PART 2 : PHYSICAL WORKS MANAGEMENT

2.1 DEVELOPER'S RESPONSIBILITY

The Developer shall ultimately be responsible for all requirements and processes.

The Developer shall appoint a suitably qualified representative for:

- Interpreting the requirements of the Resource Consent
- Submitting engineering plans and liaising with Council staff throughout the engineering plan clearance procedure
- Overseeing the physical works and certifying that the work has been completed to the required standards.

The Developer shall ensure competent professional expertise is engaged for the following work:

- Geotechnical investigation and reporting
- Design of roadworks
- Design of complex traffic facilities
- Design and supervision of complex structures
- Design of water supply
- Design of stormwater disposal
- Design of wastewater disposal
- Design and installation of wastewater pumps
- Design of landscaping
- Supervising the construction of all works
- Quality assurance and compliance monitoring.

2.2 ENGINEERING PLANS & PHYSICAL WORKS

Where a Resource Consent Application requires engineering design plans to be submitted for audit, it is the responsibility of the Developer to ensure this requirement is satisfied.

2.2.1 Drawing Standards

2.2.1.1 Size

Drawings shall be either A1, A2 or A3 size, but must be scalable using the following scales:

• Plan & Longsection	-	Horizontal	1:1000, 1:500, 1:250
	-	Vertical	1:100, 1:50
• Cross Sections	-	Horizontal	1:100
	-	Vertical	1:50

In all cases the plan size must be appropriate for the level of detail shown.

In particular, use of 1:1000 scale is to be confined to site plans, and roading and water layout plans.

2.2.1.2 Number of Sets of Drawings

Three sets of engineering plans shall be submitted to the Planning Guidance Manager to be audited by various units of Council.

2.2.1.3 Content Of Drawings

a) Locality Plan

Showing information sufficient to locate the subject site relative to existing features such as roads, already developed land, etc. All levels shall be in terms of Moturiki Datum.

b) Staging Plan

Where the development is likely to be constructed in stages, a plan showing the pattern and chronology of the land development shall be submitted. The staging should have been decided as part of the resource consent application process.

c) Earthworks and Silt Control

Plan view

- Original contours
- Final contours
- Overland drainage pattern
- Cuts and fills
- Provisions for control of silt transportation
- Inclusion of any other "required" consents, e.g. EW or Land Use Consent for earthworks.

d) Roading Plans

i) Plan View

- Horizontal alignment of kerb and channel including traffic facilities
- Horizontal alignment of footpaths
- Horizontal alignment of cycleway
- Location of vehicle crossings where known
- Location of catchpits, leads and manholes
- Location, type and colour of street light columns (may be separate plan)
- Location of landscaping areas and street trees
- Location of any reserve.

ii) Long Sections

- Existing ground levels at minimum of 15m intervals
- Proposed final centreline levels
- Cuts and fill
- Grades
- Vertical curve information
- Location of catchpits
- Location of intersecting roads.

iii) Cross Sections

- Proposed road
- Existing ground contour extending at least 3.0m into adjacent land.

iv) Road Marking and Signage

- Location and types of signage
- Location and alignment of all road markings.

Note : Road marking and signage plans are only required if the Developer intends to do this work. Council offers a road marking and signage installation service to developers on a cost plus administration basis.

v) Landscaping

- Areas and species to be planted
- List of species
- Details and location of any hard landscaping
- Details on planting specifications
- Maintenance schedule for weeding and replacement planting during Defects Liability Period.
- Landscape maintenance performance will be monitored in accordance with Checklist 7.1 (Volume 4). Note: non-compliance in respect of landscape maintenance during the defaults maintenance period (12 months for landscaping) will be rectified by Council with the cost to be paid by the applicant prior to the release of the landscape maintenance bond.

vi) Detail Drawings

Include drawings of all standard details to be used in the physical works, such as kerb and channel profile, cobblestone laying patterns, typical cross section showing footpath, berms, kerb and channel and pavement layers.

e) Stormwater

i) Plan View

- Horizontal alignment of all pipelines relative to property boundaries or kerb lines as appropriate
- Location of all manholes
- Location of all structures (including wetland/retention/sedimentation ponds)
- Location of any open drain
- Position of all property connections and the depth at the property boundary
- Secondary flow paths
- Site plan showing property boundaries, final contours (maximum 1 metre interval), catchment and sub-catchment boundaries used in stormwater flow calculations together with label annotations providing a link to the stormwater runoff calculations. (Preferably show the stormwater drainage system on this drawing as well.)
- Construction plan details for stormwater control structures; plan view to include contours at 0.5 metre interval and elevation view to show normal, discharge and overflow water levels.

ii) Long Sections

- Existing ground levels
- Proposed ground levels
- Pipe depths inverts and grade
- Pipe type size and class
- Existing and proposed pipelines, cables and ducts crossing the alignment
- Invert levels of all pipelines connecting to a manhole.

f) Wastewater

i) Plan view

- Horizontal alignment of all pipelines relative to property boundaries or kerb lines as appropriate
- Location of all manholes
- Location of all structures (including pump stations)
- Position of all property connections
- Show finished land level contours (not greater than 1 metre intervals — include RL labels on contours).

ii) Long sections

- Existing ground levels
- Proposed ground levels
- Pipe depths inverts and grade
- Pipe type size and class
- Existing and proposed pipelines, cables and ducts crossing the alignment
- Invert levels of all pipelines connecting to a manhole.

iii) Pump Station (including Rising Main and Overflow)

- Show all relevant details to enable the design to be audited and the structure constructed.
- Construction drawing of pump station structure
- Rising main plan and long section (see Wastewater i)
- Water and electrical services to the pump station
- Show the provision for pump station overflow in both plan and elevation views.

g) Water

Plan view

Horizontal alignment of all pipelines relative to face of kerb (or boundary as appropriate)

- Location of all valves
- Location of all hydrants and building sites to be provided with fire protection
- Pipe type size and class
- Position of all property connections and the depth at the property boundary
- Location of all flushing valves
- Pipe depths where it is planned for the pipeline to be at a different depth to that specified in the HCC Development Manual. Long sections are required for pipelines

of 250 NB and larger. The long section shall show existing and proposed pipelines, cables and ducts crossing the alignment.

2.2.2 Supporting Documentation

a) Geotechnical Information

Where required by Council, a report from a professional advisor experienced in geotechnical matters and having a policy of Professional Indemnity Insurance acceptable to Council detailing the ground conditions and an opinion on the suitability of the land for the purpose proposed shall be obtained.

b) Roading

Road pavement design calculations including results of preliminary soil testing.

c) Stormwater Drainage

Detailed catchment runoff calculations showing for each sub-catchment the formula input factors used in the calculations. Detailed pipeline flow capacity analysis. For stormwater control devices, detailed analysis demonstrating the design performance in respect of stormwater quantity and quality as appropriate.

d) Wastewater

Wastewater flow estimates supported by the estimates of population equivalents for each catchment together with catchment boundaries and catchment areas. Pipe flow calculations showing pipe capacity and flow velocity for average dry weather flow, peak daily flow and peak wet weather flow. Pump station calculations justifying the selection of wet well size, pump selection and rising main hydraulics.

Video Inspection and Report

A video inspection and report is required where a private drain is to become part of the public network and, in the opinion of the General Manager, Works and Services, the condition of the line is doubtful.

e) Water

Fire flow calculations.

f) Structural Information

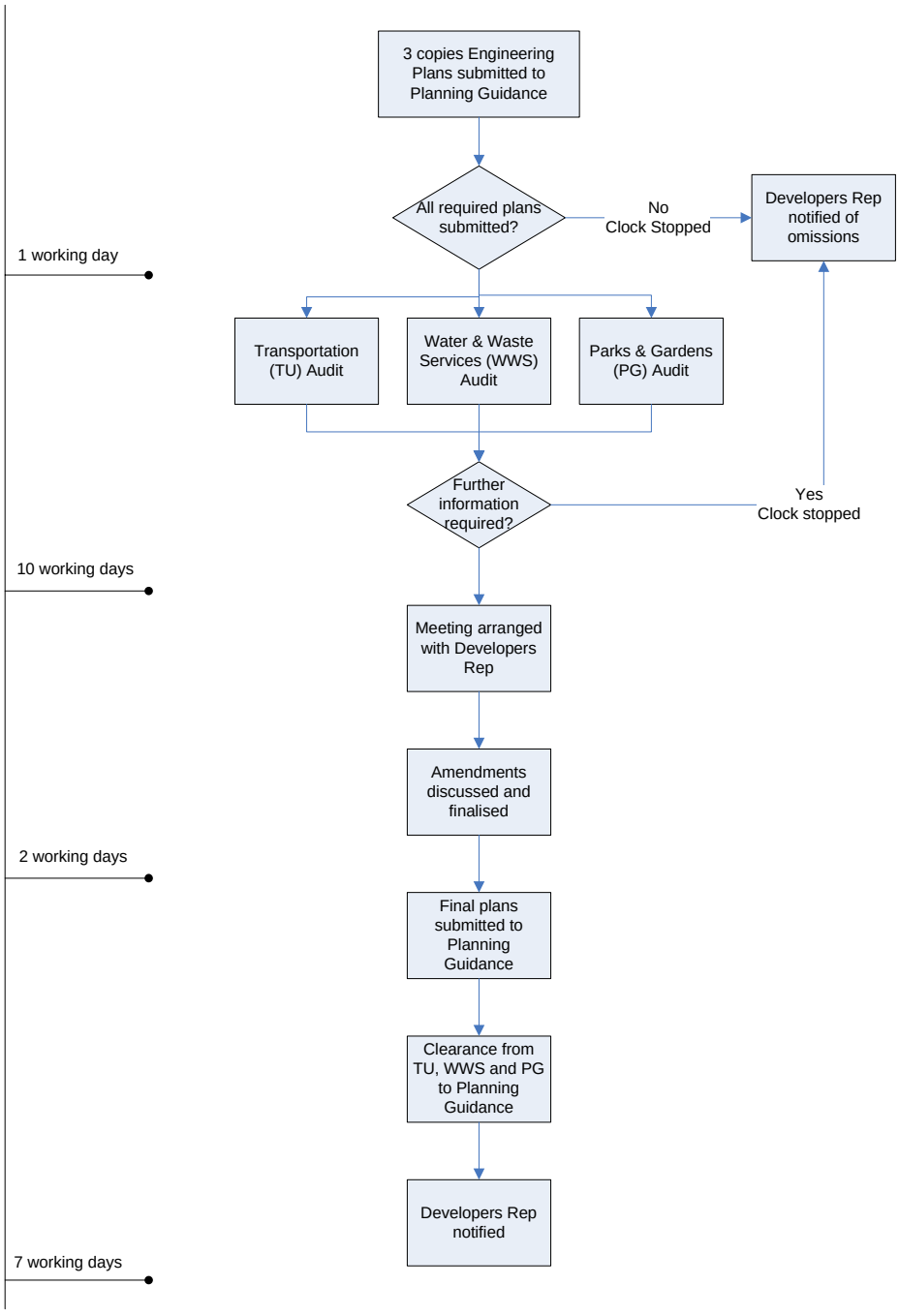
Calculations and manufacturer's specifications as and where required.

2.3 ENGINEERING WORKS

2.3.1 Engineering Plan Acceptance

Submitted engineering plans are audited against the requirements of the resource consent engineering conditions, and the standards set in the Development Manual. The process for engineering plan acceptance is set out in the flow chart following this page.

Engineering Plan Acceptance Process



NOTE : The times specified above are Hamilton City Council targets for provision of the service. They do not include any time expended whilst further information requests are being considered by other parties.

2.3.2 Final Accepted Plans

After the notification, the Developer or their Representative shall submit a further four complete sets of accepted plans for stamping and signing on behalf of Council. These copies will be returned to the Developer's Representative after signing. One complete copy of the stamped and signed plans shall be available on site at all times.

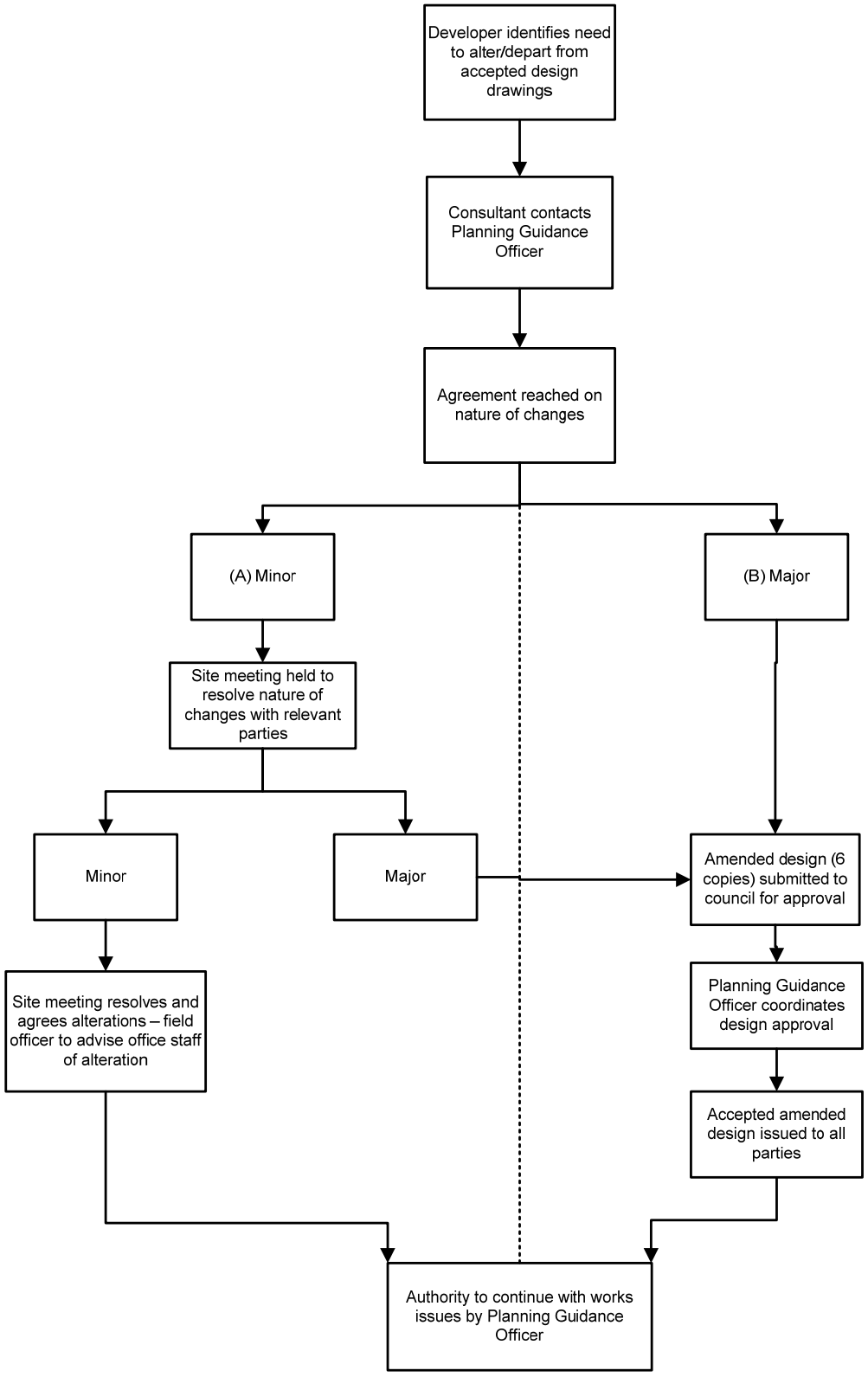
2.3.3 Changes to Accepted Plans

The accepted plans may only be amended after satisfactory consultation with the Unit or Units in Council directly involved with the proposed changes.

In all cases the changes must be documented and the amendments shown on the accepted plans.

The process for dealing with changes to accepted plans is shown in the following flowchart.

PROCEDURES TO AMEND ACCEPTED ENGINEERING DRAWINGS



2.3.4 Commencement of Work

No engineering works shall commence on any subdivision or development until all approvals and acceptances (engineering resource consent and others) have been obtained and a pre-construction meeting has been held with Council. Where construction proceeds in stages, a separate pre-construction meeting shall be held for each stage.

Confirmation of these approvals and notification of intention to commence shall be supplied on the form provided (Volume 4, Part 9 Appendix 1). The Developer shall be responsible for arranging the pre-construction meeting.

2.3.5 Auditing of Engineering Works

Auditing is covered in the Quality Systems Manual (Volume 4). Council reserves the right to enter the work site at any time for auditing, inspecting or checking purposes.

2.3.6 Quality of Work

The Developer is responsible for ensuring that the engineering works constructed by contractors are carried out according to the accepted plans and best work practices.

The Developer shall be responsible for satisfactory completion of the Quality System Checklists (Volume 4). A copy of the checklists will be issued with the final accepted plans. Where the Quality checklists require the presence of a Council representative, then the Developer shall make such arrangements as required. At least 24 hours notice should be given.

Copies of completed checklists shall be forwarded to Council as the works progress.

2.3.7 CCTV Inspections

CCTV Post Construction Inspections
Councils Subdivisional Auditor will on completion of the installation of the wastewater and stormwater drains, identify the greater of 200m of 5% to be inspected by CCTV. The developer will arrange for these inspections to be carried out and on completion will provide a DVD and defects of the completed works to Councils Subdivisional Auditor. Where faults are found the Council Auditor may instruct the developer to film additional lengths to ensure there are no further problems. All defects are to be fixed to the satisfaction of Council at the developers cost. Filming of the works is to be undertaken once the road surface is to finished level and prior to any road surfacing.

2.3.8 "Stopwork" Notices

Any person or persons carrying out `on site' works as part of any Council approved development project shall cease such work, or part thereof, immediately upon receipt of a written stopwork notice specifying restrictions and issued by a Council Officer, or authorised agent.

The developer shall have the right to appeal to the General Manager to override or amend such stopwork notice. A copy of the General Manager's written decision shall be recorded on Council's resource consent or project file. Work may recommence when the Council advises in writing.

2.3.9 Emergencies

If a situation is observed that is likely to endanger the safety and/or the security of the public, public or private property, or the operation of any public facility, the Developer will be instructed to undertake remedial action to alleviate the danger and secure the site. Any such work or supply of materials will be at the Developer's expense.

2.3.8 Public Protection

The Developer shall take all reasonable measures to protect the public from the adverse effects of the work. Particular attention should be paid to the erection and maintenance of temporary fencing, especially in areas of potential ponding. Signs shall be erected warning of danger within the site area. These protection measures should be shown in the approved Health and Safety Plan.

2.3.9 On-Site Testing

Any work that requires testing in the presence of a Council officer shall be pre-tested and proved satisfactory by the developer's representative prior to the witnessed testing.

If the work does not meet the standard, then a fee will be charged for the second and any subsequent visit to remeasure or retest the work.

Specific testing regimes are set out in the Volume 4. Subsequent work dependent on a satisfactory test result shall not be undertaken until compliance has been demonstrated.

2.3.10 Standard Audits

The following are milestones that the Developer or Developer's Representative must notify to Council to enable any audit to be carried out if required:

- Commencement of work
- Prepared earthworks and subsoil drainage prior to filling
- Completed earthworks and prepared subgrade
- Commencement of stormwater reticulation
- Commencement of wastewater reticulation
- Commencement of water reticulation
- Finished basecourse
- Prior to commencement of carriageway surfacing.

Audits will be carried out within one working day of notification if possible. Work shall not proceed until the audit has been satisfactorily completed. When work has been interrupted or delayed, the General Manager Works and Services shall be notified before it is recommenced.

2.3.11 Preservation Of Natural Features

As a condition of granting the Subdivision Consent, Council may require the Developer to make provision for the preservation of natural landscape, trees, areas of trees or bush, buildings or sites of historic or archaeological or other significance, and wildlife habitats. It

should be noted that where preparatory work is agreed to on the subdivision prior to the Subdivision Consent being granted, such approval cannot be taken to authorise the destruction of any of the features referred to in this section.

Every effort shall be made by the Developer to ensure that the subdivision is in harmony with and complements the existing and surrounding landscape, including the blending of land forms and the preservation where appropriate of existing natural vegetation and other features.

2.3.12 Connection To Existing Services

Connection of new stormwater, wastewater and water supply reticulation to existing systems shall be undertaken by Council at the Developer's cost. In some circumstances, but subject to specific approval of Council and with supervision by Council, the Developer may undertake the connection directly.

The Developer shall apply to Council for specific approval at least ten working days before the connection is to be made. The new services must be tested and shown to meet all requirements prior to the connection being made.

2.4 WORKS COMPLETION AND CLEARANCE (as part of 224(c) Certification)

2.4.1 Works Clearance

The Developer shall apply for the 224(c) Certificate only when satisfied the work is finished to the required standard. This includes the submission of the complete and accurate as-built details. Refer also sections 1.4.8 to 1.4.12 of this Volume.

2.4.2 Quality Systems Manual (Volume 4)

The Quality Checklists included in Volume 4 must be completed and submitted at the time of construction. Works clearance will not be considered until all certifications and quality assurance exercises are complete and as-built plans are received.

The Developer shall also submit completed producer statement forms, as set out in Volume 4, Part 9 Appendix 4.

2.4.3 As-Built Plans

2.4.3.1 General

Upon completion of construction, copies of "As-Built" plans showing details as constructed and certified as correct by the Developer, shall be submitted to Council. Separate plans are required for roading, earthworks (finished contours), wastewater, stormwater and water supply. Detailed as-built requirements are listed in the relevant Technical Specifications.

2.4.3.2 As Built Plan Format

The standard symbols to be used on all drawings are shown on the following page. Note: line colour is to be in black only.

2.4.4 Areas of Filling

The areas of filling shall be shown by contours showing the depth of fill in the form of lines joining all points of equal fill depth, or by contours showing original ground levels and finished ground levels.

2.4.5 Landscape Works

Where construction or land development works involve landscaping to be owned/managed by the Council, an as-built plan of landscaping works shall be provided to HCC showing the following details:

- Location and extent, types of materials
- Name and location (measured position in the berm) of street trees
- Names, grades, number, planting density of traffic island planting

2.4.6 Other Utility Services

In applying for works completion, the Developer shall submit the appropriate checklists from all other utility network operators confirming that they have received the required as-built information.

STANDARD SYMBOLS