

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

## Utilities Management Plan

**Story:** Utilities Location and Protection

**Theme:** Programme Management

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A management plan which describes how SCIRT will coordinate utility authorities and utility relocations.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit [www.scirtlearninglegacy.org.nz](http://www.scirtlearninglegacy.org.nz)



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## Utilities Management Plan

### Review:

Rev.	Status	Prepared by	Checked by	Date
A	FINAL	Dave Bain	Delivery Manager	15 November 2011
B	FINAL	Dave Bain	Delivery Manager	27 February 2013
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E	FINAL	Hunter Morton	Delivery Manager	10 May 2016

### Authorisation:

Name	Position	Date	Signature
Paula Lock	Professional Services Manager	17/5/16	<i>Paula Lock</i>
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Ian Campbell	Executive General Manager	12/5/16	<i>Ian S Campbell</i>

# Utilities Management Plan

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## Acronym

Acronym	Name
ALT	Alliance Leadership Team
AMT	Alliance Management Team
CHIRP	Christchurch Horizontal Infrastructure Rebuild Programme (The Works)
CPEng	Chartered Professional Engineer
DC	Designer's Correspondence (numbered)
DMP	Design Management Plan
IDV	Independent Design Verifier
IE	Independent Estimator
IFC	Issued for Construction
AA	Alliance Agreement
NOP	Non-owner Participant
OPs	Owner Participants
RFI	Requests for Information
SCIRT	Stronger Christchurch Infrastructure Rebuild Team (the people)
TOC	Target Out-turn Cost
UMP	Utilities Management Plan
UDA	Utilities Design Approval
VEW	Value Engineering Workshop
VFM	Value For Money
WBS	Work Breakdown Structure
WP	Project (as added to SCIRT)

## Definitions

Utility Authorities	
Orion	Underground and overhead electricity network assets from Transpower Grid Exit Point to network connection point at homes and businesses. 66KV – 230V
Transpower	HVDC Network to Grid Exit Point
CCC Water and Waste Water	Water and Waste Water
CCC Sewerage	Sewer
Contact Energy (Rockgas)	Reticulated Gas(LPG) Network and management of CCC owned Landfill Gas line
Spark	Telephone Exchanges ,Cabinets, Copper and Fibre
Chorus	Telephone Exchanges ,Cabinets, Copper and Fibre
Telstra Clear	Cabinets, Copper and Fibre
Enable	Ultrafast Broadband (UFB) network
Kiwi Rail	Rail Corridor
Liquigas	LPG pipeline Lyttleton – Chapmans Road terminal
Mobil	Oil Pipeline – Lyttleton - Christchurch

## Project Details

### Design services identity

Project Name: Christchurch Horizontal Infrastructure Rebuild Programme (CHIRP)

Project Execution Agent: Stronger Christchurch Infrastructure Rebuild Team (SCIRT)

### Client details and contacts

Clients: Department of Prime Minister and Cabinet, Christchurch City Council, NZTA (Owner Participants)

Client ALT Members:

Phone:

Fax:

Client Address:

# 1 Introduction

This Utilities Management Plan (UMP) describes how the SCIRT will manage the coordination of Utility Authority (Utilities) liaison and Utility relocations during the design and construction phases of the Rebuild Schedule.

## 1.1 Purpose

The purpose of this UMP is to:

- Coordinate road design and utility services design with the Utility Authorities (UA) and other relevant stakeholders to resolve design and construction issues to enable an efficient deployment of resources;
- Describe and document the procedures intended to provide the earliest liaison opportunities on a routine basis to ensure all Utilities that will be actually or potentially affected by the Christchurch horizontal infrastructure rebuild works share the same knowledge about the works;
- Promote the exchange of information and data which may enhance the opportunities to achieve Value for Money and 'best for City' outcomes through design and construction phases;
- Provide opportunity for Utility providers to communicate their own forward programme of works in order to optimise timing of new service installations or scheduled maintenance;
- Document and provide planning actions necessary to ensure that all known Utility issues are addressed and that Utilities are relocated efficiently and properly during construction as described in the SCIRT Design and Delivery Requirement for the location protection and mapping of utilities (**Appendix 1 and 2**);
- Provide procedures to accelerate or fast track projects through the Utilities liaison and coordination process where there is an urgent need to progress certain items of work;
- Ensure consistent standards and processes are applied to all Utilities coordination and relocation activities that utilise best practice and are in line with current legislative procedures and requirements;
- Prioritise utility provider resources as required to optimise the Rebuild schedule;
- Ensure the provisions of the Utilities Access Act 2010 and NZUAG Code of Practice are applied where required:
- <http://www.legislation.govt.nz/act/public/2010/0098/latest/DLM2248926.html>
- <http://www.nzuag.org.nz/national-code/CodeSeptember2011.pdf>
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## **1.2 Utilities Covered by the Utilities Management Plan**

The Utilities covered by the UMP include:

- Overhead and underground power (transmission and local networks)
- Overhead and underground telecommunications cables
- Gas pipelines
- Water, stormwater and sewer
- Rail.

All stakeholder contact information will be loaded into a Stakeholder database. The database will include contact information for all Utility Authorities that may have an interest in or be directly involved in the scope of works. The utilities will include water, stormwater, wastewater, telecommunications, electricity, gas and rail infrastructure, whether publicly or privately owned.

The SCIRT Utilities Manager will be responsible for maintaining the Stakeholder Database, and for ensuring that all contact addresses and numbers for personnel at the appropriate decision making levels (for administering the requirements of this plan) are detailed and up to date. The database is stored on [G:\Delivery\Utilities](#)

## **1.3 User Guide for the UMP**

The procedures and activities described in this UMP provide instruction, direction and guidance to the SCIRT project design, delivery and communications teams, and the Delivery Teams in order to meet the SCIRT Objectives and Strategies.

The UMP is intended to be accessible by all staff to quickly find Design Procedures, forms and tools. They clarify the responsibility of each party to ensure proper communication, cooperation, and coordination which is critical to minimise delays to work and provide certainty when programming works and committing resources to projects undertaken within the Rebuild Schedule.

Although various Delivery Teams may have in-house project delivery processes that vary from those contained in this UMP, or similarly, some portions of these procedures may not apply to a particular project, the overarching intent is for each party to initiate and maintain effective procedures for coordinating the work being done by SCIRT for the duration of all assigned projects.

- Electronic copies of this Plan and related procedures, forms and flowcharts and reference data are located in Project Centre or Share Point.

## **1.4 Communication of the UMP**

This UMP is communicated to the SCIRT Design and SCIRT Delivery Management Team, external Delivery Teams and Utility Providers by:

An Induction upon joining the base organisation.



Regular meetings between the SCIRT Design and Delivery Team and Utility Providers.

Electronic access to the current version of the UMP and GIS detail on the Stronger Christchurch project website.

## **1.5 Scope of the UMP**

The UMP will eventually be a sub-plan of the overall SCIRT Programme Management Plan, documenting the SCIRT Management system.

It is intended that the requirements within the UMP complement and are read in conjunction with the other SCIRT Management Plans – principally the Design Management Plan (DMP) and the Construction Management Plan (CMP).

# **2 Standard Procedures**

## **2.1 General Provisions (Design Phase)**

SCIRT has set the following design objectives:

The design of any project to be undertaken under the Alliance Agreement is to comply with the AA including the following objectives particularly relevant to design outputs;

- Best long-run value for money solution designed / Whole of life performance of new assets meets industry asset management standards.
- Reduce and Recycle to eliminate waste.
- SCIRT to go in once, quickly and do it well.
- Incorporate innovations and greater resistance to withstand subsequent seismic events.
- Handover asset information and operations manuals which set a benchmark for New Zealand.

SCIRT has added the following objectives beyond those required by the AA;

- The design incorporates Safety Principles and Practice including:
  - Safety in Design review (SIDR) by asset operator reps.
  - Constructability in Design review by construction reps including consideration of environmental management during construction.
- A high quality design team is assembled based on the “Best for Programme” principle.
- The team and project is properly managed so that these objectives can be met.
- That the UMP is integrated into the above design processes and objectives so that Utility alterations and relocations have no or minimal impact on the progression of projects once transitioned into the construction phase. In order to achieve this each Network Utility that may impact on the programme of works, will have access to the Utilities Manager within the SCIRT management team. To the extent that it relates to the interface of SCIRT works with the Utility's Network, the Utility Manager will be accountable for ;

- Managing the SCIRT relationship with that Utility;
- Negotiating concessions from the Utility with respect to standard rules on proximity of new works;
- Risk Management including ensuring accurate risk information is available to the AMT;
- Managing and approving all Utility charges to SCIRT for interface works;
- Quality Auditing of SCIRT performance in relation to interface work.
- Endeavouring to achieve a “one-pass” approach to rebuild work, such that no further disturbance to infrastructure will be required for at least 2 years following completion of work.

## 2.2 SCIRT Design Phases

Section 2.3 of the SCIRT Design Management Plan (DMP) sets out the requirements and processes in relation to the acceptance of projects from the Damage Register and their progression through the Design phases, continuing on to the Delivery Team’s construction phase.

The following Phases are broadly defined in the DMP, and each requires a set level of interaction with Utility Authorities to ensure the projects progress with the minimum disruption so that established timelines and programmes can be set, Target Out-turn Costs (TOC) are reliable and achievable, and project delivery and quality are not compromised.

### 2.2.1 Scope and Investigation Phase

When the Investigation Process is initiated by SCIRT by issue of a Project, a Scoping Investigation for the project will begin, and all stakeholder contact information from the Stakeholder Database will be passed onto the Design and Delivery Teams so that communication with the Utility Authorities can be initiated.

The SCIRT Project Definitions Manager, will assume responsibility for all utility coordination during this Phase. This includes reviewing information on the location of all existing Utilities from known records and GIS

The Scoping Investigation will also require consideration of the following:

- Opportunities to “design around” utilities when possible, provided that Value for Money and ‘best for City’ principals are not compromised.
- Existing and planned CCC Capital Works Programme.
- Existing and planned Works Programme for each UA.
- Infrastructure and services required for “Greenfield” developments.
- Any approval issues that might be associated with any Utility work, and how much lead in time is required to prepare, lodge and receive consents.
- Any Risks, perceived or real, associated with any Utility works during the course of the works.

The first formal communication with the Utility Authority will be an advance notification from the Project Definitions Team at SCIRT outlining the brief for the Scoping Investigation and any other plans, GIS output or preliminary design information for the project. This notification may request the Utility Authority to furnish all appropriate planning information pertaining to the described project, including as-built drawings and/or GIS information.

### **2.2.2 Concept Design Phase**

When each Project or project is passed to the SCIRT Design Manager to initiate standing procurement arrangements with Design Professionals, the project is considered to have passed into the Concept Design Phase.

The Design Professionals who are allocated the Project will ensure that all UAs located within the construction limits will be contacted at the commencement of design using the Utilities Design Approval (UDA) process in Project Centre 'and that each utility in the project area will be considered using the SCIRT Design Requirements for Utilities. These requirements can be found in **Appendix 1** of this document and the Project Centre Library at [FileCentre:/LIB/SDG](#)

The UDA communication will include the proposed design completion date, anticipated construction start date, and a set of plans to review. The communication must also include the following:

- Instructions on what information is expected from the UA and how this information is to be presented back to the SCIRT-nominated designer;
- The date by which the information from the UA must be returned to SCIRT.

On receipt of a response from the UAs, the Design Professional will ensure that all known utilities are drawn or referenced in the design plan.

The UDA process must be supplemented by dialogue in person with affected UA's. Cooperation with the known utilities and adherence to the principles outlined in the NZUAG Code of Practice is required.

The Design Professional will ensure there is regular contact with each affected UA to:

- Describe the project to aid the UAs understanding of the project parameters;
- Ensure that all known UA's are informed of the project status;
- Identify, discuss resolve any identified conflicts, particularly if any major utility relocations or new installations have been identified outside of the scope of the SCIRT project, regardless of the party proposing them.

When the project has cleared the Concept Design process, the Design Manager will allocate the project to an appropriate Detailed Design Team.



### 2.2.3 Detailed Design Phase

Once a Detailed Design Team has been appointed the detailed design phase will proceed. The Team's nominated representative will:

- Adhere to the SCIRT Design Requirements for Utilities.
- Update the UDA form in Project Centre and confirm with any UA's who have previously indicated work on their services is required. If it is established that they need to undertake their own design, instructions to proceed will be issued and the SCIRT Utility Manager will be informed.
- Incorporate any requests from Utility Authorities to improve or permanently disestablish services during the course of the project, and any associated financial and programming implications.
- Obtain a cost estimate for all of the required service relocation work.
- Take into account the ability for UAs to adequately resource the project in terms of plant, materials and manpower if major work is required.
- In conjunction with the ECI Coordinator from the Delivery Team, review all of the information gained from the UAs and use it to minimise utility relocations and adjustments within the scope of the project .
- if necessary and in conjunction with the ECI Coordinator from the Delivery Team recommend an adjustment to the project timing to allow sufficient time for any advance service relocations or enabling works to occur before the proposed start to physical works.
- Using the UDA form in Project Centre, confirm when all plans detailing Utility adjustments (including any done by the UAs themselves) and the technical specifications have been completed to a point where they are ready to be released to all affected UAs for final checking;
- If the Designer is satisfied that there are no substantive new issues that require a further meeting of the affected UAs, the plans will be signed off by the Utilities Authority using the UDA form in Project Centre. At this point, written agreement between the parties defining cost allocation for relocation, maintenance or network extensions may be required.
- If one UA or more wish to use the opportunity to improve existing or install new services in the project site, then a formal Joint Project Agreement (JPA) will be prepared and signed by the person(s) with the appropriate delegated authority within both SCIRT and the UAs. The agreement will detail the financial contributions each party will be responsible for, and any specific operational, contractual and legal obligations on either party.

The Detailed Design Team and Design Manager will progress the design in accordance with the processes outlined in the DMP to the point where it will go to the Estimating Team before proceeding (as a project or part of a project to the relevant Delivery Team for Construction.



#### 2.2.4 Delivery Phase

When the DDT has completed the design and the project has progressed to the Delivery Phase, the Delivery Team Project Manager will assume responsibility for overall coordination of any UA locating, protection, mapping or relocation that will happen on the project site.

If a period of more than 3 months elapses between the time the detailed design has been completed and physical works on site begins, the Delivery Team Project Manager will contact any of the affected UAs and advise them of the updated or confirmed work programme to confirm that no new effects with respect to their proposed programme of works in relation to the project.

The Delivery Team Project Manager will be responsible for:

- Adhering to the SCIRT Delivery Requirements for the location, depiction and mapping of utilities. These requirements can be found in **Appendix 2** of this document and Notice of Requirements SNR # 39 on Project Centre.
- Providing written notice of the confirmed scheduled project start date and the Notice to Proceed to all affected UAs at least 8 weeks prior to construction starting.
- Arranging a pre-construction meeting as required.

Regular meetings with the UAs will be scheduled for the duration of the project to discuss the project programme, any schedule adjustments or variations that might impact on the project cost, and any technical issues associated with the UA work and the risks associated with the issues.

The Delivery Team will be responsible for ensuring the as-built information for any utility relocations or network additions are provided by the UA, and become part of the as-built plans provided to the SCIRT Delivery Team at the conclusion of the project.

**Purpose:** Define roles and responsibilities of each party to meet their obligations under the section 2 of the NZUAG COP

<b>SCIRT IST</b>	<ul style="list-style-type: none"> <li>• Utilities Management plan and Utilities Detection program</li> <li>• Monitoring Delivery Team performance in relation to service strikes</li> <li>• Ensure Utility Operator compliance with the Code NZUAG COP</li> </ul>
<b>Designer</b>	<ul style="list-style-type: none"> <li>• Providing thorough utility clash analysis and document result of utility investigations as part of detailed design report</li> <li>• Proactive use of Service plans in the design process.</li> <li>• Proactive early engagement with the Utilities involved for their input</li> <li>• Considering constructability issues as well as design requirements</li> <li>• Proactively engage with Delivery Team for their input.</li> </ul>
<b>Delivery Team</b>	<ul style="list-style-type: none"> <li>• Early Involvement in the project and proactive engagement with the design team to achieve a best for project outcome in relation to utilities</li> <li>• Engaging early with relevant utilities for their input</li> <li>• Accurately locate and provide adequate protection to utilities using industry best practice guidelines and where necessary, engaging an appropriate service provider.</li> </ul>
<b>Utilities</b>	<ul style="list-style-type: none"> <li>• Providing up to date and accurate as built records of their network (including known redundant services)</li> <li>• Provide technical assistance to designers and delivery teams to locate services.</li> <li>• Provide technical assistance to designers and delivery teams in design and construction methodology to protect or relocate services.</li> </ul>

**DESIGN GUIDELINE**

Number :  
Design Group: GEN  
Revision : 26/02/15  
Original: 24/01/13

- |                                     |   |   |                                       |
|-------------------------------------|---|---|---------------------------------------|
| <input type="checkbox"/> Wastewater | <input checked="" type="checkbox"/> Utilities | <input type="checkbox"/> Stormwater         | <input type="checkbox"/> Geotechnical |
| <input type="checkbox"/> Structures | <input type="checkbox"/> Roading              | <input type="checkbox"/> Water Reticulation |                                       |

Subject: Utilities Coordination and Sub Surface Utilities Information

Original: Design Management

Approved: Paula Lock  
Ian Campbell  
Tony Gallagher

Updated by : Dave Bain

Keywords:  
Utilities, Services, Power, Telecommunication, Gas

The purpose of this guideline is to:

- a) Define the process for ensuring the involvement of utility owners in the design process through all SCIRT gates
- b) Define the responsibilities of designers and delivery teams in the accurate mapping, location and depiction of utilities in three dimensions

## 1. Background

A working group led by SCIRT (Utilities Review Panel) has been established and formal agreement reached to facilitate coordination between utility owners, CCC and SCIRT Design and Delivery teams. Additionally the NZUAG Code of Practice, DOL Guideline and other utility specific regulations include these requirements when working with utilities.

This guideline is consistent with NZ regulations, Australia Standard AS5488 (Draft) for Sub Surface Utility Information and the USA's ASCE 38-02 Standard Guideline for the Collection and Depiction of Subsurface Utility Data.

For the avoidance of doubt, section 2.8. of the NZUAG Code of Practice contains the framework and NZ context for these requirements

Key objectives include

- Ensuring technical issues and costs associated with utilities are incorporated into SCIRT designs.
- Taking a one pass approach to complete utility planned maintenance, upgrades or future proofing at the same time as a SCIRT project where practicable
- Avoiding undue rework costs and construction delay



## 2. Requirements

### Concept Design Stage.

Designers are responsible for:

- Including SCIRT UTILITIES Coordinator in Initiation and Risk/Constructability workshops
- Using SCIRT GIS to identify potential conflicts. GIS is an indication only for horizontal position and it must be noted that the accuracy of GIS varies depending on the utility viewed.
- The Metadata section on the GIS website contains detailed comments from each utility which can be generally summarised as follows:

Utility Type	Utility Owner	SCIRT Comment on SCIRT GIS/12D Accuracy
Electricity Overhead and Underground	Orion	Generally accurate to within 1500mm horizontally subject to local ground settlement, lateral spread and alignment of poles, cabinets, distribution boxes and streetlights . No vertical accuracy
Fibre Optic Ultra Fast Broadband	Enable	Generally accurate to within 1500mm horizontally and vertically subject to local ground settlement, lateral spread and alignment of cabinets and distribution boxes
LPG Gas and Landfill Gas	Contact	Generally accurate to within 1500mm horizontally subject to local ground settlement, lateral spread and alignment of valves and meters. No vertical accuracy
Fibre Optic and Copper Telecommunication Overhead and Underground	Chorus	<p><b>Underground</b> Indication only for copper, fibre optic,.A number of redundant cables are buried and most of these redundant cables are unmarked. Further investigation and as built will be required to confirm location.</p> <p><b>Overhead</b> copper and fibre optic is generally accurate to within 1500mm subject to local ground settlement, lateral spread and alignment of poles No vertical accuracy</p> <p><b>Above ground</b> cabinets and distribution boxes –indication only Further investigation and asbuilt will be required to confirm location.</p>
Fibre Optic and Copper Telecommunication, overhead and underground	Vodafone	Although a few unmarked live services exist, Telstra/Vodafone are generally accurate to within 1500mm horizontally subject to local ground settlement, lateral spread and alignment of poles, cabinets and, distribution boxes. No vertical accuracy

### **Concept Design Stage (continued)**

- Any subsurface utilities that are deemed **at risk** by the Designer as a result of SCIRT Design must be identified and their location should be confirmed using one of the survey options below.
- Include discussion with the ECI Coordinator from the allocated Delivery Team on utilities deemed at risk
- Lodge a Work Request Form in Project Centre. The first point of contact for all Work Requests must be the Investigations Coordinator who will assign the work to the Delivery team or specialist locating contractor.
- When deciding on what utilities are at risk, consideration must also be given to local modified ground conditions, and accuracy of As Builts. Consideration should also be given to the potential for crossovers and deviations from standard alignments.
- Communicate Concept design to utility owners via Project Centre and seek their feedback using the Utilities Design Approval form (UDA) – The UDA form is to be used in conjunction with direct contact/meetings with the Utility Owners to discuss their requirements.

### **Detailed Design Stage**

Designers are responsible to

- Obtain as builts for **at risk** utilities from each utility owner using the contact details below
- SCIRT 12D files are available for Orion and Enable For Telstra and Chorus please use B4 U Dig. Contact/Rockgas can be contacted directly for plans
- Where risk of a conflict was identified at concept design, then in conjunction with the utility location providers, locations must be confirmed to positively identify the utility and provide locations accurate to a minimum of Level B below. For constructability issues, this process is to include the Delivery Team ECI Coordinator
- Complete a Utility location briefing form and WRF in Project Centre
- Send Detailed Design and Utilities Approval Form to Utilities companies via Project Centre
- Engage directly with affected utility(s) owners and gain agreement on the design requirements and construction methodology required to protect or relocate the affected utility. The utility owner's agreement to this protection or relocation must be detailed on the UDA form in Project Centre.
- If a utility owner chooses to extend or upgrade their network as part of a SCIRT project then a commercial agreement for this work must be negotiated and agreed by the IST Utility Coordinator. That agreement will include both direct and design costs associated with the extension or upgrade

Detail for the protection/relocation/upgrade for all affected utilities must be included in the Methodology as part of the ECI documentation. For example: Input from both the designer and ECI coordinator will be required on projects where there is permanent work resulting from SCIRT design and temporary work required as part of Delivery teams construction methodology.

### **Utility Survey for Design and Construction**

This guideline is consistent with NZ regulations, Australia Standard AS5488 (Draft) for Sub Surface Utility Information and the USA's ASCE 38-02 Standard Guideline for the Collection and Depiction of Subsurface Utility Data. For the avoidance of doubt, section 2.8. of the NZUAG Code of Practice contains the framework and NZ context for these requirements

#### **Quality Level D**

Utility attribute information from SCIRT WebMaps spatial viewer shall include—

- (a) utility owner;
- (b) an indication of the utility type; and
- (c) an indicative location of the visible and subsurface features of the utility.

Tolerance does not apply to an indicative location that is attributed to quality level D.

#### **Quality Level C**

Quality level C is described as a surface feature correlation or an interpretation of the approximate location and attributes of a subsurface utility asset using a combination of existing records (and/or anecdotal evidence) and a site survey of visible evidence. The minimum requirement for quality level C is geo spatial position in the local coordinate system.

#### **Attribute information**

Quality level C attribute information shall include—

- (a) utility owner;
- (b) an indication of the utility type;
- (c) an interpolation of the location and direction of the subsurface utility using visible features or SURVEY ACCURATE coordinates if available, as points of reference;
- (d) feature codes of visible features including but not limited to pits, access chambers, poles, valves and hydrants; and
- (e) the location of visible features measured in terms of spatial positioning with a maximum horizontal tolerance of  $\pm 200$  mm.

### **Quality Level B**

Quality level B provides relative subsurface feature location in three dimensions. The minimum requirement for quality level B is geo spatial position in the local coordinate system and datum.

Attribute information

Quality level B attribute information shall include—

- (f) utility owner;
- (g) an indication of the utility type;
- (h) the location of visible features measured geospatially with a maximum horizontal tolerance of  $\pm 100$  mm; and
- (i) the location of subsurface features measured geospatially with a maximum horizontal tolerance of  $\pm 100$  mm and maximum vertical tolerance of  $\pm 100$  mm.  
Where there are contiguous services (e.g. a cluster of Chorus ducts) an indication of the horizontal extent of these shall be recorded to a minimum of Level C.

### **Quality Level A**

Quality level A is the highest quality level and consists of the positive identification of the attribute and location of a subsurface utility at a point to absolute geospatial accuracy in three dimensions. It is the only quality level that defines a subsurface utility as 'validated'.

Where the whole line segment cannot be verified by line of sight, quality level A shall not be attributed to the line segment between validated points.

**Attribute information**

Quality level A attribute information shall include—

- (j) utility owner;
- (k) the utility—
  - (i) type;
  - (ii) status (in service or unknown)
  - (iii) material;
  - (iv) size; and
  - (v) configuration,
- (l) feature codes of visible and subsurface features including but not limited to pits, access chambers, poles, valves, hydrants; and
- (m) the location of points surveyed on visible surface and subsurface features measured in terms of absolute spatial positioning with a maximum horizontal and vertical tolerance of  $\pm 50$  mm.

Local Coordinate System SCIRT: New Zealand Geodetic Datum 2000 - Mt Pleasant projection (NZGD2000 MT PLEAS)

Local Vertical Datum SCIRT: CHCH Drainage Datum (CDD)

## Approving, invoicing and payment of design costs

### Design Stage

- Designer liaises directly with utility owner and ECI Coordinator to identify best design for protection or relocation of the utility.
- Designer raises work request for utility location through Asset Assessment Team or Survey Manager.
- Designer requests assessment/design and cost estimate from utility owner using UDA form or general correspondence in Project Centre
- Where the utility owner has chosen to extend or upgrade their network in as part of a SCIRT project then a commercial agreement for this work must be negotiated and agreed by the IST Utility Coordinator.
- Where work is for protection or relocation as a result of SCIRT design, utility owner completes assessment/design and invoices SCIRT for this work
- Designer includes relocation of utility in Detailed Design Drawing
- Design Team codes invoice to Design as follows:

Design Stage	Project Number	Full Code
Concept Design	10xxx	10xxx 10.8500
Detailed Design	10xxx	10xxx 15.8500
For example:	10234	10234 10.8500

1. Invoice is approved by Design Manager

NB: Construction Coding must include Project Number 10XXX, GL code 8500, Full code 10XXX 8500



## **DELIVERY GUIDELINE**

Number :  
Design Group: GEN  
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☐ Wastewater      ☒ Utilities      ☐ Stormwater      ☐ Geotechnical  
☐ Structures      ☐ Roading      ☐ Water Reticulation

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1. Describe the process for ensuring the involvement of utilities in the design process through all SCIRT gates.
2. Provide for the accurate mapping, location, protection and depiction of utilities in three dimensions.

## **BACKGROUND**

A working group led by SCIRT (Utilities Review Panel) has been established and formal agreement reached to facilitate coordination between utility owners, CCC and SCIRT Design and Delivery teams. Additionally the NZUAG Code of Practice, DOL Guideline and other utility specific regulations include these requirements when working with utilities.

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Key objectives include:

- Ensuring technical issues and costs associated with utilities are incorporated into SCIRT designs.
- Taking a one pass approach to complete utility planned maintenance, upgrades or future proofing at the same time as a SCIRT project where practicable

## **REQUIREMENTS**

### **Concept Design Stage**

- The Delivery Team ECI Coordinator is to Include discussion with Designer from the allocated Design Team on the utility component of ECI in relation to the project.

### **Detailed Design Stage**

- Where risk of a conflict was identified by the Design Team, then in conjunction with the utility location providers, locations must be confirmed to positively identify the utility and provide locations accurate to a minimum of Level B below. For constructability issues, this process is to include the Delivery Team ECI Coordinator and Project Engineer.
- Utility location providers to provide information on any potentially relevant features or unidentified services.
- Engage directly with affected Utility(s) companies and gain agreement on the design requirements and construction methodology required to protect or relocate the affected utility, The utility's agreement to this protection or relocation must be detailed on the UDA form in Project Centre.
- If a utility chooses to extend or upgrade their network in as part of a SCIRT project then a commercial agreement for this work must be negotiated and agreed by the IST Utility Coordinator.
- Detail for the protection/relocation/upgrade for all affected utilities must be included in the Methodology as part of the ECI documentation.

### **Delivery Stage**

- Delivery Team Project Engineer to provide construction methodology for protection/relocation/upgrade of all affected utilities as part of the ECI Documentation, for consideration in TOC development.
  - Delivery Team Project Engineer to contact affected utilities and confirm their approval of detailed design.
  - Delivery Team Project Engineer must obtain as built service plans from each utility using the contact details below.
  - Do not use as built that were issued by the utility more than 30 days ago.
  - Delivery Team to complete Permit to Excavate and record in permit register.
  - Locations to be marked out to SCIRT approved standards.

To ensure best practice and to provide a focus for reducing strikes on utility networks, the following service location and protection procedures should be applied by all Delivery Teams and subcontractors:

- **Training and Education**

- Project Managers, site engineers, supervisors, operators and spotters must be provided with appropriate training in reading service plans and locating services.
- Training must be provided to a standard and in a manner approved by the Delivery Team Leader.
- Site toolbox meetings must include the procedures below for locating, exposing and working around services.

- **Consequences**

- A Non Compliance Report will be raised for each network strike where process and/or procedure has not been followed.
- Where a network strike has occurred, the site will be closed and the crew stood down until an investigation is completed and the Delivery Team Leader has authorised the reopening of the site.
- Compulsory drug and alcohol testing is required after hitting any live service.
- It is expected that that each company would follow its own internal disciplinary procedures where a Non Compliance Report has been issued. This includes both direct and subcontract personnel.

NOTE: Section 8 of the Utilities Access Act 2010 provides for the following penalty. where "... a person is subject to an order made under [section 7](#), fails to comply with the order,..... commits an offence and is liable on conviction to a fine not exceeding **\$200,000**".

- **Technical/Physical Initiatives**

- Hydro or vacuum excavation is the default method for exposing underground services on all SCIRT sites.
- The SCIRT Best Practice Guidelines for Hydro Excavation and Subsurface Utility Location outline the key considerations required for efficient and cost effective location by GPR and hydro excavation.
- In circumstances where hydro or vacuum excavation is not practical or excessively expensive, the project engineer shall undertake a formal risk analysis and the document the reasons not to hydro/vacuum excavate in the JSEA.
- The work crew, led by the project engineer shall ensure the appropriate tools and methodology for locating services are applied on their project. As a minimum, pipe and cable tracers must be present on site for use by trained personnel. If, following a risk analysis, the project engineer determines that hand digging is appropriate, the use of steel crowbars is prohibited as a tool when hand digging for services
- Use of "goal posts and buntings" to warn operators of the presence of overhead services. Where a project engineer determines goalposts are not practical, sleeved cones or signage warning of the presence of overheads are a minimum requirement on all sites where overhead lines are present.
- Physical protection of at risk services must be put in place when the construction activity may compromise the service. For example fragile AC pipes. For the avoidance of doubt, construction activity includes hydro excavation, compacting, directional drilling and grouting. The standard CSS specification for replacement of AC pipes must be followed and particular care must be taken with those utilities which span across trenches.



- **Process**

- Permits allowing machinery or hand digging within 1.5 metres of a service that is indicated on a drawing shall not be issued unless a formal risk analysis has been undertaken and the reasons behind the decision are documented on the JSEA.
- GPR or RF Cable and Pipe Tracers\* are to be used to locate the service indicated and hydro or air excavation is the default method to visually identify the service as determined by the Project Engineer. The service must be positively identified and its attributes recorded as above before excavation as specified in the pre dig documentation is commenced within 1.5 metre of that service.
- The minimum number of potholes/slot trenches required each day must be specified by the Site Engineer and recorded on the daily Pre Dig documentation. When deciding on where to slot trench or pothole and the frequency of slot trenches or potholes, consideration must be given to local conditions and the potential for crossovers and deviations from standard alignments.

### **Utility Survey for Design and Construction**

This guideline is consistent with NZ regulations, Australia Standard AS5488 (Draft) for Sub Surface Utility Information and the USA's ASCE 38-02 Standard Guideline for the Collection and Depiction of Subsurface Utility Data. For the avoidance of doubt, section 2.8. of the NZUAG Code of Practice contains the framework and NZ context for these requirements.

#### **Quality Level D**

Utility attribute information from SCIRT WebMaps spatial viewer shall include:

- Utility owner;
- An indication of the utility type and
- An indicative location of the visible and subsurface features of the utility.

Tolerance does not apply to an indicative location that is attributed to quality level D.

#### **Quality Level C**

Quality level C is described as a surface feature correlation or an interpretation of the approximate location and attributes of a subsurface utility asset using a combination of existing records (and/or anecdotal evidence) and a site survey of visible evidence. The minimum requirement for quality level C is geo spatial position in the local coordinate system\*\*.

#### **Attribute information**

Quality level C attribute information shall include:

- Utility owner;
- An indication of the utility type;
- An interpolation of the location and direction of the subsurface utility using visible features or SURVEY ACCURATE coordinates if available, as points of reference;
- Feature codes of visible features including but not limited to pits, access chambers, poles, valves and hydrants and
- The location of visible features measured in terms of spatial positioning with a maximum horizontal tolerance of  $\pm 200$  mm.

### **Quality Level B**

Quality level B provides relative subsurface feature location in three dimensions. The minimum requirement for quality level B is geo spatial position in the local coordinate system and datum\*\*.

#### **Attribute information**

Quality level B attribute information shall include:

- Utility owner;
- An indication of the utility type;
- The location of visible features measured geospatially with a maximum horizontal tolerance of  $\pm 100$  mm;
- The location of subsurface features measured geospatially with a maximum horizontal tolerance of  $\pm 100$  mm and maximum vertical tolerance of  $\pm 100$  mm. Where there are contiguous services (e.g. a cluster of Chorus ducts) an indication of the horizontal extent of these shall be recorded to a minimum of Level C

### **Quality Level A**

Quality level A is the highest quality level and consists of the positive identification of the attribute and location of a subsurface utility at a point to absolute geospatial accuracy in three dimensions. It is the only quality level that defines a subsurface utility as 'validated'.

Where the whole line segment cannot be verified by line of sight, quality level A shall not be attributed to the line segment between validated points.

#### **Attribute information**

Quality level A attribute information shall include:

- Utility owner;
- The utility i.e.
  - type;
  - status (in service or unknown)
  - material;
  - size; and
  - configuration,
- Feature codes of visible and subsurface features including but not limited to pits, access chambers, poles, valves, hydrants; and
- The location of points surveyed on visible surface and subsurface features measured in terms of absolute spatial positioning with a maximum horizontal and vertical tolerance of  $\pm 50$  mm.

\*\*

*Local Coordinate System SCIRT: New Zealand Geodetic Datum 2000 - Mt Pleasant projection (NZGD2000 MT PLEAS)*

*Local Vertical Datum SCIRT: CHCH Drainage Datum (CDD)*

## **Approving, invoicing and payment of costs**

### **Design Stage**

- Designer liaises directly with utility owner and ECI Coordinator to identify best design for protection or relocation of the utility.
- Designer raises work request for utility location through Asset Assessment Team or Survey Manager.
- Designer requests assessment/design and cost estimate from utility owner using UDA form or general correspondence in Project Centre.
- Where the utility owner has chosen to extend or upgrade their network in as part of a SCIRT project then a commercial agreement for this work must be negotiated and agreed by the IST Utility Coordinator.
- Where work is for protection or relocation as a result of SCIRT design, utility owner completes assessment/design and invoices SCIRT for this work.
- Designer includes relocation of utility in Detailed Design Drawing.
- Design Team codes invoice to Design as follows:

<b>Design Stage</b>	<b>Project Number</b>	<b>Full Code</b>
<b>Concept Design</b>	<b>10xxx</b>	<b>10xxx 10.8500</b>
<b>Detailed Design</b>	<b>10xxx</b>	<b>10xxx 15.8500</b>
<b>For example:</b>	<b>10234</b>	<b>10234 10.8500</b>

Invoice is approved by Design Manager

### **Delivery Stage**

- Project Manager/Site Engineer liaises directly with Utility to schedule the work shown on Drawings.
- Where utility has chosen to extend or upgrade their network in as part of a SCIRT project then a commercial agreement for this work must be negotiated and agreed by the IST Utility Coordinator.
- Where work is for protection or relocation as a result of SCIRT design, Utility completes the work and invoices directly to the Delivery Team.
- Delivery Team codes the invoice to Construction and approves the invoice.

NB: Construction Coding must include Project Number 10XXX, GL code 8500, Full code 10XXX 850.

## Plan Requests

When requesting plans, please ensure you provide:

- ✓ A clear description of the area concerned, preferably with a copy of the street layout
- ✓ Where 33kv or 66kv electrical cables are present, Orion representatives must be notified directly

### **Service Authority**

### **Phone Number**

### **Fax / E-mail/website**

#### Orion NZ Ltd

All requests to be made via the web page.

Underground requests at: [www.oriongroup.co.nz](http://www.oriongroup.co.nz)

#### Chorus/ Telecom NZ Ltd

(including old Gas lines which are on CD)

BeforeUdig 0800-248 344  
0800 248 747

[www.beforeudg.co.nz](http://www.beforeudg.co.nz)  
[planrequest@beforeudig.co.nz](mailto:planrequest@beforeudig.co.nz)

#### Gas - Rockgas

Plans and notifications:  
Project Engineer: Wai Yu

All requests via email to  
373-6448

[LPGAsBuiltAdminRequest@contactenergy.co.nz](mailto:LPGAsBuiltAdminRequest@contactenergy.co.nz)  
[wai.yu@contactenergy.co.nz](mailto:wai.yu@contactenergy.co.nz)

#### Enable Networks

0800 434 273

[www.beforeudig.co.nz](http://www.beforeudig.co.nz)

#### Vodafone

BeforeUdig 0800-248344

[www.beforeudig.co.nz](http://www.beforeudig.co.nz)

Plan interpretations

0800 248 747  
0508-651-050 option 2

[planrequest@beforeudig.co.nz](mailto:planrequest@beforeudig.co.nz)

Liquigas (Lyttelton to city)

Les Nelson

033842481

[les.nelson@liquigas.co.nz](mailto:les.nelson@liquigas.co.nz)



### Project Centre User Details

• Orion	Mike Miles	ORN-MM	DDI: 03 363 9824
	Coralee Cumberlidge	ORN-CC	DDI 03 363 9826
• Chorus	Ray Venis	CHS - RV	DDI: 03 339 3366
	George Condon	CHS – GC	DDI: 03 <u>353 3256</u>
• Enable	Nicholas Latham	ENN-NL	DDI: 03 741 3878
• Vodafone	Richard Schoeman	VOD –RS	DDI: 03 982 6596
	Eddie Smit	VOD – ES	DDI: 03982 6023
• Contact	Wai Yu	CTE- WY	DDI: 03 373 6413
• Two Degrees	Ron Bush	TDM-SS	DDI: <b>022 0605662</b>



## **CONTACT DETAILS**

<b>Company</b>	<b>Utility</b>	<b>Full Name</b>	<b>Business Phone</b>	<b>Mobile Phone</b>	<b>E-mail</b>
Chorus	Telecommunications	George Condon (Transfield)	03 375 1026	027 647 0509	<a href="mailto:Richard.clark@transfieldservices.co.nz">Richard.clark@transfieldservices.co.nz</a>
Chorus	Telecommunications	Ray Venis (Downer)	03 3393 366		<a href="mailto:ray.venis@downer.co.nz">ray.venis@downer.co.nz</a>
Connetics	Street lighting	Tony Walker	03 353 7246	027 438 0758	<a href="mailto:walkera@connetics.co.nz">walkera@connetics.co.nz</a>
Connetics	Street lighting	Steve Muir	03 353 7341		<a href="mailto:muirs@connetics.co.nz">muirs@connetics.co.nz</a>
Contact Energy	Gas	Wai Yu	03 373 6413		<a href="mailto:wai.yu@contactenergy.co.nz">wai.yu@contactenergy.co.nz</a>
Enable Network	Ultrafast Broadband	Nicholas Latham	03 741 3878	022 060 9462	<a href="mailto:Nicholas.latham@enable.net.nz">Nicholas.latham@enable.net.nz</a>
Kiwi Rail	Rail Crossings	Wayne Ramsay	03 3393 978		<a href="mailto:wayne.ramsay@kiwirail.co.nz">wayne.ramsay@kiwirail.co.nz</a>
Orion	Electricity Network	Mike Miles	03 363 9824	027 432 6830	<a href="mailto:mike.miles@oriongroup.co.nz">mike.miles@oriongroup.co.nz</a>
Orion	Electricity Network	Coralie Cumberlidge	03 363 9826		<a href="mailto:coralee.cumberlidge@oriongroup.co.nz">coralee.cumberlidge@oriongroup.co.nz</a>
Vodafone	Telecommunications	Richard Schoeman	03 982 6596	029 982 6596	<a href="mailto:Richard.schoeman@vodafone.com">Richard.schoeman@vodafone.com</a>
Vodafone	Telecommunications	Eddie Smit	03 982 6023	029 982 6023	<a href="mailto:eddie.smit@vodafone.com">eddie.smit@vodafone.com</a>
Vodafone	Mobile	Mark Hamlin		021 413 727	<a href="mailto:mark.hamlin@vodafone.com">mark.hamlin@vodafone.com</a>
Spark	Mobile	Jim McGregor		027 474 1512	<a href="mailto:jim.mcgregor@spark.co.nz">jim.mcgregor@spark.co.nz</a>
Two Degrees	Mobile	Ron Bush		022 060 5662	<a href="mailto:ron.bush@2degreesmobile.co.nz">ron.bush@2degreesmobile.co.nz</a>