design drawings.	<input type="checkbox"/>	
7.	Verify that the specified coating to the internal walls has been applied in accordance with the FNQROC Development Manual.	<input type="checkbox"/>	
8.	Thickness of internal coating tested (µm)	<input type="checkbox"/>	
OH&S			
1.	Verify that ladder access meets OH&S requirements.	<input type="checkbox"/>	
2.	Verify that access to valve chamber meets OH&S requirements.	<input type="checkbox"/>	
3.	Verify that all ladders are provided with the extension above the FSL.	<input type="checkbox"/>	
4.	Verify that the ladders have non-slip treads.	<input type="checkbox"/>	

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
WATER SITES

5.	Have safety cages been specified in accordance with Australian Standards.	<input type="checkbox"/>		
6.	Verify that safety cages have been installed in accordance with the design drawings.	<input type="checkbox"/>		
7.	Verify that adequate set down areas for the covers has been provided in accordance with OH&S requirements.	<input type="checkbox"/>		
8.	Verify that no overhead cables restrict access via crane trucks.	<input type="checkbox"/>		
9.	Verify Full Risk Assessment has been performed and permanent operational/ maintenance risks identified	<input type="checkbox"/>		
10.	Verify that all signage pertaining to those risks is in place	<input type="checkbox"/>		
11.	Facility Name and contacts signage	<input type="checkbox"/>		
12.	Standby Emergency Generator – cover, refueling, manuals	<input type="checkbox"/>		
13.	Adequate access, maneuver and parking for maintenance vehicles	<input type="checkbox"/>		
14.	Switchboard access and clearance meets requirements under Electrical Safety Act	<input type="checkbox"/>		
15.	Personnel/maintenance access ring install in side wall of reservoir	<input type="checkbox"/>		

Products & Materials		Complete	Date/Initials	Council Audit
1.	Verify that all products incorporated on the project are included on the list of approved products for council.	<input type="checkbox"/>		
2.	Verify that all markings as required by council specification are visible on the covers.	<input type="checkbox"/>		
3.	Verify that the covers and frames are greased in accordance with the manufacturer's requirements.	<input type="checkbox"/>		
4.	Verify that the interchangeable multi part covers have lifting lugs on the beams for removal and covers have clockwise lifting key holes.	<input type="checkbox"/>		
5.	Verify that internal ladders are stainless steel.	<input type="checkbox"/>		
Pipes and Fittings				
1.	Verify that the valves are anticlockwise closing.	<input type="checkbox"/>		
2.	Verify that adequate supports have been provided for the valves.	<input type="checkbox"/>		

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
WATER SITES

3.	Are valve extension spindles required?	<input type="checkbox"/>		
4.	Verify that there is sufficient clearance for maintenance.	<input type="checkbox"/>		
5.	Are adequate supports provided in accordance with standard drawings.	<input type="checkbox"/>	/NA	
6.	Verify that DICL pipe work has been provided to correct nominal diameter DN.	<input type="checkbox"/>		
7.	Verify that adequate supports for vertical pipe work has been provided in accordance with FNQROC Development Manual.	<input type="checkbox"/>		
8.	Verify that all gate valves operate through the full range and are left in the open position.	<input type="checkbox"/>		
9.	Verify that a flap valve has been installed on the valve chamber drain if required by the design.	<input type="checkbox"/>		
10.	Verify that the specified coating for all valves has been applied.	<input type="checkbox"/>		
11.	Verify that the specified coating for the pipe work has been applied.	<input type="checkbox"/>		
12.	Verify that the specified bolting system on the flanges has been used.	<input type="checkbox"/>		
13.	Verify that all valves can be removed through the available cover opening.	<input type="checkbox"/>		
14.	Verify that a flanged dismantling joint has been provided to allow ease of removal of valves in accordance with standard drawings.	<input type="checkbox"/>		
15.	Has the consultant submitted completed project ITP containing all signatures.	<input type="checkbox"/>		
16.	Verify all steel metalwork has been Hot Dipped Galvanized.	<input type="checkbox"/>		
17.	Verify all bolts are 316 stainless steel with 308 nuts.	<input type="checkbox"/>		
18.				
19.				

Other Services.		Complete	Date / Initials	Council Audit
1.	Verify that the water service has been fitted with an approved back flow prevention device.	<input type="checkbox"/>		
2.	Verify that all conduits through the walls have been sealed.	<input type="checkbox"/>		
3.	Verify that electricity is below ground, not above.	<input type="checkbox"/>		
4.	Verify that the sealed access track is in accordance with the design drawings and the FNQROC Development Manual.	<input type="checkbox"/>		
5.	Verify that adequate site drainage has been provided.	<input type="checkbox"/>		

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
WATER SITES

Restoration.				
Verify that the site restoration has been completed.		<input type="checkbox"/>		
Testing.				
1.	Verify that Factory Acceptance Testing of the switchboard was completed	<input type="checkbox"/>		
2.	Verify that pump tests passed	<input type="checkbox"/>		
3.	Verify that rising main has been tested	<input type="checkbox"/>		
		<input type="checkbox"/>		
Mechanical Equipment.				
1.	Refer to receiving Council for specific requirements	<input type="checkbox"/>		
		<input type="checkbox"/>		

Electrical Equipment.				
1.	Verify identification plates has been fitted to the electrical cabinet.	<input type="checkbox"/>		
2.	Verify that the telemetry antenna has adequate protection in accordance with specification.	<input type="checkbox"/>		
3.	All wiring is installed, terminated and tagged as per drawings.	<input type="checkbox"/>		
4.	All Earthing systems are installed & tested to Australian standards.	<input type="checkbox"/>		
5.	Switchboard testing - Fault protection, circuit Breakers & cable insulation tests have been carried out. Results Attached.	<input type="checkbox"/>		
6.	Verify that lighting within the switchboard has been provided.	<input type="checkbox"/>		
7.	Verify that the Council locks fitted to switchboard and operational.	<input type="checkbox"/>		
8.	Verify that quick link generator connectors provided if applicable.			

PRE-COMMISSIONING CHECKLIST FOR NEW ASSETS
WATER SITES

Security.	Complete	Date / Initials	Council Audit
1. Verify that the security fencing has been installed in accordance with the design drawings.	<input type="checkbox"/>		
2. Verify that council keyed locks installed.	<input type="checkbox"/>		
3. Verify that the switchboard meter cabinet has been fitted with Ergon Locks.	<input type="checkbox"/>		
Have all NCR items been resolved (including any raised as a result of <i>this</i> audit)?	<input type="checkbox"/>		
If YES Issue Acceptance of Works., and close audit.	<input type="checkbox"/>		
Would outstanding NCR items impact on the ability to operate the pump?	<input type="checkbox"/>		
If YES then close audit (wait for NCRs to be resolved).	<input type="checkbox"/>		
Has Council authorised the pumps to remain on?	<input type="checkbox"/>		

<p>If YES, details of the person who authorised this.</p> <p>NAME.....</p> <p>SIGNATURE:.....</p> <p>POSITION:.....</p> <p>DATE:.....</p>

APPENDIX J

Statement Of Compliance “As Constructed” DOCUMENTATION

**STATEMENT OF COMPLIANCE
“AS CONSTRUCTED” DOCUMENTATION**

Council

Name of Development:

Location of Development:

Applicant:

Consulting Engineer:

Registered Surveyor:

It is hereby certified that the “As Constructed” drawings submitted herewith have been prepared, checked and amended in accordance with the requirements of the FNQROC Development Manual and that the completed works comply with the requirements therein.

Certification by Registered Surveyor (Consulting) attached Yes

(Note: Certification is to be in accordance with the Development Manual).

Compliance with the manual Design Intent and Function not compromised by the “As Constructed” Works.	Compliance Yes / No	Non-Compliance refer to attached redesign of works to ensure satisfactory performance
Earthworks		
Roadworks		
Stormwater Drainage <ul style="list-style-type: none"> • Minor Flow System and Structures • Major Flow System and Structures 		
Water Reticulation		
Sewerage Reticulation		
“As Constructed” Documentation		

Conscientiously believing the above statements to be true and correct:

Consulting Engineer

Name in Full **RPEQ No**

Signature

Date

APPENDIX K

Example Of Surveyor's Certification Of “As Constructed” Works

APPENDIX L

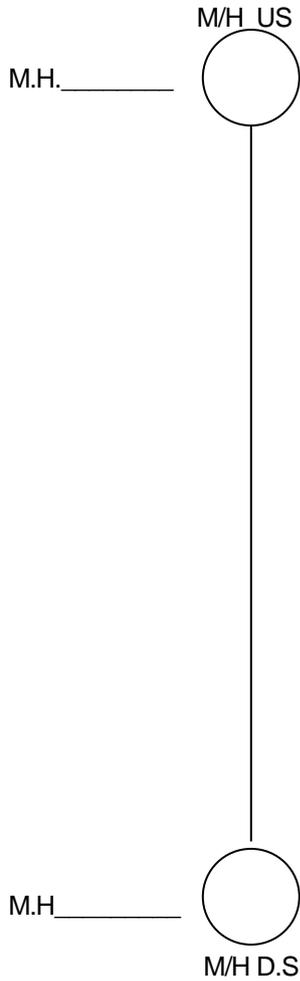
As Constructed Data Sewer Property Connection Branches

AS CONSTRUCTED DATA SEWER HOUSE CONNECTION BRANCHES

Development Name:..... Date:.....

Contractor:..... By:.....

Stage:.....



Φ	D/S IL	U/S IL	Grade	Length

PROPERTY CONNECTIONS

	D/S Mh No.	U/S Mh No.	Total	Lot. No.
Ch				
IL				
SL				
Ch				
IL				
SL				
Ch				
IL				
SL				
Ch				
IL				
SL				
Ch				
IL				
SL				

U/S M/H
TOP RL_____

NOTES:.....
.....

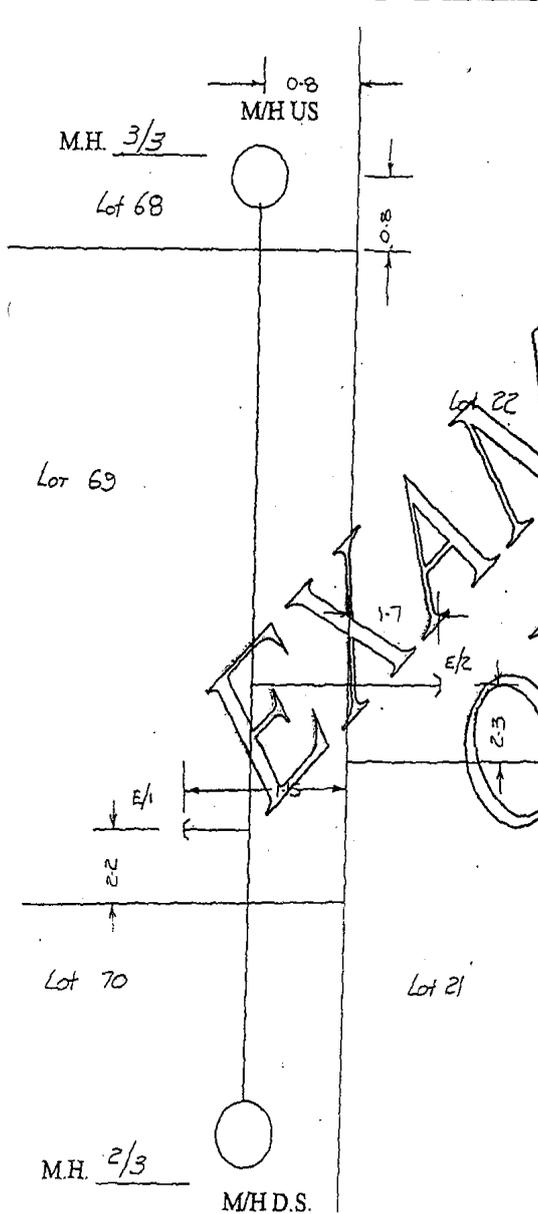
Certified as True and Correct location : Registered Surveyor.....
Signature:.....
Date:.....

AS-CONSTRUCTED DATA
SEWER HOUSE CONNECTION BRANCHES

Development Name Stillson Estate Date 16-5-96

Contractor Digwell Constructions By KLM

Stage 2



φ	D/S IL	U/S IL	Grade	Length
0.150	8.190	8.601	1:150	61.45

HOUSE CONNECTIONS

	D/S Mh No.	U/S Mh No.	Total	Lot No.
Ch	12.2	12.26	61.46	69
IL	9.539	9.542		
SL	10.859	10.863		
Ch	15.32	16.12	61.44	22
IL	9.935	9.936		
SL	10.978	10.984		
Ch				
IL				
SL				
Ch				
IL				
SL				
Ch				
IL				
SL				

U/S M/H
TOP RL 11.23

NOTES: _____

Certified as True and Correct on Behalf of the Contractor: Name: John Treadwell

Signature: J Treadwell

Date: 18/5/96

APPENDIX M

As Constructed Data Submission Form



AS CONSTRUCTED DATA SUBMISSION FORM
 For Consulting Engineers' or Registered Surveyors' Submission
 Of As Constructed Data

Applicant Details	Development Name (Title on approved Engineering Drawing)				
	File Number		Stage Number		
Property Address	Real Property Description				
	Address				
	Company Name				
	Address				
Phone Number		email			
As Constructed Documentation Submitted		Hardcopy	Electronic Copy	Amendment # (A,B,C....)	
	Survey Datum	<input type="checkbox"/>	<input type="checkbox"/>		
	Water	<input type="checkbox"/>	<input type="checkbox"/>		
	Sewer	<input type="checkbox"/>	<input type="checkbox"/>		
	Drainage	<input type="checkbox"/>	<input type="checkbox"/>		
	Road	<input type="checkbox"/>	<input type="checkbox"/>		
	Parks / Landscape / Structures	<input type="checkbox"/>	<input type="checkbox"/>		
	Utilities	<input type="checkbox"/>	<input type="checkbox"/>		
	Contours	<input type="checkbox"/>	<input type="checkbox"/>		
	Digital field survey data, ASCII	<input type="checkbox"/>	<input type="checkbox"/>		
Other Documentation Submitted		Previously Submitted	Attached	N/A	Amendment #
	Engineering drawings in electronic format (AUTOCAD):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Landscaping and park embellishments in electronic format (AUTOCAD):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Building / Structural Certification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Subgrade CBR results	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Maintenance Manuals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Office Use Only	Date Received	DISK Number			
	Officer Checked	Document Number			

APPENDIX N

(Pending) Permanent Survey Mark Coordination Request Form

APPENDIX O

Deleted

APPENDIX P

“As Constructed” Digital Data And Drawing Standards

“AS-CONSTRUCTED” DIGITAL DATA AND DRAWING STANDARDS - APPENDIX P

1. SURVEY DATUM

Survey Datum is the framework of all geospatial information and provides the starting reference that not only supports the accuracy and integrity of survey data, but also provides the geospatial correlation of assets with other data sets. The following publications, or their successors, are to be used in conjunction with this section:

Standards and Practices for Control Surveys (SP1) - Inter-governmental advisory Committee on Surveying and Mapping (ICSM) publication. Available in .PDF format from the ICSM website. <https://www.icsm.gov.au/sites/default/files/2017-05/sp1v1-7.pdf>

- GDA Technical Manual - Inter-governmental advisory Committee on Surveying and Mapping (ICSM) publication. Available in .PDF format from the ICSM website. <http://www.icsm.gov.au/datum/gda2020-and-gda94-technical-manuals>
- *Cadastral Survey Requirements* – Refer to the relevant State Government website e.g. in 2019 this is <https://www.dnrm.qld.gov.au/?a=105601> publication available in PDF format.

a. Datum Recorded

The datum adopted must be recorded, allowing full traceability back to the origin. As the Department of Natural Resource and Water carry out periodic adjustments on both the coordinate and level networks, information to be included as part of the “As Constructed” submission must include a copy of the basic elements of traceability that include but not restricted to:

- i. Starting point of Datum.
- ii. State the type, material and condition of marks used
- iii. Show all calculations relating to datum establishment i.e. copy of traverse and levelling details
- iv. Table of adjusted coordinates, coordinate system, datum and zone.
- v. Baseline closure details from processing software.
- vi. Report on adjustment (generated from software).
- vii. Network map (A3 .pdf).
- viii. Permanent Survey Mark Reports (pdf).

This information is necessary to allow subsequent re-computation of the datum’s for any future corrections made to the network.

b. Co-ordinate Datum

Co-ordinate Datum may be:

- i. Assumed (arbitrary) plane co-ordinates – No previous co-ordinates and no correlation required. Used only for where work is undertaken in an already proclaimed survey area or for subdivisions of five (5) lots or less.
- ii. MGA co-ordinates – grid co-ordinates from the adjustment of a survey traverse to a minimum of two (2) but preferably three (3) or more appropriate survey marks with MGA coordinates. Appropriate survey marks will meet or exceed Class B Order 2 specifications as set out in the ICSM Standards and Practices for Control Surveys (SP1) . Used for new survey areas to be proclaimed or for subdivisional development of greater than five (5) lots (subject to negotiation where MGA is not practical).

CONSTRUCTION PROCEDURES

- iii. Where no suitable control exists in the form of co-ordinated permanent survey marks, Council will provide coordinates of Class B Order 2 within two (2) weeks of receiving a formal request, at a set fee. Refer Appendix N for Request Form.

c. Height Datum

All height information will be on either Australian Height Datum or Australian Height Datum (Derived) and to a minimum standard of Third Order Levelling. Third order levelling is retained because of traditional acceptance. (Refer to Class C Differential Levelling (LC) as defined in the ICSM Standards and Practices for Control Surveys (SP1))

d. Meridian Datum

The meridian datum may be one of the following:

- i. For MGA co-ordinates
 - The meridian is derived from the adjusted survey traverse between the coordinated survey marks.
- ii. For Assumed co-ordinates
 - Azimuth of the current Australian Mapping Grid
 - County Arbitrary Meridian
 - Meridian from an original survey or adjoining survey

2. "AS CONSTRUCTED" DIGITAL GROUND SURVEY

A digital ground survey is required to produce the three-dimensional model of the changes to the natural surface and the location of all artificial features, pursuant to an approved operational works development permit. The Digital Ground Survey will comprise of:-

- a) Sufficient measurements to both topographical features and constructed assets, to ensure that all points and strings in the digital model accurately reflect their true geometric shape and location on the earth's surface.
- b) Spacing between points will ensure that a tolerance for the length of triangle sides in the triangulation model do not exceed 25m on pavement and 50m outside of pavement.

Data provided to Council as part of the "As Constructed" submission shall include the export of the processed survey data in either an ASCII format or in an appropriate format that is requested by the FNQROC member Council that is compatible with their design or survey software.

3. "AS CONSTRUCTED" DRAWINGS

Council requires "As Constructed" Drawings to be produced using "AutoCAD" Software and submitted in DWG format only. Consultants shall ensure that when lodging AutoCAD drawing files that they are compatible with the current version of AutoCAD being used by the relevant member Council. No drawing sheets or title blocks shall be used on the file.

- a) Specific features are represented by blocks and certain linestyles, and such require specific definition and attribute details recorded. These features, their definitions and attribute data requirements are covered in the following sections of this document.

CONSTRUCTION PROCEDURES

- b) Service plans shall be submitted in Grayscale 'PDF' format, digitally certified or with the certification (**Appendix K**) as per Section CP1.22 subsection 2 and with one (1) additional B&W hard copy paper print, produced for each service on the consultants drawing sheets. Both PDF and hardcopy plans must be legible.

The plans shall be prepared according to the following scales and sheet sizes:-

- i. Stormwater Drainage - 1: 500 (A1 Sheets)
 - ii. Sewerage - 1: 500 (A1 Sheets)
 - iii. Water - 1: 500 (A1 Sheets)
 - iv. Reservoir Sites - 1:200 (A3 Sheets)
 - v. Pump Stations - 1:200 (A3 Sheets)
 - vi. Treatment Plants - 1:200 (A3 Sheets)
- c) Electronic Data shall be supplied on CD's or DVD.
- d) The "As Constructed" Drawing may be prepared by either the Consulting Engineer or the Registered Surveyor but must comply with the requirements presented herein.
- e) Survey accuracy to be metres to three decimal points
- f) The AutoCAD Drawing shall be a single drawing containing seven (7) main elements:
- i. Cadastral Base – showing property boundaries, easements and Permanent Survey Marks and Survey Control.
 - ii. Topographical Features – including kerbing/edge of seal, top and toe of batters, change of grades, retaining wall, watercourses, structures, landscaping and park embellishments, contours at 0.5m intervals etc.
 - iii. Water – showing: existing infrastructure and the connection details for new infrastructure, offsets from boundary, connection points, main size, valves, hydrant locations to property boundaries etc together with the location of any irrigation pipes and associated fittings, and details of any water infrastructure abandoned or removed as a result of the new works.
 - iv. Sewerage - showing existing infrastructure and the connection details for new infrastructure, pipe invert levels, pipe diameter and grades, cover levels, location to property boundary, distance from downstream manhole to PCB's, PCB's levels and type, and details of any sewerage infrastructure abandoned or removed as a result of the new works.
 - v. Stormwater Drainage - showing pipe invert levels, pipe diameter and grades, pipe material, finished surface levels, drainage structure description, catch drains, open drains/swales etc.
 - vi. Roads –, showing centre of road carriageway, kerbing/edge of seal.
 - vii. Pump and lift stations Specifications as listed in 'Drafting Requirements' – Sewerage Pump Stations
- g) If MGA co-ordinates have been used, "As Constructed" drawings can be submitted in MGA Zone 55 (GDA94) or MGA Zone 55 (GDA2020). The datum used should be clearly noted on drawing details.

CONSTRUCTION PROCEDURES

4. DRAFTING REQUIREMENTS (“AS CONSTRUCTED”) ^{CRC}

The general drafting requirements for the preparation of "AutoCAD" drawings shall be as detailed in this section. Any elements encountered in the preparation of these drawings not specifically covered by this manual shall be confirmed with Council's Asset Management Section prior to submission of drawing file.

- a) The orientation of the drawing must be set to AutoCAD's default (ie 90 at 12 o'clock, and anticlockwise measured angles).
- b) 1 Drawing unit = 1 metre
- c) All symbols and line types to be as specified within this section. A digital file of Councils linestyles, layers and blocks will be made available.
- d) All colours are to be by layer (except internal block linework)
- e) All line types are to be by layer
- f) All other colours and line widths to reflect FNQROC.ctb file.
- g) AutoCAD layer names shall be in accordance with Table CP1.2 or as specified within this section.
- h) All lines are to be 2D poly lines and all blocks are to have a z value (level value).^{MSC}

(^{MSC}: All lines are to be 3D poly lines and all blocks are to have embeded z value (level value))

Table CP1.2 Layering Standards

Description of Layer	Annotation	AutoCAD Layer	AutoCAD Linetype	AutoCAD Colour Index
2.0 mm high text	2.0 mm	020_TXT	Continuous	254 (light grey)
2.5 mm high text	2.5 mm	025_TXT	Continuous	7 (white)
3.5 mm high text	3.5 mm	035_TXT	Continuous	2 (yellow)
5.0 mm high text	5.0 mm	050_TXT	Continuous	1 (red)
7.0 mm high text	7.0 mm	070_TXT	Continuous	5 (blue)
10.0 mm high text	10.0 mm	100_TXT	Continuous	30 (Orange)
Contours	N/A	CONTOUR	Continuous	252 (dark grey)
Contour heights	2.0 mm	CONTOUR_HEIGHT	Continuous	254 (light grey)
As Constructed Above Ground Electricity	N/A	ELECTRIC_ABOVE	- E - E -	220
As Constructed Underground Electricity	N/A	ELECTRIC_UNDER	- E - - - E -	220
As Constructed Aboveground Telecommunication	N/A	TELECOM_ABOVE	- T - T -	133
As Constructed Underground Telecommunications	N/A	TELECOM_UNDER	- T - - - T -	133
As Constructed Above ground Optical Fibre	N/A	OPTIC_ABOVE	- OF - OF -	133
As Constructed Underground Optical Fibre	N/A	OPTIC_UNDER	- OF - - - OF -	133

CONSTRUCTION PROCEDURES

Description of Layer	Annotation	AutoCAD Layer	AutoCAD Linetype	AutoCAD Colour Index
As Constructed Fuel Line	N/A	FUEL_LINE	- F - - - F -	44
As Constructed Gas Line	N/A	GAS_LINE	- G - - - G -	23
Electricity text	2.5 mm	ELECTRIC_TXT	Continuous	7 (white)
Telecom Text	2.5 mm	TELECOM_TXT	Continuous	7 (white)
Optical Fibre Text	2.5 mm	OFTIC_TXT	Continuous	7 (white)
Fuel Line Text	2.5 mm	FUEL_LINE_TXT	Continuous	7 (white)
Gas Line Text	2.5 mm	GAS_LINE_TXT	Continuous	7 (white)

CONSTRUCTION PROCEDURES

5. LINEWORK

1. It should be noted that Pen Size Colours are as follows:

0.15	-	132	
0.25	-	8	(Grey)
0.25	-	4	(Cyan)
0.35	-	7	(White)
0.35	-	200	(Purple)
0.50	-	2	(Yellow)
0.50	-	3	(Green)
0.70	-	5	(Blue)
0.50	-	6	(Magenta)
1.00	-	1	(Red)
1.00	-	30	(Orange)

2. Linetype scale shall be = 10
3. All line types shall be taken from the Regional Organisations standard line type file (FNQROC.LIN) or from the Department of Main Roads – ‘Drafting and Design Presentation Standards’.

6. TEXT STYLES

1. Text styles to be used on all Drawings shall be specified as below:

Text Style Name	Font Name	Height	Width	Oblique Angle	Backwards	Upside Down	Vertical
RS	Romans	0.0	1.0	0d'0"0"	N	N	N
RSO	Romans	0.0	1.0	15d'0"0"	N	N	N

7. BLOCKS

1. Council supplied blocks shall be used at all times and XREF blocks shall not be used. Many of these blocks will have numerous attributes (visible and hidden) attached to them. It is the responsibility of the Consultant preparing the As Constructed Digital Submission to complete all attributes as identified in the block attributes tables. The remaining attributes are for Council's use. Blocks must be inserted at and must remain at a scale of 1:1.

8. ACCURACY REQUIREMENTS

1. Dimensions shall be used to accurately define the location of the service entities in the as-constructed data (the dimension requirements are described below). However, to ensure the clarity of the utility plans, Council requires that consultants separate the entities to enable them to be easily identifiable at the appropriate scale. Relativity among the entities and in relation to other features must be maintained (eg if an entity is to the east of a boundary it must be shown on the plan to be east of that boundary).

Location:

- a. Dimensions shall be shown to two decimal place
- b. Pipe lengths shall be shown to two decimal place.

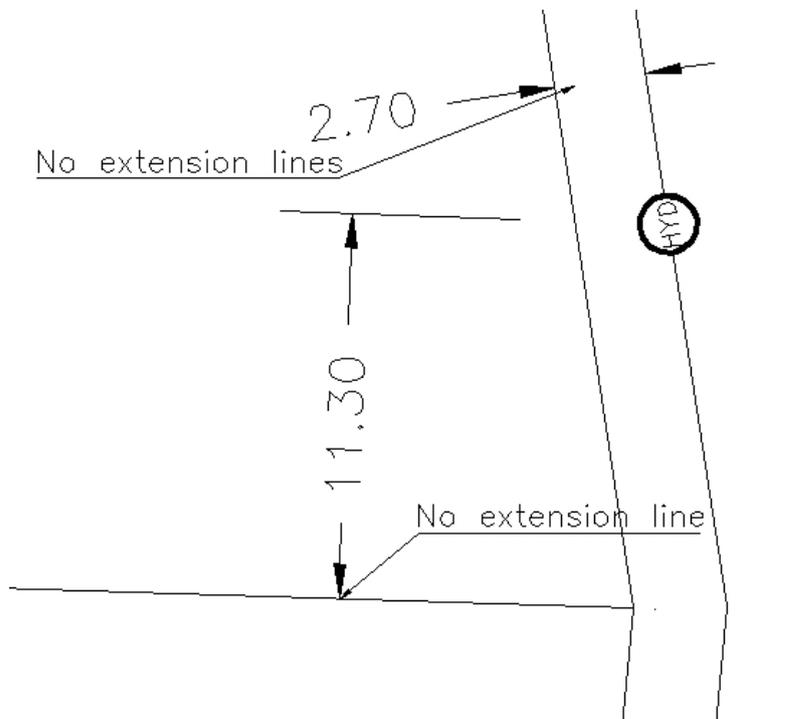
CONSTRUCTION PROCEDURES

Level:

- c. PCB Invert Levels shall be shown to two decimal places.
- d. Pipeline Invert Levels shall be shown to two decimal places.
- e. RL Manhole Lid levels shall be shown to two decimal places
- f. All depths shall be shown to two decimal places.
- g. Finished Surface Levels shall be shown to two decimal places.
- h. Pipe Grades shall be expressed as a ratio (eg 1:150) determined from full survey accuracy.

9. DIMENSIONING

1. Council requires the Dimensioning of "As-Constructed" services to conform to the following criteria:
 - a. There must be sufficient dimensions to define the location of the service without ambiguity. Pipelines must be dimensioned sufficiently to show their alignment in relation to the cadastre. Service entities (valves, hydrants, manholes, PCB's, etc) must be located in relation to the nearest cadastral corner. PCB's must be located in relation to the nearest cadastral corner of the lot it services. If PCB's have been installed to service a future stage of development, then PCB details relevant to the future stage lots are to be presented on the as-constructed drawing for that stage . Note: in areas containing a number of service entities clustered together, dimensioning is to be sufficient to locate the main elements of the cluster only (eg every service entity is not required to be fully dimensioned). Service entities located opposite cadastral boundary intersections do not require dimensioning.
 - b. The dimensioning of the utilities is to be in accordance with the Council's dimensioning styles. These styles are set in the prototype drawing that can be obtained from Councils Asset Management Section upon request. Council has developed a style for use with each of the utilities (water, sewerage and drainage). The appropriate style to use is listed with the individual utilities' requirements.
 - c. Dimension extension lines must be created manually in the appropriate dimensions layer. Extension lines are not to be created that cover other linework (pipelines, property boundaries etc). See diagram below. Note: the dimension styles supplied by Council have the extension lines set to none as a default. Do not reset
 - d. Dimension text is to be outside of the extension lines and clear of the roadways. See diagram below.
 - e. Dimensions are to be layered separately for each utility. Please refer to the relevant utilities requirements for the appropriate layer.



10. SURVEY CONTROL

The Survey Control entity requirements are as follows:

1. Linework

Description	Layer	Colour (by layer)	Linetype (by layer)
Survey Traverse	AC_SURVEY_TRAVERSE	Dark Green (96)	Continuous

2. Text

Description	Layer	Colour (by layer)	Text Style	Text Height
Permanent Survey Mark	AC_SURVEY_PSM	Dark Red (12)	RS	1.25
Survey Instrument Station	AC_SURVEY_IS	Dark Red (12)	RS	1.25
Survey Traverse details	AC_SURVEY_TRAVERSE	Dark Green (96)	RS	1.25

3. Blocks

Block	Name	Description	Layer	Colour
	SURVEY_PSM	Permanent Survey Mark	AC_SURVEY_PSM	12 (Dark Red)
	SURVEY_INST	Instrument Station	AC_SURVEY_INST	12 (Dark Red)

4. Bearings and Distances shall be recorded against all sections of the traverse line in the AC_SURVEY_TRAVERSE layer.

CONSTRUCTION PROCEDURES

11. CADASTRAL BASE

The Cadastral Base entity requirements are as follows:

1. Linework

Description	Layer	Colour (by layer)	Linetype (by layer)
Property Boundary	AC_CADASTRE_PROPBDY	4 (Cyan)	Continuous
Easements	AC_CADASTRE_EASE	4 (Cyan)	Dashed (0.0 wide)
Existing Boundary	AC_CADASTRE_EXBDY	8 (Grey)	Continuous
Existing Easements	AC_CADASTRE_EXEASE	8 (Grey)	Dashed (0.0 wide)
Future Boundary	AC_CADASTRE_FUTBDY	8 (Grey)	Continuous
Future Easement	AC_CADASTRE_FUTEASE	8 (Grey)	Dashed (0.0 wide)
Major Contours	AC_MAJOR_CONTOURS	252 (Dark Grey)	Contour Major
Minor Contours	AC_MINOR_CONTOURS	254 (Light Grey)	Contour Minor

Note: Contour information will be for internal council use only.
Not required on plotted hard copies.

- a. Property boundary linework shall not be broken when crossed by text. All text is to be located clear of linework whenever possible. Refer to the Table above.
- b. All boundaries between allotments and road reserve will be placed in the AC_CADASTRE_PROPBDY layer.
- c. Each parcel to be an individual closed polyline

2. Text

Description	Layer	Colour (by layer)	Text Style	Text Height
Permanent Survey Mark	AC_CADASTRE_PSM	4 (Cyan)	RS	1.25
Lot No's	AC_CADASTRE_LOTNO	2 (Yellow)	RS	1.25
Registered Plan No's	AC_CADASTRE_RPNO	3 (Green)	RSO	2.0
Drainage Reserve Text	AC_CADASTRE_DRTEXT	4 (Cyan)	RS	1.25
Contour Text	AC_CONTOURS	252 (Dark Grey)	RS	1.0

- a. Allotment numbers are to be located in the centre of the boundary opposite the sewer line and inside the allotment (eg if the sewer line is along the rear boundary, numbers should be placed centrally along the front boundary) or close by in a clear position.
- b. All text shown on plan, other than acceptable abbreviations, shall be in uppercase.

CONSTRUCTION PROCEDURES

12. WATER RETICULATION ^{CRC}

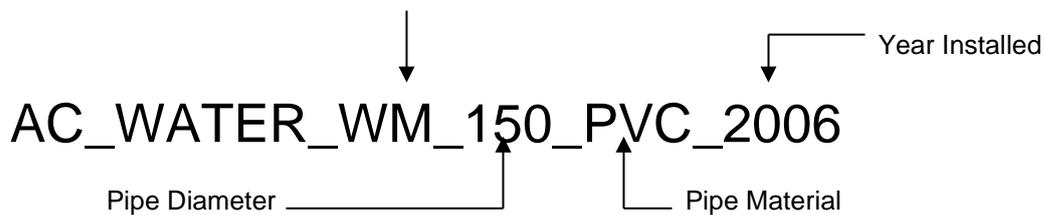
The Water entity requirements are as follows:

1. Linework ^{CRC}

Description	Layer	Colour (by layer)	Linetype (by layer)
Water Main > 50 dia	Refer Below	2 (Yellow)	Continuous Polyline (0.0 wide)
Water Main =< 50 dia	Refer Below	4 (Cyan)	Continuous Polyline (0.0 wide)
Trunk Main	Refer Below	2 (Yellow)	Dashed Polyline (0.0 wide)
Private Service	Refer Below	4 (Cyan)	Continuous Polyline (0.0 wide)
Reclaimed Water Main	Refer Below	200 (Purple)	Continuous Polyline (0.0 wide)
Service to Park or Landscaping	Refer Below	7 (White)	Continuous Polyline (0.0 wide)
Existing Water Features	AC_WATER_EXIST	8 (Grey)	Dashed (0.0 wide)

2. Layer Names for water mains shall be in the format shown below:

Denotes Water Reticulation Type: WM – Water Main, WT – Trunk Main, WP – Private Main, WI – Irrigation and WR – Reclaimed Water



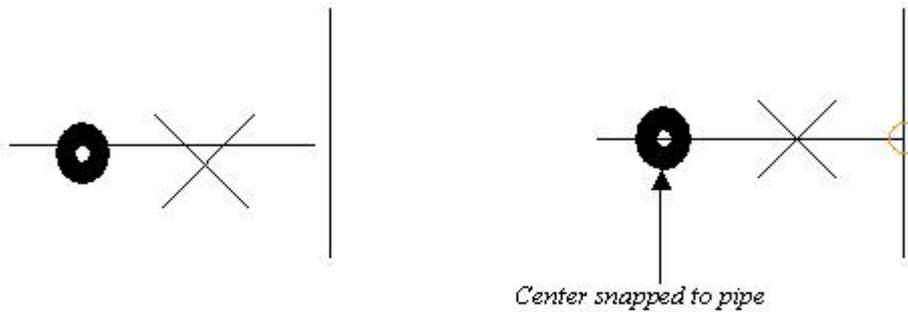
3. Crossing and connecting water pipes are to be shown as below. Connecting water pipes are to be represented by the Water_Junction block.



4. Water mains and irrigation pipes are to be one continuous 2D ^(MSC: 3D) Polyline, broken only at pipe junctions and valves.

CONSTRUCTION PROCEDURES

5. Ensure that all pipes/ junctions/ valves are snapped to the centre/ end of the object.



Incorrect

Correct

6. Connections to existing water features in Council controlled land are required and are to be placed in the AC_WATER_EXIST layer.

7. Text ^{CRC}

Description	Layer	Colour	Text Style	Text Height
Pipe Size, Material and Notes	AC_WATER_TEXT	4 (Cyan)	RS	2.0
Reservoir Text	AC_WATER_TEXT	4 (Cyan)	RS	2

8. Dimensioning

- a. Dimension Style - WATER
- b. Dimension Layer – AC_WATER_DIM

9. The following details must be shown on the 'as constructed' drawing :

- a. Mains
 - i. End caps, bends, fittings and thrust blocks
 - ii. Location – Above or below ground, default below
 - iii. Length – Length of pipe measured between junctions or changes in horizontal direction. (if requested)
 - iv. Installation depth, if not standard.
 - v. Dimensions from horizontal bends in the main to two (2) property boundaries or corners
 - vi. Operating pressure at critical locations (low points, high points). (If requested)
 - vii. Location of valves, air vents, scour valves, bends, access chambers and hydrants along the main
 - viii. For trunk mains: Long sections with surface level and crown level at changes of grade, and at a maximum of 30 metre centres.

CONSTRUCTION PROCEDURES

- b. Reservoirs
 - i. Site locality plan showing the reservoir and associated works in relation to cadastral boundaries
 - ii. Significant variations from the approved drawings including tolerances outside those specified
 - iii. Actual dimensions of reservoir
 - iv. Actual configuration of associated pipework, ladders, walkways, control boxes, man access hatch etc
 - v. Location of water service
 - vi. Set out, configuration and details of scour and overflow pipework
 - vii. Location and details of any driveways, apron slabs, fences and any other utilities.

- c. Pump Station
 - i. Actual dimensions of building
 - ii. Control Pressure - Pump control pressure.
 - iii. Control Capacity – Pump control capacity
 - iv. System curves and pump curves.
 - v. Number – Number of pumps Installed. The pumps are individually represented by the Pump block and placed next to the pump station.
 - vi. Valve Pit Floor Level, lid level and outside FSL in metres, A.H.D
 - vii. Cross reference detail drawings and standard drawings
 - viii. Full pump specification include duty, make, model, motor rating, curve number, impeller, diameter, etc.
 - ix. Site locality plan at (scale 1:200) showing the as-constructed pump station and associated works in relation to cadastral boundaries
 - x. Location of water service
 - xi. Location of operation and maintenance manuals
 - xii. Finished surface contour levels and spot levels
 - xiii. Clearance dimensions between flanges and wall surfaces
 - xiv. Cover to pipe work
 - xv. Switch Board Layout Details
 - xvi. Actual internal configuration of pumps, pipework, control panel, generator etc
 - xvii. Q100 flood line level and highest Recorded Flood Level in metres, A.H.D.
 - xviii. Locations and details of any driveways, apron slabs, fences and any other utilities.

- d. Pumps
 - i. Installation Date - Year in which the asset was constructed or installed i.e. 2007
 - ii. Number – Pump serial number.
 - iii. Housing – Housing material.
 - iv. Impeller – Impeller material
 - v. Impeller Diameter
 - vi. Impeller curve

CONSTRUCTION PROCEDURES

- vii. Shaft size
- viii. Shaft seal – Type of seal used.
- ix. Flow Rate.
- x. Motor Kilowatts
- xi. Motor Current
- xii. Motor control (VSD or DOL)
- xiii. Bearing Size.
- xiv. Size – Pump Size (weight and outside dimensions).

a. Electrical Controls

Required Attributes:

- i. Iso_size – Main Isolator size.
- ii. Type – Isolator Type.
- iii. Manufacturer – Isolator manufacturer.
- iv. Inc_Size – Main Incomer size.
- v. Wiring_enclosure – whether wiring enclosure is buried direct, conduit, cable tray.
- vi. Voltage – Voltage of switchboard.
- vii. IP – IP rating.
- viii. Installation Date - Year in which the asset was constructed or installed i.e. 2007.
- ix. Reference Dwg – Drawing number for design of constructed asset.
- x. Reference Manual – Manual detailing components etc of switchboard.

b. Valve Pit / Chlorination Plant

Required Attributes:

- i. Installation Date - Year in which the water asset was constructed or installed i.e. 2007
- ii. Reference Dwg – Drawing number for design of constructed water asset

10. Water Block Details

Block	Name	Description	Layer	Colour
	Water_Air	Air Valve	AC_WATER_AV	2 (Yellow)
	Water_Chlorin	Chlorination Plant	AC_WATER_WC	4 (Cyan)
	Water_Elec	Electrical Controls	AC_WATER_EC	4 (Cyan)
	Water_End	Endcap for pipes	AC_WATER_END	2 (Yellow)
	Water_Float	Float Valve	AC_WATER_FV	2 (Yellow)
	Water_Hydraulic	Hydraulic / Control Valve	AC_WATER_HV	2 (Yellow)
	Water_Hydrant	Fire Hydrant	AC_WATER_HYD	2 (Yellow)
	Water_Junction	Junction of Water Pipes	AC_WATER_JUNC	30 (Orange)
	Water_Pressure	Pressure reducing Valve	AC_WATER_PRV	2 (Yellow)
	Water_Reducer	Reducer	AC_WATER_RED	2 (Yellow)
	Water_Reflux	Reflux Valve	AC_WATER_RFV	2 (Yellow)
	Water_Res	Reservoir	AC_WATER_RES	2 (Yellow)
	Water_Scour	Scour Valve	AC_WATER_SCRV	2 (Yellow)
	Water_Stop	Stop Valve	AC_WATER_SV	2 (Yellow)
	Water_VPit	Valve Pit	AC_WATER_VP	4 (Cyan)
	Water_Meter	Water Meter	AC_WATER_WM	4 (Cyan)
	Water_PStn	Water Pump Station	AC_WATER_PS	4 (Cyan)

13. SEWERAGE RETICULATION^{CRC}

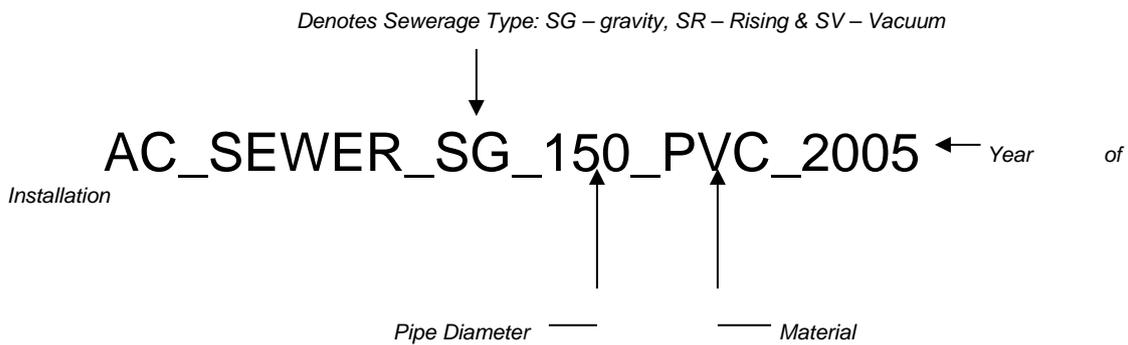
The Sewer entity requirements are as follows:

1. Linework^{CRC}

Description	Layer	Colour (by layer)	Linetype (by layer)
Pressure Rising(Pressure) (Rising) Mains	Refer Below	6 (Magenta)	Pmain (assign linetype to object)
Gravity Mains	Refer Below	6 (Magenta)	Continuous
Vacuum Mains	Refer Below	6 (Magenta)	Vmain (assign linetype to object)
Existing Features	AC_SEWER_EXIST	8	Dashed (0.0 wide)
*PCB's	AC_SEWER_PCB	Red	Continuous
Property Sewers (Private)	AC_SEWER_PROPERTY	Red	Continuous

* Refers to all PCB's, which are to service new lots created by the development to which the as-constructed drawing relates, regardless of whether or not the PCB's were installed in a previous construction or installed on an existing sewer. (Where existing PCB's have been obtained from a third party, it is recognised that they cannot be certified and in such cases need to be noted.)

- Connections to existing sewer features in Council controlled land are required and are to be placed in the AC_SEWER_EXIST layer.
- Sewer pipes are to be one continuous 2D^(MSC: 3D) polyline between manholes/valves/pump or lift stations.
- Layer Names for Mains shall be in the format shown below:

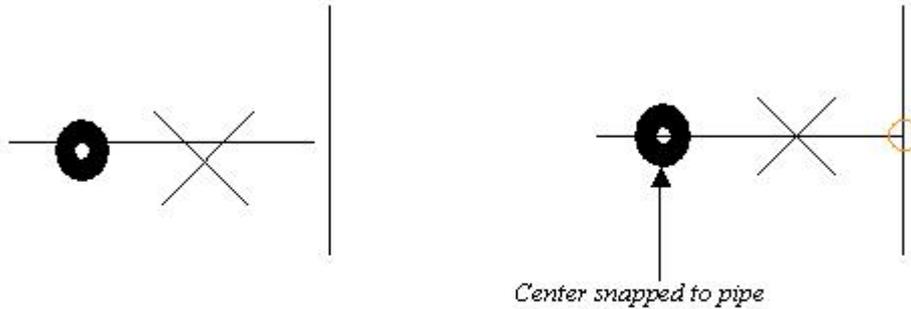


5. Text

Description	Layer	Colour (by layer)	Text Style	Text Height
Pipe Dia, Material, Length, Grade & Invert Levels	AC_SEWER_PIPE	Cyan	RS	1.25
PCB Details	AC_SEWER_PCB	Cyan	RS0	1.0

- All text other than acceptable abbreviations shall be in uppercase.

6. Ensure that all pipes/ junctions/ valves are snapped to the centre/ end of the object.



Incorrect

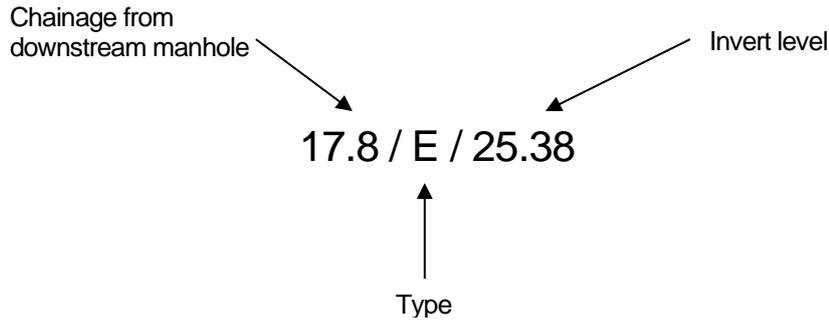
Correct

7. Dimensioning

- a. Dimension Style - SEWER
- b. Dimension Layer - AC_SEWER_DIM

8. Sewer Block Details

Block	Name	Description	Layer	Colour
	Sewer_Air	Air Valve	AC_SEWER_AV	3 (Green)
	Sewer_End	Endcap for pipes	AC_SEWER_END	Magenta
	Sewer_FSL	Finished Surface Level	AC_SEWER_FSL	4 (Cyan)
 <small>CHANGE/TYPE/L</small>	Sewer_PCB	Property Connection	AC_SEWER_PCB	6 (Magenta)
	Sewer_Reflux	Reflux Valve	AC_SEWER_RFV	3 (Green)
	Sewer_Scour	Scour Valve	AC_SEWER_SCRV	3 (Green)
	Sewer_IO	Inspection Openings	AC_SEWER_IO	4 (Cyan)
	Sewer_MS	Sewer Maintenance Shaft	AC_SEWER_MH	4 (Cyan)
	Sewer_MH	Sewer Manhole	AC_SEWER_MH	4 (Cyan)
	Sewer_ScMH	Sewer Scour Manhole	AC_SEWER_MH	4 (Cyan)
	Sewer_PStn	Sewer Pump Station	AC_SEWER_PS	Magenta



Note: For Type A the invert level will be taken as the invert level of the IO pipe of the branch (refer S3005). All other types are invert level of the sewer main at the PCB.

14. Finished Surface Levels

- a. Finished surface levels are required at all cadastral corners. The Sewer_FSL block must be used for all finished surface level information. The surface level data at cadastral corners must be placed in the layer AC_SEWER_FSL .

15. Pipe Invert Levels

- a. Gravity Mains - Invert levels must be provided for all gravity mains. The pipe invert levels are to be recorded in the Sewer Pipe Block.
- b. Pressure (Rising) Mains - Invert level information is required along all pressure (rising) mains. They must be shown at valves, in the pump station and at discharge points. The pipe invert levels are to be recorded in the Sewer Pipe Block.

16. The following details must be shown on the 'as constructed' drawing:

- a. Pressure Sewer Rising Main
 - i. Operating pressures at low and high points
 - ii. Line velocity at maximum operating flow
 - iii. Surface levels and invert levels at ends, changes in grade and at a maximum of 30 metre centres on a long section.
 - iv. Running chainages from the pump station to changes of grade, valves, air vents, scour valves, bends and access chambers along the main
 - v. Dimensions from horizontal bends in the main to two (2) property boundaries or corners

17. For pump and lift stations, all relevant details are to be recorded in the relevant pump station block. Refer to block for required data.

14. SEWERAGE PUMP STATIONS

1. The pump/lift station number shall be provided by Council.
2. Text

Description	Layer	Colour (by layer)	Text Style	Text Height
Pipe Dia, Material, Length, Grade & Invert Levels	SEWERAGE_SPS	4 (Cyan)	RS	1.25
Misc. text descriptions	AC_SEWER_TEXT	4 (Cyan)	RSO	1.0

3. The following details must be shown on the 'as constructed' drawing:

- a. Storage/Overflow
 - i. Site locality plan showing the as-constructed storage infrastructure and associated works in relation to cadastral boundaries
 - ii. Show all significant variations from the approved drawings including tolerances outside those specified
 - iii. Actual dimensions of storage infrastructure
 - iv. Actual set out and configuration of piping and external to the storage infrastructure.
 - v. Q100 flood line level and Highest Recorded Flood level in metres, A.H.D
 - vi. Overflow discharge location
 - vii. Location of water services
 - viii. Finished surface contour levels and spot levels
- b. Pump and Lift Stations
 - i. Locations and details of any driveways, apron slabs, fences and utilities.
 - ii. Q100 flood line level and Highest Recorded Flood Level in metres, A.H.D.
 - iii. Full pump specification including duty, make, model, motor rating, curve number, impeller, diameter, etc. (shown as a table on the plan)
 - iv. Site locality plan at (Scale 1:200) showing the as-constructed pump station, valve box and associated works in relation to cadastral boundaries
 - v. Overflow discharge location
 - vi. Location of water service

- vii. Location of operation and maintenance manuals
 - viii. Finished Surface Contour Levels and spot levels
 - ix. Clearance dimensions between flanges and internal wall surfaces
 - x. Cover to pipe work
 - xi. Show existing and proposed Manholes within the area of the locality plan including manhole number
 - xii. Switch Board Layout Details and any telemetry (if applicable)
 - xiii. All significant variations from the approved drawings including tolerances outside those specified.
 - xiv. System Curve – System head pressure.
 - xv. Pump Curve – Pump design head
 - xvi. Head – Maximum head at receiving mains.
 - xvii. Underside of plug (ballast) in metres, A.H.D
 - xviii. RL at Top of Sewer Pump Station
 - xix. Invert Level of Pressure Main
 - xx. Invert Level of each Gravity Main
 - xxi. Invert Level of Overflow Pipe
 - xxii. RL of High Level Alarm
 - xxiii. RL of Standby Start
 - xxiv. RL of Pump Duty Start
 - xxv. RL of Pump Stop
 - xxvi. RL of Low Level Alarm
 - xxvii. RL of Pump Station floor
 - xxviii. Pump Station Internal Diameter
- c. Electrical Controls and Pumps

Required Attributes:

- i. Refer to attribute details for sewer electrical controls and pumps.

6. Dimensioning

- a. Dimension Style - DRAINAGE
- b. Dimension Layer – AC_DRAINAGE_DIM

7. Finished Surface Levels

8. Finished surface levels are required at all cadastral corners and at changes of grade. The AC_DRAINAGE__FSL block must be used for all finished surface level information and placed in the layer AC_DRAINAGE_FSL.

9. Both above ground and underground drainage details are to be recorded in the AC_DRAINAGE_TEXT layer.

10. Drainage Blocks

Block	Name	Description	Layer	Colour
	Drain_Culvert	Culvert Text Box	AC_DRAINAGE_CULVERT	4 (Cyan)
	Drain_FSL	Finished Surface Level	AC_DRAINAGE_FSL	4 (Cyan)
	Drain_GPT	Gross Pollutant Trap	AC_DRAINAGE_GPT	4 (Cyan)
	Drain_IO	Inspection Opening	AC_DRAINAGE_IO	4 (Cyan)
	Drain_HW	Headwall	AC_DRAINAGE_HDWALL	4 (Cyan)
	Drain_EWW	Head and Wingwalls	AC_DRAINAGE_HDWALL	4 (Cyan)
	Drain_RKerb	Kerb Inlet Pit/ Grate located RHS	AC_DRAINAGE_KERB	4 (Cyan)
	Drain_MKerb	Kerb Inlet Pit/Grate located Middle	AC_DRAINAGE_KERB	4 (Cyan)
	Drain_LKerb	Kerb Inlet Pit/Grate located LHS	AC_DRAINAGE_KERB	4 (Cyan)
	Drain_MH	Manhole	AC_DRAINAGE_MH	4 (Cyan)
	Drain_Open	Open Drain Text Box	AC_DRAINAGE_DRAIN	4 (Cyan)
	Drain_Pipe	Pipe Text Box	AC_DRAINAGE_PIPE	4 (Cyan)
	Drain_Pit	Field Inlet Pit	AC_DRAINAGE_PIT	4 (Cyan)
	Drain_CPit	Field Inlet Pit, Concrete Shute	AC_DRAINAGE_PIT	4 (Cyan)
	Drain_PStn	Drain Pump Station	AC_DRAINAGE_PS	4 (Cyan)
	Drain_Tide	Tide Flap/Gate	AC_DRAINAGE_TIDE	4 (Cyan)

11. Location of Structure Point and Levels

Drainage structure location point for the various structures shall be as shown.



GRATED KERB INLET PIT



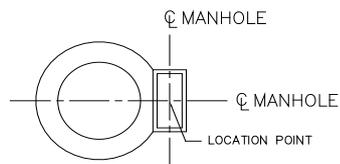
FIELD INLET PITS



MANHOLES



HEADWALLS



GROSS POLLUTANT TRAPS

12. The following details must be shown on the 'as constructed' drawings:

a. Electrical Controls / Pumps

- i. Refer to details for water electrical controls and pumps.

16. ROAD NETWORK

The Road Network entity requirements are as follows:

1. Linework

Description	Layer	Colour (by layer)	Linetype (by layer)
Barrier Kerb & Edge Restraint	AC_ROAD_KERB_SKNC	4 (Cyan)	Continuous (Polyline 0.0 wide)
Barrier Kerb & Channel	AC_ROAD_KERB_SKCC	4 (Cyan)	Continuous (Polyline 0.0 wide)
Maintenance Strip	AC_ROAD_KERB_MEDNC	4 (Cyan)	Continuous (Polyline 0.0 wide)
Semi Mountable & Layback	AC_ROAD_KERB_SMKNC	4 (Cyan)	Continuous (Polyline 0.0 wide)
Layback & Channel	AC_ROAD_KERB_SMKCC	4 (Cyan)	Continuous (Polyline 0.0 wide)
Concrete Invert	AC_ROAD_KERB_NKCC	4 (Cyan)	Continuous (Polyline 0.0 wide)
Bridge Deck	AC_ROAD_BRIDGE	6 (Magenta)	Continuous (Polyline 0.0 wide)
Paths	AC_ROAD_PATH	4 (Cyan)	Continuous (Polyline 0.0 wide)
Existing Features	AC_ROAD_EXIST	8 (Grey)	Dashed (0.0 wide)
Thresholds	AC_ROAD_THOLD	4 (Cyan)	Continuous (Polyline 0.0 wide)
Centreline	AC_ROAD_CLINE	132	Continuous (Polyline 0.0 wide)

2. Text

Description	Layer	Colour (by layer)	Text Style	Text Height
Kerb & Channel	AC_ROAD_KERB	4 (Cyan)	RS	1.0
Path Material	AC_ROAD_PATH_TEXT	1 (Red)	RS	2.0
Threshold Material	AC_ROAD_THOLD	1 (Red)	RS	2.0
Pavement Details	AC_ROAD_PAV	1 (Red)	RS	2.0
Road Names	AC_ROAD_TEXT	1 (Red)	RS	4.0

- 3. All constructed footpaths are to be located and recorded in the AC_ROAD_PATH layer, with path material type recorded in the AC_ROAD_PATH_TEXT layer.
- 4. All different kerb types are to be individually identified by their respective Layer Names refer to standard kerb drawings S1000 & S1001.
- 5. All Thresholds are to be represented by a closed polyline, with threshold material type recorded in the AC_ROAD_THOLD layer.
- 6. All bridge decks are to be located and recorded in the AC_ROAD_BRIDGE layer.

7. Subgrade CBR, Road pavement and surface details are to be recorded in the AC_ROAD_PAV layer in the Pavement block
8. Road Block Details

Block	Name	Description	Layer	Colour						
	Traffic_Sign	MUTCD Traffic Signs	AC_ROAD_SIGN	6 (Magenta)						
BRIDGE	Bridge	Bridge details	AC_BRIDGE	6 (Magenta)						
<table border="1" style="font-size: small;"> <tr><td>SUR_MATRL</td></tr> <tr><td>SUR_DEP CBR</td></tr> <tr><td>BASE_MATRL</td></tr> <tr><td>BASE_DEP CBR</td></tr> <tr><td>SBASE_MATRL</td></tr> <tr><td>SBASE_DEP CBR</td></tr> </table>	SUR_MATRL	SUR_DEP CBR	BASE_MATRL	BASE_DEP CBR	SBASE_MATRL	SBASE_DEP CBR	Pavement	Pavement details	AC_ROAD_PAV	
SUR_MATRL										
SUR_DEP CBR										
BASE_MATRL										
BASE_DEP CBR										
SBASE_MATRL										
SBASE_DEP CBR										

9. The following details must be shown on the 'As constructed' drawings:

a. Bridge

- i. Type – Type of bridge, i.e. Road or Pedestrian.
- ii. Deck – Deck material.
- iii. Span – Number of bridge spans.
- iv. Width – Width of bridge decking.
- v. Length – Length of Bridge decking.
- vi. Pylon – Pylon material.
- vii. Headstock – Headstock material.
- viii. WC – Wearing course type, for road bridges.
- ix. Depth – Wearing Course depth, for road bridges.
- x. Installation Date - Year in which the bridge was constructed or installed i.e. 2007.

17. PARKS / LANDSCAPING / STRUCTURES

The Park / Landscaping / Structure entity requirements are as follows:

1. Linework

Description	Layer	Colour (by layer)	Linetype (by layer)
Vegetation	AC_LAND_VEGETATION	96 (Dark Green)	Continuous (Polyline 0.0 wide)
Soft fall Area	AC_LAND_SOFTFALL	30 (Orange)	Continuous (Polyline 0.0 wide)
Paving / Concrete	AC_LAND_PAVING	4 (Cyan)	Continuous (Polyline 0.0 wide)
Building / Structure	AC_LAND_STRUCTURE	4 (Cyan)	Continuous (Polyline 0.0 wide)
Pedestrian Bridge	AC_LAND_BRIDGE	2 (Yellow)	Continuous (Polyline 0.0 wide)

2. Text

Description	Layer	Colour (by layer)	Text Style	Text Height
Vegetation	AC_LAND_TEXT	96 (Dark Green)	RS	1.0
Soft fall Area	AC_LAND_TEXT	96 (Dark Green)	RS	1.0
Lighting Electrical	AC_LAND_TEXT	96 (Dark Green)	RS	1.0
Paving Details	AC_LAND_TEXT	96 (Dark Green)	RS	1.0

3. All distinct landscaping features within the development are to be represented by a closed polyline and on their respective layers. These features shall include but not limited to:
- Garden Beds – AC_LAND_VEGETATION, including areas of vegetation with medians and roundabouts.
 - Areas of pavers / concrete that are not part of a pathway – AC_LAND_PAVING and attribute details recorded in the attribute block Structure.
 - Soft fall areas – AC_LAND_SOFTFALL and the description of both the border edge and soft fall material in the attribute block Park_Misc.
4. All individual features within the development are to be represented by their respective blocks. These shall include but not limited to:
- Individual Trees.
 - Rubbish bins.
 - Water bubblers.
 - Play Ground Equipment.
 - Park Embellishments.
5. The outer edge of all constructed structures are to be located and represented by a closed polyline. In association with the polyline the relevant block will be used to record the attribute details for that structure and placed at the centre of the structure. These structures shall include but not limited to:
- Buildings / Shelters – Attribute block, Structure.
 - Pedestrian Bridge – Attribute block, Bridge, refer road section.
 - Playing Court, such as basketball or tennis – Attribute block, Park_Misc.

6. Parks / Landscaping Block Details

Block	Name	Description	Layer	Colour
	TREE	Single Tree	AC_LAND_VEGETATION	92
	WATER_FNTN	Water Drinking Fountain	AC_LAND_STRUCTURE	4 (Cyan)
	RUBBISH	Rubbish Bin	AC_LAND_STRUCTURE	4 (Cyan)
	PLAY_EQUIP	Play Equipment	AC_LAND_STRUCTURE	4 (Cyan)
	PARK_MISC	Landscape Embellishments	AC_LAND_STRUCTURE	4 (Cyan)
	STRUCTURE	Building / Shelter	AC_LAND_STRUCTURE	4 (Cyan)

18. UTILITIES

Any utility laid outside of the service trench, i.e. gas or electricity that connects to a Council asset in a park or reserve (other than road reserve), must be located and recorded on layer AC_LAND_UTILITY with reference to linestyles, text and symbols as per AS1100.401 – 1984 “Engineering survey and engineering survey design drawing”

19. ATTRIBUTE INFORMATION REQUIREMENTS (“AS CONSTRUCTED”)

1) WATER

Attribute Information is to be supplied for all new water reticulation assets which ultimately become the property and responsibility of Council. Attribute information is recorded in the water layer format and the various blocks as listed in the “As Constructed” Drawing Requirements water section.

a. Mains

Compulsory attributes:

- i. Pipe diameter
- ii. Pipe material.
- iii. Pipe Class

Desirable Attributes:

- iv. Pipe lining material (If applicable)
- v. Pipe protection (if applicable)
- vi. JTYPE – Joint type
- vii. Year of Installation.

b. Valves and Hydrants

A valve entity is classified as any sort of flow controlling or limiting device that is attached to a water reticulation or service line. Entities will include but not limited to air valves, sluice valves, scour valves, reducers, end caps and hydrants.

Compulsory Attributes:

- i. Size – Internal Diameter of pipeline valve/ hydrant is connected too. Reducer size shown as 250/150.
- ii. Open/Closed – Whether valve is open or closed

Desirable Attributes:

- iii. Type – Type of flow control entity i.e. stop valve, scour valve, air valve
- iv. Pressure Setting - Pressure Setting in kiloPascal's
- v. Valve off Direction – Direction to turn off valve i.e. Left/Right
- vi. Service – Whether the valve is on a potable or non-potable supply
- vii. Installation Date – Year in which the water asset was constructed or installed i.e. 2007

c. Reservoir

Compulsory Attributes:

- i. Level of floor in metres, A.H.D.
- ii. Capacity – Maximum storage capacity in mega litres

Desirable Attributes:

- iii. Real Property description
- iv. FSL – Finished surface level of the reservoir pad in metres A.H.D
- v. BWL – Bottom water level in metres A.H.D
- vi. TWL – Top water level in metres A.H.D
- vii. Diameter - Internal
- viii. Installation Date – Year in which the water asset was constructed or installed i.e. 2007

d. Water Meter

Compulsory Attributes:

- i. Type – Whether meter is District or Service.
- ii. Meter Number – Unique number assigned to meters by Council.
- iii. Size – Internal Diameter of pipeline meter is connected too.

Desirable Attributes:

- iv. Bore Size – Internal diameter of meter bore size.
- v. Installation Date - Year in which the water asset was constructed or installed i.e. 2007.

e. Pump Station

Compulsory Attributes:

- i. Council Identification Number
- ii. RTU number (if applicable)

Desirable Attributes:

- iii. Inlet – pipe inlet diameter.
- iv. Outlet – pipe outlet diameter.
- v. Head – System head pressure.
- vi. Flow – Design flow rate.
- vii. Installation Date - Year in which the water asset was constructed or installed i.e. 2007
- viii. Slab Level in metres, A.H.D
- ix. Real Property description
- x. Reference Dwg – Drawing number for design of constructed water asset

2) SEWER

Attribute Information is to be supplied for all new waste water assets which ultimately become the property and responsibility of Council. Attribute information is recorded in the sewer layer format and the various blocks as listed in the “As Constructed” Drawing Requirements sewer section.

a. Valves

A valve entity, is classified as any sort of flow controlling or limiting device that is attached to a sewer pressure (rising) or vacuum line. Entities will include but not limited to air valves, reflux valves, scour valves and reducers.

Compulsory Attributes:

- i. Size – Internal Diameter of pipeline valve is connected too. Reducer size shown as 250/150.
- ii. Open/Closed – Whether valve is open or closed under normal operating conditions.

Desirable Attributes:

- iii. Control – Manual or Automatic
- iv. Material – Valve Material
- v. Seat – Valve seat material
- vi. Pressure Setting - Pressure Setting in Pascal's
- vii. Valve off Direction – Direction to turn off valve i.e. Left/Right
- viii. Installation Date – Year in which the sewer asset was constructed or installed i.e. 2007

b. Manholes / Maintenance Shafts

Compulsory Attributes:

- i. Name - Identity label of manhole / Maintenance Shaft as per Appendix P
- ii. LidRL - Surface level of Lid, in metres A.H.D.
- iii. Depth - Depth to invert of Manhole / Inspection Shaft.
- iv. Type – Preformed or Cast In Situ
- v. Material – Manhole / maintenance shaft material PB or PE
- vi. Class – Classification rating.
- vii. Lid_Material - Material of lid.
- viii. Diameter – Inside diameter of manhole

Desirable Attributes:

- ix. Seal – Seal Type.
- x. Lining – Manhole lining.
- xi. Installation Date - Year in which the sewer asset was constructed or installed i.e. 2007.

c. Endcaps

Compulsory Attributes:

- i. Name - Identity label of endcap as per Appendix P.
- ii. IL - Invert level.

Desirable Attributes:

- iii. FSL – Finished Surface level above location of Endcap.
- iv. Installation Date - Year in which the sewer asset was constructed or installed i.e. 2007.

d. Sewer Pipes

- Gravity Sewer

Compulsory Attributes:

- i. Size – Pipe inside diameter.
- ii. Material – Pipe material.
- iii. Pipe Length – Plan length from end to end. Chamber dimensions are not to be included.. The length is recorded in metres.
- iv. USIL – Upstream invert level of pipe.
- v. DSIL – Downstream invert level of pipe.
- vi. Class – Pipe Class

Compulsory attributes if different to FNQROC standards:

- vii. Lining – Pipe lining material
- viii. Lining - Lining installation date

Desirable Attributes:

- ix. JTYPE – Joint type
- x. Location – Above or below ground, default below
- xi. Grade – Grade of pipe between manholes/ inspection shaft or endcap.

- Pressure (Rising) Sewer Mains

Compulsory attributes:

- xii. Pipe diameter
- xiii. Pipe material.
- xiv. Length – Plan length of pipe measured between pump stations, pits, bends, connection or discharge point.
- xv. Pipe material class

Compulsory attributes if different from FNQROC Standards:

- xvi. Year of Installation.

Desirable attributes:

- xvii. Pipe Protection
- xviii. Pipe lining material
- xix. JTYPE – Joint type
- xx. Location – Above or below ground, default below
- xxi. Depth of pipe – if not standard.

e. Storage / Overflow

Compulsory Attributes:

- i. Top of Well A.H.D
- ii. Depth - Depth to invert of Manhole / Inspection Shaft.

Required attributes if different from FNQROC Standards:

- iii. Invert level in metres of outlet pipe, A.H.D
- iv. Invert level in metres of inlet pipe, A.H.D
- v. Floor Slab Level and top of tank in metres, A.H.D
- vi. Well diameter
- vii. Overflow invert level

Desirable Attributes:

- viii. Identify asset i.e. Storage or overflow
- ix. Lid_Material - Material of lid.

- x. Capacity of well
- xi. Installation Date - Year in which the sewer asset was constructed or installed i.e. 2007.
- xii. Protection coating system used
- xiii. Real Property description

f. Pump and Lift Stations

Compulsory Attributes:

- i. Council Identification number.
- ii. Pump or Lift station.
- iii. Lid RL – Lid level in metres, A.H.D.
- iv. Depth – Difference between lid RL and Well Invert
- v. Well Invert – Invert level of well in metres, A.H.D.
- vi. Inlet invert – Invert level of inlet pipe in metres, A.H.D.
- vii. Overflow invert – Invert level of outlet pipe in metres, A.H.D.
- viii. Alarm RL – High level alarm in metres, A.H.D.
- ix. Invert Level of Rising Main in metres, A.H.D.
- x. Standby Start Level in metres, A.H.D.
- xi. Duty Start Level in metres, A.H.D.
- xii. Pump Stop Level in metres, A.H.D.
- xiii. Riser Pipe Diameter
- xiv. Inlet Level in metres, A.H.D

Desirable Attributes:

- xv. The protection coating system used
- xvi. Real Property description
- xvii. Wet Well Diameter
- xviii. Inlet Diameter – Pipe inlet diameter.
- xix. Outlet Diameter – Pipe outlet diameter.
- xx. Diameter – Well Diameter or dimensions.
- xxi. Wet/Dry – Whether well is wet or dry.
- xxii. Capacity – Emergency Storage Capacity of well in hours.
- xxiii. Volume – Operational volume.
- xxiv. Pumps – Number of pumps.
- xxv. Flow – Design flow rate.
- xxvi. Start Frequency – Design starts per hour.
- xxvii. Installation Date - Year in which the sewer asset was constructed or installed i.e. 2007.
- xxviii. Reference Dwg – Drawing number for design of constructed sewer asset.
- xxix. Slab Level in metres, A.H.D.

- xxx. Underside of plug in metres, A.H.D
- xxxi. Pump Suction Level in metres, A.H.D.
- xxxii. Valve Pit Floor Level, Lid level and outside FSL in metres, A.H.D.
- xxxiii. The Level at Which the contributing sewerage system or sewer pumping station will overflow in metres. A.H.D.
- xxxiv. Rising Main Diameter
- xxxv. Incoming Sewer Diameter
- xxxvi. Capacity of wet well
- xxxvii. Maximum Operational Volume
- xxxviii. Cross-reference detail drawings and standard drawings
- xxxix. The protection coating system used
- xl. Real Property description

g. Valve Pit

Compulsory Attributes:

- i. Installation Date - Year in which the sewer asset was constructed or installed i.e. 2007.
- ii. Reference Dwg – Drawing number for design of constructed sewer asset

h. Property Connection Branch

Compulsory Attributes:

- i. Chainage – Distance from downstream manhole/inspection shaft
- ii. Type – Type as per standard drawing S3005
- iii. IL – Invert level of connection to sewer pipe, in metres A.H.D.

3) STORMWATER

Attribute Information is to be supplied for all new waste water assets which ultimately become the property and responsibility of Council. Attribute information is recorded in the drainage layer format and the various blocks as listed in the “As Constructed” Drawing Requirements stormwater drainage section.

a. Catch Drains

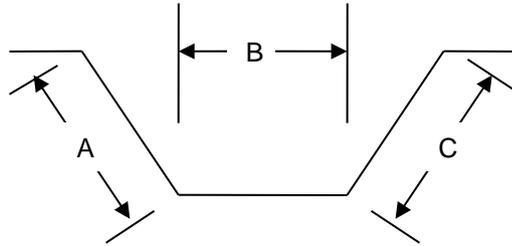
Compulsory Attributes:

- i. Material – Construction Material.
- ii. Length – Slope length of drain
- iii. USIL – Upstream invert level.
- iv. DSIL – Downstream invert level.

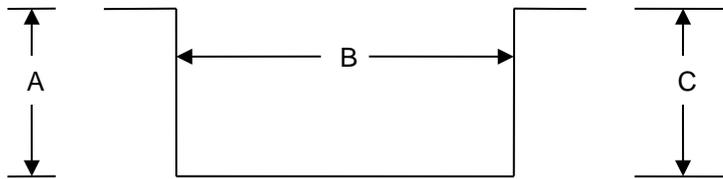
Desirable Attributes:

- v. Type – Type of Catch Drain i.e. lined, unlined and lined invert.
- vi. Shape – Shape of channel, Trapezoidal, Rectangular, V-Channel or Spoon
- vii. DIMA – Dimension A, average length of lined material, refer below.
- viii. DIMB – Dimension B, length of lined material, refer below.
- ix. DIMC – Dimension C, average length of lined material, refer below.
- x. Depth – Depth from channel invert to top of lowest embankment.
- xi. Thickness – Average thickness of channel lining.

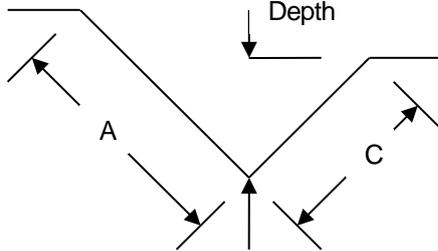
Trapezoidal



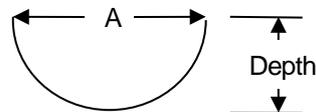
Rectangular



V-Channel



Spoon



Note: Where changes in cross sections occur, the relevant attributes should be noted on 'As Constructed' drawings

b. Stormwater Quality Improvement Device

Compulsory Attributes:

- i. Type – Type of SQID.
- ii. Manufacturer – Name of Manufacturer of the device.
- iii. LidRL – Surface level on the centre of the cover lid.
- iv. SumpIL – Invert level at the lowest point in the device.

Desirable Attributes:

- v. LidMaterial – Material from which the cover is constructed.
- vi. StorageRL- Level at which maximum storage capacity is reached.
- vii. Volume – Volume of material in cubic metres that the device is capable of holding.
- viii. DimensionA – Overall internal maximum width in millimetres.
- ix. DimensionB – Overall internal maximum breadth in millimetres, zero value if circular.
- x. InstallationDate - Year in which the drainage asset was constructed or installed i.e. 2007.

c. Detention / Retention and Bio-Retention Basins**Compulsory Attributes:**

- i. Type – Type of Basin, Dry, Wet, Bio.
- ii. Capacity - Storage capacity in storage basin.
- iii. Weir – Surface level of weir in metres, A.H.D.
- iv. Length – Length of weir at recorded weir height.
- v. Material – weir Material, soil, rock etc.
- vi. Area – Area of filter material.
- vii. Filter – Type of filter material.
- viii. Filter_depth – Depth of media material.
- ix. Wall – Wall material type.
- x. Wall_volume – Volume in cubic metres of wall material.
- xi. UGStorage – Underground Storage or Drainage, Yes/No
- xii. InstallationDate - Year in which the drainage asset was constructed or installed i.e. 2007.
- xiii. Reference Dwg – Drawing number for design of constructed drainage asset.

d. Head and Wing walls**Compulsory Attributes:**

- i. Apron – Yes/No, default no.
- ii. Wingwalls – Yes /No, default no.
- iii. Debris Trap – Yes/No, default no.
- iv. Floodgate – Yes/No, default no.

Desirable Attributes:

- v. Type – Precast, Cast In Situ, Stone Pitched.
- vi. Width – Length of headwall.
- vii. Height – Height of headwall.
- viii. InstallationDate - Year in which the drainage asset was constructed or installed i.e. 2007.

e. Kerb / Field Inlet Pits and Manhole / Access Chambers

Compulsory Attributes:

- i. LidRL - Surface level on the centre of the cover lid, grate or centre of kerb inlet.
- ii. IL – Invert level at the lowest point in the pit/ manhole or chamber.

Desirable Attributes:

- iii. Type – Type of Inlet
- iv. Dimension 1 – The overall internal width or diameter of pit.
- v. Dimension 2 – The overall height of a rectangular pit.
- vi. Cover Material – Cover Type.
- vii. Chamber Material – Construction material of the chamber.
- viii. Lintel No's – Number of lintels.
- ix. Grate No's – Number of grates.
- x. InstallationDate - Year in which the drainage asset was constructed or installed i.e. 2007.

f. Pipe / Culvert

Compulsory Attributes:

- i. Type – Pipe, Culvert or Slab Link Culvert.
- ii. Number – Number of pipes/culverts
- iii. Dimension 1 – The overall internal width for culverts or diameter of pipes.
- iv. Dimension 2 – The overall height of a culvert.
- v. Length – Slope length from end to end. Chamber dimensions are not to be included and pipe length shall be actual length, not plan length. The length is recorded in metres.
- vi. Material – Construction Material.
- vii. Class – Classification of pipe/culvert type.
- viii. USIL – Upstream invert level of pipe/culvert.
- ix. DSIL – Downstream invert level of pipe/culvert.

g. Pump Station

Compulsory Attributes:

- i. LidRL - Surface level on the centre of the cover lid.
- ii. SumpIL – lowest point in the well.
- iii. Reference Dwg – Drawing number for design of constructed drainage asset.

Desirable Attributes:

- iv.

- v. Material – Pump chamber material, concrete, masonry block etc.
- vi. Dimension 1 – The overall internal width for well.
- vii. Dimension 2 – The overall height of well.
- viii. Capacity – Capacity of well.
- ix. Volume – Operational volume.
- x. Installation Date - Year in which the drainage asset was constructed or installed i.e. 2007.

h. Tidal Flap

Compulsory Attributes:

- i. Type – Type of Tidal Flap
- ii. Manufacturer – Manufacturer of the tidal flap.
- iii. Material – Construction Material.
- iv. Size – Dimension of tidal flap.

Desirable Attributes:

- v. Installation Date - Year in which the drainage asset was constructed or installed i.e. 2007.

4) ROAD

Attribute Information is to be supplied for all new road assets which ultimately become the property and responsibility of Council. Attribute information is recorded in the road layer as text or in the various blocks as listed in the “As Constructed” Drawing Requirements road section.

An “As Constructed” drawing is not acceptable if it does not include at minimum the compulsory attributes listed below.

a. Pavement / Surfacing

Compulsory attributes:

- i. Each pavement Layers – Type of pavement material used, as per Main Roads Standard Specification.
- ii. Each pavement Layers_Depth – Depth of pavement material.
- iii. CBR – Sub-grade CBR test results, based on a 4-day soaked CBR test of the in situ sub-grade material upon which the pavement design was based.

Compulsory pavement attributes required if they vary from FNQROC Standard Construction requirements:

- iv. Surface – Type of wearing course material, Asphaltic Concrete, 2 Coat Bitumen, 80mm Pavers or Concrete.
- v. Surface_Depth – Depth of sealed road surface where applicable.
- vi. Reinforcement – Type of reinforcement used in concrete surfacing.

b. Pathways

Compulsory pathway attributes required only if they vary from FNQROC Standard Construction Requirements:

- i.
- ii. Type – Material type, concrete, paved, Asphaltic Concrete
- iii. Depth – Depth of material.

c. Signs

Compulsory Attributes:

- i. MUTCD Code – Numbering system for sign specified by the Queensland Department of Main Roads in the Manual of Uniform Traffic Control Devices (MUTCD).
- ii. Name – Common name for the sign, i.e. street, give way stop etc.
- iii. Number – number of signs attached to the same supports.
- iv. Supports – Number of support posts the sign is attached to.

d. Roundabouts

Compulsory roundabout attributes required only if they vary from FNQROC Standard Construction Requirements:

- i. Type – Type of roundabout, concrete or vegetated.

5) PARKS / LANDSCAPING / STRUCTURES

a. Playground Equipment

Compulsory Attributes:

- i. Type – Type of playground equipment, i.e. Swing, climbing frame, adventure playground etc.
- ii. Make – Manufacturer of the play equipment.
- iii. Model – Manufacturers model number for the play equipment
- iv. Installation Date - Year in which the play equipment was constructed or installed i.e. 2007.

b. Landscape Embellishments

Compulsory Attributes:

- i. Type – Descriptive comment on feature type.
- ii. Material – Construction material, if applicable.
- iii. Dimensions – Dimension of feature, if applicable.
- iv. Installation Date - Year in which the asset was constructed or installed i.e. 2007.

c. Buildings / Structures

Compulsory Attributes:

- i. Type – Type of building / structure
- ii. Roof – Roof material
- iii. Wall – Wall material
- iv. Floor – Floor material.
- v. Dim_A – Width of building in metres.
- vi. Dim_B – Depth of building in metres.
- vii. Height – Height to roof line in metres.

d. Tree

Compulsory Attributes:

- i. Type – Species name.
- ii. Name – Common Name.
- iii. Size – Trunk size.