

PART 2: GENERAL REQUIREMENTS

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2.1 REFERENCED DOCUMENTS

Planning and Policy

- The Selwyn District Plan (*District Plan*)
www.selwyn.govt.nz/services/planning
- Resource Management Act (RMA) (1991)
- Building Act (2004)
- Local Government Act (2002)
- Health and Safety in Employment Act (1992)
- New Zealand Building Code (1992)
- Selwyn District Council Long Term Council Community Plan – *Selwyn Community Plan 2009-2019*
www.selwyn.govt.nz/council-info/selwyn-community-plan

Design

- Christchurch City Council *Waterways, Wetlands and Drainage Guide, Ko Te Anga Whakaora mö Ngä Arawai Rēpo* (WWDG) (2003)
- NZS 3910: 2003 *Conditions of contract for building and civil engineering construction*
- NZS 4404: 2004 *Land development and subdivision engineering*
- AS/NZS 1100.101: 1992 *Technical drawing - General principles*
- AS/NZS 1100.401:1984 *Technical drawing - Engineering survey and engineering survey design drawing*
- United States National CAD Standard
www.buildingsmartalliance.org/ncs

Construction

- Christchurch City Council *Civil Engineering Construction Standard Specifications Parts 1-7 (CSS)*
<https://ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications>

Where a conflict exists between any Standard and the specific requirements outlined in the Infrastructure Design Standard (COP), the COP takes preference (at the discretion of the Council).

2.1.1 Source documents

This Part of the Engineering Code of Practice (COP) is based on Part 2 of the CCC *Infrastructure Standard* (IDS), by agreement and with the consent of Christchurch City Council.

The IDS is also based on Part 1 of NZS 4404:2004 by agreement between Christchurch City Council, and with the consent of Standards New Zealand.

2.2 INTRODUCTION

The COP serves as a basis of compliance for projects carried out by the Council as part of its capital works programme, as well as the subdivision and development of land, where these activities are subject to the *Resource Management Act*.

This Part of the COP includes both those components of the design process common to all developments or not restricted to one asset type and those components particular to the subdivision of land.

The provisions of the Infrastructure Design Standard must be read subject to the provisions of the *Selwyn District Plan* and to any applicable statutes, regulations and bylaws.

2.3 RELATIONSHIP WITH ACTS OF PARLIAMENT

2.3.1 Resource Management Act

The Resource Management Act is the principal statute under which the use and subdivision of land is controlled.

The *Selwyn District Plan* is a resource management instrument with the purpose of achieving the promotion of sustainable management of natural and physical resources, which is the overarching purpose of the *RMA*.

The COP serves as a technical compliance manual and, although outside the *District Plan*, its provisions are referred to and given effect through conditions of resource consent and through capital works' project briefs.

2.3.2 Building Act

The *Building Act* provides a national focus for building control to ensure that buildings are safe and sanitary and have suitable means of escape from fire, and the *Building Regulations* made under the Act provide the mandatory requirements for building control in the form of the *New Zealand Building Code*. The *Building Code* contains the objective, functional requirements and performance criteria that building works must achieve.

Where infrastructural development associated with capital works and the subdivision or development of land involves the creation of structures with associated site works, observe the requirements of the *Building Act*. Nothing in the COP shall detract from the requirements of the *Building Act* or the *Building Code*.

2.3.3 Local Government Act

The mechanism for requiring contributions under the *Local Government Act*, through land or cash, is set out in the *Long Term Council Community Plan*.

2.4 DETERMINING REQUIREMENTS FOR CONSENTS

The design and construction of utilities carried out as part of a land development or subdivision is controlled by the subdivision and the building consent processes.

The *Building Act* Part 1 Section 8 includes within its definition of a building “a mechanical, electrical or other system” but only if the system is attached to a temporary or permanent movable or immovable structure and “the system is required by the *Building Code*, or if installed, is required to comply with the *Building Code*.” The provision of water, stormwater and sewer reticulation within private land, e.g. an access lot or new access, therefore requires consent under the *Building Act*. Evidence of compliance is provided by obtaining a building consent, carrying out the works in accordance with that consent and the issue of a code compliance certificate by the Council.

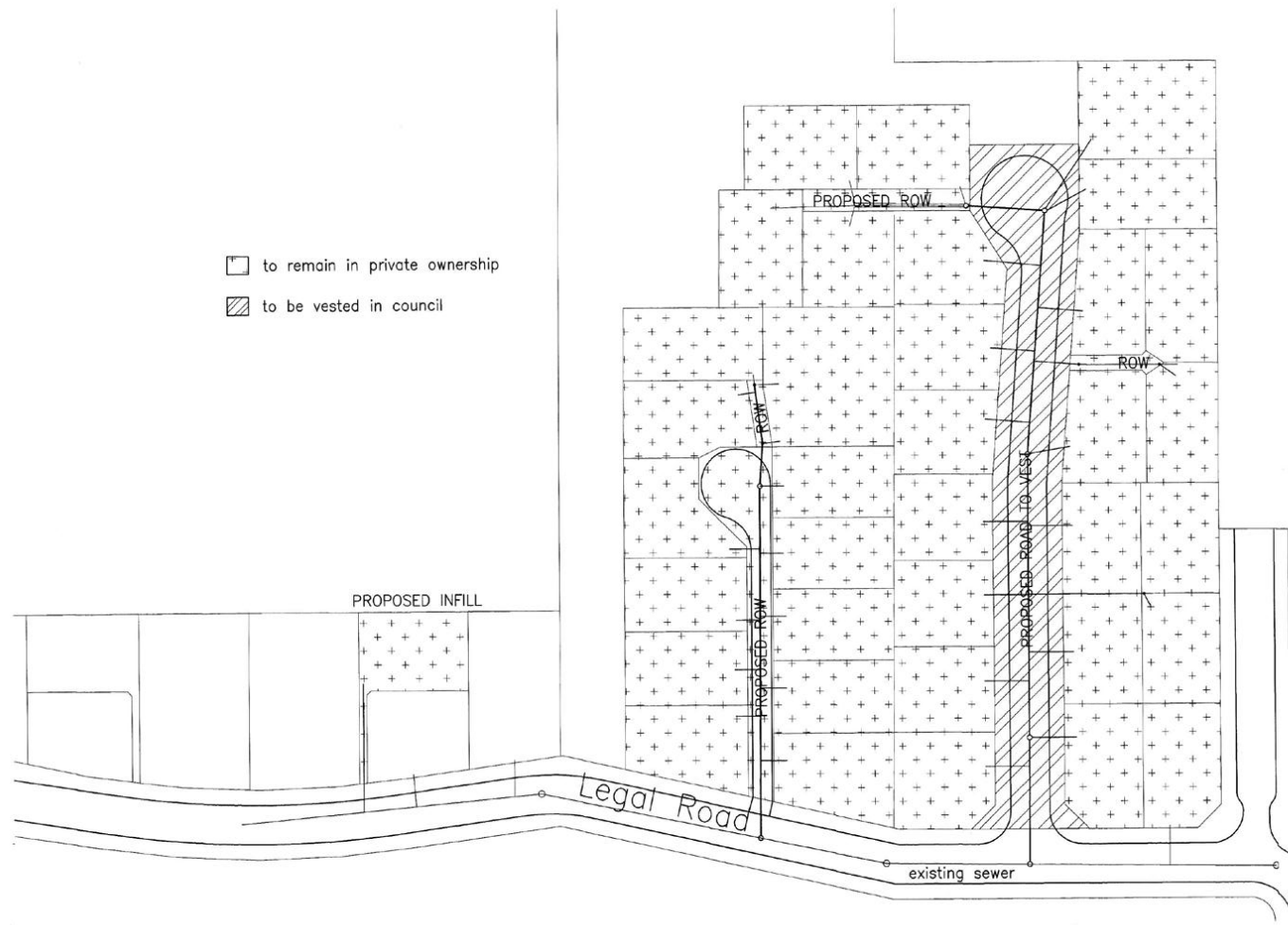
The Council will accept the COP as an alternative design solution under a Building Consent but only for reticulation which is not covered by an acceptable solution in the *Building Code*. This enables the COP to be used to design both private and public systems, removing inconsistencies in standards between these ownership types.

Systems owned or operated by a network operator (e.g. the Council) that are external to a building and are connected to, or intended to be connected to, the building to provide for the successful functioning of the network utility operator’s (NUO) system in accordance with the system's intended design and purpose are not included in the definition of a building and therefore are exempt from the provisions of the *Building Act*. Authorisation to carry out this work is provided through the conditions of a subdivision consent. Evidence of compliance is provided through certification in accordance with Part 3: Quality Assurance.

[Figure 1](#) indicates those parts of a subdivision that remain in private ownership and therefore would be covered by a building consent, and those covered by the subdivision consent and through this the requirements of the COP. This diagram applies equally to infill, unit title, greenfields or brownfields development.

Where subdivision work involves sewer, water and stormwater works on private rights of ways, providing all 100mm diameter sewer work is completed by a registered drainlayer, then the works may not require a building consent for these works, where agreed by Council.

Figure 1 Relationship between public and private ownership



As shown, water, sewer and stormwater reticulation and systems of any size installed in private land will typically remain private. Where it is intended that assets on private property are to be vested in Council a written request shall be made when the resource consent application is applied for. Appropriate easements in gross in favour of Council shall be provided for vested assets in private property and approval given. Preferably plans for approval shall show the demarcation point between private and public assets. The only exception to the requirement for private reticulation to be installed under a building consent is for a lateral laid from a main 600mm into a lot. The portion which is private i.e. the 600mm over the legal boundary and within the lot, does not require installation under a building consent.

2.5 EXPANDING ON DISTRICT PLAN REQUIREMENTS

2.5.1 Fees

The Council has a set scale of fees covering most types of subdivision application. Applications are not accepted without the fee being paid. For those types of application not covered by the scale of fees, a deposit is required. The balance of the full cost of processing the application is payable after the release of the Section 224(c) certificate.

2.5.2 Pre-application meeting

Developers and designers of “greenfields” subdivisions that will result in substantial infrastructural assts being vested in the Council, or smaller complex subdivisions for example those on the hills, are strongly advised to request a pre-application meeting at which issues and options can be discussed with the Council.

Submit a concept plan before this meeting.

2.5.3 Future development

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 or project brief.

2.5.4 Balancing landform choices

The final choice of landform for a development is dependent on many factors, which may be specific to the particular site. These include the:

- relationship with surrounding landscapes.
- natural drainage patterns.
- size of the development.
- proposed and existing roading patterns.

- preservation of natural features.
- enhancement of natural features where 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 order of importance of these factors will vary from project to project.

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. Also refer to clause 4.6.1 – Suitability of landform (Geotechnical Requirements).

2.5.5 Subdivision Lot Formation

No allotment filling is to be placed above the existing ground levels of neighbouring properties nor a cutting below existing neighbours unless there is written agreement with the neighbouring property owners and Council. Where written approval is obtained to extend fill into neighbouring properties satisfactory arrangements must be made for the grading of the fill onto the land without ponding. Where approval is obtained to cut below neighbouring properties agreement shall be obtained on type of retaining structure.

The minimum finished grade of the lots shall be 1 in 300 and the lot shall be graded to ensure there will be no ponding on the lots. The grade shall run down to the street kerb and channel or to the drainage system for rear lots.

2.5.6 Environmental considerations

The Council has policies designed to protect and enhance the District's natural environment. It also encourages parties to retain and enhance the natural environment in tandem with development works. When carrying out a design, evaluate its overall impact on the environment for both the construction and operational phases, consistent with legislation and the *District Plan*.

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 the Historic Places Trust beforehand.

Wherever possible, avoid environmentally significant areas. Some examples of these areas include:

- stands of native vegetation, bushland, habitats of threatened native species.

- waterways and floodways.
- wetlands, swamps, estuaries, sand dunes, foreshore areas.
- heritage item precincts and protected trees.
- Maori relics and significant indigenous sites.
- landfill sites and contaminated land.
- areas of aggressive ground conditions, e.g. acid sulphate soils and aggressive ground waters.

Wherever it is not possible to avoid environmentally sensitive areas, consider 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;
- issues raised in Part 4: Geotechnical Requirements.

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.

2.5.7 Road name signs

When the development contains new roads, private ways or access lots that require signage, the developer will arrange with Council for the manufacture and erection of any new nameplates and posts. The developer is responsible for moving existing signage, where the new work affects its installation.

2.5.8 Development Contributions

Council's Development Contributions Policy for new subdivisions is detailed in Volume 2 of Selwyn District Council Long Term Council Community Plan - Selwyn Community Plan 2009-2019 www.selwyn.govt.nz/council-info/selwyn-community-plan.

Where there is an agreement in place for Council to make a financial contribution to a part of the physical works then these shall be clearly identifiable and separated in contract tenders. After a contract is tendered and before works commence, Council's calculated share of these works shall be submitted to Council for prior approval along with supporting details such as tendered rates and prices. When a claim is submitted to Council for its contribution to a part of the works then these shall be clearly identifiable and separated on any pricing schedule. If the scope of the work

that was originally agreed that Council may be contributing to needs to be changed, then Council must be advised and its approval sought for any changes including the cost variations that may arise.

Subdivision roading development contributions must be received prior to 28 February in order for the related work to be considered for inclusion in the next financial year's Annual Budget if Council funding is being requested. Council is more likely to agree to a contribution for "minor works" in the year as above if they have a lower funding requirement. But for "major works" these may need to be included in Council's Long Term Council Community Plan which covers a 10 year period. This is the period when new "major works" associated with the development contribution is expected to be constructed by. Generally Council will where possible accumulate contributions from adjoining subdivisions to ensure that larger more cost effective work contracts are used and this may affect the timing of any future proposed works.

2.6 REQUIREMENTS FOR DESIGN AND CONSTRUCTION

2.6.1 Investigation and design

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

- are experienced in the respective fields;
- hold appropriate membership in the respective professional bodies;
- have appropriate professional indemnity insurance.

The provisions of the COP do not reduce the responsibility of those professionals to exercise their judgement and devise appropriate solutions for the particular circumstances of each development or project.

2.6.2 Construction

All works carried out in any development must be done by persons who:

- have the appropriate experience in the relevant areas;
- have the appropriate equipment;
- are approved for that type of work e.g. authorised drainlayers, authorised water supply installers, landscapers, building contractors, Site Traffic Management Supervisors. Refer to www.ccc.govt.nz/doingbusiness/approvedcontractors/ for details. (Contractors working in Selwyn District who are not on the City Council list should check with the Water, Wastewater and Roads and Transport section of Selwyn District for approval or the Selwyn District Council website).
- meet the requirements of the Health and Safety in Employment Act. Sanitary drainage and stormwater work not to be vested in Council as public drains and is within a private right of way is to comply with the *Building Code* and the work is

to be undertaken by a registered drainlayer. Council reserves the right to approve the contractor for drainlaying or water supply work where the work is to be vested in Council. It is advisable to check with Council that the contractor meets Council requirements for the work.

- connecting to Council's water supply reticulation is required to be carried out under the supervision of Council's water supply contractor.

All construction must comply with the requirements of the *Construction Standard Specifications*.

For subdivisions of more than 10 lots or capital projects erect Notice Boards, complying with *CSS: Part 1* clause 6.0 – Notice Boards, at construction sites. Where work is being carried out on behalf of other parties e.g. land development or subdivision, include the developer's name in place of the Selwyn District Council name and logo on the signs.

2.6.3 Quality assurance

All quality aspects of the investigation, design and construction must comply with Part 3: Quality Assurance. If any or all of the certificates or other documents referred to in Part 3: Quality Assurance are not supplied, the Council may refuse to accept the work and refuse to issue the certification of the work pursuant to Section 224(c) of the *RMA*.

2.7 SURVEY REQUIREMENTS

2.7.1 Level datum

The level datum used is in terms of the Lyttelton Datum 1937. Existing LINZ bench marks and levels need no adjustments.

No assumed datum shall be used on any Engineering drawings.

2.7.2 Benchmarks

Establish a permanent benchmark where required by the Council as a condition of subdivision consent or as part of a project brief for capital works. As a general rule, a permanent bench mark will be required when, in the case of a subdivision, there is an extension to the Council's sewer, water, stormwater or roading network resulting in a distance of more than 650m from an existing permanent bench mark.

Benchmarks must be accurate in the vertical plane to two decimal places with an accuracy of $\pm 15\text{mm}$ to the origin of the level.

Provide the following documentation:

- a finder diagram showing the reduced level to three decimal places e.g. 13.225, 13.250;

- certification from a Licensed Cadastral or Registered Professional Surveyor (a sample certificate is provided in Appendix III – Benchmark Certificate);
- the methodology used e.g. differential levelling, GPS.

2.8 DRAWINGS

Engineering drawings must be legible, clear, readable and complete. They must clearly illustrate the proposal and enable both assessment of compliance with the COP and accurate construction. Produce drawings on ISO - A series format. Follow the draughting requirements attached in Appendix I - Standard Draughting Layout and Format Requirements and detailed in *AS 1100.101 Technical drawing - General principles* and *AS 1100.401 Technical drawing - Engineering survey and engineering survey design drawing*. Follow the CAD rules for electronic draughting requirements set down in Part 12: As-Built.

Engineering drawings generally include the following:

- A locality diagram giving the overall layout and location of the works;
- Detailed drawings, longitudinal sections, cross sections and diagrams of the proposed developments and/or works;
- Special details where the standard drawings are not sufficient;
- Benchmarks at a maximum spacing of 650m;
- A north point, preferably pointing above the horizontal (i.e. in the top 180 degrees);
- Standard sheet notes, referring particularly to CSS;
- Set out information;
- A service legend, where services are shown on the drawing;
- A planting key or clearly labelled planting, where it is shown on the drawing.

If the project is large, provide a separate landscape and irrigation drawing. On smaller projects, landscaping details may be shown on the engineering drawings. In both cases, show landscape planting areas on the roading construction drawings, by shading or patterning.

2.8.1 Content of drawings

Show the following information on the drawings:

- The extent of the works showing existing and proposed roads, and the relationship of the works with adjacent works, services and/or property, including adjacent property levels;
- Proposed and existing property boundaries and street numbers;
- Significant existing vegetation to be removed and any special or protected trees, and any areas of heritage significance that may be affected by the works;

- The extent of earthworks, including earthworks on proposed reserves, existing and proposed contours, areas of cut and fill, batter slopes, proposed stockpiles, subsoil drainage, erosion and sediment control measures both temporary and permanent;
- Details and location of existing and proposed stormwater primary and secondary flowpaths;
- The design of proposed roads (and their connections with existing roads), including plans, longitudinal and cross sections, horizontal and vertical geometry and levels, typical cross sections, details of proposed pavement and surfacings, kerbing, berms, footpaths, cycleways, tree planting, road marking and signage and all other proposed street furniture;
- Details and location of existing water, wastewater and stormwater mains and service connections, valves, hydrants, manholes, sumps, bends, tees, thrust blocks, meters and backflow devices;
- The horizontal and vertical alignment and location, including invert levels, physical grades, lengths, sizes, materials, types, minimum cover, cut to invert, position relative to other services of all proposed water, wastewater and stormwater mains and service connections, valves, hydrants, manholes, sumps, bends, tees, thrust blocks, meters and backflow devices, and services that may be reconnected or plugged;
- Details and location of mechanically restrained portions of pipelines, pipeline bridges, pumping stations, reservoirs, intake and outlet structures, headwalls, swales, basins, ponds and the location of surface obstructions, hazards, or other features that may be affected by the works;
- In respect of water mains - chlorination points, pressure reducing valves with upstream and downstream design pressures;
- The street lighting layout showing the location and type of each light, proposed and existing significant road features (e.g. kerbs, property boundaries, planting and traffic management features) and property addresses;
- Details and location of existing and proposed telecommunications, electricity and gas supply, including proposed underground and above-ground junction boxes, transformers and similar equipment;
- The bedding and backfill depths, design compactions and trench restoration details for all underground services;
- Details of proposed landscaping of roads and allotments, and details of proposed reserve development including earthworks, landscaping features, landscaping structures, tree planting, irrigation, hard and soft surface treatment, park furniture and playground equipment. Include details of the ongoing maintenance requirements in accordance with Part 10: Reserves, Streetscape and Open Spaces Section 10.9.2.

This information may be expanded in the relevant part.

2.8.2 Form of drawings

Provide all drawings in paper form. Normally drawings should be supplied as full size prints to allow 'as-built' drawings to be checked with the supplied Autocad files for record keeping.

Water supply drawings and streetlighting drawings must be legible at A3 size. Streetlighting drawings can be either 1:500 or 1:1000 scale.

Prepare electronic drawings in a format that is compatible with AutoCAD and other specified formats, suitable for later addition of as-built information and inclusion in the Council's asset map base. See Section 12 As-Builts for drawing requirements.

2.9 ACCEPTANCE OF DESIGN

This clause applies to works carried out under subdivision consent.

2.9.1 Documents to be submitted for engineering acceptance

The Council will require a separate design report to be submitted for subdivisions of greater than 10 lots generally. Clause 3.3.2 – Design report (Quality Assurance) sets out in detail what is required in a design report.

Submit the design records, incorporating drawings, calculations, specifications, material specifications where not detailed elsewhere, graphical representations and calculations of infrastructure where requested, with the design report. This information should enable the process to be followed easily and should allow for replication of the results.

Include the geotechnical engineer's report on the suitability of the land for subdivision and/or development, including any site investigations.

Each separate part of the COP sets out those aspects particular to that Part which must be covered by the design or design report, where relevant.

The design report may be submitted in draft form initially as this will allow for comment by Council before a final design report is provided and accepted.

2.9.2 Cost benefit or life cycle costing

Where required by the Council, carry out a cost benefit or life cycle costing of a proposal. This will typically be for larger or unique projects or where new technologies or materials are introduced.

Life cycle costing may be used to consider options within a proposal or a proposal as a whole. In undertaking life cycle costing, consider the initial costs borne by the developer or the Council and the maintenance and replacement costs borne by the future owners and/or the Council. Maintain a reasonable balance between these short-term and long-term costs.

2.9.3 Engineering acceptance

When it is satisfied that the design and design report meets the requirements of the COP, the Council shall notify the designer that the design and Design Report has been accepted. For the purpose of this acceptance, the Council may require amendments to any quality plans, engineering drawings, specifications and/or other documentation and further reports submitted. In considering the design and design report and giving its acceptance, the Council shall act without undue delay.

2.10 APPROVAL OF CONSTRUCTION

Work must not commence on site unless and until:

- A resource consent for the work has commenced, except when no such consent is required;

- The Council has given engineering acceptance for works carried out under a subdivision consent;
- The Council has accepted the Contract Quality Plan and Engineer's Review Certificate as detailed in clause 3.3.3 - Contract Quality Plan (Quality Assurance);
- Any other consent required has been granted e.g. NZ Railways Corporation, Environment Canterbury, Department of Conservation, landowner.

Work may commence in specific circumstances after a consent is issued and the other conditions are not met by agreement with Council. In these circumstances the developer will need to undertake the work wholly at their own risk as there is no guarantee that the other conditions or final acceptance by Council will occur.

2.10.1 Notification of hold or witness points

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.

Give the Council 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.

2.10.2 Testing

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.

2.11 COMPLETION OF LAND DEVELOPMENT WORKS

2.11.1 Defects liability

The defects liability period for all works excluding stormwater must be 12 months from the issue of the Practical Completion Certificate. For stormwater, a period of 24 months is required or the period set down in the consent. Maintain the 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.

2.11.2 Completion documentation

Upon completion of all subdivisional developments, provide completion documentation in accordance with Part 3: Quality Assurance. Additionally, provide evidence that reticulation and plant to be taken over by network utility operators has

been installed to their standards and will be taken over, operated and maintained by the network utility operator concerned.

Completion documentation includes, as a minimum:

- completion certificates as per Part 3: Quality Assurance appendices;
- the geotechnical reports, certificates and as-built records required by Part 4: Geotechnical Requirements;
- an up-to-date Environment Canterbury compliance monitoring report 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 11: Lighting;
- as-built records of all infrastructure, where required by the subdivision consent or contract, showing the information required by each Part;
- as-built data, where required by the subdivision consent or contract, for all infrastructure taken over by the Council, in the format outlined in Part 12 – As Builts;
- 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;

When all the conditions of approval that are imposed on a resource consent for subdivision have been met, the Council will issue a Section 224(c) Compliance Certificate to that effect.

2.11.3 Approval of uncompleted work

Where in the opinion of the Council it is appropriate, the Council may approve uncompleted work, subject to satisfactory bonds being arranged.

2.12 BONDS

A bond template is available in Appendix IV – Bond Form.

2.12.1 Uncompleted works bonds

Bonds to cover minor uncompleted works, especially where a subdivision or development has been substantially completed, are recognised as an acceptable procedure and will be permitted at the discretion of the Council, except that acceptance of a bond for uncompleted works shall not be unreasonably withheld.

Part 2: GENERAL REQUIREMENTS

Council may consider bonding the establishment of planting, lawns and associated works as uncompleted works. Refer to clause 10.9 – Establishment (Reserves, Streetscape and Open Spaces) for further information.

Bonds must be secured by an appropriate guarantee or must be in cash and lodged with the Council. Where necessary bonds must be executed and registered.

The amount of the bond shall be the estimated value of the uncompleted work plus a margin to cover additional costs estimated to be incurred by the Council in the event of default.

APPENDIX I STANDARD DRAUGHTING LAYOUT AND FORMAT REQUIREMENTS

Provide drawings to a minimum standard that complies with *AS/NZS 1100.101* Technical drawing - General principles and *AS/NZS 1100.401* Technical drawing - Engineering survey and engineering survey design drawing. Electronic drawings complying with the *United States National CAD Standard*, used in conjunction with *AS/NZS 1100* are also acceptable and further requirements are outlined in Part 12 – As Built.

1 Drawing base data (existing topography)

Draw existing features in a lighter line thickness e.g. 0.18mm or 0.25mm. Draw standard draughting symbols un-shaded for existing features e.g. □. All drawing data shall be drawn in New Zealand Transverse Mercator 2000 projection for any electronic plans provided to Council.

2 Drawing proposed work

Draw proposed work in a heavier line thickness e.g. 0.35mm and thicker. Use the same line type, to enable clear differentiation between existing features and proposed work. Draw standard draughting symbols filled in for proposed features e.g. ■.

3 Labelling

Draw text at the suggested minimum heights in Table 1. Do not use the pen colour yellow for any test label or line feature.

Table 1 Minimum text heights

Titles and drawing numbers	5mm
Subtitles, headings, view and section designations	3.5mm
General notes, material lists, dimensions	2.5mm
Road name	7mm
Side road	5mm
Existing property levels	1.8mm
Buildings	3.5mm

Notes: 1) This table is derived from AS/NZS 1100.101: 1992 Table 4.1.

Differentiate between existing features and proposed features by using different formatting:

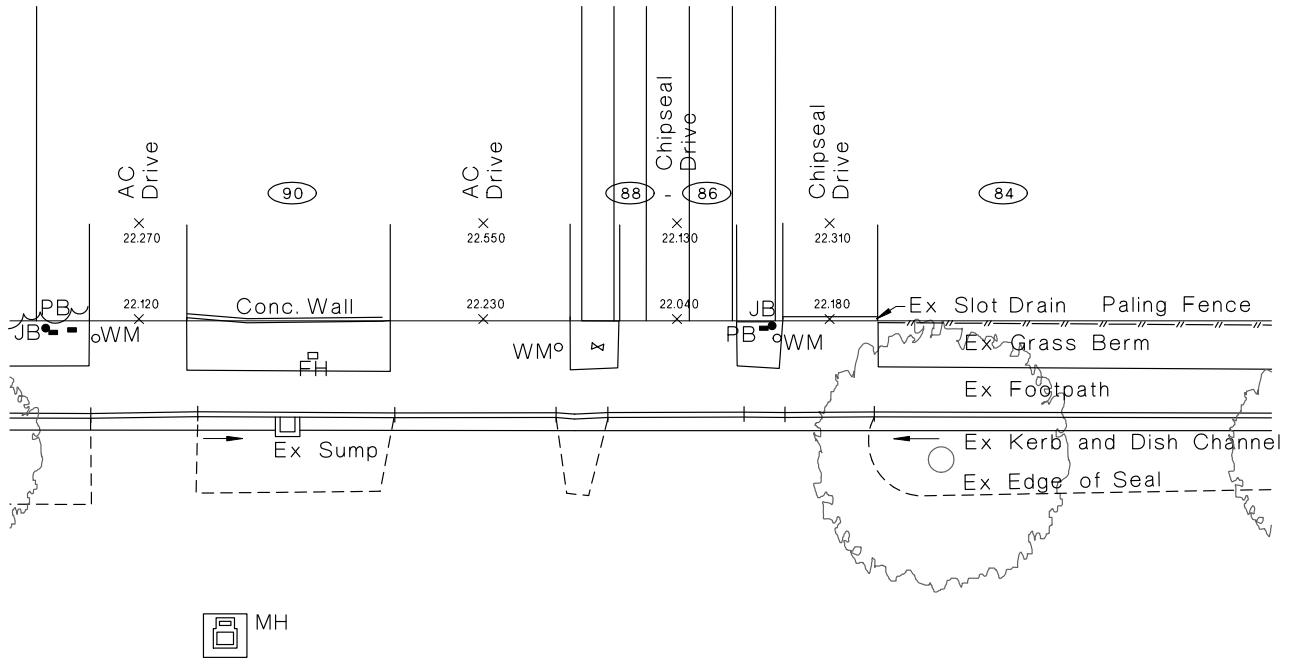
- lower case or upper case;
- normal format or bold format;
- 0.25mm pen weight or 0.5mm pen weight.

Use the abbreviations in [Table 2](#).

Table 2 Feature abbreviations

Asphaltic concrete	AC
Edge of seal	EOS
Tangent point	TP
Curve Tangent point	CTP

Figure 2 Labelling existing street features (1:200 scale)



Place road names above the north road boundary but not through section boundary lines. Show spot levels on the legal boundary and at least 3.0m inside the abutting private property.

Use standard symbols for trees, lights, service covers and boxes. Typical symbols are shown in the example drawings in section 14 of this appendix. Draw symbols to true scale. Typical abbreviations are shown in [Table 2](#), [Table 3](#), [Table 4](#) and [Table 7](#).

4 Underground services

Use either the line types set out in [Figure 4](#) or those detailed in Table 2.2.1b of AS/NZS 1100.401. Label all high voltage cables and all fibre optic cables.

Figure 3 Service legend

SERVICES LEGEND	
SEWER	— . — . — . — . — . — .
WATER	— .. — .. — .. — .. — ..
STORMWATER	— ... — ... — ... — ...
ORION	— — — —
GAS	— G — G — G —
TELECOMS	— — — —

Label all utility structures or boxes. Label water meters (these include the backflow preventers installed as part of the connection on each side).

Table 3 Service abbreviations

Water meter	WM
Fire hydrant	FH
Power box (above-ground)	PB
Power pole	PP
Sluice valve	SV
Gate valve	GV
Pressure reducing valve	PRV
Backflow preventer	BFP

Note: 1) Label telecommunications boxes, manholes and pillars to suit the development

5 Drainage

Label all stormwater and sewer pipes with pipe size and flow direction, using similar terminology to that used by the manufacturer to code or classify the pipe e.g. label a 225 diameter stormwater pipe as Ø225 RCRR Class X stormwater or DN225 u-PVC stormwater. Show sewer laterals.

For major pipes 750mm and above, show the outside width of the pipe and manholes, as the manhole lid may not be on the pipe centreline. Show the actual shape of special manholes.

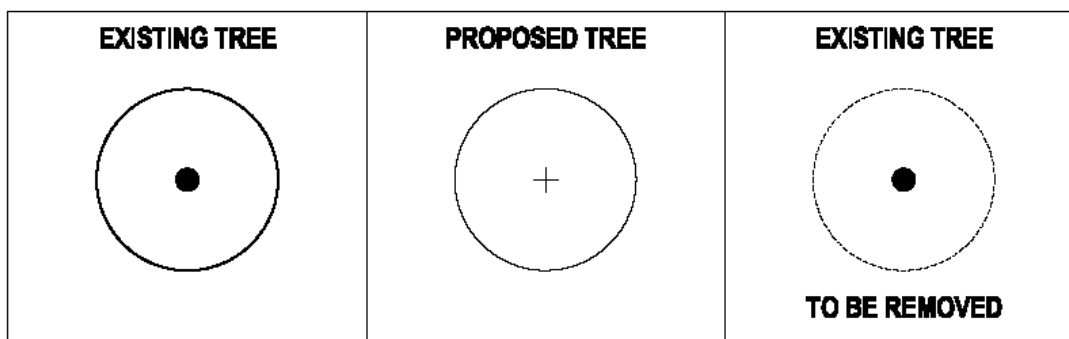
Label all sumps and manholes with the structure identifier e.g. MH with a unique letter and sump abbreviation with a unique number. Structures that are not affected by the work do not require a unique letter or number. Start at one end of the project and number or letter continuously through. Where an existing sump is being modified, draw the proposed sump over it. Label any structures that are being altered in height.

Table 4 Drainage structure abbreviations

Single Sump	SS
Double Sump	DS
Triple Sump	TS
House Drain Sump	HDS
Hillside Sump	HS
Corner Sump	CS
Manhole	MH
Inspection Chamber	IC
Flush Tank	FT
Flush Manhole	FM
Air Gap Separator	AGS

6 Landscape

Show existing trees, including those to be removed and retained, as well as proposed trees, using the symbols in Figure 4. Label any heritage or protected tree(s). Distinguish existing vegetation from proposed vegetation. Show the full canopy of existing trees that will be retained.

Figure 4 Landscape draughting symbols

Cross reference all other related drawings, including irrigation or lighting. Show underground services and street light locations on planting drawings.

All planting drawings must have a plant list. The plant list must include the botanical name, common name, container size and/or height of plant at time of planting and the quantity. The plant list can also include any abbreviations used, planting centres (plant spacings) as detailed in Figure 5 and any special maintenance requirements to retain the initial concept i.e. hedge heights, park furniture treatments. Where there is a separate plant list for trees only, cross reference any other plant lists/drawings.

Figure 5 Typical plant list

ABBREV.	BOTANICAL NAME	COMMON NAME	SIZE	CTRS	QTY.
Aca m/c	Acaena microphylla	scarlet bld bld	Pb5	600mm	14
Ane les	Anemantele lessoniana	wind grass	Pb5	600mm	63
Car tes	Carex testacea	sedge	Pb5	600mm	266
Cor aus	Cordyline australis	cabbage tree	Pb18	n/a	8
Iso nod	Isolepis nodosa	knobby clubrush	Rx90	600mm	22
Jun pal	Juncus pallidus	rush	Rx90	600mm	5
Pho coo	Phormium cookianum	mountain flax	Pb5	600mm	30
Pho CF	Phormium 'Chocolate Fingers'	dwarf flax	Pb5	600mm	31
Pho JS	Phormium 'Jack Spratt'	dwarf flax	Pb5	600mm	11
Rho spp	Rhododendron spp	rhododendron cv	Pb40	n/a	1
Rho C	Rhododendron 'Cockatoo'	rhododendron cv	Pb5	n/a	55
Ros FCA	Rosa 'Flower Carpet Appleblossom'	groundcover rose	Pb5	800mm	53

Note: 1) The abbreviation column is optional

7 Streetlighting

Where streetlighting will be altered, label all affected poles as detailed in [Table 5](#). Label poles to be removed with “R”. Number each affected streetlight with the related number from the lighting schedule on the drawing. Label existing poles that won’t be affected as “E”. Show the lighting wattage of all proposed and remaining lights.

Table 5 Lighting symbols

Symbol	Use	Numbering system
Pxxx	Every pole upon which work is to be carried out. Existing poles shall have construction material and manufacturer’s pole code shown on the drawing	Prefix to be followed with unique identifier either Network Operators pole number or sequential number for project.
Lxxx	Any alteration to lighting. Provide separate codes for replacement, new and differing light, lamp, pole or arm details	Prefix to be followed with unique identifier.
Rxxx	Any lighting equipment to be removed that is not covered by a “L” reference	Prefix to be followed with unique identifier.

8 Title blocks

The title block must include the following information:

- A project title, including street address;
- A unique number or identifier, preferably the consent or project number;
- The designer’s name, signature and contact details;
- The draughtsperson’s name;
- The drawing checker’s name;

- The design reviewer's name and signature;
- The stage of work e.g. for acceptance, accepted engineering drawings, construction, as-built;
- The date of preparation and of acceptance;
- The scale or scales used;
- A graphic scale;
- The datum and origin;
- The original sheet size;
- A drawing title e.g. Long-section;
- Sheet numbers, including the number in the set;
- An amendment box, including brief description of amendment and sign off by designer.

The scale for drawings is generally 1:200 but other accepted engineering scales may be used to suit the level of details on the drawings. Scales progress in multiples of 10 e.g. 1:1, 1:2, 1:5, 1:10, 1:20 etc as detailed in Table 5.1, *AS/NZS 1100.101*.

9 Long-sections

- Draw horizontal scales generally to match the plan. Vertical scales may be 1:20 or 1:50, to improve clarity.
- Show concrete surround on the pipe long-section. Label structures and vertical curves. Use thicker line weights for proposed work.







10 Cross-sections

- Label levels with identifiers e.g. K12.400. Use thicker line weights for proposed work.
- Provide a minimum of one fully detailed typical cross-section per sheet.
- Show construction depth outlines for roads, paths, grass berms and landscape planting. Label legal boundaries vertically.

11 Road marking drawing

Use the following line types when detailing roadmarking.

Figure 6 Roadmarking line types







Road Marking Linetypes		
Linestyle:	Used for:	Dimensions:
	Continuous Lines such as Flush Medians, Edge Lines etc	Continuous
	Centre Lines	3m line, 7m gap
	Continuity Lines	1m line, 3m gap
	No Stopping Lines less than 10m	1m line, 1m gap
	No Stopping Lines longer than 10m	1m line, 2m gap
	Dashed Line (Used parallel to Cycle Lanes)	1m line, 5m gap

The road marking drawing must show:

- The existing markings to be removed (i.e. sandblasted);
- The new road markings to be installed;
- How the proposed markings mate into the existing markings at the project's extents.

Show roadmarking on a drawing base that is essentially 'as-built' in terms of features such as kerbs and paths. Indicate the type of marker, generally by using the standard symbols and descriptions in [Table 6](#) and [Table 7](#).

Table 6 Marker symbols and descriptions

Text Description for drawings		Symbol
<u>RPM</u>	<u>Reflective Pavement Markers</u>	
	WHITE MONO RPM	
	RED MONO RPM	
	WHITE BI DIRECTION RPM	
	WHITE/YELLOW BI DIRECTION RPM	
	YELLOW BI DIRECTION RPM	
<u>KTM</u>	<u>Kerb Top Markers</u>	
	KTM	

Note: 1) Specify numbers, spacings and colours for reflective pavement markers and kerb top markers.

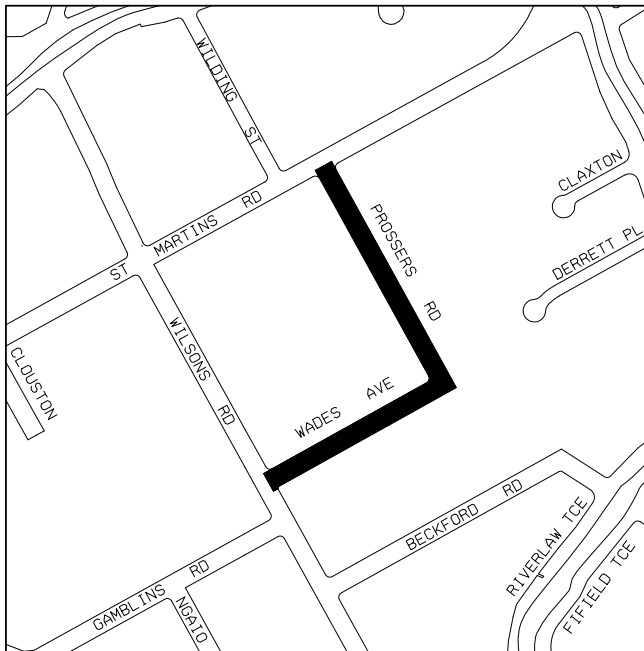
Table 7 Sign types and descriptions

Sign	Text Description for drawings
BRIDGE END MARKERS (always used in pairs)	BEM
HAZARD MARKER	HM

12 Locality diagram

Show the road boundaries and street names. Show the limit of the development. Draw the locality diagram true to the map orientation or at the same orientation as the engineering drawing.

Figure 7 Locality diagram



LOCALITY DIAGRAM

13 Examples and drawings

Examples of standard drawings follow.

Figure 8 Long-section and paving drawing

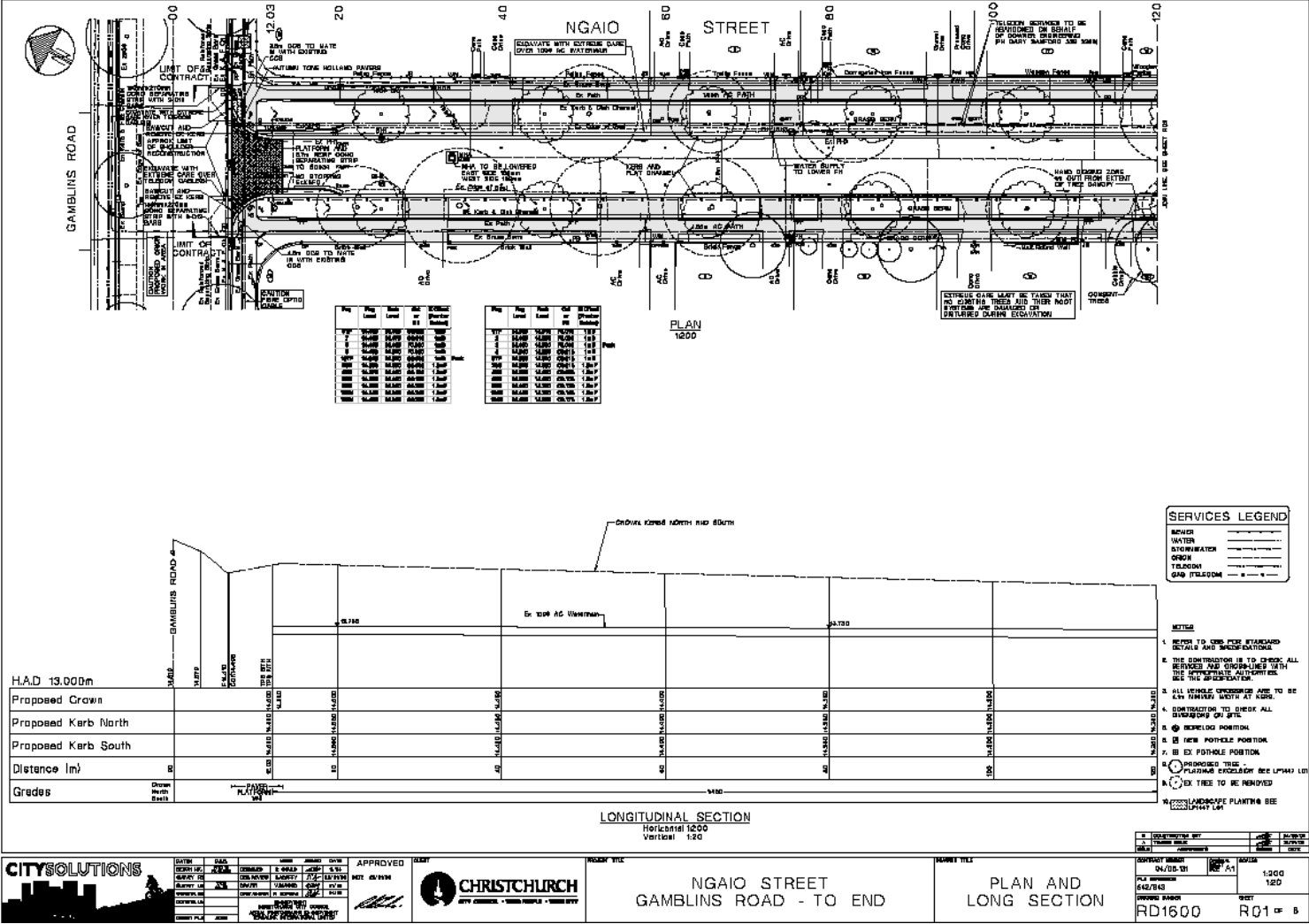


Figure 9 Concrete haunching and kerb setout

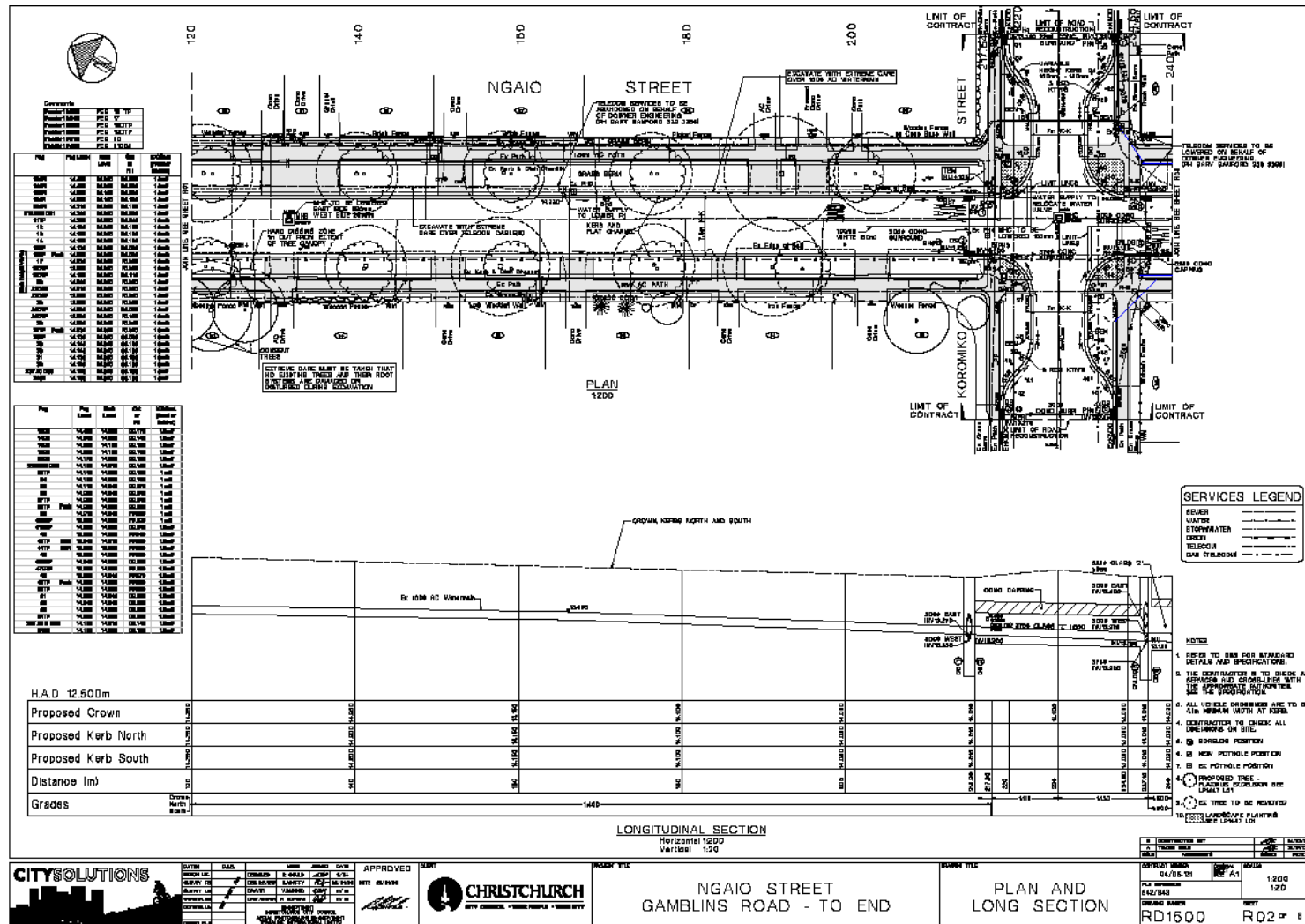


Figure 10 Cross-sections

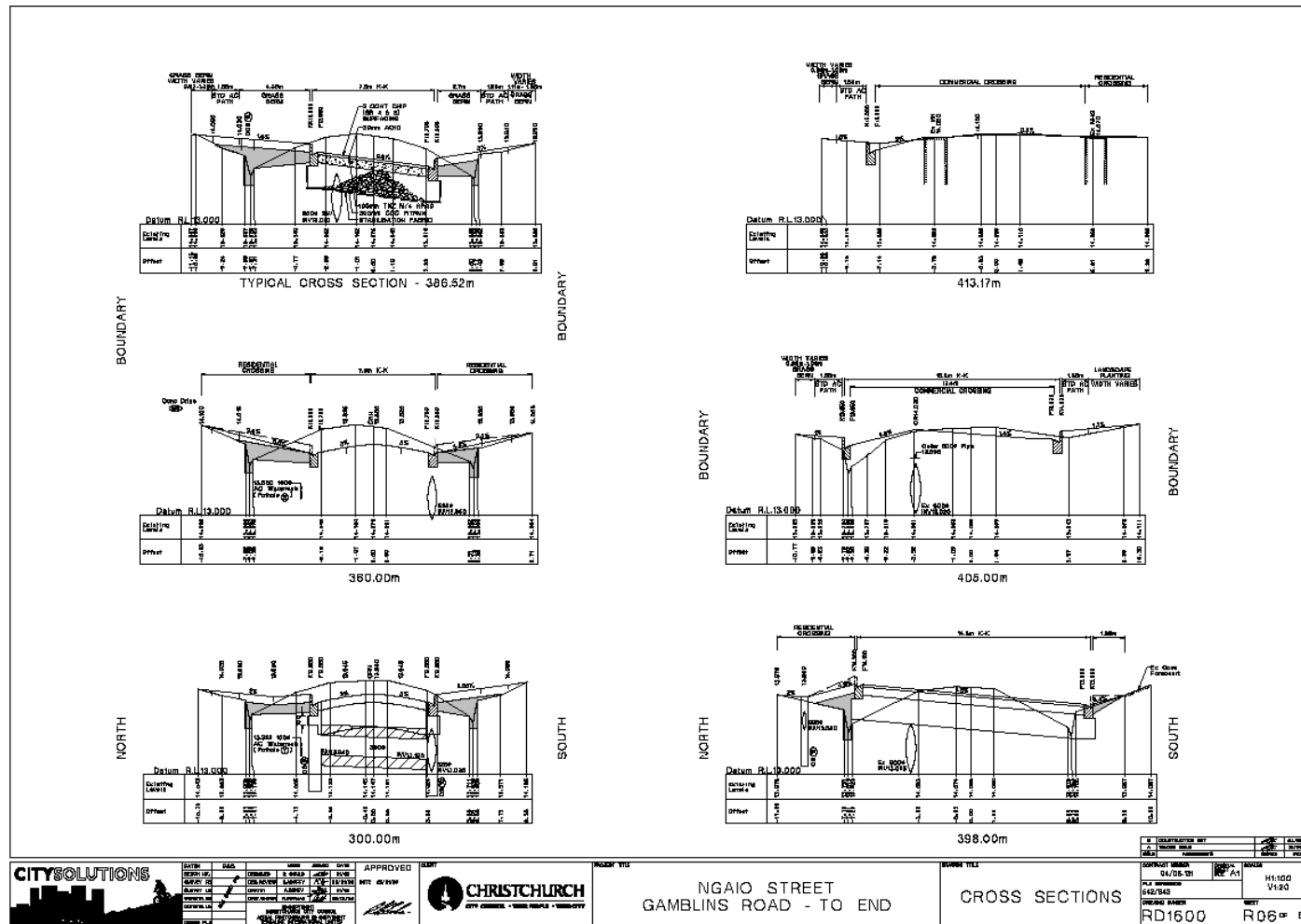


Figure 11 Drainage drawing

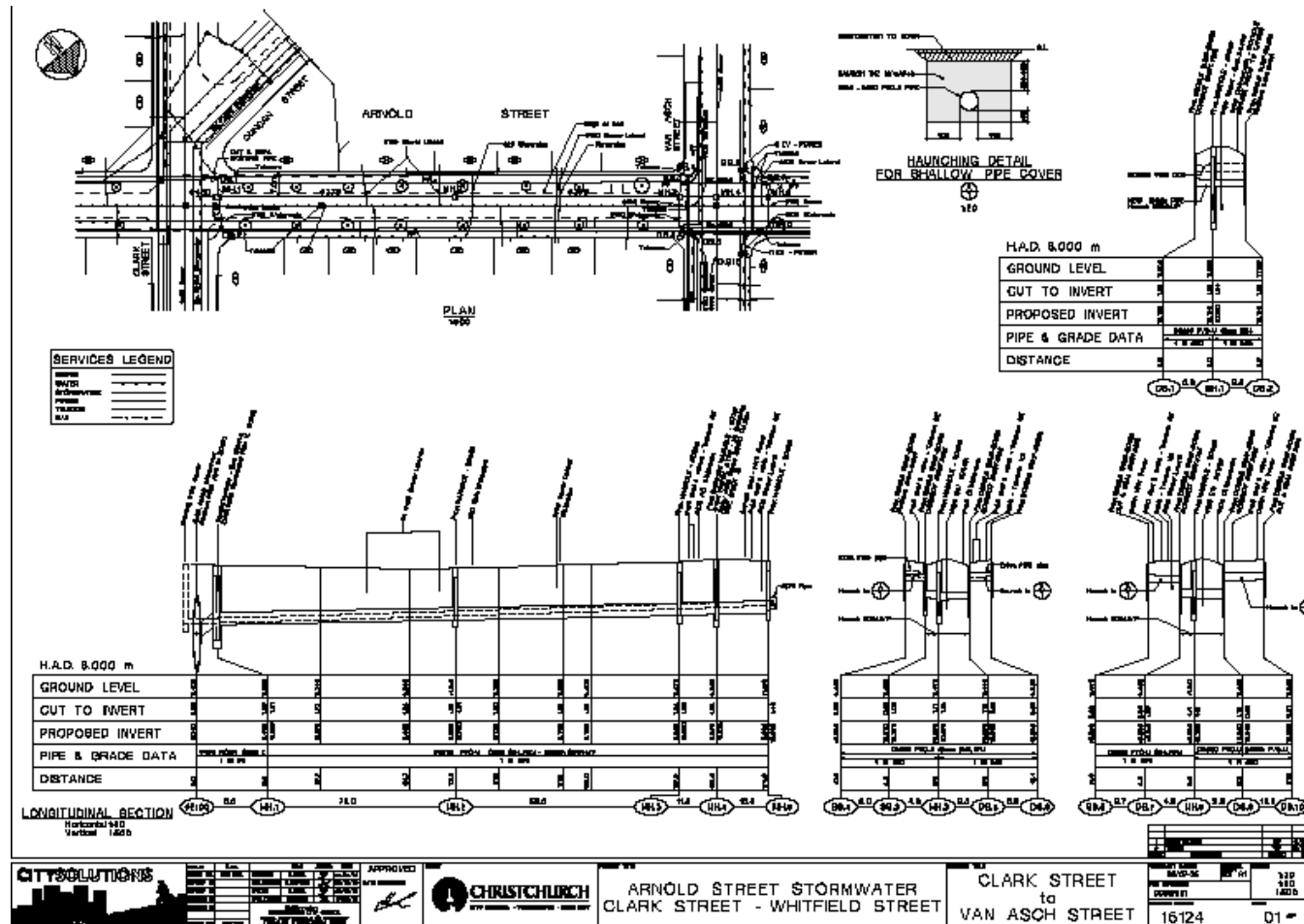


Figure 12 Special drainage details

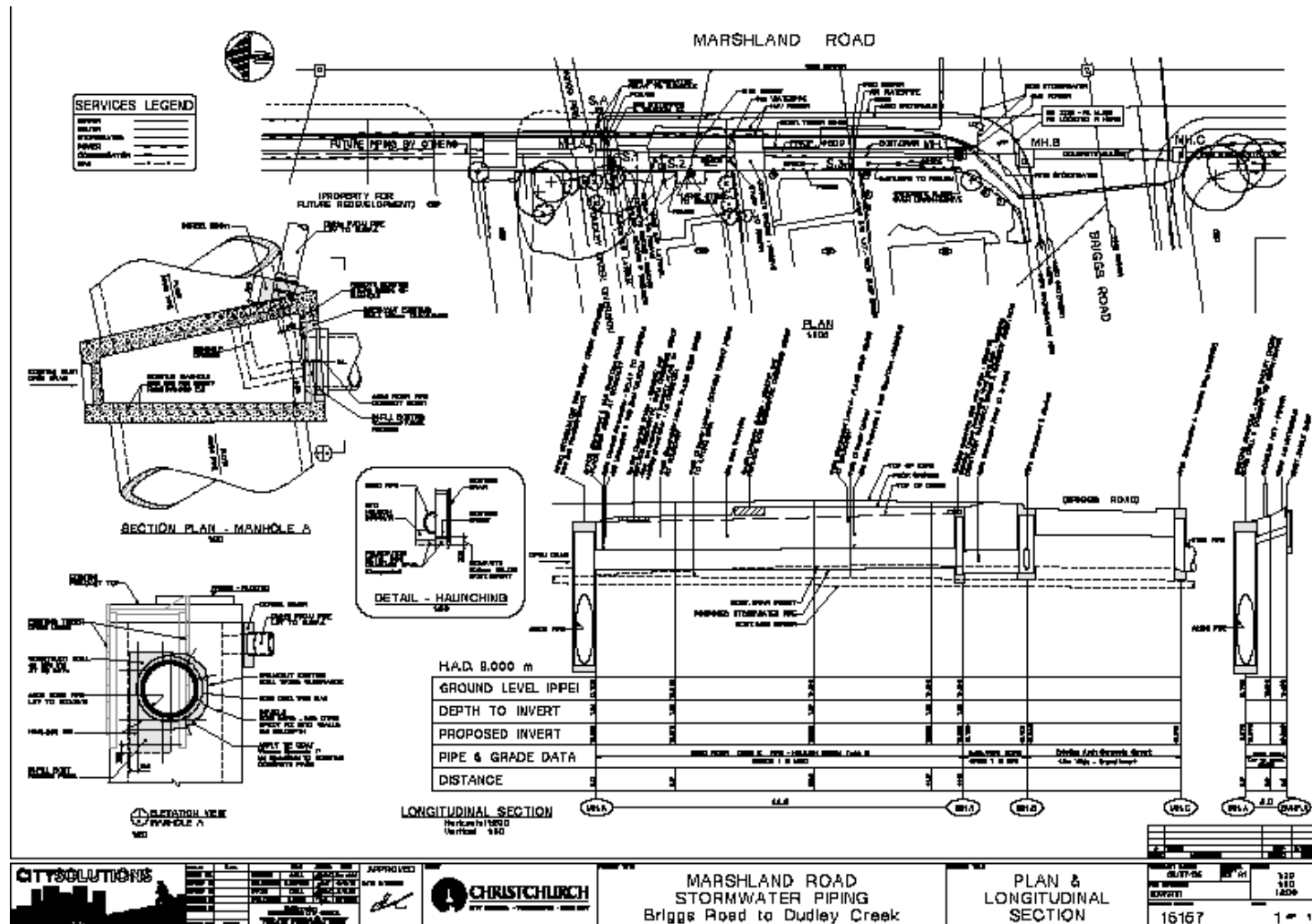


Figure 13 Pump station

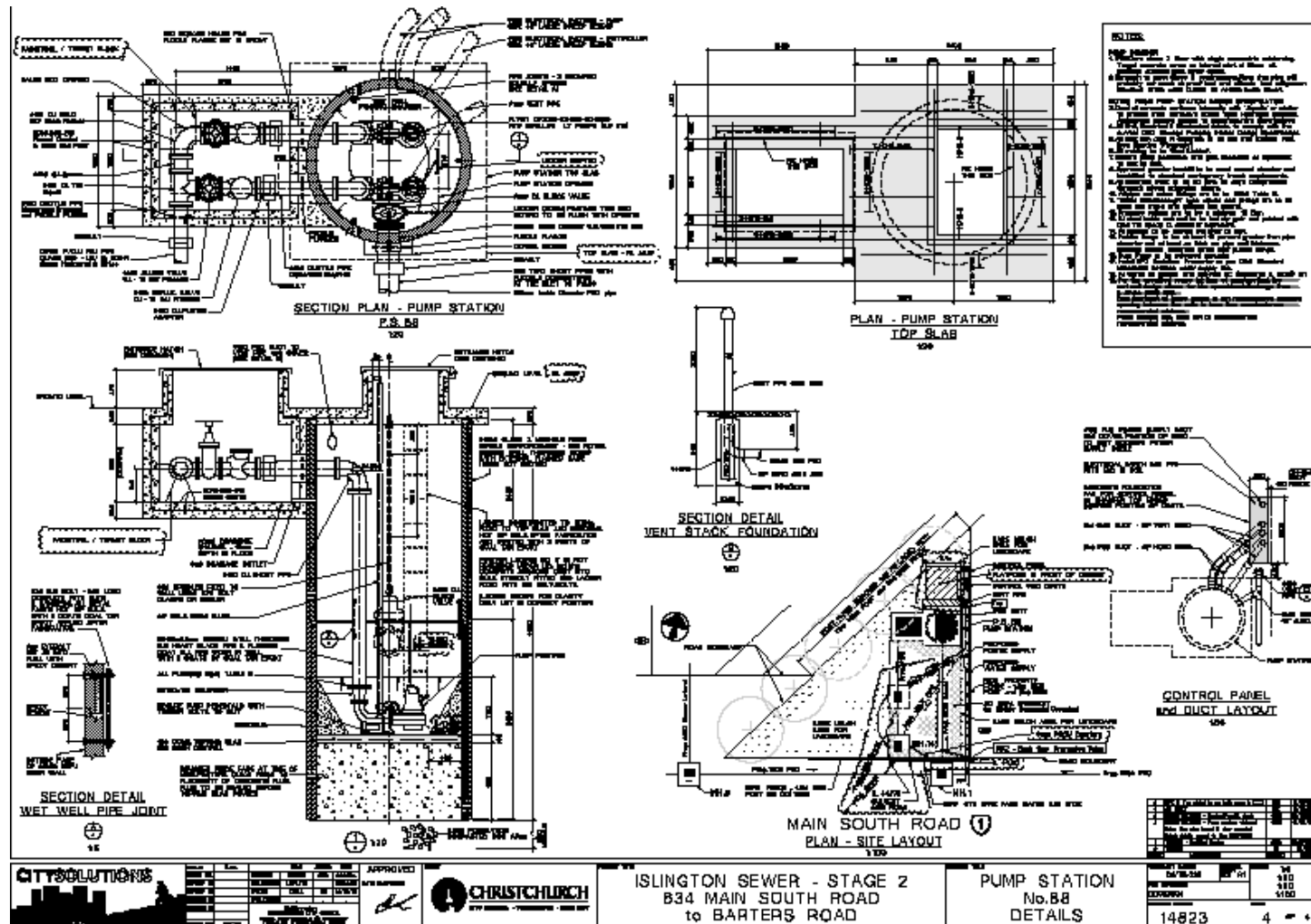


Figure 14 Landscape planting drawing

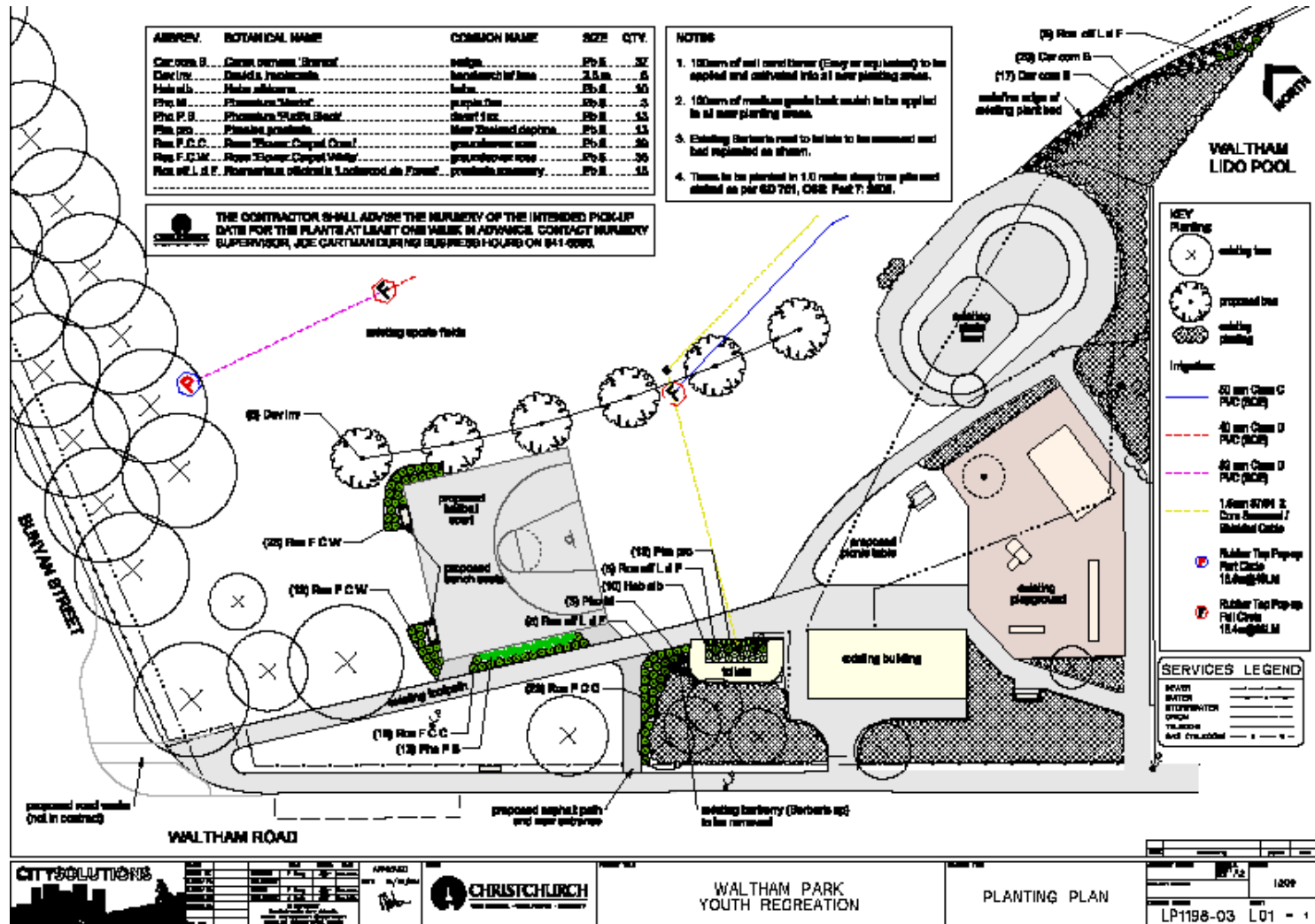
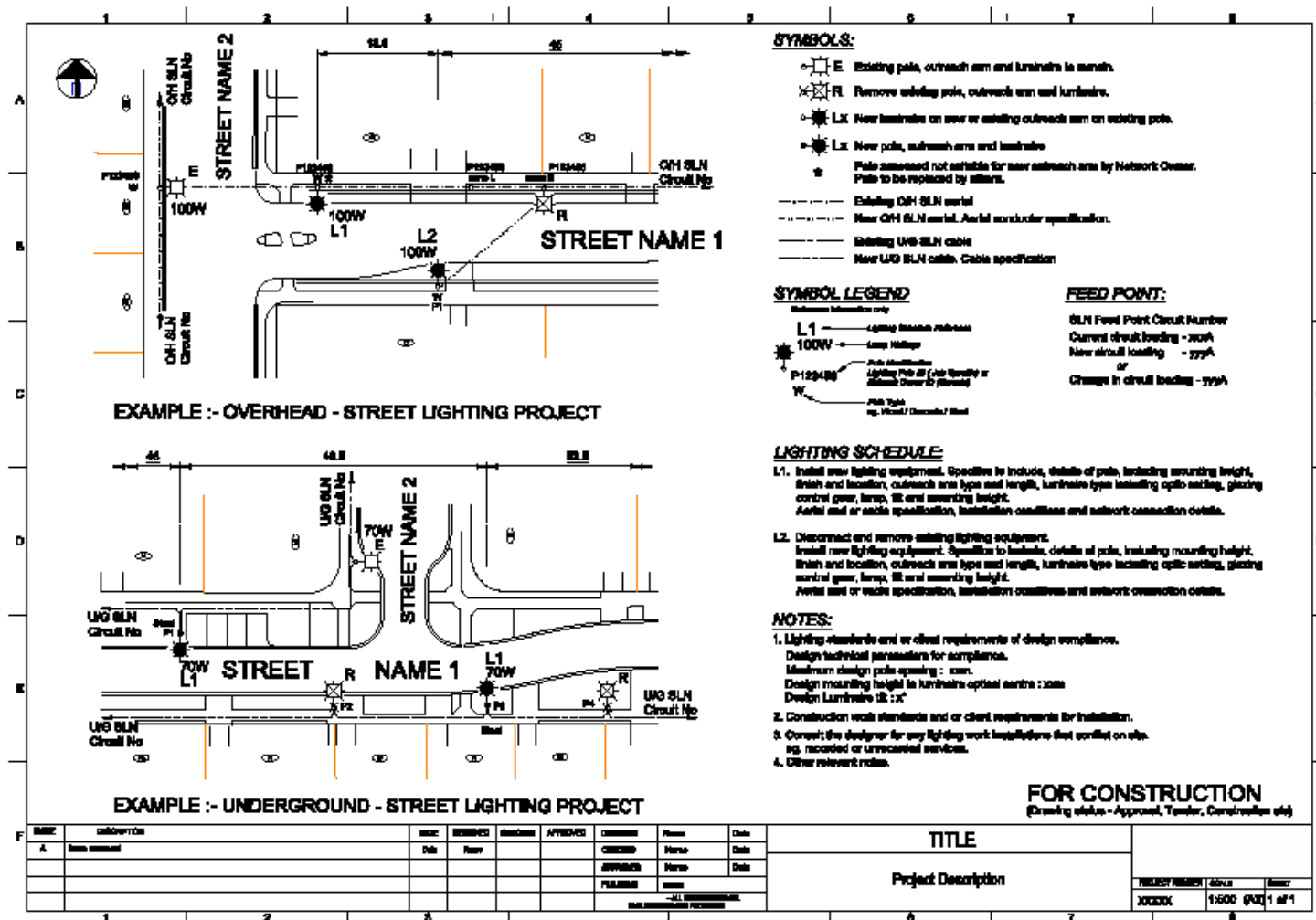


Figure 15 Streetlighting drawing



APPENDIX II DRAUGHTING CHECKLIST

DRAWING – (LAYOUT)	
Street names and waterways correctly spelt and orientated with correct text size.	<input type="checkbox"/>
Running distances are shown at top of drawing – at right angles to drawing.	<input type="checkbox"/>
Join lines (if any) are shown and labelled.	<input type="checkbox"/>
North point (should be correctly orientated i.e. not pointing down), service legend and standard notes (bottom right hand corner of sheet) shown. Drawing to be labelled with scale.	<input type="checkbox"/>
Leader arrows from notes should not cross one another.	<input type="checkbox"/>
Existing notes and proposed notes do not overlap one another, or the boundary and section lines.	<input type="checkbox"/>
Title block filled out correctly, including sheet numbers.	<input type="checkbox"/>
Any amendment to drawing to be indexed in amendments box as a letter (not number) with small description and date.	<input type="checkbox"/>
Any details or sections to be labelled correctly.	<input type="checkbox"/>
Related drawings cross referenced.	<input type="checkbox"/>
Locality diagram labelled and orientated correctly.	<input type="checkbox"/>
Proposed notes are standard in wording. Benchmark referenced.	<input type="checkbox"/>
DRAWING – (EXISTING FEATURES)	
Existing kerb and channel correctly labelled.	<input type="checkbox"/>
All existing manholes, sumps, fences, grass berms, footpaths, driveways and landscape features are labelled.	<input type="checkbox"/>
Boundaries shown – existing and proposed, including easements.	<input type="checkbox"/>
Property levels or contours are shown over development, at boundary and 3m outside development.	<input type="checkbox"/>
All buildings to be hatched and labelled (e.g. DAIRY).	<input type="checkbox"/>
House numbers shown at correct orientation.	<input type="checkbox"/>
All existing drainage pipes are correctly labelled with flow direction shown.	<input type="checkbox"/>
All existing utilities are correctly labelled.	<input type="checkbox"/>
Existing vegetation, including that to be removed, is clearly shown, in both canopy size and position.	<input type="checkbox"/>
DRAWING – (PROPOSED FEATURES)	
Proposed kerb and channel correctly labelled.	<input type="checkbox"/>
Proposed kerb and flat channel has fender line shown.	<input type="checkbox"/>
All radii on proposed kerb and channel shown.	<input type="checkbox"/>
TP's, CTP's on proposed kerb face have 'tick' shown.	<input type="checkbox"/>
Proposed cutdowns are shown and labelled (particularly at intersections and adjacent to pedestrian islands). Does not apply to standard driveways.	<input type="checkbox"/>
Proposed property/spot levels and contours are 'proposed' weight.	<input type="checkbox"/>
All proposed paths/paving/other hard surfaces are shaded and labelled correctly.	<input type="checkbox"/>
Correct Peg box attached.	<input type="checkbox"/>

Part 2: GENERAL REQUIREMENTS

Manholes being altered or installed have an allocated letter.	<input type="checkbox"/>
Extent of filling, finished levels shown.	<input type="checkbox"/>
If landscape planting is shown on drawing there must be a landscape planting key.	<input type="checkbox"/>
If there is a separate landscape planting drawing, planting to be patterned and labelled on roading drawing; cross referenced to the landscape planting drawing.	<input type="checkbox"/>
LANDSCAPE DRAWING (additional to layout)	
Proposed features/structures labelled, including furniture/bins/signs/fountains/fencing.	<input type="checkbox"/>
Proposed playground equipment/softfall areas/sports fields/recreational hard surfaces labelled.	<input type="checkbox"/>
Proposed vegetation/plant symbols clearly labelled and/or listed in plant list.	<input type="checkbox"/>
Plant list has correctly spelled botanical names, common names, sizes and quantities.	<input type="checkbox"/>
LONG SECTION (additional to layout)	
Proposed kerbs, crowns, edge of seals to be labelled. No existing kerbs, edges of seal, are shown (when required, small sections may be shown for clarity).	<input type="checkbox"/>
Pipe size, class, protection shown, vented manholes labelled.	<input type="checkbox"/>
Longitudinal section to have title below section.	<input type="checkbox"/>
Sump numbers/MH letters correspond to the drawing.	<input type="checkbox"/>
Running distances from easily located point on engineering drawing.	<input type="checkbox"/>
All required grades shown and labelled.	<input type="checkbox"/>
Existing and proposed levels shown, including cuts and fills.	<input type="checkbox"/>
Property boundaries, road intersections, crossing services shown.	<input type="checkbox"/>
Datum shown to 3 decimal places.	<input type="checkbox"/>
ROAD MARKING DRAWING (additional to layout)	
RPM'S and KTM's use the symbols and are correctly labelled.	<input type="checkbox"/>
Correct line types are used for 100 mm WHITE, NO STOPPING, CONTINUITY etc.	<input type="checkbox"/>
Correct line weights used for 'ex lines to be removed'; 'ex lines to remain' and 'proposed markings'.	<input type="checkbox"/>
CROSS SECTIONS (additional to layout)	
Every cross section sheet to have at least one typical cross section showing construction in full and labelled correctly with standard notes.	<input type="checkbox"/>
The word chainage should not appear. Cross sections labelled with chainage value only (ie 20.00 m) to be centred under cross section.	<input type="checkbox"/>
Proposed kerb and fender, quarter points, crown, interpath channel, and invert of swales to have levels shown.	<input type="checkbox"/>
Sump numbers/MH letters correspond to the drawing.	<input type="checkbox"/>
Proposed stormwater pipes, sumps and any services which could be disturbed to be shown.	<input type="checkbox"/>
North, south or west and east boundaries to be labelled as such.	<input type="checkbox"/>

Part 2: GENERAL REQUIREMENTS

Proposed trees and other plantings are shown in relation to underground services, paths and carriageways.	<input type="checkbox"/>
Datum text to be positioned at left hand side of cross section on datum line.	<input type="checkbox"/>

DESIGN CHECK BY: **DATE:**

APPENDIX III BENCHMARK CERTIFICATE

ISSUED BY: _____
(Surveying firm or suitably qualified surveyor)

TO: _____
(Owner/Developer)

TO BE SUPPLIED TO: _____
(Territorial authority)

IN RESPECT OF: _____
(Description of benchmark)

AT: _____

(Address)

On behalf of _____ I _____
(Surveying firm) (Surveyor)

a Licensed Cadastral / Registered Professional surveyor (delete one) hereby certify that

the benchmark shown on finder diagram _____ has been installed in
accordance with the requirements of the Infrastructure Design Standard and current

good survey practice, using _____ methodology.

The surveying firm issuing this statement holds a current policy of professional

indemnity insurance of no less than \$ _____

(Minimum amount of insurance shall be commensurate with the current amounts recommended
by IPENZ, ACENZ, TNZ, INGENIUM.)

(Signature of Surveyor) Date: _____

(Surveying firm)

(Address)

Part 2: GENERAL REQUIREMENTS

from the Bonded Sum held by the Council. In the event that the Bonded Sum is not sufficient to meet the costs of the Works, the Developer shall immediately pay the amount of the shortfall to the Council upon demand in writing.

5. If the Developer fails to pay to the Council any sum of money when it is due for payment the amount so unpaid shall bear from the due date for payment a rate of interest equal to the Bank of New Zealand overdraft lending base rate at the due date for payment plus 5%, calculated on a daily basis until the date of payment. Interest shall continue to accrue at that rate both before and after any judgment obtained by the Council for non performance of any obligation under this Bond.
6. The Developer shall pay to the Council:
 - (a) the reasonable legal costs (as between solicitor and client) incurred by the Council of and incidental to the preparation and execution of this Bond or any variation or release of this Bond;
 - (b) any costs incurred by the Council in relation to inspections necessary to ensure compliance with this Bond; and
 - (c) the reasonable legal costs (as between solicitor and client) incurred by the Council of and incidental to the enforcement or attempted enforcement of the terms of this Bond by the Council,and in default of payment the Council shall be entitled to deduct any such costs from any Bonded Sum held by the Council.
7. If the Developer has complied with all of the terms of this Bond and the Works have been completed to the satisfaction of the Council then:
 - (a) the Developer shall be entitled to be released from this Bond; and
 - (b) a refund of the Bonded Sum or any balance thereof shall be paid to the Developer.

EXECUTION

EXECUTED as a DEED for and on behalf)
of [])

Director

Director

SCHEDULE A- THE LAND

SCHEDULE B- THE WORKS

Forming and sealing the accessway from the road kerb to the road boundary for each residential lot on the Land in accordance with the Council's requirements in force at the time the work is undertaken.