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## 2. PROCESS AND INFORMATION REQUIREMENTS

### 2.1 INTRODUCTION

- a) This section sets out the information that Council requires in order to authorise construction of and vest new infrastructure assets within the Nelson City Council. This information typically comprises:
- Design drawings and details;
  - Supporting calculations;
  - Producer statements and certificates;
  - Specifications, and
  - As-built information.
- b) Prior to approval to commence work, Council requires the submission of fully detailed Engineering Drawings covering the design of all new roads, rights-of-way, access lots and service utilities. These drawings and associated information will be reviewed against these standards by Council.
- c) Appendix A sets out the scope of these Engineering Standards in the context of an urban development and consenting process.

### 2.2 REQUIREMENTS OF THE DESIGNER

- a) Council requires all design, construction and construction supervision of infrastructural assets and subdivisional works to be performed by suitably qualified and experienced individuals. Council standards, as set out in this document, are intended to reflect the minimum standard required by Council, and should not be seen as a replacement for professional engineering design.
- b) The responsibility for site-specific design relies solely on the Designer of the work and this may include investigation of unusual site conditions and exceptional circumstances. In particular the Designer shall consider all risks to lifeline systems (significant infrastructure) in the event of a major earthquake, flood, tsunami, slope failure and climate change.
- c) At the Engineering Drawing approval stage the Designer is required to complete and submit a Designer's Certificate and Check Sheet with the Engineering Drawings (see Appendix B and Appendix C of this section) together with the Designer's details on the plan title block.
- d) At the Engineering Drawing as-built stage the DPA is required to certify that the work has been completed in accordance with sound engineering practice and as shown in the as-built information supplied.

## 2.3 REVIEW AND APPROVAL PROCESS

### 2.3.1 Preliminary Discussion and Design

- a) Council encourages Designers and the Developer's Professional Advisor (DPA) to meet with Council in the early stages of design to discuss any proposed works and how these will meet Council's standards and integrate with existing services and infrastructure.
- b) Council has set up a Major Projects Team which is a group of inter departmental Council staff who provide pre application advice to applicants on proposed major development projects. This is a free service. Further information on the Major Projects Team can be obtained from the Nelson City Council website at [www.nelsoncitycouncil.co.nz](http://www.nelsoncitycouncil.co.nz).
- c) Normally, detailed engineering drawings will not be required at the resource consent application stage. In the case of larger subdivision development where Council's future infrastructure, low impact stormwater, and/or streets with a reduced speed design is involved, Council may require preliminary Engineering Drawings prior to the approval of subdivision consent

### 2.3.2 Review and Approval of Engineering Design Drawings and Supporting Information

- a) Engineering Drawings and supporting information must be submitted to and approved by Council prior to the commencement of physical works, and prior to the pre-construction meeting. The requirements of the Engineering Drawings and supporting information are described in section 2.4.
- b) Council will review the Engineering Drawings and supporting information and advise the applicant in writing of either:
  - 1) approval of the Engineering Drawings, and supporting information; or
  - 2) a request to modify the design and/or provide further information.
- c) Approval of the Engineering Drawings and supporting information will consist of a single copy of each of the Drawings, endorsed with the signature of the Engineering Manager or his/her approved representative.

### 2.3.3 Construction by Stages

- a) Where the landowner proposes to proceed with construction of a subdivision in more than one stage, the Engineering Drawings shall cover the whole scheme in the first instance.
- b) In the case of major staged subdivisions where Council's infrastructure is involved, Council, at its sole discretion, may relax this requirement to the extent that preliminary service layout drawings for the total project may be submitted for initial approval.

- c) Fully detailed drawings required for each particular stage shall subsequently be submitted for final approval.
- d) Engineering Drawings for each stage shall comply with the Land Development Manual at the time of the subdivision consent approval; however should an extension of time for the consent be granted, compliance with the current Land Development Manual at the time of extension may be required.

#### **2.3.4 Neighbours' Consent**

- a) Where any construction work is required on another property, the owners' consent shall be endorsed on the original drawing in opaque black ink that will permit satisfactory reproduction. Note that biro may not reproduce satisfactorily.

#### **2.3.5 Notification of Contracts and Phases of Work**

- a) At least five (5) days prior to the commencement of work the consent holder or their agent shall advise the Engineering Manager in writing of the following information:
  - the name(s), addresses and contact telephone numbers of contractor(s) to whom it is proposed to award the work;
  - the nature of the work to be awarded in each case; and
  - the date that work will commence.

#### **2.3.6 Pre-construction Meeting**

- a) The Developer shall arrange a formal pre-construction meeting (with a written agenda) at Council's offices with the DPA, contractor's site representative, the Engineering Manager or representative and the Manager Resource Consents or representative. This meeting shall occur prior to the commencement of any work and after approval of the Engineering Drawings and will include discussion of the programme of works, the inspections required by Council or their agents and any other relevant matters.
- b) Specifically, matters to be discussed at this meeting will include:
  - Type/size of work contemplated and methodology;
  - Soil types, ground, environmental and weather conditions;
  - Erosion and sediment control requirements;
  - Locality of site;
  - Consent conditions;
  - Hold points and inspections required by Council;
  - Traffic effects, corridor access requests and effects to neighbours;
  - Risk to adjacent services;
  - Health and Safety;

- Relevant experience/training of the Contractor(s);
- Relevant experience of the Designer(s) and the DPA and level of construction supervision.

c) The Designer/DPA shall bring to the pre-construction meeting:

- A construction programme;
- A set of A1 size Engineering Drawings (approved). A2 or A3 drawings may be permitted depending on clarity of the drawing;
- The construction specification;
- An outline of the proposed construction supervision approach;
- Any relevant information on how risks, environmental compliance and consent compliance are going to be managed; and

d) A letter outlining minutes of the meeting, agreed hold points, and the inspection regime will be prepared and distributed by the Council within 2 working days after the meeting.

e) There are four levels of monitoring carried out by Council. The appropriate level will be based on the list in Section 2.3.6 above and determined at the sole discretion of Council. Council reserves the right to review the level of monitoring at any stage of the construction activity.

Level 1	One visit per two weeks and at hold points
Level 2	One visit per week and at hold points
Level 3	Two visits per week and at hold points
Level 4	Random visits and at hold points

### **2.3.7 Commencement of Development Works**

a) Work shall not commence on the engineering construction of the subdivision or development unless:

- 1) The Council has granted an appropriate resource consent; and
- 2) There are no outstanding appeals or rights of appeal to the Environment Court; and
- 3) The Engineering Manager has approved the Engineering Drawings, specifications and calculations for the specific work that is required; and
- 4) The Engineering Manager has approved the Traffic Management Plan (TMP) (if required);
- 5) All other necessary consents or permits (e.g. corridor access request, building consent) have been obtained; and
- 6) The pre-construction meeting has been held.

- b) The Engineering Manager may grant staged approval to allow earthworks to commence prior to approval of other works at his/her sole discretion.
- c) The consent holder should be aware that in some cases, the Environment Court has ruled that works must not proceed without the Court's consent in cases where an appeal is lodged against consent conditions and has not been heard, or a right of appeal to the Court still exists, such as in the case of an objection lodged with the Council and still unheard.

### **2.3.8 Documentation to be Held**

- a) Throughout the construction period, the contractor's site representative shall have the following material on site at all times:
  - 1) signed copies of the approved Engineering Drawings and the initial letter from Council setting out hold points, the inspection regime and engineering administration matters;
  - 2) a verified Health and Safety Plan and the letter of verification;
  - 3) copies of the resource consent;
  - 4) copies of any Nelson City Council consents or permits necessary for the works;
  - 5) signed copies of all consents to enter land for construction for works on land not owned by the Developer; and
  - 6) plans and details of sedimentation and erosion control measures to be implemented.

### **2.3.9 Variations**

- a) No variations from the approved Engineering Drawings shall be made without the proposed amendments being first submitted to, and approved by, the Engineering Manager or his approved representative.
- b) The Designer shall identify and fully document the nature and position of the amendments.
- c) In the case of emergencies where immediate action is required to safeguard safety and health, property and infrastructure assets, such action shall be taken. At the earliest opportunity after the event, the Council shall be notified for approval.

### 2.3.10 Council Inspections and Construction Hold Points

a) The DPA shall notify the Engineering Manager, or representative at least five (5) working days (or as mutually agreed) before any of the following phases of the work are reached (and such other phases as have been determined) to enable inspection to be carried out by the Engineering Manager or representative:

- 1) Earthworks starting, (for checking of erosion and sediment control measures).
- 2) Street Works
  - i) Subgrade preparation and subsoil drains;
  - ii) basecourse prior to sealing;
  - iii) footpath and kerbside prior to sealing or concreting.
- 3) Stormwater and Wastewater
  - i) Inspection of laying first pipes of pipeline in sub-division while there is work in progress;
  - ii) inspections at a series of hold points determined by the Engineering Manager or representative to suit the particular situation and level of monitoring (refer Section 2.3.7).
- 4) Water Supply
  - i) Inspection of each line prior to backfill and trench reinstatement, including pressure testing;
  - ii) chlorination; and
  - iii) connection by Council required.
- 5) Final
  - i) After completion of all works including sweeping of roads and channels, clearing all drains, manholes and sumps, checking all valve and hydrant operations, planting riparian areas and appropriate inspections, eg CCTV, gauging or any other testing as required by Council as appropriate.

**Note:**

1. The certification by the DPA of the works at the various stages identified in section 2.3.10 should be done in accordance with section 2.3.11.
2. Council reserves the right to determine the inspection/monitoring regime on each project and the testing method of services/infrastructure which is appropriate.

### 2.3.11 Completion Certificate and Supply of As-built Drawings

a) On completion of the construction of a subdivision or development the DPA being a Chartered Professional Engineer or Registered Professional Surveyor, shall submit to Council a Completion Certificate that the work has been constructed in accordance with:

- this Land Development Manual;
- the approved Engineering Drawings and specifications;
- any approved amendments; and
- manufacturer's instructions.

b) The "certifier" may be required to provide sufficient evidence at the written request of Council to demonstrate to Council's satisfaction that they have experience and competence in the work they are certifying, that they have sufficient professional indemnity insurance and run-off cover, and they have sufficient documented observation and testing records to adequately certify the works.

c) The Work Completion Certificate shall be accompanied by as-built drawings, showing all works as actually constructed and drawn to the standards specified by Council.

d) The Certificate shall be in the form as shown in Appendix D and must be received by the Council before it decides whether to issue a certificate under Section 224(c) of the Resource Management Act.

### 2.3.12 Approval of Engineering As-Built Drawings

a) When the as-built Engineering Drawings are ready for approval and signing by the Engineering Manager, the DPA shall submit them along with electronic copies of the drawings and electronic coordinate files.

b) The DPA is responsible for collecting and documenting information set out in the as-built plans. Disclaimers or endorsement negating responsibility will render the plans unacceptable and the 224 Certificate will be withheld. Further, if underground asset locations are found to be inaccurate on excavation or otherwise, the Developer may be liable for rectifying the situation.

### 2.3.13 Maintenance Certificate

a) On expiry of the twenty four (24) month maintenance period, the DPA shall issue a maintenance certificate confirming that all outstanding maintenance has been completed.

b) The performance bond for maintenance will not be released by Council until the work covered by the maintenance certificate is verified by Council.

## 2.4 GENERAL DRAWING STANDARDS AND DETAILS SUPPORTING INFORMATION REQUIREMENTS

- a) This section sets out Council's requirements for the preparation and submission of engineering design and as-built drawings and supporting design details and information.
- b) Engineering design and as-built drawings are required by Council in all instances where works involve any or all of the following: - roading, right of ways, public drains and watermains, and drains of 150mm equivalent diameter or greater.
- c) Each and every plan must be signed by the Designer of the work. The Designer's signature is taken as evidence that the plans have been checked against and comply with Council's current Land Development Manual. Unsigned plans will not be accepted.
- d) Approval of engineering design drawings and as-built plans<sup>1</sup> together with specifications and supporting calculations where requested by Council, is required prior to approval of the survey plan of the subdivision pursuant to Section 223 of the Resource Management Act. This is to show that practical pipeline alignments and legal easements are consistent with each other. For large subdivisions, full Engineering Drawings may be required by Council prior to subdivision consent being granted.
- e) Table 2-1 sets out Council's requirements for any proposed works at the Engineering Plan approval and as-built stages.

**Table 2-1 Council's Requirements**

	<b>Design Engineering Plan submission</b>	<b>Section 223 and 224 As-Built Engineering Plan submission</b>
Engineering Drawings and As-Builts - hard copies - electronic copies	2 copies If requested	Required If requested
Electronic coordinate and attribute information		1 copy required
Specifications (electronic or hard copies)	2 copies	Changes only
Supporting calculations (electronic or hard copies)	Required	Changes only
Certificates	Design Design Review	Construction Construction Review

<sup>1</sup> As an alternative to as-built plans the Council will accept a letter of confirmation from the DPA confirming that the services covered by easements are installed and completed and are positioned central within the easements shown on the 223 survey plan.

### 2.4.1 General Format Requirements

- a) The symbols and arrangements shown on SD 201 and 202 shall be used.
- b) The standard approval signature block (SD 201) shall be placed on the bottom right hand side of all plans, with the resource consent number where applicable.
- c) A site location, in the form of a locality plan, including major street names and site identification shall be shown.
- d) Where more than five sheets are involved a title sheet shall be included showing sheet numbers, individual sheet titles and site location plan.
- e) Existing property boundary lines that abut the work and a north point shall be shown as a reference.

### 2.4.2 Hard Copy Format Requirements

- a) Hard copies of Engineering Drawings are retained by Council as a permanent record of the proposed and as-built assets. The following is required to facilitate scanning of drawings and to ensure that a durable record of the works remains:
  - 1) Two sets of Engineering Drawings shall be submitted on standard A1- or A2- (or A3- with the approval of the Engineering Manager) sized sheets of high quality paper (80 gsm or greater).
  - 2) Final sheets submitted to Council for signing must not be folded or creased.
  - 3) All drawing shall be in opaque black ink (not pencil).
  - 4) All lettering shall be ISOCP, Arial or similar approved font style.
  - 5) Minimum line thickness shall be 0.25mm.
  - 6) A minimum letter height of 2.5mm (including the actual height of lower case text) is required for all data specified by the LDM, in accordance with the relevant section of AS/NZS1100.101.

### 2.4.3 Electronic Drawing Format Requirements

- a) At the submission of hard copy as built plans the submission of supporting electronic drawing files will be required. Drawing formats for submitted plans shall be one of the following, in order of preference:
  - 1) AutoCAD drawing files along with any other required electronic files;
  - 2) 'DXF' files (dependent on compatibility with the Council system) along with any other required electronic files;
  - 3) Nelson City Council approved LandXml files along with any other required electronic files.
- b) No OLE (Object Linked or Embedded) entities are acceptable, e.g. EXCEL spread sheets "copy and pasted" into the drawing file.
- c) External referencing to image and other DWG files is acceptable as long as the referenced file is supplied with the data.
- d) When requested by the Nelson City Council any support files required by the drawing file (e.g. Text Shape files) shall be provided BEFORE the plans are approved.
- e) Data provided as a drawing file for the purposes of generating contour data, shall be provided as 3D lines and 3D points, to the Nelson City Council datum and one of the Nelson City Council accepted standard coordinate systems.

### 2.4.4 Electronic Coordinate and Attribute Data Requirements

- a) The supply to Council of electronic coordinate and attribute data is essential for the maintenance of Council's asset management system. The correct supply of this data for all new or modified assets is compulsory. This electronic data shall be submitted at the same time as the hard copy plans. Plans will not be processed until electronic data is supplied. Electronic data should be in the form specified by the template available from Council.
- b) The data supplied must be a complete and accurate representation of the same information shown on the physical Engineering As-built Drawings.
- c) A separate tabulation of all the point coordinates and levels specified in these standards shall be shown on the drawing set as a cross-referenced table. This table will be used to assist in the distribution of the data in hard copy format.

d) Where an electronic file of coordinates is required or supplied the order of preference for the format of the file is as follows:

- 1) Spreadsheet file e.g. Microsoft Excel or similar
- 2) Text file e.g. Tab or Comma (CSV) Delimited Text file
- 3) Document "Table" e.g. Microsoft Word "Table" or similar
- 4) Database file e.g. Microsoft Access or similar

e) The file must be capable of being processed with one of Council's current Microsoft compatible systems and each point (coordinated location) shall appear on a separate line.

f) Each point (EXCLUDING contouring spot heights) will be cross referenced to a point on the HARD COPY plans to clearly indicate the one that it represents.

g) The following format for each point (coordinated location) shall apply:

- 1) Cross reference to location as shown on the plan;
- 2) Easting;
- 3) Northing;
- 4) Level (0.0 if not supplied);
- 5) Invert (0.0 if not supplied);
- 6) Description as applicable.

h) E.g. for a simple text "comma" separated file:

MH3a,2530000.58,5930000.64,14.53,10.25,Sewer Manhole  
 SMP3,2530010.63,5930005.62,15.98,10.25,Sump  
 MH4a,2530020.58,5930015.24,14.89,10.55,Sewer Manhole

i) E.g. for a simple table or spread sheet file:

MH3a	2530000.58	5930000.64	14.53	10.25	Sewer Manhole
SMP3	2530010.63	5930005.62	15.98	10.25	Sump
MH4a	2530020.58	5930015.24	14.89	10.55	Sewer Manhole

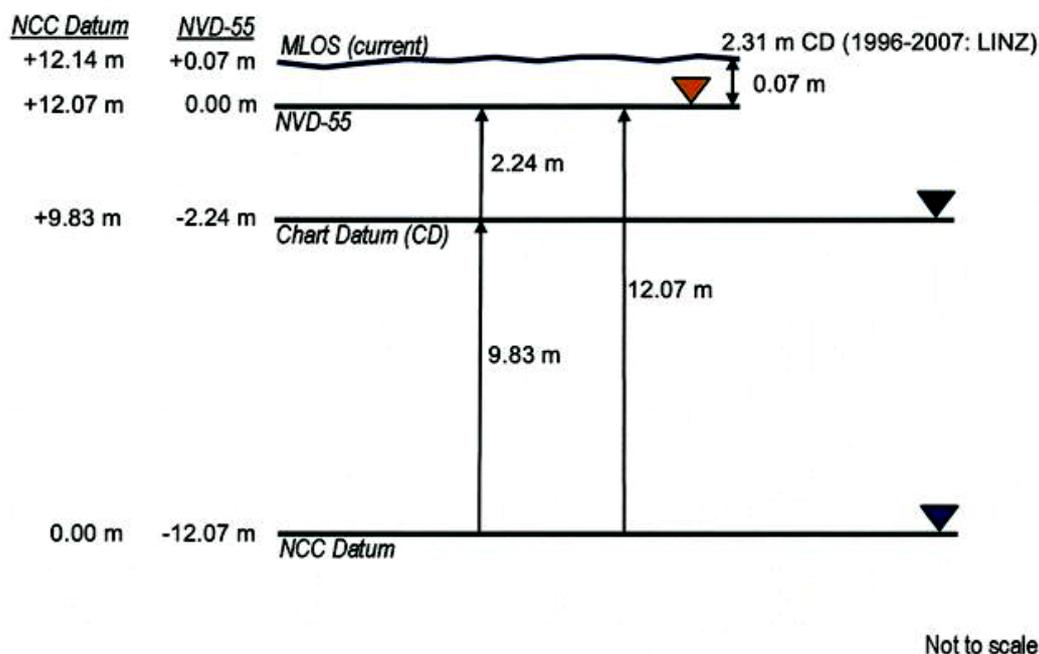
## 2.4.5 Coordinate and Elevation Standards

a) Easting and Northing coordinates shall be accurate to two decimal places and in terms of the following (in preference):

- NZMG
- Local Circuit (NZGD) 2000
- Local Circuit (NZGD) 1949

- b) The local circuit origin shall be stated on all plans.
- c) The origin of levels and height shall be recorded and accurate to two decimal places, for example "Origin of levels BP11 SO12345 = 4.26 AMSL".
- d) Known benchmarks and survey levels are recorded by Council and are available during office hours.
- e) The NCC Datum, of 9.83 m below the Chart Datum, shall be used. See Figure 2-1.
- f) Nelson City historically defined a drainage datum that was set well below low tide to ensure Reduced Levels were always positive values even for pipe networks in the ground. In recent years (1996-2007), the actual mean level of the sea (MLOS) has been at an average of 12.14 m above NCC Datum or 2.31 m above Chart Datum (CD) as determined by Land Information NZ (LINZ).<sup>2</sup>
- g) The LINZ local vertical datum, Nelson Vertical Datum-1955 (NVD-55), was set up in 1955 based on sea level measurements from 1939 to 1942. Since that time, sea levels have risen, with MLOS now at 0.07 m relative to NVD-55.

**Figure 2-1 Nelson City: conversions between the various local vertical datums.**



<sup>2</sup> <http://www.linz.govt.nz/hydro/tidal-info/tide-tables/tidal-levels/index.aspx>

### 2.4.6 Orientation of Plans and Sections

- a) Plans shall be orientated with either north or west to the top of the sheet. North point shall always be shown.
- b) In the case where a layout plan and longitudinal section appear on one sheet, the layout plan is to be orientated to suit the longitudinal section.
- c) Plans and longitudinal sections shall have the lowest distance on the left hand side of the sheet. In drainage longitudinal sections, the lowest end of the drain shall be at the lower distance and the plan should be orientated correspondingly.
- d) Cross-sections of a street shall commence at the bottom left hand corner of the sheet and proceed upwards where this is possible.

### 2.4.7 Scales

**Table 2-2 Scales to be used for all Engineering Drawings**

1	Consent applications	At recognised scales
2	Location plan	Not less than 1 in 20,000 Not larger than 1 in 5,000
3	Site contours	1:1000 or 1:500 or 1:250 or 1:200
4	Road/Streetworks plan	1:500 or 1:250 or 1:200
5	Longitudinal sections of channels - Horizontal - Vertical	1:500 or 1:250 or 1:200 1:50 or 1:25 or 1:20
6	Cross Sections - Horizontal - Vertical	1:50 1:50 or 1:20
7	Sewer, stormwater and water plans	1:500 or 1:250 or 1:200
8	Longitudinal section - Horizontal - Vertical	1:500 or 1:250 or 1:200 1:100 or 1:50
9	Details	1:20 or 1:10 or 1:5
10	Other services (e.g. streetlights) - Plans - Cross section	1:500 or 1:250 or 1:200 1:50

**Note:** Longitudinal and cross sections should be drawn at appropriate exaggerated vertical to horizontal scale ratio.

### 2.4.8 Special Scales

- a) Special scales (other than the above) may be approved by the Engineering Manager for rural areas and special cases, but only on prior application.

## 2.5 ENGINEERING DESIGN DETAILS REQUIRED

- a) The following plans and drawings of each street are required showing:

- proposed and existing survey lots and Land Transfer (LT) numbers (if known);
- street numbers;
- names of new streets; and
- the location of services, including the necessary manholes, fittings and similar features (on separate plans for each service).

- b) New services shall be located as shown on SD 201, generally along with bench marks and survey mark levels.

- c) The Designer shall make every endeavour to locate existing power and telecommunication services. Where proposed pipes cross under or over existing or proposed services, these services shall be shown on the plan and section with reduced levels.

- d) Plans shall show the location of services in existing streets which abut the subdivisions.

- e) A Traffic Management Plan is required by Council for any work on or immediately adjacent to a public road for works that will or may pose a risk to road users. Council requires demonstration that the consent holder and agents are in compliance with requirements of the Health and Safety in Employment Act 1992.

### 2.5.1 Earthworks Design Drawings

- a) Earthworks drawings shall be provided and show:

- original and finished contours;
- proposed earthworks (cut and fill);
- erosion and sedimentation control;
- geotechnical engineers input; and
- property boundaries, kerb lines and street names.

- b) A contour plan of the site at an appropriate interval in terms of NCC datum shall be provided for all subdivisions and developments of 0.25 hectares or greater.

- c) Erosion and sediment control must be shown in detail at the Engineering Drawing approval stage.

### 2.5.2 Road/Street Works Design Drawings

a) A road/street works plan shall be provided and show:

- property boundaries;
- kerbs and channels;
- road/street names;
- footpaths;
- longitudinal and cross sections of the existing ground;
- proposed road/street levels with batters;
- existing and proposed survey bench marks;
- road marking; and
- signs (where relevant).

b) Left-hand and right-hand top of kerb shall be shown separately unless they are identical, in which case this shall be stated.

c) The levels of the proposed services shall also be shown on sections. Longitudinal sections shall extend 40.0m beyond the extent of the works.

### 2.5.3 Wastewater Design Drawings

a) Wastewater services drawings shall be provided and show:

- wastewater pipes and manholes (in plan and long-section);
- pipe size, length and gradient in long section;
- pump stations;
- stormwater pipes and manholes (for proximity purposes, with a thick line for wastewater and thin line for stormwater); and
- property boundaries, kerb lines and road/street names.

b) Wastewater discharge calculations complying with Council's LDM shall be submitted.

### 2.5.4 Stormwater Design Drawings

a) Stormwater services drawings will be provided and show:

- property boundaries;
- stormwater pipes, channels, subsoil drains, manholes and structures (in plan and long-section), pipe size, length and gradient in long section;
- secondary flow paths and proposed easements;
- wastewater pipes and manholes (for proximity purposes, with a thick line for stormwater and thin line for wastewater); and
- property boundaries, kerb lines and road/street names.

b) Stormwater drawings submitted for checking shall be accompanied by:

- catchment plans showing all the catchment areas to be served; and
- stormwater discharge calculations for each and every proposed pipe and channel.

### 2.5.5 Water Supply Design Drawings

a) Water supply services drawings shall be provided and show:

- Water main and fittings;
- pump stations, and
- property boundaries, kerb lines and road/street names.

### 2.5.6 Streetlighting, Power and Telecommunication Utilities Design Drawings

a) Streetlighting, power and telecommunication utilities drawings shall be provided and show:

- Cables ducts, boxes, pillars, cabinets and substations;
- street lighting; and
- property boundaries, kerb lines, vehicle and pedestrian entrances and road/street names.

b) Power, streetlighting plans may be submitted separately to Council as these are designed by specialists other than the DPA.

## 2.6 ENGINEERING AS-BUILT DETAILS REQUIRED

a) As-built drawings shall be provided and approved before the 223 certificate pursuant to the RMA is issued. For Council's physical works contracts, as-built drawings are required within 2 weeks of the issuing of the Practical Completion certificate or within an agreed timeframe with the Engineering Manager's approval.

### 2.6.1 Separate Plans to be Submitted for Each Infrastructural Asset

a) All non-standard structures (eg pump stations, reservoirs, bridges, low impact stormwater devices) shall be shown as an outline and all lids and surface openings shall be shown and separately located. The position of all pipe connections to a structure shall also be located with coordinates and invert.

### 2.6.2 Earthworks As-built Drawings

a) Where bulk earthworks have been carried out, sufficient additional levels, coordinates and break lines to regenerate contours on earthworks plans at 1.0m intervals shall be provided. The contours are to be shown on an appropriate as-built plan.

- b) Ground level in terms of the NCC datum shall be shown on an appropriate plan at all boundary pegs for all subdivisions regardless of size.

### 2.6.3 Road/Street Works As-built Drawings

- a) In addition to the road/street works design drawing requirements, as-built plans shall show:

- 1) All kerbing (including traffic islands/traffic calming), channels where separate from kerb, or edge of seal or formed carriageway in the absence of kerbing. Points shall be located at top of kerb, centre of channel or edge of seal and in terms of coordinates and level at changes of type, direction or grade. All curves are to be located using the tangent points and at least one central point on each curve.
- 2) The location and width of footpaths. Locations in terms of coordinates are preferred but are acceptable in terms of offset from boundaries or kerb.
- 3) Road signs in terms of sign type and coordinates.
- 4) Road markings in terms of colour, width, symbol type or text and coordinates. Coordinates shall be positioned at ends and changes of type and/or direction. All curves are to be positioned using the tangent points and at least one central point on each curve. Offsets from the front face of kerb and channel will be acceptable. Road marking symbols need only be positioned to their centres.
- 5) Bridge abutments, piers, carriageway, kerbing and footpaths in terms of outline coordinates and level, as per above specifications.
- 6) New or altered benchmarks and survey standards in terms of coordinates and level in terms of NCC datum. The points shall be clearly defined as either an NCC bench mark (NCC Ownership) or survey standard (LINZ ownership) and shall be levelled/coordinated back to known benchmarks or reference points. The work must be undertaken in accordance with LINZ requirements.
- 7) Any road/street works removed or relocated shall be noted on the plans to the same level of detail as new assets.

**Note:** Further road construction information, such as the Road Assessment and Maintenance Management System (RAMM) data, as required on the standard form (see Section 4, Transport, Appendix A) and the Streetlight Data Collection Form (see Section 10, Electrical and Streetlight, Appendix E) shall be provided where applicable.

#### 2.6.4 Wastewater As-built Drawings

a) In addition to the wastewater design drawing requirements, as-built plans shall show:

- 1) Material, class and size (diameter, or height and width) and date installed for all assets.
- 2) Manholes, roding points and formed bends in terms of coordinates, lid level, invert level and size and dimensions to lot boundaries where structures are not within a road or ROW pavement area.
- 3) Pump stations, non-standard manholes, underground chambers, storage tanks, intake structures and outlet structures in terms of outline and pipe connection coordinates. Invert levels on all chambers, storage tanks, wet wells, intakes and outlet points.
- 4) Upstream and downstream invert levels on each length of pipeline. At drop manholes the invert is required for both the upper and the lower level entry point.
- 5) Any change in direction, grade or type not located by the above information is to be defined in terms of coordinates and invert level.
- 6) The blank end of pipe laterals or connection point to existing house drains. These shall be in terms of coordinates and reduced level, depth to the blank end from the final ground level and distance from two readily defined permanent points (usually boundary pegs).
- 7) Junction of laterals to mains in terms of coordinates or running distances along mains between surface features.

b) Details of any pump, automated valve, or motor components and electrical control equipment shall be incorporated into four sets of operations and maintenance instruction manuals enclosed in a hard-copy A4 bound folder. The folder shall include as-built plans of the pump station including electrical wiring, operational schematic diagrams, valves, flow meters and the like.

#### 2.6.5 Stormwater As-built Drawings

a) In addition to the stormwater design drawing requirements, as-built plans shall show:

- 1) Material, class and size (diameter, or height and width) and date installed for all assets.
- 2) Manholes, sumps and roding points in terms of coordinates, lid level, invert level and size and dimensions to lot boundaries where structures are not within a road or ROW pavement area.

- 3) Low impact stormwater devices, including detention basins, detention ponds, detention tanks, rain gardens, vegetated swales, soakage structures, filter strips, sand filters in terms of outline.
  - 4) Pump stations, non standard manholes, underground chambers, storage tanks, intake structures and outlet structures in terms of outline and pipe connection coordinates. Invert levels on all chambers, storage tanks, wet wells and intake and outlet points.
  - 5) Upstream and downstream invert levels of each length of pipeline (at node points). At drop manholes the invert is required for both the upper and the lower level entry point.
  - 6) Any change in direction, grade or type not located by the above information is to be defined in terms of coordinates and invert level.
  - 7) The blank end of pipe laterals or connection point to existing house drains in terms of depth to the blank end from the final ground level and measurements from two readily defined permanent points, usually boundary pegs, and as coordinates and reduced level.
  - 8) Junction of laterals to mains in terms of coordinates or running distances along mains between surface features.
  - 9) Subsoil drains in terms of coordinates and invert level at all changes in direction and grade.
  - 10) Watercourses, streams, rivers and secondary flow paths are to be defined by coordinates and levels at the centre line of water course and the top and bottom of both banks.
  - 11) Detention structures (inlet, outlet, spillway, dam crest) are to be specifically surveyed in terms of coordinates and level. Reservoir areas are to be defined by 0.2m contour data to maximum operating level.
- b) Details of any pump, automated valve, or motor components and electrical control equipment shall be incorporated into four sets of operations and maintenance instruction manuals enclosed in a hard copy A4 bound folder. The folder shall include as-built plans of the pump station including electrical wiring, operational schematic diagrams, valves, flow meters together with all other relevant components of the pump station. The plans shall be in a form that can be electronically scanned.
  - c) An operation and maintenance manual is required for all detention dam structures. This manual shall include key design parameters (such as reservoir catchment areas, inflows and reservoir and spillway operation) and ongoing maintenance and dam safety inspection requirements.

- d) Operation and maintenance information may be required for non-standard stormwater components (such as water treatment devices, ponds, wetlands or swales). This information would include any special maintenance or servicing requirements.

### 2.6.6 Water Supply As-built Drawings

- a) In addition to the water supply design drawing requirements, as-built plans shall show:

- 1) Material, class, type and size (diameter, or height and width) and date installed for all assets.
- 2) Valves and hydrants in terms of coordinates and lid level size and dimensions to lot boundaries.
- 3) Meter boxes in terms of coordinates and lid level and by distance to two adjoining boundary pegs. In addition the meter number and meter reading information is required. Refer to Section 7 Water, Appendix A.
- 4) Manholes in terms of coordinates, lid level size, invert level and dimensions to lot boundaries.
- 5) Water mains and rider mains, in terms of coordinates at any change in horizontal direction or material or type or diameter. Curves are to be located either using the tangent points and at least one central point on each curve or points at regular intervals.
- 6) Pump stations, storage tanks, reservoirs, chambers and non-standard manholes in terms of outline, pipe connection and lid coordinates, lid level and pipe connection tank/wet well inverts as well as floor and overflow levels.
- 7) Any horizontal change in direction or type not covered by the above information is to be defined in terms of coordinates. Curves are to be located using the tangent points and at least one central point on each curve. Offsets from the front face of kerb and channel maybe acceptable.
- 8) Junctions of laterals to mains in terms of coordinates or running distances along mains between surface features.

- b) Details of any reservoir, pump, motor components, automated valve or electrical control equipment shall be incorporated in four sets of operation and maintenance instruction manuals enclosed in a hard-copy A4 bound folder. The folder shall include as-builts, plans of the pump station including electrical wiring and operational schematic diagrams. The plans shall be in a form that can be scanned.

### 2.6.7 Telecommunication and Power Utilities

- a) Electrical, telephone and other reticulation drawings shall be supplied to the relevant network line operator(s). Council may require evidence from the relevant network line operators that the as-built plans have been received and are fit-for-purpose.

### 2.6.8 Road/Streetlights

- a) Council will require an as-built plan of all road/streetlights installed and completion of the data collection form (see Section 10, Appendix E) which shall include:
  - 1) Location in terms of coordinates.
  - 2) Light type, dimensions, wattage and date installed.

### 2.6.9 Redundant Assets

- a) In addition to new assets, as-built information shall show all existing assets that have been made redundant. The assets shall be marked as either "abandoned" or "removed". Where an existing pipe or asset has been made partially redundant the coordinates and invert of the disconnection point are required.

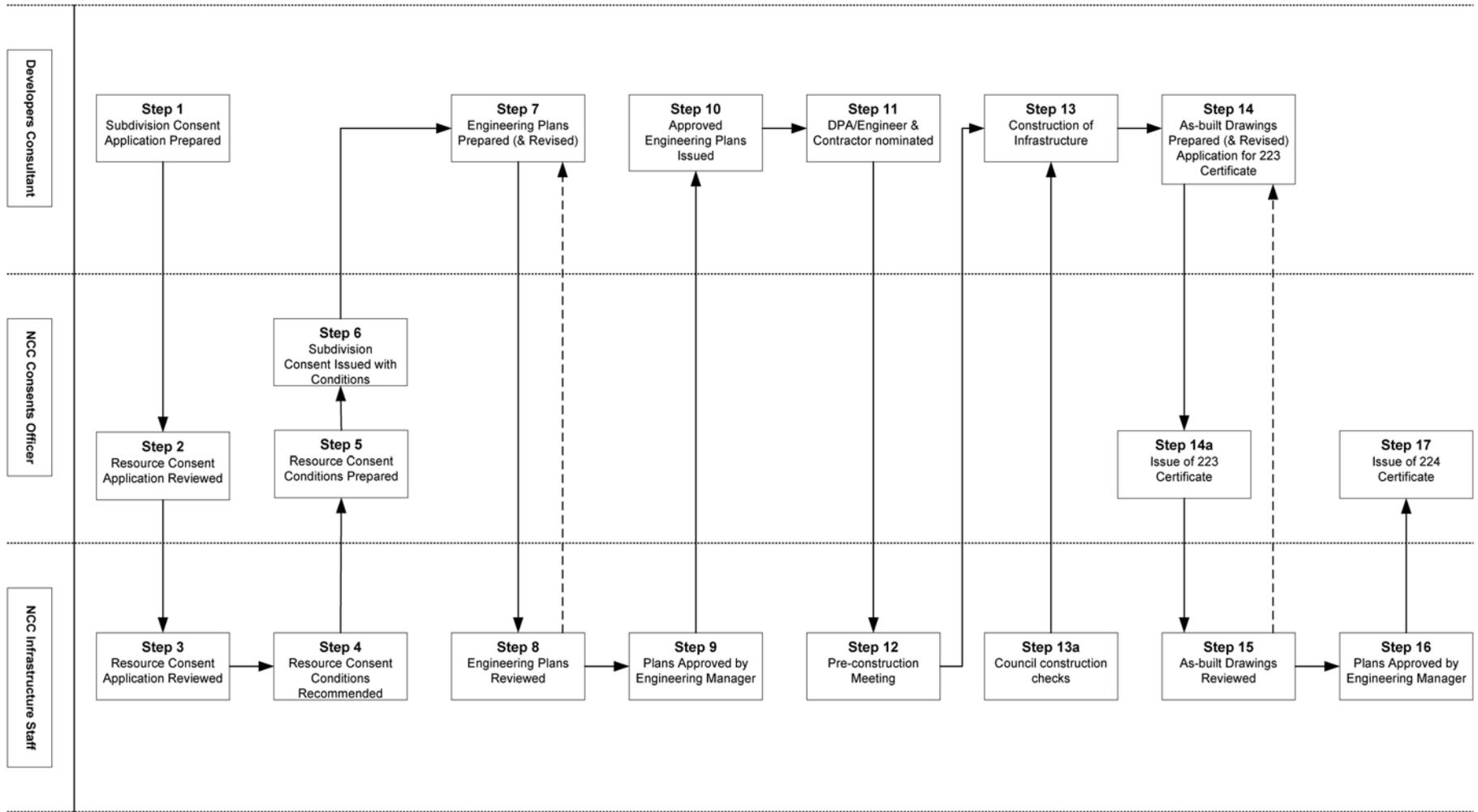
### 2.6.10 Existing Assets

- a) The location and level of all existing drainage and water services encountered during construction shall be verified and recorded on as-built plans.
- b) As a minimum, at least one asset feature (such as a manhole lid and invert, valve or hydrant lid) adjacent to each new service shall be surveyed and recorded on the as-built plans.

## 2.7 DISCLAIMER

- a) As-built plans held by Council are to the best of Council's knowledge and information received from DPA's. Council takes no responsibility for inaccurate information or unknown infrastructure found on site.
- b) All contractors, consultants, surveyors, designers and owners have a duty to investigate further and pothole if necessary to verify the position of services.
- c) Council will not be liable for any damages or loss whatsoever suffered from the use of information held by them.

# Appendix A Engineering Design Drawing and As-built Drawing Approval Process



All changes to this procedure must be agreed by NCC Engineering Manager and must be notified to the following: NCC Consents Team, All Infrastructure Department Staff, Data Management Co-ordinator. 935322

**Appendix B Design Certificate – Land Development/Subdivision Work**

ISSUED BY: \_\_\_\_\_  
(Approved certifier)

TO: \_\_\_\_\_  
(Developer/Owner)

TO BE SUPPLIED TO: \_\_\_\_\_  
(Territorial authority)

IN RESPECT OF: \_\_\_\_\_  
(Description of land development/subdivision work)

AT: \_\_\_\_\_  
(Address)

\_\_\_\_\_ has been engaged by \_\_\_\_\_  
(Consultant/Designer) (Developer/Owner)

to provide \_\_\_\_\_ services in respect of the land development and/or subdivision work described above.

I \_\_\_\_\_ have the qualifications and experience relevant to this project as set out herein and have designed the subject works and confirm that the design is to current good engineering practice, and that it satisfies all relevant resource consent conditions, all relevant Nelson City Council requirements and applicable codes and standards. I/My practice holds professional indemnity insurance in the sum of \$ \_\_\_\_\_ and run-off cover.

\_\_\_\_\_  
(Signature of approved certifier)

\_\_\_\_\_  
(Professional Qualifications)

\_\_\_\_\_  
(Address)

Date \_\_\_\_\_

- |                       |                          |            |                          |
|-----------------------|--------------------------|------------|--------------------------|
| RPSurv                | <input type="checkbox"/> | CPEng      | <input type="checkbox"/> |
| <i>Practice field</i> |                          |            |                          |
| Civil                 | <input type="checkbox"/> | Mechanical | <input type="checkbox"/> |
| Structural            | <input type="checkbox"/> | Electrical | <input type="checkbox"/> |
| Geotechnical          | <input type="checkbox"/> | Industrial | <input type="checkbox"/> |
| Environmental         | <input type="checkbox"/> |            |                          |

**Outstanding Works**

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## Appendix C Designer's Check Sheet

NCC Consent No: \_\_\_\_\_ Date: \_\_\_\_\_

Site Address:		
Site Legal Description:		
Designer:	Name	
	Address	
Qualification:	Phone No:	
	Fax No:	
Engineer/Surveyor Contact:		
Landowner:	Name:	
	Address:	
	Phone No:	

Place a tick in a box if information is provided, otherwise write NA for not applicable

Reason for Submission:	Subdivision	<input type="checkbox"/>	ROW	<input type="checkbox"/>
	Development	<input type="checkbox"/>	Other	<input type="checkbox"/>
Design Certificate provided		<input type="checkbox"/>		
Drawing Sheet size and number of sheets	A1	<input type="checkbox"/>	A2	<input type="checkbox"/>

Drawing to AS 1100.101 and NCC Standards Section 2.4.

Levels to NCC Datum	<input type="checkbox"/>	Locality Diagram	<input type="checkbox"/>	
Contour Plan	<input type="checkbox"/>	Spot Levels	<input type="checkbox"/>	
Overall Site Plan	<input type="checkbox"/>			
Plans and Sections Road/street works	<input type="checkbox"/>	Power	<input type="checkbox"/>	
	Drainage	<input type="checkbox"/>	Telecommunications	<input type="checkbox"/>
	Water	<input type="checkbox"/>	Earthworks	<input type="checkbox"/>
Sewerage Catchment Plans and Discharge Calculations			<input type="checkbox"/>	
Stormwater Catchment Plans and Discharge Calculations			<input type="checkbox"/>	
Road/Streetworks Pavement Design			<input type="checkbox"/>	
Specific Design – specify aspect:			<input type="checkbox"/>	
Owner's Consent for Work in Private Property			<input type="checkbox"/>	

## Appendix D Certification upon completion of Subdivisional Work

ISSUED BY: \_\_\_\_\_  
(Approved certifier)

TO: \_\_\_\_\_  
(Developer/Owner)

TO BE SUPPLIED TO: \_\_\_\_\_  
(Territorial Authority)

IN RESPECT OF: \_\_\_\_\_  
(Description of land development/subdivision work)

AT: \_\_\_\_\_  
\_\_\_\_\_  
(Address)

\_\_\_\_\_ has been engaged by \_\_\_\_\_  
(Consultant/Designer) (Developer/Owner)

to provide construction observation, review and certification services in respect of the above subdivisional work which is shown on the drawings numbered

NCC \_\_\_\_\_ approved by \_\_\_\_\_  
(Territorial Authority)

I have sighted the \_\_\_\_\_ consent and conditions of  
(Territorial Authority)  
consent to the subdivisional works and the approved drawings.

"I believe on reasonable grounds that the works other than those outstanding works listed below, are complete and have been constructed in accordance with:

- a) The approved engineering drawings and any approved amendments, or as modified by d) below; and
- b) The Council's Land Development Manual; and
- c) Manufacturer's Instructions; and
- d) The resource consent conditions

\_\_\_\_\_  
(Signature of approved certifier) Date \_\_\_\_\_

\_\_\_\_\_  
(Professional Qualifications)

\_\_\_\_\_  
(Address)

RPSurv

Practice field

Civil

Structural

Geotechnical

Environmental

CPEng

Mechanical

Electrical

Industrial

### Outstanding Works

\_\_\_\_\_  
\_\_\_\_\_