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3. GENERAL DESIGN AND CONSTRUCTION GUIDANCE

Designers are expected to refer to contemporary best practice for engineering and landscape design. **Specific technical compliance criteria and guidance is further detailed in the relevant sections** of this Engineering Code of Practice (ECOP).

Developers are encouraged to refer to the Selwyn District's guidance for good subdivision design. Council seeks best practice in urban design to deliver Selwyn District's vision, supported by excellent public infrastructure.

Council welcomes innovative ideas that enhance urban environments while meeting Council requirements for infrastructure that is safe, cost-effective to maintain, and reflects the unique characteristics of the Selwyn District.

All investigation, calculations, design, supervision, and certification of the works, as outlined in the ECOP, must be carried out by or under the control of persons who:

- Are experienced in the respective fields
- Hold appropriate qualifications and membership of national professional bodies
- Have appropriate professional indemnity insurance

Council understand that each Development and Project is unique; therefore, the provisions of the ECOP do not reduce the responsibility of the Designing Engineer to exercise their judgement and devise appropriate engineering solutions.

3.1 Reference material for best practice design

In line with good national practice, Council expects designers to be generally familiar with the following documents as generally accepted industry practice for land development engineering. Project capital works and specific asset design are expected to reference appropriate technically specific design standards. Refer to the list of referenced documents in Part 1, and the referenced documents for each asset type contained in each Part.

3.2 DESIGN PRINCIPLES

When assessing proposals for new designs, Council's Assets and Development teams look for specific aspects of good design, in line with good practice for engineering and land development design. Good quality design supports the vision of Selwyn District and enables speedier approvals of designs by Council.

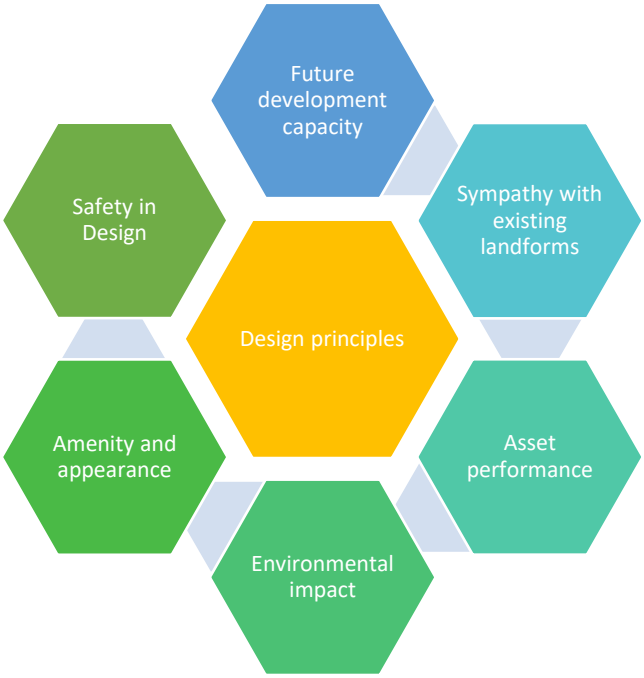

Figure 1 - Design Principles

3.2.1 Asset Performance/Levels of Service and Design Life

Good design will provide assets that will perform to reasonable standards over a full design life. Assets to be vested in Council need to support Council's objectives of meeting community needs by performing to Council's agreed levels of service, throughout the whole life of the asset. Asset design life will be as set out in Activity Management Plans or as agreed with Council asset managers, and confirmed in the Design Report.

Table 1 - Asset design life

Asset Type	Design Life	ECOP Ref
Stormwater reticulation system	100 years	Section 8
Water races	100 years	Section 9
Wastewater systems	50 – 100 years	Section 6
Water systems	50 – 100 years	Section 7
Roads, accessways and ROWs	50 years	Section 11

Assets also need to be robust, practical, and cost-effective to operate and repair. The Design Report shall articulate how the proposed design addresses Council expectations for asset performance, repair, and what engagement the designer has had with the Council to develop these aspects.

Considering longer-term performance issues such as resilience (natural hazards, regional seismicity and climate change factors) and redundancy in asset capacity will be viewed favourably by Council.

3.2.2 Future Development

Good design anticipates future development of the Selwyn District.

Provision of additional capacity for future development is viewed favourably by Council. Discuss future development with Council asset engineers as early as possible.

Where further development, upstream of or adjacent to the area under consideration, is provided for in the District Plan the Council may require infrastructure or additional capacity to be constructed to the upper limits of the development. Make allowance for these requirements where specified by the Council in the consent conditions and/or project brief. The design approach to future development should be clearly stated and described in the Design Report at Engineering Approval stage.

3.2.3 Sympathy with Existing Landforms

Good design works with and balances natural landforms and prevents introducing adverse effects on surrounding land.

The final choice of landform for a development should reflect the unique aspects of each site, such as:

- Relationship with surrounding landscapes.
- Natural drainage patterns.
- Size of the development.
- Proposed and existing roading patterns.
- Preservation of natural features.
- Enhancement of natural features were compromised by fragmentation or reduction due to the development.
- Stability of the land.
- Function and purpose of the development.
- Potential for flooding, erosion and other natural events.

The final choice of landform must represent the most desirable compromise between the development requirements, the preservation of natural features including the existing soil profile, and the natural quality of the landscape. Preservation aspects include retaining natural watercourses and excluding any development from natural gullies. Refer also to best practice design guidance.

3.2.4 Environmental Considerations

Natural environments

Engineering design is expected to incorporate environmental considerations as a fundamental part of good practice.

Designers are:

- Encouraged to refer to the Council's policies designed to protect and enhance the district's natural environment
- Expected to adopt best-practice for environmental design
- Encouraged to propose innovative design to retain and enhance the natural environment in tandem with development works

As a minimum Council expects development design to include an evaluation of the development's overall impact on the environment for both the construction and operational phases, consistent with legislation and the District Plan. The design response to this shall be included in the Design Report submitted for Engineering Approval.

Wherever possible, design should **avoid areas** likely to be considered sensitive, including:

- Landfill sites and contaminated land.
- Areas of aggressive ground conditions, e.g., acid sulphate soils and aggressive ground waters.
- Stands of native vegetation, bushland, habitats of threatened native species
- Waterways and floodway's
- Wetlands, swamps, estuaries, sand dunes, foreshore areas

Wherever it is not possible to avoid environmentally sensitive areas, address the following environmental issues during the design:

- The environmental impact of the construction
- The use of alternative excavation technology such as tunnelling, boring, directional drilling and micro-tunnelling
- The type and size of construction equipment
- Geotechnical issues (refer Part 5)

In some situations, the Council may specify that an environmental impact assessment be completed during the investigative stage. Ensure that the appropriate resource consents are obtained for work in the vicinity of protected trees and that the work is carried out in accordance with the Council's requirements.

Heritage & Archaeological Sites

An archaeological site is any place in New Zealand that was associated with human activity occurring before 1900 and which may provide evidence relating to the history of New Zealand. Any work on any part of these sites will require an archaeological authority from Heritage New Zealand beforehand. Wherever possible, avoid archeologically significant areas. Some examples of these areas include:

- Heritage item precincts
- Protected trees
- Māori relics
- Significant indigenous sites

3.2.5 Amenity and Appearance

Design of good infrastructure should also consider amenity and appearance of services. Refer design guidance from SDC and Auckland Council.

Council encourages designers to take opportunities to enhance natural features, to minimise visual and acoustic impact, and to integrate assets into the surrounding environment. Consider both the operational and the servicing/maintenance aspects.

This includes careful consideration of where utilities are placed – ideally away from the frontages of subdivisions where servicing activities may disrupt access, and where ongoing visual impact may be undesirable to future residents.

Council promotes good urban design to prevent issues or difficulties or conflicts with contemporary lifestyle. Good design should anticipate the finished amenity and serviceability of the subdivision for residents and accommodate the needs of residents.

For example:

- Ensuring road corridor and parking configurations accommodate wheelie bins and refuse collection vehicles
- Provision of a communal collection area for wheelie bins belonging to properties sharing a ROW
- Ensuring road and ROW widths and configurations are adequate to accommodate service vehicles such as delivery trucks

Council may require amendments to design where the proposal has not addressed foreseeable known issues. Council will encourage designers to take opportunities to provide resident lifestyle amenity and serviceability more effectively.

Exceptional Requirements – Major Projects

In some instances, such as for complex or major projects and subdivisions, the Council may have additional requirements.

Designers shall consult directly with Asset Managers and project delivery staff to incorporate these requirements into the project brief.

Cost Benefit or Life Cycle Costing

Council seeks a reasonable balance between the short-term and long-term costs.

Where required by the Council designers may be required to carry out a cost benefit or life cycle costing of a proposal or options. This is typically expected for larger, complex, or unique projects or where new technologies or materials are proposed. Council may require this be prepared by a Registered Professional Quantity Surveyor.

Life cycle costing may be used to consider options within a proposal, or the whole proposal. When undertaking life cycle costing, consider:

- Initial capital costs (whether borne by the applicant/developer or the Council)
- Maintenance costs borne by the future owners
- Disposal and replacement costs borne by the future owners

Where required by Council, the cost-benefit or life cycle costing analysis shall be included in the Design Report.

Peer Review

If required as a condition of consent, or where requested by the Council, the designer shall obtain a peer review of the design in accordance Engineering New Zealand's Practice Note 2: Peer Review.

In such cases, the Design Report shall include a Design Peer Review Certificate or Producer Statement 2 (Design Review) signed by a current Chartered Professional Engineer.

3.2.6 Accessibility

Design of good infrastructure should also consider accessibility for all and follow the principles included in Selwyn District Council's Charter: Accessible Selwyn Te Arataki Taero Kore (https://www.selwyn.govt.nz/community/policies-And-plans/accessible-selwyn-te-arataki-taero-kore). Designs must follow technical advice and guidance of professional and independent universal-design experts, appropriate to the scale and type of project.

3.2.7 Safety in design

Council-operated assets and facilities must be safe to build, operate, maintain, and dispose of.

Safety issues have potential to arise during construction and post-construction. **Designers of infrastructure must meet their obligations of specific Upstream duties under the Health and Safety at Work Act 2015 (HSWA).**

Specific duties for designers of plant, substances or structures prescribed by Section 39 of the HSWA are:

- *The designer must, so far as is reasonably practicable, ensure that the plant, substance, or structure is designed to be without risks to the health and safety of persons…..*
- *The designer must carry out, or arrange the carrying out of, any calculations, analysis, testing, or examination that may be necessary….*
- *The designer must give to each person who is provided with the design for the purpose of giving effect to it adequate information…..*

Further information about obligations under the HSWA is available from Worksafe including an introduction to Safety in Design.

The Design Report submitted for Engineering Approval and shall include a specific section on Safety in Design and shall describe how the designer has addressed safety. As a minimum Designers should:

- Demonstrate safety at different stages of an asset life and identify controls that are in place to manage potential risks to health and safety.
- Consult with and seek input from Council's asset teams and maintenance contractors in developing designs that will be safe and practical to operate, maintain, and dispose of.
- Include a decommissioning, demolition and disposal strategy

The Design Report shall address health and safety and comment on Safety in Design and shall record what discussions the designer has had with Council staff and contractors.

All parties involved in the design and construction are expected to maintain their obligations and responsibilities under the Health & Safety at Work Act 2015. The Design Report shall confirm this.

3.3 RESOURCE CONSENT

To be granted Resource Consent by Council applicants need to submit several documents for review by Council Planners and Engineers. The following list details some of the documentation that is required to be supplied with any Resource Consent application:

- Assessment of Environmental Effects
- Subdivision Plans (submitted in a format that complies with Section 4 and includes where applicable effluent dispersion fields and locations of existing wells)
- Infrastructure Strategy/Report
- Geotech Assessment (H.A.I.L site details and preliminary site stability investigation)
- Flood Risk Assessments and Finished Floor Level Assessments
- Traffic Impact Assessment
- Road Safety Audit

Resource Consent application documentation requirements depend entirely on the type of works being undertaken to complete the project. When necessary to accurately assess a Resource Consent application, Council Engineers and Planners will request additional design information and supporting documentation.

3.3.1 Design Requirements at Resource Consent stage

A resource consent submission will be supported with a set of plans and documents describing the proposal. Designers should present **concept** designs (refer CIC guidelines for design development) that include required infrastructure in Resource Consent applications.

Below is a brief overview of the design requirements at Resource Consent. For specific details refer to Section 4.

Some important items to clearly show on the resource consent plans are:

- Infrastructure strategy and connection points
- Road carriageway widths
- Detailed Road corridor cross-sections
- Earthwork's strategy (including bulk volume estimation, existing and proposed ground levels, and any required retaining walls)

Plans submitted for Council review should meet the standards set out in Section 4.

Depending on the nature of the proposal Council may require more details to be included in the preliminary plans. If more design details are required applicants will be notified directly. The purpose of this stage of the Resource Consent is to ensure that there are little to no issues occurring at the Engineering Approval stage – where detailed design is reviewed.

3.3.2 Infrastructure Strategy/Report

The infrastructure strategy should be clear - identifying location, connection to Council systems, and critical features (such as means of collection and disposal) to enable Council's engineering team to determine compliance with Council requirements. Council needs to see how the proposed development

will link with its adjoining existing road environment and adjoining new developments. Managing these interfaces is an important consideration for approval.

3.4 TEMPORARY BULK WATER EXTRACTION

Considering the new legislation, while it is still the site Contractor's responsibility to set up water supply for construction activities, the issue of bulk water extraction needs to be considered as part of Engineering Approval. Bulk water extraction might be required for the construction activities such as, vehicle wash down, irrigation, dust suppression etc.

The new legalisation prohibits the use of standpipes on Council owned water supplies.

Where possible Resource Consent holders are expected to obtain their own water from alternative water sources to support construction activities. Permission for water extraction from water races can be applied for and may be granted by the Water Services Team and the use of privately owned water sources (such as an existing well) is permitted so long as ECan regulations are met.

Where an alternative source of water is not available, Resource Consent holders will need to use the property's existing water connection. If the property being developed does not have an existing water connection the Resource Consent holder will need to apply for a new water connection. Applications for new water connections are made online (link here). This new water connection application will be subject to the same terms and conditions (including associated fees) of any new water connection and may be rejected depending on water availability.

Developments located within water schemes that supply on-demand water will need to install a water meter and a Reduced Pressure Zone (RPZ) backflow preventer to draw water from the designated supply point. Meter readings will be taken regularly, and the Resource Consent holder will be charged for water used. To meet the water supply demands of construction activities, Contractors may need to install water tanks with sufficient water capacity.

Developments located within schemes that require the water supply to be restricted will be subjected to restricted water connection fees and be required to install a water tank with air gap separation from Councils reticulated water supply to meet construction phase water demands.

Information supporting bulk water extraction requirements associated with Resource Consent applications is required to be included in the Design Report issued to the Development Engineering Team for Engineering Approval. In principle, the proposal will be approved, or an alternative proposal sought at Engineering Approval. If, for any reason, a development does not proceed to the construction phases of Resource Consent within a reasonable timeframe any approval to complete new water connections issued at Engineering Approval do not over-ride water capacity issues that may be present in the affected water scheme at the time of applying for a new water connection.

RPZ's are required to be calibrated once prior to installation at each new work site and will be required to submit annual calibration certificates to the Development Engineering Team if the RPZ is to remain in place for more than 12 months.

3.5 ENGINEERING APPROVAL

There are two mechanisms used by Council to issue Engineering Approval:

- Letter of Engineering Approval issued by the Development Engineering Manager
- Communication with the Development Engineers prior to construction to set up a pre-start meeting

When Developers are required to communicate directly with the Development Engineers, Engineering Approval will be given by way of communication on site or via email.

When Developers are required apply for Engineering Approval from the Development Engineering Manager an Engineering Document Package is to be sent to Development.Engineer@selwyn.govt.nz.

The application package shall contain as a minimum:

- Engineering plans
- A Design Report addressing the features and performance of infrastructure design and including a technical specification that describes the proposed quality assurance process
- A Producer Statement 1 (Design)
- Copies of resource consents issued by Environment Canterbury
- Supporting information such as geotechnical reports, traffic impact assessment reports, Road Safety Audits and whole of life costs.

The subsections below highlight specific document requirements in more detail.

3.5.1 Design Requirements

Each separate part of the ECOP sets out the design aspects particular to that part which must be covered by the design and design report.

Plans submitted for Engineering Approval should be developed to Detailed Design as per CIC guidelines.

3.5.2 Design Report Requirements

A Design Report is required for any subdivision that will result in more than 5 lots, or that will result in new infrastructure to vest in Council. Applicants shall submit the Design Report to the Council as part of the Engineering approval application package. Figure 3 (shown below) highlights the Engineering Approval process Councils uses.

Engineering Approval is subject to presentation of this report.

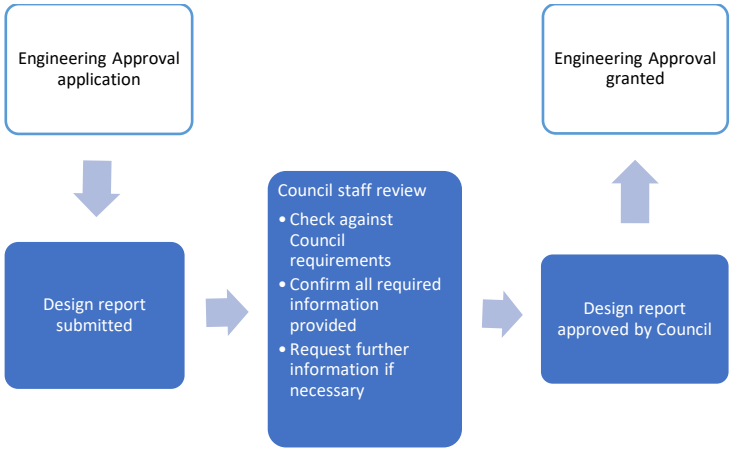

Figure 2 - Design Report approval within Engineering Approval

The purpose of the Design Report (sometimes called the Design Statement) is to provide a written record of the design and its key features, and to demonstrate conformance with Council requirements and good design practice.

The Design Report describes how the proposed works:

- Will perform to meet Council's requirements (and levels of service)
- Will provide efficient, robust infrastructure assets that are safe and cost-effective to maintain and operate
- Comply with management, administrative and legislative requirements
- Fully address Safety in Design
- Have addressed any stakeholder input
- Have been reviewed/tested to ensure compliance with the quality requirements

Additionally, the Design Report should record:

- Design quality assurance activities (including design decisions, peer review and design changes) and key responsibilities and roles
- Design assumptions made by the designer/developer

A suitable Design Report template can be found here.

The Design report shall contain design records, incorporating:

- Drawings
- Calculations
- Specifications
- Material specifications where not detailed elsewhere
- Graphical representations and calculations of infrastructure design

This information should be presented in a way that allows a reader to follow the design development process easily and should allow for replication and checking of the results.

3.5.3 Supporting Information

Over and above the detailed design requirements, applicants are required to supply information that supports their Engineering Approval Application. Supporting information may include (but is not limited too):

- Geotechnical Engineer's report on the suitability of the land for subdivision and/or development, including any site investigations.
- A Design Certificate from a suitably qualified sub- consultant designer to support the submission of the Design Report. Ensure additional information obtained from the sub-consultant designer regarding key achievement criteria or other matters is also incorporated in the Design Report.
- Traffic Impact Assessments
- Traffic Safety Assessments
- Where a departure from the ECOP is proposed (i.e., new, or alternative solutions), Designers are required to include a whole of life cost assessment in their application, included with the Design Report.

3.5.4 Temporary Bulk Water Extraction

If temporary Bulk Water Extraction is proposed, a separate heading is required in the Design Report to demonstrate that all other options have been considered first. See Section 3.4 for more guidance.

3.5.5 Road Naming and Signage

When a new development contains roads, private ways or access lots that require naming the Developer shall submit proposed Road names for Council's consideration (see policy N102 – Road Naming Policy of the Council's Policy Manual for further guidance). Once Road names have been approved by Council the Developer will arrange for the necessary signage to be commissioned and installed at the developer's expense. See policy R430 – Road Name Signs Format of the Council's Policy Manual for further guidance on approved road sign blades.

The Developer is responsible for moving existing signage, where the new work affects its installation.

3.6 CONSTRUCTION GUIDANCE

This section provides guidance on the requirements for construction and completion of Council infrastructure built under land development or capital projects.

Refer to the relevant Parts of the ECOP for technical requirements for each asset type. Where specific guidance is not given in the ECOP, SDC defer to the CCC CSS.

Contractors and developers must carry out construction:

- In accordance with the approved Engineering Approval plans. Any modifications to the approved design shall first be approved by Council.
- In accordance with all other approvals required, including those from other territorial authorities.

3.6.1 Temporary Water Supply for Construction Phase Activities

Contractors are no longer allowed to use standpipes to draw water from Council's water supply for construction activities. Instead, a designated water supply point will need to be installed on site. This can be either a Council issued water connection or an alternative water supply. The details of this supply point will have been approved at Engineering Approval and contractors will need to seek guidance on how to proceed from the Developers Engineer.

See Section 3.4 for more guidance.

3.6.2 Corridor Access Request (CAR)

A Corridor Access Request (CAR) must be approved before any work can be undertaken in the road corridor. Refer to the SDC website for information on how to apply for a CAR through BeforeUDig. This should be done as early as possible.

The application will require applicants to include a Traffic Management Plan (TMP) for approval by Council. Traffic management will be monitored by Council including any remediation/damage incurred by development activities. Council will issue a Works Access Permit (WAP) and will require the following as conditions of granting a Corridor Access Request.

A Works Completion Notice (WCN) will need to be submitted after all works are finished. The WCN shall be accompanied by the following documentation:

- Before and after photos
- Compaction test results where required (or a statement saying why they were not required)
- Pressure test results on all new pipework installed where required (or statement saying why they were not required)
- Asbuilt drawings and information
- A statement that the works comply with the WAP this ECOP, and any other conditions imposed by SDC through the WAP.

To obtain approval of a CAR applicants will also need to provide details of all underground services. Information on underground services is available online from BeforeUDig, and from Council for piped services.

3.6.3 Temporary Traffic Management (TTM)

All temporary traffic management is to be in accordance with Waka Kotahi NZ Transport Agency Code of Practice for Temporary Traffic Management COPTTM https://www.nzta.govt.nz/resources/code-temp-traffic-management/

In general, guidance on Council's approval to temporary traffic management for different types of roads is summarised below.

Table 2 - Temporary Traffic Management Guidance

Road Type (hierarchy)	Council requirements	Comments
Arterial	In accordance with the CoPTTM (Code of Practice for Temporary Traffic Management) Refer https://www.selwyn.govt.nz/services/roads-And-transport/road-corridor-access	Provide and configure Temporary Traffic Management to minimise traffic disruption. Limits on disruptions: In most cases, disruption will not be permitted during peak times (8.30-9.30, and 4.30-5.30), and overnight. Maximum approval period for a TMP is 4 weeks. A separate application must be submitted if works extend beyond this period. Maximum length of road under TTM controls is 200m at any one time.
Collector – urban		Minimise disruption to avoid peak traffic hours. Maximum approval period for a TMP is 6 weeks. A separate application must be submitted if works extend beyond this period.
Collector – rural		Minimise duration of disruption.
Local – urban		Minimise duration of disruption.
Local - rural		Minimise duration of disruption.

3.6.4 Pre-Start Meeting

Construction may not start on site until the Developer has engaged in a Pre-Start Meeting with Council's Development Engineer's. It is the Developer's responsibility to request a Pre-Start meeting by emailing Development.Engineer@selwyn.govt.nz and to secure a meeting appointment.

The purpose of the Pre-Start Meeting is to:

- Ensure all documentation and approvals are in place and Council's records are up to date.
- Clarify any uncertainty, resolve queries, and confirm the lines of communication.

Council will provide a useful information summary sheet to Developers and Contractors at the Pre-Start meeting. Note that this information sheet may be varied to reflect specific project requirements or Council requirements.

3.6.5 Condition of Existing Assets and Infrastructure

Prior to commencing work on site, it will be expected that council receives photo evidence of the state and condition of any existing assets or infrastructure that will be directly impacted by the works to be completed as part of the subdivision. It is expected that no new development will have a negative impact on existing council assets and the photos supplied prior to the construction phase of a development will be used as a benchmark to ensure this standard is maintained. At a minimum council will receive the following photos:

- Road frontage
- All construction accessways that interface with the road
- Roads that will be affected by any road/lane closures

Depending on the nature of the construction phase other photos may also be required. This will be determined on a case-by-case basis.

3.6.6 Required Council Inspections (Hold Points)

Council staff seek to ensure a consistent standard of quality of construction across the district. Council's officers will work with developers, consultants, and contractors to ensure Council requirements are understood and followed. This may include identifying where remedial works are needed. The Development Engineer (Development.Engineer@selwyn.govt.nz) is to be informed of the commencement of work and timing of the following stages to allow the opportunity to inspect the stage of work as necessary:

Council only complete inspections on assets that are going to be vested to Council. Privately owned and operated systems may have a different set of inspections and approvals. Applicants should consult with Council early to agree the appropriate approach to ensure swift approvals.

The list of required Council Inspections for works associated with Resource consents is set out in the Engineering Approval. For guidance on required inspections for works associated with Capital Works projects and Maintenance work please talk to the Council Project Manager.

Unless agreed with the Development Engineering team or the Council Project Manager, these inspections are Hold Points. Once work reaches this stage, construction shall not proceed until Council have inspected the works.

Developers (or construction managers) shall request Council inspections for Hold Points by sending a Request for Inspection notice by email to the Development Engineer or Council Project Manger **at least 2 working days prior** to the inspection being required. Failure to provide this notification may result in Council not taking over the asset or the imposition of extended defects liability periods for the contract works.

Below is a list of the common required inspections of physical works. Council reserve the right to complete other inspections as deemed necessary dependent on the specific works being completed.

Drainage:

- **Prior to backfilling.** In weak ground conditions and/or where a high-water table is present a subgrade inspection may be required along with the observation of testing as deemed necessary.
- **Prior to any manhole Corbels being poured**. Inspections of Corbels can be at Council's discretion.
- **Pressure testing of mains.** Testing needs to be witnessed by an independent. Engineers will be given first right of refusal; however, Council Representatives can be available to witness.
- **Grass strike of swales and basins.** Grass strike should be established on swales and basins prior to 224 where practical. If grass strike has not been established hydroseeding must be in place. This inspection may be undertaken as part of the 224 sign off process.
- **Practical Completion.** To allow inspection of all completed works. This may be undertaken as part of the 224 sign off process.

Roading:

- **Prior to sub-base placement.** To allow an inspection of the subgrade to be undertaken at Council's discretion.
- **Prior to sealing of carriageways or footpaths.** To allow inspection of the basecourse surface.
- **After sealing of carriageways, access ways or footpaths.** This Inspection may be undertaken as part of the S224c sign off process.
- **Practical Completion.** To allow inspection of all completed works. This may be undertaken as part of the 224 sign off process.

Water:

- **Prior to back filling of any water mains.**
- **Pressure testing of mains**. Pressure tests must be undertaken by a qualified and experienced person and independently witnessed. Engineers have first right of refusal; however, a Council Representative can be available to witness.
- **Chlorination of mains**. Chlorination must be undertaken by a qualified and experienced person within the guidelines of SDC Standard Operating Procedure WSP005.
- **Practical Completion.** To allow inspection of all completed works. This may be undertaken as part of the 224 sign off process.

For major works (i.e., pump stations, large stormwater treatment systems, etc.) the Consultant/Construction Manager shall prior to commencement of construction supply a Copy of the Contractor's Construction program, and during the course of the work any significant updates to the program that result. Inspections will need to occur for these major works as outlined in the relevant sections of the Engineering ECOP.

Notification of hold or witness points form part of the Contract Quality Plan required for each development. The developer or contractor must notify the Council at all hold or witness points and such other times as the Council may determine, for Council's information and to enable audits or witnessing to be carried out.

Council should be given at least two working days' notice and adequate access for audits or tests. Audits will be carried out within two working days of notification if possible. The Council will inform the developer of any problems encountered with these audits so they can be addressed at an early stage.

3.6.7 Witnessing Testing of Hold Points

Council witnessing of test points is a critical part of the construction phase to allow the Council confidence when accepting completed assets. The Engineering Approval letter will set out specific hold points/ notice points additional to the general ones above.

Where testing is specified (under this ECOP or in the Engineering Approval letter, or the contract technical specification) successful tests must be witnessed.

- In the first instance all testing must be witnessed by an independent witness (usually the consulting Engineer)
- Approved Council Staff (Development Engineer or Project Manager) can also witness tests as a last resort
- Test documentation must be signed by the witness and provided to Council with the Completion Documents

Any work required to be tested by the contractor or developer in the presence of the Council must be pre-tested and proved satisfactory before test witnessing by the Council is requested. Should Council staff be required to re-visit sites to re-witness testing due to failure of earlier tests, the Council will charge the applicant at hourly rates.

3.6.8 Completion of Construction

Once construction of infrastructure projects is complete, the contractor may apply for Practical Completion as defined in the contract. Alternatively, once construction of subdivisions is complete, the developer may apply for a Section 224 Certificate provided all conditions of resource consents have been met. Refer to the S224 Vetting Sheet when preparing to apply for this.

Both these approvals will require the contractor/developer to provide completion documentation confirming the assets have been constructed in accordance with the approved design, including As-Built plans (refer to Drawing and As-built section of the ECOP).

3.6.9 Expectation of Quality

For subdivision developments Council's role will include monitoring construction performance and standard of construction for assets that will be vested in Council. Standard inspections are specified in the conditions of consent and Engineering Approval. Where Council feels that the quality of construction is below expected levels, and that this risks the finished quality of the asset, it reserves its rights to take further action.

In such instances Council will raise concerns directly with the Developer/applicant directly. If improvements do not eventuate, and issues of concern continue to be raised, Council may take further measures as it sees fit, including suggesting the developer engage suitably experienced contractors to complete outstanding work.

In instances where the developer/applicant is unable to provide assurance to Council of the quality of the constructed asset, Council may withhold the issue of a Section 224 Certificate until such assurance has been provided to the satisfaction of Council.

3.6.10 Remediation of damage to existing assets

Where construction operations result in damage to existing assets including outside the physical works boundaries (such as existing roads, fences, kerb & channel etc) then the developer/applicant shall ensure this damage is remediated prior the application for a Section 224 Certificate. During construction works Council's representatives may identify areas where damage has occurred and bring them to the attention of the contractor onsite and the developer/applicant. Council expects that remediation works will be attended to promptly and effectively.

Council will carry out inspections prior to the Section 224 Certificate issue and will check for damage to existing infrastructure. Delays in completing remedial works are likely to result in delays to the issue of the Section 224 Certificate. Council reserves the right to withhold the Section 224 Certificate until it is satisfied remediation works are completed.

3.6.11 Condition of grass on berms and reserves

Where grassed berms form part of the subdivision works, berms shall have good grass growth established by the time the application/developer applies for Section 224c. No gravel or any other debris shall be dumped on berms, and any such depositions shall be removed before Council will issue a Section 224 Certificate.

Reserves shall be left grassed to a reasonable standard. Where Council is not satisfied with the grass strike, cover or condition of growth, then it reserves the right to withhold issue of a Section 224 Certificate until the reserve lawn has been established to an appropriate standard. As guidance, Council will expect grass growth to be sufficiently established to allow the reserve to be open to the public immediately.

3.6.12 Non-Conformance Reports

Where construction managers, or consultants engaged to monitor/observe site works have cause to issue Non-Conformance Reports (NCRs) pertaining to assets that will be vested in Council at the end of works, they must inform the Development Engineer and provide a copy of all NCRs. In this case, consultation with the Development Engineer is strongly encouraged to ensure Council requirements are being met, and to streamline approval at Section 224 Certificate stage.

The consultant shall record a schedule of all such NCRs issued. All such NCRs issued shall be referenced in the final Producer Statement 4 (Construction Review) and attached as a Schedule as authorised instructions/variations.

3.7 COMPLETION DOCUMENTATION

Upon completion of works for any project completed in Selwyn (subdivision, capital works or maintenance works), the applicant shall provide completion documentation in accordance with this ECOP. This is a requirement for the issue of the Section 224 Completion Certificate (S224c) and Practical Completion. Refer to Section 2.9 and 2.10 for more guidance on the application process for S224c and Practical Completion.

Completion documentation is required by Council to show that all Asset Types to be taken over by Council meet Industry Standards and Council Requirements.

To confirm the works have been completed in accordance with current good engineering practice the consultant who signs off the Engineer's Completion Certificate may require additional testing as appropriate to meet the requirements of this ECOP and any other relevant standards. Records of this are expected to be held by the consultant and to be available on request.

3.7.1 Submitting Completion Documents for 224c Engineering Document Review

All required completion documentation associated with a new subdivision shall be submitted to development.engineer@selwyn.govt.nz for review by the Development Engineering Team to ensure that key standards and requirements have been met. On order to give all applications their due respect and consideration the Development Engineering Team process S224c applications in the order that they are received.

To improve the overall service, it is expected that the Developers Engineer will submit a complete engineering completion documentation package for review. The structure of the document package will match the sections of the S224c Vetting Sheet and documents shall have the following naming convention:

RCXXXXXX – Section Name

Within five working days of the application being lodged the application will be reviewed for completeness against the Resource Consent and Engineering Approval conditions. **This step is for vetting purposes only and is not a complete engineering review of the documents.**

Incomplete applications are one of the biggest pinch points when issuing S224c and it is the purpose of this step to minimise that hold up. During the vetting process if the application has all the necessary documents for review the applicant will be notified that their application has been accepted. It is at the discretion of the Development Engineering Team to accept S224c engineering document applications that are incomplete, however, the applicant will be required to give suitable justification.

Note that **S224 applications will not be accepted if they are received before the S224 inspection of physical works has been completed and S224 inspections will not be completed until practical completion has been issued.**

If an application is not deemed acceptable it will be returned to the applicant with a brief description of what is required for re-submission.

3.7.2 Required Completion Documentation

The amount and type of completion documentation required for 224 will depend on the nature of works completed under the Resource Consent. The list below shows the full list of required Completion documentations:

- Completion certificates (PS3 and PS4 Statements).
- As-built plans and information (Section 4)
- The geotechnical reports, certificates and as-built records required by this ECOP
- Asset type specific completion documentation
- A full up-to-date Environment Canterbury compliance monitoring report for any resource consents, which indicates no significant or major non-compliance.
- Evidence of a complying post construction safety audit for works on or becoming legal road as agreed with Council.
- Completion documentation required by Part 9: Utilities & Lighting.
- As-built data and asset schedule where required by the subdivision consent or contract, for all infrastructure taken over by the Council, in the format outlined in this ECOP
- Project and contract records, e.g., inspection and test plans, non-conformance reports.
- Other documentation required by the Council including, but not limited to, operation and maintenance manuals and warranties for stormwater treatment facilities and new facilities involving electrical or mechanical plant; asset valuations for all infrastructure to be taken over by the Council.
- Bond information

Please refer to each individual section of the ECOP for detailed Completion Documents requires associated with each asset.

3.8 DEFECTS LIABILITY

The purpose of the Defects Liability Period is to allow for the potential for asset failure due to construction or design defects to emerge and be rectified by the Developer.

Council will take a bond (refer Defects and Maintenance Bonds) for the duration of the Defects Liability period.

For projects where the construction process has presented risk, Council may record specific areas for close observation during the Defects Liability Period and may adjust the Defects Liability bond to reflect this. Examples of projects that present risk:

- Where Council inspections have been missed
- Repeated instances of failed inspections
- Construction in unfavourable conditions (such as inclement weather for road sealing)
- Late or incomplete QA records supplied to Council
- A change in contractor during construction
- A high number of Non-Conformance Records (NCRs)

Council will make sole determination of what work may be addressed under the Defects Liability period. Generally, no incomplete or defective work will be accepted for completion under Defects Liability.

3.8.1 Defects Liability Duration

The Defects Liability Period will be included in the Conditions of Engineering Approval. The defects liability period shall commence from the date of issue of the 224 certificate. The standard periods of defects liability outlined below in Table 3.

Table 3 - Defects Liability Period

Asset Type	Defects Liability Period
Roading, Water, Stormwater and Sewer reticulation	1 year
Pump stations Stormwater basins devices and management areas Landscaping and reserves including irrigation	2 years
Lighting (administered by Connetics)	1 year

The minimum acceptable defects liability period shall be 12 months for all contract works.

3.8.2 Release of Defects Liability

At the end of the Defects Liability Period the developer/applicant shall apply to the Council for the release of the Defects Liability Certificate.

The release of this Certificate will allow the Council to accept transfer of the resource consents from ECan and will also allow the release of Defects Liability bonds if these are being held by Council.

It is the developer/applicant's responsibility to apply to the Council at the end of the Defects Liability Period to request a final inspection, and to request the Release of Defects Liability. Applications shall be made at least one month in advance of the expiry of the Defects Liability Period.

Once Council have completed the final inspection, it will either:

- Issue a list of defects for rectification, or
- Issue a letter confirming acceptance of the built works, and authorising transfer of consents and bond monies.

The Developer shall be responsible for contacting Council to apply for release from the Defects Liability Period. This application shall be made by emailing development.engineer@selwyn.govt.nz and arranging a joint inspection between the Consultant, Contractor and Council Staff.

This is required within one month of the expiration of any defect's liability period, unless agreed otherwise, to determine the acceptability of the works to Council and to ensure defective works previously identified by Council staff have been satisfactorily repaired. Once Council is satisfied it will issue a Release Letter to the Developer confirming the release from the Defects Liability period.

The developer/applicant shall maintain landscaping works until they are formally taken over by the Council or to a date specified in a bond for completion of uncompleted works. The developer must also remedy defective works, as defined in NZS 3910, over this period. Establish and maintain landscaping, in accordance with CSS: Part 7 clause 14.0 - Establishment, over this period or until the landscape establishment bond is released.